



(11) **EP 2 335 524 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
08.01.2014 Bulletin 2014/02

(51) Int Cl.:
A47B 47/04 (2006.01) A47B 87/02 (2006.01)

(21) Application number: **10015586.0**

(22) Date of filing: **14.12.2010**

(54) **Modular shelving**

Modulares Regal

Rayonnage modulaire

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **14.12.2009 IT MI20092184**

(43) Date of publication of application:
22.06.2011 Bulletin 2011/25

(73) Proprietor: **Fiam Italia S.p.A.
61010 TAVULLIA (PU) (IT)**

(72) Inventor: **Livi, Vittorio
61010 TAVULLIA (PU) (IT)**

(74) Representative: **Checacci, Giorgio
Porta, Checacci & Associati S.p.A.
Via Trebbia 20
20135 Milano (IT)**

(56) References cited:
**DE-C- 565 347 DE-U1-202007 004 807
DE-U1-202007 017 348**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention refers to a modular shelving.

[0002] In the field of furnishing, especially in high quality furnishing in which a lot of importance is given to the design, there is the need to hide all those elements which are essential for the stability of the structure but which can disturb its appearance. In shelvings, in particular, the attachment system of the uprights to the shelves is critical. Sometimes, it receives special attention from designers and is thus made so as to be not only clearly visible, but it is even given extra emphasis in the overall appearance impact of the shelving; other times, on the other hand, it is simply made so as to be invisible or in any case little visible.

[0003] One very particular case is that of glass or crystal furnishing. Due to its aesthetic qualities, glass is very popular in furnishing and in particular in bookshelves. However, the mechanical characteristics of this material make it impossible to only use glass to make these furnishings. Normally, therefore, a load-bearing structure is used, possibly modular, made from wood, metal or other suitable material, on which the glass shelves are fixed or rested. In solutions of this type, optimal from the structure solidity point of view, the elements that are not made from glass are however clearly visible; for appearance reasons, on the other hand, it would be desirable to have a structure in which such elements have the least visible impact possible.

[0004] Many systems for modular shelving are known. E.g., DE 202007017348 U1 discloses a system that makes use of vertical supports that are fixed to horizontal shelves by means of expandable elements; these elements are inserted in channels formed in the supports and through holes formed in the shelves. Vertical supports and expandable elements are thus to be made from metal, or anyway from a material other than glass, and are therefore very visible.

[0005] There is thus the problem of making a shelving made from glass in which the elements not made from glass are few in number and are hidden from sight, in which at the same time an excellent structural solidity is ensured and good flexibility that characterises modular shelving is maintained.

[0006] Consequently, the present invention concerns a modular shelving according to claim 1. Preferred characteristics are indicated in the dependent claims. In particular, the modular shelving according to the invention comprises

- at least two shelves, arranged horizontally;
- at least two uprights, arranged vertically between said two shelves; and
- an attachment system between said uprights and said shelves,

and is characterised in that said attachment system com-

prises

- at least one fastening element fixed to each of said uprights
- 5 - a major horizontal profile, stably fixed (preferably glued) to each of said shelves, said major profile comprising at least one grooved guide suitable for partially housing said at least one fastening element, and
- 10 - a vertical minor profile stably fixed (preferably glued) to each of said uprights and fixed to said fastening elements.

[0007] The minor profile, fixedly connected to the upright, structurally connects the fastening elements for the upper shelf and for the lower shelf, improving the structural strength.

[0008] In this way, the shelving has a modular structure, with a number of shelves that can vary according to the height of the shelving, and a number of uprights that can also vary, according to the width. The grooved guide allows a rapid assembly and ensures extreme freedom in positioning the uprights, which can be arranged according to the preferred configuration in any position along the shelves without jeopardising the solidity of the structure. Moreover, the attachment system is not very bulky and is thus not very visible.

[0009] Preferably said fastening element comprises a plate and a pin substantially perpendicular to the plate; the grooved guide is suitable for housing the plate, and the minor profile comprises a hole in which the pin is inserted. In such a way the simplicity of the assembly process is ensured. Moreover, the uprights can be rotated around the pin of the fastening element, according to the desired aesthetic effect.

[0010] Preferably, said major profile is fixed to a rear edge of said shelf; preferably, said minor profile is fixed to a rear edge of said upright. In both cases, the profile is less visible thanks to its position, behind the shelf and the upright, respectively.

[0011] Preferably, each of said uprights is provided with at least one contact block against each of said shelves, said contact block being of relatively soft material having high friction against the shelf. Thanks to these characteristics, the contact block ensures the stability of the coupling between the upright and the shelf, i.e. the absence of accidental reciprocal movements, even if the attachment between them occurs only in the rear area.

[0012] Preferably, the major profile comprises two grooved guides, parallel and superimposed one another, one facing upwards and the other facing downwards. One same profile thus allows the attachment of the shelf both to an upright on top and to an upright below it, simplifying the assembly of the shelving.

[0013] Preferably, the uprights and/or the shelves are made from glass or another transparent material. The best aesthetic effect ensured by this material is not disturbed by the attachment system according to the inven-

tion.

[0014] Preferably, the glass uprights are curved or bent. In such a way a better stability and solidity of the structure is ensured.

[0015] Further characteristics and advantages of a shelving according to the invention shall become clearer from the following description of a preferred embodiment, given with reference to the attached drawings, In such drawings:

- fig. 1 is an overall view of a modular shelving according to the invention;
- fig. 2 is an enlarged view of a detail of two shelves with an upright placed between them;
- fig. 3 is a partial exploded view of the detail of fig. 2, also with two mounting tools;
- fig. 4 is a further enlarged view of a detail of fig. 3;
- fig. 5 is a view like that of fig. 4, during an assembly step of the shelving;
- figs. 6 and 7 show two different shelving configurations according to the invention.

[0016] With reference to the figures, and in particular to figure 1, a modular shelving according to an embodiment of the invention is wholly indicated with reference numeral 10. The shelving 10 comprises some shelves 20 arranged horizontally and some uprights 30 arranged vertically, more precisely five shelves 20 and eight uprights 30 in the illustrated configuration; it must be clear however, that the shelving according to the invention is modular and that therefore the configuration shown is only one of the infinite configurations possible. Each of the uprights 30 is arranged between two of the shelves 20.

[0017] Both the shelves 20 and the uprights 30 are made from glass. More in particular, the shelves 20 are formed with slabs of flat glass, whereas the uprights 30 are formed with slabs of bent glass, with two vertical bends 38 and 39, facing opposite directions from one another so as to give the upright 30 an S-shape, when seen in plan view.

[0018] Each of the shelves 20, at a rear edge, is fixed to a major horizontal profile 21, which comprises two grooved guides 22 and 23, parallel and superimposed one another, one facing upwards and the other facing downwards. The major profile 21 is made from metal, for example extruded aluminium alloy, and is stably fixed to the shelf 20 through suitable gluing.

[0019] Each of the uprights 30, at a rear edge, is fixed to a vertical minor profile 31, which comprises two vertical holes 32 and 33, aligned vertically with one another; preferably, the two holes 32 and 33 can be formed as end portions of a single hole, formed from side to side along the minor profile 31, in a vertical direction. The minor profile 31 is made from metal, for example extruded aluminium alloy, and is stably fixed to the upright 30 through suitable gluing.

[0020] The shelving 10 also comprises fastening ele-

ments 40, each comprising a plate 41, for example rectangular, and a pin 42 substantially perpendicular to the plate 41, in a central position on the plate 41.

[0021] The plate 41 is sized so as to be able to be inserted and slide in the grooved guides 22 and 23 of the major profiles 21; the pin 42 is sized so as to be able to be inserted and rotate in the holes 32 and 33 of the minor profiles 31. The grooved guides 22 and 23 are C-shaped, so as to be able to house and vertically hold the plates 41, letting them slide longitudinally and leaving space for the pins 42. Two threaded holes 34 and 35 are formed on the sides of the holes 32 and 33 so as to house respective dowels 36 and 37 for attaching the pins 42 into the holes 32 and 33.

[0022] Therefore, the profiles 31 and 41 and the fastening elements 40 form an attachment system between the uprights 30 and the shelves 20.

[0023] Each of the uprights 30 also comprises plugs 50 for making contact against the shelves 20. The plugs 60 are fixed to the uprights 30 at the upper and lower edges thereof, in a number that is suitable according to the horizontal extension of the uprights 30; in the configuration shown in the drawings, three plugs 50 are provided between each upright 30 and each shelf 20. The plugs 50 are made from relatively soft material having high friction against the shelf 20; for example and preferably, such a material is an elastomer, possibly transparent, like a silicone rubber.

[0024] Finally, the shelf 20 placed in a lower position with respect to the configuration of the shelving 10 is provided with feet 60, glued on the lower face of the shelf itself, to rest on the ground.

[0025] Of course, since it is a modular structure, the configuration can be not only that of the shelving 10 of fig. 1, but also any other, such as for example that of the shelving 10' of fig. 6 or that of the shelving 10" of fig. 7; in such figures, the same reference numerals have been used as for the shelving 10 of fig. 1, since they are elements which are individually the same. It should be noted that the shelving 10' has uprights 30 with directions that are different from one another, and that the shelving 10" has uprights 30 which are partially offset.

[0026] The installation of a shelving 10 according to the invention typically comprises a step of assembly in the factory and one of assembly on site.

[0027] The factory assembly provides for the gluing of the profiles 21 and 31 respectively to the shelves 20 and to the uprights 30; the feet 60 are also glued to the shelf or to the shelves 20 intended to be in the lower position of a shelving configuration 10.

[0028] The assembly on site firstly provides that the lower shelf 20 is positioned on the ground. Then, the plate 41 of a fastening element 40 is inserted in its upper grooved guide 22, and an upright 30 is positioned so that its hole 33 houses the pin 42 of the fastening element 40; the dowel 37 is tightened (through the wrench K) thus locking the upright 30 on the fastening element 40. Analogously, the plate 41 of another fastening element 40 is

then inserted in the grooved guide 22, and another upright 30 is positioned so that its hole 33 houses the pin 42 of the fastening element 40; the dowel 37 is tightened (through the wrench K) thus locking the second upright 30 on the fastening element 40. The shape of the uprights 30 with the two S-shaped bends helps its vertical positioning in this step.

[0029] At this point, two further fastening elements 40 are arranged inserted with the respective plates 41 in the lower grooved guide 23 of a second shelf 20. This shelf 20 is then rested on the two previously assembled uprights 30, making the pins 42 insert into the holes 32 and then locking them tightening the respective dowels 36.

[0030] Then analogously, further uprights 30 and further shelves 20 are mounted, until the desired shelving configuration 10 is obtained.

[0031] During the assembly steps just described, the uprights 30 are vertical, with their rear part fixedly connected to the shelves 20 by means of the fastening elements 40. The angular position of the uprights 30 around the pins 42 can be chosen freely, according to the desired configuration of the shelving 10; in the configuration shown, the uprights 30 substantially face forwards, but it is also possible for them to be oriented more sideways.

[0032] Once the shelves 20 and the uprights 30 have been mounted, the reciprocal position is also maintained by their weight, with together with the plugs 50 prevents any horizontal movement. Possible vertical movements, due for example to accidental bumps, are, on the other hand, prevented both by the plates 41 inserted in the grooved guides 22 and 23 without the possibility of coming out, and by the dowels 36 and 37, which lock the pins 42 in the holes 32 and 33.

[0033] The shape of the uprights 30 with the bends 38 and 39 is also important to make the shelving 10 solid with respect to horizontal movements of one shelf 20 with respect to another; this makes it possible to not use diagonal tie-rods.

[0034] Once assembled, the configuration of the shelving 10 can also be easily modified, within certain limits.

[0035] For example, it is possible to move some or all the uprights 30 horizontally, making the plates 41 slide in the grooved guides 22 and 23. The new position reached is maintained by the combined action of friction of the plugs 50 and of the weight of the shelves 20 and uprights 30.

[0036] It is also possible to vary the orientation of the uprights 30 around the pins 42. For such a purpose, it is sufficient to loosen the dowels 36 and 37, make the uprights 30 rotate around the pins 42 to the new configuration, and finally lock the dowels 36 and 37 again.

[0037] Various modifications can be made to the shelving 10, without for this reason departing from the invention defined by the following claims. For example, the shape of the uprights can have a single bend (defining a V-shape) or more than two bends, or even have a more complex shape, for example T-shaped or H-shaped.

Claims

1. Modular shelving (10) comprising

- at least two shelves (20), arranged horizontally;
- at least two uprights (30), arranged vertically between said two shelves (20); and
- an attachment system (40, 31, 21) between said uprights (30) and said shelves (20),

characterised in that said attachment system comprises

- at least one fastening element (40) fixed to each of said uprights;
- a major horizontal profile (21), stably fixed to each of said shelves (20), said major profile comprising at least one grooved guide (22, 23) suitable for partially housing said at least one fastening element (40);
- a vertical minor profile (31), stably fixed to each of said uprights (30) and suitable for partially housing said at least one fastening element (40).

2. Modular shelving according to claim 1, wherein said fastening element (40) comprises a plate (41) and a pin (42) substantially perpendicular to the plate (41), in which said grooved guide (22, 23) is suitable for housing said plate (41) and in which said minor profile (31) comprises a hole (32, 33) in which said pin (42) is inserted.

3. Modular shelving according to claim 1, wherein said major profile (21) is fixed to a rear edge of said shelf (20).

4. Modular shelving according to claim 1, wherein said minor profile (31) is fixed to a rear edge of said upright (30).

5. Modular shelving according to any one of the previous claims, wherein each of said uprights (30) is provided with at least one contact block (50) against each of said shelves (20), said contact block (50) being of relatively soft material having high friction against the shelf (20).

6. Modular shelving according to claim 1, wherein said major profile (21) comprises two grooved guides (22, 23), parallel and superimposed one another, one facing upwards and the other facing downwards.

7. Modular shelving according to any one of the previous claims, wherein said uprights (30) and/or said shelves (20) are made from glass or another transparent material.

8. Modular shelving according to claim 7, wherein said

uprights (30) are curved or bent.

wobei die eine nach oben und die andere nach unten weist.

Patentansprüche

1. Modulares Regal (10) mit

- wenigstens zwei Ablageplatten (20), die waagerecht angeordnet sind,
- wenigstens zwei Ständern (30), die senkrecht zwischen den beiden Ablageplatten (20) angeordnet sind, und
- einem Befestigungssystem (40, 31, 21) zwischen den Ständern (30) und den Ablageplatten (20),

dadurch gekennzeichnet, dass das Befestigungssystem Folgendes umfasst:

- wenigstens ein Befestigungselement (40), das jeweils an den Ständern angebracht ist,
- ein waagerechtes Hauptprofil (21), das stabil an jeder der Ablageplatten (20) angebracht ist, wobei das Hauptprofil wenigstens eine genutete Führung (22, 23) umfasst, die zur teilweisen Aufnahme des wenigstens einen Befestigungselements (40) geeignet ist,
- ein senkrechtcs Nebenprofil (31), das stabil an jedem der Ständer (30) angebracht und zur teilweisen Aufnahme des wenigstens einen Befestigungselements (40) geeignet ist.

2. Modulares Regal nach Anspruch 1, bei dem das Befestigungselement (40) eine Platte (41) und einen zu der Platte (41) im Wesentlichen senkrechten Stift (42) umfasst, wobei die genutete Führung (22, 23) zur Aufnahme der Platte (41) geeignet ist und wobei das Nebenprofil (31) eine Bohrung (32, 33) umfasst, in die der Stift (42) eingeführt ist.

3. Modulares Regal nach Anspruch 1, bei dem das Hauptprofil (21) an einem hinteren Rand der Ablageplatte (20) angebracht ist.

4. Modulares Regal nach Anspruch 1, bei dem das Nebenprofil (31) an einem hinteren Rand des Ständers (30) angebracht ist.

5. Modulares Regal nach einem der vorherigen Ansprüche, bei dem jeder der Ständer (30) mit wenigstens einem Kontaktstück (50) in Anlage an jeder der Ablageplatten (20) versehen ist, wobei das Kontaktstück (50) aus einem relativ weichen Material mit hoher Reibung an der Ablageplatte (20) besteht.

6. Modulares Regal nach Anspruch 1, bei dem das Hauptprofil (21) zwei parallele und übereinander angeordnete, genutete Führungen (22, 23) umfasst,

7. Modulares Regal nach einem der vorherigen Ansprüche, bei dem die Ständer (30) und/oder die Ablageplatten (20) aus Glas oder einem anderen transparenten Material bestehen.

8. Modulares Regal nach Anspruch 7, bei dem die Ständer (30) gekrümmt oder gebogen sind.

Revendications

1. Rayonnage modulaire (10) comprenant

- au moins deux tablettes (20), disposées horizontalement,
- au moins deux montants (30), disposés verticalement entre lesdites deux tablettes (20), et
- un système de fixation (40, 31, 21) entre lesdits montants (30) et lesdites tablettes (20),

caractérisé en ce que ledit système de fixation comprend

- au moins un élément de fixation (40) fixé à chacun desdits montants,
- un profil horizontal principal (21), fixé de manière stable à chacune desdites tablettes (20), ledit profil principal comprenant au moins un guide rainuré (22, 23) approprié pour recevoir partiellement ledit au moins un élément de fixation (40),
- un profil secondaire vertical (31), fixé de manière stable à chacun desdits montants (30) et approprié pour recevoir partiellement ledit au moins un élément de fixation (40).

2. Rayonnage modulaire selon la revendication 1, dans lequel ledit élément de fixation (40) comprend une plaque (41) et une broche (42) sensiblement perpendiculaire à la plaque (41), dans lequel ledit guide rainuré (22, 23) est approprié pour recevoir ladite plaque (41) et dans lequel ledit profil secondaire (31) comprend un trou (32, 33) dans lequel ladite broche (42) est insérée.

3. Rayonnage modulaire selon la revendication 1, dans lequel ledit profil principal (21) est fixé à un bord arrière de ladite tablette (20).

4. Rayonnage modulaire selon la revendication 1, dans lequel ledit profil secondaire (31) est fixé à un bord arrière dudit montant (30).

5. Rayonnage modulaire selon l'une quelconque des revendications précédentes, dans lequel chacun

desdits montants (30) est doté d'au moins un bloc de contact (50) contre chacune desdites tablettes (20), ledit bloc de contact (50) étant d'un matériau relativement mou présentant un frottement important contre la tablette (20).

5

6. Rayonnage modulaire selon la revendication 1, dans lequel ledit profil principal (21) comprend deux guides rainurés (22, 23), parallèles et superposés l'un sur l'autre, l'un tourné vers le haut et l'autre tourné vers le bas. 10
7. Rayonnage modulaire selon l'une quelconque des revendications précédentes, dans lequel lesdits montants (30) et/ou lesdites tablettes (20) sont réalisés à partir de verre ou d'un autre matériau transparent. 15
8. Rayonnage modulaire selon la revendication 7, dans lequel lesdits montants (30) sont courbes ou incurvés. 20

25

30

35

40

45

50

55

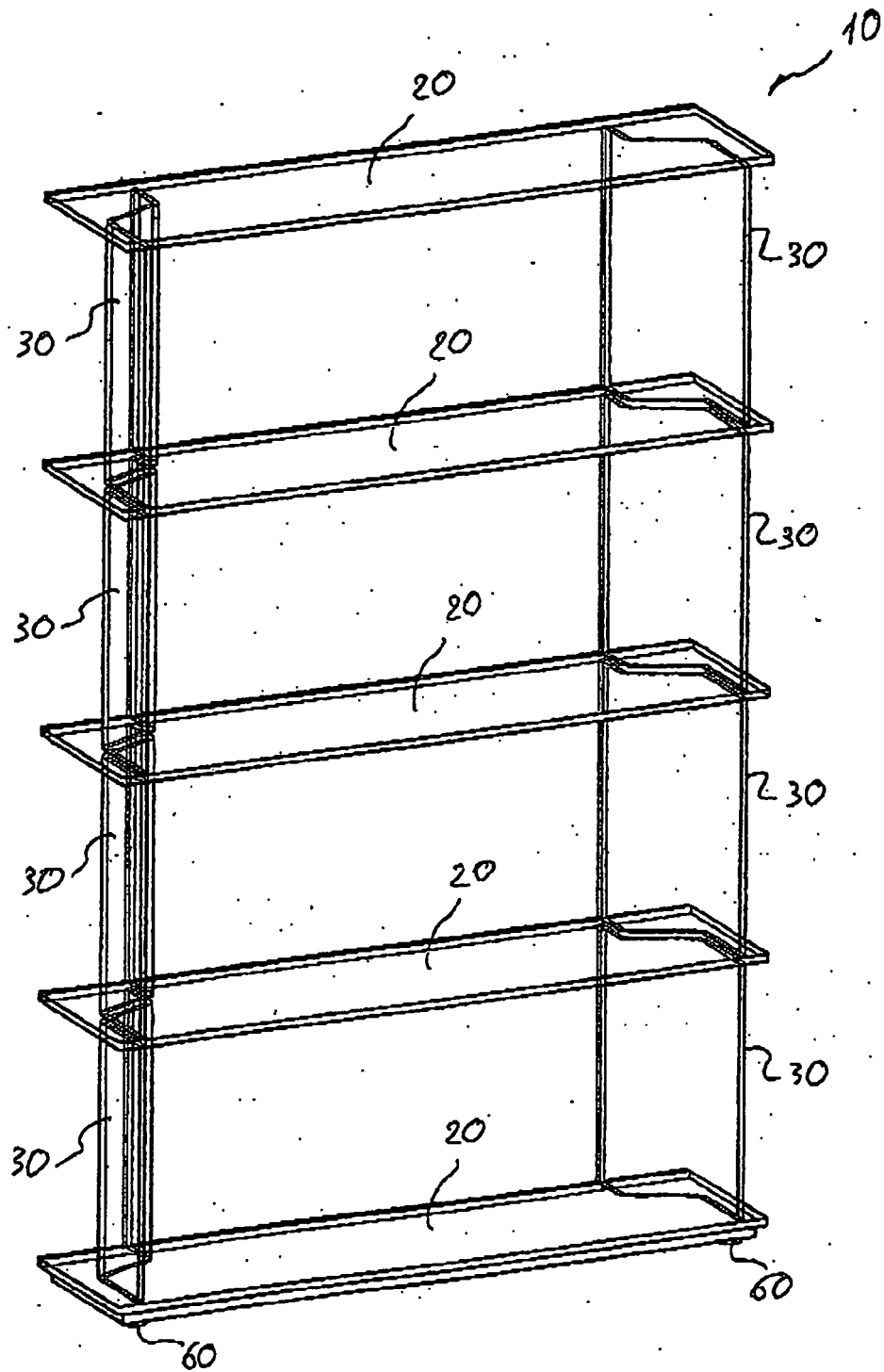


Fig. 1

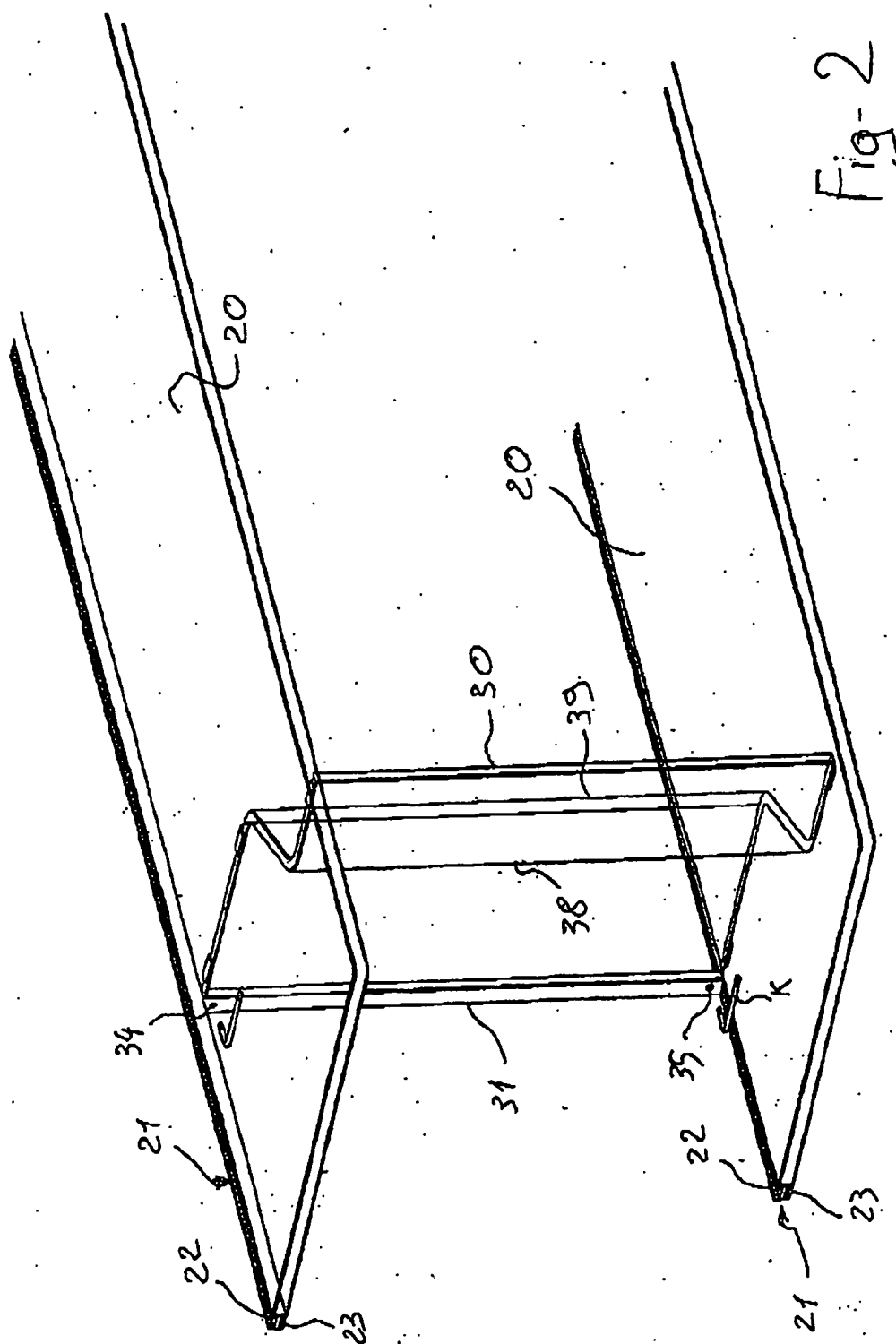
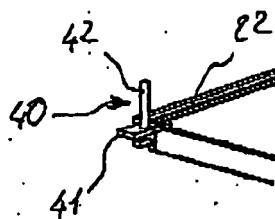
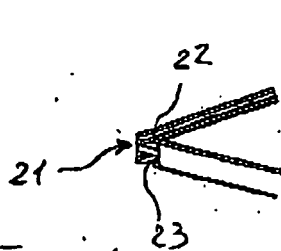
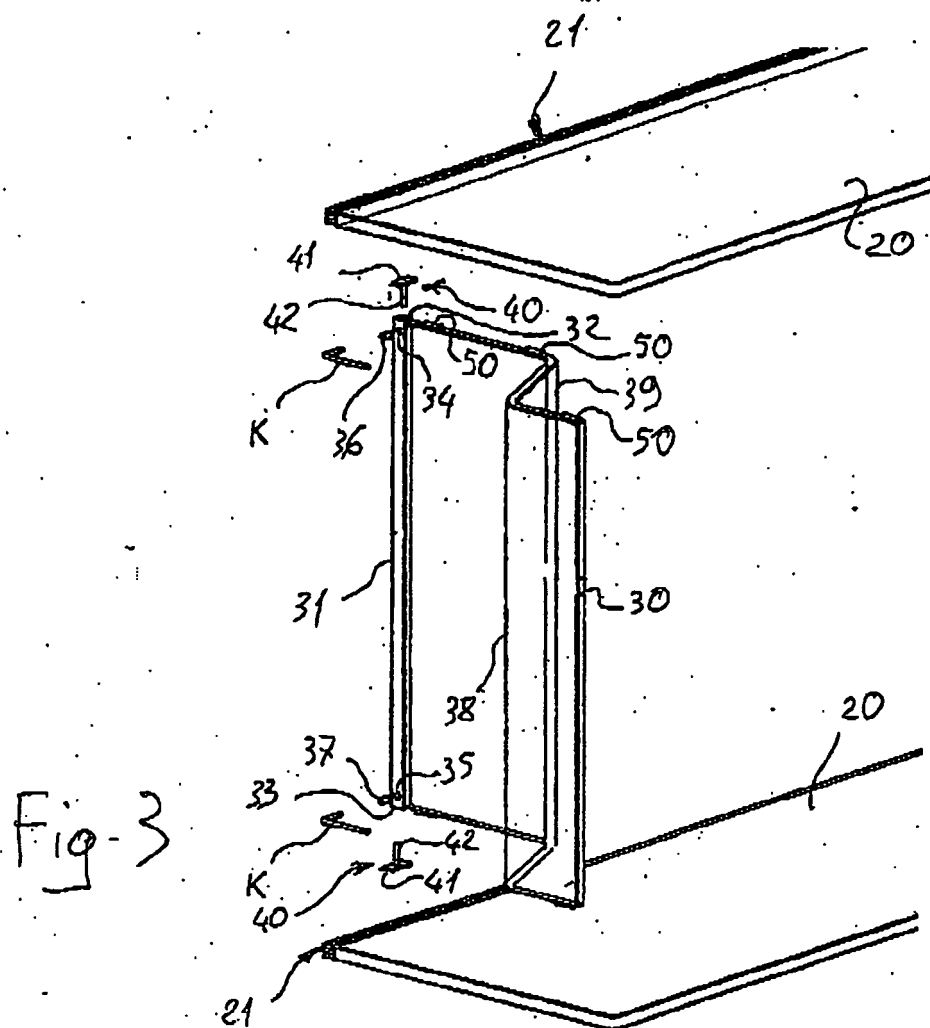
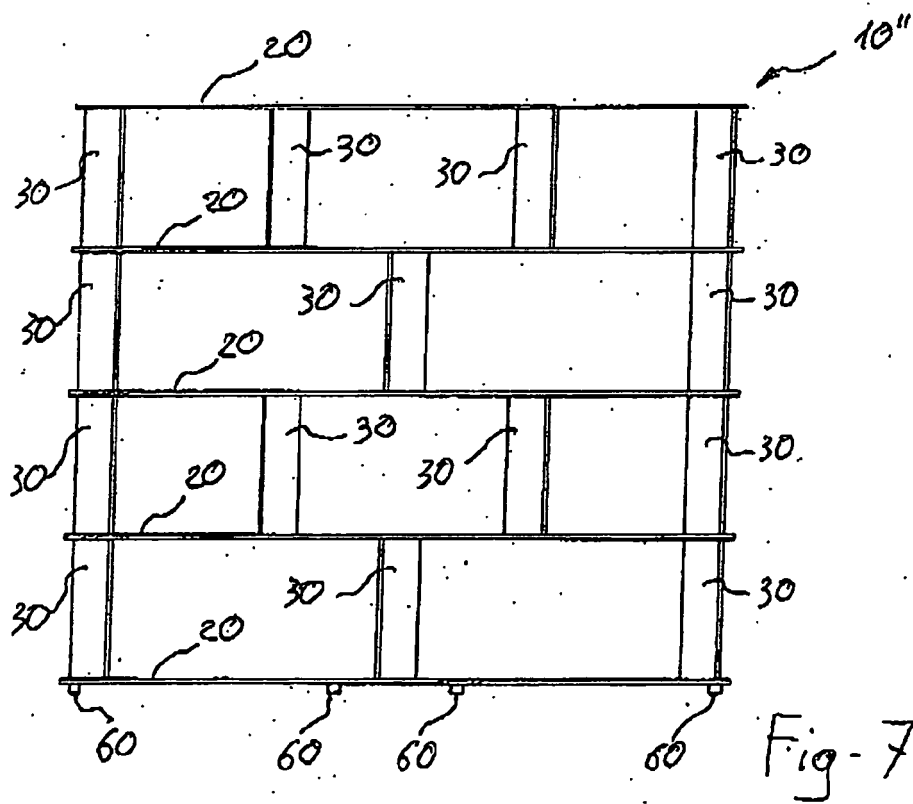
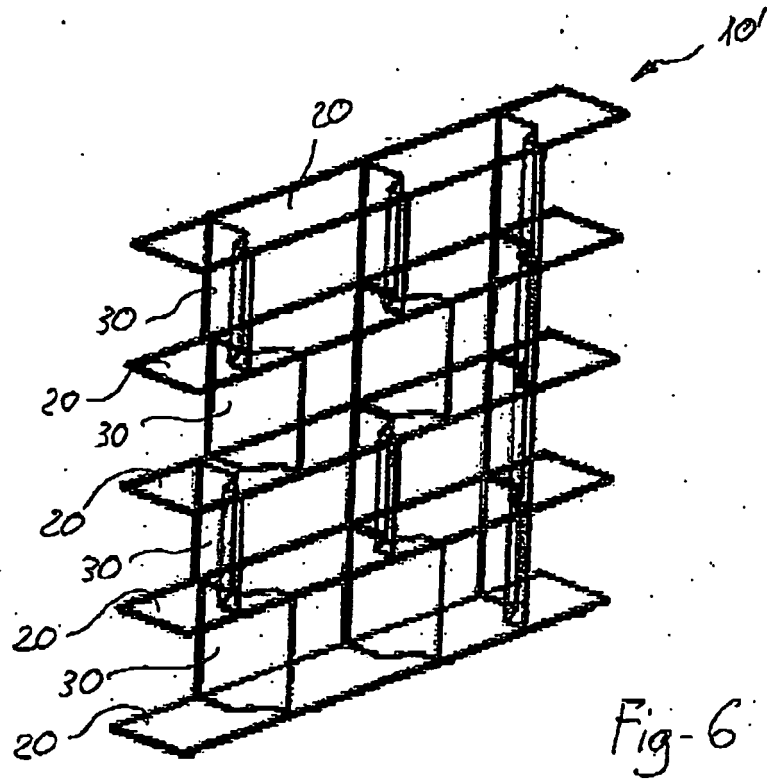


Fig-2





REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 202007017348 U1 [0004]