CONTINUOUS PROCESS FOR PRODUCING TRANSPARENT SOAP HAVING PEARLESCENT QUALITIES

Filed July 1, 1971 2 Sheets-Sheet 1

Fig. 1

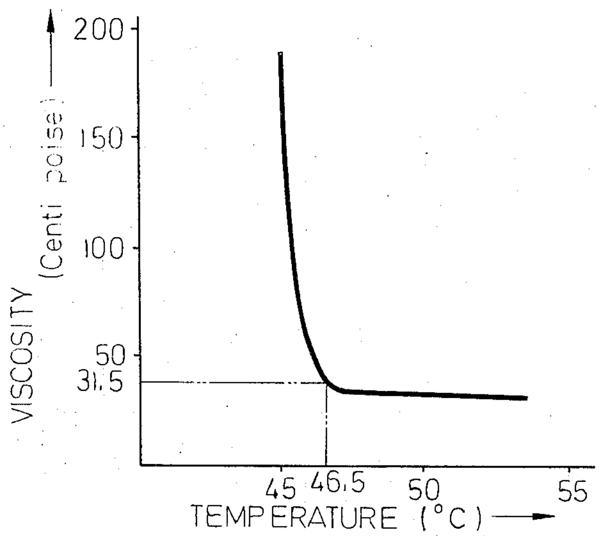


Fig. 3

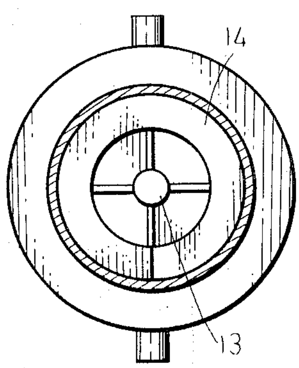
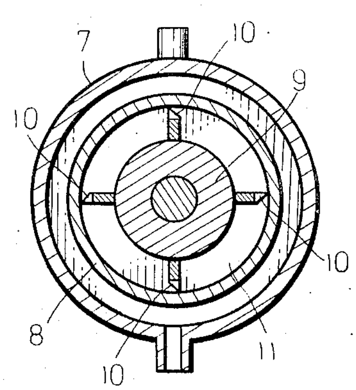


Fig. 4



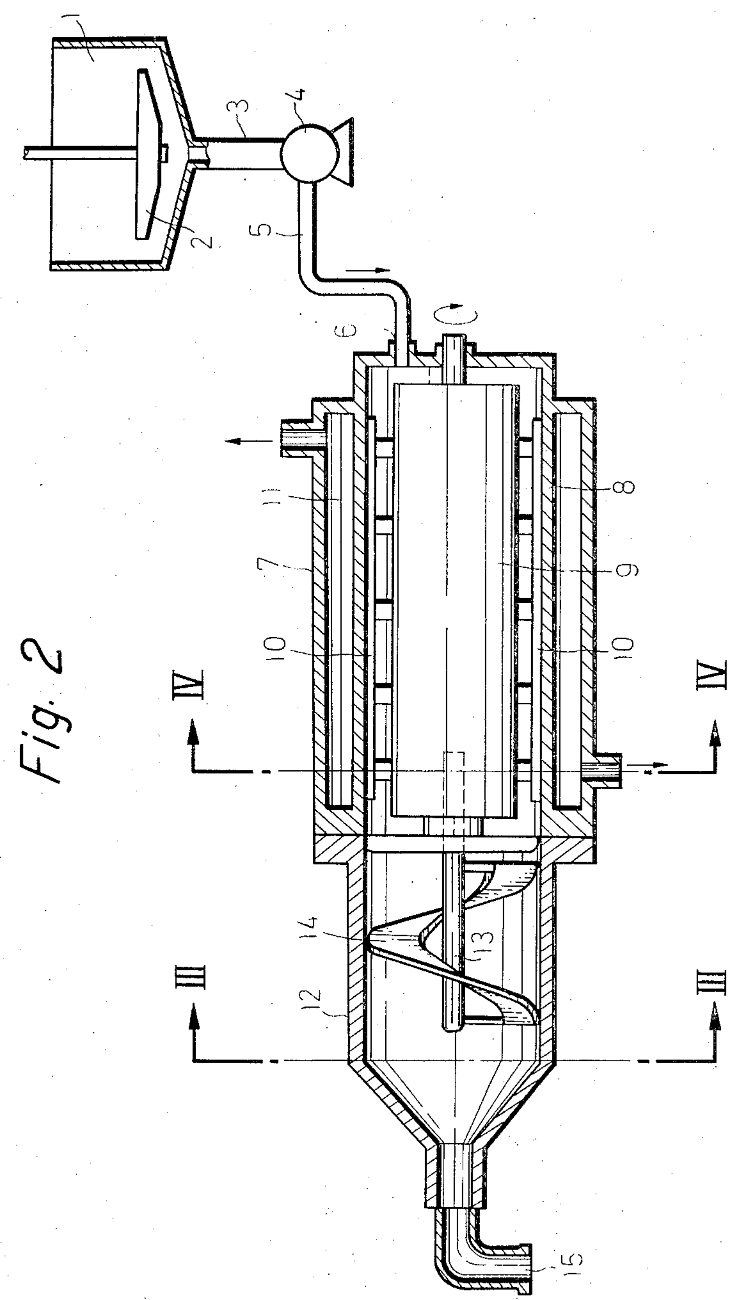


Fig. 2

United States Patent Office

3,789,011

Patented Jan. 29, 1974

3,789,011
CONTINUOUS PROCESS FOR PRODUCING TRANSPARENT SOAP HAVING PEARLESCENT QUALITIES

Yoshio Tanaka, Tokyo, Japan, assignor to Ideal Soap Company, Tokyo, Japan

Filed July 1, 1971, Ser. No. 158,807
Claims priority, application Japan, Sept. 5, 1970, 45/77,598
Int. Cl. C11d *13/08, 13/16, 9/20*
U.S. Cl. 252—367 1 Claim

ABSTRACT OF THE DISCLOSURE

A soap having pearl gloss is produced by cooling warm-fused transparent soap material containing pearl gloss developing material to a temperature range higher by at most 1.5° C. than a liquid-solid transition temperature region and pouring the cooled soap material into solidifying container while giving directional qualities to the pearl gloss material therein, and the apparatus for producing the soap is disclosed.

The present invention relates to a process and apparatus for continuously producing soap having pearl gloss.

In general, soap having pearl gloss is required to be produced in a batch style. That is, the conventional method of producing soap having pearl gloss is disadvantageous in that the operation of giving directional qualities to fish scale incorporated in fused transparent soap material in order to develop pearl gloss therein must be carried out in separate cooling containers. For this reason, it has been impossible to produce such a soap in a continuous manner.

In general, when warm-fused transparent soap material obtained according to the conventional method is cooled from its warm liquid state to a temperature inherent in the composition of said transparent soap material its viscosity rapidly rises and its solidification starts. That is, said temperature is a transition point from a liquid state to a solid state at which said soap material transfers to a solid state from a liquid state while discharging a solidifying heat. If the temperature at which the warm-fused transparent soap material is poured into a solidifying container is considerably higher than said solidifying temperature range, directional qualities given to the brightness developing material by stirring is lost before increase in viscosity in the solidifying container arises, and are dispersed uniformly to cause the precipitation of said material in the direction of the bottle thereof. Consequently, the product so produced does not possess the desired pearl gloss design. On the other hand, when the temperature concerned is lower than said temperature region, rapid increase in viscosity arises which leads to difficulties of pouring the soap material into the solidifying container, so that the soap materials poured do not dissolve into each other thus causing a crack with the result of a nonuniform product.

It is, therefore, an object of the present invention to provide a process for continuously producing soap having pearl gloss without any stirring operation in separate cooling containers by means of a stirring rod and the like using a simple operation wherein fused transparent soap material having incorporated fish scale with directional qualities given is merely poured into a cooling container in order to remove said complicated operations possessed by the prior arts.

It is another object of the present invention to provide an apparatus for accomplishing the present method.

Further features and advantages of the method and device of the present invention will be seen in detail from the following description, referring to the accompanying drawings, in which,

FIG. 1 is a graphical illustration of a relation between temperature and viscosity of a warm-fused transparent soap material during cooling according to an example of the method of the present invention,

FIG. 2 is a cross-sectional view of the device according to the present invention,

FIG. 3 is a cross-sectional view cut along III—III line in FIG. 2; and

FIG. 4 is a cross-sectional view cut along IV—IV line in FIG. 2.

For example, FIG. 1 shows a relation between temperature and viscosity obtained where 55 parts of 95 degrees alcohol, 5 parts of water and 30 parts of sucrose are added to the soap mass obtained by saponifying a mixed fat composed of 70 parts of beef tallow and 30 parts of coconut oil with an aqueous solution of 30% sodium hydroxide and disolved to prepare warm-fused transparent soap material followed by cooling said soap material to a solid state. In this case, a transition temperature region is 46.5±1° C. wherein rapid increase in viscosity with the associated solidification occurs and transition from a liquid state to a solid state takes places.

As a result of study we have found that if bismuth oxychloride, fish scale, mica or brightness imparting materials consisting of mica and other inorganic materials as pearl gloss developing materials in soap is added to the warm-fused transparent soap material obtained using the conventional method to disperse same therein, and the resulting material is allowed to cool under stirring to the liquid-solid state transition temperature region followed by pouring same into a solidifying container, and after cooling the poured soap is removed from the solidifying container, the soap having pearl gloss of a very elegant design may be easily obtained without carrying out any stirring operation for giving directional qualities to pearl material in the cooling container and further regardless of both any figures of the solidifying container and whether the heat conductivity and thickness of the solidifying container material is great or small, or thick or thin, respectively.

The process according to the present invention comprises adding pearl gloss developing materials such as bismuth oxychloride, fish scale or mica, or materials consisting of mica and other inorganic materials alone or in combination to warm-fused transparent soap material to disperse same therein, cooling the mixture to a temperature range higher, but no more than 1.5° C. higher than a liquid-solid transition temperature region at which rapid increase in viscosity with the associated solidification occurs during cooling, and pouring the soap material kept at said temperature into a solidifying container to solidify same.

If the temperature at which the warm-fused transparent soap material is poured into the solidifying container is more than 1.5° C. higher than said temperature region, it is impossible to develop pearl gloss design in the resulting soap.

In accordance with the present method, warm-fused transparent soap material to which is added pearl gloss developing material is cooled under stirring to a temperature range higher, but no more than 1.5° C. higher than a liquid-solid transition temperature region at which rapid increase in viscosity with the associated rapid solidification occurs during cooling, said region being inherent in said transparent soap, and then the soap material kept at said temperature region is poured into a solidifying container, whereupon said soap material is solidified with a rapid increase in viscosity and the associated solidification occurs while maintaining the directional qualities of the pearl gloss caused by a stirring prior to pouring and liquid movement during pouring, so that it becomes possible to provide the final product with a uniform pearl gloss design without any stirring operation at all in a cooling container.

The method of the present invention may be effectively carried out by means of the apparatus described hereinafter.

The apparatus according to the present invention comprises the following elements:

(a) a reservoir tank for storing warm-fused transparent soap material,
(b) a pump for supplying said material under pressure,
(c) a cooling means having a stirrer for cooling said material to the predetermined temperature,
(d) a means for giving directional qualities to said material,
(e) a casting nozzle for pouring said material, and
(f) a solidifying container for solidifying said material.

Referring to FIG. 2 reservoir tank **1** having a stirrer **2** at the inside thereof for warm-fused transparent soap liquid with pearl gloss developing material dispersely incorporated is connected through pipe **3**, pump **4** and pipe **5** to inlet **6** of cooling means **7**. Cooling means **7** is composed of a cylindrical tube which defines cooling jacket **8**. Inside said tube the axis of rotation **9** is disposed coaxially with said tube, and scraper **10** for avoiding the formation of a solidified soap layer at the inner wall of the cooling jacket **8** through the attachment of the soap thereto during cooling is equipped with said axis **9** in adjacent relation to said inner wall. By the rotation of scraper **10** the soap supplied from the tank **1** is passed through the cooling means **7** while being subjected to an intimate mixture, so that a satisfactory cooling effect is achieved. In the cooling means the soap is cooled to a temperature higher, but no more than 1.5° C. higher than a liquid-solid transition temperature region by cooling jacket **8** wherein cooling liquid is circulated through cooling liquid passage **11** surrounding the circumference of the cooling jacket **8**.

Then, the soap thus cooled is delivered into means for giving directional qualities **12** connected to the cooling means **7** wherein the axis of rotation **13** is provided coaxially with the axis of rotation **9** and supported thereby, and the axis of rotation **13** is equipped with stirring blade **14**. By the rotation of the stirring blade **14** the temperature of the soap is made uniform and directional qualities are given to the pearl gloss material in the soap, and thereafter the soap thus treated is flowed out from nozzle **15** provided at the end of the means **12**.

This flowing soap is poured into a solidifying container to provide the soap having pearl gloss design in a continuous manner.

When solidification is complete, the solidified soap is removed from the solidifying container and cut, dried and stamped to provide a commercial product.

One example of the method using the above-mentioned device according to the present invention is hereinafter explained.

EXAMPLE

A soap glue obtained by sponifying a mixed fat composed of 70 parts of beef tallow and 30 parts of coconut oil with an aqueous solution of 30% sodium hydroxide under heating is added to tank **1**, and 55 parts of alcohol, 5 parts of water and 30 parts of sucrose are further added thereto. Then, the mixture is dissolved under stirring by means of the stirrer **2** to give warm-fused transparent soap material. Then, 2 to 4 parts of 20% fish scale paste dispersed in alcohol is added to said soap material to disperse therein. Thereafter the soap material thus produced is supplied into the cooling means **7** through the pipe **3**, the pump **4** and the pipe **5**. In the cooling means **7** said material is cooled under stirring to a liquid-solid transition temperature region of 46.5±1° C. at which the viscosity of said warm-fused transparent soap material rises rapidly with the subsequent rapid solidification, and the soap material kept at said temperature region is delivered into the means **12** to give directional qualities, whereafter the soap so treated is poured into a solidifying container through the nozzle **15**. After cooling solidification, the solidified soap is withdrawn from the solidifying container and cut, dried and stamped to provide a soap product having gloss design.

As is clear in the above-stated description, the method according to the present invention is very efficient and extremely suitable for continuous industrial manufacturing due to the fact that same can be carried out without any cooling operation under stirring in separate solidifying containers.

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove.

What is claimed is:

1. A process for continuously producing soap having pearl gloss comprising the steps of:

(a) dispersing at least one pearl gloss developing material selected from the group consisting of bismuth oxychloride, fish scale, mica and mixtures of at least two of said developing materials in a warm-fused transparent soap material;
(b) cooling said dispersion while stirring to a temperature higher than the dispersion liquid-solid transition temperature region at which said dispersion is rapidly increased in viscosity with the associated solidification, said cooled dispersion temperature to exceed said liquid-solid transition temperature by a maximum of 1.5° C.;
(c) continuing the stirring of said dispersion so as to impart directional qualities to the pearl gloss developing material;
(d) pouring said cooled dispersion into a container at said cooled dispersion temperature; and
(e) allowing said poured dispersion to cool in said container in order to solidify said dispersion.

References Cited

UNITED STATES PATENTS

3,562,167	2/1971	Kamen et al.	252—134 X
3,485,905	12/1969	Compa et al.	252—134 X
3,420,924	1/1969	Mason et al.	264—108 X

FOREIGN PATENTS

1,199,913	9/1965	Germany	252—367

LEON D. ROSDOL, Primary Examiner

B. H. HESS, Assistant Examiner

U.S. Cl. X.R.

252—131, 132, 134, 370