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TRANSFERABLE SILK SCREEN STENCIL

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TRANSFERABLE SILK SCREEN STENCIL

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My invention relates to an improvement in stencils; and resides more particularly in that type of stencil used in silk screen stencilling work.

In the use of silk screen stencils, several processes have been commonly used. In some instances, the silk screens have merely been painted opaque throughout the desired areas, so as to prevent paint from being forced therethrough over these areas. Stencils have also been cut of opaque or paint impervious material, and these stencils applied to the silk screen. The paint forced through the screen is thus applied in a predetermined pattern.

Two difficulties exist with these usual types of stencils. In the first place it is difficult to cut intricate designs in the stencils, and such work requires much time and patience. In the second place, the surfaces of such stencils are usually smooth and glossy, making it difficult to draw a pattern or design on the stencil to be cut.

The object of the present invention is to avoid these former difficulties. The present invention involves a stencil produced in various intricate designs, and which may be applied to a silk screen. This invention also involves the formation of a stencil having a sufficiently rough surface to permit a sketch or design to be drawn directly thereupon.

An object of the present invention is to produce a stencil having a design and a blank area applied to a transfer paper. In preparing the stencil, the blank area is cut to produce any predetermined lettering or additional design desired, and the areas through which paint is to be forced removed from the transfer backing sheet. The stencil is then applied to the silk screen, and the backing sheet removed. Paint forced through the stencil will then produce a combined design and lettering arrangement.

The value of such a stencil will be better understood when it is realized that the actual silk screen processing is relatively simple, and can be done by relatively inexperienced persons, and by persons not possessed with unusual artistic talent. A poster advertising any event, such as a hockey game, a football game, a baseball game or the like is much more effective if a picture illustrating some part of the game is incorporated in the design. On the other hand, an artistic poster illustration of such an event requires the talents

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of a skilled artist. The lettering portion of the poster requires much less artistic ability.

Accordingly, I have found that by producing stencils in the form of transfers which incorporate a design and a blank area in which any desired lettering may be cut, extremely attractive posters may be made by anyone having the ability to cut lettering into the stencil. As this lettering may be done by following a template when necessary, posters may be made by persons having little experience in silk screen stencil work.

Another important feature of the present invention resides in the fact that my stencils are formed with a surface capable of receiving pencil impressions or the like. The stencil material which has previously been used is ordinarily provided with a glossy surface due to the fact that the stencil film is usually formed of lacquer or plastic material. While I desire to utilize a film embodying materials which would normally be glossy, I incorporate in this film a material which will produce a surface capable of receiving and maintaining a pencil impression. For example, in the outer layer of the film I incorporate material such as whiting, pumice or certain magnesium powders or the like. The film which results can be marked with an ordinary lead pencil and accordingly a design may be drawn directly upon the stencil. This differs materially from the usual transparent type of stencil material which must be placed over a design during the cutting operation.

A feature of my invention lies in the fact that the coating will peel readily from the gummed paper without dissolving the adhesive. In the formation of my stencil the film coating on the adhesive may be cut with a suitable stencil knife and portions of the film may be removed by peeling these portions from the adhesive. The film peels readily and the portions removed may be withdrawn in their entirety.

Another feature of the present invention lies in the fact that the coating will not come loose from, or adhere steadfastly to the gummed surface under certain atmospheric conditions, as is true of other types of adhesives such as rubber cement. I have found that a coating of rubber cement on the backing sheet will have a tendency under certain weather conditions to adhere so strongly to the backing sheet that extreme dif-

ficulty is experienced in peeling the film therefrom. Tests have shown that my coating will peel from the backing sheet in both hot and cold weather and under any normal condition of humidity. I have also found that particles of other adhesives will cling to fine mesh screens where they are not intended. Any loose particles of my coating material will not have a tendency to adhere to the screen. Thus the poor and improper printing sometimes occurring due to foreign particles of coating adhering to the silk screen is obviated.

An additional feature of the present invention lies in the fact that my coating will cut cleanly and not leave an imperfect edge along the cut line. With other types of coating such as rubber cement, excess pressure of the cutting knife has a tendency to force particles of the rubber cement into contact with fibers of the backing sheet, adhering these loose fibers to the coating and producing an imperfect or feather edge. This difficulty does not exist when my coating is employed.

An additional feature of the present invention lies in the fact that small islands of coating in very fine cut detail can not be accidentally pulled from the stencil with the backing sheet when the backing sheet is removed. This is true as the adhesive on my backing sheet is dissolved before the backing sheet is removed, obviating the necessity of pulling or peeling the backing sheet from the film coating after the stencil is adhered to the mesh of the printing frame.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawing forming a part of my specification the figure illustrates a typical poster formed from a stencil employing a preformed design and a blank area upon which suitable indicia may be added.

In the formation of my stencil I use a backing sheet such as may be formed of paper coated with a dextrine gum. Other water soluble adhesives may also be used within the scope of my invention. Upon this paper backing sheet I provide a coating at all parts of the stencil through which paint is not to be forced. This coating may preferably be in the form of a design, having a blank area in conjunction therewith. This blank area may be partially cut away to produce the necessary lettering or further design features which are to be incorporated in the finished product.

A second coating is applied over the first coating. This second coating embodies an abrasive material to produce a finish on the paper capable of receiving and maintaining a pencil impression. In other respects the second coating may be similar to the first coating mentioned. The second coating is preferably applied to the same areas as the first coating, leaving other areas of the backing sheet uncoated.

The coatings mentioned may be applied in any suitable way. For example the coating may be applied through an original silk screen as described in my copending application, Serial No. 394,103, filed March 19, 1941, for "Method of forming a transferable silk screen stencil." Alternatively, the sheet may be roller coated, or the coating may be applied thereto by a suitable intaglio or offset printing process which will print the coating in the proper position on the backing sheet.

In order that the type of coating which we desire to use may be understood and as an example

of the type of coating which may be employed, I describe the following:

Cellulose nitrate lacquer
Oily plasticizer and retarder
Aluminum bronze powder

As a second example of the ingredients incorporated in the first coating I may cite the following:

Cellulose acetate lacquer
Oily plasticizer and retarder
Aluminum bronze powder

As a more specific example of a type of the first coating which may be used, I cite the following which may produce ten gallons of solution:

Low viscosity nitro cellulose	lbs.	32
Methyl phthalyl ethyl glycollate (specific gravity 1,220)	gal.	1
Oil modified sebacate 60% N. V. (specific gravity 0.96)	gal.	1½
Butyl alcohol	gal.	1
Butyl acetate	gal.	1
Amyl acetate	gal.	1
Butyl Cellosolve	gal.	2

The second coating is similar to the first coating but incorporates 25% by volume of whiting and butyl Cellosolve. The whiting in the solution acts to form a rather roughened surface which may be readily marked by a lead pencil. In place of the whiting, fine pumice powder or magnesium powder may be employed.

In the formation of my stencils, I prefer to produce the combination stencils by application of coating material through an original silk screen pattern. The design to be used may be photographed and a suitable positive photographic gelatin sheet is produced from a photographic negative. This gelatin positive is added to a silk screen. This silk screen is then placed over the dextrine gummed paper and my first coating is processed through the screen onto the gummed paper. When this coating has dried sufficiently a second coating is then processed through the screen on top of the first coating. This second coating embodies the whiting or similar material.

In place of the above specified process a hand cut acetate or gelatine sheet can be applied to the silk screen. The coating material may then be processed through this screen onto the adhesive coated paper.

The transfer thus formed may be applied to a second screen by means of solvent, adhesive, cement, by thermal application, or by any other suitable means. This stencil is used as furnished, or after the blank portions of the stencil have been cut with the appropriate lettering. The silk screen stencil thus formed may be used in the production of posters or other displays of various types.

The stencil thus formed will easily peel from the backing sheet in use. The desired lettering or additional design may first be marked on the stencil, and the film or coating may then be cut with a suitable stencil knife. The area through which paint is to be processed may then be peeled from the backing sheet, the remainder of the stencil remaining adhered to the backing sheet.

As an example of the type of work which may be accomplished through the use of my stencil, I have illustrated in the drawings a typical poster embodying an illustration and certain indicia. A stencil is provided having incorporated therein a

design similar to that illustrated in the drawing, but in reverse. This stencil is formed in the manner previously described on a gummed backing sheet and the outer layer of coating incorporates a powdered material. Thus a surface is provided on the stencil on which the lettering 10 may be laid out. This stencil also incorporates the design 11. The completed stencil thus is provided with an illustration 10 and a blank space having a roughened surface on which lettering may be laid out and cut. After the desired lettering has been laid out in the blank area, this portion of the stencil is cut. The stencil is then applied to the silk mesh of the printing frame and any open areas about the edge of the stencil are opaqued. By processing through the printing frame the poster shown in the figure is formed incorporating a design and lettering.

In the drawing the specific lettering illustrated is shown in dotted outline as this lettering is different on each stencil if it is so desired. The figure of a golfer may be incorporated in another poster having entirely different lettering in another location.

In accordance with the patent statutes, I have described the principles of composition and operation of my transferable silk screen stencil, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims wtihout departing from the spirit of my invention.

I claim:

1. A stencil film designed for hand-cutting stencil designs for use in forming silk screen stencils, comprising a paper backing sheet, a water soluble adhesive coating thereupon, and a film removably supported by said water soluble adhesive coating, said film comprising an impervious coating including a film forming material selected from the class consisting of cellulose nitrate lacquer and cellulose acetate lacquer, and a roughening agent incorporated in said film in an amount not over 25% by volume of the film forming material, said roughening agent being selected from the class consisting of whiting, pumice powder and magnesium powder.

2. A stencil film designed for hand-cutting stencil designs for use in forming silk screen stencils, the stencil film comprising a base sheet of paper, a water soluble adhesive coating thereupon, and a film removably supported on said adhesive, said film including two layers of a material selected from the class consisting of cellulose nitrate lacquer and cellulose acetate lacquer, the outer of said layers including a roughening agent in an amount not over 25% by volume of the layer forming material, the roughening agent being selected from the class consisting of whiting, powdered pumice, and magnesium powder.

3. A stencil film designed for hand-cutting stencil designs for use in forming silk screen stencils, the stencil film comprising a base sheet of paper, a water soluble adhesive coating thereupon, and a film removably supported on said adhesive, said film including two layers of a material selected from the class consisting of cellulose nitrate lacquer and cellulose acetate lacquer, at least one of said layers including aluminum bronze powder, the outer of said layers including a roughening agent in an amount not over 25% by volume of the layer forming material, the roughening agent being selected from the class consisting of whiting, powdered pumice and magnesium powder.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,706,438	Owens	Mar. 19, 1929
2,253,562	Hinman et al.	Aug. 26, 1941
1,146,852	Dick	July 20, 1915
1,885,388	Taylor et al.	Nov. 1, 1932
1,223,399	Koch	Apr. 24, 1917
2,337,012	Bjerg et al.	Dec. 14, 1943