

Oct. 30, 1962

J. T. LINDQUIST

3,061,150

POWDER APPLYING APPARATUS

Filed Oct. 10, 1960

3 Sheets-Sheet 1

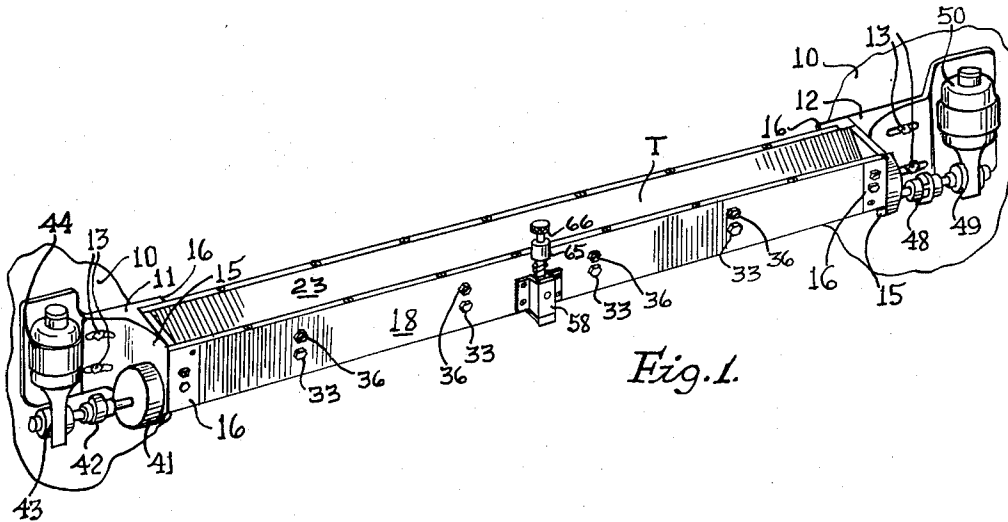


Fig. 1.

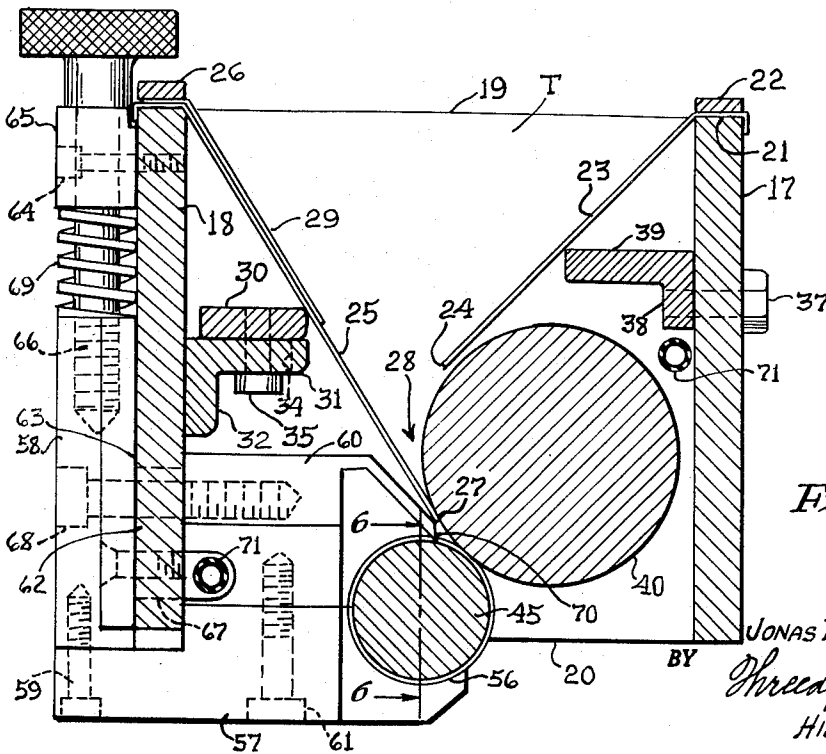


Fig. 2.

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3 Sheets-Sheet 2

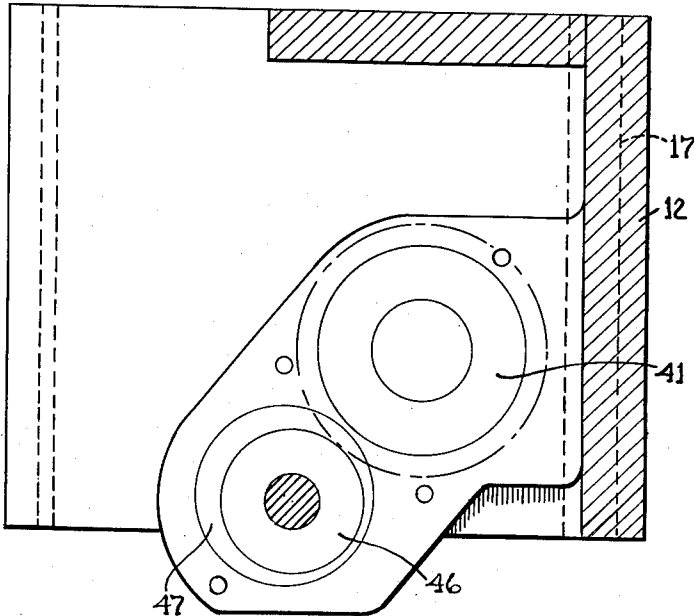


Fig. 3.

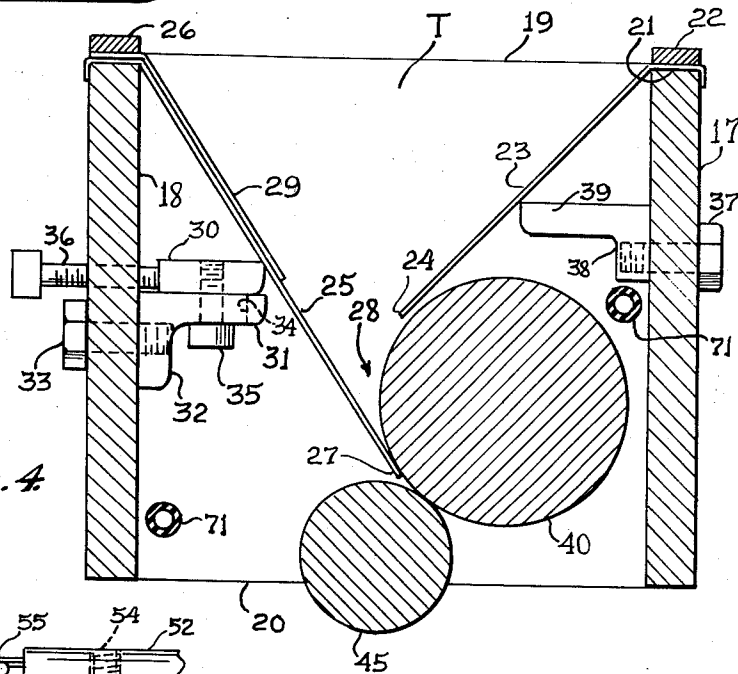


Fig. 4

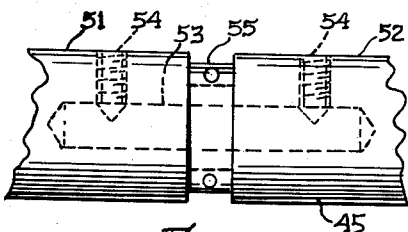


Fig. 6.

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3 Sheets-Sheet 3

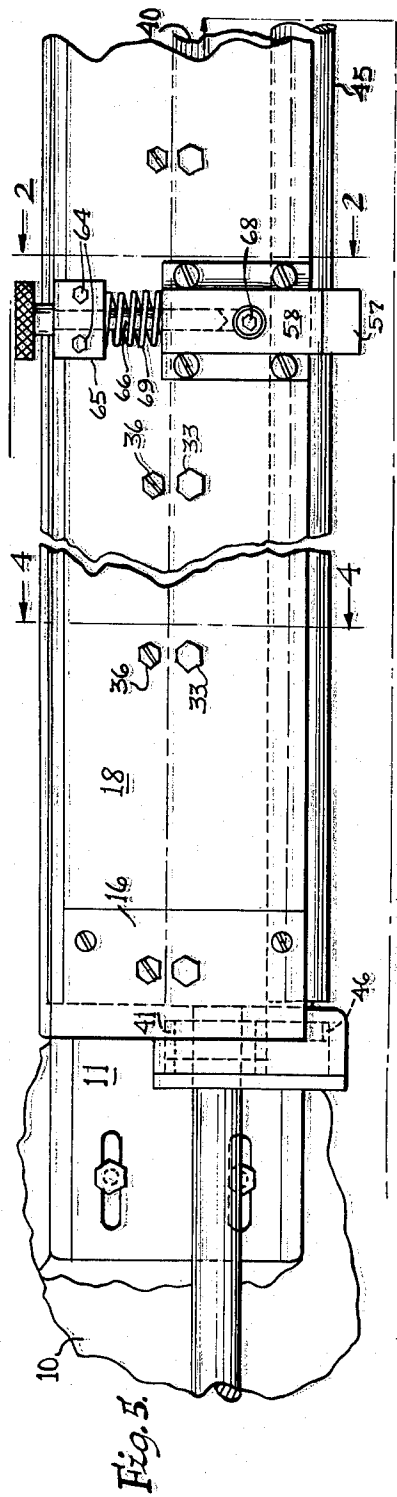


Fig. 5.

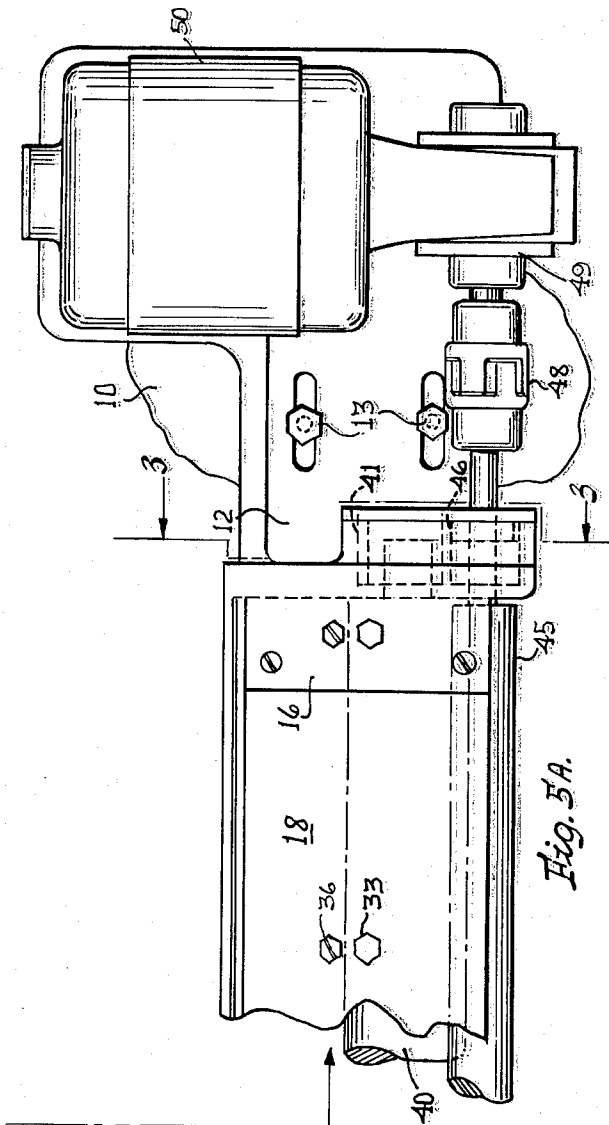


Fig. 5A.

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3,061,150

POWDER APPLYING APPARATUS

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Filed Oct. 10, 1960, Ser. No. 61,428

5 Claims. (Cl. 222—313)

My invention relates to a powder applying apparatus. More particularly my invention relates to a method and means for uniformly coating the freshly printed surface of a sheet of paper or the like whereby to dissipate the normal static in the paper sheet which interferes with the separation of the sheets and also to reduce to a minimum the sheets from adhering together by reason of having been freshly printed.

The sheets of paper when passing from the printing press generally are arranged in stack form upon a table, counter or the like. Many apparatuses have been employed to deposit between the sheets of paper a powder or the like to reduce the static and to prevent the sheets sticking together due to having been freshly printed. Such apparatuses have not proven entirely satisfactory and in most instances are relatively complicated and ineffective for bringing about a relatively fine, uniform coating of powder. The uniformity of the powder as well as the relatively thin coat is essential in the printing art for without such uniformity the uncoated surfaces of the sheets of paper will stick together either by reason of static or by reason of having been freshly printed.

It is, therefore, one of the many objects of this invention to provide an apparatus which will meet the present day requirements and which will overcome the heretofore known objections.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a perspective view of the invention;

FIG. 2 is a sectional detailed view taken substantially on line 2—2 of FIG. 5;

FIG. 3 is a sectional detailed view taken substantially on line 3—3 of FIG. 5a;

FIG. 4 is a sectional detailed view taken substantially on line 4—4 of FIG. 5;

FIG. 5 is a fragmentary side view of one end portion of the invention;

FIG. 5a is a side view of the opposite end portion of the invention; and

FIG. 6 is a fragmentary sectional detailed view taken substantially on line 6—6 of FIG. 2.

The several objects of my invention are preferably accomplished by the preferred form of construction shown in the drawings to which reference will now be made.

Elements of the printing press to which the apparatus constituting my invention is attached are indicated at 10. The apparatus is supported transversely over the table or platform preferably at a point or location where the printed paper passes out from the printing press upon such platform or table. This is accomplished by providing mounting brackets 11 and 12 adjustably secured to the printing press elements 10 by means of bolt and slot connections 13.

These mounting brackets provide laterally extending plates 15 which include side flanges 16 arranged in pairs with the flanges of each pair extending in parallel relation with respect to each other. Extending between and connected to inner corresponding flanges 16 is a back plate 17. Connected to and extending between the outer corresponding flanges 16 is a front plate 18. The plates

17 and 18 together with the laterally extending plates 15 form a box-like trough "T" having an open top 19 and an open bottom 20.

Secured to the top edge 21 of the plate 17 beneath a binder strip 22 is an inclined wall 23 the lower edge portion 24 of which terminates in spaced relation with respect to an opposite inclined wall 25. The wall 25 is secured to the plate 18 by a binder strip 26. Preferably the lower edge portion 27 of the wall 25 terminates at a point below the edge portion 24 whereby to provide a discharge opening 28 which extends the full length of the trough "T."

Bearing upon the wall 25 is a spring strip 29 likewise secured to the plate 18 by the binder strip 26. The strip 26 is adapted to bear the wall 25 into contact with a bar 30 supported on the flange 31 of an angle bar 32 secured to the plate 18 by threaded bolts 33. In the flange 31 at a predetermined point thereon are provided elongated transverse extending slots 34. Extending through these slots 34 are thread-bearing bolts 35 threaded into the bar 30, whereby to secure the bar 30 in an adjusted position upon the flange 31 with the bar bearing against the wall 25. This adjustment is accomplished by unthreading the bolts 35 so that the bar 30 may be moved toward or away from the wall 25 by set screws 36 carried by the plate 18, it being noted that the strip 29 will function to yieldably maintain the wall 25 against the bar 30.

Secured to the plate 17 by threaded bolts 37 is an angle bar 38, the top flange 39 of which bears against the wall 23 thereby to maintain the wall 23 in a predetermined position to allow excess powder to go back into the supply chamber.

Extending transversely of the trough "T" and adjacent the plate 17 is an elongated roller 40, the ends of which are journaled in suitable bearings 41 carried by the mounting brackets 11 and 12. The peripheral surface of this roller is sand-blasted and thereafter chrome-plated and rotates through a plane bisecting the discharge opening 28.

As will be noted in FIGS. 2 and 4, the long edge 27 of the wall 25 is in relatively close proximity to the peripheral edge of the roller 40 for reasons hereinafter explained. One end of the roller 40 by a coupling 42 and a gear box 43 is operatively connected to a driving motor 44 carried by the mounting bracket 11. The rotation of the roller 40 is relatively slow preferably 1/3 to five r.p.m. so as to slowly feed the powder through the discharge opening 28 of the trough "T." I preferably refer to this roller 40 as the feed roller.

Extending between the side flanges 16 is a roller 45 the opposite ends of which are journaled in bearings 46 eccentrically mounted in holders 47 of any approved construction. This roller 45 has one end portion connected by means of a universal coupler 48 to a gear box 49 in turn operatively connected to a driving motor 50. This roller 45 has a knurled plastic coating baked at approximately 700° F. to prevent the powder from adhering thereto.

The roller 45 may be of a single length or of a plurality of lengths depending upon the length of the trough "T." In the present instance I have shown the roller 45 as being in two sections 51 and 52. The adjacent end portions of these sections are connected together by means of a pin 53 fixed to these sections by set screws 54. Surrounding the intermediate portion of the pin 53, between adjacent ends of the roller sections 51 and 52, is a bearing 55 of any standard construction. This bearing fits into a seat 56 provided by a foot 57 secured to a block 58 as at 59. An inner block 60 is secured by the foot as at 61 and provides together with the block 58 a slot 63 which

receives (FIG. 2) the lower edge portion 62 of the plate 18. Secured to the plate 18 as at 64 is a bearing 65. Passing through this bearing 65 and threaded into the block 58 is an adjustment bolt 66. This plate 18 has an elongated slot 67 formed therein through which connecting bolt 68 passes for adjustably securing the block 58 to the inner block 60. Surrounding the shank of the adjusting bolt 66 between the bearing 65 and the block 58 is an expansion spring 69, the arrangement being such that by adjusting the adjusting bolt 68 a lip 70 formed as an integral part of the block 60 may be adjusted in a selected position with respect to the roller 45 beneath the long edge portion 27 of the wall 25.

In use the apparatus is connected to an element or structure of the printing press in the manner and position hereinafore stated. A powder such as talcum powder or the like or any other powder as will best serve the purpose is placed into the trough "T." The motors 44 and 50 are caused to rotate and in turn rotate their respective rollers. As previously pointed out the roller 40 rotates at a relatively slow speed so that it will act as a feed roller for the powder feeding the same to the point adjacent the long edge 27 of the wall 25 which long edge, together with the periphery of the roller 40, provides a minute opening through which the powder is fed. The roller 45, as before stated, rotates at approximately 700 r.p.m. and as it has close relationship with the roller 40 the powder by the roller 40 will be precipitated over the moving surface of the freshly printed paper passing beneath my apparatus. The uniform close spacing between the rollers 40 and 45 throughout the length of the roller 45 is maintained by adjusting the bolt 66 and the eccentric bearings 46 and center bearing if used.

The speed differential between the rollers 40 and 45 results in uniformly distributing over the surface of the freshly printed sheets of paper the required amount of powder which serves to prevent the sheets of paper sticking together by reason of static or printing material. In this manner there results a considerable saving in the amount of powder used.

To prevent the powder from collecting beneath the walls 23 and 24 I provide perforated air conduits 71 which are connected to a suitable source of air supply and which conduits serve to direct an air screen in the area beneath the plates 23 and 24 to block the deposit of powder in such area and to oppose movement of the minute particles of powder away from the sheet due to outside air currents or drafts.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. An apparatus of the class described comprising a trough having oppositely disposed inclined walls, the inner longitudinal edge of one of said walls terminating short of the opposite wall and the longitudinal edge of the opposite wall extending to a predetermined point below the longitudinal edge of said one of said walls to provide therebetween an open bottom trough, a slow speed roller supported by said apparatus and having a portion of its peripheral edge cooperating with said one of said side walls to complete one wall of said trough, and with said opposite wall to define a discharge opening for said trough, a relatively high speed roller in close proximity with the longitudinal edge of said opposite wall and said slow speed roller for receiving material from said slow speed

roller and precipitating the same therebelow, and means for adjusting said opposite wall to position the longitudinal edge relative to said rollers for varying the size of said discharge opening.

2. An apparatus of the class described comprising a trough having oppositely disposed inclined walls, the inner longitudinal edge of one of said walls terminating short of the opposite wall and the longitudinal edge of the opposite wall extending to a predetermined point below the longitudinal edge of said one of said walls to provide therebetween an open bottom trough, a slow speed roller supported by said apparatus and having a portion of its peripheral edge cooperating with said one of said side walls to complete one wall of said trough, and with said opposite wall to define a discharge opening for said trough, a relatively high speed roller in close proximity with the longitudinal edge of said opposite wall and said slow speed roller for receiving material from said slow speed roller and precipitating the same therebelow, and means for adjusting said opposite wall to position the longitudinal edge relative to said rollers for varying the size of said discharge opening, and means for adjusting the position of said high speed roller relative to said slow speed roller and said discharge opening.

3. An apparatus as defined by claim 2 whereby said means for adjusting the high speed roller includes eccentric means carried by said apparatus.

4. An apparatus of the class described comprising a trough having oppositely disposed inclined walls, the inner longitudinal edge of one of said walls terminating short of the opposite wall and the longitudinal edge of the opposite wall extending to a predetermined point below the longitudinal edge of said one of said walls to provide therebetween an open bottom trough, a slow speed roller supported by said apparatus and having a portion of its peripheral edge cooperating with said one of said side walls to complete one wall of said trough, and with said opposite wall to define a discharge opening for said trough, said slow speed roller having a peripheral surface that is sand-blasted and chrome plated so that the same presents a non-adherent surface within said trough, a relatively high speed roller in close proximity with the longitudinal edge of said opposite wall and said slow speed roller for receiving material from said slow speed roller and precipitating the same therebelow, said high speed roller having its peripheral surface knurled so as to present a material receiving surface in close proximity to said discharge opening, and means for adjusting said opposite wall to position the longitudinal edge relative to said rollers for varying the size of said discharge opening, and means for adjusting the position of said high speed roller relative to said slow speed roller and said discharge opening.

5. An apparatus for coating a freshly printed sheet of material with a relatively fine and uniform coating of powder, comprising a trough having a discharge opening, a feed roller at said discharge opening, means for rotating said feed roller at a relatively slow speed, a precipitating roller in close proximity to said feed roller, means for rotating said precipitating roller at a relatively high speed, and means for adjusting said precipitating roller relative to said feed roller including eccentric means at opposite ends of said precipitating roller and an adjustable bearing intermediate said ends.

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