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(54) **AUTOMATIC BLANKET WASH SYSTEM WITH FLOW THROUGH SPRAY BAR.**

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Description

Technical Field

The present invention relates to printing presses and more particularly to systems for automatically washing blankets on blanket cylinders of offset printing units.

Background Art

Automatic blanket cleaning systems are known in the art and one such system, for example, is disclosed in the United States Patent No. 4,344,361, issued for an invention of MacPhee, et al. This patent discloses a cleaning system requiring a cloth supply roll to bring a cleaner fabric in contact with the blankets ; solvent is sprayed onto the fabric. Another system is disclosed in United States Patent No. 3,486,448, issued for an invention of Anderson, et al. The Anderson patent discloses a cleaning system that does not require the use of a cloth, but does not provide an arrangement for dealing with cleaning mixtures that may be subject to settling after the mixing has been accomplished. United States Patent No. 3,508,711, issued for an invention of Switall, discloses another blanket wash system that does not address the settling problem associated with certain cleaning mixtures.

Other cleaning systems for printers are disclosed in United States Patents No. 3,896,730 and No. 4,534,291, issued for inventions of Garrett, et al. and Sabota, et al. respectively.

Recirculation systems for retaining mixtures of fountain solutions are disclosed in United States Patents No. 4,151,854, issued for an invention of Patsko and No. 3,485,257, issued for an invention of Gegenheimer.

There remains a need for a blanket wash system that avoids the cumbersome aspects of the cloth approach while providing a spray system that maintains mixing of wash components that may be subject to settling while still providing high pressure that are necessary for spraying.

Disclosure of Invention

The present invention provides an automatic blanket wash system that overcomes difficulties in the prior art by providing for a flow through spray bar. A plurality of spray system units are disposed in a first fluid path. Each spray system unit has a fluid input and a fluid output and includes upper and lower spray bars for spraying the mixture respectively onto the upper and lower blankets of the printing unit with which the spray system unit is associated. A spray control arrangement, associated with each spray unit, causes, upon activation, the mixture to be sprayed by the spray bar. A supply line is in fluid communication with a reservoir and the spray system units. A return line is also in fluid communication with the spray system units and the reservoir. A delivery arrangement delivers quantities of water and solvent into the reservoir in predetermined proportions. A pumping arrangement causes circulation of the mixture from the reservoir through the supply line, through the first fluid path, through the return line, and then back to the reservoir. The circulation of the mixture prevents settling of the solvent and to ensure homogeneity of the mixture throughout the system. A wash control arrangement implements the wash cycle, including actuating the spray control arrangement so as to cause the mixture to be sprayed by the spray bars.

In one embodiment of the invention, the pumping arrangement circulates the mixture through the system. A pressure control arrangement, upon actuation by the wash control arrangement, increases fluid pressure in the system upon implementation of the wash cycle.

In another embodiment of the invention, each spray bar includes a second fluid path therethrough disposed between a unit fluid input and a unit fluid output. A diverter arrangement is disposed between the unit fluid input and the second fluid path and is normally closed. Upon actuation by the wash control arrangement, the diverter arrangement permits the mixture to flow through the second fluid path in each spray bar.

In a preferred embodiment of the invention, the pumping arrangement circulates the mixture throughout the system normally at low pressure. The wash control arrangement includes an arrangement for implementing a wash cycle as follows. First, the wash control arrangement actuates the diverter arrangement to permit the mixture to flow through the second fluid path within the spray bar. Then the wash control arrangement actuates the pressure control arrangement to increase the fluid pressure within the second fluid path within the spray bars. Finally, the wash control arrangement actuates the spray control arrangement so as to cause the mixture to be sprayed by the spray bars.

Brief Description of the Drawings

These and other features of the invention will be more readily apparent in the following discussion, taken with the accompanying drawings, in which :

Fig. 1 is a schematic showing the basic fluid flow in accordance with a preferred embodiment of the present invention ;

Fig. 2 is a more detailed schematic of the embodiment of the invention depicted in Fig. 1 showing the manner in which fluid control of the wash system is maintained ;

Fig. 3 shows the unit control of the upper and

lower spray bars of the embodiment of the invention depicted in Fig. 1 ;

Fig. 4 is a schematic showing the spray bar of the embodiment depicted in Fig. 1 ;

Fig. 5 is a cross sectional view along the line A-A the embodiment depicted in Fig. 4 ;

Fig. 6 is a schematic showing the valve body assembly of the embodiment depicted in Fig. 5 ;

Fig. 7 is a cross sectional along the line B-B of the embodiment depicted in Fig. 4 ;

Fig. 8 is a schematic showing the spray bar and spray nozzle assembly of another embodiment of the invention ;

Fig. 9 is a cross sectional along the line B-B of the embodiment depicted in Fig. 8 ;

Fig. 10 is a cross sectional along the line A-A of the embodiment depicted in Fig. 8.

Detailed Description of Specific Embodiments

Figure 1 shows the basic fluid flow in accordance with a preferred embodiment of the present invention. A system control enclosure and mixture reservoir 11 receives water over line 114 and solvent over line 113. These are permitted to enter a common reservoir in item 11 where they mix. The washing mixture is delivered via supply line 111, to a plurality of unit controls 121, 122, 123, and 124 ; each unit control is associated with a single printing unit having upper and lower blankets that may be in need of cleaning. These printing units are identified as items 131-134 respectively. By way of example, there is shown upper spray bar 125 and lower spray bar 126 associated with the upper and lower blanket cylinders of unit 134. As indicated, similar spray bars are disposed with respect to each of the other printing units. Each spray bar is in fluid communication with the unit control for its particular printing unit. From each unit control, here item 124, there is provided a return line 112 back to the reservoir in item 11.

Except when the wash cycle has been commenced, the washing mixture is circulated continuously through the supply line 111 and back through the return line 112 to the reservoir. In this fashion, the washing mixture is mixed on a continuous basis. The system handles effectively a mixture of TEX 300 Concentrate, with water, available from Printex Products Corp., P.O. Box 1479, Rochester, NY 14603. This solvent forms a milky-white emulsion when mixed with water, but is subject to settling unless the mixture is continuosly agitated. The present invention provides the agitation inside a mixing tank in the reservoir and by continuous circulation. A chemical solvent in the mixture, upon spraying of the blanket, lifts foreign matter from the blanket of the blanket cyclinder. The printed paper web, by way of absorbtion, then carries the lifted foreign matter away from the blankets.

The automatic blanket wash system described so far herein can also be configured to service multiple press lines. In this configuration, as depicted in Figure 1, a central supply line 141 is in direct fluid communication with the reservoir 11 and the supply line 111 for a press line subsystem servicing an individual press line. A central return line 142 is also in direct fluid communication with the reservoir 11 and the return line 112 from the press line subsystem servicing the press line. The central supply line 141 and the central return line 142 have one way check valves 139 disposed therein for insuring circulation of the mixture in only one direction through the system.

Supply line 111, in a preferred embodiment, has associated therewith a pneumatic accumulator 137 disposed along supply line 111 and in communication with a central air supply line 145. The accumulator 137 is pre-charged by compressed air to between 65 and 75 psig. Prior to spraying, the hydraulic pressure within the system is increased to 80 psig. By means well know in the art, the accumulator 137 provides a stored cushion of pneumatic pressure in the range of 75 psig against the hydraulic pressure in the system. As the fluid pressure in the system drops below 80 psig upon the commencement of spraying the accumulator 137 provides a pressure back-up to maintain pressure in the system during spraying at 65-75 psig.

The return line 112 also has a one way check valve 139 associated therewith for insuring circulation of the mixture in only one direction through the return line 112.

In a preferred embodiment, a restrictive orifice is disposed in the central return line 142 at the mixing tank (see item 21, Fig. 2) disposed inside the reservoir 11. The restrictive orifice causes the mixture to enter the mixture reservoir 11 under increased pressure, thereby aiding in the agitation of the mixture within the reservoir 11 and, thus, further insuring a homogeneous mixture for recirculation.

A press line shut off valve 138 is also disposed in the supply line 111 to each press line subsystem servicing an individual press line for shutting off the plurality of spray system units servicing the individual press line under conditions described below.

In a preferred embodiment of the invention, each spray system unit includes a diverter valve (shown in Figure 3) in the unit controls 121-124. Referring by way of example to unit 124, in a first position, the diverter valve shunts out the second fluid path to permit fluid to flow directly from the unit's fluid input 135 to its fluid output 136, such diverter valve being normally disposed in the first position. In a second position, the diverter valve permits fluid flow from the unit's fluid input 135, through the fluid path within the spray bars 125 and 126, to the unit's fluid output 136. The diverter valve is actuatable by the wash control arrangement and, in a preferred embodiment, is pneumatically activated. The wash control arrange-

ment includes an arrangement for actuating the diverter valve to dispose the valve in the second position, so as to permit recirculation of the mixture in the spray system unit just prior to actuation of the spray valves.

In operation, in a preferred embodiment, the mixture is circulated through the system under low pressure. At the commencement of a wash cycle, the unit controls 121-124 are actuated to open the respective diverter valves permitting fluid flow from the unit control input to the spray bars associated with each unit control. Thereafter a wash valve in the return line 142 (shown as item 211 in Figure 2) is closed, causing an increase in pressure in the system. Diverting circulation away from the fluid paths within the spray bars until just prior to commencement of spraying prevents leakage of the mixture from the spray valves disposed in each spray bar. In addition, circulation of the mixture through the system under low pressure until just prior to the commencement of spraying prevents leakage of the mixture throughout the system. A solenoid valve (shown in Fig 3) in each unit control box 121-124 is in communication with an air supply line 115 and controls the flow of air from the air supply line 115 to pneumatically actuated valves in each spray system unit. (Figures 4-6, 8-9). Upon activation by the wash control arrangement, the solenoid activates the pneumatic valve associated with each spray nozzle so as to cause the mixture to be sprayed by the spray nozzle. In the multiple press line configuration, the air supply line 115 for each press line subsystem is in direct communication with a central air supply line 145.

Figure 1 shows the spray system units disposed in parallel along the first fluid path, between the supply line 111 and the return line 112. The fluid input 125 of each spray system unit is in direct communication with the supply line 111 and the fluid output 136 of each spray system unit is in direct communication with the return line 112. In addition, each press line subsystem, in the multiple press line configuration, is disposed in parallel between the central supply line 141 and the central return line 142.

While in a preferred embodiment of the invention as shown in Figure 1 the spray system units are disposed in parallel along the first fluid path, the spray system units can also be disposed in series along the first fluid path. In the series configuration one of the spray system units is the first spray system unit in the series and another of the spray system units is the last spray system unit in this series. The fluid output of each spray system unit is then in communication with the fluid input of the next spray system unit in the series. The fluid input of the first spray system unit is then in direct communication with the supply line and the fluid output of the last spray system unit is in direct communication with the return line.

Turning now to Figure 2, solvent is pumped by pump 242 from solvent reservoir 27 through solvent metering valve 252 into the mixture reservoir 21 holding the wash mixture. Water enters under line 114 through water pressure reducing regulator 113 and water metering valve 251. Pressure in the solvent flow is regulated by pressure valve 243. As a result, when solvent and water enter through their respective metering valves, they enter in proportions that may be determined in advance. Specific gravity of the wash mixture is monitored by density sensor 261 and a specific gravity readout 263 is provided, so that if a specific gravity is outside predetermined limits, the system may be shut down or the quantities of water or solvent in the reservoir 21 may be altered. In the case of TEX 300 Concentrate, a specific gravity of $0.878 \pm .005$ is typical for a proper concentration of the solvent and water of about 65 percent of solvent by volume. Further control arrangements relating to specific gravity of wash solution are disclosed in United States Patent No. 3,848,618, issued for an invention of Ryse, as well as the Patsko and Gegenheimer patents described above.

In normal operation, pump system 23 pumps the wash mixture from reservoir 21 over lines 141 and 111 past the mixture density sensor 261, past each of the unit control boxes, including unit control box 12, which is illustrated with its associated spray bars. There is also provided a return lines 112 and 142 back to the mixture reservoir 21.

It is noted that, in a preferred embodiment of the invention, all the seals throughout the system are either Teflon or Viton and are essentially inert to the mixture circulating through the system.

On initiation of the wash cycle, the wash control valve 211 is closed, in a preferred embodiment, by the wash control arrangement 22 and pressure builds up in the supply line 111. Maximum pressure in the fluid supply line is regulated by pressure valve 231 interposed between the supply line 111 and the reservoir 21. Typically, the pressure build-up is regulated in the vicinity of 80 pounds per square inch (550 K Pa). The actuation of the wash control valve is performed by the spray control system 22 in accordance with systems well known in the art.

In a typical application, spray of the wash mixture is permitted to emanate from the spray bar in a range of about one-half to one second. The web, or paper, itself serves to blot out the wash mixture from the blanket cylinder. The valves in the unit controls may be actuated in any desired sequence. Under one protocol, the spray system unit associated with the printer spray system unit associated with the unit most remote from the web dryer is actuated first, then the next remote, etc. ; this protocol minimizes the amount of web wasted since the portion of the web serving to blot the most remote unit may also serve to blot the next most remote unit, etc. However, in order to minimize the concentration of wash mixture on the web (to further reduce the risk of combustion in the web

dryer), another protocol would initiate wash of the printer unit closest to the web dryer first, then wash of the printer unit next closest to the web dryer, etc. Under this protocol, it is possible to ensure that the portion of the web that has blotted the printer unit closest to the web dryer has fully emerged from the web dryer before the portion of the web blotting the printer next closest to the web dryer has entered the dryer.

Figure 3 shows the unit control box 31 in detail. The mixture, in a preferred embodiment, is normally circulated through the system under low pressure and circulated from the supply line through the unit input connection 33 through the diverter valve 32, which is normally closed. The mixture, therefore, normally circulates from the unit fluid input connection 33 through the diverter valve 32 and through circulation line 312 and out through the unit fluid output connection 310.

Upon initiation of the wash cycle, the diverter valve 32 is pneumatically actuated by a solenoid valve 39 to allow the mixture to flow through the upper and lower spray bars associated with the unit control 31. Upon actuation of the diverter valve 32, the mixture flows through the fluid path within each the upper and the lower spray bars via input lines 38A and 38B, respectively, and then out of each spray bar via return lines 38C and 38D, respectively. A flow detector 35 is located downstream of the diverter valve 32 to monitor if a failure has occurred to the diverter valve 32 and the mixture is flowing into the spray bars at any time other than during the wash cycle. In the event the flow detector 35 detects flow of the mixture at any time other than during the wash cycle, the flow detector 35 will transmit a fail signal to the wash control arrangement thereby setting in motion a command to shut off the mixture supply valve 138 (see Fig 1) to the press line subsystem servicing the individual press line.

In a preferred embodiment, after actuation of the diverter valve 32 has permitted the mixture to flow through the fluid paths in each of the upper and lower spray bars associated with each unit control 31, fluid pressure within the fluid paths is increased, as described above. After the pressure within the fluid paths within the spray bars is increased, the spray valves in the spray bars (Figure 4) are pneumatically activated by two small three-way solenoid valves 36A and 36B, associated with the upper and lower spray bars respectively, thereby causing the spray valves to spray the mixture.

Each solenoid valve 36A and 36B has a pressure switch 37A and 37B associated therewith for monitoring the proper operation of the solenoid valves 36A and 36B respectively. The switches are electrically wired to assure a fail safe mode. If either solenoid valve 36A or 36B opens at anytime other than during the wash cycle, the respective pressure switch, 37A or 37B, will transmit a fail signal to the wash control arrangement thereby setting in motion a command to shut off the mixture supply valve 138 (see Fig.1) to the press line subsystem servicing the individual press line.

In a preferred embodiment, each return line 38C and 38D has a spring-loaded check valve 34 therein placed near the circulating line 312 within the unit control, to assure circulation of the mixture through the spray bar in only one direction and preventing any flow of the mixture from the circulation line 312 into the spray bar through the return lines 38C and 38D. In addition in a preferred embodiment, a venturi insert 313 is incorporated into a connecting tee 314, between the unit spray bar return line 38D and the circulation line 312, to produce a low pressure status over the two intersecting return lines 38C and 38D, thereby assuring that the static pressures inside the spray bars are lower than the circulating mixture pressure.

Figure 4 shows an integral flow through spray bar in accordance with the embodiment discussed herein. Spray bar manifold 41 has integral valve bodies disposed therein. Each valve body has a nozzle assembly 44 protruding from the surface of the spray bar manifold 41 and from which the spray mixture emanates. Each spray bar, in a preferred embodiment, is divided into sections, preferably quadrants. A quadrant, or web size, control valve 42 regulates spraying of the mixture by the valve bodies disposed within the section. The spray bar manifold contains as many spray valves as required to provide proper distribution of the mixture across the face of a blanket. The number, in a preferred embodiment of the invention, is always a multiple of four so the blanket wash system can accomodate running a quarter web, half web, three quarter web or a full web.

Each spray valve disposed within the spray bar manifold 41 also has an overriding manual valve stop 43 associated therewith. The overriding manual stop 43 on each nozzle prevents the spray valve from opening and the spray nozzle from spraying even when a pneumatic signal is applied to the spray valve. This allows a pressman to control the width of the spray pattern to conform to web widths other than the quarter, half, three quarters and full web adjustable by the quadrant control valves 42.

Turning to Figure 5, the spray bar manifold 41 of Fig. 4 is shown with four passages running lengthwise through the manifold. Two passages 51 and 52 are approximately a half inch in diameter and provide a passageway for supply and return of the mixture through the spray bar. The spray bar manifold also has two smaller passages 54 and 55 running therethrough for pneumatic pressure to actuate the spray valves. Along the length of the manifold are a series of machined cavities 59 to house the nozzle assembly 56, pneumatic actuated valve 57 and the overriding manual stop valve 58.

Turning now to Figure 6, showing one spray valve assembly as disposed in one of the cavities 59 (as shown in Fig. 5), a valve spring 64 forces a piston

stem 62 containing the piston seat 61 against the base of the nozzle assembly 66, thus preventing any mixture from passing through the nozzle. On a pneumatic signal, pneumatic pressure is applied to the piston 65, forcing the piston seat 61 to move away from the base of the nozzle 66, thus opening a flow path for the mixture to enter the nozzle 66. Once the pneumatic pressure is removed, the valve spring 64 closes the valve.

The piston 65 is the pneumatically actuated portion of the spray valve. It is a machined part of primarily two diameters. One diameter of approximately · 75 inches is the pneumatic piston 65 with its own packing to seal between the body of the piston and the valve body cavity 53. The other diameter of approximately · 25 inches is the stem portion 62 of the piston. It contains two o-rings 63 for sealing purposes. The o-ring 63A toward the nozzle is the seal to prevent solvent from entering the pneumatic portion of the nozzle assembly. The second o-ring 63B toward the piston prevents leakage of air into the mixture side of the nozzle assembly. The stem portion 62 of the piston is counterbored to contain the valve seat.

The nozzle assembly 66 includes the hydraulic nozzle 67, mounting flange 68 for holding the nozzle in the extruded manifold in the proper orientation and an o-ring seal 63A to prevent solvent leakage around the assembly.

The hydraulic nozzle 67 of the preferred embodiment of the invention, with a supply pressure of 80 psig, produces a fan shaped spray pattern which has an included angle of approximately 89 degrees and a flow rate of approximately 0.14 GPM. The nozzle assemblies 66 in conjunction with the appropriate nozzle-to-nozzle spacing, provides the necessary distribution of mixture across the face of the blanket.

The back portion of the nozzle assembly serves as the mating surface for the valve seat 61 contained in the stem 62 of the piston.

Figure 7 shows the web size control valve 71 disposed in the spray bar 72. The web size control valve 71, when in the closed position, prevents the pneumatic signal from the unit control from activating the spray nozzles in the quadrant or section.

An alternative embodiment of the spray bar is shown in figures 8-10.

The flow through spray bar of figure 8 performs the same functions as the integral flow through spray bar of figure 4 and, in addition, the valve assembly 81 thereof is commercially available. The pneumatically actuated valve assembly 81 performs all the functions of the integral valve assembly described above in reference to figures 4 and 5 with the exception that the valve is external to the spray bar manifold 84, as shown in figure 8. As shown in figure 8, the spray valve 81 is secured to the spray bar manifold 84 by a nut 85 and cotter pin 86. Each spray valve 81 also has a manual shut-off valve 82. Figure 8 also shows the web size control valve 83.

Figure 9 shows a cross section of the spray bar manifold 84 of figure 8 with the spray nozzle 90 disposed therein. The spray bar manifold 94 has two passageways 91 and 92 running lengthwise therethrough thereby forming a fluid path. Each spray valve 90 has a fluid port 93 for intake of the mixture during spraying when the spray valve 90 is pneumatically activated. The spray bar manifold 94 also has two smaller passages 96 and 97 running lengthwise therethrough for delivering a pneumatic signal via pneumatic port 95. Figure 9 also shows the manual override valve 98 and the nut 99 and cotter pin 991 for securing the spray valve 90 to the spray bar manifold 94.

Figure 10 shows the web size control valve 101 disposed in the spray bar manifold 102 of the embodiment depicted in Fig. 8. The passageways 103 and 104 for fluid and the smaller passageways 105 and 106 for the pneumatic signal are also shown.

Claims

1. An automatic blanket wash system for spraying a cleaning mixture onto a blanket roller of a printing press unit, the system comprising :

(a) a reservoir ;

(b) at least one spray system unit in a fluid path, each spray system unit having a fluid input and a fluid output and including a spray bar for spraying the mixture onto the blanket roller of the printing unit with which the spray unit is associated, the spray bar having (i) the fluid path therethrough and disposed between the unit fluid input and the unit fluid output, and (ii) a spray valve ;

(c) a supply line in fluid communication with the reservoir and at least one spray system unit ;

(d) a return line in fluid communication with at least one spray system unit and the reservoir, permitting return of fluid in the spray system unit to the reservoir ;

(e) pumping means for moving the mixture from the reservoir through the supply line, to the spray bar ; and

(f) wash control means for controlling the spray valve so as to cause the mixture to be sprayed by the spray valve in the course of a wash cycle.

2. A system according to claim 1 wherein :

(i) each spray system unit includes diverter means for, in a first position, permitting fluid flow from the unit's fluid input through the spray bar to the unit's fluid output and, in a second position, shunting out the fluid path through the spray bar to permit flow directly from the unit's fluid input through an alternate fluid path to the unit's fluid output, such diverter means being actuated by the wash control means ; and (ii) the wash control means includes means for actuating

the diverter means in the course of the wash cycle.

3. A system according to any of claims 1 or 2 further comprising pressure control means for, upon actuation by the wash control means, increasing the fluid pressure in the fluid path in each spray bar, prior to commencement of spraying.

4. A system according to any of claims 2-3, wherein the wash control means includes means for implementing the wash cycle as follows :

(a) actuating the diverter means so as to permit the mixture to flow through fluid path in the spray bar ;

(b) actuating the pressure control means so as to increase fluid pressure in the fluid path in the spray bar ; and

(c) actuating the wash control means so as to cause the mixture to be sprayed by the spray bar.

5. A system according to any of claims 3 or 4, wherein the pressure control means comprises wash valve means, disposed in the return line, for, upon actuation by the wash control means, substantially restricting flow through the return line.

6. A system according to any of claims 2-5, wherein the wash control means includes means for causing the diverter means to be disposed in the second position at any time other than during the wash cycle.

7. A system according to any of claims 1-6, further comprising :

low pressure means, associated with each spray system unit, for producing a fluid pressure inside the fluid path in the spray bar lower than the fluid pressure in the automatic blanket wash system outside the fluid path in the spray bat at any time other than during the wash cycle.

8. A system according to claim 7, wherein the low pressure means comprises a venturi insert disposed in the fluid path near the fluid output.

9. A system according to any of claims 1-8, further including accumulator means for maintaining a high pressure in the fluid path in the spray bar while the mixture is being sprayed by the spray bar.

Patentansprüche

1. Automatisches Gummituch-Waschsystem zum Aufsprühen einer Reinigungsmischung auf eine Gummituchwalze einer Druckeinheit, bestehend aus:

(a) einem Behälter,

(b) wenigstens einer Sprühsystemeinheit in einem Fluidweg, wobei jede Sprühsystemeinheit einen Fluideinlaß und einen Fluidauslaß besitzt sowie einen Sprühstab zum Aufsprühen der Reinigungsmischung auf die Gummituchwalze der Druckeinheit, mit der die Sprüheinheit verbunden ist, wobei der Sprühstab (i) den durch ihn verlaufenden, zwischen dem Fluideinlaß der Sprüheinheit und dem Fluidauslaß der Sprüheinheit angeordneten Fluidweg und (ii) ein Sprühventil aufweist,

(c) einer Versorgungsleitung, die mit dem genannten Behälter und wenigstens einer Sprühsystemeinheit in Fluidverbindung steht,

(d) einer Rückführleitung, die mit wenigstens einer Sprühsystemeinheit und dem genannten Behälter in Fluidverbindung steht und den Rückfluß von in der Sprühsystemeinheit vorhandenem Fluid in den Behälter ermöglicht,

(e) einer Pumpeinrichtung für die Förderung der Reinigungsmischung aus dem Behälter durch die Versorgungsleitung zu dem Sprühstab und

(f) einer Waschsteuerungseinrichtung zur Steuerung des Sprühventils in der Weise, daß dieses im Verlauf eines Waschzyklus das Versprühen der Reinigungsmischung durch das Sprühventil bewirkt.

2. System nach Anspruch 1, bei dem

(i) jede Sprühsystemeinheit Abzweigmittel aufweist, die in einer ersten Position eine Fluidströmung von dem Fluideinlaß der Einheit durch den Sprühstab zu dem Fluidauslaß der Einheit ermöglichen und in einer zweiten Position den Fluidweg durch den Sprühstab überbrücken, um eine direkte Strömung von dem Fluideinlaß der Einheit über einen alternativen Fluidweg zu dem Fluidauslaß der Einheit zu ermöglichen, wobei diese Abzweigmittel durch die Waschsteuerungseinrichtung betätigt werden, und

(ii) die Wischsteuerungseinrichtung Mittel aufweist zur Betätigung der Abzweigmittel im Verlauf des Waschzyklus.

3. System nach einem der Ansprüche 1 oder 2, dis ferner eine Drucksteuerungseinrichtung aufweist für die bei Betätigung der Waschsteuerungseinrichtung erfolgende Erhöhung des Fluiddrucks in dem durch jeden Sprühstab verlaufenden Fluidweg.

4. System nach einem der Ansprüche 2 bis 3, bei dem die Waschsteuerungseinrichtung Mittel aufweist zur Durchführung des Waschzyklus in folgender Weise :

(a) Betätigen der Abzweigmittel derart, daß die Reinigungsmischung über den durch den Sprühstab verlaufenden Fluidweg strömen kann,

(b) Betätigen der Drucksteuerungseinrichtung derart, daß der Fluiddruck in dem durch den Sprühstab verlaufenden Fluidweg erhöht wird, und

(c) Betätigen der Waschsteuerungseinrichtung derart, daß die Reinigungsmischung von dem Sprühstab versprüht wird.

5. System nach einem der Ansprüche 3 oder 4, bei dem die Drucksteuerungseinrichtung eine Waschventilanordnung umfaßt, die in der Rückführleitung angeordnet ist, um bei der Betätigung der Waschsteuerungsmittel die Strömung durch die Rückführleitung wesentlich einzuschränken.

6. System nach einem der Ansprüche 2 bis 5, bei dem die Waschsteuerungseinrichtung Mittel umfaßt, die bewirken, daß die Abzweigmittel sich jederzeit außer während des Waschzyklus in der zweiten Position befinden.

7. System nach einem der Ansprüche 1 bis 6, bei dem weiterhin vorgesehen sind :

mit jeder Sprühsystemeinheit verbundene Druckminderungsmittel, die jederzeit außer während des Waschzyklus in dem durch den Sprühstab verlaufenden Fluidweg einen Fluiddruck erzeugen, der kleiner ist als der Fluiddruck, der außerhalb des durch den Sprühstab verlaufenden Fluidwegs in dem automatischen Gummituchwaschsystem herrscht.

8. System nach Anspruch 7, bei dem die Druckminderungsmittel einen Venturi-Einsatz umfassen, der in Nähe des Fluidauslasses in dem Fluidweg angeordnet ist.

9. System nach einem der Ansprüche 1 bis 8, bei dem weiterhin eine Akkumulatoreinrichtung vorgesehen ist zur Aufrechterhaltung einen hohen Drucks in dem durch den Sprühstab verlaufenden Fluidweg, während die Reinigungsmischung von dem Sprühstab versprüht wird.

Revendications

1. Un système automatique de lavage de blanchet pour la pulvérisation d'un mélange détergent sur un rouleau porte-blanchet d'un groupe de presse d'impression, le système comprenant :

(a) un réservoir ;

(b) au minimum un élément de système de pulvérisation dans une voie de débit de liquide, chaque, élément de système de pulvérisation comportant une entrée de liquide et une sortie de liquide, et incluant une barre de pulvérisation pour pulvériser le mélange sur le rouleau porte-blanchet du groupe d'impression avec lequel le dit élément de pulvérisation est associé, la barre de pulvérisation comportant (i) la voie de débit de liquide la traversant d'un bout à l'autre et disposée entre l'entrée de liquide de l'élément de système de pulvérisation et la sortie de liquide de cet élément, et (ii) un robinet de pulvérisation ;

(c) une conduite d'alimentation dans le liquide communiquant avec le réservoir et avec au minimum un élément de système de pulvérisation ;

(d) une conduite de retour dans le liquide communiquant avec au minimum un élément de système de pulvérisation et arec le réservoir, et permettant le retour de liquide dans l'élément de système de pulvérisation, vers le réservoir ;

(e) un moyen de pompage pour faire circuler le mélange à partir du réservoir et dans la conduite d'alimentation, vers la barre de pulvérisation ; et

(f) un moyen de commande de lavage pour la commande du robinet de pulvérisation, de façon à assurer la pulvérisation du mélange par le robinet de pulvérisation au cours d'un cycle de lavage.

2. Un système selon la revendication 1, dans lequel :

(i) chaque élément de système de pulvérisation inclue un moyen de dérivation pour, dans une première position, permettre le débit du liquide, à partir de l'entrée de liquide de l'élément de système de pulvérisation, dans la barre de pulvérisation et vers la sortie de liquide de cet élément, et pour, dans une deuxième position, faire dériver la voie de débit du liquide dans la barre de pulvérisation de manière à permettre au liquide de se débiter directement, à partir de l'entrée de liquide de l'élément, dans une voie de débit de liquide alternative, vers la sortie de liquide de l'élément, ce moyen de dérivation étant actionné par le moyen de commande de lavage ; et (ii) le moyen de commande de lavage inclue un moyen pour actionner le moyen de dérivation au cours du cycle de lavage.

3. Un système selon une des revendications 1 ou 2, comprenant en outre un moyen de commande de pression pour, lors de l'actionnement par le moyen de commande de lavage, augmenter la pression du liquide dans la voie de débit de liquide dans chaque barre de pulvérisation, avant le commencement de la pulvérisation.

4. Un système selon une des revendications 2-3, dans lequel le moyen de commande de lavage inclue un moyen pour la mise en action du cycle de lavage comme suit :

(a) actionnement du moyen de dérivation de manière à permettre au mélange de se débiter dans la voie de débit de liquide dans la barre de pulvérisation ;

(b) actionnement du moyen de commande de pression de façon à augmenter la pression du liquide dans la voie de débit de liquide dans la barre de pulvérisation ; et

(c) actionnement du moyen de commande de lavage de manière à assurer la pulvérisation du mélange par la barre de pulvérisation.

5. Un système selon une des revendications 3 ou 4, dans lequel le moyen de commande de pression comprend un moyen de vanne de lavage disposé dans la conduite de retour pour, lors de l'actionnement par le moyen de commande de lavage, restreindre rigoureusement le débit dans la conduite de retour.

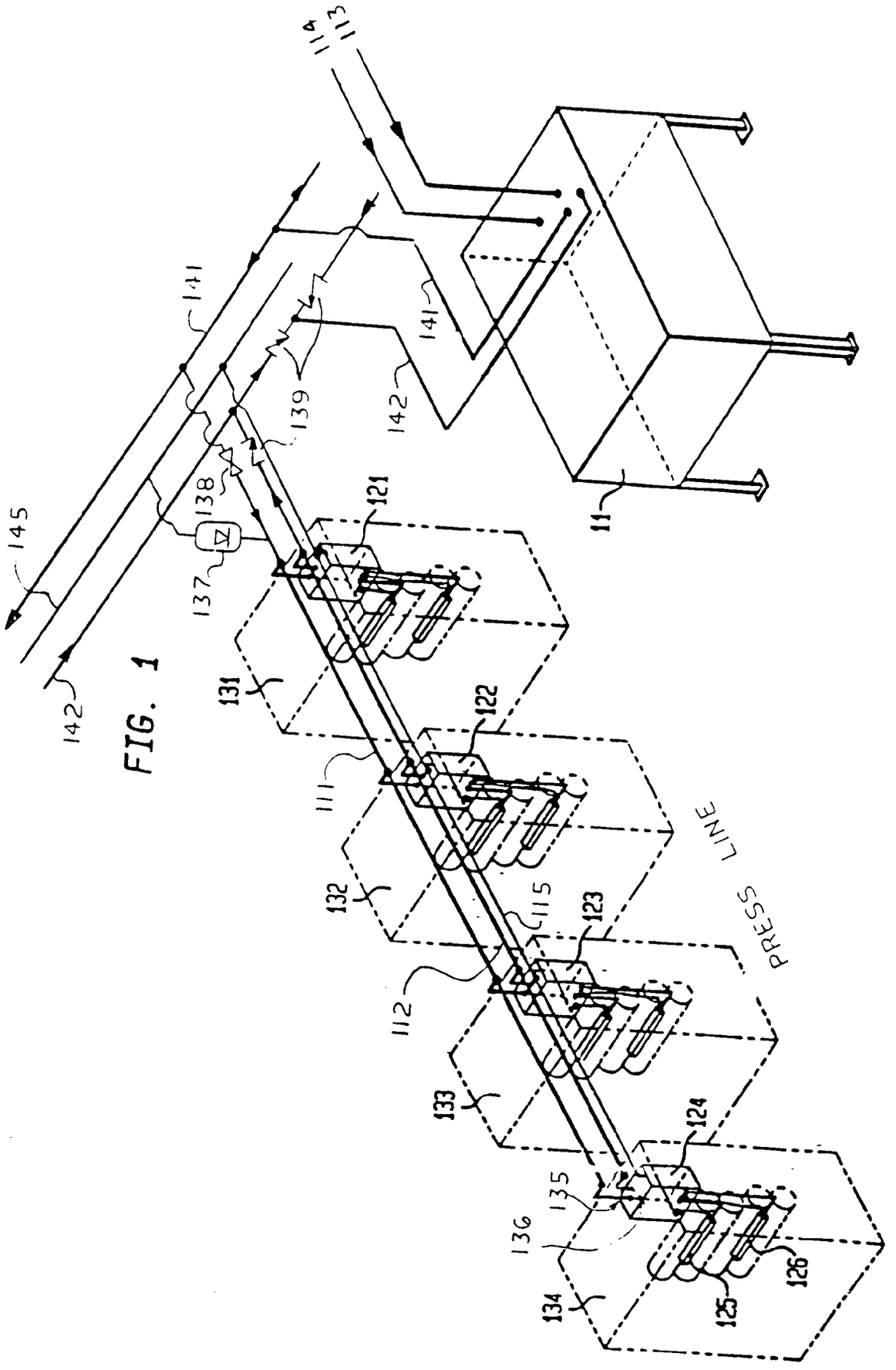
6. Un système selon une quelconque des revendications 2-5, dans lequel le moyen de commande de lavage inclue un moyen pour mettre dans la deuxième position le moyen de dérivation, à tout moment autre que pendant le cycle de lavage.

7. Un système selon une quelconque des revendications 1-6, comprenant en outre :

un moyen basse pression, associé avec chique élément de système de pulvérisation, pour la production, à l'intérieur de la voie de débit de liquide dans la barre de pulvérisation, et à tout moment autre que durant le cycle de lavage, d'une pression de liquide plus basse que la pression du liquide dans le système automatique de lavage de blanchet à l'extérieur de la voie de débit de liquide dans la barre de pulvérisation.

8. Un système selon la revendication 7, dans lequel le moyen nasse pression comprend un insert venturi disposé dans la voie de débit de liquide à proximité de la sortie du liquide.

9. Un système selon une quelconque des revendications 1-8, incluant en outre un moyen accumulateur pour le maintien d'une haute pression dans la voie de débit de liquide dans la barre de pulvérisation lorsque le mélange est pulvérisé par la barre de pulvérisation.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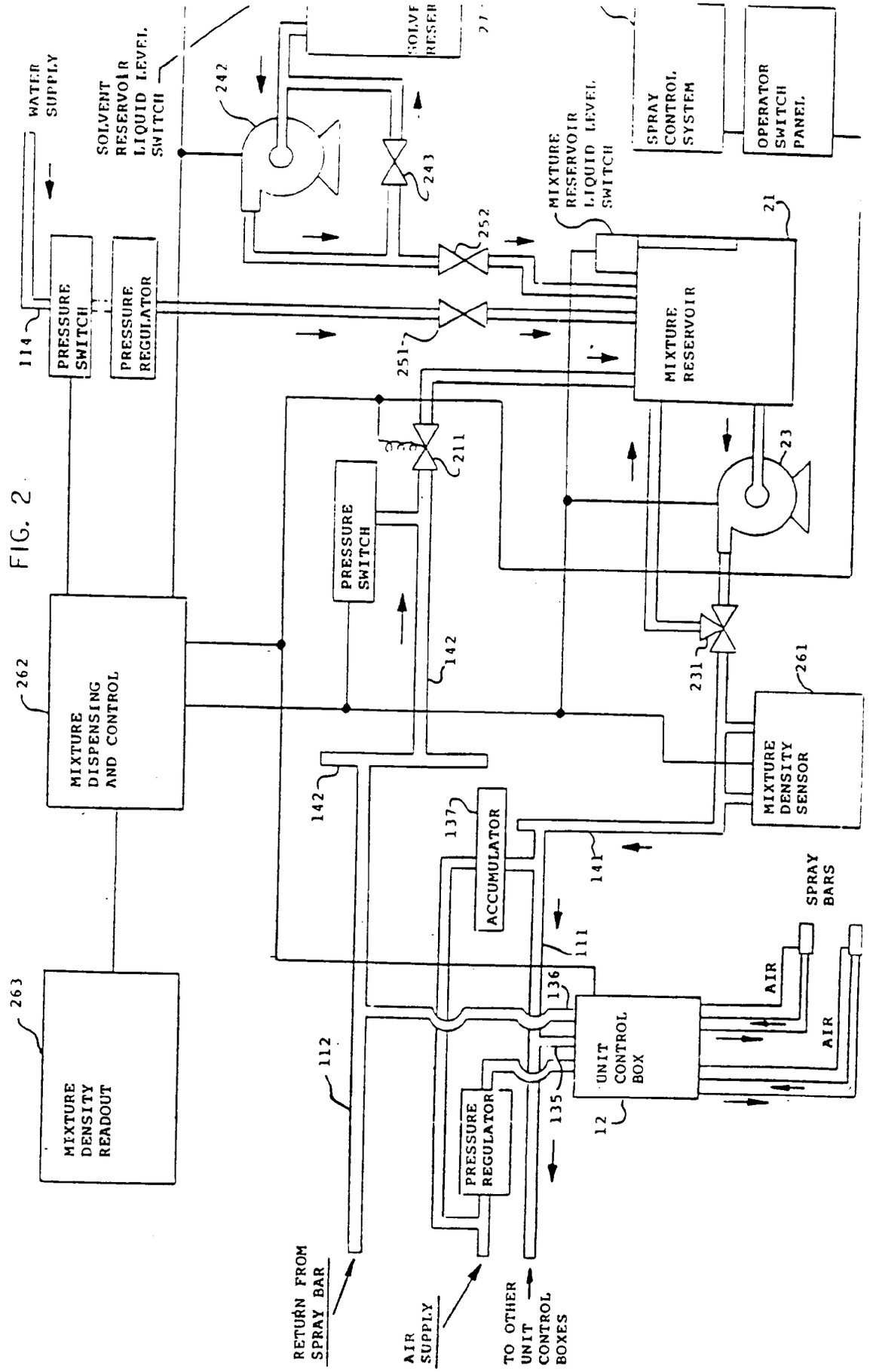
PRESS LINE

FIG. 1

FIG. 2


WATER SUPPLY
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SOLVENT RESERVOIR
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243
252
MIXTURE RESERVOIR LIQUID LEVEL SWITCH
SPRAY CONTROL SYSTEM
OPERATOR SWITCH PANEL
114
PRESSURE SWITCH
PRESSURE REGULATOR
251
211
MIXTURE RESERVOIR
21
23
PRESSURE SWITCH
142
231
261
MIXTURE DENSITY SENSOR
262
MIXTURE DISPENSING AND CONTROL
137
ACCUMULATOR
141
SPRAY BARS
263
MIXTURE DENSITY READOUT
111
136
AIR
AIR
112
UNIT CONTROL BOX
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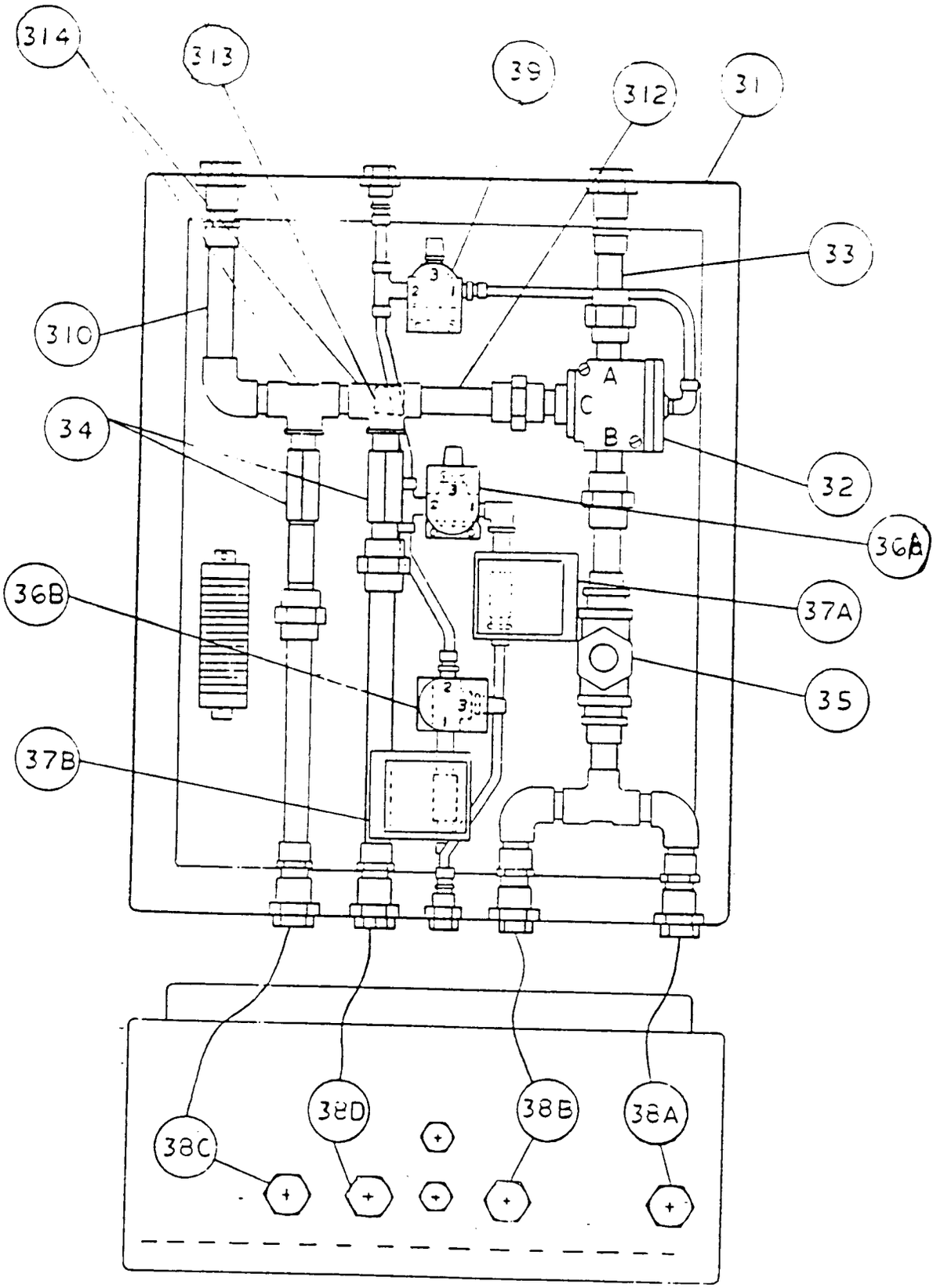
12
PRESSURE REGULATOR
RETURN FROM SPRAY BAR
AIR SUPPLY
TO OTHER UNIT CONTROL BOXES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38D
38B
38A
38C

FIG. 3

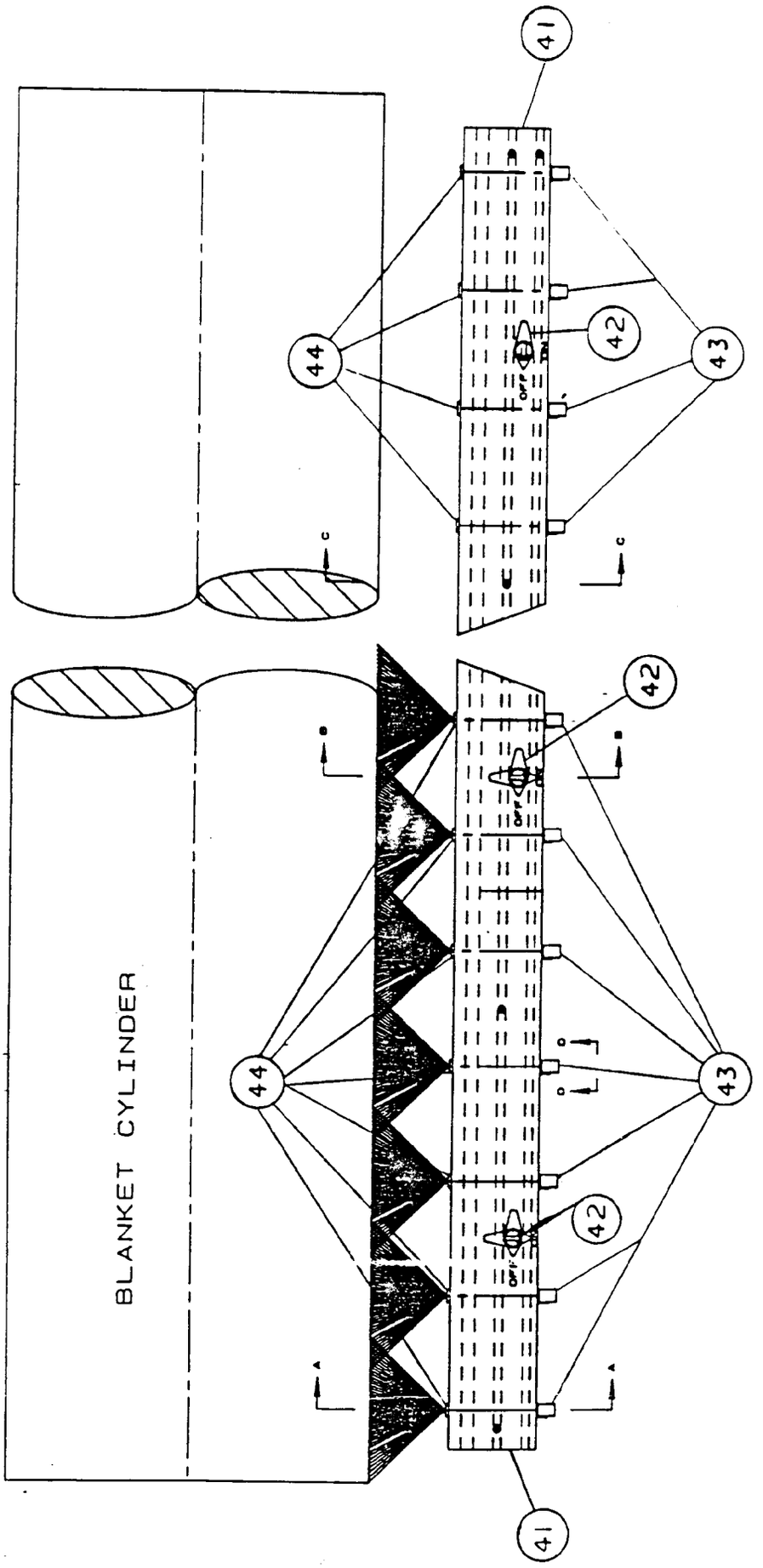


FIG. 4

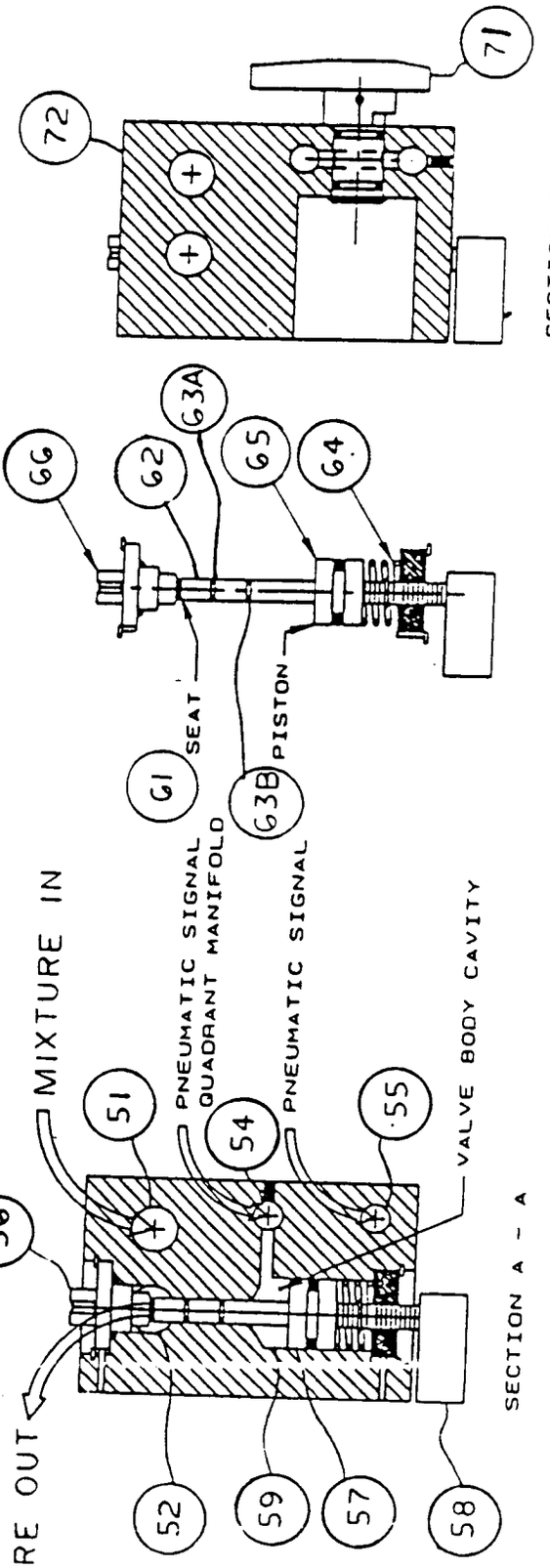


FIG. 5

FIG. 6

FIG. 7

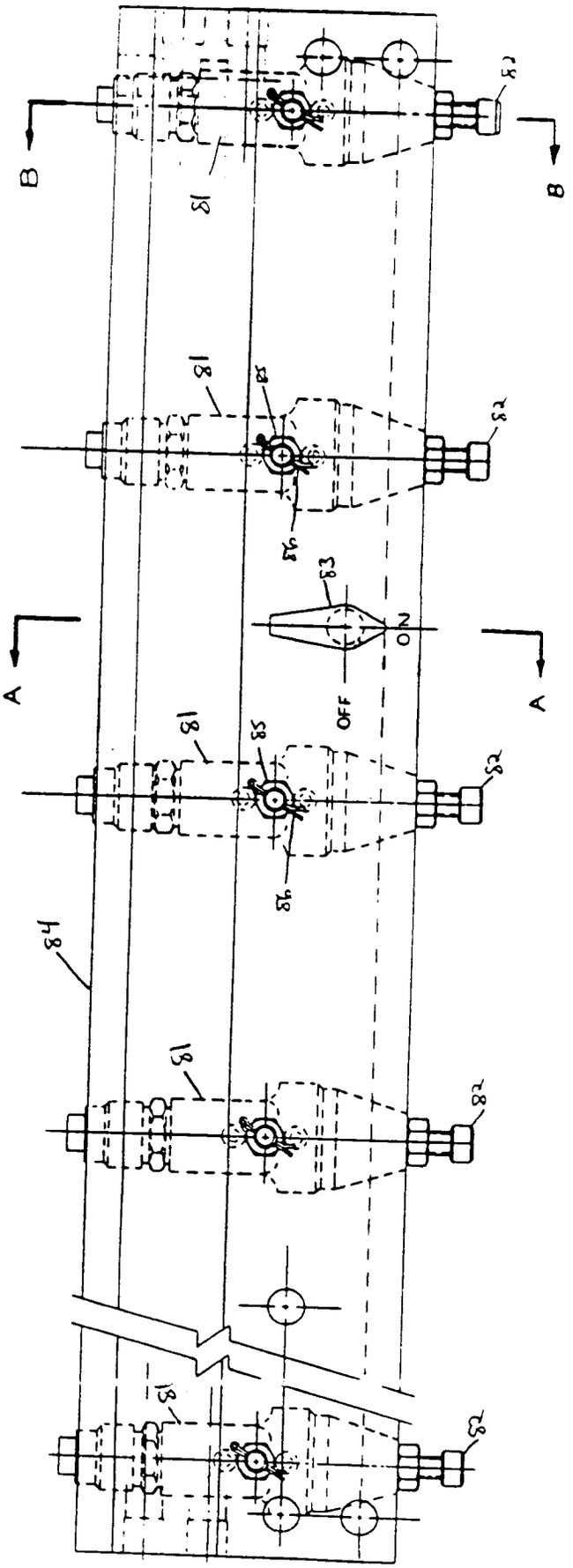
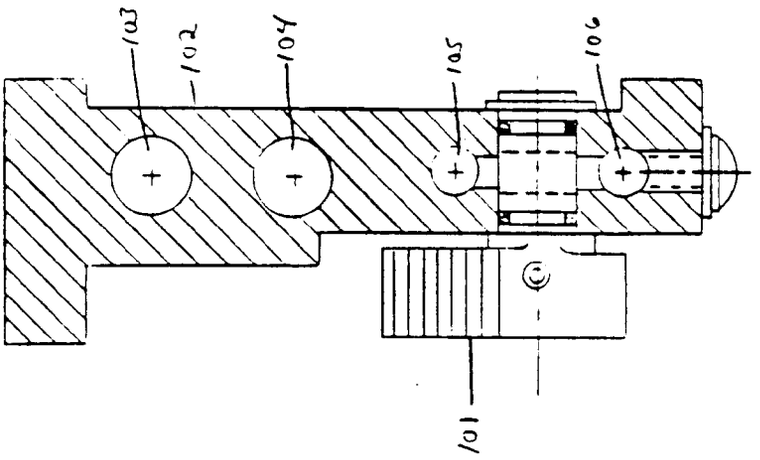


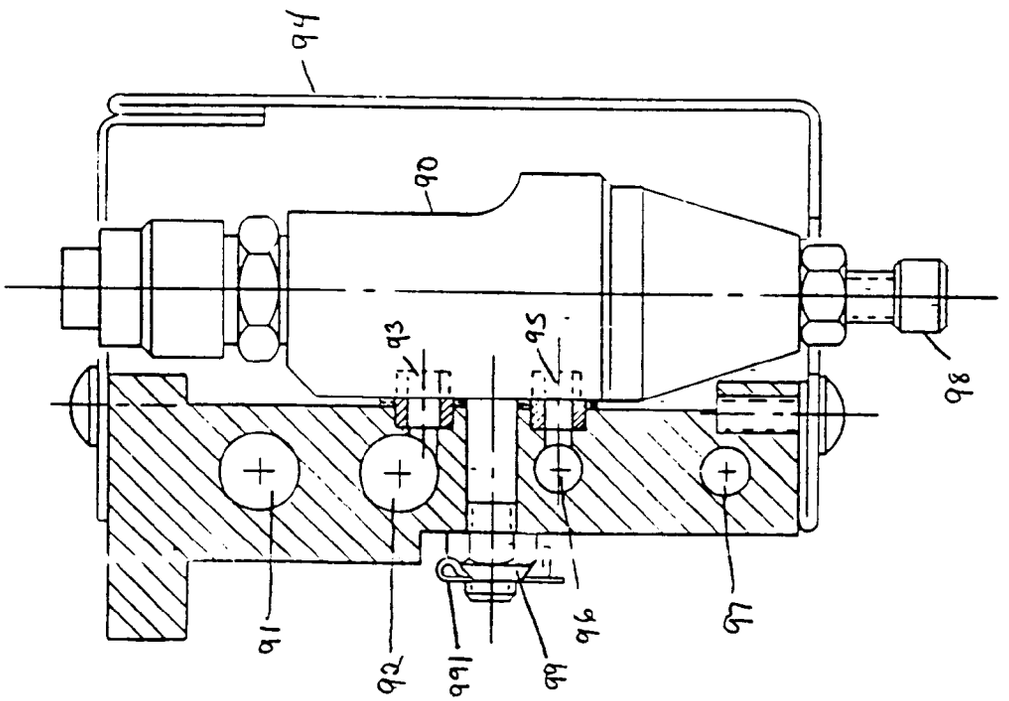
FIG. 8

FIG. 10



SECTION A-A

FIG. 9



SECTION B-B