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LUBRICANT

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This invention relates to lubricants and it pertains more particularly to plug valve lubricants.

An object of our invention is to provide a lubricant for plug valves which will be insoluble in oils, gasoline, benzene, carbon tetrachloride, ether, etc. This lubricant must not only be insoluble in the liquids with which it comes in contact, but it must tenaciously adhere to the valve and seal it, the property of forming a permanent seal being of the utmost importance. The lubricant must, however, allow the valve to be turned at the temperatures for which it is designed. It is also desirable that the material be non-corrosive, stable, and easily handled. An object of our invention is to provide a valve lubricant having all these properties.

We have discovered that salts of alginic acid are remarkably effective in giving the desired properties to valve lubricants. For instance, a composition of sodium alginate in a polyhydric alcohol such as glycerin or glycol is insoluble in all of the solvents above mentioned, it forms an excellent valve seal, and it does not decompose when it is boiled with naphtha for upwards of seven hours. The composition will not melt even when heated almost to its burning temperature, it will not disintegrate, it may be easily handled and its consistency facilitates easy valve operation throughout the entire temperature range.

Furthermore, the alginate compositions are so inert and non-corrosive that they may be easily handled and are more beneficial than detrimental to the skin. They may be used generally as protective coating compositions against gasoline, carbon tetrachloride, ether, etc.

This invention will be more clearly understood from the following specific formula:

	Percent
Sodium alginate.....	19.0
Glycerin.....	76.0
Water.....	5.0

The sodium alginate cannot be mixed directly with the polyhydric alcohol but we have discovered that it may be incorporated therein by first making an aqueous paste. The sodium alginate is mixed with an excess of water, using about 10 to 15% alginate to 85 or 90% water. Any suitable mixer may be used and the temperature may be anywhere from ordinary room temperature to the boiling point of water, high temperatures being generally preferred. The sodium alginate may be in flake form or in the

finely divided amorphous powder form and when it is incorporated in water it yields a yellowish orange mass which resembles glue in appearance, but which may be readily worked between the fingers like grease. When the alginate has been completely dispersed in water we add the polyhydric alcohol and boil the undesired water out of the mixture. The polyhydric alcohol should, of course, be thoroughly mixed with the aqueous paste, prior to the removal of water. When the proportions are approximately those given in the above formula, the mass may be forced through an orifice to form sticks which may be coated with powdered mica to facilitate handling. These sticks will be as flexible as soft rubber so that they may be easily rolled into spirals or packed into any desired shipping cartons. The material may be easily worked into a paste-like consistency, however, and when it is applied to valves it adheres thereto evenly and tenaciously and at the same time allows the valves to be turned freely.

The amount of sodium alginate in our composition may be as high as 20 to 25% but if 25% is used and the water is removed from the paste, the resulting mass will be too hard for general use. Ordinarily we prefer from 5 to 20% of sodium alginate. A hard lubricant being described in the above example, and a soft lubricant being as follows:

	Percent
Sodium alginate.....	7.2
Polyhydric alcohol.....	82.8
Water.....	10

This lubricant is made up in the same manner as the first mentioned lubricant; the sodium alginate is made up into a 10 or 15% aqueous paste, the paste is mixed with the polyhydric alcohol and excess water is boiled off. This formula yields a lubricant which must be handled like a cup grease but it has the same general properties as the stick lubricant above described.

These lubricants are absolutely unaffected by gasoline, naphtha, benzol, and carbon tetrachloride and they may also be used with chloroform, ether, toluene or monochlor benzene. If an irregular mass of the lubricant is placed in a flask of boiling naphtha and boiled for 6 or 8 hours the mass does not change shape, the naphtha is not discolored and the lubricant has exactly the same properties as it had before being subjected to this test. Furthermore, the lubricant may be heated almost to the burning temperature, without melting and even under this severe

test it does not disintegrate. Even the hard compositions may be readily worked and applied to valves and when so applied they form permanent tight seals which are not impaired by time, temperature, or continued use.

While we prefer to use the sodium alginate-glycerin composition above described we do not limit ourselves thereto and we may incorporate the alginate in other media, in much the same manner as it is incorporated in glycerin. We may use other salts of alginic acid, especially alkali metal salts like potassium alginate. It is practically impossible to remove all of the water from the above compositions and usually it is sufficient if the water content be reduced to about 5 or 10%. We prefer, however, when possible to carry the water content even lower. The hard lubricant is preferably cast into blocks and then, at about room temperature, it is forced through the orifice or die to form sticks, but it is obvious that other forms of the lubricant may be used. We do not limit ourselves to the details above set forth except as defined by the following claims, which should be construed as broadly as the prior art will permit.

We claim:

1. A composition of matter consisting essentially of a salt of alginic acid incorporated in a polyhydric alcohol.
2. A composition of matter consisting essentially of a salt of alginic acid incorporated in glycerin.
3. A method of incorporating a salt of alginic acid in a substantially non-aqueous medium which comprises making a paste of the alginic salts in water, mixing said paste with the non-aqueous medium, and substantially dehydrating the mixture.
4. A lubricant consisting essentially of a small amount, not more than 25%, of an alginic acid salt incorporated in a polyhydric alcohol.
5. A composition of matter consisting essentially of sodium alginate, a polyhydric alcohol, and a small amount of water.
6. A composition of matter consisting essentially of sodium alginate, glycerin, and a small amount of water.

7. A lubricant consisting essentially of about 5 to 20% sodium alginate, 75 to 90% polyhydric alcohol and about 1 to 10% water.

8. A lubricant consisting essentially of a stick of a sodium alginate polyhydric alcohol composition coated with an inert powder.

9. A lubricant consisting essentially of a stick of a sodium alginate polyhydric alcohol composition coated with a powdered mica.

10. A composition of matter consisting essentially of a salt of alginic acid incorporated in glycol.

11. A composition of matter consisting essentially of sodium alginate, glycol, and a small amount of water.

12. A non-corrosive valve lubricant which is insoluble in oils, gasoline, benzene, carbon tetrachloride and ether, which will tenaciously adhere to a valve and seal it and which will allow the valve to be turned, which valve lubricant comprises a pasty composition which will not melt when heated almost to its burning temperature, which will not disintegrate, and which is characterized by approximately the following formula:

Sodium alginate.....	5 to 20%.
Glycerine	75 to 90%.
Water	1 to 10%.

13. A plug valve lubricant which is insoluble in oil, gasoline, benzene, carbon tetrachloride and ether and which has the properties of adhering to and sealing a valve and yet allowing the valve to be freely operated throughout a wide temperature range, which lubricant comprises a composition of matter consisting chiefly of a polyhydric alcohol having a small amount of sodium alginate incorporated therein.

14. A plug valve lubricant comprising a rubbery stick of workable composition adapted to adhere to plug valves and seal the same, which composition is resistant to solution in organic solvents and which consists essentially of a salt of alginic acid incorporated in a polyhydric alcohol containing only a small amount of water.

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