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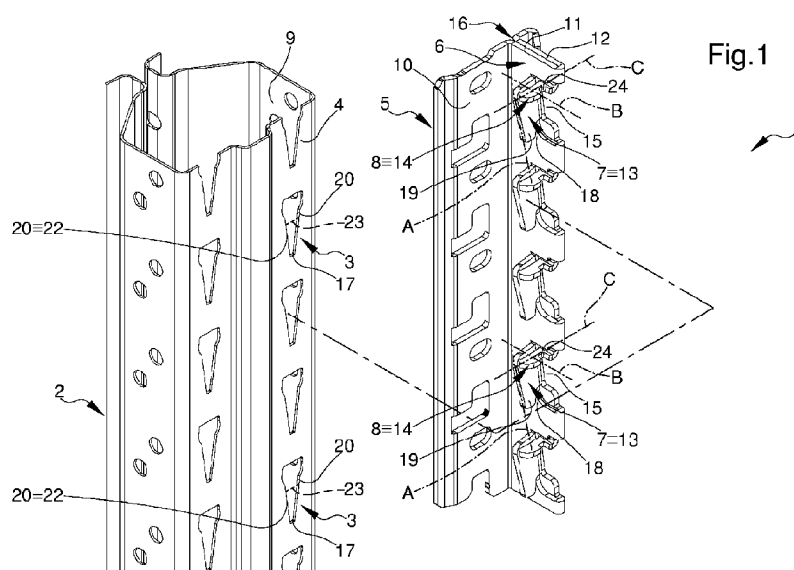
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(54) Title: LOAD-BEARING STRUCTURE FOR SETS OF SHELVES



(57) Abstract: The Load-bearing structure (1) for sets of shelves comprises: - at least one vertical upright (2), provided with at least one longitudinal wall (4) and with at least one fastening opening (3) made along the longitudinal wall (4); - at least one fastening body (5), provided with at least one fastening wall (6) and with at least one fastening portion (7, 8) made cantilevered on the fastening wall (6), insertable inside the fastening opening (3) and movable in a sliding manner inside the latter between a fastening configuration, in which it is coupled to the fastening opening (3), by fastening the vertical upright (2) to the fastening body (5), and at least one free configuration, in which it is uncoupled from the fastening opening (3), freeing the vertical upright (2) from the fastening body (5); wherein the fastening portion (7, 8) comprises a first fastening element (7), which extends along a first direction of extension (A), and a second fastening element (8), which extends along a second direction of extension (B) substantially transverse to the first direction

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of extension (A), the first and the second fastening element (7, 8) being adapted to fasten to the longitudinal wall (4) in the fastening configuration.

LOAD-BEARING STRUCTURE FOR SETS OF SHELVES

Technical Field

The present invention relates to a load-bearing structure for sets of shelves.

Background Art

- 5 Load-bearing structures for sets of shelves are known, which are distinguished by the way they are assembled, the degree of modularity of the structure and the maximum load capacity of the shelves built.

Generally, the structures of known type employ vertical uprights as a supporting base on a stable surface and suitable fastening bodies which are coupleable to
10 such uprights to make suitable supporting structures.

These structures are used both in the home and commercial sectors to preserve, display and/or store various types of products, the volume, weight and size of which can vary considerably depending on the nature of the product itself.

- For this reason, the load-bearing structures of this type do employ fastening
15 systems which are adapted to couple together different types of uprights and of fastening bodies to form a load-bearing structure of the modular type capable of housing different products depending on the users' needs.

Generally, such fastening systems comprise a fastening opening made on the vertical upright and a fastening portion made on the fastening body, insertable
20 in the fastening opening and coupleable thereto to fasten the vertical upright and the fastening body with each other.

The load-bearing structures of this type are susceptible to improvements as far as their stability and strength is concerned.

- In fact, the structural load transmitted between the fastening body and the
25 vertical upright generally comprises at least one longitudinal compression component, which pushes the fastening body longitudinally along the upright body, and a transverse torsion component which tends to rotate the fastening body around the upright body.

However, the first fastening portion employed by this type of load-bearing
30 structures comprises a single fastening element adapted to be inserted inside the fastening opening and arranged in support of the lower edge thereof to which it

is fastened.

Therefore, the transverse torsion component pivots on the fastening element, tending to rotate the latter inside the fastening opening.

Such a rotation may cause deformations of the fastening element and/or rotations of the fastening body around the vertical upright, thus compromising the distribution of the structural load among the components of the load-bearing structure.

This drawback makes the load-bearing structures of the known type unstable and fragile and reduces their maximum tolerable load, thus reducing their sales market.

Description of the Invention

The main aim of the present invention is to devise a load-bearing structure for sets of shelves which allows the stability and strength of the load-bearing structure itself to be improved over those of known type.

A further object of the present invention is to devise a load-bearing structure for sets of shelves which allows coupling the fastening body to the vertical upright so as to maximize the load tolerable by the load-bearing structure.

Another object of the present invention is to devise a load-bearing structure for sets of shelves which allows the longitudinal component and the transverse component of the structural load acting on the load-bearing structure to be distributed correctly.

Another object of the present invention is to devise a load-bearing structure for sets of shelves which allows the mentioned drawbacks of the prior art to be overcome within a simple, rational, easy and effective to use as well as affordable solution.

The aforementioned objects are achieved by the present load-bearing structure for sets of shelves having the characteristics of claim 1.

Brief Description of the Drawings

Other characteristics and advantages of the present invention will become more apparent from the description of a preferred, but not exclusive, embodiment of a load-bearing structure for sets of shelves, illustrated by way of an indicative, yet

non-limiting example, in the accompanying tables of drawings wherein:

Figure 1 is an exploded view of the load-bearing structure for sets of shelves according to the invention;

Figure 2 is an axonometric view of the load-bearing structure for sets of shelves
5 according to the invention;

Figure 3 is a detailed view of some components of the load-bearing structure for sets of shelves according to the invention;

Figure 4 is an axonometric view of another embodiment of the load-bearing structure for sets of shelves according to the invention.

10 Embodiments of the Invention

With particular reference to such figures, reference numeral 1 globally indicates a load-bearing structure for sets of shelves.

The load-bearing structure 1 for sets of shelves comprises:

- at least one vertical upright 2, provided with at least one longitudinal wall 4
15 and with at least one fastening opening 3 made along the longitudinal wall 4;
- at least one fastening body 5, provided with at least one fastening wall 6 and with at least one fastening portion 7, 8 made cantilevered on the fastening wall 6, insertable inside the fastening opening 3 and movable in a sliding
20 manner inside the latter between a fastening configuration, in which it is coupled to the fastening opening 3, by fastening the vertical upright 2 to the fastening body 5, and at least one free configuration, in which it is uncoupled from the fastening opening 3, thus freeing the vertical upright 2 from the fastening body 5.

25 Preferably, the vertical upright 2 is of the type of an upright of known type, arranged, in use, resting on the ground and extending longitudinally vertically.

Furthermore, the vertical upright 2 comprises a plurality of perimeter walls 9 associated continuously with each other to define, together with the longitudinal wall 4, the conformation of the vertical upright 2.

30 Preferably, the longitudinal wall 4 and the fastening wall 6 are of substantially flat conformation.

In this way, the longitudinal wall 4 and the fastening wall 6 are arranged facing substantially parallel to each other in the fastening configuration.

In particular, the longitudinal wall 4 and the fastening wall 6 are arranged in contact with each other in the fastening configuration.

- 5 Advantageously, the longitudinal wall 4 is associated with a perimeter wall 9 to form an angle of 90° between them.

Similarly, the fastening body 5 comprises a lateral wall 10 associated with the fastening wall 6, so as to form an angle of 90° between them.

- Furthermore, the perimeter wall 9 and the lateral wall 10 are of substantially flat
10 conformation. Consequently, the perimeter wall 9 and the lateral wall 10 are arranged facing substantially parallel to each other in the fastening configuration.

In particular, the perimeter wall 9 and the lateral wall 10 are arranged in contact with each other in the fastening configuration, as shown in Figure 2.

- 15 Advantageously, the fastening portion 7, 8 is coupleable by slotting into the fastening opening 3 in a removable manner.

- In addition, further embodiments of the structure 1 cannot be ruled out wherein the vertical upright 2 comprise a plurality of longitudinal walls 4 arranged transversely to each other and each one provided with a plurality of fastening
20 openings 3.

In particular, the fastening portion 7, 8 comprises a first fastening element 7, which extends along a first direction of extension A, and a second fastening element 8, which extends along a second direction of extension B substantially transverse to the first direction of extension A.

- 25 This expedient allows the fastening portion 7, 8 to be fastened inside the fastening opening 3 by means of two fastening elements 7, 8 which extend along two different directions of extension A, B, thus increasing the stability and strength of the fastening configuration and the maximum load tolerated by the structure 1.

- 30 Conveniently, the first and the second fastening elements 7, 8 protrude cantilevered from the fastening wall 6 along a direction of development C

substantially orthogonal to the fastening wall 6 and to the first and the second directions of extension A, B.

In addition, the first and the second directions of extension A, B are arranged substantially parallel to the fastening wall 6.

- 5 In particular, in the fastening configuration, the first and the second fastening elements 7, 8 extend along their respective directions of extension A, B inside the fastening opening 3 to fasten to the longitudinal wall 4 at the point where at least two different fastening points are located.

Preferably, the first and the second fastening elements 7, 8 are arranged
10 adjacent to each other.

Furthermore, the first and the second fastening elements 7, 8 are arranged adjacent to each other to form a predefined separation angle between the first and the second directions of extension A, B.

Advantageously, the fastening wall 6 comprises a first panel and a second panel
15 11, 12, overlapping each other and comprising a first folded portion 13, defining the first fastening element 7, and a second folded portion 14, defining the second fastening element 8, respectively.

Furthermore, the first folded portion 13 defines a passage gap 15 and the second folded portion 14 is arranged through the passage gap 15.

- 20 In particular, the first folded portion 13 defines a passage gap 15 on the first panel 11.

In other words, the first folded portion 13 is made by folding a portion of the first panel 11, on which, in this way, the passage gap 15 is made at the same time.

- 25 Similarly, the second folded portion 14 is made by folding a portion of the second panel 12 at the point where the passage gap 15 is located.

Furthermore, the folding of the second folded portion 14 defines a corresponding passage opening made on the second panel 12 at the point where the passage gap 15 is located.

- 30 In this way, the first and the second folded portions 13, 14 extend cantilevered along the direction of development C from the same side of the fastening wall 6.

The first and the second folded portions 13, 14 have a substantially flat conformation, as shown in Figure 3.

Advantageously, the fastening wall 6 comprises a slab-shaped element 16, folded on itself and defining the first panel and the second panel 11, 12.

- 5 Preferably, the slab-shaped element 16 coincides with the fastening body 5, which is made by means of machining operations, such as e.g. bending and cutting, of an individual slab-shaped element 16.

Conveniently, the vertical upright 2 comprises at least one perimeter edge 17 which delimits at least partly the extension of the fastening opening 3.

- 10 Furthermore, the first fastening element 7 and the fastening wall 6 define a slit 18 inside which the perimeter edge 17 is housed by slotting in the fastening configuration.

This expedient prevents the fastening body 5 from moving along the direction of development C in the fastening configuration.

- 15 Preferably, the perimeter edge 17 defines at least one lower boundary of the fastening opening 3.

In particular, the first fastening element 7 comprises at least one hook-shaped portion 19 extending substantially parallel to the fastening wall 6, to define the slit 18 with the latter.

- 20 The slit 18 is arranged, in the fastening configuration, inside the fastening opening 3 astride of the perimeter edge 17.

In fact, in the fastening configuration, the first fastening element 7 is arranged in support to the perimeter edge 17 from top to bottom.

- Advantageously, the vertical upright 2 comprises at least a lateral margin 20
25 which, at least partly, delimits the extension of the fastening opening 3.

In particular, the lateral margin 20 defines at least one lateral boundary of the fastening opening 3.

- Furthermore, the first fastening element 7 comprises a lateral face 21, arranged substantially transverse to the fastening wall 6 and in contact with the lateral
30 margin 20 in the fastening configuration.

Preferably, the lateral face 21 is arranged in support onto the lateral margin 20.

The vertical upright 2 comprises a pair of lateral edges 22, positioned opposite and converging to each other to define at least one narrowing 23 of the fastening opening 3.

In particular, in the fastening configuration, the second fastening element 8 is
5 positioned by slotting in between the lateral edges 22 at the narrowing 23.

Furthermore, the lateral edges 22 limit the lateral extension of the fastening opening 3 and their distance defines the lateral extension of the fastening opening 3.

Conveniently, the extension of the second fastening element 8 along the second
10 direction of extension B is substantially equal to the extension of the narrowing 23.

Furthermore, the narrowing 23 divides the fastening opening 3 into two aperture stretches arranged one on top of the other, wherein the upper aperture stretch and the lower aperture stretch have a lateral extension which are greater and
15 less, respectively, than the extension of the second fastening element 8 along the second direction of extension B.

Conveniently, the fastening body 5 comprises at least one groove 24 made on the second fastening element 8.

In addition, one of the lateral edges 22 is housed by slotting inside the groove
20 24 in the fastening configuration.

Further embodiments of the structure 1 cannot however be ruled out, wherein the second fastening element 8 is of substantially the same conformation as the first fastening element 7 and comprises a fastening portion defining a similar groove to the groove 24 together with the fastening wall 6.

25 This expedient prevents the fastening body 5 from moving along the direction of development C in the fastening configuration.

Preferably, one of the lateral edges 22 coincides with the lateral margin 20. Furthermore, the lateral edge 22 coinciding with the lateral margin 20 is opposite the lateral edge 22 housed inside the groove 24 in the fastening
30 configuration.

Preferably, the lateral edges 22 have the same inclination and converge with

each other at the bottom.

In addition, the perimeter edge 17 is positioned between the lateral edges 22, by joining them and defining with the latter at least partly the conformation of the fastening opening 3.

- 5 Further embodiments of the structure 1 cannot however be ruled out wherein the lateral edge 22, housed inside the groove 24 in the fastening configuration, coincides with the perimeter edge 17.

Advantageously, in the fastening configuration, the second fastening element 8 is arranged substantially horizontally.

- 10 Similarly, in this configuration, the second direction of extension B is substantially horizontal.

In this way, the second fastening element 8 counteracts the transverse torsion component of any structural load operating on the structure 1. Consequently, the second fastening element 8 counteracts the rotation of the fastening body 5
15 around the vertical upright 2.

Furthermore, in the fastening configuration, the first fastening element 7 extends along a first direction of extension A having an inclination substantially equal to the inclination of a lateral edge 22.

This expedient, in combination with the arrangement of the second fastening
20 element 8 in the fastening configuration, helps to counteract the transverse torsion component of any structural load operating on the structure 1.

Preferably, the first and the second fastening elements 7, 8 comprise an abutment side 25, respectively, which extends longitudinally along the direction of development C.

- 25 In particular, the abutment sides 25 are arranged side by side stopping against each other.

Furthermore, the abutment side 25 of the first fastening element 7 is arranged substantially opposite the slit 18 and the abutment side 25 of the second fastening element 8 is arranged substantially opposite the groove 24.

- 30 Conveniently, the fastening opening 3 has a substantially triangular conformation, preferably of an isosceles triangle.

Furthermore, the fastening opening 3 has an inverted triangle conformation, wherein the lateral edges 22 are arranged inferiorly to the base of the triangle, as shown in Figure 1.

Conveniently, the vertical upright 2 comprises a plurality of fastening openings 3 spaced apart from each other by a predefined distance. In particular, the fastening openings 3 are arranged aligned with each other vertically along the body of the vertical upright 2.

Furthermore, the fastening body 5 comprises a plurality of fastening portions 7, 8 spaced apart by a distance substantially equal to the predefined distance.

In particular, the fastening portions 7, 8 are arranged aligned with each other along the fastening wall 6.

In more detail, in the fastening configuration, the fastening portions 7, 8 are arranged vertically aligned with each other.

Conveniently, the structure 1 comprises a transverse element 26, associated with the fastening body 5 and arranged, in the fastening configuration, substantially transverse to the vertical upright 2.

Preferably, the transverse element 26 is made in a single body piece with the fastening body 5.

Furthermore, in the fastening configuration, the transverse element 26 is arranged orthogonal to the vertical upright 2.

Advantageously, the structure 1 comprises a pair of fastening bodies 5 associated opposite each other with the transverse element 26 to define at least one transverse body 27.

In addition, each of the fastening bodies 5 is coupled to a respective vertical upright 2.

In this way, the transverse element 26 is placed between two vertical uprights 2, as shown in Figure 4.

Conveniently, the structure 1 comprises a plurality of transverse bodies 27 and a plurality of vertical uprights 2.

Consequently, a plurality of vertical uprights 2 and of transverse bodies 27 are coupled to each other to make a structure 1 of the modular type, e.g. comprising

four vertical uprights 2, arranged to form the legs of a set of shelves and coupled to each other by the interposition of four transverse bodies 27, wherein each transverse body 27 is placed between two different vertical uprights 2.

It has in practice been ascertained that the described invention achieves the
5 intended objects.

In particular, the fact is emphasized that the first and the second fastening elements allow the fastening portion to be fastened to the fastening opening at two different fastening points, thus improving the stability and strength of the same load-bearing structure with respect to those of known type.

10 These fastening elements also make it possible to maximize the load tolerated by the load-bearing structure.

In addition, the arrangement of the fastening elements along their respective directions of extension allows for the correct distribution of both the longitudinal and transverse components that make up the load exerted on the
15 load-bearing structure.

CLAIMS

- 1) Load-bearing structure (1) for sets of shelves, comprising:
- at least one vertical upright (2), provided with at least one longitudinal wall (4) and with at least one fastening opening (3) made along said longitudinal wall (4);
 - at least one fastening body (5), provided with at least one fastening wall (6) and with at least one fastening portion (7, 8) made cantilevered on said fastening wall (6), insertable inside said fastening opening (3) and movable in a sliding manner inside the latter between a fastening configuration, in which it is coupled to said fastening opening (3), by fastening said vertical upright (2) to said fastening body (5), and at least one free configuration, in which it is uncoupled from said fastening opening (3), freeing said vertical upright (2) from said fastening body (5);
- characterized by the fact that said fastening portion (7, 8) comprises a first fastening element (7), which extends along a first direction of extension (A), and a second fastening element (8), which extends along a second direction of extension (B) substantially transverse to said first direction of extension (A), said first and said second fastening element (7, 8) being adapted to fasten to said longitudinal wall (4) in said fastening configuration.
- 2) Structure (1) according to claim 1, characterized by the fact that said fastening wall (6) comprises a first panel and a second panel (11, 12) overlapping each other and comprising a first folded portion (13), defining said first fastening element (7), and a second folded portion (14), defining said second fastening element (8), respectively.
- 3) Structure (1) according to one or more of the preceding claims, characterized by the fact that said first folded portion (13) defines a passage gap (15) and said second folded portion is arranged through said passage gap (15).
- 4) Structure (1) according to one or more of the preceding claims, characterized by the fact that said fastening wall (6) comprises a slab-shaped element (16), folded on itself and defining said first panel and said second panel (11, 12).
- 5) Structure (1) according to one or more of the preceding claims, characterized

by the fact that:

- said vertical upright (2) comprises at least one perimeter edge (17) which delimits at least partly the extension of the fastening opening (3);
- said first fastening element (7) and said fastening wall (6) define a slit (18)
- 5 inside which said perimeter edge (17) is housed by slotting in said fastening configuration.

6) Structure (1) according to one or more of the preceding claims, characterized by the fact that:

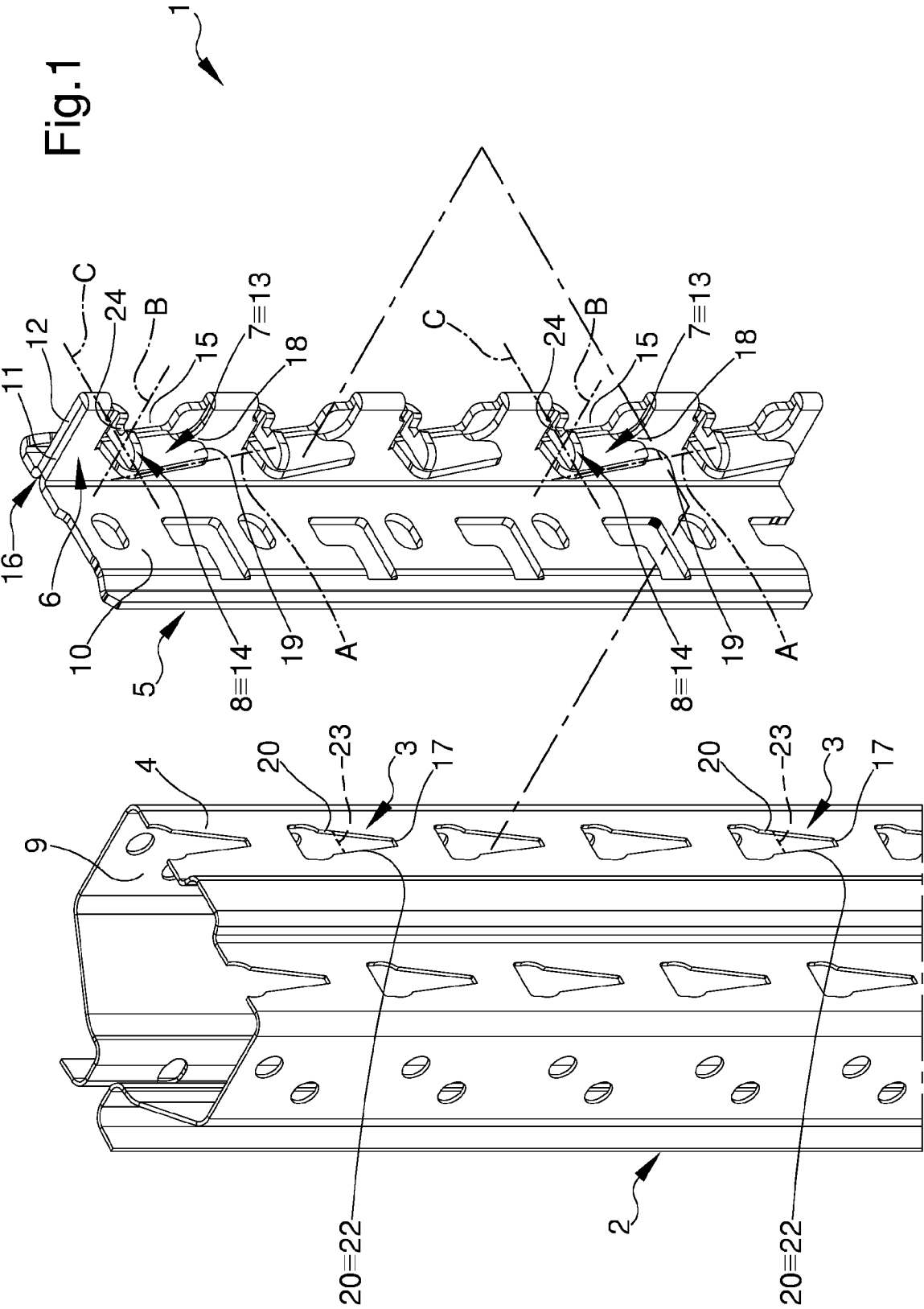
- said vertical upright (2) comprises a pair of lateral edges (22), placed
- 10 opposite and converging to each other to define at least one narrowing (23) of said fastening opening (3);
- said second fastening element (8), in said fastening configuration, is positioned by slotting in between said lateral edges (22) at said narrowing (23).

- 15 7) Structure (1) according to one or more of the preceding claims, characterized by the fact that said fastening body (5) comprises at least one groove (24) made on said second fastening element (8), one of said lateral edges (22) being housed by slotting inside said groove (24) in said fastening configuration.

- 8) Structure (1) according to one or more of the preceding claims, characterized
- 20 by the fact that it comprises at least one transverse element (26), associated with said fastening body (5) and arranged, in said fastening configuration, substantially transverse to said vertical upright (2).

- 9) Structure (1) according to one or more of the preceding claims, characterized by the fact that it comprises a pair of fastening bodies (5), associated opposite
- 25 each other with said transverse element (26) to define at least one transverse body (27) and by the fact that each of said fastening bodies (5) is coupled to a respective vertical upright (2).

- 10) Structure (1) according to one or more of the preceding claims, characterized by the fact that it comprises a plurality of said transverse bodies
- 30 (27) and a plurality of vertical uprights (2).



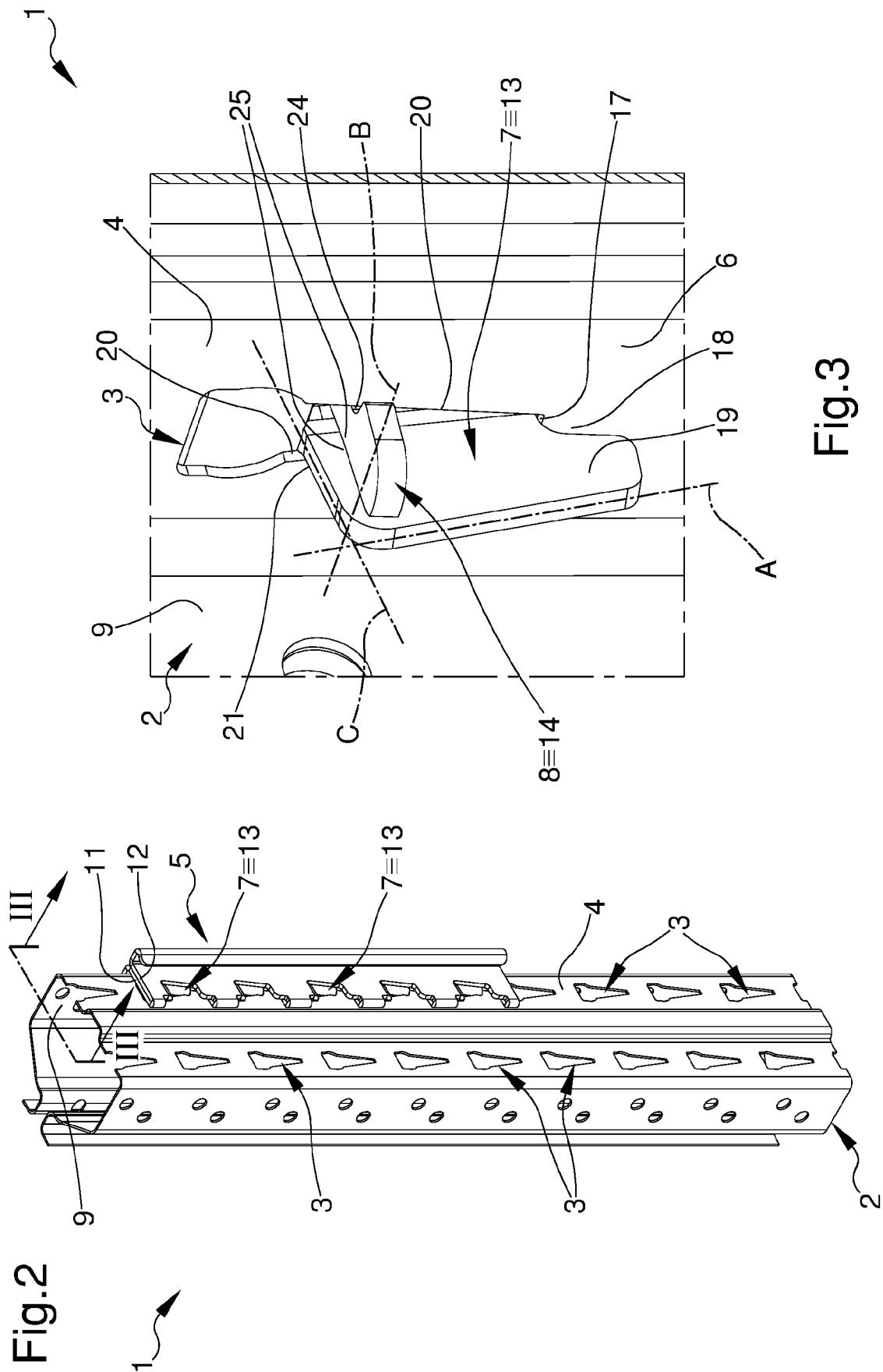


Fig. 3

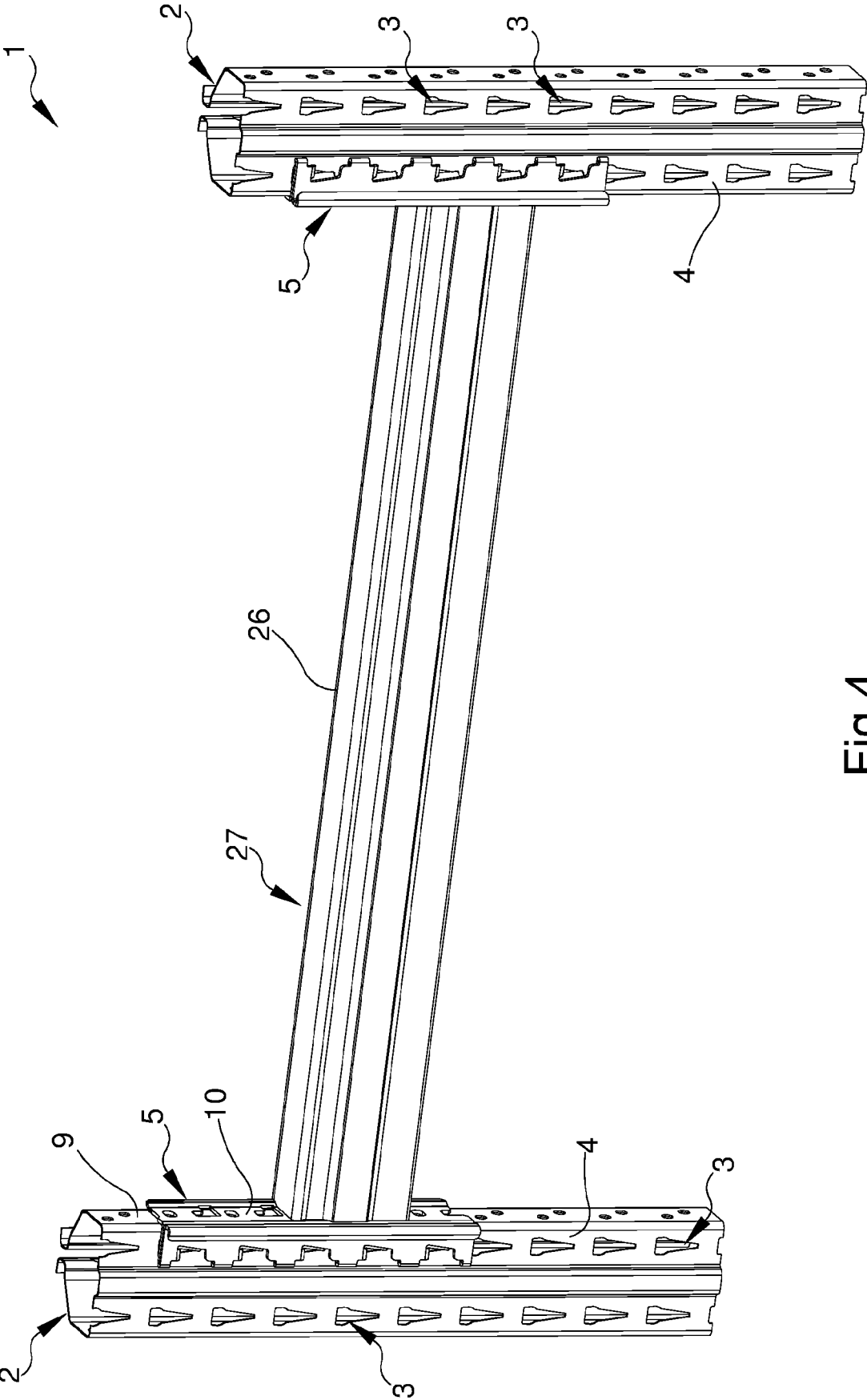


Fig.4

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER

INV. A47B57/40
ADD. A47B57/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	EP 0 664 094 A1 (ROSSS DEI FRATELLI BETTINI S N [IT]) 26 July 1995 (1995-07-26) figures 11-14 -----	1, 2, 5, 6, 8
X	EP 1 854 375 B1 (BITTMANN BITO LAGERTECH [DE]) 9 December 2009 (2009-12-09) paragraph [0012] - paragraph [0016]; figures 1, 2 -----	1, 2, 4, 5, 8-10
X	US 3 697 034 A (SHELL IRVING W) 10 October 1972 (1972-10-10) column 2, line 25 - line 60; figures 1-3b -----	1, 2, 4, 5, 8-10

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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