March 21, 1967 W. E. MEYER 3,310,205

FEED MECHANISM FOR AN APPARATUS FOR OPPOSING OFFSET IN PRINTING

Filed March 9, 1964

Fig. 1

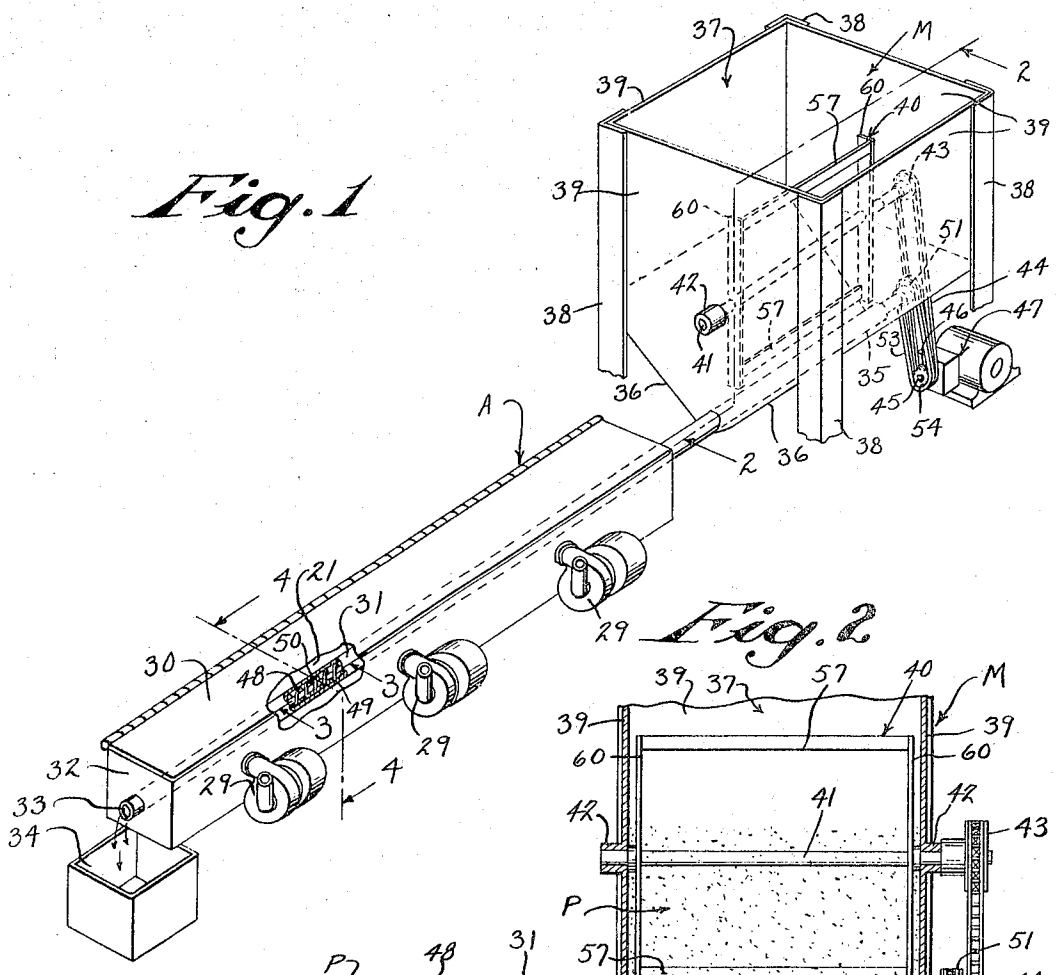


Fig. 2

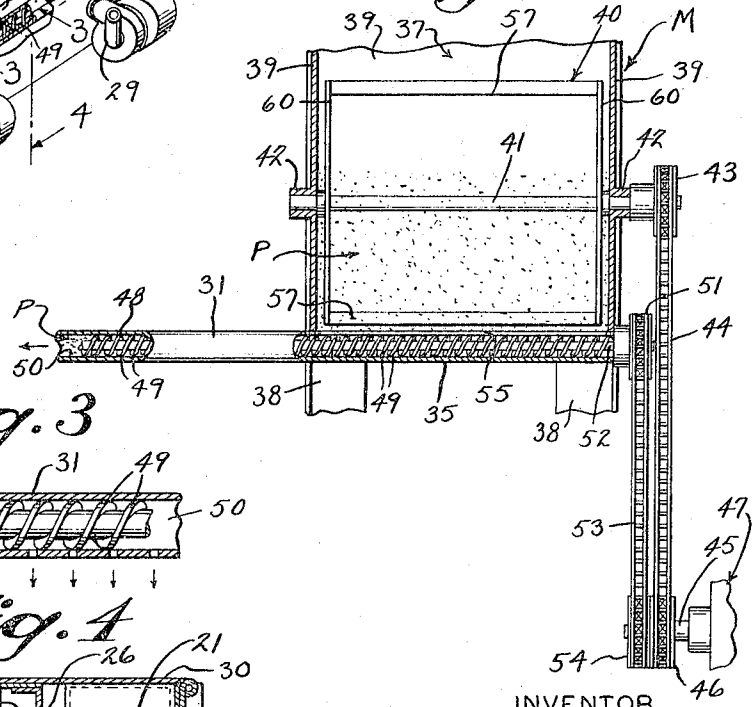
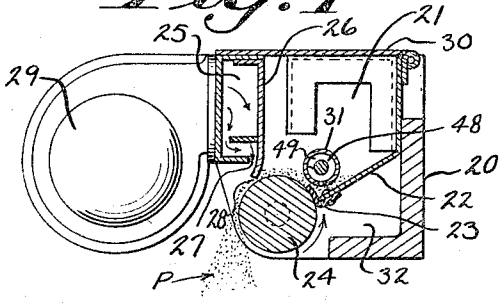


Fig. 3

Fig. 4



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FEED MECHANISM FOR AN APPARATUS FOR OPPOSING OFFSET IN PRINTING

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This invention appertains to an apparatus for coating paper with fine powdered material for opposing offset in printing, and more particularly to certain new and useful improvements in a feed mechanism for the fine powdered material.

This invention is primarily designed to be associated with the type of apparatus shown and described in the co-pending application of Walter E. Meyer entitled, "Apparatus for Opposing Offset in Printing," executed January 15, 1964, and identified by Ser. No. 346,932 and given a filing date of Feb. 24, 1964, now Patent No. 3,238,919 of Mar. 8, 1966.

In this co-pending application, the apparatus for opposing offset in printing includes a device or container extending transversely across the web or sheets to be treated. The powdered material is placed in the container and a roller picks up the material, and air blowing means is provided to direct a spray of fine powdered material, such as starch or flour, onto the printed sheets or webs to oppose offset. It is important, particularly where materials such as flour or starch are used, that a very fine control of the material be had. Thus, in the co-pending application I have described various adjustment means for regulating the feed gap between the top of the roller and container, and for regulating the amount of air necessary to blow the particles from the roller. It is very important that the fine powdered material be spread evenly throughout the entire length of the container and roller and when the container is filled, it is necessary that the same be filled evenly. It is necessary at times to smooth the fine powdered material in the container, since often it tends to feed faster at one place along the roller than at other places.

Therefore, a primary object of the present invention is to provide a novel feed means which constantly keeps the device supplied with the fine powdered material, and which discharges the same evenly over the entire length of the container and roller.

Another important object of the present invention resides in providing an improved feed mechanism, wherein the fine powdered material can be flour, which will be spread above the roller in such a manner as to maintain an even level of material throughout the entire length of the container.

A further object of the present invention is to provide a feed tube and spiral feed screw fitting snugly therein, the tube and feed screw extending through the entire length of the container at a point just behind and slightly above the roller, and having an open end of the tube extending beyond the device so that powdered material such as flour or starch is constantly discharged from the open end when the feed screw is working and the powdered material is being properly fed to the container.

A salient feature of my present invention resides in providing a relatively large hopper adjacent the device for opposing offset in printing and in providing the hopper with an agitator to insure the proper even feed of the fine powdered material to the feed screw and wherein the bottom of the feed tube is provided with evenly spaced apertures so that the material will be fed and dispersed through the apertures by rotation of the feed screw evenly and constantly as the machine operates.

Still another object of my present invention is to provide a novel drive for the agitator and feed screw and wherein the feed tube lies at the bottom of the hopper and at the apex of the slanting bottom walls thereof.

A further object of my present invention is to provide a feed mechanism which is simple in construction, reliable in operation and not liable to get out of order.

With these and other objects in view and to the end of attaining any other advantage hereinafter appearing, this invention consists in certain features of construction and combination and arrangement of parts hereinafter described, pointed out in the claims and illustrated in the accompanying drawings, in which drawings:

FIGURE 1 is a perspective view of my novel feed mechanism shown associated with the type of apparatus for opposing offset in printing described in my co-pending application, certain parts being broken away and in section to illustrate details in its construction;

FIGURE 2 is an enlarged fragmentary vertical section taken on the line 2—2 of FIGURE 1 of the drawings, and looking in the direction of the arrows;

FIGURE 3 is a fragmentary vertical section through the tube and feed screw on an enlarged scale, the section being represented by the line 3—3 of FIGURE 1, looking in the direction of the arrows, and

FIGURE 4 is a transverses vertical section taken on the line 4—4 of FIGURE 1, looking in the direction of the arrows.

Referring now to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter M generally indicates my improved feed mechanism, and the same is shown associated with an apparatus A for opposing offset in printing.

As previously mentioned, the apparatus A is shown and described in my co-pending application and details of its construction therefore are not shown or described in this application; however, for purposes of illustration, it should be noted that the device includes broadly a metal frame **20** upon which is formed a container **21** having a slanting bottom wall **22**, a longitudinally extending sealing strip **23**, roller **24** and an air blowing conduit **25**. One wall **26** of the air conduit **25** is adjustable so that the air gap **27** and feed gap **28** can be finely controlled but the means for adjustment forms a part of my co-pending application, and no part of the present invention. The prior device was also provided with a series of spaced blowers **29**, which forced in the direction of the arrows through the gap **27** as shown more particularly in FIGURE 4 of the drawings, and this air aids in blowing the fine pulverant material P off of the roller **24** and onto the sheets or webs of paper to be treated.

As previously brought out, it is necessary that the powdered material be spread evenly throughout the entire length of the container **21** and roller **24** so that the powdered material will be very evenly sprayed on the travelling sheets or webs of paper. Heretofore, it has been necessary to open the cover **30** and fill the container **21** and spread the fine powdered material evenly throughout the container and it is also necessary to observe at times the level of the material, and if necessary, spread the same evenly or level the same. This method requires much attention and consumes a great deal of time. Therefore, in order to automatically feed the fine powdered material to the container **21** and to also insure the even spreading of the material, I provide a longitudinally extending tube **31** and this tube extends throughout the entire length of the container **21** and terminates beyond the end wall **32** thereof. This end **33** is open as shown, and powdered material fed through the tube evenly is discharged in the direction of the arrow, FIG. 1 of the drawings, from the end of the tube. Any suitable con-

tainer 34 can be provided to catch the material as it leaves the end 33. The importance and purpose of this open end 33 will become apparent as the description proceeds. The inner end of the tube 35 is secured to the apex of the slanting bottom walls 36 of the relatively large hopper 37. This hopper can be of any desired size and is supported by four vertically extending posts 38 secured to the corners of the vertical walls 39. These posts can be of any desired construction and of any desired material but for the purpose of illustration, I have shown the posts in the form of angle iron welded or otherwise bolted to the walls 39 to form the hopper or storage bin 37. Within the hopper 37 and spaced above the bottom wall 36 is an agitator 40 and this agitator is mounted on a shaft 41 which is rotatably carried by suitable bearings 42. One end of the shaft 41 has splined thereto a sprocket 43 over which is trained a drive chain 44. This chain, in turn, is driven by the drive shaft 45 and drive sprocket 46. The drive shaft 45 can be rotated by any desired power means, such as an electric motor and gear reduction unit indicated by the reference numeral 47 in FIGURE 1 of the drawings. Extending longitudinally and running through the tube 31 is a spiral feed screw 48, the convolutions 49 of which snugly engage the inner peripheral wall 50 of the tube 31. This feed screw is likewise rotated by means of sprockets 51 splined to shaft 52, chain 53 and a drive sprocket 54. It should also be noted that the size of the various sprockets and chain arrangements can be varied to provide for different speeds of rotation for the feed screw and the agitator 40. In any event, the powdered material P is dumped into the large hopper 37 and the inner end 35 of the tube 31 is provided with an open enlarged slot 55. The cross-bars 57 of the agitator will constantly move through the powdered material and insure the filtering and feeding of the powdered material into the tube and evenly between the convolutes 49 of the feed screw. Thus, as the feed screw is rotated, the material P is moved through the entire length of the tube 31 and within the confines of the container 21 the bottom of the tube is provided with evenly spaced apertures 56 and the material is forced through these apertures in the direction of the arrows, FIG. 3 of the drawings, over the roller 24 and as the roller turns in a counter-clockwise direction indicated by the arrows, FIG. 4, it picks up the material and the same is then blown off of the roller by means of air through gap 27. Roller 24 is machined so that it will pick up the powdered material evenly throughout its entire length and as the tube and feed screw direct and disperse the powdered material evenly throughout the entire length of the container, the resultant spray of the powder P will be evenly and equally dispersed along the paper sheets or web. As the material P moves through the entire length of the tube 31, a constant even flow is discharged from the discharge end 33 of the tube and this indicates that the apparatus and feed mechanism is operating correctly and that a constant and even supply of the powdered material is being dispersed within the container 21. This makes it possible to use flour which heretofore has not been used, since it was difficult to evenly disperse the same throughout the entire length of the roller.

It should be noted that the cross-bars 57 of the agitator are held in position by means of the spaced parallel extending arms 60 which are in turn splined or fastened to the shaft 41 in any desired manner. Obviously, the cross-bars 57 and agitator are so constructed that the bars will clear the bottom wall 36 of the hopper regardless of the shape thereof and the cross-bars should be relatively thin as shown to properly function and keep the finely pulverant material from packing and becoming hard to move or handle.

Further, the exact location of the tube 31 within the container 21 is stressed and the tube is positioned just above and rearward of the roller 24 so that the openings or apertures 56 are above and adjacent the bottom wall 22 to thus assure an even level of the material.

While I have shown and described certain specific embodiments of my novel feed mechanism, it should be understood that the same can be adapted to other types of devices for opposing offset in printing, wherein fine powdered material is picked up by a roller and then loosened therefrom in the spray form. It will be understood that these embodiments are merely for the purpose of illustration and description, that various other forms may be devised and that changes may be made in the proportions and minor details of construction without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. A powder dispenser comprising, a substantially rectangular shaped frame of the type adapted to extend transversely above a moving bed of a printing machine carrying freshly printed webs and printed sheets, including an elongated container for powdered material carried by said frame and having a rear, front, bottom and end walls, said bottom wall slanting forwardly and downwardly from said rear wall and terminating in spaced relation with said front wall forming an elongated relatively large discharge opening, a roller mounted for rotation substantially closing said opening and in sealing relationship with the end termination of said bottom wall, an air conduit above and adjacent the forward portion of said roller, means for providing a steady flow of air through said air conduit to impinge upon the outer peripheral surface of said roller, a feed mechanism for supplying a steady and even flow of powdered material to said container including, a longitudinally extending hollow feed tube extending through said container above the bottom wall thereof and having its end terminations projecting beyond the respective end walls of said container, a powdered material supply hopper adjacent one end termination of said feed tube, said respective end of said feed tube being so constructed and arranged as to extend into the said hopper adjacent the bottom portion thereof, a longitudinally extending spiral feed screw received in said tube and extending substantially through the entire length thereof, means providing open communication between said feed tube and said hopper, means within said container for evenly and steadily dispersing said powdered material from said tube into said container, and means for rotating said feed screw to constantly and simultaneously feed material through said tube into said container and out the open end termination of said tube.

2. An apparatus as set forth in claim 1, wherein said means within said container for evenly and steadily dispersing said material from said tube into said container includes positioning said tube above and rearward of said roller and providing a series of evenly spaced apertures in the bottom portion of said tube extending the entire length of the container and roller.

3. An apparatus as set forth in claim 2, wherein said means providing open communication between said tube and said hopper includes an elongated slot in the upper portion of said tube extending substantially the entire length of said hopper.

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