April 3, 1934. F. J. STRASSNER ET AL 1,953,784

DECORATING ARTICLE SURFACES

Filed March 10, 1933 2 Sheets-Sheet 1

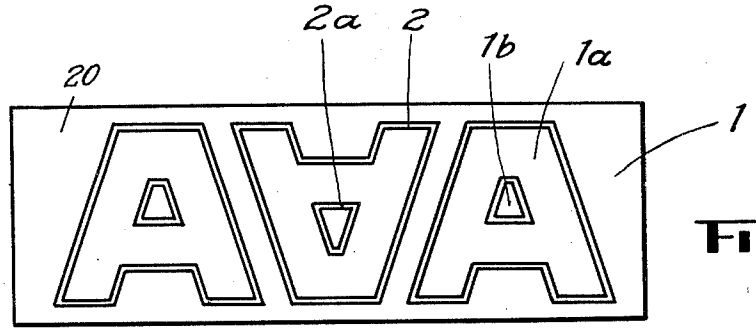


FIG. 1

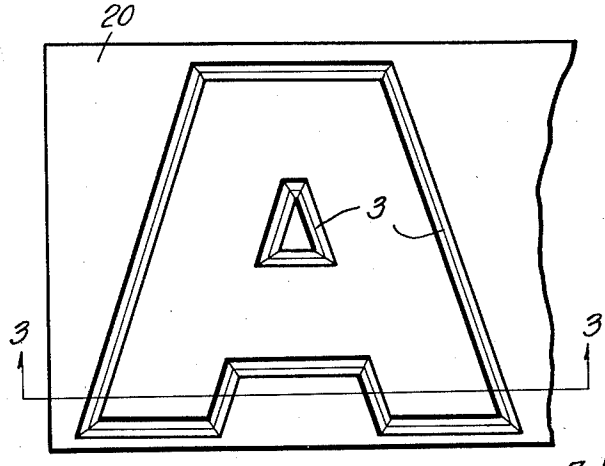
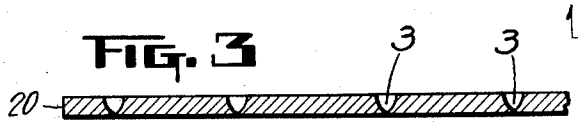


FIG. 2

FIG. 3



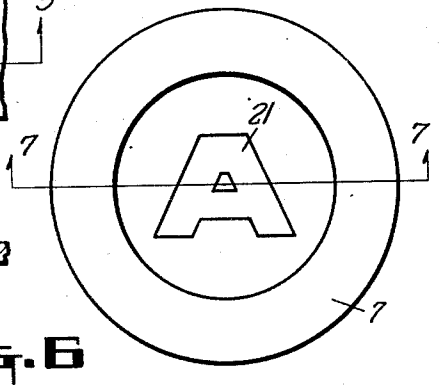
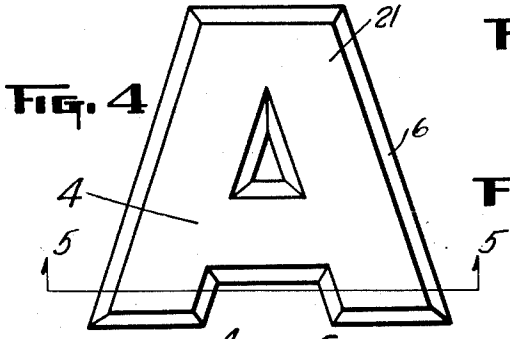


FIG. 6

FIG. 4



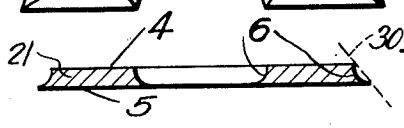


FIG. 5

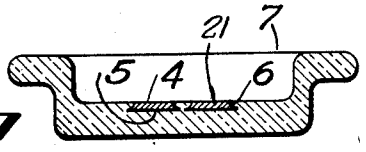


FIG. 7

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FIG. 12

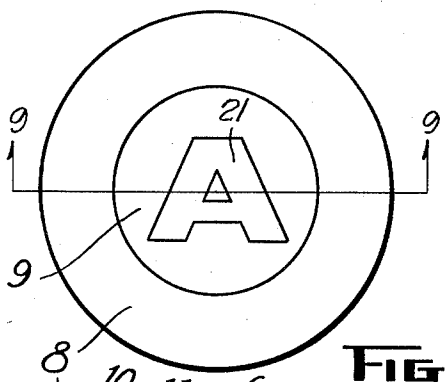


FIG. 8

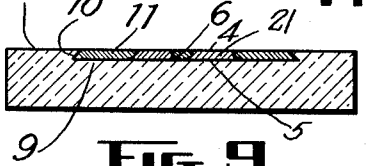
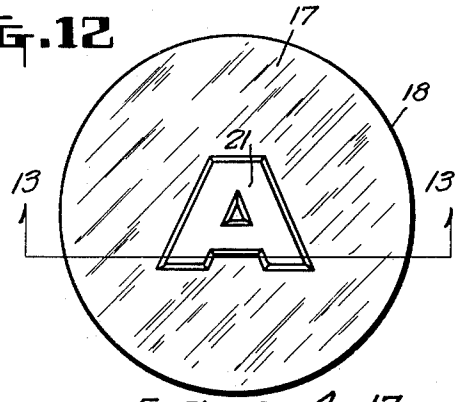


FIG. 9



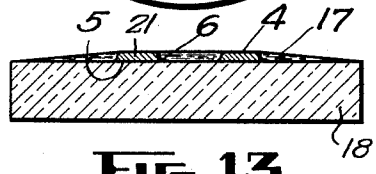


FIG. 13

FIG. 14

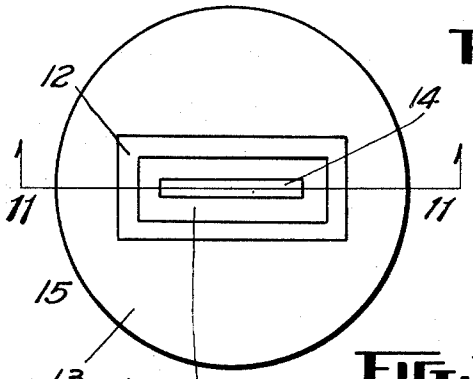


FIG. 10

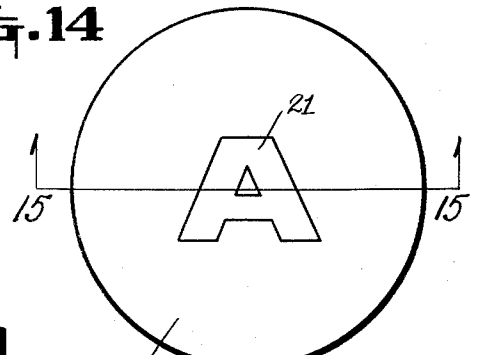


FIG. 11

FIG. 15

FIG. 16

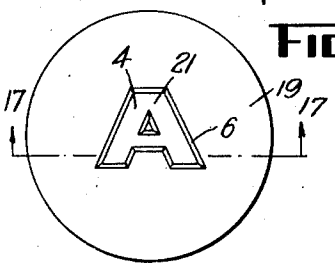
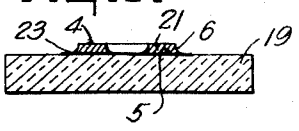


FIG. 17



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Patented Apr. 3, 1934 1,953,784

UNITED STATES PATENT OFFICE

1,953,784

DECORATING ARTICLE SURFACES

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Application March 10, 1933, Serial No. 660,230

12 Claims. (Cl. 40—136)

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. when same are made of plastic materials which are molded either by the hot or cold processes common to the plastic industry, or of such other materials as are commonly employed in the making of such articles.

The purpose of the invention is to produce metal ornaments suitable for decorating said articles and to combine said metal ornaments with said 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 securely apply them to the articles in an inexpensive manner.

Reference is directed to the accompanying drawings in which:—

Figure 1 represents a sheet of metal prepared for etching.

Figure 2 shows a portion only of the sheet of metal after etching.

Figure 3 shows a cross-section thru Figure 2 on line 3—3.

Figure 4 shows an ornament, or cut-out, or insert after having been etched out of a sheet metal plate.

Figure 5 shows a cross-section thru Figure 4 on line 5—5.

Figure 6 shows a plan view of an ash tray decorated with a sheet metal ornament.

Figure 7 shows a cross-section thru Figure 6 on line 7—7.

Figure 8 shows a plan view of a disc, decorated with a sheet metal ornament set in cement.

Figure 9 shows a cross-section thru Figure 8 on line 9—9.

Figure 10 shows a plan view of a disc, decorated with a sheet metal ornament within another ornament.

Figure 11 shows a cross-section thru Figure 10 on line 11—11.

Figure 12 shows a plan view of a disc decorated with a metal ornament fastened to one face thereof by means of lacquer.

Figure 13 shows a cross-section thru Figure 12 on line 13—13.

Figure 14 shows a plan view of a disc with a metal insert pressed therein.

Figure 15 shows a cross-section thru Figure 14 on line 15—15.

Figure 16 shows a plan view of a disc to the surface of which has been cemented a metal ornament.

Figure 17 shows a cross-section through Figure 16 on line 17—17.

We are familiar with the practices of imbedding metal parts in molded plastic articles, among which is the practice of placing thin metal sheets having various types of anchorages fastened to them, such for example as pins soldered to one side thereof, and placing the ornaments in molds and molding the plastic compounds around them. Our invention deals primarily with the holding of the ornaments to the finished articles, whether the articles be molded, cut and formed, or pressed from the materials comprising them. In our invention we employ an ornament having concave beveled edges which may be affixed to its associated part by molding it therein integrally, pressing it into the material so that it becomes an integral part thereof, cementing it thereto or by coating the article and ornament with an overall lacquer or similar substance.

While it is possible to produce sheet metal ornaments having beveled edges by means of profiling, coining, or casting, it is very costly so to produce these bevels in a concave form. Also there are then instances in which it is possible to produce the bevels only on certain edges owing to the minuteness of the spaces to be cut out between various sections of the design used. There is, however, a distinct advantage in having bevels on all edges of the design, and by our invention we are able to produce concave beveled edges thruout each and every edge of the design. These concave beveled 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 plastic material securing and fastening the ornament therein, while allowing the plastic material to flow flush to the exposed periphery of the ornament. When the ornament is retained against the article surface by means of lacquer overlays the thin tapering bevel again affords a high degree of security. The concave beveled 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 ornament face is well defined. These edges also present refracting facets which enhance the beauty of the article when clear lacquer overlays are used for fastening them on.

In carrying out our invention 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. Allowances are made for the cutting back action of the acid during the etching process described further on. It will be obvious that 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 is repeated by means of a "step and repeat" camera as a photographic positive on a large film or plate of a size suitable for subsequent handling thus making a positive with repetitive designs thereof.

A metal sheet from which the ornament is to be made is prepared so as to have a smooth surface 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 solution of solvents which will remove the unchanged sensitized solution and expose the metal at these areas. The plate is then "burned in" by heating gently which will cause the remaining sensitized 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. The sheet is subjected to the action of an acid bath until the design outlines are etched thru to a point where the ornaments drop out or may be removed readily by hand. The area of the plate protected from the action of the acid by the light-changed, sensitized solution may be reinforced after the first "bite" of the acid by topping with a suitable acid resisting varnish applied with a gum roller so as not to fall into the etched lines or recesses. After the ornaments have been removed from the sheet the acid resisting paint or compound is washed off with suitable solvents, and they are then ready for molding into, or affixing to the article they are to decorate.

Referring to drawings:—

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

Figures 2 and 3 represent a portion only 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 in Figures 2 and 3 are the result of the acid bath eating thru the metal at the areas not covered by the acid resisting compound.

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 action of the bath, or varying the strength of the bath or heating the bath, or varying the composition of the topping varnish or by any combination of the four variants named.

Figures 4, 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 a letter "A" as the ornamental figure or design throughout Figures 1 through 5, this is illustrative only and no limitation whatever to letters or any other particular form of design is contemplated. In Figures 4, 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 of 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. Without intending to limit all aspects of our invention thereto, we have illustrated as an approximate right angle the angle formed with the smaller face 4 by the edge 6.

Having thus described the ornament, cut-out or insert and the method of producing it, we will now show how it may be combined with the article which it is to ornament in a variety of ways which are embodied in our invention.

Figures 6, 7 illustrate a small tray 7, made from plastic material into which has been molded an ornament 21 such as shown by Figures 4, 5. The ornament has been laid in the bottom of the mold with the face 4 against the mold. The plastic material in powder or sheet form is placed over it and then the mold closed and the usual operations followed for molding such as applying heat or pressure or both. It will be noted that the smaller area face 4 is exposed and the edges 6 are covered over with the plastic compound comprising the tray thus locking the ornament securely to the tray.

Figures 8, 9 show the ornament 21 cemented into a disc of material 8 into which has been cut a depression 9 having bevelled edges 10, the cement 11 being filled in the depression 9 and around the edges 6 of the ornament. Articles having contrasting colors may be made by this method, as for example the ornament could be of silver, the cement a brilliant red and the disc jet black.

Figures 10, 11 show a series of ornaments, which it will be understood are contemplated as having the concave bevelled edges 6 as in the case of ornament 21, placed one within another on a disc of plastic material. In this case the larger ornament 12 is molded into the disc 13 which is provided with a recess into which a smaller ornament 14 is set in cement 15.

Figures 12, 13 show an ornament 21 affixed to another disc 18 by means of lacquer or similar

substance floated over the entire surfaces and then that portion of lacquer, etc. covering the ornament is removed. The ornament being represented by the faces 4, 5 and edges 6; and the lacquer by 17.

We also press the ornament into such substances as celluloid and similar materials as shown by Figures 14, 15, in which 16 is the celluloid or other composition article with the larger face 5 and the edges 6 of the ornament 21 imbedded and in intimate contact with the celluloid 16. In this method of combining the ornament with plastic materials, a sheet of celluloid 16, is placed in a press with the ornament laid on top of it with face 5 against the celluloid. Heat and pressure is then applied to force the ornament into the position shown in Figure 15. In some cases suitable solvents for the plastic material are used to facilitate the flow of the material around the ornament.

Figures 16, 17 show an ornament 21 affixed to a flat 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 17.

While we have described and shown 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.

Having thus described our invention, we claim:—

1. The combination with an article having a visible surface, of a thin, substantially flat, metal member united with said article and exposing one only of its two respectively opposite faces for the ornamentation of said article surface, said face being of ornamental contour, and said member having edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to the unexposed said member face, and by an appreciably more acute angle of intersection with said unexposed face.

2. The combination with an article having a visible surface, of a thin, substantially flat, metal member united with said article and exposing one only of its two respectively opposite faces for the ornamentation of said article surface, said face being of ornamental contour, the unexposed said member face being slightly larger than and essentially parallel to said exposed face, and said faces being bounded and mutually joined by bevelled edges forming with said unexposed face an angle of substantial acuteness and with said exposed face an angle approximating a right angle.

3. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face in substantial contact with said article surface, and edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said rear face, and by an appreciably more acute angle of intersection with said rear face.

4. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face, and edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said rear face, and by an appreciably more acute angle of intersection with said rear face; a portion of said article contacting with at least a portion of said rear face, and the outer material of said article surrounding and intimately contacting with said edges at least to the extent of their rear portions, whereby said member is firmly united with said article with its front face exposed.

5. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face, and edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said rear face, and by an appreciably more acute angle of intersection with said rear face; and means mutually associated with said article and said rear face for securing said face in substantial contact with said article surface.

6. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face slightly larger than and essentially parallel to said front face, and bevelled edges bounding and mutually joining said faces and forming with said rear face an angle of substantial acuteness and with said front face an angle approximating a right angle; and cementitious means securing said rear face in substantial contact with said article surface.

7. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face in substantial contact with said article surface and covering a portion thereof, and edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said rear face, and by an appreciably more acute angle of intersection with said rear face; and means overlying and adhering to portions of said article surface adjacent to but not covered by said member and overlying said edges at least to the extent of their rear portions, for securing said member to said article surface with its front face exposed.

8. The combination with an article having a visible surface, of means for ornamenting said surface comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face slightly larger than and essentially parallel to said front face and in substantial contact with said article surface and covering a portion thereof, and bevelled edges bounding and mutually joining said faces and forming with said rear face an angle of substantial acuteness and with said front face an angle approximating a right angle; and a layer of cementitious material overlying and adhering to portions of said article surface adjacent to but not covered by said member and overlying said edges at least to the extent of their rear portions, whereby said member is secured to said article surface with its front face exposed.

9. The combination with an article of plastic material, of means for ornamenting a surface thereof comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face, and edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said rear face, and by an appreciably more acute angle of intersection with said rear face; said rear face, and said edges at least

to the extent of their rear portions, projecting into said material beneath the level of the surrounding surface.

10. The combination with an article of plastic material, of means for ornamenting a surface thereof comprising a thin, substantially flat, metal member having a front face of ornamental contour, a rear face slightly larger than and essentially parallel to said front face, and bevelled edges bounding and mutually joining said faces and forming with said rear face an angle of substantial acuteness and with said front face an angle approximating a right angle; said member projecting into said material to render substantially level with each other said front face and the surrounding article surface, and being retained in said position by said bevelled edges.

11. As a surface ornament, a thin, substantially flat metal member having a face of ornamental contour adapted to be exposed within the confines of an article surface for ornamentation thereof, having an opposite face substantially parallel to said first mentioned face, and having edges bounding and mutually joining said faces and characterized in section by a concave form, by an acute average inclination to said second mentioned face, and by an appreciably more acute angle of intersection with said second mentioned face.

12. As a surface ornament, a thin, substantially flat, metal member having a face of ornamental contour adapted to be exposed within the confines of an article surface for ornamentation thereof, and having an opposite face slightly larger than and essentially parallel to said first mentioned face, said faces being bounded and mutually joined by bevelled edges forming with said second mentioned face an angle of substantial acuteness and with said first mentioned face an angle approximating a right angle.

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