



(12)

EUROPEAN PATENT APPLICATION

(43)

Date of publication:

02.01.2019 Bulletin 2019/01

(51)

Int Cl.:

A47C 17/16 (2006.01)

A47C 17/40 (2006.01)

A47C 7/40 (2006.01)

(21)

Application number: 18020274.9

(22)

Date of filing: 22.06.2018

(84) Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME Designated Validation States: KH MA MD TN	(72) Inventors: • Meers, Carl 3650 Dilsen-Stokkem (BE) • Drijkoningen, Guido 3650 Dilsen-Stokkem (BE)
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(54)

SEAT COMPRISING A BACK CUSHION ADJUSTABLE IN HEIGHT

(57)

The present invention relates to a seat, comprising a seat cushion (12), a back cushion (14) and a back rest (13), mounted on a base element (11), whereby the back cushion is adaptable between a low and a high position,

the position of the back cushion in any position between the low and the high position is adjustable by the user by means of a motor-driven driving mechanism (M2) and a

double guidance mechanism, the high position of the back rest is at least 10 cm higher than the low position and the double guidance mechanism comprises two guides (G1, G2), mounted on the front side of the back rest (13) and four guiding blocks (GB1, GB2, GB3 and GB4), two for the guidance of each guide, mounted on the back side of the back rest (14).

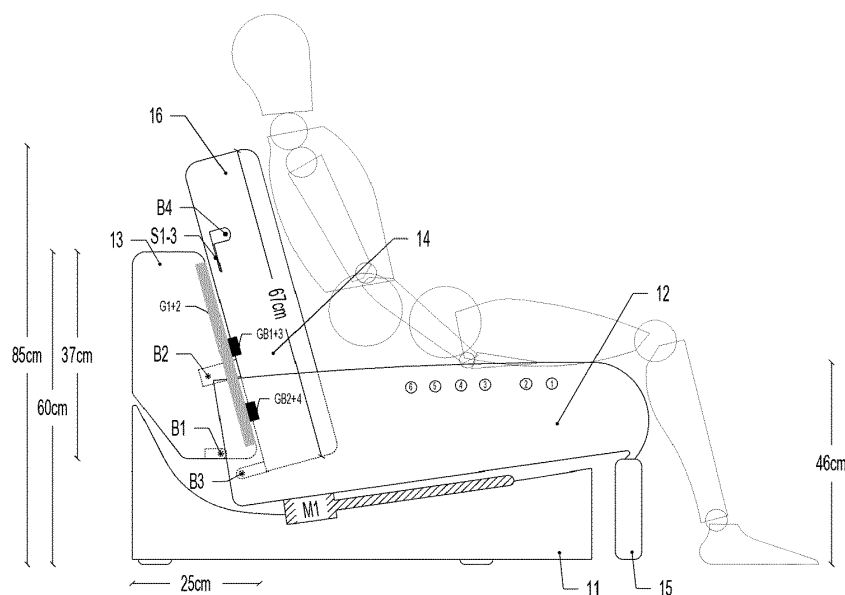


Fig. 1.1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a seat comprising a back cushion adjustable in height and being suitable to partly pop-out from a recess in the seat cushion. By incorporating in an inventive manner according to the invention a telescopic, sliding or extensible back cushion, a seat can be manufactured that combines on the one hand the comfort of a traditional relaxing seat with the stylish, elegant appearance of a contemporary seat.

BACKGROUND OF THE INVENTION

[0002] It is known that up to now seats are available on the market that offer to the user a relaxing or comfortable position, besides or on top of the usual seating position.

[0003] Such classical or traditional relaxing seats are characterised by the presence of a high back rest, in some cases comprising an additional head support. This type of seat offers to the user apart from the seating function or seating position, an additional supporting function at the level of the back and/or the head. One of the drawbacks of these seats is that in most cases they are characterised by a quite bulky or heavy appearance. Such is occasioned by the fact that the back cushion of this seat model is situated fully above the seat cushion, whereupon the butt of the user is positioned, and extends until the shoulders of the user and in some instances, until the head of the user.

As a result, this seat model is characterised by its typical high back, resulting in a less elegant appearance.

[0004] In contrast hereto, the trend in the present design of seats is that a generally low back rest and back cushion should be offered to the customer. By such a low back rest and back cushion, the seat appears as trendy, elegant and aesthetic according to present standards.

The German utility model DE 200 21 776 U1 in the name of Hukla Werke GmbH, filed on February 22, 2001, the US patent application Nr. US 2013/341974 A1 in the name of Daito Electric Machine Industry Company Ltd., published on December 26, 2013 and the US patent 5,836,648 issued on November 17, 1998, in the name of Recaro GmbH & Co, describe models of seats whereby the position of the back cushion is adjustable by the user. These contemporary seats have trendy appearances but they do not offer to the customer or user the comfort of the traditional relaxing seats.

In view thereof there remains a need for seats that combine or offer the advantages of both type of seats, on the one hand the comfort of a traditional relaxing seat, on the other hand a contemporary seat with a low back rest and cushion. The difficulty to realise both requirements in practice is linked to the fact that the means required to offer the above described movements and different

positions of the seat, namely the required mechanical and electrical components, cannot or can only with great difficulty be incorporated in a seat with such a 'low' back. Indeed, there is not sufficient space behind the back cushion and/or beneath the seat cushion to install the driving & guiding mechanisms required so as to enable a user to obtain the various positions of the cushions typically offered in a relaxing seat.

SUMMARY OF THE INVENTION

[0005] The aim of the present invention is to remedy the abovementioned problems and challenges, by offering a seat:

comprising a seat cushion (12), a back cushion (14) and a back rest (13), mounted on a base element (11), whereby:

- the back cushion is adaptable between a low and a high position,
- the position of the back cushion in any position between the low and the high position is adjustable by the user by means of a motor-driven driving mechanism (M2) and a double guidance mechanism,
- the high position of the back cushion is at least 10 cm higher than the low position.

In such seat, the double guidance mechanism comprises two guides (G1, G2), mounted on the front side of the back rest (13) and four guiding blocks (GB1, GB2, GB3 and GB4), two for the guidance of each guide, mounted on the back side of the back cushion (14).

According to a preferred mode of the invention, the seat is characterised in that the motor-driven driving mechanism (M2) comprises an electrical motor and a driving steering column, mounted on the front side of the back rest, and a guiding block (B2) mounted on the back side of the back cushion.

According to a further preferred mode of the invention, the seat is characterised in that the upper side of the back cushion in the low position is located at most 95 cm above the ground floor.

More in particular the invention relates to a seat as set forth in the claims following the present description.

DESCRIPTION OF THE INVENTION

[0006] The seat according to the invention comprises the following components:

- a base element (11);
- a seat cushion (12);
- a back rest (13);
- a back cushion (14).

[0007] Optionally, the seat according to the invention may comprise the following additional components:

- a feet support (15);
- a head support (16).

Each of the above described components 11 until 16 is mounted on a fixed frame, whereupon crushable cushions are affixed, upholstered with suitable clothing or leather. The base element comprises a frame, preferably upholstered with suitable clothing or leather.

[0008] The base element (11) of the seat according to the invention supports the seat cushion and the back rest. It is placed on the ground floor.

The seat cushion serves as support for the butt of the user and is mounted on the base element.

The back cushion serves as support for the back of the user and is mounted on the back rest.

The back rest is mounted on the base element.

The optional feet support is installed at the front side of and beneath the seat cushion.

The optional head support is mounted either on top of the back cushion or is integrated in the top part of the back cushion.

[0009] The terms 'front side', respectively 'back side' of a component (for example the back rest or the back cushion) of the seat according to the invention, indicate the side of the component situated before or after the component to which it relates from the point of view of a user, when the user is located in front of the seat and his view is directed towards the seat.

[0010] A characterising part of the seat according to the invention resides in the fact that the position of the back cushion is adaptable or adjustable in height.

In such a way, the back cushion can take any position in between and including one of the following two positions:

- an utmost low position, corresponding to the usual position of the back cushion, hereinafter referred to as the low position,
- an utmost high position, hereinafter referred to as the high position, whereby the seat according to the invention offers to the user an additional support in the higher part of the back, neck and/or head.

Apart from the above two extreme positions, various intermediate positions of the back cushion are available for the user. The transition from the low to the high position, or vice versa, is performed gradually, as will be explained hereinafter.

[0011] In the low position, the lower part of the back cushion resides in a recess or cut-out of the seat cushion. When the position of the back cushion gradually changes from the low position till the high position, the back cushion gradually pops-out of the recess or cut-out of the seat cushion until it reaches, as desired by the user, its utmost high position. When the position of the back cushion is adjusted from the low position till the high position, or vice versa, preferably no visual gap or opening appears in between the seat and back cushions; both cushions remain perfectly in line or matched one to the other.

[0012] In the high position the back cushion offers a support to the user, in particular at the level of his/her back and/or head, similar or equivalent to the support that is offered by a traditional relax seat to the user.

5 This support is at best in the utmost high position of the back cushion.

[0013] In the low position the seat according to the invention retains a shape and appearance in line with and in conformity with the contemporary requirements for aesthetic, elegant seats.

[0014] The height of a contemporary seat should not exceed 95 cm, preferably 90 cm, more preferably 85 cm, as counted from the floor whereupon the seat is positioned.

15 The upper side of the seat cushion of a contemporary seat should be positioned in between 40 and 50 cm, for example at 46 cm, as counted from the floor, in order for the user to move from a standing until a seating position, or vice versa, in an elegant, user-friendly manner.

20 **[0015]** So as to enable the back cushion to move between the low and the high position, the seat according to the invention comprises a guiding mechanism, preferably actuated by an actuating means, more preferably actuated by an electric motor. These components can be actuated by the user by means of an interface or operating system known as such. Such an interface system may comprise for example steering buttons, positioned at the side of the seat cushion. These buttons can be actuated by push or touch actions by the user, whereby a motor is actuated that causes the back cushion to move up- or downwards. Each driving system preferably is actuated by two buttons, one actuating the upwards movement, the other actuating the downwards movement. In a preferred embodiment, the actuating buttons for a given function should be positioned in a grouped manner. For example, the actuating buttons for the up- and downwards movement of a given component should be positioned near to each other, one besides the other or one above or beneath the other. As an alternative embodiment, one actuating button can be used for both functions, up/down, open/closed.

[0016] The guidance system comprises guides and guiding blocks.

45 **[0017]** The guides can be mounted or installed for example on the side of the back rest facing the back side of the back cushion. The guiding blocks can be mounted for example on the back side of the back cushion. For the motor, for example, a linear actuator can be used comprising an internal gear transmission. This motor can be operated by means of an electric transformer (24 V) or a battery.

50 The back cushion will then move up and down as the guiding blocks on the rear side of the back cushion will be steered up and down by means of the guides, mounted on the back rest.

55 According to a preferred embodiment of the invention this driving mechanism should be installed at the lower side of the back rest, for example by means of a clevis pin.

The upper side of this steering mechanism can be mounted e.g. on the back cushion.

The inventors have found that a double guiding mechanism yields satisfactory results. When designed in a sufficiently solid manner and installed on the back cushion, these suffice to carry, resp. to support a person of moderate to high weight.

By such positioning and mode of execution, surprisingly, the weight of a reasonably heavy person can be supported without problems by the back cushion, whereas at the same time, the whole construction can be integrated in the seat according to the invention.

This is quite surprising as the dimensions of a back cushion typically are situated in the following ranges:

- width comprised between 40 and 60 cm, preferably within 40 and 45 cm, for example, 42 cm;
- depth comprised between 20 and 30 cm, preferably within 23 and 27 cm, for example, 25 cm;
- height comprised between 60 and 70 cm, for example 67 cm.

[0018] According to a preferred embodiment of the invention, the back cushion internally comprises two parts. The upper part of the back cushion can be used as head support and to this end can move upfront or backwards as a function of the position of this support as desired by the user. Both parts of this two-part back cushion are then connected to each other by means of hinges or hinged joints.

In a further preferred embodiment of the invention the upfront, resp. backwards movement of the head support can be actuated by a driving system, preferably actuated by an electrical motor.

According to a further preferred mode of operation of the invention, this driving system comprises a linear actuator with internal gear transmission. The motor can be driven by a transformer (24 V) or a battery.

This driving system may be mounted or installed on the one part at the rear side of the back cushion, on the other part at the upper rotating part of the back cushion (the rotating head support). In an alternative embodiment of the invention, this head support is not driven by a steering system electrically driven by a motor, but manually by the user.

[0019] In a further preferred embodiment of the invention, the seat comprises a feet support.

This component can also be driven by a driving system, enabling the support to gradually be lifted from a vertical position underneath the front side of the seat cushion until - in its maximum upright position - its upper side is positioned at the upper side of the seat cushion. At the latter position, such feet support together with the seat cushion offers one and the same horizontal support for the user.

In a further preferred embodiment of the invention, this driving mechanism comprises also a linear actuator with an internal gear transmission. The motor can then be

driven by means of a transformer (24 V) or a battery.

[0020] The operation of this driving system can be performed by the user through means known as such, for example by touching or pushing activating buttons positioned at the side of the seat cushion.

The feet support can be designed and executed in a so-called closed or open manner: in case of a seat provided with legs, the seat has a lighter appearance, referred to as an open seat. A seat whereby the legs are upholstered with clothing or leather, is generally referred to as a closed seat. The present invention is applicable to both embodiments.

[0021] In a further preferred embodiment of the invention, concomitantly with the upward movement of the feet support, the back cushion is moved backwards. Such joint movement of both components yields an even more comfortable position for the user. The reason for this is that the seating angle, this is the angle formed between the legs and the torso of the user, enhances by the above joint movement. This upward movement of the feet support and the backward movement of the back cushion can be actuated by one and the same mechanism, which may be driven by an electrical motor. In an alternative embodiment, both movements are occasioned by separate driving mechanisms.

In the utmost backward position of the back cushion, the user resides in a full, or near to full horizontal or relaxation position.

[0022] In a preferred embodiment, the back side of the back rest is positioned vertically above the rear side of the base element in the basic configuration or position of the seat according to the invention. In such basic configuration the back cushion is in its low position, the seat cushion is not in its (utmost) front position, and the optional feet support is in its downward vertical position. In this configuration, both back components (the back rest and the back cushion) do appear as one integrated aesthetic form.

A surprising effect of the seat according to the invention is that despite the movement of the seat cushion forwards and the concomitant rotation of the back cushion, this complete movement is performed within the floor space of the base element. This in turn gives rise to the remarkable advantage that the back rest of the seat according to the invention can be placed in closed proximity of a wall at the rear side of the seat. For the seat as described hereinafter in greater detail with reference to the drawings, this implies that the seat can be placed at a distance of only 13 cm as measured from the wall at the rear side of the seat.

In such a position quite closed to the rear wall after the seat, the seat according to the invention still can be converted from the seating to the relaxing position, whereby neither the base element, neither the back rest, neither the back cushion, neither the head support touch the wall at the rear side of the seat.

[0023] The invention will hereinafter be explained and described with reference to the appended drawings.

The operating buttons 1 through 6 are positioned at one side of the seat cushion. When touching, resp. pushing button 1, a drive system 1 is actuated, causing the feet support to move up.

By touching, resp. pushing button 2, the drive system is actuated in reverse sense, causing the feet support to move downwards, back to its original or usual position, underneath the seat cushion.

[0024] By touching, resp. pushing button 3, a drive system 2 is actuated, causing the back cushion to move upwards relative to the back rest.

By touching, resp. pushing button 4, the drive system 2 is actuated in reverse sense, causing the back cushion to move downwards, back to its original or usual position, partly hidden in the recess of the seat cushion.

[0025] By touching, resp. pushing button 5, a drive system 3 is actuated, causing the head support to rotate forwards.

[0026] By touching, resp. pushing button 6, the drive system 3 is actuated in reverse sense, causing the head support to rotate backwards, back to its original or usual position, in line with the lower part of the back cushion.

[0027] The rotation of the head support relative to the lower part of the back cushion is performed by means of the hinges S1, S2 and S3.

DETAILED DESCRIPTION OF THE INVENTION WITH THE DRAWINGS

[0028] So as to more clearly describe the features of the invention, hereinafter some preferred embodiments of the seat according to the invention are described with reference to the appended drawings.

[0029] The figures 1.1 up to and including 3.3 illustrate the seat according to the invention in various positions, all of the figures being side-views of the seat.

[0030] All in total nine different positions are shown, such views showing the seat as follows:

- in the (utmost) high and low position of the back cushion (16);
- in the utmost positions of the feet support (15), this means in the full vertical and full horizontal position;
- in the utmost positions of the upper part of the back cushion, this means completely in line with the lower part of the back cushion, or according to a strongly rotated position in the direction of the user;
- in the utmost rotational positions of the back cushion, this means in a rather vertical position, whereby the user is in a rather seating position on the seat, or in a rather horizontal position, whereby the user is in a rather relax or horizontal position on the seat; in the latter position, the back cushion along with the back rest being rotated so as to offer an optimal lying- or comfort-position to the user when the user lies rather than sits on the seat.

[0031] In between each of the abovementioned utmost

or extreme positions of the various components of the seat, each seat component may take any intermediate position as desired by the user.

The following reference signs are used in the figures and drawings appended hereto:

1 through 6 refer to the buttons for actuating the various drive systems of the seat:

1 & 2 relate to the drive system for the feet support and the back rest;

3 & 4 relate to the drive system for the back cushion;

5 & 6 relate to the drive system for the rotating head support;

11 refers to the base element of the seat according to the invention;

12 refers to the seat cushion;

13 refers to back rest;

14 refers to the back cushion;

15 refers to the feet support;

16 refers to head support, integrated in the upper part of the back cushion.

M1 refers to the drive system with electrical motor for actuating the feet support and the back rest (relax - function), so as to have the feet support rotate between its usual vertical position and its horizontal position;

M2 refers to the drive mechanism, steered by an electrical motor, for actuating the back cushion upwards and downwards;

M3 refers to the drive mechanism, steered by an electrical motor, for actuating the head support, resp. for rotating the head support towards the user;

G1 and G2 refer to the guides of the double guiding mechanism for the back cushion;

GB1, GB2, GB3 and GB4 refer to the guiding blocks of the double guiding mechanism of the back cushion;

S1, S2 and S3 refer to the rotating mechanism, e.g. to hinges, by means whereof the head support situated above the back cushion may rotate relative to the back cushion;

B1 refers to a fixation point for the motor M2;

B2 refers to a guiding block by means whereof the driving or steering bar or column of the driving mechanism M1 actuates the back cushion relative to the back rest upwards and downwards;

B3 refers to a fixation point for the motor M3;

B4 refers to a hinge, for example a pin mechanism, enabling the head support, integrated in the upper part of the back cushion, to rotate forwards.

[0032] As set forth supra, the figures 1.1 up until 3.3 all illustrate schematically and as side view the seat according to the invention, in various positions for the user.

[0033] Figures 1.1, 1.2 and 1.3 show the traditional re-

lax function of the seat according to the invention.

In figure 1.1 the feet support is in its usual vertical position, underneath the front side of the seat cushion.

In figure 1.2 the feet support is in the upwards position, whereby the front side of the feet support is at the same height as the upper side of the seat cushion.

In figure 1.3 the back rest with the back cushion mounted thereupon has been rotated and the back cushion is in a more horizontal position. The latter position enhances the comfort for the user.

These various positions of the seat according to the invention can be chosen by the user by means of the operating buttons 1 & 2. These buttons are shown on the figures at the side of the seat cushion.

By means of the operating buttons 1 & 2 the user may lift the feet support upwards and in a further position, may rotate the back rest in a more horizontal position, thereby causing the back cushion gradually to take a more horizontal position.

[0034] This up & down movement of the feet support (15) and rotation of the back rest (13) has been illustrated in the drawings by the arrows with reference signs 1 & 2. In each of these positions of the seat according to the invention, the back cushion (14) resides in its lower position and the upper part of the back cushion, namely head support (16) resides in line with the back cushion. The head support in this case is not rotated forwards.

These figures illustrate the traditional relax function of the seat according to the invention.

[0035] The figures 2.1, 2.2 and 2.3 illustrate the seat according to the invention, whereby the back cushion resides in its (utmost) high position.

The three positions of the seat according to the invention as shown in the figures 2.1, 2.2 and 2.3 are in line with the previous positions of the seat as shown in figures 1.1, 1.2 and 1.3, with the difference however that in all three positions of the seat in these figures 2.1, 2.2 and 2.3 the back cushion resides in its (utmost) high position.

The user can move the back cushion from its (utmost) low position to its (utmost) high position, as well as any intermediate position situated between both of these extreme positions, by means of the operating buttons 3 & 4. This up and down movement of the back cushion (14) is illustrated on the figures by the arrows with reference signs 3 & 4.

[0036] Figures 3.1, 3.2 and 3.3 show the seat according to the invention, whereby the head support (16) resides in its forwards rotated position.

The three positions of the seat according to the invention as shown in these figures 3.1, 3.2 and 3.3 are in line with the previous positions of the seat as shown in the figures 1.1, 1.2 and 1.3 with the difference however that in all three positions of the seat in figures 3.1, 3.2 and 3.3 the head support (16) resides in its forward rotated position.

[0037] The user may move the head support from its usual position, in line with the back cushion, to the forwards rotated position, as well as to any intermediate position between both of these extreme positions by

means of the operating buttons 5 & 6.

[0038] This forward and backward rotation of the head support (16) is illustrated on the figures by the arrows with reference signs 5 & 6.

[0039] The figures 4 and 5 show a part of the seat according to the invention schematically in front view. These figures also show the position of the driving mechanism M2 and M3, as well as the double guiding mechanisms for the back cushion, comprising the guides G1 and G2 and the guiding blocks GB1, GB2, GB3 and GB4. These figures also show the rotating mechanisms S1, S2 and S3.

[0040] Figure 4 shows the seat according to the invention whereby the back cushion resides in the low position. The dotted line shows how in this position the lower part of the back cushion resides at the level of the upper side of the seat cushion, or how the lower part of the back cushion still resides for a minimal part in the cut-out of the seat cushion.

Figures 4 and 5 show a front view and schematically the internal drive & guide mechanism mounted and/or incorporated in the back cushion, respectively mounted on the back rest of the seat.

[0041] Figures 6, 7 and 8 show a three-dimensional view, as seen from the rear side of the seat according to the invention, of the back rest (shown in transparent mode) up until the rear side of the back cushion.

(The rear side of the back cushion relates to the side of the back cushion that is situated after the back cushion, from the point of view of a user who is placed in front of the seat.)

[0042] At the back of each of these figures a plate is shown that represents the rear side of the back cushion. The back cushion is mounted on such plate. As can be seen on figure 1.1 the back cushion comprises in a preferred embodiment two parts: a solid non-compressible part directly mounted on the mounting plate and on top hereof a comfort zone that is installed on this non-compressible part and that offers the necessary comfort for the user.

The back cushion is being mounted or installed on the front side of this plate (as seen from the point of view of the user).

On the rear side of this plate, the following components are being mounted:

- the guiding blocks GB1, GB2, GB3 and GB4;
- the driving mechanism M3 for the head support for the back cushion;
- a component in U-shape for fixation of the guiding block B2 for the driving mechanism M2 for the back cushion.

[0043] Figure 6 shows the high position of the back cushion, figure 7 shows the low position of the back cushion.

Figure 8 shows the position whereby the head support is being rotated towards the user.

[0044] On each of these figures 6, 7 and 8 at the left and right side, the double guiding mechanism for the back cushion is shown, comprising the guides G1 & G2, as well as the guiding blocks GB1, GB2, GB3 and GB4. The guides G1 and G2 are being mounted on the back rest, the guiding blocks are being mounted on the rear side of the back cushion. Also, the driving mechanism M2 for the back cushion is shown, comprising an electrical motor, a steering bar actuated hereby and the guiding block B2. The electrical motor and the steering bar of the driving mechanism M2 are mounted on the back rest; the guiding block that interacts with the steering bar of the steering mechanism is being mounted by means of a U-shaped connection piece with the rear side of the back cushion. The driving mechanism comprises for example a threaded bar that performs an up- and downwards movement; the guiding block B2 then comprises a gear transmission that interacts with this threaded bar, whereby the electrical motor moves the guiding block upwards or downwards via the threaded bar. To this end the guide block B2 is mounted by means of a U-shaped connection piece to the rear side of the mounting plate of the back cushion. This U-shaped connection piece is clearly shown on figures 10 & 11.

Also, the driving mechanism M3 for the head support (16) is shown, comprising an electrical motor, a driving bar actuated hereby, and ending in a hinge point B4.

The hinge mechanisms S1, S2, and S3 are also shown. These enable the part of the back cushion that is situated above the guiding mechanism G1 & G2 to rotate forwards to the user.

[0045] Figures 9, 10, 11 & 12 are photos taken from a specific embodiment of a seat according to the invention. Figures 9 & 10 show the back plate of the back cushion and the back rest of the seat according to the invention, whereby the front side of the back cushion is placed on the floor. In this way, one observes at the right and left sides the guiding mechanisms and at the central position, the driving mechanisms M2 & M3.

Figure 11 shows the rear side of the mounting plate of the back cushion, whereby the guiding blocks GB1, GB2, GB3 & GB4 are clearly shown.

Also, the U-shaped connection piece for the guiding block M2 is shown.

One also can observe the driving mechanism M3 for the head support (16), as mounted at the rear side of the mounting plate of the back cushion.

The one end of the driving bar of this driving mechanism is coupled to the electrical motor, mounted on the rear side of the mounting plate of the back cushion. The other end is fixed by means of a pin mechanism to the front side of the mounting plate of the back cushion. This end part has been coupled by means of a pin mechanism to the fixation point B4 at the front side of the upper part of the mounting plate.

[0046] By means of an up- and downwards movement of this steering bar and rotating coupling to this fixation point B4, this upper part of the mounting plate, and as a

consequence hereof, the upper part of the back cushion, is able to rotate forwards to the user and is able by this movement to offer an additional head support.

[0047] The hinges S1, S2 and S3, mounted on the one part at the bottom of the upper part of the mounting plate of the back cushion, and on the other part, at the top of the lower part of the mounting plate of the back cushion, enable the rotation of the upper part of the back cushion relative to the lower part.

[0048] Figure 12 finally shows the fixation point B4 as well as two hinges S1 and S2. The fixation point in this figure is executed in the form of a so-called 'clevis' pin. The driving bar of the driving mechanism M3 can be executed in the form of a usual steel bar, the upper part whereof takes the form of a finger ring.

A 'clevis' pin connects this finger ring with a fixation element mounted on the mounting plate of the back cushion.

Claims

1. Seat, comprising a seat cushion (12), a back cushion (14) and a back rest (13), mounted on a base element (11), whereby:

- the back cushion is adaptable between a low and a high position,
- the position of the back cushion in any position between the low and the high position is adjustable by the user by means of a motor-driven driving mechanism (M2) and a double guidance mechanism,
- the high position of the back cushion is at least 10 cm higher than the low position, and
- the double guidance mechanism comprises two guides (G1, G2), mounted on the front side of the back rest (13) and four guiding blocks (GB1, GB2, GB3 and GB4), two for the guidance of each guide, mounted on the back side of the back cushion (14).

2. Seat according to claim 1, **characterised in that** the motor-driven driving mechanism (M2) comprises an electrical motor and a driving steering column, mounted on the front side of the back rest, and a guiding block (B2) mounted on the back side of the back cushion.

3. Seat according to claim 2, **characterised in that** the motor-driven driving mechanism (M2) is mounted in between the two guides (G1, G2) of the guiding mechanism.

4. Seat according to any of the preceding claims, **characterised in that** the high position of the back cushion is at least 12, preferably at least 15 cm higher than the low position.

5. Seat according to any of the preceding claims, **characterised in that** in the low position the back cushion is partly located in a recess of the seat cushion corresponding in size to the size of the back cushion and that upon movement of the back cushion to its high position, the back cushion gradually has popped out of the recess. 5

6. Seat according to claim 5, **characterised in that** the underside of the back cushion in the high position of the back cushion is positioned at the level of the upper side of the seat cushion, preferably is situated at least 1, more preferably at least 2 cm under the upper side of the seat cushion. 10
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7. Seat according to any of the preceding claims, **characterised in that** a part (16) of the back cushion, situated above the guidance mechanism, is suitable for rotation by the user by means of a motor-driven steering mechanism (M3) and a rotating mechanism (S1, S2, S3) forwards to the user. 20

8. Seat according to any of the preceding claims, **characterised in that** it further comprises a feet support (15), adjustable between a vertical position beneath the front side of the seat cushion (12) and a horizontal position whereby the front side of the feet support is located at the upper side of the seat cushion and whereby the position of the feet support in between both positions can be adjusted by the user by means of a motor-driven driving mechanism (M1) and a rotating mechanism mounted respectively on the base element and on the back side of the feet support. 25
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9. Seat according to any of the preceding claims, **characterised in that** the back rest (13) and the back cushion (14) are rotatable relative to the base element (11), causing the back cushion (16) gradually to take a more horizontal position. 35
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10. Seat according to claim 9, **characterised in that** the position of the back rest and the back cushion is suitable for adjustment by the user by means of the motor-driven driving mechanism (M1) and a rotating mechanism, simultaneously with the rotation of the feet support (16). 45

11. Seat according to any of the preceding claims, **characterised in that** the upper side of the back cushion in its low position is situated at most 95 cm, preferably at most 90, still more preferably at most 85 cm above the ground floor. 50
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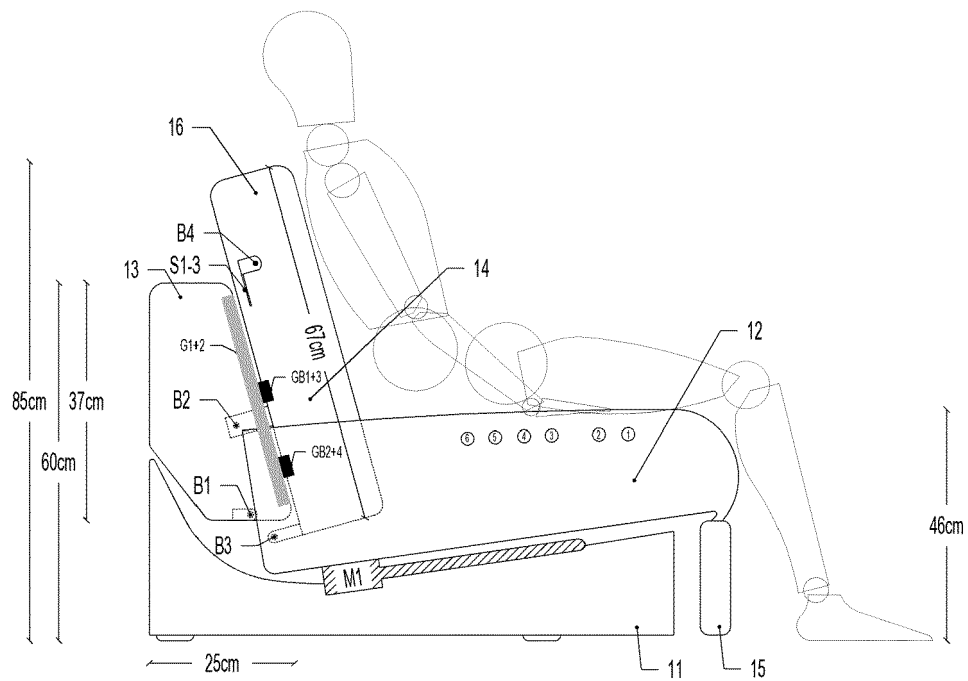


Fig. 1.1

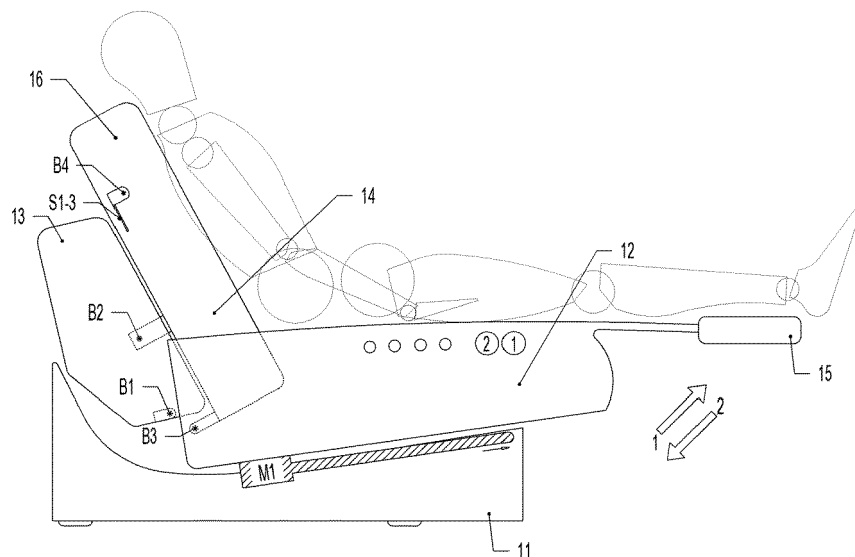


Fig. 1.2

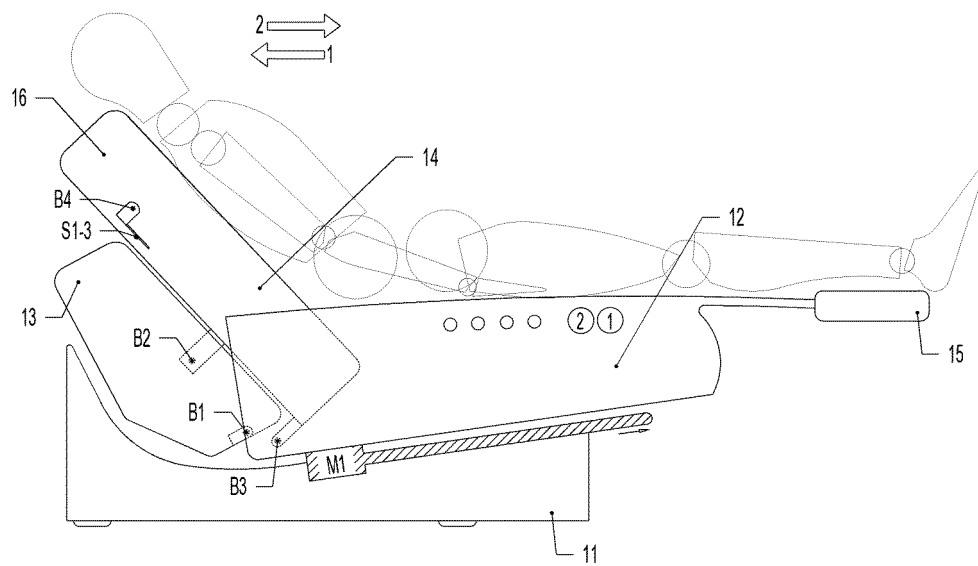


Fig. 1.3

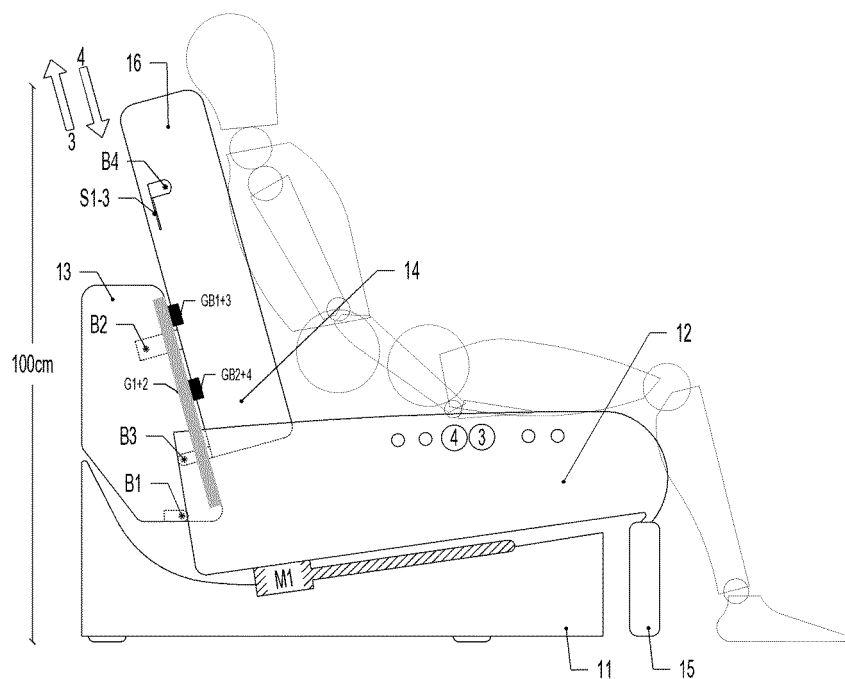


Fig. 2.1

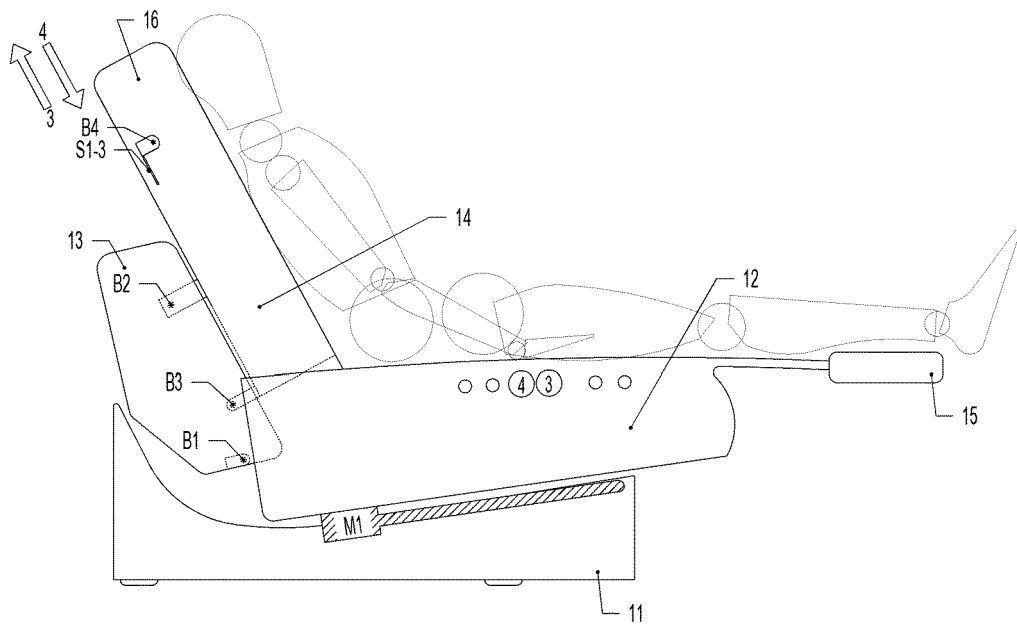


Fig. 2.2

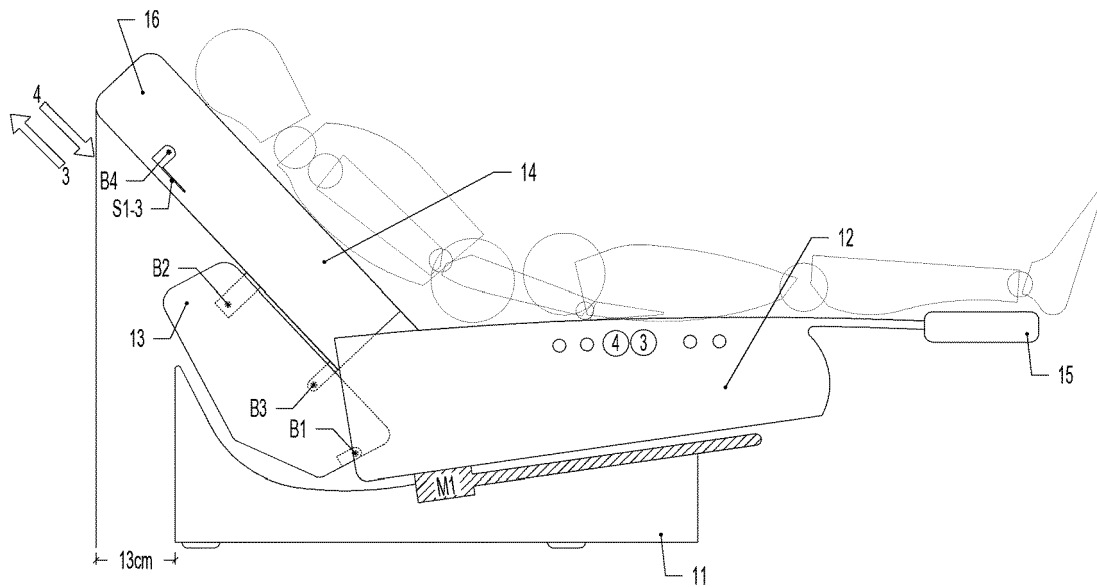


Fig. 2.3

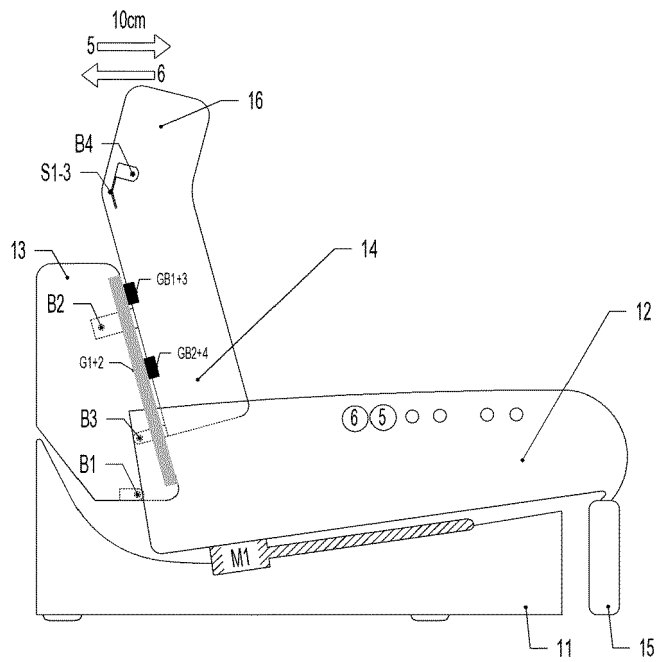


Fig. 3.1

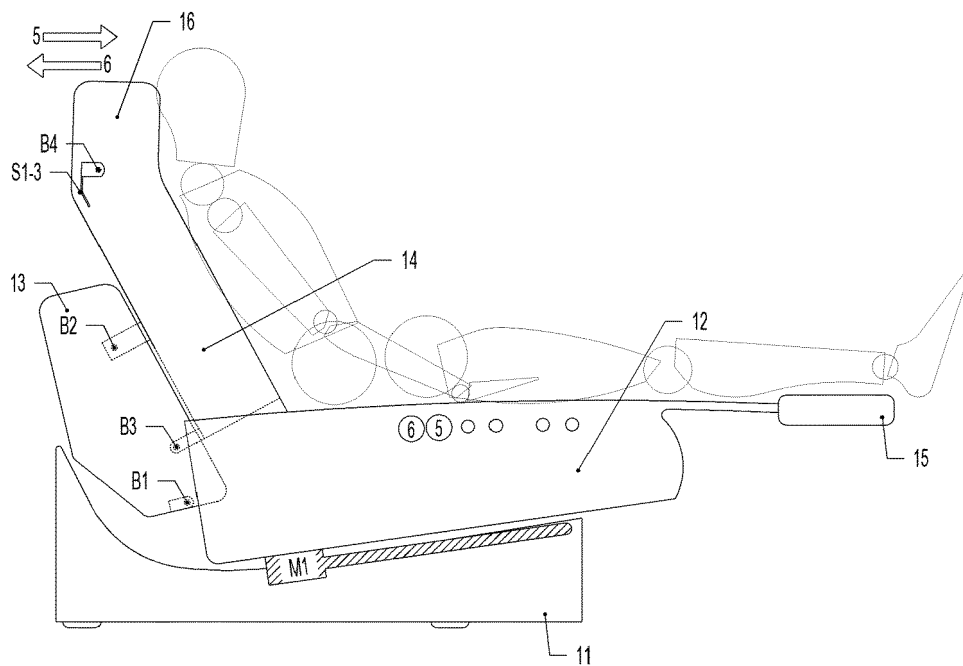


Fig. 3.2

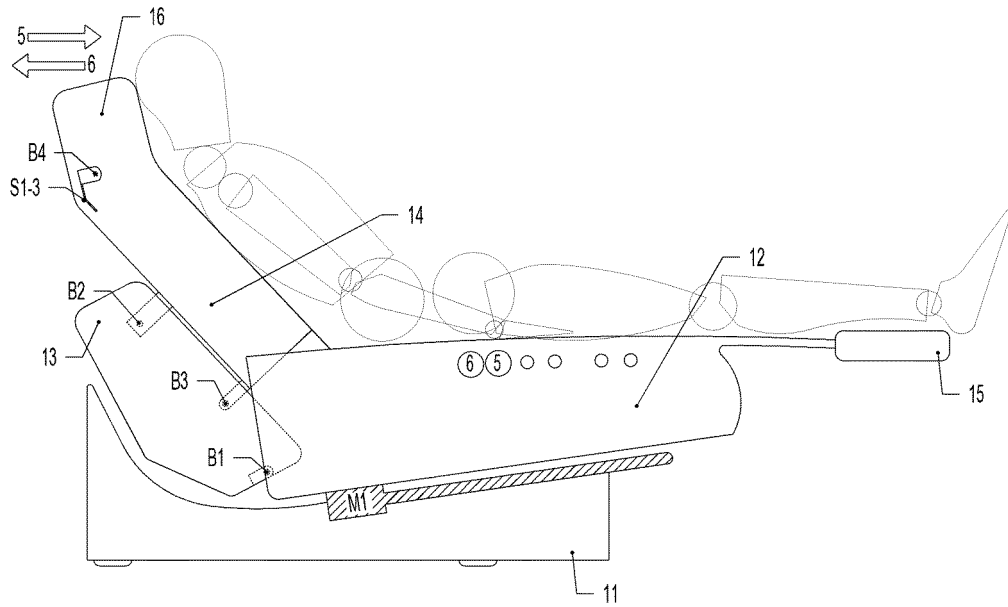


Fig. 3.3

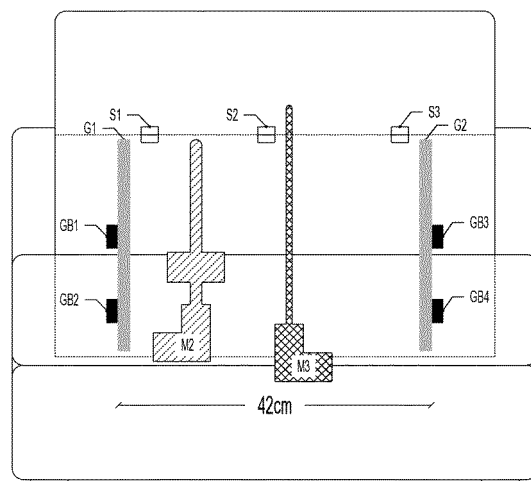


Fig. 4

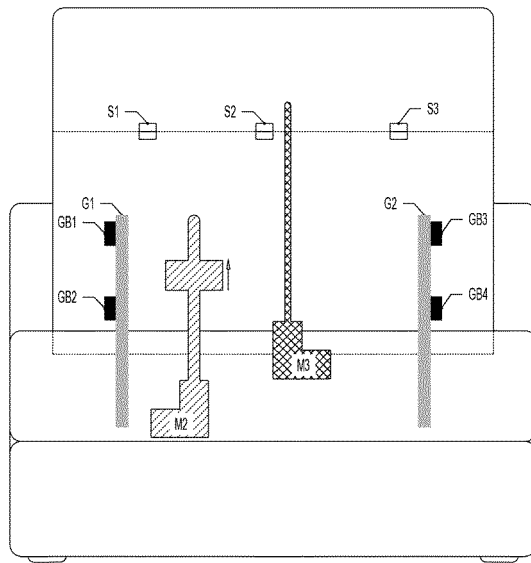


Fig. 5

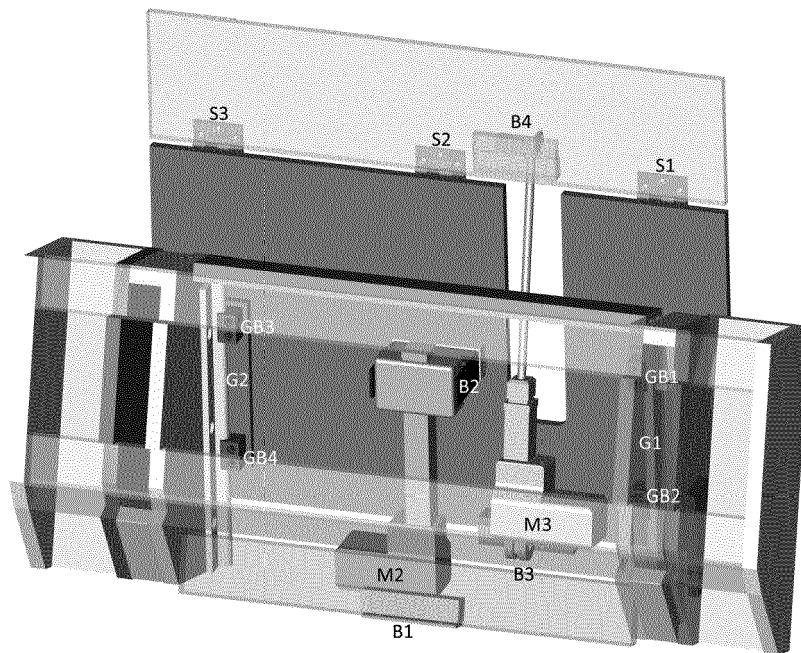


Fig. 6

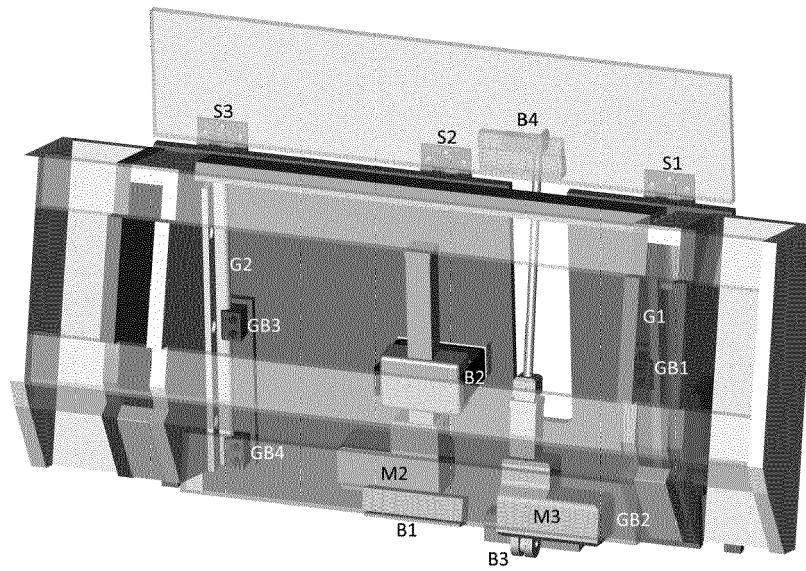


Fig. 7

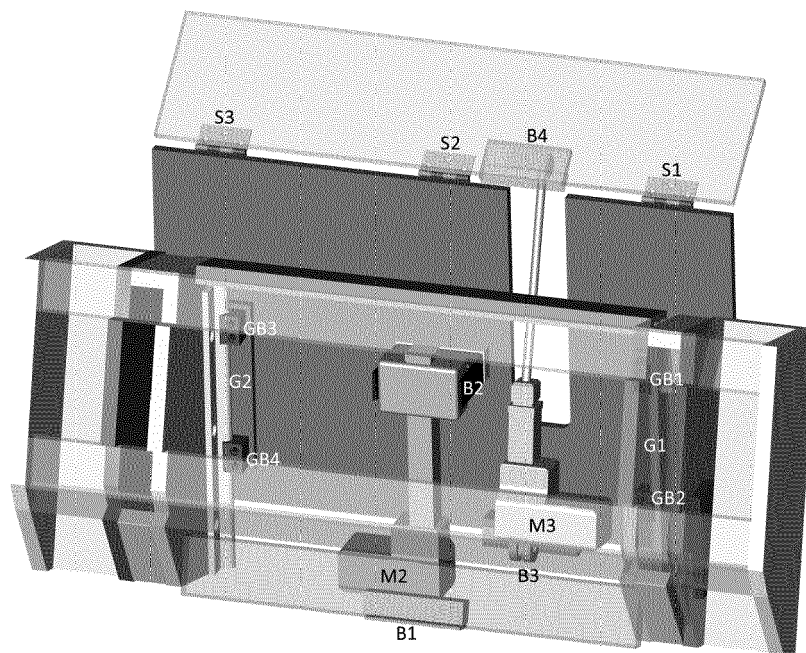


Fig. 8

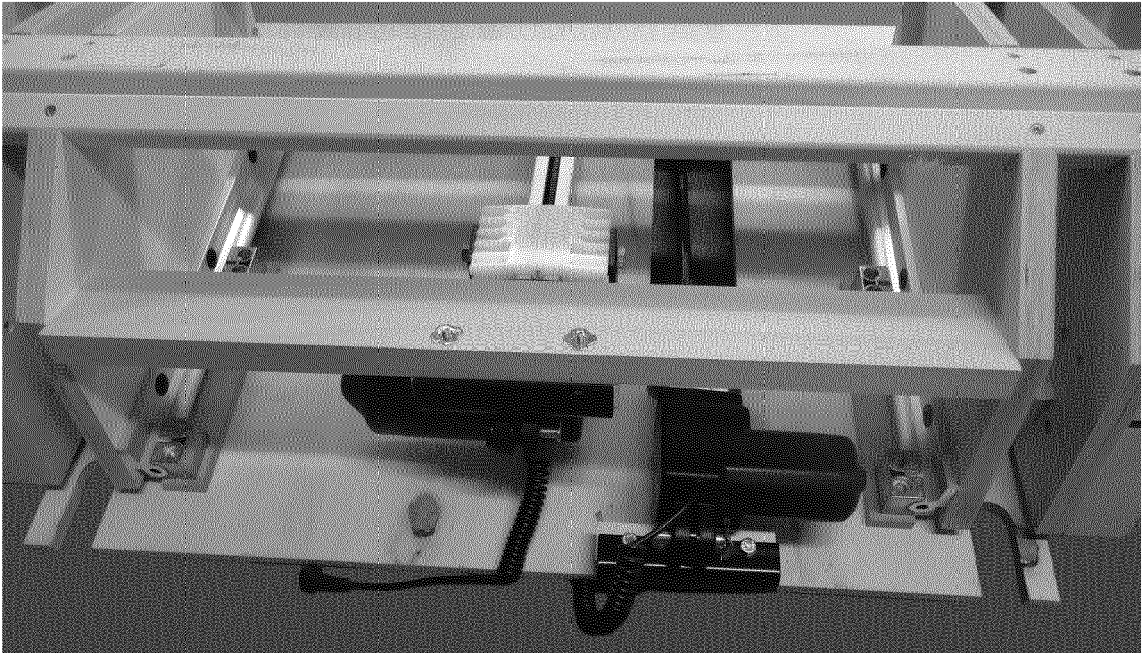


Fig. 9

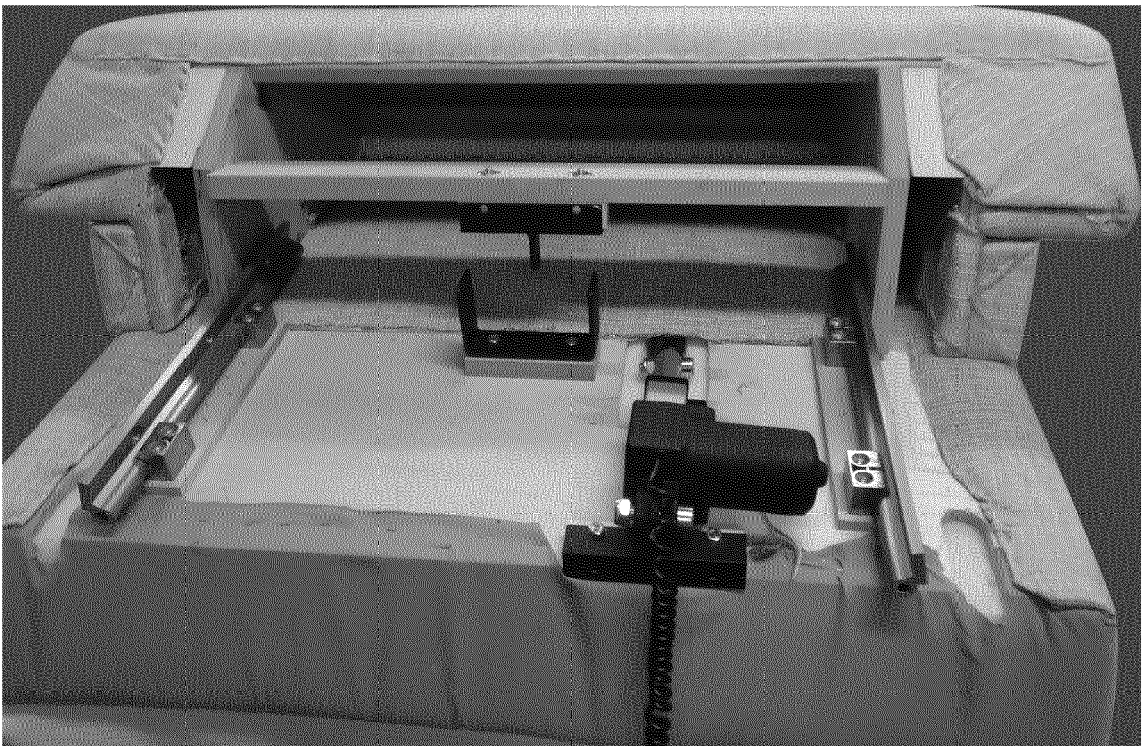


Fig. 10

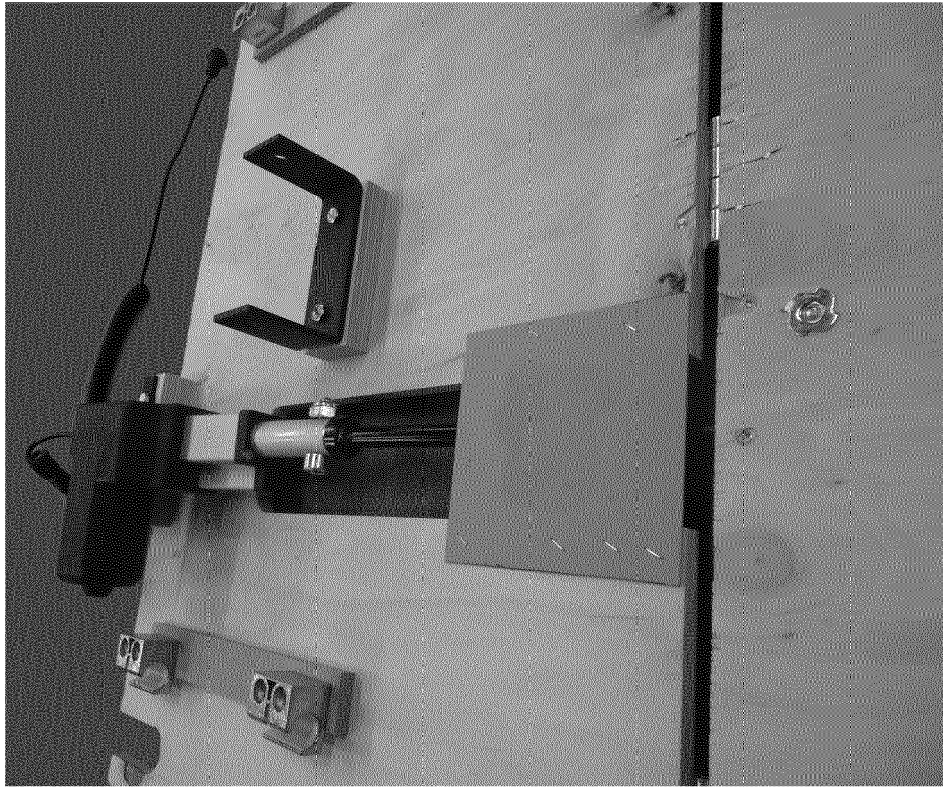


Fig. 11

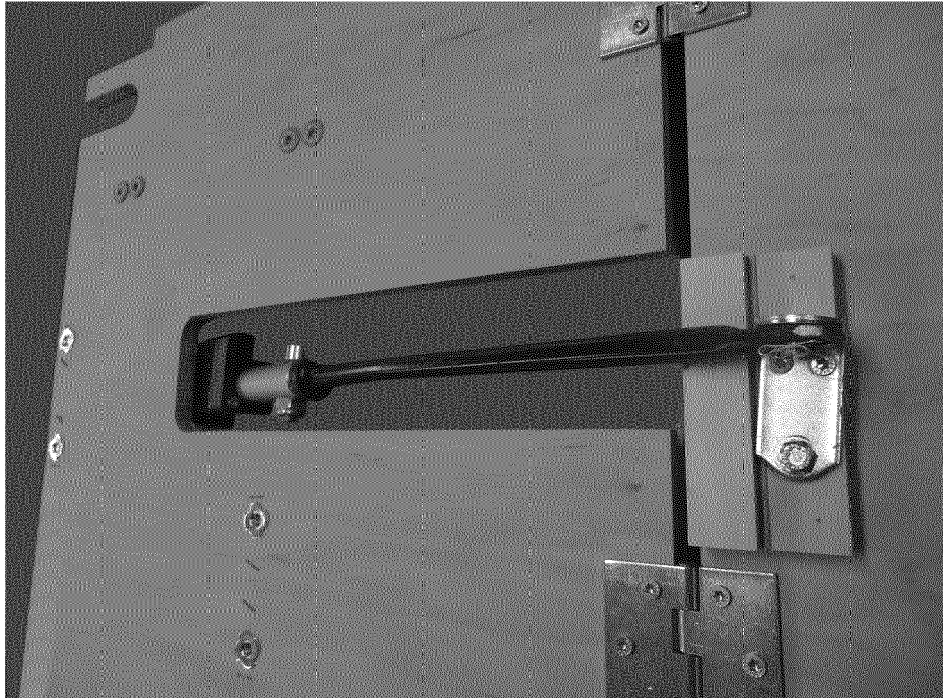


Fig. 12



EUROPEAN SEARCH REPORT

Application Number
EP 18 02 0274

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A	DE 200 21 776 U1 (HUKLA WERKE GMBH [DE]) 22 February 2001 (2001-02-22) * page 3, paragraph 1; figures 1-3 * -----	1-11	INV. A47C17/16 A47C7/40 A47C17/04
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A	US 5 836 648 A (KARSCHIN KURT [DE] ET AL) 17 November 1998 (1998-11-17) * column 3, lines 45-56; figures 1-3 * -----	1-11	
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			A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 October 2018	Examiner Melo Sousa, Filipe
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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