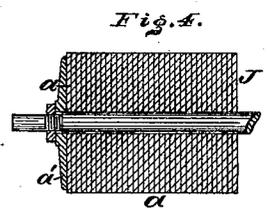
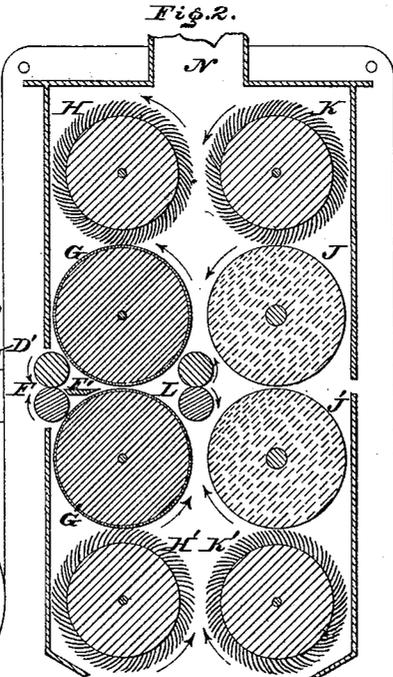
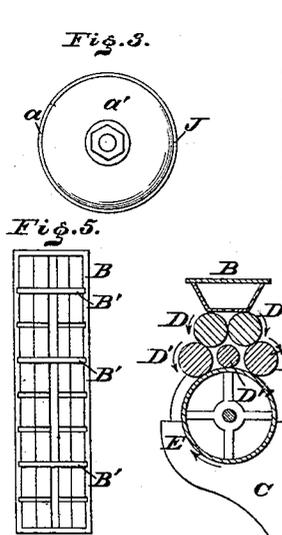
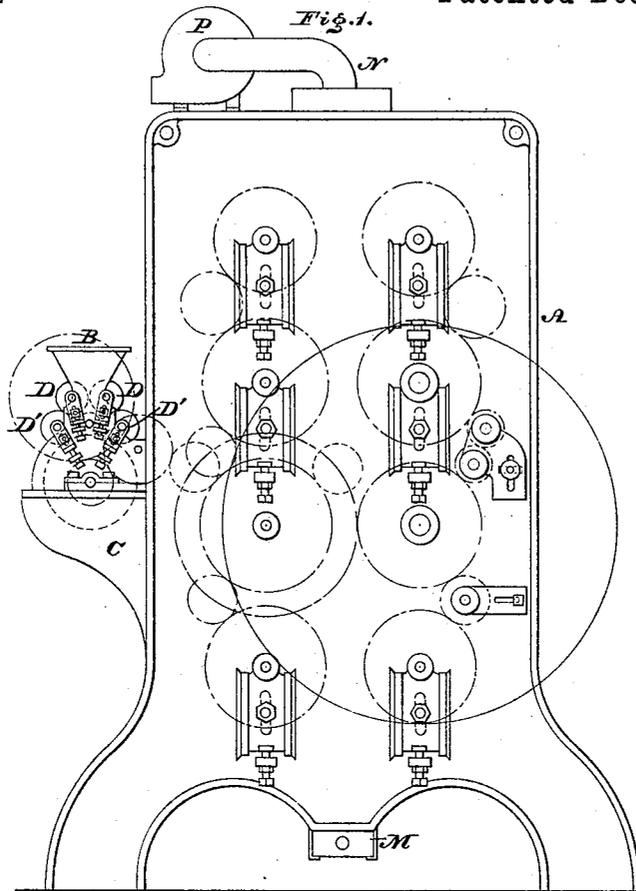


(No Model.)

J. RESTEIN.
BRONZING MACHINE.

No. 251,066.

Patented Dec. 20, 1881.



WITNESSES:
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JULIUS RESTEIN, OF PHILADELPHIA, PENNSYLVANIA.

BRONZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 251,066, dated December 20, 1881.

Application filed October 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, JULIUS RESTEIN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Bronzing-Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the machine embodying my invention. Fig. 2 is a vertical section thereof. Fig. 3 is an end view of one of the cleaning and polishing rollers. Fig. 4 is a face view of a portion thereof, and Fig. 5 is a top view of the bronze-fountain.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of rollers for applying the bronze uniformly and reliably to the sheet, the construction and combination being hereinafter fully set forth.

It also consists of peculiarly-constructed cleaning and polishing rollers, as hereinafter set forth.

It also consists of the combination of parts forming an improvement in bronzing-machines.

Referring to the drawings, A represents the casing or box of the machine, and B represents a fountain or hopper containing bronze to be supplied to the sheet, said fountain being supported on a table or stand, C, in the present case connected to the casing A.

D D' represent a series of rollers, which are mounted on bearings supported on the stand C and geared together so as to rotate in the direction of the arrows, said rollers being below the fountain B, the rollers D being above the rollers D'. Below the rollers D' is a feed-roller, E, which is mounted on the stand C and receives power from a suitable member of the machine, it being seen that the sheet to be bronzed is passed between the roller E and rollers D', and so directed into the casing A. The sheet, after leaving the rollers D' E, is carried forward by feeding-rollers F, which are mounted on the casing A, adjacent to which are cleaning-rollers G G', which are located within the casing A and mounted on the sides thereof, and arranged one above the other.

Above the roller G is a clearing roller or brush, H, and below the roller G' is a clearing

roller or brush, H', said rollers or brushes being mounted on the sides of the casing A and located within the same.

J J' represent polishing-rollers, and K K' represent clearing rollers or brushes therefor, all of which are located within the casing A and mounted on the sides thereof, the said rollers J J' being located one above the other, the brush K being located above the roller J, and the brush K' being located below the roller J'.

Between the rollers G G' and J J' are feed-rollers L, which are mounted on the sides of the casing A, the several rollers being so arranged that after the bronzed sheet leaves the feed-rollers F it passes between the cleaning-rollers G G', then between the feed-rollers L L, and finally between the polishing-rollers J J', from which latter the bronzed sheet, as cleansed and polished, is discharged from the machine, and may be directed to a place of collection.

The several rollers F G G' J J' L and brushes H H' K K' are geared together, and rotate in the direction indicated by the arrows, but the feed-rollers L rotate at a greater rate of speed than the feed-rollers F, the cleaning-rollers G G' rotate at a greater rate of speed than said feed-rollers F, and the polishing-rollers J J' rotate at a greater rate of speed than the feed-rollers L, and, if desired, the brushes K K' may rotate at a greater rate of speed than the brushes H H'.

The casing A has at its bottom a drawer, M, which communicates with the casing, and at top a communicating pipe, N, which is provided with a fan or blower, P, the object whereof is that when the bronzed sheet is being cleansed the heavy particles removed from the sheet fall to the bottom of the casing and are collected in the drawer M, and the lighter particles removed from the sheet, instead of floating within the casing, are blown out through the pipe N and directed to a place of deposit.

When the machine is set in motion the several rollers and brushes are rotated in the order stated and shown. The sheet to be bronzed is inserted between the roller E and front roller, D', and, carried along thereby, is passed between said roller E and the inner lower roller, D'. As the bronze leaves the fountain B it is taken up by the upper rollers, D, and supplied to the lower rollers, D', it being noticed

that while the rollers D D' rotate in the direction of the arrows they are not actually in contact, but when said rollers take the bronze their surfaces are increased, and the bronzed surfaces are in contact, said bronze yielding without interfering with the proper feed of the rollers. The sheet first receives the bronze from the outer or front lower rollers, D', and if any part thereof is not properly supplied it receives an additional charge from the inner lower rollers, D'. It will be noticed that between the lower rollers, D', is a roller, D'', this being mounted on the stand C and properly geared, and its object is to assist in keeping the sheet on the feed-roller E and pressing down the bronze on the sheet, as well as preventing gathering or clogging of bronze in the space between the rollers D'. When the sheet reaches the cleaning-rollers G G', which rotate at a greater rate of speed than the feed-rollers F, said rollers G G' clear or clean the sheet of surplus bronze, and the sheet then passes to and between the rollers L, and next to and between the rollers J J'. As these rollers J J' rotate at a greater rate of speed than the feed-rollers L, said rollers J J' polish the bronzed surface on the sheet, and cause the same to be bright and uniform, it being noticed that as the sheet is subjected to the cleaning and polishing actions of rollers G G' J J' its passage is at such rate occasioned by the less rapidly rotating feed-rollers F L, respectively, that said cleaning and polishing rollers have full opportunity to perform their respective work in an effective and uniform manner. The bronze that is gathered on the periphery of the rollers G G' J J' is removed therefrom by the brushes H H' K K', and the surplus bronze from all sources is conveyed to the drawer M and pipe N, as has been stated.

The polishing-rollers are formed of layers or bats of cotton or pieces of chamois fabric, &c., cut into disk-shaped pieces *a*, of uniform diameter, or nearly so, fitted on the mandrel or shaft and clamped between heads *a'* on said shaft. By this provision the body of each roller is firm without harshness, and the surface is soft and yielding, and yet sufficiently compact to accomplish the polishing of the bronze on the sheet. Furthermore, the surface can be readily cleansed by the clearing-brushes or teasels, so that the proper nature of said surface may be preserved.

If desired, the cleaning-rollers G G' may be constructed similarly to the polishing-rollers, as above stated, it being noticed that should the surfaces of the rollers wear away fresh surfaces are always presented, owing to the solid nature of each disk *a*.

While the rollers F serve to feed the sheet to the cleaning-rollers G G', said rollers F also constitute a pair of highly calendered rolls for pressing the bronze on the sheet and making it of close grain, as well as imparting to it a certain brightness, somewhat in imitation of gold-leaf.

Secured to the casing A, between the rollers F and the cleaning-rollers G G', is a horizontal ledge, F', for preventing the sheet, after leaving the rollers F, from being lowered in front of the rollers G'.

The lower roller of the pair of feed-rollers L may be made of gum or rubber, so that when sheets are passed through between them the upper roller, of hard material, preferably of iron, will serve to flatten the lower roller at the point of contact of the paper, and thus prevent creasing of the sheet, especially when it is of thin nature.

The several rollers and brushes are mounted on adjustable bearings, and may thus be set relatively to requirements.

The fountain B is provided with removable partition-strips B', (see Fig. 5,) whereby the bronze may be supplied to any portion of the length of the rollers D, and thus applied to the sheet at either the middle, sides, or any part of the sheet. By removing said strips B' the entire surface of the rollers D may be fed with bronze.

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

1. The fountain, in combination with the series of applying-rollers D D' and the feed-roller E, substantially as and for the purpose set forth.
2. The fountain, applying-rollers, and feed-roller, in combination with the pressing-roller D'', substantially as and for the purpose set forth.
3. The feed-rollers F, in combination with the cleaning-rollers G G', the latter rotating at a greater rate of speed than the former, substantially as and for the purpose set forth.
4. The feed-rollers L, in combination with the polishing-rollers J J', the latter rotating at a greater rate of speed than the former, substantially as and for the purpose set forth.
5. The feed-rollers F L, in combination with cleaning-rollers and polishing-rollers, the feed-rollers L revolving at a greater rate of speed than the feed-rollers F, and the polishing-rollers revolving at a greater rate of speed than the cleaning-rollers, substantially as and for the purpose set forth.
6. The calender-rollers F and cleaning-rollers G G', combined and operating substantially as and for the purpose set forth.
7. The bronzing-rollers, calender-rollers, and cleaning-rollers, combined and operating substantially as and for the purpose set forth.
8. The rollers F and rollers G G', in combination with the ledge F', substantially as and for the purpose set forth.
9. The cleaning and polishing rollers, in combination with the feed-rollers formed in pairs, one of which is of hard material and the other of gum or soft material, substantially as and for the purpose set forth.
10. The feed-rollers F, cleaning-rollers G G', brushes H H', feed-rollers L, polishing-rollers

J J', and brushes K K', combined and operating substantially as and for the purpose set forth.

5 11. In a bronzing-machine, rollers formed of bats or disks of fibrous or other material of uniform diameters, mounted on a mandrel and clamped between heads with tightening-nuts, thus forming the rollers uniformly compact

from diameter to periphery and adapting them both for polishing and cleaning, substantially as and for the purpose set forth.

JULIUS RESTEIN.

Witnesses:

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