

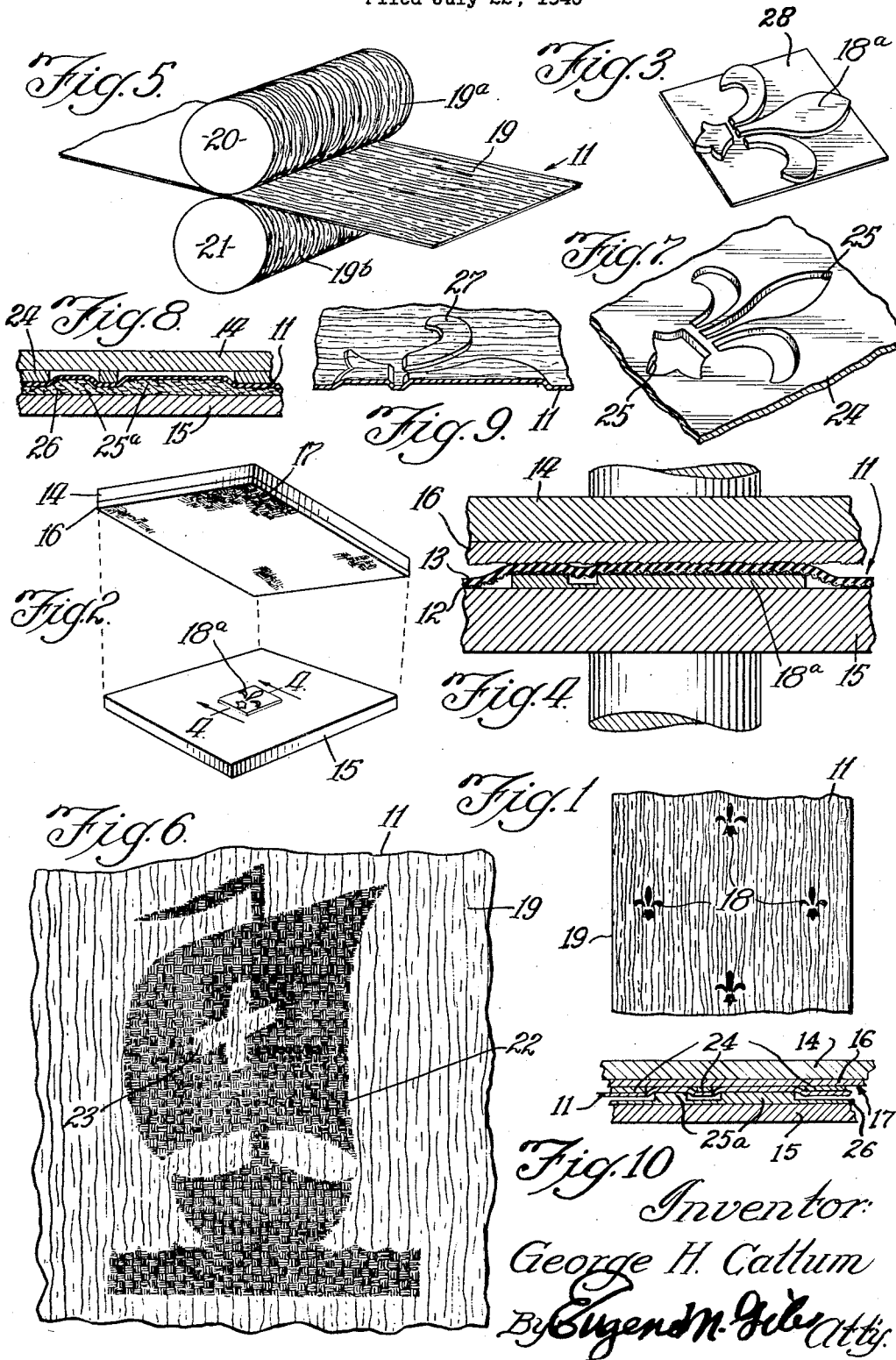
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EMBOSSING METHOD AND MEANS

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EMBOSSING METHOD AND MEANS

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My invention relates to the embossing of sheet materials and has reference more particularly to a method of and facilities for embossing ornamental features or the like at selected locations on sheet materials made of or surfaced with rubber or on other similar sheet materials.

Ordinarily in embossing such ornamental features or the like on sheet materials of the above mentioned character it is customary to prepare a plate or roll specially for the purpose with a negative of the desired design or ornamental features engraved thereon and to use such specially prepared plate or roll to impress the design on the sheet material. The engraving of such plates or rolls, however, is tedious and expensive and as such plates or rolls are only useful for embossing the particular design engraved thereon, the expense of making the engraved plate or roll is prohibitive unless large quantities of material are to be embossed with the same pattern or design.

In many cases, however, such materials are desired with unusual or special designs or markings but in quantities insufficient to justify the expense of an engraved plate or roll and heretofore there has been no acceptable way of producing such quantities at a reasonable cost. This is accomplished in accordance with the present invention by securing patterns of cardboard or other suitable material onto the surface of the backing plate or roll by which the material is pressed against an opposed engraved plate or roll so as to impress the design of the engraved plate or roll only on selected areas of the material corresponding to the shape and arrangement of the cardboard pattern thereby providing the material with embossed impressions of any selected shape and in any desired relative locations on the sheet.

Thus an engraved roll or plate with an appropriate overall design may be employed, by the mere application of suitable cardboard patterns on the opposed roll or plate, to produce a great variety of embossed designs or markings on the sheet material and at a negligible cost for the special facilities for each different design. Moreover, color contrast may readily be provided between these embossed areas and the other areas of the sheet material to accentuate the design by proper application of an overall color, the depth or shade of which may be controlled by the depth and texture of the embossing so as to give a two-tone effect. Furthermore, by utilizing patterns on one plate or roll

and a matching cutout on the opposed plate or roll, attractive raised or offset features or configurations may be produced having an appearance simulating that of hand tooled leather.

The principal objects of my invention are to provide an improved method and improved facilities for producing ornamental figures or the like on sheet materials made of or surfaced with rubber or the like or on any other sheet materials of similar character; to produce such ornamental figures by superficially embossing selected areas of the sheet material or by offsetting such areas in a manner to simulate hand tooling; to permit variations or changes in the patterns or designs without appreciable expense; and to provide color variations in the different areas of the pattern or design surface; these and other objects being accomplished as pointed out hereinafter and as shown in the accompanying drawing in which:

Fig. 1 is a face view of a sheet of material showing an illustrative form of ornamentation produced in accordance with this invention;

Fig. 2 shows somewhat diagrammatically an embossing press with raised pattern for producing the ornamentation of Fig. 1;

Fig. 3 is an enlarged perspective view of the raised pattern of Fig. 2;

Fig. 4 is an enlarged detail sectional view of the press of Fig. 2 taken on the line 4—4 thereof showing the press closed upon the raised pattern in the embossing operation;

Fig. 5 is a perspective view of rolls for producing a basic overall surfacing on the sheet;

Fig. 6 is a face view of sheet material showing another illustrative form of ornamentation;

Fig. 7 is a fragmentary perspective view of a cut out facing that may be used in connection with the raised pattern of Fig. 3 to produce offset designs;

Fig. 8 is a view similar to Fig. 4 showing the raised pattern of Fig. 3 and the facing of Fig. 7 in the offsetting operation; and

Fig. 9 is a fragmentary perspective view showing a sheet of material with offset figure as produced by the operation of Fig. 8, the offset figure being shown partly in section.

Fig. 10 is a view similar to Fig. 8 but showing the use of the overall embossing plate of Fig. 2 to apply the design thereof to the raised ornamentation.

This invention may be used with any sheet material sufficiently plastic or deformable to be embossed or shaped as required herein although it is particularly applicable to sheet materials com-

posed of or surfaced with a rubber composition or the like which, before vulcanization, is readily shaped or embossed and upon subsequent curing permanently retains the shaping or embossing previously imparted thereto. A typical form of material to which the invention is applicable is a rubber surfaced fabric such as represented in the drawing at 11 wherein 12 indicates a fabric base and 13 a lamination or coating of rubber composition, such rubber surfaced fabrics being extensively used for upholstery and similar purposes and commonly provided with an overall embossing and suitably colored to simulate leather.

For imparting a design on such materials in accordance with this invention, a conventional press may be employed comprising upper and lower press plates 14 and 15 respectively, the lower plate preferably being operable to and from the upper plate and the lower or bed plate being adjustable to regulate the extent to which the plates may be closed together and thereby insure whatever spacing of the plates may be required to accommodate the work between the plates for properly embossing or shaping the work.

The upper plate 14 preferably has an embossing plate 16 secured in any convenient manner to the underside thereof and engraved or otherwise provided with any desired overall design 17 suitable for the special figures or markings that are to be embossed on the sheet material. Any desired figures or markings may be provided, as for example, fleur-de-lis markings or figures such as shown at 18 in Fig. 1.

To produce these markings or figures on the sheet a pattern of the selected design, for example the fleur-de-lis, is cut out of cardboard or other suitable inexpensive material as shown at 18^a and secured to the top surface of the bed plate 15 of the press as indicated in Fig. 2. Then by placing the sheet material 11 on the bottom plate 15 with the rubber surfacing 13 presented upwardly and by closing the upper plate 14 with its embossed plate 16 against the work, the embossing 17 of the plate 16 will be stamped only on the area of the sheet 11 overlying the pattern 18^a and thus produce on the sheet 11 an embossed figure of the exact fleur-de-lis configuration of the pattern 18^a.

Obviously the raised pattern 18^a on the bed plate 15 elevates the particular portion of the sheet 11 overlying the pattern 18^a and holds this area with sufficient firmness so that when it is pressed against the upper plate 14 the design 17 is impressed on this particular area whereas the other areas of the sheet 11, being relatively unsupported and freely accommodated between the embossing plate 16 and bed plate 15 receive no impression from the embossing plate 16.

Instead of merely embossing the selected area over the pattern 18^a with the design 17 of the embossed plate 16 the entire surface of the sheet 11 may be embossed with the same design 17 but with selected pattern shaped areas embossed to a greater depth than other areas so that they are accentuated and distinguishable by the difference in the depth of embossing. Further contrast of these areas may be produced by a color wash which imparts a greater depth of color at the deeply embossed areas than at the areas which are lightly embossed.

To accomplish this differential depth of embossing, a thin pattern 18^a is employed on the bed plate 15 of the press, the pattern being merely of such thickness to raise the sheet material

11 thereover sufficiently to give the desired difference in depth of embossing, and when the top plate 14 and embossing plate 16 are depressed the design 17 is impressed upon the entire surface of the sheet material 11 on the bed plate 15 so that said surface has the same overall design. However, since the area of the sheet over the thin pattern 18^a is held by the thin pattern at an elevation slightly higher than that of the other areas of the sheet, the raised area, corresponding in shape to the pattern 18^a will be embossed to a greater depth and thus produce on the surface of the sheet a figure of exactly the same shape as the pattern and with the same embossed design as that on the other areas of the sheet but defined and distinguishable by the greater depth of embossing.

Moreover the sheet 11 may be provided with overall embossing but with the embossing at the pattern areas of a different character than that of the other areas of the sheet. This may be accomplished by first embossing the sheet 11 with an overall or basic design and thereafter by employing a plate 16 with some different design, embossing the selected areas with the latter design.

The overall or basic design may, for example, be such as to simulate leather graining as indicated at 19 and may be impressed on the sheet 11 in any convenient manner. For example a pair of rolls 20 and 21 may be provided, one of which, for example 20, may be embossed with a negative of the leather graining as indicated at 19^a and the other roll 20 may be embossed as at 19^b with a positive of the leather grain design 19 so that by passing the sheet 11 between the rolls 20 and 21 the rubber surfacing 13 thereof is embossed over the entire surface with the leather grain design 19.

After the sheet 11 is thus provided with the leather grain embossing 19 the sheet is then interposed between the press plates 14 and 15 with the desired pattern 18^a on the lower plate and of sufficient thickness to hold the area of the sheet over the pattern at a suitable elevation to confine the press embossing to that area and avoid embossing of the sheet elsewhere in the press. The press is then operated and by reason of the elevation of the selected area by the underlying pattern 18^a the criss cross design 17 of the embossed plate 16 is impressed only on the area of the sheet 11 above the pattern 18^a and as the other areas of the sheet with their embossing 19 are not affected by this embossing in the press 14-15, the pattern 18^a is reproduced in the fleur-de-lis form 18 on the rubber surface 13 of the sheet 11 in the particular embossing 17 whereas the remainder of the surface of the sheet retains the original leather grain embossing 19. Obviously the leather graining 19 directly over the pattern 18^a is obliterated in the operation of the press 14-15 and the rubber surface reformed by the embossed plate 16 to produce the design 17 on the rubber surface over the pattern.

The design 18 may, of course, be applied at random to the sheet 11 if desired or by carefully positioning the sheet with suitable guides or indexing means, it can be applied repeatedly at regular intervals to produce a sheet 11 with the design 18 in any desired distributive arrangement throughout the surface of the sheet 11. Moreover, any desired shape or form of design may be produced, such as running patterns, silhouettes, emblems, floral designs, lettering and

the like by merely employing a pattern 18^a of the appropriate form, one other illustrative form of design being shown in Fig. 6 wherein a ship 22 is impressed in the criss cross engraving 17 on a grained surface 19 and with this graining 19 showing at the center of the sail in the form of a cross 23. Also a number of patterns 18^a may be provided on the press plate 15 to produce a number of embossed figures simultaneously.

Furthermore, a pair of rolls, similar to the rolls 20 and 21 may be employed instead of the press 14—15 to produce the pattern effects, for example by applying the patterns 18^a on the surface of a lower roll 21 which is properly spaced from the roll 20 so that in passing the sheet 11 between the rolls, the design 18^a or other design on the roll 20 will be embossed only on the areas elevated by the patterns 18^a on the lower roll. Thus there is performed in a continuous operation the same embossing that is accomplished intermittently in the press 14—15. Thin patterns 18^a may of course, be employed on the roll 21 to produce an overall embossing with the patterns reproduced on the sheet by embossment thereof to a greater depth than elsewhere as above explained in connection with the press 14—15.

After the sheet 11 has been embossed with the designs 18 thereon or any other designs the sheet material is vulcanized in the usual manner and the embossed design is thereby given permanence.

Either before or after vulcanization of the sheet the surface may have a color coating applied thereto to provide a finished surface of any desired color, the coating being preferably applied before vulcanization. This color coating may be spread over the embossed surface by wiping with a doctor blade or in other similar manner so as to produce varying depths of color according to the depth and texture of the embossing. Thus with a relatively coarse leather graining 19 and a relatively fine lined embossing of the figures 18 or 22 a greater depth of color occurs throughout the embossed areas 18 and 22 than throughout the other leather grained areas 19 of the sheet thereby providing a two-tone or contrast of color which accentuates the figures or other markings 18 that are embossed on the sheet.

In addition to its applicability of selective embossing of various figures or designs on sheet material as above explained, this invention may also be employed to produce offset figures, formations or designs of a character similar to those produced for example in leather by hand tooling.

To accomplish this hand tooling effect the upper plate 14 is provided, as shown in Fig. 8, with a stencil 24 of cardboard or other suitable material having one or more cut outs of the design to be produced on the sheet material 11, and which for the purpose of illustration and as shown at 25 in Fig. 7 is of the same fleur-de-lis configuration as the pattern 18^a hereinbefore referred to. The opposed press plate 15 is provided with a facing 26 having raised portions 25^a matching the cut outs 25 of the stencil 24 and when the sheet material 11 is interposed between the plates 14 and 15 and the press plates closed thereagainst, a raised figure 27 is produced as shown in Fig. 9 corresponding to that of the raised portion 25^a and of the same contour of the cut out 25. The material is thereafter vulcanized

and the offsetting thus permanently imparted thereto.

To produce the facing 26 with raised portions 25^a, the press plate 15 is provided with an overall covering of paper of the blotting variety and while the latter is wet, the stencil 24 is pressed thereagainst, thereby compressing those areas of the covering opposite the solid parts of the stencil 24 and leaving at the stencil openings 25 raised portions 25^a. Upon drying the paper covering hardens and retains the form imparted to it by the stencil 24 with raised portions 25^a matching the cut outs 25 of the stencil 24.

In this offsetting, sheet material may be employed to which an embossed surface, such as the leather grain 19, has been applied, and the depth or thickness of the stencil 24 and of the raised portions 25^a, and the extent to which the press plate 14 approaches the bed plate 15 may all be so arranged to avoid any direct pressure against the embossed surface of the sheet which would mutilate the embossing. On the other hand, raised portions 25^a may be provided, as in Fig. 10, which are of sufficiently greater depth or thickness than the stencil 24 to cause pressure of the upper plate against the top surface of the raised portion of the sheet 11 on the raised portion 25^a. If the upper plate is plain (as in Fig. 8) it will impart a smooth surface to the raised portions of the sheet while the other areas of the sheet are devoid of pressure and thus retain the leather graining 19 or other surfacing previously imparted thereto. If the stencil 24 is thicker than the elevation of the raised portion 25^a the graining 19 or other surfacing would be preserved on the raised portion of the sheet over the raised portion 25^a and a pressure applied to the remainder of the sheet to smooth the surface.

Moreover if the stencil 24 is applied to the embossed plate 16 of the upper press plate and the raised portion 25^a is of greater depth than the stencil 24 as in Fig. 10, the design 17 of the plate 14 will be embossed on the top surface of the offset area 27.

Thus in this offsetting of pattern areas it will be understood that various different effects may be obtained by using stencils 24 and raised areas 25^a of different relative depths or by using a plain surfaced upper plate or embossed upper plate, and in both the embossing of Fig. 4 and the offsetting of Fig. 8 substantially any form of pattern may be employed and as both the patterns and facings are of inexpensive material and readily made, a great variety of markings or ornamental figures either embossed or offset or both may be provided on the sheet 11 each at a very nominal expense.

Both the patterns and the facings may be made of any desired material suitable for the purpose and they may be treated with lacquer or shellac or surfaced with fabric to impart greater durability thereto, and it will be understood that the patterns 18^a or other patterns may be directly applied and secured to the press plate or may be mounted on a base as indicated at 28 in Fig. 3 and the latter applied to the bed plate 15 of the press. Also it will be understood that either the embossing roll 20 or the embossing plate 16 may be heated if desired to facilitate the embossing and this heating may be accomplished electrically or by supplying hot water or steam to the interior of the roll or plate or in any other conventional or known manner.

While I have shown and described my invention in a preferred form, I am aware that various

changes and modifications may be made therein without departing from the principles of the invention, the scope of which is to be determined by the appended claims in which the terms ornamentation and ornamenting contemplate any design or configuration or marking which may be produced on the sheet material in accordance with the invention even though such design may not be used strictly for ornamentation.

I claim as my invention:

1. The method of producing ornamentations on sheet materials of rubber or the like, which said method comprises applying an overall embossing to the face of the sheet, applying to the surface of a pressure member a temporary removable pattern of an ornamentation to be produced on the face of the sheet and applying to the surface of an opposed pressure member a temporary removable lamination having a cut-out corresponding to and registerable with but shallower than the pattern of the other pressure member, and then interposing and compressing the sheet material between the pattern and lamination and impressing on the face of the sheet

an ornamentation pre-determined as to location and configuration by the presence of the pattern on the back of the sheet, while simultaneously modifying the embossing of the ornamentation area.

2. Sheet material ornamenting means comprising, a pair of opposed pressure members having opposed surfaces for compressing sheet material therebetween, a temporary removable pattern of an ornamentation to be produced on the face of the sheet carried by one of said pressure members, the other of said pressure members having the surface thereof provided with a design for embossing, and a temporary removable lamination carried by said second pressure member and having a cut-out corresponding to and registerable with but shallower than the pattern of the first pressure member, the embossing design of said second pressure member being exposed within said cut-out for impressing the embossing design upon a portion of the sheet material overlying said pattern.

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