

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THE MANUFACTURE OF SOAP.

Specification forming part of Letters Patent No. 158,720, dated January 12, 1875; application filed November 28, 1874.

To all whom it may concern:

Be it known that I, CHARLES LEHMANN, of the city, county, and State of New York, have invented a certain new and useful Improvement in the Manufacture of Soap, of which the following is a specification:

This invention consists in heating tallow or grease with a suitable quantity of rosin in a separate vessel, and adding to this mass, while the same is hot, caustic lye of from 30° to 36° Baumé, at a temperature of 212°, so that, by the chemical reaction, the heat is increased, and a perfect saponification takes place in a short time, and without entailing any waste of lye.

In the usual process of making soap a quantity of fat mixed with rosin at different proportions is put in a kettle; then caustic-soda lye, of the strength of 15° to 20° Baumé, is added; then the mixture is boiled until saponification takes place, and finally an additional quantity of soda-lye is added, so as to raise the boiling mass to the required strength. By this process a large surplus of water is mixed with the soap, and strong salt-lye is added for the purpose of effecting a separation of the water from the soap. The water thus separated contains a quantity of caustic lye, whereby its strength becomes of the same grade as that of the soap floating on the liquid; and, furthermore, the water also contains the salt-lye, the glycerine, and other ingredients, which previously had been chemically combined with the fat, but which at this stage of the process form parts of the waste or mother lye. After leaving the mass at rest for several hours this mother-lye is drawn off and thrown away; then a fresh quantity of caustic-soda lye, of from 12° to 14° Baumé, is added to the soap-stock in the kettle; the mass is again boiled; a fresh quantity of salt-lye is added; the mass is permitted to rest; then the mother-lye is drawn off and again thrown away. One full day at least is needed for each of these operations, and it requires five days in succession till the soap is finished. After that the soap has to rest in the kettle, for cooling and settling the so-called "nigré." For cooling, three or four days are required; then the soap is taken out of the kettle and mixed with various ingredients, such as sal-soda or silicate of

soda; then the soap is put in frames, in which it stands for six to eight days, until it is hardened and ready for cutting. The time required for the whole operation averages seventeen days. During this time steam or fire is required for six days, and, furthermore, a large quantity of caustic soda and all the salt required in the separation are lost.

By the process which I have invented not only much time is saved, but the waste of soda-lye is avoided.

I charge the kettle with a quantity of tallow or grease, and add thereto a quantity of rosin, according to the desired quality of the product; then I heat, either by means of steam or by a direct fire, until the mass is entirely dissolved. If a direct fire is used, a quantity of water must be added to the grease. After the mass has been melted it is allowed to settle, while it is kept as hot as possible.

The caustic-soda lye which I use is of the strength of from 30° to 36° Baumé. This strong lye is heated to the boiling-point in a separate kettle, and then a certain quantity of the fat and the rosin, prepared as above stated, is mixed with a corresponding quantity of the boiling lye in a third vessel, and in a few minutes a chemical reaction will commence, whereby the heat of the mixture still further increases, and a perfect saponification takes place at once. The soap is now ready to be mixed with sal-soda, silicate of soda, or other suitable ingredients, the same as long boiled soap.

By this process the saponification is more intensive and more accurate than it is when the fat and a weak lye are boiled together, because the heat, in consequence of the chemical reaction, rises rapidly above 212°; and, furthermore, no soda-lye is lost or wasted in my process, no salt-lye is requisite to effect any separation of water from the soap, and it requires no particular skill to effect the saponification.

In the manufacture of boiled soap with weak lye it is necessary to employ practical men, and even they fail sometimes to effect a correct saponification, and it sometimes happens that the soap is spoiled; and, since the result can only be examined after the soap is cold enough to be cut, it happens frequently

that the whole mass of soap must be boiled over at a considerable loss of time, labor, and fuel.

By my process a correct saponification is insured, and the time for manufacturing soap is shortened more than one-half, and a manufacturer who has the facilities to manufacture twenty thousand pounds of soap by the old process can produce sixty thousand pounds by my process in half the time, with less expenditure, and with a great saving in wages.

In my process the fat, on being heated in a separate vessel, is freed from impurities, which latter settle down, together with the water which is added to the fat, when the kettle is exposed to the direct action of the fire, or which results from the condensation of the steam, in case such is used for heating; and, as the refined fat free from water is mixed with the strong heated lye in a separate ves-

sel, the heat produced by the chemical combination of the fat and the alkali promotes the saponification, and no further heating is required to remove any surplus water.

What I claim as new, and desire to secure by Letters Patent, is—

The within-described process of manufacturing soap by melting the fat in a separate vessel, then heating a strong lye of from 30° to 36° Baumé to the boiling-point in another vessel, and mixing the molten fat and the boiling lye in a third vessel, whereby a perfect saponification is effected without any waste of lye, substantially in the manner set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

CHARLES LEHMANN.

Witnesses:

J. VAN SANTVOORD,
W. HAUFF.