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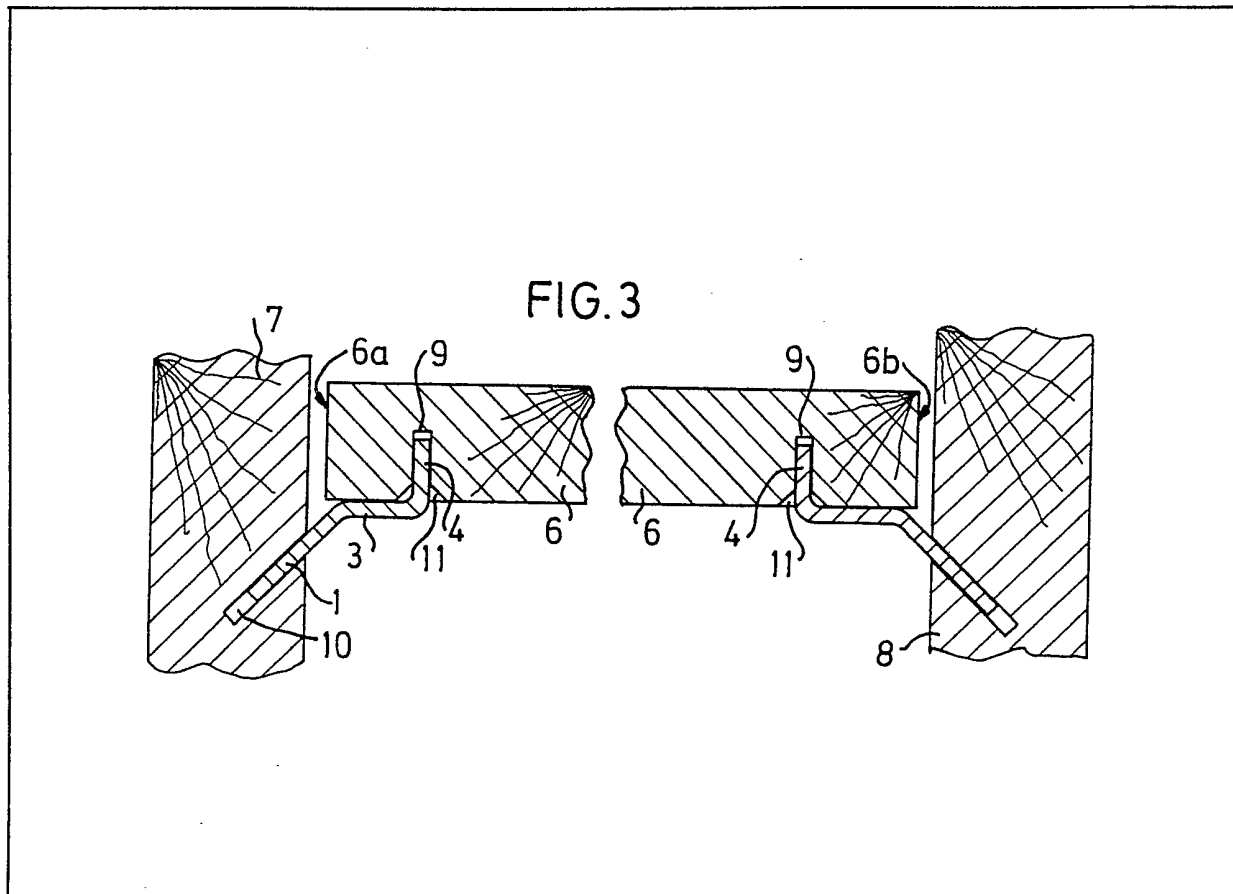
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(54) A joint element for supporting a shelf from an upright

(57) A joint element for supporting a shelf in relation to an upright, comprising a first insertion part (1) adapted for insertion into a recess that is directed obliquely downwards in a surface of the upright and a bent section (2) connected to the first insertion part, said bent section comprising a supporting portion (3) for supporting the shelf and a second insertion part (4) that is directed upwardly substantially at right angles to the supporting portion and is intended to be inserted into a recess in a lower surface of the shelf.



GB 2 118 026 A

FIG. 1

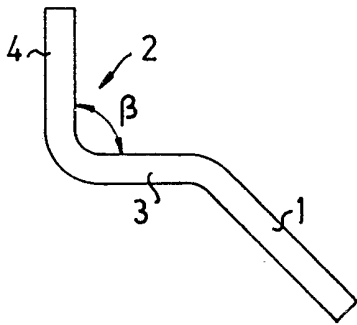


FIG. 2

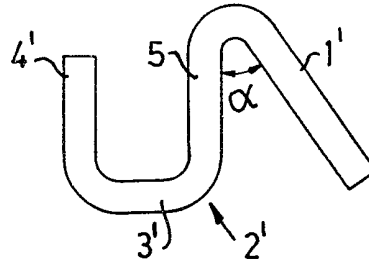


FIG. 3

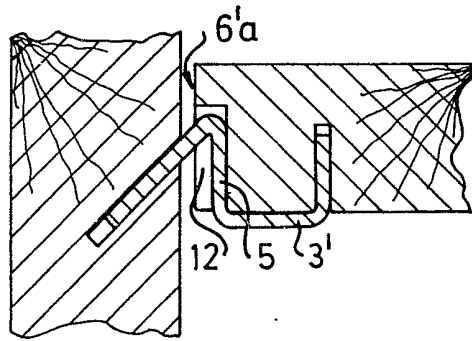
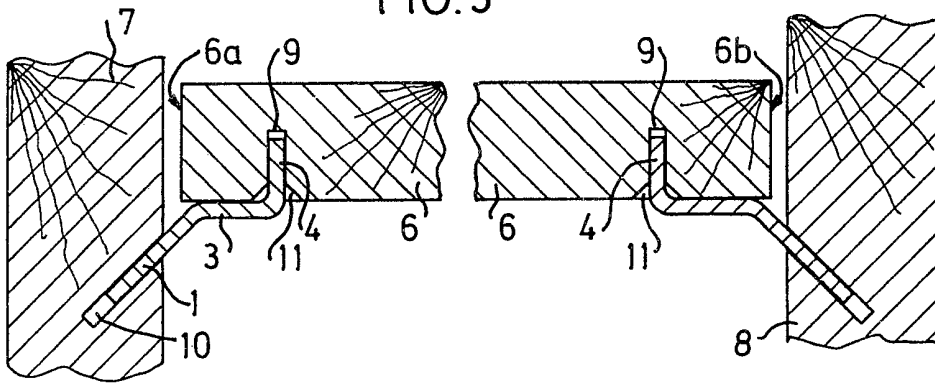


FIG. 4

SPECIFICATION

A joint element for supporting a shelf

The present invention relates to a joint element for supporting a shelf in relation to an upright, and to a shelf assembly employing such joint elements to support and secure shelves between uprights.

Many different systems for supporting shelves between the uprights of a bookcase or stand are known. In almost all of these known systems shelves are loosely supported by support means arranged at the ends of the shelves. The known systems are often complicated and often require relatively expensive machining of the ends and surfaces of the shelves and/or the attachment of various support brackets or fittings to the shelves or the uprights.

In one aspect the invention provides a joint element for supporting a shelf in relation to an upright, comprising a first insertion part adapted for insertion into a recess that is directed obliquely downwards in a surface of the upright and a bent section connected to the first insertion part, said bent section comprising a supporting portion for supporting the shelf and a second insertion part that is directed upwardly substantially at right angles to the supporting portion and is intended to be inserted into a recess in a lower surface of the shelf.

Preferably, the supporting portion is directed to be substantially perpendicular to an upright and the second insertion part is arranged to be substantially perpendicular to the plane of the lower surface of the shelf.

Providing the joint element with a first insertion part intended to be inserted in a recess arranged obliquely downwardly in the surface of the upright, said recess preferably consisting of a blind hole with circular cross-section having a depth exceeding the length of the insertion part, ensures reliable retention of the joint element in the upright when assembling a set of shelves. The bent section connected to the first insertion part, provides the supporting capacity of the joint element in an extremely simple manner. The second insertion part, that is arranged to extend substantially at right angles to the supporting portion and to be received in a recess arranged substantially perpendicularly in the lower surface of the shelf, serves to ensure that the shelves are secured to the uprights, the uprights simultaneously pressing against the ends of the shelves.

In a first embodiment the bent section of the joint element is substantially L-shaped, the first insertion part being connected directly to the lower leg of the L. This embodiment of the joint element requires only the arrangement of partially drilled holes in the uprights and in the under surface of the shelf. These holes can be made with conventional drilling equipment.

Alternatively, the bent section of the joint element may be U-shaped. In which case, the bent section comprises a supporting portion, a second insertion part and a leg portion that connects the

first insertion part to the supporting portion. However, this embodiment requires a recess along the end surface of the shelf to receive the leg portion of the bent section. This embodiment is preferable if the shelf is to be able to carry heavy loads since any tendency towards deformation of the upright in conjunction with its recess is to a great extent eliminated by the presence of the end of the shelf which will exert a force to counter such deformation.

In another aspect, the invention provides, a shelf assembly comprising at least one shelf supported by an upright in which the joint between the upright and the shelf is achieved by the use of a joint element as described above.

Preferably, at least one obliquely downwardly directed first recess is arranged in a surface of the upright that faces the shelf, said first recess being designed to receive the first insertion part of the joint element, and at least one second recess is arranged in a lower side of the shelf, said second recess being designed to receive the second insertion part of the joint element, the distance between the second recess on the lower side of the shelf and an end of the shelf being equal to or slightly exceeding the length of the supporting portion of the joint element.

An advantage of using a joint element with a U-shaped bent section is that this enables the shelves to be inclined between the uprights. In this case, however, the holes in the under surface of the shelf may be displaced slightly backwards to permit inclination of the shelf. It may then be expedient to arrange two holes in the under surface of the shelf, permitting optional horizontal or inclined placing of the shelves between the uprights.

Inclined placing of the shelves is also possible when using joint elements with L-shaped bent sections, in which case the inclination can be increased by giving the blind holes in the uprights greater diameters than the diameters of the first and second insertion parts.

By inclining the recesses in the uprights downwardly, for receipt of the first insertion parts of the joint elements, and by adjusting the distance between the shelf ends and the recesses in the lower side of the shelf so that the insertion parts of the joint elements are located slightly inside the shelf ends, has the effect that, when the shelf is loaded, the uprights will be pressed towards the shelf ends.

The uprights being thus drawn together when the shelves are loaded contributes to the stability of the set of shelves, thus reducing the need for covering the rear of the set of shelves. Such a rear piece may possibly be replaced by relatively weak strips or wires arranged diagonally at the rear of the set of shelves. In the case of an open bookcase, i.e. one without any rear piece, it may even be unnecessary to stay the rear when the shelves are fully loaded.

To facilitate assembly of the set of shelves, the openings of the recesses on the lower side of the shelves are preferably bevelled. The recesses can

thus be felt more easily with the fingers and can therefore more easily be manoeuvred into the correct position to co-operate with the second insertion part of the joint element during

5 assembly. Bevelling also enables the free ends of the second insertion parts to pass more easily into the recesses, said recesses preferably comprising partially drilled holes with cylindrical cross-section.

10 In order that the invention may be more readily understood, and so that further features thereof may be appreciated, embodiments of the invention will now be described, by way of example, with reference to the accompanying

15 drawings, in which:

FIGURE 1 is a side view of a first embodiment of a joint element according to the invention;

FIGURE 2 is a side view of a second embodiment of a joint element according to the

20 invention;

FIGURE 3 is a longitudinal section through a shelf assembly, using the joint element of Figure 1; and

25 FIGURE 4 is a longitudinal section through a shelf assembly, using the joint element of Figure 2.

Figure 1 shows a first embodiment of a joint element of the invention comprising an insertion part 1 and a generally L-shaped bent section, indicated at 2, that comprises a supporting portion 3 and a second insertion part 4.

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Figure 2 illustrates another embodiment of a joint element of the invention that has a first insertion part 1' and a generally U-shaped bent section, indicated at 2', that comprises a supporting portion 3', a second insertion part 4' and a leg portion 5 connecting the first insertion part 1' to the supporting portion 3'.

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Figure 3 shows the joint element of Figure 1 positioned in a shelf assembly comprising a shelf 6 between two uprights 7 and 8. A circular hole 9 is provided in the shelf 6 to receive the second insertion part 4, and a hole 10 is provided in the upright 7 to receive the first insertion part 1 of the

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Figure 4 shows the shelf 6 during assembly between uprights 7 and 8, i.e. the shelf 6 has not yet assumed its final position between the uprights. To obtain maximum stability in the finished shelf assembly, it is desirable for the shelf 6 to be loaded in order to draw together the uprights 7 and 8. This is achieved by lowering the shelf 6 with respect to the uprights 7 and 8, from the position shown in Figure 3, so that the first insertion parts 1 of the joint elements will provide a compressing action. This effect will be maximal if the ends of the shelf, indicated 6a and 6b, protrude slightly over the first insertion part 1 of each joint element.

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Pressure on the shelf 6 and the uprights 7 and

50 8 may be utilized, if desired, to provide permanent

securing of the shelves to the uprights. For example, pressure, achieved by loading the shelf 6, may be used when glueing the shelves to the uprights.

70 Figure 4 illustrates the joint element of Figure 2 positioned between a shelf and one upright during assembly. In contrast to the embodiment described and shown in conjunction with Figures 1 and 3, the shelf end 6'a is provided with a notch 12 to receive the leg portion 5 of the bent section 2'. In other respects assembly of the shelf assembly using the element of Figure 2 is similar to that described in conjunction with the embodiment shown in Figure 3.

80 It is possible to position a shelf 6 so that it is inclined with respect to the uprights 7 and 8. In the embodiment shown in Figure 3 an inclination of about 30° can be achieved without the need for special adaptations of the joint element or the holes drilled in the shelf or uprights. The angle of inclination can be further increased to a certain extent, however, if the diameter of the hole in the upright is somewhat larger than the outside diameter of the insertion part 1.

90 The uprights are preferably provided with sets of drilled holes running in rows along the sides of the uprights. If the shelf is desired to be inclined the joint elements used to support the rear part of the shelves may be inserted in holes located higher than the holes into which the joint elements for the front part of the shelves are inserted.

If the joint elements of Figure 2 are to be used to support an inclined shelf, special drill holes are required in the lower sides of the shelves to receive the joint element. An increased angle of inclination when using joint elements of Figure 2 can be achieved by increasing the angle α between insertion part 1' and the leg part 5, depending upon the desired angle of inclination. This joint element can then only be used for inclined shelves.

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It should be mentioned in this connection that the angle β between the supporting portion 3 and the second insertion part 4 of the joint element of Figure 1 can be increased if desired for supporting inclined shelves, but this is not normally necessary.

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The first insertion parts 1, 1', respectively, and the second insertion parts 4, 4', respectively, may be bevelled at their ends in order to facilitate insertion into the holes in the uprights and/or shelves and, importantly, to eliminate the risk of pieces being chipped out of the uprights, which are often surface-treated, during insertion.

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An embodiment of the present invention provides a joint element for supporting and securing shelves in bookcases or stands, which is inexpensive to manufacture and requires minimal machining of the shelves and uprights, whilst providing a strong and reliable joint.

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A shelf assembly of the invention has also been found to be extremely easy to assemble and dismantle. It has further been found that an embodiment of the shelf assembly of the invention

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provides for a strong joint between shelves and uprights at increased loading of the shelves.

CLAIMS

1. A joint element for supporting a shelf in relation to an upright, comprising a first insertion part adapted for insertion into a recess that is directed obliquely downwards in a surface of the upright and a bent section connected to the first insertion part, said bent section comprising a supporting portion for supporting the shelf and a second insertion part that is directed upwardly substantially at right angles to the supporting portion and is intended to be inserted into a recess in a lower surface of the shelf.
2. A joint element according to claim 1, wherein the supporting portion is directed to be substantially perpendicular to an upright and the second insertion part is arranged to be substantially perpendicular to the plane of the lower surface of the shelf.
3. A joint element according to claim 1, or claim 2, wherein the bent section is substantially L-shaped.
4. A joint element according to claim 1, or claim 2, wherein the bent section is substantially U-shaped.
5. A joint element according to claim 4, wherein the bent section comprises a supporting portion, a second insertion part and a leg portion that connects the first insertion part to the supporting portion.
6. A joint element according to any one of claims 1 to 5, wherein the joint element is constructed as a bent wire.
7. A joint element according to claim 6, wherein the diameter of the joint element is less than the diameter of the recess in the upright or in the shelf.
8. A shelf assembly comprising at least one shelf supported by an upright in which the joint between the upright and the shelf is achieved by the use of a joint element according to any one of claims 1 to 7.
9. A shelf assembly according to claim 8, wherein at least one obliquely downwardly directed first recess is arranged in a surface of the upright that faces the shelf, said first recess being designed to receive the first insertion part of the joint element, and at least one second recess is arranged in a lower side of the shelf, said second recess being designed to receive the second insertion part of the joint element, the distance between the second recess on the lower side of the shelf and an end of the shelf being equal to or slightly exceeding the length of the supporting portion of the joint element.
10. A shelf assembly according to claim 8 or claim 9, wherein respective ends of the shelf are provided with recesses to receive legs of substantially U-shaped bent sections of the joint elements.
11. A shelf assembly according to any one of claims 8 to 10, wherein one or more shelves are arranged at an angle between the uprights.
12. A shelf assembly according to any one of claims 8 to 11, wherein openings of the second recesses in the lower side of the shelves are bevelled to facilitate insertion of the second insertion part.
13. A joint element substantially as herein described with reference to, and as shown in, Figures 1 and 3 of the accompanying drawings.
14. A joint element substantially as herein described with reference to, and as shown in, Figures 2 and 4 of the accompanying drawings.
15. A shelf assembly substantially as herein described with reference to, and as shown in, Figure 3 of the accompanying drawings.
16. A shelf assembly substantially as herein described with reference to, and as shown in, Figure 4 of the accompanying drawings.
17. Any novel feature or combination of features disclosed herein.