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LUBRICATING OIL

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My invention relates to lubricating oils and more particularly to improved lubricants containing as an addition agent dialkyl polysulphides.

Sulphur bearing lubricants or lubricants containing addition agents comprising sulphur compounds are known to the art. One use for sulphurized or sulphur bearing lubricants is for improvement as cutting oils. Sulphurized animal and vegetable oils and free sulphur have been used for many years. One disadvantage of sulphurized animal and vegetable oils for use in compounding cutting lubricants is that this type of lubricant becomes very viscous after a short period of use and darkens materially in color. The oils tend to sludge.

One object of my invention is to provide an improved lubricant which may be used as a cutting lubricant.

Another object of my invention is to provide an improved lubricant which may be used for lubricating internal combustion engines and which possesses marked non-oxidizing properties.

Other and further objects of my invention will appear from the following description.

In general, my invention contemplates blending with a hydrocarbon oil a small quantity of a dialkyl polysulphide. Polysulphides containing any aryl group do not appear to give the improved results which I obtain with dialkyl polysulphides such as diamyl polysulphides, dibutyl polysulphides, diethtyl polysulphides, dipropyl polysulphides and the like.

In preparing a cutting lubricant, amounts bearing from one per cent to ten per cent by weight are added to a hydrocarbon oil. The cutting lubricant is extremely satisfactory and appears to have a markedly long life, continuing to give good smooth cutting edges when used to lubricate the end of a cutting tool. The good color, lack of odor and high stability of the cutting oils are very pronounced. The dialkyl polysulphides have another very valuable property which makes them remarkably satisfactory for use when blending cutting lubricants. They are solvents for sulphur. Free sulphur is of advantage in cutting lubricants and in some cases, the efficiency of a cutting lubricant is almost directly proportional to the free sulphur present. The cutting lubricants may be prepared by dissolving free sulphur in the dialkyl polysulphides. In one test, cutting lubricants were prepared with hydrocarbon oil and with one, three and six per cent of diamyl polysulphide by weight, in which compounds four per cent by weight of free sulphur was dissolved. This cutting lubricant was found to be very efficient and could be employed in places where the usual type of cutting oil lubricant could not be used. The viscosity index of these cutting lubricants was remarkably level and did not appear to undergo viscosity changes during use. With another type of cutting lubricant in which sulphurized animal and vegetable oils are employed as blending agents, the oil becomes very viscous and turns dark in color. With my type of lubricant, the viscosity not only remained substantially the same, but the color remained good.

Any dialkyl polysulphides, if desired, may be treated with sodium plumbite prior to use in cutting oil. The sodium plumbite stabilizes the dialkyl polysulphide and removes any residual mercaptan odor which is apt to be present in dialkyl polysulphides.

In preparing a crank case lubricant, I employ from .05 per cent to 2 per cent by weight of the crank case lubricant of a dialkyl polysulphide such as diamyl polysulphide, as an antioxidant. It appears that most crank case lubricants, after being in use for some time, become very corrosive.

A blend containing .1 per cent of diamyl polysulphide by weight was blended with a hydrocarbon oil having an SAE 30 viscosity range. This lubricant was tested by the Underwood corrosion test together with a control sample of the lubricant to which no diamyl polysulphide was added. It was found that the straight lubricant showed corrosion after four to five hours' operation of the test. The same lubricant containing .1 per cent of diamyl polysulphide did not corrode for twelve hours.

Another sample of the same lubricant was blended with a .3 per cent of diamyl polysulphide and this showed no corrosion for a period of nineteen hours.

Another sample of the same base was blended with .6 per cent of diamyl polysulphide and no corrosion was noted after thirty hours of continuous subjection to the Underwood corrosion test.

It does not appear that much improvement is obtained after 2 per cent of the dialkyl polysulphide has been blended, though in some cases more may be used.

The oils containing the diamyl polysulphide, which were subjected to the Underwood corrosion test showed an improvement in final color and some decrease in sludge formation.

The good color of dialkyl polysulphides, their lack of odor, and their great stability in use makes

them very desirable agents for blending with crank case lubricants as antioxidants and with hydrocarbon oils as cutting oils. Furthermore, their property of being good solvents for sulphur enables very efficient cutting oils to be blended.

The boiling points of dialkyl polysulphides vary, depending upon their molecular weight. If a high temperature operation is contemplated, higher molecular weight dialkyl polysulphides may be employed. For most practical purposes, diamyl polysulphide may be used as it boils about 250° C.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. A lubricant comprising in combination a hydrocarbon oil and from .05 to 10 per cent by weight of a dialkyl polysulphide having dissolved therein elemental sulphur.

2. A lubricant comprising in combination a hydrocarbon oil and from .1 to 10 per cent by weight of a diamyl polysulphide having dissolved therein elemental sulphur.

3. A lubricant comprising in combination a hydrocarbon oil and from .05 to 2 per cent by weight of a diamyl polysulphide having dissolved therein elemental sulphur.

4. A lubricant comprising in combination a hydrocarbon oil and from 1 to 5 per cent by weight of a diamyl polysulphide having dissolved therein elemental sulphur.

5. A lubricant comprising in combination a hydrocarbon oil and a small amount of dialkyl polysulphide having dissolved therein elemental sulphur.

6. A lubricant comprising in combination a hydrocarbon oil and a small amount of diamyl polysulphide having dissolved therein elemental sulphur.

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