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PROCESS OF MANUFACTURING A PHOTOGRAPHIC STENCIL

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Generally speaking our invention relates to stenciling designs and the like on surfaces, such for instance as glass, wood, porcelain, enamel and other material and comprises a new and improved stencil for such purposes and a process of manufacturing the same.

Such stencils are now prepared by a photographic process, but by the present practice it is impossible to obtain sharp and clear cut edges in the stencil, and therefore the result is that a product with blurred and uneven edges is obtained.

In our process we stretch on a rigid frame a piece of fine mesh material, such as bolting cloth, silk, organdy, or fine wire mesh to form a screen. This material is stretched tautly on the frame, and we then de-size the bolting cloth, as by immersing it in boiling water. This operation not only removes the sizing but also causes the material, if not made of wire mesh, to shrink, and increases its tautness. The frame with the screen material tautly stretched thereon is then carefully immersed in cold water so that no air is trapped or occluded beneath the screen.

The frame upon which the screen is stretched is preferably made of wood or like material so that it will float and the screen is at the surface of the water, but the porosity of the screen causes its upper surface to become wetted. The screen is then carefully brushed to remove any dirt or foreign material.

We then carefully lay on the screen a sheet of hard rolled gelatin of the proper dimensions and of the thickness of approximately two thousandths of an inch to five ten thousandths of an inch. The dimensions of the gelatin are less than that of the screen because the reaction of the gelatin with the water causes the gelatin to expand in area. Obviously there will be less expansion in a relatively thin sheet of gelatin than in a thicker sheet of gelatin, so the dimensions of the gelatin sheet are regulated by its thickness.

It is important that both sides of the sheet of gelatin be fully wetted, as otherwise it will curl and buckle.

After the sheet of gelatin has been thoroughly saturated and has expanded to cover the screen to the desired degree, the frame with the screen and the gelatin layer superimposed thereon is lifted from the cold water bath. Then the gelatin surface is sensitized as with a potassium dichromate solution. The under side of the screen is then painted with a thin layer of sensitized glue solution, such for instance as fish glue solution.

Both sides of the screen are now sensitized and the screen is allowed to dry in a dark room, and after it has dried we prefer to add another layer of sensitized glue to the back of the screen. The glue acts to firmly bond the elements together and this is expedited and assisted by the hydrated condition of the gelatin.

After the second layer of sensitized glue has dried we then apply to the front or gelatin face of the screen the positive of the design desired to be reproduced in the stencil. This is done by inserting the screen and the positive in a regular photographic printing frame with a black surface as a backing for the screen.

The assembled positive and the screen are then exposed to natural or artificial light to print the design on the screen. The printed screen is then removed from the printing frame and we then immerse the front or gelatin face of the screen in hot water of preferably about 100 to 120° Fahr. for the purpose of dissolving away the portion of the gelatin surface which was protected by the positive in the printing operation and also to dissolve away the protected portion of the sensitized glue on the rear of the screen.

After the hot water begins to come through the previously protected portion of the screen to the back side of the same, we push the screen up and down in the hot water with considerable force so as to assist and expedite the passage of the hot water through the meshes of the screen. The water does not pass through the unprotected portion of the screen because during the printing operation such portion was exposed to the light and is set, and therefore the materials do not dissolve in the hot water. The sensitized gelatin and the sensitized glue after being exposed to light become insoluble in water materially less than boiling temperatures.

The screen is then thoroughly dried and the gelatin face is coated with a material to render the stencil flexible and more permanent. For this purpose we have successfully used an alcohol solution of glycerine or an aqueous solution of resin.

The result is that the screen has now been formed into a stencil in which the parts protected in the printing operation are clear screen mesh, the previously protected sensitized materials having been dissolved away and removed, while throughout the remaining portions of the stencil, the previously unprotected sensitized material remains.

The result is that our stencil thus obtained has sharp, clean cut margin lines, and there is

no blurring or unevenness but each part of the design is brought out clearly and sharply throughout. The lines do not follow the mesh of the material of the screen but reproduce faithfully the lines of the print from which the stencil has been made, regardless of whether or not the lines of the print are parallel with or transverse to the mesh of the screen. Therefore the stencil is as clear and clean cut as the positive from which it was made.

It will be noted that in our improved stencil there is a photographic action resulting in printing of the stencil in the sensitized material on both sides.

One of the advantages of our stencil is that the sheet of gelatin forms a unit layer on the surface of the front of the screen and is held there by the first coating of sensitized glue applied to the back of the screen. The second coating of sensitized glue forms a unit layer on the back surface of the screen. These individual or unit layers on the front and back of the screen permit the screen to be worked or flexed when it is used as a stencil without danger of cracking or otherwise loosening the gelatin sheet from the screen. If the gelatin sheet were applied to the screen in its dry state and secured thereto, or if the gelatin were applied in the form of a solution, as by a brush, it would loosen and break away from the screen when flexed repeatedly during the process of making stenciled products and shorten the effective life of the stencil.

Another advantage of our stencil resides in the fact that the design, to be printed on the sensitized sheet of gelatin after it is secured to the screen, may be placed so that the sharpest side of the design is adjacent the gelatin during the printing operation which results in providing the sharpest outline of the stencil immediately adjacent the article to which the stencil is to be applied. By employing a sheet of gelatin, which is of uniform thickness, in the first instance, this advantage is quite a marked improvement in the art which would not occur if the gelatin were uneven as by being formed in the first instance by the brushing or spraying of a solution of gelatin.

By using different thicknesses of sheet gelatin we are enabled to vary the thickness of the finished stencil and thus regulate with reasonable precision the thickness of layer of pigment or other substance on the article to be decorated.

We claim:—

1. The process of producing a photographic stencil which comprises applying a sheet of sensitized gelatin to one surface of a mesh screen, applying sensitized glue to the other side of the screen, printing the design on the sheet, and then removing the soluble sensitized material from the portions of the screen which were protected during the printing step.

2. The process of preparing a photographic stencil comprising the steps of stretching a mesh screen on a frame capable of floating in water, floating said frame on water, permitting the water to wet the upper surface of the screen, applying a sheet of gelatin to the wetted surface of the screen, removing the frame from the water, sensitizing the gelatin, applying a coating of sensitized glue on the under side of the screen, printing a design on the sensitized gelatin while backing the screen with a black surface, washing the soluble sensitized portions of the gelatin and glue from the screen, which portions were protected during the printing step.

3. The process of producing a plate to be sensitized for use as a photographic stencil which comprises applying a sheet of gelatin to one surface of a mesh screen and applying a binder through the mesh screen from the other side thereof to hold the gelatin thereto.

4. The process of producing a plate to be sensitized for use as a photographic stencil which comprises applying a sheet of gelatin to one surface of a mesh screen, applying a binder through the mesh screen from the other side thereof to hold the gelatin thereto, and applying a second layer of material on the binder.

5. The process of producing a plate to be sensitized for use as a photographic stencil which comprises the application of a gelatin sheet of predetermined thickness to one side of a mesh screen, hydrating said sheet causing it to expand over the screen and applying a binder through the mesh screen from the other side thereof to hold the gelatin thereto.

6. The process of preparing a sensitized screen which comprises laying a sheet of gelatin in juxtaposition to a screen mesh while in a liquid, and lifting said gelatin and said screen out of solution in juxtaposition.

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