Patented Nov. 29, 1932 1,888,974

UNITED STATES PATENT OFFICE

ARMAN E. BECKER, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO STANDARD OIL DEVELOPMENT COMPANY, A CORPORATION OF DELAWARE

LUBRICATING COMPOSITION CONTAINING SULPHONATES

No Drawing. Application filed July 18, 1927. Serial No. 206,798.

This invention relates to improvements in oil compositions adapted for lubrication and other purposes. In a preferred form of the invention, a petroleum lubricating oil is compounded with small amounts of soaps of fatty acids and of oil soluble sulfonic acids derived from mineral oil.

A principal object of my invention is to provide a lubricant having essentially the oil-film-maintaining properties of soap-oil compositions, such as are described in my United States Patent No. 1,628,646, granted May 17, 1927, together with a high degree of "penetration power". By virtue of this latter property, the improved compositions may be used with special advantage on bearings to which the lubricant is fed by a capillary device, such as a wick. The compositions are adapted for many other uses, some of which are referred to below.

Following is a preferred lubricant for wick-fed marine engine bearings or railroad car wheel boxes:

	Per cent by weight
Petroleum lubricating oil, viscosity 465–475 sec. Saybolt at 100° F.	98.33
Alkali metal oleate	0.17
Oil soluble alkali metal sulphonate derived from mineral oil	1.50
	100.00

Sodium oleate and sodium sulphonate are preferred.

This composition contains less than 0.2% of moisture, is fluid at room temperature, and has a slightly higher viscosity than the petroleum lubricating oil used. The increase of the penetration power is indicated by the larger amount of oil fed in the wick test during a certain number of hours. With a lubricant containing 99.83% petroleum lubricating oil (viscosity 470 sec. Saybolt at 100° F.) and 0.17% sodium oleate, 22 cubic centimeters of lubricant were fed per hour in a 16 hours' test at room temperature, while with the lubricant of the above example, containing 98.33% of the lubricating oil, 0.17% sodium oleate and 1.50% sodium sulphonate derived from mineral oil, 168 cubic centimeters were fed per hour under the same test conditions.

Instead of sodium oleate, other alkali metal salts of fatty acids may be used, for example, sodium or potassium stearate or palmitate, or mixtures of these or similar salts. The amount of this type of soap may be varied, but should not in general be less than 0.1% nor more than 0.5% by weight of the composition. Alkaline earth metal soaps such as calcium oleate, are also suitable, especially for gear box lubricants and the like. A typical composition of this type is as follows:

	Per cent by weight
Petroleum lubricating oil, viscosity 500–600 sec. Saybolt at 100° F.	91.5
Calcium oleate	1.5
Oil soluble sodium sulphonate derived from mineral oil	7.0
	100.0

This composition has a moisture content of less than 0.2 per cent and is fluid at room temperature. The viscosities are: 599 (Saybolt at 100° F.) for the straight lubricating oil, 749 for the composition; and the corresponding cold test figures are: 5 and 9 respectively.

The alkali metal sulphonates are preferably made by neutralizing sulphonic acids in petroleum oil which has been treated with fuming sulphuric acid. By a well known method, the sulphonates are extracted from the oil by alcohol, or the like, and are then separated from the solvent. They are readily soluble in petroleum oil and are known as oil soluble sulphonates derived from mineral oil in contradistinction to water soluble sulphonates derived from mineral oil by a different method.

From about 1.0% to 5.0% by weight of alkali metal sulfonates derived from mineral oil is usually suitable for use in compositions containing about 0.1 to 0.5% of alkali metal soap of fatty acids.

The lubricating oil base for my composition will be selected in accordance with the type of machine on which it is to be used.

Wide variation in viscosity is permissible, for example, between about 75 seconds to 600 seconds or more Saybolt at 100° F. When the compositions are to be used in steam cylinder lubrication or the like, a cylinder oil of high viscosity may be used as a base.

When a substantially colorless product is desired, a highly purified petroleum lubricating oil (liquid petrolatum or white oil) may be compounded with soaps of the type described.

A preferred way of making the composition is to dissolve the soap in the oil while it is heated to above 250° F., but below the boiling point of the oil. In general, the finished composition will be a liquid having a slightly higher viscosity than the oil used as a base.

The formulas and uses of the improved composition as given above are merely illustrative, and various modifications may be made within the scope of the appended claims, in which it is my intention to claim all novelty inherent in the invention as broadly as the prior art permits.

In the appended claims, "alkali" is meant to cover alkali or alkaline earth metals, and "sulphonate" is means to cover oil soluble sulphonates derived from mineral oil.

I claim:

1. A lubricant comprising over 90% of a petroleum lubricating oil, an alkali soap of a fatty acid and an oil soluble alkali metal sulphonate derived from mineral oil.

2. A lubricant comprising over 90% of a petroleum lubricating oil, an alkali metal soap of a fatty acid and an oil soluble alkali metal sulphonate derived from mineral oil.

3. A lubricant comprising over 90% of a petroleum white oil containing an alkali soap of a fatty acid and an oil soluble alkali metal sulphonate derived from mineral oil.

4. A lubricant comprising a petroleum lubricating oil containing about 0.1% to 0.5% by weight of an alkali metal soap of a fatty acid and about 1.0% to 5.0% by weight of an oil soluble alkali metal sulphonate derived from mineral oil.

5. A lubricant comprising over 90% of a petroleum lubricating oil containing a small amount of sodium oleate and of an oil soluble sodium sulphonate derived from mineral oil.

6. A lubricating composition consisting essentially of over 90% of a heavy petroleum lubricating oil and small amounts of an alkali oleate and of an oil soluble alkali metal sulphonate derived from mineral oil.

7. A lubricant comprising a petroleum lubricating oil having a viscosity of about 75 to 600 seconds Saybolt at 100° F., and containing a small amount of an oil soluble alkali metal soap of a fatty acid and of an oil soluble alkali metal sulphonate derived from mineral oil.

8. A lubricant comprising a petroleum lubricating oil containing about 0.17% by weight of sodium oleate and about 1.5% by weight of an oil soluble sodium sulphonate derived from mineral oil.

9. A lubricating oil composition comprising over 90% of petroleum lubricating oil, an alkali metal soap of a fatty acid and an oil-soluble alkali metal sulphonate derived from the fuming acid treatment of petroleum oil.

10. A lubricating oil composition comprising over 90% of petroleum lubricating oil and an alkali metal soap of a fatty acid, containing an oil soluble alkali metal sulphonate derived from mineral oil to increase the penetration power of the composition.

ARMAN E. BECKER.