Jan. 31, 1950 S. BENNETT 2,496,194

POWDER DISTRIBUTOR FOR PREVENTING OFFSET FROM FRESHLY PRINTED SHEETS

Filed Aug. 19, 1946 3 Sheets-Sheet 1

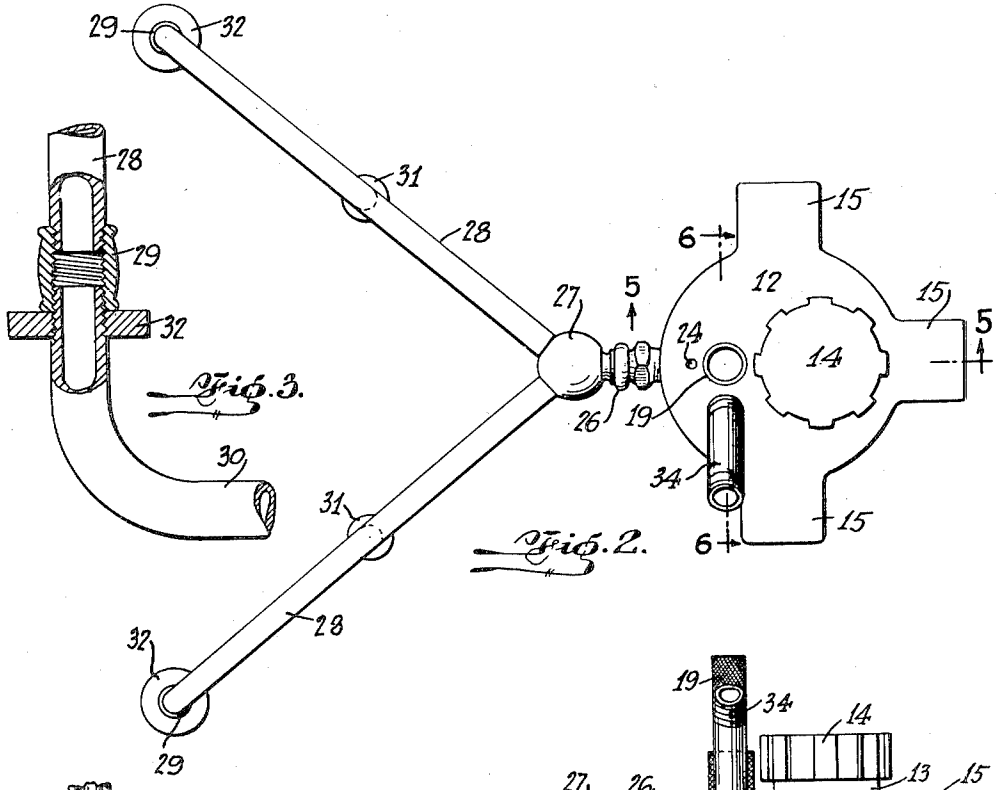


Fig. 3.

Fig. 2.

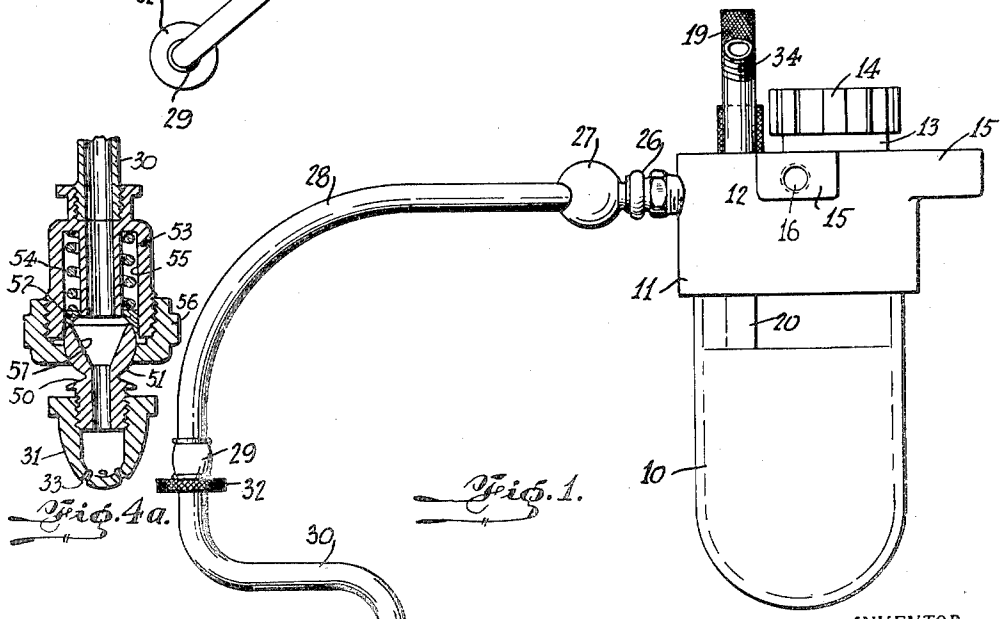


Fig. 4a.

Fig. 1.

Fig. 4.

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POWDER DISTRIBUTOR FOR PREVENTING OFFSET FROM FRESHLY PRINTED SHEETS

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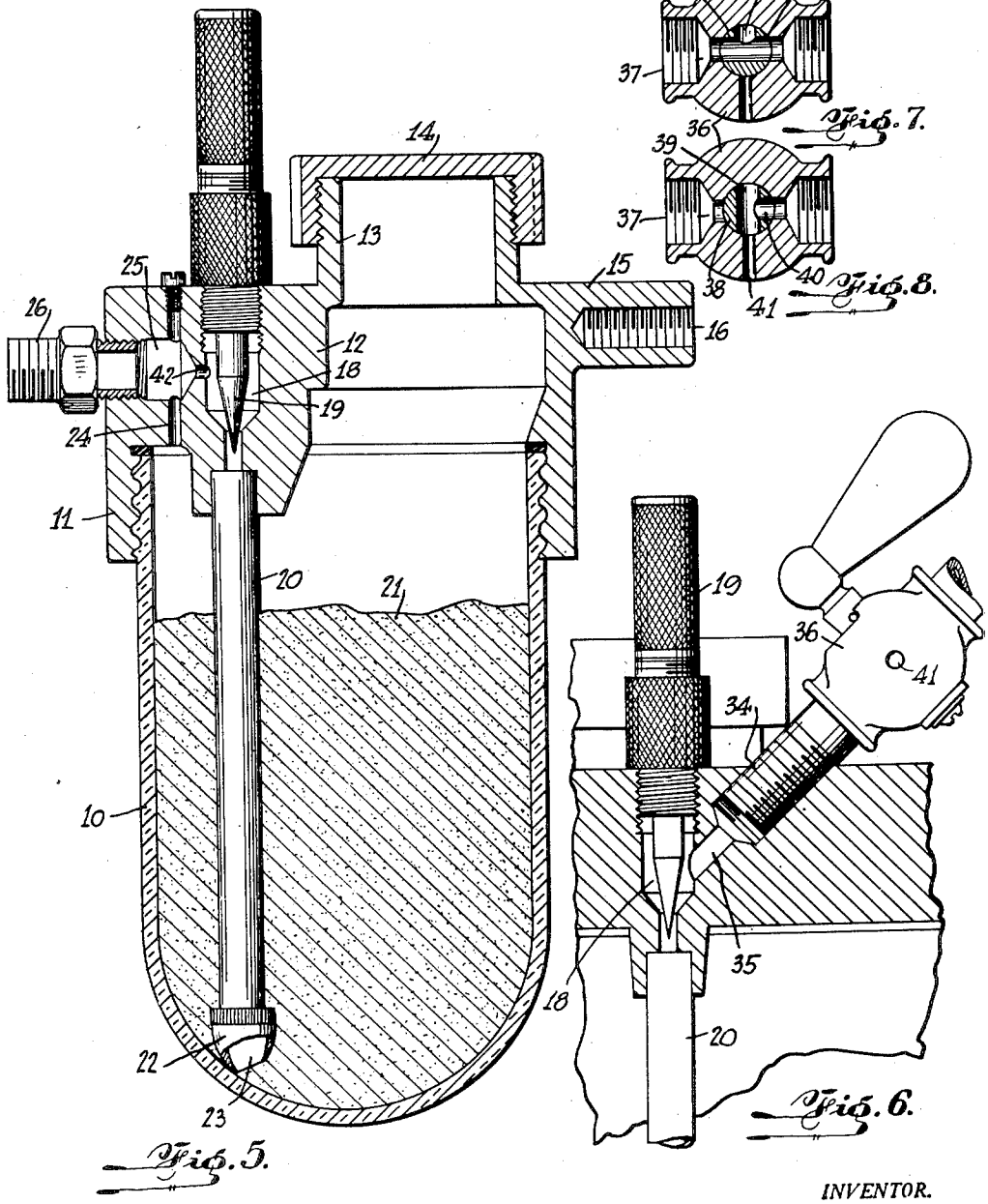


Fig. 5.

Fig. 7.

Fig. 8.

Fig. 6.

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POWDER DISTRIBUTOR FOR PREVENTING OFFSET FROM FRESHLY PRINTED SHEETS

Filed Aug. 19, 1946 3 Sheets-Sheet 3

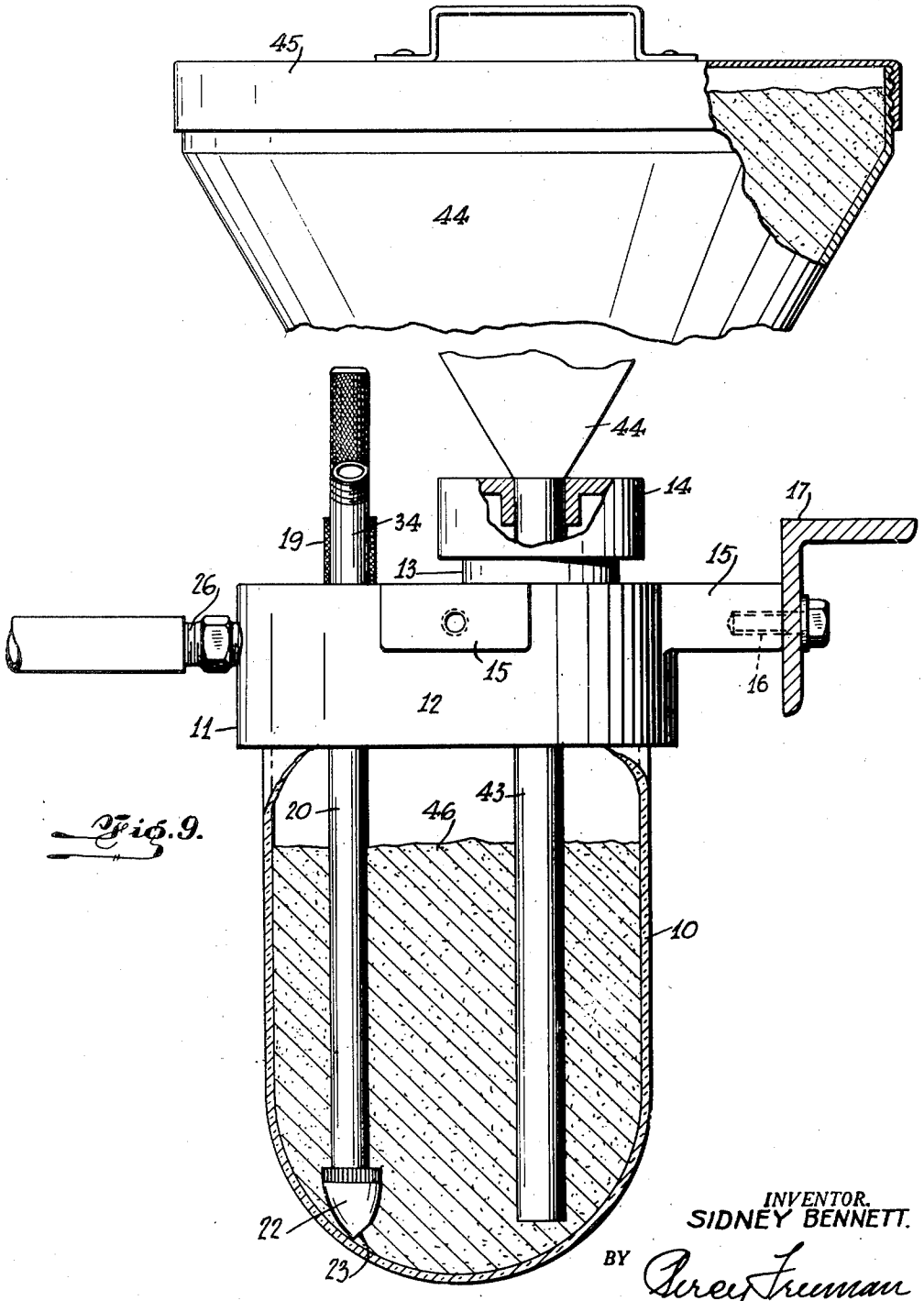


Fig. 9.

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UNITED STATES PATENT OFFICE

2,496,194

POWDER DISTRIBUTOR FOR PREVENTING OFFSET FROM FRESHLY PRINTED SHEETS

Sidney Bennett, New York, N. Y.

Application August 19, 1946, Serial No. 691,620

4 Claims. (Cl. 91—44)

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This invention relates to new and useful improvements in devices for blowing powder and has especial reference to a device for blowing powder onto stacked printed sheets to prevent offsetting.

A main object of the invention is to provide a simple, compact, efficient device, which will dispense the powder in small regulated quantities onto the printed sheet without interruption in the operation due to clogging of the powder either in the powder holder or in the passages through which it travels, and without variation in the spray.

A further object is to provide a device in which the direction of the blasts of powder can be easily and quickly adjusted to cover a wide variation of area on the printed sheet.

A still further object is to provide means whereby the force of the admitted air will facilitate the discharge of the powder from the device and prevent clogging.

Yet another object is to provide a simple means whereby the powder in the bottom of the tank or holder is automatically agitated and prevented from clogging and is kept active so that the amount of powder blasted remains uniform at all times.

A further object is to provide a device in which the inlet line is controlled by a valve so that when in inoperative position, the incoming air will exhaust to the atmosphere, thus obviating the collection of moisture in the system.

Further and more specific objects, features, and advantages will more clearly appear from the detailed specification hereinafter set forth especially when taken in connection with the accompanying drawings which illustrate present preferred forms which the invention may assume and which form part of the specification.

In brief and general terms the invention concerns a powder receptacle having a cover containing air-admission and powder discharge passages. The air is admitted to the bottom of the receptacle and caused to sweep across the preferably curved bottom to thoroughly stir up the powder and keep it agitated. When the receptacle is provided with a powder supply reservoir having also a pipe to admit powder at the bottom of the tank, the second pipe is disposed adjacent the first at the respective bottoms thereof, and means is provided so that the blast of air from the first will sweep across the bottom of the second to sweep away the powder at the bottom and allow fresh powder to fall by gravity and to prevent clogging thereat.

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Furthermore the invention concerns a plurality of spray pipes connected to the discharge opening of the receptacle whereby the powder blast can be directed in a plurality of directions to cover a large and variable area of the sheet to be powdered, with ease and dispatch, and by means of readily adjustable connections in said spray pipes.

Still further the invention provides that a small portion of the admitted air is caused to flow directly into the atmosphere so that there is a continuous flow of air through the valve to obviate condensation of moisture which is the cause of clogging of powder at the valve while it is closed to the passage of powder. This applies particularly when the source of air is from the plunger system on the printing press.

The present preferred form which the invention may assume is illustrated in the drawings, of which:

Fig. 1 is a side elevation of the device.

Fig. 2 is a plan view thereof.

Fig. 3 is a partial section through the swivel joint for one of the adjustable nozzles.

Fig. 4 is a cross-section detail of one of the powder spray nozzle tips.

Fig. 4a is a longitudinal sectional view of a modified form of nozzle construction.

Fig. 5 is an enlarged vertical cross section through the powder receptacle.

Fig. 6 is an enlarged partial cross section showing the air admission and control valve.

Fig. 7 is a cross section of the admission valve in one position when the powder is to be blown.

Fig. 8 shows the valve in the position when air is not applied to the powder receptacle; and

Fig. 9 is an enlarged partial cross section through a modified form of tank showing a special powder feed device.

The device which forms the simple compact, efficient apparatus for blowing powder upon successive printed sheets to prevent offsetting, comprises a receptacle or tank 10 preferably of glass threaded at its upper end into a dependent neck 11 of a cover block 12 having a filling opening 13 covered by a cap 14. The block has a lug 15 bored at 16 to enable a supporting element to be screwed in to hold the device in any desired location. For instance, in Fig. 9, the device is shown bolted to an angle iron frame member 17.

The cover block is provided with an air passage 18 which is controlled by an adjustable needle valve 19. An air pipe 20 is connected to the lower end of this passage 18 and extends down into the receptacle 10 in which the powder

21 is disposed. The lower end of the air admission pipe 20 is provided with a nozzle 22 the orifice 23 of which is sloped as shown, to discharge the air into the powder 21 in a direction at an angle to the line of the pipe and somewhat in a direction along the bottom of the tank 10 so as to thoroughly stir up the powder at the bottom where it might be most likely to pack too tightly. As the powder is stirred up into a fine dust, it passes out at the top of the tank through a dust passage 24 into the main powder discharge passage 25 in the block 12, to which is connected a nipple 26 leading to a union element 27 from which extend one or more pipes 28 extending outwardly and downwardly. These pipes 28 are connected by swivel joints 29 to curved pipes 30 which have nozzles 31 at their lower ends. The pipes 28 are divergent and the lower adjustable swivelled pipes 30 can be swung around to make the application of the powder to desired areas most easy and convenient. The swivel joint is shown in Fig. 3 and comprises a well-known construction such as the threaded collar 29 into which the ends of pipes 28 and 30 are threaded. A lock ring 32 enables the lower pipes 30 to be swung with ease by loosening the ring. The nozzles shown in Fig. 4 may be screwed onto the lower ends of the pipes 30 and have apertures 33 of suitable size to pass the powder onto the sheets to prevent offsetting. This arrangement gives a very flexible construction which can be disposed to cover quite a wide area, if necessary and desirable.

An alternative form of nozzle construction is shown in Fig. 4*a* wherein the nozzle is universally mounted on a ball and socket arrangement to enable the tipping of the nozzle at various angles relative to the axis of the pipe on which it is supported and in a complete circle around said axis. In this form, the nozzle 31 is secured to the end of stem 50, the other end of which is spherically shaped as at 51 to cooperate with the similarly, though reversely shaped surface of a ring 52 slidably received within walls of a fitting 53. A coil spring 54 housed in an annular groove 55 of the fitting 53 urges the ring 52 against the sphere which is retained in place by the screw cap 56 which is threadedly engaged with the fitting 53. The fitting 53 is threadedly engaged with the end of tube 30 or may be directly engaged to the end of tube 28 as will be obvious.

A communicating opening extends through all of the parts mentioned, the spherical member 51 being provided with a conical opening 57 to permit uninterrupted communication regardless of the angular adjustment of the member 51.

As seen in Fig. 6, the air is admitted to the main air passage 18 through a pipe 34 connected to an inclined passage 35, opening into the passage 18 as shown. This pipe 34 has in it a control valve 36 (Figs. 6, 7) having an air passage 37 and a valve plug 38 which has a through passage 39 and a lateral passage 40 leading therefrom at right angles thereto. The valve casing has also a lateral passage 41 opening to the atmosphere. When the plug 38 is in one position shown in Fig. 7, the air passes straight through the main passage 37 into the pipe 34 and thence into the main air passage 18 but when it is in the position shown in Fig. 8, the air enters through passage 40 and then out through passage 39 into the lateral outlet passage 41 to the atmosphere. When the plug 38 is in one position shown in Fig. 7, the air passes straight through the main passage 37 into the pipe 34 and

thence into the main air passage 18 but when it is in the position shown in Fig. 8, the air enters through passage 40 and then out through passage 39 into the lateral outlet passage 41 to the atmosphere. This action thus permits the air to flow through the valve obviating condensation and thus tends to keep the valve passages clear of powder which would otherwise tend to clog the passages while the valve is shut off.

When the blast of air enters passage 18, it not only passes down the pipe 20 into the powder but some of it will pass through a small by-pass passage 42 directly into the powder discharge passage in nipple 26 and serve as an additional blower means to assist the blowing of the powder into the union 27 and through the pipes 28. In other words, the admitted air not only is forced down into the powder chamber to force the powder out through the passage 25 but some of the air passes straight through passages 25, 26 to pick up and carry with it powder issuing from powder-discharge passage 24. It will be understood that during the blast, pressure is built up in pipes 28 and 30 and upon cessation of the air blast a back pressure or kick-back occurs forcing some air back through passage 24 and on top of the powder supply, and serves to fill up any void which may tend to form around nozzle opening 23.

In the form shown in Fig. 9, the construction is the same as above described except that the material is now replenished by a filling pipe 43 which extends through the cap to a point near the bottom of the receptacle 10 and adjacent the discharge end of the air admission pipe 20 so that the air as it rushes from the inclined nozzle 23 at the bottom of pipe 20 will tend to sweep across the lower end of the powder admission pipe 43 and thus make more certain the gravity flow of the powder down the pipe 43. It has been found that as the puff of air occurs, some of it also passes upward into the filling pipe 43 and tends to agitate the powder supply above.

The pipe 43 at its upper end is connected to a reservoir 44 for a reserve supply of powder and is in the form of an inverted cone or hopper having a cover plate 45. It will be seen that the powder will flow by gravity down the pipe 43, though it is probably aided by the air blasts which enter the bottom of the filling tube 43. The intermittent pulsation of the air will cause blasts of it to sweep across from the nozzle 23 and clear away the slightly packed powder at the bottom of the pipe 43 and thus allow more powder to flow down to take the place of that thus swept away. It has been found that with this arrangement, the level of the powder in the receptacle 10 shown at 46 will remain substantially constant, and the gravity flow automatically replaces the powder as it is blown out of the receptacle.

The result of the novel construction and cooperative operation of the parts is that the powder is blown from the tank or receptacle in a finely divided state, and is effectively spread over the sheet by the ready and adaptable adjustment of the discharge pipes disposed over the sheet. The powder is effectively blown and operated upon by the air blast to effectively prevent it from packing or clogging, and thus interrupting the smooth operation. In the modified form, the feed of the powder into the tank from the reservoir is automatically effected and thus can be operated for long periods of time without replenishment.

While the invention has been described in de-

tail and with respect to present preferred forms which the invention may assume, it is not to be limited to such forms and details since many changes and modifiations may be made in the invention without departing from the spirit and scope of the invention in its broadest aspects. Hence, it is desired to cover any and all forms and modifications of the invention which may come within the language or scope of any one or more of the appended claims.

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

1. A device for blowing powder which comprises a tank having a curved bottom, a cover for the tank having air-admission and powder-discharge passages therein, a pipe extending from the air-admission passage to the bottom of the tank and having a discharge nozzle opening into the tank in a direction to force the air along the curved bottom of the tank, a powder supply pipe extending into the tank to a point near the bottom thereof and adjacent the lower end of the air admission pipe, the arrangement being such that the force of air from the air admission pipe sweeps across the bottom of the tank and across the end of the powder-admission pipe to prevent powder from packing thereat.

2. A device for blowing powder which comprises a tank having a substantially hemispherical bottom, a cover for the tank having air-admission and powder-discharge passages therein, a pipe extending to the bottom of the tank from the air-admission passage, means for controlling the amount of air admitted to said pipe, means for admitting a small portion of said air directly to the powder discharge passage, a powder reservoir disposed on top of the cover, a powder supply pipe exteding therefrom to the bottom of the tank adjacent the lower end of the other pipe, to supply powder from the reservoir to the pipe by gravity, said first pipe having a discharge nozzle opening into the tank in a direction to cause the air issuing therefrom to sweep across the lower end of the second pipe to prevent clogging of the powder thereat and facilitate the gravitational flow of the powder into the tank.

3. In a powder blowing device of the type used in connection with the intermittent air supply from the plunger system of a printing press for blowing powder on a printed sheet to prevent offsetting, a tank having a substantially hemispherical bottom, a cover for the tank having air admission and powder discharge passages therein, a pipe for connecting said air admission passage to an intermittent air supply, a tube extending from the air admission passage to the bottom of the tank and having a discharge nozzle opening into the tank in a direction to force air supplied to the device, along the curved bottom of the tank, a needle valve for controlling the flow of air into said tube, said admission passage above the valve communicating with the powder discharge passage whereby air under pressure passing directly from the admission passage to the discharge passage may facilitate the flow of powder from a supply in the tank, one or more pipes extending from the discharge passage, each of said discharge pipes having at its outlet end a nozzle having small exhaust holes, the construction and arrangement being such that when an intermittent supply of air under pressure is fed to the device, the sudden discontinuance of the air pressure during the lulls will cause a commensurate sudden release of back pressure to force some air back through said powder-discharge opening to fill up any void which may tend to form around the discharge nozzle in the tank.

4. In a powder blowing device of the type used in connection with the intermittent air supply from the plunger system of a printing press for blowing powder on a printed sheet to prevent offsetting, a tank having a substantially hemispherical bottom, a cover for the tank having air admission and powder discharge passages therein, a pipe for connecting said air admission passage to an intermittent air supply, a valve in said pipe and having operative and inoperative positions, and means in the valve when in the inoperative position, to allow incoming air to exhaust into the atmosphere to obviate condensation of moisture, a tube extending from the air admission passage to the bottom of the tank and having a discharge nozzle opening into the tank in a direction to force air supplied to the device, along the curved bottom of the tank, a needle valve for controlling the flow of air into said tube, said admission passage above the valve communicating with the powder discharge passage whereby air under pressure passing directly from the admission passage to the discharge passage may facilitate the flow of powder from a supply in the tank, one or more pipes extending from the discharge passage, each of said discharge pipes having at its outlet end a nozzle having small exhaust holes, the construction and arrangement being such that when an intermittent supply of air under pressure is fed to the device, the sudden discontinuance of the air pressure during the lulls will cause a commensurate sudden release of back pressure to force some air back through said powder-discharge opening to fill up any void which may tend to form around the discharge nozzle in the tank.

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