H. BATTERMANN.

Bronzing-Machine.

No. 161,734. Patented April 6, 1875.

Fig. 1

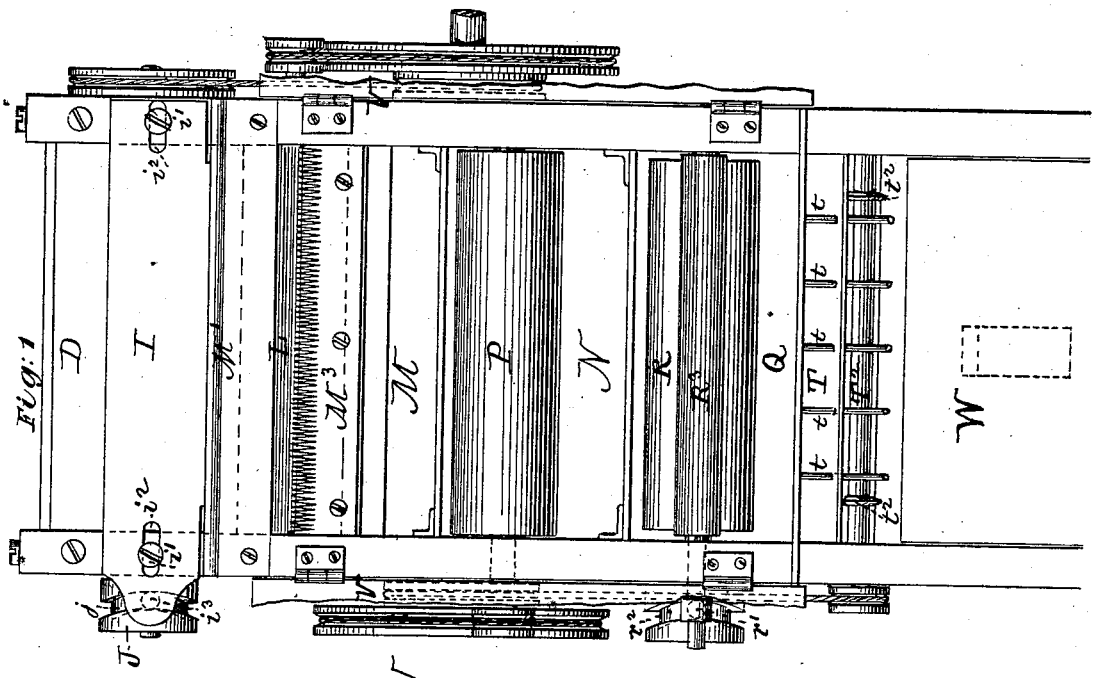
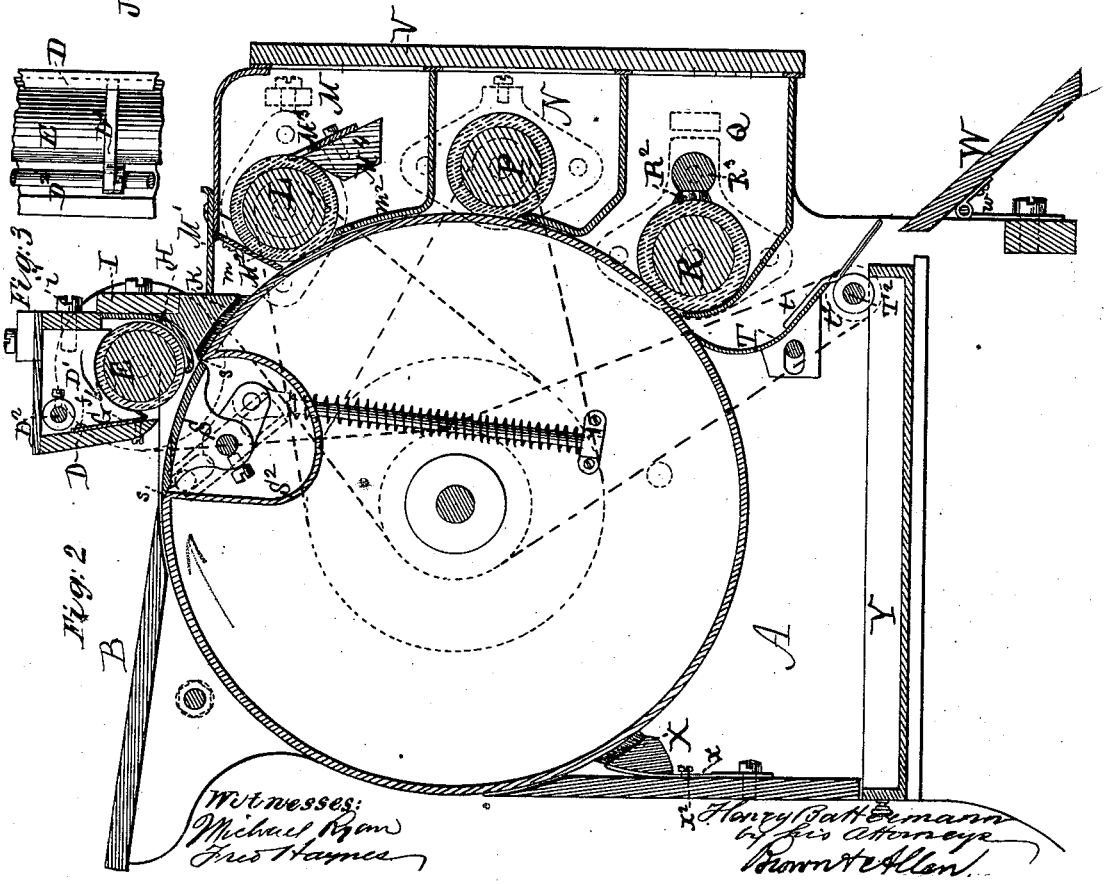


Fig. 2



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UNITED STATES PATENT OFFICE.

HENRY BATTERMANN, OF NEW YORK, N. Y., ASSIGNOR TO FRANCIS EMMERICH, OF SAME PLACE.

IMPROVEMENT IN BRONZING-MACHINES.

Specification forming part of Letters Patent No. **161,734**, dated April 6, 1875; application filed February 4, 1875.

To all whom it may concern:

Be it known that I, HENRY BATTERMANN, of the city, county, and State of New York, have invented an Improved Bronzing-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification.

My invention relates to a machine for applying bronze or other powder to paper, foil, oil-cloth, &c., after the same has been printed with ink or size.

The invention consists in a novel combination and arrangement of a revolving cylinder and a number of bronzing and cleaning devices, whereby the powder is applied to the printed or sized portions of the work, and wiped from the other portions, and whereby, also, the parts are kept clean and free from superfluous powder and dust.

In the accompanying drawing, Figure 1 is an end view of a machine constructed according to my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a detail view.

A A represent the side pieces of the machine, in which is journaled a revolving cylinder, C, over which, attached to the side pieces, is a feed-board, B, a short distance in advance of which is a trough or box, D, which serves as a receptacle for the bronze or other powder. In the lower portion of the trough or box D is a roller, E, journaled in the end pieces of the trough or box, and arranged to protrude through the bottom of the same to within a short distance of the surface of the cylinder C. This roller is connected, by belts or gearing, with the cylinder C, so as to revolve toward the same. Above the roller E is the bronze or other powder, which is supplied to the receptacle D in any suitable quantity. The surface of this roller E consists of metal, rubber, felt, leather, cloth, or any other suitable material, sufficiently rough or porous to contain a small quantity of bronze, as it revolves thereunder. The quantity of bronze on the surface of the roller is regulated by means of a knife or scraper, G, which is attached adjustably to the inner surface of the side of the receptacle D nearest the feed-board B by means of set-screws *f* passing through slots in the scraper, so that it may be raised or lowered, as desired. The lower edge of the scraper is bent up at an acute angle toward the roller E, and by adjusting it up or down the edge is brought nearer to or farther from the surface of the roller, so as to press more or less closely against the same. On the side of the receptacle D, opposite the knife or scraper G, is another scraper, H, the lower portion of which is curved so as to nearly conform to the surface of the roller E. The scraper H is attached to the upper portion of the inner side of a bar, plate, or board, I, to the lower edge of which is attached a pad or cushion, K, composed of fur, plush, cotton, wool, or any other suitable material. The board I is attached to the receptacle D by means of bolts i^1 passing through slots i^2 in the board I, and into the receptacle D. Near one end of the board I, on the side nearest the roller E, is a stud or projection, i^3, which engages with a cam-groove, *j*, in a pulley, J, on the end of one of the journals of said roller. To regulate the pressure of the bronzing pad or cushion K the receptacle D may be adjusted up or down by means of set-screws.

To regulate the width of the quantity of bronze powder in the receptacle D, over the roller E a number of partitions, D^1, are suspended from a bar, D^2, the ends of which rest in recesses in the ends of the box D, by which means the partitions may be moved along so as to increase or diminish the length of the space inside the receptacle. A short distance below the receptacle D is a roller, L, journaled in the side pieces A, and arranged to revolve in a direction opposite to that of the roller E. The surface of the roller L is covered with fur, plush, or other suitable soft elastic material, which bears against the surface of the cylinder C, and serves to wipe the superfluous powder from the sheet, as hereinafter particularly described. In the top of the chamber or compartment M, in which the wiping-roller L works, is an opening, *m*, which is covered by a slide, M^1, to prevent the loose powder from flying about outside of the chamber, which slide may be withdrawn to afford ac-

cess to the inside of the compartment, and to allow of the removal of the scraper H and pad K. A sliding plate, M^2, lies against the surface of the wiping-roller L, to prevent the powder from flying upward therefrom, and may be adjusted and removed when necessary.

On the side opposite this plate M^2 is a comb, M^3, which may be of metal, horn, rubber, or any other suitable material, and which is so arranged, by means of screws or other adjusting devices, that it may be adjusted to cause the teeth to enter more or less deeply into the fur or other soft material on the wiping-roller L. The comb M^3 is attached to a plate or block, M^4, which is inclined outward and downward toward the bottom of the chamber. The lower portion m^2 of the inner side of the chamber M extends upward, parallel with, but not touching, the surface of the cylinder C, so that the sheet may pass between it and the cylinder, as hereinafter described. Below the chamber M is a similar chamber, N, in which is another roller, P, similar in its construction and operation to the roller L. Below the chamber N is a similar one, Q, in which works a roller, R, which is journaled in the side pieces A. This roller is covered with an elastic material of even texture, such as rubber, felt, cloth, &c. It is arranged to bear against the cylinder C, or the sheet which lies thereon, so as to revolve, in consequence of such pressure, in an opposite direction to that of the rollers L and P. On the rear side of the roller R is a brush, R^2, of equal length with the roller, and attached to a bar, R^3, the ends of which rest in bearings in the side pieces A, one of the ends extending out through the side piece, and being provided with a stud or projection, r^1, for engagement with a cam, r^2, in the end of the journal of the roller R. The cylinder C is provided with a griper, S, the construction and operation of which are substantially the same as the griper in an ordinary cylinder printing-press, except that in this case the griper is of a width equal to, or slightly greater than, the width of the slot in the cylinder, so that when one edge closes down on the edge of the sheet to carry it from the feed-board, the other portion closes the slot to prevent, as far as possible, the falling of the powder into the inside of the cylinder. To still further prevent this the edges of the griper and the slot are packed with strips *s*, of rubber, leather, or other suitable flexible and elastic material. The griper works in a recess or trough, S^2, formed inside the cylinder, immediately under and around the slot, which recess or trough is made with tight joints, so that if any powder shall accidentally pass through the slot, it will be retained in the recess or trough.

The work to be bronzed is placed upon the feed-board B in the same manner as in an ordinary printing-press. The edge of the sheet is caught by the griper, and, as the cylinder revolves, the sheet is carried under the bronzing-roller E, the quantity of powder on which is regulated by the knife or scraper G. The portion of powder which remains on the roller after passing the scraper G is scraped off by the elastic scraper H, and deposited in a loose state on the sheet and carried along under the bronzing pad or cushion K, to which a longitudinal reciprocating motion is imparted by means of the engagement of the stud i^3 and cam-groove *j*, so as to distribute the powder over the sheet and cause it to adhere to the printed portion thereof. As the sheet passes the wiping-roller L, the fur or other material thereon wipes the superfluous powder from all but the printed portion, and carries said powder over until it reaches the comb M^3, which cleans the powder from the roller and causes it to run down the inclined plate or block M^4, and be deposited on the bottom of the compartment M. On passing the wiping-roller P, the sheet is again wiped by said roller, so as to effectually remove any powder which may have been left thereon by the roller L, and deposit the same in the chamber N. After passing the roller P the sheet passes between the cylinder and the delivery-roller R, which gives an even polished surface to the sheet and collects the last particles of bronze therefrom and from the cylinder, which particles are brushed and wiped off by the brush R^2, which has a longitudinal reciprocating motion imparted to it through the engagement of the stud r^1 and cam r^2, and are deposited in the bottom of the chamber Q. The rear sides of the chambers M, N, and Q are closed by means of closely-packed hinged doors V, which may be opened for the purpose of removing the powder therefrom.

As the lower edge of the sheet passes the delivery-roller R the griper begins to open, and allows the sheet to pass the upper edge of an adjustable curved plate, T, and slide down the fly-board W. A number of wires, *t*, are arranged over the curved portion of the plate T to prevent the rear side of the sheet from taking up any bronze-powder which may be on the plate T; and for the same purpose a number of disks, t^2, are arranged to revolve with a shaft, T^2, in the direction of travel of the sheet, which disks work between the wires *t*, and also assist the sheet in its passage to the fly-board. The hinges *w* of the fly-board W are arranged, by means of set-screws passing through slots in one of the leaves of each hinge, so that the upper edge of the board may be raised or lowered in order to adjust the height and angle of inclination thereof. As the cylinder continues to revolve after the griper has released the sheet, the surface of the cylinder is thoroughly wiped and cleared of any powder which may still remain thereon, by means of a brush, X, attached to a spring or elastic plate, *x*, fastened to the frame of the machine, so as to bear against the cylinder and griper, which spring-plate is adjusted by means of set-screws x^2. As the slotted portion of the cylinder reaches the brush X the spring *x* forces the brush into the slot with a

sudden motion, and thus cleans the brush and shakes out the loose powder therefrom, leaving the brush in a clean condition for engagement with the cylinder in its next revolution. A drawer, Y, is arranged under the cylinder to collect the powder wiped off by the brush X, and also the powder which may collect in the trough S^2 and may fall out through the slot in the cylinder. The ends of all the rollers are suitably connected with the driving-power to cause them to revolve in the proper directions and at the proper rates of speed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the cylinder C, of the bronze-receptacle D, bronzing-roller E, and scrapers G and H, and bronzing pad or cushion K, adjustable substantially as and for the purpose shown and described.

2. The combination, with the receptacle D and bronzing-roller E, of the removable and adjustable partitions D^1 and bar D^2, substantially as and for the purpose shown and described.

3. The combination, with the bronze-receptacle D, of the reciprocating scrapers G and H, and pad K, and their carrying-bar I, substantially as and for the purpose shown and described.

4. The combination of the sliding plate M^2 with the wiping-roller L and the cylinder C, substantially as shown and described.

5. The slide M^1, in combination with the reciprocating pad K and sliding plate M^2, substantially as and for the purpose shown and described.

6. The combination, with the delivery-roller R, of the reciprocating brush R^2, substantially as shown and described, for the purpose specified.

7. The combination of the curved plate T, wires *t*, and disks t^2, on the shaft T^2, as shown and described, for the purpose specified.

8. The combination, with the fly-board W, of the slotted hinges and the set-screws, for adjusting the height and inclination of the fly-board, substantially as described.

9. The combination, with the cylinder C and griper S, of the brush X, arranged to bear, by spring-pressure, upon the cylinder C, for cleaning the same and removing the powder from the brush itself, substantially as shown and described.

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