(No Model.)

# J. H. MASON.

## BRONZING MACHINE.

No. 307,130. Patented Oct. 28, 1884.

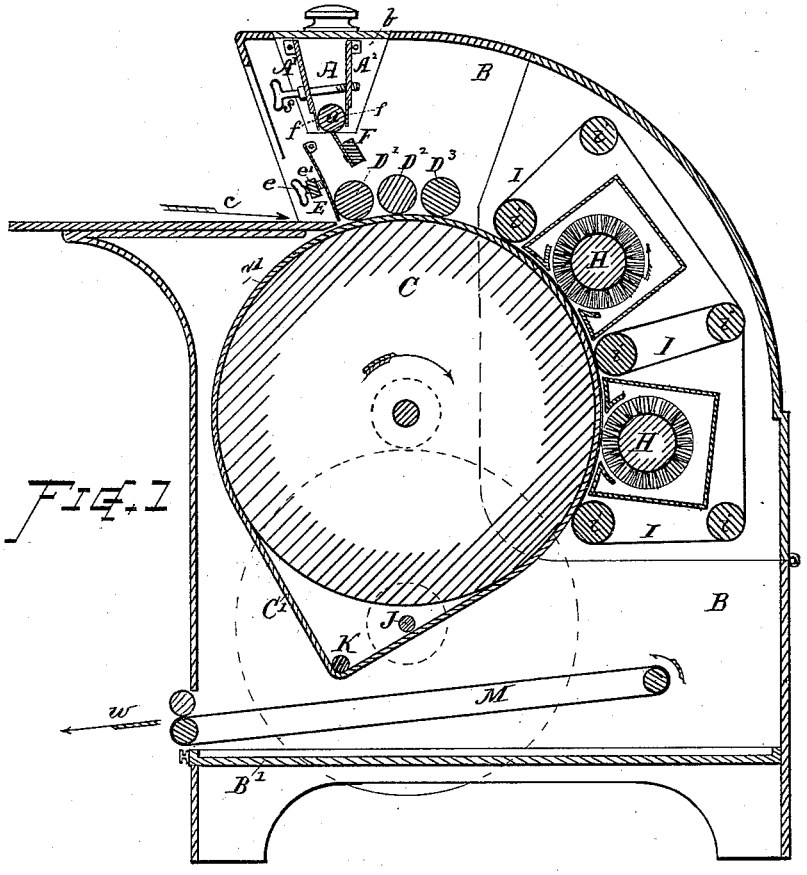

FIG. 1

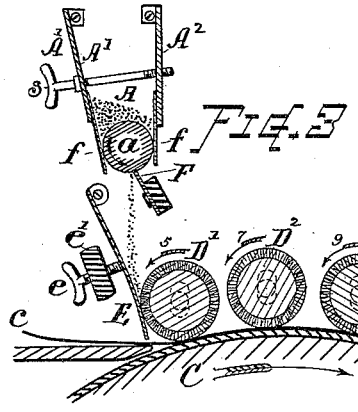

FIG. 3

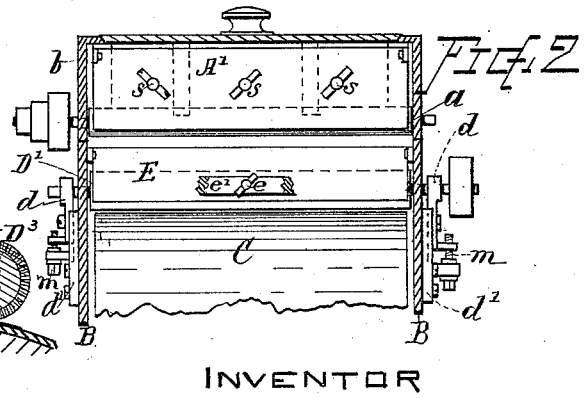

FIG. 2

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# UNITED STATES PATENT OFFICE.

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## BRONZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 307,130, dated October 28, 1884.

Application filed June 9, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. MASON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Bronzing-Machines; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain improvements which are more especially applicable to that class of bronzing-machines described in Letters Patent of the United States No. 247,582, to which Letters Patent reference may be had for a more complete understanding of the nature and operation of such parts of the machine as are not herein particularly described.

The objects of my invention are to provide a practical and efficient mechanism of improved construction for feeding or delivering bronze-powder automatically as required, and means for distributing said powder in a uniform and thorough manner over the sheet, to render said delivering and distributing devices independently operative, and to afford facilities for the convenient adjustment of the feed to give greater or less supply of bronze, and also to afford facilities for the convenient, ready, and accurate adjustment of the distributing mechanism to the various thicknesses of paper to be operated upon without reference to the feeding devices; also, to provide means for overcoming the adhesion of the paper to the bed-surface, (caused by the electrical attraction induced by the action of the brushes upon the paper,) and for effecting the proper discharge of the sheets from the machine. These objects I attain by mechanism the nature, construction, and operation of which is illustrated in the drawings, and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

Figure 1 is a vertical section of a bronzing-machine, showing such parts as are necessary to illustrate the nature of my improvements. Fig. 2 is a transverse section showing the front of the bronze feeding and distributing devices, and Fig. 3 is a section showing the details of the feeding and distributing devices on a somewhat larger scale.

In referring to parts on the drawings, A designates the fountain or hopper for containing the supply of bronze-powder.

B indicates the supporting-frame, which is properly inclosed to prevent the escape of bronze-dust, and provided with a drawer, B′, to receive the dust as it settles.

C denotes the cylinder or carrier on which the paper sheets to be bronzed are supported and conducted forward while undergoing the bronzing operation, said sheets being entered from the feed-table at *c* and discharged from the machine at *w* by moving bands M. The cylinder C is in the present instance provided with a covering-belt or endless traveling feed-bed, C′, for the purpose hereinafter explained.

D′ $D^2$ $D^3$ indicate distributing-rolls for spreading and settling the bronze upon the paper.

E is a plate for directing and pressing the bronze upon the surface of the first distributing-roll D′.

F is a device for scraping or releasing the bronze from the surface of the delivering-roll.

H H indicate the brushes for clearing off the surplus bronze from the sheets.

I indicates the holding-cords for retaining the sheets beneath the brushes, and *i i* are guide-pulleys for said cords. These brushes H H, cords I, and pulleys *i* may be arranged substantially as described in the patent above referred to, and as they are not of my invention need not be herein more fully defined.

The fountain A, for supplying the bronze, is placed somewhat above the distributing-rolls, which latter can be operated and adjusted as required without reference to the feeding devices, while the feed devices are adjustable and operative independently of the distributing mechanism.

The bottom of the fountain or hopper A consists of a cylinder or roll, *a*, mounted to revolve in suitable bearings on the end pieces, *b*, whereby the fountain is supported on the sides of the main frame B. The sides of the hopper are formed by front and rear plates, A′ $A^2$, which are arranged to bear against the roll *a* tangent to its surface, and to extend

somewhat below the bearing-point, as indicated. One or both of the plates A' A² may be adjustable to and from the roll-surface. In the present instance both plates are hinged near their upper angles, and are held to the face of the roll *a* by thumb-screw bolts *s* passing through the plates, and by means of which their adjustment can be readily effected to give greater or less space for the passage of bronze between the plates and roll *a*. The plates A' A² extend from side to side of the machine, parallel, or nearly so, with the axis of the roll *a*. Said plates are preferably made of iron, with facings *f f* of thin brass or steel at that portion which bears against the surface of the roll *a*. The facing-plates *f* are for the purpose of presenting a perfectly smooth surface against which the roll *a* turns, so as to allow the roll to carry down a thin film of bronze, but to prevent the escape of any bronze from the fountain other than that which adheres to the surface of the roll *a;* also, to give a slight degree of elasticity to the bearing-pressure of said plates. The roll *a* may be of wood or of metal, or of any material that will give a hard surface suitable for conveying or feeding the bronze-powder, as set forth. Said roll may be fitted with cone-pulleys or other means for giving various speeds of revolution.

In contact with the delivery-roll *a* is a scraper, F, made of rubber or other suitable material, and mounted on a bar extending across the frame. Said scraper is adapted for releasing the adhering bronze from the surface of the roll *a* and permitting it to fall in front of the distributing-roll D'. The scraper F may be made adjustable, so as to give greater or less pressure on the roll *a*, or to take up the wear of the parts, as required.

The adjustable metal plate or guard E, which is arranged at the front of roll D', receives the falling bronze and directs it upon the surface of roll D' before it is brought in contact with the paper. Said guard E is hinged or pivoted at its upper edge, while its lower portion rests against the roll D', tangential to the surface thereof, and one or more thumb-screws, *e*, are arranged in a suitable support-bar, *e'*, at the front of the plate, whereby said plate can be adjusted to bear with greater or less force against the surface of the roll D', as desired. The bronze falling from the roll *a* is by the plate E pressed and spread uniformly onto the surface of the roll D', which roll transfers it to the sheet of paper and distributes it upon the sized surface thereof.

The rolls D', D², and D³ are of substantially similar form, each being covered with cotton plush or other surface material suitable for working bronze-powder. Said rolls are mounted to run in close proximity to the face of the cylinder or feed-bed, and are independently adjustable to accommodate different thicknesses of paper. In the present instance the boxes or hangers *d* of these distributing-rolls are arranged to slide in suitable guideways, *d'*, and are also provided with screws *m*, by means of which said boxes can be readily raised or depressed and accurate adjustment of the rolls toward or from the cylinder be thereby conveniently effected. The roll D³ is adjusted to bear with considerable pressure upon the cylinder or bed C, and it is operated with a surface speed corresponding to that of the bed-surface. The roll D² is arranged to bear less hard upon the bed-surface, and is operated at a slower rate of speed, while the roll D' is run at a rate of speed yet slower than the roll D². The relative speeds or revolutions of the several rolls D', D², and D³ may be in about the proportion of five for D', to seven for D², to nine for D³, more or less, or as required to give the best results on different classes of work. The action of the distributing-rolls D' D² at slower surface speed than the paper sheet serves to lay the bronze flatly upon the surface of the sizing, while the roll D³ compacts and presses it down, so that it will lie smooth and adhere firmly under the action of the clearing-brushes H.

The cylinder C and several rolls are operated or rotated in the directions indicated by means of suitable pulleys, belts, or gears, which may be connected with the driving-shaft J outside the frame B, or in any convenient or desired manner for imparting the necessary movemont thereto and effecting action as herein specified.

In the operation of the machine the action of the clearing-brushes H upon the paper sheets passing through the machine generates sufficient frictional electricity to perceptibly charge the sheets, and this causes them to adhere quite strongly to the cylinder or bed-surface, and in the case of thin paper it has been found a matter of some difficulty to prevent the sheets from being carried around with the cylinder. To overcome this induced electrical attraction, I provide the face of the cylinder with a belt or endless traveling-bed, C', formed of cloth, leather, or other suitable material, of equal width, or nearly so, with the cylinder-surface, and somewhat longer than the circumference thereof. This belt lies close upon the cylinder C about the greater portion of its periphery, or excepting that portion where the sheets are to be discharged, at which position the belt C' is carried away from the cylinder and over a small roll or guide-pulley, K, thereby making an abrupt angle or turn in the bed-surface, so that the sheets will, as it were, be stripped from the surface, the electrical attraction not being sufficiently strong to bend the sheet about the short turn at K. The sheets are thus thrown down or caused to drop upon the carrier-bands M, and are thence run out upon the delivery-table by said bands in the usual manner.

I am aware that traveling belts or aprons are used in bronzing-machines for a bed for the sheets while passing through the machine, and I do not therefore broadly claim the feature of a belt or traveling bed, except in the construction and for the purpose specified.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. The combination of the roll *a*, the plates A′ A², bearing tangentially upon the face thereof, the adjusting screw or screws S, and the scraper F, substantially as and for the purpose set forth.

2. In a bronzing-machine, the plate E, arranged for receiving the falling bronze-powder, in combination with a roll, as D′, which distributes the bronze upon the paper sheet, as hereinbefore set forth.

3. The combination of the roll *a*, the adjustable plates A′ A², having elastic edge plates, *f f*, bearing tangentially upon said roll, the scraping devices F, the distributing-roll D′, the pressing-plate E, and adjusting screw or screws *e*, substantially as and for the purpose set forth.

4. The combination of the cylinder C, the distributing-rolls D′ D² D³, independently adjustable to or from the cylinder-surface, and the independently-operated feed apparatus A, for delivering bronze to the first of said distributing-rolls, substantially as set forth.

5. The combination, with the cylinder C and clearing-brushes H H, of a series of distributing-rolls independently mounted in adjustable bearings *d*, and adapted to operate at proportionally-different rates of speeds, as set forth, and the independently-operated feeding mechanism for supplying bronze thereto, substantially as set forth.

6. The combination, with the distributing-roll D′, of the adjustable plate E, arranged tangentially against the face of said roll, and the bronze-supply fountain A, located above and independent of said parts, and adapted for delivering the bronze, so that by gravity it falls between said distributing-roll and plate, as set forth.

7. The combination, as described, of the cylinder C, traveling bed or belt C′, with deflecting-roll K, the fountain A, having roll *a*, and adjusting-plates A′ A², and scraper F, the adjustable plate E, the distributing-rolls D′ D² D³, relatively speeded, as set forth, the clearing-brushes H H, and carrier-strings M, for the purposes specified.

Witness my hand this 6th day of June, A. D. 1884.

JOHN H. MASON.

Witnesses:
CHAS. H. BURLEIGH,
S. R. BARTON.