Sept. 13, 1938. W. H. BARRETT 2,130,222

DECORATING LEATHER

Filed April 9, 1935

Fig. 1

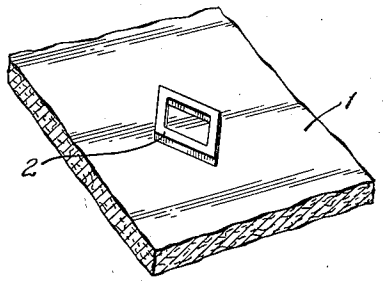


Fig. 2

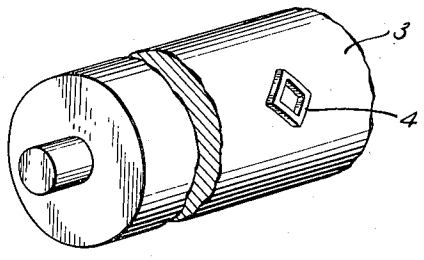
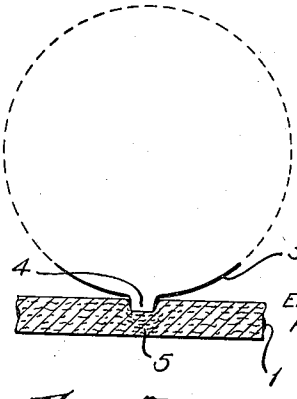
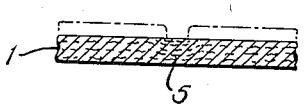


Fig. 3



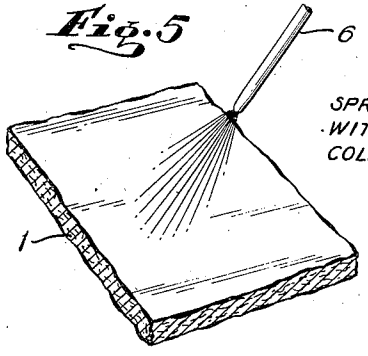
EMBOSS IN REVERSE

Fig. 4



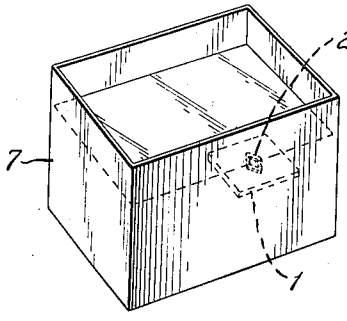
CUT AWAY MORE OR LESS OF THE INITIAL RELIEF PORTIONS.

Fig. 5



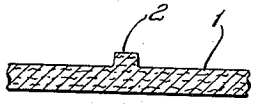
SPRAY WITH COLOR

Fig. 7



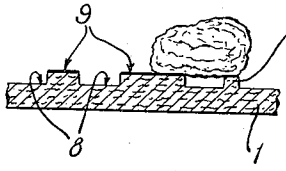
IMMERSE IN DYE, WITH OR WITHOUT PADDLING

Fig. 6



MOISTEN TO SWELL LEATHER TO THE FINAL EMBOSSMENT DESIRED.

Fig. 8



TIPPING

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DECORATING LEATHER

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14 Claims. (Cl. 41—24)

My invention relates to decorating leather by the conjoint use of embossing and surface effects such as are obtained by the use of color, buffing, blocking, etc. Broadly it provides means for obtaining some new results, improved forms of some old results, and a substantially uniform color effect with a certain method of embossing. It can be employed to decorate the grain side or the flesh side, and with splits as well as whole skins, certain peculiar effects are obtained by applying it to the grain side, or to a simulated grain. Generally speaking, two methods of embossing leather are known. In the older of these methods the embossment is direct, as it were; that is to say, a plate or roll carrying a negative of the design desired on the finished leather is pressed against the side of the leather to be the face side, and thereby the portions of the leather surface which are to be in intaglio in the finished leather are depressed initially to substantially their final positions. In the newer embossing method also the material is pressed by plates or rolls carrying the design. In this newer process however, the embossing plate or roll may carry either a positive or a negative of the design that is to appear on the finished leather (depending on the particular form of the process employed), and after the leather has been pressed and initially embossed by the plate or roll the initial reliefs resulting from this operation are removed to a greater or lesser extent, as by a cutting operation of some kind, and then the leather is moistened to swell it back, i. e. restore it to more or less of a uniform or its initial density. As a result, portions of the surface left standing in relief initially by the plate or roll in this newer embossing method, appear in the final product at more nearly the general level of the leather surface, or may even be in deep intaglio.

My invention contemplates the use of the second or newer method of embossing in conjunction with operations producing surface effects, such as coloring and tooling, performed subsequent to the initial embossing, and usually performed subsequent to the step of removing the initial reliefs produced by the action of the embossing plate or roll (or in the case of some tooling operations, performed simultaneously with the step of removing initial reliefs); in some instances it employs a coloring operation performed, preferably, subsequent to the moistening of the leather to swell it back. One such coloring operation alone may be used, or such an operation may be supplemented by another coloring operation at the same or another stage of the embossing process depending on the effect desired. Likewise one such tooling operation will obtain certain effects, while other effects can be obtained by supplementing this tooling by other tooling operations. Or both coloring and tooling operations may be used on the same piece of leather at the same or different stages.

With the older embossing method color is applied to leather in various ways; for example, by spraying (say with a liquid dye) and by swabbing, printing, stencilling and tipping; the latter is swabbing an embossed surface gently, say with a liquid dye, so that only the reliefs are colored by the operation. Dyeing also is employed; I herein use the term dyeing as meaning the operation of dipping or immersing the piece in liquid dye; when immersed the piece may or may not be paddled, or it may be drummed (i. e. tumbled in a revolving vat). The foregoing indicate the kinds of coloring operations that can be used with my invention. Conceivably japanning, lacquering or the like may be used in certain instances as will be apparent. Also with the older embossing method leather is tooled in various ways; for example, by buffing (as by a buffing wheel), and by scuffing, sandpapering, blocking (which is rubbing with sandpaper fastened to a block), by plush wheeling, polishing, etc. These indicate the type of tooling operations that can be used with my invention.

Subsequent to the initial embossing by the plate or roll, and prior to the cutting away of initial reliefs, color can be applied to the initial reliefs and intaglios by any method that does not introduce so much moisture to the leather as to swell it unduly; for example, by spraying or swabbing. This tends to produce a contrasting effect in the finished leather, since the cutting away of reliefs tends to expose whatever color the leather may have below its surface while the color applied to the initial intaglios remains undisturbed or is less disturbed than that applied to the initial reliefs. Likewise subsequent to the cutting of the reliefs and prior to moistening for swelling the leather, color can be applied over the whole face side of the leather uniformly, or substantially uniformly over an individual part or parts of the face, by any method that does not introduce an undue amount of moisture to the leather; for example by spraying, swabbing, printing or stencilling. This tends to produce a uniformly colored face for the finished leather. Herein the phrase "uniformly colored" and the like is used to indicate that the coloring is substantially uniform over the whole or such parts

of the surface as are colored by the operation, within intaglios as well as on reliefs, except as the color effect to the eye may seem to vary from place to place due to differences in physical structure of the face surface or otherwise. At the same stage, i. e. subsequent to cutting reliefs and before swelling, color can be applied as by dyeing; this operation introduces considerable moisture to the leather however and thus tends to swell it; dyeing therefore, when required, I prefer to do at a later stage. At the same stage also, providing the cutting leaves some portions of the initial reliefs standing, tipping can be employed. This provides for, say, a contrasting color on parts of the surface that sink down with the swelling operation; if the leather is moistened to such a degree that these parts come to be intaglios, then this tipping operation provides for obtaining a desired color in the intaglio depths. After the step of moistening the leather to swell it back, the leather may be dyed, i. e. colored by immersion or by dipping as before mentioned. This produces a uniformly colored effect with as deep a dye penetration into the body of the leather as is possible.

As before indicated, such coloring operations can be supplemented by others to produce certain effects. For example, the leather may be colored uniformly before the initial embossment by the plate or roll as by dyeing, spraying, etc., and then after the step of cutting reliefs again uniformly colored by an operation appropriate to this stage as described above. This produces in the finished product intaglios colored by the second coloring operation and reliefs colored in accordance with the joint effects of the two coloring operations. Again, the leather may be uniformly colored prior to the initial embossment, and then after cutting the initial reliefs away partially it may be tipped. This produces a final product in which the reliefs are colored in accordance with the first coloring operation and the intaglios by the second. Still again, the leather may be colored uniformly prior to embossment by the plate or roll, and then after swelling it may be uniformly colored again as by dyeing. This produces a finished product in which the color at the intaglios depends on the penetration of the first coloring operation and the depth of the cutting operation, and the color on the reliefs is the color of the second coloring operation or the joint effect of both coloring operations. Also, about the same joint effects can be produced by performing the first coloring operation after the initial embossment and before cutting of the reliefs; spraying, swabbing and the like are best adapted for a first coloring operation at this stage. Also, after initial reliefs have been partially cut away the leather may be tipped, and after swelling may be tipped a second time, or may be colored uniformly by dyeing, spraying, etc. When the second coloring is tipping, the finished product has distinctly different surface colorings in the final intaglios and on the final reliefs; and when the second coloring is a uniform one, the reliefs of the final product have the color of the second coloring operation and the intaglios may exhibit joint effects of the two coloring operations. Also again, after the initial reliefs have been cut, the face may be uniformly colored, preferably as by spraying, swabbing, etc., and then after swelling the leather may be tipped, or it may be colored uniformly. When the second operation is by tipping, the intaglios of the finished product have the color of the first operation and the final reliefs the tipping color or the joint effect of the two colors; when the second coloring is a uniform coloring, the leather may exhibit the joint effect of the two operations.

In general, the foregoing is descriptive of all surface effect operations in my invention, e. g., tooling as well as coloring. By way of examples of tooling however, and using as an example of tooling the operation of buffing by an abrading buffing wheel which is a peculiarly important form: After the step of cutting away, partially, initial reliefs left by the embossing plate or roll, the tops of the remains of the initial reliefs may be buffed; in the alternative, the cutting away of the initial reliefs to a material depth may be done entirely by buffing. In either case, (the initial intaglio surfaces being untouched by the buffing) the tops of the reliefs of the finished leather consist of the initial surface of the leather, having a rather hard, shiny appearance if on the grain side, while the finished intaglios have a soft suede appearance and surface. Again, prior to embossing by the plate or roll the whole of the leather face may be buffed, and then after initial reliefs have been cut away partially, the tops of the remains of the reliefs may be buffed; or in the alternative the cutting away of initial reliefs may be done entirely by buffing. In either case this procedure permits, in effect, separate and independent tooling of the intaglios and the reliefs of the finished product and accordingly the production of either, say, similar or entirely different results on the two surfaces. Instead of doing the second buffing on the initial relief portions only however, the buffing may be carried down to and on to the surface of the initial intaglios also; the effect at the tops of the final reliefs is then the joint effect, more or less, of the two toolings. Generally, however, I prefer operations which permit entirely separate and independent toolings of the intaglio and relief portions, since this permits better control of the work. Again, after the initial reliefs have been cut away in part, the remains of these reliefs may be buffed (or in the alternative the cutting may be by buffing), and then after swelling the tops of the final reliefs may be buffed. This operation also, it will be observed, permits separate and independent tooling, in effect, of the final intaglios and reliefs. Still again, after the initial embossing (and with or without preliminary cutting of initial reliefs) both the initial intaglio portions and the initial relief portions of the leather may be buffed, and then after swelling the final reliefs may be buffed. The surfaces of the final intaglios are then products of the first buffing and the surfaces of the final reliefs are products of both toolings.

As before indicated, both coloring and tooling may be employed on the same piece of leather, and a number of combinations of these are possible. A few important examples will suffice: After the initial embossing of the grain side of the leather by the plate or roll (and either before cutting or after partial cutting away of the initial reliefs), the tops of the initial reliefs may be buffed (without buffing of the initial intaglios), and then after swelling at least the face side of the leather may be colored uniformly, for example by dyeing. The final product is then uniformly colored, the tops of the final reliefs are bright and shiny, and the final intaglios have a suede surface. Again, after initial embossing by the plate or roll (on either side of the leather) the initial reliefs may be buffed, then after swell-

ing at least the face surface of the leather may be colored uniformly with at least some material degree of penetration, and then the tops of the final reliefs buffed. With most colors (dyes) this produces a satisfactory two-tone coloring effect, both the final reliefs and final intaglios being in suede. For entirely-suede blacks however, I prefer this procedure: Prior to initial embossment, buff the entire face side; after the initial embossing buff the initial reliefs; after swelling give a uniform coloring, preferably by dyeing.

It will be observed of course that various of the specific procedures described above are applicable only when the swelling of the leather by moisture subsequent to the cutting of reliefs is so complete that initial intaglios appear as reliefs in the finished leather. In this and some other respects I have described my invention above as employing what I regard as the best form of the new embossing process. Various forms of the newer embossing process are known however; so far as these are known to me, all can be employed with my invention, in some instances with some variation in the procedure as will be apparent.

The matter below and the accompanying drawing describe and diagrammatically illustrate in greater detail some of the procedures described above. Fig. 1 illustrates a piece of leather decorated by my invention; specifically, embossed and uniformly colored. Fig. 2 is a diagrammatic illustration of an embossing roll such as may be used to produce the embossment of Fig. 1. Figs. 3 and 4 illustrate diagrammatically successive steps in the operation, a piece of leather being shown in section. Fig. 5 illustrates diagrammatically coloring the leather by spraying. Fig. 6 illustrates diagrammatically the result of thorough moistening and swelling the leather of Fig. 4. Fig. 7 illustrates diagrammatically coloring by dyeing. Fig. 8 illustrates tipping the reliefs with color as a possible additional step.

For illustrative purposes the very simple decoration shown in Fig. 1 will suffice. This consists simply of a diamond **2** rising from or in relief on the surface of the skin **1**, the whole of this face of the leather, i. e. the top and sides of the diamond as well as the major part of the surface which is in intaglio to the diamond **2**, being dyed some color. The whole of the leather may be dyed the same color, substantially from side to side throughout. As appears from the foregoing to produce such a relief as **2** on the face or exposed surface, I initially depress below this surface of the leather, by compression, the four bars forming the diamond. The leather may first be wetted or dried as may be necessary to get it into a condition suiting it to take and hold this initial compression and embossing, and for the subsequent operations; usually I have the leather about as dry as it can be and still take the marking or initial embossing without deleterious effect. This reverse or initial embossing can be done manually for example; commercially it can be done by a positive of the pattern, for example a plate or roll **3** carrying a similar diamond **4** projecting in relief from the surface of the plate or roll (Fig. 2) exactly as it is to appear on the finished leather. With such a roll for example, the piece of leather is laid against a firm ground and the roll is passed over it (Fig. 3) with enough pressure to sink the diamond into the leather to a sufficient depth to secure that degree of compacting of the leather beneath the bars of the diamond that is needed to secure the ultimate projection of the diamond from the leather surface desired, as will be understood from what follows hereafter. In Figs. 3 and 4 the compacting of the leather beneath a part of one bar of the diamond is indicated at **5**.

A negative of the design having thus been formed on the face of the leather, more or less of the initial relief thus produced is then cut away; the relief or reliefs may be cut away to a level even with the bottoms of the depressions as shown in Fig. 4; the broken lines indicate the amount of leather usually cut away with this particular form of this embossing method; compare Fig. 4 with Fig. 3. The leather to be cut away may be removed by buffing or otherwise; when removed by buffing, or when the surface is buffed after cutting, the bottoms of the intaglio or sunken portions of the final product are left roughened and hence have a suede-like effect.

At this stage the leather may be colored if desired; for example by swabbing, spraying with a suitable liquid color by means of a suitable spray-throwing device **6**, by printing, etc. (Fig. 5); preferably the coloring matter is a dye, so that the surface is dyed to the desired color.

The leather having been cut or re-surfaced, and perhaps colored, the compacted portions are permitted or caused to expand until these portions again have, say, the same density as the remainder of the piece. The result is that the portions of the design depressed into the leather surface by the initial depressing or embossing rise to say their initial levels and thus appear in the relief in the final product (Figs. 6 and 1). The swelling can be done by subjecting the leather to any swelling agent not adversely affecting the leather for its intended purposes. Conceivably the swelling agent or some part of it may be present in or applied to the leather even prior to the initial embossing, but I contemplate that usually it will be applied only after the surface is cut away. Usually I use moisture for the purpose; plain water is satisfactory for most leathers. Since I usually do the initial embossing on a rather dry leather, I usually swell the compacted portions into relief by thoroughly wetting the leather in water; usually by paddling the leather in water for sufficient time to restore the piece to a uniform density.

If the color is applied immediately after the step of removing relief as described above, the whole face of the leather, i. e. the top of the relief **2** and the intaglio surface at a lower level exhibits substantially the same color effect; except of course as this effect to the eye may seem to vary somewhat from point to point due to differences in physical structure of the leather surface or otherwise. In the alternative substantially the same surface result can be secured and at the same time the leather dyed deeply into its body, by omitting the coloring step described (Fig. 5), and, after the moistening step (Fig. 6), dyeing the embossed leather by repeatedly dipping it into liquid dye, or by immersing it in a vat **7** of liquid dye, with or without paddling or drumming (Fig. 7). Conceivably both the coloring operations of Fig. 5 and Fig. 7 may be employed to produce, in conjunction, some special effect.

Thereafter the leather can be finished further if and as desired, in various ways. For example, a broad surface coloring having been given to the leather by either of the two operations described above (Fig. 5 or Fig. 7), the leather may be tipped with another color, i. e. swabbed lightly with another color so as to color only the top or tops of

the relief or reliefs 2 (Fig. 8). This will produce a leather having one color at or in the intaglios 8 and another color on the reliefs 2 as at 9.

To obtain a uniformly colored embossed leather having rather shiny top surfaces on the reliefs and suede at the intaglios, the initial embossment (Fig. 3) may be on the grain side of the leather; the cutting of the initial reliefs (Fig. 4) may be done by buffing, care being taken not to buff deeply enough for the buffing wheel to strike the initial intaglios; and the coloring may be by dyeing (Fig. 7) after the leather has been swelled to obtain the final reliefs (Fig. 6).

The procedure described above for obtaining a two tone suede for most colors may be carried out by cutting the initial reliefs (Fig. 4), as deeply as desired, by buffing; then swelling to develop the final reliefs (Fig. 6); then dyeing (Fig. 7); and then buffing the top surfaces of the final reliefs indicated by 2 in Fig. 6.

Another procedure for obtaining a two tone suede is this: Prior to the initial embossing of Fig. 3, uniformly color the side to be the face of the finished piece by dyeing (Fig. 7), spraying (Fig. 5) or otherwise, without attempting to get exceptional penetration; then after initial embossing (Fig. 3), buff away the initial reliefs (Fig. 4) and buff the initial intaglios also; then swell to develop the final reliefs (Fig. 6). The final intaglios then display a lighter shade of the color than the final reliefs.

Also suede on the entire surface with color can be obtained by cutting the initial reliefs (Fig. 4), as deeply as needed by buffing; then swelling to develop the final reliefs (Fig. 6); then buffing the top surfaces of the final reliefs shown at 2 in Fig. 6; and then dyeing (Fig. 7).

As indicated above however, I prefer the following for entirely-suede blacks: Prior to the initial embossment (the operation of Fig. 3), buff the entire surface that is to be the face of the leather; then emboss (Fig. 3), and then buff the initial reliefs away more or less (Fig. 4); then swell the leather, and then give a uniform coloring, preferably by dyeing (Fig. 7).

In all cases, except where no contrast or the greatest possible sheen or shiny effect on the tops of the final reliefs is desired, the tops of the final reliefs may be buffed or similarly tooled slightly as a final operation, even when these reliefs have been sueded already; this tends to give a rather pleasing contrasting effect.

It will be understood of course that my invention is not limited to these specific operations and details except as appears hereinafter in the claims.

I claim:

1. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios thereon, then removing at least portions of the initial reliefs, and then moistening the leather to restore it more or less to its initial density and performing an operation producing a surface-effect on the face of the leather, said operation producing a surface effect being performed either before or subsequent to said moistening of the leather.

2. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios thereon, then removing at least portions of the initial reliefs and performing an operation producing a surface-effect on the face of the leather, and thereafter moistening the leather to restore it more or less to its initial density.

3. The subject matter of claim 2 in combination with performing a second operation producing a surface-effect, said second operation being performed subsequent to the moistening of the leather.

4. The method of decorating leather which consists in compressing leather with an embossed member to produce initial reliefs and intaglios thereon, then removing at least portions of the initial reliefs, and then moistening the leather to restore it more or less to its initial density and applying color to at least one side of the leather, the operation of applying color being performed either before or subsequent to said moistening of the leather.

5. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios thereon, then removing at least portions of the initial reliefs, then applying color to at least one side of the leather, and thereafter moistening the leather to restore it more or less to its initial density.

6. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios thereon, then removing at least portions of the initial reliefs, then moistening the leather to restore it more or less to its initial density, and thereafter dyeing the leather.

7. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios, buffing the initial reliefs without materially buffing initial intaglio portions, then swelling the leather, and then applying color substantially uniformly to the leather.

8. The method of decorating leather which consists in compressing the leather with an embossed member to produce initial reliefs and intaglios, buffing the initial reliefs, then swelling the leather, then applying color, and then buffing on the top surfaces of the reliefs resulting from the swelling.

9. The method of decorating leather which consists in buffing the face side of the leather, then compressing the leather with an embossed member to produce initial reliefs and intaglios, buffing the initial reliefs, then swelling the leather, and then applying color to the leather.

10. A process of ornamenting grain-leather comprising the steps of embossing a design on grain-leather, removing the grain surface from the high spots of the design, obliterating the embossing and dyeing the leather.

11. The process of ornamenting grain-leather comprising the steps of forming on the surface of grain-leather a design having high and low portions, removing the grain surface from the high portions of the design, and wetting and dyeing the leather to give it the desired color and show the surface of the grain above the remaining portion.

12. In a leather ornamenting process, the steps of buffing off the grain surface from portions of grain leather without disturbing the remaining portions of said grain surface, and dyeing the buffed and unbuffed portions of the leather with dye of one color, whereby the more porous buffed portions will be given a relatively deep shade of said color and will possess a suede-like appearance, and the less porous unbuffed portions will be given a relatively light shade of the same

color and will maintain their grain surface, thereby producing a novel combination of suede and grain leather in contrasting shades of the same color.

13. In a leather ornamenting process, the steps of buffing portions of the grain surface from grain leather and placing the unbuffed portions of said grain surface in relief upon the buffed portions, and dyeing both the unbuffed and the buffed portions with dye of one color, whereby the more porous buffed intaglio portions will be given a relatively deep shade of said color and will possess a suede-like appearance, and the less porous unbuffed relief portions will be given a relatively light shade of the same color and will maintain their grain surface, thereby combining suede and grain leather in contrasting shades of the same color with the grain in relief upon the suede.

14. A method of treating leather, which comprises embossing a design on the grain side, buffing off the raised portions of the grain surface, and submerging the leather in a liquid dye.

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