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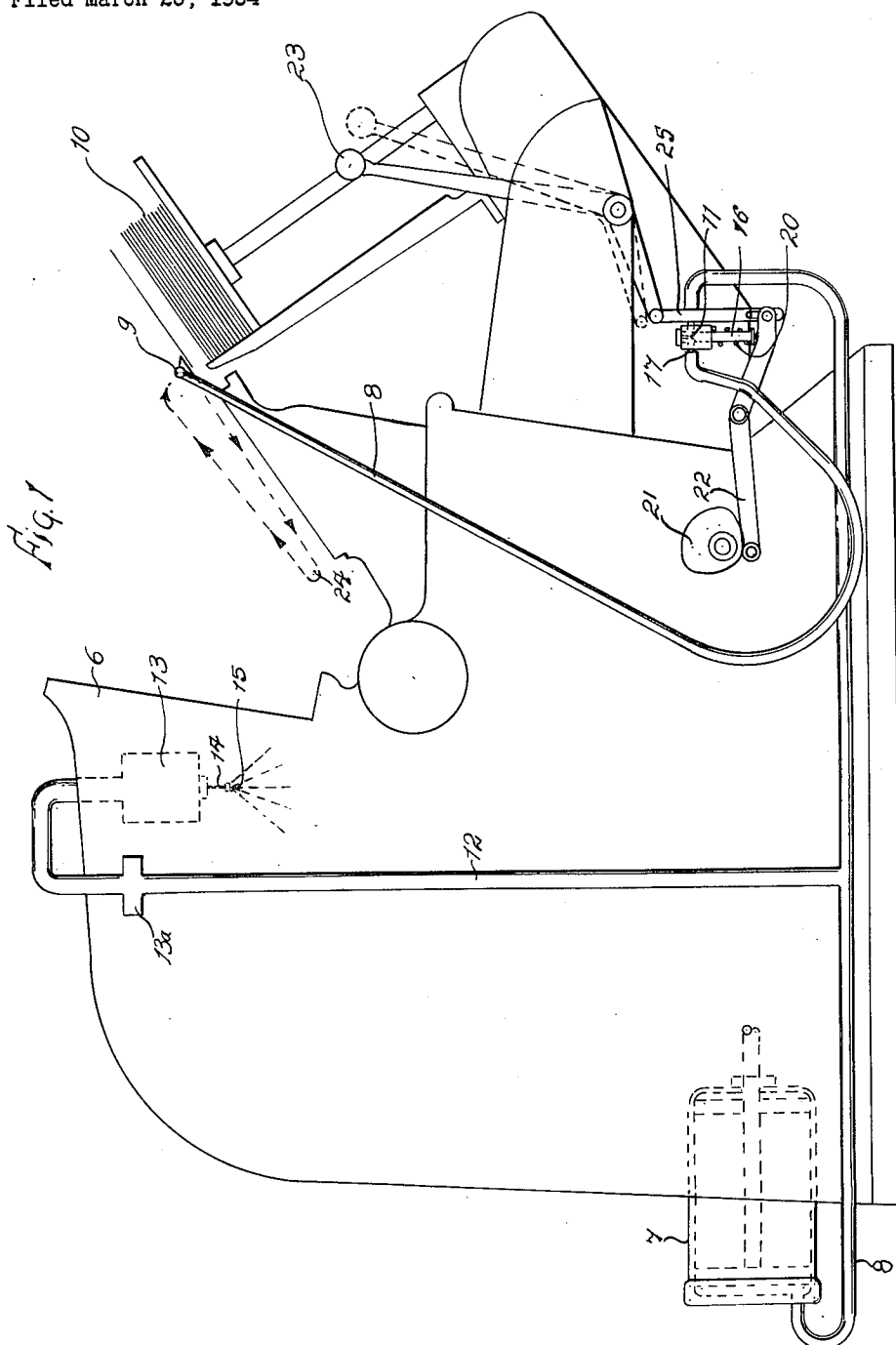
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SPRAY APPARATUS FOR PRINTING PRESSES

Filed March 25, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3

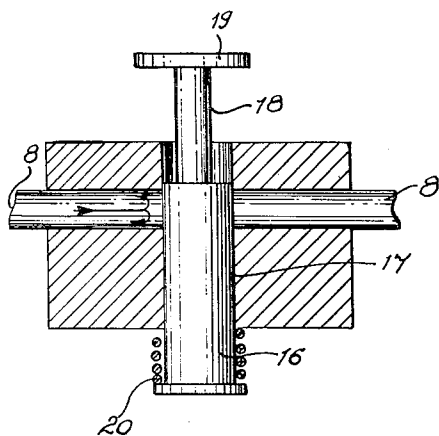


Fig. 4

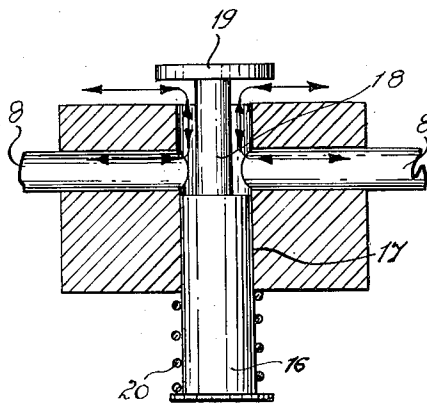


Fig. 5

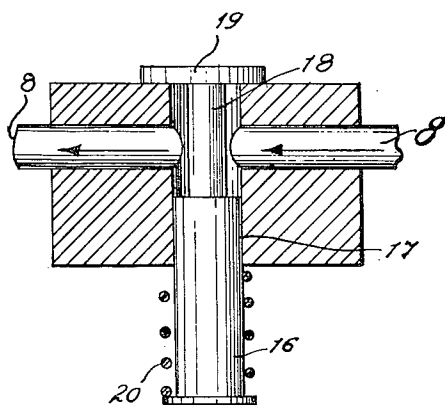
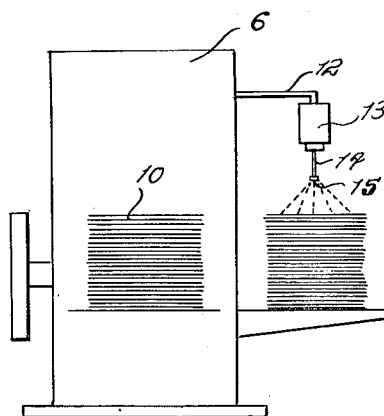


Fig. 2



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SPRAY APPARATUS FOR PRINTING PRESSES

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5 Claims. (Cl. 118—46)

This invention has reference to spray apparatus for printing presses and has for its object to provide improvements in the means whereby liquid or powder can be sprayed on the face of a printed sheet on a platen printing press to prevent the transfer of the print on to the back of the next sheet laid on the pile in a manner which permits a more satisfactory regulation of the air pressure used for effecting the spray.

On the type of printing press in which a pump consisting of a cylinder and piston makes one reciprocation for each cycle of the machine for the purpose of supplying suction and blow to assist the feed and delivery of the sheets, it is common practice to use the whole or part of either the up or down stroke of the same pump to operate an apparatus for spraying anti set-off liquid upon the freshly printed sheets.

More recently it has become practice to substitute a powder for the liquid spray.

The methods used up to now have not been entirely satisfactory, even with liquid spray, and with the newer powder spray where it is desirable to regulate the air pressure precisely, they are not satisfactory at all. The present invention though described with reference to a powder spray can also be used with a liquid spray.

According to the invention, a platen printing press having suction feeding and releasing means actuated by a pump for lifting blank sheets from a pile for transfer to the platen, and also having a spraying device for spraying the printed sheets, has the air supply for the paper lifting and releasing means and for the spraying means controlled automatically by a valve in the pipe line operated independently of the pump but synchronised with the pump in its movement.

The invention is more particularly set forth with reference to the accompanying drawings wherein:

Fig. 1 is a general side elevation of the machine showing the parts referred to herein;

Fig. 2 is a diagrammatic front elevation to show more clearly the position of the spray; and

Figs. 3, 4 and 5 are sectional diagrammatic views showing the valve in three different positions.

As shown in the drawings in which the numeral 6 indicates the press as a whole, the air pump 7, which is reciprocated by any convenient means, has a tube 8 connected to its lower or back end through which it draws in and blows out air. This tube at the end remote from the pump has openings at 9 and is used for lifting sheets of paper 10 by suction as the pump draws the air in, releasing them when the suction is cut off. Between the pump 7 and the openings at 9 there is inserted in the tube 8 a valve 11 and between the valve 11 and the pump 7 is a branch tube 12 to a container 13 for a spraying medium preferably a powder, but which may be a liquid. The tube to the container 13 has a one way valve 13a and from the container there is an outlet tube 14 to conduct the spraying to the part where it

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is needed, a spraying nozzle 15 being on the end of the tube 14.

The valve 11 in the tube 8 is in the form of a plunger 16 in an open-ended cylinder 17, the movement of the plunger being transverse to the axis of the tube 8. The plunger 16 has two diameters, one diameter filling the full bore of the cylinder so that when it is in one position, it completely cuts off the pump from the open end of the tube, see Fig. 3, the other diameter 18 being less, so that when the plunger is moved out of the position where it completely closes the tube, Fig. 3, the part of smaller diameter 18 opens the passage through the tube 8. The end of the part of the plunger which is of smaller diameter has on it a head or washer 19 and this, when the plunger is appropriately moved, closes the end of the cylinder when it comes into contact therewith (Fig. 5). The movement of the plunger 16 is effected by a cam action or other means such as a trip and is synchronised to work with the other parts of the machine associated with the pump in one direction against a spring 20 around the plunger 16 outside the cylinder abutting on a head. A suitable cam action is shown where a cam 21 operates on one arm of a lever 22 whose other arm engages the end of the plunger 16 and is at its end connected to a lever operated mechanism for use when it is desired to stop a sheet from being lifted off the pile 10, the operator pulling back the hand lever 23 and so preventing the valve from opening and allowing air to enter the tube 8 at the openings 9. The size and shape of the cam are made according to requirements of pressure and timing so that the cam will move the piston to the positions shown in Figs. 3 and 4 and will allow the spring to move the piston to the position shown in Fig. 5.

During the compression stroke of the pump 7 the plunger 16 is moved to the position where it closes the tube 8 as shown in Fig. 3, so that the only escape for the air is through the branch pipe 12 through the one way valve 13a to the container 13 for the material to be sprayed, the spray thus being ejected, the length of time that is allowed for the actual spraying is determined by the length of time the valve plunger is in position for closing the tube. When the plunger 16 is moved to the position where its smaller diameter 18 is across the tube 8, a free passage for the air is provided through the open cylinder end as indicated by the arrows in Fig. 4 and through the open end of the tube 8, this inlet of air stops the blow at 15 by lowering the pressure.

After this inlet of air, the valve at once closes to the position shown in Fig. 5 as the suction stroke of the pump begins.

During the suction stroke of the pump 7, the valve is in the position shown in Fig. 5 and air is drawn in at 9 and by its suction lifts the blank sheet at the top of pile 10 and while holding it carries it to the platen in the direction of the arrow 24 and being moved by mechanism of any suitable kind to do this, such a motion being known in connection with platen printing presses and not constituting part of this invention, the suction being broke at the turn of the arrow when the valve again (but this time on the suction stroke) is moved to the Fig. 4 position, thus releasing the sheet on to the platen. It will thus be understood that while the valve reaches the position of Fig. 4 on both the suction and compression strokes of the pump, on the suction stroke it releases the paper from the pile 10 on to the platen and on the compression stroke it stops the blow from 15.

If it be required to discontinue the action of the valve as described so that sheets are not fed on to the platen, a handle 23 is provided working through a link 25 to lift the end of the arm 22 and put the valve into the position shown in Fig. 4 to prevent the head or washer 19

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from closing the open end of the cylinder, in which case outside air as indicated by the arrows in Fig. 4 is sucked into the pipe 8 through the cylinder end, during which time the suction stroke of the pump is prevented from acting to feed sheets from the pile 10 into the press.

It will be understood that the cam 21 is made and timed to control the flow of air to and from the pump and that the cam is rotated by a suitable part of the mechanism of the machine, so that the lifting and spraying of the sheets are automatically effected in the correct sequence and correctly timed in connection with the pump.

I claim:

1. Apparatus for spraying in a printing press comprising, a pump, suction lifting and releasing means for lifting blank sheets from a pile and subsequently releasing the sheets for the printing operation, a container for a spraying medium for spraying the printed sheets, a spray device connected to said container, a main pipe line from said pump to said suction lifting and releasing means, a branch pipe line to said container, a one way valve in said branch pipe line, a reciprocating spring return valve in said main pipe line to said suction lifting and releasing means situated between said branch pipe line and said suction lifting and releasing means, and means synchronised with said pump for actuating said return valve to control in alternate reciprocations the supply of air to said suction lifting and releasing means for the lifting and releasing of the blank sheets and the supply of air to said container for the spraying of the printed sheets.

2. Apparatus for controlling printing press spraying comprising, a pump, a main air pipe from said pump, a valve in said air pipe, a container for a spray medium, a branch air pipe between said valve and said pump and connected to said container, a one way valve in said branch pipe, said main air pipe having a suction and blowing device for lifting sheets to be printed at the terminal end thereof, means for operating said valve, said valve being operated in synchronization with said pump and allowing a predetermined portion of the total volume of air displaced by said pump to be directed through said branch pipe past said one way valve to the container for blowing the spray medium on to printed sheets removed from the printing position and simultaneously controlling the air to and from said suction and blowing device for feeding the sheets.

3. In apparatus for printing press spraying comprising, an air pump positioned on the printing press and operated thereby, a main pipe connected to said pump and a valve operated in synchronisation with said pump, said main pipe carrying suction and blowing means for lifting blank sheets onto the printing press for the printing thereof, a secondary pipe between said pump and said valve, a one way valve in said secondary pipe, and a container for a spraying medium connected to said secondary pipe to spray on to printed sheets removed from the press and deposited on a pile.

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4. In apparatus for printing press spraying comprising, an air pump disposed on the press and operated thereby, a primary pipe from said pump, a container for a spray medium, a secondary pipe from said pump connected to said container, a one way valve in said secondary pipe between said pump and said container, a valve in said primary pipe beyond said secondary pipe, a suction and blowing end on said primary pipe beyond said secondary pipe, a suction and blowing end on said primary pipe beyond said valve, said valve having a cylindrical opening at right angles to said primary pipe, a piston in the opening of said valve, a spring on said piston outside the cylindrical opening of said valve, part of said piston being of the same diameter as said opening and part less, said lesser part projecting from the cylindrical opening of said valve at the end of said piston opposite from said spring, cooperative means between said valve and pump, a head on said lesser part for closing the cylindrical opening of said valve when said valve is down, said valve being pressed in one direction by positive action and being returned by said spring.

5. In apparatus for printing press spraying comprising, an air pump fixed to the printing press and operated thereby, a main pipe from said pump, a container for a spray medium, a branch pipe leading to said container, a valve beyond said branch pipe in said main pipe, and cooperative means between said valve and pump, said main pipe leading from said valve to a suction and blowing terminus, said valve comprising an open ended cylinder at right angles to said main pipe, ports in said cylinder being aligned on the axis of said main pipe, a piston in the cylinder of said valve and projecting through the open ends thereof, said piston being of the same diameter as the cylinder of said valve for part of its length, a spring on said piston outside of the cylinder of said valve urging said piston outwardly, a head on the other end of said piston to close the open end of the cylinder of said valve remote from said spring when said piston is pulled down by said spring, said piston from said head downwards between said head and said part of equal diameter with the cylinder being of less diameter whereby when said piston is fully moved in one direction one open end of the cylinder is closed and both ports are open and when said piston is at the other extreme position both ports are closed and the end of the cylinder under said piston head is open and when said piston is at a midway position both ports are open and also the end of the cylinder.

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