

Dec. 29, 1936.

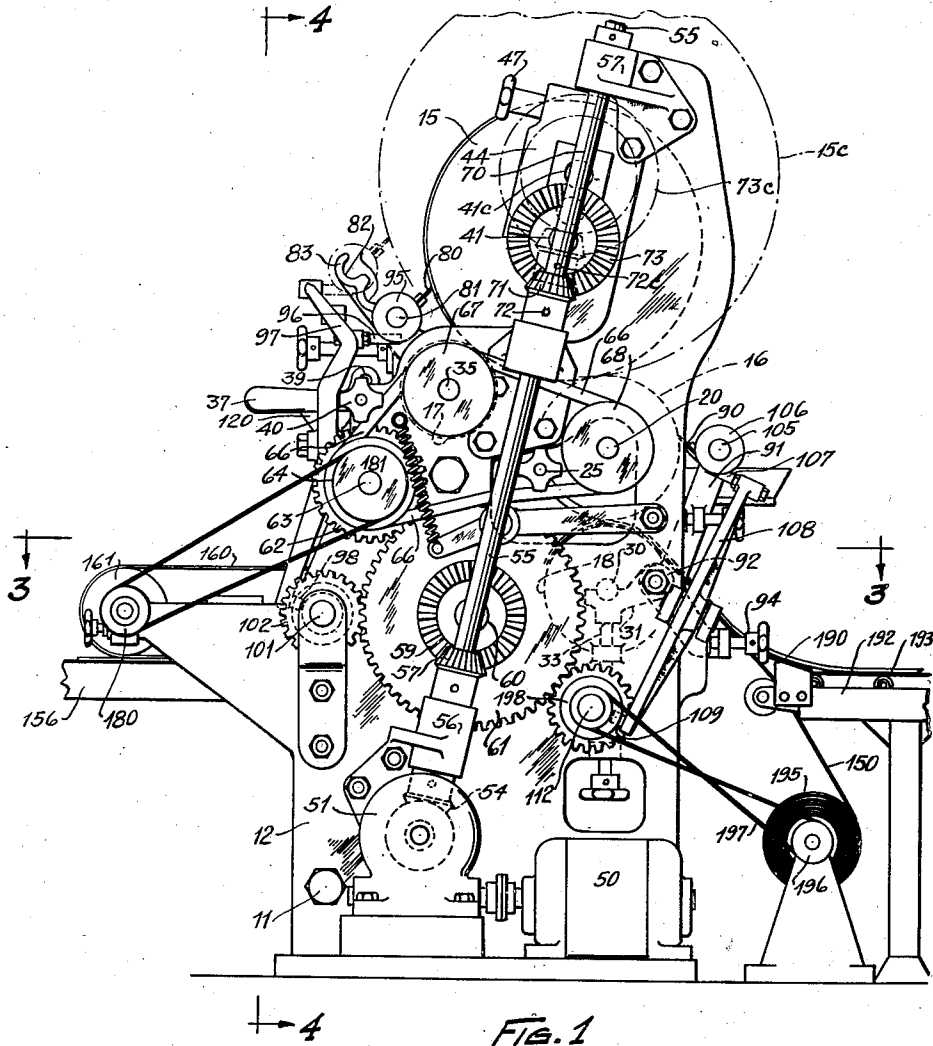
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2,065,545

SURFACE DECORATING METHOD AND APPARATUS

Filed April 23, 1935

5 Sheets-Sheet 1



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5 Sheets-Sheet 3

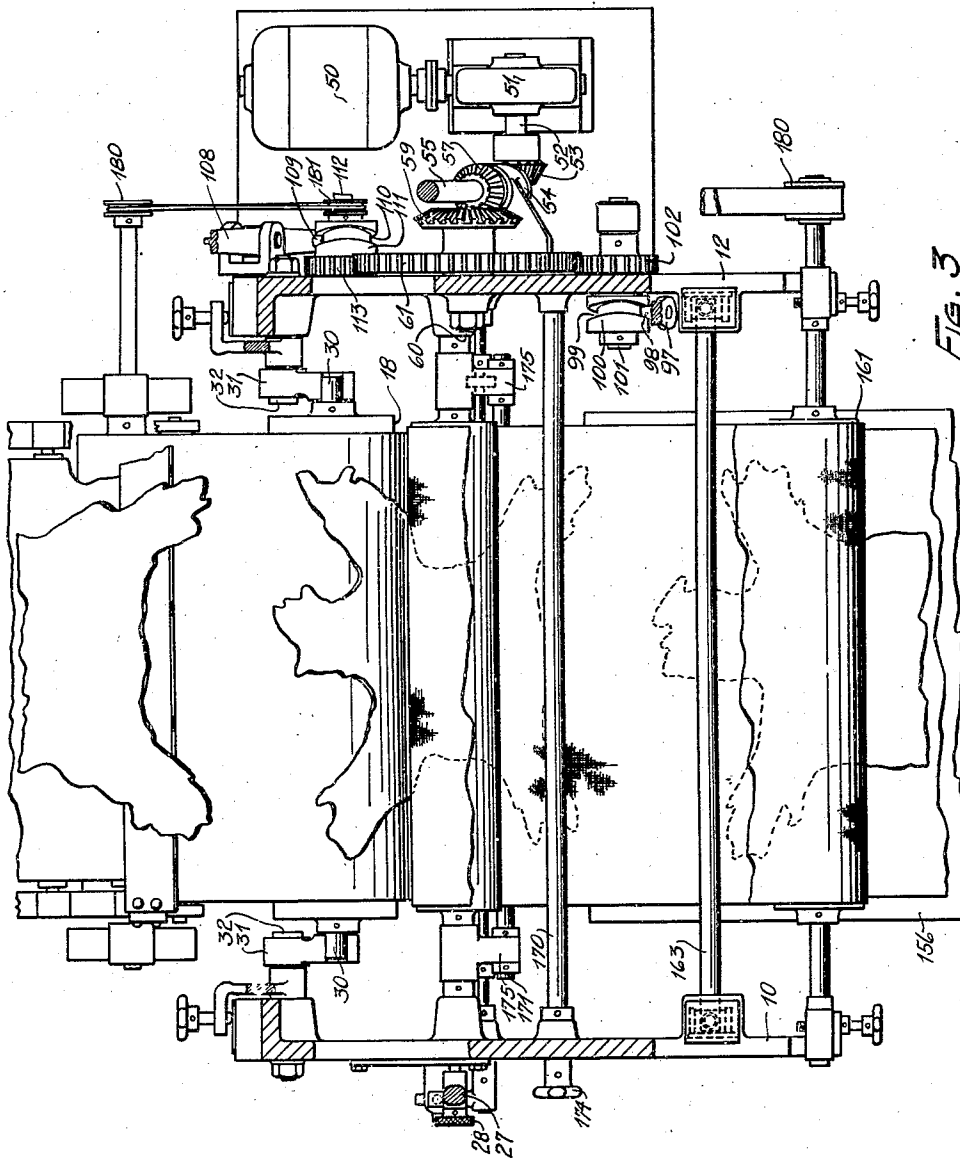


FIG. 3

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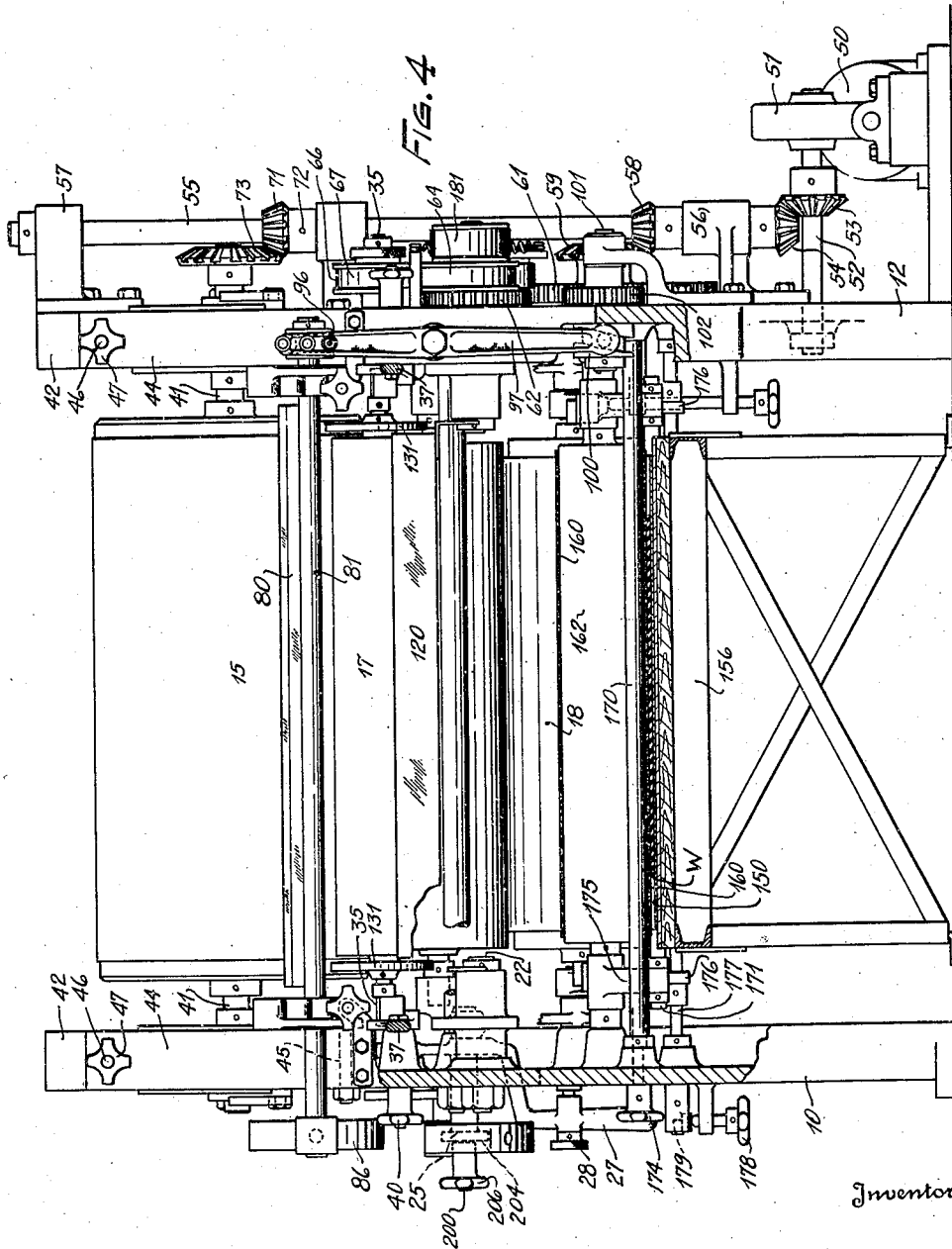
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5 Sheets-Sheet 4



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5 Sheets-Sheet 5

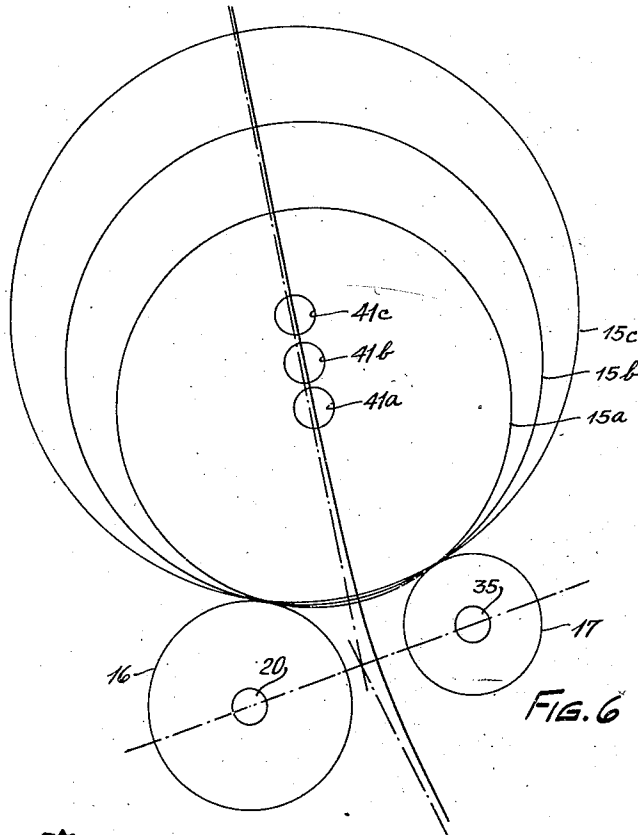


FIG. 6

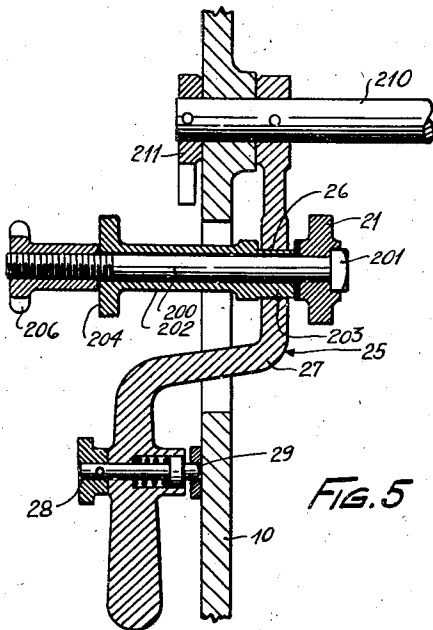


FIG. 5

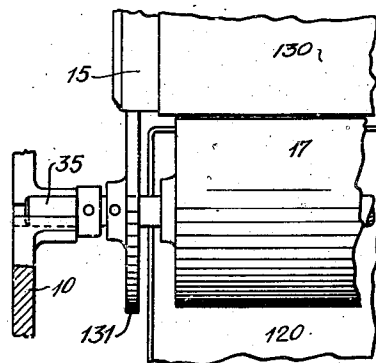


FIG. 7

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2,065,545

SURFACE DECORATING METHOD AND APPARATUS

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Application April 23, 1935, Serial No. 17,825

3 Claims. (Cl. 101—154)

This invention relates to an improved method and apparatus for decorating articles, and especially to the decoration of articles in simulation of natural objects. This, therefore, is the general object of the invention.

A more specific object of the invention is to provide an improved decorating method and apparatus for decorating comparatively small articles, such as small pieces of leather or other flexible similar materials.

A further object is the provision of an improved decorating mechanism, in which the pattern roll may be replaced by a pattern roll of a different diameter, and the pattern transferred therefrom, without altering the mechanism, and in which only such adjustments are required as would be required when changing from one pattern roll to another pattern roll of the same diameter.

Another object is to provide a surface decorating machine which will smooth out the article to be decorated, so that articles, such as small pieces of leather and the like, may be decorated without danger of folding or creasing the article.

Another object is to provide a method and apparatus for applying color to a decorating member, as, for instance, an etched pattern plate, in such a manner as to prevent deterioration of the pattern plate or printing member.

Other objects of the present invention will become more apparent from the following description, reference being had to the preferred form of mechanism for carrying out the method.

In the drawings, Fig. 1 is a side elevation of a preferred form of mechanism; Fig. 2 is a side elevation of the opposite side of the machine from that shown in Fig. 1; Fig. 3 is a horizontal section taken along the line 3—3 on Figs. 1 and 2; Fig. 4 is a vertical section, as indicated by the line 4—4 on Figs. 1 and 2; Fig. 5 is a sectional detail, the plane of the section being indicated by the line 5—5 on Fig. 2; Fig. 6 is a diagram illustrating the relative position of the various rolls; Fig. 7 is a sectional detail, illustrating one form of absolute stop mechanism for the color applicator roll; Fig. 8 is a diagram illustrating a step in the method used when decorating relatively small flexible articles, such as leather, or the like.

Referring now in detail to the drawings, and first to Figs. 1 and 2, substantially all the major parts of the machine are supported on a pair of side frame members, as 10 and 12, which are connected together by cross-frame members 11. Supported on these side frame members are suitable bracket arrangements for respectively sup-

porting a pattern roll 15, a transfer or offset roll 16, an inking roll 17, together with a platen roll 18.

The pattern roll may be an intaglio cylinder comprising a continuous etched copper plate, and is arranged to contact with the surface of a transfer roll 16, which preferably comprises a continuous annulus of gum material, such as congealed glue and glycerin. All of the rolls are removably arranged on their respective brackets to permit them to be readily changed.

The transfer or offset roll 16 is shown as mounted on a suitable shaft 20, carried adjacent its ends in suitable bracket members 21, which are pivotally mounted on a shaft 22, supported by the frame members 10 and 12. The rock arms are retained in their normal or active positions by an eccentric mechanism 25, hereinafter to be described in detail, but which is engaged by a cam slot 26 in a pivoted lever 27. The lever is arranged so that when the eccentric mechanism 25 is in the left-hand portion of the slot, as shown in Fig. 2, the offset roll 16 will be in its active position, whereas, when the mechanism 25 is in the right-hand portion of the slot 26, due to the shifting of the lever about its pivot, the offset roll 16 will be lowered from its active position. This enables the gum roll to be moved free of the pattern roll 15, which lies thereabove. A suitable spring-pressed plunger arrangement 28, carried by the lever 27, and arranged to engage openings 29 in the side frame member 10, serve to maintain the lever and therefore the roll 16 in its active or inactive positions.

Each eccentric mechanism 25 comprises, as shown, in Fig. 5, a stud or rod 200 carried by its respective bracket member 21 and secured against relative rotation thereto by a squared end 201. Rotatably mounted on each stud is a sleeve 202 having an eccentric portion 203 engaging the slotted opening 26 in the respective lever 27. Hence, when the sleeve is turned by means of an enlarged head 204, the axis of the stud will be changed, raising or lowering the coacting bracket 21 as desired. After the eccentric sleeve has been adjusted, it is clamped as a unit with its respective bracket 21 by a clamping nut 206, which threadingly engages the outer end of the stud 200.

The platen roll 18 comprises a comparatively hard surface roller, mounted on a suitable shaft 30, supported in bracket members 31, pivoted as at 32, to the frame members 10 and 12, respectively. Suitable pressure screws 33, carried by the frame members 10 and 12, are arranged

to urge the platen roll upwardly into contact with the offset roll and thereby provide a printing pressure.

The inking roller 17 is preferably a hard rubber roll and is drivingly carried by a shaft 35, the ends of which are engaged by a yoke 36, formed in respective levers 37, which are pivotally mounted as at 210 to respective side frame members 10 and 12. The arrangement is such that the roll 17 may be adjusted toward or from the pattern roll 15, as desired, by swinging the levers 37 about their respective pivots, clamping them in place by a suitable clamping bolt 40 carried by the frame and passing through slotted openings 39 in the respective levers.

The pattern roll is drivingly secured to a suitable shaft 41, which is journaled in upstanding brackets or arms 42 of the frame members 10 and 12. As shown in Fig. 2, each arm 41 has secured thereto half of a split bearing member 43, the other halves of which are carried by bracket members 44, which are pivoted adjacent their lower ends as at 45 to respective frame arms 42 and are bifurcated adjacent their upper ends to permit pivoted clamping studs 46, which are threadingly engaged by suitable clamping members 47, arranged to coact with brackets 44 to maintain them in position relative to the frame arm 42.

As shown, the bearing members 43 are provided with openings 41a, 41b and 41c, each opening being arranged to engage the shaft of a pattern roll having a different diameter. As shown in Fig. 6, the arrangement is such that the openings 41a, 41b and 41c are in a substantially straight line, which is substantially parallel with a hyperbolic curve defined by the locus of a point equi-distant from the periphery of the offset and ink rolls 16 and 17. This arrangement permits the removal of one pattern roll and the substitution therefor of another pattern roll having a different diameter without changing the adjustment of the pattern roll and likewise permits the use of offset and feeding rolls of different diameters, which diameters are determined by functional operation of their respective rolls without regard to the use of a plurality of pattern rolls.

The various rolls are driven by a suitable motor 50. As shown in Figs. 1 and 3, the motor 50 is drivingly connected to a gear-reduction unit 51, and the driven shaft, 52 of which, is provided with a bevelled pinion 53 arranged to mesh with a bevelled pinion 54, drivingly secured to a shaft 55, such shaft lying in a plane passing through the axis of the openings 41a, 41b and 41c in the pattern roll bearing members 43. The shaft 55 is mounted in suitable bearing brackets 56 and 57 carried by a frame member 12 and is provided with a suitable bevelled pinion 57 arranged to mesh with a bevelled gear 59, carried by a shaft 60 journaled in the frame member 12. Mounted on the shaft 60, and drivingly connected to the bevelled gear 59, is a gear 61 arranged to mesh with a pinion 62 mounted on a shaft 63 journaled in the frame member 12, and drivingly connected with a pulley 64, which in turn, through the medium of a suitable driving belt 66, and pulleys 67 and 68, drives the ink roll shaft 35 and the offset roll shaft 20 respectively.

The upper end of the shaft 55 is provided with a spline 70, arranged to engage a bevelled pinion 71 normally retained in a fixed position by a suitable pin 72 passing through the hub of the

pinion and a suitable opening in the shaft. The pinion 71 meshes with a bevelled gear 73, which is drivingly secured to the pattern roll shaft.

When the pattern roll is removed and a pattern roll of the largest diameter substituted therefor, the bevelled pinion 71 is moved upwardly along its shaft and the pin 72 is inserted through an opening in the shaft, corresponding to the size of the pattern roll used. The gear, as shown in dotted lines in Fig. 1, indicates the use of a pattern roll 15c, the shaft 41 of which is positioned in the openings 41c in the pattern roll bearing members. The pattern roll is provided with a bevelled pinion 73c, which meshes with the bevelled gear 71, when the pin 72 is in the opening 72c on the shaft 55. The relative sizes of the gears 73c and 73 is such that the pinion 72 will drive the rolls 15 and 15c at the same peripheral speed. It will therefore be seen that the speed of the pattern roll is controlled relative to the speed of the offset and inking rollers, and without requiring an adjustment of the mechanism which would alter in any way the speed of any of the gearing.

As heretofore mentioned, the mechanism is especially arranged for use on an intaglio printing roll. I therefore provide a scraper or doctor blade mechanism which acts to remove excess color or ink from the roll, leaving color only in the low portions or pockets of the pattern. The doctor blade mechanism is best illustrated in Figs. 1 and 2. As there shown, the doctor blade comprises a thin metallic blade 80, which is rigidly supported in a suitable shaft 81, arranged to be seated in any of several recesses 82 in brackets 83, carried by respective frame members 10 and 12. The brackets are secured to their respective frame members by suitable bolts 84 passing through slotted openings 85 in the brackets to permit the brackets to be adjusted to carry the doctor blades toward or from the pattern roll. A suitable weight 86 carried by an arm 87 is rigidly secured to the doctor blade shaft 81, and maintains the blade in contact with the periphery of the pattern roll.

The excess ink remaining on the offset roll 16 after the pattern has been transferred to the work is removed by a scraper blade 90. As illustrated in Fig. 1, the scraper 90 comprising a thin metallic blade mounted on a shaft or bar 105, the ends of which are carried by arms 91 pivoted as at 92 to the frame and provided with suitable adjusting screws 93 and 94, arranged to engage the frame to vary the pressure of the blade on the roll.

The doctor blade 80, as well as the scraper blade 90, are mounted for reciprocation relative to their respective rolls, to prevent undue wear on or scoring of the pattern or offset rolls. As shown, the shaft 81 of the doctor blade 80 is mounted for reciprocation movement in the bracket members 83, and is provided, as shown in Figs. 1 and 3, with a grooved roller 95, arranged to be engaged by a pin 96, carried by a pivoted arm 97. The lever 97 also carries a pin 98, arranged to engage a cam groove 99 in a cam 100, rigidly secured to a stub shaft 101 journaled in the frame member 12. The cam 100 is driven by a suitable gear 102, drivingly secured to the stub shaft and meshing with the gear 61 heretofore described.

The shaft of the scraper 90 is similarly mounted for reciprocation in its bearings and carries a grooved roller 106 (Fig. 1) arranged to be en-

gaged by a pin 107 carried by a pivoted lever 108. The lever 108, as shown in Fig. 3, is provided with a second pin 109 arranged to engage a cam slot 110 in a cam 111 carried by a stub-shaft 112 journaled in the frame member 12. The shaft 112 has drivingly secured thereto a spur gear 113 arranged to mesh with the gear 61 heretofore described, to thereby drive the cam 110 and cause the reciprocation of the scraper blade.

Mechanism is provided to move the scraper 90 out of contact with the offset roll 16 whenever such roll is moved out of contact with the pattern roll. As illustrated in Fig. 2, the lever 27, which rocks the offset roll free from the pattern roll, is secured to a shaft 210, pivotally carried by the frame members 10 and 12. When the lever 27 is swung in a clockwise direction, an arm 211, rigidly carried by the shaft 210, engages a lever 212 carried by the scraper roll shaft 105, rocking it against the action of a weighted arm 213 and removing the scraper from the offset roll.

The inking roll 17 receives its ink from a suitable ink fountain, comprising a pan 120 which is normally filled with ink and in which the lower portion of the ink roller rotates. In the past, it has been customary to maintain the ink roller in close contact with the pattern roll. I have, however, found that a pattern, such as an etched copper plate, has a tendency to rapidly wear and deteriorate to such an extent that the sharp impression can no longer be made therefrom. In the past, this has been laid to the action of the scraper blade or doctor blade on the roll. However, many improvements made in such doctor blades have had little effect upon the length of the life of the pattern.

I have found that, to a great extent, the wearing away of the pattern is due more to the rolling contact between the pattern and the inking roller than by the scraping action of the doctor blade upon the pattern. I therefore find that when the inking roll is moved a slight distance away from the pattern roll, a distance sufficient to prevent actual surface contact between the two rolls, the wearing of the life of the pattern roll is materially lengthened. I therefore position the inking roll so that it is spaced from the pattern roll a distance sufficient to prevent contact between the two rolls, and yet which distance is less than the thickness of the film of ink or paint picked up by the inking roll. This provides the pattern with sufficient ink or color and yet materially lengthens the life of the pattern. I therefore provide, as shown in Fig. 7, a stop mechanism which will prevent the operator from bringing ink roll into contact with the pattern roll. As there shown, the pattern roll is extended beyond the edge of the pattern 130, and is engaged by a disc roller 131, drivingly secured to the ink roll shaft 35. The diameter of the roller 131 is slightly greater than the diameter of the ink roll. The distances have been exaggerated in the drawings to more clearly illustrate the principle embodied therein.

Small pieces of leather and similar materials are difficult to decorate, in that they have insufficient rigidity to permit them to be fed into the bite of the offset and platen rolls in the same manner as metal, or even paper, sheets are fed. I therefore have provided a comparatively simple method of decorating such materials and have incorporated mechanism to carry out such method as part of the decorating machine herein illustrated.

My improved method comprises feeding a substantially continuous web 150 of paper or fabric between the graining and decorating rolls, and securing the articles to be decorated to this web before it enters the bite of the offset and platen rolls, either by means of the adhesive carried by the web or by suitable gummed wafers, and after such articles have passed between the offset and platen rolls I remove the article from the web.

The web 150 may be in the form of a continuous loop, or, as shown in Figs. 1 and 2, it may be a substantially continuous web, in roll form. As illustrated, the web is drawn upwardly from a roll of material 153, carried by suitable brackets 151, and passes around a guide roll 155, supported by a table 156 and thence across the table into the bite of the offset and platen rolls, as will be hereinafter more fully described. As the web passes across the table, the operator secures to it the leather article indicated at W, Figs. 2 and 3, either by gum carried by the web or adhesive coated stickers 157. Thereafter, a continuous fabric belt 160, looped about drums 161 and 162, presses the work into intimate contact with the web and a suitable spring-pressed roll 163 urges the web and the article into intimate contact with the table top, thereby smoothing the article and securely fastening it to the web.

Adjacent the forward or left-hand end of the canvas web or belt 160, I provide a pair of ironing rods 170 and 171. The rod 170, as shown in Fig. 2, has an eccentric end portion 173 arranged to be clamped in adjusted position relative to the frame by suitable clamping members 174, preferably threadingly engaging the ends of the rod and clamping it to the frame plate 10 and 12 respectively. The other ironing bar or rod 171 engages the paper 150 between the ironing bar 170 and the forward drum 162, about which the belt 160 passes. The bar 171 is carried by suitable pivoted arms 175, and are arranged to be swung about their pivots by cams 176, carried by a suitable stub shaft 177, which are mounted in respective frame members 10 and 12 and swung about their pivot by suitable adjusting screws 178 arranged to co-act with respective levers 179, secured to the shaft 177. In this way the pressure on the web may be adjusted to smooth or iron out any wrinkles in the hides or articles.

The fabric felt 160 may be driven at the same peripheral speed as the platen roll 18. As shown in Figs. 1 and 3, the forward roller 161 about which the web belt 160 is looped, is provided with a pulley 180, which is driven by a pulley 181 drivingly carried by the shaft 63, heretofore described in detail.

The work pieces W are stripped from the paper web 150 after the impressions have been made upon the article by a suitable stripper knife 190. As shown in Fig. 1, the knife 190 comprises a thin metallic blade carried by a table 192 from which the workpieces are taken by the operator, or pass to a suitable conveyor 193 from any well-known type. The web 150 is thereafter wound about a suitable take-up reel 195 which may be frictionally driven in the usual manner by a pulley 196, frictionally connected to the take-up roll in the usual manner and driven by a driving belt 197 from a pulley 198, carried by the shaft 112, heretofore described.

From the foregoing description, it is obvious that I have provided an improved method and apparatus for decorating materials, and especially for decorating small leather or similar articles, which apparatus serves to iron or smooth out the

wrinkles in the articles, and thereafter decorate the same, and I have provided an improved mechanism for carrying out such method.

I claim:

5 1. In a surface decorating machine, a main frame, a transfer roll carried by the frame, an ink roll carried by the frame, a pattern roll supporting device carried by the frame and arranged to support a plurality of sizes of pattern rolls in contact with the transfer roll and in intimate
10 association with the inking roll, said supporting device arranged to retain the axes of the various sized pattern rolls in a line substantially parallel with a hyperbola formed by the locus of a point
15 equidistant from the periphery of the transfer and inking rolls.

2. In a surface decorating machine, a main frame, a transfer roll carried by the frame, an ink roll carried by the frame, a pattern roll supporting device carried by the frame and adapted to support a plurality of sizes of pattern rolls in contact with the transfer roll and in intimate
20 association with the inking roll, means to drive the ink roll and the transfer roll, means to drive the pattern roll, said last-named means including a shaft in a plane of a line passing through

the locus of the axes of the pattern roll positions, said line being substantially coincident with a hyperbolic curve defined by the locus of a point equidistant from the periphery of both the ink and offset rolls, a driving gear slidably mounted
5 on said shaft, and a driven gear drivingly carried by the pattern roll and removable as a unit therewith.

3. A surface decorating machine having an ink roll, a transfer roll, a pattern roll mounting
10 for pattern rolls of various sizes in cooperative relationship with both the ink roll and the transfer roll, said mounting being provided with means to support the axes of various sized pattern rolls in substantially the same straight line, driving
15 means for said rolls, including a shaft parallel with said straight line, means to rotate said shaft, a gear slidably mounted on said shaft, adjustable means to restrain the gear against movement relative to said shaft and retain the gear in any of
20 certain predetermined axial positions relative to said shaft, and wherein each pattern roll is provided with a gear arranged to mesh with said aforesaid gear.

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