

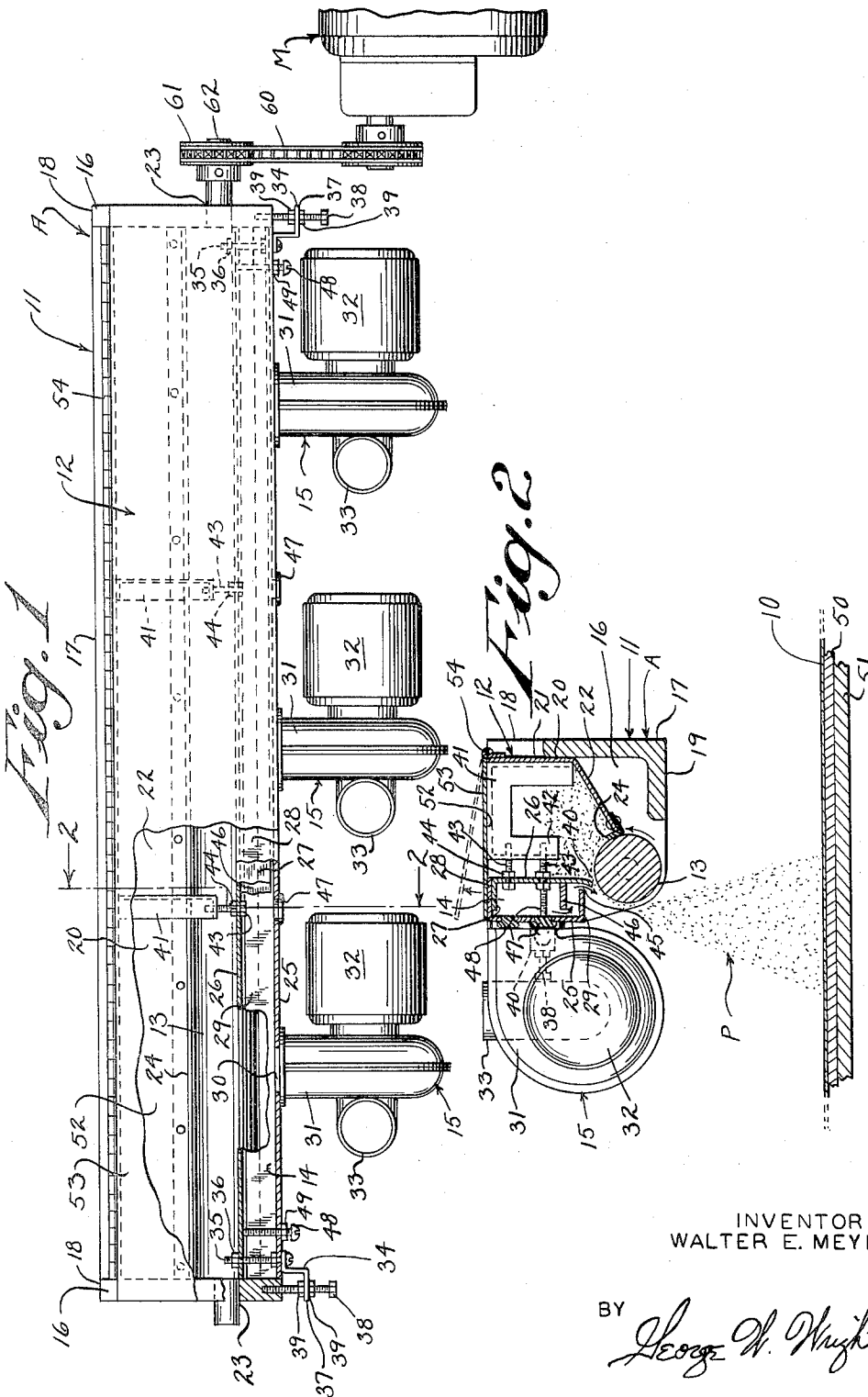
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APPARATUS FOR OPPOSING OFFSET IN PRINTING

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APPARATUS FOR OPPOSING OFFSET IN PRINTING

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This invention appertains to printing, and more particularly to certain new and useful improvements in a method and apparatus for opposing offset in printing.

The present invention represents improvements over the inventions and disclosures set forth in the copending applications of Frederick S. Crane, Jr. entitled "Method and Apparatus for Opposing Offset in Printing" and identified by Serial No. 83,470, filed January 18, 1961 and Serial No. 264,403 filed March 11, 1963, respectively. These applications are now abandoned.

The entire right, title and interest in and to said above identified applications is now vested in the Cra-Vac Company of Port Washington, Wisconsin, by reason of assignments from Frederick S. Crane, Jr.

In these prior applications, it is clearly set forth that many methods of spraying a powder, passing certain gases over the set ink, and electrostatically depositing particles of powder upon a printed sheet by high tension electric current, have been used in the past with varying degrees of success, in an effort to prevent offset impressions of set ink from a previous sheet or web, particularly when it becomes necessary to stack the sheets or rewind the web at the end of a printing operation.

All known prior methods and apparatus for opposing offset in printing, have either been relatively complicated and expensive or have possessed additional dangers particularly in the case of electrostatically depositing particles by high tension electric current.

Therefore, the above mentioned applications relate to an entirely different method and apparatus for treating a freshly printed sheet or web by treating said sheets or web with a variable cloud of powder material while the sheets or web are in transit from one position to another, and wherein the cloud of powdered material will be varied in accordance with the type of print, speed of travel or other variations of the printed sheets, by providing a pick-up roller associated with a supply hopper and by blowing the powder from the top or side of the pick-up roller.

The method and apparatus disclosed in the aforementioned applications, overcame the major objections to the prior art and worked very well, but it has been found that in the adaptation of this new method and apparatus to different types of printing operations and to varying types of shop printing, that a better control of the roller pick-up and hopper arrangement, the air blowing means and finer adjustment means, is needed. Particularly, since the amount of powder deposited on the sheets or web is critical and the control thereof is important to the end result.

Therefore, a primary object of my present invention is to provide an improvement in a method and apparatus of opposing offset in printing, wherein the powdered material is in direct contact with the top portion of the pick-up roller.

Another important object of the present invention is to provide a finer control and adjustment in a continuous air delivery opening.

A further object of the present invention is to provide a fine adjusting means for the gap defined by the roller and a wall of the supply hopper.

Another object of the present invention resides in providing not only adjusting means for regulating the size of the air delivery opening but to provide means for adjusting

the relative position of the openings in relation to the roller.

A salient feature of the present invention resides in new and useful improvements in an apparatus for opposing offset in a freshly printed sheet or web by providing a variable cloud of powdered material by blowing the material off of one side of the pick-up roller and wherein relatively low air pressure is used and wherein the roller is located adjacent the bottom portion of the supply hopper so that the powdered material contacts the upper portion of the roller and wherein fine adjustment means is provided for the powdered material, air and the relative position of each member.

A still further object of the present invention is to provide a simple, practical and reliable construction that is economical to manufacture, easy to assemble and positive in its operation.

With the above and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel method, construction, combination and arrangement of parts, herein-after more fully described, illustrated and claimed.

One preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

FIGURE 1 is a top plan view of the apparatus for preventing offset in printing with certain parts thereof being broken away and in section to illustrate details in its construction, and

FIGURE 2 is a transverse vertical section taken through the apparatus on the line 2—2 of FIGURE 1 of the drawings, and looking in the direction of the arrows, illustrating more particularly the variable cloud of powdered material.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates one type of the improved apparatus for opposing offset in a moving printed sheet or web 10, and the same includes broadly a supporting frame 11, a supply hopper 12, a roller 13 and an adjustable air conduit 14 carrying the spaced blowers 15. The apparatus itself is designed to be located at a desired distance above a freshly printed moving sheet or web and can be supported by any desired means (not shown) and in any event the frame 11 includes the substantially rectangular shaped end wall members 16, joined at the rear portion thereof by an angular member 17. Preferably, the angular member 17 is made of a relatively heavy gauge metal, and firmly secured within the peripheral edges of the rear walls 18 and bottom walls 19 of the respective end wall member 16. Mounted longitudinally within the frame 11 is a sheet of metal 20 formed to provide a rear wall 21 and the slanting bottom 22 of the supply hopper 12. Also mounted longitudinally with the frame 11 is the pick-up roller 13 and this roller is provided with and supported by suitable bearings 23 in the end wall members 16. Further, the roller 13 is provided with a highly polished outer peripheral surface and the roller may be made of any desired material that is fairly sturdy and to which particles of the powder P will adhere. This roller 13 is mounted adjacent the lower end termination of the downwardly and angularly extending hopper bottom 22, and in order to keep the fine powder from shifting out between the end termination of the hopper bottom 22 and point where it contacts the roller 13, I provide a longitudinally extending resilient seal 24.

The construction of the air conduit 14 and the adjustments in connection therewith form a very important part of the present invention and thus the conduit includes two opposed longitudinally extending sheets of material 25 and 26 respectively, and the sheet 26 is so constructed and arranged so that it forms the forward wall for the

hopper 12 and its upper horizontally running wall 27 is welded or otherwise secured to the adjacent wall 23 of the opposed piece 25. Piece 25 therefore is U-shaped as shown, and forms the front wall of the apparatus and includes the inwardly extending top and bottom walls 23 and 29 and as brought out, wall 28 is welded or otherwise secured to wall 27. Thus, a unitary longitudinally extending box-like structure is formed and the interior of the same forms the air conduit 14. For this purpose, the piece 25 adjacent the forward portion thereof is provided with a series of spaced openings or apertures 30 for the entrance of air from the blowers 15. Obviously, any number of blowers may be provided but in the usual construction three blowers have been found to suffice and these blowers are secured to piece 25 so that the air outlets 31 thereof are in a sealed relationship with the apertures 30. These blowers 15 may be of any standard desired construction and therefore include the motor 32, air inlet 33 and air outlet pipe 31. Air conduit 14 is arranged within the frame 11 so that the forward portion of the pipe 25 lies flush with the front end terminations of the end walls 16 and the conduit is supported by the frame through end brackets 34, each of which is secured to the piece 25 by means of the adjusting screws 35 carrying the lock nuts 36. Leg 37 of the brackets 34 is secured to each respective end wall 16 by means of the bolt 38 and the pair of lock nuts 39. Thus, it can be seen that the air conduit 14 is mounted to the frame and its position can be initially adjusted by means of the bolts 38 and lock nuts 39, and thus the material feed gap 40 formed by the curved end termination of piece 26 and peripheral surface of the roller 13 can be initially adjusted. Further, this air conduit 14 is also supported through an inverted pair of U-shaped brackets 41, one vertical leg of which is secured by welding or the like to the rear wall 21 of the hopper assembly and the other leg 42 carries the aligned pairs of bolts 43 which not only act to further support the air conduit assembly 14 but also may be utilized to provide a finer adjustment for the material feed gap 40. This adjustment will become apparent as the description proceeds. Lock nuts 44 are provided for the bolts 43 so that upon adjustment they will be held against movement or loosening while the machine is running. It should be noted at this point that the inwardly extending bottom wall 29 terminates short of the end termination of piece 26 and forms a continuous air gap 45 and in order to insure an even flow of air through the gap a longitudinally extending baffle plate 46 is provided and any turbulence of air within the air conduit 14 proper will be alleviated by the baffle 46 and thus an even flow of air will be had in the direction of the arrows FIGURE 2. It is important to the invention that the air strike the periphery of the roller 13 at a point just beyond the material feed gap 40 so that the material will be broken completely off of the roller and so that the feed of the material will not be influenced by undue suction created by the flow of air. It should also be noted that the roller 13 rotates counter-clockwise, as indicated by the arrow FIGURE 2, and inasmuch as the powder or material P is located adjacent the top of the roller a continuous and steady feed through the entire length of the roller is assured. If, however, after the initial adjustment of the air conduit, either too little or too much powder is being picked up by the roller, the gap 40 can be adjusted to compensate, and a very slight adjustment will greatly influence the amount of finely divided material used. Incidentally, this material may be starch, or other type of extremely finely divided powder.

Therefore, to adjust the clearance of the gap 40, it is only necessary to remove the plugs 47 in the front wall of piece 25 and adjust the aligned pairs of bolts 43. This will cause a slight inward or outward movement of the rear wall of piece 26 and thus the distance between its curved end termination and the periphery of the roller 13 can be adjusted.

A salient feature of this invention resides in the fact that the air delivered from the blowers 15 need not be under high pressure, but a very low pressure air will suffice and thus it is relatively important that the gap 45 be adjustable. This can be accomplished in the following manner and for this purpose I provide at each respective end of piece 25 adjacent the screws 35 adjusting screws 48 likewise carrying lock nuts 49. Thus it can be readily seen that by turning the screws 48 in one direction the front and rear walls of the respective pieces 25 and 26 can be spread and the air gap will thus be made larger. Then the lock nuts 36 on screws 35 are adjusted and the gap will be held to this adjusted size. In order to reduce the size of the air gap, lock nuts 36 or more correctly, screws 35 will be turned in the opposite direction and then adjusting screw 48 can be turned so that it is moved outwardly and the walls under their inherent spring tension will be move toward one another and the air gap will be reduced in size. Thus, it can be seen that I have provided a relatively simple apparatus which nevertheless provides very fine adjustment for delivering just the right amount of material or powder P to a freshly printed sheet or web 10. Obviously, the apparatus per se is placed transversely across the bed 50 and printing press base 51 of the conveying apparatus of a printing machine. Thus, the individual sheets or web 10 may be covered with just the upright amount of powder and when the same are stacked, or in the case of the web, when the web is rewound, this will oppose offset in the printing.

It is important that the material or powder be spread evenly within the hopper 12 and in order to fill the hopper the material is induced into the open top portion 52, and I also provide a cover 53 which acts as a closure for the top of the apparatus and this cover overlies the wall 27 and the top portions of the end wall member 16, and is preferably hinged to the rear vertical wall 21 by means of a piano type hinge 54.

It should also be noted that the roller is rotated in its counter-clockwise direction in any desired manner, but for purposes of illustration I have shown a motor M having a chain drive connection 60 with a gear 61 mounted on the protruding axle portion 62 of roller.

From the foregoing, it is believed that the features and advantages of this invention will be readily apparent to those skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. An apparatus for opposing offset in printing comprising a substantially rectangular shaped frame of the type adapted to extend transversely above a moving bed of a printing machine carrying a freshly printed web and printed sheets, including a hopper for powdered material carried by said frame and having rear, front, bottom and end walls, said bottom wall slanting forwardly and downwardly from said rear wall and terminating in spaced relationship with said front wall forming an elongated relatively large discharge opening, a roller mounted for counter-clockwise rotation substantially closing said opening and in sealed relationship with the end termination of said bottom wall, a substantially rectangular shaped air conduit having front, rear, top and bottom walls carried by said frame, said bottom wall being spaced from said rear wall to provide an elongated air discharge opening adjacent said roller, said front wall of said hopper being so constructed and arranged as to form the rear wall of said air conduit and terminating above the peripheral surface of said roller to form a material feed gap, means associated with said air conduit to provide an even steady flow of air through said air discharge opening and to impinge upon the outer peripheral surface of said roller, means for adjusting the relative size of said air discharge opening, means for adjusting the relative

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size of said material feed gap, and means for initially adjusting the relative position of said air conduit with relation to said roller, whereby the amount of material picked up by said roller can be controlled and separated from the roller by air impinging directly on the outer peripheral surface thereof to fall in a controlled variable cloud below the roller and upon the printed surface.

2. An apparatus as set forth in claim 1, wherein said means for providing an even steady flow of air includes, a series of spaced blowers having their air outlets in open communication with said air conduit, and a baffle within said air conduit above and adjacent the air discharge opening extending the entire length of said air conduit.

3. An apparatus as set forth in claim 1, wherein the means for adjusting the relative size of said air discharge opening includes spaced screws threadedly received in said front wall of said air conduit and having their inner ends abutting the rear wall of the air conduit, whereby the spacing between the walls can be varied, and means for locking said walls in said varied spaced relationship.

4. An apparatus as set forth in claim 1, wherein said means for adjusting the relative size of said material feed gap includes, spaced inverted U-shaped brackets having one respective leg secured to the rear wall of said hopper, pairs of aligned bolts freely and rotatably carried by said combined front hopper wall and rear conduit wall projecting rearwardly and being threadedly received in the other leg of a respective bracket, and lock nuts on said bolts

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for holding said combined front hopper wall and rear conduit wall in its adjusted position and said combined wall having its lower end termination curved forwardly in the direction of rotation of said roller.

5. An apparatus as set forth in claim 1, wherein said means for initially adjusting the relative position of said air conduit relative to said roller includes spaced bolts having their inner ends carried by the respective front portion of said frame end walls in such a manner that the major portions of their respective shanks project forwardly from said end frame walls, a bracket slidably carried on each respective bolt, each of said brackets having one end secured to a respective front wall portion of said air conduit, and lock nuts for moving and holding said brackets in a desired position along the shank of a respective bolt, whereby the entire air conduit as a unit may be moved forwardly and rearwardly in relation to the hopper and roller.

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