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(54) Title: EMULSION COMPOSITIONS

(57) Abstract: The present invention relates to emulsion compositions comprising mineral oil, an oil-soluble polymer and water, to their use as polishes, and to aerosol products comprising these compositions.



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Emulsion Compositions

The present invention relates to emulsion compositions comprising mineral oil, an oil-soluble polymer and water, to their use as polishes, and to
5 aerosol products comprising these compositions.

Polishes are used to produce or restore a glossy finish on various surfaces as well as prolong the useful lives of those surfaces. The appearance enhancement provided by polishes generally results from the presence in the polish of components that leave a glossy coating, and/or
10 materials that smooth and clean surfaces. Floor, furniture, and shoe polishes rely on the deposition of a film.

Significant polish formula changes have occurred in the last decades, motivated by demands for easier use, changes in the composition of the surfaces to be polished, the need for more consistent quality (especially with
15 respect to better durability of synthetic polymer alternatives to natural waxes), and economic factors. The need to buff to achieve gloss was characteristic of earlier formulas. Many modern polishes are self-polishing and impart gloss without having to be buffed, or with minimal buffing.

Modern furniture polishes are designed to be used on a wide variety
20 of surfaces, i.e., plastics, metal, and synthetic and natural resin coatings. Furniture polishes clean, provide protection from abrasion, marring and spills and impart shine.

Furniture polishes contain one or more of three classes of film-forming ingredients, solvents, and various stabilizers:

- 25 1. Natural and synthetic waxes
2. Silicones, whose lubricant properties improve ease of application of the polish. In addition, silicones make the dry film easier to buff and more water-repellent.
3. Mineral oils (or historically a vegetable oil, e.g. linseed oil).
- 30 Solvents facilitate oil-borne detergency, provide the solvency required for a stable formulation of the desired consistency, and control the film drying rate after application.

A key problem, however, associated with any mineral oil based polish is the short duration of gloss, often only 1 or 2 days.

Emulsion polishes may be either oil-in-a-continuous-water-phase (o/w) or water-in-a-continuous-oil phase (w/o) types. Generally, o/w
5 emulsions provide better cleaning properties for water-soluble soils but poorer gloss. For o/w emulsions, ethoxylated, nonionic emulsifiers with high levels of ethoxylation are used. For w/o emulsions, sorbitan esters commonly are used.

There are five different formats of marketed furniture polishes; liquid
10 or paste solvent waxes, clear oil polishes, emulsion oil polishes, emulsion wax polishes, and aerosol or spray polishes.

Of these, aerosol or spray polishes typically contain 20-5 wt % of a silicone polymer, 1-3 wt% wax, 0-30 wt % of a hydrocarbon solvent, and about 1 wt % emulsifier; the remainder is water.

15 EP0839876 describes a coating composition such as an oil-in-water emulsion which contains a stabilising amount of a cross-linked acrylic acid containing polymer, and which gives improved performance in terms of streaking.

US 3392335 describes anhydrous, complex mixtures for use as
20 polishes on wooden floors which comprise a solid film forming macro-molecular compound such as cellulose derivatives, polyvinyl esters or polyvinyl ketals, along with a resin, plasticisers, solvents and silicones. Such polishes give good gloss properties.

WO 03/035783, which is the closest prior art to the present invention,
25 describes a wax-free non-emulsion polish composition made suitable for dispensing as a spray or a mist by means of a non-pressurised spray apparatus comprising a shear-thickening thixotropic thickener.

Surprisingly, we found a way to have mineral oil based polish giving a long lasting gloss by adding an oil soluble polymer to the mineral oil. The
30 gloss thereby conferred lasts much longer (more than 3 weeks) than the gloss given by a standard mineral oil based polish without any such added

polymer. This is thought to be applicable to any type of mineral oil-based polish (aerosols, emulsions, solutions, creams).

The closest prior art composition differs from the present invention in that it is not an emulsion, but is a complex multi-component system for use in
5 a non-pressurised spray, with a viscosity in excess of 100 SUS (Saybolt Universal Seconds) at 100°F. No beneficial properties with respect to longer lasting gloss are disclosed.

The technical effect of these differences is the provision of an emulsion polish which gives longer lasting gloss without the need of multiple
10 component systems and expensive film forming agents, and which is suitable for pressurised spraying such as aerosols.

The objective technical problem solved by the present invention is therefore the provision of an improved emulsion polish composition.

There is accordingly provided an emulsion composition comprising water,
15 mineral oil and an oil soluble polymer wherein:

- the ratio of mineral oil to polymer in wt% is between 99:1 and 30:70;
- the viscosity of the (mineral oil:oil soluble polymer) combination is more than 50cps at 20°C; and
- the viscosity of the emulsion composition is less than 15000 cps at 20°C.

20 For the purpose of the present invention, the term mineral oil is intended to cover all suitable petroleum distillates, especially materials known as mineral oil, mineral spirits, naphthenic oil, isoparaffinic hydrocarbon solvents and mixtures thereof.

By oil soluble, it is meant that the polymer in question can be blended
25 with the mineral oil at a temperature of between 5 and 100°C to yield a substantially clear solution at 20°C which does not separate out over the course of time at a level of from 99:1 wt% to 30:70 wt% in mineral oil.

Viscosity measurements are made using a Brookfield LVDV unit at 20rpm and a No 3 paddle disc.

In a further embodiment of the first aspect of the invention, there is provided an emulsion composition as described above comprising from 10 wt% to 30 wt% of mineral oil.

Preferably, in the emulsion composition hereinbefore described the oil
5 soluble polymer comprises a (tri)block copolymer of ethylene/propylene/styrene or of butylene/ethylene/styrene or a mixture thereof.

For the purpose of the present invention, the term triblock polymer is intended to cover all polymers wherein 3 specified monomer components
10 have been incorporated successfully into the final product by a process which results in relatively long sequences of each monomer unit in the polymer chain. This also covers polymers which further comprise other monomer components in addition to the 3 primary monomer components hereinbefore described.

15 A particularly preferred polymer is a SynergelTM block copolymer available from Penreco.

Preferably, the emulsion composition as hereinbefore described has a ratio of mineral oil to oil-soluble polymer of between 90:10 and 70:30, preferably between 85:15 and 75:25.

20 Without wishing to be bound by theory, it is believed that the technical effect of the present invention derives from a synergy between the mineral oil and the oil-soluble polymer, whereby as the water component of the emulsion evaporates, an fluid oil-polymer mixture remains deposited which on evaporation of a portion of the mineral oil leaves a gel-like mixture of the
25 remaining oil and the polymer. It is this gel which confers the properties of long lasting gloss.

Preferably the emulsion composition when coated onto a surface has a visually perceived gloss remains substantially for more than 3 days, preferably for more than 5 days, more preferably for more than 10 days,
30 especially for more than 15 days.

In an alternative embodiment of the first aspect of the invention, there is provided an emulsion composition as hereinbefore described which further comprises a silicone film forming agent.

5 In a different alternative embodiment of the first aspect of the invention, there is provided an emulsion composition as hereinbefore described which is free of silicone film forming agents.

In a further embodiment of the first aspect of the invention, there is provided an emulsion composition as hereinbefore described which further comprises a hydrocarbon solvent, preferably a solvent with a boiling range
10 under 180°C, more preferably selected from the group comprising aliphatic hydrocarbons, isoparaffinic hydrocarbons, turpentine, white spirit, mineral spirits, or aromatic hydrocarbons. Examples of especially preferred solvents are Exxsol D3135TM and Isopar CTM, available from Exxon Chemicals.

In a further embodiment of the first aspect of the invention, there is
15 provided an emulsion composition as hereinbefore described which further comprises an emulsifier, which may be any of anionic, amphoteric, cationic or nonionic, singly or in combination.

In a further embodiment of the first aspect of the invention, there is provided an emulsion composition as hereinbefore described which further
20 comprises an adjuvant, preferably selected from the group comprising preservatives, fragrances, corrosion inhibitors and colorants.

In a particular embodiment of the first aspect of the invention, there is provided an emulsion composition comprising:

- 10 to 30 wt% mineral oil;
- 25 • 0.1 to 8 wt% oil soluble polymer;
- 0.1 to 10 wt% hydrocarbon solvent;
- 0.01 to 2 wt% emulsifier;
- 0.01 to 2 wt% corrosion inhibitor;
- 0.01 to 0.5 wt% preservative;
- 30 • 0.05 to 2 wt% fragrance; and
- 50 to 90 wt% water.

Preferably, the emulsion composition according to this embodiment comprises:

- 15 to 25 wt% mineral oil;
- 1 to 5 wt% oil soluble polymer;
- 5 • 3 to 8 wt% hydrocarbon solvent;
- 0.1 to 1 wt% emulsifier;
- 0.1 to 1 wt% corrosion inhibitor;
- 0.05 to 0.3 wt% preservative;
- 0.1 to 1 wt% fragrance; and
- 10 • 60 to 80 wt% water.

An especially preferred emulsion composition according to this embodiment comprises:

- 15 to 20 wt% mineral oil;
- 15 • 3 to 5 wt% oil soluble polymer;
- 3 to 7 wt% hydrocarbon solvent;
- 0.4 to 0.8 wt% emulsifier;
- 0.1 to 0.8 wt% corrosion inhibitor;
- 0.05 to 0.2 wt% preservative;
- 20 • 0.1 to 1 wt% fragrance; and
- 65 to 75 wt% water.

In a second aspect of the invention, there is provided a method of preparation of an emulsion composition as hereinbefore described

25 comprising the steps of:

- blend an oil soluble polymer with a mineral oil
- add hydrocarbon solvent if used (and an emulsifier if used)
- add an emulsion blend of preservative and corrosion inhibitor if used
- add fragrance if used
- 30 • add water
- homogenise.

In a third aspect of the invention, there is provided the use of an emulsion composition as hereinbefore described as a polish, preferably as a furniture or wood surface polish.

- 5 In a fourth aspect of the invention, there is provided an aerosol composition comprising an emulsion composition as hereinbefore described and a propellant.

10 In a fifth aspect of the invention, there is provided a spray device comprising an aerosol composition as hereinbefore described in the fourth aspect of the invention.

The invention will now be described further without limitation by the following examples.

Examples

- 15 The ingredients listed in the Table below were formulated into a furniture polish emulsion in the following manner:

- The hydrocarbon solvent and the blend of mineral oil and oil soluble polymer(s) was charged into a vessel and mixed to uniformity at room temperature.
- 20 • The emulsifier and the mineral oil were then added and mixed with the oil phase.
- In a separate vessel, the preservative, the corrosion inhibitor and 3% of the water were charged and mixed to uniformity.
- This mixture was then slowly added into the vessel containing the oil phase at room temperature with agitation.
- 25 • The fragrance and remaining water were finally charged into the main vessel and the emulsion was homogenized at room temperature.

Ingredients		amount in wt%
DI Water		72.2
Corrosion inhibitor	Sodium benzoate	0.5
Surfactant	Sorbitan sesquioleate	0.6
White Mineral oil		0.1
(Mineral oil:oil soluble polymer*) blend	(Parol 70 TM :Synergel M1600 TM)	(17.0:4.2)
Hydrocarbon solvent	Exxsol D3135 TM	5.0
Preservative	Kathon TM	0.1
fragrance	Prolemon 438.483B TM	0.3

- The resulting oil-out furniture emulsion provides a very high and long lasting gloss - after 3 weeks it still gives a very high shine to the surface. The same
- 5 formulation but prepared without the oil soluble polymer only gives a gloss for 2 days.

CLAIMS

1. An emulsion composition comprising water, mineral oil and an oil soluble polymer wherein:
 - the ratio of mineral oil to polymer in wt% is between 99:1 and 30:70;
 - 5 • the viscosity of the (mineral oil:oil soluble polymer) combination is more than 20cps at 20°C; and
 - the viscosity of the emulsion composition is less than 15000 cps at 20°C.
2. An emulsion composition according to claim 1 comprising from 10 wt% to 30 wt% of mineral oil.
- 10 3. An emulsion composition according to either claim 1 or claim 2 wherein the oil soluble polymer comprises a (tri)block copolymer of ethylene/propylene/styrene or of butylene/ethylene/styrene or a mixture thereof.
4. An emulsion composition according to any preceding claim which
15 further comprises a hydrocarbon solvent.
5. An emulsion composition according to any preceding claim which further comprises an emulsifier.
6. An emulsion composition according to any preceding claim wherein the ratio of mineral oil to oil soluble polymer is between 90:10 and 70:30.
- 20 7. An emulsion composition according to any preceding claim which further comprises an adjuvant selected from the group comprising preservatives, fragrances, corrosion inhibitors and colorants.
8. An emulsion composition according to any preceding claim which
25 further comprises a silicone film forming agent.

9. An emulsion composition according to any claim of claims 1 to 7 which is free of silicone film forming agents.
10. An emulsion composition according to any preceding claim comprising:
- 10 to 30 wt% mineral oil;
 - 0.1 to 8 wt% oil soluble polymer;
 - 0.1 to 10 wt% hydrocarbon solvent;
 - 0.01 to 2 wt% emulsifier;
 - 0.01 to 2 wt% corrosion inhibitor;
 - 0.01 to 0.5 wt% preservative;
 - 0.05 to 2 wt% fragrance; and
 - 50 to 90 wt% water.
11. A method of preparation of an emulsion composition according to any preceding claim comprising the steps of:
- blend an oil soluble polymer with a hydrocarbon solvent if used
 - add mineral oil (and an emulsifier if used)
 - add an emulsion blend of preservative and corrosion inhibitor if used
 - add fragrance if used
 - add water
 - homogenise.
12. The use of an emulsion composition according to any of claims 1 to 10 as a furniture or wood surface polish.
13. An aerosol composition comprising an emulsion according to any of claims 1 to 10, and a propellant.
14. A spray device comprising an aerosol composition according to claim 13.