Feb. 14, 1928. 1,659,179

L. WILSON

POWDER DISTRIBUTING MACHINE

Filed June 4, 1926 3 Sheets-Sheet 1

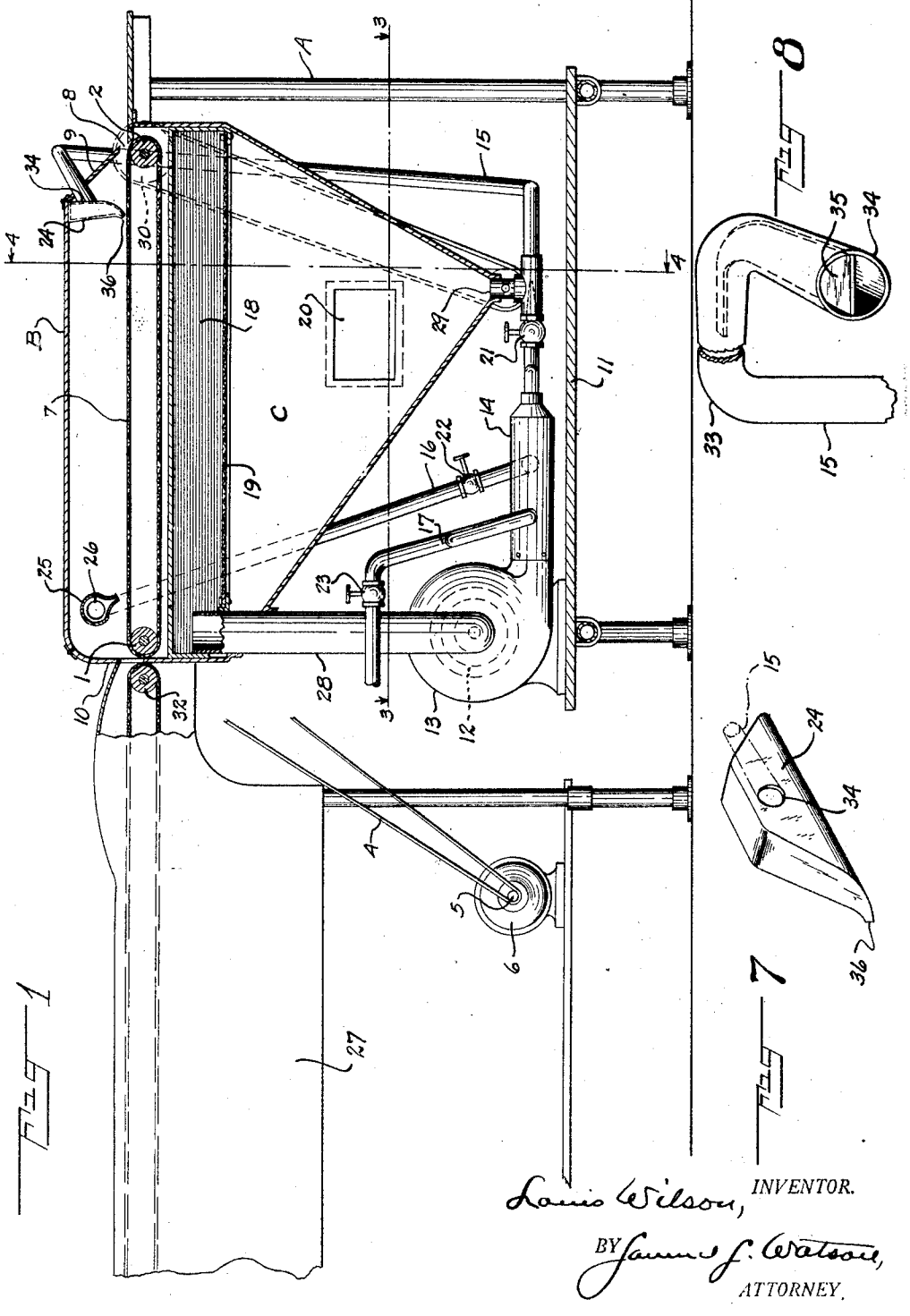


FIG 1

FIG 8

FIG 7

Louis Wilson, INVENTOR.

BY James J. Watson,

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Feb. 14, 1928.

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3 Sheets-Sheet 2

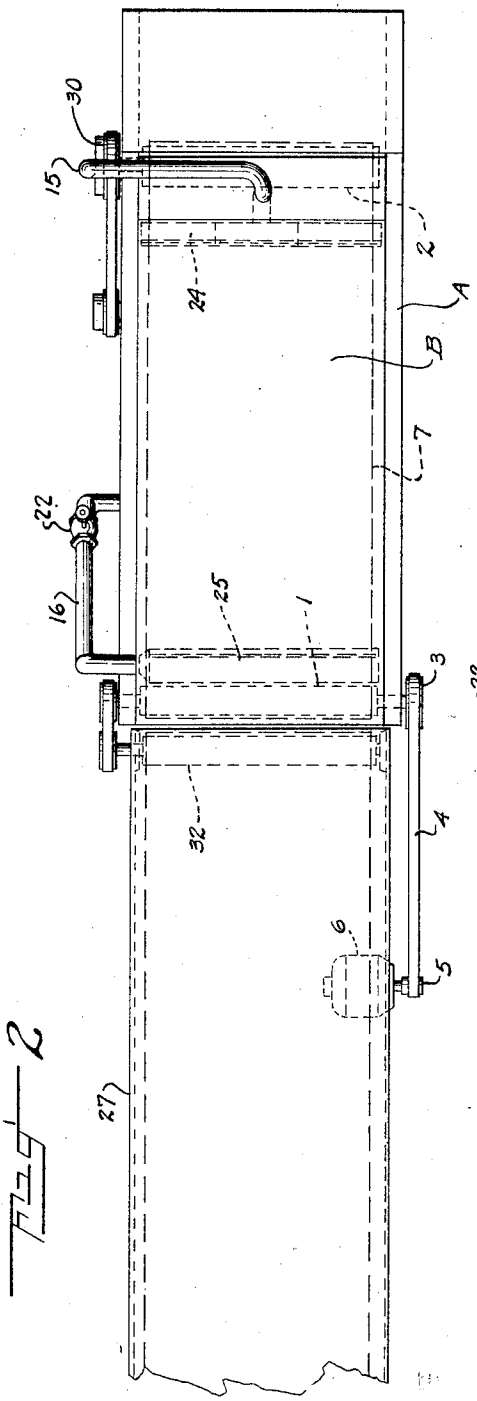


Fig. 2

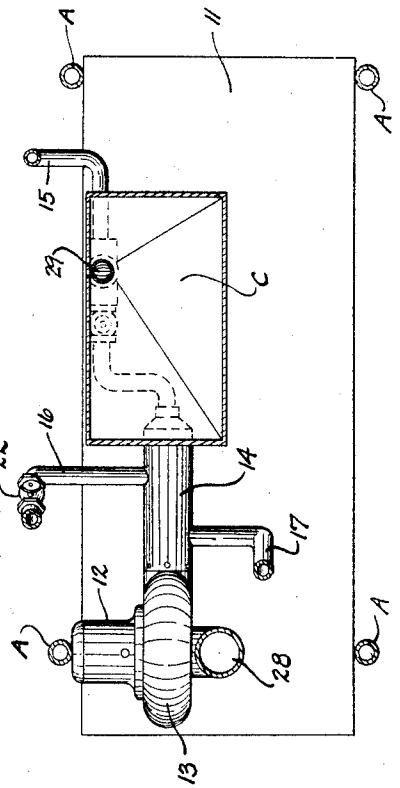


Fig. 3

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Fig 4

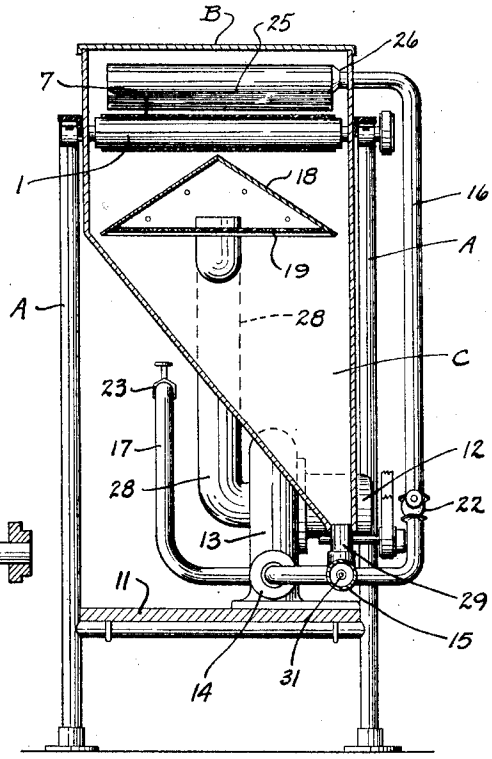


Fig 6

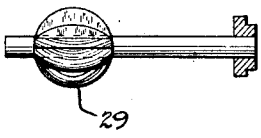
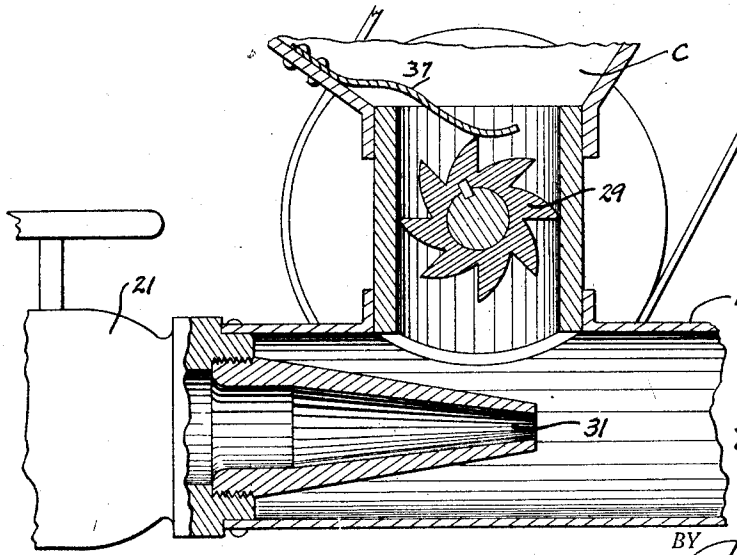


Fig 5



Louis Wilson,
INVENTOR,

BY James J. Watson,
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Patented Feb. 14, 1928. 1,659,179

UNITED STATES PATENT OFFICE.

LOUIS WILSON, OF BROOKLYN, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO B. L. NICHOLES & CO. INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

POWDER-DISTRIBUTING MACHINE.

Application filed June 4, 1926. Serial No. 113,633.

My invention relates to improvements in machines for spreading powder upon wet printed matter, which is done during a continuing movement of the printed matter, and includes the removal from the printed matter of all surplus powder, the collection of such surplus powder in a receptacle from which it may be taken for subsequent use, and means whereby the surplus powder, after the same has been collected, may be mechanically conveyed for immediate re-use without rehandling.

I obtain these objects by the mechanism illustrated in the accompanying drawings in which—

Fig. 1 shows a side elevation of my mechanism in prospective; Fig. 2 shows a plan view of my mechanism; Fig. 3 shows a section plan view on the lines 3—3 of Fig. 1; Fig. 4 shows a sectional view on the lines 4—4 of Fig. 1; Fig. 5 shows a sectional view of a rotating ball valve and air nozzle pipe connections, etc.; Fig. 6 shows a side view of the revolving ball valve; Figs. 7 and 8 are detail views of the powder distributing nozzle and its pipe connections.

Similar letters and numerals refer to similar parts throughout the several views.

My mechanism is mounted on the frame, A, which may be secured to the floor by any of the usual means. The rollers, 1, and 2, are mounted on the frame A. The roller, 1, may be operated by the pulley, 3, driven by a belt, 4, from a pulley, 5, on the motor, 6. The meshed belt carrier, 7, which is preferably of wire mesh, stretches between the two rollers 1 and 2, and is operated by the roller 1; it is preferably substantially the same width as the rollers, 1, and 2. This meshed belt carrier receives the wet printed matter to be powdered at 8, and this matter is carried through the machine on this meshed belt carrier. Above the meshed belt carrier is the cover B which encloses the meshed belt carrier and the top of the frame A. It is provided with a door, 9, at the receiving end and by the door, 10, at the rear end, for the purpose of access to the operating parts and for the admission and emission of the printed matter. At or near the bottom of the frame, A, I provide the supporting shelf, 11, on which is secured the motor, 12, and the blower, 13. The blower, 13, is provided with the air supply reservoir pipe, 14, from which compressed air from the blower is distributed through the pipes, 15, 16, and 17.

Below the meshed belt carrier, 7, and secured to the frame, A, I provide the powder collecting and supply receptacle, C, which is preferably of the form shown in Figs. 1 and 4. Within this receptacle C, I secure the angle-shaped distributor, 18, and beneath the distributor, 18, I provide the screen, 19, which is preferably of fine woven fabric, as bolting cloth, metal, or similar fabric. This screen preferably covers the bottom of this distributor, 18, as shown in Figs. 1 and 4. The powder supply receptacle, C, is provided with the door, 20, for the purpose of supplying powder to the receptacle, C, and as a means of access to its interior.

The blower, 13, which is operated by the motor, 12, is provided with the outlet, 14, which is preferably considerably larger in diameter than the connecting pipes, 15, 16 and 17, in order that it may contain and furnish a reserve supply of compressed air. The outlet pressure of this compressed air in the pipes 15, 16, and 17, is controlled by the valves 21, 22, and 23.

The distributing powder pipe, 15, is supplied with a distributing nozzle, 24, shown in Fig. 7, (front view) and Fig. 1 (end view); this nozzle distributes the powder over the wet printed matter as it passes beneath this nozzle, carried thereunder by the meshed belt carrier, 7. The discharge end of this distributing nozzle preferably points slightly toward the rear end of the machine, as shown in Fig. 1.

The pipe 16 leads to the blow-off nozzle, 25, and is connected therewith at 26; this nozzle, 25, is shown in Fig. 4 (front view) and in Fig. 1 (end view), and the air current from this nozzle blows off the surplus powder from the printed matter after it has passed under the nozzle, 24, and before the printed matter leaves the machine. The discharge end of this blow-off nozzle preferably points slightly toward the front end of the machine as shown in Fig. 1.

A baking oven, 27, is secured to the frame, A, as shown in Fig. 1, and the pipe, 17, with its controlling valve, 23, may be used to supply a current of compressed air to cool the sheets as they pass from the baking oven, 27.

The pipe, 28, is the intake pipe of the

blower, 13. The blower intake creates a partial vacuum under the powder distributor, 18, and above the screen, 19, and separates the excess air from the powder, leaving the powder substantially free from excess air and in a normal condition. The screen, 19, suffices if it merely covers the intake of the pipe, 28. An end view of the angle-shaped powder distributor, 18, showing the pipe connections leading from it to the blower, is shown in Fig. 4 (end view) and in Fig. 1 (side elevation).

In the bottom of the powder collecting and supply receptacle, C, I provide the revolving valve, 29, a view of which (in section) is shown in Fig. 5, and (in plan) in Fig. 6. This revolving valve controls the powder supply to the powder distributing pipe, 15, and is operated by a belt from pulley, 30, on the roller, 2. The pulley, 30, and the pulley on the revolving valve, 29, are preferably cone or step pulleys, which permit a speed control of the revolving valve, 29. This revolving valve, 29, in turn controls the powder supply to the powder distributing pipe, 15. The connecting construction between the air reserve supply pipe, 14, and the powder distributing pipe, 15, and the construction to control the amount of the powder supply to the powder distributing pipe, 15, is shown in Fig. 5 (in section) and in Fig. 6 (in elevation). The air pressure to the nozzle, 31, is controlled by the valve, 21. The spring, 37, may be provided to agitate the powder above the revolving valve, 29.

The method of operation of my device is as follows:—

A supply of the powder to be distributed upon the wet printed matter is placed in the powder supply receptacle, C. The wet printed matter to be powdered is placed or moved upon the meshed belt carrier, 7, which carries the wet printed matter under the powder distributing nozzle, 24, and from this nozzle the powder is distributed over the printed matter. Powder from the powder supply receptacle, C, is supplied to the powder distributing pipe, 15, through the revolving valve, 29, and is conveyed through the powder distributing pipe, 15, to the powder distributing nozzle, 24, by the compressed air pressure from the blower, 13, and the reserve air-reservoir pipe, 14.

The meshed belt carrier, 7, carries the wet printed matter toward the rear end of the machine where it passes under the blow-off nozzle, 25, air from which blows the surplus powder from the printed matter, the surplus powder dropping upon the powder distributor, 18, and then into the supply receptacle, C.

After the printed matter passes under the nozzle, 24, and the nozzle, 25, it continues to be carried to the rear end of the machine by the meshed belt carrier, 7, until it passes onto a carrier running into and through the baking oven, 27, from which it emerges as a finished product. As the printed matter passes from the baking oven, 27, it may be cooled by a current of compressed air supplied through the pipe, 17.

In Fig. 8, is shown an enlarged view of the upper end of the powder distributing pipe, 15, showing a view, partly in section, of its connection with the powder distributing nozzle, 24. I have found it preferable to increase slightly the diameter of the upper end of the powder distributing pipe, 15, preferably beginning at the turn, 33, and continuing the increase in size until the pipe enters the nozzle at 34. I have also found it preferable to place a horizontally located partition, 35, in the upper end of the powder distributing pipe, 15. This partition, 35, prevents clogging of the powder, partially separates the powder from the air, the powder, for the most part, passing to the nozzle, 24, above the partition, 35, and the air passing, for the most part, below the partition, 35. When the powder reaches the nozzle, 24, it meets the air current which passes into the nozzle, 24, under the partition, 35, and this air current further assists in propelling and distributing it throughout the nozzle, 24, from which it passes to the wet printed sheets through the outlet, 36, of the powder distributing nozzle, 24.

It is obvious that the blower, 13, and the several pulleys may be operated by other means and their speed regulated by other than the means shown, and that the parts of my machine may be otherwise relatively located, without departing from my invention. For example, I have found it convenient to connect the motor, 6, by a belt to the pulley, 32, on the baking oven, (or to pulley, 3), and operating the roller, 1, by a belt from a pulley on the same shaft as that to which the pulley, 32, is secured.

Other modifications may also be made without departing from my invention.

I claim:—

1. A powder distributing mechanism of the character described, consisting of a meshed belt carrier and means for operating same, a powder distributing nozzle extending across said carrier, a powder supply reservoir, means for supplying compressed air as an operating means for conveying powder from said powder supply reservoir to said powder distributing nozzle and for removing the surplus powder from the printed matter, means for regulating and controlling the quantity of powder to be distributed from said powder supply receptacle to said powder distributing nozzle consisting of a revolving bucket valve installed between said powder supply reservoir and said powder supply distributing pipe.

2. A powder distributing mechanism of

the character described, consisting of a meshed belt carrier and means for operating same, a powder distributing nozzle extending across said carrier, a powder supply reservoir, means for supplying compressed air as an operating means for conveying powder from the powder supply reservoir to the powder distributing nozzle and for removing the surplus powder from the printed matter, means for regulating and controlling the quantity of powder to be distributed from the powder supply reservoir to the powder distributing nozzle consisting of a revolving bucket valve, and means for increasing the aeration of the powder in the powder distributing nozzle consisting of a horizontally divided pipe connecting the powder supply distributing pipe and the powder distributing nozzle.

3. A powder distributing mechanism of the character described, consisting of a meshed belt carrier and means for operating same, a powder distributing nozzle extending across said carrier, a powder supply reservoir, means for supplying compressed air as an operating means for conveying powder from the powder supply reservoir to the powder distributing nozzle and for removing surplus powder from the printed matter, means for regulating and controlling the quantity of powder to be distributed from the powder supply reservoir to the powder distributing nozzle, consisting of a revolving bucket valve, means for agitating the powder in the supply reservoir, consisting of spaced springy prongs secured at one end within the supply reservoir above the revolving valve, with their free ends normally sprung against the top of the buckets of the revolving valve, and moved up and down when the valve revolves.

4. A powder distributing mechanism of the character described, consisting of a meshed belt carrier and means for operating same, a powder distributing nozzle extending across said carrier, a powder supply reservoir, means for supplying compressed air as an operating means for conveying powder from said powder supply reservoir to said powder distributing nozzle and for removing the surplus powder from the printed matter and conveying said surplus powder to said powder supply reservoir, means for regulating and predetermining the quantity of powder to be distributed from said powder supply reservoir to said powder distributing nozzle consisting of a revolving bucket valve installed between said powder supply reservoir and said powder supply distributing pipe, and means for regulating the speed of said revolving valve consisting of cone pulleys installed upon the driving and driven shaft of said revolving valve and a driving belt connecting said cone pulleys.

LOUIS WILSON.