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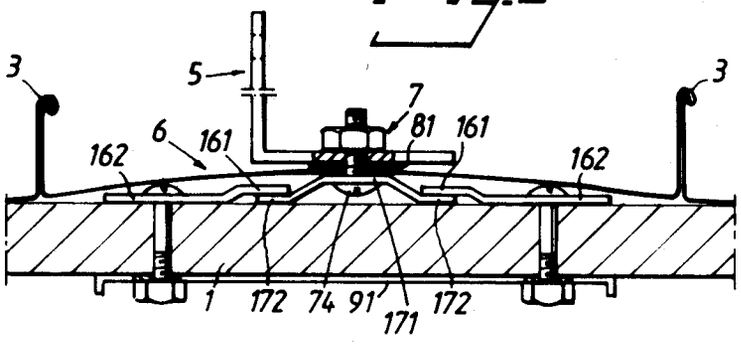
(54) Bracket device.

(57) A bracket device for a roof which comprises a load-bearing sub-roof construction (1) and a sheet metal roof covering (2) arranged thereon. The bracket device includes a guide means (6) which is fixedly connected to the load-bearing construction (1) and which is positioned beneath the roof covering (2), and a slide plate (7) which is guided by the guide means (6) and which is fixedly connected to the bracket (5) and the roof covering (2). The bracket (2) is stably connected to the sub-roof construction but is, nevertheless, able to accompany movement of the sheet metal (2) in response to thermal influences.

Fig.3



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The present invention relates to a bracket device of the kind set forth in the preamble of Claim 1.

There are many situations in which it is desirable to fit bracket devices to metal roofs, for example in order to support snow-slide guards, safety railings, steps, and the like.

The bracket devices are anchored in the load-bearing sub-roof construction, in order to be stable. Metal sheet roof coverings, however, are normally constructed to allow for panel movement relative to the sub-roof construction as a result of thermal expansion.

Consequently, items, such as bolts for instance, which extend from the sub-roof construction through a metal roofing panel to the bracket device will move relative to the roofing panel and it is known from experience that this will result in fatigue cracks in the roofing panel.

The object of the present invention is to avoid this drawback of the known construction, i.e. to provide a bracket device by means of which the bracket is connected stably to the sub-roof construction, wherein those parts of the bracket device which penetrate the sheet metal roof covering are stationary in relation to said covering, which moves relative to the sub-roof construction in response to thermal influences.

This object is achieved with the device defined in Claim 1.

Further embodiments of the device are defined in the depending Claims.

As a result of the present invention, the bracket is affixed to the sheet-metal roof covering, and is connected to a slide plate which is guided for sliding movement in a guide mounted beneath the roof covering and connected to the sub-roof construction.

The edge surfaces of the slide plate include channels which accommodate the guide bars.

The actual bracket itself may be provided with a bottom flange which rests on the sheet-metal roof covering and which forms an upper part of the slide plate, i.e. forms the walls which, in practice, define the channels upwardly (via the metal-sheet roof covering in this particular case).

Thus, the bottom flange of the bracket is broader than the distance between the bars. The slide plate is able to slide along the bars, i.e. in the direction in which the sheet-metal roofing expands.

Naturally, the guide means may have another configuration, for example the bars may have or may define channels and the slide plate may have edges which are guided in said channels. In this case, the channels are thus formed by the bars and an underlying plate or by the surface of the actual sub-roof construction.

In the case of conventional sheet metal roofs in which metal sheet panels are laid on a wooden sub-roof construction, a recess may be cut in the sub-roof for accommodation of the bottom parts of the bracket device.

Those parts of the bracket device which are intended to be located beneath the sheet-metal roof covering, including the bolts or the like which are intended to extend through said covering, are mounted on the sub-roof construction, whereafter the roof covering is fitted in position in a conventional manner.

The roof fitter is now able to feel the position of the bolts and make openings in respective metal panels of the roof covering through which the bolts can pass, for instance with the aid of a hollow tubular metal punch. The bracket can then be fastened to the bolts with the aid of nuts, and forms the upper part of the channel of the slide plate. A lead sealing plate can be positioned between the bracket and the roof covering in a conventional manner.

The invention will now be described in more detail with reference to an exemplifying embodiment thereof and with reference to the accompanying drawings.

Figure 1 is a sectional view of an inventive bracket device.

Figure 2 is a view taken on the line II-II in Figure 1.

Figure 3 is a sectional view of another embodiment of the bracket device.

Shown in Figure 1 is a sub-roof construction 1 in which a recess 11 has been cut. Mounted in the recess 11 is a guide means 6. The guide means 6 includes two parallel guide bars 61 which are supported against the bottom of the recess 11 by means of spacers 62. The bars are fixedly secured by means of through-passing bolts 63.

The upper surfaces of the bars 61 lie flush with the upper surface of the sub-roof construction 1, such as to form a smooth and even support surface for a sheet metal roof covering 2.

The sheet metal roof includes metal panels 2 which are mutually joined by means of folds 3, wherein the panels can be firmly anchored by means of fixed clamps and slide clamps at the folds 3.

A slide plate 7 is guided for sliding movement by the guide means 6. The slide plate 7 includes a plate 71 which is located between the bars 61 and a bottom plate 72, which overlaps both bars 61.

The bracket 5 has a vertical leg 51 for supporting rods, etc., and a horizontal leg 73 which is broader than the plate 71 and rests on the metal panel 2.

A bolt 74 extends through the plate 71, 72 and the flange 73 and holds these members together

such as to form the slide plate 7. The thickness of the plate 71 is slightly larger than the thickness of the bars 61.

As shown in Figure 2, the bars 61 may be mutually connected by means of crosspieces 65, such as to form a stable guide frame. Similarly, at least two bolts 74 are provided for connecting the bracket 5 stably to the slide plate 7.

Naturally, the construction of the slide plate 7 may be varied, as shown in Figure 3. The embodiment illustrated in Figure 3 corresponds, in all essentials, to the embodiment illustrated in Figure 2. The difference between the two embodiments is that the separate plates 71, 72 of the Figure 2 embodiment have been replaced with a first deep-stamped metal plate 171, 172 which has the same function as the said separate plates, the base 171 of the deep-stamped metal plate corresponding to the plate 71 and the two end flanges 172 of said metal plate corresponding to the collared rim portions of the plate 72.

In addition, both pairs of plates 61, 62 have been replaced with stamped metal-plate sections or profiles 161, 162 which have the same function as said plate pairs. The profiles include a base 162 which corresponds to the spacer 62, and a spaced flange 161 which corresonds to the collared portion of the bar 61.

In the case of the Figure 3 embodiment, it has been possible to make the bracket device so thin as to render it unnecessary to form a recess 11 in the sub-roofing 1.

The Figure 3 embodiment also includes a lead plate 81 positioned between the roofing panels and the bracket 7, and also a reinforcing plate 91 on the underside of the sub-roof structure 1.

Naturally, the guide means 6 of the Figure 3 embodiment (analogous with Figure 2) may have the form of a frame structure of which two mutually opposing sides are formed by the profiles 161, 162. In roof constructions of the kind in which, for instance, a semi-rigid layer of heat-insulating material, such as mineral wool, is placed on the sub-roof structure and the sheet-metal roofing panels are to be mounted on top of the insulating layer, the guide means may, of course, be supported flush with the upper surface of the insulating layer, by means of a supporting device connected to the sub-roof structure by means of screws, for instance. This supporting device may suitably have a foot part which lies flat against the sub-roof structure and a web part which extends perpendicularly to the foot part, wherein the supporting device carries the guide means on the upper end of said web part, for example is connected fixedly thereto.

The guide means, which have the form of a frame structure, may be connected at one edge part to the upper edge of the web part, so that the supporting device and the guide means will together have essentially a Z-profile shape.

The guide means or its supporting device may be fitted from above onto the load-bearing roof construction by means of a number of screws, anchoring nails or the like, instead of through-passing bolts or as a complement to such bolts.

By bracket device is meant an external fitting intended to support external constructions, particularly such safety constructions as (snow) slide guards, roof-ridge railing, footbridges (overpasses) and like structures.

The bracket device is primarily intended for roofs which are constructed from sheet-metal panels where said panels are placed side-by-side on the underlying supporting structure with the longitudinal axis of said panels extending essentially in the direction in which the roof slopes. The panels are mutually joined by means of fold joints.

The underlying supporting structure normally has the form of a load-carrying tongued and grooved covering or the like. The sheet metal covering panels are placed on the underlying support structure and anchored thereto with the aid of conventional clamps, for example fixed clamps and slide clamps which are attached in the fold joints between adjacent panel edges.

The inventive bracket device is primarily intended for roofs of the aforedescribed kind, but is different from those clamps used to secure sheet metal roofing panels and is intended to support safety equipment and can be placed freely in the region between mutually adjacent fold joints.

In a preferred embodiment of the bracket device illustrated in Figure 3, the bracket has a total height of about 5 mm from the upper surface of the underlying support structure for the profiles 161, 162. This height should be at most 8 mm.

The slide plate 171, 172 will preferably have a width of about 5 cm, so as to afford effective stability against tilting in the cross-direction of the bracket.

The underlying support structure will normally cover the whole of the roof area and may consist of load-carrying sheets or the like supported on beams.

Claims

1. A bracket device for a roof comprising a load-bearing sub-roof construction (1) and a sheet-metal roof covering (2) mounted thereon, wherein the bracket device is connected to the load-bearing construction (1) and includes a bracket (5) which extends upwardly from the roof covering (2), **characterized** in that the bracket device includes a

guide means (6) which is connected firmly to the load-bearing construction and which is positioned beneath the roof covering (2); in that the bracket device includes a slide plate (7) which is guided by the guide means; and in that the slide plate is fixedly connected to the bracket (5) and the roof covering (2).

2. A bracket device according to Claim 1, **characterized** in that the guide means (6) includes two parallel and mutually spaced guide bars (61).

3. A bracket device according to Claim 1 or 2, **characterized** in that the slide plate (7) includes a plate (72) which overlaps the underside of the bars (61), and also a bottom flange (73) of the bracket (5) resting on the sheet metal covering, said bottom flange (73) having two mutually opposing edge portions which overlap the upper side of the bars (61).

Fig.1

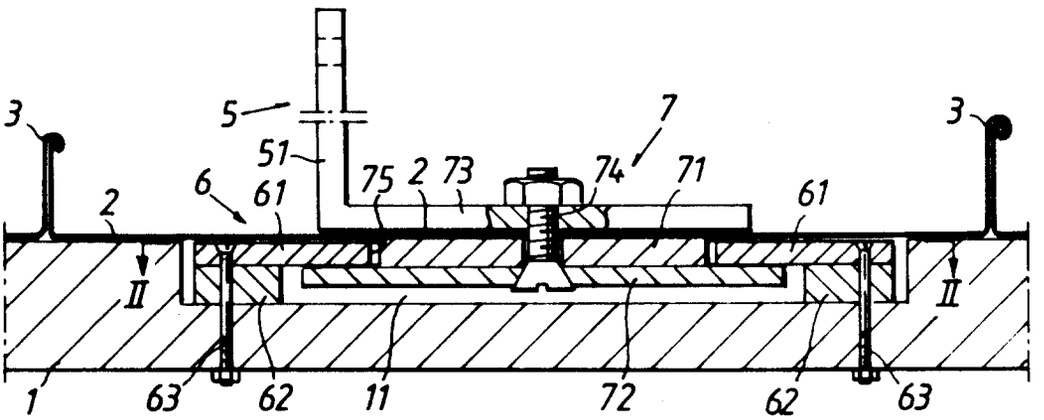


Fig.2

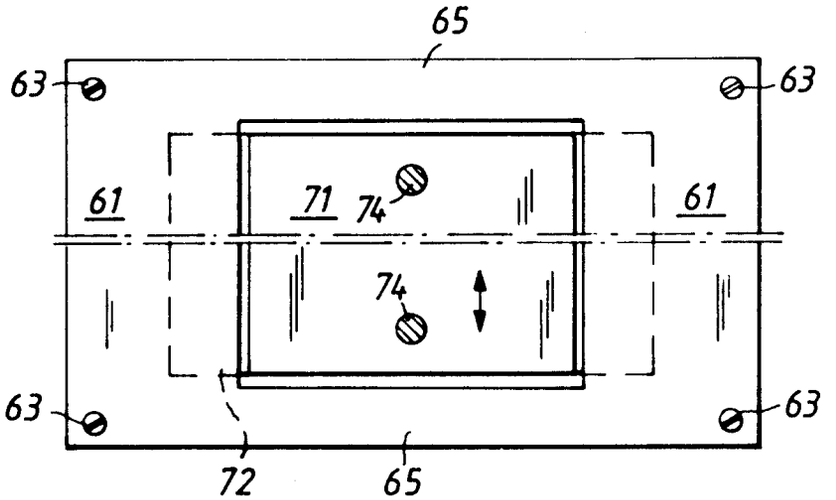
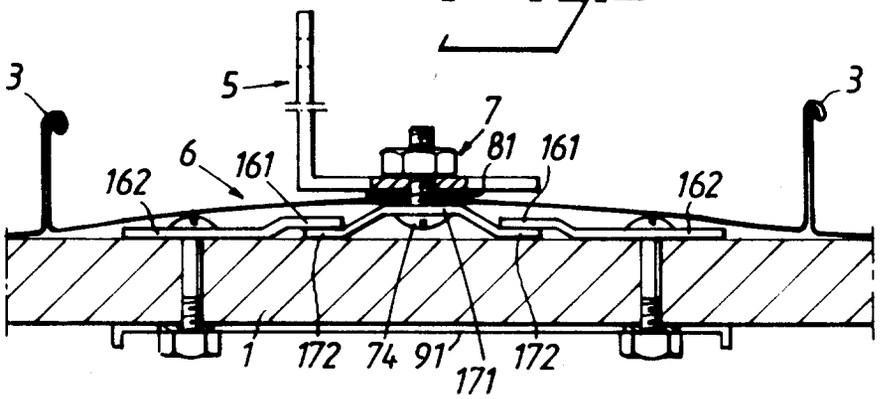


Fig.3



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EUROPEAN SEARCH REPORT

Application Number

EP 91 85 0290

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 A	FR-A-1 452 957 (F.REZ ET AL.) * page 2, column 2, line 53 - page 3, column 1, line 21; figures 1,4 *	1,2 3	E04D13/10 E04D13/12 E04D3/36
A	EP-A-0 099 298 (GROUP. ENTR. DE COUVERTURE) * abstract; figures 1,9-15 *	1-3	
A	DE-A-2 517 457 (BRAAS & CO) * claims; figures 1-3,6,7 *	1-3	
A	FR-A-2 661 440 (D.BISIAUX) * claims; figures *	1	
A	CH-A-506 679 (R.MEYER) * page 1, column 1, line 18 - column 2, line 3; figures *	1	
A	US-A-3 373 532 (H.F.STRANGE) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 JULY 1992	RIGHETTI R.

CATEGORY OF CITED DOCUMENTS

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