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SOLID LUBRICANT

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This invention relates to solid lubricants for the lubrication of locomotive journals and other bearings operating at high speeds and high temperatures and particularly to dehydrated lubricating compounds having a water content less than one percent and a melting point of the order of 400° F. or over.

One object of this invention is to provide an improved dehydrated lubricating compound which, in comparison with the similar compounds now in use, has increased hardness and a dense consistency that enables it to be more readily formed into blocks or cakes by pressing or molding and to retain its shape during all ordinary handling or shipping.

Another object is to provide a dehydrated lubricating compound having an improved fibrous structure which improves the retention of the lubricating oil by the sodium soap to provide at all times a proper lubricating film over the working parts to which the lubricant is applied.

In the practice of this invention dehydrated lubricating compounds of improved oil retaining and lubricating properties have been successfully produced in accordance with the following formula:—

	Per cent
Heavy distilled naphthenic petroleum lubricating oil	30.8
Residual naphthenic petroleum lubricating oil	13.6
Stearic acid	14.0
Oleostearine	28.0
Caustic soda	6.6
Water	7.0

The above ingredients are compounded in an open-top fire heated kettle according to the following procedure:—The mineral oil and stearic acid are introduced into the kettle and sufficient heat supplied to melt the fat. The caustic soda in solution in the water is then added while stirring the contents of the kettle with a paddle agitator. The heating and agitation is continued until the water content of the mixture is less than one percent. The oleostearine is then added and the mixture heated to approximately 400° F. to bring it to the condition of a fibrous paste suitable for drawing from the kettle. In the cooled state the resulting product comprises a solid compound having a consistency similar to that of hard soap. In comparison with previously known dehydrated lubricating compounds the compound produced in accordance with this invention is characterized by a melting point of approximately 480° F. (when melted on the surface of a mercury bath) and by an improved adsorption or absorption of the oil by the soap which substantially increases the resistance to loss of consistency incident to the pressing or molding operations by which the compound is formed into blocks or cakes.

The analysis of the finished product is substantially as follows:—

	Per cent
Sodium soap	47.7
Free alkali (as NaOH)	0.6
Petroleum oil	48.1
Water	0.5
Glycerine	3.1

The presence of the small amount of glycerine resulting from the saponification of the oleostearine is found to improve the lubricating properties of the compound in some respects. The use of heavy distilled naphthenic petroleum lubricating oil and residual naphthenic petroleum lubricating oil in place of the unfiltered cylinder stock generally used in the manufacture of dehydrated lubricating compounds has been found to give improved grease structure and lubricating properties. The use of both distilled heavy naphthenic oil and residual naphthenic oil while not absolutely essential is recommended because of the improved effects obtained.

In the foregoing description the term "naphthenic lubricating oil" is used in the sense in which it is commonly employed in the trade to indicate lubricants produced from naphthenic crude oils. It may also be explained that the viscosity characteristics of the naphthenic lubricating oil used in accordance with our invention are similar to lubricants manufactured from crude oils produced along the gulf coast of Texas, U. S. A. Such lubricating oils are characterized by a high viscosity at 100° F. for the same viscosity at 210° F. when compared with paraffinic lubricants. It is also important to note that whereas the lubricating oils previously used in the manufacture of dehydrated driving journal lubricants have a viscosity index varying from fifty (50) to one hundred (100), the viscous naphthenic lubricating oils which are preferably used in accordance with our invention have a viscosity index of from zero (0) to thirty (30). The term "viscosity index" is widely used by the industry to classify oils from varying crude oil sources by means of their viscosity characteristics and the particular method which we have used for determining the viscosity index of the naph-

thenic oils used in accordance with our invention is that described by Dean and Davis "Chem. and Met. Engineering" Vol. 36, page 618 (1929) and by Davis and McAllister in "Industrial and Engineering Chemistry" Vol. 22, page 1326 (1930).

Having thus described what we now consider to be the preferred embodiment of our invention, we reserve the right to resort to slight changes in the proportions of the ingredients and the method of procedure which fall within the scope and spirit of the invention as defined by the appended claims.

Having thus described our invention, what we claim is:—

1. A solid dehydrated lubricant for locomotive journals and the like containing, as its principal ingredients, highly viscous naphthenic petroleum oil having a viscosity index of less than thirty and a sodium soap made from animal fat and stearic acid saponified with caustic soda, the oil and soap together constituting approximately 95% of the lubricant and being present in substantially equal proportions together with less than one percent water and from one to four percent glycerine.

2. A solid dehydrated lubricant for locomotive driving journals and the like containing, as its principal ingredients, highly viscous naphthenic petroleum oil having a viscosity index of less than thirty and a sodium soap made from animal fat and stearic acid saponified with caustic soda under conditions conducive to retention of glycerine in the finished product, the oil and soap together constituting approximately 95% of the lubricant and being present in substantially equal proportions together with not more than one percent of water and from one to four percent glycerine.

3. A solid dehydrated lubricant for locomotive driving journals having substantially the following analysis:—

	Per cent
Sodium soap	47.7
Free alkali (as NaOH)	0.6
Highly viscous naphthenic oil	48.1
Water	0.5
Glycerine	3.1

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