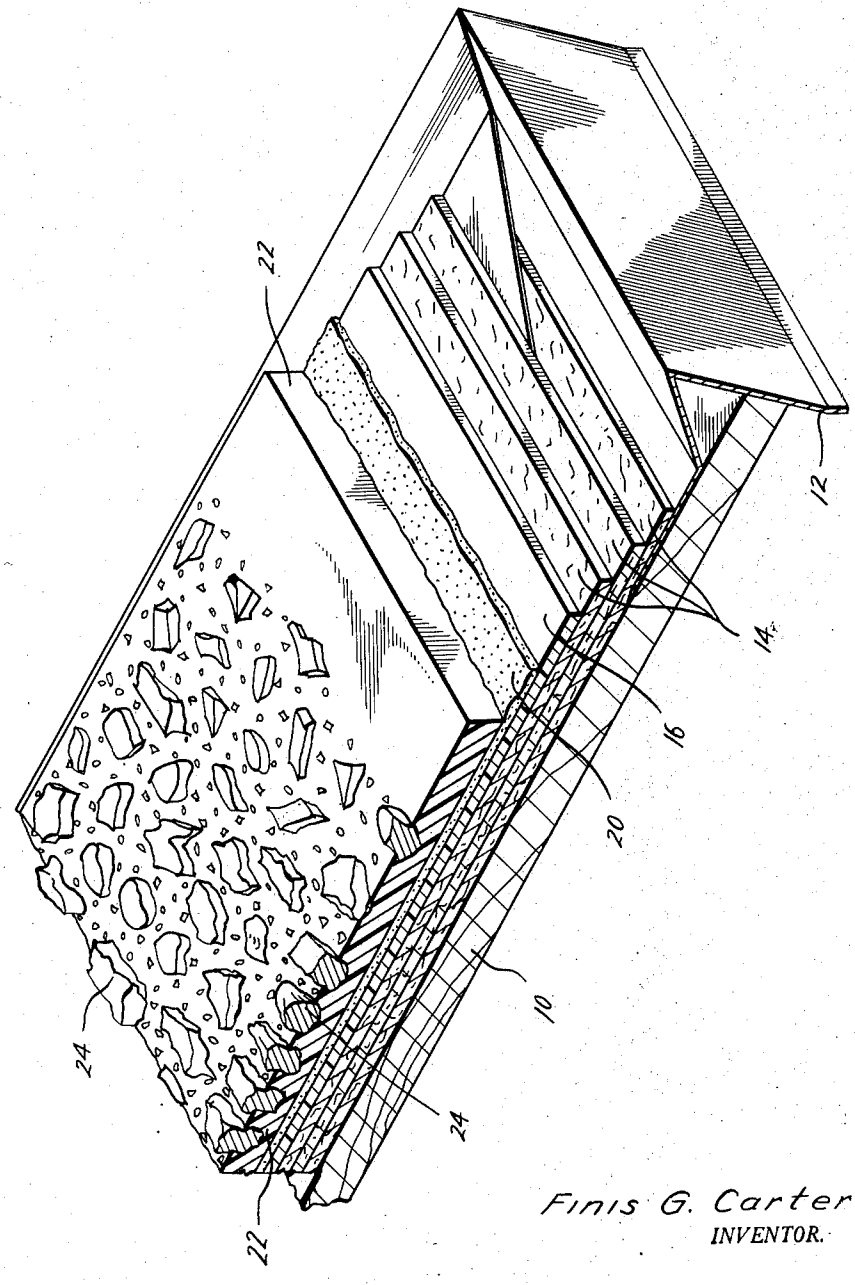
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METHOD OF FORMING A SURFACE COVERING

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METHOD OF FORMING A SURFACE COVERING

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1 Claim. (Cl. 117—30)

This invention relates to an improved covering for roofs, walls and similar building structures and to a method of and composition for making such covering.

While not limited to such use the invention finds particular application in connection with roofing of the built-up type having a number of layers of materials of different kinds and wherein the outer layer comprises a plastic composition which is covered with an aggregate of particulate material whose particles are partially embedded in said plastic composition.

In the construction of roofs of this type, as heretofore practiced, it has been customary to apply a layer or coating of hot asphalt on top of one or more sublayers of roofing felt or other roofing material, and then apply crushed stone, gravel, or the like to the asphalt while the same is in a soft condition, in order to partially embed such particulate material in the asphalt. It has been found, however, that roof coverings of this kind are easily damaged and lack durability because the particulate material does not adhere well to the asphalt when cold and the particles are easily detached. Moreover, when such a roof covering is applied on a sloping surface the particles are easily dislodged and washed away.

Loose gravel has also been used in the construction of relatively flat roofs or roofs which have very little slope, but in order to secure the required stability and durability in roofs of such character it has been found necessary to employ a layer of gravel several inches deep to assure against loss due to heavy rain or wind. In addition roof coverings employing asphalt and gravel or gravel alone possess the disadvantage that these materials are poor in insulating and heat reflecting qualities.

The present invention has for an important object the overcoming of the above mentioned disadvantages by the provision of a covering of the kind referred to having improved fire resisting, water proofing and weather resisting qualities.

Another object of the invention is to provide a covering of the kind referred to having an outer coating of plastic composition, to which an aggregate of particulate material is applied, whose particles are securely bonded to the composition to prevent the particles from becoming dislodged due to weathering or rough treatment, such as persons walking on the covering, or from being washed away when the covering is applied to a sloping structure.

A further object of the invention is the provision of a covering of the type mentioned which possesses improved heat reflecting and insulating properties.

Another object of the invention is to provide an improved plastic coating composition for use in the making of coverings of the kind referred to which may be applied in a flowable condition and which becomes sufficiently hardened or set within a few minutes to withstand the action of rain.

A further object of the invention is the provision of a plastic composition comprising separate liquid and dry mixtures which may be stored without deterioration for long periods of time, and which may be mixed together immediately before application to form a composition which is easily and quickly spread, but which hardens or sets within a few minutes to form a rain resistant coating and reaches its maximum hardness only after a number of weeks.

Another object of the invention is to provide an improved method of making a covering of the character described, whereby a structure having increased strength and durability may be produced.

A further object of the invention is the provision of an improved method of bonding the layers of a multilayer covering of the kind mentioned.

The above and other important objects and advantages of the invention may best be understood from the following detailed description, constituting a specification of the same, when considered in conjunction with the annexed drawing illustrating a preferred embodiment of the invention.

The drawing is a fragmentary, perspective, cross-sectional view, illustrating the invention as applied to the roof of a building, and showing the various layers of the covering partly cut away to reveal their arrangement and the manner in which they are bonded together.

Referring now to the drawing in greater detail, the invention is illustrated in connection with its application to a roof of conventional construction having the usual sheathing or decking **10**, and to whose outer marginal portions a gravel guard **12** of usual design may be secured.

Upon the sheathing or decking **10** one or more layers **14** of roofing felt are applied in the customary manner in overlapping relation to the inner edge portions of the gravel guard, which layers may be secured to the decking by nailing or cementing with asphalt or the like or by both nailing and cementing. A layer of asphalt **16** of suitable thickness is then applied over the uppermost of the layers **14** to form an undercoating for the composition of the invention.

In accordance with the invention a relatively thin layer **20** of particulate mineral bonding material is uniformly spread over the asphalt **16**, while the same is hot, which bonding material may be rolled or otherwise embedded in the asphalt layer. This bonding material preferably takes the form of sharp particles of crushed stone, such as marble or the like, of uniform, relatively fine, particle size commonly known as No. "0" marble, and is applied at the rate of about 30 pounds of the marble to each 100 square feet of asphalt surface.

A layer of the plastic composition of the invention, hereinafter described in detail, is then spread over the bonding material at the rate of about 4 gallons of the composition for each 100 square feet of the roofing surface to form an upper layer **22**, and upon this upper layer while the same is in a soft condition, mineral material, such as crushed marble of relatively large particle size, such as from ½ to ⅜ inch, known as No. 1 marble, is immediately spread at the rate of about 33 pounds for each 100 square feet of the roofing surface. Due to the soft, flowable condition of the plastic composition, these large particles sink into and become partially embedded in the layer **22**, as indicated at **24** in the drawing, leaving between them uncovered areas of the composition. Finely crushed particulate, mineral material, such as crushed marble of the grade known as No. 0 is then spread over the layer **22** to fill in between the larger particles **24**, whereby the upper surface of the plastic composition is substantially completely covered with the particles embedded therein.

The nature of the plastic composition of the invention is such that it retains its soft consistency when applied to the sublayers of the roofing for a sufficient time to permit the spreading thereon of the coarse and fine par-

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ticles above referred to, and to permit the particles to become embedded in the composition, but increases in durability within a few minutes after application to an extent to resist damage due to heavy rain or other cause. Thus, the composition becomes sufficiently hard to resist rain action within about thirty minutes after the composition is applied as a coating to the roof and the coating gains its maximum hardness and durability only after a period of about thirty days after application.

When the roof structure has been thus completed the roof may be swept or washed to remove excess loose particulate material which has not become embedded in the composition and the structure is then found to be strong and durable, capable of resisting weathering, damage due to objects falling upon the roof and even the action of persons walking thereon.

The plastic composition of the invention is made up of two components, which may be stored and kept for indefinite periods without substantial deterioration, and which are mixed together immediately before application to the roof. One of these components is a mixture of substantially dry materials and is termed the "dry concentrate," while the other component is a mixture of liquid and solid materials and is termed the "wet concentrate." The "dry concentrate" comprises a mixture of a finely divided particulate filler, a fibrous binder material and Portland cement. The following is an example of one such mixture:

	Pounds
Crushed marble, 300 mesh	200
Short asbestos fibre	74
White Portland cement	376

The proportions of the ingredients may be varied somewhat in accordance with the particular conditions to be met, such as, the material available and the prevailing climatic conditions. Other suitable particulate bonding material may be employed instead of marble, such as, crushed stone or quartz, and other fibrous bonding material may be substituted for asbestos, the latter being preferable due to its fire resisting quality.

In making the above dry concentrate, the ingredients are intimately mixed together in any suitable manner to form a homogeneous product which may conveniently be stored in bags.

The "wet concentrate" may, for example, be made up of the following ingredients in substantially the proportions stated:

	Pounds
White marble flour	150
Short fiber asbestos	8
Powdered bloated aluminum silicate	6
Titanium dioxide	6
Polyvinyl acetate, plasticized with 2 quarts of dibutyl phthalate to each 500 pound barrel	45

In making up the wet concentrate the dry ingredients are thoroughly admixed and added in a continuous stream to 25 gallons of water while agitating to thoroughly and completely wet the particles, and the plasticized polyvinyl acetate is then added and the agitation continued until a mixture of uniform consistency is obtained. Two more gallons of water is then added with agitation to complete the wet concentrate, which may be stored indefinitely.

The plastic composition of the invention is made up immediately before application by adding 5 gallons of the wet concentrate and 200 pounds of the dry concentrate to 30 gallons of water while agitating. The composition thus formed must be applied to the surface to be covered within about two hours after the concentrates have been mixed together, while the composition is in a flowable condition and before setting takes place.

The above plastic composition is used as a covering in the construction of roofs, walkways and the like, in the manner previously described, the composition being applied as a coating to suitable supporting sub-layers and covered with an aggregate of particulate material in the manner previously described.

In the examples given above the ingredients were selected for the purpose of providing a composition which is white in color and which has high heat reflecting and insulating qualities. It will be understood, however, that the color of the composition may be varied as desired by the addition of pigments or the like, as well as by the substitution of naturally colored ingredients for those mentioned.

By the term "plastic composition" in this specification is meant the water-emulsified adhesive which is the result of mixing all of the ingredients referred to, in the above stated proportions, ready for application as set forth.

It will thus be seen that the invention provides a surface covering having high insulating and fire resisting properties, which may be economically produced and applied, and which is tough and durable.

While the invention has been disclosed herein in connection with certain specific examples and embodiments of the same, it will be understood that these are intended by way of illustration only and that numerous changes can be made in the structure as well as in the method and materials used in forming the same, without departing from the spirit of the invention or the scope of the appended claim.

Having thus clearly shown and described the invention ,what is claimed as new and desired to secure by Letters Patent is:

A method of forming a surface covering which comprises applying to a surface a coating of heat softened asphalt, applying to said asphalt while in a soft condition, finely divided mineral particles, applying over said particles a layer of a flowable, settable composition comprising unset Portland cement, plasticized polyvinyl acetate, finely divided inert filler, asbestos fibers, powdered aluminum silicate and water, depositing mineral particles on said layer so that the latter particles become partially embedded therein and allowing said settable composition to harden thereby forming a fire resistant and weather resistant covering.

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