

Feb. 16, 1937.

C. H. FRANZ, JR

2,071,031

EMBOSSED PRINTED SHEET AND METHOD OF MAKING THE SAME

Filed March 2, 1936

3 Sheets-Sheet 1

Fig. 1.

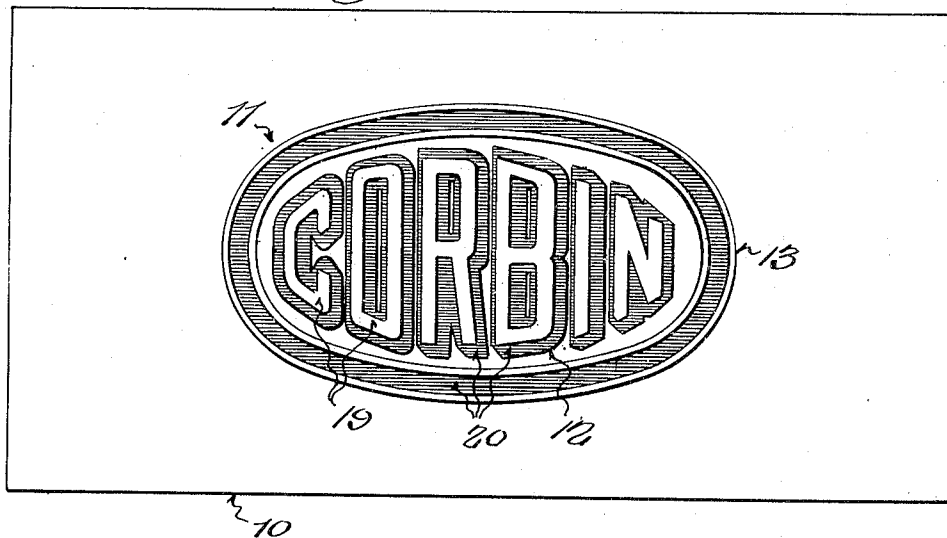
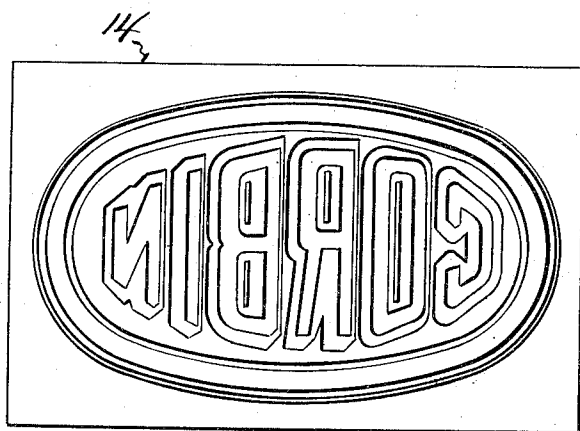


Fig. 2.

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3 Sheets-Sheet 2

Fig. 5.

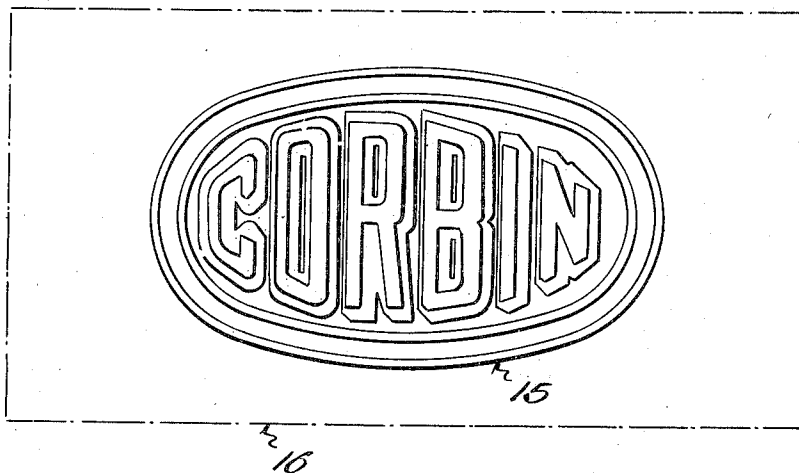
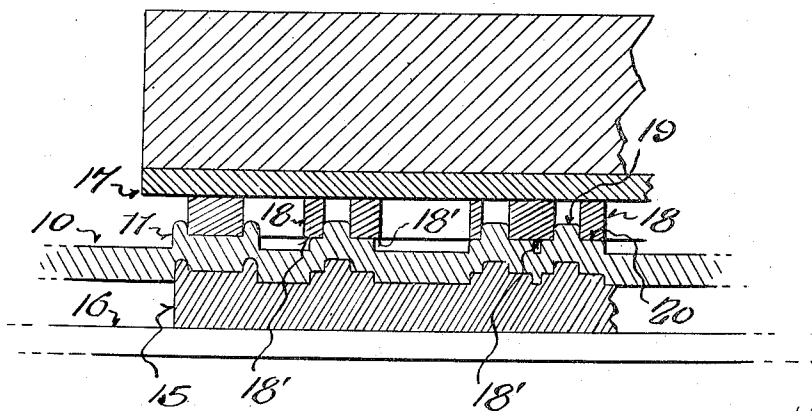


Fig. 6.



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3 Sheets-Sheet 3

Fig. 4.

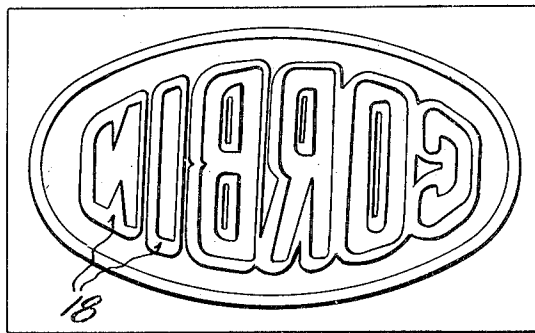


Fig. 5.

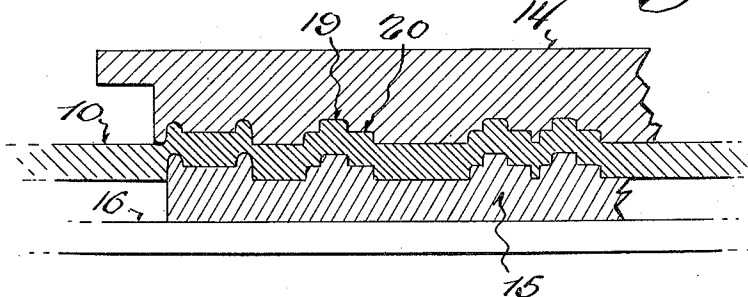
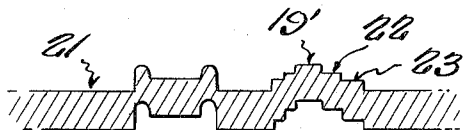


Fig. 6.



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UNITED STATES PATENT OFFICE

2,071,031

EMBOSSSED PRINTED SHEET AND METHOD
OF MAKING THE SAMECharles H. Franz, Jr., Wauwatosa, Wis., assignor
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Application March 2, 1936, Serial No. 66,686

3 Claims. (Cl. 101—32)

This invention pertains to a novel form of embossed printed sheet, and the method of making the same. More particularly the invention relates to printed embossing on relatively thin, pliable sheets of material, such as leather, composition, paper, foil, and the like.

Heretofore, it has been customary in the foregoing art to first print upon a flat sheet, and subsequently emboss or raise the printed surface. This is objectionable, due to the tendency of the ink to flow on the flat surface of the sheet, particularly in that color printed upon certain materials, such as leather, imitation leather, and other compositions, requires several printing operations to attain an even, complete covering of the decorated surface. Also, an extremely accurate registration of the embossing die with the printed surface is essential and difficult to obtain.

In addition to the foregoing, it has been customary in printed embossing to raise the printed surface above the plane of other surfaces of the sheet, with the result that in the handling and use of the sheet, the raised surfaces are exposed to contact with other objects, and the ink or covering material becomes either shoddy, or entirely worn off.

The present invention has primarily for its object to overcome the foregoing objections by an improved method, consisting of first embossing, and then printing, which provides a clean, sharp character, and eliminates the necessity of close registration between the embossing and printing plates.

Incidental to the foregoing, a more specific object of the invention resides in the method of first embossing the sheet, and printing upon one or more surfaces on a plane, or a plurality of planes, below the uppermost embossed surface, while the sheet is supported upon a matrix conforming to the embossing, thus preventing the material from breaking down, and insuring a sharp, clean outline for the printed character.

Another important object is to provide an embossed printed sheet, in which one embossed surface is upon a higher plane than the printed surface, thus protecting the latter against wear.

A more specific object is to provide an embossed sheet having a plurality of printed surfaces upon different planes below the plane of an unprinted, raised surface.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel structure and method, substantially as hereinafter described,

and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate several forms of embossed printed sheets embodying the present invention, and the several elements preferably employed in the novel method comprising the present invention.

In the drawings:

Figure 1 is an elevation of one form of an embossed printed sheet formed in accordance with the present invention, and by the novel method described herein.

Figure 2 is an elevation of a typical embossing die.

Figure 3 is an elevation of a matrix.

Figure 4 is an elevation of a printing plate.

Figure 5 is a fragmentary, transverse section through the embossing die, sheet, and matrix, in their operative positions.

Figure 6 is a similar view through the printing plate, sheet, and matrix, and

Figure 7 is a fragmentary section through a sheet illustrating a modification in which a plurality of printed surfaces are disposed below a raised surface.

Referring now more particularly to the accompanying drawings, Figure 1 illustrates a relatively thin sheet of pliable material designated by the numeral 10, and having an embossed printed design 11 formed thereon. In the present instance the design comprises a plurality of letters 12 surrounded by a border 13. However, it is to be understood that the invention is applicable to any form of design or characters.

For the purpose of explanation, the invention will be described in connection with printing, but it is to be understood that it is not essential that ink be employed, in that gold leaf or other covering material may be employed.

The novel method comprising the present invention may be accomplished in several ways. However, in the preferred form, it is proposed to employ a die plate 14 illustrated in Figures 2 and 5. In connection with the die plate, a conventional matrix 15 is employed, the latter being used in both the embossing and printing operations, as will be hereinafter described. Figure 3 illustrates an elevation of the matrix 15 mounted upon a suitable base or plate 16.

Figure 4 is an elevation of a printing plate 17 employed in the present instance, and provided with face type 18 of such contour as to

engage only the surfaces to be printed, as better illustrated in Figure 6.

In that form of sheet illustrated in Figures 1, 5, and 6, the sheet 10 is embossed upon two planes, the top plane or surface being indicated by the numeral 19, and the intermediate surface, which in the present instance is the printed surface, by the numeral 20.

In the form of sheet illustrated in Figure 7, and designated as 21, three embossed surfaces are illustrated, the surfaces 22 and 23 being disposed upon planes intermediate the face of the sheet and the uppermost raised surface 19'.

Considering now the preferred method employed to carry out the principle of the present invention, the metal die plate 14 is first formed in the conventional manner, and from this the matrix 15 is made, the latter being formed from composition material in a plastic state, and subsequently hardened, all of which is old in this particular art.

The sheet 10 is then placed on the matrix 15 and embossed by means of the die plate 14, as best shown in Figure 5. The sheet is then ready for printing, which is accomplished with the printing plate 17, as shown in Figure 6.

While any desired surfaces of the sheet 10 may be printed, in that form illustrated in Figures 1, 5, and 6, only the intermediate surfaces 20 are engaged by the printing plate, and with particular reference to Figure 6, it will be noted that the face type 18 may extend slightly beyond the surface to be printed, as indicated at 18', without detrimental effect, due to the fact that the ink or covering material has no tendency to travel downwardly from the embossed printed surface, because the edge or shoulder breaks the capillary attraction of the ink, and, therefore, the same is confined to the surface to be printed, regardless of accurate registration of the printing plate with the embossed surfaces of the sheet.

During the printing operation, it will further be obvious that the matrix 15, upon which the sheet is supported, effectively prevents the same from being broken down by the pressure of the printing plate.

From the foregoing explanation, considered in connection with the accompanying drawings,

it will be readily seen that the novel method employed insures printed characters having sharp clean outlines, and entails no further expense than that required by the present method of first printing and then embossing.

It will also be noted that in printing upon a surface below the uppermost embossed surface, the printed surface is protected against contact with adjacent objects, and will, therefore, not wear or become shoddy in appearance, which occurs in the present type of embossed printed sheets, wherein the uppermost surface is printed or covered.

In that form of sheet shown in Figure 7, wherein two intermediate surfaces 22 and 23 are provided, the same may be printed with contrasting colors, thus producing a very attractive and effective design, practically unattainable in the conventional method heretofore employed, due to the tendency of the ink to flow and overlap when the printing is attempted upon a flat surface and thereafter embossed.

Having thus described the invention in considerable detail, it is to be understood that variations are contemplated as coming within the principles of the invention, and, therefore, the same is to be limited only to the extent of the appended claims.

I claim:

1. The method of decorating a thin pliable sheet of material consisting of, first, embossing the sheet by means of a die and matrix to form a plurality of raised surfaces upon different planes, and then printing upon an intermediate raised surface below the plane of the upper surface while the sheet is supported upon a matrix.

2. The method of decorating a thin pliable sheet of material consisting of, first, embossing the sheet by means of a die and matrix to form surfaces upon different planes, and then printing upon a plurality of intermediate surfaces while the sheet is supported upon a matrix.

3. An article of manufacture comprising a sheet of thin pliable material having a plurality of embossed surfaces adjacent one another, and having an embossed printed surface disposed between the plane of the top embossed surface and the surface of the sheet.

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