Patented Aug. 18, 1942 2,293,052

UNITED STATES PATENT OFFICE

2,293,052

LUBRICANT CONTAINING A LITHIUM COMPOUND

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No Drawing. Application November 4, 1940, Serial No. 364,246

7 Claims. (Cl. 252—40)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to a new and improved lubricant that is adapted for use over a great temperature range. More particularly, it relates to lubricants containing a soap of lithium together with a soap of either sodium or calcium, or both.

It is the object of this invention to provide lubricating greases having improved thixotropic and lubricating properties so that a single lubricant is adapted for use between wide temperature extremes.

My copending application, Ser No. 328,095, filed April 5, 1940, now Patent Number 2,274,673, discloses the highly beneficial results arising from incorporating lithium soaps of the higher fatty acids in lubricating oils, both in mineral and in non-drying vegetable oils.

I have found that the use of lithium soap or salts of soap forming higher fatty acids in the production of lubricating greases gives the greases entirely different properties from those obtained by the use of the other alkali metal salts. The greases produced by my method are water resistant, whereas the other alkali salts do not give such a property. My lithium soap greases withstand temperatures greatly in excess of those containing other alkali metal salts. The properties of these improved lubricating greases are not only widely different from the other alkali metal soap types but also they are much more stable to temperature and pressure, both chemically and physically.

I have also found that lubricating compositions having the enhanced properties due to the incorporation of lithium soaps may be prepared by using higher fatty acid salts of calcium or sodium, or both, with lithium soaps of like acids.

A lithium-sodium grease may be made with the following composition:

	Per cent
Lithium soap of mixed fatty acids having an average molecular weight of 277	17.52
Sodium soap of mixed fatty acids having an average molecular weight of 277	18.48
Mineral oil having a viscosity of 31.8 centistokes at 210° F	64

or

Sodium soap of mixed fatty acids	13.4
Lithium soap of mixed fatty acids	4.6
Mineral oil having a viscosity of 20.6 centistokes at 100° F	82.0

A lithium-calcium grease may have the following composition:

	Per cent
Calcium soap of mixed fatty acids	9.5
Lithium soap of mixed fatty acids	8.5
Mineral oil having a viscosity of 20.6 centistokes at 100° F	82.0

It is to be understood that the percentages above given are illustrative and not limiting since the quantity of soap added depends upon the consistency desired in the final product. The consistency is, of course, increased by using a greater percentage of soap.

The invention herein described and claimed may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A lubricating composition, comprising a mineral oil, a lithium soap and a calcium soap, the proportion of said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

2. A lubricating composition, comprising a non-drying vegetable oil, a lithium soap and a calcium soap, the proportion of said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

3. A lubricating composition, comprising a mineral oil, a lithium soap and a sodium soap, the proportion of said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

4. A lubricating composition, comprising a non-drying vegetable oil, a lithium soap and a sodium soap, the proportion of said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

5. A lubricating composition, comprising a mineral oil, a lithium soap, a calcium soap and a sodium soap, the proportion of said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

6. A lubricating composition, comprising a non-drying vegetable oil, a lithium soap, a calcium soap and a sodium soap, the proportion of

said soaps being at least sufficient substantially to thicken said oil but not substantially in excess of 40% of the total said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oil.

7. A lubricating composition, comprising an oleaginous substance selected from the group consisting of mineral oils and non-drying vegetable oils, a higher fatty acid soap of lithium, and a higher fatty acid soap of at least one element of the group consisting of calcium and sodium, said soaps being present in quantity at least sufficient substantially to thicken said oleaginous substance said lithium soap being at least such proportion of the total soap that it is sufficient by itself to effect a detectible increase in the viscosity of said oleaginous substance.

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