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COATING COMPOUNDS

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This invention relates to surfacing materials, and more particularly to compounds which may be used as decorative or filling coatings upon buildings, walls, ceilings or other surfaces, and particularly upon Portland cement-containing surfaces. This application is a continuation-in-part of my co-pending application Serial No. 517,909, filed June 24, 1955.

In various kinds of concrete and concrete block construction, efforts have been made to apply paint, or even wall paper, directly on the concrete surfaces with unsatisfactory results. The materials in the concrete attack the paint and its ingredients are saponified; in the case of wall paper the paste is destroyed and the results are short-lived and unsatisfactory. Moreover, the rough concrete surfaces provide depressions which form air spaces and when paint is applied over them, bubbles bridging these air spaces result, and the film of paint that forms these bubbles ruptures, causing a spotty effect on the wall. It is therefore apparent that a surfacing treatment for concrete surfaces prior to the application of paint or wall paper, is a necessity.

It is therefore an object of the present invention to provide such a surfacing material and a method of applying it, and by which the surfaces will be made smooth and uniform in appearance and over which decorative materials may be applied with satisfaction and superior results generally achieved.

In my Patent No. 2,700,615, dated January 25, 1955, is disclosed a filler, marketed under the name of "K-B" coating, and which chiefly consists of a water soluble cellulose derivative employed as a binder, and with chalk and graded sand material utilized as a filler, and which material, when spread on the concrete surface, was found to fill the depressions therein, thus resulting in a surface suitable for subsequent treatment. I have now ascertained that when a filler such as that above described is employed as a primary coating, the addition of an inorganic material, which mainly has a grain size larger than the grain size of the material in the "K-B" coating, results in a most complete filling in of the surface depressions or irregularities with a resultant better effect than is secured by other preparations and methods of surfacing. A great deal of the satisfactory results attained are undoubtedly due to the fact that upon the application of the surfacing material the large grains of the inorganic filler are forced into the surface depressions when the material is smoothed on and air in such depressions is thus forced out. As a result, the subsequently-applied paint is free from spots and presents a uniform appearance.

In the application of the improved surfacing material to a surface, I have found that the best results are obtained by the use of a suitable smoothing tool, an example of one found most satisfactory being a flat-surfaced, cork-faced tool which may be of slab-like form. When the applied material is smoothed over a surface with a tool of this character, the coarse grains of the

compound serve as "ball-bearings" during the smoothing operation. The moist basic compound does not adhere to the tool and a film is obtained in which the fine-graded basic compound lies in a relatively smooth and dense layer between the coarse grains and their rubbing marks. The applied layer is mainly of the some thickness as the diameter of the coarse grains.

Experiments have indicated that various kinds of binders, such as drying oils, silicones, varnishes or solutions of resins, plastics and others can be incorporated in a compound manufactured in accordance with this invention. Emulsions based on polyvinyl acetate, polyvinyl chloride acetate, styrenebutadienstyrene, acrylate, alkyd, linseed oil, oil varnishes, and in fact most materials used for surface treatment can be added without difficulty. Small quantities of suitable binders favorably affect the resistance to water and mechanical stresses.

When priming the green concrete with the compound, the compound can, if desired be treated with a pigment, the pigment used being not necessarily cement and lime resistant, since the foundation of the compound is sufficiently insulative and protective against relative green concrete. Thus, it is possible to inexpensively obtain tints covering a wider range than was formerly possible.

I have found that a mixture of oil in water and water in oil emulsions provide a suitable binder combination for the compound. This makes it possible to readily adapt the compound to different methods of treatment and to dilute it both with water and also/or a solvent, such as turpentine. Increasing the quantity of the water in oil emulsion provides stopping and filling qualities, good flow and ease of handling, particularly when its consistency is thick.

Below are given some examples of the composition of the new compound:

Example 1

10–20 parts by weight K-B coating
0.2–2 parts by weight water
5–15 parts by weight broken marble
0.1–1 part by weight cork powder

If the above compound is to be used for example, for repair work, 1 to 20 parts of cement or gypsum can be added just prior to use.

Example 2

10–20 parts by weight K-B coating
0.2–2 parts by weight water
5–15 parts by weight polyvinyl acetate emulsion
5–15 parts by weight broken marble

Cement can be added prior to use if the compound is to be used, for example, for repair work or as a primer.

Example 3

10–20 parts by weight K-B coating having a grain size as graded below
0.2–5 parts by weight alkyd emulsion of oil in water type
0.1–2 parts by weight alkyd emulsion of water in oil type
5–15 parts by weight broken marble having a grain size as graded below

For use in repair work and for leveling uneven surfaces, such materials as wood dust, asbestos fibre or cellulose powder can be added.

Example 4

10–15 parts by weight filler of the same grain size as in the K-B coating
0.2–7 parts by weight polyvinyl acetate emulsion
5–15 parts by weight broken marble of a grain size specified below
1–5% of a consistency improving agent, for example, an animal or vegetable glue, casein solution, etc.

Examples of the filler grain size in the K-B coating

	Percent
0.3 mm	0
0.150–0.300 mm	30–80
0.075–0.150 mm	20–50
0.075 mm	20–50

The graded sand may be mixed as follows:

3–8 parts methyl cellulose (dry)
100–150 parts suspended chalk
200–300 parts graded sand
3–20 parts pumice stone No. 3
80–150 parts water

Examples of the grading of broken marble

	Percent
0.5–1.0 mm	60
0.3–0.5 mm	40

When using coatings such as the K-B coating containing fillers ranging in grain size from 0.0005 to 0.8 mm. the size of the filler grains of the present invention should differ from those in the K-B coating to the extent that they are, for example, approximately 0.1 to 0.2 millimeter larger, preferably 0.2 mm. larger than the grain size in the K-B coating. If in the K-B coating the maximum grain size of the filler is 0.8 mm. the grain size of the extra large fillers may be approximately 1.00 mm. or 0.2 larger than the grain in the K-B coating.

A surface treated in accordance with Examples 1, 2, 3 and 4 was white without covering white pigment or requiring it to be contained in the composition. The coarse filler grains and the subsequent treatment with a cork slab or similar tool produced abrasion marks on the surface and which resulted in shadows and a depth effect which enhanced the appearance of the surface by giving life and texture thereto. By adding to the compound such binders as water in oil and oil in water emulsions, the quality, appearance and ease of handling of the compound can be affected. For example, by adding both oil in water and water in oil emulsions such as modified alkyd, the compound can be diluted both with water and solvents such as turpentine. A high percentage of water in oil emulsion provides good brushing qualities while retaining perfect filling and leveling properties.

The nature of the compound is such that it may be applied in various ways, particularly when made as just stated, such as by spraying, painting, filling, rolling or other methods. With the inclusion of a pigment, any desired tint may be achieved, and particularly when the pigment is ground into the filler, such as linseed oil and/or wetting agents such as soy lecithin. The use of such a paste permits the colored compound to be mixed at the site without employing expensive mixers.

In the subsequent smoothing of the applied pigment-containing compound with a suitable tool, such as a cork slab or a cork-surfaced pad, the pigment will be ground into and distributed throughout the compound in a manner more effective than mechanical mixture into the compound prior to its application to a surface. The coarser filler grains on the surface, and which can consist of quartz, glass, marble, etc., and which are more or less transparent or translucent, are to some extent not covered with the pigment, and combined with the finer-grained filler which may also be transparent, give effects of refraction. It is not possible to achieve this result with the usual covering paint. With the present compound

in which a pigment is incorporated, the luminescent effect is so marked that the paint appears luminous. It is, of course, possible to secure even greater luminosity by the addition of luminous paint. When the compound is applied to a wall surface by a tool as above described, the coarser particles in the mixture act as spacing elements between the surface of the tool and the surface of the wall and they thus tend to define the thickness of the spread layer.

It will be clear from the foregoing that the compound provides a coating or paint which consists of a relatively fine-grained, preferably graded, inorganic and/or organic binder, such as water soluble cellulose derivatives, plastics, oils, oil in water and water in oil emulsions, characterized by the fact that the compound contains material grains of a larger size distinguishing them from the size of the grains of the substances used as basic material. It is desirable that there be a difference in the grain size of at least 0.1 mm. between the inorganic graded fillers of the basic material and the added coarse inorganic filler. The quantity of the inorganic filler must be at least 5 percent of the weight of the total compound.

While it is herein suggested that the improved compound is particularly adapted for use on concrete surfaces, it can also be effectively used on other surfaces, such as those of wall board, glass and many others.

What I claim is:

1. A coating compound capable of use as an exterior decorative paint coating on Portland cement-containing and like surfaces, said compound consisting essentially of a mixture of a water-soluble cellulose derivative as a binder, relatively fine-grained inorganic filler material graded in size, and relatively coarse-grained inorganic filler material graded in size, said coarse-grained material constituting at least 5% by weight of the compound, said fine-grained material being composed of particles of sizes in the range of from 0.0005 to 0.8 millimeter, and said coarse-grained material being composed essentially of particles which are in the order of 0.1 to 0.2 millimeter larger than the largest size particles in said fine-grained filler portion.

2. A coating compound as defined in claim 1, wherein the size grading of said fine-grained filler material is approximately as follows:

	Percent by weight
0.3 mm	0
0.150 to 0.300 mm	30 to 80
0.075 to 0.150 mm	20 to 50
0.075 mm	20 to 50

3. A coating compound as defined in claim 1, wherein the size grading of said coarse-grained filler material is approximately as follows:

	Percent by weight
0.5 to 1.0 mm	60
0.3 to 0.5 mm	40

4. A coating compound as defined in claim 1, containing also fine-grained organic filler material in an amount of from about one-fifteenth to one-fifth the amount of said coarse-grained inorganic filler material.

5. A coating compound as defined in claim 1, containing also a mixture of a water-in-oil emulsion and an oil-in-water emulsion of a binder selected from the group consisting of drying oils, silicones, varnishes and resins selected from the group consisting of alkyd resins, polyvinyl acetate, copolymers of vinyl acetate and vinyl chloride, copolymers of butadiene and styrene, and acrylic acid polymers.

6. The process of producing on cement surfaces a coating resistant to attack by substances contained in the cement, which consists of applying to said surface a composition containing (1) pulverulent water-insoluble inorganic material of sizes graded below about 0.3 millimeter, (2) from 5% to less than 50% of coarser particles of inorganic filler material, said particles being of

sizes graded so that the smallest of said particles are at least 0.1 millimeter larger than the largest of the particles of said pulverulent material, and (3) a liquid vehicle of a film-forming material in an amount to form a spreadable mixture; said coating being applied by spreading the same on said surface by a flat-surfaced cork-faced instrument so that said coarser particles act to space said flat cork face from said surface and define the thickness of the spread film.

7. The process of claim 6 and wherein said composition contains a water-soluble cellulose derivative as a binder.

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