Feb. 23, 1943. H. F. SCHEETZ, JR 2,311,876

DECORATION OF VITREOUS ARTICLES

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Fig. 1.

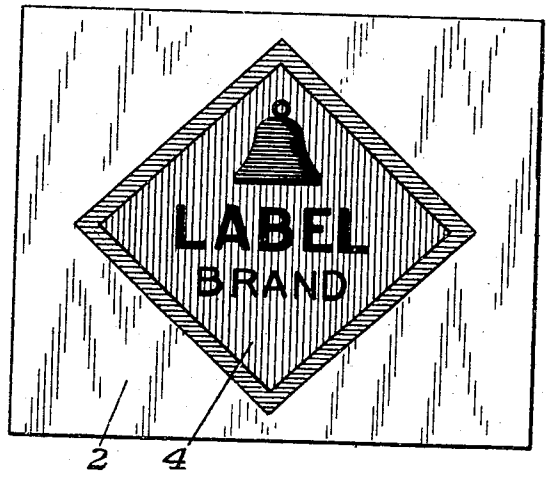
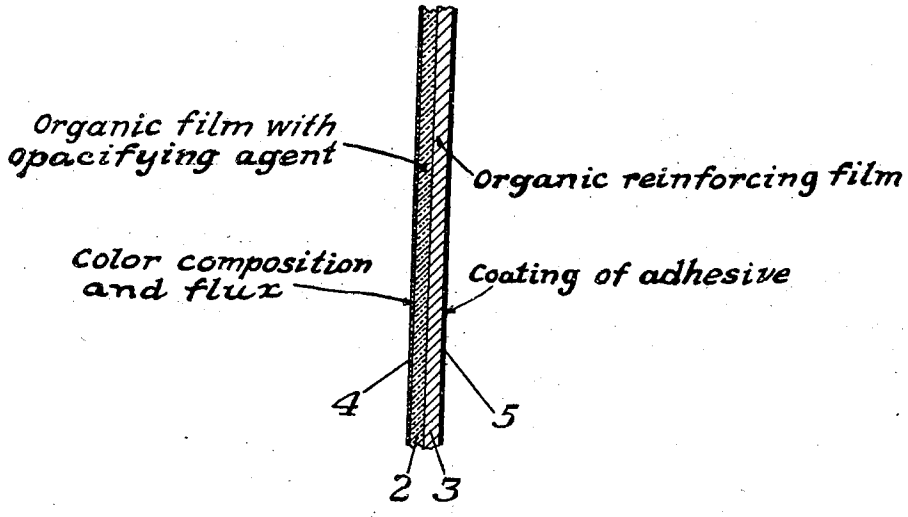


Fig. 2.



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DECORATION OF VITREOUS ARTICLES

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3 Claims. (Cl. 41—26)

This invention relates to the decoration of vitreous articles, such as glassware, china and glazed earthenware and enameled ware, but is most especially applicable to the decoration of transparent glassware. By decoration I refer to the application of color to the vitreous article either for the purpose of enchancing its ornamental value or for the purpose of labeling.

Articles of china and earthen tableware and enameled metal articles are now successfully decorated by the use of decalcomania transfers wherein a colored design or pattern is formed on a thin film which in turn is carried on a paper backing with a water soluble adhesive, the practice being to apply the decoration to the article to be decorated, wet the decalcomania transfer to loosen the color-bearing film from the paper and cause it to be deposited on the vitreous article after which the article is fired to "burn in" the decoration so applied. This method can also be applied to the decoration of glassware, but the resulting product is of an unsatisfactory character due to the fact that the color pattern is formed by a very thin film of color, and when it is placed on a transparent article so that light can shine through the pattern, the quality of the colors is unsatisfactory and they are not entirely opaque with the result that they do not present the same intensity or quality of color that appears when the same design is displayed on an opaque or nearly opaque background as in the case of a dish or a piece of enameled metal ware. For this reason the decoration of glassware has heretofore been largely accomplished by the use of stencils through which color is forced by a squeegee onto the surface of the glass.

The present invention may be applicable to a decalcomania transfer in which the decoration is carried on a thin destructible film which is incapable of self-support and which therefore requires a paper backing, or it may be applied to a destructible film which can be applied directly to the glassware and which is of a thickness such as to be self-supporting. According to my invention the decoration is applied to a film which, instead of being transparent, is opaque or contains an opacifying medium which fuses into the body of the glass or other object to be decorated so as to reduce or eliminate the light transmitted through the decoration so that the decoration will be seen only or principally by reflected light and the colors will therefore have the same quality and density as they have when they are applied to an opaque object. My invention may be described in conjunction with the accompanying drawing in which

Figure 1 represents a transfer element embodying my invention; and

Figure 2 is a more or less schematic view illustrating on a greatly enlarged scale a transverse section through a transfer element embodying my invention.

According to the present invention, a destructible organic film is prepared into which is mixed an indestructible opacifying agent or medium of a vitrifiable substance. The design is then applied by any preferred method to this opaque film. The film is then applied to the surface of the object to be decorated and the object is fired. In the firing of the article, the film is destroyed, the opacifying agent is fused into the glass, and the colors are fused onto the surface which has been rendered opaque or partially opaque by the opacifying medium. This may be accomplished by using as a base for the opaque film a material which is thick enough to be self-supporting or by laminating the opaque film with a more flexible film to make the object self-supporting, or the opaque or partially opaque film may be formed as the transfer film of a decalcomania.

Referring to the drawing, 2 designates a destructible film of an organic nature such that it may be destroyed by heating it to a temperature below the fusing point of the vitreous surface to be decorated. The film may be formed of pyroxyline or collodion or it may be formed of cellulose acetate or various other film-forming plastics may be used such as acrylic acid resins or the film may be formed of very thin non-elastic rubber which resembles in appearance the cellulose product sold as "Cellophane". The thickness of the film will vary according to the type of transfer, the film being ordinarily thinner for a decalcomania type of transfer than for a direct transfer. Incorporated into the composition of the film 2 at the time that it is formed is a ceramic opacifying medium such as is commonly used in making glassware opaque or colored. The opacifying agent or medium may either be of a nature to produce a white color or to produce any other desired color. The composition of the opacifying medium forms no part of the present invention, as such substances are obtained in a form which can be introduced into the film-forming material from the manufacturers of ceramic colors. After the destructible film 2 has been formed with the opacifying medium incorporated in it, it may then be more

easily broken than a film of the same material without the opacifying element, and when this is the case, another thin film 3 of the same general character but having no opacifying substance in it is applied onto one surface of the film 2. The film 3 is only necessary when the film 2 is of a brittle nature or is otherwise too thin to be conveniently handled without tearing or breaking. A design 4 is applied to one surface of the film 2. It may be applied by any desired method which can be used for forming decalcomanias such as for example, printing, lithographing, offsetting, gravure or stencilling. The design 4 is illustrated as being in the different colors. It may be either a purely ornamental design or it may be a commercial label. The colors employed are similar to the color used in making decalcomania transfers; i. e., it is of a ceramic nature such that the colors can be fused at a temperature slightly below the fusing temperature of the surface of the article to be decorated so as to be melted directly onto or into the surface to be decorated as explained, for example, in United States Letters Patent, Reissue No. 19,839 to J. F. McNutt. One surface may then be covered with a glue or adhesive so that the transfer device can be wet and stuck to the surface of the glass or other object to be decorated. In Figure 2 the film 4 designates not only the design of Figure 1 but also a film of fluxing material as for example, a coating formed of a finely pulverized glass and a binder. One surface of the label may also have a layer of varnish or glue applied thereto so that the label may be temporarily stuck to the object to be decorated. In Figure 2 this layer of adhesive is designated 5.

It will be understood of course that the thickness of the label is very much exaggerated in Figure 2 and that a laminated label of the structure described need not be any thicker than an ordinary film of paper. In use it may be applied to the bottle by a labeling machine in the same way that paper labels are now applied. After the labels have been applied to the bottles, the bottles are run into a lehr or heating furnace where the film 2—3 is volatilized or burned off depositing the ceramic substances on the surface of the glass. The temperature of the glass objects is then further raised until the opacifying ingredients contained in the film 2 are fused into the surface of the glass and the ceramic colors are fused onto the surface of the glass over the opacifying material. A flux coating is preferably used over the whole label so that the flux will also fuse over the surface of the applied decorations and impart a bright lustrous appearance to the colors.

As a modification of my invention, the film 2 carrying the opacifying agent may be cemented by a water soluble cement to a layer of water absorbent paper which might be the layer 3 of Figure 2. The decoration would be applied to the opaque film 2 and an adhesive substance would either be applied to the film or to the glassware to which the decalcomania transfer was to be applied. In use, the wetting of the paper would cause the separation of the paper and the film. In this case the decoration 4 would be interposed between the film 2 and the paper 3 so that the opaque medium would lie between the design and the glass when the transfer was finally slipped onto a glass.

The present invention, by forming on the article to be decorated an opaque or semi-opaque screen which prevents or reduces the transmission of light through the applied pattern, enables glassware to be decorated in a highly satisfactory way using the same general kind of decalcomania patterns that are available for the use in the decorating of pottery and vitreous enamelware and enables glass bottles and containers to be permanently labeled at an expense much below the expense required for stencilling labels or decorations onto glassware and with much more satisfactory results. Moreover, the present method is applicable to the decoration of opaque as well as transparent articles. It permits, for example, the application of a permanent label with a white background on a piece of granite or blue enamelware. Through the fact that the opacifying agent or medium is incorporated directly into the destructible film, it is not necessary to have successive printing operations as might be required if the opacifying medium were applied to the film instead of incorporated in it, and greater density of opacifying medium can be obtained by incorporating the opacifying material into the film. An added advantage is secured by reason of the fact that labels and designs made by the present invention are less likely to blister than are labels and/or designs made by other methods where, for example, attempts to secure the desired color density require that successive layers of coloring material be applied by applying an adhesive to the film and then dusting the coloring medium onto the adhesive, because where there are a succession of layers of adhesive with dusting material therein, the tendency toward blistering is increased.

The opaque coloring medium which is incorporated into the film may have a composition similar to the composition of the coloring material referred to in said McNutt patent; the design may be of a similar composition so that both the opaque coloring medium and the design may be fused to the surface of the article to be decorated, and if a glaze or flux is to appear over the color, it may also be of a similar composition, my invention residing not in the composition of the ingredients per se, all of which are available from manufacturers of ceramic coloring compositions, but in the transfer and the method of using such element.

The term opaque as used herein is not restricted to absolute opacity, but includes any such light screening medium as will effectively reduce the transparency to a point where the design will be more effectively displayed.

While I have illustrated and described certain specific examples of my invention, it will be understood that this is merely by way of illustration and that various changes may be made in the construction of the label or transfer element and in the method of using the same within the contemplation of my invention and under the scope of the following claims.

I claim:

1. A transfer medium for decorating vitreous objects comprising a thin self-sustaining plastic film destructible at a temperature below the fusing temperature of the surface of the object to be ornamented and which carries an opaque ceramic color that will readily fuse to the object to be decorated and which is deposited on said object when the film is destroyed, said film also having applied thereto outermost on its surface a decoration composed of a ceramic material that will also readily fuse to the object to be decorated and which will be deposited on the

object over the opaque material, and a coating of adhesive on the side of the film opposite the design, said adhesive being normally exposed and forming an original surface of the label so that it may be wet in a labelling machine and applied directly to the ware.

2. A transfer element for decorating glassware and the like comprising a thin film composed of an organic plastic and destructible at a temperature below the fusing temperature of the object to be ornamented, said film having incorporated therein a ceramic opacifying medium, a reinforcing film also composed of an organic plastic, overlying one face of the first-mentioned film, a design formed of a fusible ceramic color composition carried by the composite film structure, said transfer element being self-sustaining whereby it may be applied directly to the ware to be decorated without any supporting membrane, and a coating of adhesive over the other surface of the reinforcing film forming an exposed surface of the transfer element.

3. In a method of decorating vitreous ware, the steps including providing a film of an organic plastic having an opacifying agent incorporated therein, permanently applying to said film a reinforcing film composed of a similar organic plastic to thereby provide a self-contained and self-supporting composite plastic film, applying a design in ceramic colors on the composite film structure, placing the composite film structure on a piece of ware with the design uppermost and the body of the film interposed between the design and the ware, and firing the ware to destroy the film structure and fuse the opacifying agent and the ceramic color on the surface of the ware.

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