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(54) Element for coupling a functional roofing with an aestetical covering.

(57) The invention refers to an element (46, 56, 66, 76, 86, 96, 106) for coupling a functional roofing with an aesthetical covering, wherein said functional roofing is comprised of panels (41, 51, 61, 71, 81, 91, 101) having raised parts (43, 53, 63, 73, 83, 93, 103) and lowered parts (42, 52, 62, 72, 82, 92, 102) alternated, coupled side by side in correspondence of one of said raised parts (43, 53, 63, 73, 83, 93, 103), said coupling element (46, 56, 66, 76, 86, 96, 106) comprising a section bar having a first portion (46', 56', 66', 76', 86', 96', 106') longitudinally coupled on said raised part (43, 53, 63, 73, 83, 93, 103) of the panels of the functional roofing by the same coupling means (45, 55, 65, 75, 85, 95, 105) for the coupling with the bearing structure, said section bar being provided of a second portion (46", 56", 66", 76", 86", 96", 106") for the coupling and the fixing of two adjacent panels (47, 57, 67, 77, 87, 97, 107) of the aesthetical covering.

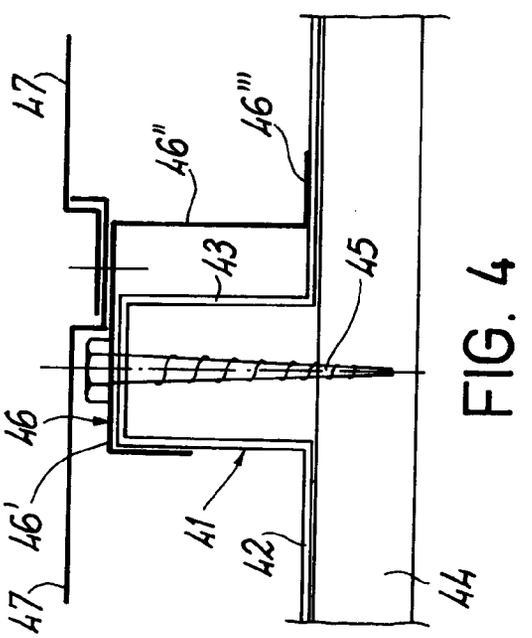

FIG. 4

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The present invention concerns an element for coupling a functional roofing with an aesthetical covering.

More particularly, the invention relates to an element of the above kind allowing to realize the coupling between the functional roofing that usually fulfils the function of seal, and the aesthetical covering, that is usually placed above the functional roofing only to improve the final appearance of the structure, without influencing the sealing features of the roofing, but even improving said features.

During the last years, there has been a remarkable diffusion of the roofing made up of sheets having a profile presenting flat zones and raised zones, these sheets being usually called "fret like".

These roofings must usually fulfil the duty of draining away meteoric waters so that they are realized employing material shaped so as to provide downflow channels for the water, and are fixed to the support structure by piercing and sealing anchoring systems.

In many cases, the aesthetical appearance of this kind of roofing is not considered satisfying, so that a further layer of sheets above it is provided, said further layer having only an aesthetical function.

To tell the truth, it must also be noted that this aesthetical covering has also a certain function of dampening of the thermal changes with a very hot whether.

On the other side, the coupling of these "aesthetical" sheets with the "functional" roofing below involves a complex series of anchoring steps that unavoidably influences the final features of the functional roofing.

All the solutions already known to couple the sheets of the aesthetical covering with those of the functional covering have some drawbacks.

A first known solution is the one shown in the enclosed figure 1, wherein, with reference 1 it is indicated the bearing structure of the functional roofing, generally indicated by reference 2.

Above the roofing 2, transverse with respect to the fret shaped elements 3, inverted Ω elements 4, fixed to the same the fret shaped elements are provided.

The panels realizing the aesthetical covering are rested on the inverted Ω elements 4: they are coupled by the elements 6 to the same Ω 4. In correspondence of the coupling zone with the adjacent panel 5, on the Ω element 4, said panels creates gutters 6 collecting the water.

The water flows above the panels 5, collects within the gutters realized by the Ω 4, said Ω 4 being pierced in order to allow to the water to flow on the sheet 2 of the functional roofing.

A drawback of this kind of solution resides in that it is quite expensive.

Further, the final high of the roofing remarkably increases in view of the provision of the Ω elements 4.

A second solution already known in this field for coupling a functional roofing and an aesthetical covering is the one shown in the enclosed figure 2, wherein the parts corresponding to those of figure 1 are indicated by the same reference with the add of a'.

In this case, Ω elements 4' are coupled on the fret shaped elements 3' of the sheets 2'.

As it can be easily understood, this kind of solution substantially presents all the drawbacks of the solution previously described.

Further, the Ω elements provided in an intermediate position creates remarkable load concentration points.

Still a solution according to the prior art is the one shown in the enclosed figures 3a, 3b and 3c. This solution is particularly adopted in case it is necessary to cover structures having a very variable profile.

In this case, a stiff sealing layer 11 is provided on the zinc plated sheet 10, and above said layer an impermeabilization layer 12 is provided.

For fixing the aesthetical covering 13, some pillars 14 must be bolted to the zinc plated sheet 10, said pillars being provided with a metallic base 15 bolted on the sheet 10.

In order to realize this coupling, it is naturally necessary to break the impermeabilization 12 and the sealing layer 11, and then restore them around the pillar 14.

The coupling of the covering panels 13 with the pillars 14, as it is shown in figure 3b, is realized by a classic Ω profile 16 provided above the same pillar 14.

It is immediately evident that the coupling of an unavoidably large number of pillars 14 involves a noticeable work, besides extremely relevant problems for the seal of the structure.

In view of the above mentioned problems, the Applicant has realized a solution that allows to obviate to all the described drawbacks.

Particularly, the solution according to the present invention does not require the piercing of the functional roofing besides the strictly unavoidable for the fixing.

Further, the solution according to the present invention does not influence in any way the sealing features of the functional roofing, but even improves them.

A further advantage of the solution according to the present invention consists in allowing of making the structure of the aesthetical covering lighter than the preceding solutions, with the consequent structural and economical advantages.

Further, the solution according to the invention has features and assembling time definitely better than the prior art.

Still an advantage of the solution according to the invention is that of having a higher strength with respect to the solutions presently known, since it creates rests always on the lower functional roofing, so that, adopting the suitable contrivances usually adopted in this cases, also allows to have the aesthetical covering walkable.

These and other results are obtained according to the invention by the realization of an element for coupling a functional roofing with an aesthetical covering, said element being substantially made up of a section bar coupled to the fret of the below sheet, in correspondence of the connection points of the same sheets with the bearing structure, and provided of a face allowing the direct coupling of the aesthetical covering panel.

It is therefore specific object of the present invention a element for coupling a functional roofing with an aesthetical covering, wherein said functional roofing is comprised of panels having raised parts and lowered parts alternated, coupled side by side in correspondence of one of said raised parts, said coupling element comprising a section bar having a first portion longitudinally coupled on said raised part of the panels of the functional roofing by the same coupling means for the coupling with the bearing structure, said section bar being provided of a second portion for the coupling and the fixing of two adjacent panels of the aesthetical covering.

In a preferred embodiment of the element according to the invention, said section bar has a third portion, connected to said second portion and faced downward, resting on the lowered part of the functional roofing panel adjacent to the raised part of the same panel coupled to the section bar.

Still, according to the invention, said second portion of the section bar coupling the aesthetical covering panels is raised with respect to the raised part of the functional roofing panel.

Furthermore, according to the invention, said second portion of the coupling section bar of the aesthetical covering panels can be lowered with respect to the raised part of the functional roofing panel.

Further, said second portion of the coupling section bar of the aesthetical covering panels can be provided on a level with the raised part of the functional roofing panel.

Said second portion can be also comprised, according to the invention, of a portion slightly raised with respect to said first portion, with a curved external profile.

Always according to the invention, said first portion can have a lowered central part and two raised lateral parts.

In a further embodiment of the element according to the invention, said section bar can be comprised of portions having an undulating shape, in function of the profile of the below panel.

According to the invention, said coupling means of the functional roofing panels each other and with the section bar can be made up of raised head screws or of lowered head screws.

Among the panels of the aesthetical covering and the panels of the functional roofing, a layer of soundproofing material can be provided, placed along all or part of the covering surface.

The present invention will be now described for illustrative, but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

Figure 4 is a transverse section view of a first embodiment of the element according to the invention;

Figure 5 is a transverse section view of a second embodiment of the element according to the invention;

Figure 6 is a transverse section view of a third embodiment of the element according to the invention;

Figure 7 is a transverse section view of a fourth embodiment of the element according to the invention;

Figure 8 is a transverse section view of a fifth embodiment of the element according to the invention;

Figure 9 is a transverse section view of a sixth embodiment of the element according to the invention;

Figure 10 is a transverse section view of a seventh embodiment of the element according to the invention; and

Figures 11a and 11b are perspective views of aesthetical covering panels that can be employed with the element according to the invention.

Referring first to figure 4, with the reference number 41 it is indicated the fret like sheet of the functional roofing, said sheet providing lowered parts 42 and raised or fret-shaped parts 43.

The sheet 41 is coupled to the bearing structure of the roofing 44 by screws 45 in correspondence of the fret 43.

In the solution according to the invention, it is provided a section bar 46 coupled with the sheet 41 in the same point of coupling of the same with the adjacent sheet.

Said section bar 46 extends all through the length of the same sheet 41.

The section bar 46 can be suitably shaped according to the specific needing, and in figure 4 a first preferred embodiment is shown providing a first horizontal portion 46', a vertical portion 46", parallel with respect to the vertical wall of the fret 43, and a second horizontal portion 46'", resting on the flat portion 42 of the sheet 41.

In this way, the section bar creates a zone on the portion 46' projecting with respect to the fret 43, for

the connection of panels 47 of the aesthetical covering.

The portions 46" and 46"' instead makes a support and strengthening function for the structure. It is evident that, in this case, as well as in other cases, it is possible to avoid the portions 46" and 46"', realizing the projecting part with a higher strength.

In order to avoid soundproofing problems between the head of the screw 45 and the panel 47, a soundproofing material can be provided between them, said material not being shown in the figure.

As already mentioned, by this solution, it is only necessary to realize the couplings necessary to make the usual functional roofing, so that the sealing of the functional roofing is not affected.

The fixing of the panels 47 on the section bar 46 is realized in different points and no new coupling is realized, so that the water filtering across the coupling points between the panels 47 and the section bar 47 is normally drained by the below roofing.

Further, by the solution illustrated, according to the dimensions of the panels 47, not all the fixing points of the sheets 41 could be used, it being understood that the panels 47 must have a pitch corresponding to the pitch of the frets.

The coupling between sheets 41 and panels 47 so realized allows to remarkably improve the overall sealing in case of low gradient, since the great part of the water is discharged from the aesthetical covering and the functional roofing must only support a minor amount of water.

Other advantages and features of the solution according to the invention will be appreciated by the examination of the following figures 5 - 10, showing further embodiments of the section bar. Obviously, said embodiments must not be considered limitative, but illustrative of the invention .

In the various figures, the parts corresponding to the parts of figure 4 will be indicated by the same number, with the only difference that the first number instead of being 4, will be the number of the corresponding figure.

In figure 5, the section bar 56 has the portion 56' ending at the end of the fret 53, and is connected to the vertical portion 56", in this case lowered, by two portions 56^{iv} and 56^{v}, so that the coupling of the section bar 56 with the panels 57 occurs in correspondence of the portion 56^{v}, i.e. below the top of the fret 53.

In the solution shown in figure 6, the section bar is substantially realized as the one of the preceding figure, with the difference that the portions 66^{iv} and 66^{v} have an extension opposite with respect to those shown in figure 5, i.e. the coupling zone of the section bar 66 and the panels 67, on the portion of the section bar 66^{v} is placed above the fret 63.

The solution of figure 7 is practically identical to the solution of figure 5 as far as the section bar 76 is concerned, but the difference exists for the kind of screw 75 employed for coupling the section bar 76 and the sheets 71. In fact, in this case the screw has a flat head, so that there is no contact with the panel 77, being it possible in this situation, if desired, to realize a direct contact between the section bar 76 and the panel 77.

Obviously, this screw can be provided with any other kind of section bar.

The section bar shown in figure 8 has a particular shape of the portions 86^{iv} and 86^{v}: In fact, the first one extends upward and the second is rounded, the corresponding panel 87 being necessarily shaped correspondingly. This solution helps in avoiding the rotation of the panel 87 with respect to the section bar 86.

The section bar 96 of figure 9 is very similar to the section bar of figure 7. However, the portion 96' in this case has the shape of a squared Ω, in such a way that the panel 97 is far from the head of the screw 95.

A last illustrative embodiment is shown in figure 10: the section bar 106 has been expressly realized for a sheet 101 that instead of having a lower flat part and a raised part has a sinusoidal outline.

In figures 11a and 11b, two kinds of panel to be used with the element according to the invention are shown for illustrative purposes, particularly the panel 117a does not follow the profile of the sheet, while the panel 117b has a transverse section corresponding to the sheet of the functional roofing.

It must be pointed out once more that each of the solutions illustrated provides that the portion of the section bar resting on the lower part of the sheet can be avoided, in this case being it necessary to modify the technical and structural features of the section bar in order to obtain the desired strength.

Obviously, the section bar can be realized by any suitable material.

The present invention has been described for illustrative, but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Element for coupling a functional roofing with an aesthetical covering, wherein said functional roofing is comprised of panels having raised parts and lowered parts alternated, coupled side by side in correspondence of one of said raised parts, said coupling element being characterized in that it comprises a section bar having a first portion longitudinally coupled on said raised part of the panels of the functional roofing by the same coupling means for the coupling with the bearing structure, said section bar being provid-

ed of a second portion for the coupling and the fixing of two adjacent panels of the aesthetical covering.

2. Element according to claim 1, characterized in that said section bar has a third portion, connected to said second portion and faced downward, resting on the lowered part of the functional roofing panel adjacent to the raised part of the same panel coupled to the section bar.

3. Element according to one of the claims 1-2, characterized in that said second portion of the section bar coupling the aesthetical covering panels is raised with respect to the raised part of the functional roofing panel.

4. Element according to one of the claims 1-2, characterized in that said second portion of the coupling section bar of the aesthetical covering panels is lowered with respect to the raised part of the functional roofing panel.

5. Element according to one of the claims 1-2, characterized in that said second portion of the coupling section bar of the aesthetical covering panels is provided on a level with the raised part of the functional roofing panel.

6. Element according to one of the claims 1-2, characterized in that said second portion comprises a portion slightly raised with respect to said first portion, with a curved external profile.

7. Element according to one of the preceding claims, characterized in that said first portion have a lowered central part and two raised lateral parts.

8. Element according to one of the claims 1-2, characterized in that said section bar has portions having an undulating shape, in function of the profile of the below panel.

9. Element according to one of the preceding claims, characterized in that said coupling means of the functional roofing panels each other and with the section bar are made up of raised head screws.

10. Element according to one of the preceding claims, characterized in that said coupling means of the functional roofing panels each other and with the section bar are made up of lowered head screws.

11. Element according to one of the preceding claims, characterized in that a layer of soundproofing material is provided among the panels of the aesthetical covering and the panels of the functional roofing, placed along all or part of the covering surface.

FIG. 1

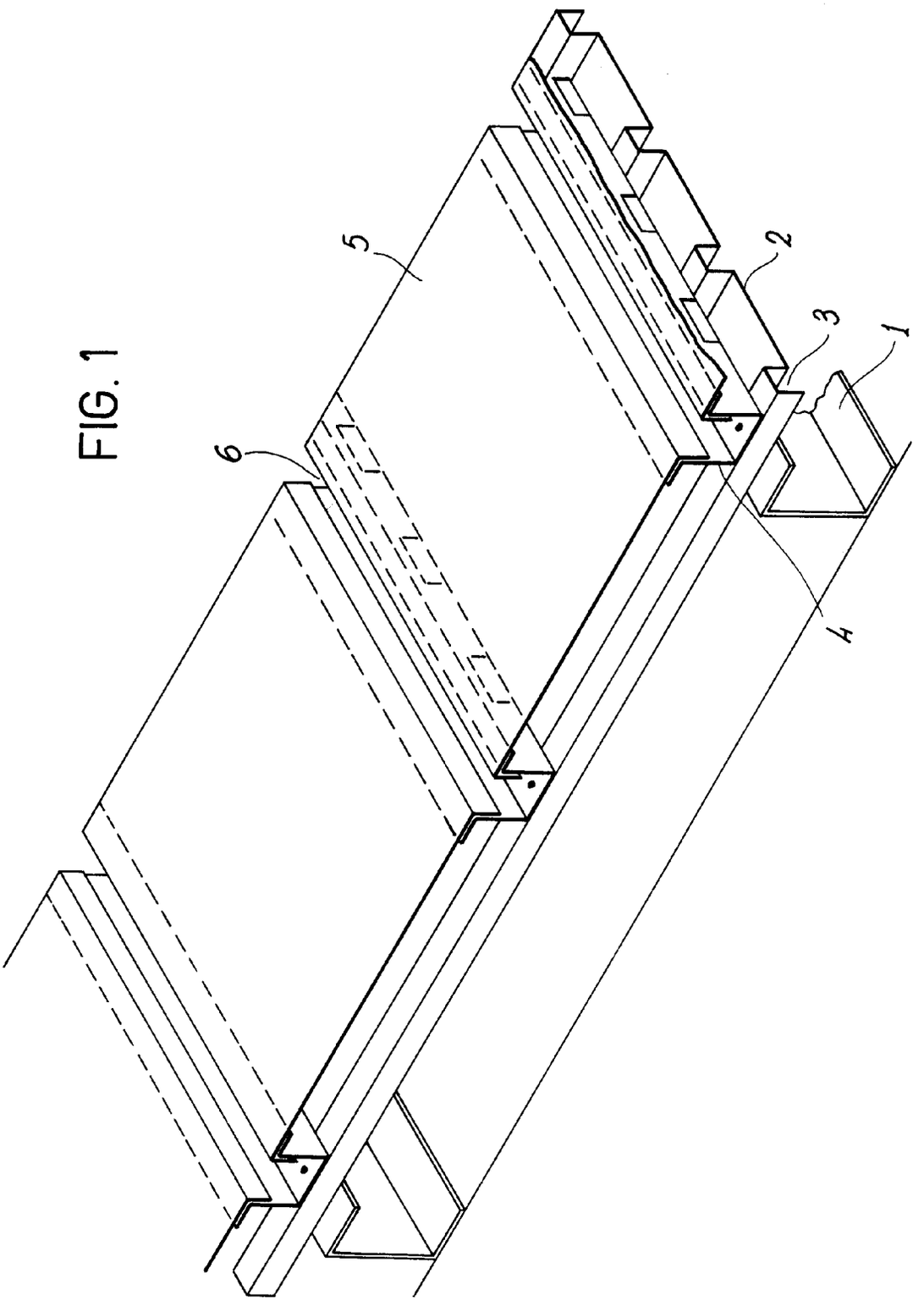


FIG. 2

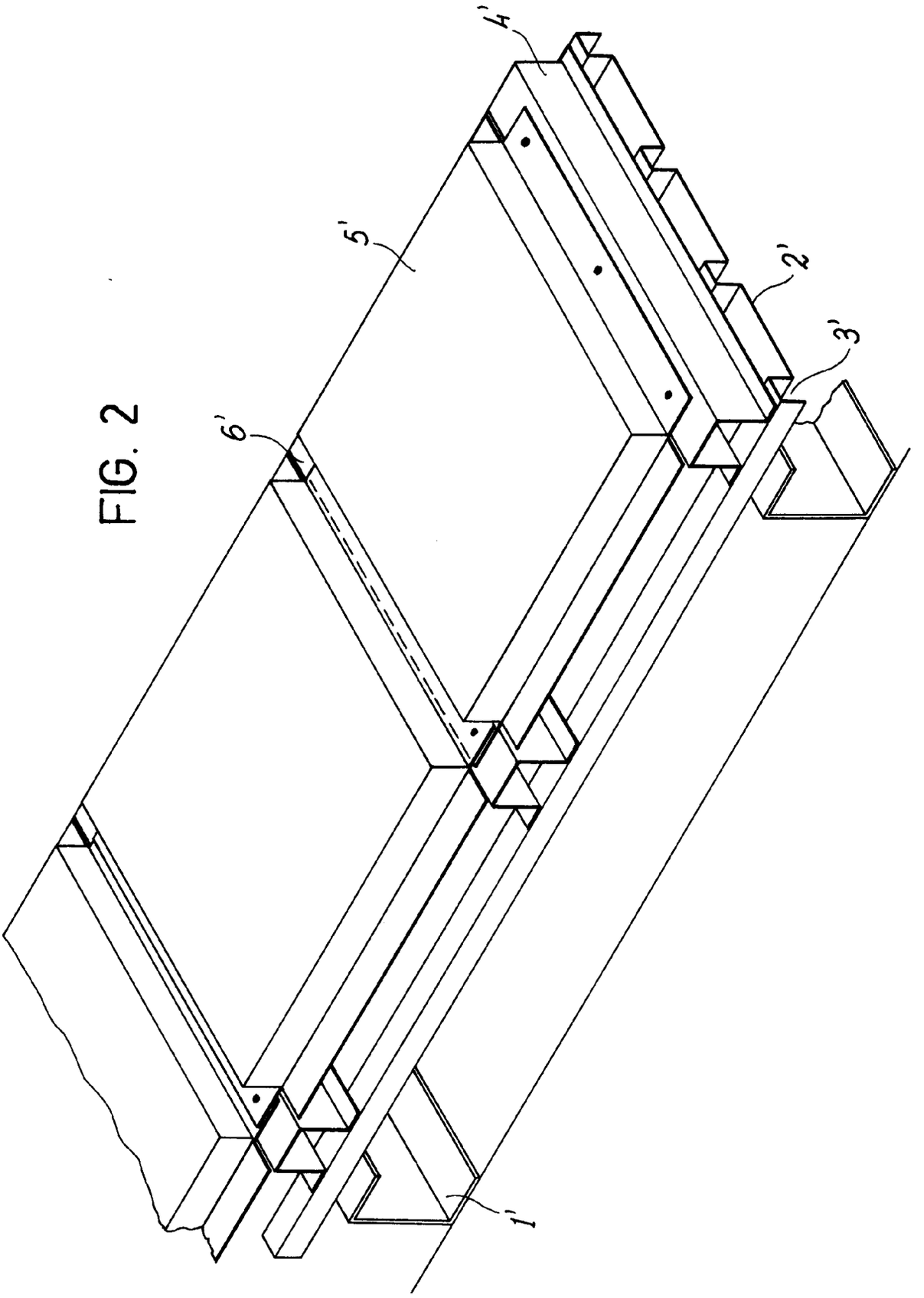
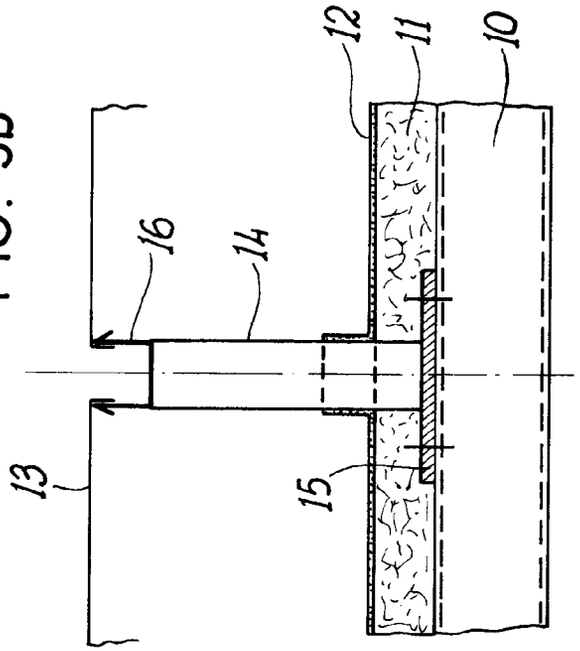


FIG. 3b



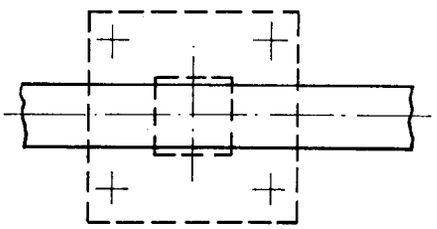


FIG. 3c

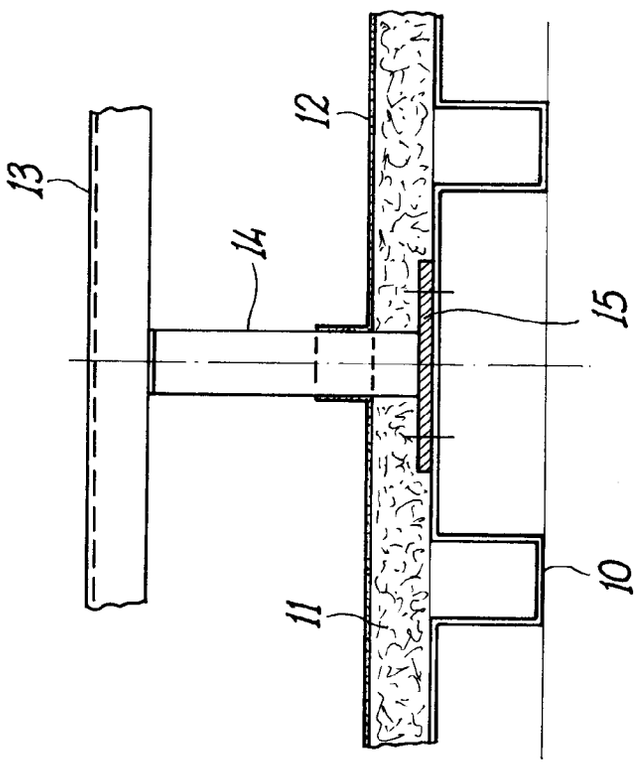


FIG. 3a

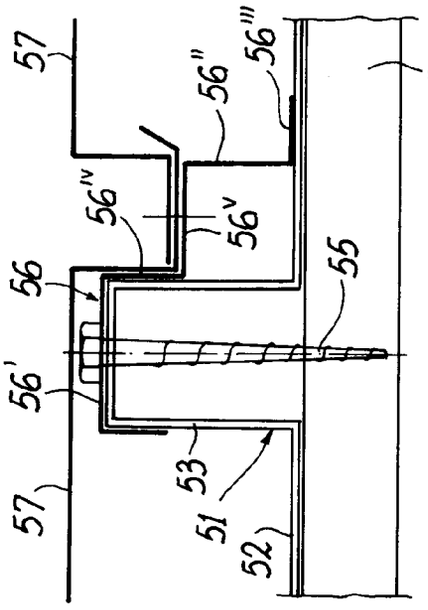


FIG. 5

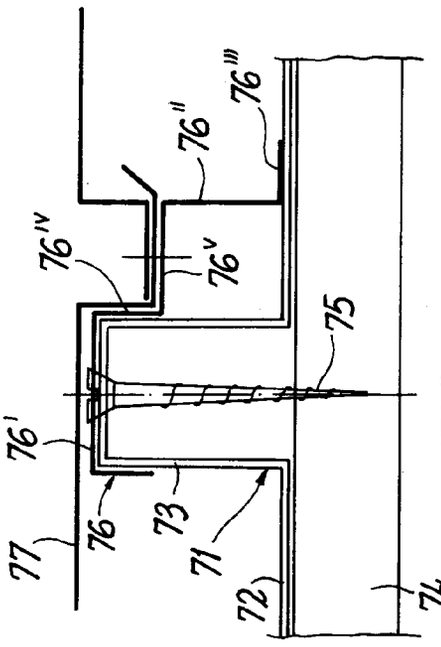


FIG. 7

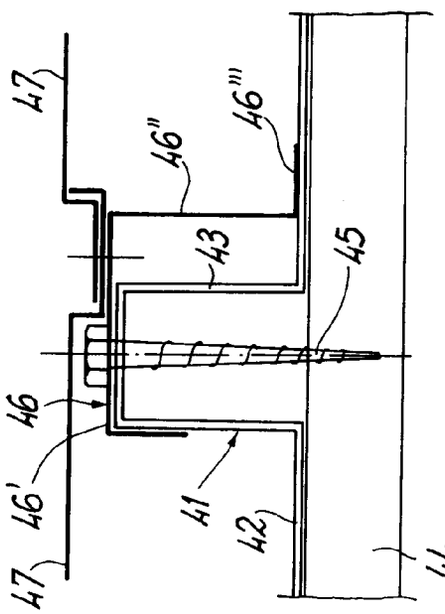


FIG. 4

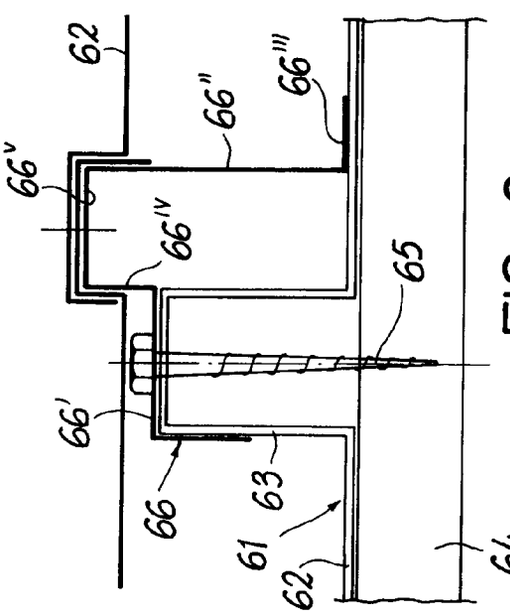


FIG. 6

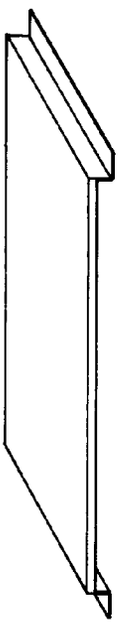


FIG. 11a

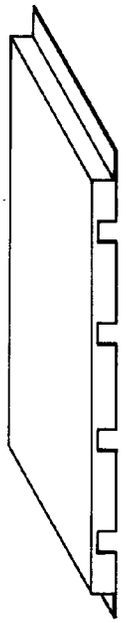


FIG. 11b

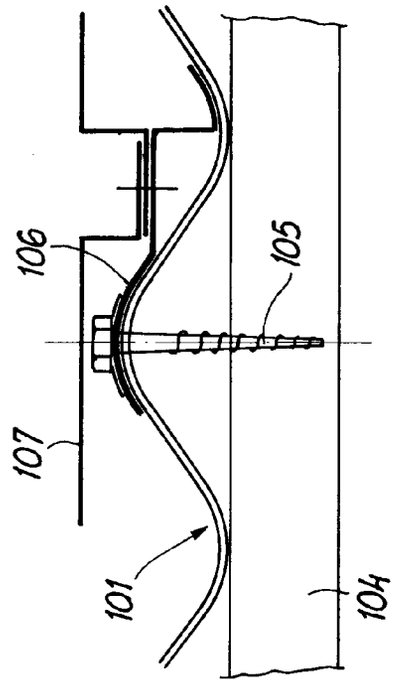


FIG. 10

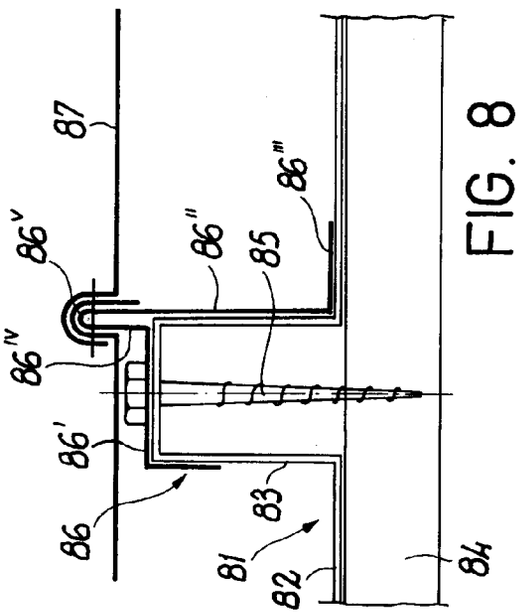


FIG. 8

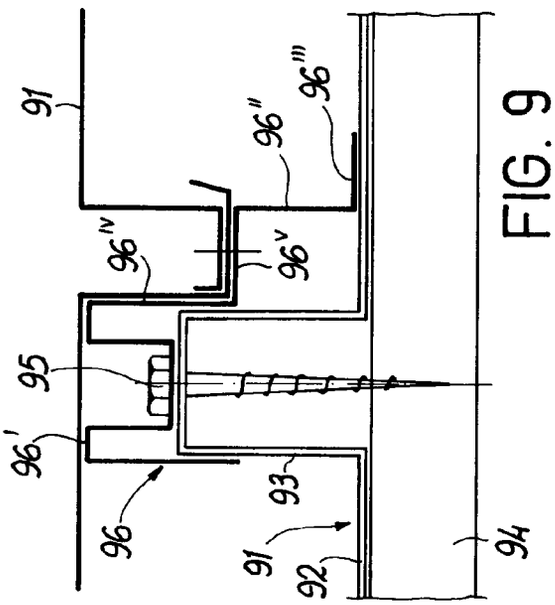


FIG. 9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0178

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)
X Y A	AT-B-384 060 (F. KREMPELMEIER) * page 2, line 24 - page 3, line 17; figures * ---	1,3,7,8 2,6,9-11 4,5	E04D3/36
Y	GB-A-2 092 202 (ITW) * abstract; figures * ---	2,9-11	
Y	DE-U-91 04 370 (G + H MONTAGE GMBH) * figures * ---	6	
A	DE-A-36 27 950 (H. BIEBER) * abstract; figures * ---	2,6	
A	FR-A-2 648 170 (FINANCIERE ETERNIT) * abstract; figures * ---	1,9,10	
A	EP-A-0 035 148 (CELOTEX CORP.) * abstract; figures * ---	1,5,9,10	
A	US-A-4 348 846 (BELLEM) * abstract; figures * ---	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) E04D
A	US-A-5 127 205 (EIDSON) * abstract; figures * -----	6	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 September 1995	Righetti, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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