

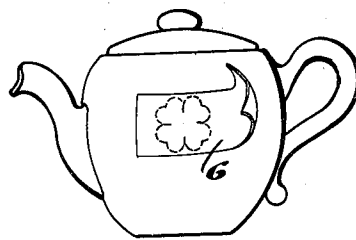
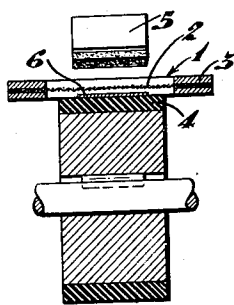
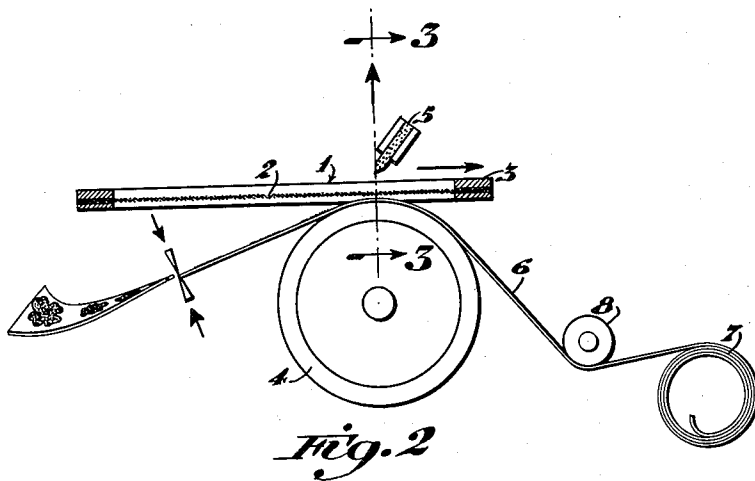
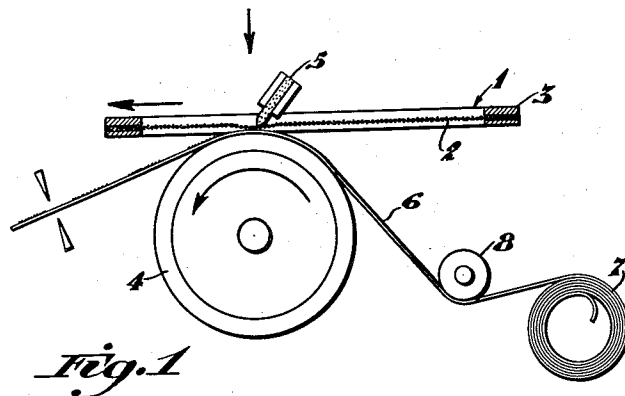
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2,340,643

PROCESS AND APPARATUS FOR DECORATING ARTICLES OF MANUFACTURE

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PROCESS AND APPARATUS FOR DECORATING ARTICLES OF MANUFACTURE

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2 Claims. (Cl. 41—33)

This invention relates to the art of decorating articles of manufacture. The invention is disclosed particularly in relation to the application of ornamental designs and similar indicia of glass and ceramic materials which, by virtue of their shape and configuration, cannot conveniently be decorated by the present silk screen method.

The principal object of the present invention has been to provide a process for decorating such articles which is equally as convenient as the usual screen stencil process, but more specifically adapted for the application of designs upon irregular contours or shapes, which the silk screen cannot accommodate. It will be understood that the method is applicable to the decoration of metal and plastic articles as well as those of ceramic glass, or vitrified materials.

In its simplest aspects, the present invention is predicated upon the concept of applying the material coloring media which is to form the design, in the given design configuration, through a stencil screen upon a transfer medium, and then depositing the color material from the transfer medium to the surface to be decorated. By this process, the limitations of the silk screen, its inability to be used upon the irregularly contoured surfaces for forming borders or the like, are avoided, yet its advantages in respect to cost, speed, and convenience are utilized.

The transfer medium, upon which the color design is first applied, is of a thin, pliable nature; for example, tissue paper, decalomania paper, so called "duplex" paper or "simplex" paper, or the like, is suitable. The pliability of the transfer medium enables it to be shaped easily and conveniently to the contour of the surface upon which the design is to be transferred.

In the preferred process, a roll or continuous web of the transfer material is utilized. Successive lengths of this web are fed over a rubber roller or platen and the stencil screen is placed adjacent the roller or the platen so that coloring media may be forced through the perforated design portions of the stencil onto the transfer tissue by means of a squeegee. While the flimsiness of the transfer tissue makes the application of a stencil design upon it very difficult, by the usual stencilling process, it has been determined that clear, sharp designs may be applied provided that a relatively stiff stencil be used, the paper be supported upon a somewhat yieldable platen and the platen be moved with the paper to advance successive portions of it and the screen into contact with one another. If these precau-

tions are not observed there is danger that the paper will wrinkle and the design will, therefore, either be smudged or the paper torn.

Next, the transfer medium is moved upon the platen and the portion of it which bears the design is cut from the web and is applied to the article of manufacture. Meanwhile, another length of web deposited upon the platen is receiving its design.

After the color designs have been applied upon the transfer tissue it is preferable that they be left to dry until the coloring material is of a tacky consistency or even practically dry to the touch. Thereafter the tissues are brought into contact with the articles to be decorated and the tissue is separated from the coloring material by applying a soap and water solution to it. In this manner the sharpness and clarity of the design is not disturbed in the transferring operation.

From the foregoing principles of the invention, and the following detailed description of a preferred embodiment of it, those skilled in the art will readily comprehend the modifications to which it is susceptible. A typical apparatus adapted for the practice of the invention is illustrated diagrammatically in the drawing in which:

Figure 1 is a sectional elevation showing, somewhat diagrammatically, the relationship of the squeegee, screen, transfer tissue and platen of a typical apparatus adapted for the practice of the invention. The screen is shown at the start of its travel.

Figure 2 is a view similar to Figure 1 except that the screen is shown at the end of its travel.

Figure 3 is a cross sectional view taken on line 3—3 of Figure 2.

Figure 4 is a perspective view showing the application of the transfer tissue to a surface of the ware to be decorated.

In the drawing, the screen member is indicated generally at 1. This comprises the screen membrane 2 which is perforated or foraminous in the areas of the design and imperforate in the portions bounding the design. The screen membrane preferably is of silk or tulle fabric and it is stretched tightly and held within a frame 3. The screen stencil 1 is supported in the usual manner so as to be moved linearly.

A rotatable roll or platen 4 is mounted for substantially tangential contact with the stencil member, and a squeegee 5 is provided to engage the surface of the stencil member and press it into contact with the roll periphery.

It is preferable that the stencil member be mounted so that its contacting edge is in substantial alignment with the axis of rotation of the roller. The stencil member should be a relatively stiff element and not of the soft rubber variety commonly used in conventional screen stencilling operations. Celluloid, spring steel or the like is suitable, in fact, any material which is capable of engaging the stencil along a sharp, substantially thin line of contact. Likewise, as disclosed in the drawing, it is desirable that the squeegee be positioned at a somewhat acute angle with respect to the plane of the stencil so as to minimize the friction and the wear exerted upon the latter member.

The rubber roll 4 should be of substantial diameter and this element, in contrast with the stiffness of the squeegee, should be made of a relatively soft resilient composition. The periphery of it is smooth. In the preferred structure it is preferable that the screen be mounted in slightly spaced relationship from the roll periphery, and that a stencil member be used which is sufficiently resilient to give slightly under the pressure of the squeegee and thereby be brought into contact with the roller surface. Under these conditions the paper frictionally grips the roller surface so the two advance in unison.

The transfer tissue is indicated generally at 6, for example, a roll of it, 7, may be mounted for rotation to provide a continuous length. The transfer tissue passes from the roll 7 intermediate the surface of the roll 4 and the stencil membrane, and an idler roller 8 is provided intermediate the rolls 7 and 4, so as to keep the web of tissue advancing toward the rubber roller 4 in taut condition. In this manner the tissue is prevented from wrinkling and becoming distorted and is kept in smooth flat condition. The tension which is applied through the roller 8 should not be too great, lest the paper move backwardly relative to the roller 4 when the pressure of the squeegee is relieved and the screen moves out of contact with the transfer tissue.

At the discharge side of the roller 4 the transfer tissue passes a tear-off knife or straight edge along which the paper can be drawn to divide it into individual sections, each bearing a design.

In the practice of the present invention a supply of coloring material is deposited upon the stencil membrane 2 and, with the web of transfer tissue disposed over the roll 4 beneath the stencil membrane, the squeegee 5 is depressed and the stencil member is then moved in the direction of the arrow. By virtue of the frictional contact of the stencil membrane, the transfer tissue and the roller 4, with one another along the line of contact provided by the squeegee, the paper is advanced to receive the decoration from the screen, roller 4 supporting the paper during this period, and being rotated by it. At the end of movement of the stencil membrane the pressure of the squeegee 5 is relieved and the screen moves out of contact with the transfer tissue, the tissue and roller meanwhile remaining stationary. The screen member 1 is then moved back to its starting position, squeegee 5 is then again depressed and the coloring material is applied to a successive portion of transfer material. The preceding portion now advances toward the tear-off knife and it there may be severed from the web.

If the roller is mounted to rotate freely and is not so heavy as to have greater inertia, the roller and the paper may be advanced with respect to

the squeegee by the frictional engagement of the stencil with the paper. In the alternative, separate drives, appropriately synchronized, may be employed for moving the stencil and for moving the roller. Moreover, while the invention has been disclosed in relation to a stationary squeegee and a stencil member movable past the squeegee, it will be understood that the screen with the stencil member may be arranged to rock about the roll periphery and the squeegee arranged to move along the stencil surface as it rocks over the platen surface. A typical suitable apparatus is disclosed in the John C. Smith Patent No. 2,166,269, of July 18, 1939, entitled "Apparatus for stencil decorating."

The severed sections of transfer tissue which bear the coloring material in the given design formation may be laid aside to dry or they may be dried artificially until the coloring material is of a tacky consistency. The severed sections are then applied to the ware to be decorated, with the coloring material being pressed lightly into contact with the ware. The application of a soap and water solution to the transfer tissue softens the bond of the coloring material and the transfer tissue so that the two readily may be separated leaving the coloring material and the design configuration on the ware.

The process is adapted particularly for applying decorations to irregularly configured articles of manufacture or to surfaces which cannot be decorated by the usual silk screen method, for instance, the edges of plates, handles of cups, surfaces of compound curvature such as are found in pots and pitchers, and the like surfaces. The method is also useful in instances where only a small number of pieces is to be decorated and the expense of special decorating machines or etched rollers is not justified.

Having described my invention, I claim:

1. The method of decorating an article of manufacture, which comprises positioning a thin web of pliable material intermediate a resilient surface and a screen stencil membrane which is imperforate except in a design area, with color deposited upon the said screen membrane, contacting the screen membrane with a stiff squeegee member to force said coloring material through the openings in said screen onto said pliable material, holding the pliable material in taut condition and advancing the screen and the pliable material relative to the squeegee while the material is held in taut condition as it is fed intermediate said stencil membrane and said resilient surface, thereby applying a design upon said material, then transferring the applied design from said material to an article to be decorated by bringing the applied design into contact with the surface to be decorated.

2. A machine for decorating articles of manufacture, which comprises a screen stencil membrane perforated in a design area, a roller presenting a resilient surface adjacent said screen membrane, means for feeding a web of thin pliable material intermediate said stencil membrane and said roller surface, relatively stiff squeegee means for pressing said stencil membrane against said material upon said roller to apply coloring material thereon from said screen as said screen and material are advanced relative to said squeegee member, and means for maintaining said material in taut condition as it is advanced with said stencil member.

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