



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.05.2003 Bulletin 2003/21

(51) Int Cl.7: **E04C 2/292**

(21) Application number: **02025396.9**

(22) Date of filing: **14.11.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Bassi, Iglis**
44100 Ferrara (IT)

(74) Representative: **Bonini, Ercole**
c/o STUDIO ING. E. BONINI SRL
Corso Fogazzaro 8
36100 Vicenza (IT)

(30) Priority: **15.11.2001 IT VI20010242**

(71) Applicant: **Bassi, Iglis**
44100 Ferrara (IT)

(54) **Junction device for connecting insulating panels having means for fixing the panels to a supporting structure**

(57) A junction device (1) for connecting two coplanar panels (2, 3) comprising a first shaped profile (4) being a part of a first (2) panel and being composed by one couple of ribs (5, 6) between which a central channel (7) is defined and a second shaped profile (8) being a part of a second (3) panel and being composed by one couple of channels (9, 10) each one being comprised

between a lateral (11, 12) and a central (13) rib in which every channel (9, 10; 7) is suitable for accepting a corresponding rib (5, 6; 13) when the shaped profiles (4; 8) are coupled one with another. The ends (5a, 6a; 11a, 12a, 13a) of the ribs (5, 6; 11, 12, 13) of each one of the panels are located at different distances from any axis (Y) perpendicular to the surface of the panels themselves (2, 3).

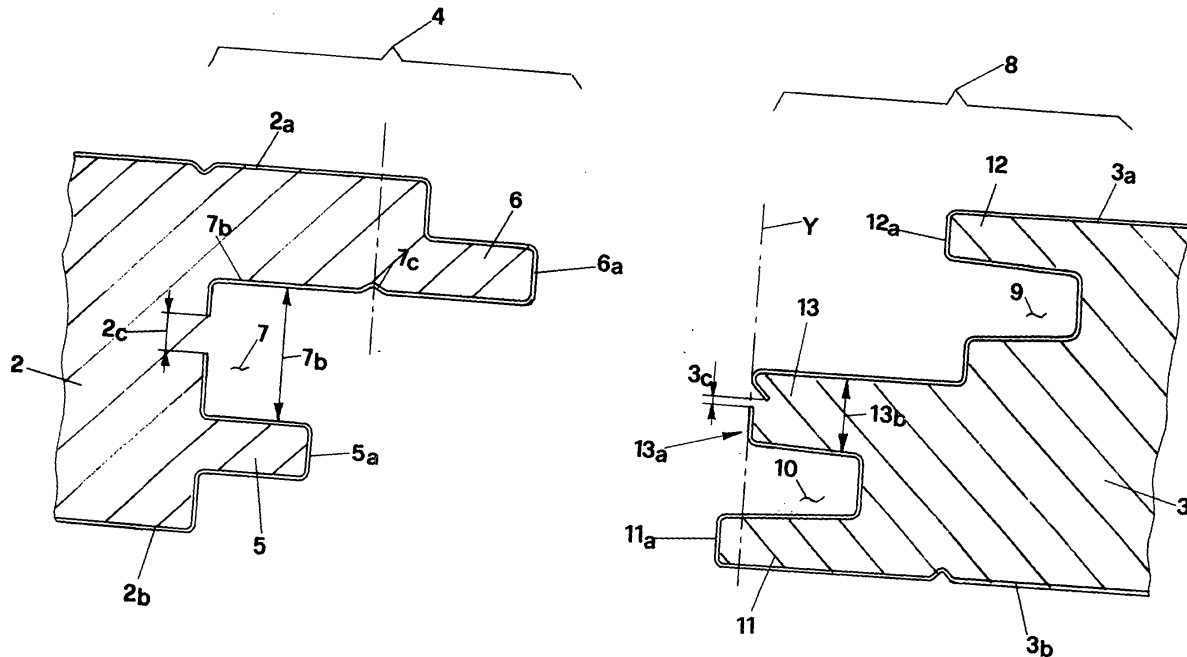


FIG.5

Description

[0001] The invention relates to a junction device for connecting two insulating coplanar panels, suitable for housing fixing means of the panels themselves to a supporting structure.

[0002] It is known that, in order to realize telescoping walls for sheds, warehouses, drying ovens, coolers and others, insulating prefabricated panels, made by parallel and spaced plane sheets surfaces, are very often used. Between the surfaces an insulating material, for example expanded polyurethane, is interposed.

[0003] In order to build the telescoping walls, a plurality of coplanar panels, two by two joined by junction devices in correspondence with the sides, are used. They have to guarantee a good connection between the panels, in order to assure mechanical resistance and enough stiffness to the telescoping wall realized by them.

[0004] The junction devices have also to guarantee a thermal insulation in the joint point of the panels.

[0005] The junction devices are generally shaped in order to receive the panel fixing means to the supporting structure, so that such fixing means, for example screws, are not visible and not accessible from the outside. Therefore this arrangement solves many safety and aesthetic problems.

[0006] A junction device of the known type and frequently used is represented in fig. 1, where we can see that the two panels to be connected, indicated respectively by A and B, are joined one with another in correspondence with a side by male-female profiles, respectively A1 and B1. Between these profiles a metallic bracket S, coupling to both profiles for a while, is interposed.

[0007] In particular, the bracket S has a shape S1 housed in a recess R of the panel A, in which the head T of the fixing screw V is housed to a supporting structure, generally indicated by C, made, for example, by the columns placed on the building perimeter.

[0008] In such a way the bracket S fixes the panel B to the supporting structure C and the panel A is constrained to the panel B through the mutual coupling of the shaped profiles A1, B1.

[0009] However, junction devices of such a type have some disadvantages and limitations.

[0010] The first disadvantage is the use of the bracket S, which obviously has a certain realization cost and also a certain mounting cost during the panel construction.

[0011] Another disadvantage is that the bracket S is in touch with both sheets La and Lb, defining the two external surfaces of each panel. Therefore, it creates a thermal bridge towards the outside because it restores the continuity between the sheets in correspondence with the panel central area. In this area, as it can be seen in fig. 1, the sheets had been intentionally interrupted.

[0012] Finally, another limitation is the presence of just one male-female fixed joint in each panel profile, which takes place only in a very little length of the panel wall and limits the mechanical resistance of the coupling.

[0013] Junction devices are also known, in which, as it can be seen in fig. 2, the panels A and B are mutually coupled by the conjugate profiles A1 and B1. One of these panels, precisely the panel B, is directly fixed to the supporting structure C by way of the through screw V. This, as it can be seen, has its head T housing in a recess R comprised between the two panels.

[0014] The junction device described has the advantage that it doesn't use any metallic bracket and therefore it is less expensive during its construction and mounting.

[0015] However, such a solution has a double disadvantage.

[0016] The first disadvantage is that in this embodiment the connecting screw V creates a thermal bridge between the sheets Lb, defining the panel B. Therefore, it realizes the thermal continuity between the thermal supporting structure C, which the panels are fixed to, and the external surface.

[0017] Another disadvantage is that, with respect to the known solution previously described, the profiles A1 and B1 of the panels, A and B respectively, guarantee a lower mechanical seal and therefore substantially a lower resistance and stiffness of the wall when the panels operate.

[0018] The present invention wants to overcome all the above mentioned disadvantages.

[0019] In particular, one of the invention aims is the realization of a junction device for connecting two insulating coplanar panels with higher mechanical resistance in respect with equivalent junctions of the known type.

[0020] It is a further aim that the junction device of the invention has, with respect to known junction devices, a better thermal insulation degree.

[0021] It is not the last aim that the junction device of the invention let house the fixing means to a supporting structure, so that such fixing means are not visible and not accessible from the outside.

[0022] Said aims are reached by a junction device for connecting two coplanar panels, each one composed by two sheets not in touch with another and spaced through the interposition of insulating material, which, according to the main claim, comprises:

- a first shaped profile making a side of a first of said panels, said first shaped profile being composed by at least one couple of ribs, among which a channel is defined, obtained by deformation of the ends of said sheets;
- a second shaped profile making a side of a second of said panels, said second shaped profile being composed by at least one couple of channels, each

one comprised between a lateral and a central rib obtained by deformation of the ends of said sheets. Each one of said channels is suitable for accepting a corresponding rib when said shaped profiles are coupled. Each channel is characterized in that said ribs ends of each of said panels are placed at different distances from any axis Y, perpendicular to the panel surface itself.

[0023] In such a way, according to the claimed embodiment, the coupling between the panels develops for a line longer than that is generally seen in the junction devices of the known type, where the rib ends are all aligned with respect to a direction perpendicular to the panels.

[0024] In this way the mechanical resistance and the coupling stiffness are increased. Therefore, also the telescoping wall stiffness, defined when the panels are connected one with another, is increased.

[0025] Each one of the ribs and of the channels are placed along the direction defined by the wall longitudinal axis, obtained when the panels are connected one with another, one aligned with another.

[0026] Between the central rib of the second profile and the respective central channel of the first receiving profile, a hollow area, suitable for housing the maneuver end of the panel fixing means to a supporting structure, is defined.

[0027] On the central channel bottom and on the central rib end, the sheet separation of each panel, after being deformed to obtain the shaped profiles, is placed.

[0028] The fixing means are in touch only with one of the sheets covering the panel and therefore they don't constitute a thermal bridge, increasing the insulation.

[0029] The first shaped profile is composed by a couple of ribs, between which a channel is defined, and the second shaped profile is composed by a couple of channels between which a rib is defined.

[0030] According to an embodiment, each one of the panels has both profiles shaped and these are realized one on one side and the other on the opposite side of the panel. In such a way a plurality of panels, one along with another, are connectable. They are all coplanar and aligned along a rectilinear direction.

[0031] According to another embodiment, each one of the panels can have the same shaped profile on each one of the sides.

[0032] According to another embodiment, each panel can have the shaped profiles placed on the four sides, where the sides of each panel, one opposed with another, have different shaped profiles.

[0033] By using panels realized according to the last two embodiments described, these panels can be, as well as in the horizontal direction, also vertically connected, one laid upon the other.

[0034] Advantageously, the junction device of the invention increases both the thermal insulation degree and the panel mechanical resistance when they oper-

ate.

[0035] Still advantageously the invention junction makes the panel fixing means to the supporting structure invisible from the outside and prevent them from maneuvering, protecting thereby both the esthetical aspect and the security.

[0036] Said aims and advantages will be better underlined during the description of a preferred embodiment of the invention referring to the accompanying drawings, where:

- fig. 1 represents a sectional view of junction device of the known type;
- fig. 2 represents another junction device of the known type;
- fig. 3 represents a section of the junction device of the invention assembled;
- fig. 4 represents a enlarged particular of the junction of fig. 3;
- fig. 5 represents the junction device of the invention separated.

[0037] As it can be seen in figs. 3-5, the junction device of the invention, indicated as a whole by 1, joins two coplanar panels together and precisely a first panel 2 and a second panel 3, each one composed by two sheets 2a, 2b and respectively 3a, 3b not in touch and spaced through the interposition of insulating material.

[0038] By shaping for plastic deformation the sheet edges, shaped profiles, making the panels sides, are obtained on the two panels and precisely:

- a first shaped profile, indicated as a whole by 4, composed by a couple of ribs 5, 6, making the side of the first panel 2, between which a central channel 7 is defined;
- a second shaped profile, indicated as a whole by 8, composed by a couple of channels 9, 10, each one being comprised between a lateral rib 11, 12 and a central rib 13, making the side of the second panel 3.

[0039] Each one of the ribs is suitable for being accepted in a corresponding channel when the shaped profiles are coupled one with another to make, through the panel joining, a continue wall, for example for a room telescoping, for an oven drying, for a freezer or others.

[0040] According to the invention the ends 5a, 6a; 11a, 12a, 13a, of the ribs 5, 6; 11, 12, 13 of each one of the panels 2, 3 are placed at different distances from any axis Y perpendicular to the surface of the panels themselves.

[0041] Infact, in figs. 3 and 5 we can see that, for example with respect to an axis Y perpendicular to the panels and passing through the end 13a of the rib 13, the ends of all the other ribs are placed at different distances.

[0042] This allows, contrary to other junction devices

of the known type, the realization of the connection between the panels by many joint areas developing for a length indicated by L in fig. 3, according to the longitudinal panel alignment direction X. This length is greater than that of the junction devices of the known type.

[0043] Further, the ends 5a, 6a of the ribs 5, 6 of the first panel 2 are distant one from another of the quantity D, allowing the passage of the fixing means from the panel to the supporting structure.

[0044] In fact, we can see that the central rib 13 has a width 13b lower than the width 7b of the respective central receiving channel 7. Thereby, between the rib and the channel a hollow area, indicated by 14 and housing the head T of the screw V to fix the panel 2 to the supporting structure, is defined.

[0045] In order to reach such an aim, in the lateral wall 7b of the central channel 7 an impression 7c is made, which is a reference for the drilling, when we want to operate the panels.

[0046] Being all the channels and all the rib placed on the above mentioned direction defined on the panel alignment longitudinal axis X, the panel junction happens by moving them mutually through opposite directions along such a direction X.

[0047] In order to prevent the thermal bridge to create, the sheets 2a, 2b of the first panel and equally the sheets 3a, 3b of the second panel 3 are spaced one with another of a quantity, respectively 2c and 3c, placed in correspondence with the bottom 7a of the central channel 7 and the end of the central rib 13.

[0048] Due to the particular way by which the junction device of the invention is realized, the screw V and its head T are in touch with only the sheet 2a of the first panel 2. Therefore, as it can be seen in fig. 4, the screw doesn't make a thermal bridge between the sheets as, on the contrary, happens in the junctions of the known type.

[0049] In order to have a greater seal and insulation warranty, between the front surface 13a of the central rib 13 and the bottom 7a of the central channel 7 a gasket 15 is interposed. The continuity between the sheets 2a, 2b and 3a, 3b, respectively of the first panel 2 and the second panel 3, is made by the interposition of the insulating shaped profiles, respectively 16, 17.

[0050] In order to favour the coupling, the channels 9, 10 of the first profile 2 have the lateral walls 9a, 10a converging towards the bottom 9b, 10b.

[0051] Operatively, in order to make the telescoping wall, we lay the first panel 1 to the supporting structure and after having made the hole in correspondence with the impression 7c, the panel is fixed through the screw V.

[0052] At this moment, the first panel 1 is flanked by the second panel 3, coupling the shaped profiles mutually.

[0053] The mounting continues by fixing the second panel 3 to the same supporting structure, in correspondence with the further shaped profile on the opposite side

and not represented in figure. The supporting structure will be the same to the shaped profile represented in fig. 4 and belonging to the first panel 1.

[0054] The panels can be made according to different configurations.

[0055] According to an embodiment, each panel is provided with both shaped profiles 4 and 8, one made on one side and the other on the opposite side. In such a way a plurality of panels, one in succession with another and all coplanar and aligned along a rectilinear direction, can be connected.

[0056] According to another embodiment, each one of the panels has the same shaped profile on each one of the sides.

[0057] According to a further embodiment, each panel has shaped profiles placed on all the four sides, where the sides of each panel, opposite with another, has shaped profiles, different one from another.

[0058] By using panels realized according to the last two embodiments described, these can be connected, as well as along the horizontal direction, also along the vertical direction, one laid upon another.

[0059] We can understand, according to the description, that the junction device of the invention reaches all the pre-established aims.

[0060] During the operating step construction and shape variations could be realized, which, if included in the following claims, have to be intended as protected from the present patent.

Claims

1. A junction device (1) for connecting two coplanar panels (2, 3), each one made by two sheets (2a, 2b; 3a, 3b) not connected and separated by the interposition of insulating material (l), comprising:

- a first shaped profile (4) making a side of a first (2) of said panels, said first shaped profile (4) being composed by at least one couple of ribs (5, 6), between which a central channel (7) is defined, are obtained through plastic deformation of said sheets (2a, 2b);
- a second shaped profile (8) making a side of a second (3) of said panels, said second shaped profile (8) being composed by at least one couple of channels (9, 10), each one being comprised between a lateral (11, 12) and a central (13) rib, obtained deforming the ends of said sheets (3a, 3b),

each one of said channels (9, 10; 7) being suitable for accepting a corresponding rib (5, 6; 13) when said shaped profiles (4; 8) are coupled one with another, **characterized in that** the ends (5a, 6a; 11a, 12a, 13a) of said ribs (5, 6; 11, 12, 13) of each one of said panels are located at different distances

from any axis (Y) perpendicular to the surface of the panels themselves (2, 3).

2. The junction device (1) according to claim 1, **characterized in that** each one of said ribs (5, 6; 11, 12, 13) and each one of said channels (9, 10; 14) is located along the direction defined by the alignment longitudinal axis (X) of said panels (2, 3) one between another. 5
3. The junction device (1) according to claim 1) or 2), **characterized in that** said central rib (13) of said second profile (3) has a width (13b) lower than the width (7b) of the respective central channel (7) of said accepting first profile (2), a hollow area (14), suitable for housing the maneuver end of said fixing means (V) of said panels (2, 3) to a supporting structure, being defined between said central rib (13) and said central channel (7). 10
15
20
4. The junction device (1) according to claim 3), **characterized in that** said fixing means are screw (V) with an head (T), each one of said screws being in touch with only one (2a) of said sheets (2a, 2b; 3a, 3b) making the panel (2, 3) which it is applied to. 25
5. The junction device (1) according to claim 1), **characterized in that** said channels (9, 10) of said second profile (8) have the lateral walls (9a, 10a) converging towards the bottom (9b, 10b). 30
6. The junction device (1) according to claim 1), **characterized in that** said sheets (2a, 2b; 3a, 3b), defining each one of said panels (2, 3), are separated one with each other in correspondence with the bottom (7a) of said central channel (7) and with the end (13a) of said central rib (13). 35
7. The junction device (1) according to claim 1), **characterized in that** said first profile (4) comprises a unique central channel (7) defined between a couple of ribs (5, 6). 40
8. The junction device (1) according to claim 1), **characterized in that** said second profile (8) comprises two (9, 10) side by side channels, defined by three ribs (11, 12, 13), among which there are one central (13) and two lateral ribs (11, 12). 45
9. The junction device (1) according to claim 7), **characterized in that** the ribs of said couple of lateral ribs (11, 12) reenter with respect to the external sheets (3a, 3b) of the respective panel (3). 50
10. The junction device (1) according to claim 8), **characterized in that** said lateral rib (11, 12) has its external wall (11a, 12a) aligned with the external wall (3a, 3b) of the respective panel. 55
11. The junction device (1) according claim 1), **characterized in that** between the bottom (7a) of said central channel (7) and the end (13a) of said central rib (13) a rib (15) is interposed.

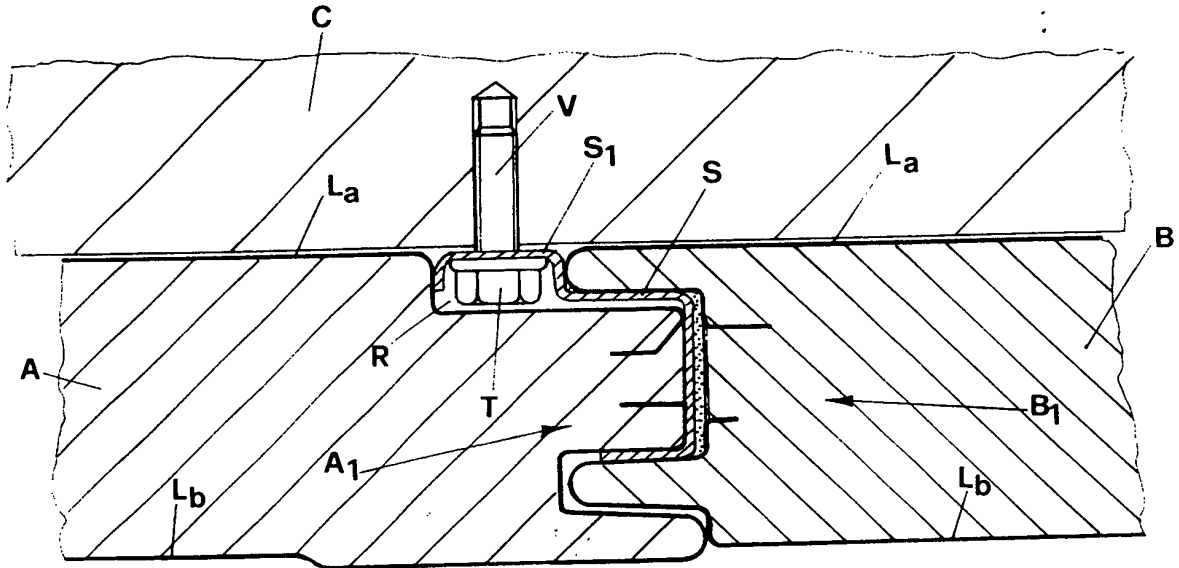


FIG. 1 PRIOR ART

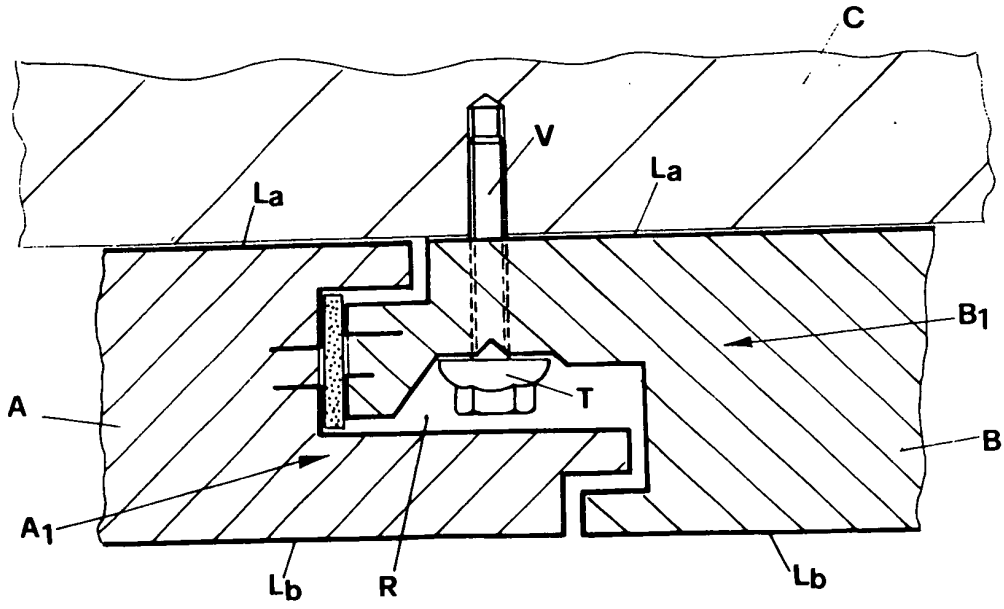
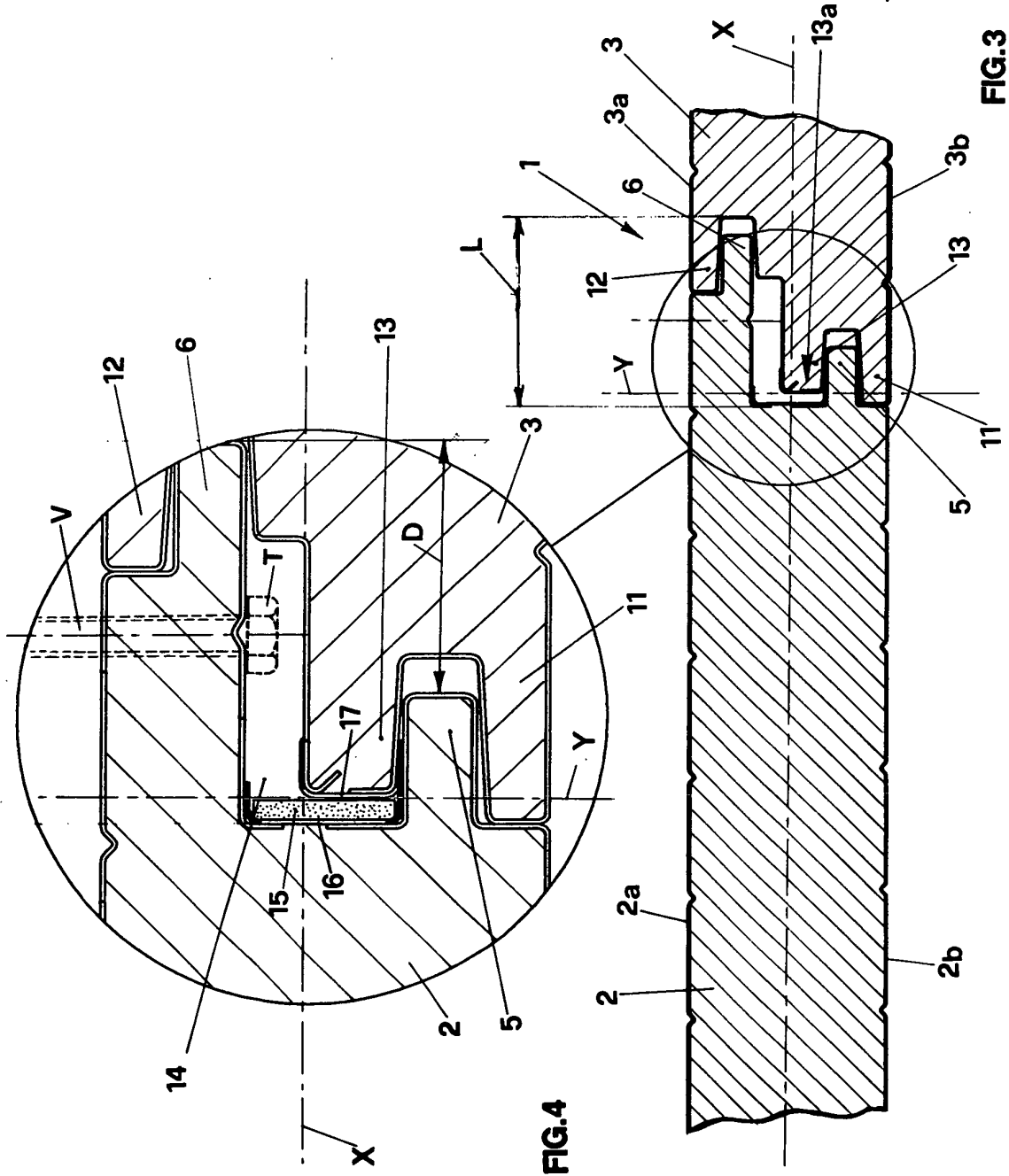


FIG. 2 PRIOR ART



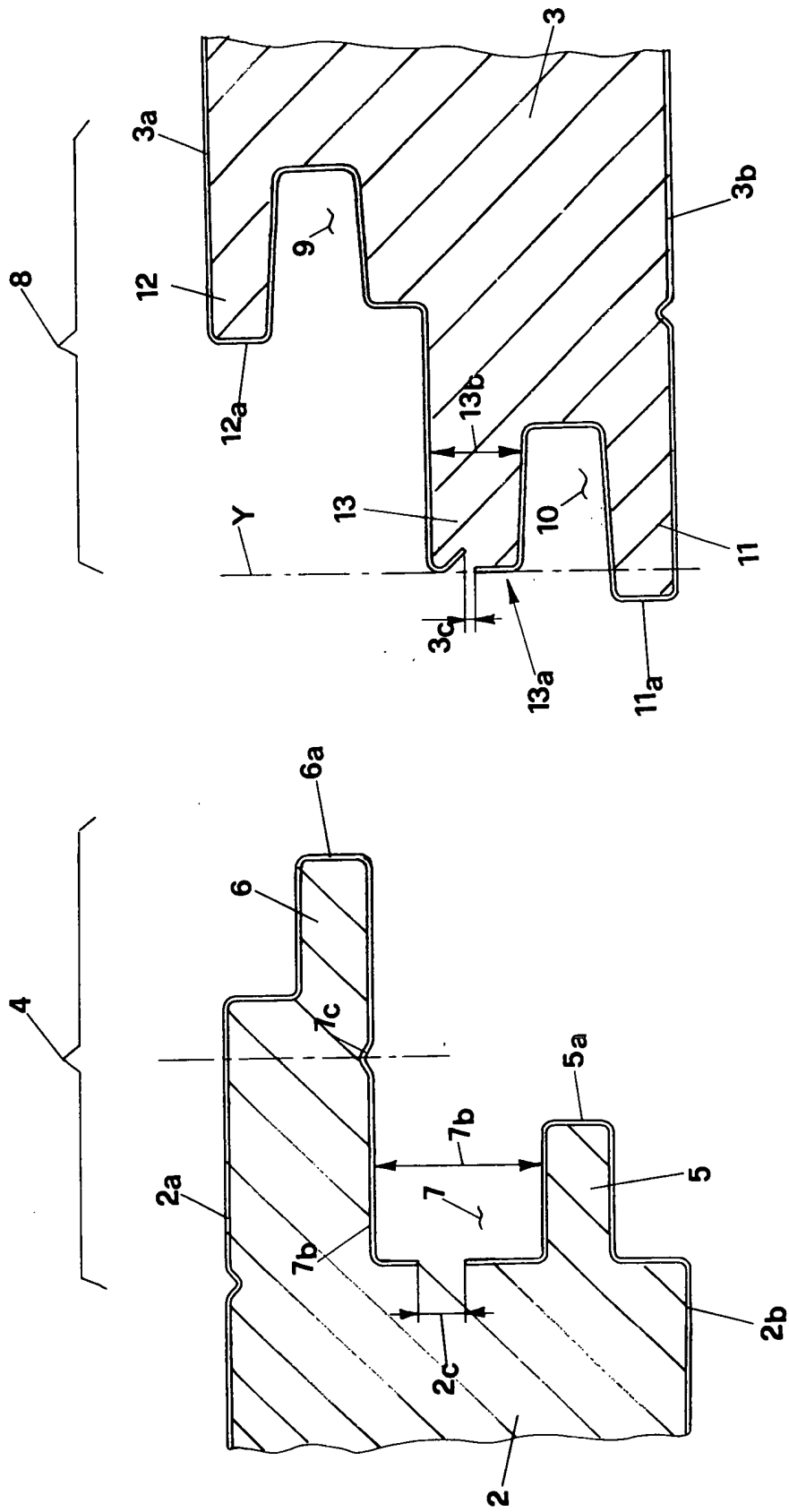


FIG.5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 02 5396

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	GB 2 325 678 A (KINGSPAN RESEARCH AND DEVELOPMENTS LIMITED) 2 December 1998 (1998-12-02)	1,2,5,7-11	E04C2/292
Y	* page 4, line 27 - page 5, line 21; figures 1-3 *	3,4	
A	---	6	
Y	DE 199 38 014 A (THYSSEN KRUPP STAHL AG) 15 March 2001 (2001-03-15) * figure 1 * -----	3,4	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			E04C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 January 2003	Examiner Mysliwetz, W
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			

EPO FORM 1503 03/02 (PO4C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 5396

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-01-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2325678 A	02-12-1998	AU 7671698 A	11-12-1998
		EP 0983406 A1	08-03-2000
		IE 980380 A1	02-12-1998
		WO 9853155 A1	26-11-1998
		PL 337067 A1	31-07-2000
DE 19938014 A	15-03-2001	DE 19938014 A1	15-03-2001

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82