

UNITED STATES PATENT OFFICE

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LUBRICANT CONTAINING LITHIUM SALTS

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This invention relates to new and improved lubricating compositions containing lithium salts of various organic acids.

It is the object of this invention to provide lubricating compositions having a suitable oil base and a consistency that may be varied to suit different uses by the addition of lithium salts.

My copending application, Ser. No. 328,095, filed April 5, 1940, 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.

Suitable oils may be treated with lithium salts to produce lubricants having consistencies ranging from viscous oil to grease-like structures. Among the lithium compounds so used are the lithium salts of acetic, butyric, ethyl butyric, ethyl hexoic and caproic acid. These lithium salts, when added to or produced by reactions in mineral or non-drying vegetable oils, in quantities from 4% to 40% by weight, give smooth homogeneous compositions that have high heat resistance, excellent water resistance and good cold operating properties.

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. Lubricating compositions, comprising a lithium salt of an acid chosen from the group consisting of ethyl butyric, ethyl hexoic and caproic acids and an oil from the group consisting of mineral oil and non-drying vegetable

oil, the said salt being present in quantities between 4% and 40%.

2. Lubricating compositions, comprising a lithium salt of an acid chosen from the group consisting of ethyl butyric, ethyl hexoic and caproic acids and an oil from the group consisting of mineral oil and non-drying vegetable oil, the said salt being present in quantities sufficient substantially to thicken said oil.

3. Lubricating compositions, comprising a mineral oil and a lithium salt of ethyl butyric acid, said salt being present in quantities of from 4% to 40%.

4. Lubricating compositions, comprising a mineral oil and a lithium salt of ethyl butyric acid, said salt being present in quantities sufficient substantially to thicken said oil.

5. Lubricating compositions, comprising a non-drying vegetable oil and a lithium salt of ethyl butyric acid, said salt being present in quantities of from 4% to 40%.

6. Lubricating compositions, comprising a non-drying vegetable oil and a lithium salt of ethyl butyric acid, said salt being present in quantities sufficient substantially to thicken said oil.

7. Lubricating compositions, comprising a mineral oil and a lithium salt of ethyl hexoic acid, said salt being present in quantities of from 4% to 40%.

8. Lubricating compositions, comprising a mineral oil and a lithium salt of ethyl hexoic acid, said salt being present in quantities sufficient substantially to thicken said oil.

9. Lubricating compositions, comprising a non-drying vegetable oil and a lithium salt of ethyl hexoic acid, said salt being present in quantities of from 4% to 40%.

10. Lubricating compositions, comprising a non-drying vegetable oil and a lithium salt of ethyl hexoic acid, said salt being present in quantities sufficient substantially to thicken said oil.

11. Lubricating compositions, comprising mineral oil and a lithium salt of caproic acid in quantities of from 4% to 40%.

12. Lubricating compositions, comprising mineral oil and a lithium salt of caproic acid in quantities sufficient substantially to thicken said oil.

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