

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 878 148 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.11.1998 Bulletin 1998/47

(51) Int Cl.6: **A47B 3/06, A47B 13/02**

(21) Application number: **98303708.6**

(22) Date of filing: **12.05.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Howarth, Alan Douglas**
Hertfordshire EN6 2RD (GB)

(74) Representative: **Howden, Christopher Andrew**
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
80801 München (DE)

(30) Priority: **16.05.1997 GB 9710041**

(71) Applicant: **Guilbert UK Limited**
Andover, Hampshire SP10 4JZ (GB)

(54) **Collapsible frame for furniture**

(57) A collapsible frame for an item of furniture such as a table having, in its erected condition, four legs disposed substantially at the corners of a rectangle, comprises two similar frame units (10) and two similar frame units (12). Each of the four frame units (10, 12) includes a respective transverse member (16, 18) carrying at either end a respective pivot formation in the form of a cylindrical tube (12, 14). The tubes (14) of the frame units (10) form the legs of the item of furniture. In the

erected condition of the frame, each tube (12) of each frame unit (12) is rotationally engaged in a complementary tube (14) formation of the adjoining frame unit (10) for pivoting about the axis of the respective leg. The tubes (14) have notches (20) at their upper ends to receive the transverse members (18) as the frame units are moved into full engagement with one another in the erected position of the frame, to lock the frame in its erected expanded condition.

EP 0 878 148 A1

Description

THIS INVENTION relates to a collapsible frame for an item of furniture, and to an item of furniture incorporating such a frame.

The invention is particularly, though not exclusively, concerned with tables or desks for office spaces, training facilities, conference halls or the like where there is a need for such tables or desks which can be readily moved about and rearranged, transported from one location to another, stored compactly when not required and so on. It is an object of the present invention to provide a collapsible frame for an item of furniture which is simple in construction and can readily be manipulated by unskilled personnel and which can nevertheless be made to be robust and to be stable in its erected position, yet easily collapsed or demounted.

According to one aspect of the invention there is provided a collapsible frame for an item of furniture or the like, the frame providing, in its erected condition, four legs disposed substantially at the corners of a rectangle, the frame comprising four frame units each including a transverse member carrying at either end a respective pivot formation pivotally engaged with a complementary pivot formation of the adjoining frame unit for pivoting about the axis of a respective said leg, at least one said pivot formation comprising a hollow tubular member defining a circular cross-section recess and the complementary pivot formation comprising a member of complementary circular external cross-section received as a sliding rotational fit in said hollow tubular member.

According to a further aspect of the invention there is provided a table or like item of furniture comprising a slab-like top supported upon an erected frame in accordance with the preceding paragraph, wherein at least two of said frame units include transverse frame members which extend horizontally close to and below the underside of said top and wherein said top includes portions which extend downwardly, past the upper edges of said transverse frame members and closely adjacent the latter, to locate the top reliably on said frame whilst allowing the top to be lifted from the frame prior to folding or lozenging the frame into a stowed condition.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings in which:-

FIGURE 1 is a perspective view of a collapsible table frame embodying the present invention in a fully assembled condition, but with the table top omitted for ease of illustration,

FIGURE 2 is a similar perspective view of the same frame but showing two end frame units partially withdrawn in preparation for collapsing the frame,

FIGURE 3 is a perspective view showing the same frame in a collapsed, lozenged condition,

FIGURE 4 is a perspective view showing one side frame unit of the frame of Figures 1 to 3 and one end unit of the frame,

5 FIGURE 5 is a perspective view from below showing the frame of Figures 1 to 4 with a table top about to be fitted thereon,

10 FIGURE 5A is a detail perspective view, to a larger scale, showing blocks, with turnbuckles, secured to the underside of the table top in Figures 5 and 6, and,

15 FIGURE 6 is a perspective view corresponding to Figure 5 but showing the table top in a fully secured position.

Referring to Figures 1 and 4, the frame comprises two side frame units of the form indicated at 10 in Figure 4 and two end frame units each of the form indicated at 12 in Figure 4. Each side frame unit comprises two parallel spaced-apart hollow tubular cylindrical legs 14 extending parallel with one another and secured, for example by welding, at their upper ends, to a transverse member 16 in such a way as to leave the upper ends of the tubular legs 14 open and unobstructed. Each end frame member 12 likewise comprises two hollow tubular insert members 15 connected at their one ends, for example by welding, to a respective transverse member 18. As shown in Figure 1 in the assembled frame, the two side frame units 10 are arranged with their legs 14 vertical and with their transverse members 16 spaced apart and parallel with one another and the two side frame units 10 are held together at their ends by respective end frame units 12, so that the legs 14 lie at respective corners of a rectangle. More specifically, at each end of the erected frame, the respective end frame unit 12 has its two insert members 15 inserted snugly within the respective legs 14 of the two side frame units at the respective end of the frame. The insert members 15 have external diameters slightly less than the internal diameters of legs 14 so that the insert members 15 are a close sliding and rotating fit within the upper ends of the legs 14.

45 On one side of each side frame unit 10, notches or cut outs 20 are formed in the walls of the tubular legs 14. In the assembled frame, these notches or cut-outs 20 receive the transverse members 18 of the end frame units 12 when the insert members 15 of the latter are fully inserted in the legs 14 at the respective end of the frame and thereby brace the frame so that the transverse members 18 extend perpendicular to the transverse member 16 and prevent the frame from lozenging when these end frame units are fully inserted. This arrangement also allows the transverse members 16 and 18 to lie substantially in the same horizontal plane in the fully assembled condition shown in Figure 1.

As illustrated in Figures 2 and 3, the frame may be

moved to the lozenged or folded position shown in Figure 3 simply by lifting the end frame units 12 slightly, sufficiently for the transverse members 18 to clear the cut outs 20, before swinging the end frame units 12 around to bring the frame into the position shown in Figure 3. During such movement from the position shown in Figure 2 to that shown in Figure 3, the tubular insert members 12 rotate smoothly within the tubular legs 14, the insert members 15 acting as journals rotating within bearings provided by the internal surfaces of the legs 14.

It will also be appreciated that, if desired, the frame can be completely disassembled simply by lifting the end frame units 12 fully from the side frame units.

It will be appreciated that whilst the insert members 15 are illustrated as being shorter than the legs 14, the insert members 15 may, if desired, be of the same length as the legs 14. Shortening of the members 15 relative to legs 14, however, allows a saving in weight, material and cost. Similarly, it will be appreciated that whilst the insert members are described as being hollow they could, of course, be solid, although this would increase the weight of end frame units 12.

Whilst the legs 14 and insert members 15 have been described as being cylindrical, they could of course, be downwardly tapered, to assume a frusto-conical form, with the insert members 15 being correspondingly tapered, allowing the insert members 15 to be lowered into close engagement with the legs 14.

The frame described may support a table top, (or other structure of any desired configuration), which preferably is arranged so that it can simply be lifted off the frame when it is desired to dismantle the table and conversely simply to be dropped into place, on the assembled frame, as the last stage in assembly of the table. The table top preferably has retaining formations on its underside which cooperate with complementary retaining formations on the upper part of the frame to prevent lateral displacement of the table top on the frame. The retaining formations on the table top may simply comprise blocks or like portions which lie closely adjacent the transverse members 16, 18 of the frame and extend downwardly past the upper edges of the transverse members 16, 18, on the inner sides or the outer sides of the transverse members. By way of example, Figures 5 and 6 show a table top 26 for the frame of Figures 1 to 4, which comprises a flat rectangular slab having, on its underside, blocks 28 which are disposed inwardly from the adjoining edge faces of the table top such that, in the assembled table, said blocks 28 fit snugly within the rectangular space bounded by the transverse members 16, 18 of the assembled frame, and lie against the inner sides of members 16, 18. The blocks 28, in addition to preventing lateral displacement of the table top on the frame, provide additional bracing against unintended lozenging of the frame. In the exemplified table top of Figures 5, 5A and 6, the blocks 28, or selected blocks 28, are of such a depth that in the assembled table the lower faces of these blocks are flush with the

lower edges of the members, and such blocks carry turnbuckles 30 on their undersides, which turnbuckles are pivotable, about respective vertical axes, on respective screws or bolts so that they can be swung between positions parallel with, and spaced from, the adjoining frame members 16 or 18, such that the table top can be lifted from or lowered onto, the frame, and positions in which they extend at right angles to the adjoining frame members 16 or 18, beneath the latter, to retain the table top 26 on the frame. It will be understood that the blocks 28 locate the table top reliably against translation or rotation on the assembled frame.

The frame and table top shown preferably forms part of a modular system comprising side units and end units of different lengths, so that the same pair of side frame units can, with end frame units of different lengths, form frames of different sizes and the same pair of end frame units can, with side frame units of different lengths, form frames of different sizes. In this case, of course, the modular system also comprises table tops of various different sizes and the dimensions of the latter are conveniently such that the lengths of the sides of the various tables stand in a predefined relation to one another, for example are integral multiples of a basic dimension, allowing assembled tables to be arranged table edge to table edge in such a way as to allow a large selection of composite tables to be formed, each comprising a plurality of individual such tables and having a different composite table surface formed by the aggregate of the table tops of the constituent individual tables. To this end, the modular system may include table tops of semicircular or quarter-circular shape and of other non-rectangular shapes.

The features disclosed in the foregoing description, in the following claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A collapsible frame for an item of furniture or the like, the frame providing, in its erected condition, four legs disposed substantially at the corners of a rectangle, the frame comprising four frame units each including a transverse member carrying at either end a respective pivot formation pivotally engaged with a complementary pivot formation of the adjoining frame unit for pivoting about the axis of a respective said leg, at least one said pivot formation comprising a hollow tubular member defining a circular cross-section recess and the complementary pivot formation comprising a member of complementary circular external cross-section received as a sliding rotational fit in said hollow tubular member.
2. A collapsible frame according to claim 1 wherein

said hollow tubular member forms a said leg of said frame.

3. A collapsible frame according to claim 1 wherein said member of complementary circular external cross-section forms a said leg of said frame. 5

4. A collapsible frame according to any preceding claim wherein said member of complementary circular external cross-section is also a hollow tubular member. 10

5. A collapsible frame according to any of claims 1 to 4 wherein at least one said frame unit has a locking formation engageable with a complementary locking formation on an adjoining frame unit as the frame units are moved into full engagement with one another in the erected position of the frame, to lock the frame in its erected expanded condition until the frame members are displaced relative to one another in preparation for folding or lozenging the frame into a stowed condition. 15
20

6. A collapsible frame according to claim 5, wherein said hollow tubular member has a notch or cut-out on one edge thereof to receive a transverse projection extending from said member of complementary circular external cross section in one angular position of the respective frame units thereby to lock the frame in its erected, expanded condition until the respective frame member, with said transverse projection, is moved to slide said transverse projection from said notch or cut-out, said notch or cut-out and said transverse projection forming complementary said locking formations. 25
30
35

7. A collapsible frame according to claim 6 wherein said transverse projection comprises a cross-member of the respective frame unit. 40

8. A table or like item of furniture comprising a slab-like top supported upon an erected frame in accordance with any preceding claim, wherein at least two of said frame units include transverse frame members which extend horizontally close to and below the underside of said top and wherein said top includes portions which extend downwardly, past the upper edges of said transverse frame members and closely adjacent the latter, to locate the top reliably on said frame whilst allowing the top to be lifted from the frame prior to folding or lozenging the frame into a stowed condition. 45
50

55

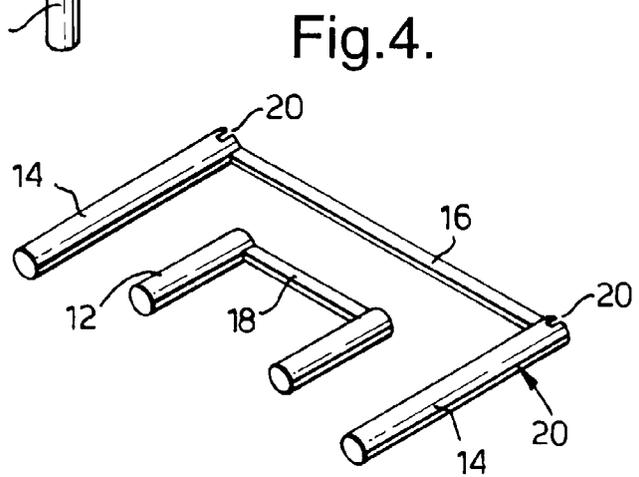
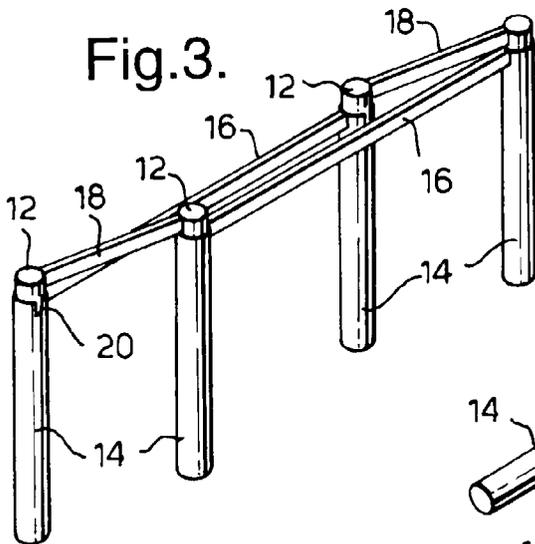
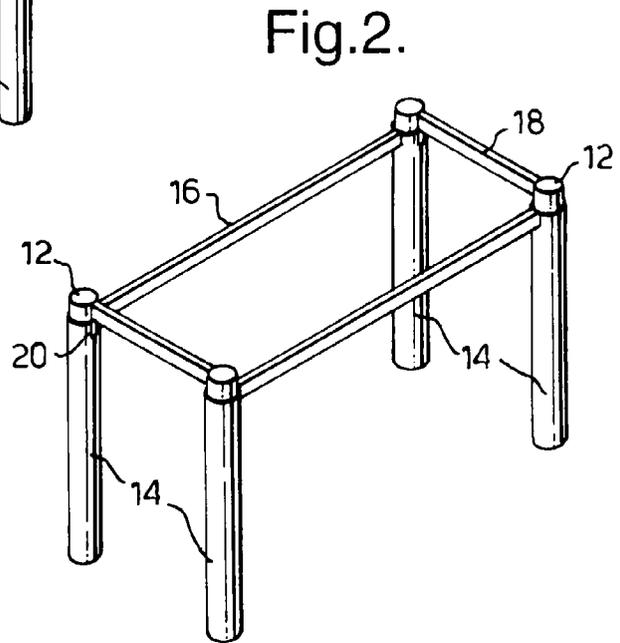
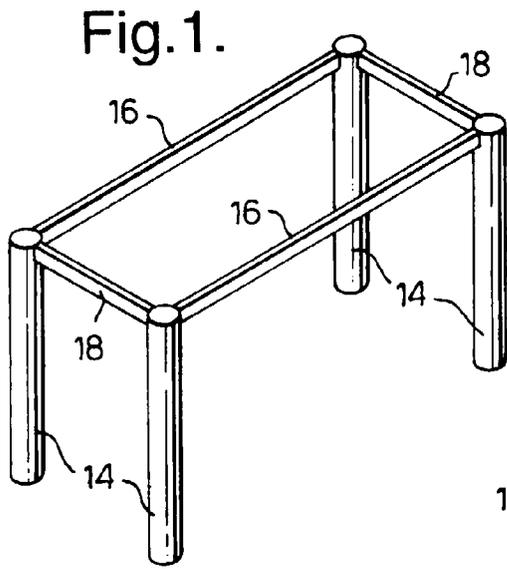


Fig.5.

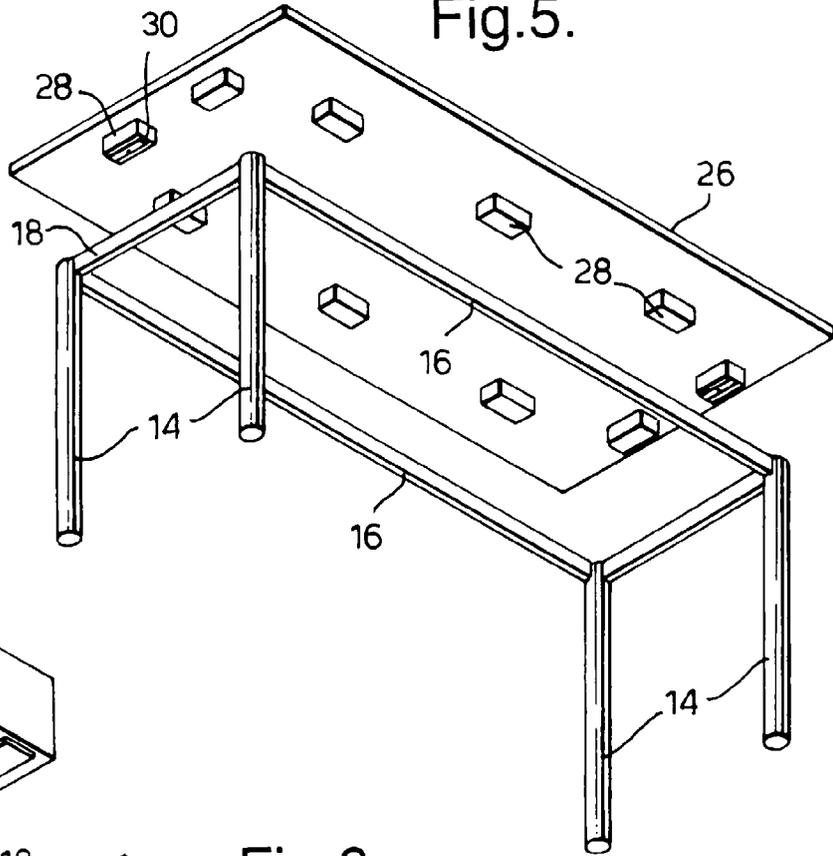


Fig.5 A.

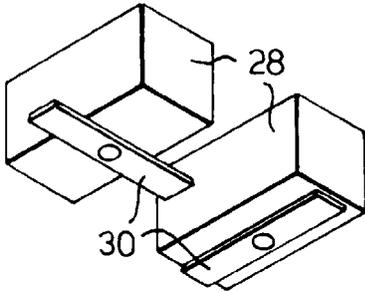
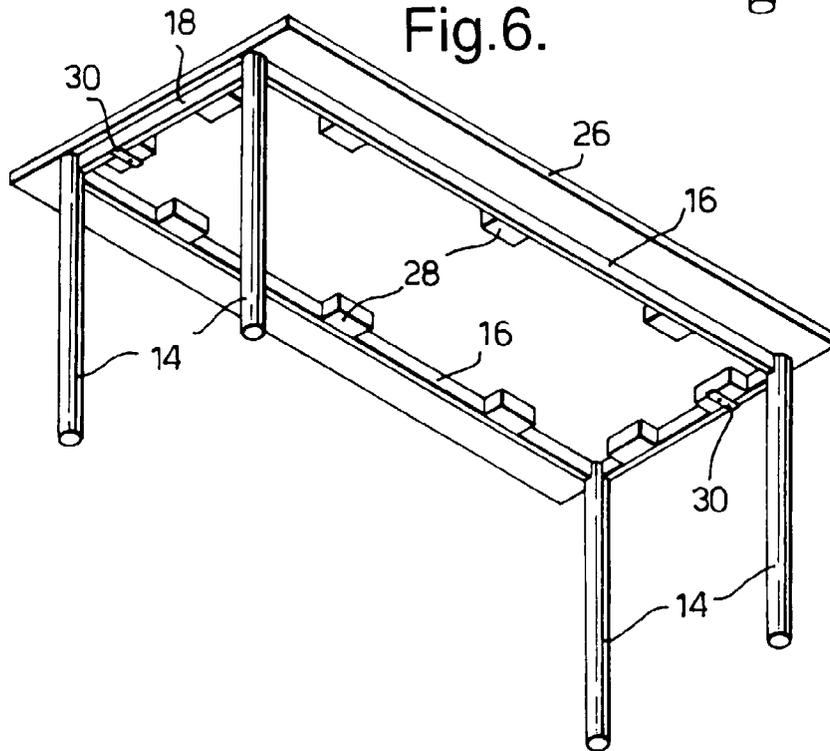


Fig.6.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 98303708.6
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)
A	DE 4114991 A (GROSSHANS, J.) 12 November 1992 (12.11.92), fig. 1,2. --	1	A 47 B 3/06 A 47 B 13/02
A	DE 2404273 A1 (BUSSE, R.) 07 August 1975 (07.08.75), fig. 1,5. --	1	
A	FR 1567787 A (H.C. SHEPHERD & COMPANY LIMITED) 16 May 1969 (16.05.69), fig. 1. --	1	
A	US 2615771 A (CURTIS, P.C.) 28 October 1952 (28.10.52), fig. 6. ----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.6)
			A 47 B 3/00 A 47 B 13/00
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
VIENNA		03-08-1998	BENCZE
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 01/82 (10/90)