April 24, 1945. E. C. BOWERS 2,374,524

METHOD OF FORMING TRANSFERABLE SILK SCREEN STENCILS

Filed May 19, 1941 2 Sheets-Sheet 1

Fig. 1

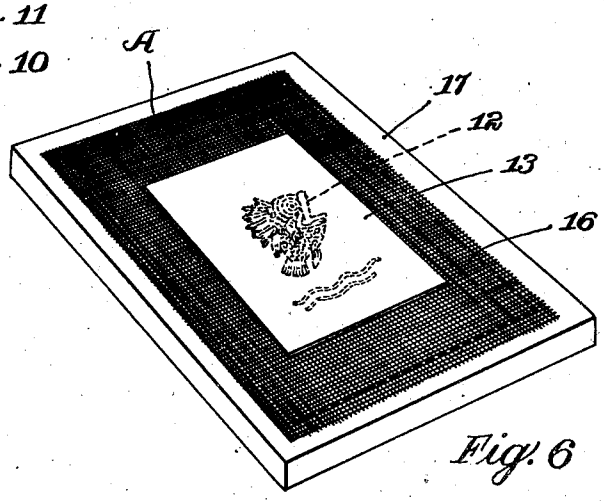

Fig. 6

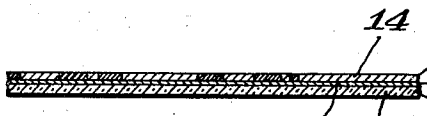

Fig. 2

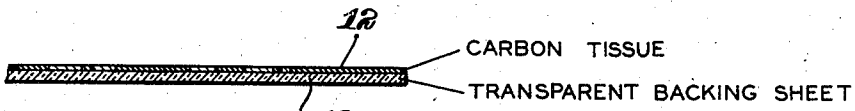

Fig. 3

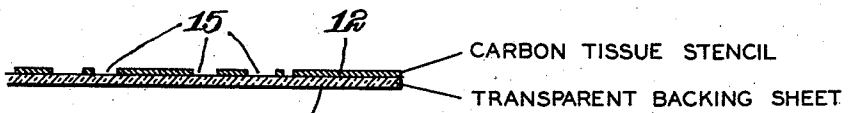

Fig. 4

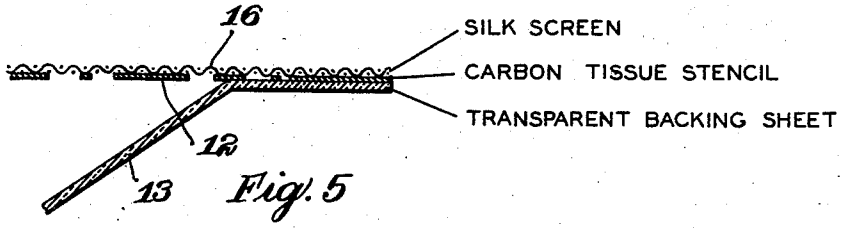

Fig. 5

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METHOD OF FORMING TRANSFERABLE SILK SCREEN STENCILS

Filed May 19, 1941 2 Sheets-Sheet 2

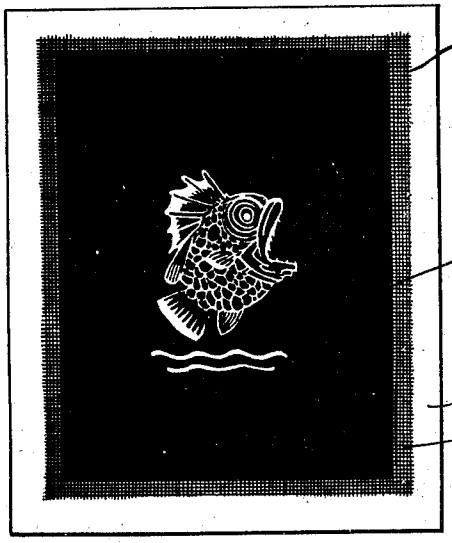

Fig. 13

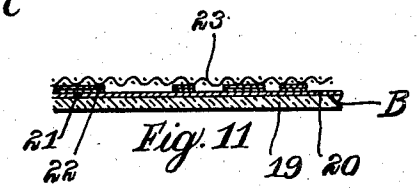

Fig. 11

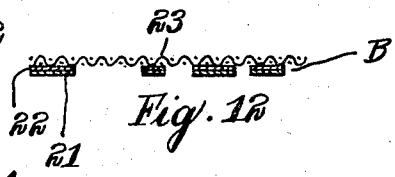

Fig. 12

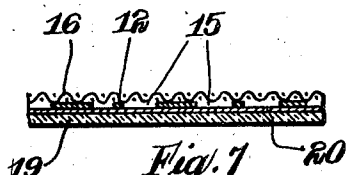

Fig. 7

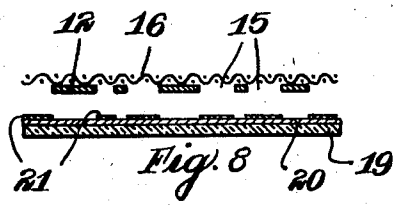

Fig. 8

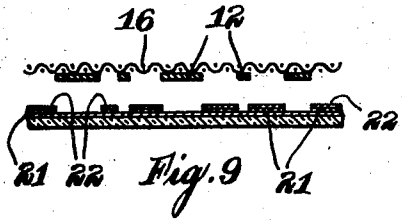

Fig. 9

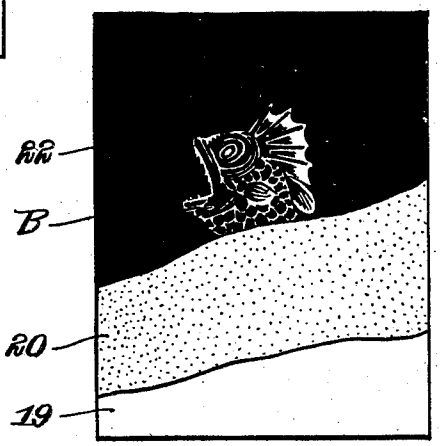

Fig. 10

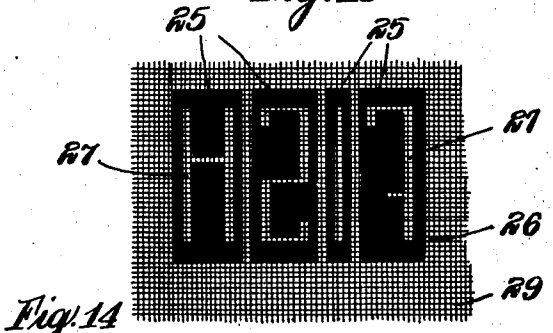

Fig. 14

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UNITED STATES PATENT OFFICE

2,374,524

METHOD OF FORMING TRANSFERABLE SILK SCREEN STENCILS

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Application May 19, 1941, Serial No. 394,103

6 Claims. (Cl. 101—128.4)

My invention relates to an improvement in a method of forming a transferable silk screen stencil wherein it is desired to provide an inexpensive and simple method of forming displays and the like.

During recent years the use of silk screen stencils, and the like, for processing display advertising has become extremely popular. Several methods have been developed for forming these stencils. One of these methods which is most commonly used is to blank out with an opaque medium, portions of the stencil through which paint, or the like, used in the formation of the display, is forced. Another manner in which stencils have been made has been to cut the stencils of a material through which paint can not flow, and to adhere such cut stencils to the surface of the screen. While this method is commonly used, the user is limited to some extent in the fineness of the design which can be produced by this method. Because of the difficulty with these methods in producing stencils having finely cut lines, photographic methods have been developed for producing stencils. These photographic methods provide a carbon tissue stencil which is adhered to the silk screen and which will produce the desired results. As this photographic method is difficult to accomplish, stencils of this type can only be produced in certain areas of the country, and such stencils are extremely costly.

As display posters for advertising of the type produced by silk screen stencils is commonly produced for local concerns in various parts of the country, it is possible that the same design be used for display advertising in various parts of the country to advertise goods of different advertisers. Such a system is commonly used in newspaper advertising, it being possible to purchase electrotypes formed from a master engraving. These electrotypes are selected from a catalog and may be purchased more reasonably than any store could have an individual engraving made. It has been proposed to sell photographically formed negatives on a nation-wide scale, but as the cost of these negatives comes, for the most part, from the cost involved in the photographic process, such stencils have still been extremely high in price.

It is the object of the present invention to form a suitable stencil by any means, such as by the photographic process mentioned, and to use this stencil as a master stencil in forming any number of duplicate transfers. These transfers are of a type which makes it possible to adhere the same to a silk screen so that any number of duplicate displays can be formed. Because of the fact that a large number of stencils may be inexpensively formed from a single master stencil, the cost of the finished transfers is relatively low. Furthermore, as the transfers may be readily applied to a silk screen, but little time is required in the formation of an advertising display.

Such a method provides great possibilities in the field of processing, through the use of silk screen stencils, or the like. With this process, it is possible for a department store, or other concern, which commonly uses display advertising, to purchase large sheets containing numerous transferable designs from the transfer manufacturer. When a certain type of display is desired which may be appropriate for a certain season of the year, or for a certain type of merchandise sold, it is only necessary to cut this design from the transfer sheet and to apply the same to the silk screen. When once attached, this design is firmly embedded into the fabric and is resistant to considerable wear and abuse. An extremely thin film is formed on the silk screen which will permit fine work to be accomplished at a minimum of cost.

A feature of the present invention lies in the fact that with my new transferable silk screen stencil designs a relatively small department store, or the like, may have for advertising purposes, display cards bearing designs which are extremely fine in character and which would require a photographic stencil to produce. However, in place of spending the necessary amount to prepare a drawing and to form a photographic stencil, it is only necessary to purchase an inexpensive sheet of transfers to accomplish the result. For this reason my process is of extreme importance to merchandisers.

A further feature of my invention lies in the fact that a single stencil may be formed using a series of designs. It is, therefore, obvious that an extremely large number of combinations of designs can be obtained from a few simple basic designs. For this same reason it will be obvious that decorative lettering may be produced in any size for any stencil on a stencil, and that individual letters or words may be cut from the stencil in assembling an artistic design. As a result, it will be obvious that persons not bestowed with any particular artistic talent may assemble a silk screen stencil through the use of preformed illustrations and letters. It is, therefore, possible for more stores to use display card advertising at a low cost of production.

A feature of my invention resides in the use of a powdered metallic material in the formation of the transfer, which provides an absolutely opaque and continuous coating over the portions of the stencil to be covered, and which prevents paint from passing through the stencil where it is not desired.

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 drawings forming a part of my specification:

Figure 1 is a view of a design which is to be imprinted upon a display card, and this figure may also be used to represent the finished display card.

Figure 2 illustrates a step in the formation of a photographic negative.

Figure 3 illustrates a subsequent step in the formation of a photographic negative.

Figure 4 illustrates still another step in the formation of the photographic negative.

Figure 5 illustrates the photographic stencil applied to a silk screen, or the like, with the stencil backing sheet partially removed.

Figure 6 illustrates a photographic negative in place upon the silk screen before the stencil backing sheet has been removed.

Figure 7 illustrates the formed photographic stencil in place over a transfer sheet.

Figure 8 illustrates the transfer sheet of Figure 7 having a first stencil coating thereupon.

Figure 9 is a view similar to Figure 8, illustrating a transfer sheet having two coatings of stencil forming material thereupon, and the photographic stencil slightly removed therefrom.

Figure 10 is a view of the stencil formed on the transfer sheet, a part of the stencil being broken away to show the composition of the transfer sheet.

Figure 11 illustrates the transfer sheet of Figure 10 being adhered to a silk screen, or the like.

Figure 12 is a view similar to Figure 11 showing the stencil backing sheet removed.

Figure 13 illustrates the stencil formed by the transfer after application to the silk screen.

Figure 14 illustrates a section of silk screen, or the like, having thereupon an assemblage of separately applied designs adhered thereto.

In order that the invention be clearly understood, I first desire to disclose in general a manner in which the master stencil may be formed. It will be understood that this master stencil may be formed by methods other than that actually used and disclosed, if it is so desired.

Figure 1 may be considered an original drawing, which is to be applied to a series of display cards. As some of the lines of the design 10, upon the backing sheet 11, are relatively fine, a design of this type would be difficult to cut upon a stencil, and it would also be difficult to opaque out the screen by actually applying a filling material to the screen, as with a brush or the like. A design of this type is most easily applied to the stencil by forming a photographic negative.

A picture is taken of the original drawing, thus forming a negative which may be of relatively small size for the purpose of economy. A positive is made therefrom on transparent material which is of the desired size. In other words, the positive is made the same size as the finished display should be. This positive is reversed to form a negative of the original print.

This positive in reversed form is placed over a sensitized carbon tissue on a Celluloid support. The enlarged picture is then exposed to light, forming an impression upon the carbon tissue on its Celluloid or transparent support. Through the use of suitable solvents the back ground of the picture may be dissolved, leaving on the Celluloid or transparent backing sheet, an open illustration comprising merely the lines which appeared on the original drawing formed of the carbon tissue, thus forming a positive of the original. A silk screen is then applied to the carbon tissue.

In Figure 2 of the drawings the carbon tissue is illustrated at 12 and is secured to the backing sheet 13. The transparent picture forming the negative is illustrated by the numeral 14. In Figure 3 of the drawings the transparent backing sheet 13 is shown with the reverse carbon tissue 12 thereupon after the exposure of the negative. Figure 4 illustrates the backing sheet 13 supporting the carbon tissue 12 after the background has been washed away to provide open spaces, such as 15, through the carbon tissue. In Figure 5 of the drawings the silk screen 16 is shown overlying the carbon tissue 12 and adhered thereto, the backing sheet 13 being removed from the carbon tissue to leave this tissue adhered to the stencil for formation of a transfer.

In Figure 6 of the drawings the silk screen 16 is shown secured marginally to a frame 17. The backing sheet 13 is shown still overlying the carbon tissue which forms a design similar to the design 10. In Figure 6 the stencil is shown somewhat smaller than the screen 16, it being understood that the relative size of the design and of the screen may be varied at will.

I now provide a stencil formed by a photographic process, and which may be used to form transferable stencil designs in the manner which will now be described. The silk screen stencil illustrated in Figure 6 of the drawings is applied over a sheet of absorbent book paper 19 bearing the coating of dextrine gum 20 thereupon. The stencil A illustrated in Figure 6 then acts in the manner usual to any stencil, the interstices 15 in the carbon tissue 12 permitting a coating to be applied to the gummed surface 20 of the absorbent sheet 19. Liquid Celluloid, or a suitable cellulose material, is then processed through the silk screen 16 onto this gummed surface. The liquid Celluloid preparation contains liquid Celluloid with suitable retarder and oils, gums, and resins, if desired. This preparation includes aluminum lining compound which is designed to provide continuity in the coating. This preparation forms a coating layer 21 on the gummed surface 20 which is similar in shape to the interstices 15 of the stencil formed by the carbon tissue 12. After the coating 21 has set sufficiently the screen 16, with its carbon tissue stencil 12 is again placed in registered position over the gummed surface 20, and a second preparation is processed through the interstices 15 of the tissue 12. This second preparation contains liquid Celluloid with retarders and oils therein, and possible a certain amount of gum and resin to which is added coloring pigment. This second coating 22 is applied directly over the coating 21 and reinforces this coating 21. A finished transfer is thus provided which is indicated in general by the letter B in Figure 10 of the drawings.

It will be noted that the transfer B is really in reverse of the desired illustration in that the lines of the finished illustration which are to be colored, are open spaces through the coatings 21 and 22. Accordingly, when the stencil design is again ap-

plied to a silk screen the color processing through the screen will result in the desired arrangement of lines.

In Figure 11 of the drawings I disclose the stencil B including the backing sheet 19, the dextrine gum surface 20 thereupon, and the coatings 21 and 22 overlying the gum surface 20 applied to a silk screen 23. The upper surface of the liquid Celluloid coatings is moistened with an adherent liquid, which preferably softens the surface of the liquid Celluloid and permits the coatings 21 and 22 to embed themselves directly into the silk screen. When the coatings 21 and 22 have been applied to the silk screen 23 the backing sheet 19 is removed, as illustrated in Figure 11 of the drawings. This result is accomplished by moistening the absorbent paper 19 with moisture to dissolve the dextrine gum coating and to permit separation of the backing sheet from the coatings 21 and 22 which were applied thereto. It will be noted that the first coating containing metallic powder, such as aluminum lining compound, is outermost and, therefore, engages the surface of the display paper to be processed when the stencil is used.

Figure 13 of the drawings discloses the finished silk screen stencil C, which is used to form the displays which are similar to the original picture illustrated in Figure 1. The silk screen 23 is mounted on a suitable frame 24, and the pigment material is forced through the interstices in the design through the use of a squeegee or other suitable device, in a manner well known in the art.

From the foregoing description it will be obvious that in forming a silk screen stencil C, it is only necessary for the merchandiser or his display advertising man to select a desired transfer B, to apply this transfer to the silk screen, to remove the backing sheet 19 by dissolving the dextrine gum 20, and to blank in any remaining portion of the screen through which it is not desired to have paint flow. The simplicity of this process in comparison with cutting an original stencil is clearly obvious, and because of the fact that numerous identical transfer designs B, of the type illustrated in Figure 10 of the drawings, are made from a single master stencil, the cost of production is greatly decreased without decreasing the effectiveness of the display.

In Figure 14 of the drawings I disclose a section of silk screen, or the like, which has embodied thereupon, a series of individual displays indicated by the numeral 25. In the form illustrated these individual displays are in the form of letters which are arranged in alignment upon the silk screen and which have been cut from a transfer in the obvious manner. These individual displays each enclose a masking background 26 having interstices 27 therein. These interstices form passages through the stencil through which pigmented material may be forced.

In forming a stencil the individual displays 25 are adhered to the silk screen 23 in the usual manner previously described and after the various designs have been assembled in proper relationship, the background of the stencil is filled in with a filling material which will prevent the flow of paint therethrough. This filling in process may be easily accomplished even by an inexperienced painter, and the completed stencil may thus be formed with little difficulty by a person not experienced in the art of forming letters or drawing designs.

In the use of the words "silk screen" I desire to have it understood that such screens or fabrics need not be formed of silk. As the process defined is ordinarily referred to as a silk screen process by those skilled in the art, this term is used in this specification to denote a general class of screens, rather than a specific screen material. Similarly, the use of the term "carbon tissue" relates to a type of film which will serve my purpose, rather than to a specific film material. Any other film material impervious to cellulose material such as liquid Celluloid may be used.

In accordance with the patent statutes, I have described the principles of construction and operation of my method of forming transferable silk screen stencil designs, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that this is only illustrative of a means of carrying out my invention and that obvious changes may be made within the scope of the following claims, without departing from the spirit of my invention.

I claim:

1. The method of producing a stencil design through the use of a silk screen process and a transfer paper, the method consisting in producing a design on a silk screen in the form of a stencil, processing through this stencil onto the transfer paper a film forming liquid containing powdered aluminum to produce a film free of pinholes on the transfer paper and then processing a second film forming liquid free of powdered aluminum over the first formed film and contiguous therewith, the second film acting as a protecting covering for the first film when the combined films are secured to a second silk screen.

2. The method of producing a stencil design through the use of a silk screen process and a transfer paper, the method consisting in producing a design on a silk screen in the form of a stencil, processing through this stencil onto the transfer paper a liquid cellulose material containing powdered aluminum to produce a film free of pinholes, and then processing a second film of liquid cellulose free of aluminum powder over the first formed film and contiguous therewith, the second film acting as a protecting covering for the first film when the combined films are secured to a second silk screen.

3. The method of producing a silk screen stencil with the use of a silk screen process and a transfer paper, the method including the steps of forming a design on a first silk screen in the form of a stencil, processing a film forming liquid containing powdered aluminum onto the transfer paper to produce a first film free of pinholes, processing a second film forming liquid free of aluminum powder upon the first film to provide a protecting covering therefor, and adhering the combined films to a second silk screen with the protecting covering film in contact with the screen.

4. The method of producing a silk screen stencil with the use of a silk screen process and a transfer paper, the method including the steps of forming a design on a first silk screen in the form of a stencil, processing a liquid cellulose material containing aluminum powder through this silk screen onto the transfer paper to form a film thereon free of pinholes, processing a second film of liquid cellulose material free of aluminum powder upon the first film and contiguous therewith to provide a protecting covering therefor, and adhering the combined films to a second

silk screen with the protecting covering film in contact with the screen.

5. The method of producing a silk screen stencil with the use of a silk screen process and a transfer paper, the method including the steps of forming a design on a first silk screen in the form of a stencil, processing a liquid cellulose material containing aluminum powder through this silk screen onto the transfer paper to form a film thereon free of pinholes, processing a second film of liquid cellulose material free of aluminum powder upon the first film and contiguous therewith to provide a protecting covering therefor, applying a solvent to the second coating to soften the same, and pressing a second silk screen into the softened second coating.

6. The method of forming a silk screen stencil which comprises producing a film of liquid cellulose material containing aluminum powder in a predetermined design, applying a covering coating of liquid cellulose material free of aluminum powder over the first formed film, softening the last applied film through the use of a solvent, and pressing a silk screen into the softened covering coating to adhere the combined film and coating to the silk screen.

ERNEST CLAIR BOWERS.