

[54] **PROCESS FOR PREPARING POWDERED
CLEANING AND DETERGENT
COMPOSITION**

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[22] Filed: **July 9, 1973**

[21] Appl. No.: **377,679**

[52] **U.S. Cl.** **252/539**; 252/131; 252/163;
252/259.5; 252/383; 252/385

[51] **Int. Cl.²** **C11D 3/065**

[58] **Field of Search** 252/539, 163, 131, 383,
252/385, 259.5; 106/308 Q

[56] **References Cited**

UNITED STATES PATENTS

3,544,474 12/1970 Shaffer..... 252/259.5 X

3,634,338 1/1972 Laugle et al. 252/539 X

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[57]

ABSTRACT

A process for incorporating pine oil in a dry, powdered cleaning or detergent composition containing various solid components is provided which comprises first contacting the pine oil with a powdered silica sorbing material whereby the pine oil and the sorbing material form a dry, free flowing, non-caking powder and combining the resulting dry, free flowing, non-caking powder with the other various components to form a dry, free flowing, non-caking powdered cleaning or detergent composition comprising pine oil.

8 Claims, No Drawings

PROCESS FOR PREPARING POWDERED CLEANING AND DETERGENT COMPOSITION

Generally stated, the subject matter of the present invention relates to a process for preparing an improved free-flowing powdered detergent or cleaning composition. More particularly, it relates to a method for the preparation of free-flowing powdered cleaning or detergent compositions, both abrasive and non-abrasive, which contain pine oil. The process involves incorporating in the composition of a highly porous sorbing material on which the liquid has been sorbed.

BACKGROUND OF THE INVENTION

Conventional powdered cleaning compositions often tend to cake and become non-free flowing and lumpy. In commercial cleaning preparations the tendency of various materials to cake under adverse atmospheric conditions becomes a serious problem. Various means have been used to overcome this tendency by incorporating additives such as chalk, talc, silica, and the like. These attempts have been successful to a limited degree.

It sometimes becomes desirable to include liquid materials in such dry powder cleaning formulations. These are especially useful in cleaning compositions intended for hard surfaces; however, inclusion of a liquid in any substantial quantity in a cleaning composition is materially limited since the composition has a tendency to cake and become non-free flowing.

The present invention represents the culmination of a long series of investigations, conducted largely by the inventors, directed to finding a process for incorporating large quantities of pine oil in dry powdered cleaning or detergent compositions.

Accordingly, it is a primary object of the present invention to provide a process for incorporating pine oil in dry powdered cleaning or detergent compositions.

Another object of the invention is to provide a process for preparing free flowing non-caking dry powdered cleaning or detergent compositions comprising pine oil.

Generally then, it is an object of this invention to provide a process for preparing an improved free flowing, non-caking, dry powdered cleaning or detergent composition comprising pine oil.

Additional objects and advantages of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or may be realized by practice of the invention, the objects and advantages being realized and attained by means of the methods, processes, instrumentalities and combinations particularly pointed out in the appended claims.

THE INVENTION

To achieve the foregoing objects and in accordance with its purpose, as embodied and broadly described, the present invention relates to a process for incorporating pine oil in a dry powdered cleaning or detergent composition containing various solid components which comprises first contacting the pine oil with a powdered silica sorbing material whereby the pine oil and the sorbing material form a dry, free flowing powder and combining said resulting dry, free flowing powder with the other various components to form a dry, free flowing, non-caking powdered cleaning or detergent composition comprising pine oil.

The present invention is based on a method for incorporating substantial quantities of pine oil in dry, powdered cleaning and detergent formulations. This includes both conventional cleaning powders to be used as dispersions in water; and powdered scouring cleanser compositions used where a minimum amount of water is involved.

The method involves first the preparation of a combination of pine oil on a sorbing material followed by incorporating the resulting product into the cleaning formulation. Thus, by the use of the proper sorbing material a relatively large amount of pine oil may be incorporated in the cleaning formulation. The use of a powdered silica sorbing material in the process of the invention is not to be confused with the use of such materials or related materials in powdered cleaning compositions for the sole purpose of maintaining a free-flowing condition and to prevent caking. The use here of such sorbing materials affords a means of incorporating substantial quantities of pine oil into the cleansing composition.

From time to time it is desirable to include various liquid components in cleaning compositions including pine oil. However, the addition of pine oil in substantial quantities is not possible because of caking tendencies. The use of pine oil in cleaning and detergent compositions has thus been limited to liquid formulations.

The sorbing materials useful in the process of the invention include various types of finely divided and high surface area silica and metal silicates in various forms. These include for example porous calcium silicates, available commercially, as Micro-Cel E and Silene EF, fumed silicas available commercially as Cab-O-Sil; silica gels available commercially as Syloid Silicas and fume silicon dioxide available commercially as Silanox 101.

The particle size of these sorbing agents may vary from about 0.007 to 0.05 or more microns, while surface area may vary from about 95 to about 600 or more square meters per gram. A preferred sorbing agent is synthetic calcium silicate available commercially as Micro Cel E with a surface area of about 95-180 square meters per gram.

In the preparation of a solid free-flowing cleaning composition pine oil is first sorbed into a calcium silicate which may take up as much as two parts of pine oil with one part of calcium silicate. This process is also useful for incorporating kerosene in powdered cleaning or detergent compositions.

The resulting free-flowing powder is then incorporated with the conventional components of the powdered cleaning composition including for example, sodium carbonate, a synthetic detergent such as sodium dodecylbenzene sulfonate, borax, etc.

In formulations which are intended for use dissolved or dispersed in water, the pine oil is released as a liquid from the sorbing material when the mixture is placed in water.

In those compositions for abrasive use such as scouring cleansers, the pine oil in the composition containing the abrasive is released during the cleaning process.

It will be apparent that depending on the amount of the sorbing material containing the liquid which is incorporated into the cleaning composition a wide range of concentration of the liquid may be achieved. In some instances the liquid portion may be a substantial part of the composition; in other instances it may be desirable

to have the liquid component present only in a minor proportion in some instances even only for purposes of scenting the composition. In most instances the total concentration of pine oil present in the composition is approximately 2 percent by weight, while the concentration of sorbing material is approximately 1.25 percent by weight.

The following examples are provided for illustrative purposes and may include particular features of the invention. However, the examples should not be construed as limiting the invention, many variations of which are possible without departing from the spirit or scope thereof.

EXAMPLE I

A cleaning composition intended for use by dissolving or dispersing in water and thereupon applied for the cleaning of hard surfaces, was prepared using the materials listed below. The pine oil was first sorbed onto synthetic calcium silicate with a high surface area resulting in a composition containing about two parts pine oil per 1.25 parts of the calcium silicate. This powder was then incorporated with other conventionally used components of a cleaning composition to give a formulation with the following composition:

	Weight %
Sodium sesquicarbonate (FMC grade 800)	64.00
Sodium metasilicate (Mesto beads 2048)	5.00
Soda ash (Stauffer No. 13-17 "Lite")	15.05
Sodium dodecylbenzene sulfonate (Richonate P-85)	1.00
Sodium glucoheptonate (AC Belzak)	5.00
Borax, anhydrous	1.70
Protective Colloid Polymer (Gantrez AN-149, GAF)	5.00
Pine Oil (Union Camp - Unipine 80)	2.00
Synthetic calcium silicate (Micro-Cel E)	1.25
	100.00%

The resulting composition was a free-flowing, powder, with a non-caking characteristic under various atmospheric conditions, and which when added to water evidenced the results of the pine oil being released from the sorbed material.

EXAMPLE II

Using a procedure similar to that described in Example I, 20 parts of pine oil was sorbed into 12.50 parts of synthetic calcium silicate. This was used to prepare a solid cleaning composition of the formulation:

	Weight %
Sodium sesquicarbonate	44.50
Sodium metasilicate	3.90
Soda ash	9.30
Sodium dodecylbenzene sulfonate	0.70
Sodium glucoheptonate	3.90
Borax, anhydrous	1.30
Protective Colloid Polymer (Gantrez AN-149, GAF)	3.90
Pine oil	20.00
Synthetic Calcium silicate (Micro-Cel E)	12.50

The resulting composition was a non-caking, free flowing powder.

EXAMPLE III

Using a procedure similar to that described in Example I, 20 parts of deodorized kerosene was sorbed into 12 parts of synthetic calcium silicate. This was used to prepare a solid cleaning composition of the formulation:

	Weight %
Sodium sesquicarbonate	42.00
Sodium Tripolyphosphate	21.00
Trisodium phosphate, anhydrous	3.00
Sodium dodecylbenzene sulfonate	1.50
Deodorized kerosene	20.00
Synthetic calcium silicate (Micro-Cel E)	12.50

The resulting composition was a non-caking free flowing powder.

EXAMPLE IV

Using a procedure similar to that described in Example I, 35 parts of pine oil was sorbed into 15 parts fumed silica. This was used to prepare a solid cleaning composition of the formulation:

	Weight %
Pine oil	35.00
Fumed Silica (Cab-O-Sil M-5)	15.00
Soda ash	21.00
Potassium Tripolyphosphate	25.00
Sodium dodecylbenzene sulfonate	4.00

The resulting composition was a non-caking, free flowing powder.

EXAMPLE V

A scouring cleanser composition for scouring hard surfaces using a minimum of water was prepared using the materials as listed below.

Using a procedure similar to that described in Example I, 2 parts of pine oil was sorbed into 1.25 parts synthetic calcium silicate. This was used to prepare a solid cleaning composition of the formulation:

	Weight %
Chlorinated trisodium phosphate	15.00
Silicon dioxide	73.75
Synthetic calcium silicate (Micro-Cel E)	1.25
Pine oil	2.00
Sodium dodecylbenzene sulfonate	2.00
Sodium tripolyphosphate	6.00

The resulting composition was a non-caking, free flowing powder.

EXAMPLE VI

A scouring cleanser composition for scouring hard surfaces using a minimum of water was prepared using the materials as listed below.

Using a procedure similar to that described in Example I, 5 parts of pine oil was sorbed into 3.25 parts amorphous silica gel. This was used to prepare a solid cleaning composition of the formulation:

	Weight %
Soda ash	5.00
Sodium dodecylbenzene sulfonate	2.38
Silicon dioxide	83.32
Pigment	0.05
Sodium metasilicate, anhydrous	1.00
Pine oil	5.00
Amorphous Silica Gel (Syloid 244, W. R. Grace, fine particle size amorphous silica gel)	3.25

The resulting composition was a non-caking, free flowing powder.

We claim:

1. A process for incorporating pine oil in a dry, powdered cleaning or detergent composition containing

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various solid components which comprises first contacting the pine oil with a powdered silica sorbing material having a particle size of from about 0.007 to 0.05 microns and a surface area of from about 95 to about 600 square meters per gram, the amount of pine oil being up to about two times by weight as the amount of silica, whereby the pine oil and the sorbing material form a dry, free flowing, non-caking powder and combining the resulting dry, free flowing, non-caking powder with the other various components to form a dry, free flowing, non-caking powdered cleaning or detergent composition comprising pine oil.

2. The process according to claim 1 wherein the silica sorbing material is calcium silicate.

3. The process according to claim 1 wherein the pine

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oil is present in a concentration of about 2 percent by weight of the total composition.

4. The process according to claim 2 wherein the calcium silicate is present in a concentration of about 1.25 percent by weight of the total composition.

5. The process according to claim 1 wherein kerosene is substituted for pine oil.

6. The process according to claim 1 wherein the silica sorbing material is fumed silica.

7. The process according to claim 1 wherein the silica sorbing material is amorphous silica gel.

8. A cleaning or detergent composition produced by the process of claim 1.

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