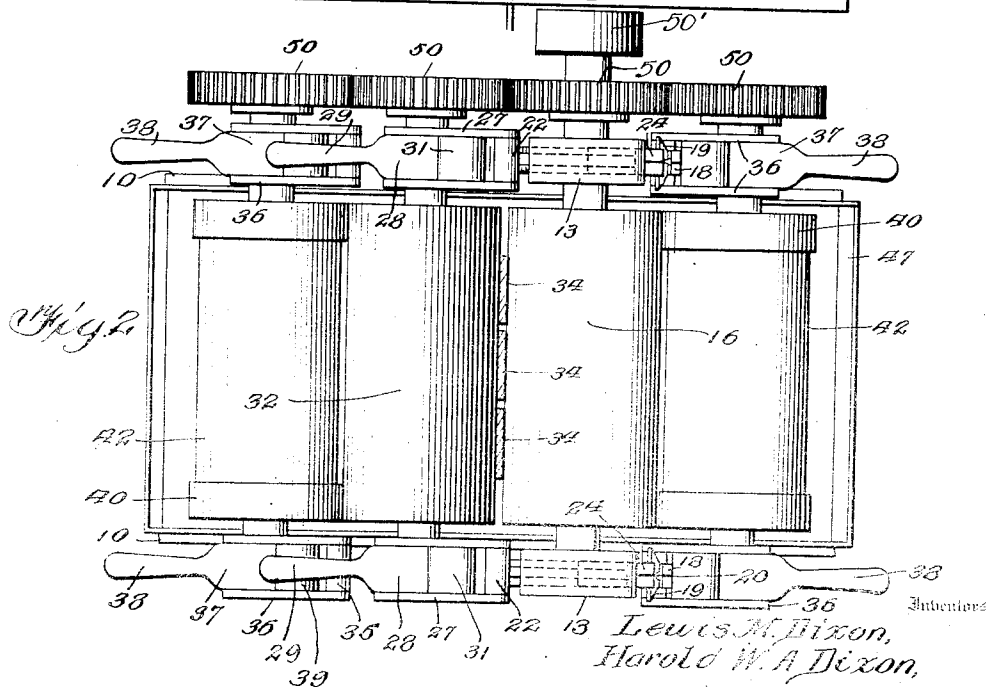
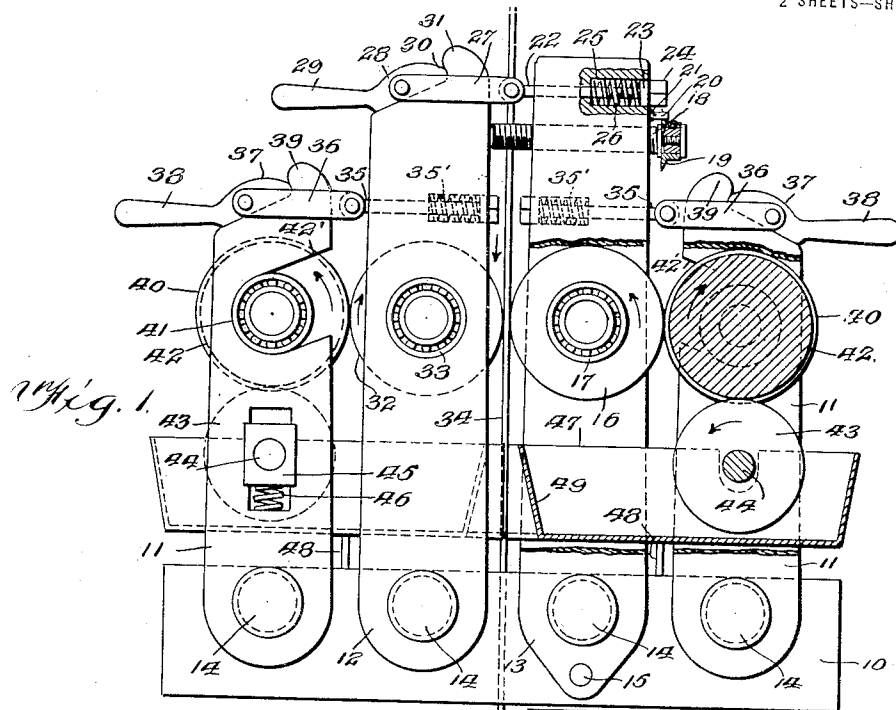


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 INKING, COATING, AND IMPREGNATING MACHINE.
 APPLICATION FILED OCT. 10, 1917.

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2 SHEETS—SHEET 1.



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Dixon Fenwick Lawrence,

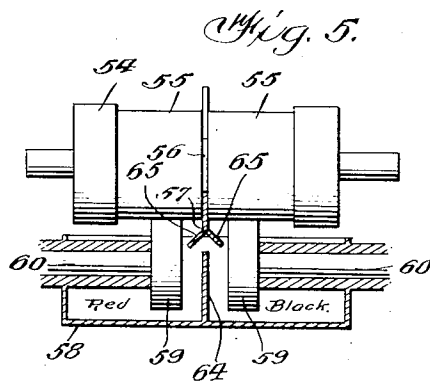
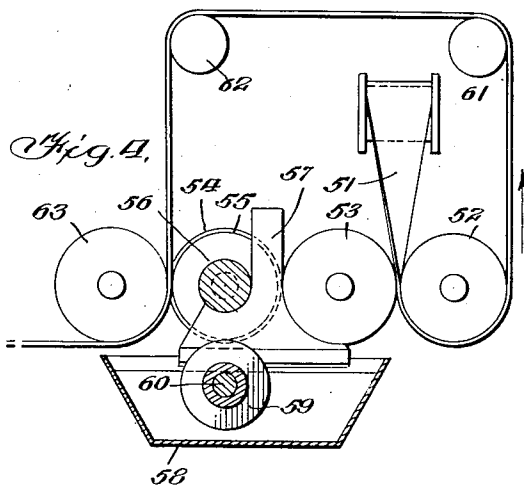
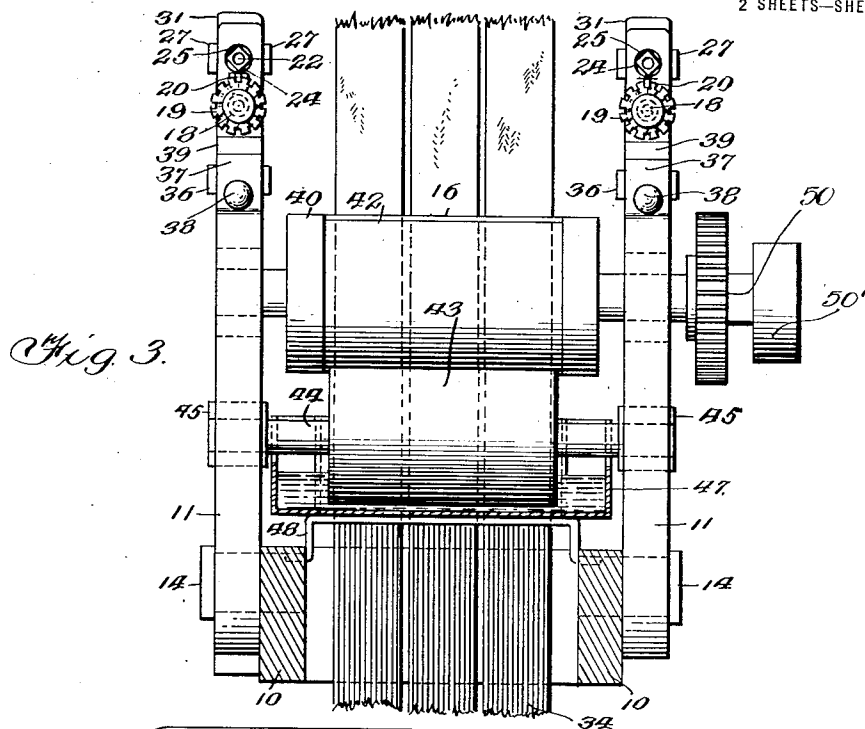
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 Harold W. A. Dixon,

Mason Fennick Lawrence,

Attorneys

UNITED STATES PATENT OFFICE.

LEWIS M. DIXON AND HAROLD W. A. DIXON, OF NEW YORK, N. Y.

INKING, COATING, AND IMPREGNATING MACHINE.

1,404,589.

Specification of Letters Patent. Patented Jan. 24, 1922.

Application filed October 10, 1917. Serial No. 195,794.

To all whom it may concern:

Be it known that we, LEWIS M. DIXON and HAROLD W. A. DIXON, subjects of the King of England, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Inking, Coating, and Impregnating Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of this invention are to provide a machine of the type referred to which will give an even and smooth distribution of ink on the material being impregnated; to thoroughly impregnate the material with a minimum of pressure; to permit adjustment of the pressure; to provide visible means for indicating the pressure employed; to avoid adjustments as to the amount of ink applied to the material during operation of the machine; to provide a machine which may be successfully operated by unskilled operators; to enable substitution of rollers to be readily effected; to secure simplicity of construction and operation and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate similar parts throughout the several views;

Figure 1 is a side elevation of a machine constructed in accordance with this invention, showing parts thereof broken away for the sake of clearness;

Figure 2 is a plan thereof;

Figure 3 is an end elevation having portions thereof broken away for clearness;

Figure 4 is a composite sectional view and end elevation of a machine of modified form; and

Figure 5 is a cross-section thereof, showing the fountain and gauging rollers in elevation.

In the following description the invention will be referred to more particularly with reference to its application to inking typewriter ribbons, but it is to be understood that this is done for clearness and brevity, and that the invention is applicable for

treating, coating, inking, or impregnating fabrics, ribbons, cloth or any other materials.

Heretofore, the usual practice of making typewriter ribbons has been to take a piece of cloth and cut it up into strips of suitable dimensions, after which a suitable gum is applied to the marginal edges of these strips and permitted to dry. This is done to prevent ravelling of the edges of the strips. The strips are then immersed in an inking solution and passed through squeezing rollers to remove the surplus ink. Extreme pressure is necessary to accomplish this result, and the hardened gum frequently cracks and renders the strip unsuitable for use. Even when strips having selvage edges are employed, the pressure of the rollers often distorts the fibre of the material beyond repair. It is essential, therefore, that this extreme pressure ordinarily required should be eliminated. This is accomplished in the present invention by applying just enough ink to the ribbon and then working it into the ribbon with just enough pressure for that purpose, as distinguished from the usual method of saturating the ribbon and then working out the excess ink by pressure.

Generally described, the machine comprises moving surfaces on which a film of inking substances is deposited, and these surfaces are brought into contact with the ribbon to receive the inking substances, having the faces adjustably spaced to impart only enough compression on the ribbon to work the inking substances into the fibres of the ribbon without crushing the weave. The inking substance is formed in uniform films of predetermined desired thicknesses, and the surfaces between which the ribbon passes approach each other in yieldable spaced relation, having micrometer adjusting means for use in treating ribbons of different thickness and for the different degrees of inking of the ribbons.

In said specific embodiment of the invention illustrated in said drawings, and referring more particularly for the moment to Figures 1, 2 and 3, the reference numeral 10 indicates a base which supports arms 11, 12, and 13, as by pins 14. The arms are arranged in pairs, and the arms 13 of one pair are held in relatively fixed position, one at

each side of the machine, as by pins 15. These fixed arms 13 serve as the basis for all adjustments to be hereinafter described.

The arms 13 are drilled or otherwise recessed to receive bearings for shafts or trunnions on an ink applying roller 16 which extends across the machine, one of the bearings being shown as at 17, Figure 1. Each arm 13 carries a screw 18 near its upper end, these screws each having a dial 19 mounted on the head end of the screw. The dials can be rotated on the screws 18 so as to be set at zero and may then be locked in position, as by set-screws. These dials are graduated and slotted so that when set to the desired adjustment, pointers 20, pivoted between ears 21, may be swung to engage in the slots positioned to receive them when the screws 18 will be held in fixed position. The ends of the said screws 18 opposite from the head ends bear against the arms 12 of the next adjacent pair and limit their approach, but one pair may be moved away from the other under pressure as will be next described.

Suitable means, such as eye-bolts 22 are carried by the arms 13, the screw-ends of said bolts having washers 23 and nuts 24 applied thereto. Said bolts 22 pass through sockets 25 formed in the arms 13 within which are compression springs 26 positioned upon the bolts and in bearing relation between the end of the socket and the washers 23 so that by adjustment of the nuts 24 the desired compression on the springs may be obtained. The head of each bolt 22 has links 27 connected thereto which support toggles 28 on which handles 29 are mounted. The nose 30 of each toggle engages a lug 31 formed on the upper end of each of the arms 12. An applying roller 32, provided with trunnions, is mounted in bearings 33 supported by arms 12, similar to the applying roller 16 previously described, and parallel thereto. The toggles 28, links 27, bolts 22, springs 26 and nuts 24 cooperate to draw the arms 12 and 13 toward each other causing rollers 16 and 32 to normally press toward each other into close relation but allowing the said arms and rollers to move apart under pressure.

One or more ribbons or other material 34 may be passed between the rollers 16 and 32 so that a film of ink or other material carried by the surface of these rollers may be picked up by the ribbon, and to establish the desired compression of ribbons to work the ink into the fibres thereof, manipulation of the screws 18 to the desired degree will position the rollers 16 and 32 to establish this impregnating action. The yieldable mounting of the bolt 22 will permit necessary adjusting of the screws 18 and will maintain the established impregnating action.

The arms 11 at the ends of the machine may likewise be maintained in adjustable

and yieldable relationship to the intermediate arms 12 and 13, as by bolts 35, springs 35', links 36, and toggles 37 on which handles 38 are formed. These toggles in like manner to toggles 28 engage the lugs 39 formed on arms 11. Said arms 11 removably support gauging rollers 40 which have a suitable bearing 41 at each end thereof mounted in slots 42' formed in the arms 11. When handle 38 is raised to disengage the toggle 37 from the ends of arms 11, these arms may be swung from their normal relationship with the arms 12 and 13 and other gauging rollers substituted for those shown at 40. The gauging rollers 40 have recessed portions 42 of predetermined depths in which films of ink are formed, and by having on hand a number of such rollers with different depths of recesses, the one for applying the proper film of ink to the ribbon may be selected and inserted in the machine for use. In the present disclosure the gauging rollers are shown as having end portions which engage the corresponding end portions of the applying rollers, the middle part of the gauging rollers having the recess 42. It is by virtue of this recess 42 that ink applied to the gauging roller will pass between it and the applying roller 16 or 32 in a film of predetermined thickness and will thus coat the applying roller with a film which is thereafter deposited on and absorbed by the ribbon as it passes between the applying rollers. While a gauging roller having a single recess is shown, it is to be understood that this may be varied as found desirable.

In order to apply ink in suitable quantity to the gauging rollers, it is preferable to employ a mechanical feed so as to insure a constant and adequate supply. Obviously the precise means employed may be varied considerably. The feed shown herein includes a roller 43 of much less length than the gauging rollers as clearly shown in Figure 3, and is suitably mounted on a shaft 44 journaled as in blocks 45 carried by arms 11, or it may be yieldably carried by bearings formed in the ink pan 47. These journal blocks may be slidably carried by the arms 11 and may have the springs 46 interposed between the journal blocks and the lower ends of the slots to normally cause these fountain rollers 43 to frictionally engage with the gauging rollers 40. The fountain rollers 43 are partly immersed in the inking material in the pan 47 shown mounted upon swinging supports 48 carried by the frame 10. This pan has an upwardly tapering wall 49 therein through which the ribbon or ribbons 34 pass after having received the ink.

The rollers 16, 32 and 40 may be driven in unison by having spur gears 50 on extensions of the shafts thereof and the gear car-

ried by the shaft of roller 16 will preferably be driven by any desired means, as by a pulley 50', and will in turn transmit motion to the meshing gears 50 on other rollers. The rollers may be frictionally driven by having any of them impart movement to the others as by contact therewith.

By the structure thus described it will be seen that the ink is taken from the troughs or pans 47 by the two fountain rollers 43 in considerable quantity so as to apply and spread it over the gauging rollers 40. It remains on the gauging roller because the fountain roller is short and the ink passes by centrifugal action from the sides of said fountain rollers to the surface of the gauging rollers. The ink thus applied is considerably in excess of that required to constitute the desired film, and gathers at the approaching sides of the gauging and applying rollers thus spreading the ink along the entire length of the recess 42 of the gauging roller. In this manner a film of ink is permitted to pass through and remain on each of the applying rollers, and the one applying roller 16 impregnates one side of the strip or ribbon 34 with the ink or other substance, while the other applying roller 32 impregnates the other side of the strip in the same manner. As a result of this means of impregnating the strip or ribbon, a minimum pressure of the applying rollers on the ribbon is utilized and the likelihood of injury to the said ribbon is very remote.

In Figures 4 and 5 is shown a construction illustrative of the invention as applied to the production of what is termed the bichrome ribbon. In said figures the reference numeral 51 indicates the ribbon which is passed between applying rollers 52 and 53, the roller 53 conveying and applying the ink to one side of the ribbon, and the roller, 52, serving to establish the desired impregnating action between these rollers and the ribbon. A film of ink is applied to the circumference of roller 53 by contact of this roller with a recessed gauging roller 54. This gauging roller, as shown in Figure 5, has a peripheral crevice 56 intermediate the ends of said roller and preferably in a plane midway between the said ends, thus dividing the roller into two sections. A partition 57 is positioned edgewise between the rollers with one margin in said crevice and its opposite edge curved to conform with the contour of a portion of the circumference of applying roller 53 and in substantial engagement therewith. The partition 57 has wings 65 formed thereon which are spread to deliver ink to the opposite sides of the separating wall or partition 64 in the ink pan 58 as the excess drips from the rollers. The partition 64 separates the pan 58 into two compartments of which one side of the pan may receive red ink and

the other black ink or any other colors desired. Fountain rollers 59 arranged one in each compartment of the pan on a shaft 60, are in engagement, one with one end section of gauging roller 54, and the other with the other of said end sections. It may also be here noted that the fountain rollers 59 are each of less length than the corresponding end section of the gauging roller whereby the ink will be carried up on the end surfaces of the fountain rollers and applied to the gauging roller. The different colored inks will be kept separated when picked up by the surface of gauging roller 54 and applying roller 53 by the crevice 56 and partition 57. When it is desired to ink both surfaces of the ribbon, the ribbon may be passed from applying roller 52 over idler rollers 61 and 62 and then about another applying roller 63 at the opposite side of gauging roller 54 from the first described applying roller 53. Proper pressure of the various rollers against each other is maintained in a suitable manner as in the structure first described.

Obviously other modifications and changes may be made in the manufacture and use of our invention, and we do not wish to be understood as limiting ourselves except as set forth in the following claims when construed in the light of the prior art.

Having thus described our invention, we claim—

1. A machine for impregnating a fabric comprising a pair of contacting rollers one of which is uniformly cylindrical and adapted to engage said fabric and the other of which is peripherally recessed and supplies impregnating material to the first, said roller being arranged and adapted to predetermine the thickness of the film of impregnating material applied to said roller engaging the fabric, and means for supplying impregnating material to said recessed roller.

2. In a machine for impregnating a fabric, a base, two pairs of supports rising from said base, one of said pairs of supports having an applying roller, the other pair of supports carrying a fountain roller and a gauge roller, said gauge roller and the applying roller forming means for determining the thickness of the film to be applied to the fabric, and said gauge roller being removably mounted relatively to its support.

3. In a machine for impregnating ribbons of fabric material, two pairs of supports, one of said pairs of supports having an applying roller rotatably mounted therein, and the other pair of supports carrying a gauging roller and a fountain roller, said rollers having means for determining the thickness of the film applied to the applying roller by the gauging roller.

4. In a machine for impregnating ribbons of fabric material, two pairs of supports,

one of said pairs of supports carrying an applying roller, the other pair of supports carrying a gauging roller and fountain roller, and said supports being yieldably and adjustably held relatively to each other.

5 5. A machine of the class described comprising a pair of relatively yieldable applying rollers adapted to simultaneously apply a film of impregnating material on opposite
10 sides of a strip or ribbon passed between said rollers, and means for supplying impregnating material to said applying rollers in a film of predetermined thickness.

15 6. A machine of the class described comprising an applying roller and a relatively yieldable member in association therewith and between which roller and member a strip or ribbon may be passed, a gauging roller for transferring impregnating material to the applying roller and including
20 means for predetermining the thickness of the film of such material, and means for supplying impregnating material to said gauging roller in quantities in excess of that
25 required to make the desired film.

7. A ribbon inking machine comprising a pair of relatively yieldable and parallel applying rollers, and means for supplying a measured quantity of impregnating material
30 to each roller, comprising a gauging roller having a circumferential recessed surface, and means for supplying a quantity of impregnating material to said gauging roller in excess of the amount necessary to make
35 the desired film.

8. A ribbon inking machine comprising a pair of relatively yieldable and parallel applying rollers, and means for supplying a measured quantity of ink to each roller,
40 comprising a gauging roller having a circumferential recessed surface, and a fountain roller for supplying impregnating material to the gauging roller.

9. In a ribbon inking machine, a pair of applying rollers between which the ribbon
45 passes to be impregnated, a fountain roller, a recessed gauging roller to receive therefrom a quantity of ink and then to deliver a substantially uniform film to one of said applying rollers, said gauging roller being
50 yieldably and removably mounted relatively to its support, and driving means for said rollers.

10. A fabric impregnating machine comprising a pair of relatively yieldable
55 and parallel applying rollers and means to supply a measured quantity of ink to one of said applying rollers, said means including a gauging roller having a circumferential recessed surface, and a fountain
60 roller for supplying ink to the gauging roller.

11. A fabric impregnating machine, comprising an applying roller and a gauging roller normally in engagement with each
65 other, a pivotally mounted support for said gauging roller permitting the gauging roller to be swung away from the applying roller for removing said gauging roller from
70 its support whereby the said gauging roller may be exchanged for others for varying the degree of ink.

12. In a machine of the character described, the combination of rollers and supports therefor adapted to approach or
75 retract from each other, a spring actuated bolt in one member having a toggle pivotally attached thereto, and a lug on the other member for engagement by the toggle for resiliently holding the said supports and
80 rollers toward each other.

In testimony whereof we affix our signatures in presence of two witnesses.

LEWIS M. DIXON.
HAROLD W. A. DIXON.