Feb. 28, 1933. J. F. WALSH ET AL 1,899,068

DECORATED THERMOPLASTICS AND PROCESS OF MAKING SAME

Filed Jan. 11, 1930

Fig. 1.

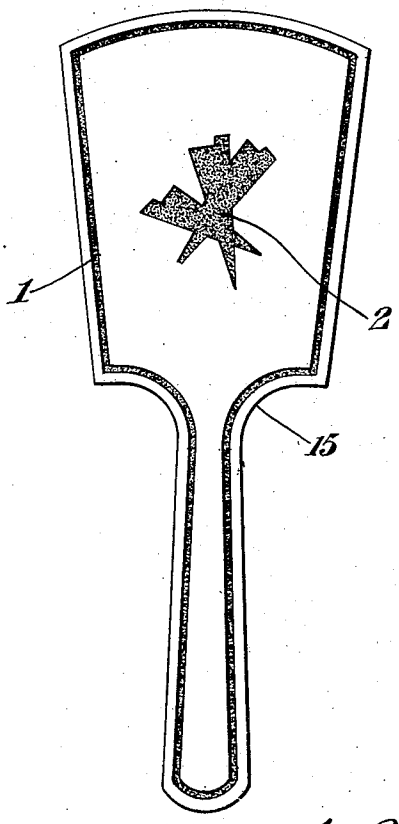


Fig. 2.

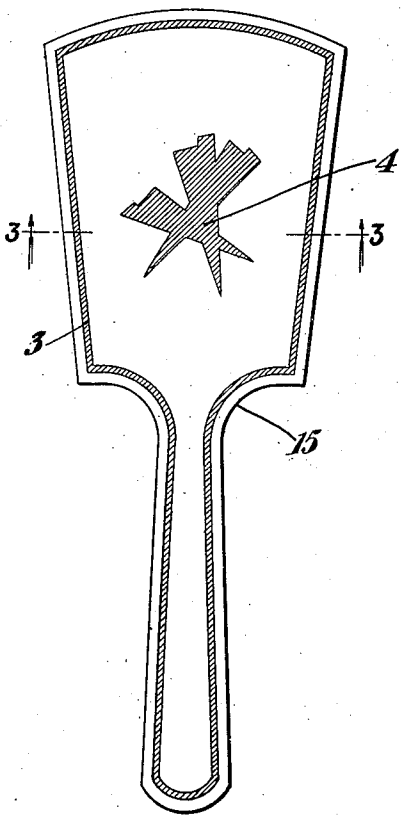


Fig. 3.



Fig. 4.



Fig. 5.

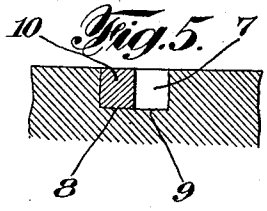
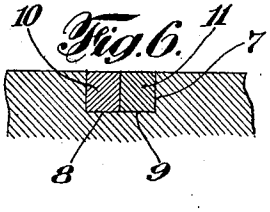


Fig. 6.



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Patented Feb. 28, 1933 1,899,068

UNITED STATES PATENT OFFICE

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DECORATED THERMOPLASTICS AND PROCESS OF MAKING SAME

Application filed January 11, 1930. Serial No. 420,159.

This invention pertains to the general class of decorated materials and particularly to the class of decorated thermoplastics.

The invention is particularly applicable to the decoration of cellulosic thermoplastics which are used so extensively for all forms of ornamentation. The present practice of ornamenting thermoplastics with metallic substances is largely confined to the use of metal foil, together with a die or stamp to impress portions of the foil into the material. The operations are more or less cumbersome, the percentage of rejects fairly high, and the amount of waste metallic foil resulting from the operation is tremendous. This operation therefore, is limited to the use of metallic foils of relatively low cost.

An object of our invention, therefore is to provide novel means for decorating thermoplastics with metals.

A further object of our invention is to provide novel means for decorating thermoplastics with metallic substances wherein the decorating may be expeditiously performed, wherein rejects are reduced to a minimum, wherein a superior bond is effected between the thermoplastic and the metallic substance, wherein the amount of waste metallic substance is reduced to a minimum, and that is otherwise highly satisfactory for its intended purpose.

Many other objects and advantages will become apparent to persons skilled in the art as the specification proceeds.

Our novel invention comprises applying metallic substances in the form of a fused spray to roughened portions of the thermoplastic. The temperature of the fused metallic spray is sufficient to cause the metal to firmly bind itself to the roughened portions of the thermoplastic. Further application of the metallic spray serves to build up the thickness of the applied metal, each layer of spray binding itself firmly and becoming a part of the layer previously deposited. It is therefore merely necessary to reproduce the desired design on the surface of the thermoplastic by roughening the surface thereof, leaving the balance of the surface polished or smooth, and then the spray may be applied thereto.

This roughening may be carried out if desired by means of a stencil having openings corresponding to the desired design and applying a sand blast or similar means to the thermoplastic through the openings in the stencil.

When the metallic spray is applied to the surface of the thermoplastic, it is not necessary to use the stencil inasmuch as the metal spray binds itself only to those portions that have been roughened. This is no doubt due to an interlocking of the particles assisted by fusion of exposed parts of the thermoplastic. The sprayed metal is easily removable from all polished parts. Should the metal which is applied to the roughened portions overlap the polished portions, the overlapping edges may be readily trimmed away. It is of course, understood that a stencil or similar device may be used if desired.

In applying the metallic spray to the thermoplastic, we prefer to start with metals or alloys having low melting points such as zinc tin, pewter, etc. After the thermoplastic is given a thin coating of a low melting point metal, we prefer to apply a metal having a high melting point, such as brass, copper, bronze, silver, gold, platinum, or alloys of same. Although the metals of higher melting point may be applied directly to the thermoplastic, we find that a superior bond is effected by using a metal having a low melting point before using the metal or alloy having a high melting point. It is understood, however, that the entire decoration may be carried out in any of the metals or alloys of low melting point if desired.

The final metallic surface may be finished by any of the known means applicable to the particular metal or alloy used, such as polishing, grinding, applying a mat, satin or other finish, etc.

The preferred thermoplastic materials are those made with cellulose nitrate and/or cellulose acetate, and particularly those made with cellulose acetate. Examples of other thermoplastic materials are those made with cellulose esters such as cellulose formate,

cellulose propionate, and cellulose butyrate, as well as those made with methyl cellulose, ethyl cellulose, benzyl cellulose, cellulose phthalate, viscose, casein, etc.

In the drawing wherein like reference characters are appended to like parts in the various figures,

Figure 1 is a plan view of a mirror back having a design reproduced thereon by roughening the surface.

Figure 2 is a plan view of the mirror back shown in Figure 1 but having a metallic coating applied to the roughened portions.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section similar to Figure 3 but showing a modification.

Figure 5 is a section illustrating a method of forming a plurality of parallel lines of different metals.

Figure 6 is a section similar to Figure 5 illustrating a roughened portion filled out with a plurality of parallel lines of different metals.

Referring to Figures 1, 2, and 3, wherein a mirror 15 is shown merely for the purposes of illustration, the border 1 and the design 2 also shown merely for the purposes of illustration, have been reproduced on the mirror back by roughening the surface thereof. This roughening may be carried out by any means such as with a tool, with emery cloth, sand paper, or other abrasive with a blast of abrasive, such as a sand blast, etc., or by any other means known in the art. The surface may be merely roughened or a roughened channel may be formed such as illustrated, more or less in exaggerated scale in Figure 3.

At 3 and 4, in Figure 2, are shown the border 1 and design 2, respectively covered with a metal. The metallic portions may be of any thickness and need not be flush with the surface of the mirror unless desired, but may be sunken or elevated.

In Figure 4, the metallic portions 5 are of one metal and the metallic portions 6 are of a second metal. As previously pointed out, it is often desirable to begin coating with one metal and to finish the coating with a second metal.

In Figure 5 is illustrated means for forming adjacent portions with different metals such for instance, as silver, and gold. The roughened portion 7 comprises two parts, 8 and 9. The part 8 is first formed and filled with metal 10. The part 9 is then formed along side of the solidified metal 10 and is then filled with the metal 11. Any number of different metals and designs may be used by this or equivalent means, and any desired contrast between metals may be formed.

It is, of course, understood that the term "metals" as used herein, also includes alloys.

The apparatus for applying the metallic spray may be of any desired design and operation. In other words, any means known in the art to produce the metallic spray may be employed. We have successfully employed apparatus for this purpose which comprises feeding a metallic rod end-wise into an oxyacetylene flame and blowing the fused metal by suitable means against the roughened portions of the plastic.

Having described our invention, it is obvious that many modifications may be made in the same within the scope of the claims without departing from the spirit of the invention.

We claim:

1. The process of decorating a polished thermoplastic surface comprising roughening selected portions thereof, applying a fused metallic spray to said surface and then removing the metal from the polished portions thereof.

2. The process of decorating a polished surface of a cellulose acetate plastic comprising roughening selected portions thereof, applying a fused metallic spray to said surface and then removing the metal from the polished portions thereof.

In testimony whereof, we have hereunto subscribed our names:

JAMES F. WALSH.
BJÖRN ANDERSEN.