

# UNITED STATES PATENT OFFICE.

ALBERT DOMEIER AND OTTO CHRISTIAN HAGEMANN, OF LONDON, ENGLAND; ASSIGNORS TO JAMES S. KIRK & CO., OF CHICAGO, ILLINOIS.

## PROCESS OF RECOVERING GLYCERINE AND SALT FROM SPENT SOAP-LYE.

SPECIFICATION forming part of Letters Patent No. 453,829, dated June 9, 1891.

Application filed September 26, 1890. Serial No. 366,257. (No specimens.) Patented in France April 24, 1889, No. 197,713.

### *To all whom it may concern:*

Be it known that we, ALBERT DOMEIER, merchant, and OTTO CHRISTIAN HAGEMANN, chemical engineer, both subjects of the Queen of Great Britain, and residing at London, England, have invented certain new and useful Improvements in Recovering Glycerine and Salt from Spent Soap-Lye, of which the following is a specification.

The object of this invention is to provide an improved process for removing the impurities from spent soap-lye to facilitate the recovery of crude glycerine and salt therefrom. If the spent lye contains an appreciable quantity of alkali worth recovering, we prefer, first, to make use of such alkali in manner prescribed in Letters Patent of the United States No. 385,105, dated June 20, 1888. Whether this preliminary step has been taken or not, we next proceed as follows: We take the lye into a convenient tank or similar receptacle, and there neutralize any free alkali by means of a suitable acid, such as hydrochloric or sulphuric acid. We next add to it a small proportion of a suitable metallic oxide or hydroxide—such as that of iron or baryta—capable of decomposing soapy matters and combining with the fats therein contained to form insoluble metallic soaps. The proportion of such oxide varies with the character of the spent lye under treatment, and should always be sufficient or just a little in excess of the quantity required to combine with all the fatty matters contained in the lye. For instance, we have found from eight to fourteen pounds of hydrated oxide of iron sufficient for one ton of spent lye. The proper proportion of the oxide may be added to the lye first, and the acid to neutralize the lye afterward, if so preferred, and additional quantities of acid added from time to time to neutralize the alkali set free by the oxides, as more fully stated below. We next thoroughly mix or agitate the oxide with the neutralized lye. This can be effected by mechanical agitation, or by preference by blowing air through it. We maintain this agitation constantly or accomplish it at frequent intervals during the time necessary to complete the reaction, which may be quickened by heating the liquor

to 70° or 80° centigrade. As the process proceeds the liquor becomes alkaline by reason of the decomposition of the soapy matters by the metallic oxide and consequent setting free of the alkali which they contained. From time to time this alkalinity is corrected and the liquor brought back to the neutral state by the addition of a small quantity of acid. Finally, when after some time the liquor is found to maintain its neutral condition, the process is finished. The agitation is then stopped, the precipitate, consisting for the most part of metallic soaps and albuminous matters, is allowed to subside and the liquor decanted or filtered therefrom. We next concentrate the clear liquor by boiling to a temperature of about 150° centigrade, thus producing crude glycerine fit for distillation without further treatment, and salt which crystallizes during the concentration and which can be washed and made available for use again in the arts.

In order that the process may be fully understood, we will recapitulate the various steps where chemical reactions occur.

First, by neutralizing the lye albuminous matters are precipitated; second, by adding a suitable metallic oxide with agitation and correcting the alkalinity of the liquor from time to time by the addition of acid the soapy matters are decomposed and the fatty acids therein combine with the metallic oxides, the alkali set free forming, with the acid, salt, which is recovered in the subsequent concentration. It will thus be seen that the crude glycerine and salt are extracted from the lye and that the salts produced by the union of the chemicals employed are also recovered.

The process is particularly well adapted to small soap factories, as no expensive lead-lined tanks or the like are required and the purifying operation can be conducted entirely in one vessel.

We do not confine ourselves to the metallic oxides or earthy metallic oxide mentioned; but any suitable metallic or earthy metallic oxide or hydroxide is regarded by us as their equivalent.

We claim—

1. In the recovery of glycerine and salt from

spent soap-lye, the improvement which consists in neutralizing the free alkali in the lye with acid and treating it with a suitable metallic oxide or hydroxide capable of decomposing soapy matters.

2. In the recovery of glycerine and salt from spent soap-lye, the improvement which consists in neutralizing the free alkali in the lye with acid and decomposing the soapy matters therein by treatment with suitable oxides or hydroxides, adding acid to neutralize the alkali thus set free, and separating the clear liquor from the precipitate.

3. In the recovery of glycerine and salt from

spent soap-lye, the improvement which consists in neutralizing the free alkali in the lye with acid, decomposing the soapy matters therein by treatment with a suitable oxide or hydroxide, adding acid to neutralize the alkali thus set free, and finally separating and concentrating the clear liquor.

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Witnesses:

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