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Kaniecki

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[54] **METHOD AND APPARATUS FOR PRODUCING STRIPED SOAP BAR**

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Related U.S. Application Data

[63] Continuation of Ser. No. 111,443, Feb. 1, 1971, abandoned.

[52] **U.S. Cl.** **264/171**; 252/90; 252/367; 264/75; 264/148; 264/245; 425/131; 425/224

[51] **Int. Cl.** **B29f 3/12**

[58] **Field of Search** 264/171, 173, 75, 245, 264/148, 349, 211; 425/130, 131, 224; 252/367, 368, 371, 134, 90

[56] **References Cited**

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[57] **ABSTRACT**

Striped, multi-colored soap bars can be produced by introducing coloring matter into the soap mass while the soap mass is passing through the ducts of an extruder plate in a soap plodder. The apparatus for producing such a bar comprises a conventional soap plodder with a modified extruder plate having a plurality of injector tubes which permit the flow of the coloring matter into the ducts of the extruder plate.

6 Claims, 3 Drawing Figures

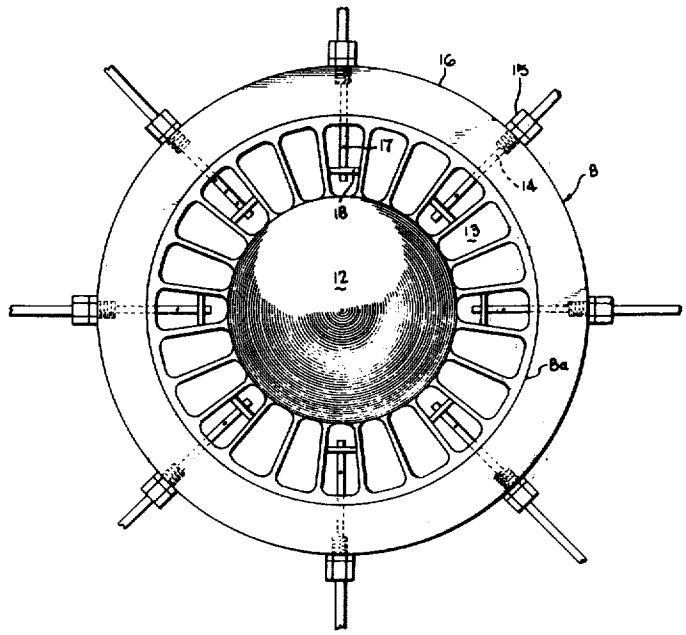


FIG.1

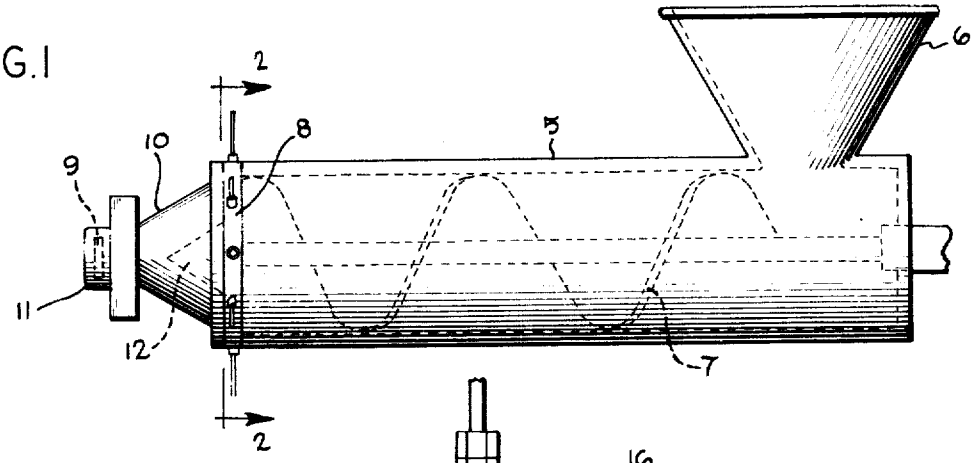


FIG.2

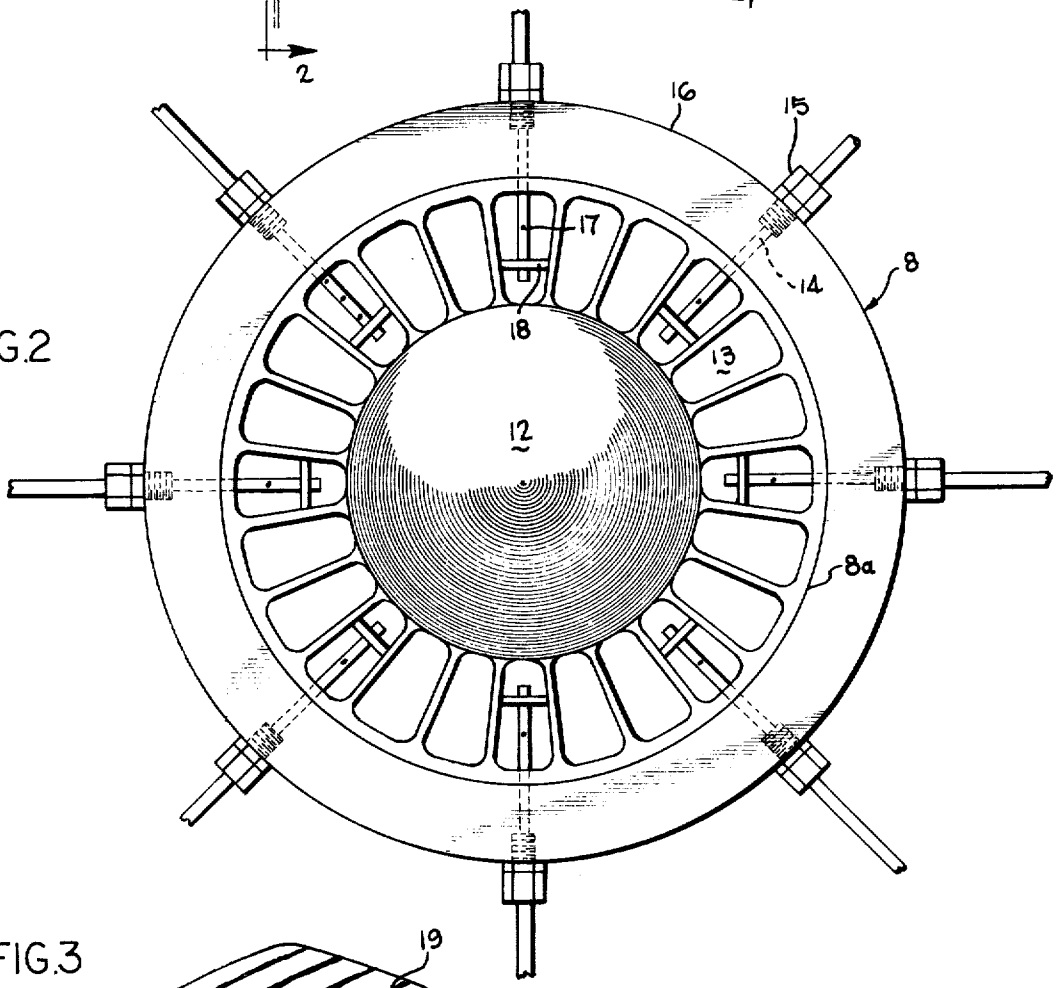
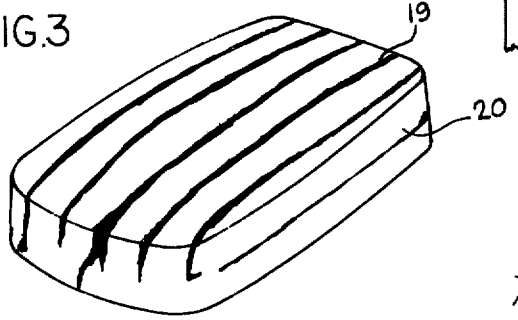


FIG.3



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METHOD AND APPARATUS FOR PRODUCING STRIPED SOAP BAR

RELATED APPLICATIONS

This application is a continuation of my application Ser. No. 111,443, filed Feb. 1, 1971, now abandoned.

This invention relates to a method and apparatus for producing multi-colored detergent bars or cakes. More particularly, it relates to the manufacture of a striped bar of soap. Generally the bar of soap will have an appearance somewhat similar to the so called "marbleized" soap bar, except that the striping extends throughout a greater depth of the bar, is straighter, and is more solid than the random swirling features of marbleized soap.

Marbleized soap is generally made by either adding soap chips containing coloring matter different from that of the regular colored soap stock to the hopper of the soap plodder or by injecting dye or other coloring matter into the screw-feed area of the soap plodder. As the soap chips are compressed while passing through the screw-feed area, the colored soap chips become intermingled with the base soap stock in a jumbled or completely random fashion, thereby producing the random swirling appearance of marbleized soap. It is also known to produce differently colored bars of soap by inserting plugs of colored soap into finished soap bars or by other physical intermixing of two separately plodded soap logs.

Further, Swiss Pat. No. 457,680 seems to show injection of coloring matter into a soap mass while the soap is passing through the nose cone of a soap plodder. Such a procedure would suffer certain disadvantages. As the soap mass moves through the nose cone area it undergoes extreme compression, and any piercing of the nose cone itself to permit injection of dye could result in a structural weakness leading to cracking and breakage of the nose cone. The resultant shutdown of equipment for replacement or repair would be expensive not only due to materials and labor but also due to the stoppage of production. In addition, the closer such injection is to the terminal end of the nose cone, that is towards the face plate, the greater would be the likelihood of introducing structural weaknesses into the resultant soap log and soap bar. These structural weaknesses in the bar could result in a high incidence of defective soap bars, in that the bars would crack or split along the structurally weak lines during useage of the bar.

It has now been discovered that if the coloring matter is introduced into the soap mass as the soap mass is passing through the extruder plate and entering into the nose cone, the extruded log of soap will contain different colored stripes without substantial twisting or random streaking as is characterized by marbleized soap and without the potential structural weaknesses of the bar or apparatus characterized by injection of dye into the nose cone area.

Thus it is an object and advantage of the present invention to provide an apparatus and method of producing a striped soap, detergent or soap and detergent bar or cake.

Another object and advantage is the provision of an apparatus for and method of making soap bars having a differently colored striping, which bars will not excessively crack or break apart during use.

A further object and advantage is to provide an apparatus and method for producing a striped multicolored, such as a tri-colored, bar of soap.

A still further object and advantage is to provide an apparatus and method for producing a striped soap bar that avoids weakening the structure of the soap producing apparatus.

Still another object and advantage is to provide an apparatus and method for producing a striped soap wherein the number and width of the stripes is highly variable.

The apparatus for producing striped soap bars; comprising a casing, means for directing a flow of plastic soap through the casing, means for finally compacting the soap mass into an extruded log, and an extruder plate between said casing and said final compacting means having injection tubes for directing a flow of coloring matter into the soap; is more fully described in the following specification and illustrated in the accompanying drawings, in which:

FIG. 1 is a longitudinal sectional view through a single stage soap plodder showing the position of the modified extruder plate of this invention.

FIG. 2 is a transverse section taken along line 2—2 of the extruder plate shown in FIG. 1.

FIG. 3 is a perspective view of a finished bar of soap showing an example of a striped bar of soap produced by this invention.

For convenience, reference is particularly made to soap bars. This invention is generally applicable to bars of soaps, non-soap synthetic detergents, or mixtures thereof. Further, the term bar is used in a general sense and the final product can take other shapes as is well known in the art by further processing plastic soap materials extruded from a plodder, and such inclusion is intended. All or some portion of such bars may additionally contain agents such as perfumes, additional dyes, skin softeners, germicides and the like as are known in the art of manufacturing soaps. Also, for ease of description, FIG. 1 depicts a single stage soap plodder, but it is understood that the present invention is directed to improvements in the final stage of the soap plodding procedure and also encompasses the final stage of multiple stage plodding apparatus, preferably of the vacuum type.

In the production of finished soap bars, the neat soap is dried and worked into pellet form and then is either passed through roller mills and the like before being compressed, or is directly compressed into log form by means of a soap extrusion apparatus, referred to in the trade as a "plodder", shown more particularly in FIG. 1. The plastic soap mass is extruded from the plodder as a continuous log through a face plate 9 mounted at one end of the plodder by means of cap 11. THe extruded soap log is thereafter cut into slugs, and the slugs are then pressed to form the familiar shapes of commercial soap bars.

In the plodder shown in FIG. 1, the elongated outer cylindrical casing 5 has a filling hopper 6 at one end of the casing 5 for receiving the soap mass, such as soap chips. The soap entering the casing 5 from the hopper 6 is directed along the casing 5 by a rotatively mounted helical feed screw 7 connected to a suitable source of power not shown. Casing 5 is provided with an extruder plate 8 having a plurality of ducts 13 (shown in FIG. 2), and is positioned between the end of casing 5 and the nose cone 10 which is hingedly secured to casing 5. At

the opposite and narrow end of nose cone **10** is the face plate **9**, secured to the nose cone **10** by cap **11.**

In operation, soap chips are introduced into the hopper **6** whereupon the soap chips become intermeshed into an amorphous soap mass by the action of feed screw **7.** It will be appreciated that as the soap passes along the casing **5** via feed screw **7**, the individual soap chips become intimately admixed with each other and compressed in a circular tumbling or random fashion. Thus if a suitable dye were introduced in the casing area, a random or non-uniform marbleizing effect would be produced in the resultant soap bar. When the soap mass passes through the ducts **13** of extruder plate **8** it ceases its circular motion and moves in a substantially straight manner and enters the nose cone **10** area as a series of ribbons. Thereafter the ribbons pass through the final compression zone defined generally by the nose cone **10** and are compacted into a solid mass which is then extruded through the log forming face plate **9**, emerging as a continuous log of soap which is thereafter cut into lengths by a suitable cutter. By injecting the coloring matter directly into the extruder plate **8**, soap bars are produced having colored stripes yet without substantial weakening of either the soap bar or processing apparatus.

Referring to FIG. **2**, a modified extruder plate **8** of the invention is shown in preferred form. A spacing ring **16** is attached to a conventional extruder plate **8***a* by means of set screws or the like. The purpose of the spacing ring **16** is to allow room between the end of casing **5** and the nose cone **10** for the injector tubes **14.** The extruder plate **8** as shown in FIG. **2** has a plurality of ducts **13** disposed around a central cone **12**, shown by dotted lines in FIG. **1.** Injector tubes **14** pass through the spacing ring **16** and into the ducts **13.** The tubes are secured to the spacing ring by means of fastening means **15** such as No. 316 stainless steel standard swagelock fasteners having a drilled out chamber to receive, for example, a ⅛ inch o.d. tube **14.** The number of tubes **14** in extruder plate **8** depends upon the number of stripes that are desired in the finished soap bar. For example, the use of less than about 4–6 tubes will produce a bar having just a few widely spaced colored stripes; whereas the use of more tubes will produce a larger number of more closely spaced stripes in the bar. Since most extruder plates contain about 24 ducts, the plate may thereby contain up to about 24 tubes **14.** Each tube is provided with at least one orifice **17**, the orifice being positioned within duct **13.** It is preferred to have a single orifice **17** per tube **14** and the location of orifice **17** on tube **14** may be varied from tube to tube to produce striping at different levels in the resultant soap bar. Bracing means **18** are preferrably employed in conjunction with tube **14** as an optional structural reinforcing member and are preferrably of ⅜ inches thick stainless steel located about 1 inch in from the outer rim of duct **13.**

The type of coloring matter to be injected via tubes **14** is not critical, although it is preferred that the coloring matter be a non-bleeding dye or pigment, such as D & C Green dye No. 5. The pressure required to inject the coloring matter into the flowing stream of soap also is not critical. It has been found that 75 pounds per square inch gauge (psig) or more is satisfactory.

In operation chips of soap are milled and the milled chips are fed through a hopper into the top worm of a three stage plodder, the third stage being a vacuum stage substantially as described above and illustrated in the accompanying drawings. As the soap is fed into the top worm in the first stage of the plodder, the top worm carries the soap forward, at the same time, packing or compressing it and forcing it through a grinding plate whereupon it drops by gravity into a second stage and onto the second stage worm which again carries the soap forward for a repetition of this process. The soap after passing through a second grinding, drops by gravity into a third stage where it is again fed by a worm such as screw **7** towards the nose cone **10.** As the soap passes through extruder plate **8**, the dye such as a solution of D & C Red No. **19**, is introduced into the soap by means of tube **14** and orifice **17.** The extruder plate **8** was fitted with four injector tubes **14**, each tube having a single orifice **17.** Each of the orifices **17** was positioned in tube **14** at various depths within duct **13** varying from ⅛ inch to 1 ½ inch from the top or outermost rim of the duct **13.** The resulting soap bar had approximately four widely spaced reddish-colored bands **19** running part way through the white bar background **20** shown in FIG. **3.**

The following specific examples illustrate production of bars of soap having a striped appearance in accordance with the invention.

EXAMPLE 1

Milled soap chips comprising 15% by weight coconut fatty acid sodium soap and 85% by weight hydrogenated tallow sodium soap were fed into a triple-stage plodder as described above.

The extruder plate **8** of the third stage was equipped with twelve injector tubes **14**, each tube having one orifice **17** of 1/32 inch diameter.

As the soap passed through ducts **13**, the soap was contacted with a 0.5% aqueous solution of D & C Green dye No. 5 under pressure of about 200 psig.

The extruded soap log contained a large number of relatively uniform stripes spaced approximately ⅛ inch apart and blending through the depth of the log. The resulting finished soap bar had an appearance similar to that shown in FIG. **3**, but with the stripes **19** being closer together. Using 4–6 injector tubes 14 soap bars as shown in FIG. **3** were obtained. The dye was injected into the soap mass at a pressure of about 125 psig.

EXAMPLE 2

Milled soap chips as set forth in Example 1 were run through the same apparatus having six injector nozzles **14** in the extruder plate **8.** A 0.5% D & C Green dye No. 5 solution was injected at 500 lbs. psig. The resultant finished soap bar had an appearance very similar to the bar shown in FIG. **3.**

EXAMPLE 3

Milled soap chips as set forth in Example 1 can be fed into a soap plodder as shown in FIG. **1** of the attached drawings, that is a single stage vacuum plodder. The extruder plate **8** is then equipped with twelve injector tubes.

A 0.1% aqueous solution of Red No. **19** under a pressure of 125 lbs. psig can be introduced into alternate tubes. A 0.5% aqueous solution of D & C Green No. 5 under a pressure of 125 lbs. psig is introduced into the soap through the remaining tubes.

The extruded log will present the appearance of substantially uniform striping of alternate red and green

stripes on a white background. The stripes will be approximately ⅛ inch apart and extend approximately 182 inch into the log.

In the foregoing, the present invention has been illustrated by specific preferred embodiments. Various modifications may be made in the present invention without departing from the spirit or scope thereof.

What is claimed is:

1. In a method for producing a multi-colored detergent bar which includes pressing and passing a detergent material in a circular motion through a final plodding stage in which said material is passed forwardly through a cylindrical channel in said plodding stage by screw action to knead said material, then passing said material through a plurality of separate ducts contained in a plate between said plodding area and a conical area and into said conical area, and compacting said material in said conical area, the improvement which comprises introducing coloring matter in a confined stream into said material from an injection tube and directing said stream from a stationary orifice in said tube with said tube being located within one of said ducts in the direction in which the detergent material is being passed through said duct, the area of said confined stream being small as compared to the area of said duct, whereby to produce an extruded bar having a stripe therein.

2. A method as set forth in claim 1 in which said coloring matter is introduced separately into a plurality of said ducts whereby there is produced an etruded bar of said material having a plurality of stripes therein.

3. The method of claim 1 wherein said detergent is soap.

4. In apparatus for producing a multi-colored detergent bar comprising a final stage plodder cylindrical in form containing a screw for kneading detergent material and passing the same longitudinally through said plodder, a nose cone located forwardly of said screw for compacting said material radially of the axis of said cone, a plate located between said screw and said cone having ducts therein providing channels through which said material may pass in separate channels, a tube extending into one of said ducts, said tube being in fixed position with respect to said duct and containing an orifice within said duct which is aligned with said duct whereby coloring matter passed through said tube and out of said tube through said orifice is directed into said channel in the direction in which said material is being passed through said duct.

5. Apparatus as set forth in claim 4 in which said plate includes a ring disposed between said cone and said plodder and wherein said tube is carried radially within said ring.

6. Apparatus as set forth in claim 4 including a bracing member extending within said duct and connected to said tube for positioning said tube with respect to said duct.

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