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DETERGENT COMPOSITION AND PROCESS OF MAKING SAME

Samuel J. Miller, Boris Sway, and Edward P. Breckel, Cincinnati, Ohio, assignors to The Du Bois Soap Company, Cincinnati, Ohio, a corporation of Ohio

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This invention is directed to a detergent composition. More particularly, this invention relates to a cleaning composition which, when used with water on a dirty surface, causes saponification, emulsification, and absorption of the dirt to take place in situ.

It is frequently a problem to remove heavy dirt accumulations from surfaces which are adversely affected by harsh chemicals or severe treatment. As an example, it may be desired to clean a painted or a tile floor, where greases, oils, and dirt have accumulated. Obviously, strong alkalies in conjunction with soap, which would ordinarily be used to saponify and emulsify dirt components, are definitely undesirable because the surface might be adversely affected. Under such circumstances, prolonged scrubbing might be the only way of cleaning the surfaces, but such a procedure is not only time-consuming, but also tends to injure many surfaces physically.

There are, to the contrary, many instances where strong chemical solutions may be safely used to effect the removal of greases and oils through emulsification. Generally, however, the emulsions formed by such treatment are not highly stable, and when the surfaces so treated are rinsed, the rinse water disturbs the balance of the emulsion and causes the unsaponified components to drop from the emulsion and redeposit on the surface.

It is therefore the object of this invention to provide a detergent composition characterized by the power to emulsify oily and greasy soil when used in combination with water and likewise characterized by the capacity to hold said soil in suspension upon dilution of the emulsion with rinse water.

It is another object of this invention to provide a method of compounding the component liquid and powdered materials to obtain a granular detergent material capable of performing the specified functions.

Another object of this invention is to provide an efficient cleansing composition which is effective against soils difficultly removable, and which does not affect painted, glazed, or varnished surfaces.

The detergent of this invention comprises a material adapted to emulsify heavy, oily, or greasy soil in water and a material adapted to absorb soil of this type from the emulsion so constituted so that the soil is not redeposited on the surfaces being cleaned when the initial emulsion is diluted with rinse water and the concentration of emulsifying agent thereby diminished.

When this detergent is used in cleansing a surface, the gradual absorption of the soil from the emulsion augments the capacity of the detergent to reduce additional soil to emulsified condition. In order to secure the full benefits of this invention, it is requisite that the absorbing agent possess greater affinity for the soil than the combination of the emulsifying agent and water.

The alkalinity of the detergent composition may be adjusted to suit the requirements of the intended preferred use. Generally speaking, alkalinity increases the cleaning action, but, inasmuch as the effectiveness of this detergent is not dependent upon alkalinity alone, its alkaline strength may be materially reduced in comparison to that which would be normally required to accomplish the intended cleaning operation.

Therefore, a still further object of this invention is to provide in a cleansing composition an absorbent material in conjunction with emulsifying and saponifying materials, with the same proportioned whereby preferential absorption occurs to regenerate the emulsifying bodies.

Concisely, we have found that if cresylic acid, diethylene glycol, soap, an alkali or alkaline salt, and colloidal earth be compounded, each ingredient will cooperatively interact with the others to produce a highly efficient peptizing detergent composition, which exhibits effective prolonged activity in respect to difficultly removable types of dirt.

When added to water, a detergent material of this type produces an emulsion or suspension of its ingredients in the water. The suspension thus created exhibits high wetting power in relation to the dirt components. This initial emulsion or suspension has the power of emulsifying or suspending the soil and also the power of absorbing the soil thus emulsified or suspended. The latter action tends to regenerate the initial emulsion or suspension.

Cresylic acid is an effective cleanser and an excellent disinfectant but is substantially insoluble in water, so that its usefulness is greatly limited. For example, cresylic acid alone, in addition to being highly corrosive to the skin, is not practical as a cleansing agent. In conjunction with an agent such as diethylene glycol, the utility of cresylic acid as a cleanser is greatly enhanced, in that it may be emulsified or suspended in water and brought into wetting contact with the oils, greases, and soil, and rinsed freely without deposition of a residual film.

In conjunction, cresylic acid and an emulsifying agent cooperate to dissolve and emulsify the usual greasy and oily constituents which bind soil to

a surface. Alone or in conjunction, however, the potency of these ingredients rapidly diminishes in that, as the initial emulsion or suspension becomes saturated with the soil, the peptizing action of the composition is reduced.

We have found that if an absorbent earth be used in conjunction with these two materials, the earth preferentially absorbs the dirt constituents, especially the greases, oils, and fatty bodies, from the emulsion, and holds the same without being affected by rinse water. This interaction between the emulsion and the earth causes the dirt components to be passed from the former to the latter, with the result that the emulsion forming and cleansing constituents of the detergent are not rapidly rendered impotent, but are regenerated for further usefulness at the surface to be cleaned.

The absorbent earth preferred for use in the composition is natural hydrated aluminum silicate, which has been purified by the usual process of washing in water or acid, or floating, or air blowing. The size of the particles is preferably at least 200 mesh or smaller, since the effectiveness of the earth is based on surface area per unit of weight. Other types of absorbent earths may be used, such as diatomaceous earth or bentonite.

Fatty acid soap and alkali or alkali-yielding salts are preferably used in combination with the specified ingredients to render the composition effective in relation to the greatest possible range of dirt and soil.

A specific example of one such composition is as follows:

	Per cent
Powdered soap, of which 20% is soap, 40% is water, 40% is sodium carbonate	25
Cresylic acid	5
Diethylene glycol	3
Trisodium phosphate	40
Absorbent earth	27

In the example it will be noted that the relationship of diethylene glycol to cresylic acid to absorbent earth is one part to one and two-thirds parts to nine parts respectively. The percentage of each of the components, diethylene glycol, cresylic acid, and absorbent earth, in relation to the total weight of the detergent, may be varied with considerable latitude for most purposes. However, it is desirable for best results that the ratio which the components, diethylene glycol, cresylic acid, and absorbent earth have to one another be maintained within certain limits. Thus, the maximum inter-component ratio is substantially one part of diethylene glycol to four parts of cresylic acid to twenty parts of absorbent earth. Likewise, the minimum inter-component ratio is substantially one part of diethylene glycol to one part of cresylic acid to five parts of absorbent earth.

In the composition, coal tar acid oils may be substituted for cresylic acid or its homologues may be used. In the place of the trisodium phosphate disclosed, sodium metasilicate, soda ash, sodium hydroxide, or a similar alkaline material may be used. Glycerine or the cyclohexanols may be used as substitutes for the diethylene glycol.

The conjoint action and interaction of the diethylene glycol, the cresylic acid and the colloidal earth are greatly enhanced by their incorporation in the above-stated proportions, too great variations from these proportions tending to reduce the unique cleaning action otherwise obtainable.

Our cleaner or detergent with the stated proportions of ingredients, is different from the usual caustic alkali cleaners in that it is not dangerous to the user or harmful to finished surfaces, and in that it will loosen, emulsify, and absorb dirt from badly soiled surfaces without leaving any residual deposit or film. Our detergent is highly useful in such specific uses as the cleaning of garage floors, kitchen floors, lavatories, showers and swimming pools, motor blocks, engine and boiler room floors, machine parts, oil tank trucks, and the like.

At the present time the users of cleaning materials have a very decided preference for detergents which are in granular condition because materials of this type can be used with the greatest ease and quickness and with the least waste. It is therefore highly desirable that the ingredients of the composition of this invention be compounded to provide a granular body as distinguished from a cake or paste.

In compounding the ingredients stated in the example, the absorbent earth is placed in a mixing tumbler and agitated, while a mixture of the liquid components is sprinkled over it. The agitation is continued until the mixture is free from lumps. The trisodium phosphate or alkali are next added and the mixing continued. Finally the soap powder is added, and the material further mixed until it is of uniform consistency. The composition so compounded is granular and may be easily handled and used.

In summary, the preferred detergent of this invention is a granular body adapted to be used with water for heavy cleaning purposes and comprises a material of the type of cresylic acid possessed of peptizing power in relation to the soil, a material of the glycerin type which has the property of peptizing the cresylic acid in respect to water, and an absorbent material, such as colloidal clay, which has the power to take up suspended or emulsified soil or dirt, particularly heavy mineral oil and the like.

Having described our invention, we claim:

1. A powdered granular detergent composition, comprising, substantially, 25% soap powder, 5% cresylic acid, 3% diethylene glycol, 40% of trisodium phosphate, and 27% absorbent earth.

2. The process of obtaining a free flowing granular detergent composition, which process comprises, sprinkling diethylene glycol and cresylic acid over absorbent earth, while the latter is being agitated, until a ratio substantially from one part diethylene glycol, one part cresylic acid and five parts absorbent earth to one part diethylene glycol, four parts cresylic acid and twenty parts absorbent earth is obtained, then adding soap powder and water soluble alkali and further agitating the intermixture to obtain a composition of uniform granular consistency.

3. A free flowing granular detergent composition, comprising, water soluble fatty acid soap, cresylic acid, diethylene glycol, and an alkali selected from the group consisting of trisodium phosphate, sodium metasilicate, soda ash and sodium hydroxide, and an absorbent earth, the intercomponent ratio between the diethylene glycol and cresylic acid and absorbent earth of said composition extending from substantially one part to one part to five parts respectively, to one part to four parts to twenty parts respectively.

4. A detergent composition in which the constituting components comprise soap powder, diethylene glycol, cresylic acid and absorbent earth,

in which composition the ratio of diethylene glycol to cresylic acid to absorbent earth is within the range of approximately one part to one part to 5 parts respectively, to one part to four parts to twenty parts respectively, the said composition adapted to be used with water to render the cresylic acid and diethylene glycol effective for peptizing and dirt liberation, the absorbent earth effective to sequester the dirt liberated and regenerate the diethylene glycol and cresylic acid for further peptizing action.

SAMUEL J. MILLER.
BORIS SWAY.
EDWARD P. BRECKEL.