Feb. 13, 1934. L. V. CASTO ET AL 1,946,483

SURFACE DECORATING METHOD AND APPARATUS

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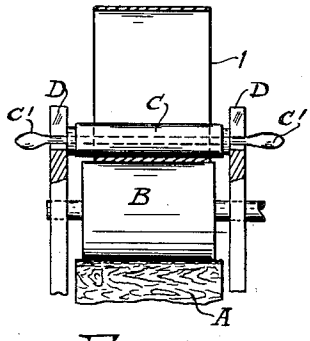


FIG. 1

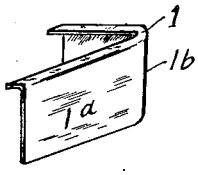


FIG. 4

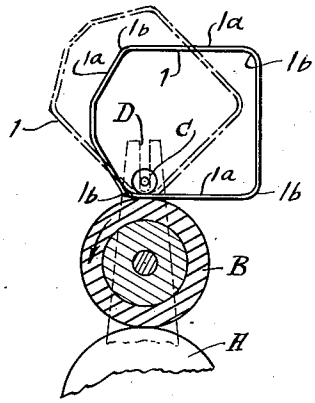


FIG. 2

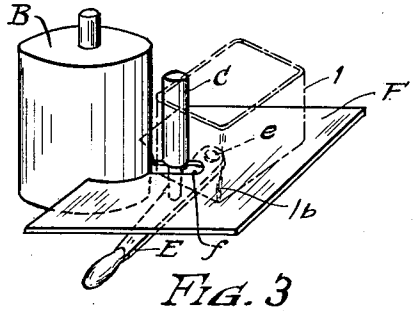


FIG. 3

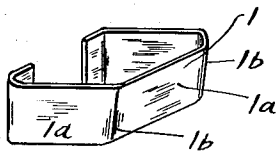


FIG. 5

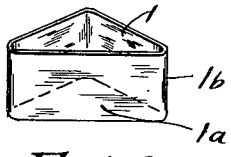


FIG. 6

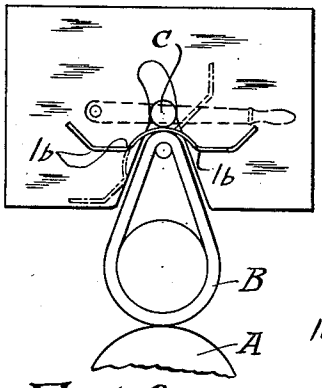


FIG. 8

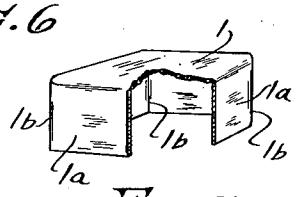


FIG. 7

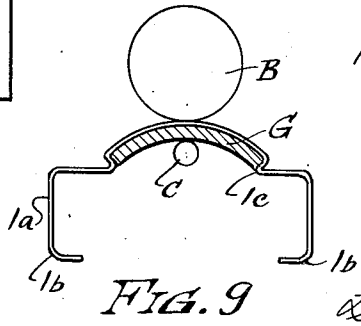


FIG. 9

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SURFACE DECORATING METHOD AND APPARATUS

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Application May 28, 1930. Serial No. 456,319

5 Claims. (Cl. 101—35)

The primary object of this invention is to provide a simple and efficient method of and apparatus for graining or similarly decorating the surfaces of blanks, such for example as rings, boxes and similar shapes having surfaces which deviate from a single plane. The method is particularly useful in connection with bent sheet metal members, such for example as L-shaped, U-shaped or S-shaped members and boxes of various shapes with continuous or substantially continuous side walls to be decorated.

Still another object is to provide an efficient method for decorating a number of deviating but substantially contiguous surfaces of an article in one continuous operation.

Further objects and features of the invention will become apparent from the following description which relates to the accompanying drawing illustrating the preferred steps in carrying out the invention as well as suitable apparatus therefor. The essential characteristics are summarized in the claims.

In the drawing, Fig. 1 is a diagrammatic view showing in side elevation an apparatus including a plurality of rolling elements by which the method may be carried into effect and showing one type of blank in cross section, the exterior surfaces of which blank are to be decorated; Fig. 2 is a view at right angles to Fig. 1, according to the line 2—2 on the latter figure; Fig. 3 is a perspective view of still another type of apparatus by which the method may be carried into effect; Figs. 4 to 7 are illustrations in perspective of various types of work which may be decorated by the present method; Fig. 8 is a diagrammatic plan view of still another shape of article which may be decorated by the method, and suitable apparatus therefor, and Fig. 9 is a plan view of a still different shaped article and additional apparatus which may be used to decorate this and similar shapes.

In the class of surface decoration of which wood graining is an example, considerable time is lost or expense incurred in decorating the desired surfaces of shapes such as illustrated. Unlike ordinary decorative work, the pieces must, in general, be fully formed before the decorative design is applied.

Referring to the shape of article shown in Fig. 7 for example, and assuming this is a sheet metal box or cover, the sides 1*a* and corners 1*b* may be grained by a hand roller carrying the pigment pattern, the roller being pressed against the box with the latter supported, say on a special mandrel. This is tedious and each shape and/or size of article requires a separate mandrel to effectively support it. Another way the sides of such box may be grained is to pass the box through a graining machine in the usual way several times, presenting a new surface to the graining elements each time the box is passed through. This is timetaking and often fails to produce good work, particularly where the box has rounded corners such as shown in Fig. 7, as will be obvious.

The present method saves a great amount of time, in comparison with those above outlined, and other, for example, previously known methods, and may, in general, be carried out without the use of special mandrels and with very simple equipment, as will be hereinafter shown. Moreover, the problems heretofore presented by rounded corners, particularly in machine graining for example, are entirely eliminated.

The outstanding feature of the invention is that the blank or member to be decorated is allowed to swing and travel in the various directions it naturally tends to, in being decorated, such directions being determined by the shape of the blank.

Referring to Fig. 1, a pattern roll, such for example, as an intaglio printing cylinder, is shown conventionally at A, to which roll may be applied a suitable film of pigment, the excess pigment being scraped off in a known manner, leaving a pigment pattern on the surface. Such pigment pattern may be transferred to a resilient roll B and this pattern then transferred from the roll B to the work.

The element B may take various shapes; in Fig. 8 for example, it is shown as a belt rather than a roll. Further the element B may carry the pattern without the use of a pattern roll, as by having the desired pattern configurations formed on it, in intaglio or relief effect, for example, depending on the mode of printing selected or best adapted. The element B may moreover be of any shape in longitudinal cross section rather than of generally cylindrical shape as shown; e. g. for operating on ribbed or grooved work shapes the element B may have corresponding ribs or grooves. The element B may be termed the pattern transfer member whether or not it has the design configurations formed on it, as above suggested.

The work, as illustrated in Figs. 1 and 2, comprises a continuous hollow member, such as the sides of a special shaped box, to which top and/or bottom members may be later secured to complete it. The work may, of course, comprise any suitable material, sheet metal or pressed board

for example of the necessary thickness for strength. The work blank is indicated at 1 in all figures, the side portion at 1*a* and the corners at 1*b*. The blank is shown, in Figs. 1 and 2, as held in contact with the pattern transfer roll by a pressure roller C which is suitably held in place in any manner, for example wholly or in part manually as by reason of handle members C' rigid with a central shaft on which the roller itself may turn freely. As shown, the roller is held, in part, by fixed guide members D. One of the elements, A, B or C, may be suitably driven to advance the work, or all three may be driven.

Suppose, for example, the roll B is turned by any suitable power device in the direction of the arrow, Fig. 2. It is preferable to also drive the pressure roller in, of course, the opposite direction and at the same or substantially the same surface speed, as that of the roll B. As the roll B is thus driven and pressure is applied by the roller C toward the axis of the roll B, the blank will be fed first horizontally, as shown, and the pigment pattern on the roll B will be transferred to one exterior surface 1*a* of the blank. When the corner nearest the printing contact line is reached, the blank will assume the position shown in broken lines at 1', during the time the corner is being printed, and will then again assume a position similar to that shown in full lines. This free repositioning of the blank by bodily swinging movement thereof, as required by the shape of the corners and other deviations from a plane surface, results in very good work at all portions of the blank, notwithstanding the simplicity of the apparatus and, in general, notwithstanding whether the corners are sharp or rounded.

It is obviously desirable in many cases to provide a guide for the work to definitely locate it with reference to the pattern on the roll B. One or more of such guides may be provided, which would simply extend adjacent the blank on one or both ends thereof, as desired. No guides are illustrated in connection with Figs. 1 and 2, but may comprise any suitable arrangement of plates, rollers or the like.

Another apparatus suitable for carrying out the method is shown in Fig. 3. This is especially adapted to work such as shown in Fig. 7 where one end is closed. In Fig. 3 a pattern transfer element B is shown in upright position and the pressure roller C supported parallel thereto but free at its upper end to allow the work to be placed over it endwise of the roller. The roller may be moved by an operating arm E which may be pivoted as at *e* to any suitable support (not shown). The roller may be mounted on the arm or otherwise connected to it for movement thereby. F indicates a guide which in this arrangement is also a supporting table for the work. The table has an opening *f* through which the pressure roller C or its supporting shaft may extend. Such an apparatus is particularly useful in that it is adaptable for other kinds of work than that specifically concerned with in the present method. For example, straight strips or blanks may be readily handled as in an ordinary graining machine, by this form of apparatus. The shape such as shown in Fig. 4 might be set down on the table and fed edge foremost into the bite of the elements B and C; those like Figs. 6 and 7 would be set down over the roller as heretofore suggested.

It will be seen that in any case, the blank will be supported and guided for its various movements by the table and the movements will be entirely as determined by the shape of the blank. In case both the roll B and roller C are positively driven, it is preferable that the roller C be of such size that it will fully enter the corners to prevent blurring the work by relative slippage.

If desired, the arrangement of apparatus elements may be reversed and the interior surfaces of blanks, such as shown at 1 in Fig. 1, for example decorated. In such case, the pattern transfer element would be located on the inside of the blank, and the pressure element outside.

In case of blanks, such as shown in plan in Fig. 9, wherein one or more of the side walls have inward protuberances, such as shown at 1*c* for example, or in other cases presenting similar problems portions of the blank may require temporary fill-out inserts, such as the arcuate block G in Fig. 9. This figure further illustrates that the work blank does not have to be of uniform cross section insofar as the effective operation of the method is concerned.

It will be understood that the pigment pattern application is or may be an intermediate step in a decorative process, such as wood marble and like graining, and there may be as many applications or imprints as desired. Ordinarily the blank is first treated to give it a ground color appearance as by dipping it in suitable paint and drying the coating. The pigment transfer or transfers are then applied as above described. Afterward, or between the successive imprints if desired, other coatings are applied, for example locking coats of lacquer or varnish and finally a finishing varnish. The various imprints and coatings are of course suitably dried or baked on. It will be seen from the above that the sheet materials of the blanks illustrated could not receive the decorative treatment outlined above, prior to shaping because the finish would crack during such formation into L-shapes, U-shapes, etc. boxes, frames and the like.

We claim:

1. A method of decorating the surfaces of articles having relatively abrupt bends, comprising supporting the article adjacent a moving pigment applying member, continuously supplying a pigment pattern to the member, and continuously applying rolling pressure to the surface of the article opposite the pigment applying member to thereby cause the article to be frictionally driven bodily while allowing it to swing freely in the general plane of the article as required by the successive bends thereof.

2. A method of decorating the exterior surfaces of substantially hollow shaped articles having abruptly bent portions, comprising supporting the entire weight of the article in edgewise contact with a guide to present the exterior surface of the article to a moving pigment applying member and continuously applying rolling pressure to the interior surface of the article opposite the pigment applying member and thereby causing the article to be driven and swung bodily as required by the shape of the article.

3. The method of graining a generally hollow sheet metal member having relatively abrupt bends, comprising treating the member to cause it to represent the ground color of the grain design, and then driving the member by rolling contact with oppositely disposed graining and pressure elements, and moving said elements relatively toward and away from each other when the bends of the member pass between the ele-

ments, while supporting the member in loosely embracing relation to one of such elements and free to swing about such element as required by the shape of the member.

4. The method of decorating articles having surfaces deviating from a single plane, said surfaces having edges lying in a common plane, comprising supporting the entire weight of the article on a guide contacting the edges, presenting the surfaces to a moving pattern transfer member and continuously applying rolling pressure to the other side of the article surface opposite the pattern transfer member, and thereby causing the pattern to be continuously transferred to the contacted surface while the article swings freely, supported on the guide.

5. A method of decorating the outer surfaces of articles having abrupt bends, comprising supporting the article with its outer surface adjacent a pattern transfer member, placing a filler member against the inner surface of an abrupt bend, and continuously applying roller pressure to the surface of the filler member opposite the pattern transfer member to thereby cause the article to be frictionally driven bodily while allowing it to swing freely on the support.

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GUIDO VON WEBERN

DISCLAIMER

1,946,483.—*Lloyd V. Casto*, Detroit, Mich., and *Guido von Webern*, Dayton, Ohio. SURFACE DECORATING METHOD AND APPARATUS. Patent dated February 13, 1934. Disclaimer filed August 8, 1941, by the assignee, *Oxford Varnish Corporation.*

Hereby enters a disclaimer to claims 1 and 4 of said patent.

[*Official Gazette September 2, 1941.*]