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54 **Claddings for roofs.**

57 A cladding panel for a roof or otherwise which
avoids the present need for penetration of fixing
means from the exterior of the panel.

The cladding panel 10 is of larger size at least
relative to slate/tile systems and comprise an outer
water-impervious layer (12) preferably formed in a
mould and thus able exteriorly to take on any de-
sired appearance including that of a traditional
slate/tile system, which panel has anchorage 16 for
fixing members 20 to extend away from interior
surface of the water impervious layer, which fixing
members are to be secured to sides of supporting
beams/rafters or studding. The anchorage provides a
key-way that extend across the panel also providing
stiffness to the panel. The panels preferably com-
prise an inner layer 18 of insulating material.

EP 0 401 438 A1

Claddings for roofs etc.

This invention relates to claddings, particularly to claddings for roofs.

Traditional roof cladding methods include application of slates and tiles of various types, patterns and styles, all requiring fixing, usually via secondary timberwork such as laths often involving nailing thereto and nowadays usually over felting. With time, such roof claddings deteriorate in various ways leading to a need for repairs, ultimately replacement. Wherever there has been penetration of the cladding and passage of water past cladding elements, at least secondary timberwork is usually in a poor state and also requires replacement, most often the underlying felt too, and substantial refurbishment is not infrequently necessary of main timberwork

Alternative roof claddings using relatively large sheets, usually corrugated and overlapped at sides and ends wherever necessary, generally also involves securement in a manner requiring penetration through the sheets and into underlying timberwork.

It is an object of this invention to provide cladding suitable, inter alia, for roofs, and that is simpler to install and more reliable after installation, whether at replacement of an existing roof cladding or as original roof cladding.

According to one aspect of this invention, cladding panels, generally of large size at least relative to slate/tile systems if not also relative to conventional overlapped sheet systems, comprise an outer water-impervious layer, preferably formed in a mould and thus able exteriorly to take on any desired appearance including that of a traditional slate/tile system, which panels have anchorage for fixing members to extend away from interior surface of the water layer, which fixing members are to be secured to sides of supporting beams/rafters or studding. Anchorage is preferably by way of elongate members that may by their nature contribute to overall strength and stiffness of the panel and afford key-ways that extend across the panel substantially horizontal in relation to intended installation for retaining engagement by appropriately formed ends of fixing members whose other ends are adapted for fixing to sides of supporting beams etc. Such panels further preferably comprise an inner layer of insulating material that can readily be compatible at least in terms of mutual adherence and heat expansion characteristics with the outer layer.

A suitable outer layer can be made using resin bonded glass fibre materials, preferably self-coloured for the desired exterior finish, and said elongate members for anchoring fixing members can

then be bonded onto that outer layer also using resin bonded glass fibre material, advantageously as a further applied layer prior to application of said insulating material itself advantageously as a spray-on foaming plastics material such as a suitable polyurethane.

Suitable elongate members for anchoring fixing members can have an interior key-way within which the first mentioned ends of the fixing members are captive, say after insertion through an elongate slot of such key-way and rotation through an angle, conveniently 90 degrees, into capture below sides of the slot.

Preferred application of panels hereof to roofs is as single panels for each pitch of a roof, or part of such pitch, at least as to width of the pitch, which avoids side jointing between such panels. If necessary, wide roof pitches could be divided, say stepped, to suit. Alternatively joining of panels to form continuous lengths can be done conveniently by way of guttering for which we find particular advantage from bonding the guttering along an edge of the panelling, usually to one panel inset from the edge then overlapped by the adjacent panel. Such guttering can provide for stepped overlapping of panels in relation to falls as well as side by side connection.

Accordingly, another preferred aspect of this invention is to produce panels using an overall mould of large enough size to suit most roof pitches, for example forty feet wide and twenty feet long, from which full size moulded panels products could be cut down to actual desired size or, normally preferably, the mould selectively partitioned to suit known production requirements.

Whilst application of panels hereof to roofs is particularly advantageous in covering pitches by a single unpenetrated panel, other applications could be to cladding studding of walls in place of tiling or slating as is a feature of some buildings. Whether for roofs or other applications, it is feasible to joint panels hereof one below and overlapped by another, preferably then sealed at the overlap.

Specific implementation of embodiment of this invention will now be described, by way of example, with reference to the accompanying drawing, in which:-

Figure 1 is a fragmentary section through part of one panel;

Figure 2 is a fragmentary rear plan view of part of that panel;

Figure 3 shows a fixing member;

Figure 4 shows fixing to a rafter; and

Figure 5 indicates an adjustable width mould.

In the drawing, referring first to Figures 1 and 2, part of a roofing panel, though capable of other cladding application, is indicated generally at 10. The panel 10 comprises an outer layer 12 of moulded resin bonded glass fibre material whose outer surface 12A has a multiple tile or slate appearance taken from the bottom of an appropriate mould. Such material can conveniently be self-coloured as desired. Bonded on to the outer layer at its inner surface 12B, using another layer 14 of resin bonded glass fibre, are elongate anchorage members, see 16, presenting an interior key-way 16K entrant from a slot 16S. The panel 10 has an insulating inner layer 18 of a material compatible with the resin-bonded glass fibre, say a foam polyurethane and which may be spray-applied.

The elongate anchorage members 16 serve for fixing members 20 of generally T-shape, see cross piece 20C and stem 20S in Figure 3, the latter shown flattened to a plate-like form at 20P and apertured for fixing to sides of supporting beams etc, for example nailed to a rafter 22 as in Figure 4.

Further concerning the elongate anchorage members 16, they are shown disposed extending along the width of the panel 10, i.e. transversely of conventional roof supporting rafters 22, and may contribute to strength and stiffness of the panel 10. As shown, the members 16 are of composite construction where a base part carriers joggled side parts to define the key-way 16K and slot 16S, and are typically of steel sheet spot welded together beyond the key-way 16K. However, other materials could be used and other constructions, for example of integral type suitable for extrusion in aluminium and/or plastics materials.

Generally, the members 16 can be of lengths substantially less than the whole width of the panel 10, perhaps up to two or three feet long compared with up to forty feet width of panel. However, they should, of course, be disposed to suit support beam (e.g. rafter) spacings and reasonable fixing requirements for the panels 10.

At least for domestic properties, most roof pitches are less than forty feet wide and less than twenty feet long. Accordingly, a mould of that size is envisaged, see 30 in Figure 5, but preferably can be selectively and adjustably partitioned at least as to lesser width, see movable partition 30P. Then, panels can be made to fit the whole of a pitch. Longer pitches can be dealt with by overlapping panels 10 hereof, preferably minus an edge-adjacent portion of inner insulating layer 18 at the intended lower edge, which can be a normal feature of the panels hereof as same would not be required at overhang for draining into gutters.

Joining of panels to form a continuous length is also contemplated especially by way of guttering extending along one edge of the panelling and on

to which an adjacent panel is placed. Such guttering may be of any convenient shape usually providing an open channel with opposite, usually parallel, side edges, one of which may be bonded or otherwise secured to one panel on the undersurface and inset from the edge thereby leaving the guttering projecting from the edge to be contacted by an adjacent panel, usually abutting on that edge providing sealing either by way of a sealing edge say of plastics or by subsequent bonding using resin or the like.

Resilience in the guttering and/or dimensioning of the free edge may be such as to allow the adjacent panels to fit in overlapping relation. The guttering allows build up of continuous lengths where one piece construction of sufficient size to cover a whole roof pitch, are impractical.

Claims

1. A cladding panel for a roof which cladding panel is generally of large size at least relative to slate/tile systems if not also relative to conventional overlapped sheet system, and comprises an outer water-impervious layer, and anchorage means for fixing members to extend away from interior surface of the water-impervious layer, which fixing members are to be secured to sides of supporting beams/rafters or studding.

2. A cladding panel as claimed in claim 1 in which the anchorage means is provided by elongate members.

3. A cladding panel as claimed in claim 2 in which the elongate members by their nature contribute to overall strength and stiffness of the panel.

4. A cladding panel as claimed in claim 1, 2 or 3 in which the anchorage means affords key-ways that extend across the panel substantially horizontally in relation to intended installation for retaining engagement by appropriately formed ends of fixing members.

5. A cladding panel as claimed in claim 4 in which said ends of the fixing members are captive in the key-way after insertion through an elongate slot of such key-way and rotation into capture below sides of the slot.

6. A cladding panel as claimed in any one of claims 1 to 5 further comprising an inner layer of insulating material.

7. A cladding panel as claimed in any one of claims 1 to 6 in which at least the outer layer is formed in a mould and thus able exteriorly to take on any desired appearance including that of a traditional slate/tile system.

8. A cladding panel as claimed in claim 7 in which the mould is of a size large enough to suit most roof pitching from which full size moulded

panels can be cut down to actual desired size or the mould selectively partitioned to said known production requirements.

9. A cladding panel as claimed in any preceding claim in which the outer layer is made using resin bonded glass fibre materials and said anchorage means

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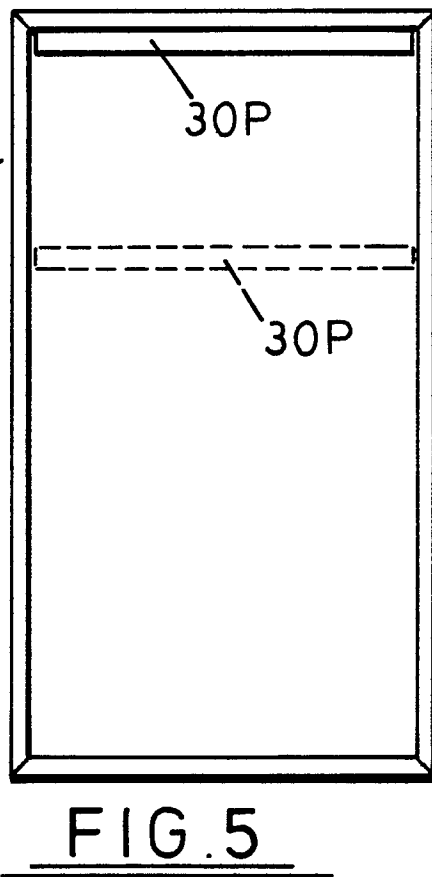
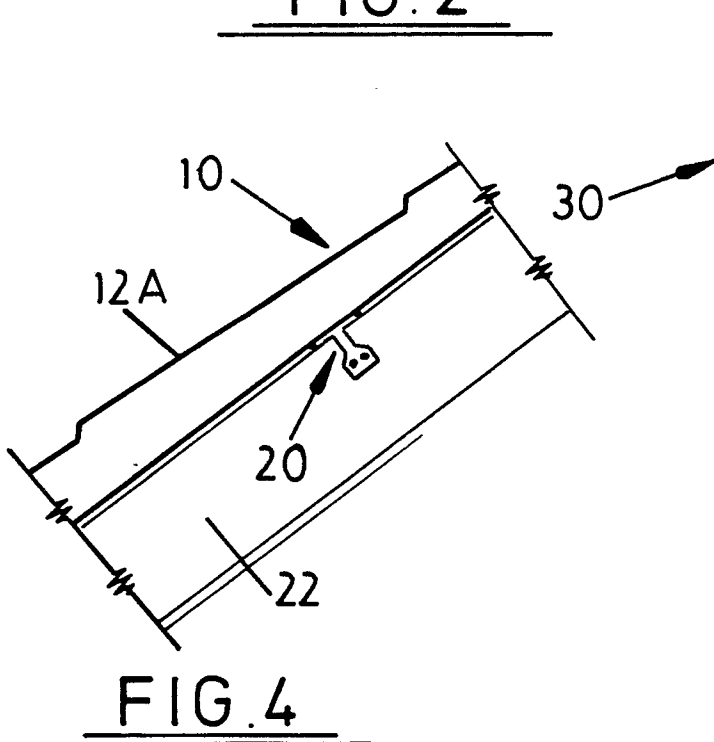
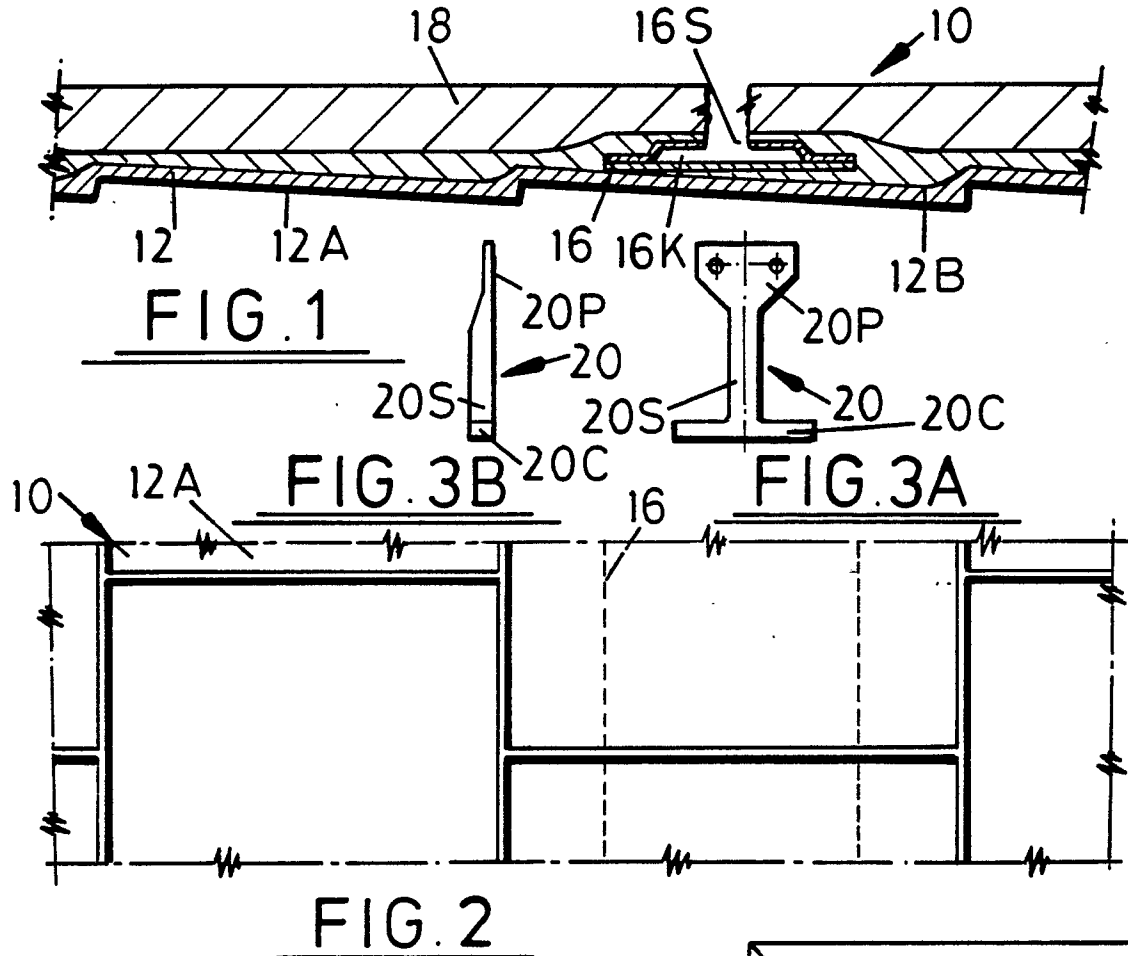
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-2 126 617 (PARKER) * Page 1, lines 53-59,95-98,113-116; page 2, lines 15-45; figures 1,2,3,5 *	1,4,5,7 ,8	E 04 D 3/35 E 04 D 3/36
Y	---	2,3,6	
A		9	
Y	WO-A-8 701 752 (MARLEY TILE) * Page 3, lines 12-25; page 4, lines 17-37; page 5, lines 1-8; figures 1,3,4 *	2,3	
Y	---	6	
A	US-A-4 741 131 (PARKER) * Column 2, lines 48-53; column 4, lines 30-53; figures 3,4,5,7,8 *	9	
A	---	1,2,3,4 ,5	
A	FR-A-2 021 371 (ALCAN) * Page 3, lines 26-28; page 4, lines 4-5,14-38; page 5, lines 1-2; figures 1,2,4-8 *		

			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 04 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30-01-1990	Examiner HENDRICKX X.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			