Oct. 30, 1973 R. G. MATTHAEI 3,769,225

PROCESS FOR PRODUCING MARBLEIZED SOAP

Filed Feb. 12, 1971 2 Sheets-Sheet 1

Fig. 1

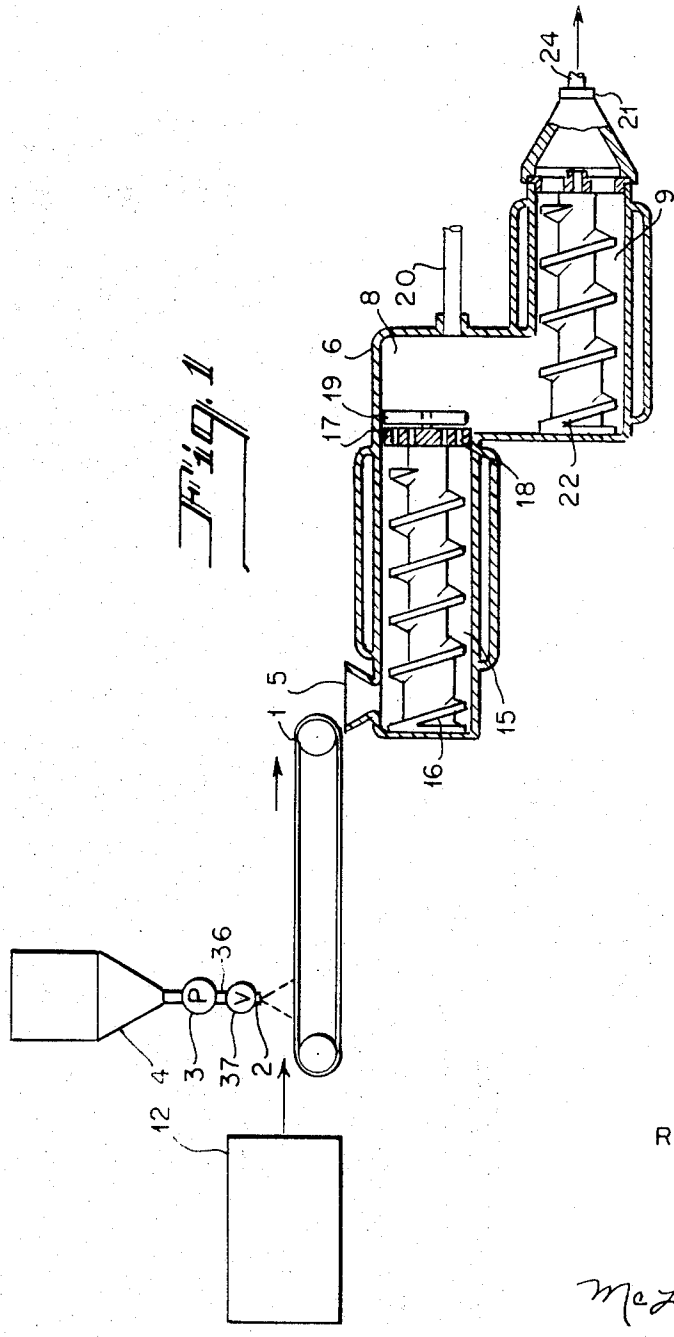


Fig. 3

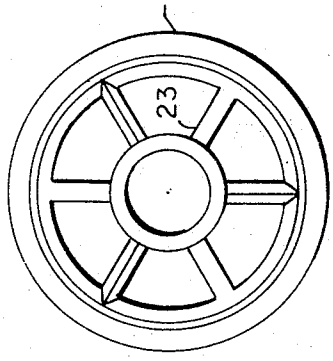
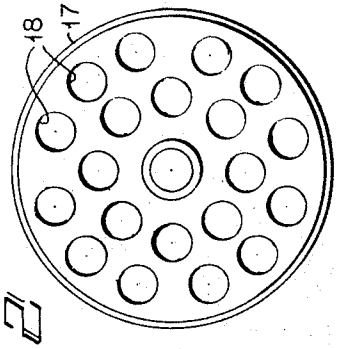


Fig. 2



RAYMOND GEORGE MATTHAEI

INVENTOR.

BY

McLean, Boustead and Ilyre

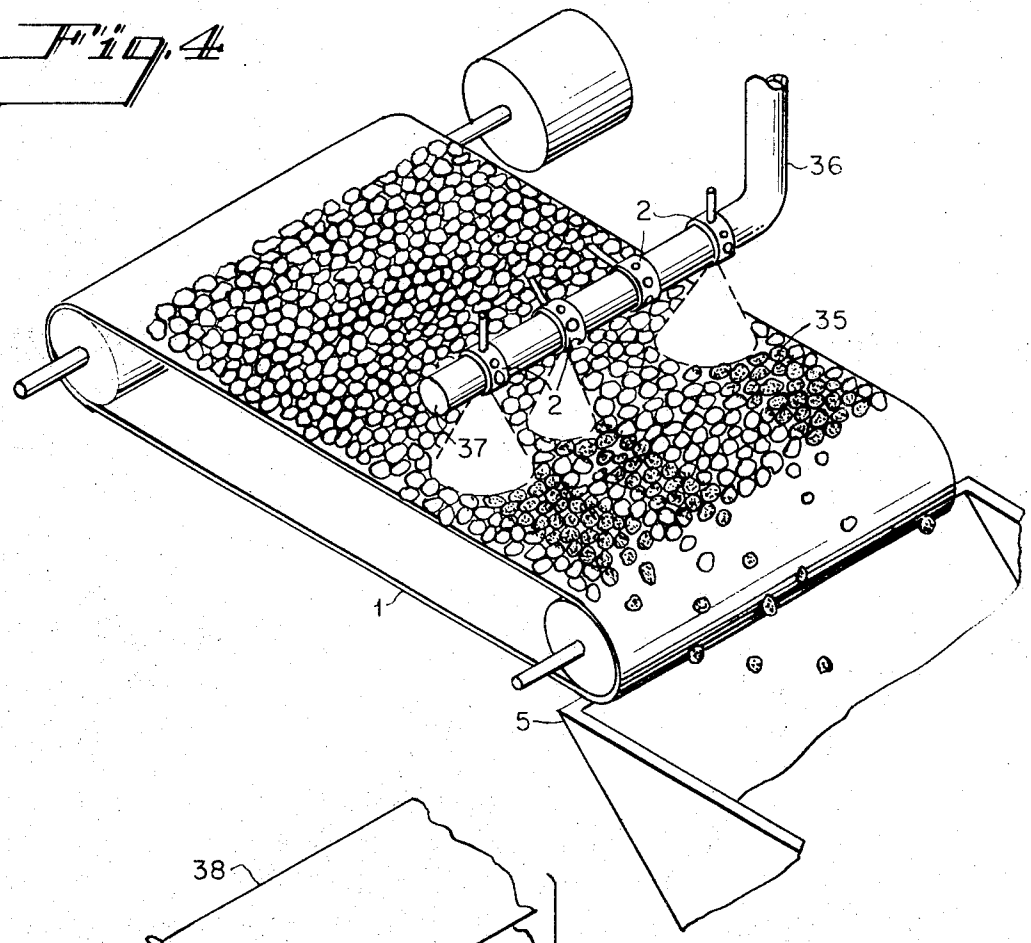
ATTORNEYS

Oct. 30, 1973 R. G. MATTHAEI 3,769,225

PROCESS FOR PRODUCING MARBLEIZED SOAP

Filed Feb. 12, 1971 2 Sheets-Sheet 2

Fig. 4



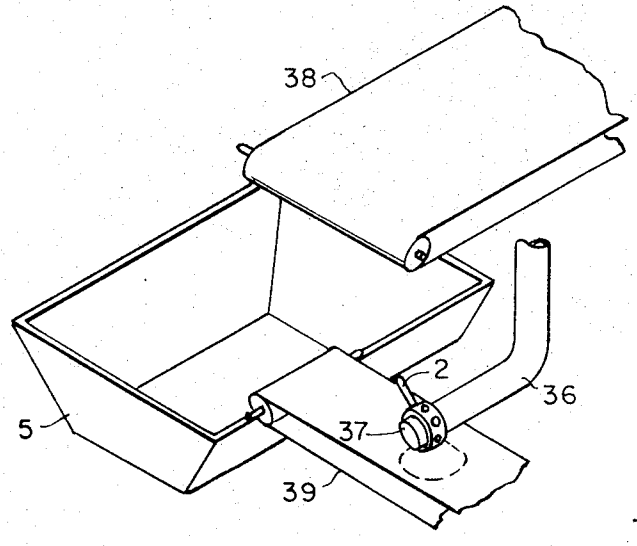


Fig. 5

RAYMOND GEORGE MATTHAEI
INVENTOR.

BY
McLean, Boustead and Sayre
ATTORNEYS

United States Patent Office 3,769,225 Patented Oct. 30, 1973

3,769,225

PROCESS FOR PRODUCING MARBLEIZED SOAP

Raymond George Matthaei, Fairlawn, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 12, 1971, Ser. No. 114,785
Int. Cl. B29f 3/12
U.S. Cl. 252—134 4 Claims

ABSTRACT OF THE DISCLOSURE

A marbleized mass of soap in the form of a log is produced by introducing a soap additive, e.g., a dye, onto a moving bed of milled soap chips entering the upper barrel of a soap plodder and extruding the admixture of soap chips and soap additive.

BACKGROUND OF THE INVENTION

(1) Field of the invention

This invention relates to the production of marbleized soap masses including detergent masses.

(2) Description of the prior art

Marbleized soap masses have been produced by several methods. As presently known, such soap masses have been produced either by a framing process or by introducing the additive into the vacuum chamber between the stages of a two-stage soap plodder. Soap framing—a batch process—has its inherent disadvantages, and the introduction of the dye into the vacuum chamber is subject to the disadvantages that the ability to control the appearance of the finished product is relatively limited in that the dye-addition location is fixed. Soap logs produced in this fashion frequently suffer from a relatively high degree of dye-migration, lack of adequate contrast, and the lack of relatively reproducible variations in the finished soap patterns.

SUMMARY OF THE INVENTION

It has now been found that a marbleized soap mass can be produced by the dropwise or steady stream addition of the desired additive completely outside of the plodder itself.

In the preferred embodiment of this invention the additive, e.g., a dye solution, in varying concentration is proportioned onto a moving bed of milled soap chips or pellets as the soap chips are being charged to the upper barrel feed hopper of the plodder. Using this process in which the applied additive is a dye, a marbleized soap is produced as an otherwise homogeneous mass having colored streaks distributed throughout the mass to produce a variegated appearance. The invention is also useful in producing heterogeneous soap in masses in which the applied additive is a composition such as a sequestering agent, a deodorant, a perfume or emollient. In producing such heterogeneous soap masses suitable additives can be applied to the soap on the moving soap bed using a spray nozzle or several additives can be applied at the same time using separate dropwise, steady stream and spray nozzle depending on design characteristics. The addition of these latter materials by the method of my invention greatly reduces processing and equipment problems inherent in the use of such additives. As used herein, the term "marbleized" soap refers to all of the described soap masses although for purposes of simplicity the dedescription of my invention hereafter will be directed to the production of variegated soap masses by dye addition.

The process will produce a marbleized mass having greater or less contrast between differently colored areas according to the process variables including the soap formulation, the plasticity of the soap mass, the amount of additive used, the size of extrusion equipment used and

similar variables. Thus, the present description is directed to applicant's preferred process in which variations within the mass are in distinct zones distributed substantially throughout the mass. Many of the process variables within reasonable limits are non-critical but relate only to degree of contrast to be obtained between differently colored areas of the soap mass.

In a typical soap production according to my invention dried kettle soap chips are mixed with desired addition agents such as perfumes, fillers, germicides, emollients, water, salt, etc., and milled. The milled soap is then placed on a moving belt and conveyed to a soap plodder. While on the moving belt the dye is proportioned by dropwise addition onto the moving bed of soap chips. The proportion of dye solution to soap depends on the design target. The soap is then charged to the hopper feeding the upper barrel of the plodder.

The compacted soap is discharged from the first stage of the plodder through relatively large apertures in a pressure plate and cut into pellets as it enters into a vacuum chamber enclosing the discharge side of the pressure plate.

In the vacuum chamber entrapped air within the soap pellets is removed. The soap pellets pass through the vacuum chamber and into the plodder second stage which compresses the soap pellets and extrudes the soap as a continuous log of marbleized soap. Thereafter, the marbleized log is cut and stamped into soap bars in the manner known in the art.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a flow diagram depicting the soap making process and includes the mill, a dye addition system and the plodder.

FIG. 2 is a plan view of a pressure plate used in the soap plodder of FIG. 1.

FIG. 3 is a plan view of an alternate pressure plate to that shown in FIG. 2.

FIG. 4 is an enlarged view of the dye addition system of FIG. 1.

FIG. 5 is an alternative dye addition system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, a flow diagram of the marbleized soap making process is shown. Soap chips and pellets leave mill **12** on a moving soap bed **1**. As the soap is moved on bed **1** towards plodder hopper **5** an additive, in this case a dye, is pumped by pump **3** from dye tank **4** to nozzle **2** and applied dropwise, in a steady stream, or as a spray onto a predesigned area of the soap on bed **1**. During the interval between dye addition to belt **1** and introduction to plodder hopper **5**, the dye will absorb and penetrate the surface of the soap thus setting itself in a relatively stable position. The soap then enters the upper barrel **15** of plodder **6** at plodder hopper **5**.

A two-stage soap plodder **6** is shown consisting of a water jacketed upper barrel **15**, a vacuum chamber **8** and a water jacketed lower barrel **9**. Barrels **15** and **9** contain, respectively, extrusion screws **16** and **22** each of which is driven by conventional means (not shown).

Particles of soap with applied additive on bed **1** are introduced to the upper barrel **15** through plodder hopper **5** and are picked up by the feed-end flights of extrusion screw **16**. Extrusion screw **16** compacts the soap particles and extrudes the compacted soap through a pressure plate **17**. Blade cutter **19** is provided on the face of pressure plate **17** and operates to cut the extruded mass of soap into pellets 0.5 to 4 inches in length.

Having passed through pressure plate **17** and rotary cutter **19**, the soap pellets enter vacuum chamber **8** in which gases entrapped in the soap are removed by main-

taining a vacuum of the order of approximately 25–29 inches of mercury. Chamber **8** is evacuated through vacuum line **20**. The soap pellets discharged fall upon the feed end flights of a second extrusion screw **22** in lower barrel **9**. Extrusion screw **22** compacts the marbelized pellets and extrudes a continuous strip **24** of soap through a nose plate **21**. The strip is thereafter treated, usually by cutting and stamping, to form individual bars of soap.

In the process of the invention, it is important to use a relatively open pressure plate **17** to provide relatively large soap pellets to vacuum chamber **8** and lower barrel **9** to avoid excessive mixing of the additive and soap mass, which would have the effect of producing a mass in which the additive has substantially migrated throughout. For example, as shown in FIG. 2, when using a 10 inch plodder, i.e., the inside diameter of barrels **15** and **9** is 10 inches, pressure plate **17** has holes **18** distributed across its surface, each hole **18** having an inside diameter of 1 to 1¼ inches.

In general, the openings in plate **17** should be as large as possible while providing for the maintenance of vacuum in chamber **8** and the development of adequate pressure in barrel **15** to compact the soap chips into a continuous mass of soap. An alternate construction of pressure plate **17** is shown in FIG. 3. In this instance, a plate **17'** is provided having an open face except for a series of struts **23**. This type of pressure plate is especially useful with smaller diameter extrusion screws, e.g., 6 inch.

When using pressure plate **17** with its relatively large apertures, it has been found necessary to shorten extrusion screw **16** in order to produce a 2–3 inch heel of soap in the upper barrel **15** to maintain the required vacuum in vacuum chamber **8**. From the vacuum chamber **8** the soap is drawn through bottom barrel **9** by means of extrusion screw **22** and extruded at nose plate **21**.

FIG. 4 is an enlarged view showing the dye addition system of FIG. 1. A selected additive is pumped from the dye tank **4** (not shown) through line **36** into header **37**. Located on header **37** are sleeve fittings (**2**) with a variety of orifices or, in the alternative, spray nozzles (not shown). Each sleeve fitting or spray nozzle can be set to spray or drip upon a certain segment of the moving belt carrying the soap chips **35**, thereby creating a product with definite design characteristics.

An alternative method of dye application is illustrated in FIG. 5. In FIG. 4 the additive was applied by spraying or dripping upon a specific area of the moving belt, thereby creating areas of dyed and undyed material. In FIG. 5 soap chips to which dye is added are conveyed to hopper **5** on moving belt **39**. Additional chips not subjected to the dye system are conveyed to hopper **5** via moving belt **38**. A setting is selected by rotating sleeve **2** on header **37** over belt **39** to spray the entire area of the belt or a certain segment of the belt. A further function of this alternative feed design is to permit mixing different color soap chips into the soap hopper **5** at the same time the dye or additive is being applied to one color of chips.

Illustrative of the production of bars of soap having a marbleized appearance are the following examples:

EXAMPLE 1

Blue streaks on white soap

Chips of soap comprising 35.05 percent coconut fatty acid sodium soap, 43.03 percent tallow acid sodium and 5.97 percent coconut fatty acids are mixed with germicide preservative and perfume in the proportions.

Ingredients:	Weight percent
35.03:43.03 coco:tallow sodium soap chips	78.06
Coco fatty acid	5.97
Germicide TBS:TCC 3:1 ratio	2.0
Perfume	1.0
Water	11.08
NaCl	.77
Glycerine	.48
Colorant D & C Blue #6	.0073
Misc.	.64

The soap chips, germicide preservatives, perfume and water are mixed and milled. A 1% dye solution, was added at a rate of 3.33 ml./lb. of soap to the moving bed of chips or pelletized soap just prior to the soap entering the plodder hopper.

EXAMPLE 2

Blue streaks on white soap

Milled soap chips having the composition given hereinafter were fed to the hopper **5** of a double-barrel vacuum plodder.

Ingredients:	Weight percent
Anhydrous soda coconut soap	35.43
Anhydrous soda tallow soap	43.03
Coconut fatty acid	5.97
Germicides TBS:TCC 3:1 ratio	2.0
Perfume	1.0
Water	11.09
NaCl	.77
Glycerine	.48
Colorant Monastral Fast Blue	.00611
Misc.	.23
	100.00

The above example was processed in the same way as Example 1, except that the type of colordant solution was changed and it was added as a 12% dye solution at a rate of .77 ml./lb. of soap.

EXAMPLE 3

Blue streaks on white soap

Milled soap chips having the composition given hereinafter were fed to the hopper **5** of a double-barrel vacuum plodder.

Ingredients:	Weight percent
Anhydrous soda tallow soap	66.00
Anhydrous soda coconut soap	16.50
Titanium dioxide	.20
Glycerol	.42
Sodium chloride	.56
Sodium sulfate	.13
Butylated hydroxy toluene	0.2
Sodium carbonate	.11
Colorant Monastral Fast Blue	.000529
Perfume	.9
Versene	.06
Water	15.09
	100.00

The above example was processed in the same way as Example 2 except that the colorant was added as a 3% dye solution at a rate of 0.8 ml./lb. of soap.

In general soap formulations within the following ranges may be used:

Coco soap (including palm kernel, sesame, etc.): —5 to 95%; preferably —5 to 45%.
Tallow soap (including choice white grease etc.): —5 to 95%; preferably —45 to 95%.
Free fatty acid: —0 to 30%; preferably —5 to 10%.
Water: —0 to 26%.
NaCl: —0.1 to 5%.

Other known soap formulations may be used and the soap component can be replaced by detergent materials such as sodium fatty alcohol sulfates, alkoxyhydroxypropane sulfonates, sodium fatty acyl isethionate, and sodium fatty acyl taurates. Translucent soaps can also be used and these can contain nacreous pigments comprising transparent platelets of high refractive index which produce pearlescent soap bars.

Dye compositions containing water or oil soluble dyes particularly color-fast compositions can be used. Suitable dyes used include those sold under the following names:

Monastral Fast Green
Monastral Fast Blue
Heliogen Green
Heliogen Blue
F D & C Red #4
D & C Red #19

Dye concentrations between 0.5% and 30% are applied either continuously or in a dropwise fashion of from 0.04 ml. to 5.0 ml. of dye solution per pound of soap.

Except as discussed herein, conditions otherwise applicable to soap plodding are observed in the practice of my invention. These include temperatures of 70° F. min. to 160° F. max. and pressures, 10 to 400 p.s.i., within the soap plodder.

I claim:

1. The method of making a milled and plodded marbleized toilet bar mass selected from the group consisting of fatty acid soaps, sodium fatty alcohol sulfates, sodium fatty acyl isethionate and sodium fatty acyl taurates wherein a moving bed of milled chips is introduced into the upper barrel of a two-stage soap plodder, which comprises adding a minor amount of a dye to a major amount of said milled chips immediately prior to the chips entering the soap plodder, the amount of dye being 0.04 to 5 ml. per pound of base toilet bar composition and thereafter blending said admixture of dye and soap chips in the soap plodder and extruding a marbleized toilet bar mass, the upper barrel of the soap plodder having an extrusion screw and a relatively open pressure plate with openings proportioned to the extrusion screw diameter such that a heel of soap is maintained between the extrusion screw and the pressure plate.

2. The method of claim 1 in which the dye is added by dropwise or steady stream application.

3. The method of claim 1 in which the toilet bar mass is milled soap chips, and the dye is applied by addition to a predetermined restricted area of a moving bed of milled soap chips immediately prior to their entering the upper barrel of the soap plodder.

4. The method of claim 1 in which the toilet bar mass contains 5–95% coco soap, 5–95% tallow soap, 0–30% free fatty acid, 0–26% water, 0.1–5% NaCl and the dye is added in the form of a 0.5–30% solution.

References Cited

UNITED STATES PATENTS

3,485,905	12/1969	Compa et al.	252—134 X
3,494,869	2/1970	Armstrong	252—109
2,649,417	8/1953	Compa	252—371 X
3,663,671	5/1972	Meye et al.	252—134 X
3,676,538	7/1972	Patterson	252—367

FOREIGN PATENTS

584,141	10/1958	Italy.

HERBERT B. GUYNN, Primary Examiner

U.S. Cl. X.R.

252—174, 367, 368; 264—75