

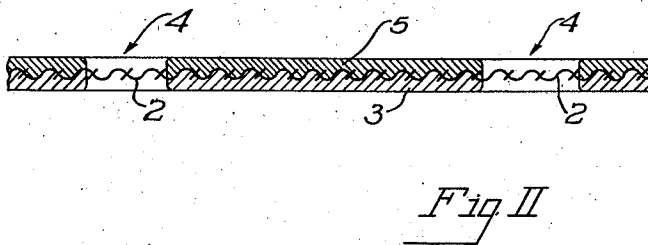
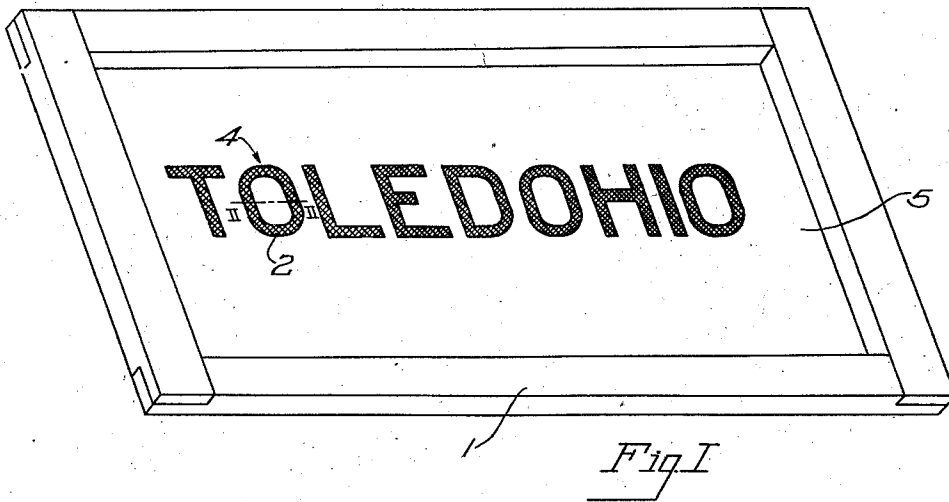
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PROCESS FOR MAKING PHOTOGRAPHIC STENCIL SCREENS

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## PROCESS FOR MAKING PHOTOGRAPHIC STENCIL SCREENS

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One of the objects of my invention is the provision of a process for making photographic stencil screens which avoids appreciable change in dimensions of the design such as have heretofore resulted from swelling and shrinkage of materials.

Another object of my invention is the provision of a process for making photographic stencil screens which reduces the liability of accident or spoilage during production and which produces a stencil screen of great durability on which the designs to be reproduced are clearly demarked.

And still another object is the provision of a process for producing a photographic stencil screen having a web which remains in such condition that it may be easily cleaned and reused.

Other objects and advantages will be apparent from the following description, in which reference is had to the accompanying drawing illustrating a preferred embodiment of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawing:—

Figure I shows a photographic stencil screen mounted on a frame and finished in accordance with my process.

Figure II is a greatly enlarged sectional view of a portion of the screen sectioned on the line II—II of Figure I.

### *Preliminary preparation of the screen*

In preliminary preparation of the screen a piece of fine silk web is fastened by any preferred means, such as tacking, upon an open frame of wood or other suitable material, care being taken that the silk web when fastened to the frame is smooth and free from wrinkles.

After the silk web is fastened in place upon the frame it is washed with hot water to remove starch and other water-soluble material which may adhere to it. Upon drying, the web shrinks and becomes taut. It is then cleaned with alcohol to remove any grease or oil with which it may be contaminated, after which a thin coat of nonsensitized photo-gelatin is applied to the web with a soft cloth, care being taken that the threads are coated separately so that films of gelatin do not close the openings in the web. It is then permitted to dry.

### *Preparation of sensitized sheet for exposure*

In carrying out my process, thin, transparent sheet celluloid is utilized to protect damp, sensitized gelatin during exposure to light and to carry the exposed gelatin, while still damp, from paper tissue to a silk mesh screen. A piece of transpar-

ent sheet celluloid, preferably about .0075 of an inch in thickness, is cut to the size of the screen desired. A thin coat of waxing compound, which may consist of a mixture of beeswax and rosin dissolved in turpentine, is applied to the celluloid sheet, which is then polished with a cloth until dry. Commercially available pigmented, gelatin-coated paper tissue provides gelatin in convenient form for use. The color of the pigment is not important, but I have found the grade of gelatin-coated tissue known to the trade as Autotype No. 106, Red Chalk Color, to be suitable for use in carrying out my process. A piece of such gelatin-coated tissue is cut to the desired size and immersed for two minutes at 60° F. in a bath of the following formula:

13 ounces water	
¼ ounce potassium dichromate	
⅛ ounce ammonium dichromate	
2½ ounces alcohol	20
5 drops 28% ammonium hydroxide	

The action of the bath is to render the gelatin sensitive to the influence of light so that upon exposure to light the sensitized gelatin becomes relatively insoluble in water. While the gelatin is being treated in the sensitizing bath the sheet of waxed and polished celluloid is dipped in cold water and then placed upon a flat surface with the waxed side up and upon removal from the bath the gelatin-coated tissue is placed gelatin-side-down on the waxed surface of the celluloid and the gelatin is rubbed into intimate contact with the celluloid by means of a squeegee so that the sensitizing solution is forced from between the gelatin and celluloid. The celluloid, gelatin and tissue are then placed under pressure for 30 minutes to insure reliable adherence and avoid liability of slippage between the celluloid and gelatin.

### *Exposure*

The laminated sheet consisting of transparent celluloid, damp, sensitized gelatin and paper tissue is then placed in a printing frame with a positive—i. e. a translucent sheet upon which the design to be reproduced is relatively opaque—overlying the celluloid and exposed for 14 minutes more or less (depending upon the character of the design) to the light of a 1000 watt lamp at a distance sufficient to avoid softening of the gelatin by heat, e. g. approximately 37 inches. Light transmitted to the sensitized gelatin through the translucent portions of the positive render the portions of the gelatin which the light reaches relatively insoluble.

### *Transferring the gelatin to the silk web*

The laminated sheet of celluloid, gelatin and tissue then is removed from the printing frame and placed in water at a temperature of about 105° F. The portion of the gelatin in contact with the tissue, having been shaded by the pigment during the exposure and therefore having remained relatively soluble, will soften after about three minutes so that the tissue can be readily peeled off. After the tissue is removed, the remainder of the soluble gelatin is washed away by further rinsing in water at a temperature of 105° F., so that the design to be reproduced appears as a transparency. The sheet is then rinsed in cold water to chill and stiffen the gelatin, drained, placed on a flat surface with the celluloid down, and the tautly stretched silk web is laid over the gelatin and pressed down tightly with blotting paper. The water is absorbed so far as practicable by the blotting paper and the gelatin is allowed to dry, whereupon the sheet of celluloid is peeled away. Often the curling tendency of the celluloid will cause it to peel away from the gelatin when the latter dries. While the gelatin adheres to the celluloid sheet it is prevented from shrinking appreciably as it dries out. Hence the dimensions as they finally appear when stenciled through the silk web are substantially the same as the dimensions of the designs on the positives from which they were photo-imprinted upon the gelatin.

### *Reinforcing the screen*

The screen now consists of a fine-mesh, silken web 2 tightly stretched on a frame, with a layer of gelatin 3 adhering to one side of the web, except that portion occupied by the open parts of the design 4. It is possible to use the screen in this condition for a limited number of applications of the design to the surface upon which it is to be finally stenciled, but in order to prolong the life of the screen, and to render it tougher and less liable to damage by accident as well as by wear, I apply a coating of celluloid 5 dissolved in two parts of lacquer to the side of the web opposite to that covered by the gelatin. In applying the coating of celluloid, the open portions of the screen as well as the closed portions are coated, but the coating of celluloid is subsequently removed from the portions of the screen not covered by the gelatin by applying a solvent to the gelatin-coated side of the screen. The solvent passes through the openings in the gelatin coating and dissolves away the celluloid immediately behind the openings. In an intricate design, these openings are often very small, but the lacquer solvent, when applied to the gelatin-coated side, seeks them out nevertheless. In the completed screen, the silk web 2 lies between a layer of gelatin 3 and a layer of celluloid 5, except at the open parts 4 of the design where the gelatin has been dissolved away by warm water and the celluloid has been dissolved away by solvent applied to it through the openings in the gelatin. (See Figure II.)

In the screen illustrated in Figure I the celluloid-coated side 5 of the web lies inside the frame 1 and the gelatin-coated side of the web faces downwardly. It is in this position that the screen is placed upon the surface to be stenciled. The stenciling compound is applied to the celluloid-coated side of the web and rubbed through the openings in the design by means of a squeegee, the design thus being reproduced

upon the surface to be stenciled. The wear resulting from the operation of the squeegee occurs only on the celluloid-coated side of the web. After long use the celluloid coating may be renewed by another application of celluloid dissolved in lacquer and the coating overlying the open portions of the design dissolved by the application of solvent through the openings in the gelatin coating as was done in respect of the original application.

### *Removing the coatings from the screen*

The celluloid coating may readily be removed from the side of the web inside the frame by applying solvent thereto. By reason of the fact that the threads of the silk web are coated with nonsensitized soluble gelatin and by reason of the fact that the coating of insoluble gelatin is applied to only one side of the web, the gelatin coating may be readily removed from the web by the action of hot water applied without removal of the celluloid coating. The decoated web after drying may be cleaned with alcohol to remove any grease that may have been deposited upon it in handling, treated with thin, nonsensitized gelatin and a new gelatin and celluloid stencil applied to it.

The embodiment of my invention herein shown and described is to be regarded as illustrative only, and it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

Having described my invention, I claim:—

1. A process for making photographic stencil screens which includes the steps of applying a thin sheet of transparent celluloid to the gelatin side of a gelatin-coated tissue, exposing the celluloid covered gelatin to light received through an element bearing a design to be reproduced and through the transparent celluloid, removing the tissue while the gelatin remains adhering to the celluloid, dissolving unexposed portions of the gelatin, applying a web to the gelatin while damp, drying the gelatin, and peeling away the celluloid.

2. A process for making photographic stencil screens which includes the steps of light-sensitizing the gelatin of gelatin-coated tissue, applying a sheet of thin, transparent celluloid to the gelatin while still wet with the sensitizing solution, exposing the celluloid covered gelatin to light received through an element bearing a design to be reproduced and through the transparent celluloid, wetting the gelatin and tissue with warm water, removing the tissue, washing away unexposed portions of the gelatin, applying a taut web to the gelatin while it is still damp, drying the gelatin, and removing the transparent celluloid sheet.

3. A process for making photographic stencil screens which includes the steps of light-sensitizing the gelatin of gelatin-coated tissue, applying a sheet of thin, transparent celluloid to the gelatin while still wet with the sensitizing solution, exposing the celluloid covered gelatin to light received through an element bearing a design to be reproduced and through the transparent celluloid, wetting the gelatin and tissue with warm water, removing the tissue, washing away unexposed portions of the gelatin, applying a taut web to the gelatin while it is still damp, drying the gelatin, removing the transparent celluloid sheet, applying a coat of celluloid to the side of the web opposite the side applied to the gelatin,

and dissolving away the celluloid overlying portions of the web not covered by the gelatin.

5 4. A process for making photographic stencil screens which includes the steps of applying a  
thin sheet of transparent celluloid to the gelatin  
10 side of a damp gelatin-coated tissue, exposing the celluloid covered gelatin to light received through an element bearing a design to be re-  
15 produced, removing the tissue from the damp gelatin while the gelatin remains adhering to the celluloid, dissolving unexposed soluble portions of the sheet of gelatin adhering to the celluloid, applying a web having its threads treated with soluble gelatin to the sheet of damp gelatin ad-  
hering to the celluloid, drying the gelatin, and peeling away the celluloid.

5 5. A process for making photographic stencil screens which includes the steps of coating the threads of a web with unsensitized soluble gelatin and applying a sheet of relatively insoluble  
20 gelatin to the web.

25 6. A process for making photographic stencil screens which includes the steps of treating the threads of a web with unsensitized soluble gelatin, applying a sheet of relatively insoluble gelatin to one side of said web, and applying a coat-

ing of celluloid in solution to the other side of said web.

7. A process for making photographic stencil screens which includes the steps of treating the threads of a web with soluble unsensitized gelatin, applying a sheet of relatively insoluble gelatin to one side of said web, said sheet of gelatin having openings therein corresponding to designs to be reproduced, applying a coating of soluble celluloid to the other side of said web, and  
10 dissolving away the portions of said celluloid coating overlying the openings in said sheet of gelatin by the application of a solvent to said portions of said celluloid coating through said openings.

15 8. A photographic stencil screen comprising, in combination, a web, the threads of said web being treated with unsensitized soluble gelatin, a sheet of relatively insoluble gelatin adhering to one side of said web, and a coating of soluble  
20 celluloid adhering to the other side of said web, there being registering openings in said sheet of gelatin and said celluloid coating corresponding to a design to be reproduced.

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