(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 January 2009 (08.01.2009)

PCT

(10) International Publication Number
WO 2009/006647 A2

(51) International Patent Classification:
E04C 2/288 (2006.01) *C04B 26/18* (2006.01)
E04B 2/08 (2006.01)

(21) International Application Number:
PCT/ZA2008/000056

(22) International Filing Date: 3 July 2008 (03.07.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2007/05346 5 July 2007 (05.07.2007) ZA

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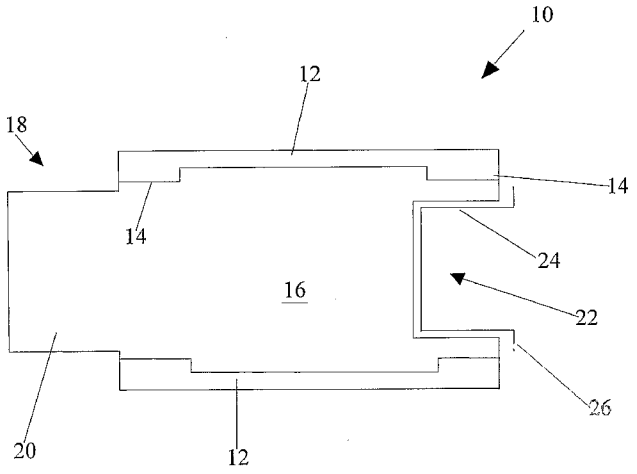
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

(54) **Title:** BUILDING ELEMENTS AND A METHOD OF MANUFACTURE OF PREFORMED BUILDING PRODUCTS

FIG 1



(57) **Abstract:** The invention relates to a novel composite for forming pre-fabricated building elements, as well as a method of using the composite to mould new building elements. The composite comprises a combination of organic and inorganic material mixed with a binder and a catalyst. The volumes in which each element of the formulation is added depends on which specific element is being formed - the formulation may for instance differ between a building block and a pre-cast wall or a floor tile. The mould used to in the method to manufacture building elements comprising the novel composition contains one or more sheets of fiberglass in a specific shape.

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BUILDING ELEMENTS AND A METHOD OF MANUFACTURE OF PREFORMED BUILDING PRODUCTS

TECHNICAL FIELD OF THE INVENTION

This invention relates to building elements and a method of manufacture of pre-formed building products and in particular wall board.

BACKGROUND ART

Pre-formed or pre-moulded building products are well-known and are popular particularly for use in low cost housing initiatives.

Light steel structure becoming more prevalent for the building of structures. Typically, a steel framework is set into conventional concrete foundations and cladding is added for external walls and dry wall being used for internal walling.

It is an object of this invention to provide a new composite building material and a building element comprised thereof which is lightweight, easily produced, waterproof and fireproof, as well as a method of manufacture thereof.

DISCLOSURE OF THE INVENTION

According to the invention a composite building material comprises an inorganic filler material, organic material of fine particulate size, an adhesive or binder and a catalyst to expedite the curing process, the materials being mixed and poured into a mould into which one or more sheets of fibreglass sheeting have been laid to produce a moulded product which may be cut to size if required.

According to a second aspect of the invention, a method of manufacture of a building element includes the steps of mixing an inorganic filler material, a particulate

organic material and an adhesive or binder in the presence of a catalyst, then pouring the slurry thus formed into a mould containing one or more sheets of fiberglass and allowing the mixture to cure.

In the preferred form of the invention, the inorganic filler material comprises one or more of expanded perlite powder, foamed plastic, magnesia, ash, chloridised magnesium, gypsum or calcium carbonate. The inorganic filler preferably comprises 45% of the material by weight.

The organic material may comprise wood sawdust, crop powder or nutshell powder and comprises approximately 5 to 15% of the material by weight.

The adhesive preferably comprises a polyester adhesive while a polyester resin may be employed to provide a waterproof and /or fireproof finish. The binder or adhesive comprises approximately 10 % by weight of the material.

The catalyst makes up approximately 40% of the material by weight.

The material may be produced in sheets and cut to size.

The material may be produced in panel form with a tongue and groove design for ease of construction and for the insertion of a steel profile for reinforcement and fixing.

Curing preferably takes place in curing room where temperature is maintained at approximately 60 degrees Celsius and humidity is high, for a period of seven days. The material may then be air-dried in the sunshine. There surface may be painted with a resin lacquer to give a protective and decorative finish.

The mixture may be varied to produce building products having different applications. For example, in one form, the filler material may comprise between 5 and 15% by weight of recycled plastic, 30 to 40% of perlite powder, 10 to 20% ash, and between 5 and 15% calcium carbonate, which are mixed with an adhesive. This product has it ideal application as a middle-layer building element.

In an alternate form, the filler material comprises between 70 and 85 % of chloridised magnesium, between 13 and 18 % magnesia, and between 2 and 17% of a modifier, which are mixed with an adhesive. This material may be used as a surface tile.

In a further alternate form, the filler material may comprise 25 to 35% magnesia, which is mixed with sawdust (15 to 25%) and between 10 and 25% of a modifier, all mixed together with an adhesive. This material may be used as a building block or brick type of product.

The material may be molded to form tiles, wall boards, blocks, bricks, doors or even furniture or the like.

In one form of the invention, foamed concrete or a mixture of foamed concrete and expanded polystyrene (EPS) may be located between two wall board-like sheets of the material of the invention to form a type of pre-cast wall.

In the preferred form of the invention, each board element includes at the ends thereof a protruding formation in the form of a right-angled ridge. When used to form a moulded panel, a pair of boards is arranged with the ridges orientated inwardly toward the interior of the panel to be formed.

The panels formed interengage and include along one vertical end, a channel formation extending into the body of the panel for receiving and engaging a corresponding protruding formation on the opposite end of an adjacent panel in a tongue and groove relationship.

The channel formation preferably engages a vertical steel or the like metal profile affixed to the floor by means of a mounting element. The profile may comprise a channel section in which the arms of the channel include perpendicular flanges dimensioned to cover at least the filler portion of the panel. Panels are located between a framework of the spaced apart steel profiles which are themselves secured in conventional footings.

BRIEF DESCRIPTION OF THE DRAWING

The preferred embodiment of a panel of the invention is described below with reference to the accompanying drawing, Figure 1 which is a section through a panel.

BEST MODE FOR CARRYING OUT THE INVENTION

In the drawing, a panel 10 comprises a pair of moulded boards 12 each having right-angled ridges 14 at their ends. The boards comprise a composite of an inorganic filler material, organic material of fine particulate size, an adhesive or binder and a catalyst to expedite the curing process, all of which are mixed and moulded together with fiberglass sheeting as described above.

A pair of boards 12 are integrally moulded with a filler portion 16 comprising foamed concrete and expanded polystyrene to form the panel 10. One end 18 of the panel has a tongue formation 20 for engaging the opposite end 22 of an adjacent panel, which is formed with a groove or channel. The grooves and tongues preferably engage steel profiles 24 which are anchored in convention footings and provide a framework between which the panels are located.

CLAIMS:

1. A composite building material characterized in that it comprises an inorganic filler material, organic material of fine particulate size, an adhesive or binder and a catalyst to expedite a curing process, the materials being mixed and poured into a mould into which one or more sheets of fiberglass sheeting have been laid to produce a molded product which may be cut to size if required.

2. A method of manufacture of a building element characterized in that it includes the steps of mixing an inorganic filler material, a particulate organic material and an adhesive or binder in the presence of a catalyst, then pouring the slurry thus formed into a mould containing one or more sheets of fiberglass and allowing the mixture to cure.

3. A composite building material as claimed in claim 1 characterized in that the inorganic filler material comprises one or more of expanded perlite powder, foamed plastic, magnesia, ash, chloridised magnesium, gypsum or calcium carbonate.

4. A composite building material as claimed in claim 3 characterized in that the inorganic filler comprises 45% of the material by weight.

5. A composite building material as claimed in any of claims 3 or 4 characterized in that the organic material comprises wood sawdust, crop powder or nutshell powder and comprises 5 to 15% of the material by weight.

6. A composite building material as claimed in any of claims 3 to 5 characterized in that the adhesive comprises a polyester adhesive while a polyester resin is employed to provide a waterproof and fireproof finish.

7. A composite building material as claimed in claim 6 characterized in that the binder or adhesive comprises 10 % by weight of the material.

8. A composite building material as claimed in any of claims 3 to 7 characterized in that the catalyst makes up 40% of the material by weight.

9. A composite building material as claimed in any of the above claims characterized in that the material is produced in sheets and cut to size.

10. A composite building material as claimed in any of the above claims characterized in that the material is produced in panel form with a tongue and groove design for ease of construction and for the insertion of a steel profile for reinforcement and fixing.

11. A composite building material as claimed in any of the above claims characterized in that the curing takes place in curing room where temperature is maintained at 60 degrees Celsius and humidity is high, for a period of seven days after which the material is air-dried in the sunshine and painted with a resin lacquer.

12. A composite building material as claimed in any of the above claims characterized in that the mixture varies to produce building products having different applications.

13. A composite building material as claimed in claim 12 characterized in that the filler material comprises between 5 and 15% by weight of recycled plastic, 30 to 40% of perlite powder, 10 to 20% ash, and between 5 and 15% calcium carbonate, which are mixed with an adhesive for application as a middle-layer building element.

14. A composite building material as claimed in claim 12 characterized in that the filler material comprises between 70 and 85 % of chloridised magnesium, between 13 and 18 % magnesia, and between 2 and 17% of a modifier, which are mixed with an adhesive to be used as a surface tile.

15. A composite building material as claimed in claim 12 characterized in that the filler material comprises 25 to 35% magnesia, which is mixed with 15 to 25% sawdust and between 10 and 25% of a modifier, all mixed together with an adhesive to be used as a building block or brick type of product.

16. A composite building material as claimed in any of the above claims characterized in that the material can be molded to form tiles, wall boards, blocks, bricks, doors, furniture or the like.

17. A building element formed according to claims 10 and 16 characterized in that it comprises foamed concrete or a mixture of foamed concrete and expanded polystyrene (EPS) located between two wall board-like sheets of the material of the composite building material to form a pre-cast wall panel.

18. A building element as claimed in claim 17 characterized in that each board element includes at the ends thereof a protruding formation in the form of a right-angled ridge.

19. A building element as claimed in any of claims 17 to 18 characterized in that a pair of boards is arranged with the ridges orientated inwardly toward the interior of the panel to be formed.

20. A building element as claimed in any of claims 17 to 19 characterized in that the panels formed interengage and include along one vertical end, a channel formation extending into the body of the panel for receiving and engaging a corresponding protruding formation on the opposite end of an adjacent panel in a tongue and groove relationship.

FIG 1