Oct. 22, 1929. J. C. COON 1,732,641

POWDERING MACHINE

Filed April 7, 1926

Fig. 1.

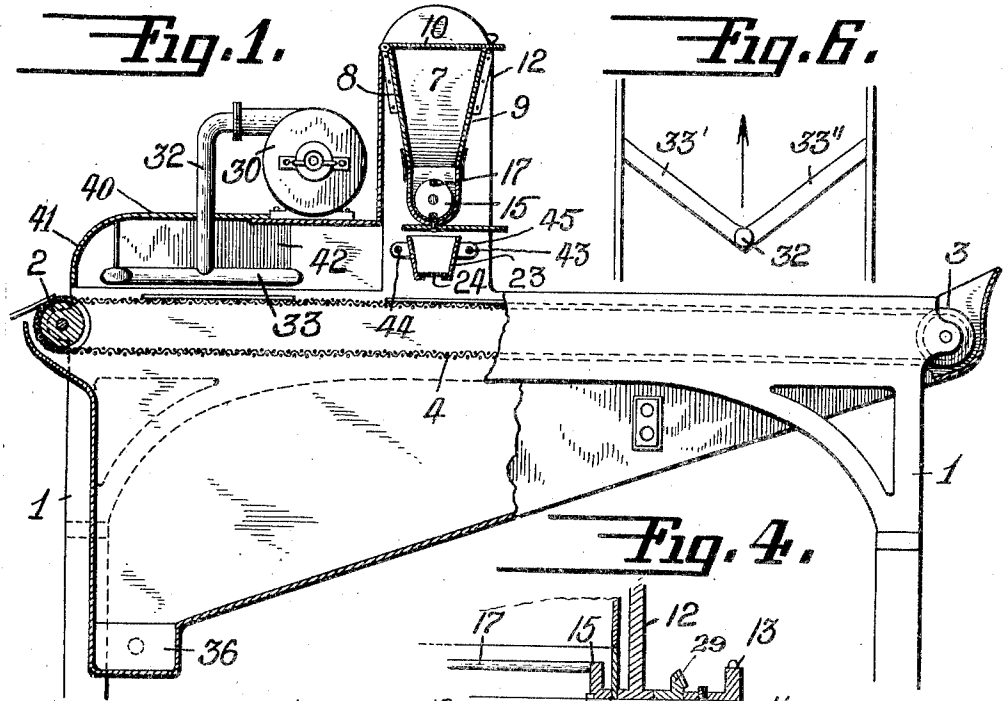


Fig. 6.

Fig. 4.

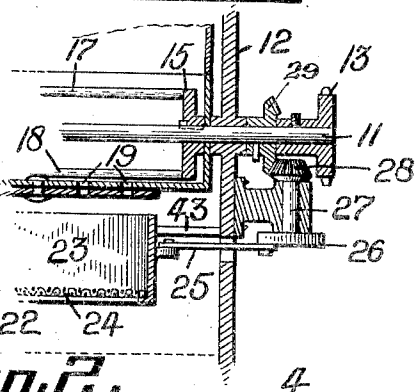


Fig. 3.

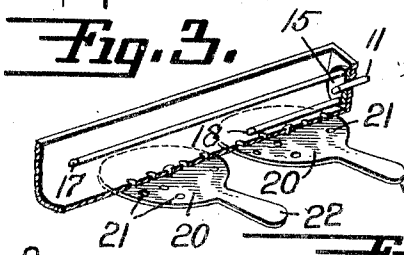


Fig. 2.

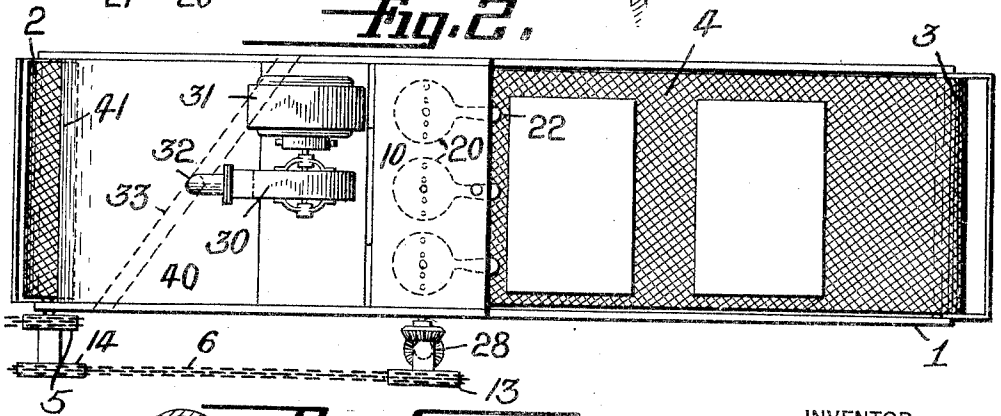
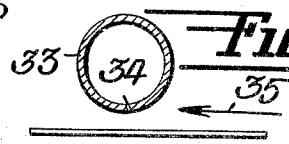


Fig. 5.



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UNITED STATES PATENT OFFICE

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POWDERING MACHINE

Application filed April 7, 1926. Serial No. 100,268.

This invention relates to powdering machines such as employed to sprinkle a film of powder on sheets of paper, cardboard or the like to aid in various kinds of printing operations. The invention is shown as applied to a powdering attachment for printing presses employing the system of plateless engraving and comprises essentially a means for sprinkling a film of powder of uniform thickness on the work and then blowing off the excess powder before the work leaves the machine. One of the objects of the invention is to improve upon and simplify the powdering machine disclosed in my prior application for improvements in plateless engraving machines, Serial No. 10,503 filed February 20, 1925.

Referring to the drawings in which a preferred form of the invention is shown.

Fig. 1 is a side elevation partly in section of my powdering machine or attachment.

Fig. 2 is a plan view of the same.

Fig. 3 is a detail view in perspective with parts broken away, of the means of regulating the amount of powder used.

Fig. 4 is a vertical section through one end of the container for the powder and the agitator.

Fig. 5 is a section on enlarged scale through the blower-pipe.

Fig. 6 is a detail plan view showing a modified form of blower pipe.

The machine is shown as mounted on a suitable support 1 having journaled therein at opposite ends a pair of rollers 2 and 3 over which passes an endless open-work belt 4 serving as a traveling carrier for the work. The machine may be mounted between a printing machine and a heating machine and the rollers may be driven if desired by the latter as by means of a pulley 5 and chain or belt 6. Above the traveling belt is mounted a container 7 for the powder. Said container is shown as extending substantially across the belt with sides 8 and 9 tapering downwardly and a hinged top 10. Near the bottom there is journaled a stirring or agitating mechanism. As shown this comprises a central shaft 11 journaled in the uprights 12 and driven from a sprocket-wheel 13. Said wheel in turn may be driven from a second sprocket wheel 14 mounted on the shaft of pulley 5. To said shaft is secured discs 15, between which extend rods 17 and 18, so that as the shaft is revolved the rods continuously stir the powder at the bottom of the container.

The container is provided with a plurality of apertures 19 at its bottom for the powder to flow through. Adjustable means may be provided to vary the amount of powder flowing. Such means are shown in the form of a plurality of discs 20 pinned at spaced points to the bottom of the container, each having a plurality of staggered apertures 21. A variable number of apertures in said discs may be brought into register with the apertures in the container by rotating the discs by means of the handles 22 thereon.

Beneath the container and between it and the work is mounted a powder distributing or agitating device. This is shown as a shallow box 23 having a wire mesh bottom 24 and is slidably supported on rods 43 and 44 by ears 45 thereon (Fig. 1). The agitator is continuously reciprocated by any suitable means such as by means of a link 25 connecting the agitator to a crank 26 on the stub shaft 27 having at its other end a bevel gear 28 meshing with a bevel gear 29 on the shaft 11 of the stirring mechanism.

The blower proper is shown as inclosed within a housing 30 and driven by an electric motor 31. The blower is connected by a downwardly extending pipe 32 to a transverse pipe 33 having therein small apertures or nozzles 34 from which the air is blown on the work. Preferably said transverse pipe 33 extends diagonally across the traveling belt so that the draught of air emerging therefrom will not blow the paper or cards away or cause the same to flutter by getting under the advancing edge of the same. Also the apertures 34 are slightly inclined to the vertical (see Fig. 5 where the arrow 35 shows the direction of travel of the work), so that the air is blown slightly against the travel of the work. The powder after being blown from the work drops through the open-work wire belt 4 down into the compartment where

it gradually collects at the bottom thereof. At this point I may provide a removable drawer 36 so that the powder collecting therein may be poured back into the container.

Preferably the powdering machine proper and blower are covered by a housing 40 which prevents the powder from being wasted or blown into the air of the room when removed from the sheets. As shown said housing is provided at the far end with the end wall 41. There may be also provided within the housing a wall or plate 42 entending downwardly from the top of the housing to the transverse pipe 33. This may serve both to aid in supporting the pipe and is an additional means of preventing the escape of the powder dust.

In Fig. 6 is shown a modified form of transversely extending blower pipe. Instead of extending the pipe at the same angle across the work it is shown as extending from the central point thereof where it joins the downwardly extending pipe 32 at two equal but opposite angles to form pipes 33′ and 33″ thus preserving the acute angle of attack for the air blast but avoiding any tendency of the air to blow the sheets toward one side of the belt.

From the foregoing, the operation of my invention will be apparent. When the machine is running the paper or cards or other sheet material being printed are received from the printing machine on to the traveling belt 4. From there they are carried under the agitator or distributor 23 which receives the powder from the container 7 above the same in a uniform amount due to the operation of the stirring means. The amount of powder flowing is regulated by moving the handles. No matter how much or how little powder is flowing it is equally distributed by the continuous operation of the agitator. It will be understood by those skilled in the art that the part of the powder alighting on the moist ink will stick to the same while the remainder is removed by the blower as the sheets advance under the transverse pipe. From there the sheets are carried on to the heating machines or to any other process desired.

In accordance with the provisions of the patent statutes, I have herein described the principle and operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means. Also, while it is designed to use the various features and elements in the combination and relations described, some of these may be altered and others omitted without interfering with the more general results outlined, and the invention extends to such use.

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

1. A powdering machine for the plateless engraving of separate cards or sheets of paper comprising a traveling belt adapted to carry said cards, means for sprinkling powder on the cards on said belt after printing, and means for blowing off excess powder before heating including a pipe extending diagonally across the belt and provided with a plurality of apertures adapted to direct the air generally downwardly and against the travel of the work.

2. A powdering machine for the plateless engraving of separate cards or sheets of paper comprising a traveling belt adapted to carry said cards, means for revolving said belt, a perforated container for the print powder, means on said container for varying the rate of flow of the powder therefrom, and a blower having an outlet member extending diagonally across said belt between the said member and the delivery end of said belt for blowing the excess powder from the paper before it leaves the machine.

3. An attachment for plateless engraving heating machines adapted for cards and separate sheets of paper, comprising a traveling belt, means for revolving the same, perforated container for the print powder, means on said container for varying the rate of flow of the powder therefrom, and a blower having an outlet member extending diagonally across said belt between the said member and the delivery end of said belt for blowing the excess powder from the paper before it enters the heating machine.

4. An attachment for plateless engraving heating machines adapted for cards and separate sheets of paper, comprising a traveling perforated belt, a container for the print powder above the same, a sieve between the container and belt, a blower having an outlet member extending diagonally across said belt provided with a plurality of downwardly facing apertures, said member being located between the said member and the delivery end of said belt for blowing the excess powder from the paper before it enters the heating machine, and a catch pan under said belt for catching said excess powder.

In testimony whereof I have affixed my signature.

JAMES C. COON.