

UNITED STATES PATENT OFFICE.

JOHN HOPKINSON, OF BRADFORD, ENGLAND.

PROCESS OF REFINING DISTILLED GREASE.

SPECIFICATION forming part of Letters Patent No. 645,623, dated March 20, 1900.

Application filed August 17, 1898. Serial No. 688,795. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN HOPKINSON, a subject of the Queen of Great Britain, residing at Bradford, in the county of York, England, have invented certain new and useful Improvements in the Treatment of Distilled Grease, of which the following is a specification.

This invention is applicable to greases obtained by distilling oleaginous matters with superheated steam. In the distillation of these greases the material is split up chemically and the distillate is found to consist of oleic and stearic acids (and sometimes other acids, depending on the matter distilled) dissolved in or combined with matters consisting entirely of carbon and hydrogen and which I will hereinafter call the "residual products." It has hitherto been found impracticable to separate the fatty acids from the residual products, as they distil substantially at the same temperature, and if the acids be saponified the residual products dissolve in the soap and spoil it.

Now this invention is designed to separate the residual products from the fatty acids and obtain both in a salable form. I find that if the saponifiable matters in the grease be saponified with a slight excess of caustic alkali the resulting soap is soluble in dilute alcohol, while the residual products are not. These latter therefore separate and rise to the surface on the whole being allowed to stand. The separation is not, however, complete; but if another light hydrocarbon insoluble in dilute alcohol—such, for instance, as benzol—be added this greatly assists the heavier residual products to rise and separate from the soap solution. If, however, the benzol be added at first, a much larger amount of benzol is required to be added than when as much of the residual products as will easily separate without it are separated first. In the last instance all the benzol can be used for diluting the small residual quantity of hydrocarbon. Consequently much less is required than if the benzol be added with the alcohol.

In carrying out my invention I take distilled grease—that is, the grease which is distilled over and condensed when animal or vegetable oils or greases are distilled (see

Campbell Morfit's book, published by Parry & McMillan, of Philadelphia, in 1856, page 485, *et sequitur*)—and saponify the saponifiable matters in it by a slight excess of a solution of caustic alkali and add to it about three and a half times its bulk of ethyl or methyl alcohol or methylated spirits, (which is a combination of the two largely used in England,) and I allow the mixture to stand. The alcohol is added, as combined with the water of the saponified mass it will dissolve the soap, but will not dissolve the residual products. A large proportion of the residual products consequently rise, being lighter than the solution of soap, and they are now skimmed off, as by so doing less benzol is required in the next step of the process than if they were allowed to stand, and consequently allowed to dilute the benzol. When the hydrocarbon oil ceases to rise freely and what has risen has been skimmed off, coal-tar benzol or other light hydrocarbon solvent is added a little at a time and agitated with the soap. By thus agitating it with the soap the remaining residual products which are mechanically mixed with the soap in a state of fine division or emulsion are enabled to combine with it, and the benzol, being exceedingly light, assists in buoying up the residual products to the surface. These residual products and the benzol in solution are next skimmed off and further benzol added with agitation and again skimmed off and the process continued until all the residual products have been removed from the soap. The soap is now freed from the spirits by distillation and is ready for finishing in ordinary course. In practice benzol to about one-fourth of the bulk of the impure soap operated upon is used. The solution of residual products is also freed from the benzol or other light hydrocarbon by distillation and is a valuable machinery-oil; the light distillate being used again for separating further residual products in the first part of the process. Instead, however, of finishing the soap as above mentioned I may, if desirable, acidify it with an excess of mineral or organic acid in the manner well known, and thus obtain a mixture of stearic and oleic acid and a solution of the soda salt of the mineral or organic acid which was added. The mixture of stearic or oleic acid, which is

much lighter than the salt solution, and consequently floats on the top, is in such case skimmed off, is crystallized in bulk, and is submitted to hydraulic pressure to separate
5 the solid stearic acid from the liquid oleic acid. The latter is known in commerce as "olein." The solid stearic acid is now ready for the manufacture of candles, and the olein can be used for lubricating wool or for making
10 soap or for any other purposes for which it is now applied.

I declare that what I claim is—

1. The treatment of distilled grease containing unsaponifiable matter which consists
15 in treating them with a solution of caustic alkali and ethyl or methyl alcohol, skimming off the residual products which rise and adding a little at a time with agitation to the remainder a solution of light hydrocarbon such
20 as coal-tar benzol insoluble in methyl or ethyl alcohol and distilling each solution separately, substantially as described.

2. The process of obtaining soap from distilled or other grease containing unsaponifiable
25 matter which consists in fully saponifying with caustic alkali adding methyl or ethyl

alcohol whereby the residual products become insoluble in the soap and separating the residual products substantially as described, distilling off the spirits and finishing the soap. 30

3. The process of separating residual products from distilled grease which consists in fully saponifying the saponifiable matter in the grease, dissolving the same in methyl or ethyl alcohol whereby the greater portion of
35 the residual products separate and float on the surface and can be skimmed off and separating the remainder of the residual products by adding a light hydrocarbon such as benzol insoluble in dilute spirits a little at a time
40 with agitation and skimming off, and separating the light residual products from the heavier ones by distillation whereby they can be used again in the first operation.

In witness whereof I have hereunto signed
45 my name, this 3d day of August, 1898, in the presence of two subscribing witnesses.

JOHN HOPKINSON.

Witnesses:

WILLIAM SERNTON,
DAN COATES.