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**(54) A POSITIONING DEVICE OF AUXILIARY BEARING PLANES OR EXTENSIONS**

POSITIONIERVORRICHTUNG FÜR HILFSEBENE ODER VERLÄNGERUNGEN

DISPOSITIF DE POSITIONNEMENT POUR PLANES OU EXTENSIONS AUXILIAIRES

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**Description**. Field of the invention

5 [0001] The present invention relates to a positioning device of auxiliary supporting or bearing planes, which are also referred to as "extensions", as well as a table with an extension mechanism and a method for the use thereof.

[0002] In particular, the present invention relates to a positioning device of auxiliary bearing planes or extensions comprising a fixed bearing plane forming a first bearing surface, as well as a mobile extension plane or extension.

10 [0003] Said mobile extension plane or extension forms with at least one portion thereof a second supporting or bearing surface or extension surface.

[0004] This device further comprises a sliding structure allowing an extension support structure sliding along a pre-defined extension direction.

[0005] This device further comprises at least one mechanism secured with a first end thereof to the support structure and, with the opposite end, it is secured to the extension.

15 [0006] The present invention particularly relates to those solutions where the extension is handled so as to move from a first rest position, adapted to store said extension, to an operative position in which it is with a bearing surface thereof coplanar to the first bearing surface of the fixed plane.

. State of the art

20 [0007] It is known that the extension mechanisms, for example for bearing planes, such as tables, comprise systems to lift the extensions. However, such known solutions are typically very complex from both a constructive viewpoint and an end use viewpoint, as well as very bulky, especially in height in order to ensure a proper stability and precision to the table assembly.

25 [0008] The document GB156430 by ARTHUR NORMAN and HENRY GALE PARKER shows an extendable table having a sliding guide that allows mutually moving away two planes with a fixed height. A folded extension is received in a seat arranged centrally and below the planes with fixed height. This extension is guided in the extraction thereof and the opening thereof to a position that is coplanar to the planes with fixed height.

30 [0009] This state of the art is very difficult to be manufactured in order to handle both the fixed-height planes, and several operations, even very complex, are required to the user to bring the extension plane to the use position.

[0010] All these known solutions force to operate in three steps: extraction of the auxiliary plane, opening thereof, positioning thereof *in situ*.

35 [0011] The document AT500895 by TEAM 7 NATUERLICH WOHNEN GMBH shows a table having a fixed-height plane mounted on slidable guides and a pair of extension planes arranged below the fixed-height plane. One of the extension planes is provided with a pin which slides along a curved guide to rotatably guide the pair of extension planes during the extraction thereof. This solution is extremely complex to be obtained, forcing to constructive tolerances that, on one hand, have to facilitate the sliding of the pin into the guide and, on the other hand, have to limit the clearances in order to not create stickings or difficulties in the use, as well as a unsafety feel when using the extension plane. Document DE 20 2013 100 154 U1 shows another extensible table, disclosing the preamble of the present claim 1.

40 [0012] Actually, no one of the known solutions suggests how to obtain a positioning device of auxiliary bearing planes or extensions that is able to bring the extension to the use position with few and simple operations, while being simple to be manufactured.

. Solution

45 [0013] Therefore, the object of the present invention is to propose a carriage or cart and a positioning device of auxiliary bearing planes or extensions that allows bringing an extension to place in a simple manner.

[0014] A further object of the present invention is to propose a positioning device of auxiliary bearing planes or extensions that is easy to be manufactured.

50 [0015] A still further object of the present invention is to propose a positioning device of auxiliary bearing planes or extensions that has reduced or very reduced overall dimensions.

. Figures

55 [0016] Further characteristics and advantages of the device according to the invention will be apparent from the description set forth below of preferred embodiment examples thereof, given by way of illustrative, nonlimiting example, with reference to the appended figures, in which:

- Fig. 1 represents an axonometric view of a table with a portion of a rest plane with a fixed height and two opposite mobile rest plane portions;
- Fig. 2 illustrates a detail of a longitudinal section to the table of Fig. 1, so as to highlight the positioning device of auxiliary bearing planes or extensions;
- 5 - Fig. 3 illustrates a cross section of a detail of the table of Fig. 1, in which some details of the device and the extension are highlighted when the table is with the sliding structure thereof in the extended position;
- Fig. 4 represents a detail of a longitudinal section of the table of Fig. 3 in the extended position;
- Fig. 5 represents an axonometric view of a detail of the support structure in which an extension is stored where part of the device is illustrated in transparency;
- 10 - Fig. 6 illustrates an axonometric view of the detail of Fig. 5 in which the extension is in a first extraction position;
- Fig. 7 represents an axonometric view of the detail of Fig. 5 in which the extension is in a second extraction position;
- Fig. 8 represents an axonometric view of the detail of Fig. 5 in which the extension is in a fully extracted position and resting on the support structure arranged in the extended position;
- Fig. 9 represents an axonometric view from a different observation point of the detail of Fig. 7;
- 15 - Fig. 10 shows a view of a quadrilateral mechanism in a partially lifted position;
- Fig. 11 shows the detail of Fig. 10 according to the section C-C of Fig. 10;
- Fig. 12 illustrates a perspective view of a quadrilateral mechanism in the rest position;
- Fig. 13 represents a perspective view of a table with the support structure thereof in the extended position and the mobile extension plane or extension in the stored rest position arranged within the support structure seat;
- 20 - Fig. 14 represents a perspective view of the table of Fig. 13 in which the mobile extension plane or extension is in the extracted position and rested on the outer frame of the support structure with a portion thereof folded as a book;
- Fig. 15 illustrates a perspective view of the table of Fig. 13 in which the mobile extension plane or extension is the extracted position, extended and rested on the outer frame of the support structure.

#### 25 Description of some preferred embodiments

**[0017]** With reference to the above-mentioned figures, a positioning device of auxiliary bearing planes or extensions 1 comprises at least one fixed bearing plane 2.

**[0018]** Said fixed bearing plane 2 forms a first bearing surface 3.

30 **[0019]** Said device further comprises at least one mobile extension plane, also referred to as an extension member or extension 4, forming, with at least one portion thereof, a second bearing surface or extension surface 10.

**[0020]** Said device further comprises a support structure 6 mobile along a predefined extension direction X-X, as well as at least one sliding structure 5 that allows said support structure 6 sliding along said predefined extension direction X-X.

**[0021]** Said device further comprises at least one articulated quadrilateral mechanism 7.

35 **[0022]** In accordance with the invention, said articulated quadrilateral mechanism 7 is secured with at least one first connecting rod 8 thereof to the support structure 6.

**[0023]** In accordance with the invention, said articulated quadrilateral mechanism 7 is secured with a second connecting rod 9 thereof to said mobile extension plane or extension 4.

40 **[0024]** In accordance with the invention, said mobile extension plane or extension 4 is connected to the articulated quadrilateral mechanism 7 so as to move from a first rest position, adapted to store said mobile extension plane or extension 4 so that the second bearing surface 10 thereof is not coplanar to the first bearing surface 3 of the fixed plane, to a second operative position in which it is with at least one part of said second bearing surface 10 coplanar to the first bearing surface 3 of the fixed plane.

45 **[0025]** In accordance with the invention, the movement of the articulated quadrilateral occurs along a trajectory T that is inclined by a predefined angle A, with respect to the extension direction X-X, different from 0 DEG (hexadecimal degrees) and 90 DEG.

**[0026]** In accordance with the invention, said trajectory T of the quadrilateral mechanism 7 has a predefined inclination so that the mobile extension plane 4 ends the trajectory thereof directly in the use position, for example, rested on said support structure 6 with at least one portion of the second bearing surface or extension surface 10 thereof coplanar to said first bearing surface 3 of the fixed plane 2.

**[0027]** In accordance with an embodiment the angle A between the trajectory T of the quadrilateral mechanism and the extraction direction X-X ranges between 10 DEG and 80 DEG, preferably 75 DEG.

**[0028]** In accordance with an embodiment said articulated quadrilateral mechanism 7 has connecting rods 8, 9 and cranks 11 mutually connected by hinges 12.

55 **[0029]** Said hinges have a rotational axis Y-Y inclined with respect to the extension direction X-X by an angle that is different from 0 DEG and 90 DEG.

**[0030]** In accordance with an embodiment the angle that the rotational axis Y-Y of said hinges forms with the extension direction X-X ranges between -10 DEG and -80 DEG, preferably -15 DEG.

[0031] In accordance with an embodiment said support structure 6 comprises a seat 13 and a frame 14.

[0032] In accordance with an embodiment said mobile extension plane or extension 4 is connected to the articulated quadrilateral mechanism 7 so as to move from a first rest position, adapted to store said mobile extension plane or extension 4 in said seat 13, to a second operative position in which it is at least partially rested on said frame 14.

[0033] In accordance with an embodiment said mobile extension plane 4 is formed by two portions 15, 16 that can be overlapped and mutually hinged to form, when they are in the extended position and mutually coplanar, a single bearing surface 10 arranged coplanar to the first bearing surface 3 of the fixed plane 2.

[0034] In accordance with an embodiment said mobile extension plane 4 is connected to two articulated quadrilateral mechanisms 7, both forming mutually parallel trajectories T, T'.

[0035] In accordance with an embodiment both said articulated quadrilateral mechanisms 7 have connecting rods 8, 9 and cranks 11 mutually connected by hinges 12.

[0036] In accordance with an embodiment, said hinges 12 have a rotational axis Y-Y inclined with respect to an extension direction X-X by an angle that is different from 0 DEG and 90 DEG.

[0037] In accordance with an embodiment the articulated quadrilateral mechanism 7 comprises components 8, 9, 11 that are plate-shaped and arranged to one another so as, when they are in rest conditions, to be arranged all mutually coplanar, reducing the transversal overall dimensions of the quadrilateral mechanism 7.

[0038] In accordance with an embodiment said device comprises a stop or end stroke member 19 that limits the stroke of the trajectory T of the articulated quadrilateral mechanism 7 when in a fully extended position so as to fully or partially unburden the weight of the mechanism itself and the mobile plane or extension 4 on the stop member 19.

[0039] In accordance with an embodiment the articulated quadrilateral mechanism 7 comprises:

- connecting rods 8, 9 having a plate-shaped body provided with loops 17 for securing to the fixed plane 2 and the support structure 6;
- cranks 11 having a plate-shaped body forming the frame of the quadrilateral mechanism;
- hinges 12 for an articulated connection of the connecting rods 8, 9 to the cranks 11 with an hinge axis Y-Y parallel to the plate-shaped extension of the connecting rods and the cranks.

[0040] In accordance with an embodiment the connecting rods 8 for the connection of the articulated quadrilateral mechanism to the fixed bearing plane 2 are in a number of two and are arranged mutually parallel and mutually spaced so as to connect a wide surface of the fixed plane 2 thus increasing the mechanism stability.

[0041] In accordance with an embodiment the connecting rods 9 for the connection of the articulated quadrilateral mechanism to the support structure 6 are in a number of two and are arranged mutually parallel and mutually spaced so as to connect a wide surface of the support structure 6 thus increasing the mechanism stability.

[0042] In accordance with an embodiment the cranks 11 are in a number of two and are connected by crossbeams 18 so as to keep them mutually spaced and parallel.

[0043] In accordance with an embodiment the hinges 12 are in a number of four to connect two connecting rods 8 for the connection of the fixed plane to first ends of the two cranks 11 and to connect the two connecting rods 9 for the connection to the support structure to the two opposite ends of the cranks 11.

[0044] In accordance with an embodiment the connecting rods 8, 9 for securing to the fixed plane and to the support structure and the cranks 11 are obtained from a shaped and/or cut plate, and they are mutually suitable to be arranged in a coplanar position to reduce the overall dimensions of the device.

[0045] The present invention particularly relates to a table, or similar article of furniture, comprising a device 1 as described above according to the any of the various embodiment.

[0046] A method for the positioning of auxiliary bearing planes or extensions is described herein below.

[0047] A possible positioning method of an extension comprises the steps of:

- extending a support structure 6 with respect to a fixed bearing plane 2 having a first bearing surface 3 along an extension direction X-X;
- lifting a mobile extension plane or extension 4 from a rest position;
- having the mobile plane or extension 4 follow a trajectory T that is inclined with respect to the extension direction X-X by an angle A different from 0 DEG and 90 DEG;
- ending the trajectory T by bringing the mobile plane or extension 4 to its use position so that at least one portion of the second bearing surface 10 is coplanar to the first bearing surface 3.

[0048] In accordance with a different method, the further step is provided for, of:

- opening the extension 4 bringing the entire second bearing surface thereof to be coplanar to the first bearing surface 3.

**[0049]** In accordance with a different method, the further step is provided for, of:

- at the end of the inclined trajectory T, resting the mobile plane or extension 4 to the support structure 6.

**[0050]** In accordance with a still different method, the further step is provided for, of:

- at the end of the inclined trajectory T, at least partially resting the mobile plane or extension 4 to the stop member 9.

**[0051]** Of course, those of ordinary skill in the art, in order to meet contingent, specific needs, will be able to make a number of modifications and variations to the cart or mechanism according to the invention, all anyhow falling within the protection scope of the invention, as defined by the following claims.

## REFERENCES

**[0052]**

|     |                                                               |
|-----|---------------------------------------------------------------|
| 1   | Positioning device of auxiliary bearing planes or extensions  |
| 2   | Fixed bearing plane                                           |
| 3   | First bearing surface                                         |
| 4   | Mobile extension plane or extension                           |
| 5   | Sliding structure                                             |
| 6   | Support structure                                             |
| 7   | Articulated quadrilateral mechanism                           |
| 8   | First connecting rod                                          |
| 9   | Second connecting rods                                        |
| 10  | Second rest surface or extension surface                      |
| 11  | Articulated quadrilateral cranks                              |
| 12  | Hinges                                                        |
| 13  | Seat obtained in the support structure                        |
| 14  | Frame obtained in the support structure                       |
| 15  | First mobile plane portion                                    |
| 16  | Second mobile plane portion                                   |
| 17  | Connecting rod securing loops                                 |
| 18  | Articulated quadrilateral crossbeams                          |
| 19  | Stop or end stroke member                                     |
| X-X | Extension direction                                           |
| T   | Articulated quadrilateral movement trajectory                 |
| A   | Inclination angle of the articulated quadrilateral trajectory |
| Y-Y | Rotational axis of the hinges                                 |
| T'  | Parallel trajectory of the second articulated quadrilateral   |

## Claims

**1.** An auxiliary bearing planes or extensions positioning device (1), comprising:

- at least one fixed bearing plane (2), said fixed bearing plane (2) forming a first bearing surface (3);

- at least one mobile extension plane or extension (4) forming, with at least one portion thereof, a second bearing surface or extension surface (10);
- a support structure (6) mobile along a predefined extension direction (X-X);
- at least one sliding structure (5) allowing said support structure (6) sliding along said predefined extension direction (X-X);
- at least one articulated quadrilateral mechanism (7);
- said articulated quadrilateral mechanism (7) being secured with at least one first connecting rod (8) thereof to the support structure (6);
- said articulated quadrilateral mechanism (7) being secured with a second connecting rod (9) thereof to said mobile extension plane or extension (4);
- said mobile extension plane or extension (4) being connected to the articulated quadrilateral mechanism (7) so as to move from a first rest position, adapted to store said mobile extension plane or extension (4) so that the second bearing surface (10) thereof is not coplanar to the first bearing surface (3) of the fixed plane, to a second operative position in which it is with at least one part of said second bearing surface (10) coplanar to the first bearing surface (3) of the fixed plane;

#### characterized in that

the movement of the articulated quadrilateral mechanism occurs along a trajectory (T) that is inclined by a predefined angle (A), with respect to the extension direction (X-X), which is different from 0 DEG and 90 DEG.

2. The device (1) according to claim 1, wherein said trajectory (T) of the quadrilateral mechanism (7) has a predefined inclination so that the mobile extension plane (4) ends the trajectory thereof directly in the use position, for example, rested on said support structure (6) with at least one portion of the second bearing surface or extension surface (10) thereof coplanar with said first bearing surface (3) of the fixed plane (2); and/or wherein the angle (A) between the trajectory (T) of the quadrilateral mechanism and the drawing direction (X-X) ranges between 10 DEG and 80 DEG, preferably 75 DEG, and/or wherein said articulated quadrilateral mechanism (7) has connecting rods (8, 9) and cranks (11) mutually connected by hinges (12), said hinges have a rotational axis (Y-Y) inclined with respect to the extension direction (X-X) by an angle that is different from 0 DEG and 90 DEG and/or wherein the angle that the rotational axis (Y-Y) of said hinges forms with the extension direction (X-X) ranges between - 10 DEG and -80 DEG, preferably -15 DEG.
3. The device (1) according to claim 1 or 2, wherein
  - said support structure (6) comprises a seat (13) and a frame (14);
  - said mobile extension plane or extension (4) is connected to the articulated quadrilateral mechanism (7) so as to move from a first rest position, adapted to store said mobile extension plane or extension (4) in said seat (13), to a second operative position wherein it is at least partially rested to said frame (14); and/or wherein
  - said mobile extension plane (4) is formed by two portions (15, 16) that can be overlapped and mutually hinged to form, when they are in extended position and mutually coplanar, a single bearing surface (10) arranged coplanar to the first bearing surface (3) of the fixed plane (2).
4. The device (1) according to any of the preceding claims, wherein said mobile extension plane (4) is connected to two articulated quadrilateral mechanisms (7), both forming mutually parallel trajectories (T, T'); and/or wherein both said articulated quadrilateral mechanisms (7) have connecting rods (8, 9) and cranks (11) mutually connected by hinges (12); said hinges (12) have a rotational axis (Y-Y) inclined with respect to an extension direction (X-X) by an angle different from 0 DEG and 90 DEG.
5. The device (1) according to any of the preceding claims, wherein the articulated quadrilateral mechanism (7) comprises components (8, 9, 11) that are plate-shaped and arranged to one another so as, when they are in a rest conditions, to be arranged all mutually coplanar, thus reducing the transversal overall dimensions of the quadrilateral mechanism (7); and/or wherein said device comprises a stop or end stroke member (19) that limits the stroke of the trajectory (T) of the articulated quadrilateral mechanism (7) when in a completely extended position, so as to partially unburden the weight of the mechanism itself and of the mobile plane or extension (4) on the stop member (19).
6. The device (1) according to any of the preceding claims, wherein the articulated quadrilateral mechanism (7) comprises:

- connecting rods (8, 9) having a plate-shaped body provided with loops (17) for securing to the fixed plane (2) and to the support structure (6);
- cranks (11) having a plate-shaped body forming the frame of the quadrilateral mechanism;
- hinges (12) for an articulated connection of the connecting rods (8, 9) to the cranks (11) with an hinge axis (Y-Y) parallel to the plate-shaped extension of the connecting rods and the cranks; and/or wherein
- the connecting rods (8) for the connection of the articulated quadrilateral mechanism to the fixed bearing plane (2) are in a number of two, and are arranged mutually parallel and mutually spaced so as to connect a wide surface of the fixed plane (2), thus increasing the mechanism stability; and/or wherein
- the connecting rods (9) for the connection of the articulated quadrilateral mechanism to the support structure (6) are in a number of two, and are arranged mutually parallel and mutually spaced so as to connect a wide surface of the support structure (6), thus increasing the mechanism stability; and/or wherein
- the cranks (11) are in a number of two and are connected by crossbeams (18) so as to keep them mutually spaced and parallel; and/or wherein
- the hinges (12) are in a number of four to connect two connecting rods (8) for the connection of the fixed plane to first ends of the two cranks (11) and to connect the two connecting rods (9) for the connection to the support structure at the two opposite ends of the cranks (11); and/or wherein
- the connecting rods (8, 9) for fixing to the fixed plane and to the support structure and the cranks (11) are obtained from a shaped and/or cut plate, and they are mutually suitable to be arranged in a coplanar position to reduce the overall dimensions of the device.

7. A table comprising a device (1) as described in any of the claims 1 to 6.

8. A method for positioning auxiliary bearing planes or extensions, comprising the steps of:

- providing at least one articulated quadrilateral mechanism (7); where said articulated quadrilateral mechanism (7) being secured with at least one first connecting rod (8) thereof to a support structure (6); and said articulated quadrilateral mechanism (7) being secured with a second connecting rod (9) thereof to a mobile extension plane or extension (4); and said mobile extension plane or extension (4) being connected to the articulated quadrilateral mechanism (7) so as to move from a first rest position, adapted to store said mobile extension plane or extension (4) so that the second bearing surface (10) thereof is not coplanar to the first bearing surface (3) of the fixed plane, to a second operative position in which it is with at least one part of said second bearing surface (10) coplanar to the first bearing surface (3) of the fixed plane;
- extending a support structure (6) with respect to a fixed bearing plane (2) having a first bearing surface (3) along an extension direction (X-X);
- lifting a mobile extension plane or extension (4) from a rest position;

#### characterized in that

- having the mobile plane or extension (4) follow a trajectory (T) that is inclined with respect to the extension direction (X-X) by an angle (A) different from 0 DEG and 90 DEG;
- ending the trajectory (T) by bringing the mobile plane or extension (4) in its use position, so that at least one portion of the second bearing surface (10) is coplanar to the first bearing surface (3).

9. The method according to claim 8, wherein the further step is provided, of:

- opening the extension (4) bringing the entire the second bearing surface thereof to be coplanar to the first bearing surface (3).

10. The method according to claim 8 or 9, wherein the further step is provided, of:

- at the end of the inclined trajectory (T), resting the mobile plane or extension (4) to the support structure (6); or
- at the end of the inclined trajectory (T), at least partially resting the mobile plane or extension (4) to the stop member (9).

#### Patentansprüche

1. Hilfslagerebenen- oder Verlängerungen-Positioniervorrichtung (1), welche aufweist:

- zumindest eine feste Lagerebene (2), wobei die feste Lagerebene (2) eine erste Lageroberfläche (3) bildet;
- zumindest eine bewegliche Verlängerungsebene oder Verlängerung (4), die mit zumindest einem Abschnitt davon eine zweite Lageroberfläche oder Verlängerungsoberfläche (10) bildet;
- eine Tragstruktur (6), die entlang einer vordefinierten Erstreckungsrichtung (X-X) beweglich ist;
- zumindest eine Schiebestructur (5), die ein Verschieben der Tragstruktur (6) entlang der vordefinierten Erstreckungsrichtung (X-X) beweglich ist;
- zumindest einen Vierseit-Gelenkmechanismus (7);
- wobei der Vierseit-Gelenkmechanismus (7) mit zumindest einer ersten Verbindungsstange (8) davon an der Tragstruktur (6) gesichert ist;
- wobei der Vierseit-Gelenkmechanismus (7) mit einer zweiten Verbindungsstange (9) davon an der beweglichen Verlängerungsebene oder Verlängerung (4) gesichert ist;
- wobei die bewegliche Verlängerungsebene oder Verlängerung (4) mit dem Vierseit-Gelenkmechanismus (7) so verbunden ist, dass sie von einer ersten Ruheposition, die dazu ausgelegt ist, die bewegliche Verlängerungsebene oder Verlängerung (4) so unterzubringen, dass ihre zweite Lageroberfläche (10) zu der ersten Lageroberfläche (3) der festen Ebene nicht koplanar ist, zu einer zweiten Betriebsposition, in der sie mit zumindest einem Teil der zweiten Lageroberfläche (10) zu der ersten Lageroberfläche (3) der festen Ebene koplanar ist, zu bewegen;

**dadurch gekennzeichnet, dass**

die Bewegung des Vierseit-Gelenkmechanismus entlang einer Bahn (T) erfolgt, die im Bezug auf die Erstreckungsrichtung (X-X) um einen vorbestimmten Winkel (A) geneigt ist, der von 0 Grad und 90 Grad verschieden ist.

2. Die Vorrichtung (1) nach Anspruch 1, wobei die Bahn (T) des Vierseit-Mechanismus (7) eine vordefinierte Neigung hat, so dass die Bahn (T) der beweglichen Verlängerungsebene (4) direkt in der Gebrauchsposition endet, zum Beispiel mit zumindest einem Abschnitt der zweiten Lageroberfläche oder Verlängerungsoberfläche (10) davon koplanar mit der ersten Lageroberfläche (3) der festen Ebene (2) auf der Tragstruktur (6) aufliegt;

und/oder wobei

der Winkel (A) zwischen der Bahn (T) des Vierseit-Mechanismus und der Ausziehrichtung (X-X) zwischen 10 Grad und 80 Grad reicht, bevorzugt 75 Grad,

und/oder

wobei der Vierseit-Gelenkmechanismus (7) Verbindungsstangen (8, 9) und Kurbeln (11) aufweist, die durch Gelenke (12) miteinander verbunden sind, wobei die Gelenke eine Drehachse (Y-Y) haben, die im Bezug auf die Erstreckungsrichtung (X-X) um einen Winkel geneigt ist, der von 0 Grad und 90 Grad verschieden ist,

und/oder

wobei der Winkel, den die Drehachse (Y-Y) der Gelenke mit der Erstreckungsrichtung (X-X) bildet, zwischen -10 Grad und -80 Grad reicht, bevorzugt -15 Grad.

3. Die Vorrichtung (1) nach Anspruch 1 oder 2, wobei

- die Tragstruktur (6) einen Sitz (13) und einen Rahmen (14) aufweist;

- die bewegliche Verlängerungsebene oder Verlängerung (4) mit dem Vierseit-Gelenkmechanismus (7) verbunden ist, um sich von einer ersten Ruheposition, die dazu ausgelegt ist, die bewegliche Verlängerungsebene oder Verlängerung (4) in dem Sitz (13) unterzubringen, zu einer zweiten Betriebsposition, in der sie zumindest teilweise auf dem Rahmen (14) aufliegt, zu bewegen;

und/oder wobei

- die bewegliche Verlängerungsebene (4) durch zwei Abschnitte (15, 16) gebildet ist, die überlappen und aneinander angelenkt sein können, um, wenn sie in der ausgefahrenen Position sind und zueinander koplanar sind, eine einzelne Lageroberfläche (10) bilden, die koplanar zu der ersten Lageroberfläche (3) der festen Ebene (2) angeordnet ist.

4. Die Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei die bewegliche Verlängerungsebene (4) mit zwei Vierseit-Gelenkmechanismen (7) verbunden ist, die beide zueinander parallele Bahnen (T, T') bilden;

und/oder wobei

beide Vierseit-Gelenkmechanismen (7) Verbindungsstangen (8, 9) und Kurbeln (11) aufweisen, die durch Gelenke (12) miteinander verbunden sind;

wobei die Gelenke (12) eine Drehachse (Y-Y) haben, die im Bezug auf eine Erstreckungsrichtung (X-X) um

einen Winkel geneigt ist, der von 0 Grad und 90 Grad verschieden ist.

5. Die Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Vierseit-Gelenkmechanismus (7) Komponenten (8, 9, 11) aufweist, die plattenförmig sind und zueinander so angeordnet sind, dass, wenn sie in einem Ruhezustand sind, alle zueinander koplanar angeordnet sind, um hierdurch die gesamten Querabmessungen des Vierseit-Mechanismus (7) zu reduzieren;

und/oder wobei

die Vorrichtung ein Anschlag- oder Endhubelement (19) aufweist, das den Hub der Bahn (T) Vierseit-Gelenkmechanismus (7) begrenzt, wenn er in einer vollständig ausgefahrenen Position ist, um das Gewicht des Mechanismus selbst und der beweglichen Ebene oder Verlängerung (4) auf das Anschlagelement (19) partiell zu entlasten.

6. Die Vorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Vierseit-Gelenkmechanismus (7) aufweist:

- Verbindungsstangen (8, 9), die einen plattenförmigen Körper haben, der mit Schleifen (17) versehen ist, um ihn an der festen Ebene (2) und an der Tragstruktur (6) zu sichern;

- Kurbeln (11), die einen plattenförmigen Körper haben, der den Rahmen des Vierseit-Mechanismus bildet;

- Gelenke (12) zur gelenkigen Verbindung der Verbindungsstangen (8, 9) mit den Kurbeln (11), mit einer Gelenkachse (Y-Y), die parallel zu der plattenförmigen Verlängerung der Verbindungsstangen und den Kurbeln ist; und/oder wobei

- die Anzahl der Verbindungsstangen (8) für die Verbindung des Vierseit-Gelenkmechanismus mit der festen Lagerebene (2) zwei beträgt, und sie zueinander parallel und mit Abstand voneinander angeordnet sind, um eine breite Oberfläche der festen Ebene (2) zu verbinden, um hierdurch die Stabilität des Mechanismus zu erhöhen,

und/oder wobei

- die Anzahl der Verbindungsstangen (9) für die Verbindung des Vierseit-Gelenkmechanismus mit der Tragstruktur (6) zwei beträgt, und sie zueinander parallel und mit Abstand voneinander angeordnet sind, um eine breite Oberfläche der Tragstruktur (6) zu verbinden, um hierdurch die Stabilität des Mechanismus zu erhöhen;

und/oder wobei

- die Anzahl der Kurbeln (11) zwei beträgt und sie durch Querträger (18) verbunden sind, um diese mit Abstand voneinander und parallel zu halten;

und/oder wobei

- die Anzahl der Gelenke (12) vier beträgt, um zwei Verbindungsstangen (8) für die Verbindung der festen Ebene mit ersten Enden der zwei Kurbeln (11) zu verbinden und um die zwei Verbindungsstangen (9) für die Verbindung mit der Tragstruktur an den zwei entgegengesetzten Enden der Kurbeln (11) zu verbinden;

und/oder wobei

- die Verbindungsstangen (8, 9) zum Befestigen an der festen Ebene und an der Tragstruktur und die Kurbeln (11) aus einer geformten und/oder geschnittenen Platte erhalten werden, und sie in einer zueinander koplanaren Position angeordnet werden, die geeignet ist, um die Gesamtabmessungen der Vorrichtungen zu reduzieren.

7. Tisch, der eine Vorrichtung (1) nach einem der Ansprüche 1 bis 6 aufweist.

8. Verfahren zum Positionieren von Hilfslagerebenen oder Verlängerungen, welches die Schritte aufweist:

- Bereitstellen von zumindest einem Vierseit-Gelenkmechanismus (7); wobei der Vierseit-Gelenkmechanismus (7) mit zumindest einer ersten Verbindungsstange (8) davon an einer Tragstruktur (6) gesichert ist; und der Vierseit-Gelenkmechanismus (7) mit einer zweiten Verbindungsstange (9) davon an einer beweglichen Verlängerungsebene oder Verlängerung (4) gesichert ist; und die bewegliche Verlängerungsebene oder Verlängerung (4) mit dem Vierseit-Gelenkmechanismus (7) so verbunden ist, dass sie von einer ersten Ruheposition, die dazu ausgelegt ist, die bewegliche Verlängerungsebene oder Verlängerung (4) so unterzubringen, dass ihre zweite Lageroberfläche (10) zu der ersten Lageroberfläche (3) der festen Ebene nicht koplanar ist, zu einer zweiten Betriebsposition, in der sie mit zumindest einem Teil der zweiten Lageroberfläche (10) zu der ersten Lageroberfläche (3) der festen Ebene koplanar ist, zu bewegen;

- Erstrecken einer Tragstruktur (6) im Bezug auf eine feste Lagerebene (2), welche eine erste Lageroberfläche (3) aufweist, entlang einer Erstreckungsrichtung (X-X);

- Anheben der beweglichen Verlängerungsebene oder Verlängerung (4) von einer Ruheposition;

dadurch gekennzeichnet, dass

- die bewegliche Ebene oder Verlängerung (4) einer Bahn (T) folgt, die im Bezug auf die Erstreckungsrichtung (X-X) um einen Winkel (A) geneigt ist, die von 0 Grad und 90 Grad verschieden ist;
- Beenden der Bahn (T), indem die bewegliche Ebene oder Verlängerung (4) in ihre Gebrauchsposition gebracht wird, so dass zumindest ein Abschnitt der zweiten Lageroberfläche (10) koplanar zu der ersten Lageroberfläche (3) ist.

9. Das Verfahren nach Anspruch 8, wobei der weitere Schritt vorgesehen ist von:

- Öffnen der Verlängerung (4), um die Gesamtheit ihrer zweiten Lageroberfläche koplanar zu der ersten Lageroberfläche (3) zu machen.

10. Das Verfahren nach Anspruch 8 oder 9, wobei der weitere Schritt vorgesehen ist von:

- am Ende der geneigten Bahn (T), Auflegen der beweglichen Ebene oder Verlängerung (4) auf die Tragstruktur (6); oder
- am Ende der geneigten Bahn (T), zumindest teilweises Auflegen der beweglichen Ebene oder Verlängerung (4) auf das Anschlagelement (9).

## Revendications

1. Dispositif de positionnement de plans de support auxiliaires ou extensions (1), comprenant :

- au moins un plan de support fixe (2), ledit plan de support fixe (2) formant une première surface de support (3) ;
- au moins un plan d'extension mobile ou extension (4) formant, avec au moins une portion de ceux-ci, une seconde surface de support ou surface d'extension (10) ;
- une structure de soutien (6) mobile le long d'une direction d'extension prédéfinie (X-X) ;
- au moins une structure coulissante (5) permettant à ladite structure de soutien (6) de coulisser le long de ladite direction d'extension prédéfinie (X-X) ;
- au moins un mécanisme quadrilatéral articulé (7) ;
- ledit mécanisme quadrilatéral articulé (7) étant attaché avec au moins une première tige de liaison (8) de celui-ci à la structure de soutien (6) ;
- ledit mécanisme quadrilatéral articulé (7) étant attaché avec une seconde tige de liaison (9) de celui-ci audit plan d'extension mobile ou extension (4) ;
- ledit plan d'extension mobile ou extension (4) étant relié au mécanisme quadrilatéral articulé (7) de manière à se déplacer depuis une première position de repos, adaptée pour stocker ledit plan d'extension mobile ou extension (4) de sorte que la seconde surface de support (10) de celui-ci ne soit pas coplanaire par rapport à la première surface de support (3) du plan fixe, jusqu'à une seconde position fonctionnelle dans laquelle il est avec au moins une partie de ladite seconde surface de support (10) coplanaires par rapport à la première surface de support (3) du plan fixe ; **caractérisé en ce que**

le déplacement du mécanisme quadrilatéral articulé a lieu le long d'une trajectoire (T) qui est inclinée à un angle prédéfini (A), par rapport à la direction d'extension (X-X), qui est différent de 0° et 90°.

2. Dispositif (1) selon la revendication 1, dans lequel ladite trajectoire (T) du mécanisme quadrilatéral (7) a une inclinaison prédéfinie de sorte que le plan d'extension mobile (4) finisse la trajectoire de celui-ci directement dans la position d'utilisation, par exemple, reposant sur ladite structure de soutien (6) avec au moins une portion de la seconde surface de support ou surface d'extension (10) de celui-ci coplanaire avec ladite première surface de support (3) du plan fixe (2) ;  
et/ou dans lequel  
l'angle (A) entre la trajectoire (T) du mécanisme quadrilatéral et la direction de traction (X-X) s'inscrit entre 10° et 80°, de préférence 75°, et/ou  
dans lequel ledit mécanisme quadrilatéral articulé (7) a des tiges de liaison (8, 9) et des manivelles (11) reliées mutuellement par des charnières (12), lesdites charnières ont un axe de rotation (Y-Y) incliné par rapport à la direction d'extension (X-X) à un angle qui est différent de 0° et 90°  
et/ou dans lequel

l'angle que l'axe de rotation (Y-Y) desdites charnières forme avec la direction d'extension (X-X) s'inscrit entre -10° et -80°, de préférence -15°.

3. Dispositif (1) selon la revendication 1 ou 2, dans lequel

- ladite structure de soutien (6) comprend un siège (13) et un cadre (14) ;
- ledit plan d'extension mobile ou extension (4) est relié au mécanisme quadrilatéral articulé (7) de manière à se déplacer depuis une première position de repos, adaptée pour stocker ledit plan d'extension mobile ou extension (4) dans ledit siège (13), jusqu'à une seconde position fonctionnelle dans laquelle il repose au moins partiellement sur ledit cadre (14) ;

et/ou dans lequel

- ledit plan d'extension mobile (4) est formé par deux portions (15, 16) qui peuvent se chevaucher et être articulées mutuellement pour former, lorsqu'elles sont dans une position étendue et mutuellement coplanaires, une seule surface de support (10) agencée coplanaire par rapport à la première surface de support (3) du plan fixe (2).

4. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel ledit plan d'extension mobile (4) est relié à deux mécanismes quadrilatéraux articulés (7), formant tous deux des trajectoires mutuellement parallèles (T, T') ;

et/ou dans lequel

lesdits mécanismes quadrilatéraux articulés (7) ont tous deux des tiges de liaison (8, 9) et des manivelles (11) reliées mutuellement par des charnières (12) ;

lesdites charnières (12) ont un axe de rotation (Y-Y) incliné par rapport à une direction d'extension (X-X) à un angle différent de 0° et 90°.

5. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le mécanisme quadrilatéral articulé (7) comprend des composants (8, 9, 11) qui ont la forme de plaques et qui sont agencés les uns par rapport aux autres de manière, lorsqu'ils sont dans une conditions de repos, à être tous agencés mutuellement coplanaires, réduisant par conséquent les dimensions globales transversales du mécanisme quadrilatéral (7) ;

et/ou dans lequel

ledit dispositif comprend un élément d'arrêt ou de fin de course (19) qui limite la course de la trajectoire (T) du mécanisme quadrilatéral articulé (7) lorsqu'il est dans une position complètement étendue, de manière à libérer partiellement le poids du mécanisme lui-même et du plan mobile ou extension (4) sur l'élément d'arrêt (19).

6. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le mécanisme quadrilatéral articulé (7) comprend :

- des tiges de liaison (8, 9) ayant un corps en forme de plaque muni de boucles (17) permettant de l'attacher au plan fixe (2) et à la structure de soutien (6) ;
- des manivelles (11) ayant un corps en forme de plaque formant le cadre du mécanisme quadrilatéral ;
- des charnières (12) pour une liaison articulée des tiges de liaison (8, 9) aux manivelles (11) avec un axe de charnière (Y-Y) parallèle à l'extension en forme de plaque des tiges de liaison et des manivelles ;

et/ou dans lequel

- les tiges de liaison (8) pour la liaison du mécanisme quadrilatéral articulé au plan de support fixe (2) sont au nombre de deux, et sont agencées mutuellement parallèles et mutuellement espacées de manière à relier une large surface du plan fixe (2), augmentant par conséquent la stabilité de mécanisme ;

et/ou dans lequel

- les tiges de liaison (9) pour la liaison du mécanisme quadrilatéral articulé à la structure de soutien (6) sont au nombre de deux, et sont agencées mutuellement parallèles et mutuellement espacées de manière à relier une large surface de la structure de soutien (6), augmentant par conséquent la stabilité de mécanisme ;

et/ou dans lequel

- les manivelles (11) sont au nombre de deux et sont reliées par des entretoises (18) de manière à les garder mutuellement espacées et parallèles ;

et/ou dans lequel

- les charnières (12) sont au nombre de quatre pour relier deux tiges de liaison (8) pour la liaison du plan fixe à des premières extrémités des deux manivelles (11) et pour relier les deux tiges de liaison (9) pour la liaison à la structure de soutien au niveau des deux extrémités opposées des manivelles (11) ;

et/ou dans lequel

- les tiges de liaison (8, 9) pour la fixation au plan fixe et à la structure de soutien et les manivelles (11) sont obtenues à partir d'une plaque formée et/ou découpée, et elles sont mutuellement appropriées pour être agencées dans une position coplanaire pour réduire les dimensions globales du dispositif.

7. Table comprenant un dispositif (1) tel que décrit dans l'une quelconque des revendications 1 à 6.

8. Procédé permettant de positionner des plans de support ou extensions auxiliaires, comprenant les étapes consistant à :

- fournir au moins un mécanisme quadrilatéral articulé (7) ; où ledit mécanisme quadrilatéral articulé (7) est attaché avec au moins une première tige de liaison (8) de celui-ci à une structure de soutien (6) ; et ledit mécanisme quadrilatéral articulé (7) est attaché avec une seconde tige de liaison (9) de celui-ci à un plan d'extension mobile ou extension (4) ; et ledit plan d'extension mobile ou extension (4) est relié au mécanisme quadrilatéral articulé (7) de manière à se déplacer depuis une première position de repos, adaptée pour stocker ledit plan d'extension mobile ou extension (4) de sorte que la seconde surface de support (10) de celui-ci ne soit pas coplanaire par rapport à la première surface de support (3) du plan fixe, jusqu'à une seconde position fonctionnelle dans laquelle ils sont avec au moins une partie de ladite seconde surface de support (10) coplanaires par rapport à la première surface de support (3) du plan fixe ;
- étendre une structure de soutien (6) par rapport à un plan de support fixe (2) ayant une première surface de support (3) le long d'une direction d'extension (X-X) ;
- lever un plan d'extension mobile ou extension (4) à partir d'une position de repos ;

**caractérisé par**

- le fait de faire suivre au plan mobile ou extension (4) une trajectoire (T) qui est inclinée par rapport à la direction d'extension (X-X) à un angle (A) différent de 0° et 90° ;
- le fait de finir la trajectoire (T) en amenant le plan mobile ou extension (4) dans sa position d'utilisation, de sorte qu'au moins une portion de la seconde surface de support (10) soit coplanaire par rapport à la première surface de support (3).

9. Procédé selon la revendication 8, dans lequel l'étape supplémentaire est fournie, consistant à :

- ouvrir l'extension (4) amenant toute la seconde surface de support de celle-ci à être coplanaire par rapport à la première surface de support (3).

10. Procédé selon la revendication 8 ou 9, dans lequel l'étape supplémentaire est fournie, consistant à :

- à la fin de la trajectoire inclinée (T), faire reposer le plan mobile ou extension (4) sur la structure de soutien (6) ; ou
- à la fin de la trajectoire inclinée (T), faire reposer au moins partiellement le plan mobile ou extension (4) sur l'élément d'arrêt (9).

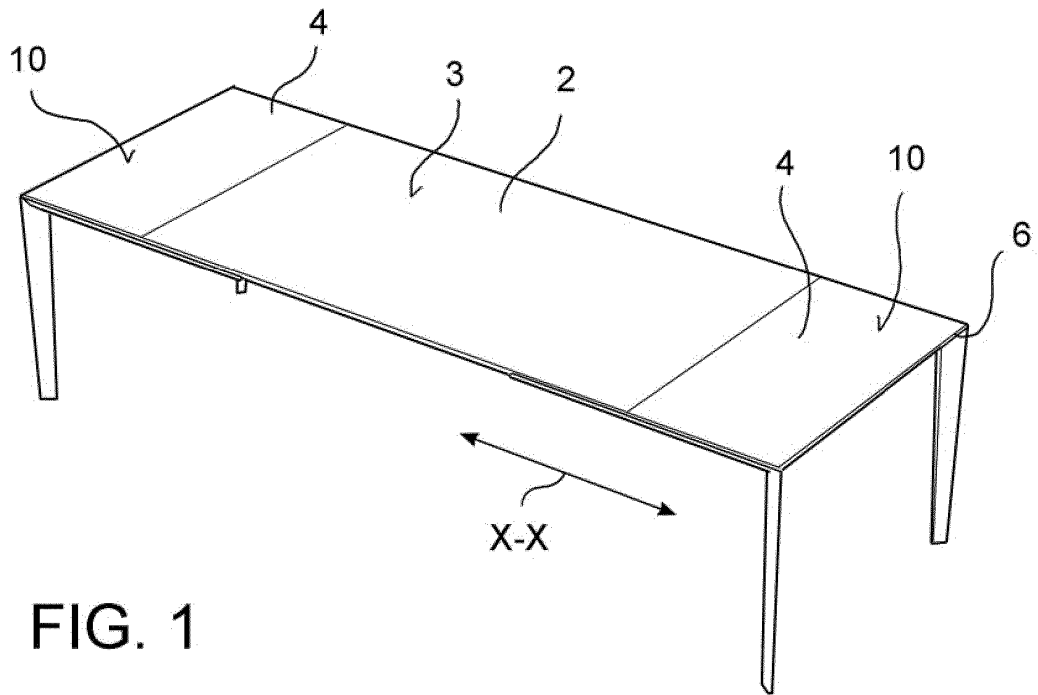


FIG. 1

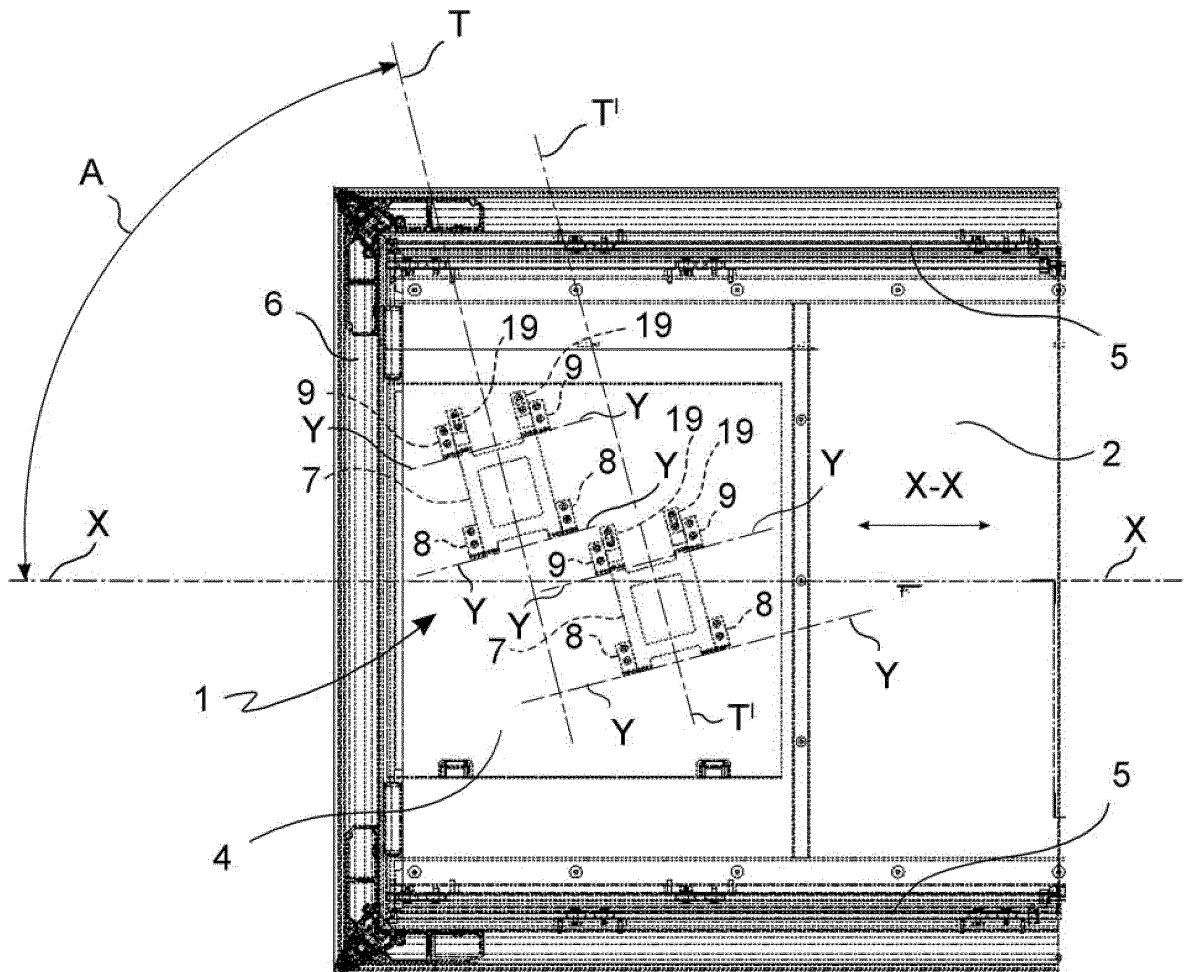


FIG. 2

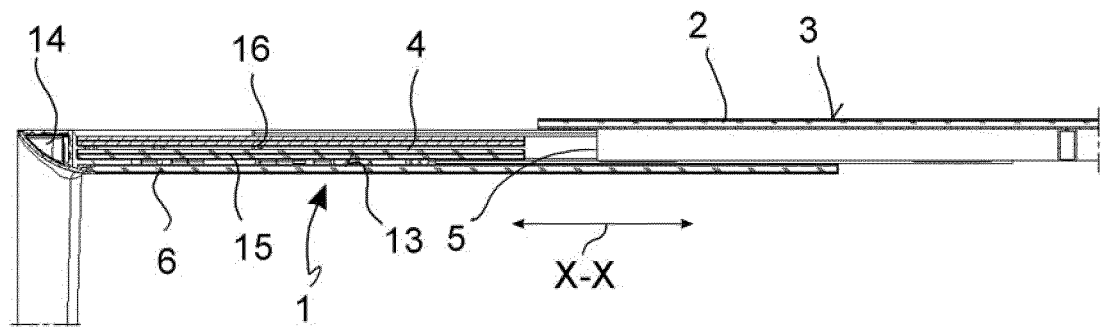


FIG. 3

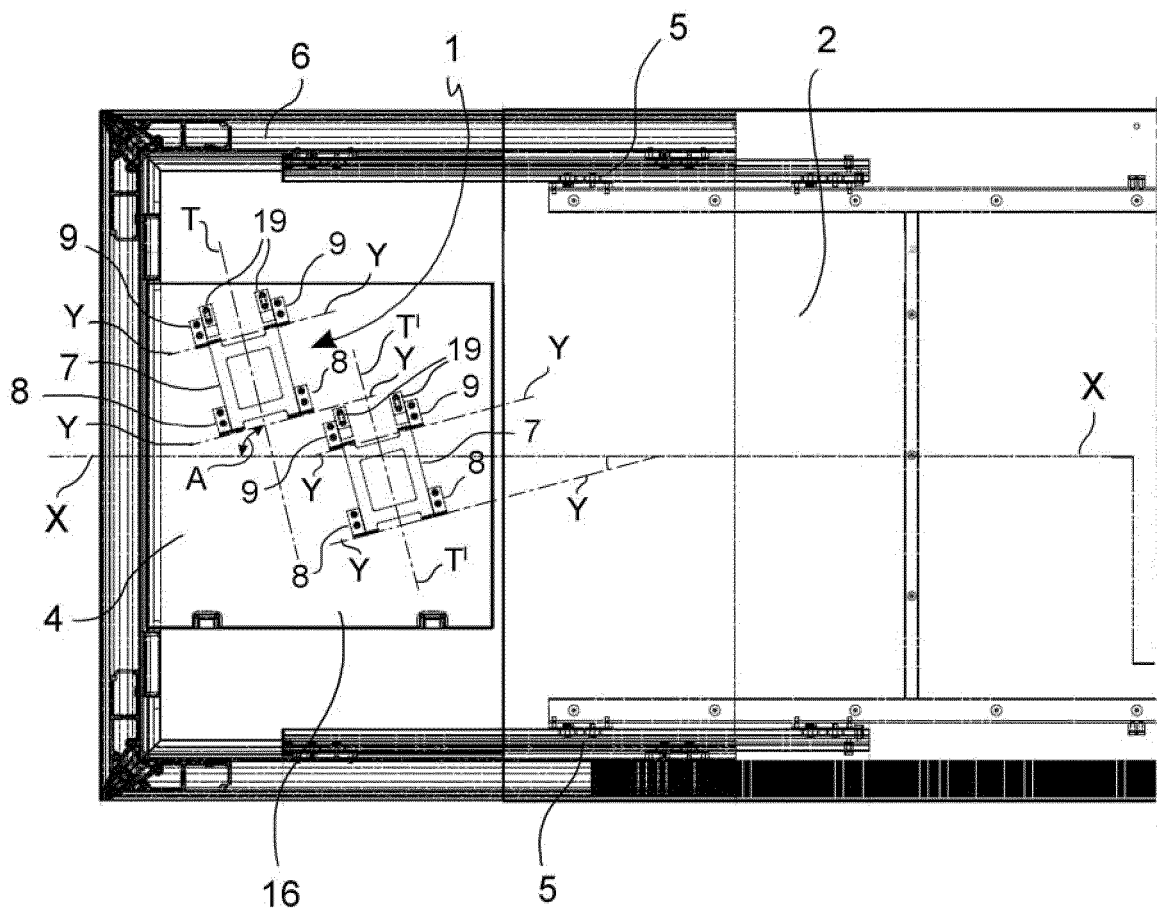


FIG. 4

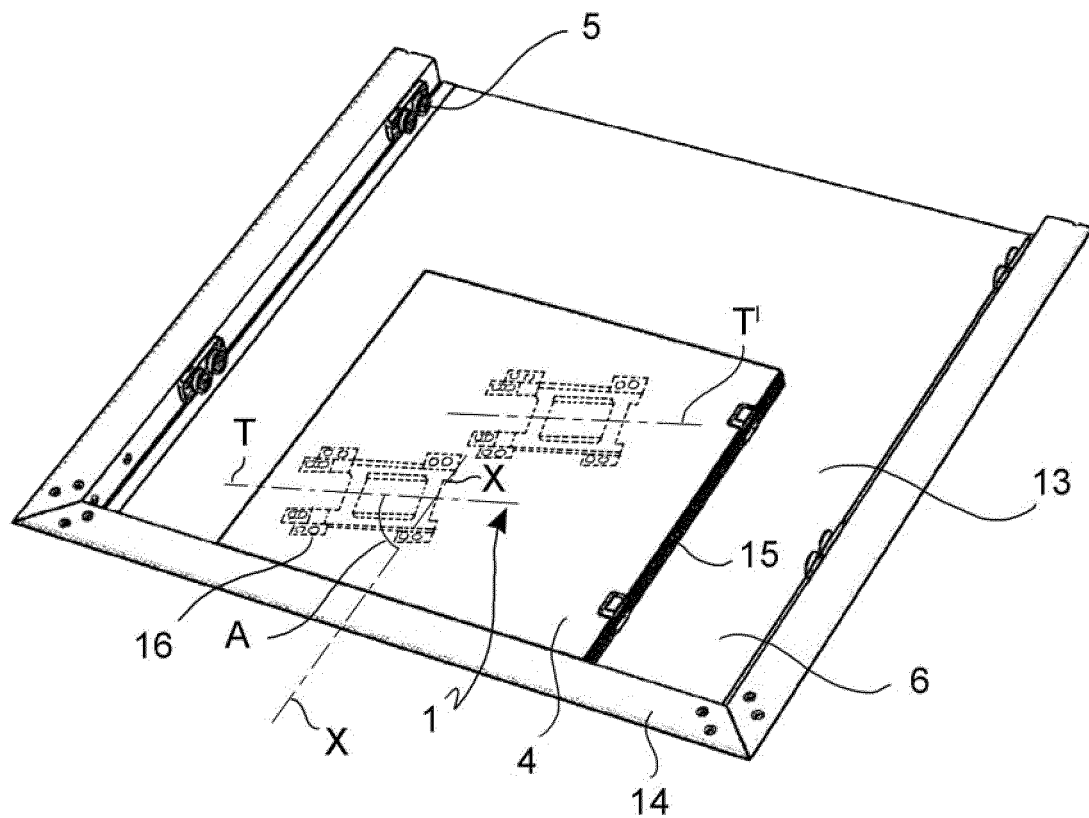


FIG. 5

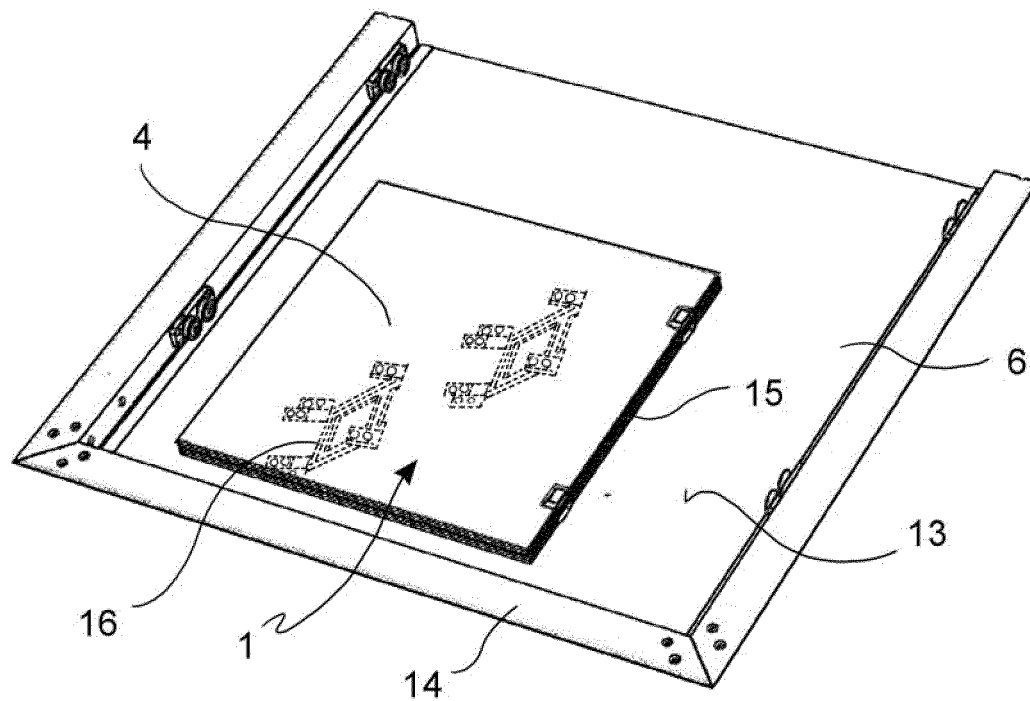


FIG. 6

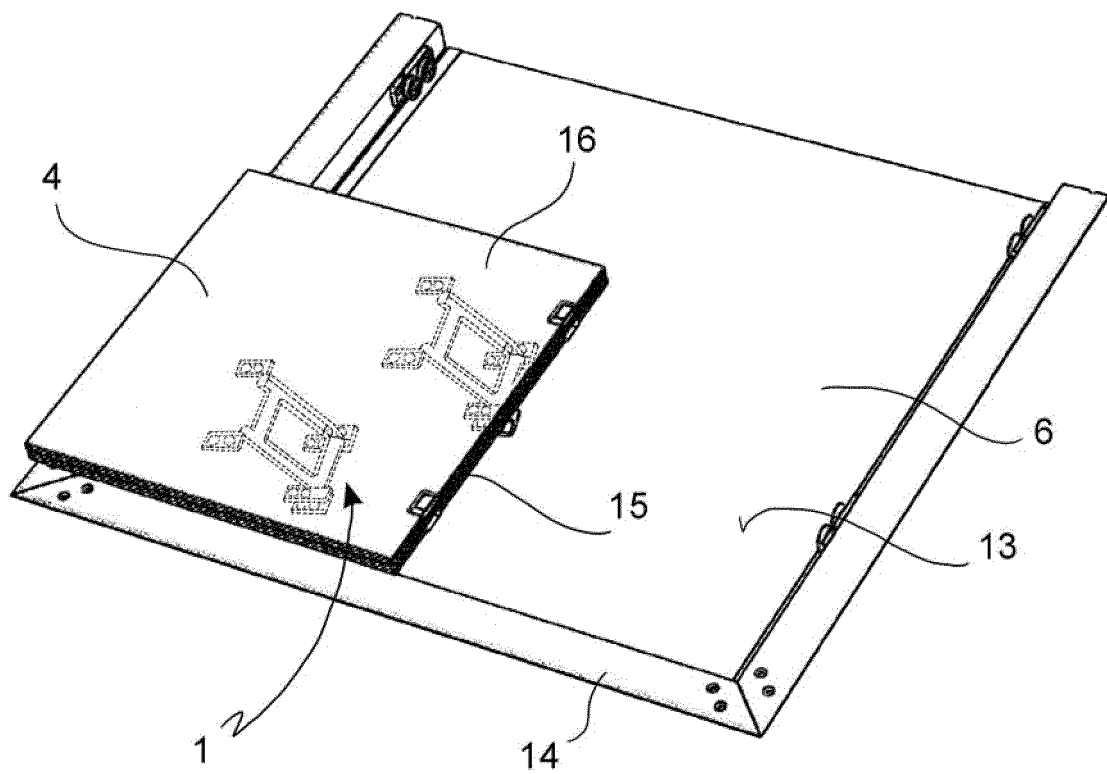


FIG. 7

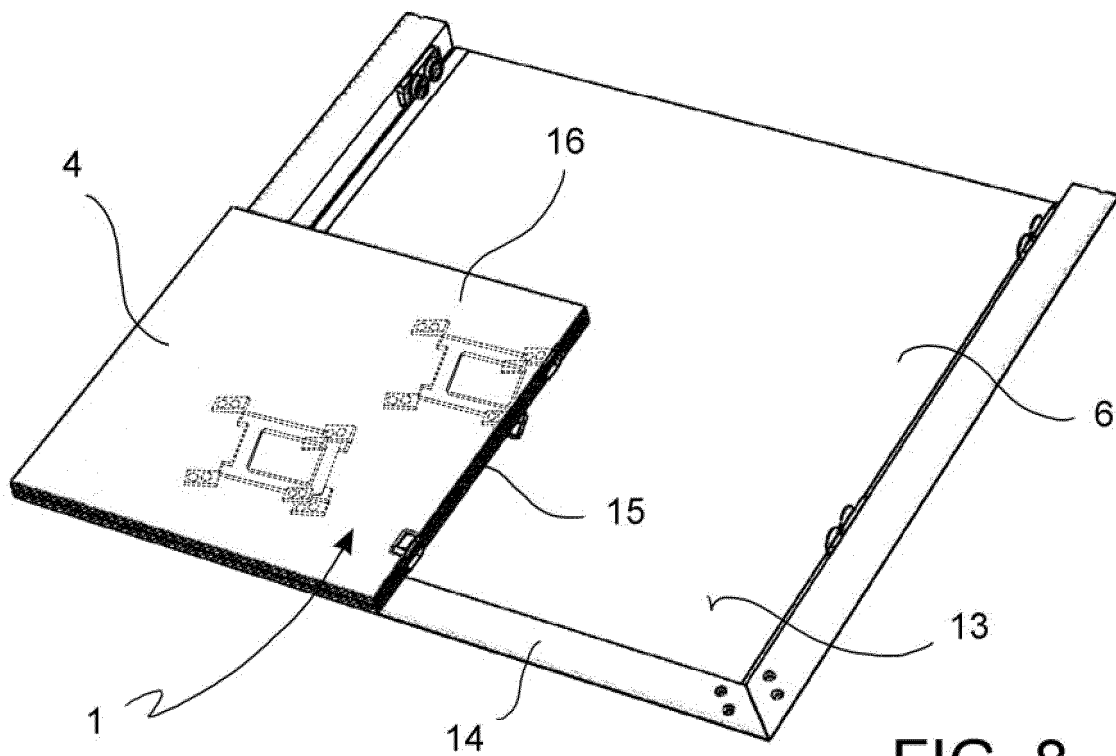


FIG. 8

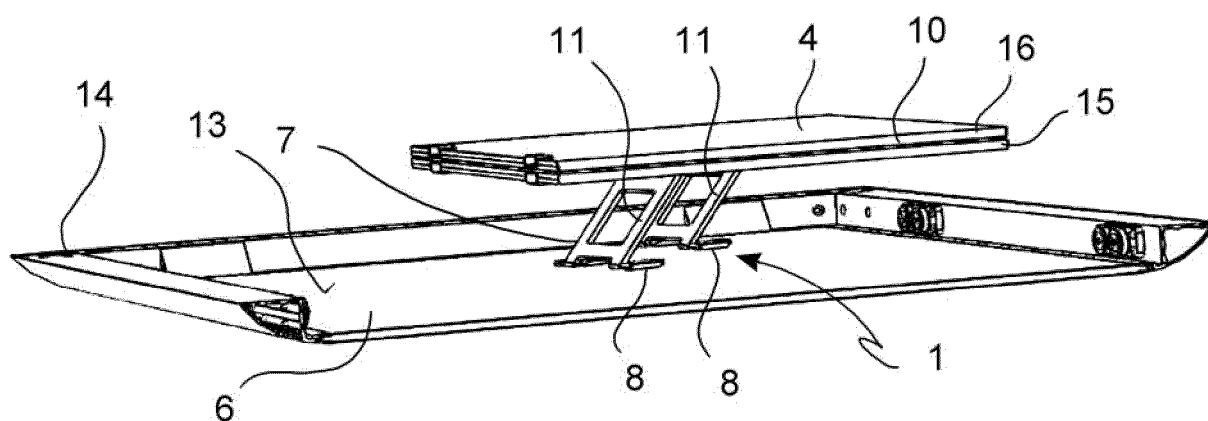


FIG. 9

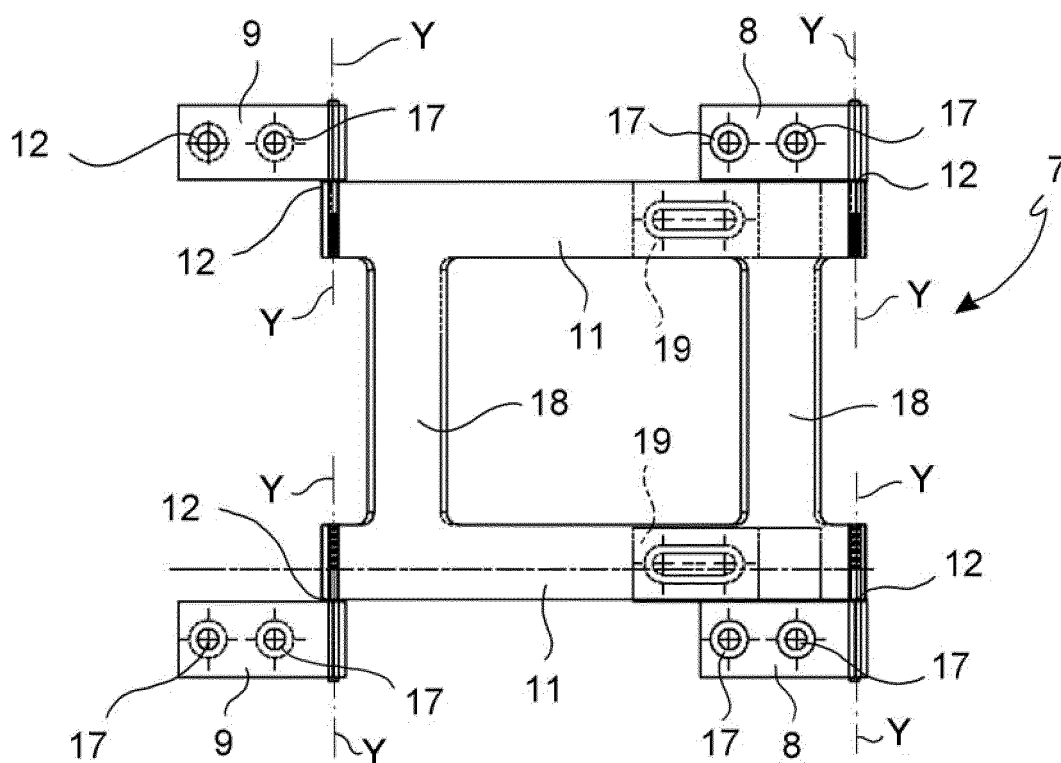


FIG. 10

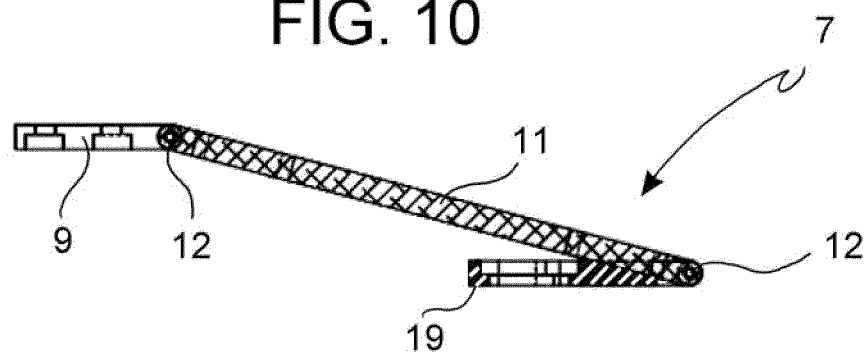


FIG. 11

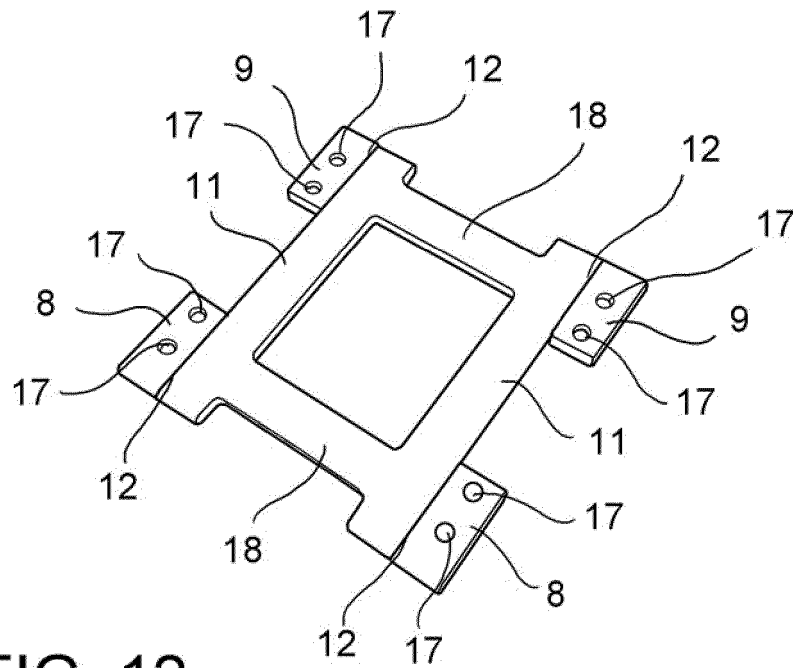


FIG. 12

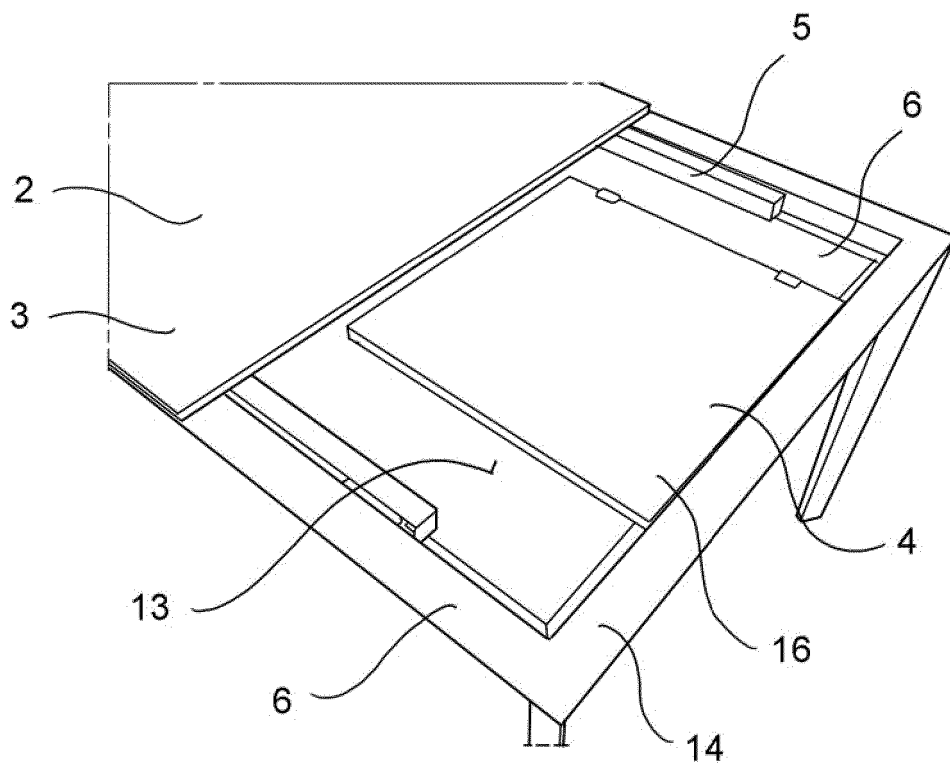
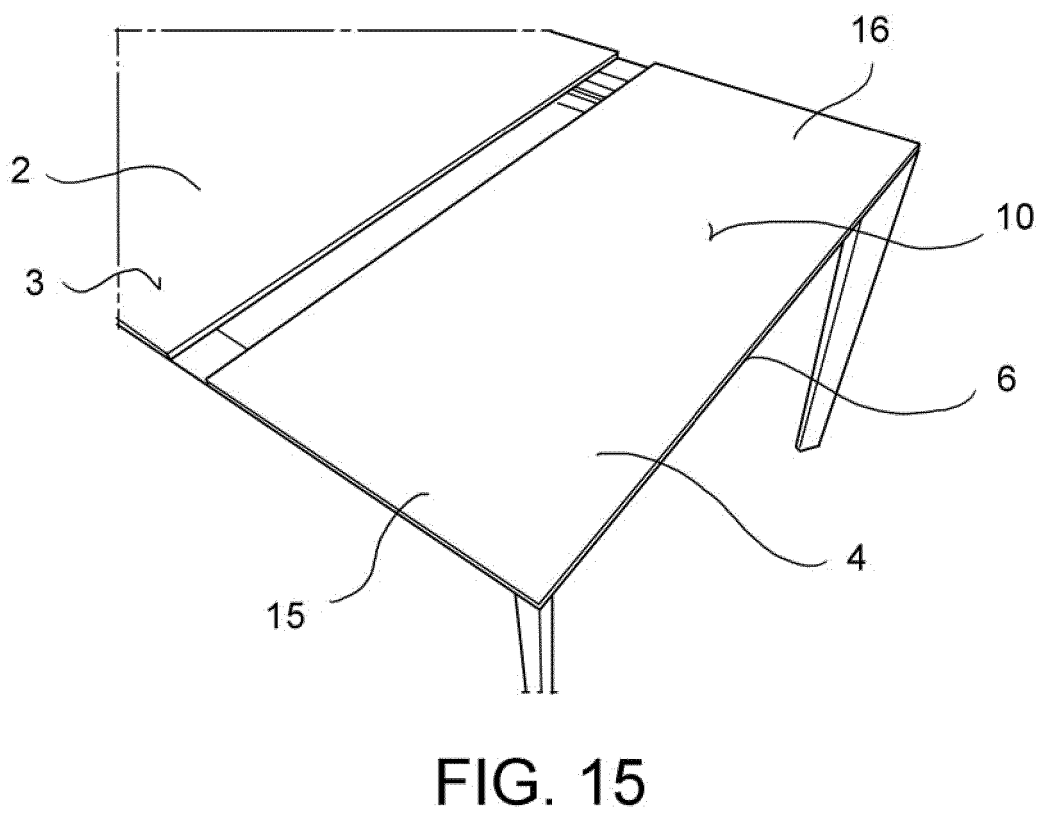
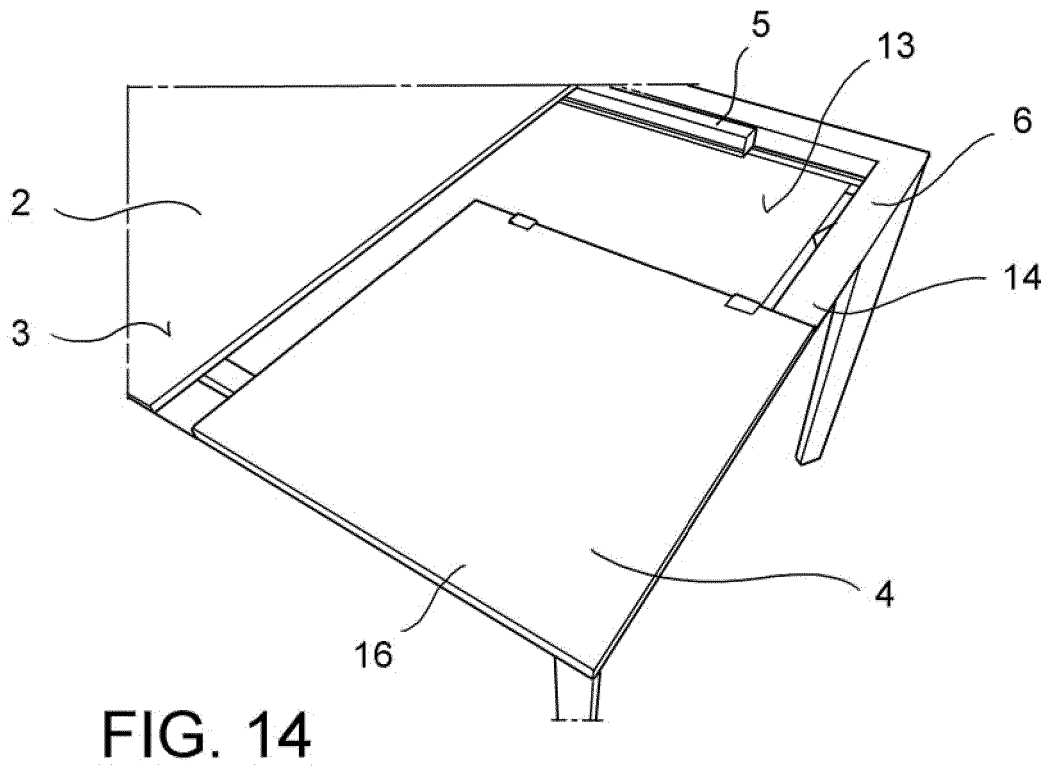


FIG. 13



**REFERENCES CITED IN THE DESCRIPTION**

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