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LUBRICANT.

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Our invention relates to oils and semi-grease products for general lubricating purposes and particularly for the lubrication of internal combustion engines and motors.

The object of our invention is to produce lubricants which shall be comparatively thin and free-flowing at normal temperatures, which shall have greater lubricating values at all temperatures than ordinary lubricants, and which particularly shall retain their lubricating values at high temperatures to a greater degree than is common to lubricants now in use.

Lubricating oils in common use for general purposes (except for some special purposes, such as steam cylinder oils, marine engine oils, etc.) and particularly for internal combustion engines and motors, are, generally speaking, straight or blended hydrocarbon (petroleum) oils, as distinguished from compound oils, (petroleum oils compounded with animal or vegetable oils, fatty acids or soaps). Such lubricants made from Pennsylvania or paraffine base oils, are rather thin at normal temperatures, cease flowing at temperatures from 20° to 40° F., but resist to a certain degree, the tendency of all lubricants to lose lubrication values at high temperatures. Such lubricants made from midcontinent or other asphalt base crude oils, are thicker at normal temperatures, cease flowing at temperatures from 0° to 10° F., but lose lubrication values rapidly and disastrously at high temperatures, such as the temperatures developed in the operation of internal combustion engines or motors.

For certain lubricating requirements it has been customary to thicken petroleum oils by compounding them with metallic oleates and fixing the compound with a small percentage of fatty acid. The products thus produced are quite "stringy", very viscid at ordinary temperatures, have a marked tendency to become thinner with age and are commonly known as castor machine oils. They are undesirable for general lubrication and are used almost exclusively for the lubrication of farm machinery.

Our present invention aims to produce a class of lubricants which may be termed "compound oils" since they contain materials other than petroleum hydrocarbons, but which are distinguished from petroleum and ordinary compound oils, in that they have better values for general lubrication, and particularly for the lubrication of internal combustion engines. They have a more stable body than castor machine oils with no "string" and a more unctuous, oily body than straight hydrocarbon oils; are comparatively thin at normal temperatures, remain fluid at temperatures of 5° to 10° F., and resist the loss of lubrication values at high temperatures to a degree hitherto unknown in internal combustion engine lubricants, which attributes, combined in one lubricant, are features of novelty and an advantage in lubricants for the purposes described.

The lubricants which we have invented and which we term for convenience our "thin-thick" series of lubricants, consist of petroleum oils, compounded with a metallic soap, such as aluminum oleate, a fatty acid such as red oil, or a fat such as corn oil, and a small percentage of another soap, in addition to the metallic soap. This additional soap, which is employed in very small quantities, may be a soap derived from corn oil, or any other vegetable oil or fat, or from lard oil, or any other animal oil or fat, or any fatty substance or material capable of forming soap with any of the alkalies, ar alkaline earths, or their oxides or salts, such as soda or calcium oxide, or with any of the metals, their oxides or salts, such as lead or zinc; or with any of the organic bases such as aniline; whether made by the dry method, or the wet method by transposition.

The additional soap acts to control the viscosity of the lubricant and a very slight increase or decrease in the quantity of this soap will have a marked effect in changing the viscosity of the product on account of the small proportion in which the additional soap is used. The quantity of the additional soap may be increased or decreased to change the viscosity of the product at will without materially changing the percentage composition of the product.

Our experiments have shown that soaps of a wide range of composition are suitable for our purpose and we wish to be understood as claiming broadly, the use of any soap which

will control the action of the thickening soap and add to the lubricant the properties described herein.

One of the soaps we have found very satisfactory for our present purpose is a lime soap made from about 69% of corn oil, 10% caustic soda and 21% lime chloride, (53% pure) the resulting turnout being about 70% by weight of the total ingredients. Before this product is taken from the kettle, it is mixed with about 1½ times its weight of petroleum oil, so that it is more easily handled in subsequent use and contains 40% of soap.

Before we take the oleate out of the kettle, we also mix it with about 1½ times its weight of petroleum oil, for the same reason.

The following are examples of several compositions prepared according to our invention for lubricants of different grades. The lime soap is varied slightly to produce the desired viscosity.

No. 1—Medium automobile oil.

Saybolt viscosity 90°–100° at 210° F.

90.80%—200° viscosity Pennsylvania neutral.
8.00%—40% aluminum oleate.
.20%—40% lime soap.
1.00%—red oil.

100.00%—Total.

No. 2—Farm tractor oil.

Saybolt viscosity 250°–275° at 210° F.

85.75%—200° viscosity Pennsylvania neutral.
13.00%—40% aluminum oleate.
.25%—40% lime soap.
1.00%—red oil.

100,00%—Total.

No. 3—Mine car lubricant.

Semi-grease product with some "string."

71.00%—200° viscosity Pennsylvania neutral.
27.00%—40% aluminum oleate.
1.00%—40% lime soap.
1.00%—red oil.

100.00%—Total.

In compounding the above lubricants, the aluminum oleate and the red oil are placed in a steam jacketed kettle and heated with about ¾ of the lime soap, to a temperature of about 130° C., and the petroleum oil is added, stirring constantly and maintaining the temperature. The remainder of the lime soap is then added, varying the amount very slightly, to produce the exact viscosity and to eliminate the "string" as desired.

The petroleum oil content may be any of the vaporized petroleum lubricants, from the light bodies to the very heavy bodies. The light bodies do not retain the soaps in solution so satisfactorily, while the very heavy bodies do not produce such an all-around satisfactory product.

Our invention may be practiced either by making the complete lubricant at the factory and selling it as such, or by making a compound of the two soaps and the red oil and selling it alone, or in combination with a small amount of petroleum as a compounding material, to be made up into the final lubricant by the customer. It will therefore be understood that our invention comprises not only the finished lubricant, but also the compound base as a distinct article of manufacture, forming a species of our general invention.

As we have already indicated, there is a wide range of materials, proportions, and manipulations which are suitable for use according to our invention, and we therefore desire that no limitations be imposed upon our invention, except such as are indicated in the appended claims.

We claim as our invention:

1. A lubricant comprising a hydrocarbon oil, aluminum oleate, oleic acid, and a lime soap.

2. A lubricant comprising a hydrocarbon oil, aluminum oleate, oleic acid, and a lime soap derived from corn oil.

3. A lubricant containing at least 65% to 70% by weight, of hydrocarbon oil, and not over 30% to 35% of aluminum oleate, 1% of red oil and .20% to 1% of an additional soap.

4. A compounding material for making lubricants, comprising hydrocarbon oil, aluminum oleate, oleic acid and a lime soap.

5. A compounding material for making lubricants, comprising a hydrocarbon oil, a smaller quantity of aluminum oleate, a still smaller quantity of oleic acid, and a still smaller quantity of lime soap.

6. A compounding material for making lubricants, comprising hydrocarbon oil, aluminum oleate, oleic acid and a relatively small amount of a lime soap derived from corn oil.

In testimony whereof, we the said HARRY H. WILLOCK, SAMUEL J. CAPLAN, and JOSEPH E. BABB, have hereunto set our hands.

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