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(54) **FOLDING TABLE**

(57) The invention relates to a folding table comprising: a board which is formed by two articulated halves (2,2') which can be extended or folded in relation to one another, and a frame which is positioned beneath the board and which supports the table at the desired height off he ground. The two halves (2,2') of the board are articulated to one another by means of hinges (18) which are located at the connecting area between said two halves. The aforementioned frame comprises at least two support assemblies (4; 4') which are symmetrical to the imaginary plane which is perpendicular to the plane of the extended board and which passes through the axis along which the two halves are articulated. Moreover, each support assembly comprises: two legs (5, 6; 5', 6'), the upper parts (A; A') of which are articulated to the corresponding half of the board, and uprights (7, 8; 7', 8') having one end (B; B') which is articulated to a leg and another end (C; C') which is articulated to the other half of the board at a certain distance from the articulation (D) between the two halves (2; 2').

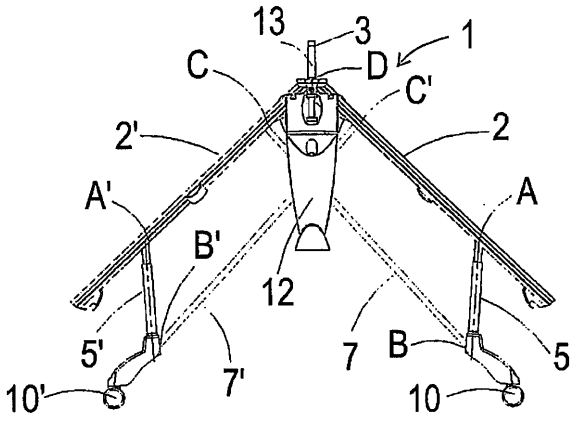

FIG. 3

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Description

Technical field of the invention

[0001] The present invention relates to the technical field of folding tables. It relates more specifically to a folding table of the type that comprises a table top consisting of two halves that are articulated to one another, it being possible for the two halves to be either extended to form a single plane or folded against one another, and a frame underneath the table top to support the table at the right height from the floor. The present invention is particularly applicable for a folding table of the aforementioned type that is adapted for use as a table tennis or ping-pong table.

Background of the invention

[0002] As is well known, some ping-pong tables offer the possibility of being folded along the middle, in such a way that each of the halves is in vertical position, one adjacent to the other. This means that once play has finished, the space occupied by the table is reduced as much as possible so that it can be occupied by other items or for a different activity. Except in permanent competition or merely recreational facilities, it is advisable for tables to be foldable and light, in order to enable their easy removal and leave the occupied space free.

[0003] Therefore, the aim is to achieve a ping-pong table that is easily foldable, which, once folded, occupies the smallest possible space, is light yet robust and has a simple folding mechanism that is safe and efficient (in order to reduce production costs). Normally, the simultaneous application of all these factors creates conflicts wherein the manufacturer is forced to optimise one or more of said characteristics to the detriment of the rest. For example, in theory, a simple folding mechanism could be associated with a mechanism that is not very robust or low-quality.

[0004] There are currently several types of folding tables in the prior art. These include utility model ES256416U, which claims an underneath frame that is very large and is not foldable. The foldable part that is claimed for this table is the table top.

[0005] Another Spanish utility model, with publication number ES1007292U, discloses a folding ping-pong table wherein the legs are removed from the table top when this is to be folded.

[0006] In general, it is desirable for all the pieces or elements that form part of the table during its operational state to be attached thereto when it is stored or transported.

[0007] The utility model with application number ES0208534U discloses a folding ping-pong table wherein the structures of the legs fold inwards by means of telescopic arms. This type of mechanism, which is well known in different industrial sectors, involves a certain degree of complexity in its manufacture and is not sufficiently robust, especially when the table must be folded and unfolded frequently.

[0008] The present invention presents an alternative mechanism that is applied to ping-pong tables so that they may be folded quickly and easily. At the same time, said mechanism is simple to manufacture and the result is a folding ping-pong table that, once folded, occupies very little space and is easy to store and transport.

Explanation of the invention

[0009] For this purpose, the object of this invention is a folding table of the aforementioned type, which is essentially characterised in that

the two halves are articulated to one another on hinges situated in the area where the two halves of the table top join one another;

and in that

the frame comprises at least two support assemblies that are symmetrical with regard to the imaginary plane that is perpendicular to the plane of the extended table top which passes through the axis of the articulation of the two halves of the table top, each support assembly having at least two legs articulated at the top to the corresponding half of the table top, and at least one strut connected by articulation at one end to one of the legs and by the other end to the other half of the table top, also by articulation, at a certain distance from the articulation of the two halves of the table top, in such a way that, in each support assembly, the leg, the strut, the segment of one half that is between a first articulation and a third articulation, and the segment of the other half that is between a second articulation and a third articulation form an articulated quadrilateral structure. This allows the table to be folded by lowering the opposite ends of the two halves.

[0010] According to another feature of this invention, in each support assembly the lengths of their elements are such that they substantially verify the relationship wherein the sum of the lengths of the strut plus the section of the table top that runs from the articulation of the two halves of the table top to the point of articulation of the strut with the table top is equal to the sum of the lengths of the segment that runs from the point where the strut is attached to the leg to the articulated top end of said leg plus the segment that runs from said articulated top end of the leg to the articulation of

the two halves of the table top.

[0011] According to another feature of the present invention, the shaft of the hinges is situated, in the table's unfolded position, below the level of the plane formed by the two unfolded halves, and on the vertical plane defined by the adjacent edges of the two halves of the table, the two halves thus being positioned in parallel, in the table's folded position, for transport or storage.

[0012] Preferably, the two halves are positioned at a distance of less than 110 mm from one another in the table's folded position.

[0013] According to another feature of the present invention, each support assembly comprises a strengthening crossbar that joins at least two of the legs of said assembly.

[0014] According to another feature of the present invention, at least one strut is connected by articulation by one end to the corresponding crossbar and by the other end, also by articulation, to the other half of the table top, at a certain distance from the articulation of the two halves.

[0015] According to yet another feature of the present invention, the legs comprise corresponding wheels on the end that rests on the floor.

[0016] In the case of a ping-pong table that simply has said attributes, these might not be sufficient to pass the European Standard in preparation regarding table tennis tables, which will require the table to withstand forces of more than 80 kg.

[0017] Another feature of this invention is that the table comprises central support legs at each end of the articulation, which work with the legs to support the table on the floor and receive support from the articulation of the rotating shaft of the hinges and the table. Preferably, the support legs will stand slightly outside the perimeter of the table top area.

[0018] This feature helps to provide a very robust ping-pong table, which means that it can easily withstand said minimum of 80 kg.

[0019] According to another feature of the present invention each central support leg has a safety system that comprises a bushing which slides with friction along a vertical bar of said central leg, each bushing having at least two support arms that are secured by one end to the bushing by articulation, and secured by the other end, by articulation and so that they may slide, to the underside of a respective half of the table top.

[0020] This safety system works in a similar way to the spoke structure of an umbrella and provides friction between the bushing and the vertical bar of the central leg, thus preventing the sudden fall of the folded or half-folded table. A system whereby the bushings lock onto the bar of the leg can secure the table in a folded position, it thus having both active and passive safety systems.

[0021] According to another feature of the present invention, the table comprises a vertical net along the axis of articulation of the two halves of the table top in such a way that both the net and the table have dimensions and a shape that are suitable for playing table tennis or ping-pong.

[0022] Another additional feature of the present invention is that the vertical posts that hold up the net are attached to the tops of the central support legs.

[0023] Another feature of this invention is that the vertical posts may be detached from the tops of the central support legs.

[0024] The vertical posts are preferably able to regulate the height and separating distance, in order to modify the tension of the net.

[0025] Another feature of the present invention is that the folding table comprises two T-shaped connection pieces, with three connection points respectively for the corresponding end of the central hinge assembly, the base of the corresponding vertical post of the net and the top of the corresponding central support leg, the shape of said connection pieces being graded from a substantially circular cross-section to a substantially oval cross-section in correspondence with the respective cross-sections of the central support legs and of the central hinge assembly.

[0026] The support arm of each of the wheels swivels at the point where it is joined to each of the respective legs in such a way that said wheels have at least three fixed positions in relation to the position of play: 0°, 90° and 180°.

[0027] Persons skilled in the art will appreciate that the new and inventive features of this invention, in addition to providing an overall effective solution to the aforementioned disadvantages, make it possible to manufacture a folding ping-pong table with a folding mechanism that is solidly joined to the structure of the table and is at the same time simple and robust, with the consequent advantages from the production point of view. Furthermore, the space occupied by the table in its folded state is minimal as the two halves of the table top are positioned against one another.

[0028] Moreover, the modular structure and functionality of the parts of the table according to this invention mean that it is possible to manufacture these entirely from plastic, with the consequent advantage that the joints may be achieved by riveting, which is a very fast, economical and safe procedure. The table can be manufactured in subsets and/or modules, which facilitates logistics and can simplify the production process in batches.

Brief description of the drawings

[0029] In the attached drawings embodiments of the folding ping-pong table that is the object of the invention are

illustrated by means of a non-limiting example. In said drawings:

Fig. 1	is a plan view of the folding ping-pong table of this invention;
Fig. 2	is a front view of the ping-pong table of this invention when folded;
Fig. 3	is a side view of the ping-pong table according to this invention in an intermediate state between the extension of the table top and the folded state thereof;
Fig. 4	is a side view of the ping-pong table of this invention when completely folded;
Fig. 4b	is a side view of the ping-pong table without the covers of the central support legs;
Fig. 5	is a side view of the ping-pong table of this invention when completely un folded;
Fig. 6	is a perspective view of the underneath of the table of this invention;
Fig. 7	is a longitudinal cross-section of the folding table of this invention;
Figs. 8, 9 and 10	are details of the folding system by friction with the bushing, as shown in Fig. 7, in a completely unfolded position, a halffolded position and a completely folded position of the table respectively; and
Fig. 11	is an exploded view of the central hinge assembly, the central support legs and the T-shaped connection pieces of the table of this invention.

Detailed description of the drawings

[0030] Said drawings show a preferred embodiment of this invention, which is applicable to a ping-pong or table tennis table.

[0031] Fig. 1 shows a plan view of the ping-pong table 1 unfolded as for play. Obviously, this state is irrelevant in terms of the advantages provided by this invention as the standard measurements of the table top determine the space that the whole table must obligatorily occupy and the aforementioned figure is shown for illustrative purposes.

[0032] The folding table 1 comprises a table top consisting of two halves 2; 2', which are articulated on two hinges 18, one on either side of the table 1, that are particularly visible in Fig. 6. The halves 2, 2' can be extended to form a single plane or positioned adjacent to one another in parallel for transport or storage purposes, and there is a frame underneath the table top to support the table on the ground at the right height.

[0033] In order to aid comprehension of the folding mechanism that will be described below, the numerical references designate equivalent and symmetrical elements in both halves of the structure of the table 1, although they are differentiated by the symbol ('). For example, said figure shows that the two halves 2, 2' of the table 1 adopt the same reference (2), the only difference being the one just stated above.

[0034] The folding mechanism, situated underneath the table 1, can be best seen in Fig. 3. Said folding mechanism also acts as the frame that supports the table 1. It essentially consists of two articulated quadrilateral structures that are known in other industrial and mechanics sectors. Each half 2, 2' of the table 1 has a corresponding articulated quadrangle. For example, in the case of half 2, the quadrangle consists of the leg 5 or 6, the strut 7, segment CD (C being the point of articulation of said strut 7 in relation to the opposite half 2' of the table top) and segment AD (A being the point of articulation of the leg 5 or 6 in relation to the corresponding half 2 of the table top). One of the segments has been defined as the leg 5 or 6 due to the fact that the strut 7 can be attached to the end of either of the two legs 5, 6, or, as will be seen later, it can be attached to a strengthening crossbar 9 (optional though preferred) that joins the two legs 5, 6; it is also possible for the table 1 to have a greater number of struts 7 depending on the desired mechanical resistance for the materials with which the table 1 is made in each case. All these elements can be seen more clearly in Fig. 6 which shows the underside of the table 1.

[0035] The same articulated quadrilateral structure is symmetrically repeated for the other half 2' of the table 1. The four vertices A, B, C, D (or A', B', C', D where this is the case) of the quadrangle are points of articulation of the corresponding segments that form the sides thereof so that the structure can be folded, the sides of the quadrangle thus being positioned adjacently in pairs. In order to achieve an optimum folding of the table 1, that is, a folded state that occupies the smallest possible space so that the two halves 2, 2' are substantially parallel and folded against one another, the following situation must be achieved: BC + CD = BA + AD for one quadrangle, and B'C' + C'D = B'A' + A'D for the other. This guarantees that it is possible to achieve the situation in which the vertices BAD and BCD substantially form 180° and segments AD and BA, and BC and CD, respectively, substantially form two straight lines. The same situation can be extrapolated for the quadrangle of the other half 2' of the table 1 by exchanging A, B and C for A', B' and C', respectively.

[0036] Points C and C' correspond to the articulations of the struts 7, 7', 8 and 8' on the hinges 18 of the two halves 2 and 2'.

[0037] In Figs. 6 and 7 it can be observed that the shaft 19 of the hinges 18 is situated, in the table's unfolded position, below the level of the plane formed by the two unfolded halves 2, 2', and on the vertical plane defined by the adjacent edges of the two halves of the table 1. This means that when the table 1 is folded, the two halves 2, 2', in the folded position of the table 1, (Fig. 4), are positioned adjacent to one another in parallel for transport or storage, thus occupying

a smaller space, so that there is a gap of less than 110 mm between the table tops, as specified by European Standards, in order to prevent the entry of adults and children (Fig. 4b). This is possible thanks to the movement of the shaft 19 of the hinges 18, which allows the adjacent edges of the two halves to move away from one another as they rotate, which was not possible with tables in the prior art.

[0038] Fig. 4, is a side view of the table 1 shown in Fig. 3 in a completely unfolded position. As can be seen in said figure and more specifically in Fig. 4b (where the covers of the central legs 12, 12' have been omitted for the sake of greater clarity) the space occupied by the table 1 is reduced as much as possible, enabling it to be stored in any free area of a house or, for example, sports facilities. Furthermore, the angled structure of the bases of the legs 5, 5', 6, 6' helps provide the table 1 with sufficient stability to transport it easily to the desired place. It can be observed that the total thickness of the folded table 1 is only a little greater that that of the sum of the two halves 2, 2' of the table top. Fig. 5 shows the table 1 completely unfolded and in said figure the double articulated quadrilateral structure of vertices A, B, C and D, and A', B', C' and D, respectively, can be more clearly observed. The eight vertices of the two quadrangles are articulated, which, together with the aforementioned situations BC + CD = BA + AD and B'C' + C'D = B'A' + A'D, enables one half 2 of the table top to be practically folded flat in parallel to the other half 2'.

[0039] The materials from which the quadrilateral structure or frame of the table 1 is made are not essential for the purpose of the invention, although it is desirable to use lightweight materials in order to facilitate transport of the table 1 and it is essential to achieve an economical and easy assembly of the table 1. Also, the connection or shape of the elements that make up the articulated quadrangles of said frame are not essential either. The fundamental aspect is the existence of two complementary articulated quadrilateral structures that, with the geometrical form established above, allow the table 1 to be folded completely.

[0040] Another aspect to be taken into account in tables 1 of this type is the ability to move or transport them with the greatest possible ease. For this reason, the table 1 has a set of wheels 10, 10', 11, 11' positioned accordingly on the lower ends of the legs 5, 5', 6, 6'. Once the table 1 is completely folded, it can be move more easily and occupies less space.

[0041] The preferred embodiment of the invention also includes two central support legs 12, 12' which improve the stability of the table 1 when in its unfolded operation state. These central legs 12, 12' are connected by a crossbar that forms the shaft 19 of the hinges 18, and they can be as robust as necessary according to the additional stability desired for the table and depending on the materials used in each case.

[0042] The central legs 12, 12' receive support from the articulation of the bar of the rotating shaft 19 of the hinges 18 and, consequently, the rotation that folds / unfolds the table.

[0043] The central legs 12, 12' may also form a decorative and therefore commercially attractive element for the sides of the table 1, especially when it is folded, said legs 12, 12' hiding the sight of the underneath of the table 1. Furthermore, in one of the preferred embodiments of the invention, the tops of the central legs 12, 12' can act as support for the posts 13, 13' that hold up the net 3 and in another alternative of the invention, said posts 13, 13' can be detached from said legs 12, 12'.

[0044] The vertical posts 13; 13' can regulate the height and separating distance, in order to modify the tension of the net, by means of a retaining mechanism 21 and 22 (Fig. 11).

[0045] The posts 13 and 13' are also designed so as to act as a handle to aid the folding or unfolding procedure of the table 1.

[0046] Another of the advantages of the table 1 of this invention is that the folding system allows the table 1 to be folded in such a way that the playing surfaces face outwards. This facility aids the folding procedure, whereby it is only necessary to apply a pushing force, thanks to the wheels 10, 10', 11, 11' on the legs 5, 5', 6, 6', and not a lifting or raising force to lift each half 2, 2' of the table 1.

[0047] Figs. 7 to 10 serve specifically to show the folding system by friction with the bushing 14, 14'. Each of the legs 12, 12' has a bushing 14, 14' connected by friction to a respective vertical bar 20 of each leg 12, 12', along the outside whereof it can slide. This bushing 14, 14' can slide along each leg 12, 12' so as to aid the folding and unfolding of the table 1, as these movements are made more smooth thanks to the friction of the corresponding bushing 14, 14' with the leg 12, 12' on which it is mounted, and thanks to a pair of respective support arms 15, 16, 15', 16' that join each bushing 14, 14' by articulation with the two halves 2, 2' of the table top. Each bushing 14, 14' also has an inner bushing 23, 23'. Furthermore, the arms 15, 16, 15', 16' can slide, by the end fixed to the table 1 by articulation, along the underneath of said table 1. Said bushing 14, 14' and support arm 15, 16, 15', 16' assembly can be seen in an ordered exploded view in Fig. 11. Figures 8 to 11 also show a Z-shaped safety lever 24, which is actuated by a spring and which is blocked in the corresponding safety position by means of a catch. Said safety position prevents the accidental opening of the table 1 in order to avoid possible accidents or injury to the user.

[0048] In the folded position of the table 1, the bushings 14, 14' are in their lower position (Fig. 10), in which they are blocked by the corresponding locking systems to the bars 20.

[0049] The support arm of each of the wheels 10, 11; 10', 11' swivels at the point where it is joined to each of the respective legs 5,6; 5', 6' and comprises a mechanism for fixing the angular position of the wheel in at least three fixed positions in relation to the position of play: 0° (normal playing position), 90° (packaging and transport position) and 180°

(playing position for disabled people in wheel chairs). This fixing mechanism may consist of locking systems in fixed positions of rotation of the conventional type.

[0050] It should also be mentioned that, although this description has been drawn up on the basis of a ping-pong table 1, said description is not limitative and all the characteristics applicable to folding tables in general (such as the folding system using articulated quadrangles) are protected by the attached claims as can be assumed from these. For example, the folding table could be used to support blackboards or audiovisual projection screens in meeting rooms or classrooms. This feature is very useful, for example, in schools, colleges and educational establishments in general, in which the combination of purely academic activities and leisure or sports activities is usual.

[0051] Having sufficiently described the nature of the present invention and the way in which it is put into practice, it is stated that anything that does not alter, change or modify its fundamental principle is subject to variations regarding details.

Claims

1. Folding table (1), which comprises a table top consisting of two halves (2, 2') that are articulated to one another that can be either extended to form a single plane or folded, and a frame underneath the table top adapted to support the table at the right height from the floor, **characterised in that**
the two halves are articulated to one another on hinges (18) situated in the area where the two halves (2, 2') of the table top join one another;
and **in that**
the frame comprises at least two support assemblies (4;4') that are symmetrical with regard to the imaginary plane that is perpendicular to the plane of the extended table which passes through the axis of the articulation of the two halves of the table top, each support assembly having at least

    - two legs (5, 6; 5', 6') joined by articulation at the top (A; A') to the corresponding half of the table top, and
    - at least one strut (7, 8; 7', 8') connected by articulation by one end (B; B') to one of the legs and by the other end (C; C') to the other half of the table top, also by articulation, at a certain distance from the articulation (D) of the two halves (2; 2'),

    in such a way that, in each support assembly, the leg (5), the strut (7), the segment of one half (2) that is between the articulation (A) and the other articulation (D), and the segment of the other half (2') that is between the articulation (C) and the other articulation (D) form an articulated quadrilateral structure, which allows the table to be folded by the opposite ends of the halves (2, 2').

2. Folding table (1) according to claim 1, **characterised in that** in each support assembly the lengths of its elements are such that they substantially verify the BA + AD = BC + CD relationship.

3. Folding table (1) according to claims 1 or 2, **characterised in that** the shaft (19) of the hinges (18) is situated, in the table's unfolded position, below the level of the plane formed by the two unfolded halves (2, 2'), and on the vertical plane defined by the adjacent edges of the two halves of the table, the two halves (2, 2') thus being positioned in parallel, in the folded position of the table (1), for transport or storage.

4. Folding table (1) according to claim 3, **characterised in that** the two halves are positioned at a distance of less than 110 mm from one another in the table's folded position.

5. Folding table (1) according to any of the previous claims, **characterised in that** each support assembly (4; 4') comprises a strengthening crossbar (9; 9') that joins at least two of the legs (5, 6; 5', 6') of said assembly.

6. Folding table (1) according to claim 5, **characterised in that** at least one strut (7, 8; 7', 8') is connected by articulation by one end (B; B') to the corresponding crossbar (9; 9') and by the other end (C; C') to the other half of the table top, also by articulation, at a certain distance from the articulation (D) of the two halves (2; 2').

7. Folding table (1) according to any of the previous claims, **characterised in that** the legs (5, 6; 5', 6') comprise corresponding wheels (10, 11; 10', 11') on the end that rests on the floor.

8. Folding table (1) according to any of the previous claims, **characterised in that** it comprises central support legs (12, 12') at each end of the articulation (D), which work with the legs (5, 6; 5', 6') to support the table on the floor

and receive support from the articulation of the rotating shaft (19) of the hinges (18) and the table.

9. Folding table (1) according to any of the previous claims, **characterised in that** the articulations (C, C') are integrated into the hinges (18).

10. Folding table (1) according to any of the previous claims, **characterised in that** each central support leg (12, 12') has a safety system that comprises a bushing (14, 14') which slides with friction along a vertical bar (20) of said central leg, each bushing (14, 14') having another respective bushing (23, 23') inside the other and at least two support arms (15, 16; 15', 16') that are secured by one end by articulation to the bushing, and secured by the other end, by articulation and so that they may slide, to the underside of a respective half of the table top (2, 2').

11. Folding table (1) according to any of the previous claims, **characterised in that** it comprises a vertical net (3) along the axis of articulation of the two halves of the table top in such a way that both the net and the table have dimensions and a shape that are suitable for playing table tennis or ping-pong.

12. Folding table (1) according to claim 11, **characterised in that** the vertical posts (13; 13') that hold up the net (3) are attached to the tops of the central support legs (12; 12').

13. Folding table (1) according to claim 12, **characterised in that** the vertical posts (13; 13') may be detached from the tops of the central support legs (12; 12').

14. Folding table (1) according to any of claims 11 to 13, **characterised in that** the vertical posts (13; 13') are able to regulate the height and separating distance, in order to modify the tension of the net.

15. Folding table (1) according to any of claims 11 to 14, **characterised in that** it comprises two T-shaped connection pieces (17, 17'), with three connection points respectively for the corresponding end of the central hinge assembly (18), the base of the corresponding vertical post (13, 13') of the net (3) and the top of the corresponding central support leg (12, 12'), the shape of said connection pieces being graded from a substantially circular cross-section to a substantially oval cross-section in correspondence with the respective cross-sections of the central support legs and of the central hinge assembly.

16. Folding table (1) according to any of claims 11 to 15, **characterised in that** the support arm of each of the wheels (10, 11; 10', 11') swivels at the point where it is joined to each of the respective legs (5, 6; 5', 6') and comprises a mechanism for fixing the angular position of the wheel in at least three fixed positions in relation to the position of play: 0°, 90° and 180°.

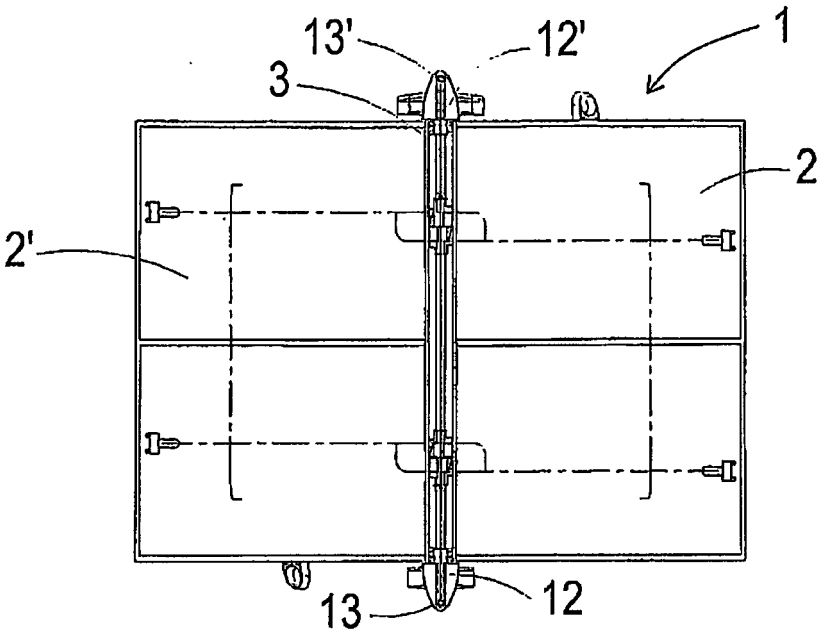

FIG. 1

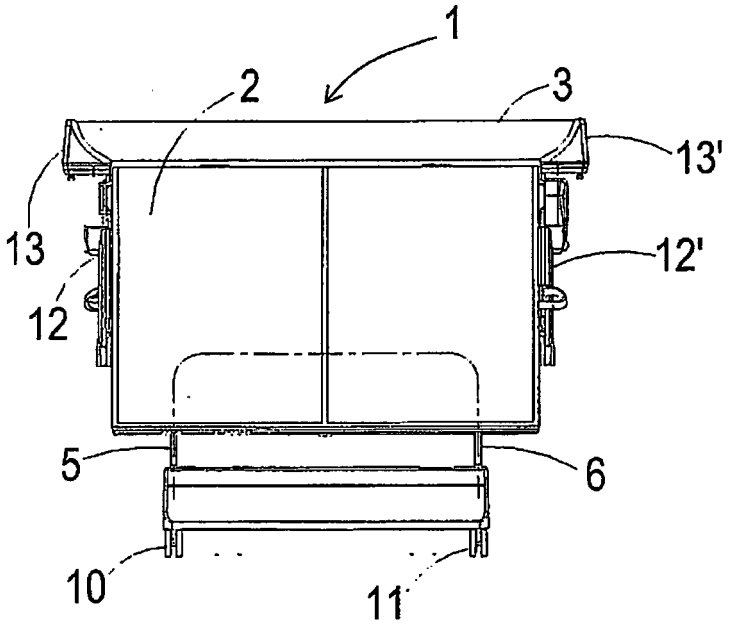

FIG. 2

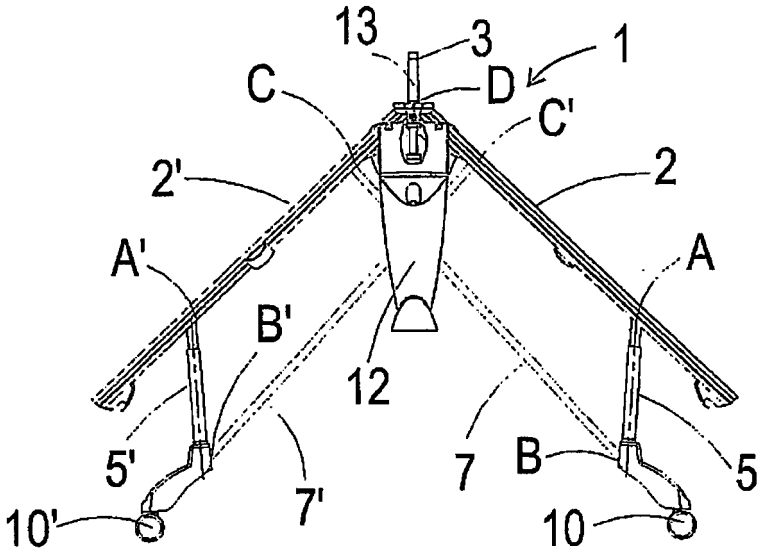

FIG. 3

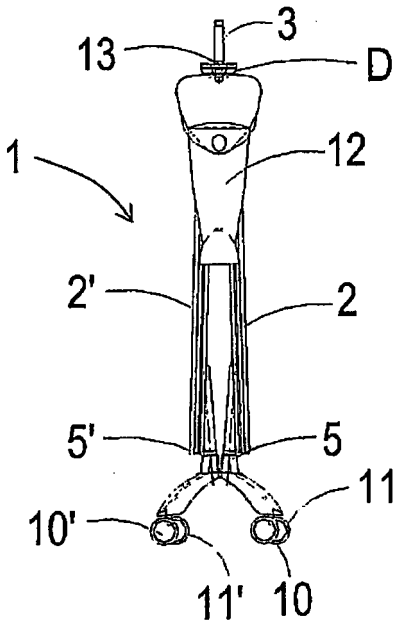

FIG. 4

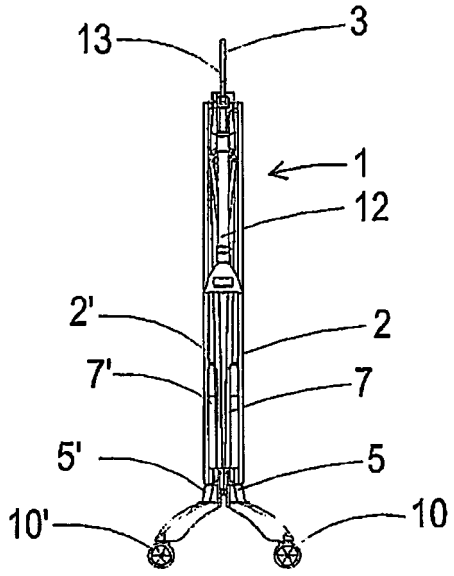

FIG. 4B

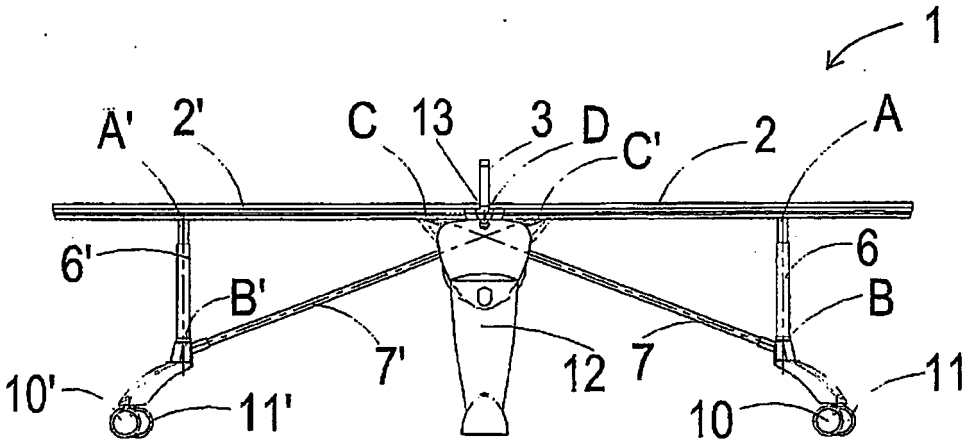

FIG. 5

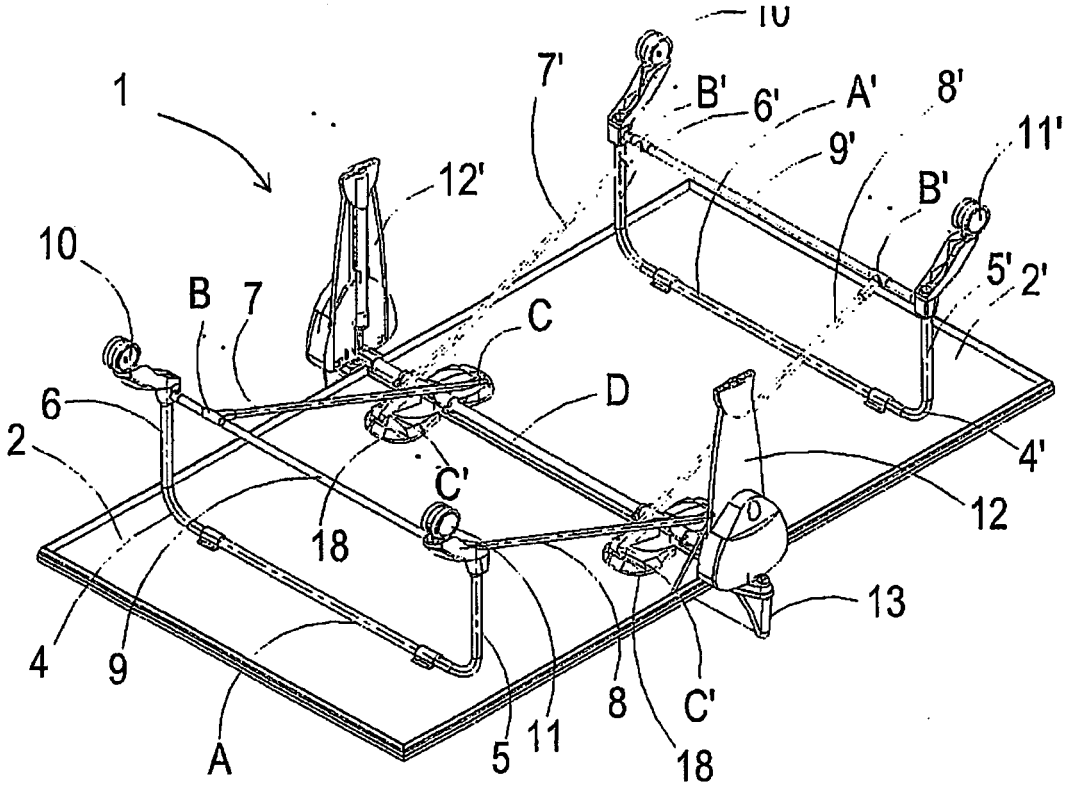
10
1
7'
B'
6'
A'
8'
11'
9'
12'
B'
10
B
7
C
5'
2'
6
D
2
4'
C'
12
18
13
4
9
8
C'
A
5
11
18

FIG. 6

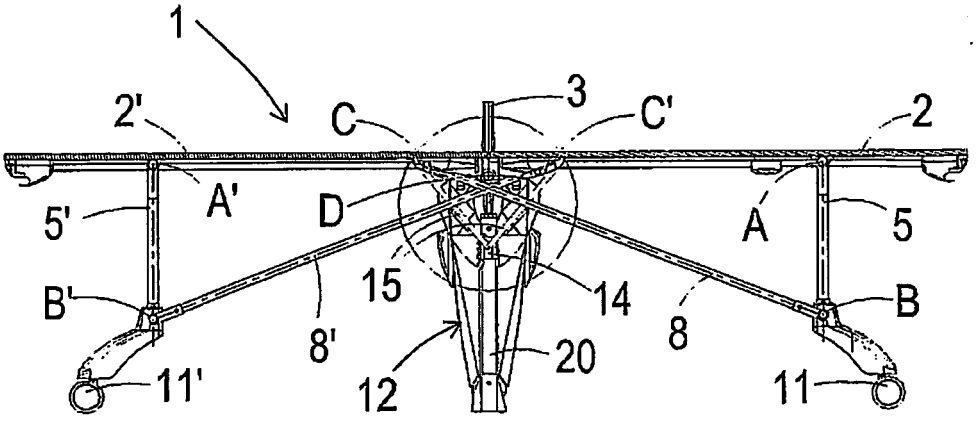
1
2'
C
3
C'
2
A'
D
5'
A
5
B'
15
14
B
8'
8
20
12
11'
11

FIG. 7

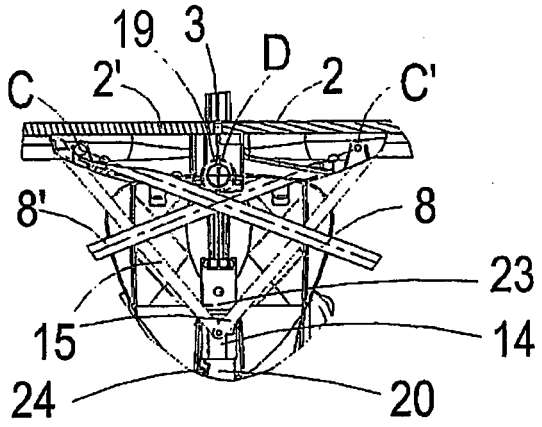

FIG. 8

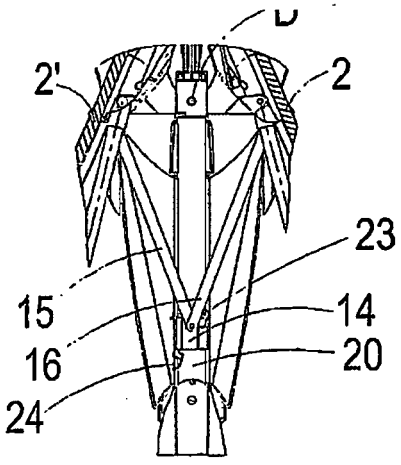

FIG. 9

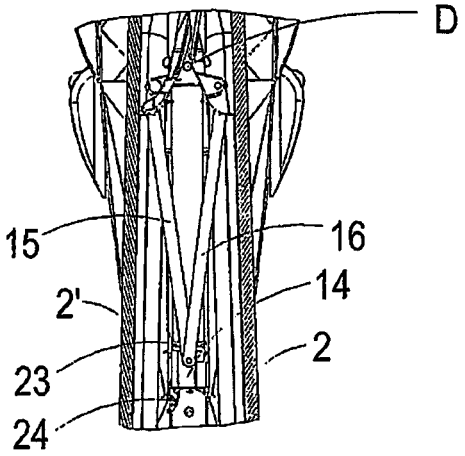

FIG. 10

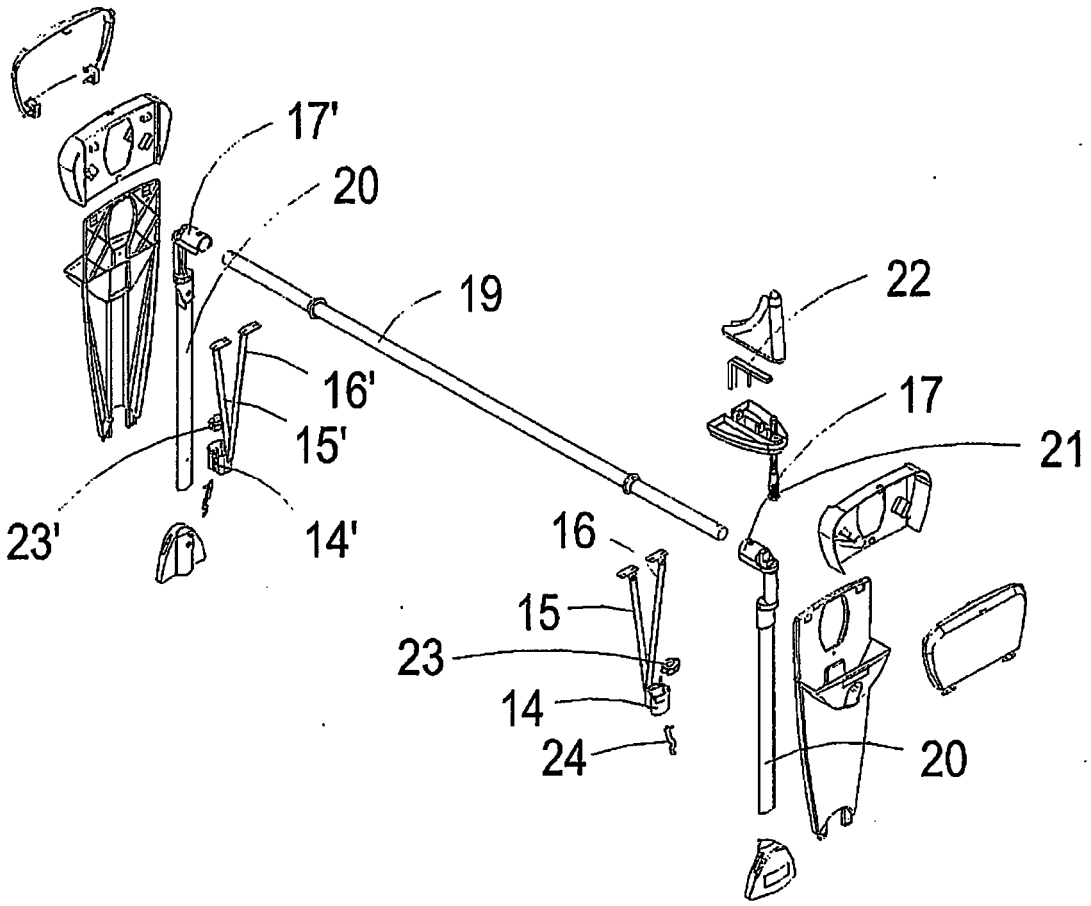

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2005/000675

A. CLASSIFICATION OF SUBJECT MATTER

A47B 3/087 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47B+

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CIBEPAT,EPODOC,WPI,PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE4334276 A1 (WILKHAHN WILKENING & HAHNE) 13.04.1995; **abstract and** figures.	1-4, 7, 9
X Y	US2730417 A (WILLIAM MITCHELL) 10.01.1956 ; column 2, line 59 - column 4, line 74; figures.	1, 3, 8, 10 5, 6, 8
Y	US3884160 A (GUTIERREZ JULIAN) 20.05.1975; column 2, line 14 - 47; **abstract and** figures.	5, 6, 8
X	FR2809965 A3 (E. R. ROVERA S. P. A.) 14.12.2001; page 3, line 5 - page 5, line 33; **abstract and** figures.	1, 2, 5, 7, 11, 12
A	US3557720 A (BLINK ROBERT O; LUTZKE WILLIAM C; SCHIER ROBERT W; HOLZ FREDERICK C) 26.01.1971; **the whole document**	

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 February 2006 (16.02.2006)	**23 February 2006 (23 02.2006)**
Name and mailing address of the ISA/ Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ ES 2005/000675

Patent document cited in search report	Publication date	Patent familiy member(s)	Publication date
DE4334276 A	13.04.1995	none	
US2730417 A	10.01.1956	none	
US3884160 A	20.05.1975	none	
FR 2809965 A	14.12.2001	ITMI 20001295A	10.12.2001
US3557720 A	26.01.1971	none	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 256416 U **[0004]**
- ES 1007292 U **[0005]**
- ES 0208534 U **[0007]**