

UNITED STATES PATENT OFFICE

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OIL COMPOSITION, ETC.

No Drawing.

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This invention relates to improvements in oil and grease compositions and to a treatment of mineral oils and greases and vegetable and animal oils to give compositions of greater stability than ordinary oils and greases.

According to the present invention, there is added to and compounded with the oil or grease composition a small amount of an alkylene diaryl diamine, for example, ethylene diphenyl diamine. The addition of a small amount of such a product materially improves the aging properties of the composition and retards deterioration thereof at high temperatures or under the influence of an electric current and also retards deterioration of the composition when exposed to the action of the air.

When mineral oil lubricants, for example, are used in internal combustion engines, the high temperature to which the oils are subjected results in more or less rapid deterioration with loss of lubricating properties, particularly where air comes in contact with the oils at the same time that they are subjected to heat, and the oils undergo more or less decomposition, with the attendant formation of carbon or sludge-like ingredients. Lubricating oils generally are hydrocarbon oils, although they may have small amounts of vegetable or animal oils compounded therewith. The addition of a small amount of an alkylene diaryl diamine to a lubricating oil used under such conditions tends to stabilize the oil and retard deterioration.

In the case of transformer oils, the addition of a small amount of an alkylene diaryl diamine increases the period of usefulness of the oil and prevents or retards its deterioration. By preventing or retarding the deterioration, the oil may be used over a greater period of time and the expense of frequent replacement, etc., is eliminated. The saving in oil is appreciable and there is a further saving incident to the use of a good grade of oil rather than a partially decomposed oil.

Oils used for saturating cable wrappings are kept at high temperature over a long

deterioration, and further deterioration results from the electrical stresses set up when the cable is in use. The addition of a small amount of an alkylene diaryl diamine stabilizes the saturating oil, giving it longer life and increasing its efficiency as an insulator.

The invention is applicable to vegetable and animal oil compositions containing fatty acids or glycerides, including cutting oils and other compositions containing fatty oils. Cutting oils, for example, may be composed entirely of fatty oils, or of a mixture of animal or vegetable oils and mineral oils. When not stabilized against deterioration, these tend to become rancid rapidly, particularly during use at elevated temperatures. Deterioration produces an undesirable condition in the oil which may cause irritation when the oil comes in contact with the hands or other parts of the body of the workmen. By incorporating in the cutting oil composition a small amount of an alkylene diaryl diamine, it is possible to use a greatly increased amount of fatty oil in the composition and still maintain stability of the composition and its resistance to rancidity.

The stabilizing agents which are added in small amounts to the oils or oil compositions according to my invention are alkylene diaryl diamines. The alkylene diaryl diamines can be obtained by the condensation of alkylene dihalides such as ethylene dichloride with aromatic amines such as aniline, etc. Other alkylene halides containing more than two carbon atoms in the alkylene group can be condensed with aniline or with other aromatic amines, while ethylene dichloride can also be condensed with other aromatic amines besides aniline, for example, toluidine, naphthylamine, etc.

The alkylene diaryl diamine is employed in the oil or fat compositions in small amounts, usually less than one percent, for example, from 0.2 to 0.5 of one percent, although the amount can be increased or decreased.

Example 1.—0.25% of ethylene di-para-tolyldiamine is added to olive oil with stir-

fect by oxygen as the untreated oil and remains sweet under oxidizing conditions which would render ordinary olive oil rancid.

Example 2.—0.5% of ethylene di-para-tol-
yldiamine is gradually added to a refined
mineral oil of specific gravity 0.915 such as
is used for lubricating cable wrappings of
high voltage cables. The oil is heated and is
stirred sufficiently to insure uniform solution
of the amine in the oil. The treated oil has
improved properties as a saturant for cable
wrappings.

The action of the alkylene diaryl diamine
as a stabilizing agent is somewhat obscure
but apparently its value lies in the fact that
it retards oxidation at the elevated tempera-
tures or under electrical conditions to which
the oil compositions are subjected in use, and
particularly where air or oxygen comes into
contact with the oil.

The expression "oil, grease or fat" is used
in the claims to include hydrocarbon oils and
greases and animal or vegetable oils and fats.

I claim:

1. An oil or grease composition compris-
ing an animal or vegetable oil or fat and a
small quantity of an alkylene diaryl diamine.

2. A composition comprising a fatty oil
and a fraction of a percent of an alkylene
diaryl diamine.

3. An animal or vegetable oil or fat con-
taining an alkylene diaryl diamine to pre-
vent or retard decomposition with resulting
rancidity.

4. A vegetable or animal oil composition
comprising a fraction of a percent of ethylene
diphenyl diamine.

5. An oil, grease or fat composition com-
prising in addition to the oil, grease or fat a
small quantity of an alkylene diaryl diamine.

6. An oil, grease or fat composition com-
prising in addition to the oil, grease or fat a
fraction of a percent of ethylene diphenyl
diamine.

In testimony whereof I affix my signature.
WALTER W. EVANS.