

UNITED STATES PATENT OFFICE

JOHN SCHWARTZ, OF PELHAM STREET, MILE END, NEW TOWN, ENGLAND.

IMPROVEMENT IN PROCESSES FOR CLARIFYING SUGAR.

Specification forming part of Letters Patent No. **189,504**, dated April 10, 1877; application filed December 12, 1876.

To all whom it may concern:

Be it known that I, JOHN SCHWARTZ, of Pelham Street, Mile End, New Town, in the county of Middlesex, England, have invented certain Improvements in the Manufacture of Sugar, of which the following is a specification:

This invention relates to the treatment of sugar, both in the raw state, and after it has been boiled in the vacuum-pans, by a clarifying process which will cause less waste in the production of the crystals than is now commonly experienced.

My invention is based on the fact that in proportion as the temperature of the water or sugar-liquor used in the centrifugal machine for liquoring the sugar is reduced, so will the tendency of the crystals to dissolve during the clarifying process be diminished.

As raw sugars contain a certain proportion of coloring matter, salts, and uncrystallizable sugar, I propose to subject raw sugar to the following treatment, in order to remove all such matters therefrom prior to the sugar being melted in the refinery.

Thus I use an ordinary centrifugal machine, with the simple addition of a movable inner drum or cylinder, which will form, with the perforated copper drum of the machine, an annular chamber for the reception of the sugar to be clarified, which sugar is to be placed in the annular chamber in a powdered or crushed condition. The machine, when charged with the raw sugar, is to be set rotating, and when the necessary speed is attained for insuring the adherence of the sugar to the perforated copper drum, I remove the inner circular drum, and liquor the dry sugar with a spray of water, or of refined sugar-liquor, reduced to a temperature of 32° Fahrenheit, or as near the freezing-point as possible, by the means described under the second head of the invention. This liquoring operation I continue (keeping the machine in action) until the coloring matters are washed out of the sugar.

Having described my mode of dealing with raw sugars so as to cleanse them from their impurities prior to melting them in the refinery, or to fit them for use for domestic or household purposes, without subjecting them

to any other process of refining, I now proceed to describe my plan of dealing with sugar as it leaves the vacuum-pan or other evaporating-pan in a concrete state, before undergoing the process of drying in the centrifugal machine.

The sugar, when sufficiently boiled, is discharged into a suitable vessel, and from thence into centrifugal machines, in the ordinary manner. When the sirup has been partially or wholly driven out by the centrifugal action, I apply to the face of the sugar, while in motion, a spray of water or liquor at a temperature as near freezing-point as possible, taking care that the water be brought into close contact with the sugar, so as not to be heated by coming in contact with the surrounding atmosphere. Of various modes of proceeding I prefer the following plan: I place a ton of block-ice in a tank carefully felted, and about ten feet above the machine-floor, and add from time to time as much water through a perforated pipe (to spread it over the surface of the ice) as will be found requisite to supplement the water due to the melting of the ice. The iced water I convey, through pipes carefully felted, to the machine, wherein is fixed a vertical pipe finely perforated on the side facing the sugar that is revolving in the centrifugal machine; or I use a finely-perforated rose at the end of an india-rubber pipe, to be held by the attendant close to the sugar while in motion.

The duration of the process will vary according to the material under operation, and the water being in either case perfectly under the control of the attendant, he will only have to turn a tap on and off. I find a ton of ice daily yields sufficient iced water to liquor a daily out-turn of one hundred tons of sugar even in the summer-time.

If sugar-liquor be used in preference to water, it will be most conveniently cooled down to the required temperature of 32° Fahrenheit, or thereabout, by being passed through copper coils embedded in ice or surrounded by iced water.

Hitherto it has been found that however carefully the sugar, after leaving the centrifugal machine, was spread out in the cooling-floors or sugar-bins, it was impossible to suffi-

ciently cool it to prevent its loss of bloom, and its becoming darker in color, which result from the packing of the sugar while hot in casks or bags. I claim for my invention the advantage of reducing the temperature of the sugar, while in the centrifugal machine, to that of the atmosphere, and even below it, during the summer months, thus insuring its retaining its bloom and not deteriorating in value.

In the manufacture of loaf-sugar, instead of liquoring the loaves of sugar, in the usual way, with fine liquor of suitable density, I find that by first reducing the temperature of the fine liquor to as nearly 32° Fahrenheit as possible, a very much less percentage of sugar is dissolved out of the sugar-molds, and hence results in a greater weight of loaf-sugar than that usually obtained, the crystals being as effectually cleansed, but not melted by this new liquoring process.

With the view of expediting the process, I connect the nozzles of the molds with a vac-

uum-pump, and thereby facilitate the passage of the cold sugar-liquor through the sugar in the molds. The fine liquor may easily be reduced to 32° Fahrenheit, or thereabout, by passing it through a series of copper pipes embedded in ice immediately before being used for the liquoring process.

Having now set forth the nature of my invention, and the manner of carrying it into effect, I wish it to be understood that I claim—

The process of clarifying raw and refined sugar, which consists in submitting it to the action of a spray of water or sugar-liquor reduced to a temperature of 32° Fahrenheit, or thereabout, the same being evenly diffused through the sugar mass by centrifugal force, substantially as and for the purpose specified.

Dated this 23d day of November, 1876.

JOHN SCHWARTZ.

Witnesses:

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