This invention relates to an apparatus for producing a striated soap bar in a double barrelled extruder. A soap mass is levigated and homogenized in an upper barrel and forced through a compression plate assembly to form soap pellets which pass through a vacuum chamber into an extruder into which dye is injected. Then, the pellets mixed with the dye are forced through conically tapering nozzles to form a striated soap bar.

3 Claims, 6 Drawing Figures
APPARATUS FOR MAKING A STRIATED SOAP BAR

BACKGROUND OF THE INVENTION FIELD OF THE INVENTION

This invention relates to an apparatus for forming striated soap employing a double barrel Mazzone type extruder.

DESCRIPTION OF THE PRIOR ART

In the past, attempts have been made to use a Mazzone double barrel extruder unit either of the single bore or double bore type for manufacturing striated soap bars. These previous attempts have failed because the striated soap bars produced have failed to pass the wet-crack test. The use of a double barrel Mazzone type extruder is well known in the field of plastics and in the production of soap bars. Further, the use of a double barrelled extruder is shown in the British Pat. No. 1,308,410.

SUMMARY OF THE INVENTION

The present invention overcomes the failures of the prior art in employing a Mazzone type double barrelled extruder for producing striated soap bars. In carrying out the invention, the soap is homogenized and levigated in a first barrel and forced by a screw or auger through a compression plate assembly to form soap pellets which are then passed through a vacuum chamber into a second and preferably double bored barrel. Dye is injected in the area of the vacuum chamber into the second barrel and counter rotating screws drive the mixed soap pellets and dye through a conical nozzle arrangement to form continuous striated soap bars. Suitable cutting and trimming apparatus may thereafter be employed. Further, to render the use of the Mazzone double barrel extruder functional for the use of extruding satisfactory striated soap, dye injection including a metered pressure feeding system is employed. The screw or screws of the bottom barrel are provided with only one vertical strut for the centering plate so as to provide for the smallest allowable cross section so as to reduce homogenizing and mixing which might reduce striations. Dual conical nozzles are preferably employed for eliminating uneven residual stress while also providing for an individual centralization striation pattern and an even cross sectional grain. The invention further employs the use of deep flight screws in lieu of the standard Mazzone compression screws so as to reduce excessive deep blending or saturation of the dye at the periphery of the screws against the surface of the barrel.

It is therefore an object of the invention to provide a process and apparatus for manufacturing striated soap bars using a modified Mazzone double barrelled extruder.

Still further objects and features of this invention reside in the provision of a process and apparatus for making striated soap that is capable of employing existing Mazzone double barrel extruders with modifications which can be made at a moderate cost, while still obtaining the relatively high extrusion rate capabilities of these type extruders, and which can be commercially employed to produce a high quality striated soap bar at a reasonable cost.

These features, together with the various ancillary objects and features of this invention, which will become apparent as the following description proceeds, are attained by this apparatus and process for making a striated soap bar, preferred embodiments of which are illustrated in the accompanying drawing, by way of example only, wherein:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a vertical sectional schematic view of a double barrel extruder employing the concepts of the present invention;

FIG. 2 is a perspective view of the compression plate means such as is used at the end of the upper barrel for forming soap pellets;

FIG. 3 is a vertical sectional view taken along the plane of line 3—3 in FIG. 1;

FIG. 4 is a detail view looking in the direction of line 4—4 in FIG. 1 and showing one type of centering strut for supporting the screw or screws;

FIG. 5 is an elevational view of a dual nozzle arrangement, and;

FIG. 6 is a plan view of a modified form of a dual nozzle arrangement.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With continuing reference to the accompanying drawing, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate a double barrelled extruder having an upper barrel 12 provided with an auger or screw 14 or two screws (not shown) therein having tapering flights 16 thereon. An intake chute 18 is provided for feeding soap into the barrel 12 wherein it is homogenized and levigated and then driven past a compression plate assembly, such as generally indicated at 20, FIG. 2 and of the type shown in applicant's prior U.S. Pat. No. 3,584,355, which includes a centering support plate 22 having a plurality of struts 24 for holding a centering ring 26 for centering the screw 14.

A heavy duty mesh screen plate 28 is provided as is a compression plate 30 having a plurality of bores 32 therethrough through which the mass of soap is extruded to form soap pellets.

This soap then passes through a vacuum chamber 34 and thence through an opening 36 into the lower barrel 38 of the two superposed barrels. A lower auger or screw 40, or a pair of screws 40, 41 in the case when the lower barrel 30 is preferably provided with double bores, are deep flight screws in which the shaft or shafts 43, 44, taper convergingly toward the delivery end of the screws 40, 41 with the flights 45, 47 becoming successively larger so that there is a reduction of excessive deep blending or saturation of the dye in the periphery of the flights 45, 47 against the inner walls 49, 51 of the barrel 38.

Dual dye injection tips 54 and 56 are provided which extend into the barrel 38 and are disposed approximately two inches above the tops of the flights 45, 47 and are on the side of the outer revolving screws 40, 41, the injection tip 54 being located generally in the counterclockwise position of 1:30 to 2:00 o'clock, while the clockwise screw 40 has the associated injection tip located approximately 10:00 to 10:30 o'clock as can be seen in FIG. 3. The longitudinal position for both the tips 54 and 56 is to the rear area of the vacuum chamber 34 and in the pellet cascade from the screw or screws 14 theretofore. Each injection tip 54, 56 is used to inject one half the formula amount of dye.
required for the soap being processed. The dye injection may be by gravity feed, but preferably is by metered pressure feeding system which may be synchronized with the screw drive system for synchronized automatic stopping and starting.

In FIG. 4 there is shown a centering plate 70, which includes only one vertical strut 72 for supporting the centering ring 74 at the discharge end of the screw 40 for centering the barrel. The reason for this arrangement is to reduce any possible mixing and blending of the striated mixed soap as it passes thereby and into, as shown in FIGS. 1 and 5, a nozzle plate assembly 80 which includes a plate 82 on which two tapering conical nozzles 84, 86, whose inlet openings are approximately 2 1/4 to 3 times the diameter of the outlet diameter and whose length is at least equal to the bore of the barrel with which it is associated.

In FIG. 6 there is shown an arrangement in which a collar 90 is employed to which a conical stub nozzle assembly 92 is attached, the stub nozzles 94 being at its inlet opening the same diameter as the bores of the collar 90 which in turn are the same as the bores of the barrel. The outlet opening for discharge is approximately one-third of the inlet diameter for the nozzle plate assembly 92 and the length thereof may be from one-half the inlet diameter to the same as the inlet diameter.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the present invention may be employed without a corresponding use of other features.

I claim:

1. An apparatus for producing striated soap bars on a double barrel soap plodder comprising a first barrel and a second barrel arranged in superposed position, first auger means in said first barrel, means for feeding soap into said first barrel at one end of said first barrel, a compression plate assembly for forming soap pellets at the other end of said first barrel a vacuum chamber at said other end of said first barrel communicating with said second barrel, second auger means including a pair of counter rotating screws in said second barrel, a pair of dye injection tips for injecting dye into said vacuum chamber and nozzle means at the other end of said second barrel for discharging striated soap bars, one of said screws rotating in a clockwise direction, the other of said screws rotating in a counter clockwise direction, each of said dye tips being disposed outwardly of the centerline of one of said screws and on the climb side thereof, said injection tip associated with said clockwise rotating screw being located at a position corresponding to a clock position of about 10:00 to 10:30 o’clock, said injection tip associated with said counter clockwise rotating screw being located at a position corresponding to a clock position of about 1:30 to 2:00 o’clock.

2. An apparatus according to claim 1, wherein said nozzle means includes a nozzle plate having a dual outwardly tapering nozzles.

3. An apparatus according to claim 2, including a collar between second barrel and said nozzle plate.