(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 516 557 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.03.2005 Bulletin 2005/12

(51) Int Cl.[7]: **A47B 1/02**

(21) Application number: **04019285.8**

(22) Date of filing: **13.08.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK

(30) Priority: **15.08.2003 MY 0303118**

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(54) Extensible table with improved extension system

(57) The present invention is an extension table with an automatic extending and closing system. The extension table comprises of a pair of main top panels and a main frame and sliding rails which allows the pair of table top to be pulled apart when it is extended and to be pull together when it is close. It also comprises of a pair extension panel of which it is position underneath the pair of large table top, when the table is close and is position at the same level as large table top incorporating into a large or extended size of table top when the table is extended and a single extension mechanism that allows the table to be extended and close automatically with ease in one continuous action pulling and pushing of large table top. The automatic extending and closing system comprises of a pair of inclined groove and horizontal groove at the inward faces of side bars of the table frame and extending guided pin at the support block of extension panel. The extending guided pin slides along the inclined groove and will rest at the horizontal groove which resulted the extension raise up the table level incorporated into a large extended table top. In order to close the table, the pin slides along horizontal groove toward inclined groove and drop along the inclined groove back to original position underneath the large table top. The table top is then pushed back to its original closed position.

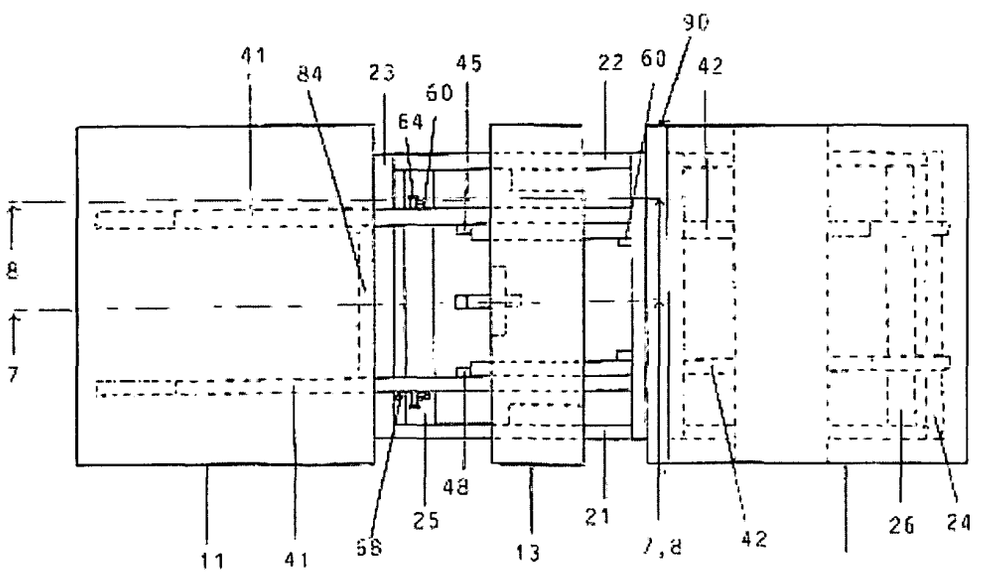

Figure 4

EP 1 516 557 A1

Description

Field of invention

[0001] The present invention relates to the extensible table, more particularly to an extensible table having an improved extension system which enable the table to be extended and closed and importantly also enable the table to be extended automatically and closes automatically.

Background of the invention

[0002] The demand for more and more innovative creation which is space saving has led to the invention of extension table. A usual and conventional extension table comprise of a pair of table top and one extension leaf so that the pair of table top can be pull apart for the centre extension leaf to be incorporate into a large or extended size of table top. This conventional kind of extension table may be constructed from a pair of extension leaf which hidden underneath the pair of large table top in a folded position when it is not extended. When it is extended, the two pair of large table top is pulled apart to allow for the extension leaf, unfolded and incorporate into a large or extended size of table top when it is joint with the two large table top.

[0003] However, the abovementioned conventional extension table is very troublesome requires extra steps to extend or to close the table.

[0004] Therefore the object of the present invention is to provide an easy and user friendly extension system which is essential for the operation of the extension table.

[0005] Another object of the present invention is to provide an innovative extensible table which is intended to ensure convenience of space saving.

[0006] Yet another object of the present invention is to provide an extensible table which can be extended and closed automatically Yet another object of the present invention is to provide an extension system whereby upon pulling the two end leaves of the table top horizontally outwardly and pushing inwardly relatively to each other to the center, the extension leaves will be lifted up into operative position between the two end leaves with a single improved extension system.

Summary of Invention

[0007] The present invention is an extension table comprises of a pair of main top panels and a table frame and sliding rails which allows the pair of main top panels to be pulled apart when it is extended and to be pushed together when it is in contracted position. It also comprises of a pair extension panels of which it is position underneath the pair of main top panels, where said extension panel is position at the same level as main top panel incorporating into a large or extended size of table top when the table is extended and a single extension mechanism that allows the table to be extended and close automatically with ease in one continuous action of pulling and pushing of the main top panels of the table.

[0008] Preferably, the present invention has a table frame consists of a two longitudinal side bars, two end cross bars and fixed bar that has a cut out for the table top to be slide or pull apart or pull together and also have grooves includes inclined groove and horizontal grooves at the inwards faces of the side bars; and extension panel consists of support block which is equipped with extending guided pin. The present invention is arranged in such a way that the extending guided pin will be placed inside the grooves for enabling the extension panel to be moved to main top panel level when the table is extended and also move to underneath of the main top panel when it is in closed position.

[0009] The table is characterized by the above easy extending and easy closing arrangement that the table can be extended or closed automatically by one continuous action of pulling and pushing of main top panel instead of conventional system which may require up to 5 steps to extend and to close an extension table.

[0010] In this design, in the operation of extending the table, the pair of main top panels is pulled apart to allow for the extension panel to be incorporated into a large extended size table. As the main top panel pulled to the end, beyond a push block, the table is to be pushed in reversed direction toward the centre of the table, the push block is triggered into operation push the extension leaf position underneath the large table top slide along the inclined groove move upward until it slide onto the horizontal groove and release from the push block. The table is thus extended automatically in the course of pulling and pushing of large table top in one continuous action

[0011] Meanwhile in the operation of the closing of the extension table requires the pulling of the main top panel, which will result in the pulling of the extension leaf away from the horizontal groove as soon as the hook fixed underneath the main top panel reach bottom side of the extension panel. The extension panel will be pulled by the hook beyond the horizontal and drop along the inclined groove back to the position the extension panel is kept when the table is closed. After the extension leaf is drop back to the original position underneath the main top panel, the table top is to be pushed toward centre to have the large table top to meet with the centre of the table. The table is thus closed automatically in the course of pulling and pushing of large table top in one continuous action.

Brief Description of the drawings

[0012] The invention is illustrated, but not limited, by the following description of a preferred embodiment with reference to the accompanying drawings, in which;

Figure 1 is a side view of an extensible table of the present invention in its normal unextended condition;

Figure 2 shows a extensible table by the inclusion of one of a pair of extension panels;

Figure 3 is a front view of the extensible table seen in direction arrow A of figure 1;

Figure 4 depicts a top view of the extensible table with the hidden parts shown in phantom lines;

Figure 5a is a view of the underside of an extension panel of the extensible table;

Figure 5b is a side view of a guide block of the extension panel, seen in the direction of arrow B of figure 5a;

Figure 5c is a side view of a L-shaped block of the extension panel, seen in the direction of arrow C of figure 5a;

Figure 6 depicts a side view of a fixed guide bar of the main frame of extensible table;

Figure 7 shows a partial cross-sectional view of the extensible table of figure 4 showing the position of the main top panel, the sliding rail, the push block and the extension panel in the stowed position taken along line 7-7;

Figure 8 shows a partial cross-sectional view of the extensible table of figure 4 showing the position of the groove and extension panel with the guide block in stowed position taken along line 8-8;

Figure 9 is a partial cross-sectional view of the extensible table showing the position of the extension panel with the L-shaped block when the extension panel is raised when the main top panel is moved inwardly;

Figure 10 shows a partial cross-sectional view of the extensible table showing the extension panel and its guide block at the middle of the travel of along the groove; and

Figure 11 is a top perspective view of the push block..

Detailed Description of the Preferred Embodiment

[0013] Referring now to figure 1, the table (50) includes a table top having two main top panels (11, 12), a pair of extension panels (13, 14), a support structure (1) with legs and a main frame (20). The two main top panels (11, 12) are slidably mounted on the main frame (20) in the longitudinal direction in which they can be pulled outwardly and pushed inwardly with respect to the centre of the table (50).

[0014] As shown in figure 1, the table (50) is in unextended position where the two main top panels (11, 12) are completely pushed together and the pair of extension panels (13, 14) are disposed beneath the two main top panels (11, 12) respectively with the bottom side of the extension panels (13, 14) rest on top of the main frame (20).

[0015] Figure 2 depicts the main top panel (11) of the table (50) is pushed against the extension panel (13) and the table top is now extended by the extension panel (13). The main top panel (11) can be slidably pulled slightly farther away than in this normal extended position. The main frame (20) of two longitudinal side bars (21, 22), two end cross bars (23, 24) connected at the corresponding opposite ends of the side bars (21, 22) and two transverse support bars (25, 26) as shown in figure 4, each mounted at its opposite ends with the bottom side of the side bars (21, 22) adjacent the two end cross bars (23, 24) of the main frame (20) by fasteners (not shown).

[0016] There is a central stop rail (90) mounted transversely at the top of the main frame (20) at its middle and forming fixed part of the table top. The central stop rail (90) consists of a fixed bar formed by a rectangular bar (31) and two blocks (32) secured at the opposing ends of the rectangular bar (31) of the fixed bar; and a pair of steps (33, 34) mounted at each side of the two blocks (32) of the fixed bar on which the bottom side of inner edge of said extension panels (13, 14) or of the slidable main top panels (11, 12), rest when the table is in extended or contracted positions. The steps (33, 34) have a length corresponding to the length of the end cross bars (23, 24) while the rectangular bar (31) has a length corresponding to the width of the main top panels (11, 12) and extension panels (13, 14). The edges of the rectangular bar (31) of the fixed bar have holes (35) to receive extension tongues (15) located at the first side of the extension panels (13, 14) and main tongues (16) of the main top panels (11, 12).

[0017] Figure 4 shows the part of the table structure where the main top panel (11) has been pulled out so as to open up the extension gap. The two main top panels (11, 12) have each two longitudinal sliding rails (41) and (42) respectively secured on their bottom side and guided by slots (44) at the end cross bars (23, 24) as shown in figure 3 and a pair of fixed guide bars (43) having apertures (47) as shown in figure 6, which is securely mounted to the two longitudinal side bars (21, 22) of the main frame (20) respectively beneath the two steps (33, 34) of the central stop rail (90). The main top panel (11) is secured to the sliding rail (41) via a space block (45) as to provide a clearance gap (46) for receiving the extension panel (13) when the table (50) is in the unextended position as shown in figure 1 to 3. The width of

the space block (45) is preferably less the width of the sliding rail (41).

[0018] The fixed guide bar (43) further comprising a horizontally extending beam (48) extended from each aperture (47) corresponding with the bottom side of the sliding rail (41) for supporting said sliding rail (41) in sliding movements. Each of the inner side of the two sliding rail (4 1) of the main top panel (11) is provided with push block (60) adapted to guide and raise the extension panel (13) into a position which is same level with the main top panel (11) and incorporate with the main top panel (11) and central stop rail (90) into an extended size of table as shown in figure 4.

[0019] The push blocks (60) are in rectangular shaped blocks which are pivotably mounted to the inner side of the sliding rails (41, 42) by fasteners. The outwardly facing side of the push block (60) which is the opposite side of where the push block (60) in engagement with the inner side of the sliding rail (41) has a cut out slot (63) at the first end (61) of the push block (60) to provide a smaller thickness than the second end (62) of the push block (60) so as the push block (60) is in vertical upright position when the push block (60) is in engagement free condition. The first end (61) of the push block (60) is preferably having one tapering edge facing the centre of the table. A block stopping means (64) is provided adjacent the push block (60) mounted at the sliding rail (41) in between the push block (60) and the end cross bar (23) to stop the push block (60) further pivots backwardly when raising up the extension panel (13). At least one top panel stopping means (64) is provided at the sliding rail (41) adjacent the block a stopping means () to prevent the over outwardly pulling of the top panel (11) with respect to the central stop rail (90).

[0020] The outer side of the end cross bar (23) is provided with a fixing bar (84) mounted in between of the slots (44) and having its bottom side resting on the top side of the sliding rail (41). The outer opposing edges of the fixing bar (84) will interact with the inner sides of the sliding rails (41, 42) to fix and further guide the sliding rails (41, 42) when the table (50) is in unextended position.

[0021] Figure 5a shows the bottom surface of the extension panel (13). The extension panel (13) is provided with a pair of guide blocks (71) at suitable length having one edge mounted align to the edge of the second end of the extension panel (13) at positions corresponding to the inner sides of the side bars (21, 22) of the main frame (20). Figure 5b shows the detail of the guide block (71). A pair of guide pins (74) is fixed extending from the inner side to the outer side of the guide block (71). A L-shaped block (72) is mounted extending outwardly from the middle section of the second end of the extension panel (13) via a extension spacer block (73) secured at one side inline with the edge of the second end of the extension panel (13). Figure 5c shows the detail of the L-shaped block (72) mounted to the extension panel (13).

[0022] The side bars (21, 22) at their inner sides each are provided with a pair of grooves (80) disposed at positions reciprocating with the guide pins (74) at the guide blocks (71) when the extension panel (13) is raised or lowered. Each of the grooves (80) consists of an inclined portion (81) and a horizontal portion (82) adjacent the top side of the side bars (21, 22) as shown in figure 8.

[0023] The structure of the table (50) on the side of the other main top panel (12) and the structure of the other extension panel (14) are the same as those just described. The operation of the mechanism for raising and lowering the extension panel (13) into and out of the operative position will now be described in details. It will be understood that the description applies equally to the operation of the other extension panel (14).

[0024] The extensible table (50) may be of any suitable or known construction and the form shown in the drawings and described is to be regarded as merely typical of one embodiment. For clearness the table portions are shown in chain dotted lines and the unit in full lines.

[0025] Assuming the table (50) is closed or contracted position, where the extension panels (13, 14) are stowed away beneath the main top panel (11, 12) and accommodated in the clearance gap (46). At this position, the underside of the extension panel (13) is seated on one or more longitudinal side bars (21, 22). The push blocks (60) are at horizontal and parallel with the sliding rails (41, 42) within the apertures (47) of the fixed guide bars (43). The guide pins (74) are fixed to the lower most position of the inclined portions (81) of the grooves (80). To extend the table (50) by bringing one of the extension panels, say extension panel (13) into the raised or operative position, the movable main top panel (11) is pulled outwardly by hand from the engagement of the main tongue (16) of the main top panel (11) and the hole (35) of the fixed bar to a position slightly farther than the extension which is stopped by the stopping means (68) at the sliding rail (41) until the whole extension panel (13) is exposed. During this movement, the push block (60) is caused to pass under the extension panel (13) from the first end to the second end. At fully extended position, the push block (30) will be brought into a vertical upright position by gravity force at shown in figure 7.

[0026] The main top panel (11) is then pushed inwardly to the centre of the table (50). By doing so, the push block (60) will come into contact with edge of the second end of the extension panel (13) thereby pushed the extension panel (13) to move upwardly guided by the guide pins (74) moving upwardly along the inclined portions (81) of the grooves (80) as shown in figure 9. At a position where the tapered end of the push block (50) in contact with the extension panel (13), the L-shaped block (72) is then in engagement with a top panel spacer block (49) located at the main top panel (11) to support the movement of the extension panel (13).

[0027] Further inward movements of the main top panel (11) then raised the extension panel (13) until the

guide pins (74) of the guide block (71) engaged the horizontal portions (82) of the grooves (80) and to locate the extension panel (13) in co-planar alignment therewith as shown in figure 9 and 10. The extension panel (13) is then stopped by the central stop rail (90) where the bottom side of inner edge of the extension panel (13) resting on the step (33) and the extension tongues (15) of the extension panel (13) and main tongues (16) of the main top panel (11) having engagement with fixed bar holes (35) and extension panel holes (85) respectively. The table (50) has now completed the operation into extended condition.

[0028] In order to reverse the movement of the table and stowing away the extension panel (13), the main top panel (11) is slightly pulled apart to disengaged the tongues (15, 16) from the holes (35, 85). The guide pins (74) traveled along the horizontal portions (82) of the grooves (80) while the L-shaped block (72) will then hooked onto the top panel spacer block (49) of the main top panel (11). Further outwardly movement of the main top panel (11) will pull the guide pins (74) into contact with the inclined portion (81) of the grooves (80) and leaving substantial gap to allow the extension panel (13) drop by gravity into stowed position.

[0029] It is to be understood that the present invention may be embodied in other specific forms and is not limited to the sole embodiment described above. However modification and equivalents of the disclosed concepts such as those which readily occur to one skilled in the art are intended to be included within the scope of the claims which are appended thereto.

Claims

1. An extensible table comprising:

a main frame includes a pair of longitudinal side bars, each having at least one groove;
a main top panel horizontally movable on said main frame having at least one sliding rail mounted at the bottom side of said main top panel;
an extension panel locatable into and out of an operative position with said main top panel whereby said extension panel having guiding means interactively connected into said groove of said main frame:

means which is operative by gravity into vertical upright position mounted to said sliding rail of the main top panel to guide and raise said extension panel into the operative position when said main top panel is moved inwardly to the centre of said table.

2. The extensible table as claimed in claim 1, wherein said main frame further comprising a pair of end cross bars connected at the corresponding opposite ends of said longitudinal side bars; and a pair of transverse support bars each mounted at its opposite ends with the bottom side of said side bars adjacent said end cross bars by fasteners.

3. The extensible table as claimed in claim 2, wherein said main frame includes a central stop rail mounted transversely at the top of said main frame at its middle and forming fixed part of said table.

4. The extensible table as claimed in claim 3, wherein said central stop rail includes a fixed bar formed by a rectangular bar and a pair of blocks secured at the opposing ends of said rectangular bar; and a pair of steps mounted at each side of said pair of blocks on which the bottom side of inner edge of said extension panels or of said slidable main top panels, rest when said table is in extended or contracted positions.

5. The extensible table as claimed in claim 4, wherein said rectangular bar has holes at its corresponding edges.

6. The extensible table as claimed in claim 2, wherein said end cross bars of said main frame having slots at corresponding position to receive and guide said sliding rail.

7. The extensible table as claimed in any claim 1 to 6, wherein said table further comprising a pair of fixed guide bars having apertures, which is securely mounted to said two side bars of said main frame respectively beneath said two steps of said central stop rail.

8. The extensible table as claimed in claim 7, wherein said fixed guide bar includes a horizontally extending beam extended from each said apertures corresponding with the bottom side of said sliding rail for supporting said sliding rail in sliding movement.

9. The extensible table as claimed in claim 1, wherein said main top panel is secured to said sliding rail via a sliding rail spacer block as to provide a clearance gap for receiving said extension panel when said table is in the contracted position.

10. The extensible table as claimed in claim 1, wherein said means is a push block rotatably mounted to the inner side of said sliding rail of said main top panel which is adapted to guide and raise said extension panel into a position which is same level with said main top panel and incorporate with said main top panel and said central stop rail into an extended size of table.

11. The extensible table as claimed in claim 10, wherein said push block having its outwardly facing side which is the opposite side of where said push block in engagement with said inner side of said sliding rail has a cut out slot at a first end of said push block to provide a smaller thickness than said second end of said push block so as said push block is in vertical upright position by gravity when said push block is in engagement free condition.

12. The extensible table as claimed in claim 1, wherein said groove of said side bar consists of an inclined portion and a horizontal portion adjacent the top side of said side bar.

13. The extensible table as claimed in claim 1, wherein said extension panel includes a pair of guide blocks having guide pins slidably fixed at said groove to raise or lower said extension panel to said main top panel and a L-shaped block mounted extending outwardly from the middle section of said second end of said extension panel via a extension spacer block.

14. The extensible table as claimed in claim 9, wherein said main top panel further comprising a top panel spacer block where said L-shaped block can be hooked onto it when said main top panel is pulled to stow said extension panel into the recess of said main frame.

15. The extensible table as claimed in any claim 1 to 14, wherein said extension panel comprising extension tongues located at the first side of said extension panel and said main top panel comprising main tongues which are to be slidably received into said holes of said rectangular bar of said fixed bar.

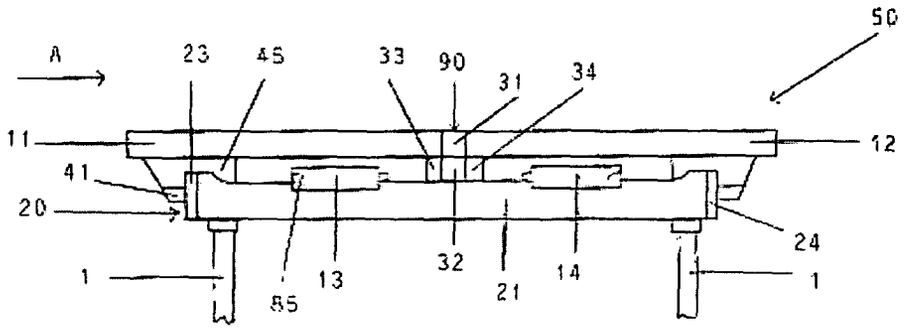

Figure 1

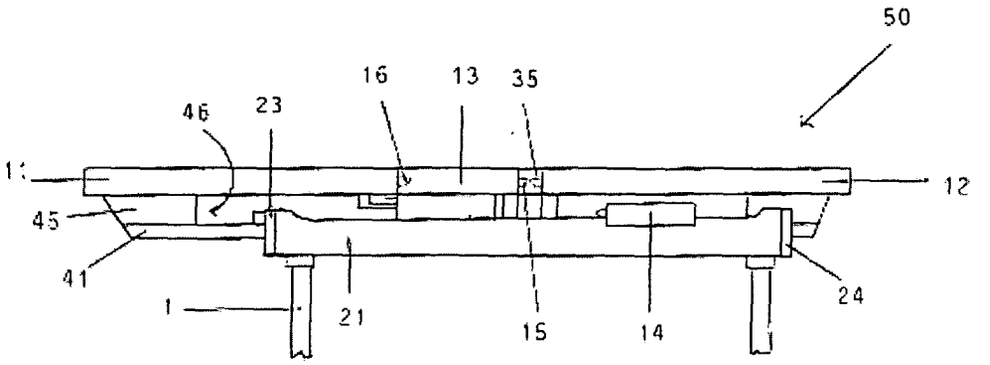

Figure 2

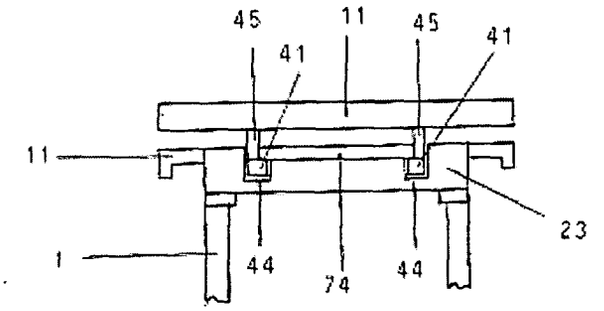

Figure 3

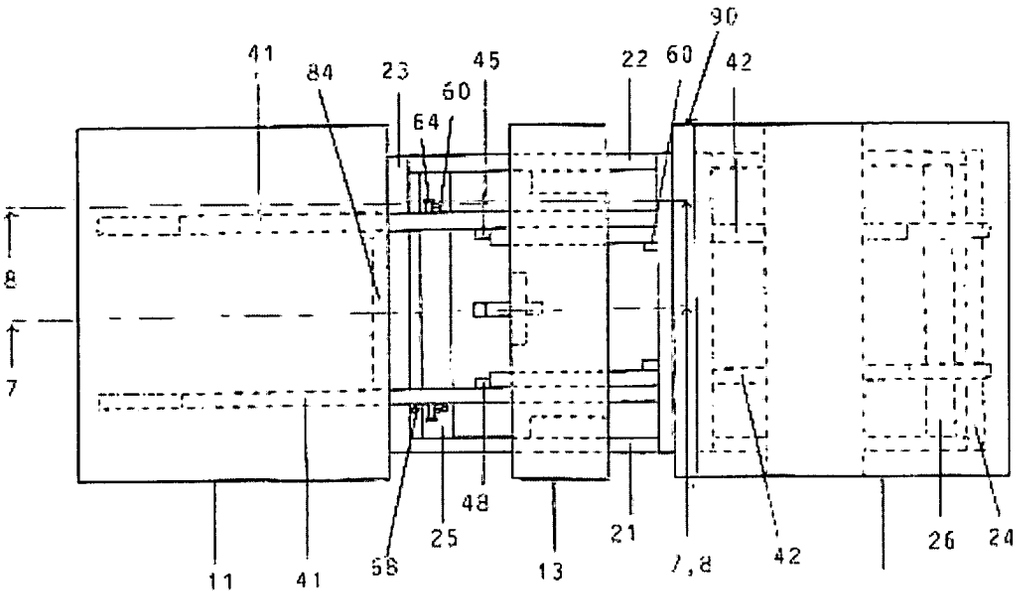

Figure 4

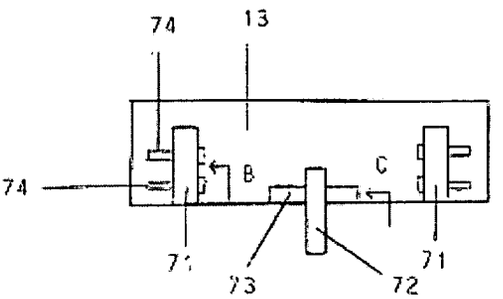

Figure 5a

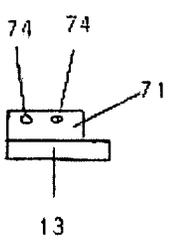

Figure 5b

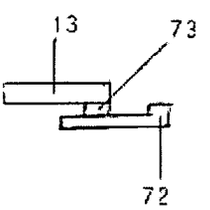

Figure 5c

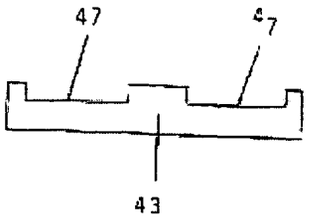

Figure 6

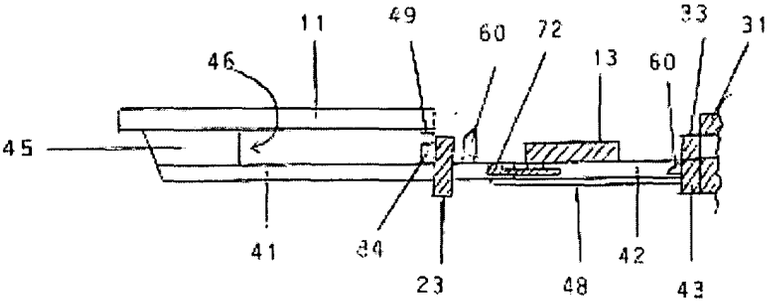

Figure 7

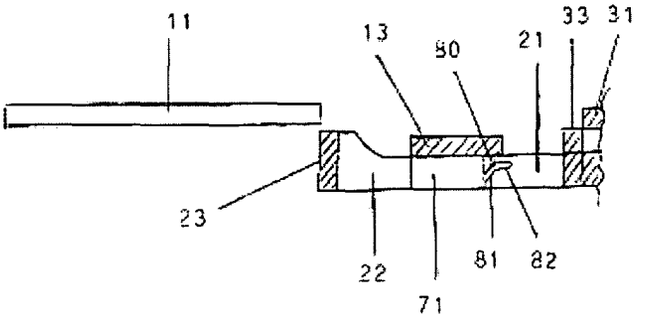

Figure 8

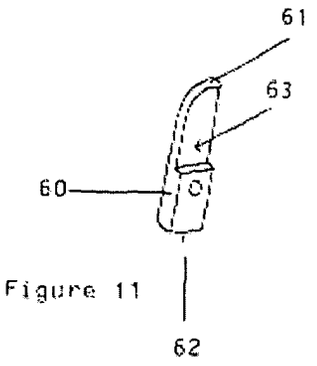

Figure 11

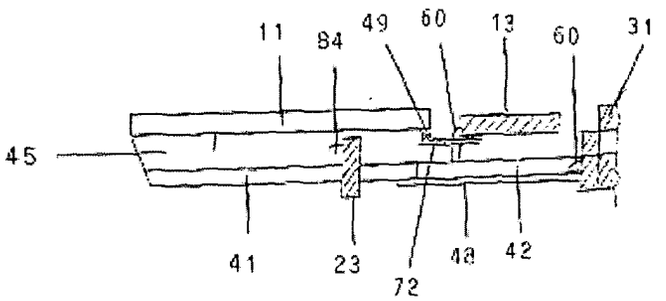

Figure 9

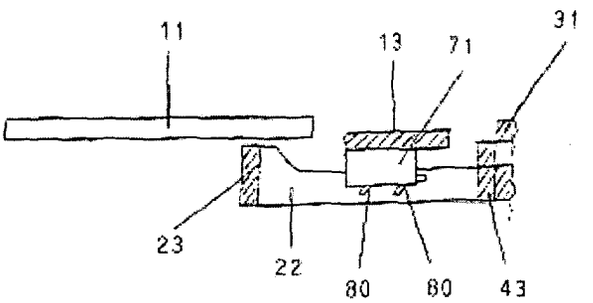

Figure 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 9285

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 044 629 A (BT FURNISHING SDN BHD) 18 October 2000 (2000-10-18)	1	A47B1/02
A	* the whole document *	2-15	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 January 2005	Noesen, R

CATEGORY OF CITED DOCUMENTS

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25-01-2005

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