This invention relates to lubricating compositions containing compounds of lithium and more particularly to lubricants having a resin or non-drying vegetable oil base, which lubricants are particularly adapted for heavy duty.

It is the object of this invention to produce lubricants having desirable properties for high temperature use and in particular for service as chain and cable lubricants.

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.

Several lithium compounds have been incorporated in various types of resins, as well as in different oils, the lithium compounds being preferably soaps of the higher fatty acids having an average molecular weight of 277. Certain chlorinated compounds such as chlorinated diphenyl and chlorinated diphenyl oxide have been used as a base into which the lithium soaps were incorporated. For the particular use mentioned, namely, superior chain and cable lubricants, the quantity of lithium soap used was 18%. However, it will be apparent to those skilled in the art that different percentages of a soap will be employed to obtain varying desired consistencies.

Not only have the lithium soaps been formed and introduced as such into an oil, but the soap has been produced in the oil by introducing lithium compounds that hydrolyze and simultaneously saponify a portion of the constituents of the oil itself so that the soap is formed in the oil. As an example, I have found that jojobo oil derived from the edible seed of Simmondsia californica, when so treated gives a grease-like substance of a relatively stiff consistency and excellent thixotropic and lubricating properties. This composition has an unusually high resistance to heat, its lubricating properties being retained at temperatures in excess of 400° F. While accurate determinations have not been made, it is estimated that the resulting lithium soap constituted about 8% of the total.

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 chlorinated diphenyl and about 18% of a lithium soap having an average molecular weight of 277.
2. A lubricating composition, comprising chlorinated diphenyl and a lithium soap having an average molecular weight of 277 sufficient in quantity substantially to thicken said chlorinated diphenyl.
3. A lubricating composition, comprising chlorinated diphenyl oxide and about 18% of a lithium soap having an average molecular weight of 277.
4. A lubricating composition, comprising chlorinated diphenyl oxide and a lithium soap having an average molecular weight of 277 sufficient in quantity substantially to thicken said chlorinated diphenyl oxide.
5. A lubricating composition, comprising at least one substance from the group consisting of chlorinated diphenyl and chlorinated diphenyl oxide, and lithium soap of an average molecular weight of 277 sufficient in quantity substantially to thicken said diphenyl.
6. A lubricating composition, comprising jojobo oil and about 8% of a lithium soap.
7. A lubricating composition, comprising jojobo oil and sufficient lithium soap substantially to thicken said oil.

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