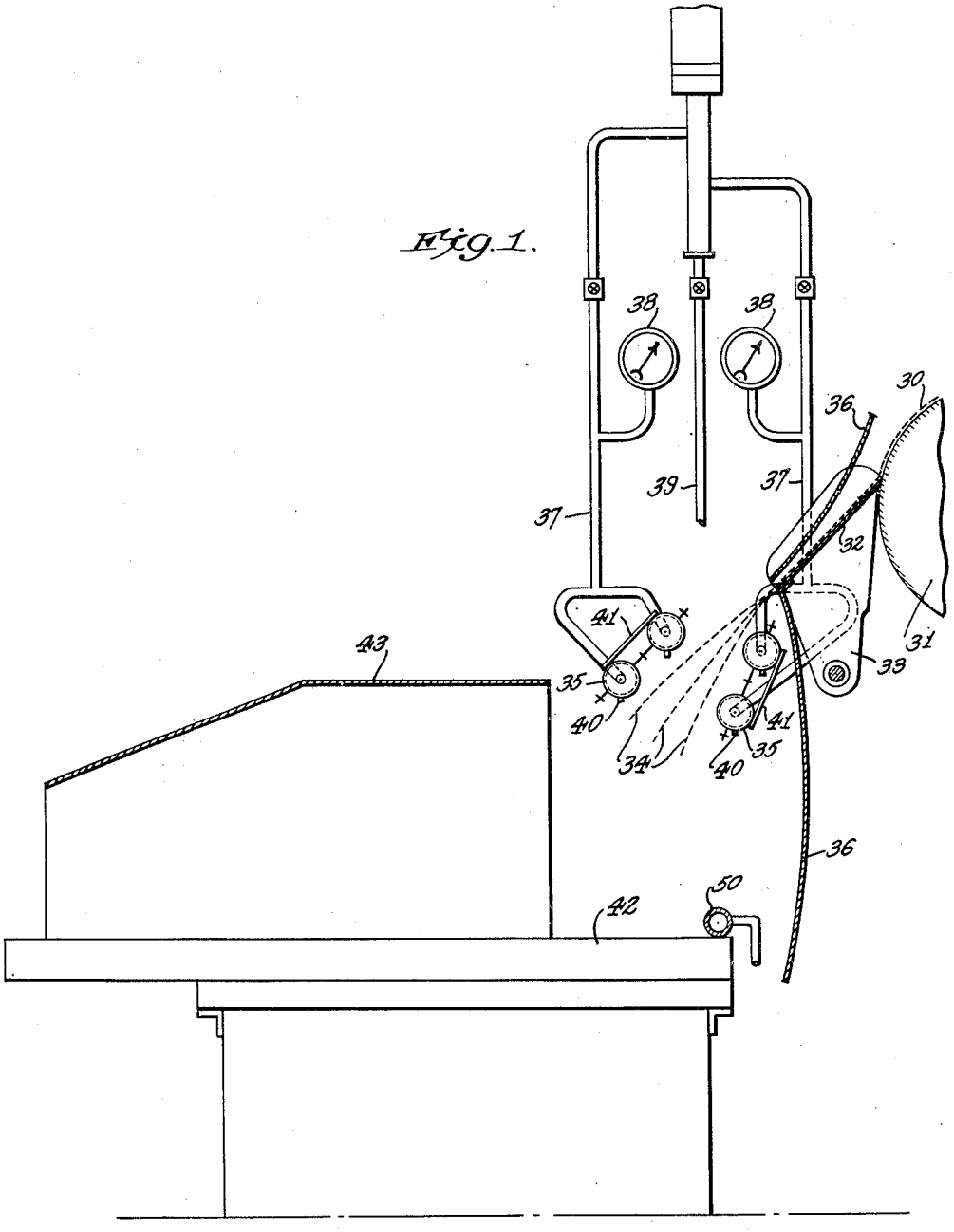
Dec. 6, 1949 T. PENNY 2,490,089

METHOD AND APPARATUS FOR TREATING SOAP PRODUCTS

Original Filed April 2, 1941 2 Sheets-Sheet 1

Fig. 1.



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Original Filed April 2, 1941 2 Sheets-Sheet 2

Fig. 2.

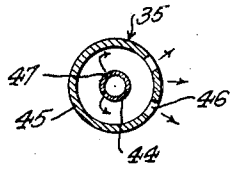
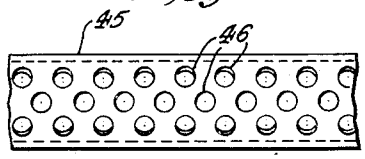


Fig. 3.



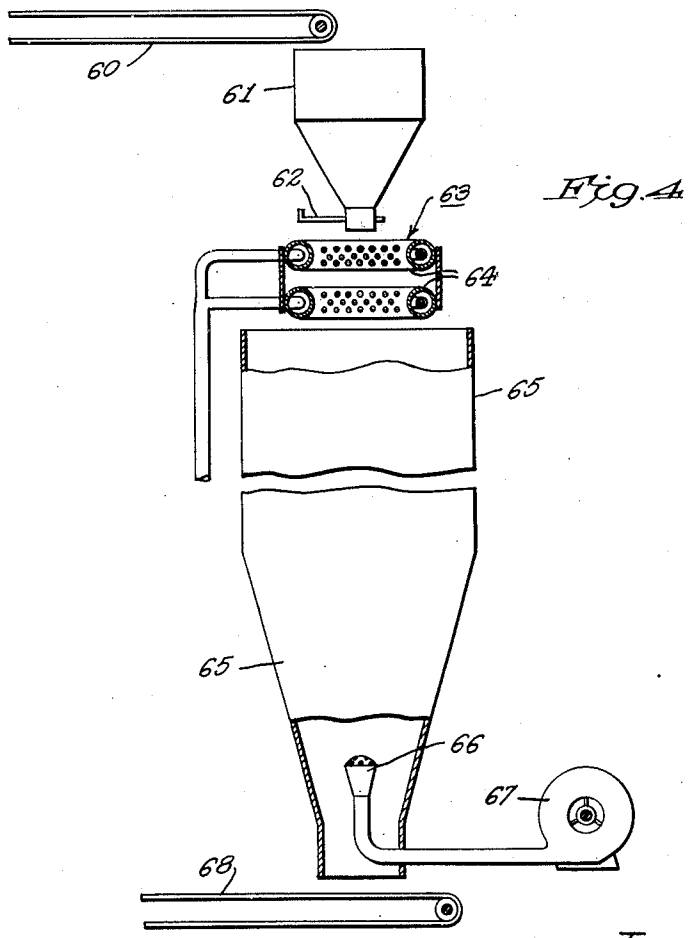


Fig. 4

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UNITED STATES PATENT OFFICE

2,490,089

METHOD AND APPARATUS FOR TREATING SOAP PRODUCTS

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Original application April 2, 1941, Serial No. 386,476, now Patent No. 2,391,919, dated January 1, 1946. Divided and this application May 4, 1945, Serial No. 591,865. In Great Britain April 29, 1940

7 Claims. (Cl. 252—367)

1

This invention relates to the manufacture of soap flakes and has for its object to improve the appearance of the flakes.

Soap flakes are commonly produced by passing partly dried soap in the form of chips or ribbons through a mill, one roller of which is equipped with a cutting device for dividing the thin sheet of soap as it leaves the mill into small flakes of a definite design. As a general rule the cutting device is so arranged that the sheet is only partly cut through, the final division into separate flakes being subsequently effected.

As a result mainly of the milling operation the flakes acquire a slight glossy surface and become more or less transparent. In order to enhance the gloss and transparency it is customary to pass the chips or ribbons through a preliminary mill before passing them through the finishing mill or to repeat the milling operation twice or even three times. Many other methods of improving the gloss and transparency have been proposed; for example, incorporating in the soap small quantities of sugar, glycerine, mineral oil or other substances.

It is an object of the present invention to provide a smiple method and apparatus for imparting to soap flakes a highly polished or glossy surface and a high degree of transparency.

The invention consists in a continuous method of enhancing the gloss and transparency of soap flakes, which comprises passing the flakes through a steaming zone in which they are exposed freely but briefly to the action of steam and then passing them through a drying zone in such manner that they are kept substantially separate from each other until their surface has become sufficiently dry to prevent them from sticking together when they are collected.

Preferably the flakes are allowed to fall through the steaming and drying zones.

The invention is applicable both to separate flakes and to flakes which, owing to the arrangement of the cutting device, still adhere along the lines cut or scored by the latter.

The invention also consists in apparatus suitable for carrying out the process according to the invention, comprising a steaming unit consisting of one or more pipes adapted and arranged to project steam onto the flakes, drying means adapted to supply drying air and means for collecting the treated flakes.

In order to ensure as far as possible that both sides of the flakes are polished it is necessary to blow steam onto both sides and this is preferably

2

done by passing the flakes between two oppositely arranged steam jets.

The degree of gloss and transparency is partly determined by the temperature of the steam and it is an advantage to maintain a high temperature in the steaming zone. Very good results have been obtained at temperatures therein of 90°–100° C.

The invention will now be described with reference to the accompanying diagrammatical drawings which illustrate by way of example one method and apparatus for polishing soap flakes according to the invention:

Fig. 1 is a diagrammatic view of apparatus which may be used for treating soap chips or flakes, in accordance with my invention;

Fig. 2 is a cross-sectional view of the steam pipes utilized in the apparatus shown in Fig. 1;

Fig. 3 is an enlarged view of the surface openings of the steam pipes shown in Fig. 2; and

Fig. 4 is a diagrammatic view of apparatus which may be used for treating soap chips or flakes, which is separate from the apparatus utilized in making the soap chips or flakes.

In the preferred mode of carrying out my invention, soap flakes may be caused to pass between opposing flows of hot steam, such as may be provided by steam jets in such a fashion that the steam contacts substantially the entire surface of the soap particle for a short period of time. In the case of soap flakes or chips, the soap may be permitted to fall between oppositely directed flows of steam, whereby both sides of the chips or flakes may be treated. After the steaming operation, it is desirable to dry the surface of the soap without material delay. This may be accomplished, for example, by passing the soap through a zone of drying air which, if desired, may be heated for more effective drying. If heated air is used, it is desirable to cool the soap after drying by means of a flow of cool air or by permitting the soap to cool naturally prior to wrapping or packaging.

Referring to Fig. 1, I have provided apparatus which is adapted for use with conventional apparatus for making soap flakes. In accordance with the usual operation of conventional apparatus of this type, a scored soap film 30 is removed from a roll 31 (partially cut away in the drawing) by means of a knife blade 32 mounted on a knife blade holder 33. The scored film so removed is at least partly broken up into chips which are permitted to fall as indicated by dash lines 34 between a plurality of steaming pipes 35, to be described more particularly hereinafter, which are disposed adjacent to the knife blade holder

33. If desired, baffles 36 may be provided for preventing steam emerging from the steaming pipes from being directed against the soap chip making apparatus.

The steaming pipes 35 are supplied with steam in any convenient manner, for example, by a plurality of conduits 37 provided with suitable control devices, such as gauges 38 and a drain pipe 39. Water taps 40 may be provided in the steaming pipes to remove any droplets of moisture which may accumulate therein. Each set of steaming pipes 35 may be provided with a plate 41 for preventing air from mixing with the steam by injector action.

The soap chips which have been permitted to fall between the steaming pipes 35 are met thereafter by a flow of air, which may be heated if desired, supplied by a pipe 50 connected to a suitable source of air under pressure (not shown in the drawing). The drying air so provided may be directed substantially at right angles to the normal path of the soap flakes to cause them to fall onto a collecting tray 42 at a distance, for example, of from 7 to 12 feet from the mill. This provides ample time for the drying air to dry the surface of the steamed flakes and prevents them from sticking together. If desired, a housing 43 may be provided for preventing scattering of the soap flakes and for directing them onto the collecting tray 42.

The steaming pipes 35 preferably are formed with in inner pipe member 44 situated centrally within an outer pipe member 45. The outer pipe member preferably is provided with a plurality of openings 46 disposed in three rows, as shown more particularly in Fig. 3. The inner pipe member preferably is perforated with a number of smaller holes 47 arranged slightly staggered, and is closed at one extremity. The arrangement of the pipe members is such that the holes 47 in the inner pipe member 44 direct the steam onto the wall of the outer pipe member 45 which is opposite to the three rows of openings 46 in the latter pipe, as indicated in Fig. 2. This type of steaming pipe is particularly desirable for obtaining a uniform flow of steam. It will be apparent that the size of the steaming pipes utilized is not critical. As a specific example, I have obtained desirable results with steaming pipes comprising an outer pipe member having an inside diameter of two inches, and an innnr pipe member having an inside diamter of one quarter inch.

Instead of polishing the flakes immediately after they leave the flake-making apparatus, this may be accomplished at some subsequent time, if desired. For example, the flakes may first be collected from the mill and thereafter treated in a separate polishing plant, such as is shown in Fig. 4. The soap flakes may be carried by means of a belt 60 to a hopper 61, from which the flakes may be released at a uniform rate of flow by means of a gate 62. The flakes released from the hopper 61 are permitted to fall through a steaming unit 63 similar to that described above, in connection with Fig. 1, and comprising a plurality of circular pipes 64 having inner and outer members, as described above in connection with Figs. 2 and 3.

After the flakes have passed through the steaming unit 63, they may be permitted to fall through a drying tower 65 wherein they are met with a counter-current of air which may be heated, if desired, and which, preferably, is introduced at the bottom of the tower through a nozzle 66 which is supplied with air in any convenient manner, for example, by means of a blower 67. The soap flakes, upon reaching the bottom of the tower 65, ordinarily will be sufficiently dry and cool, whereupon they may be collected in a convenient manner, for example, upon a conveyor belt 68.

In carrying out my invention, I prefer to utilize a steam pressure or quantity of steam just sufficient to cause the steam to emerge gently from the steam jets. This ordinarily provides a sufficient steaming action to bring about the desired surface modification of the soap products. It will be apparent to one skilled in the art, however, that this rate of flow is not critical and may be varied depending upon the extent of the surface modification desired, the efficiency of the steaming apparatus, the character of the soap product being treated, and other variables.

The temperature of the steam at the place of contact with the soap products also may be varied over a wide range. In general, a temperature in the neighborhood of 90 to 100° C. will produce desired results. Other temperatures may be utilized depending, for example, upon the characteristics of the soap being treated or upon the length of time during which the soap is in contact with the steam.

I have found that wet or dry steam, or steam mixed with air, may be employed in the steaming zone. In general, it is desirable to avoid the presence of visible droplets of moisture in the steam coming into contact with the surface of the soap, as these may spoil the evenness of the gloss.

For efficient operation, it is preferred to cause the soap products to pass rapidly through the steaming chamber, inasmuch as a very brief treatment suffices to produce a high gloss on the surface. A contact with the steam for about one second may be sufficient, although a somewhat longer treatment may be required. The time required to obtain desired results may be readily determined, and will depend upon the factors of operation, such as the temperature and rate of flow of the steam utilized.

It generally is more desirable to pass the soap product successively through the steaming and drying operation with the shortest practical interval of time between the two operations.

If heated air is utilized for drying the soap, it may be preferred to utilize a temperature, for example, of the order of 130 to 150° C. The temperature may be varied, as desired, to effect the requisite drying rate. After drying with heated air, it may be desirable subsequently to treat the soap with cool air to completely solidify and retain the resulting gloss on the surface of the product although in many instances, normal cooling will suffice. In general, a longer period of time is required for drying the soap than is required during the steaming operation.

After the soap flakes have been dried, as described above, the surface of the soap shows a high gloss or polish which greatly enhances the appearance of the soap product. The flakes may be collected and packaged without their sticking together and without impairing the gloss to any substantial extent.

In the case of soap flakes treated in accordance with my invention, I have found that in addition to the above described advantages, they acquire a pronounced curl. This is found to be an advantage because it tends to prevent clogging of the flakes when they are thrown into water.

This application is a division of my copending application, Serial No. 386,476, filed April 2, 1941,

which has resulted in U. S. Patent 2,391,919 issued January 1, 1946.

It will be apparent that my invention will be susceptible to modifications by one skilled in the art without departing from the scope thereof, and all such modifications are intended to be included within the scope of the following claims.

I claim:

1. A continuous method for enhancing the gloss and transparency of soap flakes, which comprises passing preformed solidified flakes of soap through a steaming zone in which they are freely exposed to the action of steam for not more than a few seconds and then passing them through a drying zone in such manner that they are kept substantially separate from one another until their surfaces have become sufficiently dry to prevent them from sticking together when they are collected.

2. A continuous method for enhancing the gloss and transparency of soap flakes, which comprises causing preformed solidified flakes of soap to fall successively through a steaming zone and then through a drying zone, the dimensions of the two zones being such that the flakes are in the steaming zone for not more than a few seconds and are in the drying zone for a sufficient time to dry them until they no longer stick together when they are collected.

3. Apparatus for improving the appearance of soap particles comprising a plurality of opposed steam jets, means for causing the soap particles to fall between said opposed steam jets, and means for providing a flow of drying air directed at an angle to the normal path of the soap particles subsequent to their passage between the steam jets.

4. Apparatus for imparting an enhanced gloss and transparency to soap flakes, comprising a steaming unit containing means to project a gentle current of steam onto both sides of a stream of soap flakes and a drying unit adjacent said steaming unit to receive and to project currents of drying air onto both sides of said stream of soap flakes after it has passed through said steaming unit.

5. Apparatus for imparting an enhanced gloss and transparency to soap flakes, comprising a tower, means to feed soap flakes to the top of said tower and to permit them to fall in a uniform stream down the interior thereof, and means to remove or permit the removal of soap flakes from the lower part of said tower, together with means intermediate said first and second means, for admission of steam to the top part of said tower to establish a steaming zone therein, said means comprising a set of steam emitting means opposing each other and spaced apart to permit the flakes to pass therebetween to be steamed thereby, and means to admit a current of air to the lower part of said tower and to withdraw it from the upper part thereof, so as to establish a drying zone in the lower part of said tower.

6. A process for improving the appearance of solidified soap flakes which comprises the steps of permitting the flakes to fall by gravity through a steaming zone while in suspension to subject the flakes to steaming on all sides to enhance the gloss and transparency of said flakes and thereafter passing the steamed flakes downwardly through an upwardly flowing current of drying air to dry said flakes on all sides.

7. Apparatus for improving the appearance of soap particles comprising steaming jets for directing a flow of steam against substantially the entire surface of soap particles falling therethrough, said steaming jets comprising an inner pipe member having a perforated portion, and an external pipe member enclosing said inner pipe member and having a perforated portion substantially diametrically opposite from the perforated portion of the inner pipe member, means for causing the soap particles to fall through said steam directing means, and means for directing a flow of drying air against said soap particles subsequent to their passage through the steam directing means.

THOMAS PENNY.

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The following references are of record in the file of this patent:

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1,484,271	Murdock	Feb. 19, 1924
1,942,418	Forte	Jan. 9, 1934
2,272,663	Grumann	Feb. 10, 1942
2,391,919	Penny	Jan. 1, 1946
2,423,452	Holuba	July 8, 1947

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Number	Country	Date
592	Great Britain	of 1863
26,133	Great Britain	of 1908

Certificate of Correction

Patent No. 2,490,089 December 6, 1949

THOMAS PENNY

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 1, line 26, for "smiple" read *simple*; column 3, line 51, for "innnr" read *inner*; column 6, line 14, for "thereafter" read *then*; line 15, after the word "flakes" insert *while still in suspension*; list of references cited, under the heading "UNITED STATES PATENTS" add the following—

2,142,982	Thurman	Jan. 3, 1939
2,249,675	Thurman	July 15, 1941
2,381,368	Ross	Aug. 7, 1945

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of April, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.