

UNITED STATES PATENT OFFICE

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LUBRICANT PRODUCT AND PRODUCING PROCESS

No Drawing.

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My invention relates particularly to lubricant products and a producing process therefor.

The invention concerns chiefly the use of oils of the oxy-fatty series, particularly castor or ricinus oil, to produce a lubricant whose viscosity remains more uniform during temperature variations. Although my product is very desirable for lubrication in general, it is particularly advantageous and desirable when subjected to temperature changes through a comparatively wide range, as for example, in connection with internal combustion engines and vehicles where it is subjected to weather and engine temperature changes through a wide range. In winter time the motor oil is subjected to a temperature range from extreme winter cold to running engine heat. The problem has therefore been to provide a lubricant which will have a viscosity sufficiently low for efficient engine running but which will remain sufficiently thin for starting or cold engine operation. The practice heretofore has been to use a lighter lubricant in winter but whereas such lighter lubricant facilitates starting of a cold engine, it becomes too thin for efficient operation of the heated up engine.

In my improved process, castor oil forms the main or essential element, but only after it has been treated to be readily soluble in substances in which it would otherwise be insoluble, as for example, mineral oils. Castor oil is well known in the lubricating field on account of its comparatively uniform viscosity under the ordinary weather temperature changes, and its film stability. It is however quite expensive.

One of the important objects of my invention is to infuse the desirable characteristics of castor oil into the ordinary lubricating oils, and I prefer to use the castor oil compounded in the form of a metal ricinoleate, or so-called metallic castor oil soap. However, to obtain such metal ricinoleate which will readily dissolve in the ordinary lubricating oils, mineral oils, or other commercial solvents, the castor oil used must first have been treated and conditioned to be itself soluble in such oils or solvents, as by the process

disclosed in my co-pending application Serial No. 205,848, filed July 14, 1927 or in my co-pending application Serial No. 286,492 filed June 18, 1928. Castor oil and a distillate agent such as a mineral oil of say 100 degrees viscosity (Saybolt) at 100° Fahrenheit, are mixed in a closed vessel, the castor oil being greatly in excess of the mineral oil, say about 90% castor oil to 10% mineral oil. The oils are kept well mixed by agitation while they are being heated to a temperature of about 650 degrees Fahrenheit or higher, and under vacuum of about 20 inches, and for a time approximately six to eight hours. During such treatment distillation takes place, and the albuminous or gumming substances and other undesirable elements such as the odor-producing aldehydes are removed from the castor oil. The mineral oil will distill at a lower temperature than the castor oil is subjected to at the vacuum stated, and will carry off such gumming and other undesirable products. The castor oil which has thus been treated is perfectly soluble in mineral or petroleum hydrocarbon oils.

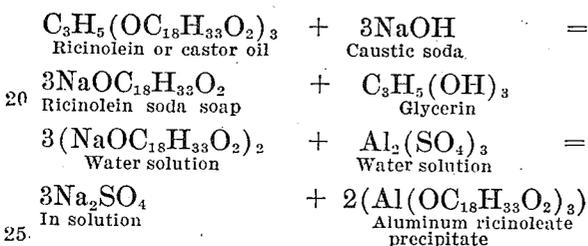
A preferred procedure in carrying out my process of producing the metal ricinoleate is to first make a soap, which may be an alkali soap, of castor oil which has been treated to be soluble in petroleum hydrocarbon oils. A water solution of this soap is added to a water solution of a salt, the result being the precipitation of water insoluble ricinoleate of the salt metal. This precipitate is removed, washed and fused and will then be the commercial metal ricinoleate of my invention, it being of a jelly consistency and readily soluble or miscible to any proportion in the ordinary lubricating or mineral oils or other solvents such as benzene, alcohols, or acetone in which it would otherwise be insoluble.

As a specific example suppose that it is desired to produce aluminum ricinoleate. I first make a soap in the well known manner by treating with caustic soda castor oil which has been made soluble in mineral oil. I then make a water solution, of say 20 to 30%, of such soap and mix it with a water solution of an aluminum salt such as aluminum sulphate. The amount of such salt will de-

pend upon the amount of aluminum necessary to replace the sodium of the soap and any one skilled in the art can readily determine these proportions. The solutions may be mixed at ordinary room temperature or may be heated as desired. The mass is then allowed to stand and the aluminum ricinoleate which has been formed will precipitate and settle and the sodium sulphate solution which has been formed is then drawn off.

If it were desired to produce, for example, lead ricinoleate, a water soluble lead salt such as lead acetate would be used instead of the aluminum salt.

The chemical reactions would be as follows:—



The precipitate, after being washed and dried will be in commercial form to be mixed or blended in any proportion with the mineral oil to be improved or other solvents such as benzene, alcohol or acetone. If the castor oil itself had not first been treated to be soluble in such solvents, the ricinoleate would not have been soluble therein.

The metal ricinoleate is of itself a good lubricant but is too expensive on account of the cost of castor oil and it is therefore preferably used as a base to be mixed with the ordinary lubricating mineral, vegetable or animal oils, and the viscosity of the mixture will be materially increased and more stable and less variable with temperature changes. Where the mixture is used as a motor oil in internal combustion engines the viscosity variation will be so reduced that engines will operate efficiently whether cold or heated and can be readily started in zero weather as the oil in the oil pan and in the cylinders will not congeal but will be of sufficient fluidity to supply and thoroughly lubricate the cylinders and prevent sticking or freezing of the pistons. As the treatment of the castor oil to make it soluble in mineral oils also removes therefrom the albuminous or gumming substances and other undesirable elements such as aldehydes, the ricinoleate base or a mixture thereof with lubricating oil will be free from such disturbing elements.

The ricinoleate mixed with a mineral lubricating oil will also lower the freezing point of the mixture as it will prevent precipitation of the amorphous or inert substances such as waxes. To such mixture treated castor oil may be added to further lower the freezing point.

In practice, to form the proper lubricating compound for a desired temperature range, I start with an oil which is of light weight and which may be even too light to be used for lubrication. To this oil I add sufficient metal ricinoleate to increase the viscosity to the point desired for the temperature range under which the oil is to be used. Then I may add treated, soluble castor oil in quantity to lower the freezing point to the degree desired.

Having described my invention I claim as follows:—

1. As a commercial product, a metal ricinoleate soluble in mineral oils.

2. As a commercial product, aluminum ricinoleate soluble in mineral oils.

3. A metal ricinoleate formed from a castor oil soluble in lubricating oil.

In witness whereof, I hereunto subscribe my name this 29th day of September, 1927.

RUDOLPH R. ROSENBAUM.