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(54) **Joint assembly for connecting a leg to a work surface**

Gelenkverbindung zur Befestigung eines Beines an einer Arbeitsfläche

Ensemble de joint pour raccorder un pied a une surface de travail

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(56) References cited:
**EP-A- 0 467 460 EP-A- 0 685 186
EP-A- 0 847 715 FR-A- 2 443 607
GB-A- 2 064 055**

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Description

[0001] The present invention refers to a joint assembly for connecting a leg to a table .

[0002] A joint assembly for connecting a leg to a table according to the closest state of the art is disclosed in EP 0 685 186 A. Document FR 2 443 607 A discloses a device for connecting by expansion two tubular elements with each other, wherein an expansion means is inserted at its opposite ends in the two tubular elements and expanded inside them.

[0003] As is well known to experts of the sector, to reduce encumbrance and the risk of damage during storage and transportation, legs are preferably assembled to the work surface at the time of final installation where the user wants it.

[0004] Moreover, in the sector of table production there is a strong need to realise the surfaces themselves so that they can be disassembled into many distinct parts which can be connected together at a later point in time in a stable and practical manner.

[0005] For example, the realisation of tables for workplaces in particular requires a high flexibility of configurations of the work surface, to combine maximum functionality with the aesthetic aspect.

[0006] The need to cut production costs, whilst still offering the client a vast range of solutions has led to the development of modular structures, which foresee the variable combination of surfaces with a determined number of standardised shapes.

[0007] To standardise the assembly instruments and the tools needed to put together tables or support structures, to benefit both producers and users, multifunctional connectors have also been developed. Multifunctional connectors can be used both to connect the legs of tables to surfaces or to structures and to join two surfaces together.

[0008] Connectors can possibly be dismountable to allow the at least partial reuse of the individual elements in the realisation of new configurations of tables or of support structures, or more simply to allow the subsequent storage thereof.

[0009] Connectors for legs must first of all guarantee a connection which is stable through time to obtain a table or a structure which is solid without the risk of deterioration of the materials used.

[0010] Indeed, resistance to stresses, for example deriving from lifting or sliding, must be guaranteed.

[0011] Moreover, it is desirable that joints for legs also allow end users to rapidly carry out connections with the help of common tools, such as a screwdriver or an Allen key.

[0012] Dismountable joints which are currently available do not allow all of the listed factors to be optimised. Above all they have great difficulty in combining simplicity of construction and use with the requirements of strength, in any case losing out on the aesthetic aspect.

[0013] The general purpose of the present invention

is that of overcoming the aforementioned drawbacks of the prior art in an extremely cost-effective, simple and particularly functional manner.

[0014] Another purpose is that of realising a joint assembly for connecting a leg to a table which achieves an excellent aesthetic result.

[0015] In view of the aforementioned purposes, according to the present invention, it has been thought of to realise a joint assembly for connecting a leg to a table having the characteristics outlined in the attached claims.

[0016] The structural and functional characteristics of the present invention and its advantages compared to the prior art shall become even clearer from an examination of the following description, referring to the attached drawings, which show a joint assembly for connecting a leg to a table realised according to the innovative principles of the invention itself.

[0017] In the drawings:

- figure 1 shows a plan view of a first embodiment of a joint assembly for connecting a leg to a table mounted at a corner of a surface;
- figure 2 is a section view of figure 1, according to the line II-II;
- figure 3 is a plan view of the joint of figure 1 shown with the expandable body removed and mounted as a joint between two surfaces;
- figure 4 is a section view of the joint of figure 3 realised at the middle point;
- figure 5 is a perspective view of an expandable body equipped with a manoeuvring pin
- figure 6 is a plan view of the expandable body of figure 5, partially sectioned to show a threaded seat of the manoeuvring pin;
- figure 7 is a section view of figure 6 according to the line VII-VII;
- figures 8 and 9 schematically show the deformation action caused by the manoeuvring pin on the expandable body;
- figures 10 and 11 are, respectively, plan and section views of a second embodiment of an expandable joint assembly;
- figure 12 is a plan view of a further embodiment of an joint assembly for a leg with a sleeve having a squared section shown with the expandable body removed;
- figures 13-16 are, respectively, perspective and section views of an joint assembly for connecting a leg to structures of tubular profiles.

[0018] With reference to the drawings, a joint assembly for connecting a leg to a table is wholly indicated with 10. In the illustrated examples, according to the present invention, the joint assembly 10 comprises a sleeve 12 for interaction with a leg 13, which extends from an attachment 14 in a perpendicular direction with respect to the attachment itself and into which an expandable body 15 is inserted.

[0019] The expandable body 15, shown in detail in figures 5-9 comprises an outer wall 16, for example cylindrical, equipped with a portion which is easy to deform, which in the figures consists of a notch 17 extending for the whole height of said outer wall 16. Such a notch 17 can be realised in the outer wall 16 according to generic inclinations or can be replaced by another element which gives the wall elasticity.

[0020] The expandable body 15 is moreover equipped with a threaded seat 18 for a manoeuvring pin 19 through which the expansion is realised, according to that which is shown schematically in figures 8 and 9.

[0021] The manoeuvring pin 19 at one end has a hexagonal seat 20 for the intervention of a tool 21 and at the point terminates with a frustum-of-cone guide surface 22.

[0022] Near to the notch the expandable body has guide surfaces 23 of the deformation to a shape which matches the frustum-of-cone surface 22 of the manoeuvring pin 19.

[0023] The expandable body 15, in the proposed embodiments can be used in combination with joints 10 of different types and characteristics, some embodiments of which shall be described hereafter.

[0024] In figures 1-4 a joint assembly 10 is shown which can be used for the connection of the leg 13 to a table 24 or else also as a joint between individual parts 24a and 24b of the surface.

[0025] Indeed, in such expandable joint assemblies 10 the attachment 14 to a table consists of a triangular-shaped plate 14', upon the sides of which holes 25 are realised, according to a design which allows it to be used in both of the represented assembly situations, given that the tables 24 are equipped at the corners with multifunctional standard prepunching.

[0026] The sleeve 12 has a substantially cylindrical inner surface 26 for coupling with the expandable body 15 and an outer surface 27, also substantially cylindrical and which can be coupled with tubular legs 13 having a matching cross-section.

[0027] The sleeve 12 is also equipped with notches 28 parallel to an axis 29 of the sleeve 12 itself, and more precisely two partial notches 28' and two notches extending for the whole height of the sleeve 28'', arranged facing one another in pairs in diametrically opposite positions.

[0028] The extended notches 28'' give the sleeve 12 the necessary elasticity to be forced against the inner surface of the leg 13, as shown for example in figure 2. The partial notches 28' as well as contributing to giving elasticity, above all allow the tool 21 to access the manoeuvring pin 19. For aesthetic reasons access to the pin 19 is always carried out from a zone hidden from view when the table is assembled, as shown in figures 1 and 3.

[0029] The tubular leg 13, having an inner diameter such as to fitted onto the sleeve 12, is equipped with a hole, not shown, for the intervention of the tool 21 from the outside.

[0030] In figures 10-12 joint assemblies 10 for mounting a tubular leg to a table are shown, where the attach-

ment 14 to the table consists of a punched plate 14'' of a small size, for example L-shaped, which can be mounted flush with the surface in a seat 31 formed here.

[0031] In these embodiments of the joint assembly 10 the sleeve 12 is preferably closed by a base wall 32 equipped with a plurality of holes 33 for attachment to the table 24 through screws.

[0032] The sleeves 12 can have a circular cross-section just as they can for example have a square section (figures 10 and 12).

[0033] Finally, the attachment 14 to a table can consist of an expansion tang 114 for jointing to tubular profiles 34, which constitute a frame support structure for the table 24. Figures 13-16 show joint assemblies 10 which form a terminal element of the frame support structure which can be of different shapes.

[0034] In figure 13 the attachment, partially in view, allows the attachment of the legs 13 in a protruding position with respect to the table 24.

[0035] The described embodiments of the expandable connector 10, refer to sleeves 12 inserted and forced by expansion inside the hollow end of the tubular legs 13.

[0036] The joint assembly for connecting a leg to a table are preferably made out of die-cast aluminium.

[0037] To connect a leg 13 to a table 24 the expandable body 15 is inserted into the sleeve 12 (figure 2), taking care to make the manoeuvring pin 19 fit into the notches 28 and the holes 36 arranged for intervention by the tool 21.

[0038] In rest position, shown in figure 8, the manoeuvring pin 19 is already positioned in the threaded seat 18 of the expandable body 15. By further screwing the pin 19 into the threaded seat 18 through the tool 21 the progressive engagement between the additional guide surfaces of the point of the pin 22 and of the wall 23 near to the notch 17 is caused. The outer wall 16 of the expandable body is therefore deformed until it reaches a circumferential size (figure 9) which takes it to couple by interference with the tubular element with a matching shape which receives the expandable body 15, in other words the sleeve 12.

[0039] From that which is described above with reference to the figures, it is clear how a joint assembly for connecting a leg to a table according to the invention is particularly useful and advantageous. The purpose mentioned in the preamble of the description is thus achieved.

[0040] A joint assembly for a leg, object of the present invention is indeed advantageously realised through simple shapes, which allow fast treatment cycles to be carried out.

[0041] A joint assembly, according to the preferred embodiment with a base wall, also ensures excellent rigidity which is particularly useful in jointing many pieces to form the table.

[0042] Moreover, the outer appearance is not at all penalised by the possible assembly configurations.

[0043] Of course, the forms of the joint assembly for connecting a leg to a table object of the present invention,

can be different from the one shown just as a non-limiting example in the drawings, just as the materials can also be different.

[0044] The scope of protection of the invention is therefore defined by the attached claims.

Claims

1. Joint assembly for connecting a leg (10) to a table (24) comprising an attachment punched plate (14', 14'') to be attached to the lower surface of the table (24), said plate (14', 14'') having a sleeve (12) provided with at least one notch (28) parallel to its axis (29), said sleeve (12) extending perpendicular or oblique thereto and being insertable into the leg (13), the joint further comprising a substantially cylindrical expandable body (15) to be inserted into said sleeve (12), wherein said cylindrical expandable body (15) comprises an outer wall (16) provided with a notch (17) to delimit two expandable shanks and with a threaded seat (18), opposite to said notch (17), for receiving a manoeuvring pin (19) used to expand or contract the two shanks.
2. Joint assembly for a leg (10) according to claim 1, **characterised in that** said sleeve (12) is closed by a base wall (32) equipped with a plurality of holes (33) for attachment to the table (24).
3. Joint assembly for connecting a leg (10) to a table (24) comprising an expansion tang (114) for jointing to tubular profiles (34) which constitute a frame support structure for the table (24), said expansion tang (114) having a sleeve (12) provided with at least one notch (28) parallel to its axis (29), said sleeve (12) extending perpendicular or oblique thereto and being insertable into the leg (13), the joint further comprising a substantially cylindrical expandable body (15) to be inserted into said sleeve (12), wherein said cylindrical expandable body (15) comprises an outer wall (16) provided with a notch (17) to delimit two expandable shanks and with a threaded seat (18), opposite to said notch (17), for receiving a manoeuvring pin (19) used to expand or contract the two shanks.
4. Joint assembly for a leg (10) according to claims 1 or 3, **characterised in that** said expandable body (15) has guide surfaces (23) of the deformation which engage with said manoeuvring pin (19).
5. Joint assembly for a leg (10) according to claims 1 or 3, **characterised in that** it is made out of die-cast aluminium.

Patentansprüche

1. Verbindungsanordnung zum Koppeln eines Beines (10) mit einem Tisch (24), umfassend eine gestanzte Befestigungsplatte (14', 14'') zur Befestigung an der unteren Fläche des Tisches (24), wobei die Platte (14', 14'') eine Hülse (12) aufweist, die mit zumindest einer Kerbe (28) parallel zu ihrer Achse (29) versehen ist, wobei die Hülse (12) rechtwinklig oder schräg dazu verläuft und in das Bein (13) einsetzbar ist, wobei die Verbindung ferner einen im Wesentlichen zylindrischen ausdehnbaren Körper (15) zum Einsetzen in die Hülse (12) umfasst, wobei der zylindrische ausdehnbare Körper (15) eine Außenwand (16) umfasst, die mit einer Kerbe (17), um zwei ausdehnbare Schäfte zu begrenzen, und mit einem mit Gewinde versehenen Sitz (18) gegenüberliegend der Kerbe (17) zur Aufnahme eines Manövriestifts (19) versehen ist, der dazu verwendet wird, die beiden Schäfte auszudehnen oder zusammenzuziehen.
2. Verbindungsanordnung für ein Bein (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hülse (12) durch eine Basiswand (32) geschlossen ist, die mit mehreren Löchern (33) zur Befestigung an dem Tisch (24) ausgestattet ist.
3. Verbindungsanordnung zum Koppeln eines Beines (10) mit einem Tisch (24), umfassend einen Ausdehnungszapfen (114) zum Verbinden mit rohrförmigen Profilen (34), die eine Rahmenstützstruktur für den Tisch (24) bilden, wobei der Ausdehnungszapfen (114) eine Hülse (12) aufweist, die mit zumindest einer Kerbe (28) parallel zu ihrer Achse (29) versehen ist, wobei die Hülse (12) rechtwinklig oder schräg dazu verläuft und in das Bein (13) einsetzbar ist, wobei die Verbindung ferner einen im Wesentlichen zylindrischen, ausdehnbaren Körper (15) zum Einsetzen in die Hülse (12) umfasst, wobei der zylindrische ausdehnbare Körper (15) eine Außenwand (16) umfasst, die mit einer Kerbe (17), um zwei ausdehnbare Schäfte zu begrenzen, und mit einem mit Gewinde versehenen Sitz (18) gegenüberliegend der Kerbe (17) zur Aufnahme eines Manövriestifts (19) versehen ist, der dazu verwendet wird, die beiden Schäfte auszudehnen oder zusammenzuziehen.
4. Verbindungsanordnung für ein Bein (10) nach einem der Ansprüche 1 oder 3, **dadurch gekennzeichnet, dass** der ausdehnbare Körper (15) Führungsflächen (23) der Verformung besitzt, die mit dem Manövriestift (19) in Eingriff treten.
5. Verbindungsanordnung für ein Bein (10) nach einem der Ansprüche 1 oder 3, **dadurch gekennzeichnet, dass** sie aus druckgegossenem Aluminium herge-

stellt ist.

Revendications

1. Système d'assemblage pour monter un pied (10) sur une table (24), comprenant une plaque de fixation perforée (14', 14'') destinée à être fixée à la surface inférieure de la table (24), ladite plaque (14', 14'') ayant une douille (12) pourvue d'au moins une encoche (28) parallèle à son axe (29), ladite douille s'étendant perpendiculairement ou obliquement par rapport à celle-ci et pouvant être insérée dans le pied (13), l'assemblage comprenant en outre un corps déployable sensiblement cylindrique (15) destiné à être inséré dans ladite douille (12), ledit corps déployable cylindrique (15) comportant une paroi extérieure (16) pourvue d'une encoche (17) afin de délimiter deux corps déployables et d'un support fileté (18), opposé à ladite encoche (17), pour recevoir une tige de manoeuvre (19) servant à déployer ou contracter les deux corps. 5
10
15
20
2. Système d'assemblage pour pied (10) selon la revendication 1, **caractérisé en ce que** ladite douille (12) est fermée par une paroi basale (32) pourvue d'une pluralité de trous (33) pour la fixation à la table (24). 25
3. Système d'assemblage pour monter un pied (10) sur une table (24), comprenant un tenon de déploiement (114) pour assemblage avec des profilés tubulaires (34) qui constituent une structure de support de cadre pour la table (24), ledit tenon de déploiement (114) ayant une douille (12) pourvue d'au moins une encoche (28) parallèlement à son axe (29), ladite douille (12) s'étendant perpendiculairement ou obliquement par rapport à celui-ci et pouvant être insérée dans le pied (13), l'assemblage comprenant en outre un corps déployable sensiblement cylindrique (15) destiné à être inséré dans ladite douille (12), ledit corps déployable cylindrique (15) comportant une paroi extérieure (16) pourvue d'une encoche (17) afin de délimiter deux corps déployables et d'un support fileté (18), opposé à ladite encoche (17), pour recevoir une tige de manoeuvre (19) servant à déployer ou contracter les deux corps. 30
35
40
45
4. Système d'assemblage pour pied (10) selon la revendication 1 ou la revendication 3, **caractérisé en ce que** ledit corps déployable (15) a des surfaces de guidage (23) de la déformation qui viennent contre ladite tige de manoeuvre (19). 50
5. Système d'assemblage pour pied (10) selon la revendication 1 ou la revendication 3, **caractérisé en ce qu'il** est réalisé en aluminium moulé sous pression. 55

Fig.1

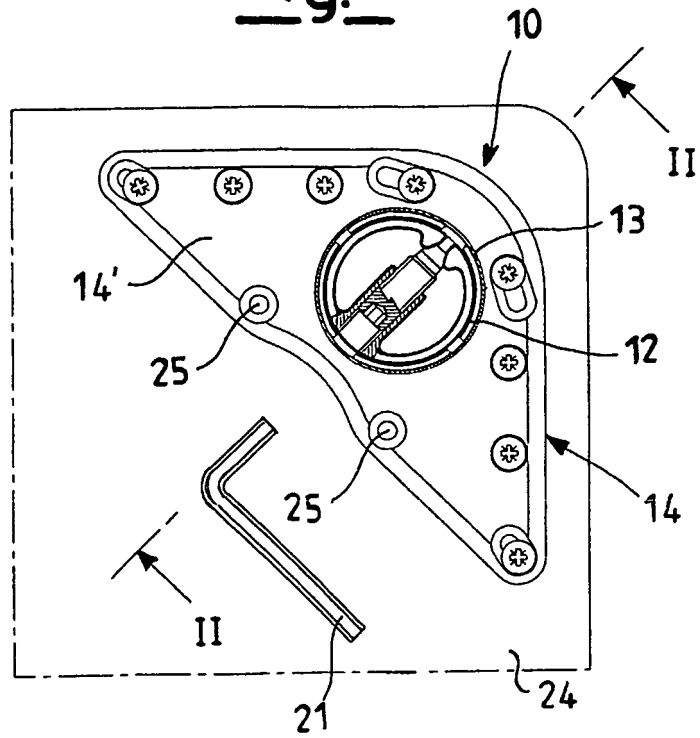


Fig.2

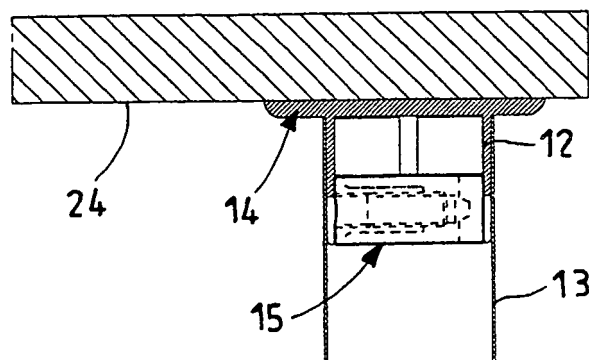


Fig.3

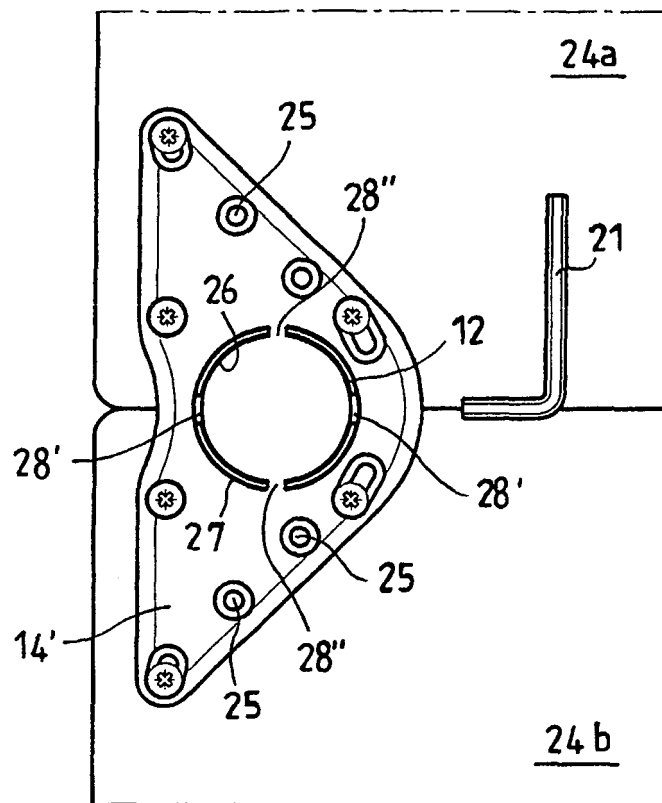
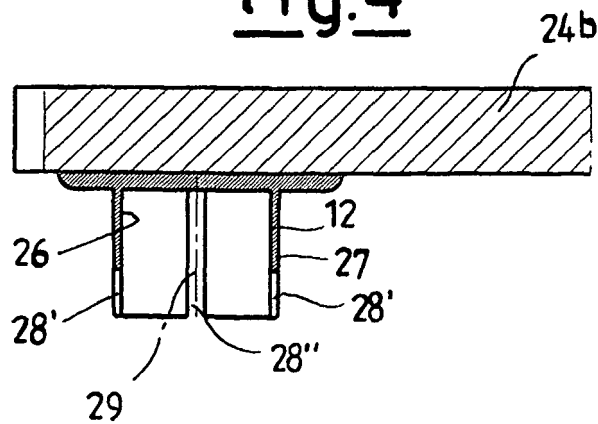


Fig.4



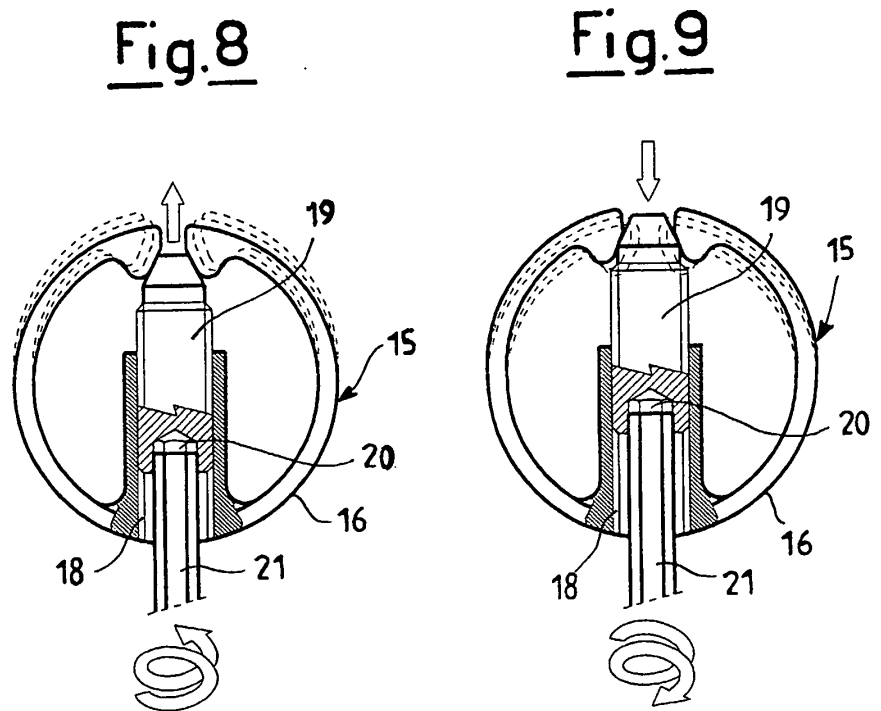
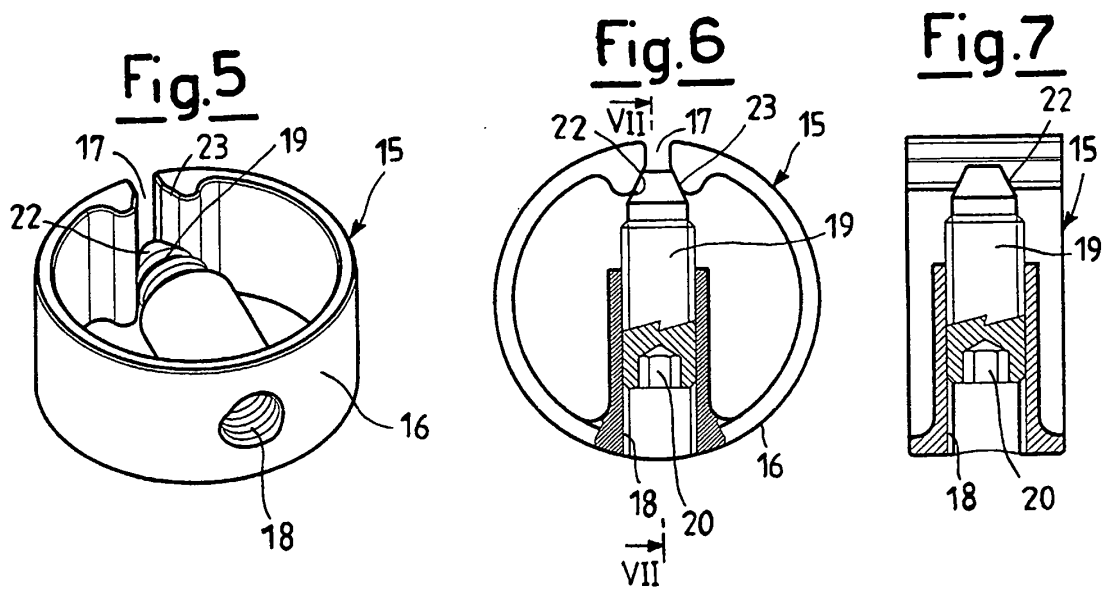


Fig.10

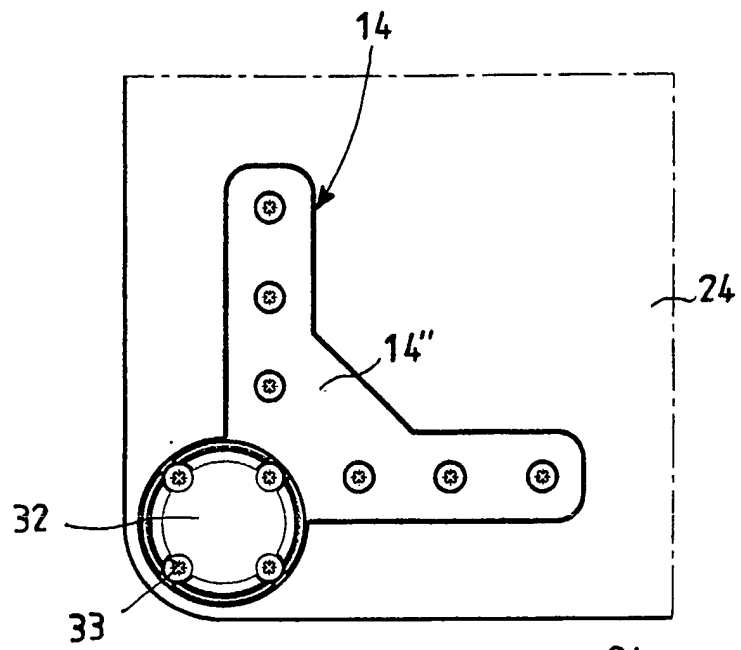


Fig.11

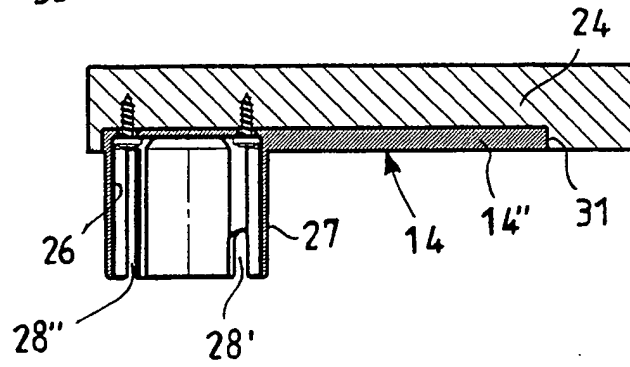


Fig.12

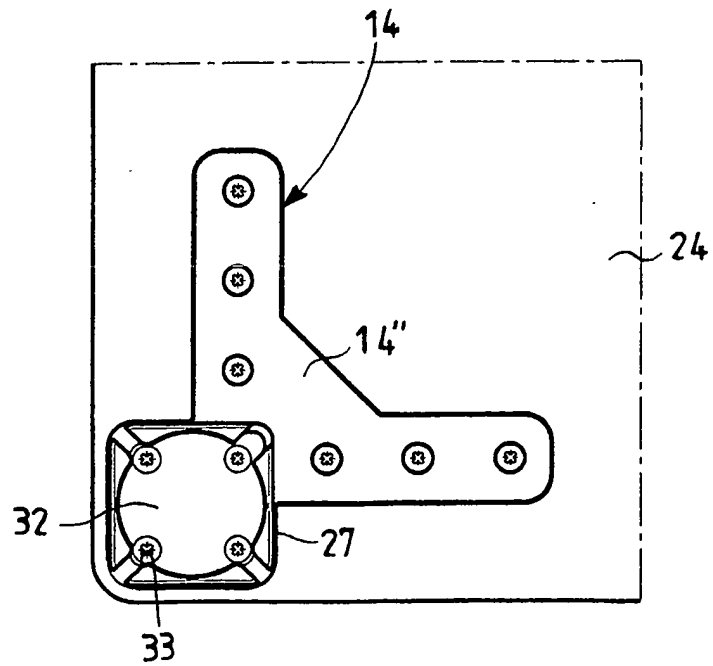


Fig.13

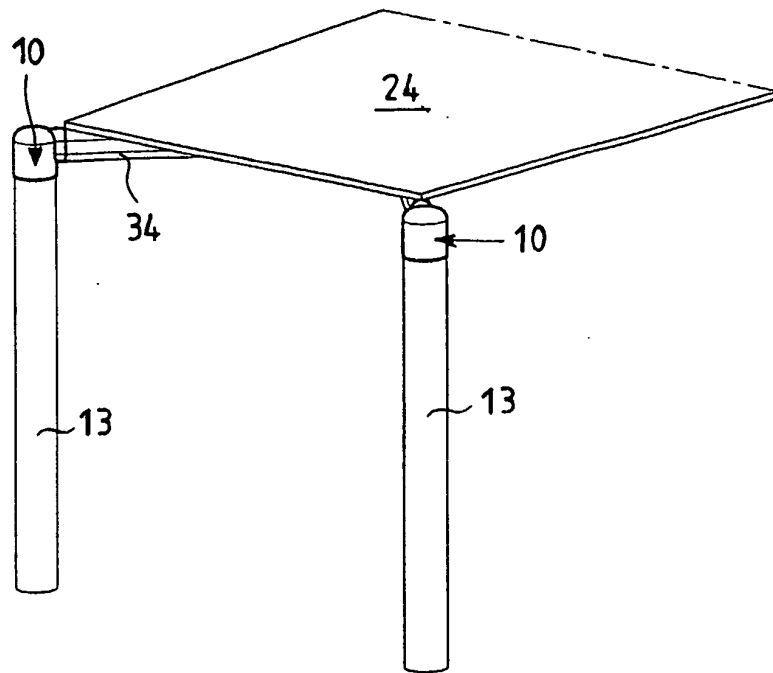


Fig.14

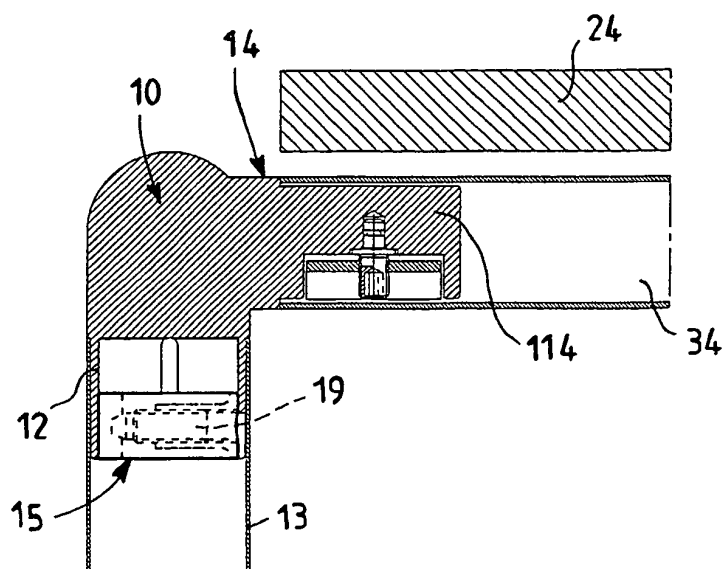


Fig.15

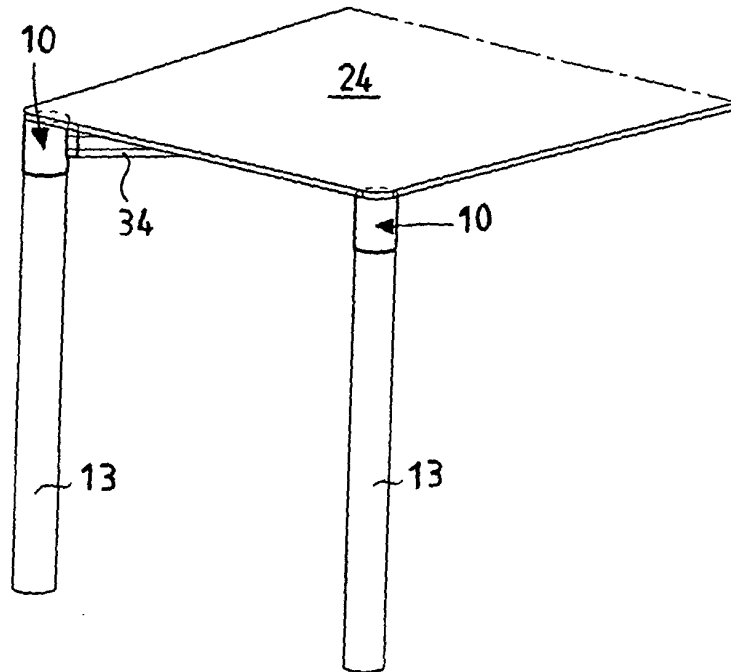
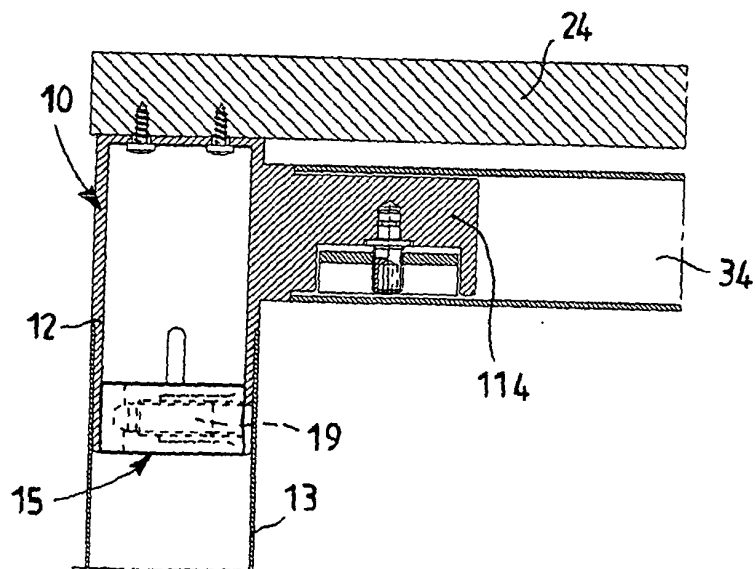


Fig.16



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0685186 A [0002]
- FR 2443607 A [0002]