

Jan. 4, 1938.

O. D. KING

2,104,044

METHOD AND APPARATUS FOR THE DECORATION OF ELONGATED SURFACES

Filed July 10, 1936

3 Sheets-Sheet 1

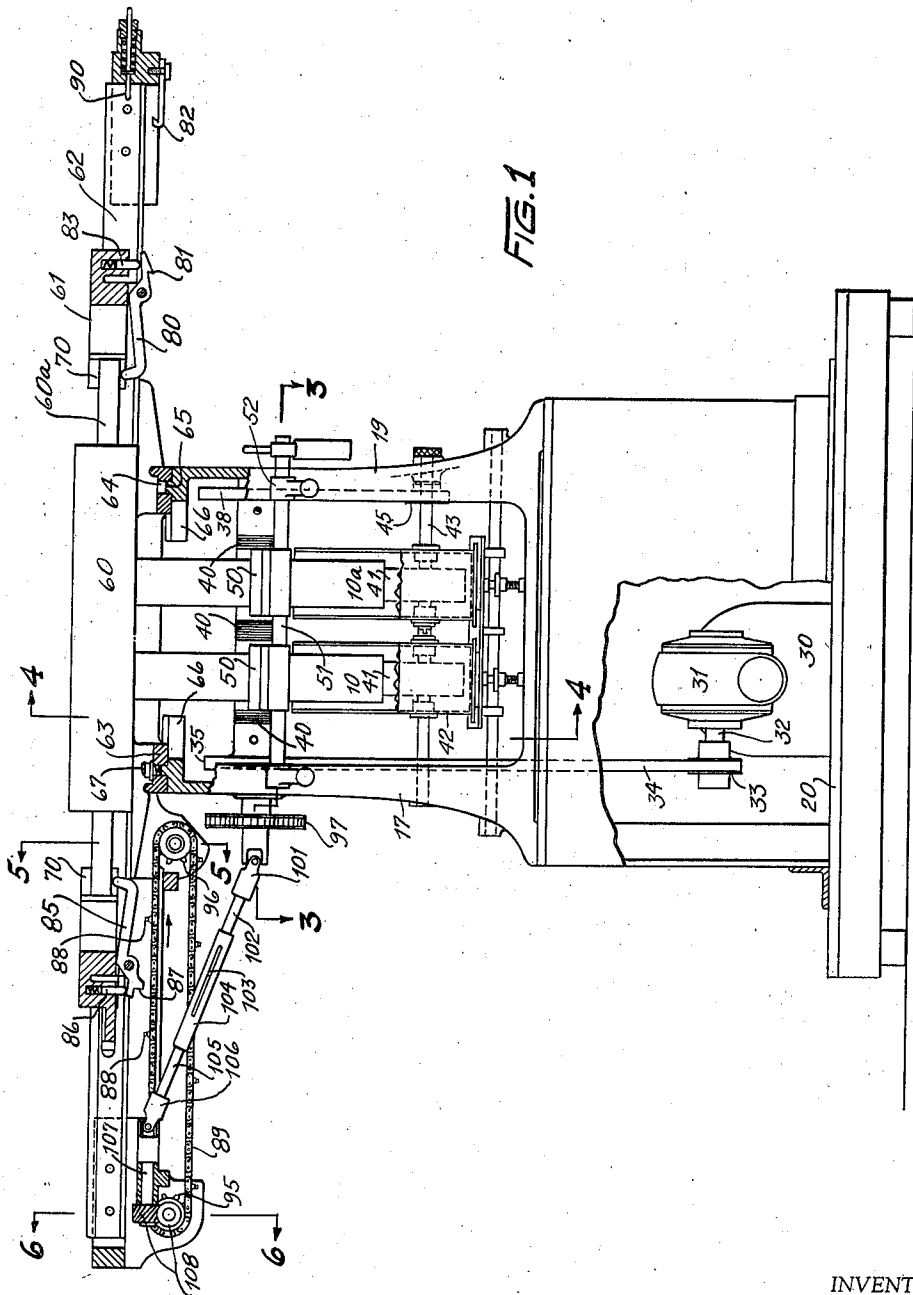


FIG. 1

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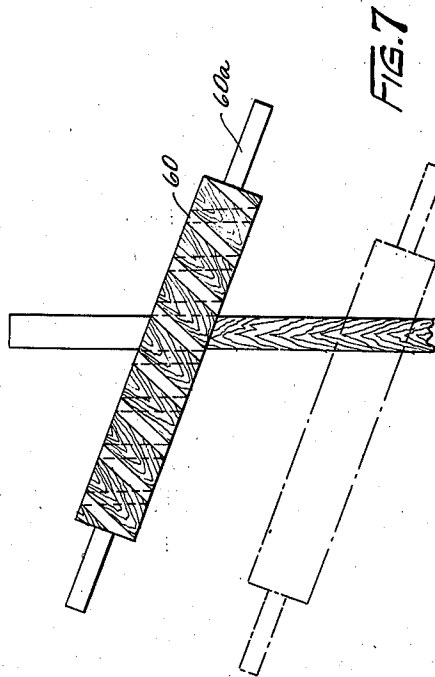
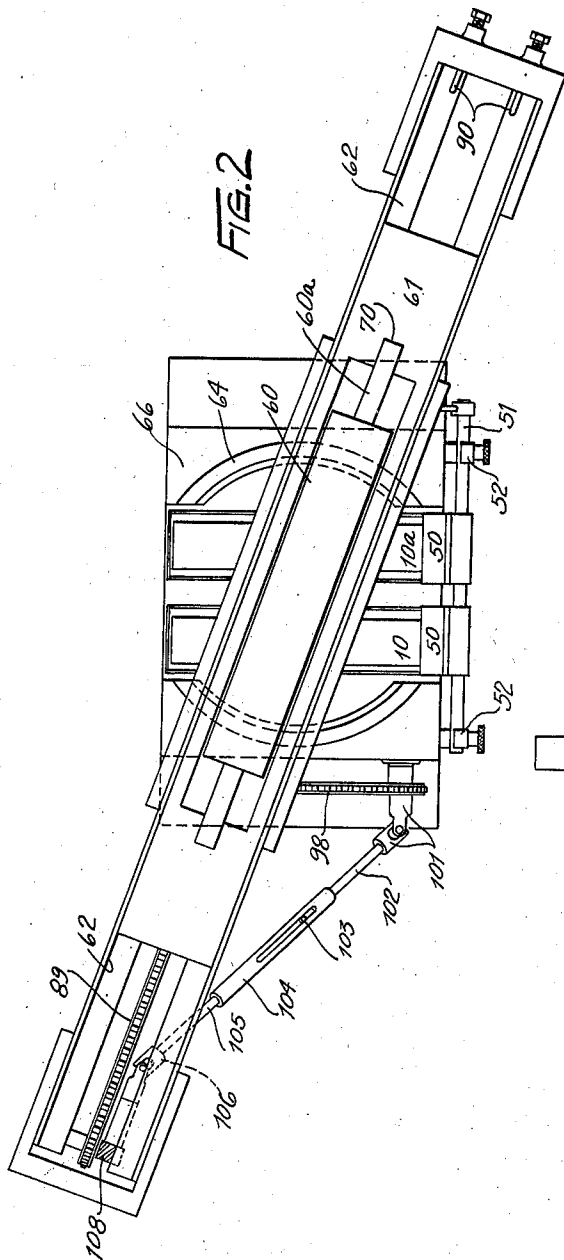
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METHOD AND APPARATUS FOR THE DECORATION OF ELONGATED SURFACES

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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

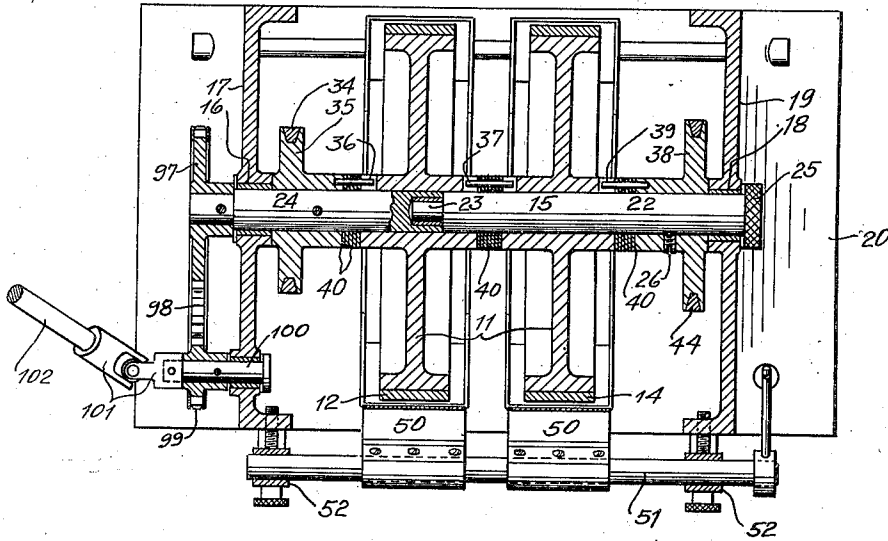


FIG. 3

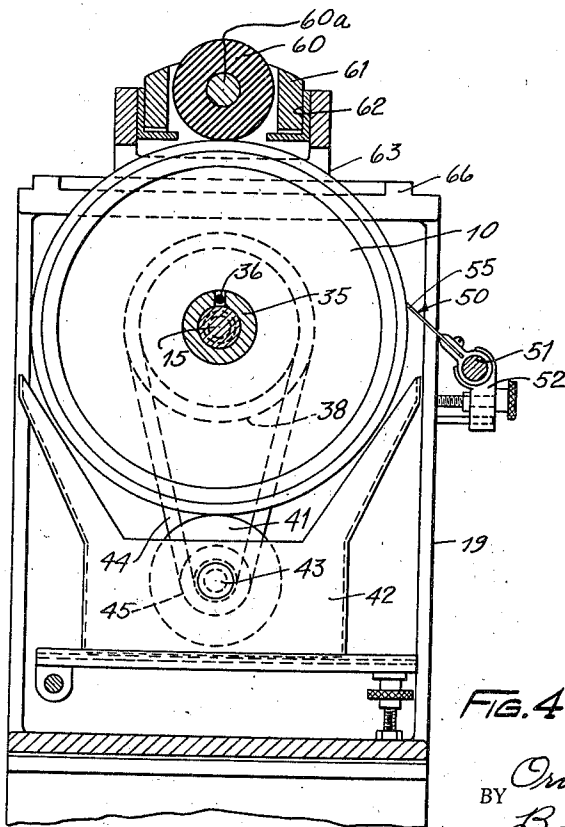


FIG. 4

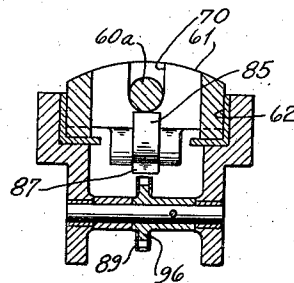


FIG. 5

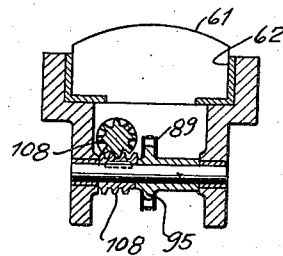


FIG. 6

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UNITED STATES PATENT OFFICE

2,104,044

METHOD AND APPARATUS FOR THE DECORATION OF ELONGATED SURFACES

Orville Doering King, Dayton, Ohio, assignor to Oxford Varnish Corporation, Detroit, Mich., a corporation of Michigan

Application July 10, 1936, Serial No. 89,887

16 Claims. (Cl. 101—154)

The present invention relates to a method and apparatus for decorating materials, and more particularly to a method and apparatus for decorating surfaces when an offset impression process is used to apply a decorative transfer to an article of manufacture.

The present invention is an improvement over the method and apparatus described, illustrated and claimed in Patent No. 2,047,718 issued to my assignee, Oxford Varnish Corporation, July 14, 1936.

An object of the present invention is to provide a method and apparatus for the decorating of surfaces, the use of which will permit wide variations of colors, tones and even designs, in a rapid and economical manner. I prefer to accomplish these objects by transferring the inked design of two patterns to the same offset printing rolls and subsequently transferring the composite design to the surface to be decorated in one continuous rolling movement.

A further object of the invention is to provide an apparatus which will effectively apply to an offset transfer roll decorative designs carried by a plurality of printing cylinders, whereby several designs may be applied to the transfer roller simultaneously, one design being superimposed on the other, or spaced therefrom as desired.

The specific application of the method and apparatus herein shown is particularly adaptable for industrial use for the decoration of surfaces or articles of manufacture, which are comparatively long, relative to the width thereof, and upon which surfaces the decorative designs may be applied.

In the art of decorating articles of manufacture, as, for instance, surfaces of sheet metal, a design may be reproduced on a pattern cylinder by a photomechanical process. Usually, such designs are etched on the surface of the cylinder in such a manner as to form an intaglio printing surface. The color, such as ink or a graining paste or paint, of the proper consistency, is then applied to the pattern and the excess color removed by a suitable scraping action, as, for instance, by a doctor blade. A soft, resilient surfaced transfer roll is then brought into rolling contact with the pattern, thereby transferring the design in color to such transfer roll, which is thereafter brought into rolling contact with the surface to be decorated, applying the design in color thereto. This process, as well as variations of such process, is generally well known and in use at the present time.

When framings and other articles which pre-

sent elongated surfaces are to be decorated, it is desirable to so decorate these surfaces that the patterns or designs will not be repeated on the same surface or strip. In the past, this has been accomplished by providing pattern and transfer rolls having circumferences greater than the length of the strip to be decorated. However, as the length of the strip increases, such rolls become unwieldy. This is especially disadvantageous when the offset or transfer roll is manually rolled across the work. Further, these transfer rolls are generally made of a gum or glue and glycerine composition, and being quite resilient, the tendency of the rolls is to become distorted and this increases as the diameter of the rolls is increased. This makes it difficult to obtain accurate production of the pattern. Likewise, cumbersome mechanisms are required to mechanically transfer the pattern to such large offset rolls.

Furthermore, in the decoration of the internal surfaces, especially frames having curvilinear internal corner surfaces, such as automotive window frames, the diameter of the transfer or offset is limited by the size of the opening in the frame, and not by the internal perimeter thereof, as the roll must be of a diameter small enough to permit the entrance of the roll into the frame, as well as to permit the imprint of rounded internal corner surfaces having comparatively small radii. Therefore, an additional object of the present invention is to provide a method and apparatus to facilitate the graining of the elongated surfaces, such as window frames, moldings and the like for automotive bodies by an offset printing process, which will permit a design in a plurality of tones or colors to be transferred to the elongated surfaces of such articles by manually rolling one comparatively small offset roll along the surface thereof.

It is a further object of the present invention to provide a method and apparatus which will permit economical graining of elongated surfaces by simultaneous application of a plurality of designs or colors thereto.

Likewise, an object of this invention is to provide a method and apparatus for decorating surfaces which will enable the simultaneous transfer to an offset roll of two patterns, or one pattern in two color designs, which patterns may be transferred to the work to be decorated, to form a composite design thereon. This may be accomplished by superimposing the designs or colors one on the other on the transfer roll and the simultaneous application of the composite design on the work, or by transferring both designs to different areas

of the offset roll and independently transferring such designs to the work to form a composite design thereon.

Further objects of the present invention will become more apparent from the following description, which refers to a preferred form of apparatus, especially adapted and arranged for carrying out my improved method. The essential features of the invention will be summarized in the claims.

Referring now to the drawings, Fig. 1 is a side elevation, a preferred form of apparatus for carrying out my improved method, certain parts of the apparatus being broken away to more clearly illustrate the internal construction thereof; Fig. 2 is a plan view of the apparatus; Fig. 3 is a horizontal section through the pattern rolls, as indicated by the line 3—3 on Fig. 1; Figs. 4, 5, and 6 are vertical sections, as indicated by the correspondingly numbered lines on Fig. 1; Fig. 7 is a diagrammatic view illustrating a manner of transferring the design from the transfer or offset roll to the work.

My improved method comprises, in general, the provision of two patterns, the length of each of which is greater than the length of the strip to be decorated. These patterns may be in the form of cylinders, the circumferences of which are longer than the strip to be decorated. The designs may be applied to the patterns in any well known manner, such as photomechanically. However, I prefer to apply the design to form a continuous pattern on the roll, as explained and claimed in Patent No. 1,944,200, issued to Guido Von Webern, January 23rd, 1934, and assigned to my assignee, Oxford Varnish Corporation. Color or ink is applied to the pattern, and the excess color removed by a doctor blade in the usual manner. An offset printing roll, having a diameter considerably less than the diameter of the pattern roll, but having a greater surface width than the pattern, is then brought into rolling contact with both patterns simultaneously. The offset roller is brought into rolling contact with the pattern rolls in such a manner that the patterns are applied in the same spiral path on such offset roll, one pattern being superimposed upon the other pattern. The work being in strip form, the offset roll is rolled therealong in a path at an angle to the long dimension of the work. Thus, two colors may be simultaneously applied to the work by the pattern roll.

The designs of the two pattern rolls may be the same, the colors applied thereto may differ. Likewise, the designs may vary, or be either in or out of registration with each other,—that is, while the color from both patterns is transferred to the offset roll along the same spiral path, the design of the two rolls may register to such an extent that neither color overlies the other or that only predetermined portions of the design overlap, thus producing a three-color effect. It is also contemplated that the pattern rolls may be so arranged that the one design may be transferred to the offset roll slightly out of registration with each other, to thereby obtain an effect similar to that provided in Reissue Patent No. 17,912, dated December 30, 1930, and assigned to my assignee, Oxford Varnish Corporation.

While I have described my method above, as relating to an arrangement of pattern rolls wherein the patterns are applied to the offset roll in a superimposed arrangement, namely, the same spiral path, I nevertheless contemplate the application of the patterns to the offset roll in the

form of a double spiral,—that is, the transfer from one pattern taking one spiral path on the offset roll, and the transfer from the second pattern, taking a second spiral path, on the offset roll, in the nature of a double threaded screw, so that the patterns will lie side by side. The operator may then decorate the work with one color, using one spiral path, and subsequently decorate the same work, or another piece of work, to which the first pattern had been previously applied, with a second spiral pattern on the transfer roll, thus superimposing the two designs, one on the other, on the work, rather than on the transfer roll, in this manner the overlapping of the pattern may be varied by the operator for substantially each workpiece, thereby preventing exact duplication of the design on various workpieces without departing from the general characteristics of the design.

As illustrated in the apparatus shown in the drawings, the axis of the offset roll is positioned at an acute angle to the axes of the pattern rolls, and the offset roll is moved along its own axis, simultaneously with its rotary movement. The pattern rolls are preferably rotated about a common axis, and are constrained from any axial displacement relative to the transfer roll, other than through the predetermined amount above stated. This effectually transfers the design from the pattern roll to the offset roll, and particularly due to the characteristics inherent in offset printing rolls, used in this type of work, there is substantially no blurring of the design during its transfer. The relative axial travel of the offset roll is preferably controlled by its frictional contact with the pattern roll. The offset roll is then removed from the transfer apparatus, and rolled across the work, as indicated in Fig. 7. The axis of the roll is maintained at all times at an angle to the strip to be decorated, to cause the spiral pattern to be transferred to such strip with the grain lines or pattern thereof substantially parallel with the edges of the strip. Obviously, this angle is determined by the angle maintained between the offset roll and the pattern rolls at the time the patterns were applied to the offset roll. Such method permits the use of an offset roll having a diameter comparatively small in relation to the diameter of the pattern rolls, and hence, is readily handled by the operator to manually roll it across the work. Likewise, since the offset roll is small in diameter, there is less tendency of the roll to become lopsided or flattened, as the periphery thereof is closer to the axis of the roll. This smallness of the transfer roll in diameter facilitates the graining of internal surfaces of frames and the like.

The apparatus shown in the drawings comprises a motor-driven mechanism, to apply a two-colored combination pattern to an offset or composition roll either in a single spiral path, that is, one pattern superimposed upon the other, or a double spiral path, that is, one laid spirally alongside of the other. The patterns may be supplied with the same or different colors, they may be lined or ruled off, linearly or form blocks, or other geometric combinations in ink or suitable printing fluid or paints of any desired color or description, which designs may be in accurate registration or out of registration, as desired.

As shown in the drawings, and especially in Figs. 1 and 3, there is provided two pattern rolls 10 and 10a. Each pattern roll comprises a drum 11, having about its periphery a suitable pattern

plate 12 or 14. These rolls are rotatably jour-
nalled on a compound shaft 15, one end of which
is journalled in a bushing 16, carried by an up-
right frame member 17, and the other end of
5 which is journalled in a bushing 18, carried by
another upright frame member 19. The two
frame members 18 and 19 are supported by a
base 20.

The shaft 15 comprises a two-part shaft to
10 facilitate the removal of the pattern rolls from
the machine. As shown in Fig. 3, the right-
hand side of the shaft 15 comprises a shaft
member 22, the inner end 23 of which is jour-
nalled in a stub-shaft member 24, which com-
15 prises the left-hand end of the shaft 15. The
right-hand end of the shaft 22 is provided with
a knurled head 25 by means of which the shaft
may readily be removed from the machine to
facilitate removal of the rolls 10 and 10a. A
20 set screw, such as that indicated at 26, is pro-
vided, to prevent withdrawal of the shaft mem-
ber 22 under normal operating conditions.

The pattern rolls are continuously rotated by
a motor 30 (Fig. 1). This motor is supported by
25 the base 20 of the machine and is drivingly con-
nected to a gear-reduction unit 31. The driv-
ing shaft 32 of the gear reduction unit carries
a pulley 33, which, by means of a driving belt
34, drives a pulley 35 secured to the shaft mem-
30 ber 24. The pulley 30 is drivingly connected with
the pattern roll 10 by a pin 36, such pattern roll
being in turn drivingly connected to the second
pattern roll 10a, by a similar pin 37, and the
pattern roll 10a is in turn drivingly connected
35 to a pulley 38, by a similar pin 39. The latter
pulley is rotatably journalled on the shaft 15
and is drivingly connected to an inking mech-
anism, as will hereinafter be more fully described.

As shown in Fig. 3, a series of washers or
40 collars 40 are mounted on the shaft 15, inter-
mediate the various units carried by the shaft
15, namely, the pulley 35, the pattern roll 10,
the pattern roll 10a, and the pulley 38. Thus,
the pattern rolls 10 and 10a may be adjusted
45 relative to each other in an axial direction by
rechanging the locations of various collars 40.
Thus, I am able to secure either a single or dou-
ble spiral of the pattern carried by the patterns
10 and 10a on the offset roll mounted thereabove,
50 as will be hereinafter more fully described.

Pigment is supplied to each pattern roll by
respective ink rolls 41, mounted beneath the
respective patterns and having their lower re-
55 gions in respective reservoirs of ink 42, which is
supported between the frame members 17 and
19, in any suitable manner. The ink rolls 41
are drivingly mounted on a shaft 43, on which
they are mounted for sliding movement in an
axial direction to permit alignment thereof with
60 their respective pattern rolls 10 and 10a.

The shaft 43 is preferably removable from the
frame members 17 and 19 to facilitate the re-
moval of the ink rolls and their reservoirs, as
desired. The shaft 43 is driven by the pulley 38
65 carried by the pattern roll shaft 15, heretofore
described. As shown in Figs. 1 and 3, the pulley
30 is connected by a driving belt 44, with a pulley
45, drivingly carried by the shaft 43.

Excess ink is removed from the pattern rolls
70 by respective doctor blades 50, which are mount-
ed on a shaft or rod 51, journalled in bearings
52 carried by the machine frame. Each block
40 is mounted on the shaft 50 for independent
axial adjustment, to permit them to be aligned
75 with their respective pattern rolls. As shown

in Fig. 4, each doctor blade comprises a thin,
metallic plate 55 somewhat longer than the width
of its respective pattern roll. If desired, the
shaft 51 may be mounted for reciprocation in
the bearings 52 in the usual manner and con-
5 stantly reciprocated in a manner well known in
machines of this general type.

As heretofore mentioned, the particular mech-
anism with which this invention is concerned,
is especially adaptable for use with a graining
10 process, wherein an offset roll is manually rolled
across the work. Hence, the mechanism is ar-
ranged to have an offset roll deposited thereon,
by the operator, and consequent upon the de-
posit of the roll automatically transfer the de-
15 sign from the pattern rolls 10 and 10a thereto,
and to be automatically conditioned to receive
another offset roll consequent upon the removal
of a roll therefrom.

As shown in Figs. 1 and 2, I indicate an offset
20 roll 60 which is manually positioned in a carriage
61. The carriage is reciprocally mounted in
an elongated guideway 62, which is carried by
a turntable 63. As shown in Fig. 1, the turntable
63 is provided with recesses 64, arranged to be
25 engaged by annular ribs 65, formed on turntable
supports 66, which are secured to the frame
members 17 and 19. Suitable bolts 67 are pro-
vided to clamp the turntable to secure the guide-
way 61 in any desired angular position relative
30 to the axis of the pattern rolls 10 and 10a, and
hence determine the angular position of the pat-
tern rolls relative to the offset roll 60. This
angular position of the turntable controls the
degree of pitch of the spiral affected by the de-
35 sign on the offset roll during the transfer there-
of from the pattern roll. Likewise, the angular
position of the turntable and the axial position
of the pattern rolls 10 and 10a relative to each
other determines whether the designs taken from
40 pattern rolls 10 and 10a will be superimposed,
one on the other, in the same spiral path on the
offset roll or whether such designs will be trans-
ferred to the offset roll 60 in two independent
45 spiral paths.

The carriage 61 comprises a rectangular frame,
having at its opposite ends pockets 70, arranged
to receive the ends of the offset roll shaft 60a.
Pivoted pawls 80 and 85, carried by the carriage
61, are urged into contact with the offset roll
50 shaft by respective spring-pressed plungers 82
and 86 to resiliently support the offset roll and
insure proper frictional driving contact between
it and both pattern rolls.

In Fig. 1, the offset roll 60 is illustrated at an
55 intermediate stage of the transfer of the grain
design from the pattern rolls 10 and 10a thereto.
However, when the roll is placed in the machine
the carriage is at its extreme right-hand position,
in which position a latch portion 61 of the pawl
60 80 is engaged by a coating catch 82, secured
to the right-hand end of the guideway 62. How-
ever, consequent upon the depositing on the car-
riage, by the operator, of an offset roll, the shaft
60a of such roll engages the pawl 80, as indicated
65 in Fig. 1, rocking the latch in a counter-clockwise
direction, thereby freeing it from the catch,
whereupon a suitable spring-pressed plunger 90,
mounted in the end of the guideway and which
engages the end of the carriage 61, acts to over-
70 come the inertia of the carriage and permit
the pattern roll to rotate the offset roll and propel
it, together with its carriage 61, along the guide-
way 62. Due to the resilient supporting pawls
80 and 85, the offset roll rests entirely by gravity
75

on the pattern rolls, and hence small variations in the diameters thereof are readily compensated for, and a driving frictional contact between the two pattern rolls and the offset roll is insured.

5 The pattern rolls 10 and 10a progress the transfer roll 60 along its guideway 62 until the entire roll has been covered with a pattern, at which time the right-hand end of the offset roll has progressed a slight distance beyond the end of the pattern roll 10 and the driving connection therebetween is thus broken. The carriage remains in this position unaffected by the mechanism until the offset roll is removed therefrom by the operator.

15 Consequent upon the removal of the offset roll 60 from the carriage by the operator, the left-hand end of the offset roll shaft 60a is removed from contact with the pawl 85. Thereupon, the spring-pressed plunger 86 rocks the pawl 85 in a counter-clockwise direction, causing a lip 87 thereof to swing into a position to be engaged by lugs 88 of a continuous chain 89, which is driven in the direction of the arrow shown in Fig. 1. This provides a positive drive to return the carriage 61 to its extreme right-hand position and to cause the latch 81 to re-engage the catch 82. The spring-pressed plungers 90 carried at the end of the guideway 62 are compressed under the influence of this drive and act to absorb any shocks and to thereafter maintain the latch 81 in engagement with the catch 82, until another offset roll is placed in the carriage.

20 The carriage drive chain 89 is carried by a pair of sprocket members 95 and 96, journalled in the frame of the guideway 62. This chain is constantly driven from the shaft 15, heretofore described. As shown in Figs. 1, 2, and 3, a sprocket 97 is secured to the shaft 15, and is connected by a driving chain 98 with a sprocket 99 carried by a stub-shaft 100 suitably journalled in the frame member 17.

25 The stub-shaft 100 has secured to its outer end, a universal joint mechanism 101, which is provided with a shaft 102, having a splined connection 103, with a sleeve 104. This sleeve is rigidly secured to a shaft 105, which, in turn, through a universal joint 106, is drivingly connected to a shaft 107, journalled in the guideway 62. Spiral gears 108 drivingly connect the shaft 107 to the sprocket 95, thereby driving the chain 89 to return the carriage as heretofore explained.

30 From the foregoing description it will be seen that I have provided a method of decorating articles having long surfaces, such as elongated strips or the interior surfaces of frames or the like, and may be readily grained, either in two colors or by two patterns, superimposed one upon another, by one passage of an offset roll thereacross. Likewise, I have provided an apparatus for simultaneously transferring designs from two independent pattern rolls to one offset roll, either in a single or a double spiral path,—that is, either one design being superimposed on the other in one spiral path on the offset roll or both designs being transferred to the offset roll in independent spiral paths.

35 While I have described the mechanism as utilizing two pattern rolls of the same diameter, the use of the resilient offset roll and the resilient support therefor permits the diameters of the pattern roll to vary slightly without any disadvantageous effects on the patterns transferred. I also contemplate using pattern rolls having entirely different diameters. In such instances the pattern rolls are mounted so that the periphery

of both will coact with the same offset roll, by providing an independent supporting shaft for each pattern roll and suitable gearing to drive such offset rolls, one independent of the other so that their peripheral speeds at the point of contact with the offset roll will be substantially identical. Such arrangement permits one pattern roll to be of such diameter relative to the diameter of the other pattern roll that the patterns, when applied to an offset roll, one above the other, will, for practical purposes, never register in the same manner,—that is, the periphery of one pattern roll would be of such length relative to the periphery of the other pattern roll that for practical purposes the summation of the periphery of one roll would never be a multiple of the summation of the length of the periphery of the other roll.

40 It will be seen that I am able to produce patterns, the designs or tones of which, for all practical purposes, would never repeat. It is likewise to be noted that the mechanism functions automatically to transfer such patterns to the offset roll and also to reset itself so as to receive another offset roll without further attention by the operator.

45 From the foregoing description it will be seen that I have provided a simple, efficient and economical method and apparatus for the simultaneous application to a surface to be decorated, of two transfers, each having its own independent tonal variation and thereby I obtain by a single transferring operation, from the transfer medium to the work, a design having a double tonal variation and including two single tone-varying patterns, each of which may be apparent independent of the other in certain areas of the work surface, and both of which may combine to produce a double tonal variation design on other areas of the work surface.

I claim:

1. The method of effecting the decoration of an elongated surface, comprising applying a design to a plurality of members to form patterns thereon, obtaining a transfer therefrom on an offset roll by rolling such roll along both patterns simultaneously, at the same time moving the roll relative to the patterns in the direction of its axis, so that both patterns will be transferred to the offset roll in spiral paths, and subsequently transferring both designs from the offset roll to the article to be decorated.

2. The method of effecting the decoration of an elongated surface, comprising applying designs to a plurality of members to form patterns, obtaining a transfer therefrom on an offset roll by rolling such roll along both patterns, at the same time moving the roll relative to the patterns in the direction of its axis, so that both patterns will be transferred to the offset roll in spiral paths thereon and subsequently transferring both designs simultaneously from the offset roll to the article to be decorated.

3. The method of effecting the decoration of an elongated surface, comprising applying designs to a plurality of members to form patterns, obtaining a transfer therefrom on an offset roll by rolling such roll along both patterns, at the same time moving the roll relative to the patterns in the direction of its axis, so that both patterns will be transferred to the offset roll in a spiral path with one pattern superimposed over the other, and subsequently transferring the composite design from the offset roll to the article to be decorated.

4. The method of decorating an elongated surface, comprising applying a design to each of two members to form patterns thereon, applying different colors to respective patterns, obtaining a transfer therefrom to an offset roll by effecting a simultaneous rolling contact between both patterns and the rolls, while moving the roll in a direction at an angle to both patterns, subsequently transferring the design from the offset roll to the surface to be decorated by effecting a rolling contact between the roll and the work while moving the roll in a direction at an angle to the work.

5. The method of decorating an elongated surface, comprising applying a design to each of two rolls, obtaining a transfer therefrom to an offset roll by effecting the simultaneous rolling contact between both pattern rolls and the offset roll, and simultaneously causing a relative movement between the offset roll and both pattern rolls in a direction parallel to the axis of the offset roll, and subsequently transferring the designs from the offset roll to the surface to be decorated by effecting a rolling contact between the offset roll and the work.

6. The method of effecting the decoration of elongated surfaces by the use of a pair of pattern rolls, comprising transferring a pattern from each pattern roll to an offset roll by simultaneously rolling the offset roll along such pattern rolls while maintaining the pattern rolls spaced a predetermined distance one from the other, and while maintaining the axis of the transfer roll at an angle to the axes of the pattern rolls and subsequently transferring the composite design from the offset roll to the work to be decorated.

7. The method of effecting the decoration of elongated surfaces, by the use of a pair of pattern rolls, comprising transferring a pattern from each pattern roll to the same surface area of an offset roll by simultaneously rolling the offset roll along such pattern roll while retaining such pattern rolls spaced a predetermined distance one from the other, and while maintaining the axis of the transfer roll at such an angle to the axes of the pattern rolls to cause the pattern from one pattern roll to be transferred to the offset roll in a spiral path and to cause the pattern from the other pattern roll to be transferred to the offset roll on the same spiral path, whereby one pattern is superimposed on the other pattern in a spiral path on the surface of the offset roll, and subsequently transferring such composite pattern from the offset roll to the surface to be decorated.

8. The method of effecting the decoration of elongated surfaces, by the use of a pair of pattern rolls, comprising transferring a pattern from each pattern roll to a different surface area of an offset roll by simultaneously rolling the offset roll along such pattern roll while retaining such pattern rolls spaced one from the other, and while maintaining the axis of the transfer roll at such an angle to the axes of the pattern rolls as to cause the pattern from each pattern roll to be transferred to the offset roll in a different spiral path thereon, subsequently transferring one design from the offset roll to the article to be decorated, and thereafter transferring the second design from such offset roll to the article in a superimposed relationship to the first design transferred thereto.

9. The method of effecting the decoration of surfaces by the use of a pair of pattern rolls having substantially the same diameter, com-

prising spacing such pattern rolls from each other on a common axis, bringing an offset roll into simultaneous rolling contact with both of said pattern rolls and with its axis at an angle to the axis of the pattern rolls, which angle combined with the spacing of the pattern rolls will cause the design of both of said pattern rolls to be transferred to the offset roll in the same spiral path, one design being superimposed on the other, and subsequently transferring the design to the surface to be decorated.

10. The method of effecting the decoration of a surface by the use of a pair of pattern rolls of different diameters, comprising spacing such pattern rolls from each other on different but parallel axes, bringing an offset roll into simultaneous rolling contact with the periphery both of said pattern rolls and with its axis at an angle to the common plane of the pattern rolls, while maintaining the pattern rolls spaced apart a predetermined distance which, combined with the angle of deflection between the plane of the axes of the pattern rolls and the offset roll causes the design of both of said pattern rolls to be transferred to the same spiral path on the offset roll, and subsequently transferring such composite design to the surface to be decorated by rolling the transfer roll across such surface.

11. The method of effecting the decoration of an elongated surface by the use of a pair of pattern rolls, comprising providing each pattern roll with a different pattern, spacing such pattern rolls from each other axially, applying a different color to each pattern, bringing an offset roll into simultaneous contact with both of said pattern rolls and with its axis at an angle to the axes of the pattern rolls, and while maintaining the pattern rolls spaced apart a predetermined distance which, combined with the angle of deflection between the pattern roll and the offset roll causes the design of both of said pattern rolls to be transferred to the same spiral path on the offset roll, one color being superimposed on the other, and subsequently transferring both colors to the surface to be decorated by bringing the offset roll into rolling contact with such work.

12. In an apparatus of the class described, the combination with a pair of patterns, means to apply color to said patterns, of an offset printing roll, means to support said roll in peripheral contact with both of said patterns simultaneously, means to rotate said roll while maintaining contact with both of said patterns and means to cause the offset roll to move along its axis simultaneously with its rotary movement.

13. In an apparatus of the class described, the combination with a pair of pattern rolls, independent means to supply color to each of said pattern rolls, a carriage arranged to receive and hold an offset printing roller in peripheral contact with both of said pattern rolls, a guideway for said carriage whereby said carriage may move in a direction at an acute angle to the axis of the pattern rolls while maintaining peripheral contact between both of said rolls and the roller, and means to rotate both of said rolls whereby the patterns will be applied to the roller in a spiral path thereon.

14. In an apparatus of the class described, the combination of a pair of pattern rolls having substantially the same diameter, means to apply color to each roll, independent of the other, supporting means for said rolls, means to maintain said rolls spaced a predetermined distance apart, a carriage arranged and adapted to support an

offset printing roller with its axis at an angle to the axes of the pattern rolls while maintaining the roller in peripheral contact with both of said rolls, a guideway to support the carriage for movement in the direction of the axis of said roller, and means to drive said rolls whereby said roller will simultaneously rotate and progress in the direction of its axis.

15 In an apparatus of the class described, the combination with a pair of pattern rolls, of means to rotatably support an offset printing roller, a carriage to support said pattern rolls with their peripheries in frictional contact with said roller, a guideway to support said carriage for movement in the direction of the axis of said roller, angularly adjustable means to support said guideway while maintaining peripheral contact between the rolls and said roller, and means whereby the rolls may be adjustably spaced apart from each other and means to simultaneously drive said rolls at the same peripheral speed.

16. In an apparatus of the class described, a frame, a pair of pattern rolls of substantially the same diameter, means to rotatably mount said pattern rolls side by side in said frame on a common axis, adjustable means to control the spacing of said rolls one from another, means to apply color to said rolls independent of each other, means to support an offset printing roller in peripheral contact with both of said rolls simultaneously, adjustable means to control the angle between the axis of the offset roller and the axis of said rolls while maintaining said rolls in peripheral contact with said roller, and means to drive said roller, and means whereby said roller may move in the direction of its axis consequent upon its rotation due to frictional contact with said printing rolls, whereby the patterns from said pattern rolls are transferred to said roller in a spiral path thereon.

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