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F. J. STRASSNER ET AL
DECORATING ARTICLE SURFACES
Original Filed March 10, 1933

2,010,336

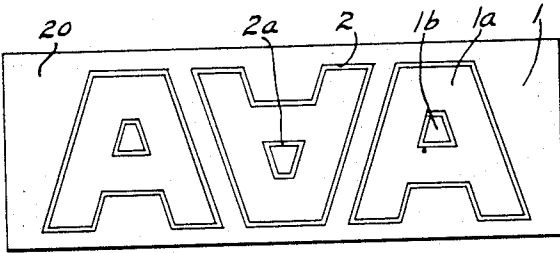


Fig. 1

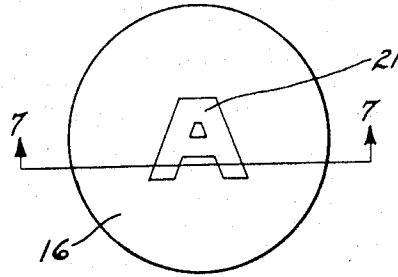


Fig. 6

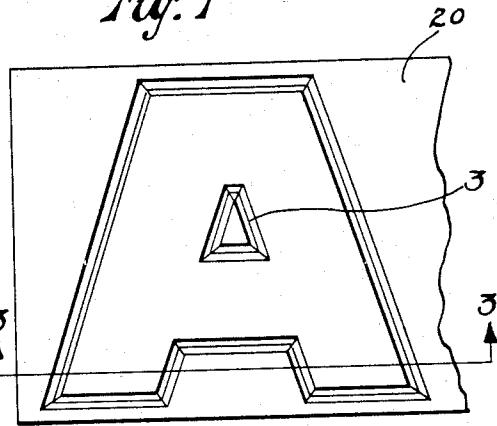


Fig. 2

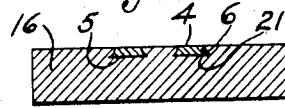


Fig. 7

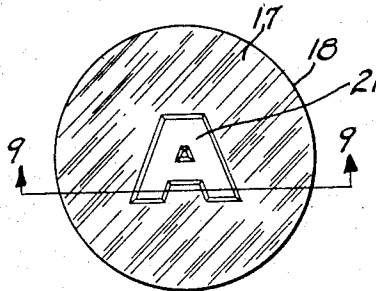


Fig. 8



Fig. 3

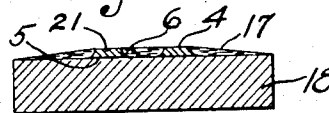


Fig. 9

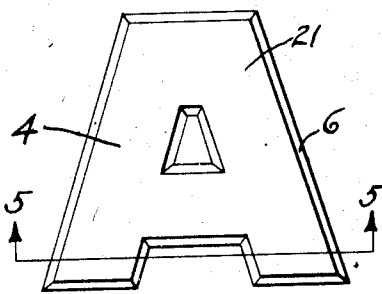


Fig. 4

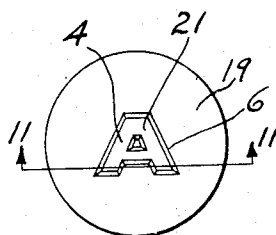


Fig. 10

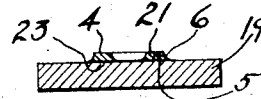


Fig. 11

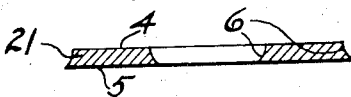


Fig. 5

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2,010,336

DECORATING ARTICLE SURFACES

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Original application March 10, 1933, Serial No. 660,230. Divided and this application March 30, 1934, Serial No. 718,101

3 Claims. (Cl. 41-18)

This invention relates to the art of decorating such articles as serving trays, ash trays, cigarette and cigar boxes, cosmetic containers, candy boxes, toilet articles, clock cases, tableware, flat slabs, etc., the articles being either molded of plastic materials or made of such other materials as are appropriate thereto.

The purpose of the invention is to produce metal ornaments suitable for decorating the articles and to combine the metal ornaments with the articles in such manner as to make them a permanent part of the article.

A further purpose of the invention is to produce the ornaments, and to apply them securely to the articles, in an inexpensive manner. Other and allied objects will hereinafter become more fully apparent.

This application is filed as a division of our co-pending application Serial Number 660,230, on which U. S. Letters Patent No. 1,953,784 were issued April 3, 1934.

In the following description reference is had to the accompanying drawing, of which:—

Figure 1 represents a sheet of metal prepared for etching of ornaments as contemplated by our invention;

Figure 2 shows a portion of the sheet after etching of the same;

Figure 3 is a cross-sectional view taken along the line 3-3 of Figure 2;

Figure 4 shows an ornament produced from the sheet by the etching;

Figure 5 is a cross-sectional view taken along the line 5-5 of Figure 4;

Figure 6 shows the ornament of Figure 4 molded or pressed into the surface portion of a disc;

Figure 7 is a cross-sectional view taken along the line 7-7 of Figure 6;

Figure 8 shows the ornament of Figure 4 secured to the surface of a disc by means of a lacquer overlay;

Figure 9 is a cross-sectional view taken along the line 9-9 of Figure 8;

Figure 10 shows the ornament of Figure 4 cemented to the surface of a disc; and

Figure 11 is a cross-sectional view taken along the line 11-11 of Figure 10.

An ornament for such purposes as above outlined may be affixed to the article which it is to decorate by molding the ornament in the article, pressing the ornament into the article, coating the article with the ornament in place thereon with an overall lacquer or similar substance, or cementing the ornament to the article. The

ornament as contemplated by our invention is well suited for affixation to the article in any of these and other manners, being desirably characterized by concave bevelled edges throughout its entire design. Such edges are desirable from several standpoints. For example, when the ornament is molded into the article material these edges provide a thin tapering bevel which projects under the surface of the material, securing and fastening the ornament therein while allowing the material to flow flush to the exposed periphery of the ornament. When the ornament is retained against the article surface by means of a lacquer overlay the thin tapering bevel again provides a high degree of security. The concave bevelled edges present a razor-like periphery on one side of the ornament, providing a relatively smooth junction of the ornament edge with the article surface when the ornament is cemented thereto. At the same time in any case wherein the edges of the ornament are visible the periphery of the exposed face is well defined. These edges also present reflecting facets which enhance the beauty of the ornamented article when clear lacquer overlays are used for fastening the ornaments in place.

According to our invention the ornament itself is produced by an improved etching process, wherein the concave bevelling throughout each and every edge of the ornament design is readily obtained. In carrying out this process we proceed preferably as follows:—

An outline drawing is made on bristol board with black ink, representative of the ornament desired, to such a scale as lends itself to ease of delineation. In the preparation of the drawing allowances are made for the cutting back action of the acid occurring during the etching operation described further on; these allowances comprise a slight enlargement of the outlined area by a fixed increment around its borders—i. e., "arithmetic", as distinguished from "geometric" or purely proportionate enlargement. A photographic negative is made from this drawing, and from this negative a photographic positive is made to the exact size of the ornament wanted.

Where a number of ornaments are required the design may be repeated in positive form, by means of a "step and repeat" camera, on a large film or plate of size suitable for subsequent handling, thus making a positive with a plurality of similar designs thereon.

A metal sheet from which the ornament is to be made is prepared so as to have a smooth sur-

face, which is then coated with a bi-chromated gelatin solution or similar light-sensitive solution. The sheet thus prepared is then placed in a suitable photographic printing frame with the positive in contact with the sensitized surface and subjected to a high intensity light. Certain areas—i. e., the outlines corresponding to the outlines of the original drawing—of the positive will prevent the light from chemically acting upon the sensitized surface, thus printing the design upon the sheet. The sheet is then developed by washing in a suitable solution of solvents which will remove the unchanged sensitized solution and expose the metal at the mentioned areas. The sheet is then "burned in" by heating gently which will cause the remaining areas to resist the cutting action of acids. The side of the sheet opposite that which is printed is then coated with an acid resisting paint or compound such as asphaltum varnish.

Figure 1 shows a metal sheet 20 which has been printed and prepared for etching. The areas 1, 1a and 1b are covered with the acid resisting compounds, whereas the areas 2 and 2a—i. e., the design outlines—are not covered but have the bare metal exposed.

The sheet so prepared is subjected to the action of an acid bath, or etched. After the first "bite" of the acid the areas 1, 1a and 1b may be re-inforced by topping with a suitable acid resisting varnish, applied with a gum roller so as not to fall into the now slightly etched areas 2 and 2a. The etching is continued until the design outlines are etched through to a point where the ornaments drop out or may be removed readily by hand.

Figures 2 and 3 show a portion of the metal sheet 20 after having been immersed in the etching bath and just prior to the final cutting through action of the bath and before the ornaments have been removed from the sheet. The grooves 3 are the result of the acid bath etching through the metal at the areas 2 and 2a. The tops of the grooves are of a considerable width, whereas the bottoms terminate in sharp lines. The action of the acid bath is such as to eat away the metal and form a groove the sides of which are in the form of a concave bevel. The radii and angles of these sides may be predetermined within certain limits by varying the width of the metal exposed to the bath—i. e., of the outline areas 2 and 2a—or varying the strength of the bath or heating the bath, or carrying the composition of the topping varnish, or by any combination of the four variants named.

After the ornaments have been removed from the sheet the acid resisting compound is washed off with suitable solvents, and the ornaments are ready for molding into or affixing to the articles which they are to decorate. Figures 4 and 5 show the ornament produced from the metal sheet 20 after completion of the etching and separation from the balance of the sheet. It will of course be understood that while we have used the letter "A" as the ornamental figure or design throughout the drawings, this is illustrated only and no limitation whatever to letters or any other particular form of design is contemplated. In Figures 4 and 5 we have designated the entire ornament as 21, the smaller face as 4 and the larger face as 5, the faces being bounded and mutually joined by the concave bevelled edges 6. These edges, while having an inclination to the faces 4 and 5 which varies from point to point vertically along the edge, have

an average inclination which is acute to the face 5 and obtuse to the face 4. Such average inclination is represented in cross-section by a straight line joining the top and bottom extremities of the edge, such as the dotted line 30 in Figure 5. Obviously the angle formed by this line with the larger face 5 is acute, but less acute than the angle formed with this face by the edge 6.

Figures 6 and 7 illustrate an article in the form of a disc 16, into which has been molded or pressed an ornament 21 such as shown by Figures 4 and 5. When the molding operation is performed the ornament 21 is laid in the bottom of the mold with the face 4 against the mold. Plastic material in powder or sheet form is placed over the ornament, and then the mold closed and the usual operations for molding followed, such as applying heat or pressure or both. If the pressing operation is employed, the article 16 being of celluloid or other composition, the article is placed in a press with the ornament laid on top of it and with the ornament face 5 in contact with the article. Heat and pressure are then applied to force the ornament into the position illustrated in Figure 7. In some cases suitable solvents are used to facilitate the flow of the article material around the ornament. In either case the smaller face 4 is exposed and the edges 6 are covered with the article material, thus locking the ornament securely in the article.

Figures 8 and 9 show the ornament 21 affixed to another disc 18 by means of lacquer or other similar substance 17 floated over the article surface and the face 4 and edges 6 of the ornament, the ornament being first laid on the article 18 with the face 5 in contact therewith. After such floating of the lacquer over the surfaces that portion of the lacquer which covers the ornament face 4 may be removed.

Figures 10 and 11 show the ornament 21 affixed to another disc 19 by cementing of the larger face 5 of the ornament to the disc, the cement being shown by the heavy line 23 in Figure 11.

While we have shown and described the preferred form of our invention we do not limit ourselves thereto, as other forms, modifications and variations thereof are possible within the scope of the invention.

We claim:—

1. The method of making an ornament for surface embellishment, which consists in impressing on a metal sheet an ornamental outline; and in etching through said sheet at said outline only, whereby to produce from said sheet a flat member having a contour substantially corresponding to said outline.

2. The method of making an ornament for surface embellishment, which consists in impressing on a metal sheet an ornamental outline; and in etching grooves in said sheet at said outline, whereby to separate from the balance of said sheet a member having concave bevelled edges and a contour substantially corresponding to said outline.

3. The method of making an ornament for surface embellishment, which consists in arithmetically enlarging an ornamental figure; in impressing the outline of said so-enlarged figure on a metal sheet; and in etching through said sheet at said outline only, whereby to produce from said sheet a flat member of the contour of said first mentioned figure.

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