Patented May 25, 1948 2,442,024

UNITED STATES PATENT OFFICE

2,442,024

CLEANING AND POLISHING COMPOSITION

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No Drawing. Application February 15, 1946, Serial No. 648,010

2 Claims. (Cl. 252—166)

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This invention relates to new compositions of matter which are particularly useful for cleaning and polishing the coated metal surfaces of automobile bodies and the like.

One object of this invention is to prepare a cleaner and polish which will readily remove various kinds of soil from coated metal surfaces. A further object of this invention is to manufacture a cleaner and polish which will not corrode the metal surfaces of cans in which it is stored. A still further object is to make a cleaner and polish which will impart a pleasing appearance to surfaces to which it is applied. Other objects will appear hereinafter.

These objects are accomplished in accordance with the present invention by manufacturing a cleaner and polish which comprises an aqueous dispersion having a pH in the range of 6 to 8 and containing a hydrocarbon solvent and an abrasive powder dispersed in the water and also containing a water-insoluble higher aliphatic amine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid and a water-soluble salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid. In formulating such a dispersion, water is used in such quantities that it constitutes at least half by weight of the final composition of the dispersion. The water assists in removing water-soluble soil from the coated metal surfaces of an automobile or the like.

The hydrocarbon solvent which is dispersed in the water may be a light hydrocarbon fraction such as Stoddard solvent although somewhat higher or lower boiling mineral oil fractions may be used if desired. Likewise, hydrocarbon solvents of the aromatic and alicyclic series such as benzene and cyclohexane may be employed, in lieu of or in addition to Stoddard solvent. The hydrocarbon solvent functions in the prepared cleaner to aid in the removal from the coated metal surfaces of greases and similar types of soil that are soluble in hydrocarbon solvents.

The abrasive powder that is dispersed in our new cleaning and polishing composition is usually powdered diatomaceous earth of about 325 mesh, although any suitable abrasive powder that will stay dispersed in water may be used in its place. A colloidal clay such as bentonite may be added to the dispersion along with the diatomaceous earth in order to help retain the diatomaceous earth in a dispersed condition and keep it from settling out. The abrasive powder assists in mechanically removing soil that adheres to the coated metal surfaces that are being cleaned.

In preparing the cleaning and polishing compositions of the present invention it is important to take care that the hydrogen ion concentrations of the dispersions are not too high or too low. If the hydrogen ion concentration of the dispersion is too low, the polish will leave an easily

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markable surface. On the other hand, if the hydrogen ion concentration is too high, the polished surface is not protected from corrosion and any cracks in the paint surface are accentually pictured. It is therefore necessary to maintain the pH of the dispersion somewhere in the range 6 to 8 and preferably about 7. The pH of the dispersion can be suitably adjusted by adding small amounts of suitable acidic or alkaline substances such as trisodium phosphate, ammonium hydroxide or aluminum sulfate. The pH of the dispersion can obviously by suitably adjusted to a desired value by the addition of small amounts of suitable buffer salts.

Various miscellaneous ingredients may be included in the cleaning and polishing compositions of the present invention to accomplish certain particular objectives. A scenting agent may be added to impart the desired odor to the composition. A dye may be added to impart the desired color to the composition. Glycerine or ethylene glycol may be added to the composition to lower its freezing point and to help retain the proper moisture content upon the film of polish applied to a surface. A bactericide such as formaldehyde or phenol may be added to the composition to stop any bacterial action that might otherwise occur. Gums such as gum tragacanth and gum acacia may be used in preparing these dispersions to thicken them and thereby impede any breaking of the dispersions. Surface active agents such as sulfonated castor oil or isopropyl naphthalene sulfonate may also be used in preparing these dispersions since surface active agents will function to stabilize the dispersion.

In order that the surface being cleaned will at the same time be coated with a thin water repellant film it is desirable to include a small amount of a high viscosity mineral oil and/or a wax such as paraffin wax, carnauba wax or a synthetic wax in the composition of the cleaner.

Two of the more important ingredients of the cleaning and polishing compositions of this invention are a water-insoluble higher aliphatic amine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid and a water-soluble salt of 2-ethyl - hexyl, 3-methyl - butyl ortho - phosphoric acid. By the term "higher aliphatic amine salt" we intend to denote a salt prepared from a primary aliphatic amine containing at least 8 carbon atoms. Preferably these higher aliphatic amine salts are made from primary aliphatic amines containing from 10 to 18 carbon atoms such as the normal primary decyl, dodecyl, tetradecyl, hexadecyl and octadecyl amines. Mixtures of these amines may be used such as cocoamine which is a commercial mixture of higher aliphatic amines prepared from coconut oil fatty acids. Cocoamine contains a major amount of primary dodecyl amine, and

typical samples thereof have been found to have average molecular weights ranging from 200 to 210. Among the various water-soluble salts of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid which may be used in these compositions there may be mentioned the sodium, potassium, ammonium, and substituted ammonium salts prepared from such amines as methyl amine, dimethyl amine, trimethyl amine, ethyl amine, ethanol amine, diethanol amine, triethanol amine, propanol amine, etc. Both the water-insoluble higher aliphatic amine salts and the water-soluble salts of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid which are used in the compositions of this invention function as corrosion inhibitors. They prevent corrosion of the cans in which the compositions of the present invention are packaged for commerce.

In preparing the cleaning and polishing compositions of the present invention the first step is to dissolve all of the water-soluble ingredients except the bactericide in the water. Then while agitating the solution the powdered abrasive and colloidal clay are slowly added thereto. Meanwhile all of the water-insoluble ingredients that are soluble in the hydrocarbon solvent are dissolved in said solvent. After all of the powdered abrasive and colloidal clay have been added to the water solution, the hydrocarbon solution of dissolved ingredients is slowly run into the water solution containing dispersed abrasive material while vigorously agitating the water solution in order to cause the hydrocarbon solvent to become emulsified in the water phase. After all of the hydrocarbon solvent has been added to the water phase, the bactericide is added thereto and agitation is continued until the dispersion becomes homogeneous and is ready to be placed in cans.

In applying the cleaning and polishing compositions of the present invention to the coated metal surfaces of automobile bodies and the like, use may be made of a damp cloth, sponge or chamois.

The following examples which illustrate but do not limit the invention give two specific formulations of compositions that are comprehended by the present invention. These examples also indicate tolerable limits within which the amount of any ingredient in the composition may be varied. If the limit of any ingredient to be used is indicated to be "q. s.," that means that only enough of this ingredient is to be used to produce the desired effect such as odor, color or pH. The preferred amount and tolerable limits of any ingredient are stated in the following examples in terms of its percentage by weight of the entire composition.

Example I

Ingredients	Tolerable Limits	Preferred Amount
Water	52–75	64.98
Glycerine	0–4	4.00
Formaldehyde, 40% solution	0.15–0.25	0.25
Sodium salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid	0.001–1.0	0.20
Trisodium phosphate	q. s.	0.05
Diatomaceous earth, 325 mesh	3–20	10.50
Colloidal clay, 300 mesh	0.1–10.0	2.00
Stoddard solvent	5–20	9.90
Mineral oil, 50 S. U. S. at 100° F	5–15	7.90
Scenting agent	q. s.	0.02
Cocoamine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid	0.001–1.0	0.20
		100.00

The composition of this example has a specific gravity (60°/60° F.) of 1.034, a pH of 7, and it does not corrode steel or terne plates with which it has been in contact for twelve days.

Example II

Ingredients	Tolerable Limits	Preferred Amount
Water	52–75	69.152
Formaldehyde, 40% solution	0.15–0.25	0.150
Sodium salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid	0.001–1.0	0.200
Ammonium hydroxide	q. s.	0.023
Gum tragacanth	0.1–0.5	0.150
Sulfonated castor oil	0.1–0.5	0.300
Diatomaceous earth, 325 mesh	3–7	5.000
Colloidal clay, 300 mesh	0.1–10.0	1.000
Stoddard solvent	5–15	11.800
Paraffin Type Naphtha, B. R. 400–500° F.	2–10	8.000
Carnauba wax, No. 3N Country Refined	1–4	2.000
Paraffin wax, melting at 122° F	0.5–2.0	1.000
V. G. Synthetic wax	0.5–1.5	1.000
Gasoline-soluble orange dye	q. s.	0.005
Scenting agent	q. s.	0.020
Cocoamine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid	0.001–1.0	0.200
		100.000

Resort may be had to such modifications and variations as come within the spirit of the invention and the scope of the appended claims.

What we claim is:

1. A composition of matter suitable for cleaning the coated metal surfaces of automobile bodies which comprises a major amount of water, a hydrocarbon solvent dispersed in the water in an amount sufficient to assist in removal of grease and other hydrocarbon soluble soil, an abrasive powder dispersed in the water in an amount sufficient to assist in mechanically removing soil, and small amounts, sufficient to inhibit corrosion, of a water-insoluble higher aliphatic amine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid and a water-soluble salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid, said composition having a pH in the range 6 to 8.

2. A composition of matter suitable for cleaning the coated metal surfaces of automobile bodies which comprises a major amount of water, Stoddard solvent dispersed in the water in an amount sufficient to assist in removal of grease and other hydrocarbon soluble soil, powdered diatomaceous earth dispersed in the water in an amount sufficient to assist in mechanically removing soil, and small amounts, sufficient to inhibit corrosion, of the cocoamine salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid and the sodium salt of 2-ethyl-hexyl, 3-methyl-butyl ortho-phosphoric acid, said composition having a pH of about 7.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,675,227	Reeve	June 26, 1928
2,371,655	Smith	Mar. 20, 1945
2,374,113	Bradley	Apr. 17, 1945

FOREIGN PATENTS

Number	Country	Date
212,439	Great Britain	Mar. 13, 1924