

Dec. 30, 1969

B. D. ANDERSON ET AL

3,486,448

AUTOMATIC BLANKET CYLINDER WASHER

Filed April 27, 1967

4 Sheets-Sheet 1

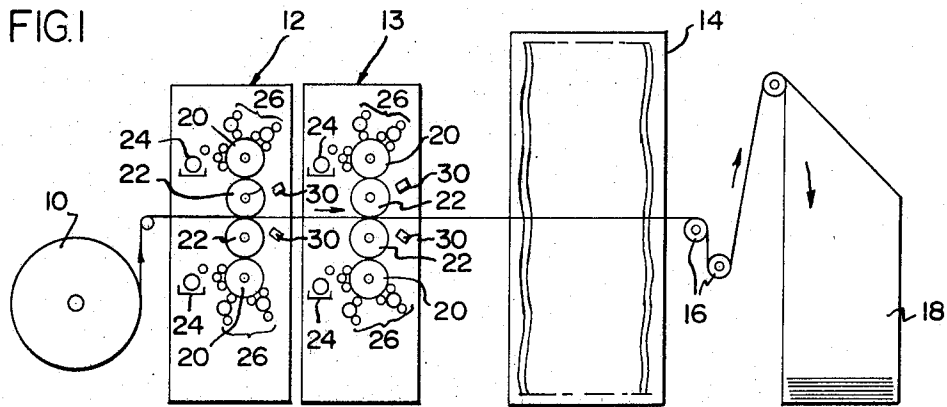


FIG. 4

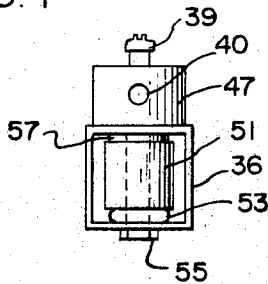


FIG. 6

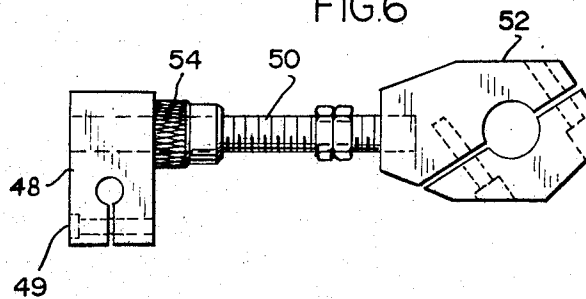
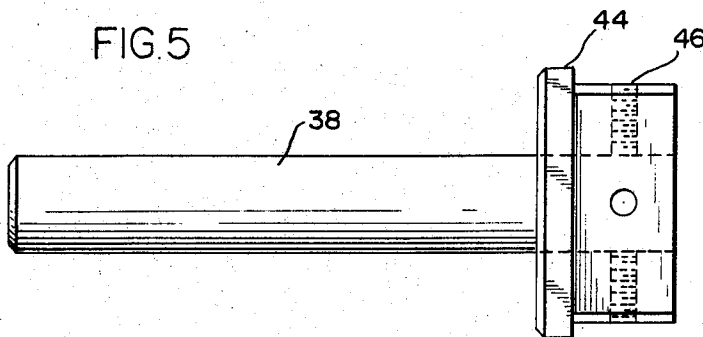


FIG. 5



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4 Sheets-Sheet 2

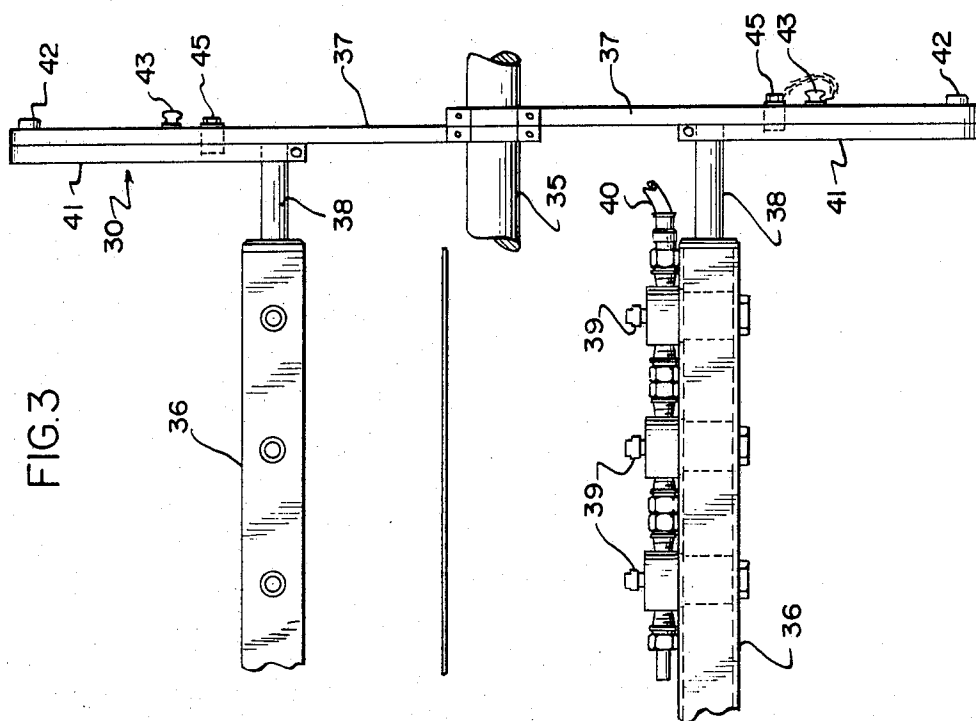


FIG. 3

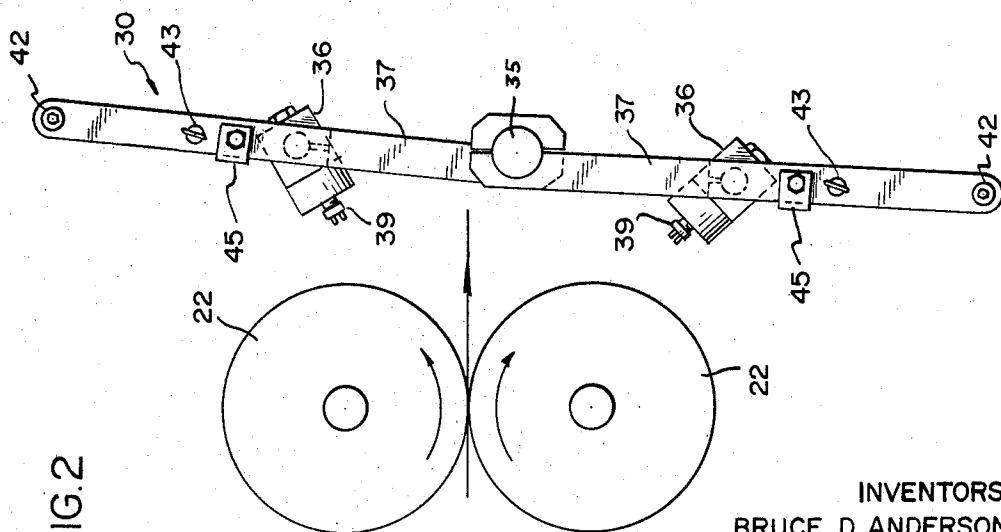


FIG. 2

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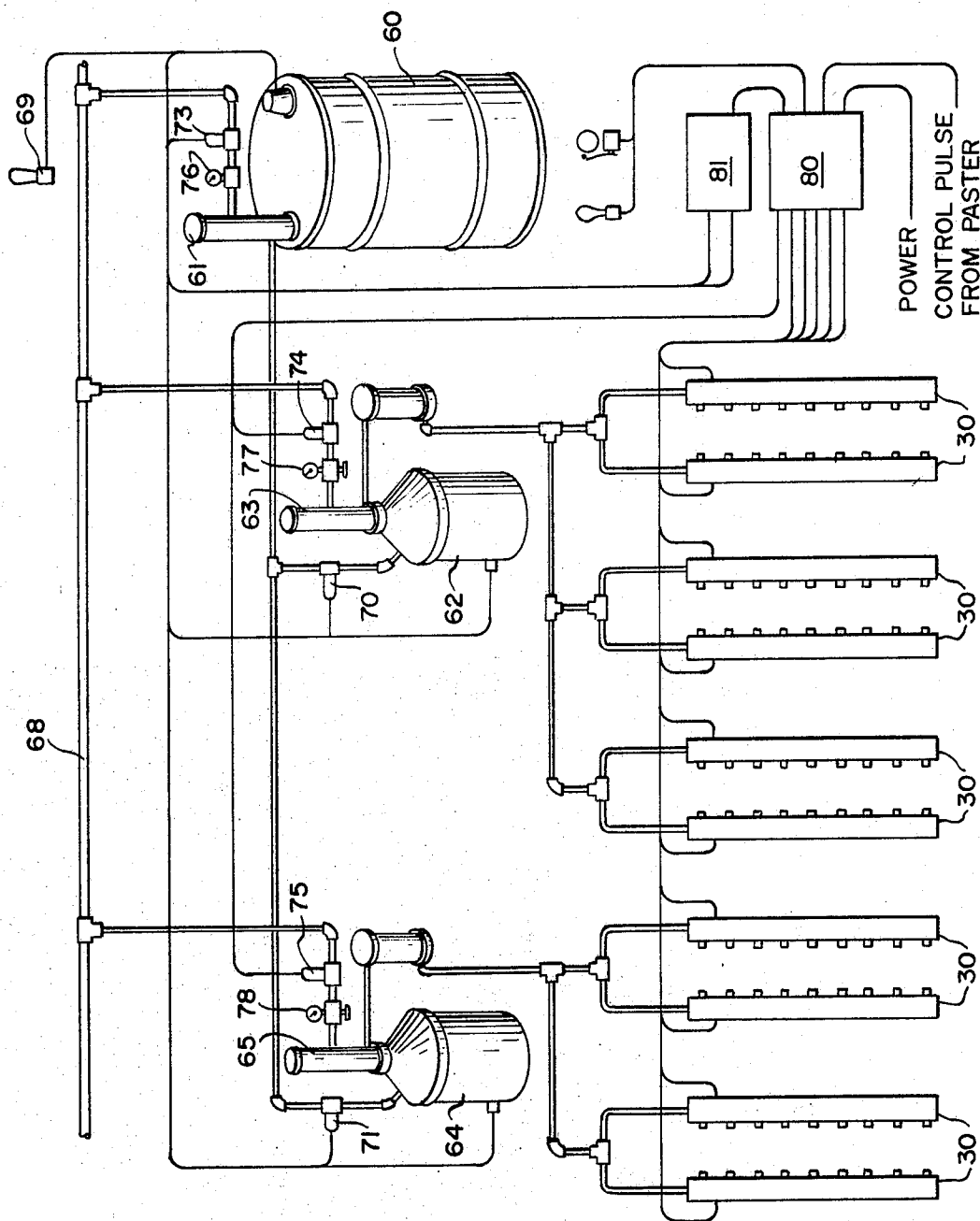
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AUTOMATIC BLANKET CYLINDER WASHER

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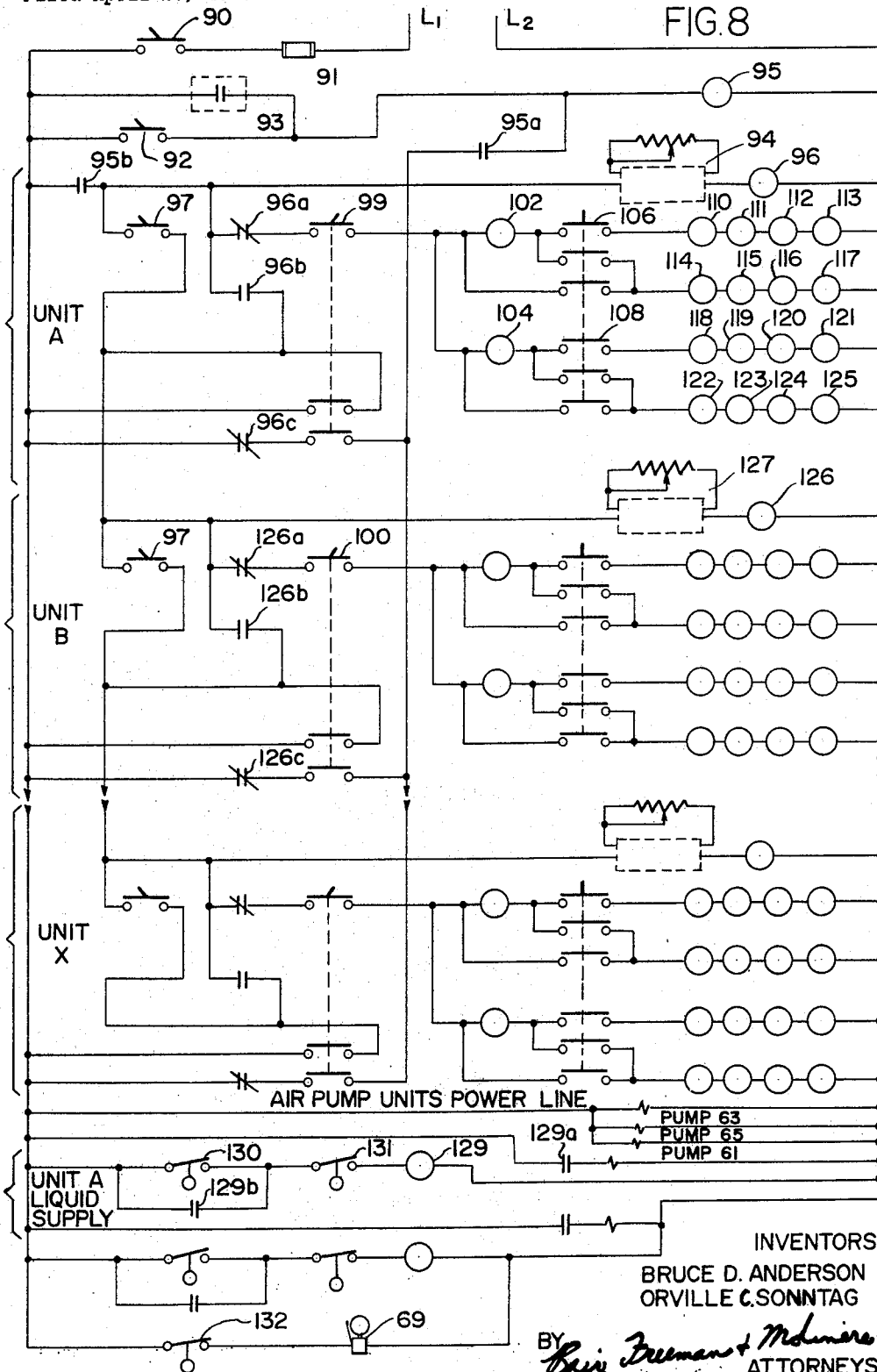
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FIG. 8



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AUTOMATIC BLANKET CYLINDER WASHER
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6 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for automatically washing the exterior surfaces of blanket cylinders in a web press. Spray nozzles disposed adjacent to each blanket cylinder discharge solvent onto each blanket cylinder for washing foreign matter from the exterior surface and for removing affinity of ink for the blanket cylinder such that during subsequent printing, the foreign matter will be carried off onto the web. Control means selectively actuate nozzles to control alternatively, (1) sequential washing of blanket cylinders in a line of printing units, or (2) washing of all the blanket cylinders at one time. The nozzles are further programmed so as to wash all or part of the width of the exterior surface of a blanket cylinder. Preferably, the blanket cylinder washing control means are initiated in response to a pulse from a paster, and the cleaning operation is automatically terminated at the end of a predetermined period of time.

BACKGROUND OF THE INVENTION

This invention relates to automatic blanket cylinder cleaning means, and more particularly to improved means for automatically cleaning blanket cylinders in a blanket-to-blanket printing unit in a web press.

A common type of web offset printing press in use today is the blanket-to-blanket type. The paper web passes between two blanket cylinders, each of which receives an image from a press cylinder and each of which acts as an impression cylinder for the other. Primarily a perfecting press, a blanket-to-blanket press prints one to six colors on both sides of the web in one pass through the press. The number of colors printed is dependent on the number of printing units.

In use, lint, ink and foreign matter tends to cling to the blanket cylinder and must be cleaned therefrom in order to prevent imperfections in the final printed product. Heretofore, one method of cleaning lint and other foreign matter from the blanket cylinder has been manually with a cleaning solution. This is undesirable for it is necessary for the press to be shut down.

More recently, bristle brushes have been employed to clean the exterior surfaces of the blanket cylinder. This has not proved entirely satisfactory, as the surface of the blanket roller or cylinder is sometimes marred by the bristle, resulting in undesirable marks being made upon the final printed product.

An object of the present invention is to provide an automatic blanket cylinder cleaning arrangement that can be employed while the press is running and which does not require bristle brushes for effectively cleaning lint and other foreign matter from the exterior surface of the blanket cylinder.

Another object of the invention is to provide an improved blanket cylinder cleaning means which includes control means for controlling the spray of solvent onto one or more of the blanket cylinders in a printing press simultaneously or sequentially. Further, the controls are adapted to regulate the spray over a selected width of the blanket cylinder, and to be initiated in conjunction

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with the flying paster operation for a predetermined period of time. Other objects and advantages of the present invention will be made more apparent hereinafter.

BRIEF DESCRIPTION OF THE DRAWING

The invention will best be understood by reference to the accompanying drawing which illustrates a preferred form of construction and in which:

FIG. 1 is a diagrammatic view of a typical web press installation embodying the automatic blanket cylinder washer arrangement of the present invention;

FIG. 2 is a side view illustrating upper and lower blanket cylinders and the disposition of the spray bar assembly adjacent thereto;

FIG. 3 is a front view of the spray bar assembly;

FIG. 4 is an end view of a spray bar with the trunnion omitted;

FIG. 5 is an elevation view of a trunnion for supporting the spray bars on the spray bar frame;

FIG. 6 is an elevation view of the mounting clamp used as an alternative means for attaching the spray bar to the press;

FIG. 7 is a schematic view of the automatic blanket cylinder spray means; and

FIG. 8 is a wiring schematic of a presently preferred form of control means.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, there is illustrated a blanket-to-blanket perfecting web offset press which illustrates one form of installation that is readily adapted to utilize the present invention. Essentially, the press includes a roll stand supporting a web 10 of paper to be fed through the press. The web passes through the perfecting units 12 and 13 which are adapted to print different colors thereon. An oven designated generally 14 is often used to increase the carrying off of solvents and to increase the speed at which the inks dry.

When the web leaves the oven 14, it passes over cooling rollers 16 that are usually cooled by continuously circulated cold water. These rollers reduce the temperature of the paper from the approximately 350° of the oven to approximately 80 or 90°.

Then the web may be received at a folder 18 where it is cut and suitably folded to size.

Each perfecting unit typically includes a plurality of plate cylinders 20 having embossings or raised portions with indicia thereon adapted to be printed off onto the blanket cylinders 22. As is common in such systems, dampening means indicated generally at 24 are provided to discharge water or like fluid onto the surface of the plate cylinders 20 to prevent adherence of ink to the plate cylinders at places other than the embossed areas. The inking system 26 is adapted to apply ink only to the embossed areas. The embossed areas then print off onto the respective blanket cylinders 22, which act as impression cylinders for one another to cause the printing to be imparted to the web 10.

As noted above, foreign matter and ink accumulate on the blanket cylinders and must be periodically cleaned therefrom in order to provide a desired high quality of printing.

By the present invention, spray means 30 are positioned adjacent to and in substantially parallel relationship with the blanket cylinders 22 for selectively discharging solvent onto the surfaces of the blanket cylinders 22 to wash off lint and to break down the affinity of the ink to cling to the blanket cylinders 22. A solvent found particularly useful in the present invention is Chem-Det Blanket Cleaner No. 43, manufactured by Chemical Detergent Company, Inc. of Pleasantville, N. J.

Referring to FIGS. 2 and 3, there is better illustrated the novel spray bar assembly and the arrangement of the spray means with respect to the blanket cylinders. The spray bar assembly 30 includes upper and lower tubular spray bars 36 adapted to be supported upon the press a spray bar frame 37 by means including trunnions 38. The frame 37 is mounted on a cross bar 35 secured to the press. Affixed to the spray bars 36 are a plurality of nozzles 39, which are connected in series, and are adapted to be connected by the conduit 40 to a source of detergent or solvent.

In FIGS. 4 and 5, there is shown further detail of the means for mounting the spray bar 36. Each trunnion 38 includes a head 44 that is adapted to be secured internally within the tubular spray bar 36. Suitable fastening means, as for example, threaded bolts 46 may be employed to fasten the trunnion heads 44 in place within the ends of the spray bar 36.

The end opposite the head 44 of each of the trunnions 38 is clamped securely in the arm 41. The arm 41 is pivotally attached to the spray bar frame 37 by the bolt 42. This allows the nozzle bar 36 to swing down out of the way of the press rolls when blankets 22 are being changed. A thumb screw 43 locks the arm 41 against the stop angle 45 thereby securing the spray bar 36 in a substantially immovable position for use.

Alternatively each trunnion is received in a suitable opening in the adaptor clamp 48 as illustrated in FIG. 6 and is retained in place by means of a clamp bolt 49. The adaptor clamp is provided with a threaded opening for receiving an adjusting screw 50 that is affixed at one end to a clamp for mounting same onto the press. As shown, the mounting clamp 52 may be comprised of split sections suitably joined to one another and mounted on the press bar 35. The nuts 54 may be threaded upon the adjusting screw to permit adjustment of the adaptor clamp along the adjusting screw. It is apparent that the press mount and adjusting screw are mounted on each side of the spray bar so as to permit parallel adjustment of the axis of the spray bar and the axis of the blanket cylinder.

FIG. 4 illustrates the nozzle construction. Detergent passes through the conduit 40 and out of the spray nozzle 39 whenever the solenoid 51 actuates the valve assembly 47. The nut 55 in combination with the spacer washer 57 secures the solenoid 51 and valve assembly 47 to the spray bar 36. A rubber grommet 53 is inserted between the solenoid 51 and the spray bar 36 to facilitate vibrationless operation.

In FIG. 7 there is illustrated the spraying system embodying the present invention. Solvent or detergent is retained in a central storage tank 60. The central storage tank is adapted to be connected to smaller tanks 62 and 64 for supplying individual printing units. Since the solvent or detergent is of a flammable nature, it is desirable that only small quantities be at the press location. The tank 60 is provided with a pump 61 for forwarding fluid to the press supply tanks 62 and 64 respectively. The tanks 62 and 64 are each provided with a pump 63 and 65, respectively for forwarding fluid to the spray means adjacent the printing unit.

The pumps 61, 63 and 65 are of the pneumatic type and are adapted to be actuated from a suitable source of air 68. Liquid sensing means are provided for each tank. In the event that the supply of solvent in the storage tank 60 drops below a predetermined level, the light 69 will be lit as a warning to the operator. Associated with each tank in the solvent supply line thereto are solenoid valves 70 and 71 which control the flow of fluid from the storage tank 60 to maintain the desired level in the supply tanks 62 and 64.

Solenoids 73, 74 and 75 are provided to control the supply of air from the supply line 68 to the respective tanks. Suitable pressure regulating means 76, 77 and 78 are provided in the supply lines to each tank.

Also provided in the control system is a spray control

unit 80 and a liquid level control unit 81. Current is supplied to the spray control unit 80 from a suitable source, and in one mode of operation the spray control unit may be actuated in response to a pulse from the roll stand mechanism. Ordinarily, the roll stand is provided with a paster for splicing the lead end of a new roll of paper to the tail end of running web at the present speed. This arrangement avoids shutting down of the press in order to start a new roll of paper. Paste is applied to the leading edge of the new roll, and just prior to make the paste, the new roll is brought up to the speed of the expiring roll. At the proper moment, the running web is pressed against the pasted edge of the new roll, and as soon as the two webs are cemented together, the stub end of the old roll is cut off and the new roll begins to feed the press.

Ordinarily, the paper just prior and just after the splice is discarded as waste. A pulse is applied to the spray control unit 80 to activate the automatic blanket cylinder washer of the present invention at this time so that lint and other impurities removed from the blanket cylinder 22 may be printed off onto this waste material. Due to the normal build up of lint and ink during a press run, it is optimum to clean the blanket cylinder each time a roll is changed at the roll stand.

FIG. 8 schematically illustrates the wiring diagram for the spray control unit 80 and the liquid level control 81. Current is supplied through the lines L1 and L2 from a suitable power source, for example, a 115 volt alternating current supply. The entire control system is energized by turning the circuit breaker 90 to the "on" position. The entire control circuit is protected by an appropriately sized fuse 91 in the power input line L1.

The spray control unit may be activated manually by the spray push button 92 or by an external signal 93 as from the paster described above.

Upon energization of the relay coil 95, the normally open contacts 95a and 95b are closed. A circuit is thus completed through contact 95b, timer 94 and the relay coil 96. The timer 94 is adjustable and controls the timer relay coil 96 which in turn controls the normally closed contacts 96a and 96c and the normally open contacts 96b. Thus, after the predetermined time set on the timer 94 has run, the coil relay 96 will be activated closing the contacts 96b and opening the contacts 96a and 96c thereby cutting power to the cleaning spray unit A.

There is shown in the circuit diagram the schematic wiring for multiple units, A through X. All units are interconnected in the same manner as illustrated for units A and B in FIG. 8.

The units may be run sequentially; that is, following the spray and washing of the blanket by unit A, unit A closes down. Unit B will then be turned on and initiate its spray and cleaning action. Switches 97 on each unit are maintained in the open circuit position to provide for the sequential spray. In the sequential spray position, unit B is activated when the timer 94 activates the timer relay coil 96. The timer relay coil 96 closes contacts 96b causing unit B to start and opens contacts 96a and 96c causing unit A to stop.

When the switches 97 are placed in the closed circuit position, the spray in each unit is activated simultaneously, i.e. in parallel. Thus, all the units A through X are activated to clean the web. In addition, each unit has its own on-off switch, 99 at unit A, 100 at unit B.

The solenoids which activate the spray nozzles on the spray bars for each unit are controlled in discrete groups. For example, in unit 1 the center spray solenoid 102 for the top spray bar is activated when the power for unit A is turned on. Likewise, the center spray solenoid 104 for the bottom spray bar is activated. For the remaining top and bottom spray bar solenoids, spray will be discharged as determined by switch 106 and 108 settings. For example, in the position illustrated in FIG. 8 both the operator solenoids, 110 through 113 on the top spray bar and 118 through 121 on the bottom spray bar, and the

gear spray solenoids, 114 through 117 on the top spray bar and 122 through 125 on the bottom spray bar, are activated. Those solenoids, termed "operator" solenoids, are disposed on the side of the printing press which has the printing press controls which are actuated by an operator. The "gear" solenoids are on the side opposite the "operator" solenoids. By adjusting the switches 106 or 108 either the gear or the operator solenoids will be activated to cause a spray on their corresponding part of the blanket cylinders.

Unit B is de-energized in a manner similar to unit A. Upon energizing of the relay coil 126 by the timer 127, the normally closed contacts 126a and 126c will open, and the normally open contact 126b will close, thus turning off the spray. The center, gear and operator solenoids in unit B are activated and controlled in the same manner as described for unit A. Likewise, for the other units in the arrangement.

FIG. 8 also illustrates the circuitry to the air pump units and liquid supply units. Typically for unit A, the liquid solvent supply activation coil 129 is activated when the liquid level switch 130 closes the circuit as the solvent fluid level decreases below a low limit. The coil closes the contacts 129a and 129b causing the supply pumps to be energized and fill the supply tanks. When a high level is reached, the switch 131 breaks the circuit thereby deactivating the coil 129, causing the pump units to de-energize. A similar liquid level control group is associated with each set of spray bars, i.e. each unit.

The central solvent storage unit provides a warning of low supply by the bell or light 69 activated by the low limit switch 132.

In the claims:

1. Means for washing the exterior cylindrical surfaces of a plurality of blanket cylinders in a web press installation during operation thereof at press speed comprising a plurality of spray bars each disposed adjacent to and in substantially parallel relationship with a blanket cylinder and nozzles carried on each said spray bar and connected to a source of solvent for spraying solvent onto the exterior cylindrical surface of an associated blanket cylinder and control means for selectively controlling the flow of solvent from the nozzles onto the exterior cylindrical surface of an associated blanket cylinder, the solvent breaking down the affinity of matter clinging to each blanket cylinder so that such matter may be carried off onto the web during the subsequent printing run, the control means being operative to alternatively (1) discharge solvent from all nozzles on each said spray bar to simultaneously clean each said blanket cylinder or (2) sequentially spray solvent on the blanket cylinders, said control means being initiated in response to a predetermined condition of the moving web and the cleaning operation being automatically terminated at the end of a predetermined period of time, said web press installation having a flying paster mechanism for joining two web material rolls, wherein said predetermined condition initiating said control means comprises a signal actuated by initiation of the joining operation of said two rolls to form a junction,

said junction formed by means of said flyer paster mechanism, said solvent subsequently being transferred and carried off on said web at said junction, and including a timer mechanism for stopping solvent flow at the end of a predetermined period of time.

2. The construction of claim 1 wherein solenoid controls are provided for each nozzle to control the spraying of solvent from each nozzle to thereby control the width of the exterior cylindrical surface being cleaned during each cleaning operation.

3. A method for washing the exterior printing surface in a web press during operation thereof at press speed comprising the steps of selectively controlling the spray of solvent onto the exterior printing surface for breaking down the affinity of matter clinging to the exterior printing surface, passing a web through the web press for engagement with the exterior printing surface for carrying off said matter from the exterior printing surface, initiating the spraying of solvent at the same time that two rolls of web material are joined, whereby said matter from the exterior printing surface is transferred to and carried off by said web at the junction of said two rolls of web material to minimize waste.

4. A method as in claim 3 including the step of terminating spraying of solvent a predetermined period of time after initiation of the spraying.

5. A method for washing the exterior printing surface of a rotating blanket cylinder in a web press during operation thereof at press speed comprising the steps of spraying solvent onto the exterior printing surface of the rotating blanket cylinder in a direction opposite the direction of rotation of said blanket cylinder for breaking down the affinity of matter clinging to the exterior printing surface and passing a web through the web press for engagement with the exterior printing surface for carrying all said matter from the exterior printing surface.

6. A method as in claim 5 including the step of initiating spraying of solvent in response to a predetermined condition of the web press and terminating spraying of solvent at the end of a predetermined period of time.

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