July 3, 1928. 1,675,561

G. I. KEEL

SENSITIZED SCREEN AND PROCESS OF MAKING SAME

Filed Aug. 9, 1926

FIG. 1

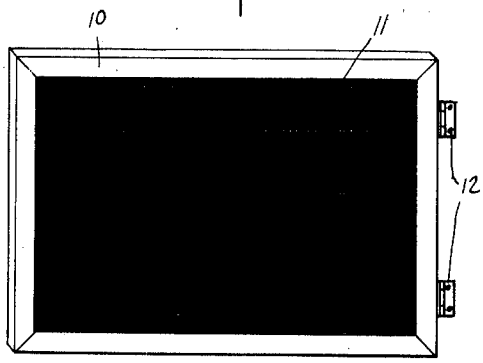


FIG. 2

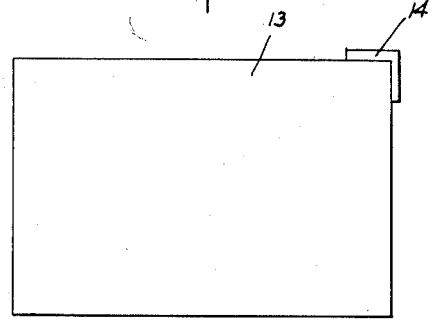


FIG. 3

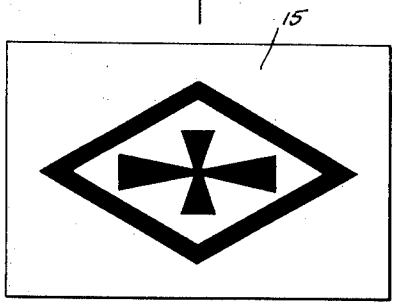
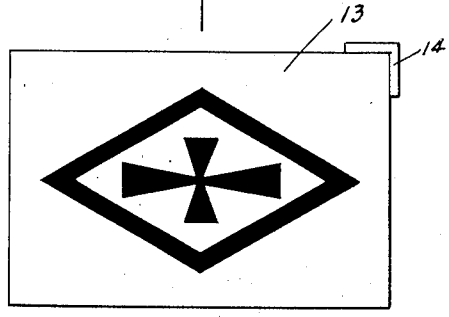


FIG. 4



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SENSITIZED SCREEN AND PROCESS OF MAKING SAME.

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This invention relates to the process of making more or less mechanically a screen for stencil process work.

The principal object of the invention is to provide a screen stencil produced mechanically by the aid of a sensitizing solution, a celluloid or glass or other transparent negative and a mesh screen which may be of silk, wire or any other material of a mesh nature.

In producing a screen stencil of this nature to be employed in the art of reproducing pictures or the like, a mesh screen is provided which has been sensitized by a chemical solution which is acted upon by light thru a negative in such a way as to render a portion of the screen impervious and also permit certain portions of said screen to be washed out, thereby producing a stencil of the opaqued portion which appeared on the negative. Thus by forcing a color medium through the said screen after it has been exposed to the light (artificial or natural) through the said celluloid or glass negative upon which the desired design has been opaqued, a perfect reproduction of said design may be had without missing a detail.

The screen furthermore permits of obtaining the finest and most delicate variations in designs such as "ben day" work, half tone work, line drawing, etching, engravings, pastel painting, photographs and numerous other works, not permissible or possible by the well known manual method of making a screen stencil, namely, the "hand blocking out" method.

A screen of this nature may be provided to take the place of costly zinc plates, litho processed stones etc., thus by the aid of such a screen, such works of art may be reproduced at lesser cost. Furthermore, it permits of forcing oil, water or other color paste mediums therethrough to produce designs which will be composed of the most intricate line variations as well as the broadest expanse of colored portions.

The full nature of the screen and the process of making the same and the advantages acquired thereby will be hereinafter more fully set forth and described in detail.

In the drawings, Fig. 1 is a perspective view showing the frame with a screen stretched thereon. Fig. 2 is a plan view of a celluloid blocking out sheet with a corner metal register strip fastened thereon. Fig. 3 illustrates the original or master design. Fig. 4 illustrates the celluloid after the design has been opaqued thereon.

In practicing this process, there is used a wooden or metal frame 10 provided with a small mesh screen 11 mounted thereon. Said screen is preferably of fabric, but may be of wire or any other suitable material. The screen is secured at the edges of the frame by tacks or sealing strips etc., and sealing strips of paper, tape or the like are glued about the edges thereof whereby the said screen will be tightly drawn and secured in place and permit no leakage of the paint which will be hereinafter described, between the screen and the frame.

One side of the frame is provided with the hinge members 12 adapted to register with corresponding hinge members which may be mounted on the work table whereby the screen when in printing position will be properly aligned by the connection between the hinge members for inserting fresh sheets of cardboard or the like thereunder. In this connection, it will be noted that the side of the frame upon which the screen is secured, is positioned adjacent the surface of the work bench.

There is further provided a celluloid sheet 13 (Fig. 2) ground on one side and of substantially the same size, or larger than the picture or design to be reproduced. Said celluloid sheet is provided at one corner with a metal registering strip 14 having two arms adapted to lie along adjacent edges thereof and to which said sheet is rigidly clamped. This permits the celluloid being properly positioned with respect to the screen and frame for printing purposes and and assists in more perfect alignment of the design on the screen.

For practicing the process, there is provided a single original or master design 15 (Fig. 3). The screen is treated in the following manner preparatory to use as will be hereinafter described. The screen 12 after it has been stretched to the frame 10 is washed thoroughly with alcohol and dried. This is done to rid the silk which forms the preferable type of screen, of oils and perspiration of the hands etc. As soon as the screen is thoroughly dry, it is taken into a dark room and by the aid of a ruby lamp or the like, a sensitizing solution is flowed onto the outer side of the screen, that side which is flush with the surface of the frame. The excess solution after flowing over the screen,

is caused to flow into a suitable black photographic tray or similar container to be again used. The screen thus treated is then set aside in a dark box to dry thoroughly. After drying, the treated surface of the screen will be hard so as to form a substantially impervious surface.

It is again processed by pouring the same solution into the frame on the inner side of the screen and washing it about therein until the surface has become thoroughly covered. By reason of the hardness of the solution on the outer side, the solution during this operation will be prevented from passing through the screen. The excess solution is then poured out of the frame and the screen is placed back in the dark box again for drying. After the screen is thoroughly dried the mesh will be completely closed by a hard substance and be impervious. It may be noted here that the reason for processing the screen in a dark room is that the solution is of such a character as to be affected by white rays of light in the manner of a photographic film or plate for reasons which will hereinafter be set forth.

The solution for sensitizing consists of the following ingredients: One quart of fish glue of the best quality such as Le Page's photo engraving glue, is mixed thoroughly with 48 ounces of boiling hot distilled water into which has been disolved one ounce of the very best quality of gelatin. Into this solution, 4 ounces of pulverized bichromate of ammonia or bichromate of potassium is mixed, after which the solution is permitted to become cool. Separately of the above solution, 2 ounces of powdered egg albumen is thoroughly mixed in 14 ounces of cold distilled water into which has been thoroughly stirred the whites of three ordinary fresh eggs. Into this solution is stirred 4 ounces of clear ammonia. The second mixture is mixed into the first mixture of the glue solution when it has become cold.

A third mixture is provided consisting of ½ ounce of pulverized nitrate of silver which is thoroughly mixed with 32 ounces of cold distilled water. This third solution is then mixed with the other two solutions, after which the combined solution is strained through a fine cloth and kept or corked in an amber bottle. It is then ready for use. A dark room is employed for processing the screen as above described and the screen is given a sensitized impervious surface which is affected by light striking it as in the case of a photographic plate, which action will be utilized for the purpose hereinafter described.

The coloring of the design is indicated by a solid block for example in Fig. 3 on the master design.

In following out the process, the celluloid sheet 13 (Fig. 2) is placed over the master design 15 and the design is blocked out on the frosted surface of the celluloid. Therefore in this instance the colored area indicated on the master design in black will be blocked out on the celluloid by any suitable means of paint so as to be opaque. In other words, the celluloid sheet will appear just as shown in Fig. 4. The screen (Fig. 1) is then positioned, (after it has been sensitized) over the celluloid sheet (on which the design has been opaqued) and aligned by the metal register strip at the corner of the celluloid negative into a suitable printing frame such as is used in a photographer's printing out frame or a blue print printing frame. The screen, after having been backed up by the printing block, (used for clamping the screen to the negative in such a way that the opaqued portion on the celluloid will be tight against the sensitized screen) is exposed to the action of light, preferably sunlight. An exposure is made through the translucent part of the celluloid. Obviously, that portion of the design which is blocked out on the celluloid or opaqued portion, will not be penetrated by the light and the sensitized surface thereunder will be unaffected by the light. A sufficient exposure is given so that the light passing through the translucent part of the celluloid will affect the sensitized screen so as to harden the solution with which it is treated to such extent that it cannot be readily washed out. However, that portion of the screen which is not reached by the light will remain soluble. The celluloid is removed in a dark room and the screen washed thoroughly in water which has the effect of washing out and removing from the mesh such of the solution as is untouched by the light. Therefore we have a design transferred from the celluloid to the screen which is represented by open mesh as against the remaining position of the mesh in the screen being closed and impervious.

The screen, after it has thoroughly dried, may be treated in the following manner for elasticity to prevent the squeegee action from wearing out the solution. The inner surface of the screen is then painted over solidly with a coat of Duco (preferably) and the screen is placed right side up on a table to dry. This may be done by daylight or artificial light. When the screen is thoroughly dried, then with Duco thinner or a solution of amyl acetate and banana oil, the screen is washed out on the opposite side with a cloth and dried. Thus we again open the mesh of the Duco and the surface of the screen that was hardened by light exposure will have a coat of Duco as against the open mesh which will be cleared through the washing out by means of the amyl acetate solution.

Whatever pinholes appear in the screen

can be painted out with a soft camel hair brush with Duco or a mixture of 10 parts orange shellac, 1 part dry lamp black and 1 part castor oil, which solution is substantially permanent and pliable as well.

The screen is then taped with paper tape at the edges of the silk, i. e. where the silk has been fastened to the frame 10 so that in this manner no paint will leak through the screen onto the cards in reproducing the design.

The operator hinges the screen in position on the operating table by interlocking the hinged sections. This readily positions the screen and permits it to be raised and lowered. The cardboard upon which the design is to be printed or reproduced is then placed under the screen and registered into place by small strips of cardboard or specially prepared registers and the usual means of forcing the color therethrough is employed by passing a squeegee across the surface of the screen. The color may be of oil, water or any other color of a paste or runny nature. Thus the color is forced through the open areas of the screen onto the cardboard.

In connection with the sensitizing of the screens, it may be observed that any suitable sensitizing solution may be employed, the particular solution set out and described in detail being suitable for the purpose and having been conceived for use with respect to this particular process. Furthermore the negative which has been described herein as a celluloid sheet may be in the nature of a glass plate or any other form of transparent material.

This process of making a screen stencil lends itself to commercial work inasmuch as the negative employed may be a photographic plate of any commercial print or a photograph such as a newspaper advertisement or picture, an oil painting, a photograph or the like.

In reproducing an engraving of a complicated character, considerable time would be eliminated in arriving at a print of this kind by making the photograph thereof by the wet plate process and taking the positive plate from the photographic negative which positive plate may be used after the same manner as the celluloid negative herein described.

A half tone negative may be made from a photograph in a sixty line screen finer or coarser, and this used as a negative for reproducing the photograph which is made up of little dots such as found in a newspaper cut. Using the process of making a screen stencil herein described, permits of reproducing the finest line to the heaviest line without missing a detail. In such a reproduction from a photograph or the like using a positive wet plate in the same manner as the negative herein, coloring may be added by opaquing or blocking out portions of the positive plate and transferring the same to screens to be used for the various colors. In this manner we will opaque on the positive instead of the celluloid negative as above described.

The invention claimed is:

1. The process of preparing and treating a screen stencil for reproducing colored designs consisting of applying a sensitizing solution over the surface thereof, printing a design thereon through a negative on which has been opaqued the desired design, washing the soluble solution therefrom, applying a lacquer over one side of the screen, and thereafter removing said lacquer from about the design formed from the non-soluble solution by applying a thinner and washing through the screen from the other side thereof.

2. The process of preparing and treating a screen stencil for reproducing colored designs consisting of washing said screen with a cleansing fluid for removing the foreign matter therefrom and permitting the same to become thoroughly dry, applying a sensitizing solution over the surface thereof, printing a design thereon through a partly blocked out translucent negative, washing the soluble solution therefrom, applying a lacquer over one side of the screen, and thereafter removing said lacquer from the open design formed by the soluble solution by applying a thinner and washing through the screen from the other side thereof.

3. The process of preparing and treating a screen stencil for reproducing colored designs consisting of removing the foreign matter therefrom by means of a cleansing fluid, flowing a sensitizing solution over the surface of said screen, permitting said solution to become dried in a suitable dark room so as to form a substantially impervious surface, printing a design thereon through a partly blocked out translucent negative, whereby said solution over the portion of said surface not covered by the design will be affected by the light so as to become insoluble, washing said screen after exposing to the light so that the soluble solution will be removed, whereby said screen will have a portion of its surface forming the design impervious and the remaining surface pervious for permitting color to be passed therethrough, applying a coating of lacquer to one surface of said screen, and thereafter washing the same therefrom with a thinning solution from the other side of said screen whereby the lacquered surface will be retained on the impervious surface and removed from the pervious surface thereof.

In witness whereof, I have hereunto affixed my signature.

GLEN I. KEEL.