July 26, 1966 J. SUTTON 3,262,405

INTERLOCKING ASSEMBLABLE FURNITURE

Filed Oct. 13, 1964

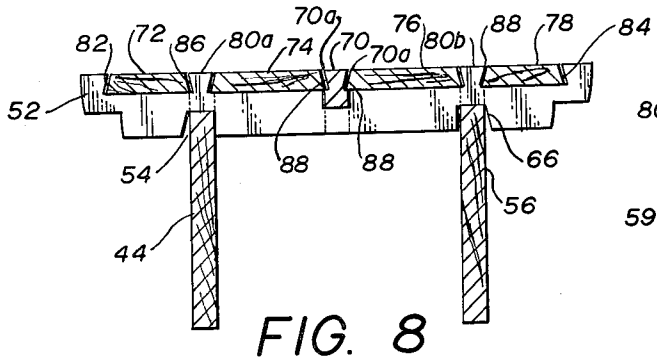


FIG. 8

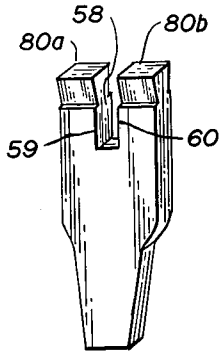


FIG. 9

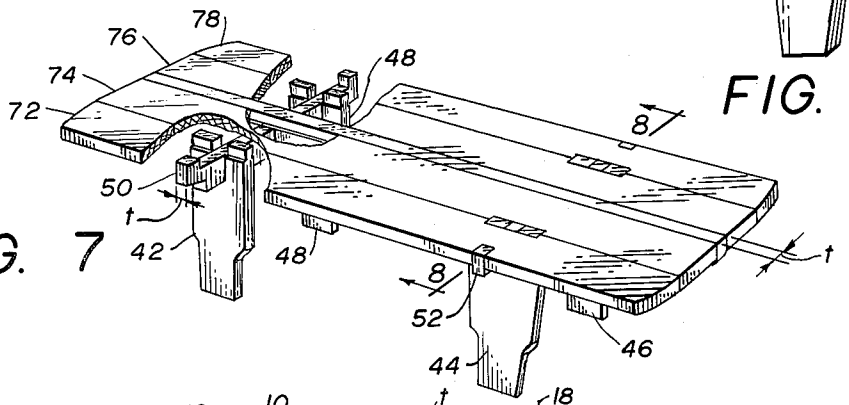


FIG. 7

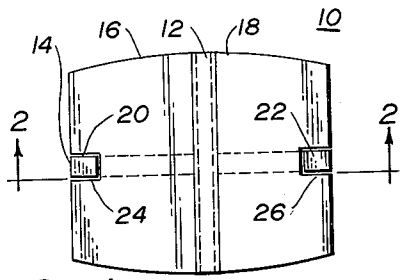


FIG. 1

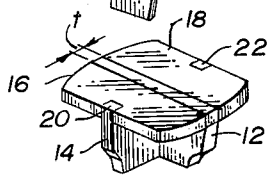


FIG. 4

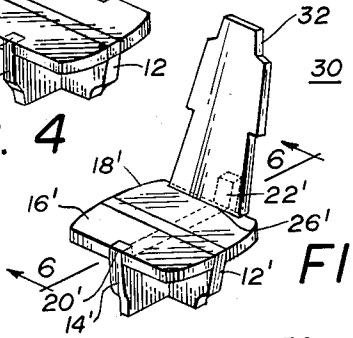


FIG. 5

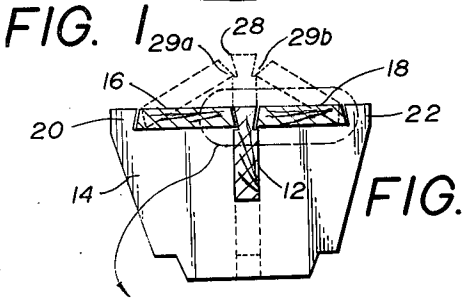


FIG. 2

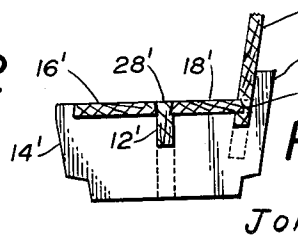


FIG. 6

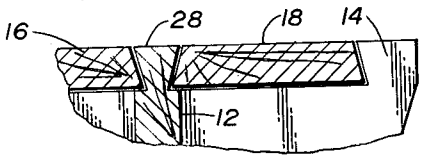


FIG. 3

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INTERLOCKING ASSEMBLABLE FURNITURE

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This invention relates to assemblable furniture, and more particularly relates to the manufacturing of furniture assemblable by the interlocking of its integral parts.

An object of this invention is to provide improved assemblable and disassemblable furniture, in which the integral parts of the particular piece of furniture are interlocking or self-integrating so that ordinary means of assembly, such as screws, bolts or glue, for example are not employed.

Obvious advantages are derived from pieces of furniture embodying the invention, for example, the pieces of furniture embodying the invention are easily assembled and disassembled so that there is no requisite of special skill in part of the person effecting the operation. Also, because there are no extraneous elements to maintain the parts assembled, the assembly or disassembly, as the case may be, is performed without the aid of special tools.

Furthermore, the pieces of furniture embodying the invention are completely disassemblable which consequently are easily transported and compactly stored.

Another object of this invention is to provide improved assemblable and disassemblable furniture which is easily manufactured and consequently of reduced cost. The interlocking integral parts of the furniture are built in corresponding planes whereby the cutting and shaping of the interlocking pieces are made in similar directions at predetermined angles so that the manufacturing tools can be permanently set for the required operations with consequent savings in time, labor and complexity of the manufacturing tools.

In addition, the integral parts of each piece of furniture are made of flat slabs or pieces of board which not only provides extremely compact storage but decreases the difficulty of storing pieces which may roll or move due to their peculiar shape.

These and other objects and advantages of the invention will be apparent upon reading the detailed description in conjunction with the drawings in which:

FIGURE 1 is a top view of a stool embodying the invention;

FIGURE 2 is a cross-sectional view along section line 2—2 of the stool shown in FIGURE 1;

FIGURE 3 is an exploded view of the encircled portion of the cross-sectional view shown in FIGURE 2, and which is helpful in describing the invention;

FIGURE 4 is a perspective diagrammatic view of the stool shown in FIGURE 1;

FIGURE 5 is a perspective diagrammatic view of a chair embodying the invention;

FIGURE 6 is a cross-sectional view along section line 6—6 of the chair shown in FIGURE 5;

FIGURE 7 is a perspective diagrammatic view of a table embodying the invention, partly cut-away to illustrate the interlocking assembly in accordance with the invention;

FIGURE 8 is a cross-sectional view along section line 8—8 of the table shown in FIGURE 7; and

FIGURE 9 is a side view of one of the legs of the table shown in FIGURE 1.

Reference is now made to FIGURES 1, 2, 3 and 4 of the drawings wherein a stool **10** embodying the invention is illustrated. The stool comprises four flat interlocking sections **12**, **14**, **16** and **18** which may be of wood, for example, and which may be easily assembled or disassembled without the requisite of special skill in the part of the assembler or of any tools.

Interlocking sections **12** and **14** constitute the supporting structure of the stool **10**. Sections **12** and **14** are shaped in accordance with the desired aesthetic design, one of which is illustrated in FIGURE 4.

As illustrated in FIGURE 2, for example, section **12** is mounted on section **14** to provide the support means of the stool **10**. To this effect sections **12** and **14** each have a mounting notch or slot to provide cross-mounting. The width of the respective notches is such that it provides snug and tight fitting and is, therefore, slightly larger than the thickness *t* of each of sections **12**, **14**, **16** and **18**.

Sections **16** and **18** which constitute the top sections or seat sections of stool **10** are placed to rest on both support sections **12** and **14**. As shown in FIGURE 2, for example, section **14** includes two ears or tongues **20** and **22**. Sections **16** and **18**, in turn, include notches or slots **24** and **26** that fit around tongues **20** and **22** respectively. The webs of notches **24** and **26** are inclined at a desired angle to provide the desired interlocking function. Similarly the wall of tongues **20** and **22** in contact with the inclined webs are inclined at a corresponding angle as shown in FIGURES 2 and 3. Cross section **12** on the other hand, includes a longitudinal wedge **28** at its uppermost end, to provide the required interlocking function with the inner end of sections **16** and **18**. To this effect, wedge **28** presents an inclined wall to each of the inner ends of sections **16** and **18**, which respectively have inclined walls at their inner sides.

Wedge **28** of section **12** and sections **16** and **18** are shown in detail in the expanded view illustrated in FIGURE 3. FIGURE 3 illustrates the respective location of sections **12**, **16** and **18** when the stool is assembled.

In FIGURE 2, sections **12**, **16** and **18** are also shown in dotted lines to illustrate the assembly operation of the stool **10**, once section **12** has been cross mounted on section **14**.

To conclude the assembly operation, the cross section **12** is lifted, without disengaging the respective mounting notches of sections **12** and **14**. This operation permits the lower part of the inclined walls of sections **16** and **18** to respectively rest against the edges **29***a* and **29***b* of wedge **28** while the webs of the notches of sections **16** and **18** rest against the tongues **20** and **22**. By pressing section **12** in the downward direction all the integral sections of the stool **10** are placed in their appropriate positions.

Once the assembly operation is ended, the resulting structure is ready for use. The stool **10** is disassembled by lifting section **28** which frees the top sections **16** and **18**. It should be noted, therefore, that if section **12** is not lifted, the stool may be transported by holding the stool on any of the other sections without danger of accidental disassembly. This is due to the interlocking feature of all the sections constituting the stool which results in pressure exerted by each section on the other. Also, as previously described, the various mounting notches and mating walls are designed to provide snug fitting which results in a compact, sturdy structure.

Reference is now made to FIGURE 5 of the drawings in which a chair **30** embodying the invention is illustrated. The supporting structure of chair **30** is similar to the structure of stool **10**, and, therefore, primed numerals are employed to identify the corresponding sections. There are, however, some variations in some of the sections as noted below.

The chair **30** includes sections **12'** and **14'** which are similar to sections **12** and **14** of the stool **10**, shown in FIGURE 1. Chair **30**, however, includes a back section **32**, shaped in accordance with the desired aesthetic design.

Section **14'** in addition to the mounting notch provided for mounting of section **12'** as described in connection with the stool shown in FIGURE 1, includes a notch provided for mounting the back section **32**. Section **32**

in turn includes a corresponding similar mounting notch at its lower end.

As shown in dotted lines in FIGURE 5, the tongue 22′ of section 14′ is longer than the tongue 20′ to provide the required support of the back section 32. Correspondingly, the notch 26′ is made slightly longer than the width of the back 32 at their mating place to provide snug fitting.

As illustrated in FIGURE 6, the back section 32 includes a transversal notch 34 to permit mating with the outer end of section 18′. Both the web of notch 34 and the corresponding wall of section 18′ are inclined at corresponding angles in a manner similar to the one described in connection with FIGURES 1, 2, and 3 of the drawings to provide the desired interlocking feature.

Also as illustrated in FIGURE 6, both the tongue or ear 22′ and the wall of section 18′ exert pressure on the back section 32 when the chair 30 is assembled to hold the section 32 in place.

Assembly and disassembly of the chair 30 is similar to the assembly of stool 10 with the exception that back section 32 is mounted previous to the assembly of sections 16′ and 18′.

Reference is now made to FIGURES 7, 8 and 9 of the drawings, wherein a table 40 embodying the invention is illustrated.

The table 40 comprises a set of table legs 42, 44, 46 and 48, each made of a flat wooden slab shaped in accordance with the desired aesthetic design, and each including a slot or notch to receive a corresponding cross member 50 or 52. As shown in FIGURES 7 and 8, for example, cross member 52 is mounted on legs 44 and 46, and cross member 50 is mounted on legs 42 and 48.

Each of the cross members 50 and 52 includes notches 54 and 56 which fit on the notch provided in each of legs 42, 44, 46 and 48 to provide cross mounting of the cross members 50 and 52 on the corresponding legs.

As shown in FIGURE 9, the leg 42 includes a slot or notch 58 having two notch legs and a web. The web is made slightly wider than the thickness of transversal or cross member 50 to provide snug fitting. The legs of notch 58 include straight walls 59 and 60. Each of slots or notches 54 and 56 on the other hand, is provided with an inclined wall 62 and 66 respectively, to provide loose fitting so that the legs on which the corresponding transversal or cross member is mounted have a limited freedom of motion to permit assembly of the integral parts of the table.

A longitudinal brace member 70 which includes two mounting slots or notches is cross-mounted on both transversal members 50 and 52. Each of cross-members 50 and 52 has a mounting notch to permit mating with the mounting notches of the longitudinal brace member 70. These mounting notches are also formed by straight walls to provide the desired snug fitting. The notches in cross-member 50 and 52 have a width slightly larger than the thickness t of the longitudinal brace member 70.

The top of the table 40 is made of four interlocking pieces 72, 74, 76 and 78, each having a thickness t. Each of interlocking pieces 72 and 78, which are identical, include a pair of slots at their outermost side to snugly fit around cross-members 40 and 42, and four slots at their internal side to integrally fit with the tongues 80*a* and 80*b* of legs 42 and 44, or legs 46 and 48 as the case may be.

As shown in FIGURE 8, the external slots of interlocking pieces 72 and 78 have sliding or inclined walls 82 and 84 at an angle which corresponds to the inclination of cross-members 50 and 52 at their mating point. Thus, the desired interlocking of the various structural pieces is provided.

Similarly, interlocking pieces 72 and 78 have inclined walls 86 and 88 at their internal slots to snugly fit with the inclined walls of tongues 80*a* and 80*b* of legs 42, 44, 46 and 48 respectively.

The interlocking pieces 74 and 76 are similarly provided with a pair of slots to snugly fit with the tongues 80*a* and 80*b* of the legs 42, 44, 46 and 48 respectively, to provide interlocking of tongues 80*a* and 80*b* and the interlocking pieces 74 and 76. Each of interlocking pieces 74 and 76 also includes a beveled edge 88 to fit with the beveled edge 70*a* of longitudinal brace member 70, and thereby provide desired interlocking of the various pieces.

As previously described, the width of the different mounting slots and notches provided in each of the integral sections of the table 40 are manufactured for snug fitting. This provides a very compact and sturdy structure. Inclined walls 72 and 76 of notches 54 and 56, however, provide loose fitting of the legs 42, 44, 46 and 48 to permit mounting of the integral parts of the table during the assembly operation.

The assembly operation of the table is as follows:

The cross-members 50 and 52 are mounted on legs 42, 44, 46 and 48 respectively. The longitudinal brace member 70 is in turn mounted on the cross members 50 and 52, to provide a four legged self-supporting structure. Top members 72 and 78 are then longitudinally mounted on the cross-members 50 and 52. Because it is devised to provide snug fitting, table legs 42, 44, 46 and 48 must be outwardly moved to permit placing of the top members 72 and 78 on the cross-members 50 and 52.

Once the top members 72 and 78 are placed in the desired location, table legs 42, 44, 46 and 48 are moved inwardly back to their vertical position thereby securing the position of top members 72 and 78.

Also, because it is desired to provide snug fitting of the various integrating structural parts, pieces 74 and 76 cannot be then mounted in their allocated spaces. To complete the table assembly longitudinal brace member 70 is lifted to provide mating of beveled edge 88, of each of members 74 and 76, with the corresponding edge 70*a* of longitudinal brace 70.

When the longitudinal brace 70 is lifted it remains in contact with the mounting slots of each of the transversal integrating members 50 and 52, but it is not inserted fully in the slots. The beveled edge 88 of the top members 74 and 76 are placed to rest on the edge 70*a* of brace 70. By pressing the center of longitudinal brace 70 in the downward direction, top members 74 and 76 and longitudinal member 70 fall into place. The assembly operation is thus terminated, and a compact self interlocking structure is provided.

Similarly, for disassembly, by lifting the longitudinal brace 70, the top members 74 and 76 may be removed and the remaining structural pieces can then be easily disassembled.

It should be understood that although the table shown in FIGURES 7, 8 and 9 of the drawings has been described with separate legs and cross mounting members, a table embodying the invention could be modified by substituting two cross members as described in connection with the stool and chair shown in FIGURES 1 and 5, respectively for the legs and mounting members described in connection with the table shown in FIGURE 7. In addition, if the length of the table so required it, a plurality of such pairs of cross mounting members could be included. A table made pursuant to the above modification would include top members, or sections 16 and 18 of the desired length.

The table shown in FIGURE 7 could also be modified by including a back section, similar to the one described in connection with FIGURE 5, to thereby provide a bench. Many other modifications of the embodiments of the invention illustrated may be suggested by their description, and as such their inclusion is intended.

What is claimed is:

1. In a furniture construction the combination of a first vertical support having tongues mounted on opposite ends of the top edge of said vertical support, a pair of horizontal members mounted on said first member, each said horizontal member formed with a notch to receive

the tongues of said vertical support member, a second vertical support member aligned with said horizontal member, means interlocking said second vertical support member with said first vertical support member, the inner edge of said horizontal members and the outer top edges of said second vertical support members being formed to provide an interlocking wedge to interlock said horizontal members with said second support members and the inner edge of said tongue and the mating notch of said horizontal members being formed in an interlocking wedge to prevent relative upward movement of said horizontal members relative to said first vertical support members.

2. A piece of furniture comprising in combination: first and second vertical structural members, each having a mounting notch formed thereon, each of said notches having a web substantially equal in size to the thickness of said vertical members, whereby said first and second vertical members may be cross-mounted, a first said vertical member including a wedge formed on the upper end thereof, a second said vertical member including a tongue formed at each of the ends of the second said vertical member and on the edge where said mounting notch of the second said vertical member is formed; and first and second flat horizontal interlocking members mounted on said vertical members, each of said interlocking members having a notch formed on one of the edges of said interlocking members and fitting around one of said tongues of the second said vertical member, and an inclined wall at the opposite edge having the same incline as said wedge so that when said first member is lifted, said notches fit around said tongues and said wedge mate with said inclined walls, and when said first member is pressed downward afterwards said interlocking members are fixedly engaged with said vertical members.

3. A table comprising in combination four legs each formed with a depending vertical notch, first and second transversal supporting members each formed with two upwardly extending vertical mounting notches at the bottom edge on a vertical mounting notch at the top edge thereof, the vertical mounting notches at said bottom edge and the notches of said legs formed in complementary dimension to allow cross-mounting of each of said first and second transversal members with two of said four legs, the upper edge of each of said four legs forming an inwardly inclining wedge face, said transversal supporting member having an upper horizontal surface aligned at an elevation below the wedged edge of said legs, each of said transversal supporting members having a pair of upwardly extending tongues formed at opposite ends in which the top extremity of the tongues are on a common elevation with the top edge of said legs, longitudinal support member having two upwardly extending vertical mounting notches, said vertical mounting notches being formed in complementary dimension with said mounting notches at the top edge of said transversal supporting members to allow said longitudinal support member and said transversal support members to be cross-mounted in mutual supporting contact with each other, the upper edge of said longitudinal support member forming an inwardly inclining wedge face, first and second pairs of horizontal members, each having a thickness equal to the height of the tongue of said transversal supporting members, said first pair of horizontal members formed to provide inwardly facing wedged edges complementary with the wedged edges of said legs and formed with notched areas on the external edge aligned to receiving the tongues of said transversal supporting members, the inner edges of said tongues declining outwardly and the outer edges of the notches of said first pair of top members extending inclining upwardly in an angle complementary with the angle of inclination of the inner edge of said tongue, said second pair of horizontal members formed to provide an inwardly facing wedged edge complementary with the wedged edge of said longitudinal supporting member and formed with notched areas on the external edge aligned to provide inwardly facing wedged edges complementary with the wedged edges of said legs.

4. A table comprising a pair of horizontally disposed transverse support members, leg means interlocked with each support member, said leg means having a depending portion extending below said transverse member and ear means extending above said transverse member, tab means extending upwardly from each end of said transverse member, a pair of first plank means mounted on said support members between said tab means and said ear means, said tab and ear means formed with inwardly inclining wedge faces, said plank means formed with complementary wedge faces to interlock said plank means between the ear and tab means, a center section mounted for vertical movement on the center portion of said support members and formed with wedge-shaped edges on opposite sides, and a second pair of plank members disposed between said ear means and said central support member, said plank members formed with angled edges complementary with the angle of said central support member on one edge thereof, and edges to receive said ear means formed in complementary angles to said ear means.

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