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LUBRICATING GREASES AND METHOD OF
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leans, La., a corporation of LouisianaNo Drawing. Application August 27, 1946,
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The present invention relates to the production of a lubricating grease containing an alkali metal soap of the saturated fatty acids, the metal component of the soap having an atomic weight varying between 6.99 and 22.99 together with an alkali metal acetate, the metal component of which has an atomic weight varying between 6.99 and 22.99, the alkali metal component of the acetate salt having the same atomic weight as the alkali component of the fatty acid soap, the latter preferably containing 14 to 24 carbon atoms per molecule. More specifically the invention relates to the production of a lubricating grease containing a sodium soap of a saturated fatty acid and sodium acetate or a lubricating grease containing a lithium soap of a fatty acid and lithium acetate. The sodium soap constituent of the grease may be made by saponifying fatty acids and preferably saturated fatty acids, or mixtures of fatty acids.

In one form of the invention a grease of the character set forth has present an alkali metal naphthenate as, for example, sodium naphthenate or lithium naphthenate. In this connection it is desired to point out that if sodium naphthenate is added to grease after it is made or formed in situ during the manufacture of the grease the final lubricating grease increases in hardness as the percentage of sodium naphthenate increases from about .5% to 10% to 15%, said percentages being taken on the weight of the final grease. The preferred amount of the alkali naphthenate present in the grease to increase the hardness of the grease varies between 3% and 7%.

If the lubricating grease of the present invention contains an excess of a fatty acid as, for example, .05% to .4% or somewhat in excess thereof, the alkali metal acetate content of the grease may be as low as 2½% taken on the weight of the final grease and the grease will not be too soft, that is, it will have an ASTM worked penetration of about 260 and may be much higher as, for example, 310. While this is the preferred worked penetration, it may vary from this somewhat and still come within the spirit of the present invention as, for example, the worked penetration may be as low as 190.

However, if the grease contains excess alkali as, for example, .02% to .8% or somewhat greater amount taken on the weight of the final grease, then the percentage of the sodium acetate present in the grease would preferably be at least 2.5% in order to prevent oil seepage. The best results will be obtained when there is present 5% to 7% of sodium acetate or the lithium acetate when a lithium soap grease is being prepared. The broad range of the amount of sodium acetate present in the sodium soap grease or of the lithium acetate present in the lithium soap grease

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varies from about 2½% to 12½% taken on the weight of the grease. The optimum results appear to be obtained by using 6% of sodium acetate or lithium acetate when the grease contains free alkali in the amount set forth.

A lubricating grease containing an alkali metal soap of a saturated fatty acid or a mixture of fatty acids and an alkali metal acetate as, for example, sodium acetate or lithium acetate, and more specifically sodium saturated fatty acid soap and sodium acetate or a lithium fatty acid soap and a lithium acetate, exhibit a tendency to bleed or seep oil and further, the grease is rather soft. This oil seepage is prevented or substantially inhibited by providing in the grease free saturated fatty acids in the percentages set forth, or when the lubricating grease contains an alkali metal soap as, for example, a sodium soap or lithium soap and also contains free alkali in the amount set forth, by having present as a component of the grease an alkali metal acetate in percentages ranging from about 5% to 7%, and preferably around 6%, the acetate salt being either a sodium soap or a lithium soap.

When the grease contains excess fatty acids or excess free alkali, the grease is made harder by having present in the grease about .05% to 15% of an alkali metal naphthenate and preferably 3% to 7% of the alkali metal naphthenate as, for example, sodium naphthenate or lithium naphthenate. That is, the worked penetration of the grease is brought to below 310.

An object of the present invention is to provide lubricating grease containing an alkali metal soap of the fatty acids or mixtures thereof, and an alkali metal acetate, the metal component of the fatty acid soap having an atomic weight varying between about 6.99 and about 22.99, and the atomic weight of the alkali metal component of the acetate soap varying between about 6.99 and about 22.99, the soaps having the basic metal component.

A further object of the present invention is to increase the melting point of a lubricating grease containing an alkali metal soap of the fatty acids by incorporating in the grease an alkali metal acetate.

A further object of the present invention is to prevent oil seepage in a grease of the character herein set forth when the grease contains free alkali.

Another object of the present invention is to prevent seepage in a sodium soap grease of the character herein set forth when the greases contain free alkali by having present at least about 5% of an alkali metal acetate.

Another object of the present invention is to counteract in greases containing an alkali metal soap of the fatty acids, excess fatty acids, and an alkali metal acetate, the tendency of the grease

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to become softer upon the incorporation in the grease of an alkali metal acetate, this being accomplished by having present in the grease a compound furnishing naphthenic acid radical as, for example, sodium naphthenate in a sodium soap grease, and lithium naphthenate in a lithium soap grease.

Another object of the present invention is to produce a lubricating grease of the character herein set forth in which a saponifiable base of the grease making batch is a fatty acid or a mixture of fatty acids, the batch also containing ingredients producing an alkali metal soap as, for example, a sodium soap or a lithium soap, said saponifiable organic base containing only a small amount of glyceride or being substantially entirely free thereof, the resulting grease being firmer when little or no glyceride is present.

The following table sets forth the effect of sodium naphthenate in grease or the hardness of the grease containing in addition to the sodium naphthenate soap, a sodium soap of a saturated fatty acid, preferably containing 14 to 24 carbon atoms in the molecule, and sodium acetate, said grease also containing free fatty acid as, for example, stearic acid:

Table I

	1	2	3
Per cent Total Soap, including sodium acetate.....	17.5.....	15.8.....	15.8.
Per cent Sodium acetate.....	5.3.....	4.0.....	4.0.
Per cent Sodium naphthenate.....	nil.....	.55.....	.92.
Melting point.....	Too soft.	425° F.	430° F.
Per cent Free Fatty Acid.....	.07.....	.25.....	.30.
Worked Penetrations.....	Too soft.	264.....	240.

In general, when a grease contains a sodium soap of a fatty acid and a sodium acetate, or when the grease contains a lithium soap of a fatty acid and lithium acetate, and when the free fatty acid varies between about 0.02% to 0.3% or over as, for example, 0.02 to 0.3%, and the total soap content including the sodium acetate or the lithium acetate varies from about 8% to about 35%, the sodium acetate or the lithium acetate may vary from about 2½% to about 12½% and the balance of the soap content of the grease may be a sodium soap of a fatty acid or a lithium soap of a fatty acid. In a lubricating grease of this character, the grease may be made harder by adding from about .05% to 15% of an alkali metal naphthenate as, for example, sodium naphthenate or lithium naphthenate.

It is desired to point out that in a sodium soap grease, the use of a sodium acetate soap in the amount set forth only has an influence on preventing seepage of oil from the grease when the grease contains free alkali. The same holds true for a lithium soap grease of a fatty acid and lithium acetate. However, in a grease either containing free alkali or free fatty acid and 3% to 35% of an alkali metal soap of a fatty acid, the sodium naphthenate increases the hardness of the grease and decreases the tendency of the grease to bleed. In connection with the above, it is desired to point out that if sodium naphthenate is added to a lubricating grease containing a mineral oil base and 3% to 35% of sodium stearate the more sodium naphthenate that is added, the softer the grease becomes, but if the grease contains a sodium acetate, then the more sodium naphthenate added to the grease, the harder the grease becomes. This also holds true for a lubricating grease containing a mineral oil base or its equivalent or a grease containing

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a mineral oil base having a small percentage of other oils present when the grease contains a lithium soap of a fatty acid and lithium acetate. The following is an example illustrating the present information:

Example I

850 gms. hydrogenated fish fatty acids (50-53 titre), 50 gms. naphthenate acid, and 1200 gms. 100 coastal oil are heated in a kettle until the fatty acids are melted. Thereafter, 124 gms. of sodium hydroxide are dissolved in water and added to the kettle. Shortly thereafter a solution of 400 gms. of sodium acetate in water is added and the mass heated until the water is driven off. The sodium acetate may also be formed in the grease by adding to the grease acetic acid and sodium hydroxide. Thereafter 1400 gms. of 100 coastal oil and 3800 gms. of 2000 coastal red oil are slowly added. The temperature of the mixture is raised when all the oil has been added to about 390° F. and the melting product is poured into a pan in a layer approximately 4 inches thick. It is then cooled to room temperature in about 12 hours. If the grease is cooled in layers of about ¼" thick, the time of cooling is decreased but the cold grease is somewhat harder in consistency. The grease produced as above set forth when subjected to the roll test described in Patent 2,397,956 had a micro penetration of 128 before rolling, and after 142 hours of rolling had a micro penetration of 145. The usual grease containing a sodium soap of fatty acid or a mixture thereof, has after rolling a micro penetration in excess of 200.

The following table shows the effect of sodium acetate in preventing oil seepage in a grease containing a sodium soap of a fatty acid, preferably having 14 to 24 carbon atoms in the molecule, said grease also containing sodium acetate, and an excess of alkali.

Table II

	1	2	3	4
Per cent Total soap, including sodium acetate.....	15.2.....	15.9.....	16.7.....	17.7.
Per cent Sodium acetate.....	3.0.....	3.9.....	4.76.....	5.9.
Per cent Sodium Naphthenate.....	.9.....	.9.....	.9.....	.9.
Melting Point.....	400°.....	428°.....	438°.....	450°.
Per cent Free Alkali.....	.33.....	.48.....	.35.....	.35.
Worked Penetration.....	164.....	176.....	190.....	190.
Oil Seepage.....	Very bad.	Very bad.	bad.....	slight.

It is noted from the foregoing table that when the sodium acetate present in the grease approximates between 5% to 7%, the tendency of the grease containing free alkali to seep oil is greatly decreased and also the grease becomes slightly softer.

The following table shows the effect of sodium acetate on the hardness of a grease containing a sodium soap of a fatty acid and sodium acetate, said grease containing excess free fatty acid.

Table III

	1	2	3	4	5
Per cent Total soap, including sodium acetate.....	17.4	16.9	16.3	15.3	14.3
Per cent Sodium acetate.....	5.8	5.2	4.6	3.95	2.7
Per cent Sodium Naphthenate.....	.9	.9	.9	.9	.9
Melting Point..... degrees.....	402	412	412	460	404
Worked Penetration.....	300	270	260	225	220
Per cent Free Fatty Acid.....	.19	.17	.38	.36	.22
Oil Seepage.....	None	None	None	None	None

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From the above it appears that if the grease contains excess fatty acid no bleeding is obvious, regardless of the increase or decrease in the amount of sodium acetate; and increasing the sodium acetate makes the grease softer.

The following table shows the effect of using a glyceride in a grease containing sodium soap of a fatty acid and sodium acetate, said grease containing some glycerine:

Table IV

	1	2	3	4
Per cent Total soap, including sodium acetate.....	17.2	17.2	16.4	17.0
Per cent Soap from glycerides.....	.38	1.0	1.58	nil
Per cent Glycerine added.....	nil	nil	nil	1.0
Worked penetrations.....	218	230	282	345

The above table indicates that the use of the glycerine makes the grease softer.

The following is an additional example showing the production of a grease in accordance with the present invention using other low carbon fatty acids:

Example II

Hydrogenated fish fatty acid, 54 titre.....	gms..	150
Palm oil.....	gms..	25
Naphthenic acids.....	gms..	25
Tartaric acid.....	gms..	40
Coastal pale oil, 100 vis. at 100° F.....	gms..	500
Sodium hydroxide in aqueous solution.....	gms..	70
Sodium acetate in aqueous solution.....	gms..	95

Add slowly:

Coastal pale oil, 100 vis. at 100° F.....	gms..	100
Coastal red oil, 2000 vis. at 100° F.....	gms..	800
Melting point of grease.....	°F..	430

The following is an additional example of grease compounded in accordance with the present invention, said grease containing free sodium hydroxide:

Example III

Hydrogenated fish fatty acids, 54 titre.....	gms..	150
Palm oil.....	gms..	25
Naphthenic acids.....	gms..	25
Lactic acid.....	gms..	40
Coastal pale oil, 100 vis. at 100° F.....	gms..	700
Sodium hydroxide in solution.....	gms..	55
Coastal red oil, 2000 vis. at 100° F.....	gms..	800
Free sodium hydroxide.....	percent..	4
Melting point of grease.....	°F..	332

The following example is directed to the production of a lithium soap grease containing lithium acetate:

Example IV

Hydrogenated fish fatty acids, 54 titre.....	gms..	150
Palm oil.....	gms..	25
Naphthenic acid.....	gms..	25
Acetic acid.....	gms..	40
Coastal pale oil, 100 vis. at 100° F.....	gms..	700
Lithium hydroxide in solution.....	gms..	80
Coastal red oil, 2000 vis. at 100° F.....	gms..	800
Worked penetration.....		322
Melting point of grease.....	°F..	422
Appearance.....	Smooth-opaque	
Micro penetration before rolling.....		166
Micro penetration after rolling 14 hours.....		175
Grease very stable to mechanical working.		

Example III clearly indicates that while greases can be made with salts of low molecular weight, other than the salts of acetic acid, greases of

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high melting point can only be made using acetic acid, the grease containing acetic acid salts.

- It is desired to point out that ordinary sodium soap lubricating greases containing a sodium soap of a fatty acid have in the past usually melted below 400° F. and when heated above their melting point separated or leaked oil when cooled at room temperature. In accordance with the present invention a sodium soap grease, that is a sodium soap grease containing a sodium soap of a fatty acid, preferably having 14 to 24 carbon atoms per molecule, has its melting point raised to 400° to 470° F. or higher by incorporating in the grease a sodium acetate. If the grease contains excess fatty acids or, stated differently, free fatty acids, varying in amount from .02% to about .3% or .4% or even higher, then the new lubricating grease which has a melting point varying between 400° F. and about 470° F. does not seep oil. However, if the grease containing the sodium acetate in the percentages hereinbefore set forth has free alkali present, varying from about .2% to .8% or more, then the grease does leak or separate oil when cooled at room temperature unless there is about 5% of the sodium acetate or lithium acetate present in the sodium soap grease or the lithium soap grease. Therefore, in a sodium soap grease or a lithium soap grease which contains free alkali, in order to prevent oil leakage there is a critical amount of alkali acetate which it is necessary to have present, this critical range being between about 5% to about 7%. Stated somewhat differently, it is the lower limit which is critical in order to prevent bleeding or oil seepage when the grease which has had added thereto sodium acetate if it is a sodium acetate grease, or lithium acetate added thereto if it is a lithium acetate grease, contains free alkali. Then it is necessary to prevent oil seepage to have at least 5% sodium acetate or lithium acetate present. The upper limit is not critical and it is not necessarily around 7% but may be as high as 12½%.

When, however, greases of the above character do not have free alkali but have free fatty acid, the amount of sodium acetate or lithium acetate added is not so critical but it may be as low as 2.5% to 5%—better results being obtained at 4%, as shown in Table I.

- The sodium soap-sodium acetate grease or the lithium soap-lithium acetate grease of the present invention is soluble in boiling water. As previously pointed out, these greases may have excess fatty acids or excess sodium hydroxide. When an excess of sodium hydroxide is used as hereinbefore specifically set forth, the grease is harder for the same soap content than it is when the similar grease contains excess fatty acids. The melting point is also slightly higher when the grease contains excess sodium hydroxide. When the grease contains excess fatty acids, it has a tendency when it contains sodium acetate to be rather soft. Therefore, even though the melting point of the grease has been increased it has a tendency to become soft, and this has been counteracted by adding naphthenic acid. The function of the naphthenic acid is to make the grease harder. However, the alkali soap of naphthenic acid which is indicated may be the sodium naphthenate or the lithium naphthenate when added to ordinary sodium stearate grease, causes the grease to become softer. However, in accordance with the present invention when the sodium or lithium naphthenate is added to a

sodium soap grease which contains sodium acetate, broadly or in the percentages herein set forth, the alkali naphthenate acts entirely differently, namely causes the grease to become harder.

The following table shows the effect of varying naphthenic acid concentration upon the hardness of the grease:

	Grease #1	Grease #2	Grease #3	Grease #4	Grease #5	Grease #6
Hydrogenated Fish Oil Fatty Acids.....	10.20%	9.83%	9.66%	8.73%	5.83%	2.93%
Naphthenic Acids.....	1.46%	1.83%	2.20%	2.93%	5.83%	8.73%
Sodium Acetate.....	4.70%	4.70%	4.70%	4.70%	4.70%	4.70%
Sodium Hydroxide.....	1.70%	1.70%	1.70%	1.70%	1.70%	1.76%
500 S. U. S. Vis. Coastal Oil.....	81.94%	81.94%	81.94%	81.94%	81.94%	81.88%
A. S. T. M. Dropping Point, ° F.....	412°	412°	413°	434°	403°	286°
A. S. T. M. Worked Penetration.....	220	252	240	240	225	240
Mechanical Stability by Roll Test.....	Good	Good	Good	Fair	Poor	Not Run.

In carrying out the present invention, it is highly desirable that the sodium soap-sodium acetate grease or the lithium soap-lithium acetate grease be made from a grease forming batch in which the fatty acids are the saponifiable constituent. A small amount of glyceride may be used but the grease becomes softer in direct proportion to the amount of glyceride used during the grease-making stage. The sodium soap-sodium acetate grease or the lithium soap-lithium acetate grease made from a batch containing fatty acids is much firmer and will have a better appearance than if the soaps are made from a grease-making batch containing even a small proportion of glycerides.

In the present specification all temperatures are in degrees F., and all percentages are by weight taken on the weight of the grease batch.

The saponifiable component of the grease making batch may be any of the materials usually used in the production of grease. The fatty acids usually used in grease making are the saturated fatty acids containing 14 to 32 carbon atoms in a molecule and preferably 14 to 24 carbon atoms in a molecule. Any of the unsaturated fatty acids may be used which are usually used in the making of grease, said unsaturated fatty acids usually containing from 18 to 22 carbon atoms per molecule.

The oil constituent of the grease making batch used in carrying out the present invention is usually a mineral oil such as is well known in the art, but may be a vegetable oil or an animal oil or any fat usually used in the production of sodium soap greases or in the production of lithium lubricating grease.

Where in the specification the melting point is referred to, this is intended to denote the ASTM "dropping point" as obtained by ASTM procedure D566, the 1942 Year Book.

While the optimum amount of naphthenic acid added to the grease varies between 2% to 6% based on the weight of the grease batch, in the final grease the optimum percentage of the alkali naphthenate varies between 3% to and including 7%. Due to the low atomic weight of the alkali metals used, the percentage increase in the final grease of the alkali naphthenate is relatively little.

In accordance with the present invention there has been provided a lubricating grease containing a lubricating oil which is preferably, although not necessarily, a mineral oil and up to 25% of sodium stearate. The grease may contain 2½% to 12% of sodium acetate, said percentages being taken on the weight of the final grease. A

grease of this character may contain 1% to 15% of naphthenic acid expressed as a sodium soap thereof.

In one form of the invention there is provided a lubricating grease having a melting point varying between 390° F. and 470° F., said grease comprising an alkali soap of the fatty acid, the alkali component of the soap having an atomic weight

varying between 6.99 and about 22.99, the grease containing 2.5 to 12.5% of an alkali salt of acetic acid, the alkali component of the acid salt having the same atomic weight as the alkali component of the fatty acid, said percentages being taken on the weight of the final grease. A grease of this character may have from 3 to 7% of an alkali naphthenate present, said percentages being taken on the weight of the final grease. In the broadest form of the invention there may be present in a grease such as here set forth .05 to 15% of an alkali naphthenate.

The invention also consists in the method of increasing the melting point of a sodium soap grease containing a lubricating oil base comprising incorporating in the grease 2.5% to 12.5% of sodium acetate, said percentages being taken on the weight of the final grease, although in the preferred form of the invention there is incorporated in the grease 4% to 7% of sodium acetate, said percentages being taken on the weight of the final grease.

In one form of the invention a method is provided of increasing the melting point of a sodium soap grease containing a lubricating oil base and having a free alkali content varying between .2% to about .8%, while at the same time substantially inhibiting the seepage of oil from the grease by incorporating in the grease at least 5% of sodium acetate, said percentages being taken on the weight of the final grease. There may also be present in said grease at least .5% of an alkali naphthenate. The melting point of a lithium soap grease containing a mineral oil base or other oil base, and having a free alkali content varying between about .2% to about .8% may have its melting point increased and at the same time may be inhibited against seepage of the oil from the grease by incorporating in the grease at least .5% of lithium acetate. The lithium soap grease may have at least .5% of an alkali naphthenate incorporated in the grease, said percentages being taken on the weight of the final grease.

The percentages set forth in all the claims are taken on the weight of the final grease.

In preparing the grease herein set forth, potassium or lithium naphthenate may be substituted for the sodium naphthenate in the same percentages as set forth for the sodium naphthenate. The sodium soap may have added thereto either a sodium naphthenate or a potassium naphthenate or a lithium naphthenate. The lithium soap may have added thereto a lithium naphthenate, potassium naphthenate or sodium naphthenate. The term "alkali naph-

thenate" as used herein is intended to cover sodium, potassium, or lithium naphthenate.

I claim:

1. A grease composition comprising a mineral lubricating oil and having incorporated therein in an amount sufficient to thicken the mineral oil to a grease consistency, an alkali soap of a high molecular weight fatty acid, and 2.5% to 12.5% by weight of an alkali salt of acetic acid, the alkali components having an atomic weight varying between about 6.99 and about 22.99.
2. A grease composition comprising a mineral lubricating oil and having incorporated therein in an amount sufficient to thicken the mineral oil to a grease consistency, an alkali soap of a high molecular weight fatty acid from about 2.5% to 12.5% by weight, alkali salt of acetic acid and 3% to 7% by weight of an alkali naphthenate, the alkali components having an atomic weight varying between about 6.99 and about 22.99.
3. A grease composition comprising a mineral lubricating oil and having incorporated therein in an amount sufficient to thicken the mineral oil to a grease consistency, an alkali soap of a high molecular weight fatty acid, from about 2.5% to 12.5% by weight alkali salt of acetic acid and 0.05% by weight of an alkali naphthenate, the alkali components having an atomic weight varying between about 6.99 and 22.99.
4. The method of increasing the melting point of a grease comprising a mineral oil and a sodium soap in an amount sufficient to thicken the mineral oil to a grease consistency, by incorporating in the grease 2.5% to 12.5% by weight of sodium acetate.
5. The method of increasing the melting point and preventing bleeding of a grease comprising a mineral lubricating oil and a sodium soap in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between about 0.2% to about 0.8%, by incorporating in the grease about 5.0% by weight of sodium acetate.
6. The method of increasing the hardness and the melting point of a grease comprising a mineral lubricating oil and a sodium soap in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between 0.2% to about 0.8% by incorporating in the grease at least 5% of sodium acetate and at least 0.5% of an alkali naphthenate.
7. The method of increasing the hardness and the melting point of a grease comprising a mineral lubricating oil and a lithium soap in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between about 0.2% to about 0.8%, by incorporating in the grease at least 5% of lithium acetate and at least 0.5% of an alkali naphthenate.
8. The method of increasing the hardness and the melting point of a grease comprising a mineral lubricating oil and a lithium soap in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between about 0.2% to about 0.8% by incorporating in the grease at least 5% of lithium acetate.
9. The method of increasing the melting point and inhibiting bleeding of a grease comprising a mineral oil and an alkali soap of a high molecular weight fatty acid present in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between about 0.2% and about 0.8%, by incor-

porating in the grease at least 5% by weight of an alkali salt of acetic acid, the alkali components having an atomic weight varying between about 6.99 and 22.99.

10. The method of increasing the hardness and the melting point of a grease comprising a mineral oil and an alkali soap of a high molecular weight fatty acid present in an amount sufficient to thicken the mineral oil to a grease consistency, said grease having a free alkali content varying between about 0.2% and about 0.8% by incorporating in the grease at least 5% by weight of an alkali salt of acetic acid, and 0.5% to 15% by weight of an alkali soap of naphthenic acid, the alkali components having an atomic weight varying between about 6.99 and 22.99.
11. The method of increasing the hardness of a lubricating grease containing a lubricating oil base, about 3.0% to 25.0% of sodium soap of a fatty acid, and about 2.5% to about 12.5% of sodium acetate comprising incorporating in the grease from .5% to 15% of an alkali soap of naphthenic acid, said percentages being taken on the weight of the final grease.
12. The method of increasing the hardness of a lubricating grease having a lubricating oil base, about 3% to about 25% of sodium soap of a fatty acid having 14 to 24 carbon atoms in each molecule, and about 2.5% to 12.5% of a sodium acetate salt comprising incorporating in a grease about .5% to about 15% of an alkali soap of naphthenic acid, said percentages being taken on the weight of the final grease.
13. The method of increasing the melting point of a grease comprising a mineral oil and a sodium soap having a free alkali in an amount sufficient to thicken said mineral oil to a grease consistency by incorporating in the grease about 5% by weight sodium acetate.
14. A lubricating grease composition comprising a lubricating oil base and containing alkali metal compounds totaling from about 8% to about 35% by weight, of which from about 2.5% to about 12.5% is sodium acetate, the balance being sodium stearate and the percentages being selected such that the major proportion is sodium stearate.
15. A lubricating grease composition comprising a lubricating oil base and containing alkali metal compound totaling from about 8% to about 35% by weight of which from about 2.5% to about 12.5% is sodium acetate, 1.0 to 15% is sodium naphthenate, the balance being sodium stearate and the percentages being selected such that the major proportion is sodium stearate.
16. A lubricating grease composition comprising a lubricating oil base and containing alkali metal compounds totaling from about 8% to about 35% by weight, of which from about 2.5% to about 12.5% is lithium acetate, the balance being lithium soap of hydrogenated fish oil fatty acids and the percentages being selected such that the major proportion is lithium soap of hydrogenated fish oil fatty acids.
17. A lubricating grease composition comprising a lubricating oil base and containing alkali metal compounds totaling from about 8% to about 35% by weight, of which from about 2.5% to about 12.5% is lithium acetate, 1.0% to 15% is lithium naphthenate, the balance being lithium stearate and the percentages being selected such that the major proportion is lithium stearate.

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