Patented July 22, 1941 2,250,265

UNITED STATES PATENT OFFICE

2,250,265

LUBRICANT

Roland Kapp, Newark, and Karl T. Steik, Upper Montclair, N. J., assignors to National Oil Products Company, Harrison, N. J., a corporation of New Jersey

No Drawing. Application July 27, 1938, Serial No. 221,566

10 Claims. (Cl. 252—11)

The invention relates in general to lubricants and in particular to non-viscous, low pour point lubricants adapted for use in the lubrication of fine and delicate mechanisms.

Heretofore, lubricants for watches, fire arms and like delicate mechanisms have been prepared from various natural sources such as from the oil obtained from the head of a porpoise. Other highly refined oils and synthetic products have been used with varying degrees of success. The prior known products have, however, been characterized by becoming gummy after a period of time, thus defeating their purpose. Moreover, the highly refined oils used heretofore have proven to be very costly in their preparation.

A general object of the invention is to obviate the foregoing and other disadvantages.

A specific object of the invention is to provide a new and improved lubricant for fine and delicate mechanisms.

Another object of the invention is to provide a new and improved fire arm cleaner and lubricant.

Other objects of the invention will in part appear hereinafter.

It has now been found that certain esters of the naphthenic acids possess remarkable lubricating and other properties which adapt them for use in fire arms and delicate mechanisms. According to the invention there is provided a lubricant comprising a neutral or basic ester of naphthenic acids with a mono or polyhydric alcohol. It has further been found that such esters are admirably suited for removing the powder deposits in gun-barrels and the corresponding chambers in other forms of fire arms.

The invention accordingly comprises a product possessing the features, properties and the relation of components which will be exemplified in the product hereinafter described and the scope of the invention will be indicated in the claims.

In the preparation of the lubricant of the invention, any suitable napthenic acid or mixture of the naphthenic acids is esterified with a suitable alcohol, such, for example, as methyl, ethyl, propyl, isopropyl, butyl, isobutyl, etc., alcohols and more particularly the polyhydric alcohols including, inter alia, glycerol, polyglycerol; the glycols, such as ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, etc., as well as the well-known glycol ethers and ether-esters. While any of the foregoing and equivalent alcohols may be used in the esterification of naphthenic acids to provide the lubricant of the invention, it is highly preferred to employ the polyhydric alcohols, such as glycerol, polyglycerol and the glycols. One or more of the hydroxyl groups may be esterified, but it is preferred to completely esterify the alcohols, thus producing neutral esters.

The expression "naphthenic acids" is employed herein to connote the mixture of acids of that name currently obtained in the petroleum refining industry, as well as naphthenic acid or acids which are now being synthetically prepared.

The foregoing esters may be produced according to known procedures as by directly reacting the naphthenic acids with the alcohol at an elevated temperature, and, if desired, in the presence of a catalyst, such as hydrochloric acid, sulfuric acid or the like. They may also be produced by the reaction of the potassium or sodium salt of the naphthenic acids with chlorides of the alcohols or by other known methods.

Specific examples of some of the esters include among others glycol mononaphthenate, glycol dinaphthenate, glyceryl naphthenate, ethylene glycol dinaphthenate, diethylene glycol dinaphthenate, triethylene glycol dinaphthenate, etc.

While the foregoing esters are preferably used alone as the lubricant and fire arm cleaner of the invention, other materials may be blended therewith to suit the particular conditions at hand. For example, light high-grade mineral, animal and/or vegetable oils may be blended with the esters as well as diluents in the form of organic solvents for the esters and/or blending oils.

As hereinbefore stated, the lubricant of the invention is particularly adapted for the lubrication of fine and delicate mechanisms and instruments. As examples of such mechanisms the following are illustrative: watches, automatic recorders of temperature, time, pressure, etc., sewing machines, calculating machines, electrical instruments, such as meters, electric clocks, automatic telephone systems, etc. The lubricant of the invention is also admirably suited for use in connection with fire arms, particularly in gun barrels and explosion chambers wherein the lubricant serves the dual purpose of removing dirt and powder deposits, as well as providing the desired lubricating film. The lubricant of the invention is characterized by having a low pour point, that is, it will not congeal when cooled to low temperatures. Moreover, the lubricant is free from becoming gummy upon exposure to air, and it is non-corrosive even when used on corrodable metals, such as brass, copper, steel and the like.

Since certain changes may be made in the above product and different embodiments of the invention could be made without departing from

the scope thereof, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention, which as a matter of language might be said to fall therebetween; and that they are intended to be inclusive in scope and not exclusive, in that if desired, other materials may be added to our novel composition of matter herein claimed without departing from the spirit of the invention. Particularly it is to be understood that in said claims, ingredients or components recited in the singular are intended to include compatible mixtures of said ingredients wherever the sense permits.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A lubricant for fine and delicate mechanisms comprising essentially an ester of naphthenic acids.

2. A lubricant for fine and delicate mechanisms comprising essentially a neutral ester of naphthenic acids.

3. A lubricant for fine and delicate mechanisms comprising essentially an ester of naphthenic acids with a polyhydric alcohol.

4. A lubricant for fine and delicate mechanisms comprising essentially a glyceryl naphthenate.

5. A lubricant for fine and delicate mechanisms comprising essentially a glycol naphthenate.

6. A lubricant and cleaner for fire arms comprising an ester of naphthenic acids with a polyhydric alcohol.

7. A lubricant and cleaner for fire arms comprising a glyceryl naphthenate.

8. A lubricant and cleaner for fire arms comprising a glycol naphthenate.

9. A lubricant for fire arms and delicate mechanisms comprising ethylene glycol dinaphthenate.

10. A lubricant for fire arms and delicate mechanisms comprising diethylene glycol dinaphthenate.

KARL T. STEIK.
ROLAND KAPP.