



(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.09.2006 Bulletin 2006/36

(51) Int Cl.:
A47C 20/04 (2006.01)

(21) Application number: **06380039.5**

(22) Date of filing: **01.03.2006**

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

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(30) Priority: **04.03.2005 ES 200500500**

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(54) **Articulated box with motor**

(57) Articulated box with a motor as a base frame for an articulated bed intended for storing objects in its interior, with the special feature that the bearing surface (2) situated by way of a cover on the frame (1), providing a space in its interior for storage, is divided into three sections, two of them, those corresponding to the headboard (3) and to the middle segment (5) of the bed, being folding as a result of the thrust exerted on them by a lifting means situated below the fixed segment (4), which extends between both. In a second embodiment the bearing surface (2) will have a fourth section, corresponding to the footboard (6) of the bed, for folding by hand. In this way, both the raising and the lowering of the folding sections is facilitated tremendously and convenient access is offered to the interior of the space for storing objects, being provided with an articulated base frame that enhances the user's comfort.

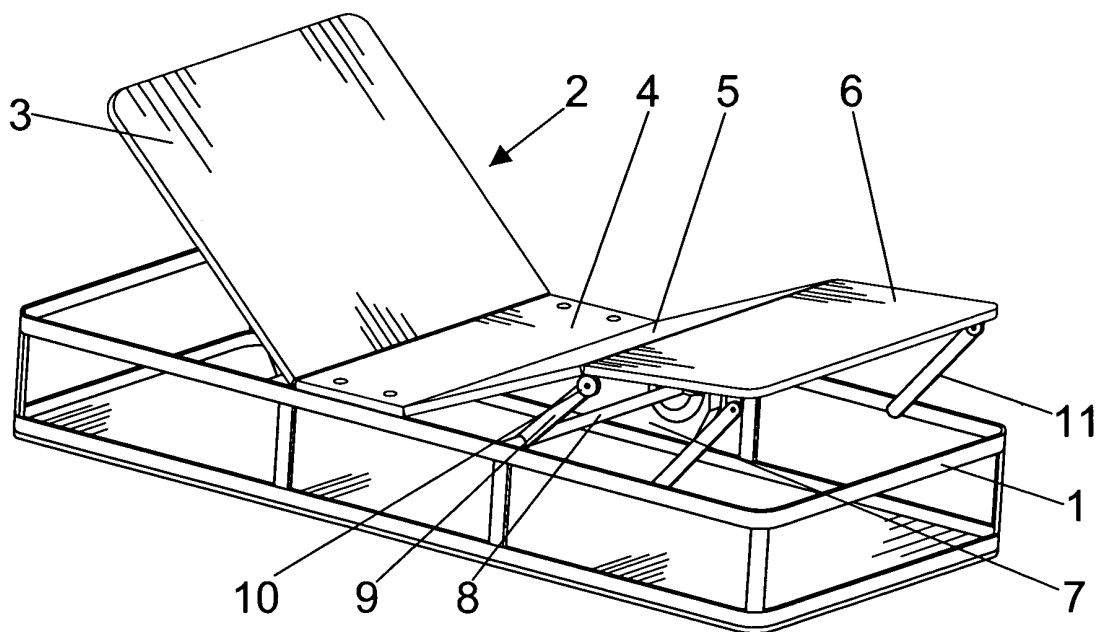


FIG.4

Description**OBJECT OF THE INVENTION**

5 **[0001]** The present invention refers to an articulated box with a motor in the form of a bed base intended for use as an articulated frame for a mattress.

[0002] The box that is the object of this invention has a hollow interior fitted out to house all kinds of articles and, furthermore, in order to facilitate access to the interior of this compartment and enhance the user's comfort, the bearing surface of the box is articulated giving rise to a number of sections, some of them folding by means of a motor. This articulation of the bearing surface successfully increases the user's comfort by offering him the option of inclining the different sections of the bearing surface to adapt it to his postural needs; for instance, if he wishes to read in bed or to keep his legs rose.

BACKGROUND TO THE INVENTION

15 **[0003]** In view of the increasing need to take maximum advantage of the space available in the home and in order to be able to make use of the space between the floor and the frame of conventional beds, the use of divan bed bases, which are upholstered supports on which the mattress is placed, has become increasingly more widespread.

[0004] Divan bed bases are made up of a frame of a form and dimensions appropriate to the mattress that is going to be laid on them and an upper cover or bearing surface, which closes the assembly and provides a space inside that may be used for storing articles, normally those that are not going to be used for lengthy periods of time (for example, blankets and other bed coverings for the winter season).

[0005] Known divan bed bases may be classed into two main groups according to how access is gained to their interior space. Thus, bed bases are known that have one or more drawers in this hollow, drawers which are accessible from one of the sides of the frame. The other type of bed bases refers to those on which the bearing surface or frame is folding, so that when this bearing surface is raised like a lid it reveals the interior compartment of the bed base, along with the objects stored in it.

[0006] Spanish document ES 1 026 585 U entitled "Perfected divan bed base" describes a bed base of the type encompassed in the first group. In this case a drawer is fitted in the central space that is provided with a series of wheels on its base that assist its movement from one of the sides of the divan bed. On its visible faces the drawer is provided with fixtures by means of which it slides with ease. Although divan bed bases of this type prove an acceptable solution to the lack of space for the storage of articles, it should be pointed out that, in view of the small size of bedrooms, it is sometimes very awkward or even impossible to pull out the drawers concealed under the bed frame completely, so that access to objects at the back of the drawer is difficult.

[0007] Compared with this drawback of the first group of bed bases, the second group, corresponding to those with a folding bearing surface, assures access to the inside of the compartment in any situation, regardless of the free space available around the perimeter of the bed. In this respect, document ES 1 053 049 U presents a folding bearing surface that is provided with two wheels on the underside of the support and mobilisation mechanism, so that when the bearing surface is raised, the wheels, which are retracted during the resting stage, protrude downwards, facilitating removal of the contents of the box. This document and many other similar ones present bed bases on which the bearing surface is folding but, in view of the dimensions of this bearing surface, the height that this bearing surface in the form of a cover may reach when raised is considered a disadvantage, as it may sometimes even knock against lamps or other hanging objects situated above the bed.

[0008] To overcome this drawback, bed bases are known on which the top cover is divided into two sections in relation to a common axis, so that each one of these sections or parts may be folded separately from the other, thereby facilitating access to the objects stored inside the bed base. Document ES 268 852 U describes an articulated folding bed base of this type.

[0009] Although the majority of folding bed bases incorporate some mechanism in the top cover or bearing surface, such that it may facilitate the raising of same (hinges, pneumatic or hydraulic cylinder), it is considered beneficial that the bed base should be provided with means that facilitate the raising of the different sections making up the top cover as far as possible, so that this type of furnishing may be used by all kinds of people irrespective of their physical constitution.

[0010] Thus, compared with the bed bases available on the market, which have various drawbacks, the object of this invention is a box whose top cover, which acts as the bearing surface, is folding and divided into different sections, whilst it is also provided with a motor-operated raising system, which simplifies the raising of the different folding sections to the utmost.

[0011] The box described below also acts as an articulated bed frame, offering the user greater comfort and improved capabilities. This dual function is achieved by appropriately distributing the sections into which the bearing surface is divided and their angles of inclination, enabling the bed frame to adapt to the activity that is going to be performed on it

(sleeping, watching television, keeping your legs up while reading, etc.).

DESCRIPTION OF THE INVENTION

[0012] The invention consists of an articulated box with a motor which has the purpose, besides the characteristic one of divan bases, i.e. acting as a support for a mattress, thereby forming a bed, of acting as a compartment for accommodating any object inside it.

[0013] Advantageously, being articulated, the bearing surface which acts as a support for the mattress on the box of this invention fulfils the functions of an articulated bed frame adaptable to the user's needs, said box together with the corresponding mattress making up an articulated bed.

[0014] As component elements making up the structure that acts as a support for the mattress, the articulated box comprises a frame and a bearing surface by way of the frame cover and mattress support

[0015] The frame consists of a rectangular element whose dimensions approximately match those of the mattress which is going to be placed on the base in the form of a box, so that it will generally comply with standard mattress manufacturing dimensions. The height of the frame will be appropriate so that the upper surface of the mattress on which the user will rest is at the normal height. This height will also be sufficient for the space defined by the inner surface of the frame to be suitable for housing such items as blankets.

[0016] The bearing surface of the articulated box is located on the frame and its dimensions match up approximately with those of the perimeter of said frame, so that when it is placed on the latter it closes superiorly the space defined by the inner surface of the frame. This bearing surface is what acts as the frame for the articulated bed composed of the box that is the object of the invention and the mattress that will be laid on it.

[0017] Advantageously, the bearing surface in the form of the upper cover of the box is articulated, so that it is divided into at least three segments or cross sections. The upper segment corresponds to the headboard of the bed and at its lower end it is joined to the fixed segment, which is of shorter length than the previous one and not folding. The middle segment is located after the fixed segment, and in one possible embodiment of the invention in which the bearing surface is made up of only three cross sections, it extends to the bottom end of the bearing surface. The possibility is also envisaged in a second embodiment that the bearing surface should comprise a fourth section corresponding to the footboard, a segment that extends from the end of the middle segment to the bottom end of the bearing surface.

[0018] As stated previously, both the headboard and the middle segment are folding, as is the footboard in the event of the bearing surface having this fourth section, for the purpose of facilitating access to the inside of the space where the items to be stored will be put and therefore forming an articulated bed frame of the type normally incorporated in articulated beds, thus considerably enhancing the comfort of the user, who may fold the different sections to adapt the position of the mattress which rests on the bearing surface in accordance with the activity to be performed on it, for example, reading, watching television or even sleeping with your legs raised. The folding of these sections takes place around the hinge axis which forms the joint between each one of them and the adjoining section, so that, when raised, the headboard forms a more or less wide angle in relation to the frame, whose vertex corresponds to the joint between said headboard and the fixed segment. Similarly, the raising of the middle segment and of the footboard, in the event of the bearing surface being divided into four segments, gives rise to an angle whose vertex corresponds to the joint between the segment in question and the adjoining segment.

[0019] Compared with other similar bed bases, where it is necessary to apply a certain force to raise the top cover or its component sections, in the event of it being an articulated base, the box being described has a lifting element installed in the inner space of the frame, below the fixed segment. To prevent as far as possible the lifting element from taking up part of the space available for storing articles, said lifting element is disposed in the upper part of the space defined by the frame, i.e. it is attached to the frame structure under the fixed segment.

[0020] The lifting element comprises a motor block with two outputs, two pushrods, two shafts and at least two connecting rods, each of which comprises a roller wheel.

[0021] During the operation of the lifting element the two motor block outputs each transmit a rotation movement by way of respective pushrods to shafts, which are disposed transversely to the frame, i.e. parallel to the hinge axis of the folding segments. When the motor block starts working, each one of its two outputs moves the respective pushrod in one direction or the other (depending on whether the folding segments are either being raised or lowered) and this longitudinal movement of the pushrod, which is connected to the shaft, causes said shaft to rotate in one direction or the other. Linked to the shaft by way of one of its ends, there is at least one connecting rod, which comprises a wheel roller at its opposite end, so that the rotation of the shaft causes the rotation of the connecting rod around it and the consequent turning of the wheel, which runs in contact with the inner surface of the respective folding segment, exerting a thrust on said surface, which brings about either the raising of the segment in question, or else its lowering, in the event of both the connecting rod and the roller wheel rotating in the opposite direction.

[0022] As mentioned earlier, in one possible embodiment of the articulated box that is the object of this invention the possibility is envisaged that the bearing surface may comprise a fourth segment, called the footboard through being at

the bottom end of the bed, in the area intended to support the feet. Like the headboard and the middle segment, this footboard may be raised in order to increase the comfort of the person who is lying on the mattress or else to gain access to the interior of the compartment fitted out for storing objects.

[0023] This fourth segment is not folded by the action of an electric motor, as in the case of the headboard and the middle segment, but instead at least one strut is provided that extends between the respective part of the frame and the inner surface of the footboard, i.e. the folding is done by hand. In this way, access is provided to the interior of the box even in the event of it not being possible to fold the motor-operated segments for various reasons (power supply failure or fault in the motor). Since the operation of the struts is independent of the motor, it is possible to raise the footboard of the bed when the rest of the bearing surface remains in a horizontal position, and it facilitates access to the storage compartment tremendously when the segment adjoining it, the middle segment, is folded down.

[0024] Normally, the number of struts comprised in the box will be two, each of them being situated at one of the transverse ends of the frame. In this way the weight of the footboard is distributed evenly over the frame structure.

[0025] To each of the cross shafts of the lifting element responsible for folding the headboard and the middle segment there may be attached at least two connecting rods, each of these being located at one of the ends of the shaft, i.e. each of the connecting rods will be linked to said shaft in the vicinity of the joint of the shaft to the bed base frame, whereby the thrust that the wheel rollers exert on the surface of the segment to be folded is doubled and the weight of the segment is thus distributed between two bearing points. The number of connecting rods may be larger, for example three, in cases in which the width of the bed so requires, normally on beds which have a width of more than 135 cm., in which cases two of the connecting rods are situated at the ends of the shaft and the third connecting rod is centred on it

DESCRIPTION OF THE DRAWINGS

[0026] To supplement the description that is being given and in order to assist in a clearer understanding of the features of the invention, in accordance with a preferential example of a practical embodiment of same, this description is accompanied as an integral part hereof by a set of drawings, wherein there is represented, for informative and non-restrictive purposes, the following:

Figure 1.- It shows a perspective view of an articulated box with a motor according to an initial embodiment of the invention, with the headboard and the middle segment folded down.

Figure 2.- It shows a perspective view of an articulated box of figure 1 without the bearing surface in order that the lifting element may be observed.

Figure 3.- It shows the cross section taken through plane A-A in figure 1.

Figure 4.- It shows a perspective view of an articulated box with a motor according to a second embodiment of the invention, with the headboard, the middle segment and the footboard raised.

Figure 5.- It shows a perspective view of the articulated box of figure 4 without the bearing surface, so that the raising element and the strut raised.

Figure 6.- It shows the cross taken made through plane A-A in figure 1.

PREFERRED EMBODIMENT OF THE INVENTION

[0027] In the light of the figures there may be seen in them two specimen embodiments of the invention, which consists of an articulated box with a motor which in both embodiments comprises a frame (1), a bearing surface (2) and a lifting element.

[0028] As may be observed in the figures, the frame (1) has a rectangular shape with rounded vertices. Although these figures show a representation of a frame (1) intended to constitute a single bed, the possibility is envisaged that the dimensions of this frame (1) may vary, such that its dimensions may match the standard dimensions of the mattresses available on the market.

[0029] As may be seen, the bearing surface (2), which performs the functions of the bed frame and the cover of the box, is articulated in such a way that it is divided into at least three sections.

[0030] Figures 1, 2 and 3 refer to an initial embodiment of the invention, in which the bearing surface (2) is made up of three segments or sections corresponding to the headboard (3), the fixed segment (4) and the middle segment (5).

[0031] As indicated by its name, the fixed segment (4), which is not folding, is the one that extends between the headboard (3) and the middle segment (5) and its length is shorter than that of the previous ones. In figure 1, in which

both the section corresponding to the headboard (3) and that corresponding to the middle segment (5) are shown raised, it may be appreciated that the height of the frame (1) is appropriate for the space defined by its inner surface to be suitable for housing items of considerable size.

[0032] Figure 1 shows the half of the lifting element that has the function of raising the middle segment (5) of the box, also represented in figures 2 and 3, together with the headboard (3) raising half. The lifting element, situated below the fixed segment (4) of the bearing surface (2) of the box, also acts on the headboard (3), such that both the middle segment (5) and the headboard (3) may be folded separately.

[0033] Figure 2 corresponds to the box of the previous figure with the same segments raised, but in this representation the bearing surface (2) that covers the inner space of the frame (1) has been removed so that the lifting element may be observed in the folded up position.

[0034] The second embodiment of the invention, represented in figures 4, 5 and 6, is similar to the previous one, although in this case the bearing surface (2) comprises a fourth segment, referred to as the footboard (6), also folding, which extends inferiorly from the middle segment (5). As indicated by its name, the footboard (6) is the part of the bearing surface (2) corresponding to the area offering support for the feet. As in the embodiment described previously, the fixed segment (4) is the only one that is not folding, as the headboard (3) and the middle segment (5) may be folded by the lifting element, common to both embodiments, which will be described later on. The footboard (6) may also be folded, but the folding of this segment is done by hand by means of a strut (11), which extends from the structure of the frame (1) to the inner surface of the footboard (6).

[0035] The lifting element, common to both embodiments, comprises a motor block (7) with the two outputs operated by electricity, which it receives via an input lead connected to the mains. Each of the two outputs of the motor block (7) transmits a longitudinal forward or backward movement to the respective pushrod, connected in turn to a shaft (8) whose length matches up with the width of the frame (1). The ends of said shaft (8) are connected to two points of the inner surface of the frame (1), such that the shaft (8) passes transversely through the space intended for storing articles. In the vicinity of the ends of the shaft (8) and attached to said shaft (8) there are two connecting rods (9, 9'), which are the ones that act as a fastening for the motor, each of them presenting, at its opposite end to that of the joint with the shaft (8), a roller wheel (10) capable of rotating around a spindle, which passes through it and acts as a link between the roller (10) and the respective connecting rod (9, 9'). In this way, as each of the pushrods receives the output movement of the motor block (7), it transmits it as rotary movement to the respective shaft (8), with the result that each of the roller wheels (10) describes a circular movement around the shaft (8). As they move, the roller wheels (10), which are in contact with the inner surface of the respective folding segment all the time, exert a thrust on said surface, causing the segment in question to be raised or lowered, depending on whether the longitudinal movement described by each pushrod is forward or backward.

[0036] With regard to the folding of the footboard (6) of the second embodiment, this does not take place under the action of a motor but is the result of a manual folding action, for which purpose a strut (11) is provided between the part of the structure of the frame (1) that is below said segment and the inner surface of the footboard (6). Figures 4, 5 and 6 show the footboard (6) in the raised position, a position that is useful not only for enhancing the comfort of the user of the bed, but also for facilitating access to the inside of the inner compartment of the frame (1), a compartment designed for storing objects.

Claims

1. Articulated box intended for storing objects in its interior and acting as an articulated bed frame for a mattress, which comprises:

a frame (1) whose inner surface defines a space for the storage of objects; and
a bearing surface (2) located on the frame (1) which closes this space superiorly;

characterised in that

said bearing surface (2) comprises at least three articulated sections corresponding to the headboard (3), the middle segment (5) and the fixed segment (4), which extends between them, while both the headboard (3) and the middle segment (5) may be raised by means of a lifting element installed in the interior space of the (1), below the fixed segment (4);

the lifting element comprises a motor block (7) with two outputs, each one of which transmits a rotation movement via respective pushrods to a cross shaft (8) joined to at least one connecting rod (9) which comprises at its opposite end a roller wheel (10), such that the rotation of the shaft (8) and the consequent rotation of the connecting rod (9) around said shaft (8) causes the movement of the roller wheel (10), which, being in contact with the articulated section to be raised, exerts a thrust on it that causes it to be folded up.

2. Articulated box according to the previous claim, **characterised in that** it comprises:

a footboard (6) which extends from the middle segment (5) as a lower section of the bearing surface (2); and
at least one strut (11), which extends from the frame (1) to the inner surface of said footboard (6) and which
permits the manual folding of the footboard (6).

3. Articulated bed base according to any of the previous claims, **characterised in that** to each one of the two cross
shafts (8) comprised in the lifting element there are at least two connecting rods (9, 9') attached, two of them being
located at the ends of the shaft (8) in question.

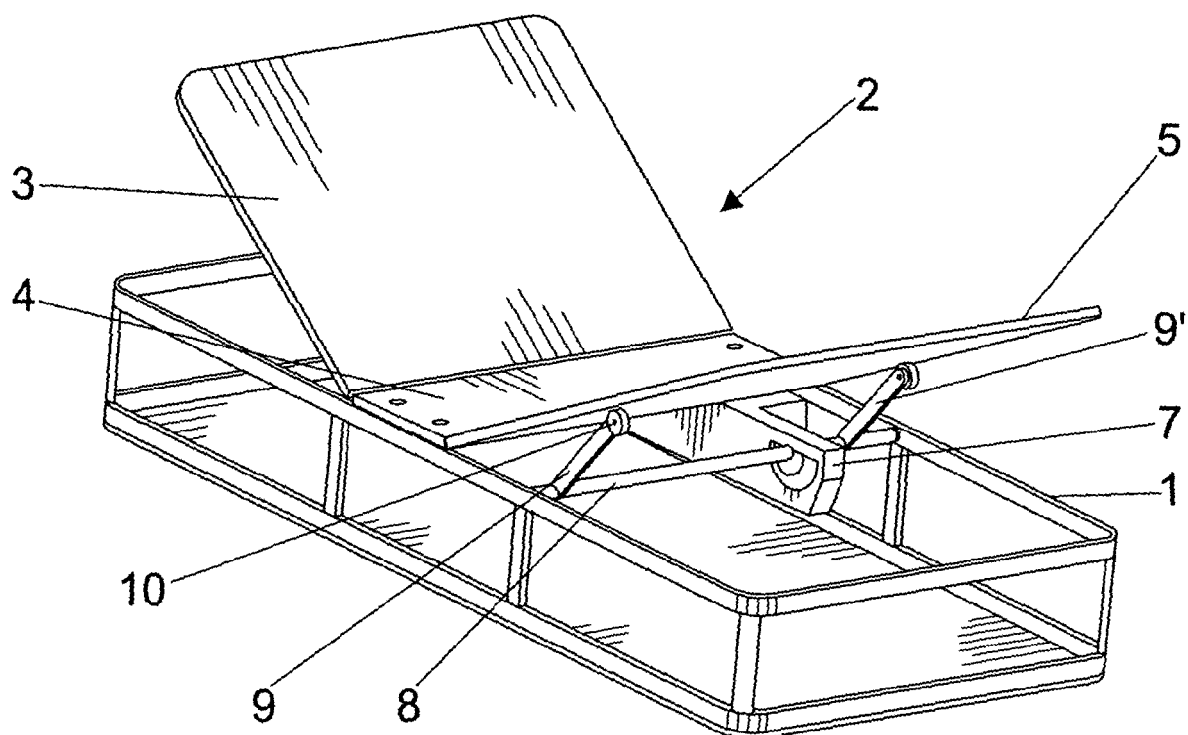


FIG.1

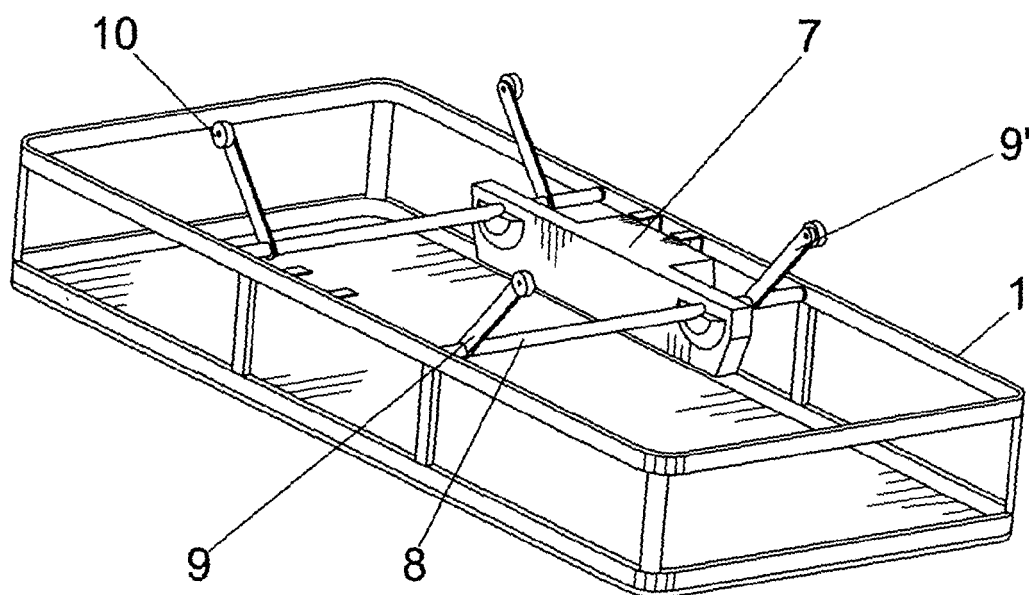


FIG.2

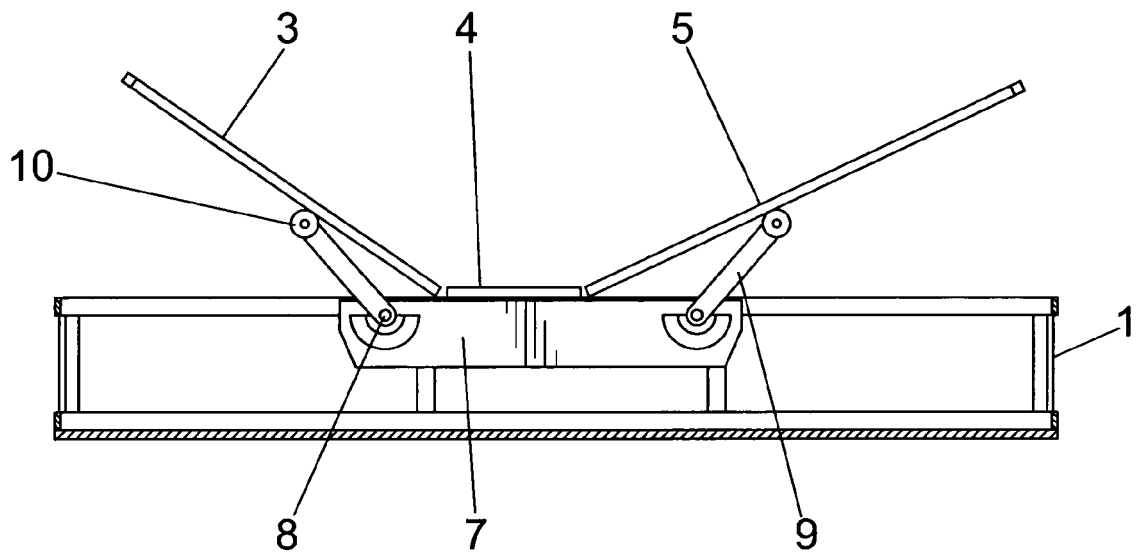


FIG.3

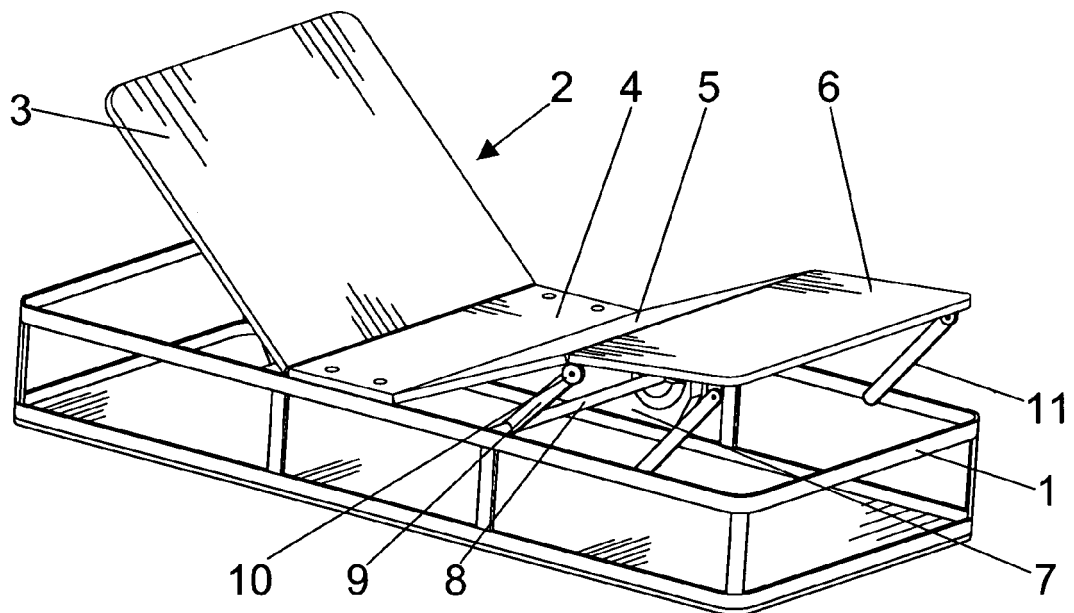


FIG.4

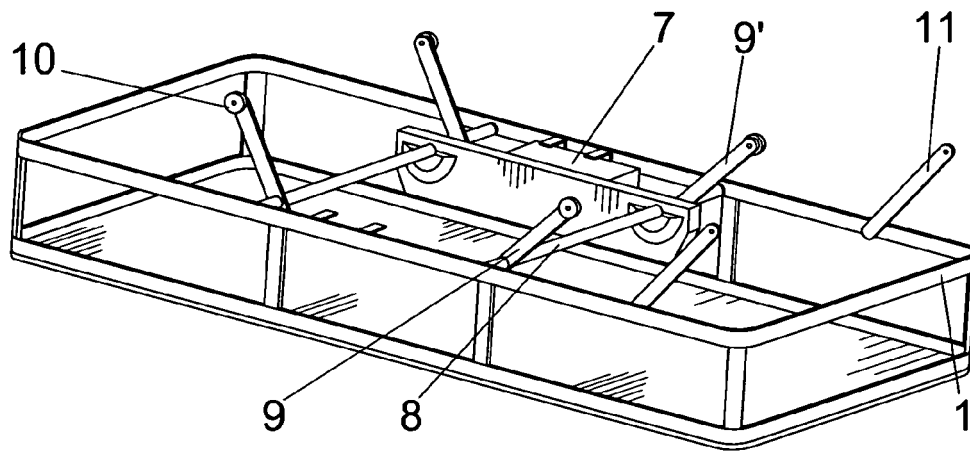


FIG. 5

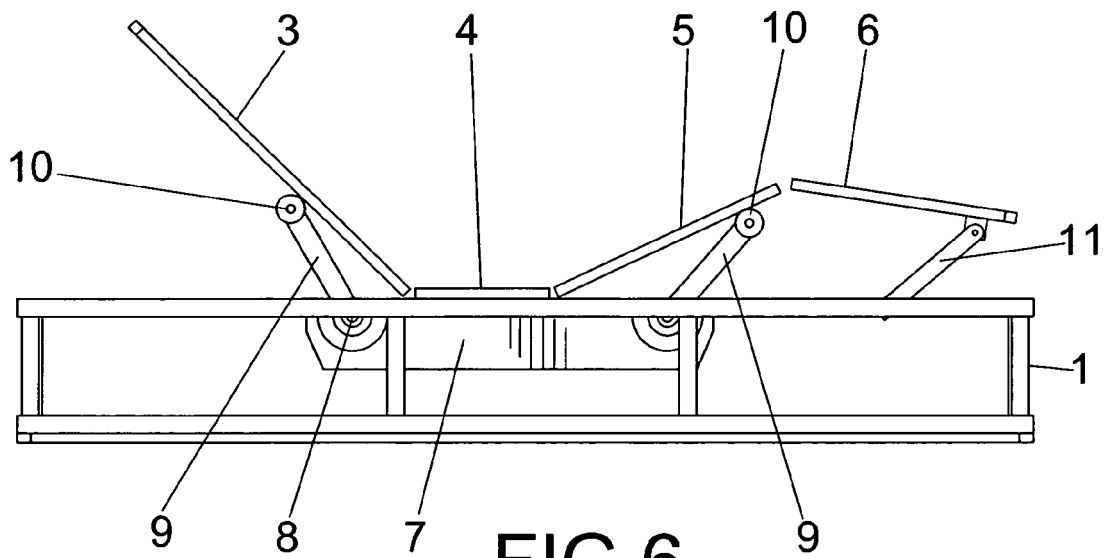


FIG. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0039

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 22, 9 March 2001 (2001-03-09) & JP 2001 120389 A (IMASEN ELECTRIC IND CO LTD), 8 May 2001 (2001-05-08) * abstract *	1,3	INV. A47C20/04
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X	WO 2004/100723 A (HILDING ANDERS INTERNATIONAL AB) 25 November 2004 (2004-11-25) * the whole document *	1,3	
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A	----- DE 92 08 736 U1 (KOETTER, HELMUT, 4901 HIDDENHAUSEN, DE; BOSSERHOFF, GERD, 4795 DELBRUE) 17 September 1992 (1992-09-17) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 May 2006	Examiner Kis, P
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 38 0039

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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09-05-2006

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