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[54] **MEDICAL APPARATUS AND METHOD FOR FEEDING AND ASPIRATING**

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[52] **U.S. Cl.** ..... **128/230**, 128/2 A, 128/276

[51] **Int. Cl.** **A61m 1/00**

[58] **Field of Search** ..... 128/230, 213, 214, 224, 128/2 A, 2 R, 2 S, 227, 276

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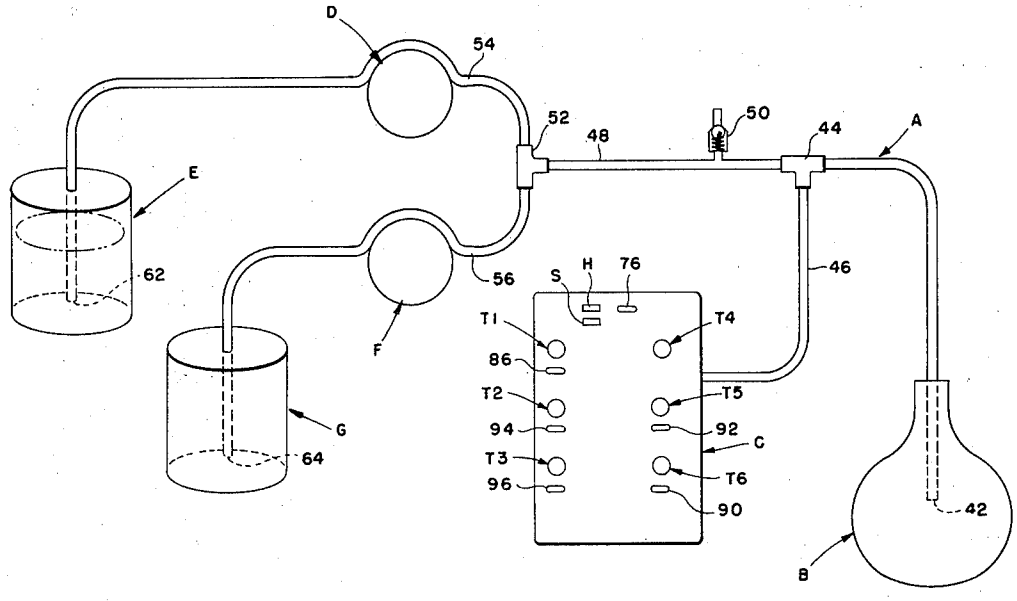
[57] **ABSTRACT**

Apparatus includes means for feeding a solution to the stomach of a patient, and sensing the pressure within the stomach to stop feeding when an overpressure condition exists. The stomach is then aspirated for a predetermined time. After aspiration, irrigation fluid is pulsed to the stomach.

20 Claims, 2 Drawing Figures



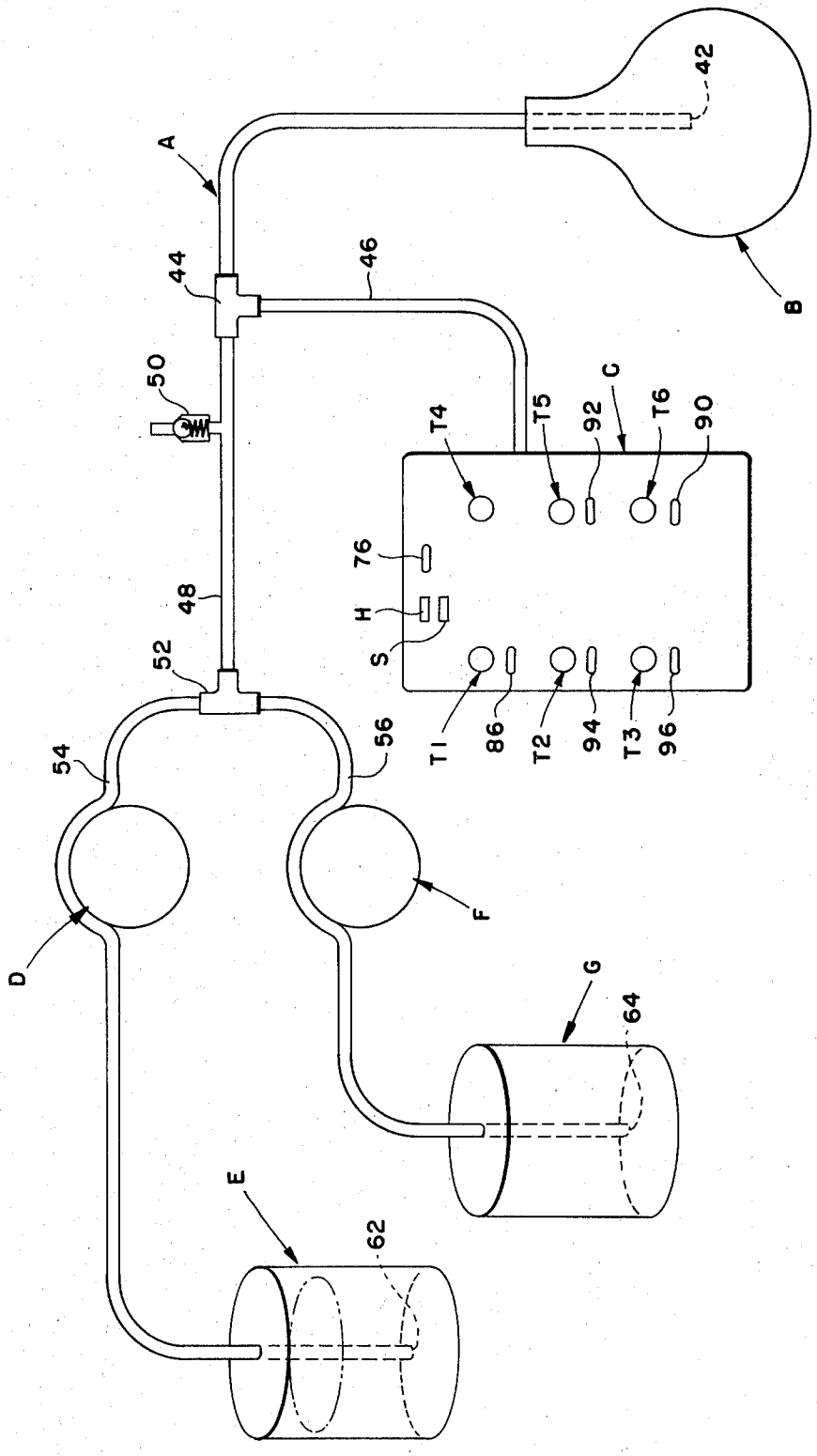

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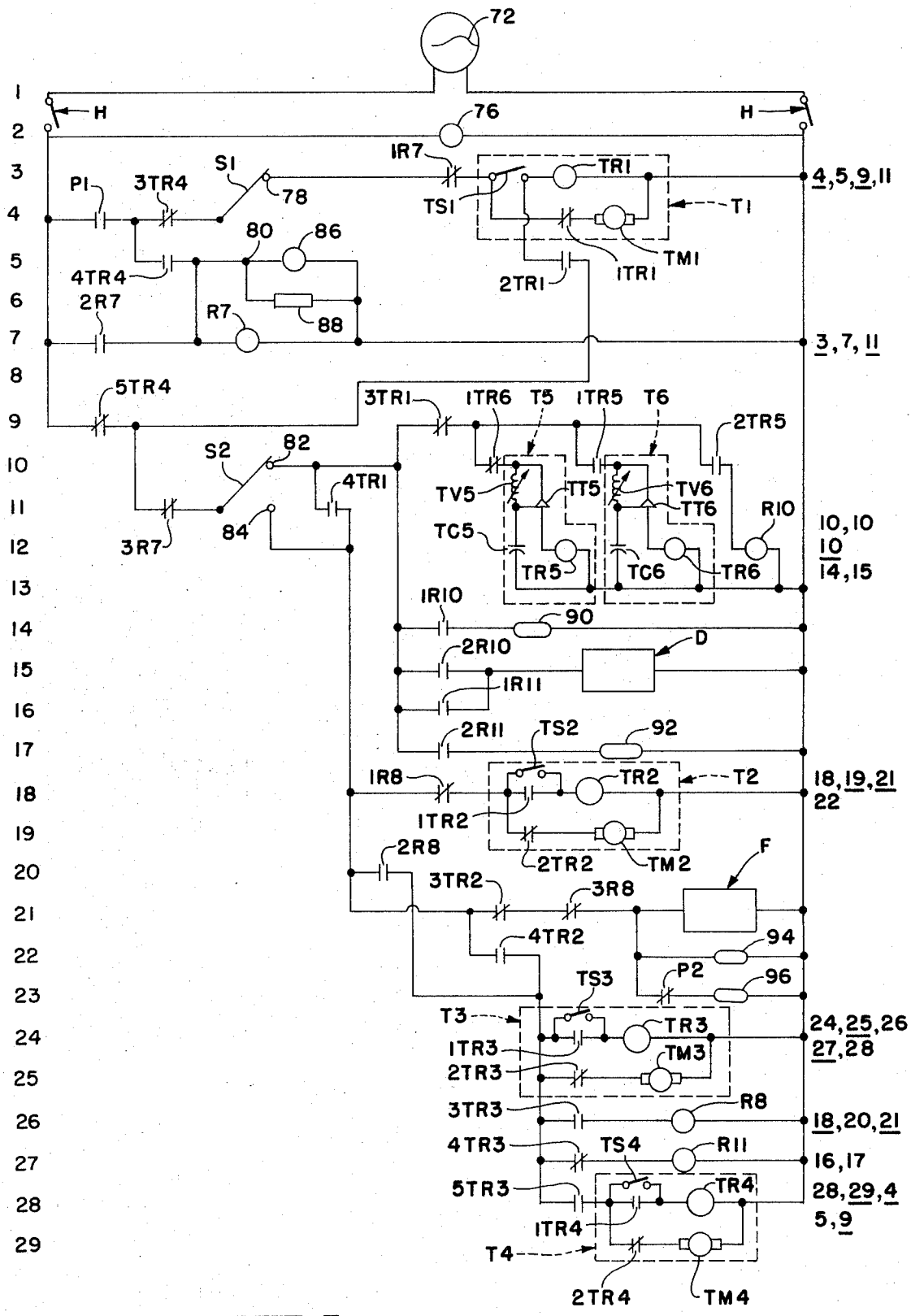
FIG. 1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2TR3
3TR3
R8
18,20,21
4TR3
TS4
R11
16,17
5TR3
TR4
28,29,4
5,9
1TR4
T4
2TR4
TM4

Fig. 2

MEDICAL APPARATUS AND METHOD FOR FEEDING AND ASPIRATING

BACKGROUND OF THE INVENTION

This application pertains to the art of feeding or aspirating, and more particularly to feeding or aspirating the stomach of a patient during medical treatment.

Medical treatment of patients often requires automatic feeding. Feeding a solution intravenously is not completely satisfactory because a relatively small blood vessel is not intended to carry enough food for the entire body, and prolonged feeding into a vessel can result in partial loss of the use of an arm.

Feeding a solution directly into the stomach of the patient eliminates the above noted objections to intravenous feeding but often results in a build up of pressure which causes rejection of the solution. A solution is sometimes fed to the stomach for enhancing wound healing, and a build up of pressure causing rejection of the solution results in poor wound healing.

Patients undergoing post-operative recovery also commonly have a large amount of gas in the stomach due mostly to swallowed air, which produces extreme discomfort and rejection of food supplied to the stomach. To relieve the pressure and minimize the discomfort, the stomach is commonly aspirated to permit supply of a feeding solution.

SUMMARY OF THE INVENTION

In accordance with the present invention, a feeding solution is supplied directly to the stomach of a patient, and the pressure within the stomach is sensed for interrupting the feeding cycle when an overpressure condition exists.

In accordance with a preferred arrangement, stoppage of the feeding cycle due to an overpressure condition automatically starts an aspirating cycle for aspirating the stomach. Preferably, the aspirating cycle does not commence until the overpressure condition has continuously existed for a predetermined time.

In accordance with one aspect of the invention, the aspirating cycle operates for a predetermined period of time, and is followed by an irrigating cycle which provides irrigating liquid for a short period of time. The irrigating liquid cleanses the tube leading to the stomach and flushes away any mucus or particles trapped in the tube openings.

Subsequent to the irrigating cycle, the stomach is again checked for an overpressure condition, and if there is no overpressure condition, the feed cycle is again automatically started. If an overpressure condition does exist, as indicated, for example, by an audible signal, the aspirating cycle may be repeated.

In accordance with another aspect of the invention, the apparatus may be selectively operated in a feeding, aspirating and irrigating cycle, or only in an aspirating and irrigating cycle.

With the foregoing in mind, it is a principal object of the present invention to provide an improved apparatus and method for feeding a solution to the stomach of a patient.

A further object is to provide an improved apparatus and method for feeding a solution to the stomach of a patient and automatically stopping the feed when the overpressure condition exists.

An additional object is to provide an improved apparatus and method for automatically aspirating the stomach of a patient when an overpressure condition exists.

Still another object is to provide an improved apparatus which is selectively operable to feed or aspirate the stomach of a patient.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWINGS

In the annexed drawings:

FIG. **1** is a schematic illustration of an improved apparatus constructed in accordance with the present invention; and

FIG. **2** is an electrical schematic of a control circuit for operating the apparatus of FIG. **1.**

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings, wherein the showings are for purposes of illustrating a preferred embodiment of the invention only and not for purposes of limiting same, FIG. **1** shows an improved apparatus constructed in accordance with the present invention.

Flexible tube A of polyvinyl chloride or the like extends through the esophagus of a patient and has an outlet opening **42** positioned within stomach B of the patient. Obviously, the opening in tube A positioned within stomach B may comprise a plurality of small openings in the wall of tube A. Tube A is connected by tee connector **44** to conduit **46** leading to a control panel C. Another conduit **48** is also connected to tee connector **44** and has a ball check relief valve **50** therein. The opposite end of conduit **48** is connected with tee connector **52.** Flexible tubes **54** and **56** are connected with tee connector **52** Tube **54** extends through a feeding and irrigating peristaltic pump D, and has an inlet **62** positioned in solution supply receptacle E. Receptacle E may contain a feeding solution of amino acids, glucose or the like. Tube **56** extends through peristaltic pump F and has an outlet **64** positioned in storage receptacle G.

Obviously, any suitable type of positive displacement pump may be used in the apparatus of the present invention. Pump D is operative for withdrawing feeding solution from receptacle E. and feeding it through tube A and outlet opening **42** into stomach B. Aspirating pump F is operative for aspirating material from stomach B through inlet opening **42** and tube A over a storage receptacle G.

Check valve **50** limits the maximum amount of vacuum which can be created in conduit **48,** and therefore in stomach B, by pump F. Control panel C includes a main on-off switch H. A selector switch S is also provided for selectively operating either pump D or pump F. A plurality of control knobs are provided for setting a plurality of timers. The knobs on panel C have been designated **T1** through **T6** to indicate the various timers which are set by the control knobs. Control panel C also includes an on indicator light **76;** an overpressure indicator light **86;** a feeding indicator light **92;** an irrigating indicator light **90;** an aspirating indicator light **94;** and an insufficient vacuum indicator light **96.** Suitable indicia may be provided on control panel C to tell

an operator what the various timer knobs and indicator lights are for.

Conduit **46** is connected to a suitable pressure switch within the box for control panel C. This checks the pressure within tube A, and therefore in stomach B, to sense an overpressure condition for stopping operation of feed pump D.

A schematic electrical circuit for operating the device is shown in FIG. **2.** The circuit is adapted to be connected to a source of alternating current generally indicated by numeral **72.** The circuit includes a plurality of relay clutch timers and solid state timing devices. As is well known, relay clutch timers may be provided with either a standard clutch feature or a reverse clutch feature. With a standard clutch feature, a clutch between the timer motor and timer cam is normally disengaged and is engaged upon energization of a relay. In a reverse clutch timer, a clutch between the timer motor and timer cam is normally engaged and is disengaged upon energizatin of a relay. The circuit of FIG. **2** uses relay clutch timers having a reverse clutch feature. However, it will be recognized that various other types of timers may be used. In a relay clutch timer having a reverse clutch feature, energization of the timer motor rotates a cam for the time set by the timer knob. When the timer is timed out, the cam operates a timer switch to energize a timer relay. During rotation of the cam by the timer motor, a coil spring connected with the timer cam is wound up. Energization of the relay disengages the clutch and the wound up coil spring resets the timer cam so that the timer is ready for another operation.

The lines of the circuit in FIG. **2** are indicated by numerals **1** through **30** to the left of FIG. **2.** The lines in which each relay has contacts are indicated to the right of FIG. **2,** with numerals indicating lines having normally closed contacts being underlined.

Relay clutch timer T1 includes motor TM1, switch TS1 and relay TR1. Relay TR1 has normally closed contacts 1TR1 and 3TR1 in lines **4** and **9** respectively, and normally open contacts 2TR1 in lines **5** and **11** respectively.

Relay clutch timer T2 includes motor TM2, switch TS2 and relay TR2. Relay TR2 has normally closed contacts 2TR2 and 3TR2 in lines **19** and **21** respectively. Relay TR2 has normally open contacts 1TR2 and 4TR2 in lines **18** and **22** respectively.

Relay clutch timer T3 includes motor TM3, switch TS3 and relay TR3. Relay TR3 has normally closed contacts 2TR3 and 4TR3 in lines **25** and **27** respectively. Relay TR3 has normally open contacts 1TR3, 3TR3, and 5TR3 in lines **24, 26** and **28** respectively.

Relay clutch timer T4 includes motor TM4, switch TS4 and relay TR4. Relay TR4 includes normally closed contacts 3TR4, 5TR4 and 2TR4 in lines **4, 9** and **29** respectively. Relay TR4 includes normally open contacts 4TR4 and 1TR4 in lines **5** and **28** respectively.

Solid state timing device T5 includes a variable resistance TV5 in series with capacitors TC5. A unijunction transistor TT5 is connected between variable resistance TV5 and capacitor TC5. Solid state timing device T5 includes a relay TR5. Relay TR5 has normally open contacts 1TR5 and 2TR5 in line **10.**

Solid state timing device T6 includes a variable resistance TV6 in series with capacitor TC6. Unijunction transistor TT6 is connected between variable resistance TV6 and capacitor TC6. Relay TR6 is connected in series with unijunction transistor TT6. Relay TR6 has normally closed contacts 1TR6 in line **10.**

Relay R7 in line **7** has normally closed contacts 1R7 and 3R7 in line **3** and **11** respectively, and normally open contacts 2R7 in line **7.**

Relay R8 in line **26** has normally closed contacts 1R8 and 3R8 in lines **18** and **21** respectively, and normally open contacts 2R8 in line **20.**

Relay R10 in line **12** has normally open contacts 1R10 and 2R10 in lines **14** and **15** respectively.

Relay R11 in line **27** has normally open contacts 1R11 and 2R11 in line **16** and **17** respectively.

Selector switch S is a double-pole double-throw switch having switch arms S1 and S2 in FIG. **2.** Switch arm S1 may be thrown for contact with either of contacts **78** or **80.** Switch arm S2 may be thrown for contact with either of contacts **82** and **84.**

A buzzer **88** may be connected in parallel with overpressure indicator light **86** to provide an audible signal when an overpressure condition exists.

Pump D is generally indicated in line **15,** while aspirating pump F is generally indicated in line **21.** This designation is simply for convenience of explanation, and it will be recognized that the rectangular blocks designated by numerals D and F in FIG. **2** may actually be electrical sockets into which the motors for the pumps would be plugged.

OPERATION

In operation of the device, main on-off switch H is closed to energize the circuit. Selector switch S may then by thrown to provide only an aspirate and irrigate cycle, or a feeding, aspirating and irrigating cycle. In the arrangement of FIG. **2,** switch S is thrown so that arms S1 and S2 are respectively engaging contacts **78** and **82.** This represents the condition of the selector switch for a feeding, aspirating and irrigating cycle.

Solid state timing device T5 may be set anywhere between 0.1 and 10 seconds by adjusting variable resistance TV5. For purposes of explanation, it will be assumed that solid state timing device T5 is set for 10 seconds. Thus, it will take 10 seconds to charge capacitor TC5 with sufficient potential for avalanching transistor TT5 to energize relay TR5.

Solid state timing device T6 can also be set anywhere between 0.1 and 10 seconds by adjusting variable resistance TV6. For purposes of explanation, it will be assumed that solid state timing device T6 is set to approximately 5 seconds. Thus, it will take 5 seconds for charging capacitor TC6 with sufficient potential for avalanching transistor TT6 to energize relay TR6. Capacitor TC5 has sufficient potential for continuing current flow through transistor TT5 for the entire timing period of timing device T6.

With the selector switch positioned as described, solid state timing device T5 is energized through normally closed contact 5TR4 in line **9,** normally closed contact 3R7 in line **11,** switch arm S2, normally closed contact 3TR1 in line **9** and normally closed contact 1TR6 in line **10.** After 10 seconds, relay TR5 is energized. This closes normally open contacts 1TR5 and 2TR5 in line **10.** Relay R10 is then energized to close normally open contacts 1R10 and 2R10 in lines **14** and **15.** This energizes feed pump D and feed light **90.** Solid state timing device T6 then times 5 seconds before relay TR6 is energized. Energization of relay TR6 opens normally closed contacts 1TR6 in line **10** for de-

energizing solid state timing device T5. This opens contacts 1TR5 and 2TR5 in line 10 to de-energize relay R10 for stopping feed pump D and de-energizing feed indicator light 90. This feeding operation is successively repeated, with feed solution being supplied to stomach B for 5 seconds between every 10 second period timed by timing device T5. Feeding continues successively for 5 second intervals every 10 seconds in the manner described. Obviously, solution may be fed at any desirable rate, and pump D may have a variable speed for adjusting the feed rate. A typical example is to feed at a rate of 450 cubic centimeters per hour while the pump is operating.

The pressure switch connected with conduit 46 of FIG. 1 is constantly checking the pressure within stomach B. An overpressure condition may be defined by any desirable pressure. A typical example is 15 centimeters of water. That is, when the pressure within stomach B is greater than 15 centimeters of water, the pressure switch will operate. The pressure switch has normally open contacts P1 in line 4. As long as an overpressure condition does not exist, feeding will continue intermittently in the manner described. However, if an overpressure condition exists, contacts P1 will close. This will energize motor TM1 of timer T1 through contacts P1, normally closed contacts 3TR4, switch arm S1, normally closed contacts 1R7 and normally closed contacts 1TR1. Timer T1 defines a delay device for stopping operation of the feed cycle. Momentary overpressure conditions often occur and it is not desirable to immediately stop feeding when an overpressure condition takes place only momentarily. Timer T1 may be set anywhere from 0 to 60 seconds. In a typical situation, timer T1 would be set for 15 seconds. If the overpressure condition does not exist for 15 seconds, contacts P1 will open and simply de-energize timer T1. Feeding will continue as previously described. However, if the overpressure exists for at least 15 seconds, timer T1 will time out and its cam will close switch TS1 to energize relay TR1. Energization of relay TR1 will open contacts 1TR1 in line 4 to de-energize motor TM1. Contacts 3TR1 in line 9 will also open to de-energize timers T5 and T6. Contacts 2TR1 in line 5 will close to provide a holding circuit through contacts 5TR4 in line 9 to maintain relay Tr1 energized when the cam re-sets and switch TS1 opens. Contacts 4TR1 in line 11 will also close to provide a circuit down to the aspirating and irrigating portions of the circuit.

Energization of relay TR1 in the manner previously described establishes a circuit through contacts 5TR4 in line 9, contacts 3R7 in line 11, switch arm S2, contacts 4TR2 in line 11 and contacts 1R8 in line 18 to timer T2. Motor TM2 is then energized through normally closed contacts 2TR2. Timer T2 may be set for anywhere between 0 to 60 minutes. In a typical example, timer TR2 is set for around 30 minutes. A circuit is also established through normally closed contacts 3TR2 and 3R8 in line 21 for operating aspirating pump F. Aspirating indicator light 94 is also lighted. Pump F will then operate to aspirate from stomach B through tube A into receptacle G. The pressure switch may have a normally closed contact T2 connected in series with an insufficient vacuum light 96. The speed of pump F may be adjusted for setting it to a desirable vacuum anywhere between 0 and 100 centimeters of water. If the pump is operating at a speed insufficient to draw the desirable vacuum, contacts P2 will remain closed and insufficient vacuum indicator light 96 will remain illuminated. Once the pump is adjusted to provide the desirable vacuum, contacts P2 will open and the insufficient vacuum light will go off. Relief valve 50 limits the maximum vacuum to around 100 centimeters of water.

When timer T2 is timed out after 30 minutes, its cam closes switch TS2 for energizing relay TR2. This opens normally closed contacts 2TR2 for de-energizing motor TM2. This also closes contacts 1TR2 for establishing a circuit to maintain relay TR2 energized. The cam of timer T2 will then automatically re-set and open switch TS2. Energization of relay TR2 opens normally closed contacts 3TR2 in line 21 for de-energizing aspirating pump F. Contacts 4TR2 in line 22 will close for energizing timer T3 and relay R11 in line 27. Timer T3 may be set for anywhere between 0 and 12 seconds. In a typical example, timer T3 is set to approximately 5 second. Energization of relay R11 closes normally open contacts 1R11 and 2R11 in lines 16 and 17. This starts operation of feed pump D and illuminates feed indicator light 92. When timer T3 times out after 5 seconds, its cam closes switch TS3 for energizing relay TR3. Normally closed contacts 2TR3 are then opened for de-energizing motor TM3. The timer clutch is then disengaged and its cam returns to its set position. Closing of contacts 1TR3 in line 24 provides a holding circuit to maintain relay TR3 energized. Energization of relay TR3 also opens normally closed contacts 4TR3 in line 27 to de-energize relay R11. This opens contacts 1R11 and 2R11 in lines 16 and 17 for de-energizing feed pump D. Operation of feed pump D for around five seconds after aspirating for 30 minutes cleanses tube A and expels any mucus or particles trapped in the openings of tube A positioned within stomach B.

Energization of relay TR3 closes normally open contacts 3TR3 in line 26 to energize relay R8. Energization of relay R8 opens normally closed contacts 1R8 in line 18 to completely de-energize timer T2. That is, timer relay TR2 is de-energized. Simultaneously, de-energization of relay TR2 will close contacts 3TR2 in line 21, while contacts 3R8 in line 21 are open for maintaining aspirating pump F de-energized. De-energization of relay TR2 also opens contacts 4TR2 in line 22. Simultaneously therewith, contacts 2R8 in line 20 are closed for completing a circuit down to and past timer T3. Energization of relay TR3 also closes contacts 5TR3 in line 28 for energizing timer T4. Timer T4 may be set anywhere from 0 to 30 seconds. In a typical example, timer T4 is set to approximately 15 seconds. When timer T4 times out after 15 seconds, its cam closes switch TS4 to energize relay TR4. This opens contacts 2TR4 to de-energize motor TM4. The cam of timer T4 then returns to its set position and switch TS4 opens. Energization of relay TR4 with switch TS4 closed also closes contacts 1TR4 to establish a holding circuit for maintaining relay TR4 energized. Energization of relay TR4 opens normally closed contacts 3TR4 in line 4 and 5TR4 in line 9. This completely de-energizes timer T1. Contacts 4TR4 in line 5 are closed. If an overpressure condition still exists within stomach B, contacts P1 will be closed. A circuit would then be established through contacts P1 and closed contacts 4TR4 to illuminate overpressure light 86 and energize audible buzzer 88. Relay R7 would also be energized to close contacts 2R7 in line 7 for maintaining relay R7 energized. Upon complete de-

energization of timer T1, contacts 4TR1 open and the lower portion of the circuit is no longer energized. The circuit then returns all of the contacts to the position shown in FIG. 2 except for contacts 2R7 which remain energized so that buzzer 88 and light 86 remain on, and relay R7 remains energized. As long as relay R7 remains energized, open contacts 1R7 in line 3 and open contacts 3R7 in line 11 completely shuts down the entire apparatus so that it cannot operate until an operator opens main on-off switch H and re-sets the apparatus. When such a condition exists, the operator may throw switch S so that contacts S1 and S2 are in contact respectively with contacts 80 and 84. In this position, timers T5 and T6, and feed pump D, are completely cut out of the circuit. Aspiration and irrigation will take place by operation of the circuit from timer T2 down in the manner previously described. At the end of that aspirating and irrigating cycle, an overpressure condition is again checked by operation of timer T4 in the manner previously described. If an overpressure condition does exist, buzzer 88 and light 86 will again be energized while the remainder of the circuit is completely de-energized by energization of relay R7. It will then be necessary for an operator to again re-set the device.

If there is no overpressure condition at the end of an aspirating and irrigating cycle, operation of timer T4 along with opening and closing of its various contacts will simply check for the overpressure condition in cooperation with contacts P1. If there is no overpressure condition, contacts P1 will remain open and relay R7 will not be energized. If switch S1 is positioned in the aspirate and irrigate cycle, an additional aspirate and irrigate cycle will again automatically take place. If switch S is positioned in the feeding, aspirating and irrigating cycle, feeding will immediately begin when timer T4 is timed out. The feed cycle will take place in the same manner as previously described by operation of solid state timing devices T5 and T6.

In the irrigation portion of the cycle, irrigation takes place at a rate of 2.5 cubic centimeters per second for 5 seconds. Material is aspirated at a rate of around 2.5 cubic centimeters per second. In general, the irrigation portion of the cycle may be considered somewhat of a pulse for a short time period simply to clean tube A, and its openings within stomach B, of any mucus or particles.

Although two pumps have been disclosed, with feed pump D being used for both feeding and irrigating from a common receptacle E, it will be recognized that it is possible to use a separate pump for irrigating a saline solution or other solution from a different receptacle. All that would be necessary would be to connect contacts 1R11 and 2R11 to a separate pump for operation by timer T3 and relay R11 for operating a separate irrigating pump for the desired time. It will also be recognized that it would be possible to use only a single pump for feeding, aspirating and irrigating. The pump could simply be reversible for rotation in one direction to feed and irrigate, and in an opposite direction for aspirating. With such an arrangement, separate tubes could be provided with solenoid-operated valves in each tube ahead of the single pump. Instead of operating separate pumps, the described circuit could then reverse the direction of operation of the pump and operate the various valves to provide either feeding, aspirating or irrigating.

The apparatus has been shown schematically for simplicity of explanation. Obviously, the various parts would be built-in to a portable cabinet or the like.

It is obvious that many other variations would also be possible, and the preferred arrangement described and schematically shown is only illustrative. Equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification. The present application includes all such equivalent alterations and modifications, and is limited only by the scope of the claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In an apparatus for feeding a solution to a patient's stomach, said apparatus including tube means having tube opening means for positioning within a patient's stomach and feed means connected to said tube means for feeding a solution through said tube and tube opening means, the improvement comprising; pressure sensing means for sensing pressure within the patient's stomach to signal an overpressure condition to stop said feed means, means for automatically stopping said feed means in response to said pressure sensing means sensing such overpressure condition, and means for delaying stoppage of said feed means until said pressure sensing means senses such overpressure condition for a predetermined period of time.

2. The improvement of claim 1 wherein said means for delaying stoppage of said feed means comprises delay means for delaying signalling of an overpressure condition until said pressure sensing means senses such overpressure condition for a predetermined period of time.

3. In an apparatus for feeding a solution to a patient's stomach, said apparatus including tube means having tube opening means for positioning within a patient's stomach and feed means connected to said tube means for feeding a solution through said tube and tube opening means, the improvement comprising; pressure sensing means for sensing pressure within the patient's stomach to signal an overpressure condition to stop said feed means, and aspirating means connected to said tube means for applying suction to aspirate patient's stomach in response to said pressure sensing means sensing such overpressure condition.

4. The improvement of claim 3 further including delay means for delaying signalling of such overpressure condition until said pressure sensing means senses such overpressure condition for a predetermined period of time.

5. The improvement of claim 3 wherein said pressure sensing means is connected for automatically stopping said feed means when such overpressure condition is sensed.

6. The improvement of claim 5 further including delay means for delaying stoppage of said feed means until said pressure sensing means senses such overpressure condition for a predetermined period of time.

7. The improvement of claim 5 further comprising means for automatically starting said aspirating means in response to said pressure sensing means sensing such overpressure condition as aforesaid.

8. The improvement of claim 7 further including delay means for delaying stoppage of said feed means and starting of said aspirating means until said pressure

sensing means senses such overpressure condition for a predetermined period of time.

9. The improvement of claim **3** further including aspirating timing means for stopping operation of said aspirating means after a predetermined period of time, and irrigating feed means for feeding irrigating fluid through said tube and tube opening means to clear said tube and tube opening means of any foreign material upon stoppage of said aspirating means.

10. The improvement of claim **9** wherein said irrigating feed means pulses a small supply of irrigating fluid for a short period of time, and pressure checking means is provided for checking pressure within a patient's stomach after operation of said irrigating feed means.

11. The improvement of claim **10** wherein said pressure checking means is connected automatically starting said feed means when such overpressure condition is not present.

12. The improvement of claim **10** wherein said pressure checking means is connected for automatically starting said aspirating means when such overpressure condition is present.

13. Apparatus for feeding or aspirating relative to a patient's stomach comprising; tube means having tube opening means for positioning in a patient's stomach, feed means connected to said tube means for feeding a feeding solution through said tube and tube opening means, aspirating means connected to said tube means for applying suction to said tube means to aspirate a patient's stomach through said tube means, and pressure sensing means for sensing pressure within a patient's stomach to signal an overpressure condition to stop said feed means, and selective control means for selectively connecting either said feed means or said aspirating means for operation.

14. The apparatus of claim **13** further including means for automatically stopping said feed means when such overpressure condition is sensed and said selective control means is connected with said feed means, and means for automatically starting said aspirating means when such overpressure condition is sensed.

15. The apparatus of claim **13** further including timing means for timing operation of said aspirating means, and irrigating means for pulsing a supply of irrigating fluid through said tube and tube opening means to clear said tube and tube opening means of any foreign material upon stoppage of said aspirating means.

16. Apparatus for aspirating and irrigating a patient's stomach comprising; tube means having tube opening means for positioning within a patient's stomach, aspirating means connected to said tube means for aspirating a patient's stomach through said tube and tube opening means, and pressure sensing means for sensing pressure within a patient's stomach to signal an overpressure condition to stop said feed means, and timing means connected to said aspirating means for timing operation of said aspirating means to stop operation of said aspirating means after a predetermined period of time, and irrigating means connected to said tube means for pulsing a supply of irrigating fluid through said tube and tube opening means to clear said tube and tube opening means of any foreign material upon stoppage of said aspirating means.

17. A method of supplying a solution to a patient's stomach comprising; feeding a solution to a patient's stomach, sensing by mechanical means the pressure within the patient's stomach to signal an overpressure condition, continuing to feed such solution to the patient's stomach until such overpressure condition has been sensed for a predetermined period of time, and stopping by automatic means the feeding of such solution after such predetermined period of time.

18. A method of supplying a solution to a patient's stomach comprising; feeding a solution to a patient's stomach, and sensing by mechanical means the pressure within the patient's stomach to signal an overpressure condition and stop feeding by automatic means the solution when an overpressure condition exists, and applying a suction to aspirate the patient's stomach upon sensing of such overpressure condition.

19. The method of claim **18** wherein the step of aspirating is carried out for a predetermined time, and is followed by the step of pulsing a small supply of irrigating fluid to the patient's stomach.

20. The method of claim **18** further including the step of checking pressure within the patient's stomach after aspirating, and subsequently either feeding a solution or aspirating depending upon whether the sensed pressure is a normal pressure condition or an overpressure condition.

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