

UNITED STATES PATENT OFFICE.

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MANUFACTURE OF SOAP AND EXTRACTIVE MATTER FROM COTTON-SEED OIL, &c.

SPECIFICATION forming part of Letters Patent No. 290,079, dated December 11, 1883.

Application filed October 5, 1883. (No specimens.)

To all whom it may concern:

Be it known that I, JAMES LONGMORE, of Liverpool, in the county of Lancaster and Kingdom of England, have invented certain
5 new and useful Improvements in the Manufacture of Soap and Extractive Matter from Cotton-Seed Oil, &c., of which the following is a specification.

Cotton-seed oil has a dark pigment or coloring-matter which unfits it for soap or colorless-oil making, and in the refining of cotton-seed oil a very large quantity of mucilage, consisting of this coloring-matter, some of the other-
10 wise best portions of the oil, water, mucilaginous matter, and alkali, is discarded, and either used for making vegetable stearine or adulterated soap.

In my invention set forth in Patent Specification No. 284,313, dated September 4, 1883,
20 I described a method of utilizing this mucilage by extracting nearly all the coloring-matter by means of caustic soda, and forming soap of the oil. My present invention is for a modification of that process—namely, the use of
25 caustic to take out the bulk of the coloring-matter, and a bleaching process to extract, oxidize, or decompose the remaining portion. I also found that the bleaching process was
30 equally valuable for bleaching crude cotton-seed oil and the fatty acids extracted from partially-decolorized cotton-seed oil, soap, or mucilage.

I will now proceed to describe my invention as applied to cotton-seed-oil mucilage, it being understood that the process herein described for the black oil of the mucilage will
35 also apply to crude cotton-seed oil.

Mucilage usually consists of partly-saponified oil, a dark coloring-matter, a large amount
40 of water, and in many cases a considerable amount of mucilaginous matter. Now, when it contains none of this latter, it can be treated at once as in my former patent; but the amount of water in it increases the quantity of caustic
45 required to such an extent that I find it cheaper to boil the material with acid and skim off the black oil as it forms, and thus get rid of the water and the mucilaginous matters, if present. I do this, therefore. This oil, thus obtained,
50 can now be saponified and separated by caustic, the colored lye run off, and the operation repeated several times, as described in my

former patent. I prefer, however, either after the first operation of this kind, when the soap is in the closed state, or even during the first
55 operation at the closed stage, to introduce and thoroughly mix with boiling a quantity—say from fifteen to twenty-five per cent., by weight—of some inert finely-powdered earth, such as carbonate of lime. When the caustic is run
60 into the mixture, the solid soap seems to form round the granules of this powder and to be almost incapable of holding any of the coloring-matter, and the lye can be filtered off in a filter-press with constant stirring till the pow-
65 dery soap and chalk is nearly pure. If this chalk process be repeated a second time, or my old process without chalk be carried through one operation and chalk used in the second, the color will be found to have almost
70 or quite disappeared. The chalky soap can now be treated with sulphuric or hydrochloric acid and the fatty acids removed; or if the soap be still colored, as will be the case if a
75 single operation only has been practiced, and the fatty acids be required to be very pure, an oxidizing agent—such as bleaching-powder or peroxide of manganese—can be stirred up and
80 boiled well with the soap and then acid applied, when the material will, after the reaction is finished, be found to be fully bleached.

There are other oxidizing agents that will act as well as bleaching-powder or peroxide of manganese. The other hypochlorites are not
85 convenient for the purpose; but most other salts of the alkalies which, by the addition of hydrochloric or sulphuric acid, will liberate one or more atoms of chlorine or oxygen will answer. The alkaline earth salts will not do
90 for obtaining soap, but only for obtaining fatty acids, as their bases combine with the fatty acids and have to be separated by using a mineral acid after. This step in the process of adding peroxide of manganese or
95 bleaching-powder to the oil or soap and acidifying is also applicable to crude oil, or to oil made from soap partially purified by one or more operations with caustic, as described in my former specification, with or without the use of chalk or like powder.
100

By an alternative process the soap of the mixture of soap and chalk can be liquidated by a large addition of chlorine-water. This at the same time bleaches the soap and frees

it from chalk, which falls down as a powder, and can be filtered out and used in a succeeding batch of soap. This plan of using chlorine-water is also applicable for soap that has been made by a single operation of my causticising process, or from crude oil, or for the fatty acids of these soaps, and if the chlorine-water be put in rather highly charged and at a considerable pressure in a closed vessel the operation is more completely successful.

In fact my present invention consists, essentially, in partially purifying the oil or soap by causticising with excess of caustic soda, as described in my former specification, with or without the use of chalk, and thus saving the coloring-matter, and then, if not sufficiently pure, bleaching by the addition to it or the liberation in it of chlorine or oxygen, so as to decompose the remaining coloring-matter, this bleaching being effected by forming the gas in the soap, fatty acids, or oil by adding an oxidizing agent and boiling with hydrochloric or sulphuric acid, or by adding chlorine-water or oxygen-water, or even the oxygen of the air, especially under pressure with continued agitation until bleaching is effected.

There are many oxygenating compounds which will also act without acids, but these are mostly too expensive; and I find in practice chlorine-water, or if fatty acids instead of soap be desired, then bleaching-powder or peroxide of manganese and one of the mineral acids above mentioned, to be the best, as being cheapest. If the peroxide of manganese be used, it is well to add five to ten per cent., by weight, of it, although theoretically more than sufficient, and then separate the lye, when the excess of the manganese will separate with the lye, and the remainder will generally be found sufficient on the addition of acid and boiling to bleach the fatty acids that then form from the soap. Some highly oxygenated compounds—as, for instance, the alkaline bichromates and permanganate—will part with some of their oxygen, and thus destroy the residual coloring-matter without the use of acid, just as chlorine-water will; but these salts are expensive, and are apt to leave their own traces in the soap, so they are not to be recommended, save in very exceptional cases. If, however, an absolutely pure oil or fatty acid be required, the use of bichromate and subsequent boiling with mineral acid is to be recommended, as the mineral acid takes away every trace of chrome.

In using the oxygen of the air, its weak action necessitates long blowing through the mixture in a heated state, or the exposure of the soap in thin shavings, or in the liquid or curdy state in thin streams in hot metallic troughs, and this requires considerable plant or labor, so that in practice I prefer the more strictly chemical modifications of the process above described.

I claim as my invention—

1. The improvement in the manufacture of

soap from cotton-seed-oil mucilage or dark-colored cotton-seed oil, which consists in separating the major part of the coloring-matter by saponifying with excess of caustic, as set forth in my former specification, (Patent No. 284,313,) and then destroying the remaining coloring-matter by means of oxygen or chlorine, substantially as described.

2. The improvement in the treatment of cotton-seed oil or mucilage, which consists in saponifying, adding finely-divided inert powder—such as chalk—thoroughly incorporating it with the soap, separating with caustic lye, and mechanically separating the lye, substantially as described.

3. The improvement in the treatment of dark-colored cotton-seed oil or mucilage, which consists in saponifying, separating the soap with caustic, withdrawing the colored lye, closing the soap, adding powdered chalk, thoroughly incorporating the two by boiling, separating with lye, and filtering, substantially as described.

4. The improvement in the process of manufacturing light-colored soap from the black oil or mucilage of cotton-seed, which consists in saponifying, intimately mixing inert powder with the closed soap, opening the soap with lye, withdrawing the lye, liquefying the soap with water, and filtering out the powder.

5. The improvement in the manufacture of light-colored oil from black cotton-seed oil or mucilage, which consists in saponifying, thoroughly incorporating finely-divided chalk with the soap in a closed state, opening with caustic, withdrawing the lye, and treating the soap and chalk with hydrochloric or sulphuric acid.

6. The improvement in the process of destroying the cotton-seed-oil coloring-matter in cotton-seed oil or other soap or fatty acid, which consists in incorporating with the material colored with said matter finely-pulverized peroxide of manganese and treating with hydrochloric or sulphuric acid, whereby free oxygen or chlorine is liberated in the mass and destroys the coloring-matter.

7. The improvement in the process of destroying the cotton-seed-oil coloring-matter in oil or soap, which consists in agitating with chlorine-water, substantially as described.

8. The improvement in the process of destroying the cotton-seed-oil coloring-matter in partially-purified fatty acid, oil, or soap, which consists in exposing the same in a heated state to contact with free oxygen until bleaching be effected, substantially as described.

9. The improvement in the process of getting rid of the coloring-matter of cotton-seed oil or mucilage, which consists in extracting the major part by saponifying with excess of caustic and bleaching the residual matter, substantially as described.

10. The improvement in the process of obtaining pure fatty acid from cotton-seed-oil-colored soap, which consists in adding an al-

kaline bichromate and treating with mineral acid, substantially as described.

11. The improvement in the process of making valuable products from cotton-seed-oil mucilage, or from black oil obtained therefrom, which consists in saponifying, agitating the closed soap with finely-powdered chalk, separating with caustic, withdrawing the lye by filtration, adding finely-powdered bleaching-powder, thoroughly incorporating the mixture by agitation, adding sulphuric or hydrochloric acid, skimming off the fatty acid, and saponifying to form soap.

12. The improvement in the process of making soap from cotton-seed-oil mucilage, or from black oil obtained therefrom, which consists in saponifying with excess of caustic, filtering out the black lye, treating the soap in a closed state with chlorine-water, and separating the soap.

13. The process of manufacturing valuable products from cotton-seed-oil mucilage, which consists in acidifying with mineral acid and skimming off the black oil, saponifying this black oil, boiling it with chalk, separating the soap and chalk with excess of caustic lye, withdrawing the lye for extraction of the coloring-matter, destroying the cotton-seed-oil coloring-matter in the remaining products by means of a bleaching agent, and at the same time separating the chalk therefrom, substantially as described.

14. The improvement in the process of purifying cotton-seed oil, fatty acid, or soap, which consists in treating it with chlorine-water, substantially as described.

15. The improvement in destroying the coloring-matter in dark-colored cotton-seed oil, cotton-seed-oil soap, or cotton-seed-oil fatty acids, which consists in the liberation of free oxygen or chlorine in the mass, by which means the coloring-matter is oxidized, substantially as described.

16. The improvement in destroying the coloring-matter in dark-colored cotton-seed-oil soap or fatty acid, which consists in adding to it an oxidizing agent, (highly oxygenated body,) and treating with sulphuric acid or hydrochloric acid, substantially as described.

17. The improvement in purifying cotton-seed oil from which the black pigment or dye has not yet been partially or wholly extracted, which consists in exposing it to the action of an oxidizing bleaching agent or agents till the dark coloring-matter remaining in it has become oxidized and the color has disappeared, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES LONGMORE.

Witnesses:

W. P. THOMPSON,
C. SOUTHALL.