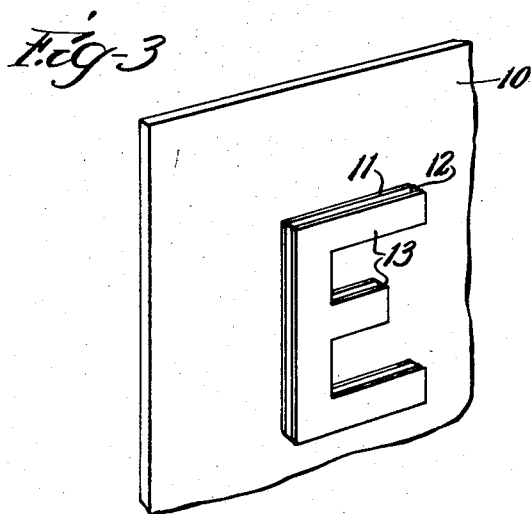
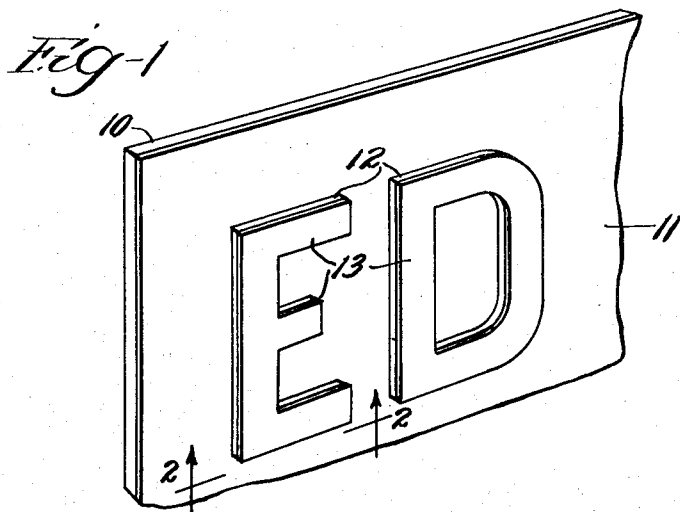


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METHOD OF TRANSFERRING AN IMAGE AND
TRANSFER SHEET THEREFOR
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METHOD OF TRANSFERRING AN IMAGE
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In most decalcomanias, a clear, lacquer film forms the support for the letters or designs being applied, and since this film will often, and usually does, discolor with age, the appearance of the transfer is impaired.

The present invention overcomes this difficulty by eliminating the lacquer base for the image or design, and in addition has other important advantages. Included among these are the following: the transfer has a transparent, temporary support so that application of the transfer in the desired position on the permanent support is facilitated; the transfer is composed of materials that are relatively unaffected by atmospheric conditions and may, therefore, be stored for long periods without damage; relatively inexpensive materials are used in the transfer, thereby holding down the cost of manufacturing; the nature of the transfer inherently permits intricate designs to be applied with ease; the transfer can be applied quickly with unskilled labor, and it is, therefore, suitable for production line techniques, and with little or no spoilage; the materials used have sufficient dimensional stability to permit accurate registration of the transfer sheet during the application of the image to the transfer, and the application of the image from the transfer, to the permanent support; and the transfer is of such character that it may be readily applied to simple and compound curved surfaces without wrinkling.

These and other advantages will become apparent as the disclosure proceeds and the description is read in conjunction with the accompanying drawings, in which—

Figure 1 is a perspective view, showing a preferred form of the invention;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1; and

Figure 3 is a view corresponding to Figure 1, but showing a modified form of the invention.

It should be understood that the disclosure of certain specific forms of the invention is in compliance with Section 4888 of the Revised Statutes, and should not be construed as imposing limitations on the appended claims, except as may be required by the prior art.

One of the outstanding features of the present invention resides in the fact that the image is applied to an extremely thin plastic film that has, as a temporary support, a base or casting sheet, upon which the film is formed, and the materials selected for the casting sheet and the plastic film are characterized by their incompatibility; i. e., the plastic film may be readily

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stripped from the casting sheet without the application of a moistener, and yet the two materials have close intimate contact and adhere together lightly throughout their entire contacting surfaces. It is this incompatibility of the materials, and the relatively tough, self-supporting character of the plastic film, which are largely responsible for the outstanding advantages of the improved transfer. Apparently a relatively smooth surface, i. e., a surface providing no mechanical key, is required for the base sheet in order to achieve the desired incompatibility.

Referring now to the drawings, I employ a base or casting sheet 10, which is preferably transparent, non-fibrous, flexible, and water-imperious and repellant. I have found that most plastic sheeting is satisfactory for this purpose, as are other non-plastic materials having the named qualities. However, I prefer to use cellulose acetate sheeting because of its relatively low cost and non-inflammable qualities, although vinyl resins, styrene resins, polyethylene, nitrocellulose, and other polymerized plastic sheeting may be used with satisfactory results.

To the base or casting sheet 10 I apply a coating of film-forming plastic solution, this coating being of a material that is incompatible with the material of the base or casting sheet 10. Preferably a five (5) per cent aqueous solution of polyvinyl alcohol is used to form the film on the casting sheet, and the coating may be accomplished by any of the conventional methods. For small scale production, the coating is preferably applied by silk screen, and for larger scale operations, machine methods may be employed.

In place of polyvinyl alcohol, I may use any other plastic material having the property of forming a thin film that is incompatible with the material of the base or casting sheet, and I have found, for example, that sodium carboxymethylcellulose and methylcellulose are also satisfactory materials for this purpose. The film formed on the casting sheet is characterized by its toughness and self-supporting qualities which enable it to be stripped in its entirety without tearing from the casting sheet without application of a moistener or solvent. The film-forming materials are also characterized by their solubility in solvents to which the base sheet has no affinity and is non-reactive; and in case of polyvinyl alcohol, sodium carboxymethylcellulose, and methylcellulose, the solvent is water, in which all of these materials are soluble.

The film 11 is extremely thin and normally should not be more than $\frac{1}{1000}$ of an inch in thick-

ness. Films of less than .0005 inch formed of the plastic materials mentioned have the required properties to serve adequately as a temporary support for the image.

The image 12 may be applied in any suitable manner, and may consist of commonly used lacquers, pigments, paints, or inks, and may be applied in any sequence required by the work. In the case of lacquers, silk screening is the preferred method of application, and any number of impressions may be applied to build up the entire body of the image itself to the desired thickness, in a manner well known in the art.

The film 11 in addition to having the other properties heretofore discussed, also has the property of readily taking a lacquer or printed image, and permitting it to dry readily thereon as distinguished from some waxy and greasy surfaces which cannot take such an image and will not, because of their waxy and oily surfaces, permit the pigments or lacquers to dry.

Applied over the image, and in perfect register therewith, is an adhesive 13 which preferably is of a kind that requires a remoistener that does not dissolve or react with the film 11 carrying the image 12. Any of the commercially available, water-insoluble adhesives are satisfactory, which require for example, toluene or other hydrocarbon remoisteners.

In applying the transfer to a permanent support surface, the required remoistener is applied to the adhesive 13, or to the permanent support surface, and the transfer put in place on the permanent support surface, which can readily be accomplished because of the transparent character of the transfer. The transfer is then firmly pressed against the support, and squeezed or rolled to remove air bubbles, and to insure good adhesion of the image to the permanent support surface. If desired, the base or casting sheet 10 may thereafter be immediately stripped from the film 11, leaving the image with its film support on the permanent support surface, and it is usually desirable to slightly separate one corner of the base or casting sheet 10 from the film prior to the application of the transfer to the permanent support surface in order to facilitate the stripping action. After stripping, if any further squeezing or pressing of the image to the permanent transfer surface is required, it may be done at this time. The film 11 is then quickly and easily removed by sponging or washing with water (in which it dissolves), leaving an open image transfer on the permanent support surface.

Instead of applying the film 11 over the entire surface of the casting sheet 10 it may be applied in register with the image as shown, for example, in Figure 3. In this case the film would be applied preferably by the silk screen process. The application of the transfer and the rest of the process is the same as discussed before.

Throughout the specification and claims, the term "transparent" has been used in a broad sense and is intended to include translucent materials, as well as materials that are fully transparent. Also the term "self-supporting," as applied to the plastic film, has been used in the sense that after the film is stripped from the base sheet, it remains as a unitary sheet even though non-rigid in character.

Although it is preferred to use water-soluble film-forming materials, other plastic materials may be used which dissolve in solvents other than water, in which case the adhesive coat 13 would

be of a character using water or some other remoistener for which the film material has no affinity.

I claim:

1. A transfer sheet comprising a base sheet of transparent, flexible, water-repellant material, and a transparent film of soluble material coated on the base sheet and having the characteristic of being incompatible therewith, whereby it may be readily separated from the base sheet by a stripping action although having a temporary adherence thereto, an image applied to the film, and an adhesive applied over the image and in register therewith, said adhesive being relatively insoluble and unaffected by a solvent that will dissolve said film.

2. The method of transferring an image from one surface to another which consists in taking a casting sheet of water-repellant material, applying thereto a thin film of a water-soluble plastic material that is incompatible therewith but which has the quality of being able to receive a lacquer or printed image, applying the image to the film, applying a water-insoluble adhesive in register with the image, moistening the adhesive and applying the image to the final support surface, and then stripping the base sheet from the plastic film, then washing the applied image with water to dissolve the plastic film.

3. A transfer comprising a casting sheet of smooth, transparent, water-repellant material, a film of transparent, water-soluble material on the casting sheet, said film being incompatible with the sheet, an image on the film, and an adhesive over the image and in registry therewith, said adhesive being unreactive to water.

4. A transfer comprising a casting sheet of transparent, polymerized, plastic material insoluble in a first solvent, a transparent film on the sheet having an image-receptive surface and soluble in said first solvent, said film being incompatible with the sheet, an image on the film, said image being insoluble in said first solvent and in a second solvent, and an adhesive on the image reactive to said second solvent and not to the first solvent.

5. A transfer comprising a casting sheet of smooth, water-repellant material, a film of water-soluble material on the casting sheet, said film being incompatible with the sheet, an image on the film, and an adhesive over the image in substantial registry therewith, said adhesive being unreactive to water.

6. A transfer as set forth in claim 5 in which the water-soluble film is polyvinyl alcohol.

7. A transfer as set forth in claim 5 in which the film is not more than $\frac{1}{1000}$ of an inch in thickness.

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