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(54) **Covering in metal sheet material**

(57) Insulating covering in metal sheet material comprising at least two building panels (1,2), each building panel comprising a first (31,32) and a second metal layer (41,42), with a layer of insulating material (51,52) in between, whereby a first building (1,2) panel is suitable for forming a covering by butting one of its sides up against a side of a second building panel (2,1), whereby the first metal layer (31) of the first building panel (1) is folded over close to the relative side, thereby creating a projecting tongue, which coacts with a recess

formed on the relative side of the first metal layer (32) of the second building panel (2), and whereby upright edges are provided on the edges of the two metal layers (41,42) of the building panels, which upright edges can be coupled together with means of fixing and in which these means of fixing have been provided in a way by which they are thermally insulated from the unfolded parts of the first metal layers (31,32).

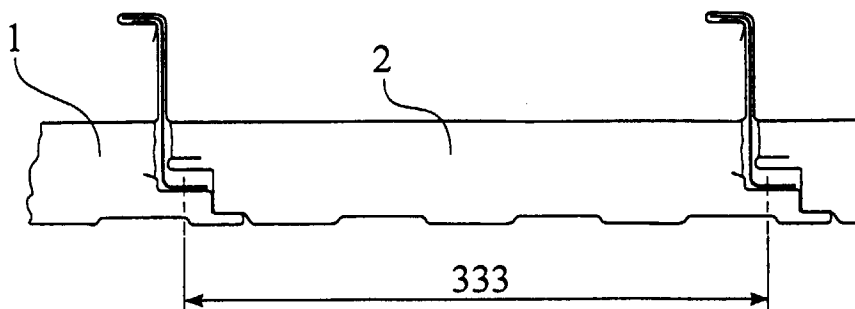


Fig. 1

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Description

[0001] The invention relates to an insulating covering in metal sheet material and to a building panel as a component of it. It is known to construct an insulating covering, for example an insulating roof, by placing a metal base of, for example trapezoid corrugated sheet across the beams supporting the roof, to lay an insulating layer of, for example, rockwool blankets on that base, to provide supports and/or strips protruding from the metal base, and then to cover off the entirety with profiled metal sheets, which are joined together and to the supports and/or strips. All in all, because of its nature and construction, placing such a covering requires a multitude of operations.

[0002] The object in accordance with the invention is to remove this disadvantage. To this end the covering in accordance with the invention comprises at least two building panels (1, 2), each building panel comprising a first (31; 32) and a second metal layer (41; 42), with a layer (51; 52) of insulating material in between, whereby a first building panel (1, 2) is suitable for forming a covering by butting one of the sides up against a side of a second building panel (2, 1), whereby the first metal layer (31) of the first building panel (1) is folded over close to the relative side, thereby creating a projecting tongue, which coacts with a recess formed on the relative side of the first metal layer (32) of the second building panel (2), and whereby upright edges are provided on the edges of the two metal layers (41, 42) of the building panels, which upright edges can be coupled together with means of fixing and in which these means of fixing have been provided in a way by which they are thermally insulated from the unfolded parts of the first metal layers (31, 32). From the published patent application EP-0275145 also a construction of an insulating covering is known which comprises at least two building panels, each comprising two metal layers, a layer of insulating material and means of fixing. Compared with this known construction the covering of the present invention has the advantage that the fixing means have been provided thermally insulated in such a way that across the thickness of the covering no cold-sinks are created. This prevents unnecessary heat-losses.

[0003] In an embodiment the means of fixing comprise an element (6) that is suitable for being placed between the upright edges, and that is capable of being fixed via or through the first metal layer of the first building panel to a base on which the building panels are supported when assembled.

[0004] This produces a good fixing of the two metal layers, if the first and second metal layers cannot be held together by the insulating layer.

[0005] Preferably the first metal layer of the second building panel is capable of being fixed to the edge coacting with the side of the first building panel by means of means of securing, which are supported on parts of the covering. This achieves the effect that the

first metal layer (32) of the second building panel (2) is secured to the edge coacting with the side of the first building panel (1) set away from the base. This can be achieved simply and efficiently if the means of securing comprise a tongue formed on the first metal layer (32) of the second building panel (2), which tongue is suitable for coacting with the element (6), more especially if the tongue coacts with the element (6), because the tongue formed on the second building panel (2) hooks at least over a portion into a recess or curvature in or behind a projection (7) on the element (6).

[0006] In an aspect the element is essentially Z-shaped in cross-section. It is preferable that the element is held clamped close to the end of the upright edges formed by the two metal layers (41, 42), because a projecting strip of the two layers (41; 42) is folded or flanged around the extremity of the other second layer (42; 41) and around the upper end of the Z-shaped element. This means that the finished covering has no fixing elements projecting from the outside through the panels, thereby offering functional and aesthetic advantages. Also this offers a simple, a compact and a rigid construction.

[0007] The invention is also embodied in a building panel as a component of the insulating covering in accordance with invention.

[0008] The invention will now be further illustrated by reference to the drawing in which Figure 1 shows schematically a cross-section through a covering in accordance with the invention and Figure 2 shows a detail of the connection of two building panels at an enlarged scale.

[0009] In Figures 1 and 2 the same reference numerals refer to corresponding parts. The dimensions given in the Figures (in mm) are solely intended as an indication of the size of the panels.

[0010] Figure 1 shows a first (1) and a second (2) building panel. The first building panel (1) is a sandwich construction of a first metal layer (31) and a second metal layer (41) with an insulating layer (51) in between (see Figure 2). The second building panel is basically the same and comprises a first metal layer indicated by (32) and a second indicated by (42) with an insulating layer (52) in between. The first and second building panels are butted together, whereby the first building panel is joined to the supporting beam structure for example with the aid of a screw (8) shown here simplified. Screw (8) can also be used for securing Z-profile (6). Profile (6) may run across the length of the building panel. Preferably profiles (6) of a small size in the order of for example 0.25m in length are arranged at regular distances from one another. Profile (6) can be of any suitable material. The upright edges of metal layers (41) and (42) are flanged together close to their ends, whereby profile (6) may or may not be enclosed. For lightweight structures and where roof panels form one whole, profile (6) may be omitted, or if more individual profiles (6) are preferred there are cross-sections where no profile

(6) is enclosed. If so desired securing can be arranged for holding the metal layer (32) in place, for example by securing a tongue-shaped projection to it that drops into a recess or space beneath a projection (7) on profile (6). When constructing the covering in accordance with the invention, as far as the composing parts are concerned, it is only necessary to provide for one kind of ready-made building panel, one kind of fixing element for fixing layer (31) to the base, and possibly one kind of Z-hook, and the amount of operations on the building site is reduced to a minimum.

[0011] The building panels of the roof covering can be manufactured for example in a continuous process, whereby the strips of metal forming the first (31) and the second (41) metal layers, for example a galvanized and painted hard steel are coiled off upper and lower coils and profiled in a continuous process, whereby an insulation layer, for example a polyurethane foam layer, is then applied between the metal layers.

[0012] The sandwich construction thus created is then led through a furnace for curing the foam layer, and cut to panel lengths, for example bandsawn and stacked.

Claims

1. Insulating covering in metal sheet material comprising at least two building panels (1, 2), each building panel comprising a first (31; 32) and a second metal layer (41; 42), with a layer (51; 52) of insulating material in between, whereby a first building panel (1, 2) is suitable for forming a covering by butting one of its sides up against a side of a second building panel (2, 1), whereby the first metal layer (31) of the first building panel (1) is folded over close to the relative side, thereby creating a projecting tongue, which coacts with a recess formed on the relative side of the first metal layer (32) of the second building panel (2), and whereby upright edges are provided on the edges of the two metal layers (41, 42) of the building panels, which upright edges can be coupled together with means of fixing and in which these means of fixing have been provided in a way by which they are thermally insulated from the unfolded parts of the first metal layers (31, 32).
2. Covering in accordance with Claim 1, whereby the means of fixing comprise an element (6) that is suitable for being placed between the upright edges, and that is capable of being fixed via or through the first metal layer of the first building panel to a base on which the building panels are supported when assembled.
3. Covering in accordance with Claim 2, whereby the first metal layer (32) of the second building panel (2) is capable of being fixed to the edge coacting with the side of the first building panel by means of

means of securing, which are supported on parts of the covering.

4. Covering in accordance with Claim 3, whereby the means of securing comprise a tongue formed on the first metal layer (32) of the second building panel (2), which tongue is suitable for coacting with the element (6).
5. Covering in accordance with Claim 4, whereby the tongue formed on the second building panel (2) coacts with the element (6), because the tongue hooks at least over a portion into a recess or curvature in or behind a projection (7) on the element (6).
6. Covering in accordance with one of the preceding Claims, whereby the element (6) is essentially Z-shaped in cross-section.
7. Covering in accordance with Claim 6, whereby the element (6) is held clamped close to the end of the upright edges formed by the two metal layers (41, 42), because a projecting strip of the two layers (41; 42) is folded or flanged around the extremity of the other second layer (42; 41) and around the upper end of the Z-shaped element.
8. Building panel as component of an insulating covering in accordance with one of the Claims 1-7.

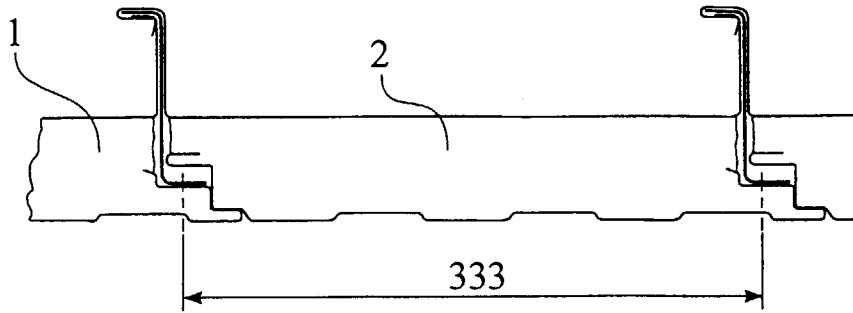


Fig. 1

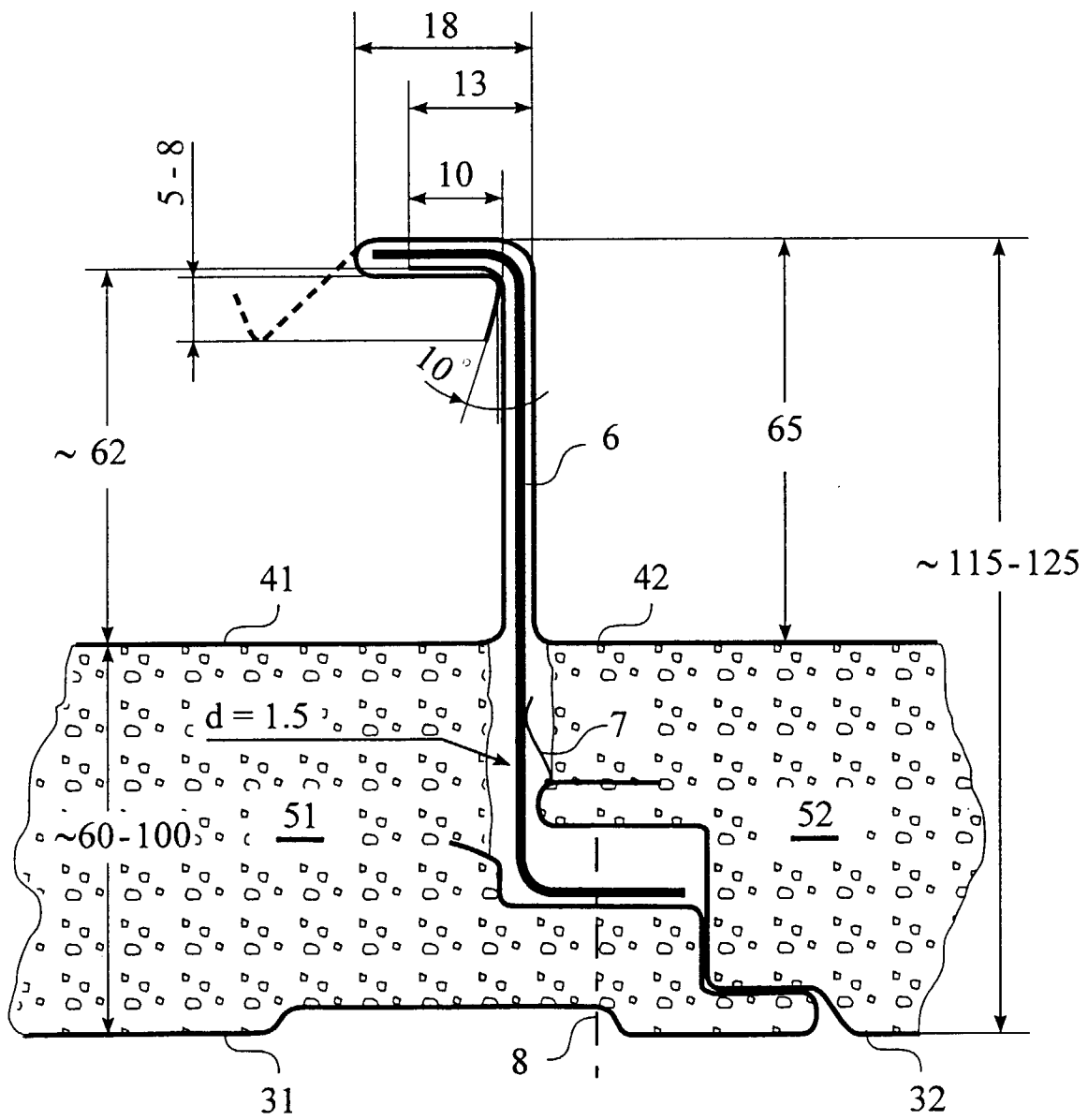


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 2787

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.6)
Y,D	EP 0 275 145 A (CROZIER CONSTRUCTION CO. LIMITED) 20 July 1988 * column 2, line 54 - column 4, line 29; figures 2-5 *	1-5,7,8	E04C2/292 E04D3/35
Y	GB 2 190 937 A (CROZIER CONSTRUCTION) 2 December 1987 * figures 4,5 *	1-5,7,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E04C E04D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		2 December 1998	Mysliwetz, W
CATEGORY OF CITED DOCUMENTS 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 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			

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