Jan. 9, 1934. H. P. FORTÉ 1,942,418

METHOD OF DRYING SOAP FLAKES

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Fig. 1.

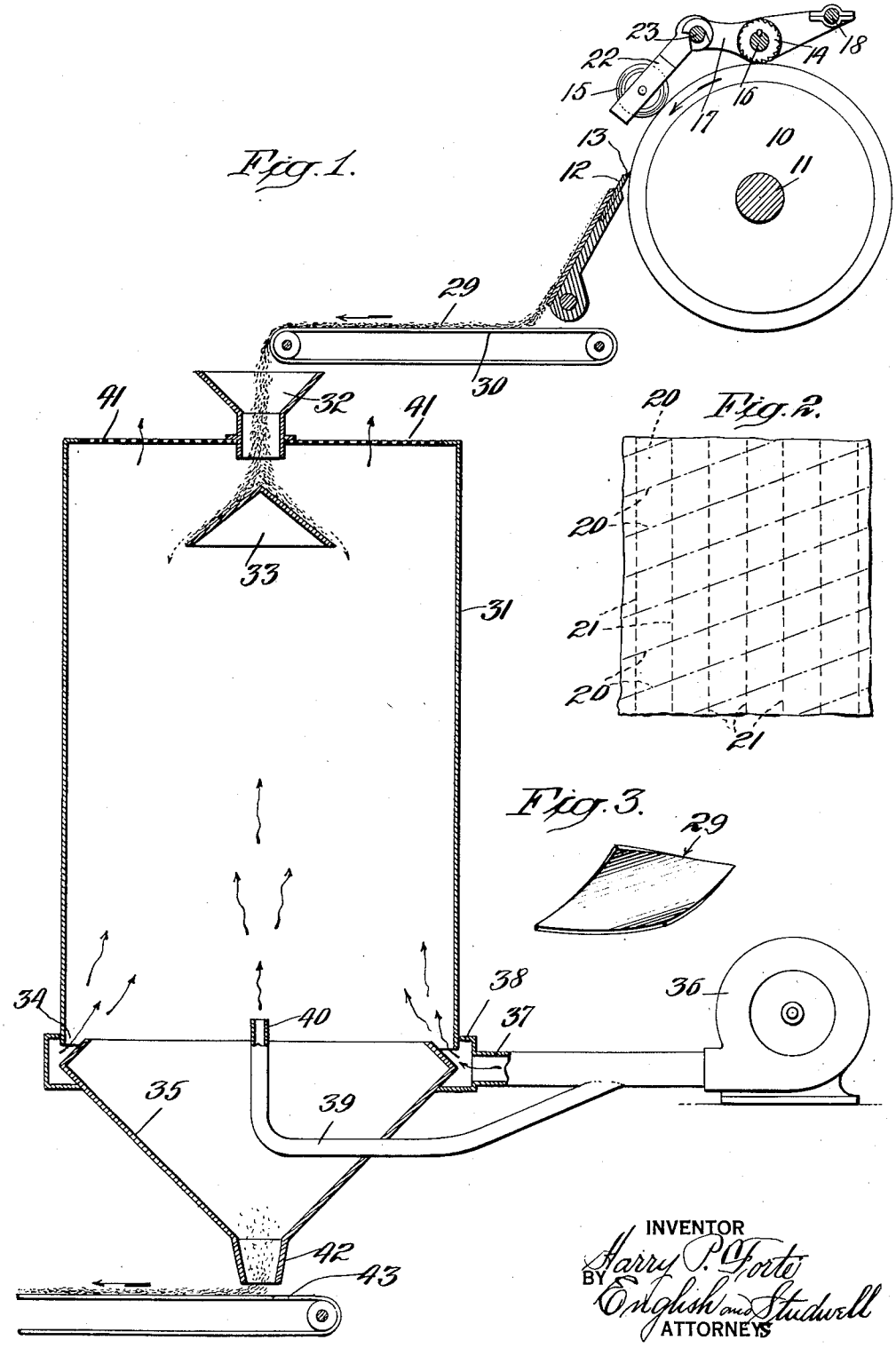


Fig. 2.

Fig. 3.

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METHOD OF DRYING SOAP FLAKES

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2 Claims. (Cl. 87—16)

This invention relates to a method of drying soap flakes.

Flaked soap made in accordance with processes generally known, is commonly sold in cartons which are automatically filled, weighed and sealed. The handling of the cartons and the vibration transmitted to them in transportation cause the flakes to become more or less broken up or reduced in size so that they pack together closely in the carton and reduce the bulk of the contents of the carton, with the result that when the purchaser opens a package, it presents the appearance of having been partially filled.

One of the objects of this invention is to eliminate, as far as practicable, the tendency of the soap flakes to break up or disintegrate while being handled preparatory to packaging, while being packed, and while in the cartons. In the past it has been proposed to curl or roll the flakes as they leave the flaking machine. While such flakes exhibit less tendency to stick together when thrown into water, and less tendency to settle or disintegrate while in the carton, they must, when the ordinary method of manufacture is employed, be made larger and thicker than is desirable, with a resultant loss in solubility.

The desideratum sought in the manufacture of soap flakes is a flake of as small a size and as thin as practicable consistent with the possession of the requisite strength to enable it to withstand the packaging and shipment processes without destruction. Thinness and reduction in size of the flake are important factors which aid immeasurably in increasing the solubility of it. A thin flake also possesses a degree of flexibility which enables it to withstand a reasonable amount of pressure in the carton without breaking. Therefore, since flakes made in accordance with this invention may be made smaller and thinner than those now in use, and yet possess an unusual degree of resistance to disintegration, the advantages of these flakes over those in general use will be apparent.

My invention contemplates the production of soap flakes of minimum size and thickness to attain the maximum degree of solubility and which are curled, curved or crinkled. These soap flakes possess the necessary strength and permanency of curvature to prevent them from being broken and compacted both while being handled preparatory to being packed, while being packaged and while in transit from manufacturer to consumer. A flake of this kind also has a lower specific gravity in the package than flakes of the kind manufactured at present, resulting in increased bulk. When a purchaser receives a carton of the flakes made in accordance with this invention, the opened package presents the appearance of being completely filled; the flakes are fluffy, are uniform in size, shape and appearance and are more soluble than those heretofore made.

These desired results are attained by a novel process employed in manufacturing the flakes, wherein the flakes are scraped from a roll to produce them in curved or distorted form and are then immediately subjected to the influence of a chilling medium, such as cool air, whereby the flakes are hardened or toughened and the curvature produced in the flakes by the cutting operation is maintained indefinitely.

In describing the flakes produced according to this invention, I herein refer to the same as curled, curved, distorted or arched. I wish these terms to comprehend also flakes having any irregular, wavy, crinkly or distorted faces or shapes which are primarily formed for the purpose of preventing the flakes from adhering together in such a manner as to prevent them from separating when thrown into water, and for preventing the flakes from closely compacting together in the package whereby a package of a given weight has a greater bulk.

In the accompanying drawing Fig. 1 diagrammatically illustrates a suggested apparatus for carrying out the improved method of manufacturing the flakes; Fig. 2 is a diagrammatic view of a portion of a sheet of soap cut transversely and longitudinally previous to its removal from the finishing roll; and Fig. 3 is a perspective view of the novel flake.

The flakes made in accordance with this invention may be cut or formed by the use of any well-known type of soap-flake making machine, a suggestion of one type being disclosed at the upper portion of Fig. 1. Here is shown a finishing roll 10, mounted on a shaft 11 that is journalled in the frame of the machine in the conventional manner well understood in this art. The roll 10 is driven in the direction of the arrow. Carried by the roll 10 is a sheet of soap which is scraped therefrom by the action of a scraper blade 12 arranged transversely of the roll 10, and held at an angle to the roll 10 with its upper curved scraping edge 13 set in close proximity to the finishing roll. All of these parts are of well-known construction, being described in detail in the United States patent to Cove, No. 1,481,417.

The sheet of soap on the finishing roll is cut prior to the scraping of the same from the roll so that when scraped from the roll, the curved flakes 29 result. The cutting of the soap sheet while it is on the roll is done by a spiral cutter 14 arranged to rest on the roll, and also by a number of disc cutters 15. Transverse cuts 20 are made in the soap sheet by the spiral cutter 14 mounted on a shaft 16 journalled at its opposite ends in arms 17 pivotally mounted on a rod 18 which is supported in any suitable manner on the machine frame. The longitudinal cuts 21 in the sheet of soap are formed by a gang of disc cutters 15, each of the cutters being mounted in a bracket 22, the gang of cutters being loosely carried upon a rod 23 connected with the lower ends of the arms 17.

The cutters do not entirely cut through the sheet of soap with the result that it reaches the scraper as a continuous sheet with the transverse and longitudinal cuts in it. The scraper blade 12 being provided with a concave surface 13, causes the flakes as cut to roll or curl up slightly in the form of an arc as they are scraped from the roll, the curved flake thus produced being shown at 29 in Fig. 3. The curved conformation of the flakes is regulated by the curvature of the scraper blade which may be altered according to the shape in which it is desired to produce the flakes.

By changing the shape of the edge of the scraping knife blade, flakes of corresponding shape result. The curve imparted to the flakes is preferably approximately from one-quarter to one-third of the arc of a circle. Crinkly and wavy flakes are easily produced by adjustment of the scraping knife relative to the face of the roll. Other apparatus may also, under certain conditions, be employed to produce these curved, arched, crinkled or otherwise distorted flakes.

The curved flakes 29, immediately upon being produced by the means herein described or by other means, are carried by a conveyor such as suggested at 30 or by some similar transporting means to a cooling tower 31.

The flakes when scraped from the roll 10 and received on the conveyor 30 are warm and soft, and in order that flakes deposited uppermost on the conveyor do not flatten the flakes that have been deposited below them, it is desirable to operate the conveyor at such speed as to quickly convey the flakes to the cooling tower. I have found that when the conveyor carries the deposited flakes to the tower in about thirty seconds time there is no appreciable flattening out of the lowermost flakes on the conveyor. The cooling tower shown preferably consists of a lengthy cylinder into which the flakes descend by gravity. The flakes in leaving the conveyor to descend through the tower become separated from one another and are uniformly cooled. A conical entrance opening 32 is provided in the top of the tower through which the flakes enter.

Located within the tower casing adjacent to the entrance opening 32 is a conical spreader 33 so that the flakes entering the tower are separated from one another and are fairly uniformly distributed. The flakes, in descending to the bottom of the tower by gravity, become cooled or chilled by contact with the cool air stream that is constantly maintained within the tower. In referring herein to the "cool" air in the tower, it is understood that such air is preferably maintained at ordinary room temperature, that is to say, at 85° to 90° F., or less, which is considerably less than the temperature of the soap when on the roll 10. The air stream which enters the tower is constantly changed in order to maintain an even or uniform temperature and is admitted to the base of the tower through the annular opening 34 located between the lower end of the tower casing and the outer face of the conical collector 35. A blower 36 furnishes the air stream which is directed through a pipe 37 to an annular casing 38 surrounding the lower end of the tower casing, from whence it passes upwardly into the tower through the annular space 34. A supplemental air stream may be directed through the branch pipe 39 which extends from the main air supply pipe 37 and passes through the collector 35, and has its end upwardly directed at 40 within the tower. The air directed upwardly through the tower, escapes through the screen 41 located at the upper end of the tower. The velocity of this upwardly directed air stream may be so controlled that it will appreciably delay the descent of the flakes within the tower, thus increasing the cooling time.

The cooled flakes reaching the bottom of the tower are received by the conical collector 35, which is provided with an outlet pipe 42 through which the flakes fall and are received upon a conveyor 43, which transports them to the packing room where they are packed in cartons or other receptacles.

It has been found that by carrying out the method of manufacture just described, wherein curved or distorted flakes are subjected to an immediate cooling or chilling operation directly after they have been made, that the outer surface of the curved flakes becomes hardened and that the curve or distortion initially produced in the flake by the cutting blade, will be retained in the flake indefinitely. It has also been found possible to make the curved or distorted flake smaller and thinner than heretofore which increases the resistance to breakage and insures greater solubility. A flake made as herein described may be of the approximate dimensions of one-quarter inch in length by .002 inch in thickness which is a distinct reduction in size over soap flakes as now sold, which measure approximately one-half inch in length by .0045 inch in thickness. Also, by subjecting the curved or distorted flakes to the cooling operation directly after their formation to harden or toughen them, a minimum amount of drying or evaporation of the inner portion of the flake occurs, so that the tendency to crumble, which is inherent in the ordinary dried flake, is obviated. Soap flakes thus treated, that is, cooled quickly after formation to provide a hardened or toughened outer surface, are not only sufficiently rigid to indefinitely preserve their curved or distorted shape, but are sufficiently tough and resilient to withstand normal handling without undue breakage. At the same time flakes thus produced have been found to possess the proper degree of solubility.

What I claim is:—

1. The process of treating soft curved soap flakes to indefinitely retain the curvature initially imparted in them to maintain the volume of packaged flakes, consisting of quickly conveying the soft curved soap flakes to a cooling chamber for precipitation therethrough, introducing the flakes centrally of the upper end of the cooling chamber, individually separating the soap flakes at the point of entrance to the cooling chamber and dispersing them laterally of the entrance, and then retarding precipitation of the flakes in their travel through the chamber by a

counter-current flow of cool air admitted to the chamber centrally and peripherally thereof whereby the flakes when discharged at the lower end of the cooling chamber will be sufficiently solidified to retain the curvature initially imparted in them and the packaged flakes remain substantially unaltered in individual shape and aggregate volume over a period of time.

2. The process of treating soft curved soap flakes to indefinitely retain the curvature initially imparted in them and to maintain the volume of packaged flakes, consisting of receiving the curved soap flakes upon a conveyor which rapidly carries them to a cooling tower through which air of a temperature of 85° to 90° Fahrenheit is centrally and peripherally introduced for passage therethrough, introducing the said flakes centrally of the upper end of the cooling tower, individually separating the curved flakes at their entrance to the cooling tower and dispersing them laterally of the entrance and precipitously passing the soap flakes through the tower in a direction counter to the flow of cool air through the tower and in such separated state to cool them and cause them to indefinitely retain the curvature initially imparted in them when discharged from the cooling tower whereby the packaged flakes do not materially alter in individual shape and aggregate volume over a period of time.

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