

UNITED STATES PATENT OFFICE

2,269,720

SOLID LUBRICANT

Harry E. Johnson, Willoughby, Ohio, assignor to
The Lubri-Zol Corporation, Cleveland, Ohio, a
corporation of Ohio

No Drawing. Application March 3, 1939,
Serial No. 259,563

7 Claims. (Cl. 252—25)

This invention relates, as indicated, to lubricating compositions, and more particularly to a lubricant which is solid at ordinary temperatures.

There has long been a demand for a lubricating composition suitable for the lubrication of automobile door latches, dove tails of automobile doors, hood lacings, and the like, which will be effective for the purpose and yet suitable for application under all conditions of temperature. Such a lubricant should be of such consistency that it can be formed into sticks for easy handling during application and should not become too hard or brittle in cold weather, nor too soft and plastic in warm weather.

It is, therefore, an object of my invention to provide a lubricating composition having the aforesaid desirable characteristics and which is relatively inexpensive to produce.

It is a further object of my invention to provide a solid lubricant which when applied to door latches, the slides of drawers and the like, will not in a short time flake off or crumble under use but will leave a comparatively dry tenacious lubricating film.

My invention, then, consists of the steps hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain steps embodying the invention, such disclosed steps constituting, however, but one of the various ways in which the principle of the invention may be used.

Briefly stated, my invention comprises the combination of candelilla wax and a lubricating oil in such proportions as to form a solid lubricant suited for use under all normal temperature conditions. By "lubricating oils" I intend to include all such unctuous materials as are suitable for lubricating purposes. Candelilla wax is a vegetable wax obtained in the Mexican region. I have employed a form of this wax known as Candelilla flaked refined wax which has a melting point of 160° F., acid number of 18 and ester number of 36. When combined with a mineral lubricating oil in proper proportions, the solid lubricant resulting from such combination will remain solid and suitable for use in warm weather and yet will not become too brittle at low temperatures. In this it differs from most other waxes, such as paraffin wax. Carnauba, Ceresin and Ozokerite waxes when mixed with mineral oil also produce hard brittle sticks which are generally unsatisfactory. Most solid lubricants when compounded of a wax and a liquid oil have a tendency to become flaky and crumble during use, and hence are of little advantage as lubri-

cants. This is generally due to the fact that the wax crystallizes in the oil and the lubricant loses its homogeneous character. Candelilla wax, on the other hand, will remain properly combined with the oil for an indefinite period.

A further advantage of candelilla wax is its pleasant odor which not only serves for its identification, but also obviates any necessity for the addition of perfuming materials. It is likewise one of the least expensive of the high melting point waxes.

My new lubricating composition may comprise from about 30% to about 60% candelilla wax by weight with the remainder lubricating oil. The viscosity of the lubricating oil may range from 35 to 32000 Saybolt seconds at 100° F. and usually preferably from 100 to 1000 sec. depending on the exact qualities desired in the finished product. Generally the low viscosity oils produce a product which is inclined to crumble while the product formed from high viscosity oils will have a greasy texture. I have found that vegetable or animal or synthetic oils form equally satisfactory products when combined with candelilla wax. The choice of lubricating oil depends upon the cost and exact qualities desired in the finished product, a Mid-Continent Pale oil having a viscosity of 300 seconds Saybolt at 100° F. being generally suitable.

If petroleum jelly or petrolatum be employed as the lubricating oil, candelilla wax may be employed in conjunction therewith in amounts of about 25% to about 60% by weight resulting in a very satisfactory solid lubricant which is sufficiently firm and solid for the purpose desired.

If a mineral lubricating oil be employed, then the quantity of wax to be added may generally range from about 40% to about 60%. Since the resultant product is generally of a slightly brownish color, it may be desirable to add from .1% to 10% of a coloring material such as lithopone or whiting.

A typical formula illustrating the composition of my new solid lubricant is the following:

	Per cent
Double refined candelilla wax.....	54.0
300 pale oil.....	43.5
Lithopone	2.5

A lubricant of the above composition may be employed to produce a stick having a satisfactory melting point and good consistency with reference to stickiness, flaking, etc.

As above pointed out, waxes other than candelilla wax, when employed in combination with

liquid lubricating oils have a tendency to crystallize out therein, thus forming an inferior product. Candelilla wax, however, forms a satisfactory lubricant whether employed in conjunction with a liquid oil or a semi-solid such as petroleum jelly, although in the latter case a smaller proportion of the wax may be employed. The sticks may be formed by melting the wax, adding the oil thereto, and mixing whereupon the lubricant is run into molds for cooling.

If desired, both mineral oil and petrolatum may be employed in the same composition, less candelilla wax being required the larger the proportion of petrolatum employed.

I prefer to incorporate a small amount of lithopone or whiting in all of the compositions of this invention to produce a more attractive article but it is, of course, to be understood that such addition is not necessary.

In addition to mineral oil and petroleum jelly, other oils may be employed in conjunction with candelilla wax, such as "Vaseline," castor oil, and other animal and vegetable oils. Among the advantages resulting from the use of my improved lubricant, the following may be noted:

1. A proper degree of solidity is maintained at varying temperature ranges.
2. The ingredients of the composition remain in homogeneous combination.
3. The lubricant is sufficiently dry to eliminate danger of soiling the hands and clothing during its application or use.
4. The lubricant once applied remains in place and is effective over a long period of time having little or no tendency to become flaky or crumbly during use. This latter applies even when a low viscosity liquid lubricating oil is employed rather than petroleum jelly.

5. Mineral oil may be employed with satisfactory results so that a relatively inexpensive stick is available.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the composition and method herein disclosed, provided the ingredients or steps stated by any of the following claims or the equivalent of such stated ingredients or steps be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A solid lubricating composition comprising in combination petroleum jelly and candelilla wax as the major wax constituent.

2. A lubricating composition comprising in combination from about 30% to about 60% candelilla wax by weight and a lubricating oil.

3. A lubricating composition comprising in combination from about 30% to about 60% candelilla wax by weight and a mineral lubricating oil having a viscosity between 35 and 32000 Saybolt seconds at 100° F.

4. A lubricating composition comprising in combination from about 25% to about 60% candelilla wax by weight and a petroleum jelly.

5. A solid lubricant comprising in combination from about 40% to about 60% by weight of candelilla wax, lubricating oil, and a small amount of lithopone.

6. A solid lubricant comprising in combination candelilla wax as the major wax constituent, petroleum jelly, and lithopone.

7. A solid lubricant comprising in combination candelilla wax as the major wax constituent, mineral oil, and petroleum jelly.

HARRY E. JOHNSON.