April 18, 1944. O. AUSTIN 2,347,022

METHOD OF APPLYING PIGMENTS TO SURFACES

Filed Dec. 27, 1941

Fig. 1.

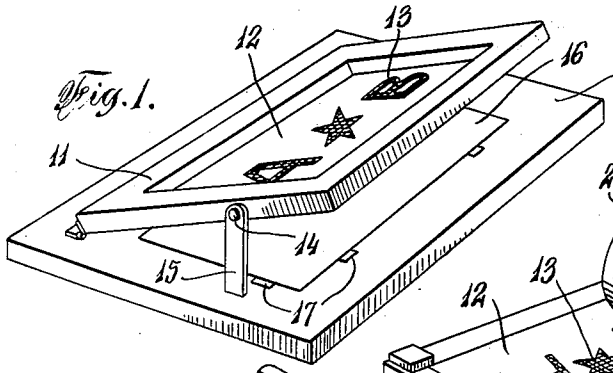


Fig. 3.

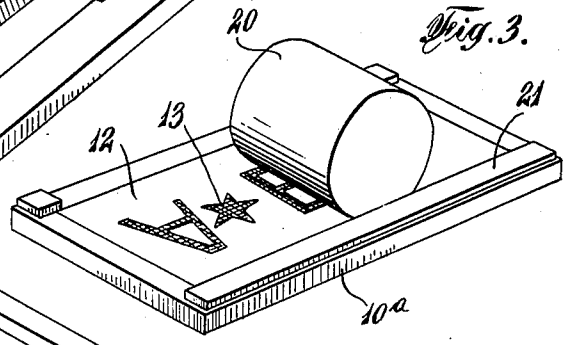


Fig. 2.

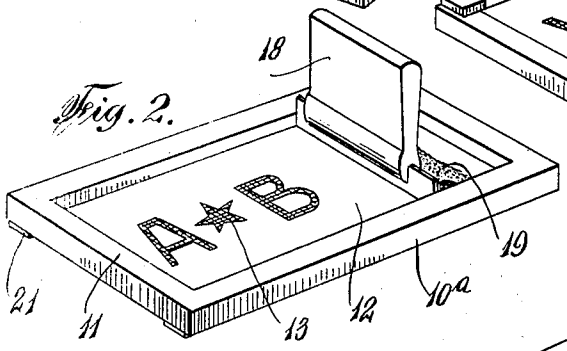


Fig. 5.

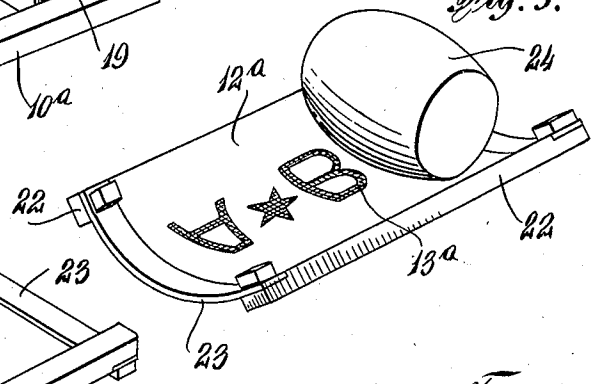


Fig. 4.

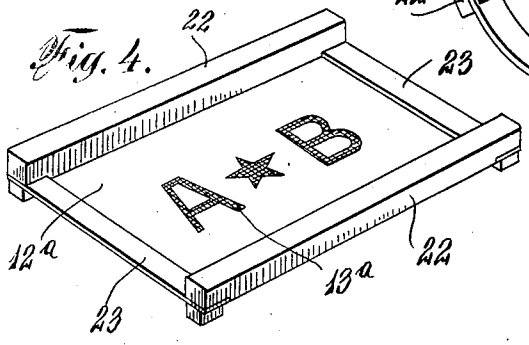


Fig. 7.

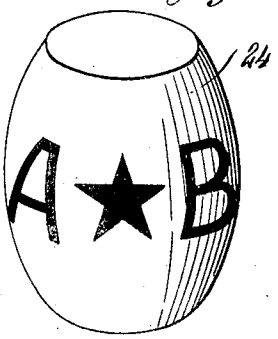
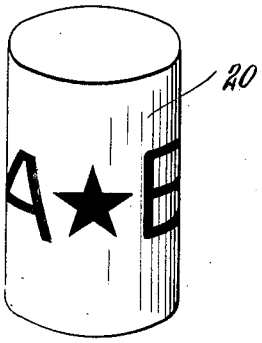


Fig. 6.



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METHOD OF APPLYING PIGMENTS TO SURFACES

Osias Austin, Brooklyn, N. Y.

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4 Claims. (Cl. 101—129)

My present invention relates to the method of applying pigments through a screen stencil to surfaces and aims to provide certain improvements therein.

Heretofore in applying pigments through a screen stencil to surfaces, the conventional practice consisted in placing the transfer surface of the stencil and the surface of the object to be imprinted into contact and impelling or forcing pigment through the stencil and onto the surface of the object by means, such as a squeegee or the like, which provided a substantially line contact between the stencil and the surface of the object. Where the pigment was to be applied onto a curved surface, either the screen stencil was made to conform to the surface and the pigment forced therethrough by a squeegee of a form complemental to said surface when in line contact thereover, or the transfer surface of the screen and the curved surface of the object were brought into contact by a progressive tangential movement of said surfaces and the pigment was forced through the screen by a squeegee or the like while said surfaces were in such tangential line contact. These prior methods required either specially formed stencil frames or specially designed mechanism and attachments depending upon the contour of the curved surface to which the pigment was to be applied. By said prior practice the surface thickness of the applied pigment was also limited by the character of the screen, the consistency of the pigment and the physical properties of the surface upon which the pigment was to be applied.

According to my present invention I provide a novel method for applying pigments in any desired thickness through a screen stencil to either flat or curved surfaces without recourse to specially shaped screen frames or specially designed mechanism and attachments. The method I employ consists in first forcing or impelling pigment through the screen stencil from the rear to the transfer surface thereof by any means whatsoever while the stencil is out of contact with the surface of the object and then bringing the transfer surface of the stencil and the surface of the object into contact. Where the pigment is to be applied to compound curved surfaces I preferably use a stencil frame at least two opposite sides of which are resilient so that they may be flexed to deform the normally flat stencil surface into a form which is complemental to the curved surface of the object when the surfaces of the stencil and the object are in line contact. The invention will be better understood from the detailed description which follows when considered in connection with the accompanying drawing wherein I have shown several applications of my invention, and wherein:

Figure 1 is a perspective view of an application of my invention to the printing upon flat surfaces.

Fig. 2 is a perspective view of a screen stencil illustrating the primary step in the carrying out of the method constituting my invention.

Fig. 3 is a perspective view of the stencil shown in Fig. 2 and the method of printing upon a cylindrical surface.

Fig. 4 is a perspective view of a modified form of stencil.

Fig. 5 is a perspective view showing the stencil of Fig. 4 deformed and the method of printing upon the compound curved surface of a barrel-shaped object.

Figs. 6 and 7 are perspective views respectively of the articles imprinted by the methods illustrated in Figs. 3 and 5.

Referring first to Fig. 1 of the drawing wherein I have shown an application of my invention to the printing upon flat surfaces, the numeral 10 represents a flat support or printing platform, adjacent to one edge of which is hinged by any suitable means a frame 11 provided with a screen stencil 12 having a design 13 thereon, the screen stencil being formed by any of the various means known to the art. Pivotally secured to one side of the frame 11 as at 14 is a spacer-foot 15 which normally supports the frame and stencil in spaced relation from the printing platform 10 during the primary step of practicing the method which consists in impelling or forcing pigment through the stencil while the latter is out of contact with the surface to be imprinted. Although no pigment or means for impelling such pigment through the stencil is shown in this figure it will be understood that the pigment may be forced through the screen by any desired means such as by drawing a mass of pigment across the rear or upper surface of the screen stencil by a squeegee or the like. To print or transfer the design from the stencil 13 to a sheet of paper or the like 16, such sheet is positioned on the printing platform 10 through the aid of register guides 17, the spacer-foot is moved about its pivot 14 and the frame 11 and stencil 13 are brought into contact with the sheet 16. As the frame and stencil are raised from the sheet the pigment impression will remain thereon. It will be understood that depending upon the character of the screen stencil and the consistency of the pigment, a predetermined amount of pigment will pass through the stencil when the mass of pigment is drawn across the stencil by a squeegee or the like. However, if instead of the mass of pigment being drawn across the stencil but once, it is drawn thereacross two or more times the amount of pigment passing through the stencil to the transfer face thereof will be materially increased. Accordingly, if it is desired to apply

a heavier than normal deposit of pigment to the surface which is to be imprinted, the pigment should be drawn across the stencil more than once. As an alternative to this last described procedure for providing a heavier than normal deposit of pigment upon the surface of the article instead of again drawing the pigment across the rear surface of the stencil while out of contact with the object the additional mass of pigment may be forced through the stencil by a squeegee or the like while pressing the stencil and the surface of the object into contact.

In Figs. 2 and 3 I have shown an application of my invention for printing upon a curved surface of an object. In carrying out this method the procedure described above in respect to forcing pigment through the screen while out of contact with the object is followed and in Fig. 2 I have shown a squeegee 18 and a mass of pigment 19 in the relation of said parts after the pigment has been drawn across the rear surface of the stencil. After this has been done the frame is turned over as shown in Fig. 3 and the object to be imprinted, such as a cylinder 20 is rolled across the transfer surface of the screen stencil to obtain an impression therefrom. As an aid in guiding the rolling action of the cylinder over the stencil, the frame 10*a* may be provided with a guide rail 21 or the like.

In Figs. 4 and 5 I have disclosed a screen stencil frame of a character such as to facilitate the application of my novel method to printing on articles having a compound curved surface. In this embodiment of my invention, the stencil frame preferably consists of a pair of spaced parallel rigid frame members 22 connected together by a pair of spaced parallel resilient frame members 23, the said frame members 22 and 23 supporting in any desired manner a screen stencil 12*a*. The stencil frame as thus constituted is adapted to be deformed into curved or arcuate form by supporting the rigid frame members 22 a distance apart less than the length of the resilient frame members 23, for example as shown in Fig. 5, it being obvious that any means (not illustrated) may be employed for holding the said frame members 22 in predetermined spaced relation. Thus, if it is desired to imprint the design upon an object having a compound curved surface such as the surface of a barrel-shaped article 24, the frame members 22 would be supported a distance apart such as to arch the resilient frame members 23 to a curvature complemental to the longitudinal curvature of the article 24. In carrying out an imprinting operation on the barrel-shaped article 24, the same procedure is followed as outlined with respect to imprinting upon the cylinder, supplemented only by the step that the screen frame upon being turned over is deformed and supported so as to give to the screen a predetermined desired curvature.

It will be appreciated that in carrying out the methods disclosed in Figs. 2 to 5 that if desired the surface thickness of the pigment applied to the articles may be suitably increased by following the procedure for applying pigment in a heavier than normal deposit as hereinbefore described with respect to Fig. 1. It will also be appreciated that with a stencil frame such as disclosed in Fig. 4 various forms of curved surfaces may be imprinted, it being only necessary that the deformation of the resilient members 23 and the spacing of the frame members 22 be such as to cause the screen stencil to conform to the complemental line contact shape of the article. For example the imprinting upon an S shaped surface may be accomplished by deforming the resilient frame members 22 into a double fold or S shape.

From the foregoing detailed description it will be apparent that although I have disclosed a simple, novel and economical method of applying pigments to the surfaces of objects by means of a screen stencil and while I have shown and described certain preferred procedures to be followed it will be understood that I do not wish to be limited to the specific details disclosed since these may be varied within the range of mechanical skill without departing from the spirit of the invention.

What I claim is:

1. The method of applying a heavier than normal deposit of pigment to the surface of an object by means of a screen stencil, said method comprising forcing viscous pigment in paste form through the screen stencil from the rear to the transfer surface thereof by drawing a mass of viscous pigment across the screen stencil while said stencil is out of contact with the object and repeating said operation to cause an additional amount of pigment to pass through the stencil prior to contact of the stencil with the object.

2. The method of applying a heavier than normal deposit of pigment to the surface of an object by means of a screen stencil, said method comprising forcing pigment in paste form through the screen stencil from the rear to the transfer surface thereof while the stencil is out of contact with the object and then forcing an additional amount of pigment through the stencil while in contact with the object by drawing a mass of viscous pigment across the stencil by a squeegee or the like which presses the transfer surface of the stencil and the surface of the object into contact.

3. The method of applying pigment to the curved surface of an object by means of a screen stencil, said method comprising forcing pigment through the screen stencil from the rear to the transfer surface thereof while said stencil is out of contact with the object, repeating said operation to cause an additional amount of pigment to pass through the stencil prior to contact of the stencil with the object and then bringing the transfer surface of the stencil and the curved surface of the object into contact by a progressive tangential movement of the surfaces of the stencil and the object.

4. The method of applying pigment to the curved surface of an object by means of a normally flat screen stencil having a stencil and a supporting frame, two opposite sides of said frame being flexible and resilient to stresses normal to the plane of the stencil, said method comprising forcing pigment through the screen stencil from the rear to the transfer surface thereof while in normally flat condition and while said stencil is out of contact with the object, flexing the resilient sides of the frame to deform the stencil into a contour substantially complemental to the curved surface of the object when in line contact therewith, holding said stencil in such flexed condition and then bringing the transfer surface of the stencil and the surface of the object into contact by a progressive substantially tangential movement of said surfaces.

OSIAS AUSTIN.