DESCRIPTION

FURNITURE WITH TOP BOARD

TECHNICAL FIELD

[0001]

The present invention relates to new furniture with a top board with an improved structure for attaching a beam to a support structure, when an unprocessed beam is attached to the support structure.

BACKGROUND ART

[0002]

There is known furniture with a top board or the like described in Patent Literature 1. In this furniture, when a plurality of support bodies are connected with a beam, an unprocessed beam is attached to the support body.

[0003]

In the furniture with a top board, the support structure is configured by connecting the plurality of support bodies with the beam, and the support structure is configured to support a top board. Provided are a bracket connected to the support body and having an upward opening concave portion, and a fixing tool detachably attached to the bracket and having a downward opening concave portion.

[0004]

The beam is mounted from above into the concave portion of the bracket, and the fixing tool is set from thereabove with the concave portion facing downward, and the bracket and the fixing tool are connected with the beam being sandwiched between the concave portions.

CITATION LIST

PATENT LITERATURE

[0005]

Patent Literature 1: Japanese Patent No. 5792805

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0006]

However, in such a structure, the beam is attached to the bracket with reference to the lower portion thereof, and thus, due to a manufacturing error and an assembly error of the beam, a variance in height at an upper end or in an upward-facing surface of the beam in the support structure may easily occur.

[0007]

Thus, when a top board support surface is formed on the top surface of the support body and the bracket is hung onto the upward-facing surface of the beam to attach an extension top board, for example, the extension top board easily offsets relative to the top board in a height direction. As a result, there occurs a problem that an extensionality of the top board surface is inhibited.

[0008]

Further, this type of beam is utilized also for attachment of an optional member of a desktop panel, for example, and thus, the optional member may also experience a similar problem to above.

[0009]

In view of such problems, an object of the present invention is to provide new furniture with a top board with an improved beam attachment structure.

MEANS FOR SOLVING THE PROBLEM

[0010]

The present invention adopts the following means in order to achieve this object.

[0011]

Thus, furniture with a top board of the present invention is configured so that a plurality of support bodies are connected with a beam to configure a support structure and the support structure supports a top board, including: a bracket which is integrally or rigidly connected to the support body and which has a downward opening concave portion; and a fixing tool detachably attached to the bracket, wherein when the beam is set to a lower portion of the concave

portion of the bracket and the fixing tool is set from a facing position of the bracket to a lower portion of the beam, the bracket and the fixing tool are connected with the beam being sandwiched therebetween.

[0012]

With this configuration, the beam is attached, with reference to the upper portion thereof, to the bracket, and thus, even with a manufacturing error and an assembly error of the beam, there is only a slight influence, if not none, to the height of the upward facing surface (upper end) of the beam in the support structure.

[0013]

Thus, for example, even if the top board support surfaces are formed on the top surfaces of the support bodies, and an auxiliary bracket is hung onto the upward-facing surface of the beam to attach an extension top board, heightwise positioning accuracy of the extension top board relative to the top board will be improved, and flushness of the top board surface will be ensured.

[0014]

Further, if the option member such as the desktop panel is attached to the beam, the heightwise positioning accuracy can be improved, as in the above.

[0015]

Even if the assembling is easy, in order to provide precision to the positioning accuracy, it is desired that a cross section of the beam is shaped into a rectangle when a corner portion of the beam is placed to face upward to form a rhomboid, the fixing tool has an upward opening concave portion, and there is a relationship, between a concave portion of the bracket and a concave portion of the fixing tool, that the both are fitted at a diagonal position of the beam.

[0016]

Alternatively, it is preferred that the bracket is formed integrally with a top board support surface configured to support the top board, along with downward facing concave portion.

[0017]

To surely fix the beam into the bracket, it is effective that the bracket is a diecasting product and the fixing tool is made of elastic sheet metal, and the fixing tool is fastened by a bolt to the bracket.

[0018]

To appropriately attach the option member or the like to the beam, it is desired that an auxiliary bracket extending in a direction orthogonal to the beam is engaged, via an engagement portion, with an upward-facing surface of a section other than an end of the beam, and the concave portion of the auxiliary fixing tool having an upward opening concave portion is set, from below, to the beam to ensure connection between the auxiliary bracket and the auxiliary fixing tool.

[0019]

In this case, to simplify the attaching task, it is preferred that a gap is formed between the beam and the top board, the engagement portion of the auxiliary bracket is arranged at a location apart, by a predetermined distance, from the end of the bracket, a region from the engagement portion to the end thereof can pass through the, and a region at which the engagement portion is provided cannot pass through the gap.

[0020]

Alternatively, it is also effective that the bracket includes a temporary holding portion, the temporary holding portion holds the beam at a location without interference with the fixing tool to ensure that the beam is not dropped off from the concave portion, and the fixing tool can be attached to the bracket while the beam held by the temporary holding portion is left in the holding portion.

EFFECT OF THE INVENTION

[0021]

The present invention can provide, through the above-described configuration, new furniture with a top board with an effectively improved, particularly, heightwise positioning accuracy for attaching a beam, even if an

unprocessed beam is attached to a support structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Fig. 1 is a perspective view, as viewed from obliquely above, of furniture with a top board according to one embodiment of the present invention.

Fig. 2 is a partially omitted perspective view, as viewed from obliquely above, of the furniture with a top board.

Fig. 3 is a perspective view, as viewed from obliquely below, of the furniture with a top board.

Fig. 4 is a partially exploded perspective view of the furniture with a top board.

Fig. 5 is an explanatory view of a first bracket used in the furniture with a top board.

Fig. 6 is a diagram illustrating a structure for attaching a beam to the first bracket used in the furniture with a top board.

Fig. 7 is a partially cut sectional view illustrating a procedure for fixing the beam to the first bracket used in the furniture with a top board.

Fig. 8 is a partially cut sectional view illustrating a procedure for fixing the beam to the first bracket used in the furniture with a top board.

Fig. 9 is a partially cut sectional view illustrating a procedure for fixing, to the beam, an auxiliary bracket used in the furniture with a top board.

MODE FOR CARRYING OUT THE INVENTION

[0023]

An embodiment of the present invention will be described below with reference to the drawings.

[0024]

Fig. 1 to Fig. 3 illustrate furniture with a top board of the present embodiment, where Fig. 1 is a perspective view as viewed from obliquely above, Fig. 2 is a partially omitted perspective view as viewed from obliquely above, and Fig. 3 is a perspective view as viewed from obliquely below. The furniture with a top board X is used as furniture such as a table and a desk, and includes an end leg 1 and a middle leg 2, which are support bodies. The end leg 1 and

the middle leg 2 are connected with a beam 3 to configure a support structure A. The support structure A is attached with an extension top board 5, a desktop panel 6 and the like, in addition to the top board 4. Hereinafter, a direction in which the legs 1, 2 face each other is referred to as a width direction, an edge side 4a with which the extension top board 5 is provided, out of edge sides 4a, 4b of the top board 4, is referred to as a front edge, and the edge side 4b with which the desktop panel 6 is provided is referred to as a rear edge.

[0025]

Specifically, in the end leg 1 made of metal, upper ends of leg rods 11 standing in a truncated chevron shape, as viewed from its side, are connected with an upper frame 12, and the end leg 1 is attached to a portion near both ends of the upper frame 12 while a first bracket 71 and a second bracket 72 protrude toward the inside of the width direction. The both brackets 71, 72, which are diecasting products, are firmly connected to the frame 12 respectively by using a bolt at a position not illustrated, and a top surface thereof is set as top board support surfaces 71z, 72z. The first bracket 71 is attached with the beam 3.

[0026]

The beam 3 is formed with its cross section being shaped into a rectangle by using metal such as steal, and in the present embodiment, as illustrated in Fig. 6 and the like, when used, the beam 3 forms a rhomboid while a corner portion 3a is placed upward.

[0027]

The middle leg 2, which is made of metal, is obtained by rigidly joining a stay 22 for supporting the top board to the upper end of a leg main body 21 having a box shape, and is attached to the both ends of the stay 22 while the first bracket 71 similar to above and a third bracket 73 equivalent to the second bracket 72 protrude to both sides of the width direction. The top board support surfaces 71z, 73z are set at the same height as the forgoing top board support surfaces 71z, 72z.

[0028]

The first bracket 71 to which the beam 3 is attached is, as illustrated in Fig. 4 to Fig. 6 and the like, formed with a downward-facing concave portion 71c including an inclined wall 71a opening in a truncated chevron shape, as viewed from its side, and a channel-like groove 71b opening downward between the inclined walls 71a, 71a. The first bracket 71 is formed integrally, outside these inclined walls 71a, with a temporary holding portion 71d bent in a downwardly-hanging direction into which the lower ends come closer to each other, that is, a direction into which an inverted truncated chevron shape is formed. The inclined wall 71a forming the truncated chevron shape of the concave portion 71c runs along an upward-facing surface 3b of the beam 3 in rhomboid illustrated in Fig. 6, and the inverted truncated chevron shape of the temporary holding portion 71d runs along a downward-facing surface 3c of the beam 3. Between the truncated chevron shape of the concave portion 71c and the inverted truncated chevron shape of the temporary holding portion 71d, the beam 3 is inserted to be fitted loosely from the width direction, as illustrated by an arrow in Fig. 6(a), and temporarily held to ensure that the beam 3 is not dropped from the concave portion 71c of the first bracket 71. With this, the fixing tool 74 is set from below for fixation. It is noted that the end of the beam 3 runs into a wall 71y (see Fig. 5) located deep into the first bracket 71.

[0029]

In the fixing tool 74 illustrated in Fig. 4 to Fig. 6 and the like, which is made of an elastic sheet metal, an upward-facing concave portion 74c is formed between the upward-opening inclined walls 74a in the inverted truncated chevron shape, an attachment piece 74b is provided which is bent after extending upwardly from the inclined wall 74a, and a window 74d is provided over a region between the inclined wall 74a and the attachment piece 74b to receive the temporary holding portion 71d. Configuration is that when a bolt V1 inserted into the attachment piece 74b is screwed and fastened at a corresponding location of the first bracket 71, a distance between the concave portion 71c of the first bracket 71 and the concave portion 74c of the fixing tool 74 can be shortened.

[0030]

That is, the beam 3 is positioned in the concave portion 71c of the first

bracket 71 as illustrated in Fig. 6(a) and Fig. 7(a), the fixing tool 74 is set to the beam 3 from the facing position of the bracket 71 while the concave portion 74c faces upward as illustrated in Fig. 6(b) and Fig. 7(b), and the first bracket 71 and the fixing tool 74 are fastened by the bolt V1 with the beam 3 being sandwiched by the concave portions 71c, 74c. In this way, the concave portion 71c of the first bracket 71 and the concave portion 74c of the fixing tool 74 are fitted each other around the beam 3 at a diagonal position to ensure fixation of the beam 3. At this time, as illustrated in Fig. 6(a) to Fig. 6(b) and Fig. 8(a) to Fig. 8(b), when the temporary holding portion 71d of the first bracket 71 is located inside the window 74d of the fixing tool 74, interference between the fixing tool 74 and the temporary holding portion 71d is avoided, and the fixing tool 74 lifts the beam 3 held by the temporary holding portion 71d to ensure fastening of the fixing tool 74 into the first bracket 71 while leaving the temporary holding portion 71d unchanged.

[0031]

It is noted that while the top board 4 is supported by the top board support surface 71z of the first bracket 71 and the top board support surface 72z of the second bracket 72 (in the middle leg 2, the top board support surface 71z of the first bracket 71 and a top board support surface 73z of the third bracket 73), , a predetermined gap Δ is secured between a bottom surface of the top board 4 and the beam 3, as illustrated in Fig. 9.

[0032]

On the other hand, a section other than the end of the beam 3 illustrated in Fig. 1 to Fig. 3 may be attached with an option member such as an extension top board 5 and a desktop panel 6 by using an auxiliary bracket 75 and an auxiliary fixing tool 76 illustrated in Fig. 2 to Fig. 4. As for a difference, the auxiliary bracket 75 configured to attach the extension top board 5 differs in length from the auxiliary bracket 75 configured to attach the desktop panel 6 and the latter does not include a hanging piece 75b, and as for a similarity, the both share the same function of engaging a horizontal piece 75a with the beam 3. Because of this, the same numeral is used as long as there is a similarity. Firstly, a structure of attaching the desktop panel 6 will be described.

[0033]

The horizontal piece 75a of the auxiliary bracket 75, which is made of metal, forms a downward channel shape, uses a top wall 75a1 as a portion for attachment to a top board bottom surface, and includes a thick wall portion 75a2 (see Fig. 9) for passing a bolt V2 through the bottom surface of the top wall 75a1. The horizontal piece 75a is inserted through the gap Δ formed between the top board 4 and the beam 3 from a direction orthogonal to the beam 3 as illustrated by an arrow in Fig. 9(a) to Fig. 9(b). Along the horizontal piece 75a of the auxiliary bracket 75, at a position apart from a distal end of 75a of the auxiliary bracket by a predetermined distance, there is an engagement portion 75a3 in an inverted triangle shape. A region from the engagement portion 75a3 to the end thereof can pass through the gap Δ, and a part at which the engagement portion 75a3 is provided cannot pass through the gap Δ, and insertion is restricted at a position at which an inclined side of the engagement portion 75a3 abuts the beam 3. The inclination of the inclined side of the engagement portion 75a3 corresponds to the inclination of the upward-facing surface 3b of the beam 3.

[0034]

On the other hand, as illustrated in Fig. 4, Fig. 9(a) and the like, the auxiliary fixing tool 76 is formed by connecting upper ends of a pair of opposite walls 76a provided in the width direction by an attachment piece 76b, and forms, at an upper edge side of the opposite walls 76a, an upward opening concave portion 76c in an inverted truncated chevron shape. In the concave portion 76c also, an upward opening groove 76d is formed at a recessed angle of the inverted truncated chevron shape.

[0035]

As illustrated in Fig. 9(a) to Fig. 9(b), when the auxiliary bracket 75 is engaged, via the engagement portion 75a3, with the upward-facing surface 3b of a section other than the end of the beam 3, from a direction orthogonal to the beam 3, and the concave portion 76c of the auxiliary fixing tool 76 having an upward opening concave 76c is set, from below, to a downward-facing surface 3c of the beam 3, the bolt V2 inserted through the auxiliary fixing tool 76 is screwed and fastened into the thick wall portion 75a2 of the auxiliary bracket

75.

[0036]

On the other hand, in the auxiliary bracket 75 for attaching the extension top board 5, an engagement portion 75a3' cut out in a triangular notch shape as illustrated in Fig. 2 is provided instead of the engagement portion 75a3 protruding in the inverted triangle shape, the auxiliary bracket 75 for attaching the extension top board is inserted, through the gap Δ formed between the top board 4 and the beam 3, from a direction orthogonal to the beam 3 at a section other than the end of the beam 3, and the engagement portion 75a3' is engaged with the corner portion 3a located at the upper end of the beam 3 so that the auxiliary bracket 75 is placed on the beam 3.

[0037]

As illustrated in Fig. 1 to Fig. 3, at a position for supporting the extension top board 5, the other end of the auxiliary bracket 75 of which one end is attached to the beam 3 is supported by an auxiliary leg 51. The auxiliary leg 51 is also formed by a leg rod 51a and an upper frame 51b substantially similarly to the end leg 1, and is attached, via the top board support surface 52z of the bracket 52, with the extension top board 5. In Fig. 2, a reference numeral 53 indicates a spacer present between the top board 4 and the extension top board 5. A thickness of the spacer 53 corresponds to a gap between the top surface of the auxiliary bracket 75 obtained when the engagement portion 75a3' is dropped to the corner portion 3a of the beam 3 and the bottom surface of the top board 4.

[0038]

Further, the auxiliary bracket 75 supporting the desktop panel 6 is configured so that an inner surface of the desktop panel 6 is screwed into the hanging piece 75b illustrated in Fig. 4.

[0039]

In Fig. 2, a reference numeral 81 indicates an upward facing channel-like wire duct, and a reference numeral 77 indicates another auxiliary fixing tool. An auxiliary fixing tool 77 has horizontal pieces 77b, 77c at an upper

end and a lower end of a hanging piece 77a, as illustrated in Fig. 4, and fixes the horizontal piece 77b to the bottom surface of the top board 4 and hangs to support a bottom wall of the wire duct 81 with the horizontal piece 77c. Further, a reference numeral 82 indicates a modesty panel which is in turn hung from the wire duct 81.

[0040]

Thus, the attachment of the beam 3 to the support structure A is completed while the beam 3 is left unprocessed, and it is possible to attach the option member such as the extension top board 5 and the desktop panel 6 by utilizing the beam 3.

[0041]

Thus, in the furniture with a top board X of the present embodiment, the support structure A is configured by connecting a plurality of legs 1, 2 or support bodies with the beam 3, including: the first bracket 71 which has the downward opening concave portion 71c and is rigidly connected to the legs 1, 2 upon supporting the top board 4 by the support structure A; and the fixing tool 74 which is detachably attached to the first bracket 71. The beam 3 is set to the lower portion of the concave portion 71c of the first bracket 71, the fixing tool 74 is set from the facing position of the first bracket 71 to the lower portion of the beam 3 while the concave portion 74c faces upward, and in this way, the first bracket 71 and the fixing tool 74 are connected with the beam 3 being sandwiched by the concave portions 71c, 74c.

[0042]

With this configuration, the beam 3 is attached with reference to the upper portion thereof, to the first bracket 71, and thus, even with a manufacturing error and an assembly error of the beam 3, there is only a slight influence, if not none, to the height of the upper end 3a or the upward-facing surface 3b of the beam 3 in the support structure A.

[0043]

Thus, even if the top board support surfaces 71z, 72z are formed on the top surfaces of the legs 1, 2 and the auxiliary bracket 75 is hung onto the

upward-facing surface 3b of the beam 3 to attach the extension top board 5, heightwise positioning accuracy of the extension top board 5 relative to the top board 4 is improved, and flushness of the top board surface is ensured.

[0044]

Further, when the option member such as the desktop panel 6 is attached to the beam 3, the heightwise positioning accuracy can be improved, as in the above.

[0045]

Further, the cross section of the beam 3 is shaped into a rectangle when the corner portion 3a is placed to face upward to form a rhomboid, the fixing tool 74 has the upward opening concave portion 74c, there is a relationship, between the concave portion 71c of the first bracket 71 and the concave portion 74c of the fixing tool 74, that the both are fitted at the diagonal position of the beam 3, and the beam 3 is fitted, in a tapering manner, into the concave portion 71c of the first bracket 71. Thus, the beam 3 is positioned without play in the forth-and-back direction, the positioning is easy resulting in easy assembling.

[0046]

Further, during molding the top board support surface 71z configured to support the top board 4, the first bracket 71 is integrally formed with the downward-facing concave portion 71c, and the positional relationship between the downward-facing concave portion 71c and the top board support surface 71z is not deviated. As a result, when the option member or the like is attached to the beam 3, in particular, the accuracy for attaching the option member to the top board 3 is improved.

[0047]

Specifically, the first bracket 71 is a diecasting product and the fixing tool 74 is made of elastic sheet metal, and the fixing tool 74 is fastened by the bolt V1 to the first bracket 71. As a result, it is possible to provide sure fastening without loosening.

[0048]

On the other hand, the auxiliary bracket 75 extending in the direction orthogonal to the beam 3 is engaged, via the engagement portion 75a3, with the upward-facing surface 3b of a section other than the end of the beam 3, and the concave portion 76c of the auxiliary fixing tool 76 having the upward opening concave portion 76c is set, from below, to the beam 3. In this way, the auxiliary bracket 75 and the auxiliary fixing tool 76 are connected. Thus, the auxiliary bracket 75 is engaged with the upward facing surface 3b of the beam 3 with improved accuracy, and thus, it is possible to improve the accuracy in the attachment height of the auxiliary bracket 75. The auxiliary bracket 75 can be attached along the beam 3 at any location, and thus, it is also possible to improve the degree of freedom of attaching the option member.

[0049]

In this case, the gap Δ is formed between the beam 3 and the top board 5, the engagement portion 75a3 of the auxiliary bracket 75 is arranged at a location apart, by a predetermined distance, from the end of the bracket 75, a region from the engagement portion 75a3 to the end thereof can pass through the gap Δ, and a region at which the engagement portion 75a3 is provided cannot pass through the gap Δ. Thus, the auxiliary bracket can be attached after being engaged at a predetermined location, in a retrofitting manner, without removing the top board.

[0050]

In addition, the first bracket 71 has the temporary holding portion 71d, the temporary holding portion 71d holds the beam 3 at a location without interference with the fixing tool 76 to ensure that the beam 3 is not dropped off from the concave portion 71c, and the fixing tool 74 can be attached to the first bracket 71 while the beam held by the temporary holding portion is left in the holding portion. Thus, the beam 3 can be placed temporarily, which results in a good assembly preparation.

[0051]

Thus, one embodiment of the present invention was described, and the rhomboid shape of the beam may be in a parallelogram shape in cross section. Further, to provide a basic operation and effect of the present invention, the

fixing tool may be in a flat shape with no concave portion. In addition, the specific configuration of each portion is not illustratively limited, and it is possible to provide various types of modifications without departing from the gist of the present invention.

DESCRIPTION OF REFERENCE NUMERALS

[0052]

1 ... Support body (end leg)
2 ... Support body (middle leg)
3 ... Beam
3a ... Corner portion
3b ... Upward-facing surface
4 ... Top board
71 ... Bracket (first bracket)
71z ... Top board support surface
71c … Concave portion
71d ... Temporary holding portion
74 ... Fixing tool
74c … Concave portion
75 ... Auxiliary bracket
75a3 ... Engagement portion
76c ... Concave portion
76 ... Auxiliary fixing tool
A ... Support structure
V1 ... Bolt
X ... Furniture with top board
Δ ... Gap

CLAIMS

1. Furniture with a top board configured so that a plurality of support bodies are connected with a beam to configure a support structure and the support structure supports a top board, comprising:

a bracket which is integrally or rigidly connected to the support body and which has a downward opening concave portion; and a fixing tool detachably attached to the bracket, wherein

a cross section of the beam is shaped into a rectangle, and the concave portion of the bracket is shaped to be fitted to the beam, and

when the beam is set to a lower portion of the concave portion of the bracket and the fixing tool is set from a facing position of the bracket to a lower portion of the beam, the bracket and the fixing tool are connected without beam processing with the beam being sandwiched therebetween.

2. The furniture with a top board according to claim 1, wherein a cross section of the beam is shaped into a rectangle when a corner portion of the beam is placed to face upward to form a rhomboid, the fixing tool has an upward opening concave portion, and there is a relationship, between a concave portion of the bracket and a concave portion of the fixing tool, that the both are fitted at a diagonal position of the beam.

3. The furniture with a top board according to claim 1 or 2, wherein the bracket is formed integrally with a top board support surface configured to support the top board, as well as the downward facing concave portion.

4. The furniture with a top board according to claim 3, wherein the bracket is a diecasting product and the fixing tool is made of elastic sheet metal, and the fixing tool is fastened by a bolt to the bracket.

5. The furniture with a top board according to any one of claims 1 to 4, wherein an auxiliary bracket extending in a direction orthogonal to the beam is engaged, via an engagement portion, with an upward-facing surface of a section other than an end of the beam, and the concave portion of an auxiliary fixing tool having an upward opening concave portion is set, from below, to the beam to connect the auxiliary bracket and the auxiliary fixing tool.

6. The furniture with a top board according to claim 5, wherein a gap is formed between the beam and the top board, the engagement portion of the auxiliary bracket is arranged at a location apart, by a predetermined distance, from the end of the auxiliary bracket, a region from the engagement portion to the end thereof can pass through the gap, and a region at which the engagement portion is provided cannot pass through the gap.

7. The furniture with a top board according to any one of claims 1 to 6, wherein the bracket has a temporary holding portion, the temporary holding portion holds the beam at a location without interference with the fixing tool to ensure that the beam is not dropped off from the concave portion, and the fixing tool can be attached to the bracket while the beam held the temporary holding portion remained is left in the holding portion.