

Aug. 28, 1934.

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1,971,900

DECORATIVE AND ACOUSTIC COMPOSITION

Filed May 9, 1933

Fig. 1.

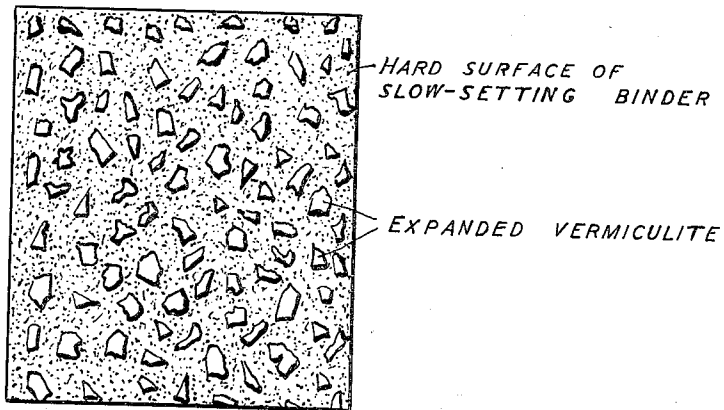
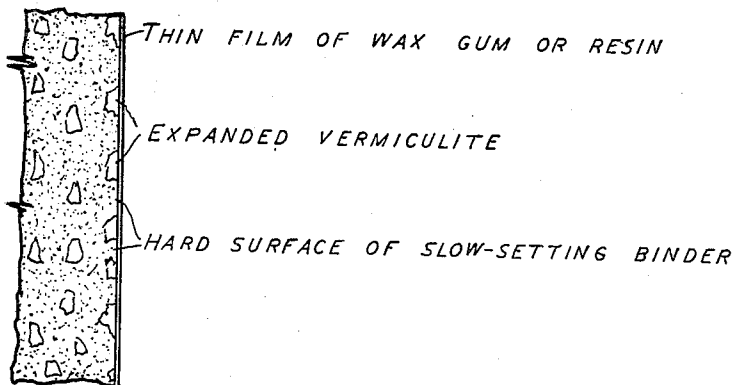


Fig. 2.



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1,971,900

DECORATIVE AND ACOUSTIC
COMPOSITIONCharles J. Cerveny, Elmhurst, and Hugh Evans,
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Application May 9, 1933, Serial No. 670,208

9 Claims. (CL 72-17)

Our invention relates to surface plaster coatings for walls, ceilings, cornices, columns, pulpit sounding boards, lighting fixtures, or any of the other decorative fixtures that are commonly employed in architectural design, and has for its principal object the provision of a surface coating which is to be applied by a trowel in the conventional manner and in which valuable acoustic properties are combined with decorative appearance. Our invention is concerned primarily with the provision of a surface coating of the type described containing an expanded vermiculite such as zonolite, jefferisite, etc. and a treatment of such coatings to increase their hardness and accentuate the decorative effect thereof. Throughout the specification and claims, whenever a wall is referred to it is to be understood that any of the other surfaces enumerated above is intended as well.

We are aware of the fact that zonolite has been used in conjunction with plaster in the manufacture of plaster board (Patent No. 1,778,008), as a substratum for acoustic plaster (Patent No. 1,839,887) and as an insulating material in safes (Patent No. 1,715,977) and in the manufacture of insulating bricks and similar molded insulating material (Patent No. 1,693,015). We are also aware of the fact that zonolite has been used as an insulating material in combination with sodium silicate and copper oxide (Patent No. 1,776,749), in combination with bentonite and other materials (Patent No. 1,830,253), and in combination with hydrated lime and diatomaceous earth (Patent No. 1,812,306) and in a roofing composition in combination with asphalt and burnt clay (Patent No. 1,743,744). So far as we know, however, expanded vermiculite has never been used in combination with a plaster or a cement as a finish coat to be applied by a trowel in the conventional manner to the walls of a room for the purpose of improving the acoustics of a room and improving the appearance of the walls.

If the acoustics of a room are poor we have found that we can improve them considerably by applying to the walls a coating of a composition essentially composed of expanded vermiculite and one of the customary cements, such as Portland cement or Keene's cement, preferably the latter. This coating can be of any desired thickness depending on the amount by which it is desired to improve the acoustics of the room. The improvement in the acoustics increases directly with the thickness of the coating.

Likewise, when a room requires decoration, we have found that our composition is much more

suitable for this purpose than the usual paints or decorative papers or fabrics. When our composition is first applied to a wall it has a mottled gray appearance. By rubbing it down with sandpaper, steel wool or some similar abrasive, the color effects of the expanded vermiculite are brought into prominence. The surface so produced is entirely satisfactory for decorative and acoustic purposes but has the disadvantage that if a portion of it is washed to remove a spot or stain the washed portion has a different shade from the remainder of the surface. We have found that this disadvantage can be eliminated and at the same time the surface can be given a glossy appearance and increased hardness by treating the surface with a thin solution in an organic solvent of a wax, gum, resin, either natural or artificial, or Irish moss. Among the gums, resins and waxes which are suitable for this purpose are gum tragacanth, gum copal, gum arabic, beeswax, Montan wax, carnauba wax, paraffin wax, soluble urea aldehyde resins, soluble phenol aldehyde resins, rosin and other vegetable resins. The solvent employed is usually benzine, benzene or alcohol. The solution can be sprayed on or applied with a brush, the former method being preferable. When the surface has dried after the application of the solution, it is polished with a soft cloth.

As a base coat for our finish coat we can use any of the common base coats or we can use a base coat containing expanded vermiculite in conjunction with a cheaper binder than that employed for the finish coat. The finish coat can contain any desired mineral pigment. Striking effects can be produced by the selection of a mineral pigment of the proper color in conjunction with the expanded vermiculite. We have also found that a very good decorative effect is produced by using fine chips obtained by breaking up sea-shells instead of or in conjunction with the expanded vermiculite. These chips of sea-shells impart a silver tone to the surface.

While ordinary quick setting gypsum plasters, such as plaster of Paris, can be used as binders for expanded vermiculite, such material is unsuitable for the purpose of our invention because, by reason of the quick setting properties of these materials, it is impossible to utilize them in a composition which is to be applied to a wall by a trowel. The reason for this is that any composition that is applied to a wall by a trowel must be subjected to considerable working before the proper finish is obtained. In the case of these quick setting materials, sufficient time is not per-

mitted the operator to properly finish the wall after applying such materials. Such materials usually go dead after being on a wall for a short period of time and thereafter are incapable of being worked. These materials have the additional disadvantage that they deteriorate very rapidly and are consequently impractical. Of course, it is possible to make these materials more suitable by the use of retarders of a chemical or physical nature. The use of these retarders is, however, not especially desirable because of the added expense and increased difficulties in working and because the durability of the coatings produced is not increased to any noticeable degree by the inclusion of a retarder.

There are several hard, usually slow setting gypsum plasters, however, that we have found to be quite suitable for our compositions. These plasters have nothing in common with plaster of Paris, except the fact that they are all obtained from gypsum rock. Most typical of this class of materials is Keene's cement referred to above.

We have further found that very good decorative and acoustic coats can be obtained by mixing expanded vermiculite, preferably ground to about one-sixteenth mesh, with one of the substances commonly known as protective colloids and including glue, gelatine, vegetable mucilage and gums. The mixture is made by converting the protective colloid to the liquid state, if it is not already in that state, and mixing it thoroughly with the expanded vermiculite in proportions such that a mixture is obtained having the consistency of dough. This mixture can be applied to any substratum, such as glass, wood, metal, plaster or stone in comparatively thin layers, or, if desired, in thick layers. As soon as the coating is hardened and dried, it is treated in much the same manner in which the plaster compositions are treated, namely, rubbed with an abrasive until smooth and, if desired, coated with a thin lacquer-like solution of a natural or artificial gum, wax or resin. It is usually sufficient to use the protective colloid in an amount approximating five percent of the amount of expanded vermiculite employed. The surfaces produced from this composition are characterized by a golden lustre which can be accentuated by the addition to the composition of mineral pigments of any desired color.

When a cement such as Keene's cement or Portland cement is used as the binder for expanded vermiculite the mixture of cement and vermiculite can be cast into plates or blocks to form a very serviceable and extremely desirable artificial stone. These plates can be made of any desired thickness and are especially advantageous in thicknesses ranging from about one-half to one inch as a covering for walls and other exposed surfaces requiring decoration.

A wall surface according to our invention is illustrated in the accompanying drawing in which Fig. 1 is a face view and Fig. 2 is a sectional view. Suitable legends appear on the face of the drawing whereby further description thereof is unnecessary. It is to be noted, however, that the expanded vermiculite on the surface has a flat face flush with the face of the binder. This is the result of the treatment with the abrading agent. It is also to be noted that in Fig. 2 the thickness of the film of wax, gum or resin is exaggerated for the purpose of illustration.

Our invention is more specifically described in the following examples which are illustrative rather than limitative.

Example 1

A mixture of one part of slow setting gypsum plaster, such as, slow setting bonding plaster, and three parts of zonolite is worked up with sufficient water into a plastic mass which is applied to a wall with a trowel. After a coating of uniform thickness has been applied and floated it is allowed to dry. The coating is then rubbed with sandpaper or steel wool or some other similar abrasive and brushed clean of dust. The wall is then sprayed with a thin solution of gum arabic in benzene and allowed to dry again after which it is polished with a soft cloth.

Example 2

The plaster in Example 1 is replaced by an equal amount of Keene's cement. The mixture is applied and treated in the same way. Instead of being applied to a wall or similar surface with a trowel, the mixture can be cast into plates of any desired thickness. Upon setting and hardening, the plates so produced have the appearance of stone. If a colored surface is desired for the plate, a saving in color can be effected by filling the mold nearly to the desired depth with an uncolored mixture and filling the remainder of the mold with a mixture to which the desired color has been added. In this way, the colored layer can be made as thin as one-sixteenth of an inch. Similar results are obtained when Portland cement is used in place of Keene's cement and when Irish moss or beeswax is employed in place of gum arabic in the finishing solution.

Example 3

One part of gum arabic is heated until liquid and is then mixed with twenty parts of sixteen mesh zonolite until a plastic mass having the consistency of dough is obtained. The mixture is then applied to a substratum by means of a trowel in the usual manner, floated, and allowed to harden. Upon setting, the particles of zonolite will be found to project somewhat from the main body of the coating. The surface is rubbed down with an abrasive until it is perfectly smooth. If desired, it is then sprayed with a thin solution of any of the natural or artificial gums, waxes or resins enumerated above.

When it is desired to add a mineral pigment to any of the above compositions, the pigment is added in a finely ground state in an amount ranging from six to ten percent of the total composition. Of course, the pigment is added during the manufacture of the mix so as to be uniformly dispersed therein.

Having thus described our invention and illustrated the preferred embodiments of the same, what we now claim as new and useful and desire to secure by Letters Patent is:

1. A finish coat for a wall comprising expanded vermiculite and a substance selected from the group consisting of slow setting gypsum plasters, cements and protective colloids, the expanded vermiculite being exposed on the surface of said finish coat as brilliant particles.

2. A finish coat for a wall comprising a slow setting gypsum plaster and expanded vermiculite, the expanded vermiculite being exposed on the surface of the finish coat as brilliant particles.

3. A finish coat for a wall comprising gum arabic and expanded vermiculite, the expanded vermiculite being exposed on the surface of the finish coat as brilliant particles.

4. A finish coat for a wall comprising a binder

selected from the group consisting of slow setting gypsum plasters, cements and protective colloids and exposed brilliant particles of expanded vermiculite with a thin surface coating of a substance selected from the group consisting of gums, waxes and resins.

5 A finish coat for a wall comprising a slow setting gypsum plaster and exposed brilliant particles of expanded vermiculite having a thin surface coating of a substance selected from the group consisting of gums, waxes and resins.

10 6. A method of decorating walls which comprises applying thereto a layer of a composition comprising a binder selected from the group consisting of slow setting gypsum plasters, cements and protective colloids and expanded vermiculite, allowing the layer to dry, rubbing the surface of the layer with an abrading agent and brushing the surface clean of dust whereby brilliant particles of vermiculite are exposed on the surface.

15 7. A method of decorating walls which comprises applying thereto a layer of a composition comprising expanded vermiculite and a substance selected from the group consisting of slow setting

gypsum plasters, cements and protective colloids, allowing the layer to dry, rubbing the surface of the layer with an abrading agent, brushing the surface clean of dust whereby brilliant particles of vermiculite are exposed on the surface and applying to the surface so formed a thin solution in an organic solvent of a substance selected from the group consisting of gums, resins and waxes.

8. A method of correcting the acoustics of a room which comprises applying to exposed surfaces thereof a mixture containing gum arabic and zonolite, allowing the mixture to dry whereupon the zonolite projects from the matrix of gum and rubbing the surface with an abrading agent until the zonolite is flush with the matrix of gum whereby brilliant particles of vermiculite are exposed on the surface.

9. An artificial substance having a density and hardness approximating that of stone and comprising expanded vermiculite and cement, the expanded vermiculite being exposed on the surface of said substance as brilliant particles.

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