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Lancz

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[54] **INDUSTRIAL CAR WASH COMPOSITION**

[75] Inventor: **Albert Jay Lancz,** Piscataway, N.J.

[73] Assignee: **Colgate-Palmolive Company,** New York, N.Y.

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[58] **Field of Search** ..... 252/525, 527, DIG. 1, 544, 252/89

[56] **References Cited**

UNITED STATES PATENTS

2,867,585	1/1959	Vitale	252/DIG. 1
2,995,523	8/1961	Germann	252/525 X
3,069,360	12/1962	Mankowich	252/DIG. 1
3,156,655	11/1964	Bright	252/DIG. 1
3,222,201	12/1965	Boyle et al.	252/544 X
3,382,178	5/1968	Lissant et al.	252/525 X
3,679,608	7/1972	Aubert	252/527 X

Primary Examiner—Mayer Weinblatt
Assistant Examiner—Edith L. Rollins
Attorney, Agent, or Firm—Arthur N. Gualtieri; Murray M. Grill; Herbert S. Sylvester

[57] **ABSTRACT**

Powder car wash compositions containing a major amount of water soluble builder or mixture of builders and minor amounts of nonionic synthetic detergent and a stabilizing agent.

7 Claims, No Drawings

INDUSTRIAL CAR WASH COMPOSITION

BACKGROUND OF THE INVENTION

This invention relates to a powder composition for automatic and do-it-yourself car washes. More particularly, this invention relates to powder car wash compositions which provide excellent cleaning even without the assistance of a brush and does not separate out when present in a stock solution.

The present invention further relates to a powder car wash composition which does not cake or freeze while remaining in storage.

Automatic and do-it-yourself car washes are those which are usually triggered by depositing a coin in a meter box and the car is then washed automatically or the driver does it himself with simplified equipment. Either system makes use of a pressure jet spray unit. The jet unit is either mounted on a track or comes in the form of a wand which is attached to a hose for easy do-it-yourself use.

Whenever these units do not employ brushes or any means for rubbing the car surface the chemical formulation and the jet spray do the cleaning work. These units typically make use of 100 gallon capacity storage tanks. The powder car wash composition is added to the 100 gallon tank containing water and a stock solution is made thereby containing about 5 to 10 percent by weight of the powder car wash formulation.

According to the current practice in the industry, the storage tanks for the stock solution do not have mechanical stirrers; as a result, if the stock solutions are not used immediately, phase separation occurs, and the cleaning efficiency of the units is greatly reduced.

Since the automatic and do-it-yourself car washes typically prepare their stock solutions with water at temperatures ranging from 120°F to 160°F, even greater separation occurs when the composition includes "low cloud point" nonionics that provide the best cleaning. In addition, many powder car wash products cake on storage in the container in which they are sold.

Examples of the car wash units are those sold under the trade names Livingston's Thrift-T Coin-OP Car Wash System, Autopride Automatic Coin-OP Car Wash, Robo-Wash, and Aceclean Automatic Coin-OP Car Wash to name just a few.

One aspect of the present invention is to provide a novel powder car wash composition which gives highly efficient cleaning of the car surfaces without mechanical assistance.

Another aspect of the present invention is to provide a powder car wash formulation which is stable and does not separate out when made up into a stock solution.

Broadly, the present invention concerns a powder car wash detergent composition comprising a builder or combination of builders, a nonionic surface active agent, and a stabilizing agent for the powder composition.

The present invention is a novel powder car wash detergent composition comprising a major amount of builder typically selected from the group consisting of polyphosphates and carbonates, a nonionic synthetic detergent which is a polyoxethylene fatty alcohol, and a stabilizing agent selected from the group consisting of saturated aliphatic mono-carboxylic acids having eight

to 16 carbon atoms in the chain and amphoteric synthetic detergents selected from the group consisting of derivatives of aliphatic secondary and tertiary amines in which the aliphatic radical can be straight chain or branched and wherein one of the aliphatic substitutes contains from about eight to 18 carbon atoms and one contains an anionic water solubilizing group such as carboxylate.

The builders which can be utilized in the practice of the present invention to give the desired cleaning performance without mechanical assistance of brushes are selected from the group consisting of water soluble carbonates, bicarbonates, borates, phosphates, condensed polyphosphates, silicates, aminopolycarboxylates, and polycarboxylates.

Suitable builders include the alkali metal salts, e.g., sodium and potassium carbonates, bicarbonates, borates, e.g., tetraborates such as borax; phosphates, e.g., tripolyphosphates, pyrophosphates; condensed polyphosphates, e.g., hexametaphosphates; silicates and metasilicates; aminopolycarboxylates, e.g., N-(hydroxy ethyl)-ethylenediaminetriacetate and nitrilotriacetate.

The builder or mixture of builders selected from the group above when employed in the present invention comprises from about 51 to 89 percent by weight of total composition. Preferred builders are tetrasodium pyrophosphate, sodium tripolyphosphate and mixtures of either of these with sodium carbonate (soda ash). When mixtures of the phosphates and carbonate builders are used, the phosphates comprise about 30–80 percent, preferably 40–50 percent and most preferably 40 percent by weight of total composition and the carbonate comprises 0–50 percent and preferably 30–45 percent by weight of the final powder car wash composition. Best cleaning results are obtained with an almost equivalent blend of phosphate and carbonate builders, the blend comprising 70–80 percent by weight of the final composition.

The nonionic synthetic detergents which can be utilized are polyoxyethylene fatty alcohols and polyoxyethylene alkyl phenols. Polyoxethylene alcohols employable in the present invention are the condensation product of aliphatic alcohols having from about six to about 18 carbon atoms, and especially from about 10 to about 15 carbon atoms in a straight chain configuration with from 3 to 15 moles of ethylene oxide per mole of alcohol. Specific nonionics suitable for use in this invention include a dodecyl-tridecyl alcohol/ethylene oxide condensate containing an average of 6.5 moles of ethylene oxide per mole of dodecyl-tridecyl alcohol.

The polyethylene oxide condensates of alkylphenols employable are the condensation products of alkylphenols or dialkylphenols wherein the alkyl group contains from about six to 12 carbon atoms in either a straight chain or branched chain configuration, with ethylene oxide, said ethylene oxide being present in amounts equal to 5–25 moles and preferably 9–15 moles of ethylene oxide per mole of alkylphenol. The alkyl substituent in such compounds may be derived from polymerized propylene, diisobutylene, n-octene, or n-nonene, for example.

Preferred nonionic synthetic detergents are polyoxyethylene straight and branched chain fatty alcohols having 10–15 carbon atoms in the fatty alcohol chain and 5–9 moles of ethylene oxide per mole of alcohol.

The nonionic detergent comprises about 10–30 percent, and more preferably 15–20 percent by weight of the total composition.

The stabilizing agents employed in the invention are those selected from the group consisting of saturated, straight and branched aliphatic monocarboxylic acids having the general formula C_nH_{2n+1} COOH wherein n=7–15, e.g., caprylic, octoic pelargonic, capric, n-undecylic, lauric, n-tridecylic, myristic, n-pentadecylic and palmitic; and amphoteric synthetic detergents described as derivatives of aliphatic secondary and tertiary amines and alkali metal salts thereof, e.g., sodium and potassium, in which the aliphatic radical can be straight chain or branched and wherein one of the aliphatic substituents contains from about eight to about 18 carbon atoms and one contains three carbon atoms and terminates with an anionic water solubilizing group such as a carboxylate. Examples of compounds falling within this definition are sodium 3-dodecylaminopropionate and the partial sodium salt of N-lauryl Beta iminodipropionate.

The stabilizing agents comprise 1–10 percent, preferably 2–8 percent and more preferably 3–5 percent by weight of the total composition.

The following examples illustrate in detail the manner in which the invention can be practiced. However, the invention is not confined to the specific limitations set forth in the individual examples.

A powder detergent composition is prepared according to the following formula shown in Example I:

Example I

Ingredient	% by Weight
Tetrasodium pyrophosphate	40
Soda ash (sodium carbonate)	39
Lauric acid	4
C_{12}–C_{13} fatty alcohol polyethoxylate with 6.5 moles of ethylene oxide/1 mole alcohol*	17
Total materials	100

* A C_{12}–C_{13} linear, primary alcohol ethoxylate marketed under the tradename Neodol 23-6.5 by Shell Chemical Company, Industrial Chemicals Division.

The components were added into a ribbon mixer in the order shown above and homogenized. The powder car wash is then stored in a container ready for use in the car wash units. The powder formulation of this invention does not cake or freeze in the container. A stable stock solution containing this powder car wash formulation is made by adding 5–8 parts of product into 90–92 parts of hot water (120–160°F). Further dilution of the stock solution results in about 0.2–0.3 percent of "use solution" that is directly sprayed on the soiled surfaces.

The cleaning efficacy of the above use solution was obtained when 9 × 9 soiled panels (similar to automotive body surfaces) were tested. The soil ingredients were similar to "road film" components. A simulated laboratory size jet-spray car wash machine was designed specifically for testing the cleaning efficacy of car wash products. Solutions of various formulas were applied to soiled metal plates by means of the laboratory size jet spray. It was observed that the car wash formulation represented by Example I removed the soil more efficiently than most of the car wash products tested.

The car wash stock solution comprises up to 8 percent of the powder car wash formulation and the balance is water. It was found that this stock solution is stable in that there is no settling out of the powder composition. The cleaning composition remains in the stock solution so that maximum cleaning is obtainable. The final cleaning solution contains up to 20 parts of water and one part of stock solution. Other ingredients may be added to the above basic formulation. Examples of some additives would be perfumes, dyes, shine additives such as ethomeens in much more substantial amounts than trace; silicone compounds, etc. Inert fillers may also be added, e.g., sodium chloride or sodium sulfate.

Other car wash compositions exemplative of the present invention are illustrated in Examples 2 and 3.

Example 2

Ingredients	% by Weight
Sodium tripolyphosphate	51
Nonylphenol-9.5 mole ethylene oxide adduct	30
Myristic acid	10
Sodium sulfate	9
	100

Example 3

Ingredients	% by Weight
Sodium silicate	89
C_{12}–C_{15} linear primary alcohol ethoxylate*	10
Palmitic acid	1
	100

*Marketed under the trademark Neodol 25-3 by Shell Chemical Company, Industrial Chemicals Division. There are 3 moles of ethylene oxide for each mole of fatty alcohol.

What is claimed is:

1. A powdered car wash composition for automatic and do-it-yourself car washes which provides a stable car wash stock solution when made up in an aqueous medium and does not cake on storage in a container consisting essentially of from about 51 to 89 percent by weight of a builder selected from the group consisting of water soluble sodium and potassium carbonates, bicarbonates, borates, phosphates, silicates, aminopolycarboxylates and polycarboxylates, from 10 to 30 percent of a nonionic synthetic detergent selected from the group consisting of polyoxyethylene fatty alcohols having from six to 18 carbon atoms and 3–15 moles of ethylene oxides per mole of alcohol and polyoxyethylene alkyl phenols wherein the alkyl group contains from about six to about 12 carbon atoms and 9–15 moles of ethylene oxide per mole of alkyl phenol and from about 1 to about 10 percent by weight of an agent selected from the group consisting of saturated hydrocarbon monocarboxylic acids having eight to 16 carbon atoms in the hydrocarbon chain and amphoteric synthetic detergents which are selected from the group consisting of hydrocarbon secondary and tertiary amines in which the hydrocarbon radical is straight chain or branched and wherein at least one of the hydrocarbon substituents contains from about 8 to about 18 carbon atoms and one contains 3 carbon atoms and terminates with a carboxylate group, said agent stabilizing said car wash composition in an aqueous solution to prevent phase separation.

2. A powder car wash composition according to claim 1 wherein said stabilizing agent is lauric acid.

3. A powder car wash composition according to claim 1 wherein said stabilizing agent is the alkali metal salt of N-lauryl-beta-iminodipropionate.

4. A powder car wash composition according to claim 1 wherein said builder is selected from the group consisting of tetrasodium pyrophosphate, sodium polyphosphate, sodium carbonate, and mixtures thereof.

5. A powder car wash composition according to claim 4 wherein said builder is a mixture of about 1:1 of sodium pyrophosphate and sodium carbonate.

6. An aqueous composition consisting essentially of the powder car wash composition of claim 1 in an aqueous solution, said powder car wash composition is present in the amount up to 8 percent by weight of the total composition.

7. An aqueous composition according to claim 6 wherein said builder is a 1:1 mixture of sodium pyrophosphate and sodium carbonate, said nonionic synthetic detergent is a C_{12} - C_{13} fatty alcohol ethoxylate with 6.5 moles of ethylene oxide per mole of alcohol, and said stabilizing agent is lauric acid.

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