

UNITED STATES PATENT OFFICE.

FRANCIS M. PLEINS, OF DUBUQUE, IOWA.

IMPROVEMENT IN THE MANUFACTURE OF SOAP.

Specification forming part of Letters Patent No. **140,789**, dated July 15, 1873; application filed June 19, 1873.

To all whom it may concern:

Be it known that I, FRANCIS M. PLEINS, of Dubuque, county of Dubuque and State of Iowa, have invented a new and original Process of Manufacturing Hard Soap in one Charge, and without using muriate of soda, wherein rosin, in combination with fat, is used, and the rosin dissolved and partly or wholly saponified with carbonate of soda, retaining the glycerine in it, and thereby not only getting a better yield, but also a better and more economical article, which, on account of its glycerine, is better adapted for the skin and chapped hands. The specification also describes three original proportions of mixtures, used by the inventor to crutch in the soap when framing it, to more fully perfect the same.

The main feature in this process is the overcoming of the difficulty to combine strong soda lyes with fats, on account of the glycerine contained in the latter, to accomplish which I commence this process with dissolving carbonate of soda in the following proportions, to wit:

By using soda-ash of fifty-four per cent. I take—

400 lbs. ash to 2,000 lbs. rosin and 6,000 lbs. fat.
375 " " 3,000 " " 5,000 "
325 " " 4,000 " " 4,000 "
300 " " 4,500 " " 4,000 "

and dissolve the respective amount of soda-ash in water to about 20° Baumé; when dissolved, I add to every one hundred pounds of ash one pound of chloride of lime; let the whole boil up well and then settle. After settling, the clear colorless solution is run into the soap-kettle, and the respective amount of rosin dissolved therein by dry steam. Using sal soda, which I prefer, in connection with sixty-two per cent. caustic soda, instead of soda-ash, I reckon two and a half pounds of the same to one pound of fifty-four per cent. soda-ash, throw the required quantity in the soap-kettle, and add one-half pound of water to one pound of sal soda, and let on dry steam and dissolve the rosin, as mentioned above. When, in either case, all is dissolved, add to this solution—which, technically speaking, forms the bridge by which the strong soda lyes are united with the fats—the respective amount of fat,

and dissolve this also; and then add at once to every pound of fat, and yet unsaponified rosin, caustic-soda lye of such strength that one pound thereof saponifies one pound of fat, to wit:

By using 76 pc. caustic 1 lb. of 20° B. to 1 lb. fat.
" 70 " " 22 "
" 62 " " 25 "

To explain further, the entire strength necessary to saponify and make into soap the first proportion—of rosin, two thousand pounds, and fat, six thousand pounds—would be as follows: Whereas, one pound of fifty-four per cent. soda-ash, or two and a half pounds sal soda, saponify five pounds rosin, the four hundred pounds of soda-ash or one thousand pounds sal soda used in that proportion will suffice for that amount of rosin, two thousand pounds; and only six thousand pounds caustic lye of the required and above indicated strength had to be added to saponify the whole, but it is safer to retain about four hundred or five hundred pounds of that lye, and add it gradually by finishing the soap. When the mass of lye and stock is all in the kettle, the whole is brought to boiling by dry steam—partly wet steam can be used, if the lye is concentrated and the soap open enough—and finished on its proper strength in the usual way, and then left in the kettle to settle and cool off till ready for the frames.

When framing, I run the soap from the kettle through a zinc strainer with little holes punched in it, and which retains all impurities, and then commence and fill up the required number of frames alike, to three-fourths or four-fifths full, as the case may be, so as to have the soap of an even temperature; then I add to eight hundred pounds of soap, according to price, and to make it harder, uniform, and compact, and more economical in use, the following respective mixtures:

First proportion—

90 pounds fat,
50 pounds caustic lye, same strength as used in kettle, and
70 pounds 36° Baumé solution of one-third sulphate of soda and two-third of sal soda—

—
210 pounds.

Second proportion—

90 pounds fat,
50 pounds silex,
55 pounds caustic lye, as above, and
100 pounds 36° Baumé solution, as above—

—
295 pounds.

Third proportion—

60 pounds fat,
125 pounds silex,
40 pounds caustic lye, as above, and
130 pounds 36° Baumé solution—

—
355 pounds.

To work to advantage in mixing the soap I arrange as follows: The same time when finishing the soap I dissolve in one kettle the necessary quantity of sulphate of soda—one-third—and of sal soda—two-thirds—to 36° Baumé density, and then cover. In another kettle I dissolve the necessary quantity of fat, and cover; to the necessary quantity of caustic lye I add to every forty pounds of it one and one-half pound of starch, stir it well and let it soak. When ready to use the mixing in the soap, I make mixture for three, four, or five frames at a time, as the case may require, and according to size of mixing-kettle, as follows: Measure off the quantity of fat and pour in mixing-kettle, which is so arranged that it can be heated by dry steam, when necessary; then mix first the quantity of 36° Baumé solution of sulphate and sal soda with the required quantity of caustic-soda lye and starch, to

thin it, and then strain the whole under steady stirring into the fat, and as soon as all is in and well mixed add, under steady crutching, to the soap in the frames the exact quantity above mentioned. After a little while the soap becomes of a thick pasty consistency, and of a very glossy smooth appearance, and the crutching is to be continued till the soap becomes cold enough to let it stand.

In mixing the second and third proportions the mixing procedure is the same, with this exception, that only part of the 36° Baumé solution of sulphate and sal soda is used to thin down the caustic lye and starch, and the other part to mix with the silex, which is in every case added after the caustic lye and starch are mixed with the fat.

In every instance the offal of a previous batch of soap has to be added to the rosin and dissolved with it before adding the caustic lye.

I claim as my invention—

1. The process of making hard soap in which rosin enters as a material in one charge, and without using muriate of soda, and commencing my process with dissolving and partly or wholly saponifying the rosin with carbonate of soda, and retaining the glycerine in it.

2. The compounding of three mixtures used in the soap to improve the same, substantially as described.

FRANCIS M. PLEINS.

Witnesses:

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