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LUBRICATING GREASE

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6 Claims. (Cl. 87-9)

This invention consists in a new lubricating grease adapted for use in conjunction with bearings carrying heavy loads and subjected to reciprocating forces or repeated shock, namely a lubricating grease compounded with aluminum soap and rubber.

The present practice in the commercial manufacture of consistent lubricating greases is to produce various mixtures and combinations of sodium, calcium, aluminum, zinc and lead salts of fatty acids with hydrocarbon oils. One of the greatest troubles experienced with such greases is their unstable character and the tendency of the metallic soap and oil phases to separate. In the grease of my new production this tendency is very materially decreased. My previous Patent 1,749,251 shows the particular process for the manufacture of an aluminum soap grease. My present process differs from this in that a small amount of rubber hydrocarbon is incorporated in the mixture, and the process can be carried out at temperatures materially lower than 335° F. The addition of this rubber is directly responsible for the increased stability of the mixture and the reduction of the tendency of oil separation. A stable gel structure is formed that is very resistant to separation usually produced by mechanical working or agitation. In order to show the improvement in stability due to the effect of this material, two samples of grease were compounded at 250° F., from aluminum stearate and 300 seconds Saybolt viscosity at 100° F., napthene base pale oil, one sample containing .5% by weight of rubber hydrocarbon.

Mixture	I	II
Percent aluminum stearate.....	9.5	9.5
Percent rubber hydrocarbon.....	0.5	0.5
Percent 300 pale oil.....	90.5	90.0

The A. S. T. M. penetration at 77° F. (original unworked consistency) was for I—278, for II—269. The A. S. T. M. penetration worked at 77° F. (50 strokes in the worker) was for I—over 400, for II—340. These tests show conclusively the increased stability due to rubber. For a complete description of the method of making this penetration test, reference should be made to Method 31.1 (A. S. T. M., D-217-27T) page 45, U. S. Bureau of Mines Technical Paper 323B, No. 2d, edition of 1927.

The product is a very stable one, being little affected by mechanical agitation, and consequently when compounded as a semi-fluid grease,

is a superior lubricant for gears, wheels, ball and roller bearings. These greases show also very increased ductility, it being possible to draw out a small portion several centimeters before it breaks off. Such greases show a very tenacious and highly adsorbed lubrication film on metallic surfaces and are for this reason superior to mixtures of soap and mineral oil alone.

This product is very adhesive to metallic surfaces, the addition of rubber considerably increasing this property in the grease. This adhesive property, together with high ductility and its tenacious film-forming ability, all go to produce a very superior and efficient lubricant.

Rubber for this process may be obtained and used in the form of pale crepe, smoked sheet, rubber latex or para rubber. The rubber hydrocarbon employed must first be dissolved in the mineral oil to be used and the two compounded in the usual manner with the aluminum soap. The process of dissolving the rubber is rather difficult so it is preferred to use the rubber latex which is a milky liquid containing globules of rubber hydrocarbon dispersed in a watery medium.

This process can be carried out at temperatures ranging from 150° to 250° F. for the usual mixture used. When, however, more than about 15% aluminum soap is used, or when the oil employed is of a paraffine base these temperatures will range from 250° to 500° F.

In the example of a grease of my invention given above under mixture II, I have specified aluminum stearate. However, I do not limit myself to the use of the stearate alone as any aluminum soap of the higher fatty acids such as stearate, palmitate, or any mixtures of them can be employed.

It is also understood that the consistency of the product may be varied at will by changing the amounts of rubber hydrocarbon, aluminum soap and mineral oil. Very dense greases may be made containing as much as 60% aluminum soap and 5% rubber hydrocarbon. The invention is extended to include that class of lubricants termed "compounded oils" or "liquid greases." These are lubricating oils to which small quantities of the alkali or metal salts of the fatty acids have been added. These may contain 1% or even less of aluminum stearate and rubber combined.

I claim as my invention:

1. A substantially water free lubricating grease comprising mineral lubricating oil, aluminum soap of a higher fatty acid in a quantity sufficient to give the compound the consistency of a grease,

and a sufficient quantity of uncoagulated rubber from latex to stabilize the grease.

2. The composition of claim 1 containing less than 5% of uncoagulated rubber from latex.

5 3. A substantially water free lubricating grease comprising mineral lubricating oil, aluminum stearate in a quantity sufficient to give the compound the consistency of a grease, and a sufficient quantity of uncoagulated rubber from latex to stabilize the grease.

10 4. The composition of claim 3 containing less than 5% of uncoagulated rubber from latex.

5. A lubricating composition comprising as its active ingredients more than about 35% mineral oil, less than about 60% aluminum soap of a fatty acid and less than about 5% uncoagulated rubber from latex.

6. A lubricating composition comprising as its active ingredients more than about 80% mineral oil, less than about 15% aluminum soap of a fatty acid and less than 5% uncoagulated rubber from latex.

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