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LUBRICANT

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This invention relates to improvements in lubricating compositions and more particularly to mineral lubricants for use in the presence of alkalies.

It is well known that water solutions of strong alkalies adhere to metal surfaces with a greater free energy of "wetting" than do hydro-carbon oils and grease. This fact accounts for the difficulty encountered in endeavoring to lubricate the moving parts of pumps, valves and the like which are exposed to the alkaline fluid being handled. The hydro-carbon lubricant cannot "wet" the metal part because it cannot penetrate the alkaline film to do so. Consequently, true lubrication of these parts exposed to water solutions of strong alkalies has been impossible.

An object of this invention is to permit lubrication of metal parts having a film of water solution of strong alkali thereon.

Another object of the invention is to utilize chemical reaction of the alkaline film with means incorporated in the lubricant to achieve lubrication of the metal surface.

Another object of the invention is to retain the lubricating properties of the lubricant while imparting the metal "wetting" qualities thereto.

Another object of the invention is to ensure that the lubricant will remain substantially water insoluble.

Other objects and advantages will become apparent from the description of the invention which follows.

I have found that the film of a water solution of strong alkali, such as sodium hydroxide, sodium carbonate and the potassium and other compounds whose water solutions have alkaline reactions can be neutralized and removed from a metal surface by means incorporated within a mineral lubricant. When the alkaline film has thus been removed the lubricant can adhere directly to the metal surface. Suitable neutralizing agents include fats, fatty acids and saponifiable wax. Such agents react with the water solution of alkali on the metal surface to form water soluble soaps and, at the same time, the alkali is neutralized.

It will be apparent, however, that the water soluble soap thus formed must first be removed from the metal surface before the lubricant can adhere directly thereto. If, therefore, a water soluble salt of a metal which forms a water insoluble soap is also included in the lubricating composition it will react with the water soluble soap to form a water insoluble soap which is soluble in the lubricant. Thus the water insoluble soap becomes incorporated in the lubricant which remains substantially water insoluble.

In preparing the lubricating composition a viscous hydro-carbon oil, such as solid petrolatum or other hydro-carbon oil or lubricant prepared from petroleum, coal, coal tar, shale and the like may be used. With this petrolatum may be incorporated about two to five per cent oleic acid. I then include about two per cent solid powdered dehydrated calcium chloride in the mixture and the resulting material will adhere directly to a metal surface previously covered with a water solution of strong alkali.

The oleic acid present reacts with the water solution of alkali on the metal surface to form a water soluble soap and the alkali is thus neutralized. The calcium chloride present reacts with the water soluble soap to form a calcium soap that is water insoluble. As this calcium soap is easily incorporated in the mass of lubricant the composition remains substantially water insoluble. Hence, the metal "wetting" properties of the hydro-carbon lubricant have been greatly enhanced by the addition of the alkali neutralizing agent and the water soluble metal salt.

Other fatty acids may be employed in place of oleic acid, such as stearic or palmitic acid. The fats such as tallow, lard oil or coconut oil are also suitable. A saponifiable wax may be used if desired. Any of the water soluble metal salts beside calcium are suitable, such as barium, magnesium, zinc, lead, aluminum and iron.

From the foregoing it will be apparent that a lubricant, capable of adhering directly to a metal surface in contact with a water solution of strong alkali, has been formed. The composition remains substantially water insoluble and is thus highly effective as a lubricant. It may be used not only in a mass for direct lubrication of moving parts exposed to the wetting effect of alkaline fluids, but has other applications extending its field of usefulness. Among such applications may be mentioned its inclusion in packing of suitable nature, to create what may be termed a neutral area in and about the points of contact with the moving metal parts exposed to water solutions of strong alkalies, whereby the packing can make direct contact with the metal parts and form a satisfactory seal against leakage.

I claim:

1. A lubricating composition for metal parts exposed to water solutions of strong alkalies consisting of a hydro-carbon oil base, and small amounts of oleic acid and dehydrated calcium chloride.

2. A lubricating composition consisting of three to five percent oleic acid, two percent dehydrated calcium chloride, and petrolatum.

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