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WALL CONSTRUCTION

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5 Claims

ABSTRACT OF THE DISCLOSURE

A wall construction including a sheet of foraminous material which is secured to a vertical supporting structure. A layer of adhesive is applied to the foraminous material and is composed of polyester resin, a granular, generally inert filler and short asbestos fibers, and a series of stones or other objects are bonded to the adhesive layer.

This invention relates to a wall construction and more particularly to a wall construction including exposed decorative articles, such as stone or the like.

Stone and brick veneer walls are normally supported by footings which extend down beneath the frost level and the stones or brick are laid up with mortar joints. This type of wall construction is relatively expensive, because of the requirement for footings and due to the necessity of individually laying up each brick or stone with mortar. In some cases, precast panels having exposed stone or aggregate surfaces are used for interior or exterior walls. With the precast panel, the stones are generally set into a horizontal mortar bed and after setting of the mortar, the panel is erected. Due to the weight of the precast panels, expensive erecting equipment, such as a crane, is required to erect and position the panels.

In the past, attempts have been made to apply relatively large stones by mortar to a vertical wall surface in order to eliminate the problems and expense associated with footings and precast panels. However, these attempts have not met with success because even relatively small stones tend to slip downwardly in the mortar.

The present invention is directed to a wall construction in which relatively large stones or other decorative objects can be applied directly to a vertical wall surface without the requirement of footings. More specifically, the wall structure of the invention includes a sheet of expanded metal lath which is secured to a vertical supporting structure, such as wallboard, sheathing, concrete block, metal studs, a concrete wall, or the like, and a layer of adhesive is applied to the expanded metal lath and is bonded within the openings of the lath.

According to the invention, the adhesive comprises a mixture of a polyester resin, a granular filler, such as sand, and relatively short asbestos fibers. After troweling the adhesive on the lath to provide an adhesive layer generally less than 1/2 inch in thickness, the stones or other objects are set in the adhesive. The adhesive, while relatively viscous, can be readily troweled on the lath and it has been found that large stones having a dimension up to 8 inches and a weight up to 5 pounds will firmly adhere to the adhesive layer on the vertical surface without slipping or sliding.

The present wall construction enables relatively large stones to be applied to a vertical wall surface without the requirement for expensive footings. Moreover, the installation of the decorative wall of the invention is a comparatively fast operation, as compared to traditional masonry methods of wall construction and this results in a substantial labor savings.

The adhesive, even though it has a relatively viscous consistency, can be smoothly troweled over the metal

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lath, and the asbestos fibers penetrate with the openings in the lath to provide a tightly adherent layer which will firmly bond relatively large stones to the vertical wall. In addition, the asbestos serves as a fibrous reinforcement for the adhesive layer which prevents cracking of the adhesive under extreme temperature variations.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIG. 1 is a plan view of a fireplace wall utilizing the construction of the invention;

FIG. 2 is a vertical section taken through the wall; and

FIG. 3 is an enlarged plan view of the wall with parts broken away in section.

The drawings illustrate a wall structure fabricated in accordance with the invention and includes a central panel having relatively large, exposed stone which is located above a fireplace 2. Positioned beneath the hearth 3 of the fireplace is a lower panel 4 which also includes a plurality of relatively small decorative stones. Side panels 5 are positioned on either side of the central panel 1 and extend the height of the wall. As shown in the drawings, the side panels are formed with a plurality of smaller, decorative type stones.

The wall of the invention is shown in greater detail in FIG. 2 and includes a series of vertical wood studs 6 which support a sheet of wallboard 7 or sheathing. A sheet of perforated or foraminous material 8 is applied over the sheathing 7 and a layer of adhesive 9 covers the sheet 8 and extends within the openings in the sheet 8. Bonded to the adhesive layer 9 are a series of decorative stones 10.

The foraminous backing member 8 is preferably formed of expanded metal lath, with the maximum dimension of the holes in the lath being less than 1 inch, and preferably the holes will have a size in the range of 1/4 to 3/4 inch. It has been found that 225 gauge expanded metal lath, having diamond-shaped openings with a size of 1/4 x 5/8 inch, provides a most satisfactory backing member.

While the drawings illustrate the metal lath 8 secured to studs 6, it is contemplated that other types of supporting members can be substituted for the studs, such as concrete block, poured concrete, metal channels or studs, or the like.

The adhesive layer 9 is a mixture of a cured polyester resin, a granular or finely divided filler and asbestos fibers.

The adhesive composition has the following general formulation in weight percent:

Polyester resin	20 to 60
Filler	35 to 75
Asbestos fibers	3 to 15

A preferred formulation is as follows in weight percent:

Polyester resin	39
Filler	54
Asbestos fibers	7

The use of the polyester resin is important to the invention, for it has been found that other thermosetting resins will not provide the desired properties for the adhesive layer. For example, it has been found that polyester resins can be formed by the reaction of a polyhydric saturated or unsaturated polybasic acid either with or without a modifying unsaturated monomer such as styrene or the like. Specific examples of the basic material are, for instance, diethylene glycol maleate, dipropylene

glycol maleate, diethylene glycol fumarate, and the like. The basic materials are readily polymerized by peroxy catalysts such as benzoyl peroxide, tertiary butyl perbenzoate, and the like.

The filler can be any conventional finely divided, generally inert material, such as sand, clay, granulated marble, pearlite (organic ash), sawdust, and the like. For most applications, sand is preferred because it is readily available and inexpensive.

The asbestos fibers provide a reinforcement for the adhesive layer which prevents the layer from cracking during extreme temperature conditions and also interlock with the openings in the backing member 8 to firmly bond the adhesive layer to the backing member. As an added advantage, the asbestos fibers, while increasing the viscosity of the adhesive, provide a certain degree of lubricity, reducing the drag and making it easier to trowel the adhesive composition onto the metal lath. Other fibrous materials, such as glass fibers, are not as satisfactory as asbestos fibers and tend to ball up in the mixture and increase the drag during troweling. The asbestos fibers have a length less than 1/2 inch and generally have a length in the range of 1/8 to 1/4 inch.

The decorative stones 10 can range in size from #1 stone, such as pea gravel, to large stones having a maximum dimension up to about 8 or 10 inches and a weight up to 5 pounds. Generally, the stones will have a thickness less than 1 inch. The stones 10 can be limestone, granite, marble, slate, or the like, and in some cases other decorative articles, such as glass, metal objects, brick cookies, and the like, can be substituted for the stones 10.

The adhesive composition is normally prepared by initially adding coloring material, if desired, to the polyester resin and then mixing in the catalyst for the resin. Following this, the sand and asbestos fibers are mixed with the resin, either by hand or mechanically to obtain uniform distribution of the ingredients.

The adhesive composition is then troweled over the expanded metal mesh 8 to provide an adhesive layer about 1/4 inch thick. As the mesh 8 normally has a thickness of about 1/8 inch, this results in a layer of adhesive about 1/8 inch thick projecting outwardly beyond the mesh. During the troweling, the adhesive composition fills in the openings in the mesh and also bonds to the supporting structure which can be the sheathing, concrete wall, or concrete block, or the like. As previously mentioned, the adhesive layer is applied normally with a thickness of about 1/4 inch and preferably less than 1/2 inch. An adhesive layer greater than 1/2 inch in thickness provides no particular advantage and is considerably more costly.

After the adhesive layer has been troweled over the backing member, the stones or other decorative objects are set by hand into the adhesive layer. It has been found that with the adhesive composition of the invention, relatively large sized objects weighing up to 5 pounds will not slip or slide from the vertical wall surface, but will firmly adhere to the adhesive layer. The adhesive layer, as troweled on the lath, is relatively viscous due to the addition of asbestos fibers, but the asbestos serves to impart a degree of lubricity which enables the adhesive composition to be smoothly troweled over the metal lath. In addition, the fibers aid in interlocking the stones 10 to the openings in the lath 8 and prevent the stones or other objects from slipping vertically along the wall.

Normally, the stones or other objects will be firmly

held by the adhesive layer and no grout need be applied between the joints unless it is desired for a particular decorative effect.

The wall construction of the invention does not require footings, and yet enables relatively large stones to be applied directly to a vertical wall surface. Moreover, the wall construction of the invention can be installed very rapidly and a fireplace wall, as shown in FIG. 1, can be easily installed by one man in several hours time. This is a substantial reduction in the time and expense required to erect a similar wall by conventional masonry practices.

While the wall construction is particularly adaptable to using relatively large stones or decorative objects, small stones, such as pea gravel or other objects, can be also used as the decorative material. The wall can be employed as either an internal or an external wall and due to the fibrous reinforcement provided by the asbestos fibers, the wall construction is able to withstand extreme variations in temperature without cracking or crazing.

The term "wall construction" as used in the description and claims is intended to include any structural or non-structural wall or panel used not only in buildings but as free standing walls, dividers, floors, roofs and the like.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A wall construction, comprising a substantially vertical supporting structure, a substantially rigid formaminous member secured to the supporting structure, said member having a series of openings with the maximum dimension of said openings being about 1 inch, a layer of adhesive comprising 20% to 60% by weight of polyester resin, 35% to 75% by weight of a granular, generally inert filler, and 3% to 15% by weight of asbestos fibers having a length in the range of 1/8 to 1/2 inch, and a plurality of stones bonded to the adhesive layer with at least a portion of the stones being exposed to provide a decorative appearance for the wall.

2. The wall construction of claim 1, in which the backing member is formed of expanded metal.

3. The wall construction of claim 1, in which the thickness of the adhesive layer is less than 1/2 inch.

4. The wall construction of claim 1 in which the adhesive has the following composition in weight percent:

Polyester resin	-----	39
Filler	-----	54
Asbestos fibers	-----	7

5. The wall construction of claim 1, in which the filler is sand.

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