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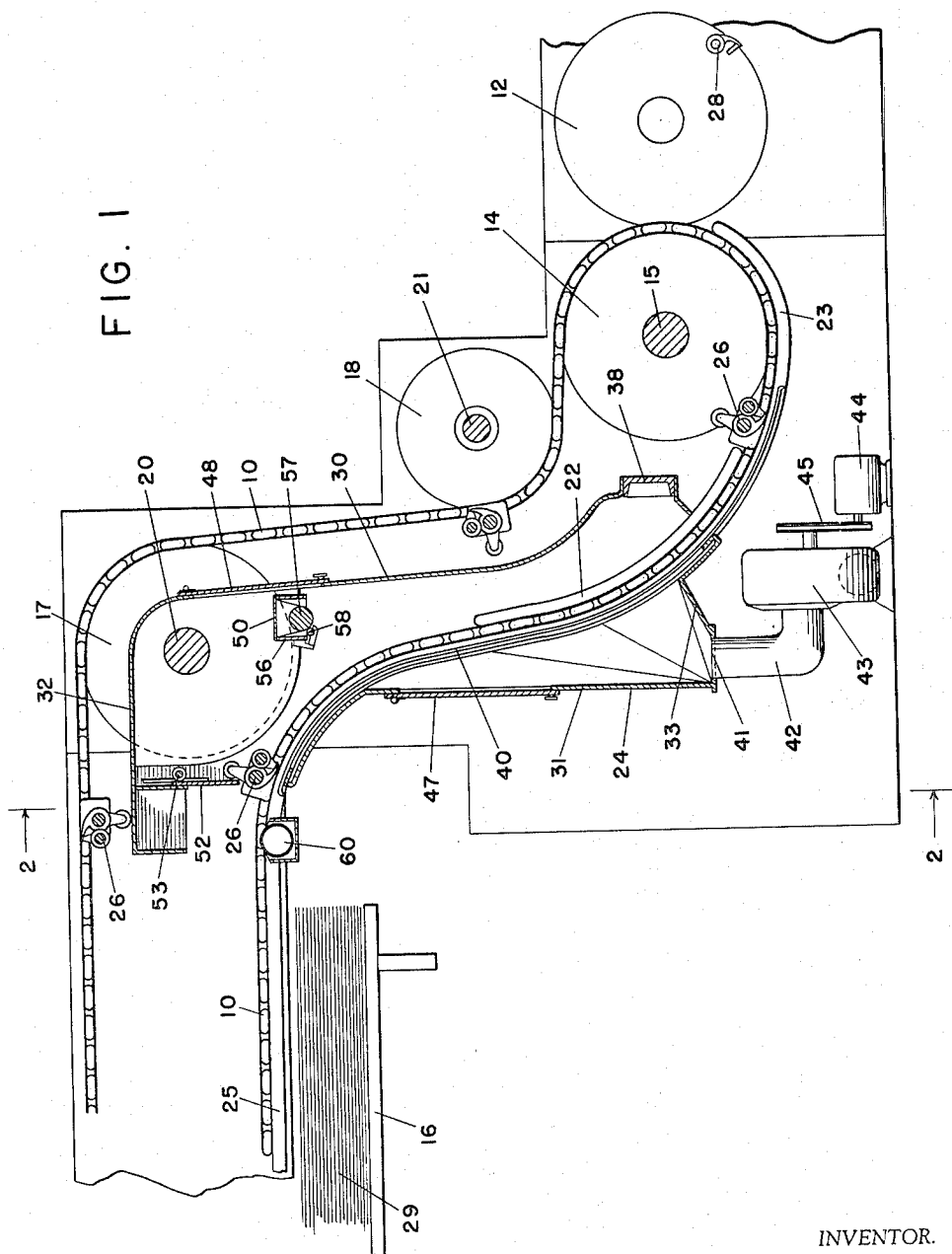
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SHEET CONTROL AND SPRAY COLLECTION CHAMBER

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2 Sheets-Sheet 1



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## 3,167,012 SHEET CONTROL AND SPRAY COLLECTION CHAMBER

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The invention relates to sheet control means having a spray collection chamber combined therewith and has for its main objective to provide an enclosing air chamber which will contain the spray mechanism employed for ink offset prevention and which will eliminate the uncontrolled distribution of the fine spray particles into the atmosphere.

In order to prevent the ink on printed sheets from sticking to or offsetting from one printed sheet to another as they are stacked in a delivery pile, it has been customary to spray the sheets in advance of their delivery to the pile with various types of either wet or dry spray compositions which tend to adhere to the sheets in the form of finely divided particles and thus prevent close contact between adjacent sheets in the pile.

The spraying technique facilitates the rapid drying of the ink and permits faster press operations with all the attendant advantages.

The various spray compositions are generally discharged from above the printed sheet by an air blast, although electrostatic means in combination with air under pressure have also been employed. However, in all cases the excess spray particles are distributed in an uncontrolled manner into the atmosphere surrounding the press and thus the spray particles are eventually precipitated onto the operating parts of the press. This necessitates periodic cleaning of the press and in addition the accompanying and objectionable contamination of the atmosphere is always present.

The invention aims to contain and control the spray particles by providing an air chamber in surrounding and enclosing relation with that part of the sheet delivery mechanism immediately preceding the delivery rack.

A more specific object is to provide an air chamber for confining the excess spray particles discharged onto the printed sheets for ink offset prevention, and wherein air will be admitted and withdrawn from the chamber in a manner to control the sheet during its passage through the chamber.

Another object of the invention resides in the provision of a spray containing chamber for the purposes described and wherein an air admitting opening is provided at the sheet entrance and exit ends with suction means being located intermediate the sheet exit and the sheet entrance end and which withdraws the air and the excess spray particles in a manner to substantially eliminate sheet flutter and which thus maintains the sheet under control for the most satisfactory application of the spray medium.

A further object is to provide a spray containing chamber as described wherein the air admitting opening is adjustable.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended thereto.

In the drawings, which illustrate an embodiment of the device, and wherein like reference characters are used to designate like parts—

FIGURE 1 is a vertical sectional view taken approximately centrally of chain delivery mechanism for a printing press having a spray collection chamber combined therewith in accordance with the invention;

FIGURE 2 is an end elevational view of the apparatus shown in FIGURE 1 taken substantially along line 2—2 of said figure; and

FIGURE 3 is a fragmentary sectional view showing in detail the rack and pinion means for the adjustable plate.

The chain delivery mechanism selected for illustrating the invention essentially comprises a pair of endless chains 10 which are spaced apart approximately the width of the impression cylinder 12, and which are adapted to travel about end sprockets such as 14 at respective ends of the chain delivery mechanism. End sprockets 14, journaled by the shaft 15, are located adjacent the impression cylinder 12, whereas the sprockets for the opposite end of the chain mechanism, not shown, are located at the rear of the delivery table 16 and above the same. The upper or return run of each chain is guided by idler sprockets 17 and 18 and which are journaled by shafts 20 and 21, respectively. The lower run of each chain is guided by the curved guard elements 22 and 23 spaced for accommodating a chain therebetween, and which extend within the spray chamber 24 to be presently described in detail. The lower run of the chains are additionally guided by the straight guard elements 25 which have location above the delivery table 16.

The plurality of gripper assemblies 26 supported on transverse shafts 27 mounted at spaced intervals on the respective chains are adapted to receive printed sheets from the grippers 28 on the impression cylinder 12. The sheets upon being engaged by the gripper assemblies 26 are conveyed in a curvilinear path through the spray chamber 24, and the sheets are eventually conveyed to a position over the delivery table 16. At a point near the rear end of the delivery table the gripper assemblies 26 are cam actuated into an open position and the sheet is deposited onto the delivery pile 29. As the sheet settles on the pile, side joggers and rear joggers, not shown, function in a well known manner to align the sheet with previously deposited sheets on the table.

The spray chamber indicated in its entirety by numeral 24 is located intermediate the sprockets 14 and the delivery table 16. During travel of the printed sheets between these two locations the sheets pass through the spray chamber, during which they are subjected to a spray for the purpose of preventing offsetting of the ink. The spray chamber essentially consists of a front wall 30, a rear wall 31, a top wall 32, and a bottom wall 33. Side walls 34 and 35, as best shown in FIGURE 2, connect the front, back, top and bottom walls of the chamber and the said chamber is suitably supported from the side frames 36 and 37 of the press by the transverse beam 38.

An opening is provided in the bottom wall 33, and it will be understood that the spaced guard elements 22 and 23 together with the lower run of the chains 10 and also the sheet supporting members 40 extend through this entrance opening. The bottom wall 33 and, to a partial extent, the rear wall 31, are formed to provide a suction opening 41 to which is connected the conduit 42 leading to the exhaust fan 43. The said fan is powered by the motor 44 through the endless belts 45 and the air and spray particles withdrawn from the chamber are delivered by the fan to the discharge conduit 46. A plate 47 is releasably fixed to the rear wall 31 of the chamber, and said plate can be conveniently removed for access to the interior of the chamber for repairing the chain mechanism or for general cleaning purposes. A similar plate 48 is releasably fixed to the front wall 30 so as to provide for access to the electrostatic spray device 50 for filling the same with the spray medium.

The rear wall 31 adjacent the upper end thereof is provided with an adjustable opening 51, FIGURE 3, formed by said rear wall 31 and an adjustable plate 52. The bottom edge of plate 52 is recessed for accommodat-

ing the gripper devices spaced along the transverse shaft 27, and the bottom edge of the plate is also recessed for accommodating the actuating lever for said devices. An actuating shaft 53 extends transversely of the chamber for effecting vertical adjustment of the plate 52, whereby it is possible to increase or decrease the size of the opening 51. A pair of pinions such as 54 are carried by the shaft 53, and said pinions have meshing relation with rack teeth 55 formed on the inside wall of the plate 52. One end of the actuating shaft 53 extends beyond the side frame 37 and this extending end is provided with a knob or handle 59 and which is conveniently accessible to the operator.

In the operation of the delivery chain mechanism as disclosed, a printed sheet will be engaged by the gripper devices 26 and conveyed into the spray chamber 24. It will be understood that whereas the leading edge of the printed sheet is engaged by the gripper devices, the body of the sheet and its tail end will be in contact with and will be supported by the curved sheet supporting members 40. As shown in FIGURES 1 and 2 the members 40 are substantially vertically disposed, since they extend from adjacent the sprockets 14 to the adjustable opening 51. Thus during travel of the sheets within the spray chamber 24 they are backed and supported by the members 40. While thus supported during their travel through a spray chamber, the sheets are subjected to a spraying operation effected by the device 50. Said device 50 essentially consists of a transversely extending container 56 which mounts the etched roller 57 for rotation with respect to the high tension bar 58. A positive high potential charge is applied by the bar 58 to the spray particles as they are discharged by the roller 57, and thus the particles of the spraying medium having an electrostatic charge of a positive polarity are deposited onto the printed surface of the sheets. To improve the distribution of the charged particles an air current may be produced by the electrostatic device and which additionally assists in the delivery of the spray particles to the sheets.

During the spraying operation the exhaust fan 43 is operated for withdrawing the air and excess spraying medium from the chamber. In order that the withdrawing action of the air from the chamber will function to prevent the excess spray from escaping from the chamber and will also function to control the sheet during its travel through the chamber, it is necessary to regulate the air entering the chamber through the respective entrance and exit openings. Not only is it important that the volume of air entering through the exit opening be sufficient to prevent the escape of excess spray particles, but it is equally essential that the velocity of the air entering the entrance opening be regulated with relation to the speed of the chain conveyor so as not to adversely affect the body or trailing portion of the sheet.

As was mentioned hereinabove, only the leading edge of each sheet is under positive control of the gripper elements 26 as it travels with the chain conveyor and thus the body of the sheet is relatively free and subject to the effect of air currents acting thereon. It is important, therefore, that the velocity of the air entering the entrance opening be maintained less than the lineal speed of the sheets so as not to disturb the travel of the trailing portion of the sheet as it enters the chamber, while the volume of air drawn in through the exit opening is maintained high enough to substantially prevent the escape of the excess spray particles.

Accordingly the invention contemplates that the air opening 51 at the exit end of the chamber will be adjustable. The amount and velocity of the air entering the chamber through the exit opening 51 should normally exceed that which enters through the entrance opening in the bottom wall 33. When such conditions exist the air flow through the exit opening not only functions to pre-

vent the spray particles from escaping, but the high velocity air moving under the sheet as the latter moves through the exit opening will function to draw the body portion thereof against the guide members 40 thereby eliminating the erratic fluttering action which normally occurs as the sheets pass over the upper curved portions of the guides 40.

Accordingly, upon leaving the spray chamber the printed sheets are caused to engage the suction device 60 located relatively adjacent the adjustable opening 51 which functions to retard and control the sheets upon their release over the pile by the delivery grippers 26. A suction device such as shown in the Claybourn Patent 2,969,980 has been found to be entirely satisfactory.

It should be noted that the air and excess spray particles are withdrawn from the chamber at a location on the side of the sheet conveying means opposite the spraying device. The spray chamber accordingly controls the travel of the printed sheets through the chamber and in addition effectively prevents the uncontrolled distribution of the excess sprayed particles into the atmosphere surrounding the press.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In sheet delivery mechanism, the combination comprising an endless conveyor having a delivery run and a return run, gripper elements on said conveyor for conveying sheets by their leading edge along the path of the delivery run from a sheet carrying cylinder to a delivery pile, a chamber encompassing the delivery run intermediate the sheet carrying cylinder and the delivery pile, a series of sheet supporting members mounted within said chamber for maintaining the free floating trailing portion of each sheet in the path of said grippers, said chamber having an entrance and an exit opening to accommodate the endless conveyor, an offset spray device located within said chamber and above the delivery run of the conveyor for spraying anti-offset material upon the printed side of the sheets as they pass through said chamber, an exhaust port in said chamber, said exhaust port being located on the side of the delivery run opposite to the spray device, suction means connected to said exhaust port for evacuating said chamber whereby air is drawn inwardly through said entrance and exit openings at a rate sufficient to substantially preclude the escape of excess spray material through said entrance and exit openings, adjustable gate means associated with one of said openings, and means for adjusting said gate means to vary the area of said opening whereby the velocity of the air entering the chamber through said entrance opening is controlled with direct relation to the lineal speed of the conveyor to preclude fluttering of the trailing portion of the sheets as they enter said chamber.

2. In sheet delivery mechanism as defined by claim 1, wherein the adjustable gate means is associated with the exit opening.

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