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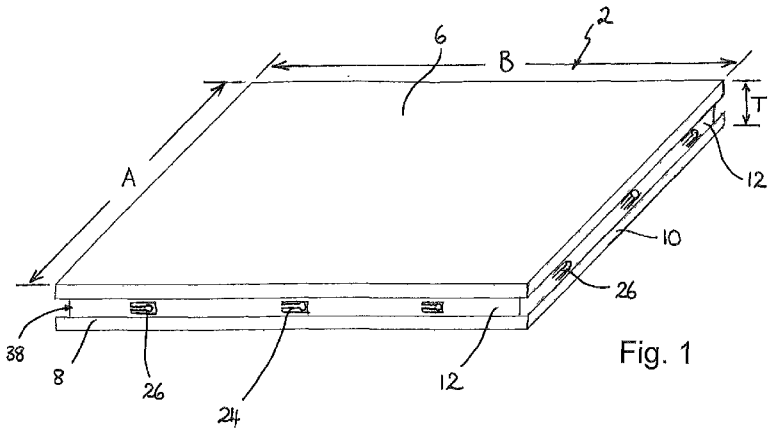

Fig. 1

(57) Abstract: This invention relates to a modular furniture kit. A modular furniture kit comprises a plurality of elongate connector members, including connector members of at least two different axial lengths, each connector member comprising a stem portion having a dimension of length x perpendicular to a longitudinal axis; a plurality of rectangular panels, including panels of at least two different sizes, each of the panels having a first pair of opposing edges, a distance between said edges defining a first dimension of the panel, and a second pair of opposing edges, a distance between said edges defining a second dimension of the panel, each of the first dimension and the second dimension having a length selected from: a; 2a+x; na+(n-1)x; complementary engaging means provided on the panels and the connector members, the engaging means configured to secure the connector member to the panel and to permit relative sliding movement between the connector member and the panel; and complementary latching means provided on the panels and the connector members, the latching means being configured to retain one of said connector members in one or more pre-defined positions relative to said panel when the connector member and panel are engaged with each other.

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Modular Furniture Kit

BACKGROUND

a. Field of the Invention

This invention relates to a modular furniture kit. In particular, this invention relates to a modular furniture kit that permits a wide range of types of furniture to be constructed and dismantled quickly and easily.

b. Related Art

It is known to self-assemble furniture such as cupboards and chests of drawers from a kit of parts. This is commonly referred to as flat pack furniture. Flat pack furniture is assembled by the user, and the securing means used to connect the parts together is often designed to be easy to use and only requires the minimum of basic tools. Furthermore, because the furniture is delivered in an initial, disassembled state, storage and transportation costs are kept to a minimum.

In many cases the furniture is designed such that standard parts will be common to a number of different pieces of furniture, thereby reducing manufacturing costs. However, many of the parts will be unique to the size or style of a particular piece of furniture.

Furthermore, although flat pack furniture may be readily assembled by the user, often it is difficult to disassemble the furniture. Some of the securing means may be single use and some of the securing means, although able to be used more than once, do not allow for a repeated consistent and robust connection between the parts. Generally, therefore, once a piece of flat pack furniture has been constructed it is not dismantled again until it is desired to dispose of the piece of furniture.

It is an object of the present invention to provide an improved, cost effective modular furniture system permitting repeated assembly and disassembly.

SUMMARY OF THE INVENTION

According to the present invention there is provided a modular furniture kit comprising:

- a plurality of elongate connector members, including connector members of at least two different axial lengths, each connector member comprising a stem portion having a dimension of length **X** perpendicular to a longitudinal axis;
- a plurality of rectangular panels, including panels of at least two different sizes, each of the panels having a first pair of opposing edges, a distance between said edges defining a first dimension of the panel, and a second pair of opposing edges, a distance between said edges defining a second dimension of the panel, each of the first dimension and the second dimension having a length selected from:

$$a; \quad 2a+x; \quad na+(n-1)x;$$

- complementary engaging means provided on the panels and the connector members, the engaging means configured to secure the connector member to the panel and to permit relative sliding movement between the connector member and the panel; and
- complementary latching means provided on the panels and the connector members, the latching means being configured to automatically retain one of said connector members in one or more pre-defined positions relative to said panel when the connector member and panel are engaged with each other.

The basic building blocks of the modular furniture kit, namely the panels and connector members, can be assembled to create a number of different structures. The engaging means permit a user to easily secure the panels and the connector

members together, and also allow the panels and the securing members to be disassembled for storage or transportation, or to change the structure to form a different piece of furniture. The inclusion of the latching means enables different sized panels and connector members to be aligned consistently and prevents accidental relative sliding movement of a panel and a connector member once a structure has been built. The latching means are configured to releasably retain the connector member and the panel in a fixed position with respect to each other, such that the structure can be easily dismantled.

Preferably the engaging means extends along the full length of each of the edges of the panel. As such, any force or weight applied to a panel will be distributed along the edges to one or more connector members, thereby allowing the panels to support more weight than if narrow or point connections were made between the panels and connector members.

Preferably the engaging means comprises a groove and a rail. A panel is, therefore, joined to a connector member by inserting the rail in one end of the groove and sliding the panel and connector member with respect to each other until the panel is in the correct position with respect to the connector member. Typically the groove will be provided in the panels and the rail will be provided on the connector members. In preferred embodiments the engaging means comprises a sliding dovetail.

The latching means preferably comprises a biased detent and a recess. In these embodiments, contact between surfaces of the panel and connector member retains the biased detent in a retracted position until the panel is in a pre-defined position with respect to the connector member. In this pre-defined position, the recess is aligned with the detent and the detent is released from its retracted position and extends into the recess into an engaged position, thereby retaining the panel in this position with respect to the connector member.

In preferred embodiments the detent comprises an arm portion and a projection

extending from a distal end of the arm portion. The projection is configured to engage with a corresponding recess.

Preferably the projection or detent has a convex curved surface and the recess has a concave curved surface. The detent and recess are preferably shaped to enable the detent to be disengaged from the recess by sliding the panel and connector member with respect to each other, in a direction substantially perpendicular to the direction of movement of the biased detent between the retracted and engaged positions.

Preferably, in embodiments in which the engaging means comprises a groove and a rail, the detent is provided within the groove and the recess is provided in the rail.

Typically the stem portion of the connector member has a square cross-sectional shape perpendicular to the longitudinal axis. Furthermore, the panels preferably all have the same thickness, and the length **X** is preferably equal to the thickness of the panels.

The modular furniture kit preferably further comprises a panel including a hinge. This panel including a hinge forms a door component to enable a user to construct, for example, a cupboard using the modular furniture kit.

Preferably at least two panels include a groove in one face of the panel, the groove extending perpendicularly from one edge. This groove may be configured to receive, for example, a part of a drawer or an end of a hanging rail. Some panels may include a groove in both opposing faces of the panel. The grooves in opposing faces are preferably parallel to each other. Furthermore, more than one groove may be provided in one or both faces of a panel.

In preferred embodiments the modular furniture kit further comprises a drawer unit,

the drawer unit having a base, two opposing side panels and opposing front and rear panels, each side panel including an elongate projecting rib, said rib being engageable with the groove in the face of the panel to permit sliding movement between the drawer unit and the panel.

Preferably the modular furniture kit further comprises an elongate rod member, first and second ends of the rod being configured to be received in the groove in the face of the panel such that the rod member extends perpendicular to the plane of the face of the panel. This rod may, therefore, be used as a hanging rail.

The modular furniture kit may additionally further comprise a bracket. The bracket is preferably configured to be secured to two adjacent connector members that are substantially perpendicular to each other.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be further described by way of example only and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a panel of a modular furniture kit according to an embodiment of the present invention;

Figure 2 is a perspective view of a connector member of a modular furniture kit according to an embodiment of the present invention;

Figure 3 is a cross-sectional view of the connector member of Figure 2, perpendicular to a longitudinal axis of the connector member;

Figure 4 illustrates a panel engaged with a connector member according to an embodiment of the invention;

Figure 5a illustrates a part of a latching means in the form of a recess formed in a connector member according to an embodiment of the present invention;

Figure 5b illustrates a part of a latching means in the form of a biased projection formed in a panel according to an embodiment of the present invention, the biased projection being configured to engage in the recess of Figure 5a;

Figure 6 is a partial cross-sectional view of a panel engaged with a connector member according to an embodiment of the present invention, showing a biased projection engaged in a recess;

Figure 7 illustrates an alternative embodiment of a biased projection;

Figure 8 is a perspective view of a panel of a modular furniture kit according to a further embodiment of the present invention;

Figure 9 is a perspective view of a drawer unit according to an embodiment of the present invention;

Figure 10 is a perspective view of part of a door component according to an embodiment of the present invention;

Figure 11 illustrates a brace bar according to an embodiment of the present invention.

DETAILED DESCRIPTION

A modular furniture kit according to the present invention comprises a plurality of panels and a plurality of connector members for connecting the panels together to

make a variety of three-dimensional structures. The panels and the connector members include complementary engaging means configured to permit repeated engagement and disengagement. This allows a user to construct a first structure from a number of panels and connector members and then, if required, to dismantle that structure and construct a second structure from the same panels and connector members, the second structure being different to the first structure.

It is envisaged that a modular kit according to the present invention may be used to construct items of furniture in situations in which temporary or emergency furniture is required. For example, the modular kits may be used to construct furniture in buildings hit by flooding, or may provide furniture in temporary shelters where people have been evacuated from their homes.

Some advantages of the modular furniture kit of the present invention are that the same components are used to construct a number of different items of furniture, the components of the kit connect together without requiring tools, and the kits can be transported and stored easily compared to complete or pre-assembled pieces of furniture.

Figures 1 to 3 illustrate a panel 2 and a connector member 4 according to a first embodiment of a modular furniture kit of the present invention.

The panel 2, shown in Figure 1, is substantially rectangular and has opposing first and second faces (only the first face 6 is shown in Figure 1). The distance between the first and second faces defines a thickness T of the panel 2. The faces are bounded by two pairs of opposing sides or edges 8, 10. A distance between a first pair of sides 8 defines a first dimension A of the panel 2, and a distance between a second pair of sides 10 defines a second dimension B of the panel 2. A groove 12 is formed in each of the sides 8, 10. Each groove 12 extends fully along the length of each of the sides 8, 10, such that a continuous groove 12 extends around all four sides 8, 10 of the panel 2. The grooves 12 form a first part of complementary engaging means for joining a panel 2 to a connector

member 4.

The connector member 4 comprises an elongate stem portion 14 having a substantially square cross-sectional shape perpendicular to a longitudinal axis 16 of the connector member 4. In this way, the stem portion 14 has four elongate, rectangular faces 18. A dimension of the stem portion 14 perpendicular to the longitudinal axis 16, i.e. a distance between opposing faces 18, has a length **X**.

In this embodiment an elongate rail 20 extends from each of the faces 18. Each rail 20 is positioned centrally on the respective face 18 and extends for the full length of the stem portion 14. The rails 20 form a second part of the complementary engaging means for connecting a panel 2 to a connector member 4. Accordingly, each rail 20 is shaped to engage with and be retained within the groove 12 on a panel 2. In this embodiment, the groove 12 and rail 20 each have a substantially triangular, dovetail shape such that the connection between a panel 2 and a connector member 4 is in the form of a sliding dovetail joint.

It will be appreciated that, in other embodiments, the rail 20 and the groove 12 may each have a different shape. For example, the rail 20 and the groove 12 may have a substantially circular or teardrop cross-sectional shape. Importantly the shape of the rail 20 and the groove 12 must be complementary such that rail 20 may be received within the groove 12 and permit sliding movement of the panel 2 relative to the connector member 4, and the shape must be such that the rail 20 is retained within the groove 12 without requiring additional fixing or retaining means.

In some embodiments, the complementary engaging means may not be in the form of a rail and groove, but may be of any suitable design that permits engagement of a panel with a connector member and relative sliding movement between these two components. For example, the engaging means may comprise a series of discrete, substantially T-shaped projections that engage with one or more substantially T-shaped channels.

The modular furniture kit comprises a plurality of panels 2 and a plurality of connector members 4. The panels 2 are of at least two different sizes and the connector members 4 are of at least two different axial lengths, corresponding to the sizes of the panels 2.

Each of the first dimension A and the second dimension B of the panels 2 has a length selected from:

$$a; \quad 2a+x; \quad na+(n-1)x.$$

Accordingly, each of the connector members 4 preferably has an axial length selected from:

$$a-x; \quad 2a; \quad na+(n-2)x.$$

Where n is any positive integer.

The thickness T of the panels 2 is preferably equal to the dimension of the stem portion 14 perpendicular to the longitudinal axis 16, i.e. the thickness T is equal to x.

In a particularly preferred embodiment the modular furniture kit comprises six sizes of panels 2 and three lengths of connector members 4. The connector members 4 have lengths of 16 inches (40 cm), 10 inches (25 cm) and 4 inches (10 cm), and the stem portion 14 of all of the connector members has a square cross-section of length 1 inch (2.5 cm). Dimensions of the panels 2 in this preferred embodiment are given in Table 1.

Table 1
Panel Dimensions

First Dimension A	Second Dimension B	Thickness T
17 inches (43 cm)	17 inches (43 cm)	1 inch (2.5 cm)
17 inches (43 cm)	11 inches (28 cm)	1 inch (2.5 cm)
17 inches (43 cm)	5 inches (13 cm)	1 inch (2.5 cm)
11 inches (28 cm)	11 inches (28 cm)	1 inch (2.5 cm)
11 inches (28 cm)	5 inches (13 cm)	1 inch (2.5 cm)
5 inches (13 cm)	5 inches (13 cm)	1 inch (2.5 cm)

Additionally, in preferred embodiments, some of the connector members 4 will have fewer than four rails 20. Some of the connector members 4 have three rails 20, the rails 20 extending from the stem portion 14 in a T-shape configuration. Other connector members 4 have only two rails 20; the rails 20 extending either from opposing faces 18 of the stem portion 14 or from adjacent faces 18 of the stem portion 14.

Figure 4 illustrates a connector member 4 having two dovetail rails 20 extending from adjacent faces 18, and a panel 2 joined to the connector member 4 through engagement of one of the dovetail rails 20 with a dovetail groove 12 in the side 8 of the panel 2. The thickness of the panel 2 is equal to the dimension of the stem portion 14 of the connector member 4 such that the first face 6 of the panel 2 lies flush with one of the faces 18 of the stem portion 14 and an opposing second face 22 of the panel 2 lies flush with an opposing face 18 of the stem portion 14.

The panels 2 and the connector members 4 of the present invention include complementary latching means 24. The latching means are configured to retain the connector members in pre-defined or fixed positions relative to the panels 2. The latching means operate automatically such that additional tools or locking means are not required to fix the panels 2 and connector members 4 in position. In this embodiment the latching means 24 comprises a biased detent 26 and a recess 28 for receiving at least a part of the biased detent 26.

The biased detent 26 is located in the groove 12 of the panel 2 and the recess 28 is located in a surface 29 of the rail 20 of the connector member 4. In this example a number of detents 26 are provided spaced apart along each side 8, 10 of the panel 2. Similarly, a number of recesses 28 are provided spaced apart along each of the rails 20 of the connector member 4. The detents 26 and recesses 28 are positioned such that when the connector member 4 is engaged with a panel 2 and an end 30 of the connector member 4 is aligned with a side 8, 10 of the panel 2, at least one detent 26 is received within a recess 28. It will be

appreciated that one or more detents 26 may be provided along one or more sides 8, 10 of the panels 2, and that one or more corresponding recesses 28 may be provided along one or more rails 20 of the connector members.

Preferred numbers and locations of detents 26 and recesses 28 are given in Table 2 for a range of preferred sizes of panel 2 and lengths of connector member 4.

Table 2

Length of first dimension A or second dimension B of panel	Position of detents (measured from one end)		Length of connector member	Position of recesses (measured from one end)
17" (43 cm)	2.5" (6.5 cm), 8.5" (21.5 cm) & 14.5" (36.5 cm)		16" (40 cm)	2" (5 cm), 8" (20 cm) & 14" (35 cm)
11" (28 cm)	2.5" (6.5 cm) & 8.5" (21.5 cm)		10" (25 cm)	2" (5 cm) & 8" (20 cm)
5" (13 cm)	2.5" (6.5 cm)		4" (10 cm)	2" (5 cm)

The ranges of sizes of panels 2 and connector members 4, together with the positions of the latching means (detents 26 and recesses 28) in each of the panels 2 and connector members 4, allows different sizes and shapes of panels 2 to be connected together and latched in position in different configurations.

A biased detent 26 and recess 28 of a preferred embodiment of the invention are illustrated in Figures 5a, 5b and 6. The biased detent 26 (Figure 5b) comprises an elongate, cantilevered arm portion 30 and a projection 32 extending from a distal end 34 of the arm portion 30. The projection 32 extends generally transverse to the length of the arm portion 30. The detent 26 is provided in a channel 36 in a base 38 of the groove 12. A depth of the channel 36 is greater than a thickness of the arm portion 30 such that a void 40 is located between a base 42 of the channel 36 and the arm portion 30.

The cantilever arm portion 30 of the detent 26 is resilient and is able to be

deflected from a first, engaged position (shown in solid lines in Figure 5b) to a second, retracted position (shown in dashed lines in Figure 5b). The detent 26 is biased in the first position, in which the arm portion 30 is straight, a first surface 44 of the arm portion 30 is continuous with the base 38 of the groove 12 and the projection 32 extends into the groove 12. In the second position the arm portion 30 is curved such that the distal end 34 of the arm 30 is nearer the base 42 of the channel 36 than when the arm 30 is in the first position. Furthermore, in the second position, the projection 32 is within the channel 36 and does not protrude from the channel 36 into the groove 12.

In use, when a connector member 4 is being joined to a side 8, 10 of a panel 2, an end of the rail 20 is inserted into an end of the groove 12 and the rail 20 is slid along the groove 12. When the rail 20 reaches the detent 26, the surface 29 of the rail 20 contacts the projection 32 and, as the rail 20 is slid further along the groove 12, the surface 29 presses the projection 32 into the channel 36, such that the detent 26 is deflected from the first position to the second position.

When the rail 20 has been slid far enough along the groove 12, a recess 28 in the rail 20 aligns with the projection 32. In this position the surface 29 of the rail 20 is no longer pressing on the projection 32 and the resilient arm portion 30 causes the detent 26 to return to the first position. In this first position the projection 32 extends into the recess 28, as illustrated in Figure 6, and the connector member 4 is retained in position with respect to the panel 2.

The detent 26 or projection 32 and the recess 28 are shaped such that if a user exerts additional force to one or both of the connector member 4 and the panel 2, the detent 26 or projection 32 can be disengaged from the recess 28 to enable continued sliding of the connector member 4 with respect to the panel 2. The disengagement of the detent 26 from the recess 28 does not damage the detent 26 and this allows the connector members 4 and panels 2 to be repeatedly engaged and disengaged with each other. To facilitate this disengagement, in this example, the projection 32 has a convex curved surface 46 and the recess 28 has

a complementary concave curved surface 48.

In this embodiment the elongate arm portion 30 of the detent 26 extends along the length of the groove 12. In other embodiments, however, it may be preferable if the channel 136 and the arm portion 130 extend transverse or perpendicular to the length of the groove 12. This is illustrated in Figure 7. In this embodiment the detent 126 has a substantially dome shaped projection 132 extending from the arm portion 130. The function of this detent 126 is substantially the same as the detent described above with reference to Figures 5b and 6, and will not be described further here.

It will be appreciated that the detent 26, 126 may be integral with the panel 2 or may be a separate piece that is fixed to the panel 2.

It is desirable if the detent 26, 126 is configured such that the connector member 4 and panel 2 may be slid in either direction with respect to each other. In particular, it is preferable if the detent or projection is shaped such that it may be disengaged from the recess 28 by sliding the rail 20 in either direction within the groove 12.

In some embodiments the recesses 26 are in the form of apertures provided in the rails 20 of the connector members 4. In these embodiments the detents 26, 126 are sized and shaped such that they can engage in the aperture to latch the panel 2 and connector member 4 in position with respect to each other, but such that they can also be disengaged from the aperture by sliding the panel 2 and connector member 4 with respect to each other.

The panels 2 are preferably made from a suitable rigid plastics material. The connector members 4 are preferably made from aluminium. Typically the panels 2 will be made by injection moulding and the connector members 4 will be made by extrusion. In other embodiments each of the panels 2 and the connector members 4 may be made of any suitable material such as a substantially rigid plastics material, wood or a metal such as aluminium.

In preferred embodiments one or more of the panels 202 comprise a groove 250 in a face 206, 222 of the panel 202. The groove 250 has the same shape and dimensions as the groove 212 provided in the sides 208, 210 of the panel 202 such that a rail of a connector member can be engaged with the groove 250. Preferably the groove 250 has a dovetail shape. The groove 250 extends perpendicularly from one of the sides 208 of the panel 202. Typically the groove 250 will extend fully across the face 206 of the panel 202 and terminate at the opposing side 208.

As illustrated in Figure 8, the panel 202 may comprise more than one groove 250 in the face 206 of the panel 202. Each of the grooves 250 extends parallel to each other. In this example the ends of the grooves 250 are in line with detents 226 in the side 208 of the panel 202, however, in other embodiments the grooves 250 may not be aligned with the detents 226.

In further embodiments the panel 202 comprises one or more grooves 250 in both faces 206, 222 of the panel 202. In these examples the groove or grooves provided in the first face of the panel extend parallel to the groove or grooves provided in the opposing second face of the panel. In other embodiments, the groove or grooves provided in the first face of the panel extend perpendicular to the groove or grooves provided in the opposing second face of the panel.

The grooves 250 provided in the face or faces 206, 222 of the panels 202 preferably include biased detents (not shown). The biased detents are provided in the same spacings as the detents 226 along the sides 208, 210 of the panel 202. For example a first detent in the groove 250 may be provided at 2.5 inches (6.5 cm) from a side 208 of the panel 202. This enables the biased detents to engage with recesses in a connector member.

It will be appreciated that one or more panels in the modular furniture kit of the present invention may include grooves in one or both faces. In some

embodiments all of the panels may be provided with such grooves.

When constructing an item of furniture it is highly likely that not all of the grooves in the panels 2 will be utilised. As such, it is desirable if the modular furniture kit further includes blanks or covers (not shown) that may be inserted into the unused grooves. The blanks are elongate strips that have a cross-sectional shape complementary to the shape of the groove. A face of the blank preferably lies substantially flush with the edge of the panel when the blank is inserted into the groove. In this way the elongate blank fills the groove in which it is engaged.

Figures 9 to 11 illustrate further components of some embodiments of the modular furniture kit.

Figure 9 shows a drawer unit 52. The drawer unit 52 comprises a base 54, a front panel 56, a rear panel 58 and two opposing side panels 60. A handle 62 is provided on the front panel 56. A rail 64 extends along an outer surface 66 of each of the side panels 60. The rail 64 extends from the front panel 56 to the rear panel 58 substantially parallel to the base 54 of the drawer unit 52. The rail 64 is shaped and sized to engage with the grooves 12, 212, 250 in the panels 2, 202. As such, the rail 64 of the drawer unit 52 is substantially the same as the rails 20 of the connector members 4. In preferred embodiments the rail 64 includes at least one recess 65 that is positioned and sized to engage with a biased detent in a groove 250 of a panel 202.

The modular furniture kit preferably includes a plurality of drawers of different sizes, corresponding to the dimensions of the panels. In particular, side panels 60 of the drawers 52 have depths of a, $2a+x$, or $na+(n-1)x$. In a preferred embodiment of the modular furniture kit the panels have the dimensions given in Table 1 and a groove is formed in the face of each panel at a distance of 2.5 inches (6.5 cm) from a parallel edge of the panel. Each of the drawers of this embodiment have side panels 60 having a depth of 5 inches (13 cm), 11 inches

(28 cm) or 17 inches (43 cm), and a rail 64 positioned on the side panels 60 at a distance of 2.5 inches (6.5 cm) from a top edge. The drawer units 52 are, therefore, able to engage with the panels to form furniture such as a chest of drawers.

Figure 10 shows part of a single door component 68 according to a preferred embodiment. The door component 68 comprises an elongate support member 70 and a door panel 72. The door panel 72 is connected to the support member 70 along one of its edges 74 by means of a hinge 76.

The support member 70 has a substantially square cross-sectional shape perpendicular to its length and has dimensions the same as the stem portions 14 of the connector members 4. The thickness of the door panel 72 is substantially the same as the dimension of the support member 70 such that, when the door is closed, a front face 78 of the door panel 72 is contiguous with a front face 80 of the support member 70 and a rear face 82 of the door panel 72 is contiguous with a rear face 84 of the support member 70. Furthermore, the hinge 76 is configured such that, when the door is opened, the door panel 72 pivots about the hinge 76 in a direction towards the front face 80 of the support member 70, as illustrated by the arrow in Figure 10.

Additionally, the support member 70 has a rail 86 extending from the rear face 84. The rail 86 is sized and shaped to engage with the grooves 12 in the sides 8, 10 of the panels 2. In this way, the support member 70 can be considered to be equivalent to a connector member 4 having only one rail 20. The rail 86 of the support member 70 will typically include recesses (not shown) for receiving the biased detents 26 of the panels 2.

Typically the length of the support member 70 will be the same as a length of a connector member 4 and the dimensions of the door panel 72 will be the same as the dimensions of a panel 2 such that the door component 68 may easily be integrated into the modular furniture system.

In some embodiments of the door component 68, an edge 74 of the door panel 72 opposite the hinge 76 comprises retaining means that engages with complementary retaining means in a connector member or panel. The retaining means are configured to retain the door panel 72 in its closed position. Preferably the retaining means comprise a biased detent and a recess, similar to the latching means described above. In a particularly preferred embodiment the retaining means comprises a biased detent or recess in the door panel and a corresponding recess or detent in a face of a connector member.

Some embodiments of the modular furniture kit may include a double door component (not shown). The double door component is substantially the same as the single door component except that a width of the door panel, i.e. a distance between the edge connected to the support member and an opposing edge, is longer by 0.5**X**, or half the dimension of the stem portion of a connector member. In this way, two of these door components may be installed in an opposing relationship to form a double door frontage to a cupboard without requiring a central connector member between the two door panels.

A mating edge of the door panel, opposite to the edge connected to the support member, preferably includes first and second retaining means. The first and second retaining means are complementary, and the first retaining means is provided at a first distance from one end of the mating edge and the second retaining means is provided at the same distance from the opposing end of the mating edge. In this way, when two double door components are arranged in an opposing relationship and the doors are closed, the respective mating edges are adjacent each other, and the first retaining means of one of the door panels is aligned with and engages with the second retaining means of the other of the door panels, thereby latching the doors closed. The first and second retaining means are configured such that when a user pulls the doors to open them, the retaining means are disengaged, and when the doors are closed again the retaining means

re-engage. The retaining means may be of substantially the same configuration as the latching means described above, and the first and second retaining means preferably include a biased detent and a recess.

Figure 11 illustrates a hanging rail or brace bar 88 which may be included in some embodiments of the modular furniture kit. The brace bar 88 comprises an elongate tube 90, which preferably has a circular cross-sectional shape. At each end of the tube 90 there is a connecting portion 92 that is sized and shaped to engage with the groove 250 of the panel 202. In this way, the bar 88 may be located between two opposing panels 202, with the connecting portions 92 received within opposing grooves 250. The bar 88 may, therefore, be used to span a gap between two panels 202 and may be used as a hanging rail in a wardrobe for example.

In preferred embodiments the connecting portions 92 have a dovetail shape to engage with the dovetail shape of the groove 250. The connecting portions 92 may be integral with the tube 90 or may be formed separately from the tube 90 and then attached to the ends of the tube 90.

Furthermore, in preferred embodiments of the brace bar 88, end faces 93 of the connecting portions 92 are provided with a recess (not shown) configured to engage with a detent in a groove 250 of a panel 2.

Some embodiments of the modular furniture kit further comprise a bracket component (not shown). The bracket component is preferably substantially triangular or L-shaped and includes grooves that are sized and shaped to engage with the rails 20 of the connector members 4. In preferred embodiments the brackets have dimensions substantially equal to the lengths of the connector members.

The bracket component may be used to form a connection between two connector members 4 substantially at right angles to each other and, in particular, may be

used to strengthen or stiffen a part of a structure.

The brackets may further comprise connecting means to enable additional accessories to be attached to a structure formed from the modular furniture kit. For example the bracket may include additional grooves for receiving a component such as an arm rest to enable a user to construct a chair or sofa.

The modular furniture kit may additionally include accessories such as cushions for a sofa or chair, arm rests, castors, or other decorative or functional pieces. Some accessories may be provided at a first end of an adjustable arm. The second end of the arm is configured to be received within a groove of a panel. Preferably the second end of the arm also comprises latching means to engage with the latching means provided in the groove.

In some embodiments the modular furniture kit includes mirror panels. A first surface of the mirror panel is provided with a reflective, or mirror, surface and an opposing, second surface is provided with one or more rails extending therefrom. The rails of the mirror panel are shaped and sized to be received within a groove 250 in the face of a panel 202.

The modular furniture kit of the present invention, therefore, provides an improved, cost effective kit that permits repeated assembly and disassembly of structures. The small set of components of the kit enables a user to build a wide range of different pieces of furniture quickly and easily without requiring additional fixing means or tools.

CLAIMS

1. A modular furniture kit comprising:

- a plurality of elongate connector members, including connector members of at least two different axial lengths, each connector member comprising a stem portion having a dimension of length **X** perpendicular to a longitudinal axis;

- a plurality of rectangular panels, including panels of at least two different sizes, each of the panels having a first pair of opposing edges, a distance between said edges defining a first dimension of the panel, and a second pair of opposing edges, a distance between said edges defining a second dimension of the panel, each of the first dimension and the second dimension having a length selected from:

$$a; \quad 2a+x; \quad na+(n-1)x;$$

- complementary engaging means provided on the panels and the connector members, the engaging means configured to secure the connector member to the panel and to permit relative sliding movement between the connector member and the panel; and

- complementary latching means provided on the panels and the connector members, the latching means being configured to automatically retain one of said connector members in one or more pre-defined positions relative to said panel when the connector member and panel are engaged with each other.

2. A modular furniture kit as claimed in Claim 1, wherein the engaging means comprises a groove and a rail.

3. A modular furniture kit as claimed in Claim 2, wherein the groove is provided in the panels and the rail is provided on the connector members.

4. A modular furniture kit as claimed in Claim 2 or Claim 3, wherein the engaging means comprises a sliding dovetail.

5. A modular furniture kit as claimed in any preceding claim, wherein the latching means comprises a biased detent and a recess.

6. A modular furniture kit as claimed in Claim 5, wherein the detent comprises an arm portion and a projection extending from a distal end of the arm portion.

7. A modular furniture kit as claimed in Claim 5 or Claim 6, wherein the projection or detent has a convex curved surface and the recess has a concave curved surface.

8. A modular furniture kit as claimed in any of Claims 5 to 7, when dependent on any one of Claims 2 to 4, wherein the detent is provided within the groove and the recess is provided in the rail.

9. A modular furniture kit as claimed in any preceding claim, wherein the stem portion of the connector member has a square cross-sectional shape perpendicular to the longitudinal axis.

10. A modular furniture kit as claimed in any preceding claim, wherein the panels all have the same thickness, and the length **X** is equal to the thickness of the panels.

11. A modular furniture kit as claimed in any preceding claim, further comprising a panel including a hinge.

12. A modular furniture kit as claimed in any preceding claim, wherein at least two panels include a groove in one face of the panel, the groove extending perpendicularly from one edge.

13. A modular furniture kit as claimed in Claim 12, further comprising a drawer unit, the drawer unit having a base, two opposing side panels and opposing front

and rear panels, each side panel including an elongate projecting rib, said rib being engageable with said groove in the face of the panel to permit sliding movement between the drawer unit and the panel.

14. A modular furniture kit as claimed in Claim 12 or Claim 13, further comprising an elongate rod member, first and second ends of said rod being configured to be received in said groove in the face of the panel such that the rod member extends perpendicular to the plane of the face of the panel.

15. A modular furniture kit as claimed in any preceding claim, further comprising a bracket securable to two adjacent connector members substantially perpendicular to each other.

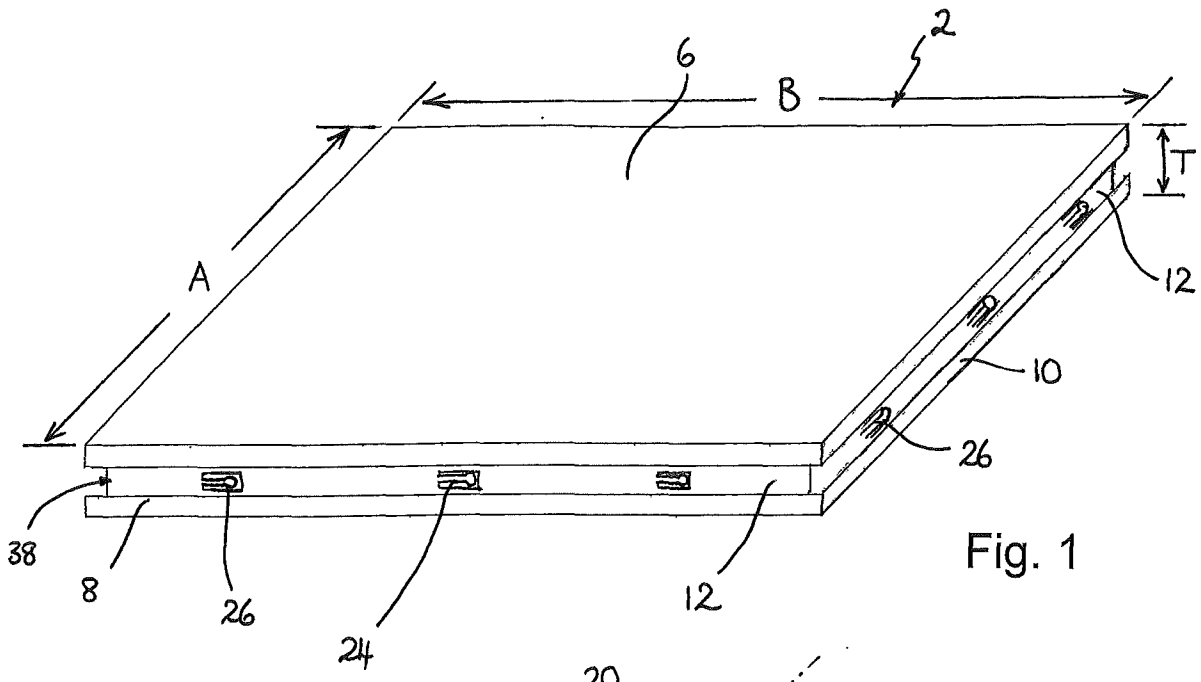


Fig. 1

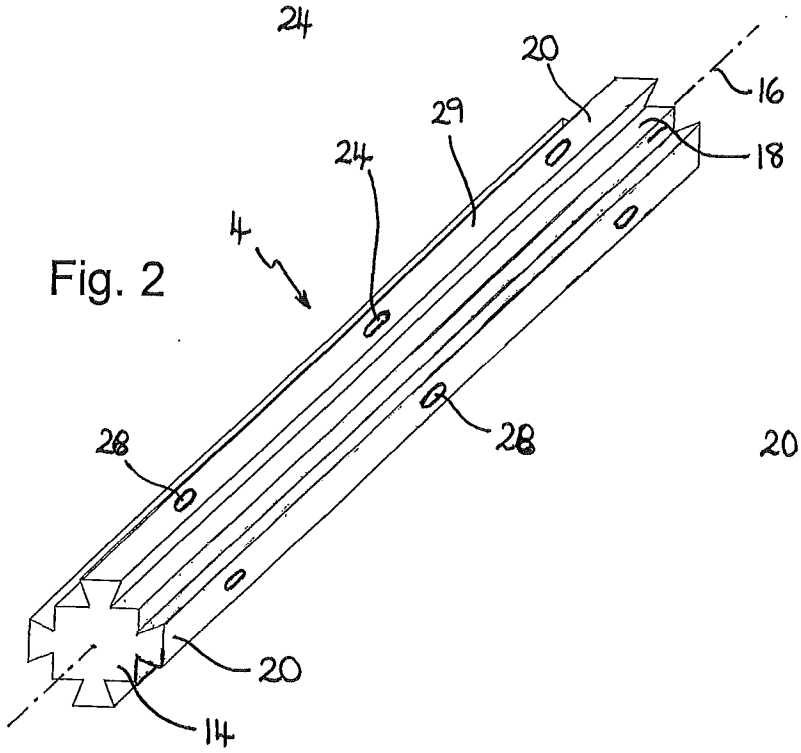


Fig. 2

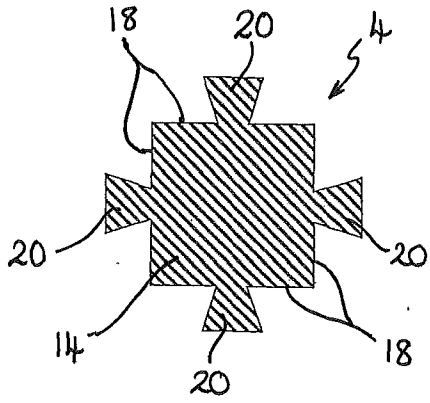


Fig. 3

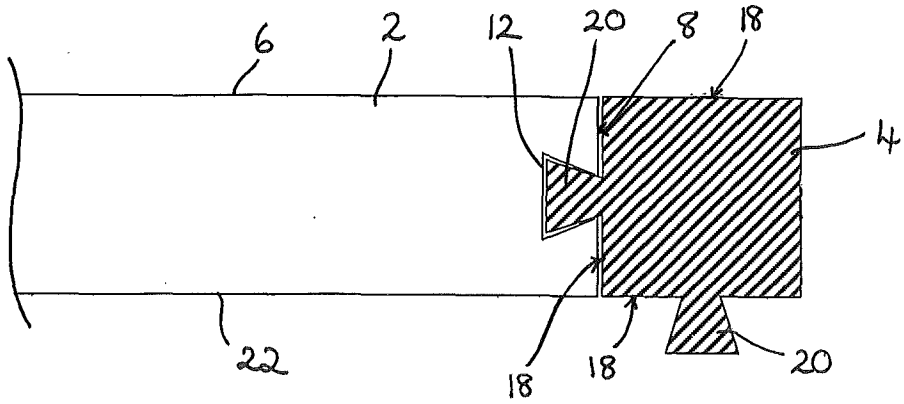


Fig. 4

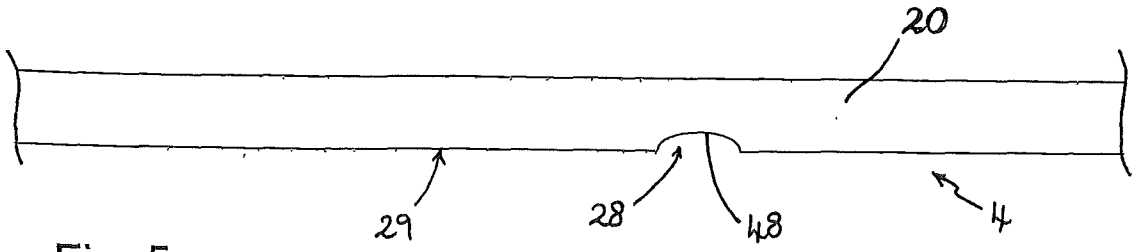


Fig. 5a

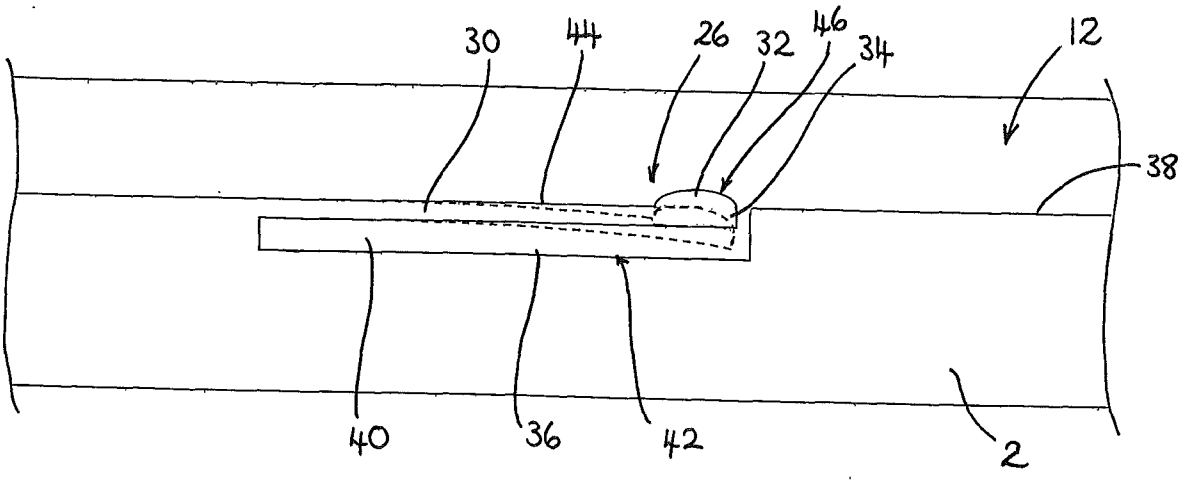


Fig. 5b

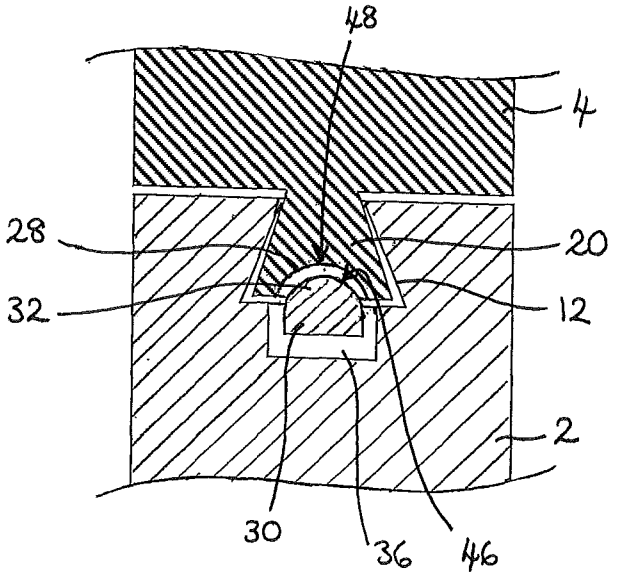
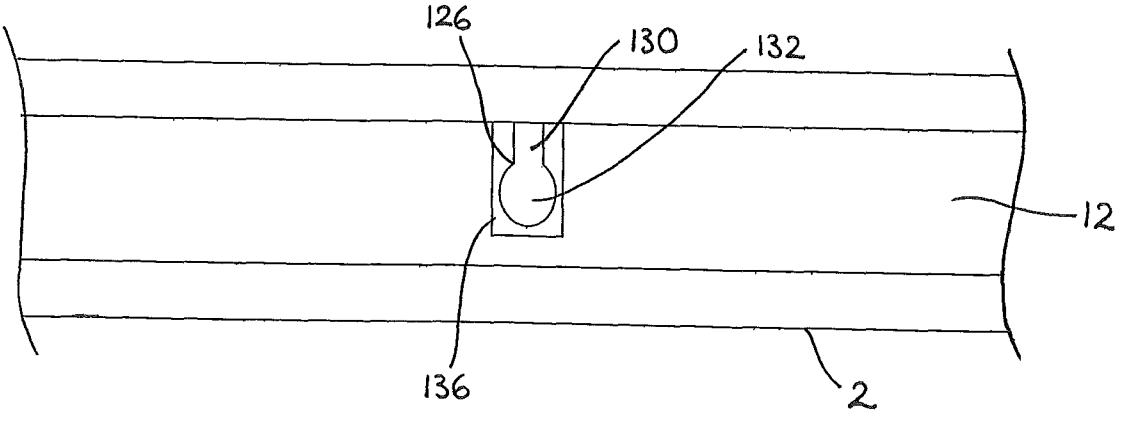


Fig. 6



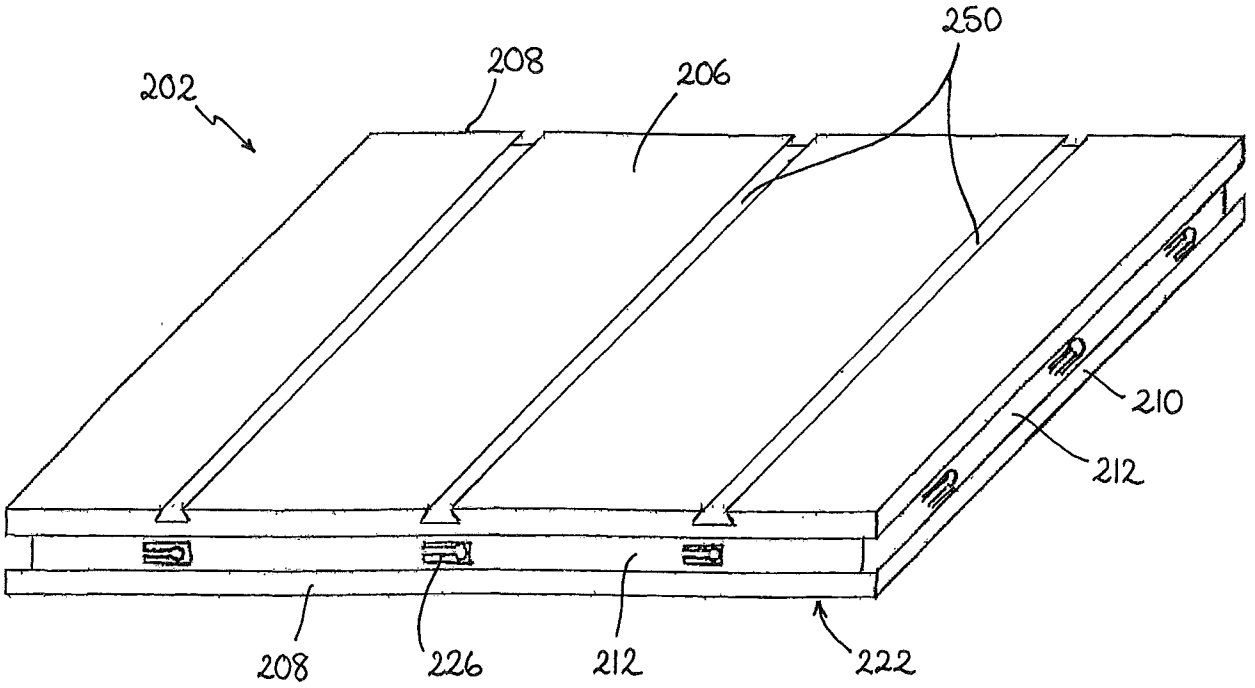

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Fig. 8

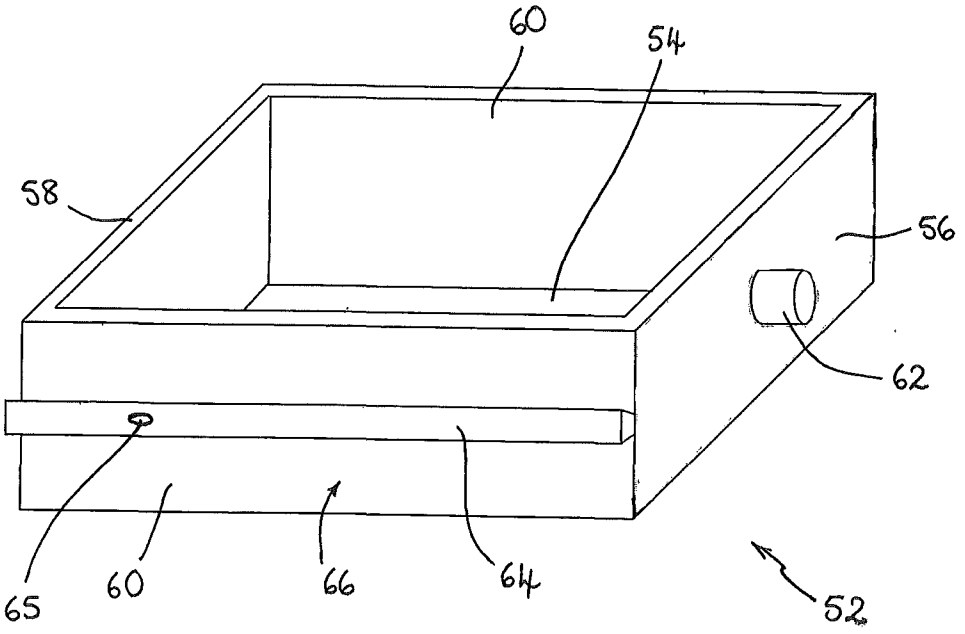
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Fig. 9

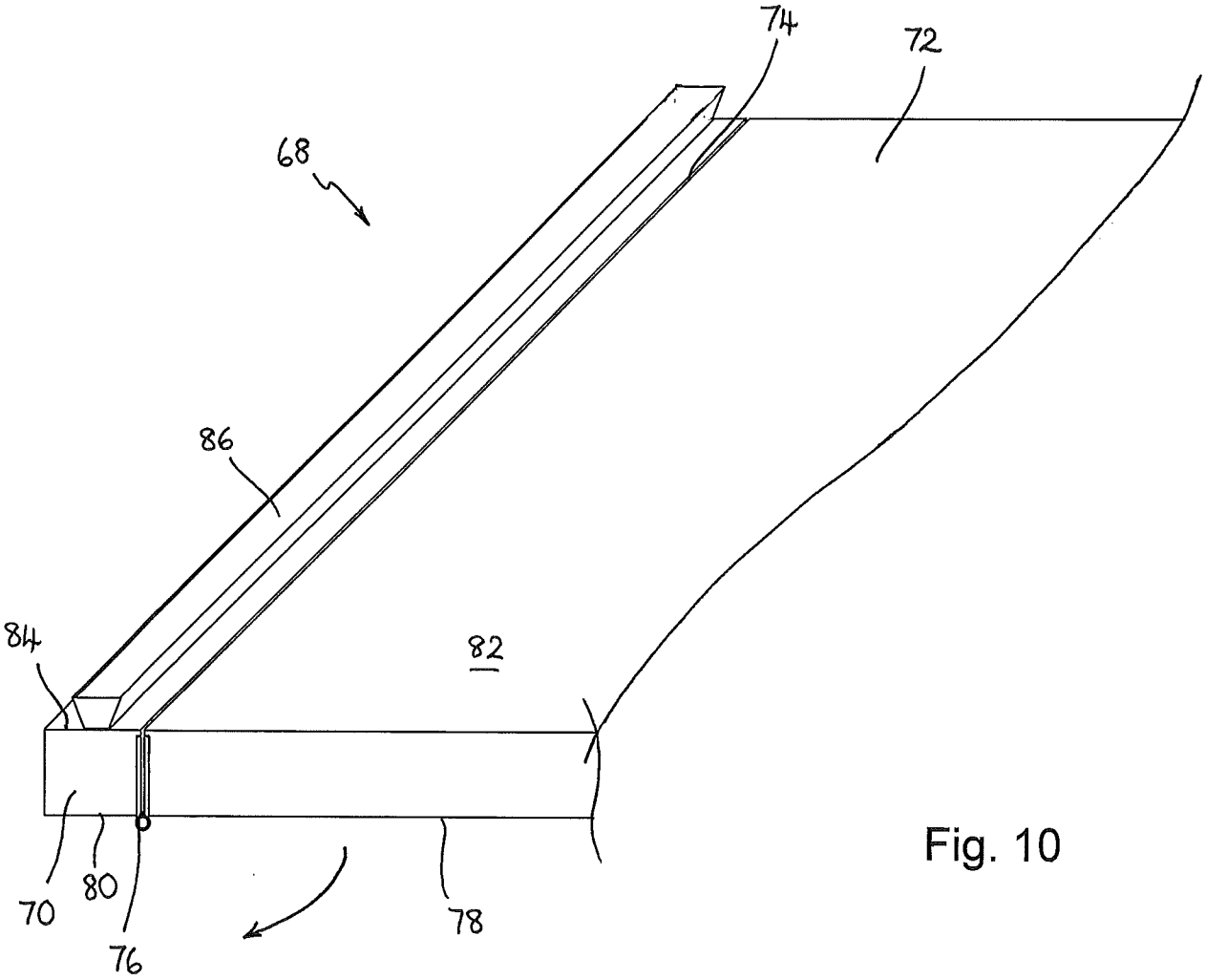

Fig. 10

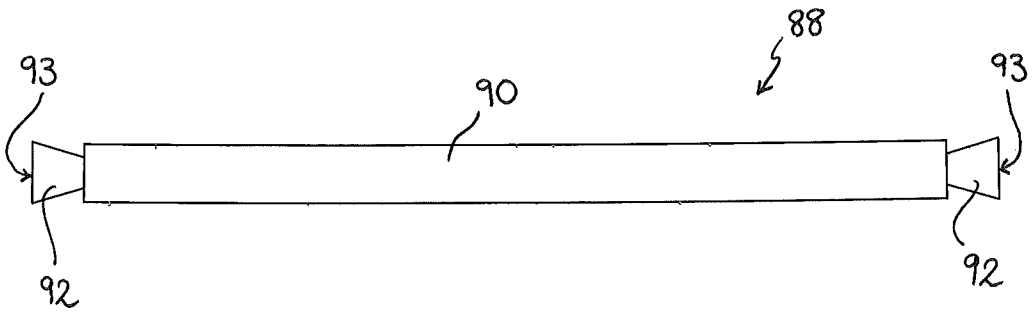

Fig. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2015/050397

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47B47/00 A47B47/04 F16B12/26 F16B12/38
ADD.

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 F16B

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	DE 68 06 393 U (BARZ ADOLF [DE]) 11 September 1969 (1969-09-11) page 6, lines 10-11; figures 1,4,5,11	1-4
X	US 2013/106268 A1 (HSU MING-HWA [TW]) 2 May 2013 (2013-05-02) figures 7,7A	1-4
X	DE 70 10 667 U (HERRIG WILLI [DE]; RICHTER BERND [DE]) 30 July 1970 (1970-07-30) figures 1,6	1-4

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 May 2015	18/05/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Martinez Valero, J

C(Continuation). 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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Information on patent family members

International application No
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