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3,480,500

PROCESSES FOR MAKING DEBOSSED DECORATIVE METAL FOIL

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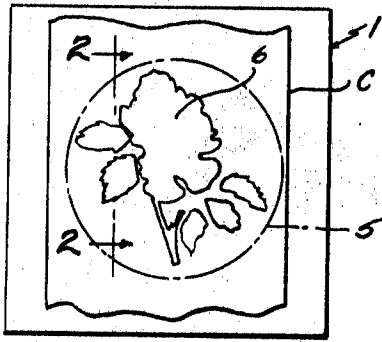


FIG. 1

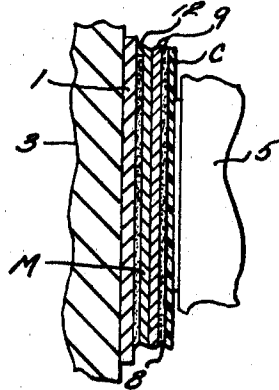


FIG. 2

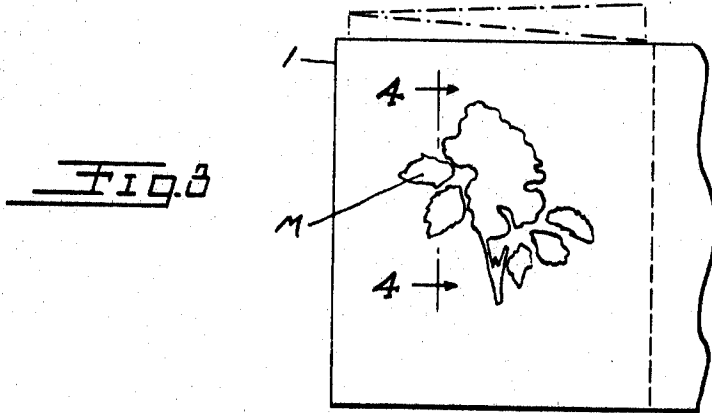


FIG. 3

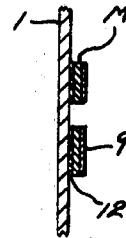


FIG. 4

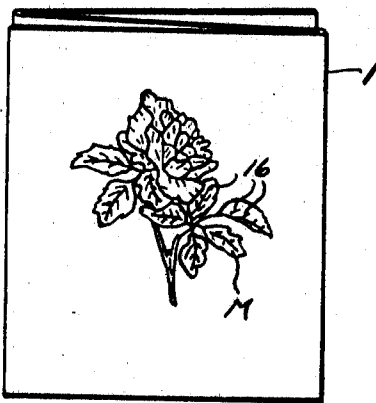


FIG. 5

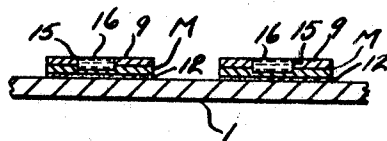


FIG. 6

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**PROCESSES FOR MAKING DEBOSSSED  
 DECORATIVE METAL FOIL**

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1 Claim

**ABSTRACT OF THE DISCLOSURE**

A method of decorating a metallic foil bonded to a base by linking the debossing portions of a printing plate, and pressing the plate against the foil simultaneously to deboss the foil and to deposit ink in the depressions formed.

The present invention relates to processes for providing a decorative metal foil design on a base and decorative articles made thereby, and more particularly relates to providing a debossed metal foil design on a greeting card, the foil having a highly desirable decorative appearance such as that of gold leaf.

It is an object of the present invention to provide a process for applying a metal foil pattern to a base in which the foil has the appearance of a highly desired decorative material such as gold leaf and the foil itself has a debossed and printed design thereon.

It is an object of the present invention to provide a process for providing a highly pleasing decorative debossed metal foil design on a paper such as a greeting card by simultaneously debossing the foil and printing thereon.

It is an object of the present invention to provide an article comprising a debossed and printed metal foil design on a base such as a greeting card, the metal foil having the desirable appearance of gold leaf.

These and other objects will be apparent from the specification that follows, the appended claims, and the drawings, in which:

FIG. 1 is a fragmentary top plan view of a paper base such as a greeting card in a position to receive a metal foil design from a metal foil that is carried by a temporary backing, a hot stamp die being shown in a dot-dash line and the design on the bottom of the die to be transferred being shown in solid lines;

FIG. 2 is a fragmentary sectional view of the card, the metal foil carrier material, and the hot stamp die taken along the line 2—2 indicated in FIG. 1;

FIG. 3 is a fragmentary top plan view of the greeting card of FIG. 1 upon which the metal foil has been transferred;

FIG. 4 is a fragmentary sectional view of the card and transferred foil taken along the line 3—3 indicated in FIG. 3;

FIG. 5 is a top plan view of the greeting card of FIG. 1 having a decorative debossed and printed metal foil design provided thereon in accordance with the present invention; and

FIG. 6 is a sectional view of the completed greeting card of FIG. 5 showing the paper base and the debossed and printed metal foil layer thereon.

It is to be understood that the invention here involved is not limited to the structural details or arrangements of parts shown in the preferred embodiment illustrated in the drawings inasmuch as the present invention may take various forms. Thus, the terminology herein employed is for the purpose of description and not limitation since the scope of the present invention is denoted by the appended claims.

The present invention provides a process of applying a highly desirable decorative design on a base having a bright lustrous metal foil bonded thereto, the design being provided by simultaneously debossing and printing on said bright metal foil to provide depressions therewithin and to fill said depressions with ink to form a pleasing metal foil design. The present invention also provides an article made by the above described process in which a highly attractive greeting card having a decorative debossed and printed metal foil design thereon can be economically produced.

A base 1, preferably of paper such as that used in a greeting card, is provided with a bright metal foil M by bonding the foil thereto, the base and attached foil M being shown in FIGS. 4 and 5.

The foil M is bonded to the base 1 by hot stamping the foil M thereon from a transfer carrier material C that carries the foil thereon. As seen in FIGS. 1 and 2, the carrier C with the foil M therein is positioned adjacent to the base 1 which is supported by a base plate 3. A hot stamping die 5 having a design 6 on the bottom thereof is pressed against the carrier material C to transfer the foil M to the base 1.

The carrier C is generally made of a thin tough plastic material such as cellulose acetate, cellophane and a polyester. Of these materials, the polyester material is preferred and the best results are generally obtained by the use of MYLAR, a polyethylene terephthalate film material that is a trademark of the E. I. du Pont de Nemours Co.

When desired, there may be other coatings with the foil M on the carrier C, the number of coatings generally depending on the requirements for hot stamping the particular base 1. There may be color coatings to add desired effects to the foil M. In general, the hot stamping foils manufactured by the vacuum metallizing process effect a visual appearance to the resultant foil which cannot be duplicated by other methods such as painting or silk screening.

The release coating 8 above described is one that will melt when the hot die 5 contacts the carrier C so that the release coating will separate the foil M and other coatings from the carrier.

In transferring the metal foil M to the base 1 such as greeting card stock, as best seen in FIG. 2, the heated die 5 is brought down toward the base plate 3 and the carrier C with the metal foil is fed into position therebetween. The heated die 5 is pressed against the base plate 3 for a suitable time and pressure to remove the metal foil M from the carrier and bond the foil to the card 1 through adhesive layer 12. At this time the lacquer coating 9 remains on the outer top surface of the foil to protect and otherwise add to the pleasing appearance thereof.

Thereafter, the card having the metal foil M bonded thereon, as seen in FIG. 4 is simultaneously debossed and printed by a suitable printing plate to provide the attractive finished article illustrated in FIG. 5.

In simultaneously debossing and inking the metal foil to provide a pleasing image thereupon, the inked die is applied to the pattern with pressure sufficient to make a plurality of depressions 15 in the pattern. The depressions are filled with ink 16 in the same operation. The pressure used is in excess of that required for a kiss impression being generally at least over about 4000 p.s.i. and up to as high as about 16,000 p.s.i. The best results have been obtained for greeting cards (in which metal foils of about 1/4 to 1 mil are bonded upon card stock of a thickness of about 2 to 5 mils) when the pressure is about 8000 to 1200 p.s.i.

The debossing forms a depression in the foil that has a depth of at least about 3/1000 of an inch and preferably a depth of about 4/1000 to 9/1000 of an inch. Generally,

however, if the surface of the foil is penetrated a distance of about  $\frac{1}{1000}$  to  $\frac{19}{1000}$  of an inch, the results are commercially acceptable.

In any event, the depression must be provided and filled with ink to get the highly desired appearance of the present invention. Although, ordinarily a good printing job is considered accomplished by a kiss impression where the surface to be printed is merely touched but not penetrated, the present invention provides an unusual decorative effect by forming depressions in the foil as the foil is printed upon.

Although the foil layer M is hit hard enough by the inked die to deboss the same, however, the foil M cannot be hit so hard that the foil is dented or even broken clear through. Although the amount of pressure depends somewhat on the nature of the base 1, the foil M and the ink, too much pressure, say 20,000 p.s.i., for a greeting card and a  $\frac{1}{2}$  to 1 mil foil, will squeeze the ink out from between the inked die and will not properly transfer the ink to the depressions in the foil.

Generally speaking, for greeting cards that have a paper base the printing step is done with an overpacking of at least  $\frac{4}{1000}$  inch, a kiss impression being obtained at about  $\frac{4}{1000}$  inch or less. Thus, when the inked die and printing base for the card are two parallel plates, the printing distance between the plates is adjusted for a kiss impression by moving the card closer to the inked die by  $\frac{4}{1000}$  of an inch preferably by using a greeting card stock of a thickness of about  $\frac{4}{1000}$  of an inch, such a card being a spacer of a softer material than a metal plate. Inasmuch as the overpacking should be enough to provide as much of a depression in the foil as possible without squeezing the ink out, for best results the overpacking is about  $\frac{8}{1000}$  to  $\frac{12}{1000}$ , although up to  $\frac{19}{1000}$  inch can be used. Hence, in the illustration used, the overpacking of  $\frac{12}{1000}$  of an inch cause the inked die to penetrate into the foil M theoretically  $\frac{8}{1000}$  of an inch beyond the kiss impression of  $\frac{4}{1000}$  of an inch.

As a specific example of the decorative metal designs and method of making the same in accordance with the present invention, an attractive greeting card was prepared from an 8 point white kromekote paper stock and all purpose bright gold hot stamp leaf, which included a polyethylene terephthalate carrier having a thickness of about  $\frac{1}{2}$  mil. The bright gold leaf in the form of a metal foil having a thickness of about  $\frac{1}{2}$  mil was bonded to the paper base by hot stamping to form a card such as seen in FIG. 4. Thereafter, using an overpacking of about  $\frac{12}{1000}$  inch and a pressure of about 10,000 p.s.i. with an inked die in exact register with the transferred foil, the metal foil was simultaneously debossed and printed upon to provide a decorative design such as seen in FIG. 5. The resultant depressions were about  $\frac{4}{1000}$  of an inch in depth and were filled with black ink to provide a good contrast with the simulated gold leaf foil.

As seen in FIG. 5, the card is of a Z-fold type, which is one of the preferred types because the ink in the depressions of the foil tends to dry slower than when applied to paper which helps absorb some of the ink to aid in the drying thereof.

The preferred ink is an ink normally used for printing on metal foil surfaces. For many designs, particularly on simulated bright gold leaf, the preferred color is black. The preferred foils M are made of copper containing alloys such as brass or bronze.

It is to be understood that various modifications can be made of the methods and articles herein described

without departing from the spirit and scope of the invention.

What is claimed is:

1. A method of making a decorative card or the like by utilizing a paper base, a sheet material laminate formed of metal foil having adhesive on its back surface and a transfer carrier material on its front surface, a heat transfer die having a predetermined decorative outline shape with substantially plane surface characteristics, and a combined debossing and printing plate having selected raised areas thereon defining a decorative pattern within an outline corresponding to said predetermined decorative outline, comprising the steps of:

- (a) positioning said sheet material laminate on said paper base with said adhesive contacting said paper base,
- (b) moving said heat transfer die into engagement with said transfer carrier material and pressing said sheet material laminate against said paper base with said heat transfer die,
- (c) releasing a decorative design shape of said metal foil from said transfer carrier material by means of heat supplied by said die, said decorative design shape corresponding to said decorative outline shape of said heat transfer die and having substantially plane surface characteristics,
- (d) bonding said adhesive and said decorative design shape to said paper base by means of heat supplied by said die,
- (e) transferring said paper base with said decorative design thereon away from said sheet material laminate,
- (f) supplying printing ink to said raised areas of said combined debossing and printing plate, and
- (g) pressing said raised areas into said decorative design shape of said metal foil on said paper base to simultaneously deboss and transfer ink to said foil forming said decorative design shape to provide said foil forming said decorative design shape with said decorative pattern.

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