(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 490 834 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **91830537.6**

(51) Int. Cl.5: **A47B 47/02**, A47B 57/40

(22) Date of filing: **06.12.91**

(30) Priority: **07.12.90 IT 954390**

(43) Date of publication of application:
17.06.92 Bulletin 92/25

(84) Designated Contracting States:
AT BE DE ES FR GB NL

(71) Applicant: **ROSSS DEI FRATELLI BETTINI S.n.c.**
Viale Kennedy n.97
I-50038 Scarperia, Firenze(IT)

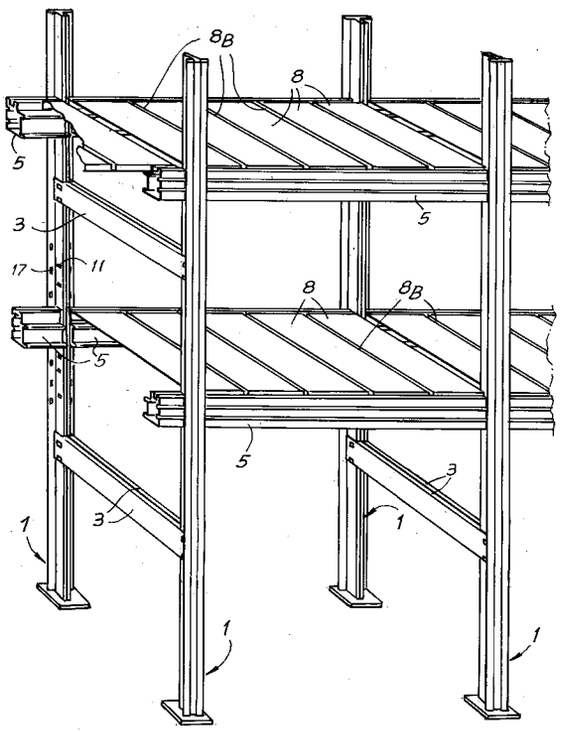
(72) Inventor: **Bettini, Rossano**
Via Cardetole n. 36
I-50037 San Piero a Sieve, Firenze(IT)

(74) Representative: **Mannucci, Gianfranco, Dott.-Ing. et al**
Ufficio Tecnico Ing. A. Mannucci Via della Scala 4
I-50123 Firenze(IT)

(54) Metal shelving.

(57) A metal shelving is described which comprises vertical posts (1), horizontal longitudinal stringers (5), means (17, 19, 21) for hooking the stringers (5) to the posts (1), cross members (3) for connecting facing posts (1) and means (11, 13, 15) for connecting the cross members (3) to the posts (1); the posts (1) have a box-type structure with T-shaped cross-section, on the web (7) of which means (11) are provided for connecting the cross members (3) to the posts (1), and on the flanges (9) of which means (17, 19) are provided for the hooking of the stringers (5).

Fig. 1



EP 0 490 834 A1

The invention relates to a metal shelving comprising vertical posts, horizontal longitudinal stringers, means for hooking the stringers to the posts, cross members for connecting facing posts and means for connecting the cross members to the posts.

The object of the invention is to provide a shelving of this type, which makes it possible, thanks to a new system for anchoring the various elements which make up the shelving, to reach an excellent stability and a particularly neat appearance, that is to say one able to hide the anchorage elements.

The shelving according to the invention is substantially characterized in that the posts have a box-type structure with a T-shaped cross-section on the web of which means are provided for connecting the cross members to the posts, and on the flanges of which means are disposed for hooking the horizontal longitudinal stringers. The use of a box-type structure makes it possible, by providing the stringer-hooking means on the inner walls of the flanges of the same post, to obtain a neat structure, that is to say a structure which does not externally show any trace of the anchoring means between the stringers and the posts.

In a particularly advantageous embodiment, the means for anchoring the stringers to the posts comprise, on one of the elements to be connected, a slot having an edge inclined to the vertical, and on the other element to be connected, a cut and drawn projection with a first joining portion being inclined like said edge and a second joining portion able to stabilize said projection. The inclined edges of the slots and the corresponding joining portions allow the stringers coupled to the two adjacent posts of the structure to be put in tension. When the stringers are loaded with the goods laid onto the shelves, the inclination of the slot edges and of the joining portions of the drawn zone allows the structure formed by the stringers and the posts to be stiffened. In a possible embodiment, the slot of the stringer-hooking means is provided on the posts, while the projection is provided on the stringer.

The means for connecting the cross members to the facing posts are advantageously positioned in such a way as to form also a support for the horizontal stringers. In this way, each stringer is anchored by means of the slots and the projections to the respective posts and further made to lean against an eyelet or other suitable means provided for anchoring the cross members.

In a possible embodiment the means for connecting the cross members to the posts are provided with an eyelet able to cooperate with an appendix; the eyelet and the appendix are provided with respective edges which are inclined to the vertical and which - when the cross member is connected to the respective posts - cause a tension on the cross member and thus a stiffening of the whole structure. Advantageously, the eyelet is formed on a side surface of the web of the T-section post, while the appendix is formed on the end portion of the cross member. To achieve an optimal connection between the facing posts of the shelving, it is particularly advantageous to provide either ends of each cross member with two appendixes engaging into two respective, vertically superimposed eyelets.

In a possible embodiment, the horizontal stringers are formed by a box-type structure which has an upper longitudinal channel for engagement with a longitudinal edge of a shelf. To improve the support of the shelf over the bearing structure, the stringer-forming box-type member forming the stringer may be provided with an intermediate longitudinal support surface onto which the shelf-reinforcing ribs are made to rest, which ribs may be therefore interrupted at some distance from the longitudinal edges of the same shelf.

The shelve-reinforcing ribs may be obtained by a U-shape bending of the sheet, which is suitably open to allow the inner region of the bending to be cleaned. This is particularly advantageous when the shelf is used for showing or stocking foodstuffs, for which special hygienic requirements must be met. Reverse T-section ribs may also be provided always by bending the shelf-forming sheet.

Advantageously, the horizontal stringer is provided with two reinforced edges formed by the body sheet forming said stringer; along said edges, the sheet is bent to form angular portions wherein the stringer wall is made up of a triple sheet thickness.

The invention will be better understood by following the description and the attached drawing, which shows a practical, not limiting example of the same invention. In the drawing:

Fig. 1 is a very schematic view of a portion of the shelving;

Fig. 2 shows a cross-section of the shelving of Fig. 1;

Fig. 3 shows a partial longitudinal section taken on line III-III of Fig. 2;

Fig. 3A shows a shelf portion in a different embodiment;

Figs. 4 and 5 show local sections taken on horizontal planes along lines IV-IV and V-V of Fig. 3;

Fig. 6 shows a detail of the end region of a horizontal stringer; and

Figs. 7 and 8 show local cross-sections taken on lines VII-VII and VIII-VIII of Fig. 6.

With reference to Fig. 1, the shelving is made up of a plurality of vertical posts 1, disposed in two

substantially parallel alignments so as to have pairs of posts 1 facing each other in tranverse direction, and connected to each other by horizontal cross members 3. The shelving is further provided with horizontal longitudinal stringers 5 which are provided along the whole front of the shelving on the two sides thereof. Resting upon the horizontal stringers 5 are suitably reinforced shelves 8, on which the goods on show or in stock are laid.

As shown in particular in Figs. 2 to 5, each post 1 has a box-type structure with a substantially T-shaped cross-section which has a web 7 and two flanges 9. Formed on the web 7 are eyelets 11 intended to engage corresponding appendixes 13, 15 of the cross members 3 for connecting the facing posts. As shown in particular in Fig. 2, the appendixes 13, 15 and the eyelets 11 are suitably inclined to stiffen the assembly formed by the facing posts 1 and the connecting cross member 3. Each cross member 3 has (see Fig. 3) a C-shape cross-section which terminates with a region 3A (Fig. 2) lacking in edges 3B in order to come close to the web portion 7 of the relevant post 1. Each pair of facing posts 1 is provided with two connecting cross members 3 disposed in facing relationship (Fig. 5). Inserted into the slot, between the cross members 3 of each pair, a grate or other element forming a vertical partition may be provided.

Formed on the inner walls 9A the flanges of each post 1 are slots 17 having an inclined edge 19 (Fig. 3) to cooperate with projections 21 worked out by drawing on the stringers 5. The projections 21 are visible in Figs. 6 and 8. They have an inclined side portion 21A intended to cooperate with the inclined edge 19 of the respective slot 17, and a horizontal upper portion 21B able to stabilize the stringer when it is hooked to the respective posts 1. The horizontal load applied on the stringers 5 causes the edges 19 to be forced into the slot formed by the projections 21 and by the surface of stringer 5, thereby stabilizing the shelving.

Once assembled (as shown in Figs. 2 and 3), the stringers 5 are made to lean against the eyelets 11 formed on the web portion 7 of the respective post 1 also by means of their lower edge and by an intermediate bend 49. In this way, each stringer 5 is anchored to the posts 1 through the two projections 21 in correspondence of each one of its own ends which engage corresponding slots 17; moreover, each stringer rests with both its ends on corresponding eyelets 11. The assembling of the stringers is possible, despite the presence of eyelets 11, by means of slots 23 formed on the end edges of the stringers.

The cross-section of the stringers 5 is shown in detail in Figs. 7 and 8. As shown in these figures, each stringer 5 has a box-type shape formed by bending a sheet. The sheet is bent in such a way as to form an upper longitudinal channel 31 which extends over the length of the respective stringer 5. Engaged in said channel is the corresponding longitudinal edge 8A of the horizontal bearing shelf 8. The disposition is shown in detail in Fig. 2, wherein the two longitudinal edges 8A of the shelf are engaged in corresponding channels 31 of opposite and parallel stringers 5 extending along the two shelving fronts. The longitudinal edges of the sheet forming the stringer 5 are folded as shown at 33 and 35 in Figs. 7 and 8, in order to close the box-type structure and form an intermediate bearing surface 37 on which reinforcing ribs 8B of the bearing shelves 8 are made to rest. By this arrangement, each shelf 8 is engaged, along its own longitudinal edges, both to the longitudinal channels 31 and to the bearing surfaces 37, thereby giving said shelves a high stability.

Each stringer 5 further has two front edges 41 and 43 reinforced by a triple bending of the base sheet forming the said stringer. In this way, angle regions are provided along the edges 41 and 43, wherein the stringer wall is formed by a triple layer of sheet confering both torsional and flexural rigidity to the stringer. Developed on the front stringer face are two bendings 45 which render the element more rigid. The longitudinal bending 49 forms a support on the eyelet 11 of the relevant post.

As shown in particular in the section of Fig. 3, the ribs 8B for reinforcing the shelf 8 have a U-shape section open on top. This allows an easy cleaning of the sheet bend, which makes this element suitable also for use in the food field, wherein it is required that the goods-bearing shelf be constantly cleaned for obvious sanitary purposes. Fig. 3A shows a modified embodiment of the shelf 8, wherein the ribs have a reverse T-shape cross-section. This shape confirs more rigidity to the shelf.

It is understood that the drawing shows an exemplification given only as a practical demonstration of the invention, as this may vary in the forms and dispositions without nevertheless coming out from the scope of the idea on which the same invention is based. The possible presence of reference numbers in the appended claims has the purpose to facilitate the reading of the claims, reference being made to the description and the drawing, and does not limit the scope of the protection represented by the claims.

Claims

1. A metal shelving comprising vertical posts (1), horizontal longitudinal stringers (5), means (17, 19, 21) for hooking the stringers (5) to the posts (1), cross members (3) for connecting

facing posts (1) and means (11, 13, 15) for connecting the cross members (3) to the posts (1), characterized in that said posts (1) have a box-type structure with T-shaped cross-section, on the web (7) of which there are provided said means (11) for connecting the cross members (3) to the posts (1), and on the flanges (9) of which there are provided said means (17, 19) for the hooking of the stringers (5).

2. Metal shelving according to claim 1, characterized in that the means (17, 19) for hooking the stringers (5) to the posts (1) are formed on the inner walls of the flanges (9) of the posts (1).

3. Metal shelving according to claim 1 or 2, characterized in that the means (17, 19, 21) for hooking the stringers (5) to the posts (1) comprise, on one of the elements to be connected, a slot (17) with an edge (19) inclined to the vertical, and on the other element to be connected, a cut and drawn projection (21), with a first joining portion (21A) being inclined like said edge (19) and a second joining portion (21B) able to stabilize said projection (21).

4. Metal shelving according to claim 3, characterized in that the slot (17) is formed on the post (1) and the projection (21) is formed on the stringer (5).

5. Metal shelving acording to one or more preceding claims, characterized in that the means (11, 13, 15) for connecting the cross members (3) to the posts (1) are so positioned as to form a support for the stringers (5).

6. Metal shelving according to one or more preceding claims, characterized in that said means (11, 13, 15) for connecting the cross members (3) to the posts (5) are provided with an eyelet (11) able to cooperate with an appendix (13, 15), said eyelet (11) and said appendix (13; 15) having respective edges inclined to the vertical which edges, when the cross member (3) is connected to the relevant posts (1), cause a tension on said cross member and a stress in the posts (1).

7. Metal shelving according to claim 6, characterized in that said eyelet (11) is formed on a side surface of the web (7) of the post (1), and the appendix (13; 15) is formed on the end portion of the cross member (3).

8. Metal shelving according to claim 6 or 7, characterized in that for each cross member there are provided two eyelets (11) and two appendixes (13, 15).

9. Metal shelving according to one or more preceding claims, characterized in that the stringers (5) have a box-type structure with an upper longitudinal channel (31) for the engagement of the longitudinal edge (8A) of a shelf (8).

10. Metal shelving according to claim 9, characterized in that said stringer (5) has an intermediate longitudinal surface (37) making up a support for the reinforcing ribs (8B) of the shelf (8).

11. Metal shelving according to one or more preceding claims, characterized in that the stringers (5) have two reinforced edges formed by bending the base sheet which forms, along said edges, angle regions (41, 43) wherein the stringer wall is made up of a triple sheet thickness.

12. Metal shelving according to one or more preceding claims, characterized in that it comprises shelves (8) reinforced by transverse ribs (8B) formed by a bending of the sheet, said bending being open on top to allow for the cleaning of the interior thereof.

13. A stringer for metal shelvings having an upper longitudinal channel (31) for the engagement of the longitudinal edge (8A) of a shelf (8), and an intermediate surface (37) for supporting the transverse ribs (8B) provided for reinforcing said shelf (8).

14. A stringer according to claim 13, characterized in that the intermediate surface (37) is formed in correspondence of the junction of two longitudinal edges (33, 35) of the sheet forming the stringer (5).

Fig. 1

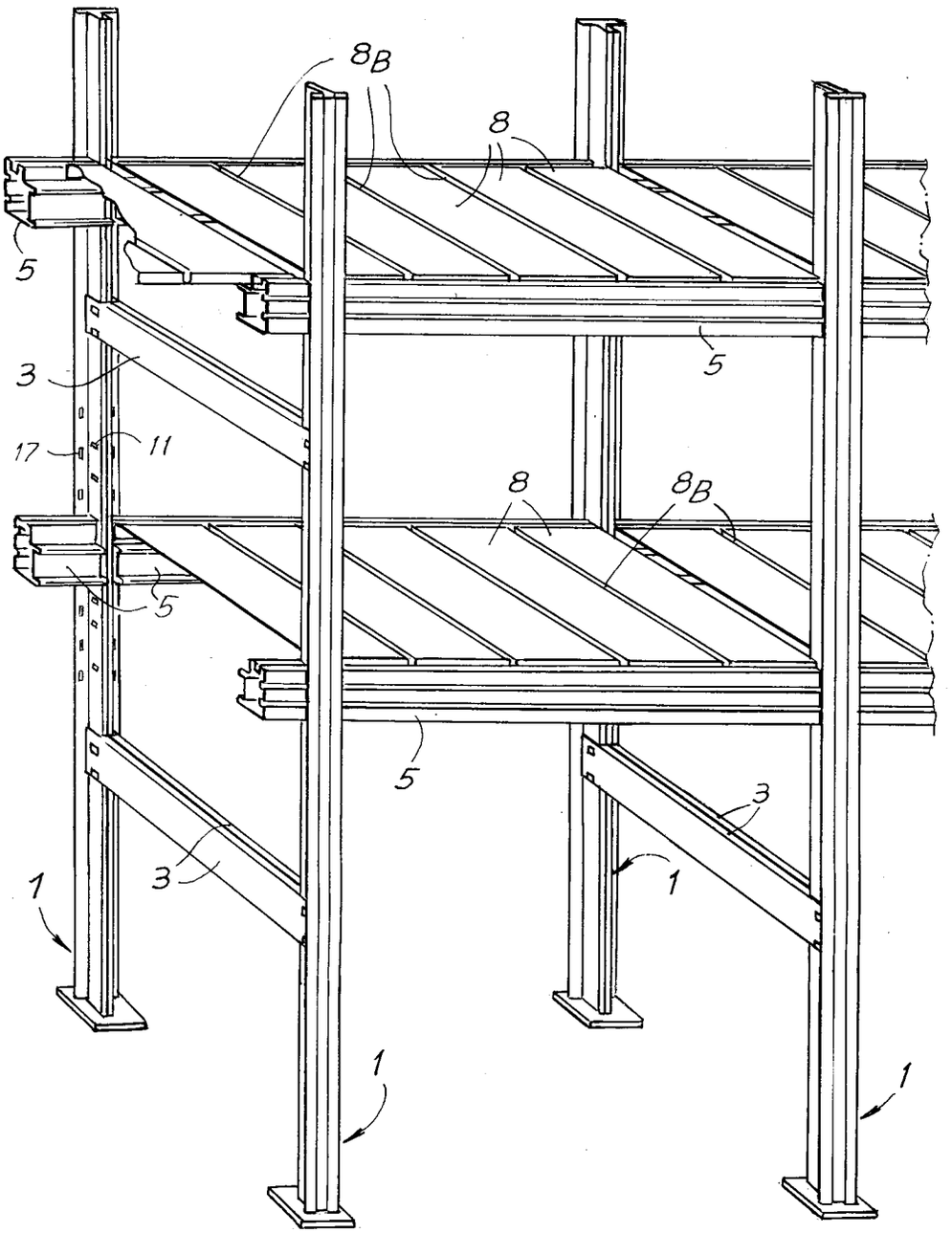


Fig.2

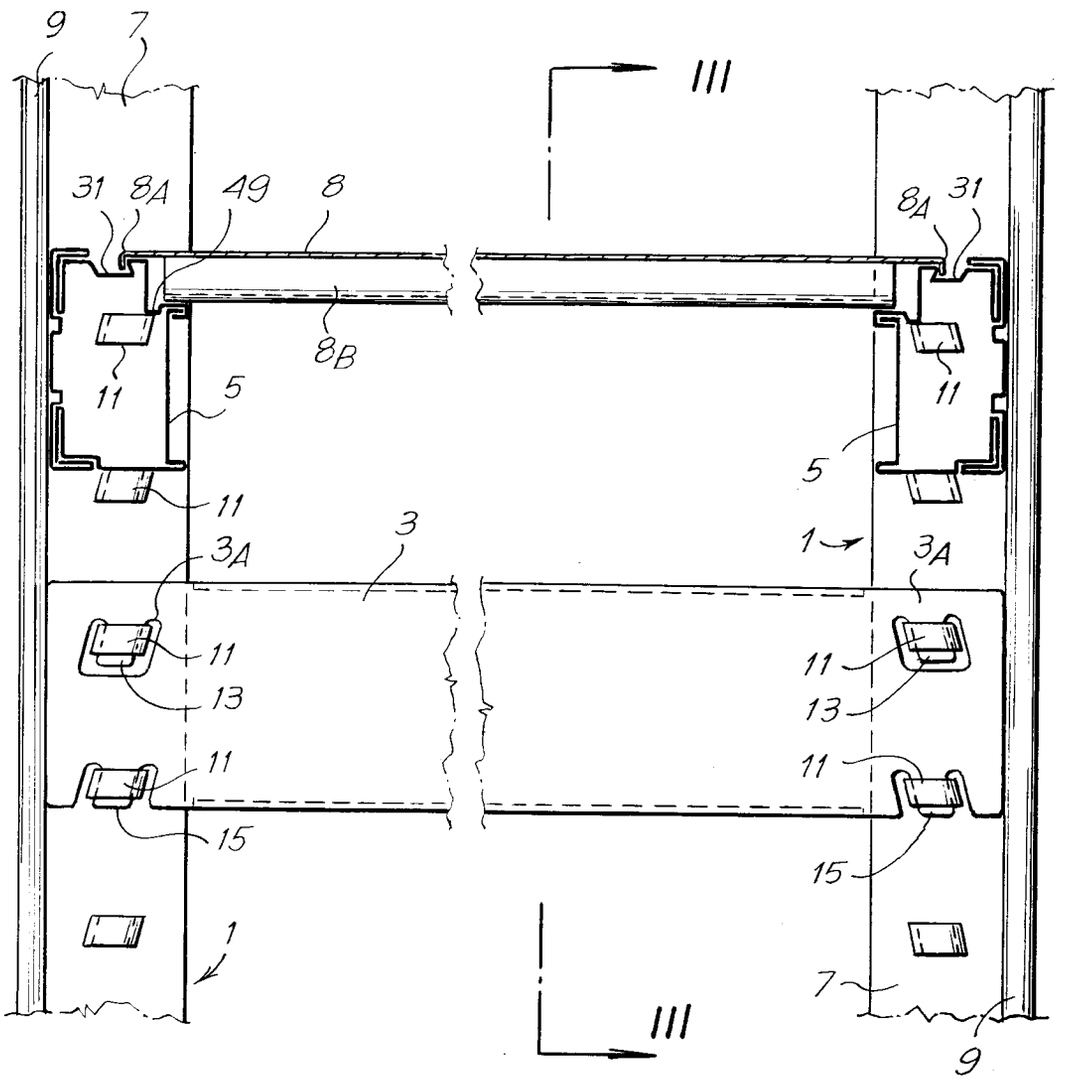

9
7
III
31
8A
49
8
8A
31
8B
11
5
11
5
11
3
1
3A
3A
11
11
13
13
11
11
15
15
1
7
III
9

Fig. 3

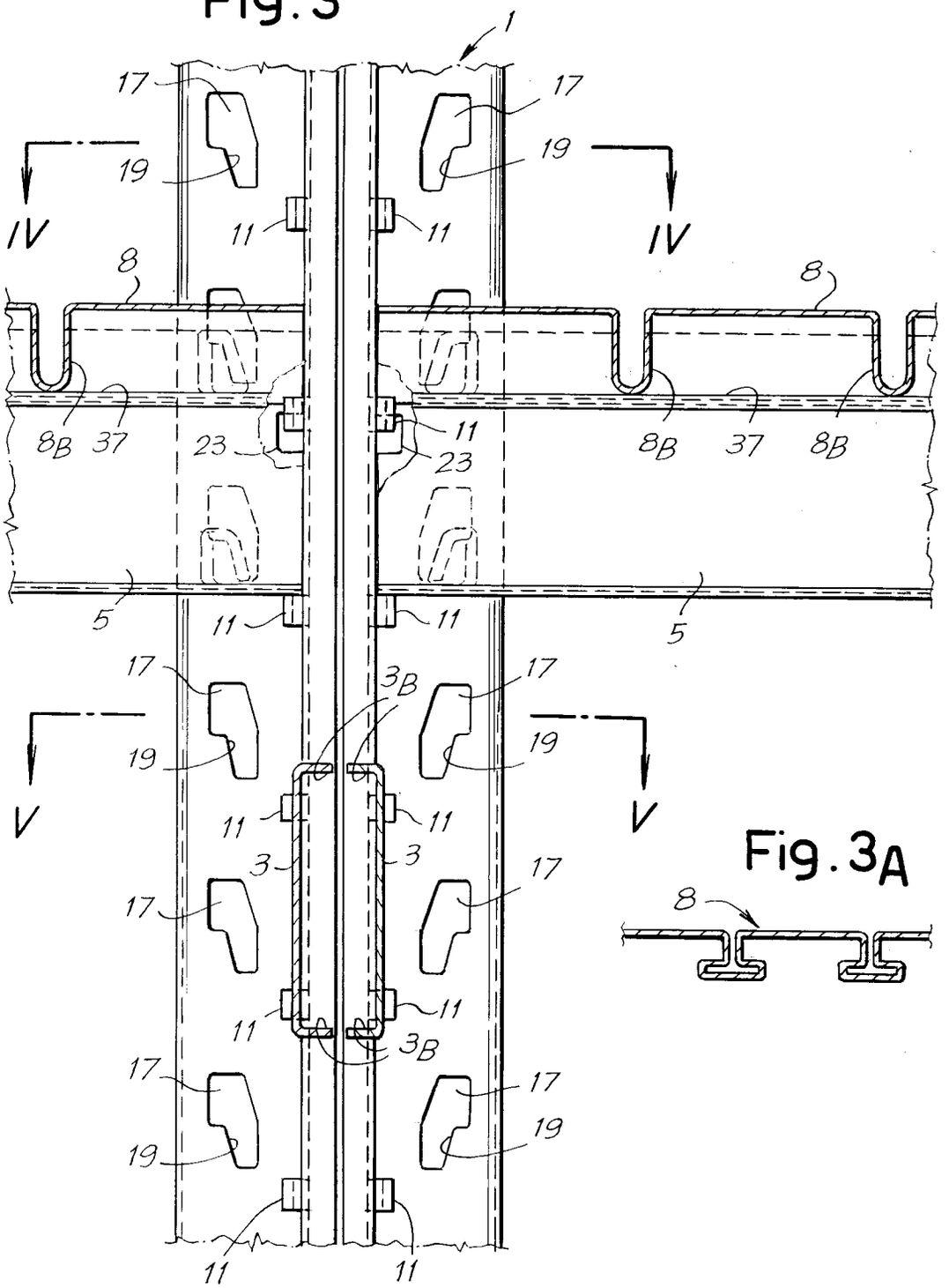
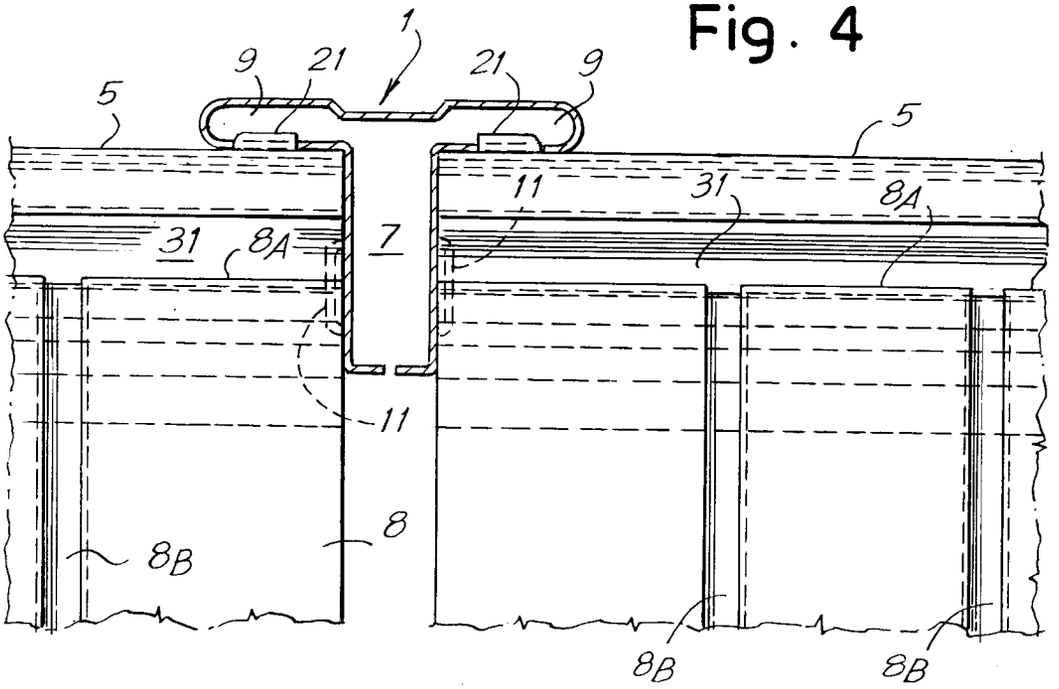


Fig. 3A

Fig. 4


1
9
21
21
9
5
5
11
31
8A
31
8A
7
11
8
8B
8B
8B

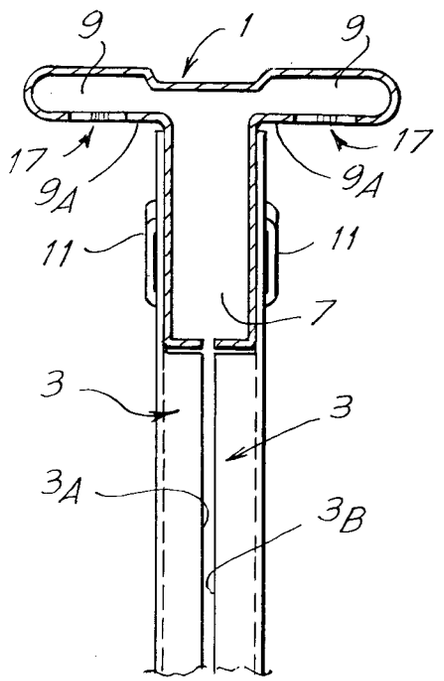

9
1
9
17
17
9A
9A
11
11
7
3
3
3A
3B

Fig. 5

Fig. 7

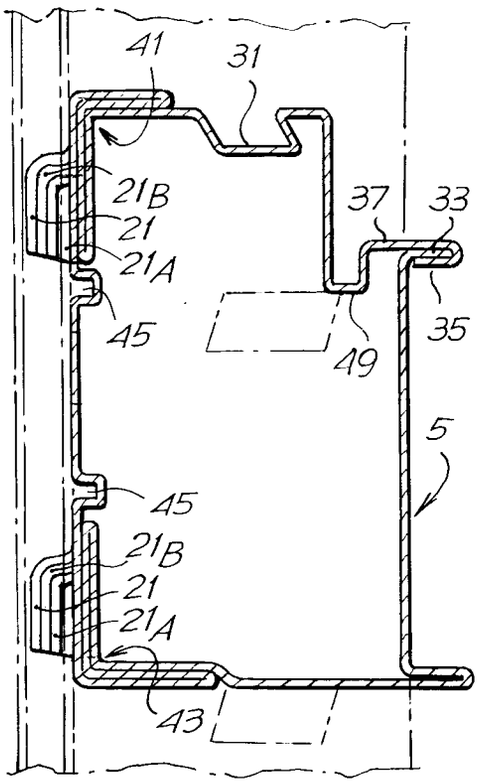
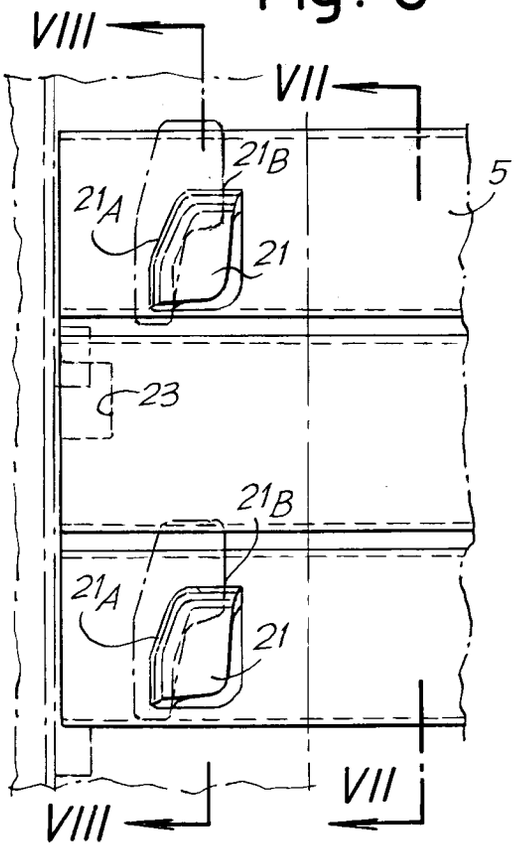


Fig. 6



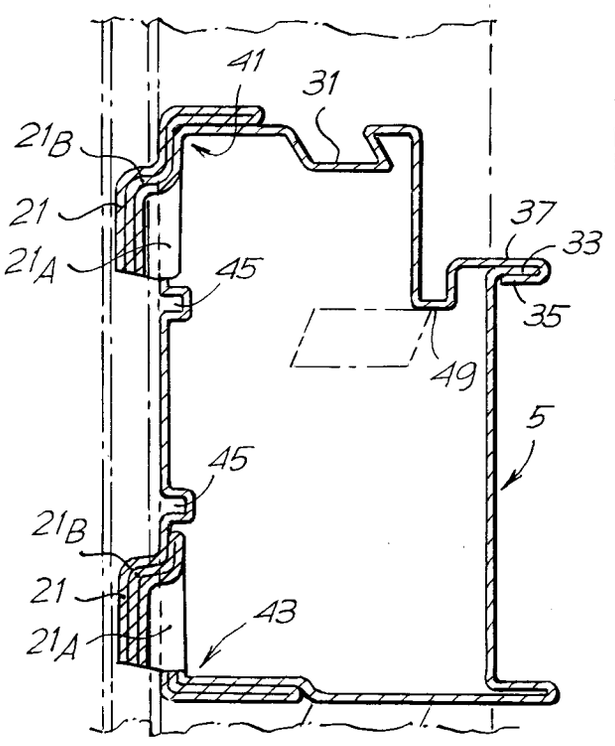


Fig. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0537

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 Y	EP-A-0 044 282 (BIANCHI; RESTELLI) * abstract; figures 4,5 * * page 15, line 21 - page 16, line 6 *	1,2,5 3,4,6,7 9	A47B47/02 A47B57/40
Y	FR-E-96 489 (AUBERT) * figure 1 *	3,4	
Y	DE-A-2 058 479 (AB NORDVERK) * page 3, line 13 - page 5, line 5; figures *	6,7	
A	GB-A-992 227 (SOCIETE BREVETS CREA) * figures 1,2,5 *	8,9	
A	FR-A-2 395 678 (LUISA LOSTAO PUEBLA) * figures 1,2,4 *	1,2,9	
A	US-A-1 340 317 (BORDEN) * figures 10,11 *	12,13	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 MARCH 1992	DE GROOT R.K.

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

EPO FORM 1503 03.82 (P0401)