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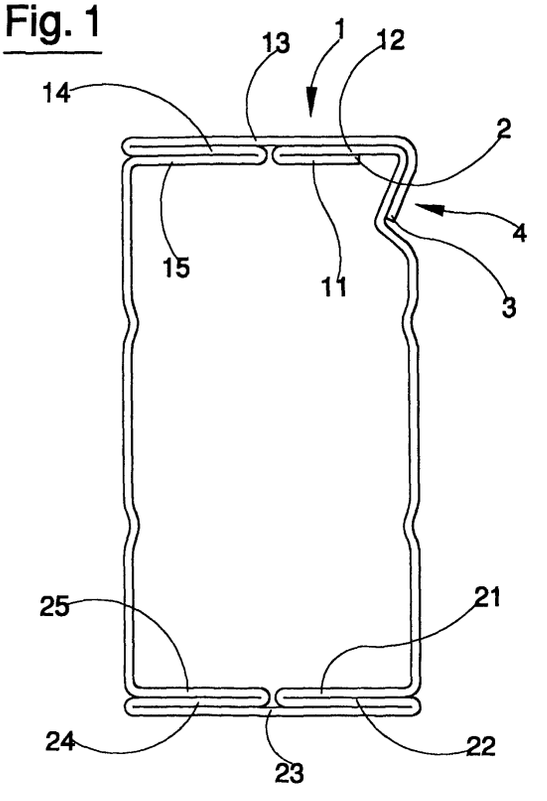
(54) A crossbeam for metal shelving

(57) The crossbeam for metal shelving, with longitudinal axis horizontally disposed, comprises a sheet of steel bent cylindrically in which the upper wall and the lower wall each comprise a series of layers of the steel, united one to another along bend lines parallel to the longituidinal axis of the crossbeam. A first layer (11, 21) occupies about a first half breadthwise of the wall. A second layer (12, 22) is externally superposed on the first layer. An external third layer (13, 23) occupies the whole wall breadthwise. A fourth layer (13, 24) is internally superposed on the third layer and is coplanar to the second layer. A fifth layer (15, 25) is coplanar to the first layer. The crossbeam can be manufactured simply and rapidly and can be used for making considerably strong metal shelving.

Fig. 1



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Description

[0001] The crossbeam of the invention is made in accordance with the preamble to the first claim hereof.

[0002] The prior art teaches a crossbeam of the present type, described in European patent publication no. EP 855157, which describes three different embodiments of a crossbeam of this type, the sections of which are illustrated in figures 2, 3 and 4. The present invention relates to a further embodiment which differs from the crossbeams described in EP 855157 in that the structure of the section is different.

[0003] The main aim of the invention to provide a constructively simpler and more economical crossbeam with respect to the prior art crossbeams.

[0004] An advantage of the invention is that it provides a crossbeam which can be used to make metal shelving characterised by its strength.

[0005] A further advantage is that the crossbeam can be manufactured simply and rapidly.

[0006] These aims and advantages and more besides are all attained by the present invention, as it is characterised in the appended claims.

[0007] Further characteristics and advantages of the present invention will better emerge from the detailed description that follows of two preferred but non-exclusive embodiments of the invention, illustrated purely by way of a nonlimiting example in the accompanying figures of the drawings, in which:

figure 1 shows a straight transversal section of the beam;
figure 2 is a straight transversal section of a second embodiment of a crossbeam made according to the invention.

[0008] The description of patent no. EP 855157 is totally incorporated into and is to be considered a part of the present description, with the exception of the parts which describe the section of the beams denoted by 14, 14' and 14". The section of these beams is changed according to the following specification.

[0009] With reference to the above-mentioned figure 1, 1 denotes in its entirety a crossbeam for metal shelving.

[0010] The crossbeam 1 is an elongate tubular section which is destined in use to be arranged horizontally. Figure 1 represents a section according to a plane which is perpendicular to the longitudinal axis of the crossbeam 1.

[0011] The crossbeam 1 is internally hollow and comprises a sheet of metal fashioned into a tube. In the embodiment of figure 1 the section is rectangular with its long sides arranged vertically. The crossbeam 1 exhibits, on its long sides, two opposite lateral walls arranged vertically and made using a single sheet of sheet steel. Preferably the lateral walls are made from a single layer of sheet steel, though one or both walls could be made of two or more layers of sheet steel.

[0012] The crossbeam 1 further exhibits, on its short sides, two opposite walls, one upper and one lower, arranged horizontally and each made from three superposed layers of the sheet steel. Preferably both upper and lower walls are made of three or more superposed layers of sheet steel, but either of the walls could be made up on one alone or two layers of sheet steel. The various superposed layers are obtained by bending and fashioning a single steel sheet. In particular, both the upper wall and the lower wall comprise a series of layers obtained by bending a single steel sheet. The layers are joined to each other along fold lines which sire parallel to the longitudinal axis of the crossbeam 1. Herein reference is made to any one of the lower or upper walls: a first layer 11 or 21 has a width of about a first half of the wall; a second layer 12 or 22 externally superposed on the first layer, has a width of about the first half of the wall; a third layer 13 or 23, externally superposed on the other two, is about the width of the entire wall; a fourth layer 14 or 24, internally superposed on the third layer and coplanar to the second layer, occupies about a second half of the wall; a fifth layer 15 or 25, internally superposed on the fourth layer and coplanar to the first layer, is about the width of the second half of the wall.

[0013] A first end 2 of the steel sheet, parallel to the longitudinal axis of the crossbeam 1, is situated internally of the upper wall (or of the lower wall). A second end 3 of the steel sheet, opposite to the first and also parallel to the longitudinal axis of the crossbeam, is situated externally of a lateral wall at a recess 4 in the wall itself. The recess 4 is made by bending the steel sheet inwardly. The recess is located on the lateral wall at a point where the edge joining the lateral wall with the upper wall is situated, i.e. with the wall internally exhibiting the first end 2 of the steel sheet. The second end 3 is located on an extremity of the sheet steel, which is inserted into the recess and inclined intemalwards.

[0014] The two bend lines uniting the first layer 11 or 21 and the second layer 12 or 22 (that is, two superposed internal layers occupying about a half of the wall) and, respectively, the fourth layer 14 or 24 and the fifth layer 15 or 25 (that is, the other two internal layers occupying the other half of the wall) are arranged internally of the tubular section and face one another at a minimum reciprocal distance: this is the case for both the upper wall and the lower wall.

[0015] With reference to the lower wall (which does not exhibit sheet steel end edges) the two bend lines uniting the second layer 22 and the third layer 23 (that is, one internal layer and the external layer which occupies more or less the whole wall), and the third layer 23 and the fourth layer 24, are arranged externally of the tubular section and at the two opposite sides of the wall.

[0016] With reference to the upper wall, (that is, the wall which in this case exhibits a sheet steel end edge 2), the second layer 12 is united, along two respective bend lines, by a part of the first layer 11 bearing the end

edge 2 and at the opposite end by a lateral wall (specifically, it is jointed to the part of sheet steel which forms the recess 4 of the lateral wall), while the third layer 13 is united along a bend line to the end bearing the other end edge 3 of the steel sheet.

[0017] Thanks to this conformation the crossbeam 1 has shown itself to be considerably strong, bearing very heavy weights. Further, this conformation enables the crossbeam to be made from a single sheet of steel, with small and simple bending operations.

[0018] The presence of the recess reduces crossbeam mass and avoids the risk of having cut parts exposed

[0019] Figure 2 shows a further embodiment in which the sheet steel is bent so as to give rise to a horizontal front ledge 35 projecting extemalwards from a lateral wall. The ledge can be used for supporting another shelf, or for other objects. In other further embodiments of the invention, the lateral walls can be not perfectly vertical, but might exhibit recesses, projections, concavities, etc. Further, the crossbeam can comprise, apart from a single sheet of steel bent on itself to obtain the tubular section, other accessory elements, for example reinforcing elements, constrained to the tubular section.

[0020] The crossbeams described herein are used in particular for the realization of modular structures for metallic shelving, of the type described in document EP 855157, which is considered as an annexed reference document for the present document.

Claims

1. A crossbeam for metal shelving, horizontally elongate, of tubular section, having at least two opposite lateral walls, arranged in a vertical direction, and two opposite walls, one upper and one lower, arranged horizontally, **characterised in that** it comprises a steel sheet fashioned tubularly and **in that** either the upper wall or the lower wall or both comprise at least three layers of the fashioned steel sheet which are at least partially bent so as to superpose one on another.

2. The crossbeam of section 1, **characterised in that** the upper wall or the lower wall or both comprise a series of folded layers of the steel sheet, united one to another along bend lines which are parallel to a longitudinal axis of the crossbeam, in which: a first layer (11, 21) occupies breadthwise about a first half of the wall; a second layer (12, 22), externally superposed on the first layer (11, 21), occupies breadthwise about the first half of the wall; a third layer (13, 23), externally superposed on the first and second layers, occupies breadthwise about the entire wall; a fourth layer (14, 24), internally superposed on the third layer and coplanar to the second layer, occupies breadthwise about a second half of the wall; a fifth layer (15, 25), internally superposed on the fourth layer and coplanar to the first layer, occupies breadthwise about the second half of the wall.

3. The crossbeam of claim 1 or 2, **characterised in that** a first end edge (2) of the steel sheet, which is parallel to the longitudinal axis of the crossbeam (1), is situated internally of either the upper wall or the lower wall.

4. The crossbeam of any one of the preceding claims, **characterised in that** a second end edge (3) of the steel sheet, which is parallel to the longitudinal axis of the crossbeam (1), is situated externally of a lateral wall and at a recess (4) of the lateral wall.

5. The crossbeam of claim 4, **characterised in that** the second end edge (3) is located on an extremity of the steel sheet which is internalwardly inclined.

Fig. 2

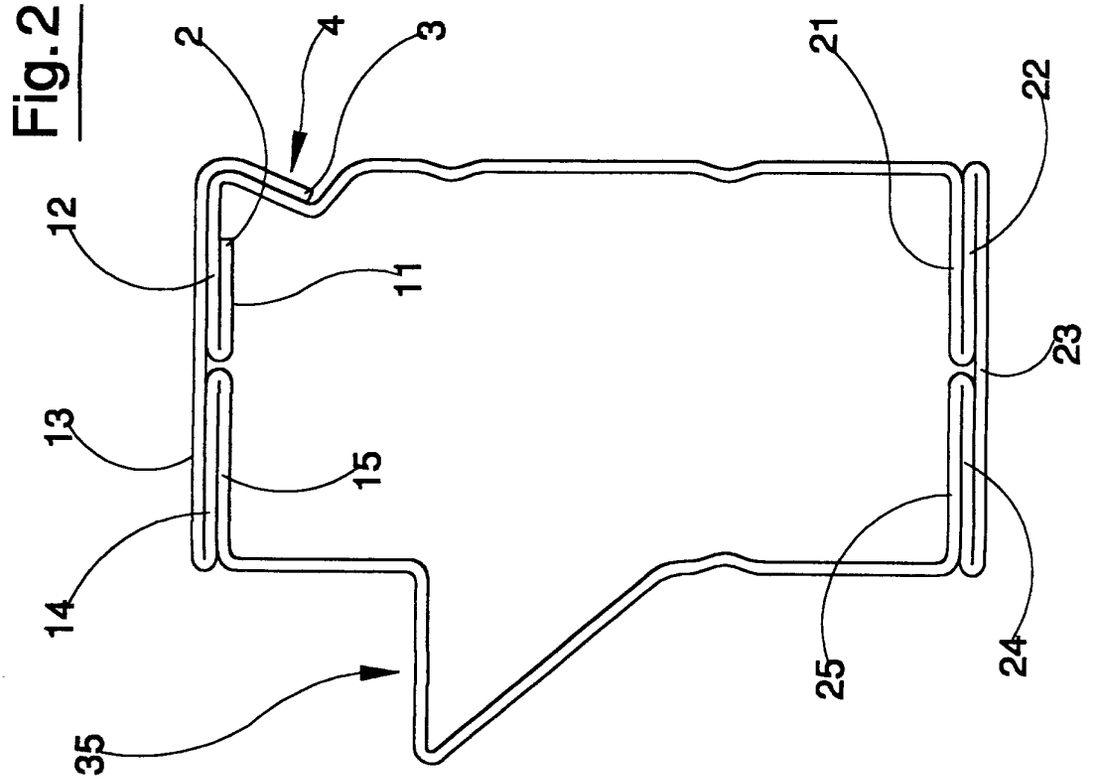
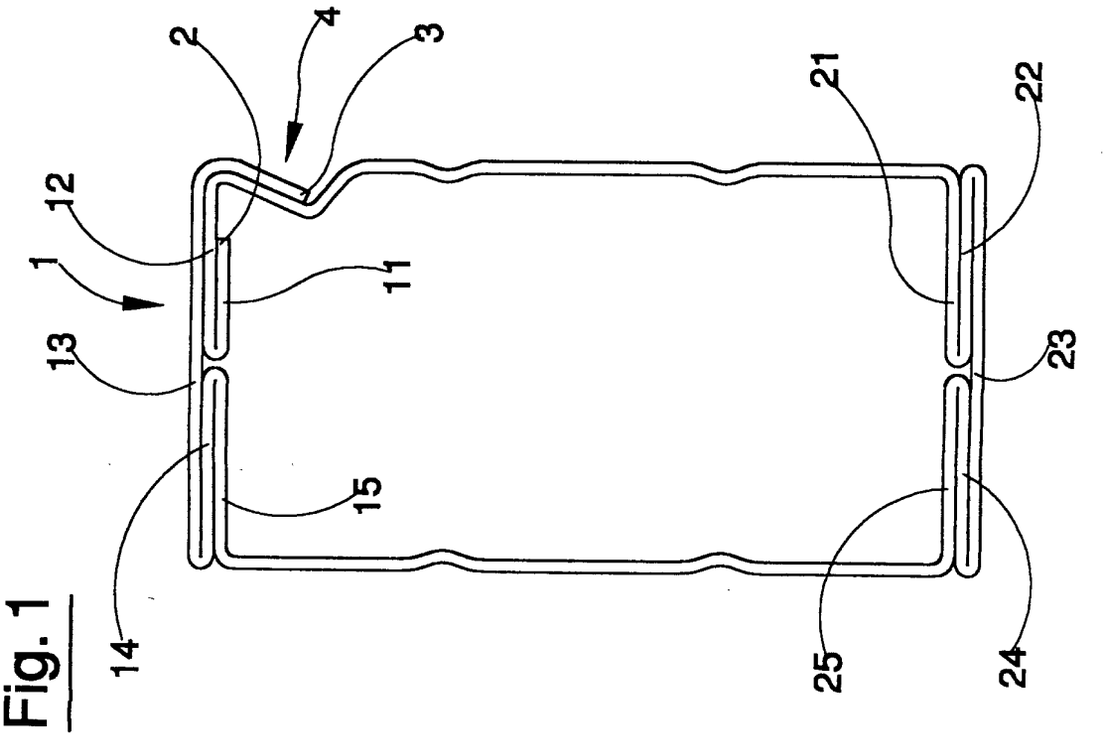


Fig. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0571

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A47B E04C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 February 2002	Jones, C

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 83 0571

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