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[54] **PROCESS FOR MAKING TRANSLUCENT SOAP BARS**


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[51] **Int. Cl.** ..... **C11d 9/26**

[58] **Field of Search** ..... 252/108, 125, 369, 370



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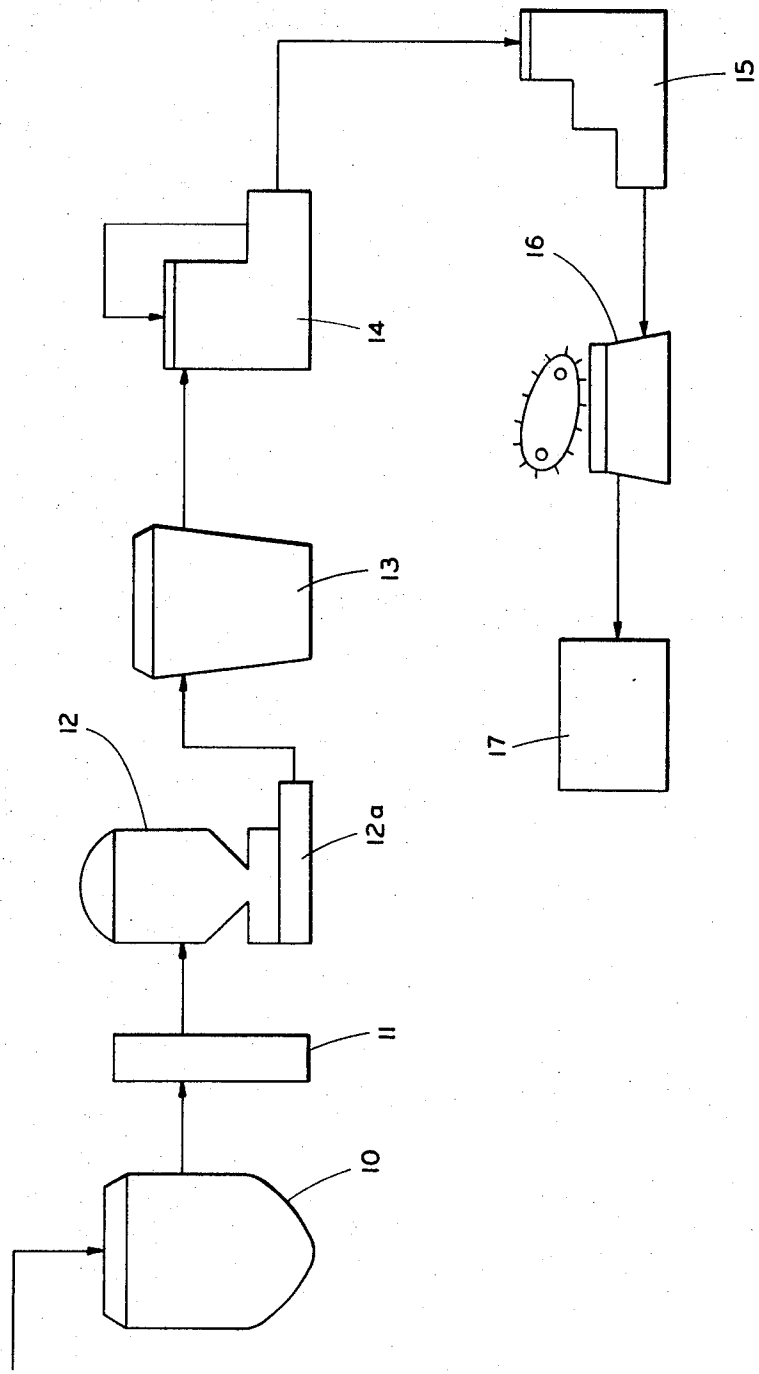
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[57] **ABSTRACT**

A process for making a translucent soap in which a blend of selected fatty acids is saponified with a special caustic solution for neutralizing these fatty acids, and there is added to the saponified material polyethylene glycol and propylene glycol as agents for promoting translucency. The soap, including these additives, is spray dried and subjected to finishing steps in which the soap is refined and formed into bars. A further improvement involves heating of the soap to a relatively high temperature before spray drying.


**10 Claims, 1 Drawing Figure**


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# PROCESS FOR MAKING TRANSLUCENT SOAP BARS

This invention relates to the preparation of translucent soap, and particularly to a process for making hard milled soap bars which have a high degree of translucency.

## BACKGROUND

By the terms "transparent" or "translucent" we do not mean that newsprint may be read through the soap, but only that the soap has the quality of transmitting a certain amount of light. Transparent or translucent soaps have in the past been associated in some way with purity or elegance, and this is a quality which many consumers desire in a bar of soap.

There have been many attempts at various times in the past to make transparent or translucent soaps, and soaps having some degree of translucency have been marketed. It has been understood in the art that translucent soaps may be made by incorporating substantial quantities of alcohol, glycerine and/or sugar into the soap formula and by framing the soap and cutting the soap from the frames in the course of its manufacture. Such a process results in a relatively soft soap bar. To our knowledged it has not been known that a translucent soap could be successfully manufactured by a process in which the soap is hard milled in the course of the refining steps of the process, and then pressed into bars.

## SUMMARY

Accordingly, it is an object of this invention to prepare a soap by the process in which the soap after being neutralized by saponification is subjected to spray drying followed by mechanical working in the refining stage and then pressed into bars, the finished soap bars having the quality of translucency. Other more specific objects will become apparent as we give the detailed description of this invention.

We have discovered that the quality of translucency can be substantially advanced by adding to the soap after saponification and before the soap is spray dried, small quantities of polyethylene glycol and propylene glycol. The manner in which these agents act to promote the quality of translucency is not precisely known but we believe that these agents have some effect on the crystal forming characteristics of the soap as it is being cooled during or after the spray drying step.

We find also that translucency of the finished product is further enhanced by employing as the fatty acids to be saponified a special blend of the fatty acids obtained from tallow and coconut oil.

Another factor found to contribute to the quality of translucency is that of heating the soap containing the above mentioned additives to a temperature which is substantially higher than usual prior to the subjection of the soap to spray drying.

Still other features which contribute to the quality of translucency in our process will be noted as the detailed description of our invention proceeds.

## THE DRAWING

The process of this invention is illustrated in the accompanying drawing in which the single FIGURE shown is a schematic representation in the nature of a flow sheet.



## DETAILED DESCRIPTION

The first stage in the process may be carried out in the crutcher **10**, a piece of equipment which is well-known in the art.

The fatty acids to be saponified may be charged into the crutcher. These acids may be a mixture of acids obtained from tallow and coconut oil in the proportion from about 70 – 85 percent tallow acids to from 15 – 30 percent coconut acids, these percentages being based on the total weight of the acids. We have found that best results are obtained using about 80 percent tallow acids to 20 percent coconut acids.

The alkali material is also charged into the crutcher. This may consist of from about 90 – 99 percent sodium hydroxide and from 1 – 10 percent potassium hydroxide, the percentages being based on the total weight of the alkali. We have found that best results are obtained when using about 95 percent sodium hydroxide and 5 percent potassium hydroxide.

In addition to the basic ingredients such as fatty acids, alkali and salts, small amounts of other ingredients such as silicate of soda, glycerine and a clarifying agent also may be included as well as water in the adjustment of moisture.

The moisture may be adjusted to about 18 percent ± 1 or 2 percent, and on the basis of this amount of moisture salt is included in an amount of about 0.4 percent ± 0.1 percent, these percentages being based on the total weight of the saponification mixture.

Both the fatty acids and the alkali solution may preferably be preheated to about 150°F., and after the acids have been neutralized steam may be opened on the jackets of the crutcher to maintain the neat soap at about 195°F. – 200°F. Then after adjusting the neat soap for the desired alkalinity there is added to the soap the additives which we have found to be effective in the production of translucency.

We find that the addition of polyethylene glycol and propylene glycol at this point is very effective in the production of translucency. Each of these glycols may be added in an amount of from 1 – 3 percent, based on the weight of the finished soap. Though not essential we perfer that the polyethylene glycol and propylene glycol be added in about the same amounts by weight. Upon addition of these additives mixing may be continued for a period such as 10 – 15 minutes to ensure uniform distribution of the glycols throughout the soap mass. Although we prefer to use both polyethylene glycol and propylene glycol as the additives employed, we may also use either polyethylene glycol or propylene glycol without the other if there is added along with the one of these glycols which is selected. The glycerine may suitably be in an amount of from 1 – 3 percent based on the weight of the soap.

The soap, with the additives included, may then be passed directly to the spray drier **12**, but for best results we pass the mixture first through a heat exchanger **11** to raise its temperature to a substantially higher point than usual, suitably to at least about 290°F., desirably about 300°F.

The hot soap mixture is passed into the spray drier **12** where it is dried and cooled preferably under vacuum, and as the soap is passed through the plodders **12*a*** of the drier and formed into pellets its temperature may be at, for example, about 80° – 86°F.

The pellets may first be transferred to the amalgamator **13**, and at this point perfume and coloring matter may be added. In the interest of good translucency the perfume additives should not exceed 1.0 percent based on the weight of the soap, and preferably there should be added along with the perfume a quantity of polyethylene glycol and propylene glycol of the order of 0.3 – 0.9 percent of each of these additives, the percent being based on the weight of the soap, with best translucency being obtained when both polyethylene glycol and propylene glycol are added at about the same proportions.

After being mixed for about 3 – 5 minutes in the amalgamator the pellets are passed to the first section **14** of the refining operation where the soap is recycled and then to the next section of the refining operation **15** where the soap is further refined and the temperature has been brought from about 75°F. to about 98° – 100°F. This refining operation produces a kind of shearing action which is beneficial to the soap. The refining and extrusion of the soap is best done under vacuum to prevent striations of the soap.

The temperature of the soap during extrusion may be about 90° – 95°F. and the slugs produced through the action of cutter **18** may be conditioned at ambient temperature for about an hour before being passed to the stamper **17** where the bars are stamped in the desired shape.

Referring to the relative importance of the steps in the above described process, we find it most important in obtaining translucency in the final product that the additives polyethylene glycol and propylene glycol be introduced after saponification and before the spray drying step. We find that if these additives are added before the saponification has been completed good translucency is not obtained. In addition, we find it important that the fatty acids to be saponified be selected from mixed tallow and coconut fatty acids and in the proportions herein set forth. Also important is the selection of the alkali containing sodium hydroxide and potassium hydroxide in the proportions prescribed. Another feature of importance is the heating of the soap and additives mixture to a high value prior to the spray drying step in which the soap is cooled. Still another feature is the addition of further amounts of polyethylene glycol and propylene glycol additives with the perfume at the amalgamation stage.

The soap bars prepared by our process have good translucency. To demonstrate the degree of translucency obtained we have devised a test which is performed as follows:

## DIRECTIONS FOR TESTS

Use a Color Master colorimeter instrument such as Model V to determine the percent reflectance. Standardization for reflectance measurement should be done first. Then, the method used in measuring translucency of soap involves cutting the bar to a thickness of one-half inch. Place the sample on the left-hand opening, turn the filter switch to the color reading which was selected in the standardization procedure. After adjusting the reflectance control to make the meter read zero, refine the adjustment by depressing the sensitivity switch. Record the reading on the reflectance dial at the percent reflectance.

The preparation of translucent soap bars in accordance with our invention and the testing of the resulting soap bars to determine their degree of translucency is further illustrated by the following specific examples:

## EXAMPLE I

(Control)

A first soap stock was provided from 65 percent tallow fatty acids, 22 percent coconut fatty acids and 13 percent of transcisoleic acid in a 50/50 mixture. Sodium chloride at 0.6 percent was added to the neat soap. The total batch of fatty acids was neutralized with 100 percent NaOH. No additives were added to the neat soap. The soap was processed into pellets. A mechanical work was put into the soap pellets and raised the temperature to 100° – 105°F. The translucency of the pellets appeared not to be substantially improved.

## EXAMPLE II

(Control)

A 75/25 tallow/coconut fatty acid blend was neutralized with 100 percent NaOH using regular tap water for the dilution of the caustic solution. Salt was added at 0.6 percent, pellet moisture from dryer was about 18 ± 1 percent. Before the soap was dried, 1 percent glycerine and 3 percent propylene glycol were added to the neat soap after neutralization was completed. The pellets were processed through the simplex refiner to put work into the soap by converting the mechanical energy into heat energy and to cause the rise of the pellets' temperature from 85°F. to 105° ± 2°F. Translucency of the pellets was not substantially improved.

## EXAMPLE III

A soap stock was provided from 15 – 30 percent coconut fatty acids and 85 – 70 percent tallow fatty acids saponified with 95 percent NaOH and 5 percent KOH. Sodium chloride at 0.6 percent was added to each batch of soap made using the same process.

The translucency reading was determined by the percent of light reflection on one-half inch thick bar of soap and is given in the following table:

TABLE I

| Tallow/Coconut Fatty Acid Ratio | % Moisture | % Light Reflection * |
|---|---|---|
| 85/15 | 17.8 | — |
| 80/20 | 18.0 | 38 |
| 70/30 | 18.0 | 46.9 |

* The lower the reflection the better the bar insofar as translucency is concerned.

The 80/20 tallow/coconut fatty acid batch was repeated using 90 percent NaOH and 10 percent KOH also having 0.6 percent NaCl.

## EXAMPLE IV

An 80/20 tallow/coconut fatty acid blend was saponified with 95 percent NaOH and 5 percent KOH using deionized water for the dilution of caustic solution. Combinations of additives such as polyethylene glycol and propylene glycol were added to the neat soap. The salt content was lowered to 0.5 percent and the moisture content was aimed between 17 – 19 percent. Translucency readings are reported in the following Table II:

TABLE II

| Tallow/Coconut Fatty Acid Ratio | Additives | % of Light Reflection * |
|---|---|---|
| 80/20 | 2 % glycerine<br>2 % propylene glycol | 19.0 |
| 80/20 | 1.5% polyethylene glycol<br>1.5% propylene glycol | 17.8 |
| 80/20 | 1.5% glycerine<br>2 % polyethylene glycol | 19.9 |

* The lower the percent of light reflection, the better is the translucency.

## EXAMPLE V

An 80/20 tallow/coconut fatty acid blend was neutralized with 95 percent NaOH and 5 percent KOH using deionized water for dilution of the caustic. The salt content was lowered to 0.4 percent and the soap moisture was 17 – 18 percent.

Additives of 50/50 mixture of polyethylene glycol and propylene glycol at 3 percent based on the finished soap were added to the neat soap. Citrus perfume at a 0.5 percent level was dissolved in an equal amount of 50/50 mixture of the above additives solution, in addition to a minor amount of Ext. D & C yellow No. 10, were added to the pellets and mixed for 3 minutes. The resulting bar showed a very good translucency with about 15 percent light reflection reading.

While we have described our invention giving specific details and specific conditions at the different stages of the preparation, it is to be understood that many changes may be made and the conditions of the process may be varied widely, all within the spirit and the scope of the invention as set forth in the appended claims.

We claim:

**1.** In a process for the production of translucent soap in which fatty acids are saponified, the resulting soap spray dried, refined and formed into bars, the improvement in which there is added to said soap after the saponifying step and before the soap is subjected to spray drying, polyethylene glycol in an amount of from 1 – 3 percent, said percentages being based on the weight of said soap.

**2.** A process as set forth in claim **1** wherein the fatty acids consist essentially of from 85 – 70 percent tallow fatty acids and from 15 – 30 percent coconut fatty acids.

**3.** A process as set forth in claim **1** wherein said soap containing said additives is heated to a temperature of at least 290°F. before spray drying.

**4.** A process as set forth in claim **1** wherein said fatty acid is saponified with an alkali consisting essentially of sodium hydroxide in a proportion of from 90 – 99 percent and potassium hydroxide in a proportion of from 1 – 10 percent, said percentages being based on the total weight of said alkali.

**5.** A process as set forth in claim **1** wherein said fatty acids consist essentially of from 85 – 70 percent tallow fatty acids and from 15 – 30 percent coconut fatty acids, said percentages being based on the total weight of the acids and wherein there is used in said saponification an alkali consisting essentially of sodium hydroxide in a proportion of from 90 – 99 percent and potassium hydroxide in a proportion of from 1 – 10 percent, said percentages being based on the total weight of said alkali, and wherein said soap containing said additives is heated to a temperature of at least 290°F. before spray drying.

**6.** A process as set forth in claim **1** which includes the step of adding to said soap after the drying step, a perfume composition in an amount up to 1.0 percent based on the total weight of the soap, said composition containing polyethylene glycol and propylene glycol each in an amount of from 0.3 – 0.9 percent based on the weight of said soap.

**7.** A process as set forth in claim **2** wherein said fatty acid consists essentially of about 80 percent tallow fatty acid and about 20 percent coconut fatty acid.

**8.** A process as set forth in claim **4** wherein said alkali consists essentially of about 95 percent sodium hydroxide and about 5 percent potassium hydroxide.

**9.** In a process for the production of translucent soap in which fatty acids are saponified, the resulting soaps spray dried, refined and formed into bars, the improvement in which there is added to said soap after the saponifying step and before the soap is subjected to spray drying, polyethylene glycol in an amount of from 1 – 3 percent, and glycerine in an amount of from 1 – 3 percent, said percentages being based on the weight of said soap.

**10.** In a process for the production of translucent soap in which fatty acids are saponified, the resulting soaps spray dried, refined and formed into bars, the improvement in which there is added to said soap after the saponifying step and before the soap is subjected to spray drying, propylene glycol in an amount of from 1 – 3 percent, and glycerine in an amount of from 1 – 3 percent, said percentages being based on the weight of said soap.

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