

March 15, 1960

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2,928,268

CLEANING SYSTEM WITH AUTOMATIC BY-PASS

Filed Aug. 3, 1956

3 Sheets-Sheet 1

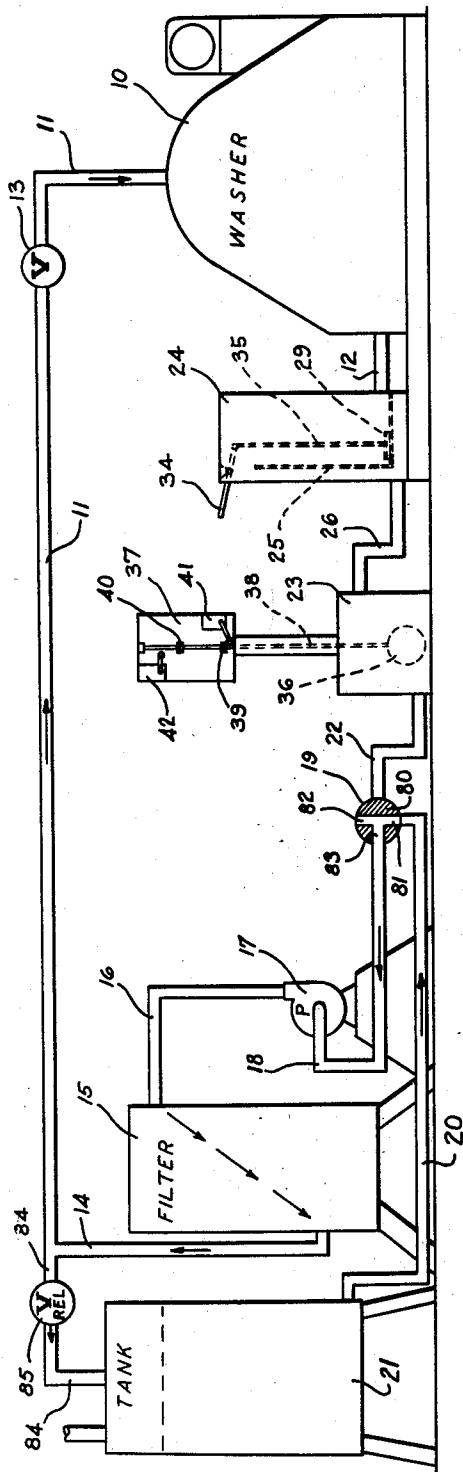


Fig. 1.

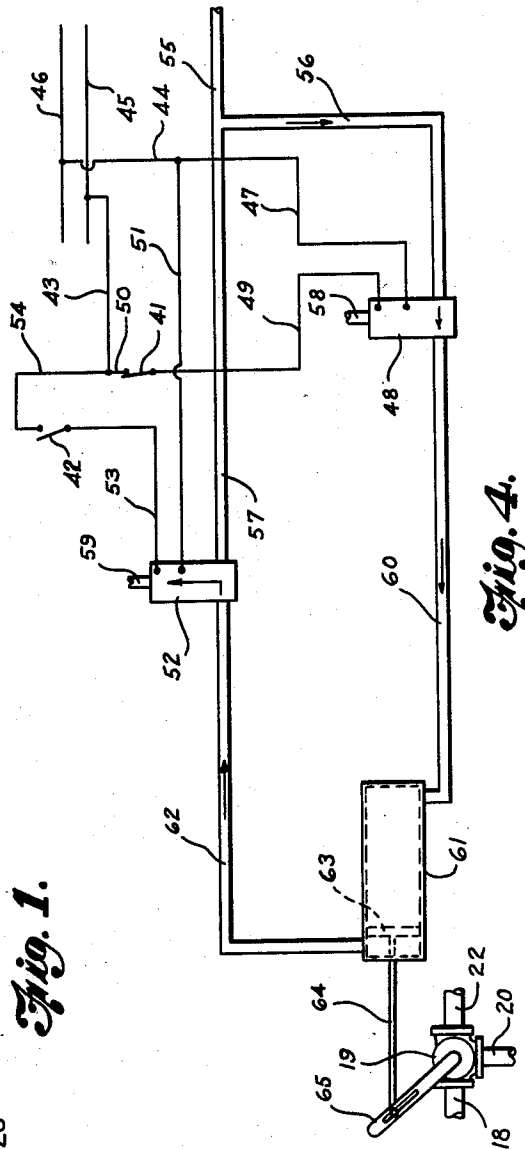


Fig. 4.

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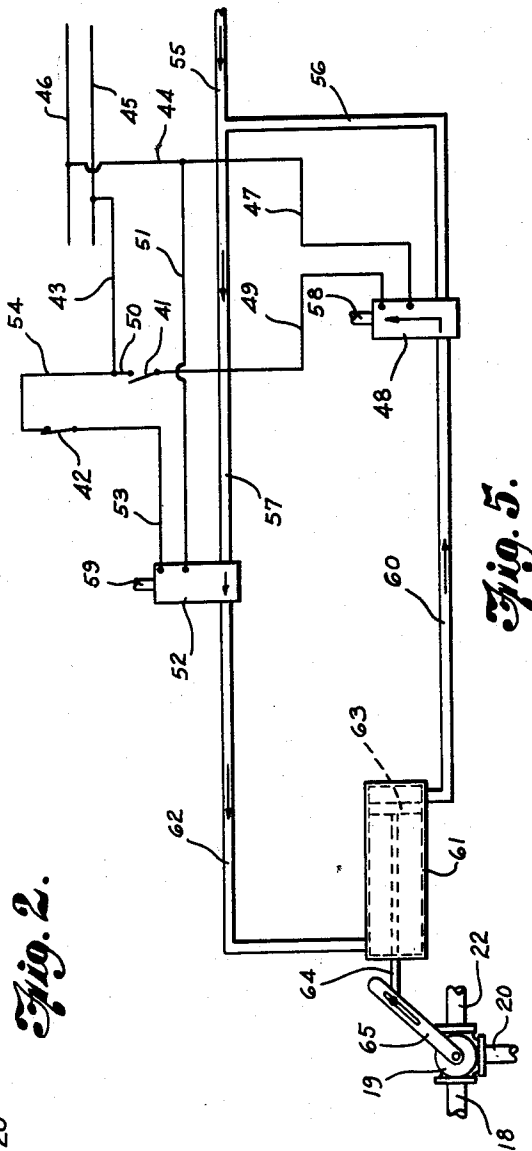
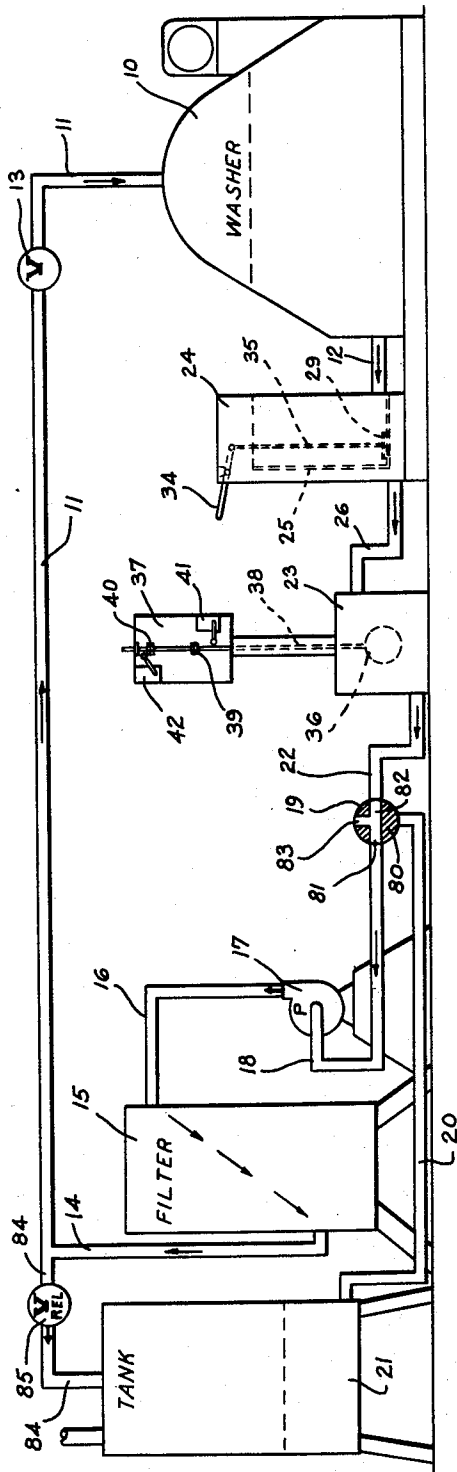
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3 Sheets-Sheet 3

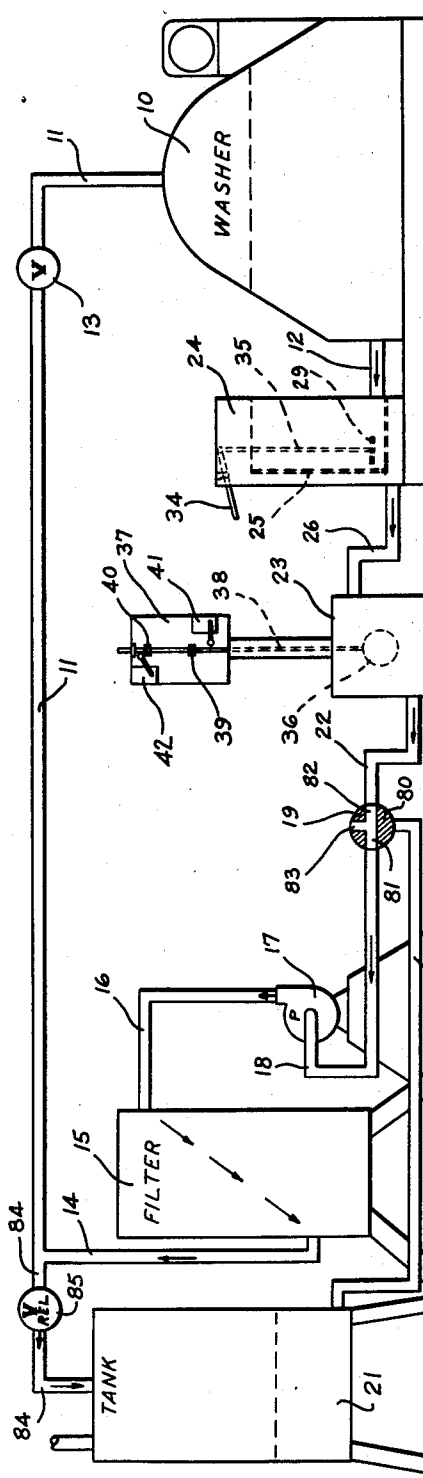


Fig. 3.

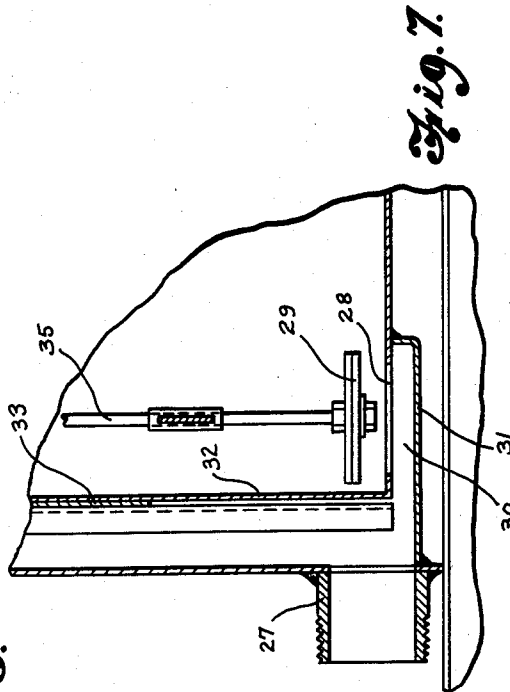


Fig. 7.

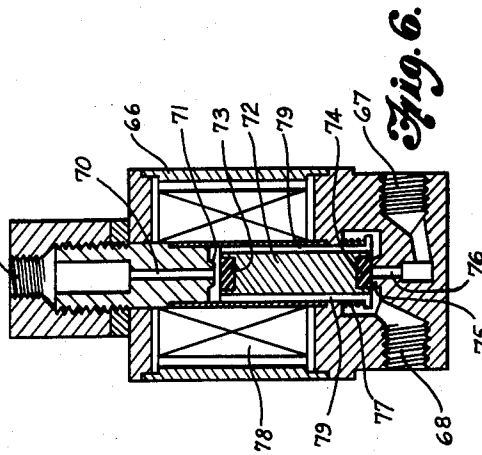


Fig. 6.

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2,928,268

CLEANING SYSTEM WITH AUTOMATIC BY-PASS

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Application August 3, 1956, Serial No. 601,988

9 Claims. (Cl. 68—18)

My invention relates to cleaning systems, and more particularly to a cleaning system provided with an automatic by-pass for the solvent liquids used therein.

It is a purpose of my invention to provide, in a cleaning system comprising a washer, a filter, pump and supply tank, means for preventing air from entering the filter and the pump that feeds the solvent liquid to the filter. My invention is applicable both to the pumping and filtering of a dry cleaning solvent soap solution or charged soap solvent and a rinsing or clear solvent. As the operation of the apparatus, whereby air entering the filter and the pump is prevented, is the same for either the washing solution or the rinsing liquid the term "solvent liquid" is used in describing the solvent material that is pumped and filtered whether it be a washing solvent solution or a rinsing solvent. In order to avoid duplication of parts in the drawings, only a single set of apparatus for preventing such entry of air into a pump and filter is illustrated, although a duplicate set of apparatus, including the by-pass means that forms the subject matter of my invention, pump, filter and tank, would have to be used in a complete two-bath cleaning system, with the single washer shown.

In an apparatus of the above referred to character continuous circulation of the solvent liquid from an extracting washer through a filter, for clarification, and return to said washer is necessary, and one of the purposes of my invention is to accomplish such continuous solvent circulation, by-passing the storage or supply tank for such solvent liquid. Such continuous circulation of the rinsing medium is also obtained by my invention, by-passing such storage or supply tank.

My invention is particularly applicable to a dry cleaning apparatus in which the supply or storage tank, or tanks, are above the level of the ground, which would place the same above the drain level of the extracting washer. However, my invention is also applicable to underground storage tanks, the solvent liquid, by the application of my invention to underground storage or supply tanks, being pumped thereto instead of flowing thereto by gravity, permitting the use of smaller size piping because of the obtaining of higher drain pipeline velocity.

More specifically my invention comprises, in combination with a washer and a supply tank, a filter and pump that has a discharge connection leading into the filter and which has an inlet connection leading to the pump, and means for maintaining a constant flow of solvent liquid through the inlet connection, comprising valve means connected with the tank and the washer, which has one position in which the valve means connects the washer with the inlet connection and another position in which the valve means connects the tank with the inlet connection, and means for controlling the position of the valve so that, if the flow from the washer should for any reason be diminished below that of the capacity of the pump, the valve will move from a position in which the washer is connected with the

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inlet of the pump to a position in which the supply tank is connected with the inlet of the pump.

Ordinarily, while the washing or rinsing operation is proceeding, unless something unforeseen occurs in the operation of the dry cleaning system, the flow from the filter to the washer and back to the pump and from the pump to the filter, will be so uniform that there will be no possibility of air entering the pump or the filter. However, when the washer is being drained the flow of cleaning solvent or of rinsing solvent will be erratic, and is often reduced considerably below the capacity of the pump. When such a condition exists the valve operating means, above referred to, will respond to this condition and adjust the valve to withdraw the liquid solvent from the storage or supply tank, thereby preventing air from entering the filter and satisfying the pump demand, so as to prevent the pump from operating in a dry condition.

When the extraction operation of the washer is taking place the speed of the washer cylinder is greatly accelerated and the solvent liquid used, either during the rinsing or washing operation, is removed from the fabrics in the washer at an accelerated rate, causing the controlling means for the valve to move to a position such that the inlet of the pump is again connected with the washer instead of the storage or supply tank. As the extraction continues the flow from the washer will be reduced and the automatic valve means will again change in position to connect the inlet of the pump with the supply or storage tank.

The valve controlling means for my improved dry cleaning system is of such a character that as soon as sufficient solvent liquid accumulates in the valve controlling means to properly supply the pump so as to prevent air from entering the pump and the filter, the valve will again be adjusted to withdraw this solvent liquid, that has come from the washer, and such back and forth adjustment of the valve means will take place as often as is necessary to withdraw all of the solvent liquid from the washer and yet maintain a constant supply of solvent liquid to the pump should the flow of the solvent liquid from the washer decrease below that required for supply to the pump.

The specific means for controlling the flow of solvent liquid to the pump above referred to comprises means, responsive to the flow of the solvent liquid from the washer toward the valve means, that determines the position of the valve, comprising a float chamber and a float therein, that actuates controlling means for the valve to move the valve to the required position. The controlling means preferably comprises means for supplying air under pressure from a suitable source of supply to opposite ends of a valve operating cylinder, that has a piston therein that is connected with a lever for throwing the valve from one alternative position to the other. To prevent flow of solvent liquid from the filter to the storage or supply tank during the washing or rinsing operation a spring loaded check valve, constituting a pressure relief valve, is located between the filter outlet and the tank.

Other objects and advantages of my invention will appear as the description of the drawings proceeds. I desire to have it understood, however, that I do not intend to limit myself to the particular details shown or described, except as defined in the claims.

In the drawings:

Fig. 1 is a diagrammatic view, of a portion of a dry cleaning system, showing my invention applied thereto, the parts being in the position that these assume when the washer is being filled with the solvent liquid.

Fig. 2 is a view similar to Fig. 1, showing the parts in the position that they will assume when the washing

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or rinsing operation is being performed and the solvent liquid is being circulated in a closed circuit, including the washer, the pump and the filter, by-passing the storage or supply tank.

Fig. 3 is a similar view, showing the parts in the position that they assume when the washer is being emptied of washing or rinsing solvent and the liquid flow from the washer is sufficient to supply the pump to its full capacity.

Fig. 4 is a diagrammatic view showing the valve controlling means in the position of the parts corresponding to that of the valve means shown in Fig. 1.

Fig. 5 is a similar view to Fig 4, showing the parts in the position corresponding to that of the valve means shown in Figs. 2 and 3.

Fig. 6 is a vertical sectional view through one of the solenoid valves forming part of the controlling means, and

Fig. 7 is a fragmentary vertical sectional view of the button and lint trap.

Referring in detail to the drawings, in Figs. 1 to 3 inclusive, is shown a washer 10, which has an inlet connection 11 and a discharge connection 12. The washer may be of any desired type that is adapted for both washing and extracting operations, which requires that the washer be provided with driving means that will rotate the washing cylinder at high speed for the extracting operation. A valve 13 is provided in the inlet connection 11, which may be manually operated, but which is ordinarily operated automatically by means of a timing device, that also controls the operations of the washer. A discharge pipe 14 from a filter 15 is connected with the inlet connection 11, the filter being of any well known pressure filter type. The fluid is introduced into the filter 15 through an inlet connection 16, which also comprises the outlet or discharge pipe of a pump 17, to which the inlet pipe 18 from a valve member 19 leads.

Also connected with the valve member 19 is a pipe or conduit 20 that extends from the lower portion of the supply or storage tank 21, which is shown as being above ground, and a pipe or conduit 22, which extends from a valve controlling device 23 that is interposed between the washer 10 and the valve 19. Also, provided between the washer 10 and the valve controlling device 23, is a lint and button trap 24, which is provided with a weir 25, over which the fluid medium passes when the washer is filled to the normal washing or rinsing level thereof, as shown in Fig. 2 of the drawings.

A conduit or pipe 26 extends from the lint trap 24 to the valve controlling device 23. The pipe or conduit 26 extends from the opposite side of the weir 25 from that to which the pipe or conduit 12 leads from the washer 10. The trap 24 has an outlet connection 27, to which the pipe 26 is connected, and has a bottom opening 28 adapted to be closed by the valve 29 leading to the passage 30 in the false bottom 31 leading to the outlet connection 27 under the weir 25, which preferably has a fixed lower portion 32 and an adjustable upper portion 33. The position of the valve 29 may be determined by a suitable timing device, but is shown as being controlled by means of a lever 34 and valve operating rod 35 in the drawings.

The valve operating member 23 is provided with a float chamber in which the float 36 is located. It will be noted that the conduit or pipe 26 enters the upper portion of the float chamber of the controlling member 23 and that the pipe or conduit 22 extends from the lower portion thereof. As long as the flow of solvent liquid such as the washing solvent solution or the rinsing solution is entering through the pipe or conduit 26 at the same or a greater rate than that at which it is being withdrawn therefrom by the pump through the pipe or conduit 22, the float 36 will be in the raised position shown in Figs. 2 and 3. If the rate of withdrawal through the pipe 22 by the pump 17 is greater than that at which

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the solvent is being supplied through the pipe or conduit 26 the float will drop to the position shown therefor in Fig. 1.

The float operated controlling device is indicated generally by the numeral 37 in Figs. 1, 2 and 3. It is shown diagrammatically in Figs. 4 and 5. The float is provided with a suitable stem 38 that has a pair of collars 39 and 40 provided thereon, that control the position of the switches 41 and 42, respectively. When the float 36 is in the down position shown in Fig. 1 the collar 39 engages the operating member of the switch 41 to move the same to circuit closing position. When the float 36 is in raised position, as shown in Figs. 2 and 3, then the collar 40 engages the operating member of the switch 42 to move the same to circuit closing position.

Referring now to Figs. 4 and 5, the operating circuit for the controlling device is shown as comprising a pair of conductors 43 and 44 extending from the line wires 45 and 46. The conductor 44 is provided with a branch 47 extending to one terminal of the solenoid valve 48, the other terminal of said valve 48 having a conductor 49 extending therefrom to the switch 41, which is adapted to engage a stationary contact that is connected with the conductor 43 through a conductor 50. A branch conductor 51 also extends from the conductor 44 to one terminal of a solenoid valve 52, the other terminal of which is connected by means of a conductor 53 with the switch 42, which is adapted to engage a stationary contact from which a conductor 54 extends to the conductor 43.

The conduit 55 extends from a source of air under pressure and is provided with branches 56 and 57 leading to the solenoid valves 48 and 52, respectively. Each of said solenoid valves also has a vent pipe extending therefrom to the atmosphere, the vent for the valve 48 being indicated by the numeral 58 and the vent pipe for the valve 52 being indicated by the numeral 59. A conduit 60 extends from the solenoid valve 48 to one end of a cylinder 61 and a conduit 62 extends from the solenoid valve 52 to the other end of the cylinder 61. Said cylinder is provided with a piston 63 therein, which is connected through a rod 64 with a lever 65 that controls the position of the valve 19.

In Fig. 6 is shown a solenoid valve of the general character of the valves 48 and 52, which are alike in construction. Said valve has a body portion 66 which has an inlet connection 67, which is connected with either the pipe 56 or the pipe 57 leading to the source of air under pressure and a threaded opening 68, with which the pipe 60 or 62, as the case may be, leading to the cylinder 61, is connected. Said valve is provided with a screw-threaded opening 69 leading to an air vent pipe, such as the air vent pipes 58 and 59. A passage 70 leads to the air vent connection 69 from a valve seat 71 and a movable valve member 72 is provided, which has a suitable sealing member 73 provided thereon for engagement with the valve seat 71. Said movable valve member also has sealing means 74 provided thereon for engagement with a valve seat 75, to which a passage 76 extends, which leads from the inlet connection 67. The spring 77 holds the movable valve member 72 normally in engagement with the valve seat 75 so as to close the passage 76. A solenoid winding 78 is provided in the valve, which, when energized, moves the movable valve member 72, which serves as a movable core in the solenoid, toward the seat 71 and away from the seat 75. There are air passages 79 provided around the movable valve member 72 for flow of air to the vent pipe connection 69.

It will be obvious that when the solenoid winding 78 is energized in the solenoid valve 48 the pipe 56 supplying air under pressure will be connected with the pipe 60 and, similarly, when the solenoid winding 78 of the solenoid valve 52 is energized the pipe 57 will be connected with the pipe 62 to supply air under pressure

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to the cylinder 61. On the other hand, when the solenoids of the valves 48 and 52 are de-energized, then the pipes 60 and 62, respectively, will be connected through said valves 48 and 52 with the air vent pipes 58 and 59.

When the float is in the raised position shown in Figs. 2 and 3 the rod 38 will be in a raised position and the switch 42 will be closed, energizing the solenoid in the valve 52 and supplying air under pressure to the left hand end of the cylinder 61. At this time the switch 41 is in open position and the right hand end of the cylinder 61, as viewed in Figs. 4 and 5, will be vented to the atmosphere. With the float in such raised position the connection from the air pressure supply pipe 57 to the cylinder 61 is through the passage 76 of the valve 52 to the pipe 62, and the connection to the air vent 58 is through the pipe 60 through the passages 79 and 70 of the valve 48 to the air vent 58. When the float 36 is in the down position, as shown in Fig. 1, the switch 42 will be open and the switch 41 will be closed, because the rod 38 is in a lowered position, and the air pressure supply pipe 56 will be connected in a similar manner to that explained above through the solenoid valve 48, which will have its solenoid winding energized, with the pipe 60 leading to the right hand end of the cylinder 61, while the vent 59 will be connected in a similar manner to that explained above with the pipe 62 leading from the left hand end of the cylinder 61 through the solenoid valve 52.

The valve 19 has a rotatable valve member 80 therein, which has the aligned passages 81 and 82 and a passage 83 extending perpendicularly to the passages 81 and 82, all said passages being connected together. It will be noted that when the float 36 is in raised position the valve 19 will be in the position shown in Figs. 2 and 3 due to the fact that the piston 63 will have been moved to the position shown in Fig. 5, as, in this position of the float the switch 42 is closed and air under pressure is supplied to the left hand side of the cylinder 61, while the right hand side thereof is vented to the air. When the float 36 has dropped to the position shown in Fig. 1 the piston 63 will be moved to the left due to the fact that the switch 42 will be opened and the switch 41 closed because of downward movement of the rod-like member 38, and air under pressure will be supplied to the right hand end of the cylinder 61 through the pipe 60 and the left hand side of the cylinder 61 will be vented through the pipe 62, the valve 19 then being moved to the position shown in Fig. 1 due to the swinging of the lever from the position shown in Fig. 5 to that shown in Fig. 4. The tank 21 is connected with the outlet or discharge pipe 14 of the filter and the inlet pipe or conduit 11 of the washer through a pipe 84 leading into the top of the tank, which pipe is provided with a spring loaded check valve 85 opening toward the tank 21 when the valve 13 is closed, said valve 85 thus serving as a pressure relief valve.

In the operation of my improved dry cleaning apparatus the washer 10 is filled with liquid washing solvent solution or clear solvent for rinsing by opening of the valve 13. At the time that this operation is started the washer 10 is empty of solvent liquid and the float chamber of the controlling device 23 is also empty, the float 36 then being in the down position shown in Fig. 1. The valve 19 will then connect the pipe or conduit 20 leading from the tank 21 with the pipe or conduit 18 leading to the pump 17 through the passages 81 and 83 in said valve member, and the solvent liquid will be pumped from the tank 21 through the conduit 16, filter 15, conduit 14 and conduit 11 to the washer.

This will continue until the washer is filled to the desired level, which is determined by the position of the top of the adjustable top member 33 of the weir 25. The valve 29 will be in the position shown in Fig. 1 so that

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in order for the solvent liquid to reach the conduit 26 it has to flow over the weir 25. As soon as sufficient solvent liquid has entered the float chamber of the controlling device 23 to raise the float 36, the rotatable valve member 80 in the valve 19 will be turned to the position shown in Fig. 2. In that position of the valve the pipe or conduit 22 is connected with the pipe or conduit 18 through the passages 82 and 81 of the rotatable valve member 80, the movement of the valve having taken place due to the piston 63 having been moved from the position shown in Fig. 4 to that shown in Fig. 5 due to the closing of the switch 42 and opening of the switch 41. Circulation of the washing solvent solution or the rinsing solvent will continue for the desired length of time, by-passing the tank 21, the flow being from the washer through the lint and button trap 24, the valve controlling device 23, the pump 17, the filter 15 and back to the washer.

The next operation consists of draining the washer of the solvent liquid, whether it be a washing solvent soap solution or a clear rinsing solvent. When this operation commences the valve 13 is closed and the valve 29 is moved to the position shown in Fig. 3 by a suitable timing means, or manually, if no timing means is provided therefor. Upon closing the valve 13 the valve 85 will open due to the increase in pressure in the pipes or conduits 14, 11, and the portion of the conduit 84 on the right hand side of the valve 85, and the flow of the solvent liquid will be from the washer 10 through the conduit 12, passage 30 and through the conduit 26 to the valve controlling device 23 and from that through the pump 17 and filter 15, conduits 14 and 84 to the storage or supply tank 21, the valve 19 having its rotatable valve member 80 retained in the position shown in Figs. 3 and 4 as long as the flow of solvent liquid from the washer 10 is sufficient to supply the pump 17. However, if the flow decreases through the conduit 26 so that it is less than that which the pump 17 tends to withdraw through the conduit 22, the float 36 will drop to the position shown in Fig. 1, the switch 41 will be closed and the switch 42 opened and the piston 63 will move to the position shown in Fig. 4 and the valve member 19 will move to the position shown in Fig. 1, whereupon the pump 17 will circulate the solvent liquid through the filter 15 and tank 21 so that the pump 17 will always be supplied with sufficient liquid to keep air from being drawn into the same and the filter 15 will always be kept filled with the solvent liquid, which will keep the filter operating at full efficiency.

The next operation, whether the solvent liquid withdrawn from the washer was a solvent soap solution or a clear rinsing solvent, is the extracting operation. When the extracting operation starts the flow of solvent liquid from the washer increases, and this will cause the float chamber to fill so that the float 36 will again rise and the valve member 19 will again move to the position shown in Figs. 2 and 3 and this position will be maintained for the valve as long as a regular flow of solvent liquid into the controlling member 23 sufficient to supply the pump 17 is occurring. The solvent liquid will, in this position of the valve, be pumped from the washer through the various apparatus shown in the drawings to the filter and pass through the filter and the valve 85 to the tank 21. Should, however, the extracting operation reach a point where insufficient flow of solvent liquid occurs to keep the pump 17 supplied, then the float chamber will empty, the float 36 will drop, and the rotatable valve member 80 will again move to the position shown in Fig. 1, the solvent liquid then circulating in a closed circuit, including the tank, the pump and the filter, in the manner above described. The arrows on Figs. 1 to 5 of the drawings indicate the direction of flow of the solvent liquid under various conditions between the various apparatus and through certain of said apparatus including the solenoid valves shown in Figs. 4 and 5.

What I claim is:

1. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump having a discharge connection leading into said filter, an inlet connection leading to said pump and means for maintaining a constant flow of said solvent liquid through said pump inlet connection comprising valve means, conduit means connecting said valve means with said pump inlet connection, said tank and the washer outlet, said last mentioned valve means having a position connecting said washer outlet with said pump inlet connection and a position connecting said tank with said pump inlet connection, a solvent liquid accumulating chamber interposed between said washer outlet and said last mentioned valve means, and means responsive to the level of said solvent liquid in said chamber controlling the position of said last mentioned valve means.

2. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump having a discharge connection leading into said filter, an inlet connection leading to said pump and means for maintaining a constant flow of said solvent liquid through said pump inlet connection comprising valve means, conduit means connecting said valve means with said pump inlet connection, said tank and the washer outlet, said last mentioned valve means having a position connecting said washer outlet with said pump inlet connection and a position connecting said tank with said pump inlet connection, and float actuated means interposed in the conduit means connecting said washer outlet with said last mentioned valve means between said washer outlet and said last mentioned valve means controlling the position of said last mentioned valve means.

3. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump having a discharge connection leading into said filter, an inlet connection leading to said pump and means for maintaining a constant flow of said solvent liquid through said pump inlet connection comprising valve means, conduit means connecting said valve means with said pump inlet connection, said tank and the washer outlet, said last mentioned valve means having a position connecting said washer outlet with said pump inlet connection and a position connecting said tank with said pump inlet connection, means for moving said last mentioned valve means from either of said positions to the other thereof, a solvent liquid accumulating chamber interposed between said washer outlet and said last mentioned valve means, and means responsive to the level of said solvent liquid in said chamber controlling the operation of said means for moving said valve means.

4. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump having a discharge connection leading into said filter, an inlet connection leading to said pump and means for maintaining a constant flow of said solvent

liquid through said pump inlet connection comprising valve means, conduit means connecting said valve means with said pump inlet connection, said tank and the washer outlet, said last mentioned valve means having a position connecting said washer outlet with said inlet connection and a position connecting said tank with said inlet connection, means for moving said last mentioned valve means from either of said positions to the other thereof, and float actuated means interposed in the conduit means connecting said washer outlet with said last mentioned valve means between said washer outlet and said last mentioned valve means controlling the operation of said valve moving means.

5. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump connected to said filter to discharge said solvent liquid into the same, valve means having a tank connection, a washer outlet connection and a pump connection and having a valve member having a position connecting said pump connection with said washer outlet connection and a position connecting said pump connection with said tank connection, a solvent liquid accumulating chamber in said washer outlet connection between the outlet of said washer and said last mentioned valve member, and means controlling the position of said last mentioned valve member comprising a float in said chamber having a position responsive to the level of said solvent liquid therein and valve actuating means responsive to the position of said float.

6. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump connected to said filter to discharge said solvent liquid into the same, valve means having a tank connection, a washer outlet connection and a pump connection and having a valve member having a position connecting said pump connection with said washer outlet connection and a position connecting said pump connection with said tank connection, and means controlling the position of said last mentioned valve member interposed between said washer and valve, said controlling means having a float chamber in said washer outlet connection receiving fluid medium discharged from said washer, a float in said chamber, a valve member operating lever, a cylinder, a piston in said cylinder and connected with said lever, and means for moving said piston comprising float controlled valve means for supplying fluid under pressure to said cylinder on one side of said piston in raised position of said float and on the other side of said piston in lowered position of said float.

7. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump connected to said filter to discharge said solvent liquid into the same, valve means having a tank connection, a washer outlet connection and a pump connection and having a valve member having a position connecting said pump connection with said washer outlet connection and a position connecting said pump connection with said tank connection, and means controlling the position of said last mentioned valve member interposed between said washer and valve, said controlling means having a float chamber in said washer outlet connection

receiving solvent liquid discharged from said washer, a float in said chamber, a valve operating lever, a cylinder, a piston in said cylinder and connected with said lever, and float controlled valve means for supplying fluid under pressure to said cylinder on one side of said piston in raised position of said float and on the other side of said piston in lowered position of said float.

8. The combination with a washer and a solvent liquid supply tank, of a filter, conduit means extending from the outlet of said filter to the inlet of said washer, a branch conduit extending from said conduit means to said supply tank, a normally closed check valve in said branch conduit responsive to pressure in said conduit means to connect the outlet of said filter with said tank, a pump connected to said filter to discharge said solvent liquid into the same, valve means having a tank connection, a washer outlet connection and a pump connection and having a valve member having a position connecting said pump connection with said washer outlet connection and a position connecting said pump connection with said tank connection, air pressure actuated means controlling the position of said last mentioned valve member and controlling means for said air pressure actuated means comprising a solvent liquid accumulating chamber in said washer outlet connection between said washer outlet and said last mentioned valve member, a float in said chamber having a position responsive to the level of said solvent liquid in said chamber and float controlled means controlling the supply of air under pressure to said air pressure actuated means.

9. In a dry cleaning system, a washer, a liquid supply tank, a filter, a pump discharging into said filter, a discharge connection from said filter having branches extending to said washer inlet and tank, conduit means extending from said washer outlet and from said tank and conduit means leading to said pump, means for establishing a closed circuit for circulation of said liquid including said filter, pump and washer and by-passing said tank, comprising a valve in one of said branches controlling flow to said washer inlet and a pressure responsive valve in the other branch controlling flow from said filter to said tank, and means adapted to selectively connect said conduit means leading to said pump with said conduit means extending from said tank or with said conduit means extending from said washer outlet comprising a solvent liquid accumulating chamber interposed in said conduit means extending from said washer outlet and valve means having a position determined by the solvent liquid level in said chamber.

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