July 17, 1973 L. PELOQUIN 3,746,647

MAKING SOAP BARS

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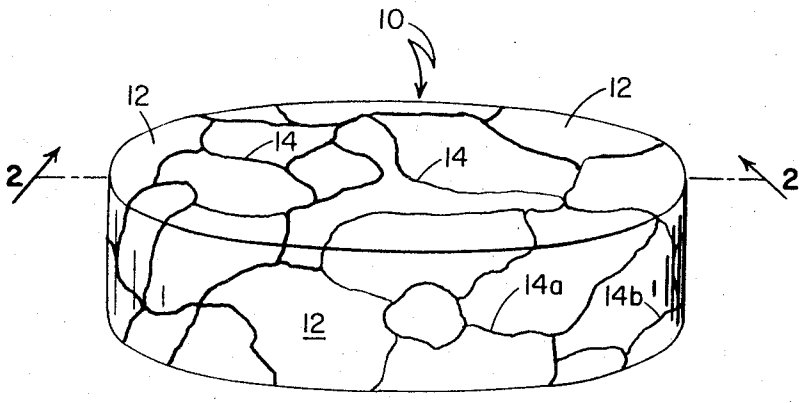


FIG. 1

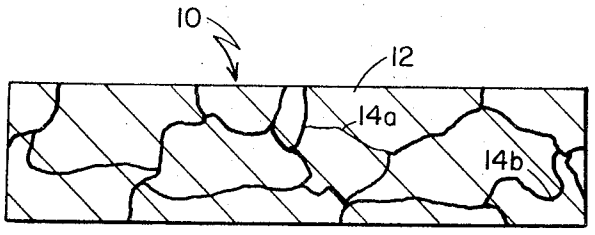


FIG. 2

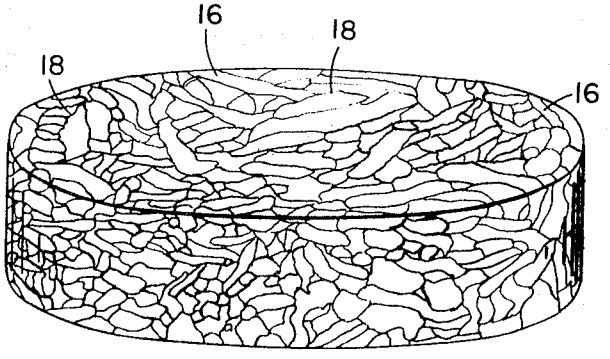


FIG. 3

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MAKING SOAP BARS

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ABSTRACT OF THE DISCLOSURE

A soap bar comprising a substantial depth of discrete soap fragments consolidated into an integral mass with adjacent fragments separated by a zone or layer of visually exposed water-insoluble pigment particles arranged to separate the interfaced borders of the fragments throughout the useful life of the fragments, the particles being of a color visually distinct from that of the fragments separated thereby, and having an average largest dimension at most 1/100 of that of the separated soap fragments.

This invention relates to decorative soap bars.

Prior efforts to provide soap bars having colored or otherwise distinctive patterns have failed to provide bars of predictable aesthetic designs to any substantial depth. Surface-printed designs of course disappear rapidly when the soap is used, and thus fail to provide lasting aesthetic or identifying indicia. Proposals to provide a pattern throughout the entire soap bar by admixing differently colored soap particle streams in a conventional plodder have, because of the uncontrollable shear and other mixing forces in the plodder, been ineffective for producing patterns which are either reproduceable or of aesthetically pleasing sharpness of definition. Neither have such sharp patterns been successfully produced by forming the soap bars in a mold having baffles. Such baffles separate differently colored soap particles during mold filling, and are removed just prior to molding, but intermingling and running of colors is inevitable. Other attempts involving filling interstices or die-cut openings or grooves of preformed bars with differently colored soap have been unsuccessful in providing a structurally stable product, and soap bars so formed have therefore tended quickly to deteriorate in use with the differently colored portions separating from each other along their boundaries.

The object of this invention is to provide a decoratively patterned soap bar, of aesthetically pleasing appearance, which will retain both its pattern and its structural integrity throughout its useful life.

A particular object is to provide soap bars having sharp, strikingly colored patterns, which neither run nor fade nor otherwise wash out during use.

Another object is to provide a soap bar having a continuously renewed identifying pattern throughout its useful life.

Another object is to provide a simple and economical method for making decoratively patterned soap bars employing in large part conventional soap-making machinery and techniques.

The invention features a soap bar comprising a substantial depth of discrete soap fragments consolidated into an integral mass with adjacent fragments separated by a zone or layer of visually exposed water-insoluble pigment particles arranged to separate the interfaced borders of the fragments throughout the useful life of the fragments, the particles being of a color visually distinct from that of the fragments separated thereby, and having an average largest dimension at most 1/100 of that of the separated soap fragments.

The invention also features a method for making a patterned soap bar as described by coating discrete soap fragments with a water-insoluble pigment of visually distinct color, consolidating the coated soap fragments into a unitary bar, and, preferably, removing pigment from the exposed fragment surfaces after consolidating, leaving exposed pigment confined between the interface of adjacent consolidated fragments.

Other objects, features and advantages will appear to one skilled in the art from the following description of preferred embodiments of the invention, taken together with the attached drawings thereof, in which:

FIG. 1 is a perspective view of a soap bar embodying the present invention;

FIG. 2 is a sectional view of the soap bar of FIG. 1 along line 2—2 of FIG. 1; and,

FIG. 3 is a perspective view of another soap bar embodying this invention.

FIGS. 1 and 2 show a soap bar **10** having discrete large irregularly sized soap fragments **12** of a first color. Adjacent fragments have their interfaces separated by thin arrays or zones **14** of water-insoluble pigment of a visually distinct second color, which, as seen particularly in FIG. 2, extends throughout the entire thickness of the soap bar. The regions **14** may be all of the same color, or regions such as **14***a* and **14***b* may be of different colors. In FIG. 3, smaller sized soap "noodles" **16** have been combined with thin pigment arrays or zones **18** into a "mosaic" pattern.

The soap fragments can be of irregular or of regular surface configuration, including all of the conventional soap fragments, such as those known as "chips," "flakes," "noodles" and "chunks," as well as preformed regular geometrical shapes such as spheres, cylinders and polyhedra. The fragments should be large enough in at least one dimension, compared to the pigment particles, to be still visually distinct in the finished bar. Preferably, the soap fragments have an average largest dimension at least 100 times, and preferably at least about 1000 times, the average largest dimension of the pigment particles. This largest soap dimension may be as low as about 1 mm., or may be sufficiently large that the finished soap bar contains no more than about 20 discrete fragments. The soap fragments preferably have an average minimum dimension of at least about 1 mm. Fragments having a largest dimension between about ¼ inch and 1½ inches provide particularly attractive patterns.

The soap forming the fragments may be of any type conventionally used in making toilet soap bars or cakes. Thus, the soap may be milled or unmilled, and may vary widely in fatty acid composition. Conventional high titer milled soap stocks made from 80% tallow and 20% coconut oil work satisfactorily, as also do lower titer stocks containing a higher percentage of unsaturated fatty acid soap. Detergents or soap-detergent mixtures may also be utilized. Exemplary of useful soaps and detergents are: sodium stearate, sodium palmitate, soaps made from tallow fatty acids and from coconut oil fatty acids, and synthetic sulfonated detergents such as sodium fatty alkyl sulfoacetates, fatty acyl methyltaurides, fatty esters of isethionic acid, fatty polyglycol ether sulfates and sulfonates, fatty acyl sarcosinates, alkyl aryl sulfonates, fatty alcohol sulfates, and fatty glyceride sulfates, and mixtures of these with each other. The soap particles may also be colored or "clear" and may contain conventional additives such as perfumes, surfactants, and the like.

The pigment must be water insoluble to provide finely lined, sharp patterns, without obscuring or diffusion of the pattern as the soap is used, and of visually contrasting color with the soap—e.g., of different hue, shade or texture.

Although the size of the particles may vary, to achieve the desired mosaic effects it is preferred that the average

largest particle dimension be 1/100 or less and preferably 1/1000 or less of the average largest soap fragment dimension. Preferred pigment particles have an average largest dimension of about 0.1 to 10 microns.

The relative amounts of soap fragments and particles are chosen to provide the desired pattern. In general, ratios by weight of soap fragments to particles may be as low as 10 to 1 and as high as 10,000 to 1, with the range of 500 to 1 being a particularly preferred ratio.

In addition, the pigment for soap bars to be used on human skin must be cosmetically and physiologically acceptable—i.e., neither irritant or toxic. The pigments should also not have such an affinity for skin that the pigment transfers to the hands during use, rather than remaining in the soap or washing away with used soap. Such pigments as meets these standards are, however, well known and those physiologically and otherwise safe are commonly so labelled by the Food and Drug Administration. Among the suitable cosmetic pigments are: cosmetic green oxide (a mixture of potassium ferric ferrocyanide and one or more of lead chromate, basic lead chromate or lead sulfochromate), cosmetic russet oxide (ferric oxide), cosmetic carbon black, ultramarine blue (a polysulfide of a sodium, potassium, lithium or silver alumino silicate), and hydrated chromium oxide. Where cosmetic and physiological factors are not important, virtually any water insoluble pigment which will not react with or otherwise degrade the soap fragments, may be used.

To make the soap bar, the pigment particles are first mixed or tumbled with or sprayed onto or otherwise applied to the soap fragments until the fragments are coated. The soap particle surfaces will generally, at ordinary ambient humidities, become coated without the use of adhesive, higher moisture content soaps providing heavier particle pick-up and better adhesion. However, moisture contents above 25% are not generally preferred because such moist fragments are not readily molded into a stable, integral bar.

The coated fragments are then loaded into a conventional soap mold, and pressed together under pressure into a consolidated bar. The temperature, time, and pressure in the mold may be selected in accordance with conventional procedures for non-pigmented soap particles. Although in general the smaller fragment sizes are more readily consolidated, the fragment size is a secondary consideration. Room temperatures are suitable, although higher temperatures, even up to about 100° C., may be used, with some slight decrease in the required pressure. Lower temperatures (but not so low as to freeze the moisture in the soap, producing brittleness) with slightly higher than room temperature pressures, are also satisfactory. The pressures used are mostly dependent on the moisture content of the fragments. For a conventional 80% tallow-20% coconut oil soap mixture, the following moisture-pressure conditions have been found suitable: about 12 to 20% moisture—about 300 to 500 p.s.i.; about 7% moisture—about 1000 p.s.i. or greater; and, essentially 0% moisture—about 2000 p.s.i. or greater.

Finally, when the finished consolidated bar is removed from the mold, the pigment on the exterior fragment surfaces is removed by light brushing, washing or similar means, to reveal the sharp surface pattern.

Other objects, features, advantages and variations will appear to one skilled in the art from the following non-limiting examples:

EXAMPLE 1

Fifty grams of 80% tallow, 20% coconut oil soap noodles (having an average largest dimension of about 20 mm.) the product of a Mazzoni Vacuum Soap Spray Dryer, were dried in a forced air oven at 100° C. for 20 minutes to provide a moisture content of about 0.13% to 7%. The noodles were placed in a jar with one gram of pigment particles. The jar was closed and shaken gently until the soap noodles became lightly coated with the pigment. After the soap and pigment particles smaller than 40 mesh were screened out, the coated noodles were poured into a mold and pressed into a bar by applying 1000 p.s.i. pressure. The heavy surface pigment deposit was removed by washing lightly with water leaving an aesthetically pleasing mosaic pattern. Such a bar was made with each of the following pigments:

Cosmetic Carbon Black A3278 (Kohnstann and Co.)
Cosmetic Green Oxide C61–6735 (Sun Chemical Co.)
Cosmetic Russett C33128J (Sun Chemical Co.)
Ultramarine Blue (Thomassett Co.).

An essentially similar mosaic pattern remained vivid on the exposed surfaces of each bar throughout its useful life.

EXAMPLE 2

The procedure described in Example 1 was repeated except that 0.1 g. of each pigment was used instead of 1 gram. The bar thus prepared had a slight surface pigment excess which was easily removed by wiping with a damp cloth. The colored lines between fragments were considerably lighter in shade than those obtained in Example 1, but persisted throughout the useful life of the bar.

EXAMPLE 3

The procedure described in Example 2 was repeated except that other forms of soap were used instead of noodles. These forms were: flakes (average largest dimension 10 mm.), pellets (average largest dimension 5 mm.), and small spheres (spray dried soap, average largest dimension 1 mm.). The patterns in the finished bars were clear and vivid, clear areas of soap being sharply outlined by the pigment lines. Again, the patterns persisted throughout the useful life of the bar.

EXAMPLE 4

The procedure described in Example 2 was repeated, except that three separate samples of noodles were dried, before pigmenting and pressing, to 3 levels of moisture content namely: 0.5%, 5% and 7%. It was observed that the color intensity of the bars increased with increased moisture content, indicating an increase in pigment pick-up by the noodles. The strength of the bar was also determined in the conventional manner by applying pressure across the width of a bar held only at its ends, and measuring the pressure necessary to break the bar. It was found that the strength of the bar increased with increasing moisture content.

EXAMPLE 5

Fifty grams of soap noodles, having a moisture content of 12.4% and an average largest dimension of about 10 mm. were placed in a container with 0.1 gram of Cosmetic Green Oxide C61–6735 (Sun Chemical Co.) and shaken gently until the soap particles were uniformly coated by the pigment. The coated noodles were poured into a mold and pressed into a bar by applying 800 p.s.i. pressure. The bar was removed from the mold, rinsed off with tap water, and allowed to dry.

The finished bar had a marbled pattern of noodles outlined in green pigment. In use the bar functioned exactly as a conventional soap bar and the pattern persisted unchanged until the bar was completely used.

EXAMPLE 6

35 grams by weight of soap noodles (average largest dimension about 25 mm.), previously coated with 0.15% by weight, based on total soap noodle weight, of Cosmetic Oxide M (Sun Chemical Corp.) was admixed with 15 grams by weight of such soap noodles, previously coated with 0.19% by weight, based on total soap noodle weight, of Ultramarine Blue. The noodles were pressed into a bar at 8000 p.s.i. for 10 seconds. The resultant bar had a marbled pattern, with randomly arranged blue, yellow

and sometimes greenish (resulting from interfacing of a blue and a yellow coated noodle) noodles.

EXAMPLE 7

50 grams by weight of large (average largest dimension between about ½ and 1½ inches) soap fragments having 12.38% moisture were mixed with 0.1 gram of hydrated chromium oxide (green), and pressed into a bar at 500 p.s.i. for 10 seconds. The resultant bar was traced in random manner by tiny green lines.

Other embodiments will occur to those skilled in the art and are within the following claims:

What is claimed is:

1. A method of making a soap bar comprising coating discrete soap fragments having a moisture content not greater than about 25% and having an average largest dimension between about ¼ inch and 1½ inches with water insoluble cosmetically acceptable pigment particles having an average largest dimension not more than $\frac{1}{100}$ that of said fragments and of 0.1 to 10 microns in size, the total weight of soap fragments being from 10 to 10,000 times the weight of said pigment particles, said pigment particles having a color visually distinct from the color of said soap fragments, consolidating said coated soap fragments under a pressure of at least about 300 p.s.i. to form a unitary bar, and removing pigment particles from the exposed surfaces of said fragments in said bar to leave pigment visible only between adjacent consolidated fragments.

2. A soap bar consisting essentially of a substantial depth of discrete soap fragments having a moisture content not greater than about 25% and an average largest dimension from ¼ to 1½ inches consolidated into an integral mass, adjacent fragments having interposed between them a layer of visually exposed water-insoluble cosmetically acceptable pigment particles having an average largest dimension not more than $\frac{1}{100}$ that of said fragments and of 0.1 to 10 microns in size, the total weight of soap fragments being from 10 to 10,000 times the weight of said pigment particles, said pigment particles having a color visually distinct from the color of said soap fragments, said layers of pigment particles remaining between adjacent consolidated fragments throughout the useful life of the bar.

References Cited

FOREIGN PATENTS

574,291	12/1945	Great Britain	252—134
577,479	6/1959	Canada	252—91

OTHER REFERENCES

Martin: The Modern Soap and Det. Industry, vol. II (1951), The Techn. Press Ltd., p. II, I, 81–82.

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U.S. Cl. X.R.

252—134, 174, DIG. 16