Patented Dec. 2, 1941 2,264,999

UNITED STATES PATENT OFFICE

2,264,999

MANUFACTURE OF LUBRICANTS

John M. Musselman, South Euclid, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio, a corporation of Ohio

No Drawing. Application July 15, 1939, Serial No. 284,714

4 Claims. (Cl. 252—34)

It has been proposed already to improve the resistance of mineral lubricating oils against deterioration, by adding certain amines. While in the main productive of advantageous results, a difficulty arises in that under some circumstances of usage which is quite drastic, particularly by high temperature exposure, such products do not last as long as is desirable. I have found however that particularly durable lubricants may be prepared, capable of standing up under various drastic usage conditions, and being particularly effective in inhibiting ring-sticking or inhibiting sticking of piston rings and accessory oil in internal combustion engines.

To the accomplishment of the foregoing and related ends, the invention, then comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

Taking an oil as a desired base, as, for instance a mineral oil the viscosity of which may be as desired, I incorporate therewith one or more compounds of detail more particularly referred to hereinafter. Thus, a petroleum stock for example of viscosity of 47 to 200 Saybolt Universal at 210° F. may be employed, and with this incorporated a small amount of a ring-containing amine compound of a carboxylic acid which is of at least ten carbon atoms or a naphthenic acid. Illustrative of such amines are dicyclohexylamine, diphenylamine, hexamethylene tetramine, and the acids are such acids as stearic, palmitic, lauric, naphthenic, etc. Representative of such compounds are dicyclohexylamine stearate, dicyclohexylamine naphthenate, diphenylamine naphthenate, diphenylamine stearate, diphenylamine laurate, hexamethylene tetramine naphthenate, hexamethylene tetramine laurate, hexamethylene tetramine stearate, etc. These compounds are made by reacting the acid and base at moderate temperatures, as for instance 200° F., in a solvent or alone, and it is desirable to employ molecular proportions, variations therefrom resulting in corresponding dilution. The said compounds are applied in quite minor proportion in the composition with the oil, in general it being unnecessary to exceed one per cent thereof in the total composition, and proportions as low as 0.01 per cent may be employed, depending somewhat upon the oil and the particular use in view. The reaction products of the amines with these acids are soluble in mineral oil, and being of generally rather high boiling points are capable of maintaining stable mixtures.

As an example: With a Midcontinent lubricating stock having a viscosity of 300 Saybolt Universal at 100° F., there is incorporated 0.25 per cent of dicyclohexylamine stearate.

As another example: With a similar lubricating stock there is incorporated 0.25 per cent of dicyclohexylamine naphthenate.

As another example: With a similar lubricating stock there is incorporated 0.25 per cent of diphenylamine naphthenate.

As another example: With a similar lubricating stock there is incorporated 0.25 per cent of hexamethylene tetramine naphthenate.

This application is a continuation, in part and to as to common subject matter, of my application Ser. No. 105,747, filed Oct. 15, 1936.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A lubricant comprising a mineral oil with lubricating viscosity and a small amount of a salt of a ring-containing amine compound from the group consisting of dicyclohexylamine, diphenylamine and hexamethylene tetramine and a carboxylic acid from the group consisting of fatty acids of at least ten carbon atoms and naphthenic acid.

2. A lubricant comprising a mineral oil with lubricating viscosity and a small amount of dicyclohexylamine stearate.

3. A lubricant comprising a mineral oil with lubricating viscosity and a small amount of diphenylamine naphthenate.

4. A lubricant comprising a mineral oil with lubricating viscosity and a small amount of hexamethylene tetramine naphthenate.

JOHN M. MUSSELMAN.