Patented Sept. 8, 1931

1,822,108

UNITED STATES PATENT OFFICE

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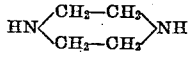
STABILIZATION OF COMPOUNDS CONTAINING A FATTY ACID RADICAL

No Drawing. Application filed August 7, 1928. Serial No. 298,135.

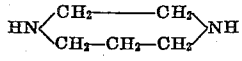
This invention relates to improvements in the stabilization of compounds containing a fatty acid radical such as fatty acids and fatty acid derivatives, e. g. soaps and animal and vegetable oils, which are liable to undergo oxidation and become rancid under the influence of air and light.

According to the present invention there is incorporated with the fatty acid or fatty acid derivative a small amount of a stabilizing material which imparts thereto increased stability and resistance to oxidation and rancidity. The stabilizing agents which are added, according to the present invention, are cyclic compounds containing two nitrogen atoms in the cyclic nucleus, such as piperazine and other dialkylene diimines. Derivatives of such compounds may be used, and are included within the scope of this invention. These stabilizers impart to compounds containing a fatty acid radical improved resistance to oxidation and rancidity even though present in small amounts.

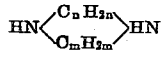
Piperazine has the formula



Another name for this compound is diethylene diimine. Other compounds belonging to the dialkylene diimine series are dimethylene diimine and dipropylene diimine. Ethylene propylene diimine having the formula



also belongs to this series. These materials have the general formula



where n and m may or may not be equal.

The stabilizing ingredient may be added to the fatty acid or fatty acid derivative directly or where the stabilizing ingredient is crystalline it may first be dissolved in a suitable solvent and added to the material to be stabilized in solution. The solvent may later be volatilized and thus removed from the material where this is desirable. The stabilizing ingredient may be added in the form of the anhydrous base, the hydrated base or as a salt in combination with an acid, such as benzoic acid, stearic acid or oleic acid.

The amount of the stabilizing material which it is necessary to add is small. In general a fraction of a per cent, such as .1% or .2% will suffice.

For example, one-tenth of one per cent of piperazine was added to olive oil, and the oil stabilized in this manner was found to be more resistant to oxidation and less liable to become rancid than oil to which no stabilizer had been added.

Cotton oil and corn oil, etc., can be similarly stabilized with a small amount of piperazine.

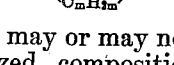
If piperazine is brought into reaction with stearic acid and the stearate formed is added to soap stock, for example, olive oil stock or cotton oil stock, in such an amount that the final product contains .1% or .2% of piperazine, soap made from this stock will be more resistant to oxidation and less liable to become rancid than soap made from similar stock not so stabilized.

Instead of adding the stabilizer to the animal or vegetable oil which constitutes the soap stock, it may be added to the soap formed by saponifying this stock.

I claim:

1. A stabilized composition comprising chiefly a compound containing a fatty acid radical and a small amount of a compound of the group comprising dialkylene diimines and derivatives thereof.

2. A stabilized fatty acid compound which comprises a fatty acid or predominating amount of a fatty acid derivative and a small amount of a compound having the formula



where n and m may or may not be equal.

3. A stabilized composition comprising chiefly a compound containing a fatty acid radical and a cyclic organic chemical containing two nitrogen atoms in the cyclic nucleus.

4. A stabilized fatty acid compound comprising a fatty acid or predominating amount of a fatty acid derivative and a small amount

of a compound from the group consisting of piperazine and derivatives thereof.

5. A composition comprising chiefly a chemical compound containing a fatty acid radical and a compound of the group consisting of dialkylenediimines and salts of dialkylenediimines.

6. A soap containing a small amount of a compound from the group comprising dialkylene diimines and derivatives thereof.

7. A soap containing piperazine.

8. A soap containing a small amount of a compound from the group comprising piperazine and salts thereof.

9. An animal or vegetable oil containing a small amount of a compound from the group comprising dialkylene diimines or derivatives thereof.

10. A vegetable oil containing a fraction of a per cent of piperazine.

11. A composition comprising a chemical compound containing a predominating amount of a fatty acid radical and a small amount of piperazine.

12. An animal oil or fat containing a fraction of a percent of piperazine.

In testimony whereof I affix my signature.

PAUL I. MURRILL.

Certificate of Correction

Patent No. 1,822,108. Granted September 8, 1931, to

PAUL I. MURRILL

It is hereby certified that error appears in the printed specification of the above-numbered patent requiring correction as follows: Page 1, strike out the formula between lines 39 and 40 and insert instead

$$HN\left\langle \begin{matrix} CnH_2n \\ CmH_2m \end{matrix} \right\rangle NH;$$

same page, line 87, claim 2, strike out "fatty acid or" and line 88, before "derivative" insert *or fatty acid;* line 99, claim 4, strike out "fatty acid or" and line 100, before "derivative" insert *or fatty acid;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of October, A. D. 1931.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.