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METHOD OF EMBOSSING SOAP OR DETERGENT BARS

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ABSTRACT OF THE DISCLOSURE

Method of embossing dry, non-plastic soap or detergent compositions by pre-heating surface portions and contacting with a heated embossing die. The bars may be wrapped with a thermally deformable wrapper prior to embossing, and either wrapped or unwrapped compositions may be printed simultaneously with embossing by interposing hot-transfer roll leaf between the composition and heated die.

The present invention relates to a method of embossing bars or cakes of a soap or detergent composition, and relates particularly to embossing bars of such materials when they are in a dry, substantially non-plastic state.

The process of embossing bars of soap or detergent compositions with some identifying indicia, tradenames, or decorative designs, is common in the art. However, at present, such embossing must be carried out as an immediate adjunct to the bar forming operation, i.e. when the soap or detergent composition still has a high volatiles content (usually water) and is in a plastic condition.

However, if pre-formed bars or cakes of soap or detergent compositions are stored for any length of time subsequent to shaping, the compositions become substantially non-plastic because of evaporative loss of moisture therefrom. The moisture loss is most pronounced in surface portions of the cakes or bars, but dryness extends into the interior of the cakes or bars to a depth depending on the length and conditions of storage.

Although the compositions of the bars or cakes are still relatively soft and the bars can be easily scratched or carved even with the fingernail, it is impossible to emboss them in their dry, substantially non-plastic state. If an attempt is made to impress a design or pattern on the dried cakes with a die, the bars will crack, chip, and flake extensively, giving a totally unsatisfactory product.

According to the present invention, a method has been discovered for embossing pre-formed, dry, substantially non-plastic bars or cakes of soap or detergent compositions. The method comprises pre-heating at least surface portions of such a bar to a temperature between about 100° F. and about 140° F., depending on the composition of the bar, and then contacting the pre-heated bar under pressure with an embossing die heated to a temperature just below the melting point of the composition of the bar. Although the latter temperature will vary somewhat depending on the specific nature of the composition, it is generally about 200° F. The techniques can be employed to emboss either bars of milled soaps or of non-milled (i.e. framed) soaps, including transparent soaps. The technique is also applicable to bars comprising both soaps and detergents, or to bars of detergent materials free of any soap content.

In practicing the invention, the bars of soap or detergent to be embossed are conveniently passed through a pre-conditioning heating tunnel kept at a temperature of 100° F. or above. As is obvious to those skilled in the art, the temperature and length of the tunnel are variable, but related, and are chosen such that at least surface portions of the soap or detergent bars leaving the tunnel have a desired temperature between about 100° F. and about 140° F., as disclosed. This can be accomplished by using a tunnel heated to the desired temperature and of a length such that surface portions of the bars passing therethrough come into temperature equilibrium with the tunnel, or by using a shorter tunnel heated to higher temperatures than those desired, whereby surface portions of the bars are brought to the desired temperature within a shorter period of time. The pre-heated bar is then passed to conventional embossing apparatus employing heated dies, most conveniently heated by electrical resistance or gas heaters.

"Embossing," as the term is used in the present specification and claims, is to be understood to include only fairly minor dislocations of surface portions of the soap, for instance as might be effected by the printing methods to be discussed hereinafter. However, embossed bars having portions vertically displaced below the finished surface of the bar by as much as one-eighth inch have been successfully produced. There is no criticality either in the amount of pressure employed in the embossing step or in the depth of the embossing effected. Sufficient pressure to dislocate the heated surface is used. When deep embossing is to be done the surface portions of the soap being embossed should be pre-heated to the required temperature at least to the depth of the intended embossing.

In another embodiment of the invention, the embossing step described above is combined with a printing step by interposing hot-transfer roll leaf between the soap or detergent bar to be embossed and the heated die prior to bringing the die and bar into contact. Hot-transfer roll leaf of this type is well-known in the art and may comprise genuine noble metals, such as gold flake, to give a metallic effect, or aluminum flake, alone or in combination with pigments, layered onto a substrate in combination with a binder commonly comprising resinous materials such as shellac, nitrocellulose, vinyl and acrylic resins, and the like. On contact of the metal-containing layer with the surface to be printed and on the application of heat and pressure to the substrate layer, the metal-containing layer is transferred from the substrate to the surface to be printed. Hot-transfer roll leaf which transfers at temperatures of about 200° F., the temperature of the heated dies commonly employed in the present process, is commercially available.

In still another embodiment according to the invention, the soap or detergent bars to be embossed are wrapped prior to embossing with a thin deformable film, either a metal foil or a plastic film, such as of cellophane, polyethylene, polyvinyl chloride, or the like. The axact chemical nature of the wrapping film is not critical, providing the film is non-rigid, is chemically stable at temperatures including the melting point of the composition, and is physically tough. Plastic film materials should not tear, char, discolor, decompose, or soften unduly under the temperatures encountered in the embossing process, i.e. during contact with the heated die at a temperature just below the melting point of the soap or detergent composition.

Finally, pre-wrapped bars can be simultaneously embossed and printed by the use of a hot-transfer roll leaf of the type earlier described herein. Contact with the heated die may be such as to effect only slight deformation of the soap surface, resulting then primarily in a printing of the wrapper with the hot-transfer roll leaf. However, even for such printing operations on the wrapper, it is necessary to have a suitable plastic supporting surface for the wrapper during the printing operation, which is why the pre-heating of the soap or detergent bar prior to wrapping and printing of the wrapper is required.

Simultaneous printing of the wrapper and deep embossing of the underlying soap or detergent bar are also possible. In this case, the physical toughness and deformability of the wrapper is of significance. The wrapper should not break or tear during the embossing operation, and must be sufficiently flexible to accept the embossed contour.

A better understanding of the present invention will be had by referring to the following specific examples given by way of illustration.

Example 1

Standard milled soap base comprising sodium soaps derived from a mixture of 80 percent tallow and 20 percent coconut oil was dried into flakes having a pure soap content of about 80 percent. The flakes were amalgamated, milled, extruded and stamped into bars. Because of their relatively high volatiles content (about 12–14 percent by weight) the bars could be embossed directly after coming from the extruder and stamping press. However, after a lapse of 24 to 48 hours, loss of volatiles from the compositions had lowered the volatiles content of surface portions of the bars to about 8 to 10 percent, rendering the surface of the bars substantially non-plastic. Attempts to emboss the bars were frustrated by cracking and spalling of the soap surface.

Dried, substantially non-plastic bars were heated to bring surface portions thereof to a temperature between 100° F. and 140° F. and were then contacted with a heated die. A design could be embossed into the soap surface without detriment to the otherwise smooth portions of the bar.

Bars of the same soap composition were also imprinted using a commercial hot-transfer roll leaf interposed between the pre-heated surface of the bar and the heated die prior to embossing.

Bars of the same soap composition were wrapped in cellophane having a thickness between 0.5–1 mil after pre-heating and prior to embossing. Still other samples of cellophane-wrapped soap were simultaneously printed and embossed using hot-transfer roll leaf. In the latter operation, the printing was transferred to the cellophane surface simultaneously with deformation of the underlying pre-heated soap surface by the heated embossing die.

Other pre-heated samples of the same soap were wrapped with polyvinyl chloride film (0.5–1 mil), and with polyvinylidene chloride ("Saran") and aluminum foil household wrap prior to embossing.

Example 2

Similar operations of embossing and printing unwrapped and pre-wrapped non-milled soap bars were carried out. The bars comprised a sodium soap derived from 100 percent tallow poured in liquid condition into frames for solidification. Although framed soaps are, in general, softer than milled soaps, the framed soap of the example could not suitably be embossed once surface portions thereof had dried, subsequent to framing, to a volatiles content less than about 10 percent by weight.

Example 3

A mixture comprising sodium soaps derived from a combination of coconut oil, tallow, and castor oil, was combined with sugar, glycerin, alcohol, and water to give a transparent soap composition having a pure soap content of 40–50 percent. The composition was formed into bars by framing. The same embossing and printing operations, on both wrapped and unwrapped bars were performed after the soap had been stored and surface portions had dried to a nonplastic condition.

Example 4

A detergent bar comprising sodium lauryl sulfate superfatted with lanolin and mineral oil was prepared by milling, extruding, and stamping. The finished bars, surface portions of which had a moisture content of less than about 10 percent by weight, were embossed by preheating the surface and contacting with a heated die according to the invention.

The above-described detergent composition was modified by the addition of 25–35 percent by weight of flakes of the soap of Example 1. The mixture was milled, extruded, and stamped into bars. After 24—28 hours, the surface of the bars had lost plasticity, and could only be embossed successfully using the techniques of the present invention.

What is claimed is:

1. In the method of embossing a bar of soap or detergent composition in a dry, substantially non-plastic condition by pre-heating surface portions of said bar and then contacting the pre-heated bar with an embossing die, the improvement wherein surface portions of said bar are preheated to a temperature between about 100° and about 140° F., said embossing die is heated to a temperature just below the melting point of the composition, and wherein said bar is printed by interposing hot-transfer roll leaf between said bar and said heated die prior to contacting them.

2. The method of embossing a bar of a soap or detergent composition in a dry, substantially non-plastic condition, which process comprises pre-heating surface portions of said bar to a temperature between about 100° and about 140° F., wrapping said bar with a deformable thermally stable film, and then contacting the pre-heated bar with an embossing die heated to a temperature just below the melting point of the composition.

3. The method as in claim 2 wherein said wrapped bar is printed by interposing hot-transfer roll leaf between said bar and said heated die prior to contacting them.

4. The method as in claim 2 wherein said wrapper is of metal foil.

5. The method as in claim 2 wherein said wrapper is a thermoplastic film.

6. The method as in claim 2 wherein said wrapper is a film consisting of cellophane, polyethylene, polyvinyl chloride, or polyvinylidene chloride.

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