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(54) **VARIABLE HEIGHT BACKREST/HEADREST FOR AN UPHOLSTERED ITEM OF FURNITURE HAVING AN ELECTROMECHANICAL LIFT MECHANISM**

(57) The present invention concerns the field of electromechanical devices, particularly electromechanical lift mechanisms, designed to allow vertical movement of the backrest, also functioning as a headrest, of an upholstered item of furniture (such as a sofa or an armchair), which upholstered item of furniture also comprises a seat base, a reclining loin rest and an extendable footrest; more specifically, the present invention refers to a mechanism suitable to be installed in an upholstered item of furniture and designed to allow vertical movement of the backrest/headrest, wherein said backrest/headrest is not anchored or mechanically connected to the seat base

and to the loin rest and wherein said backrest/headrest can be moved, by means of said mechanism, independently of the movement of said seat base or of said loin rest.

In another independent aspect, the present invention relates to an upholstered item of furniture comprising a backrest/headrest, a seat base, a reclining loin rest and an extendable footrest and also incorporating an electromechanical lift mechanism for vertically moving said backrest/headrest independently of the movement of said seat base or of said loin rest.

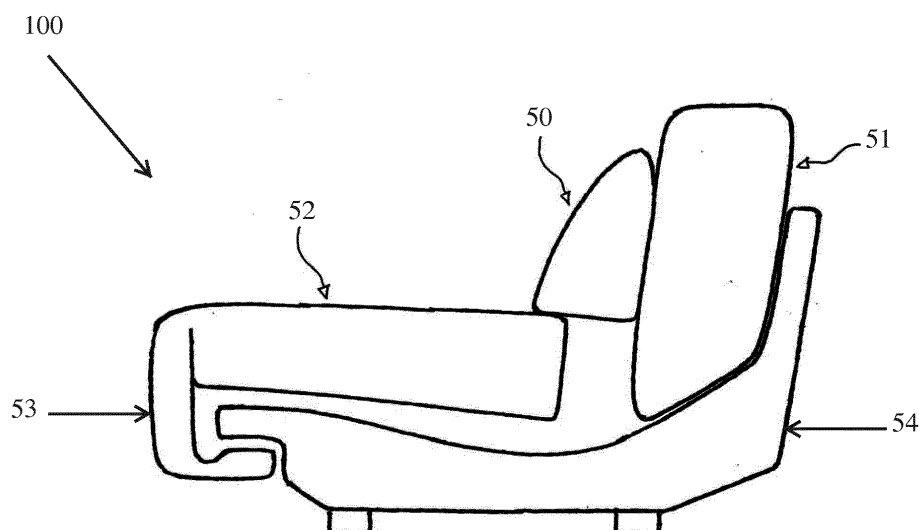


Fig. 5

Description

DESCRIPTION

TECHNICAL FIELD

[0001] The present invention relates to the field of upholstered furniture and, in particular, to the field of electromechanical systems designed to allow vertical movement of the backrest of an upholstered item of furniture (such as a sofa or an armchair), which upholstered item of furniture also comprises a seat base, a reclining loin rest and an extendable footrest and which backrest also functions as a headrest.

[0002] The object of the present invention is a mechanical device which is suitable to be installed in an upholstered item of furniture and designed to allow longitudinal movement of the backrest/headrest with respect to the base supporting the upholstered item of furniture, which backrest/headrest is not anchored or mechanically connected to the seat or the loin rest and which backrest/headrest can be moved, by means of said mechanism, independently of the movement of said seat base or of said loin rest.

[0003] It is also an object of the present invention an upholstered item of furniture comprising a backrest/headrest, a seat base, a reclining loin rest and an extendable footrest and also incorporating an electromechanical lift mechanism for vertically moving said backrest/headrest independently of the movement of said seat base or of said loin rest.

PRIOR ART

[0004] In the current prior art, there are already mechanisms designed to move the backrest and the headrest of upholstered furniture (such as a sofa or an armchair) but all of them present some problems.

[0005] The main problems of the existing mechanisms consist in their requiring the designs of the upholstered furniture to have specific shapes, their being particularly bulky and needing a considerable amount of material for their realisation; these aspects will be made clearer in the continuation of the present description.

[0006] Preliminarily and with reference to Fig. 1, it should be noted that, usually, high quality upholstered furniture 1 constructively present, for aesthetic and ergonomic reasons, a backrest 10 and a headrest 11, each one distinct from the other one, but both joined together to form a single body.

[0007] These types of headrests 11 generate a semi-circular motion as shown in Fig. 1A, in order to change from a "closed" position, in which they are horizontal, parallel to a seat 13, to an "open" position, quite vertical, perpendicular (or almost perpendicular) to said seat 13, passing through all the intermediate positions.

[0008] Referring again to Fig. 1, high quality upholstered furniture 1 comprise - besides said reclining back-

rest 10, said movable headrest 11 and said seat 13 - an extendible footrest 12, in which said headrest 11 and said footrest 12 are in the "closed" position and the backrest 10 is in the vertical position with respect to the seat 13, i.e. in the sitting position.

[0009] With reference to Fig. 2, the same upholstered furniture 1 is shown in an extended position, or relaxing position, and it has the headrest 11 raised, the backrest 10 reclined and the footrest 12 extended, lengthened.

[0010] In said upholstered furniture 1, the movements of the three aforesaid parts - the backrest 10, the headrest 11 and the footrest 12 - are interconnected so that the movement of one part follows the movement of the other parts in order to ensure maximum comfort and the most ergonomic sitting position for a user U.

[0011] According to the foregoing, when the user U decides to extend the footrest 12, bringing it from the "closed" position (as shown in Fig. 1) to an extended position (as shown in Fig. 2), the backrest 10 also reclines and necessarily moves the seat 13 forward: this happens, as mentioned, in order to ensure maximum relaxing comfort for the user U; it is worthy to note that, theoretically, it would be conceivable to allow the lengthening of the footrest 12 without reclining the backrest 10, and therefore without the seat 13 moving forward, but the user U would be in an unnatural and uncomfortable position, which would not be sustainable for a long time.

[0012] The laws of ergonomics dictate that the elongation of the user's legs be accompanied by downward relaxation of the user's back; moreover, in order to make the user U even more comfortable, when the footrest 12 is extended and the backrest 10 is reclined, upholstered items of furniture already existing on the market are usually have the possibility of "raising" the headrest 11, as shown in Fig. 2, to provide support for the user's head in the event that the user U, from a semi-supine position, wishes to keep his or her head upright, so as to carry out activities such as reading a book or watching television or simply to prevent the head from lolling.

[0013] For clarity's sake, all the above serves to better understand the invention that will be described in detail hereinbelow and that is limited to upholstered furniture with extendable footrests, reclining backrests and adjustable headrests.

[0014] Hereafter a description is given of the operation modes of upholstered items of furniture 1, existing and known in the prior art, that are equipped with extendable footrests 12, reclining backrests 10 and adjustable headrests 11 operating in synergy with each other, as already shown in Fig. 1 and Fig. 2; in said upholstered item of furniture 1, the mechanism that governs the movement of said footrest 12 must be coupled with the mechanism that regulates the movement of said backrest 10, so that activation of the footrest 12 entails, for ergonomic reasons, a forward motion of the seat 13 and, thus, of the backrest 10 and of the headrest 11.

[0015] The traditional system described above has some negative critical aspects: from a constructive point

of view, a separation between the lower part 14 of the upholstered item of furniture 1 and the rear part 15 of the backrest 10 is necessary so that the latter can move forward when the footrest 12 is elongated; it follows that an upholstered item of furniture 1 that implements such a mechanism must always have - at its rear - a fissure, a gap, 16 (visible in Fig. 1 and Fig. 2) that inevitably involves its appearance and dictates the construction methods related thereto.

[0016] When it is desired that also an extendable footrest 12 is comprised in the upholstered item of furniture 1, the mechanism responsible for the movement thereof must be coupled with the mechanism that regulates the movement of the backrest 10 and of the headrest 11 since, as previously indicated, to extend only the footrest 12, leaving both backrest 10 and headrest 11 in their original position, would give rise to an anti-ergonomic sitting/relaxing position, which would be overly uncomfortable and unsustainable over time; an extension of the user's legs must in fact be accompanied, according to the laws of ergonomics, by a reclining of the user's back and of the user's head and, therefore, by a reclining of the backrest 10 and a raising of the headrest 11 in a harmonic movement that supports the structure of the human body, as shown in Fig. 2.

[0017] To avoid the formation of the gap 16, one might think - having available only those mechanisms known from the prior art - either of rendering the movement of the footrest 12 independent from that of the backrest 10, or of joining the seat 13 to the backrest 10.

[0018] However, these solutions would not be reasonably achievable because an item of upholstered furniture thus made would not only not conform to the dictates of ergonomics and have an unpleasant appearance, but would also be technically difficult and expensive to achieve.

[0019] Indeed, should one wish to realise an upholstered item of furniture where the extension of the footrest 12 and the forward motion of the seat 13 does not cause the forward motion of the rear part 15 of the backrest 10, in order to avoid the creation of the gap 16 at the rear as shown in Fig. 2, it would give rise to a movement that would create a deep fissure 30 between the backrest 10 and the headrest 11, which, as already said, would make the sitting/relaxing position uncomfortable and aesthetically unacceptable, as it is shown, for clarification purposes only, in Fig. 3.

[0020] A further negative aspect of the traditional system described above lies in the fact that existing mechanisms have consistently large dimensions, as can be seen in Fig. 4. The prior art closest to the present invention is represented by the following patent documents: the US Patent application no. US 2012/112519 A1 published on May 10, 2012, the US Patent application no. US 2013/062914 A1 published on March 14, 2013, the European Patent application no. EP 0 056 070 A1 published on July 21, 1982, the GB Patent application no. GB 2 417 895 A published on March 15, 2006 and the

US Patent 8146190 B1 granted on April 3, 2012.

[0021] All the above-mentioned prior art documents disclose, *mutatis mutandae*, devices suitable for moving the backrest of a piece of upholstered furniture and comprising an upper frame and a base frame assembled by means of clamps with an actuator ensuring movement of the backrest.

[0022] None of the above-mentioned prior art documents discloses or suggests the independency of movement of said backrest from the loin rest or the seat base comprised in an item of furniture, which is therefore a need not satisfied so far. Moreover, none of the above-mentioned prior art documents discloses or suggests an upholstered item of furniture comprising a backrest/headrest, a seat base, a reclining loin rest and an extendable footrest and also incorporating a device for vertically moving said backrest/headrest independently of the movement of said seat base or of said loin rest, which is therefore a further and autonomous need not satisfied so far.

[0023] In this context, therefore, the present invention intends to overcome all the problems of the current prior art by providing a technical and inventive solution to the existing problems.

OBJECTS AND SUMMARY OF THE INVENTION

[0024] It is the object of the present invention to overcome the prior art drawbacks.

[0025] In particular, the present invention is designed to allow longitudinal, or lengthwise, sliding of the backrest of an upholstered item of furniture along an axis perpendicular to that of the seat, without the need for the seat and the footrest, or the mechanisms that make them move, to be united or connected in any way - physically or functionally - to the backrest or to the mechanism designed to move the backrest, so that it is not necessary to provide a fissure at the back of the upholstered item of furniture.

[0026] The attractive appearance of the lines and shapes, the comfort of the seat and the ergonomics are ensured by the introduction of a lower back-rest that, while the backrest remains motionless, moves forward with the seat and reclines.

[0027] An advantage of the device according to the present invention lies in the fact that it is consistently smaller than those of the prior art, the former being able to save over 10 cm in depth, as can be seen in Fig. 4 and in Fig. 4A comparing the known system with that of the present invention; therefore, due to its specific construction and assembly characteristics, the device according to the present invention allows the realisation of upholstered items of furniture having a depth of about 10 cm less than traditional products.

[0028] The smaller dimensions mean, consequentially, that the realisation of an upholstered item of furniture implementing the present invention is carried out with a reduced use of raw materials such as frame, upholstery

and covering; said saving increases with the size of the upholstered item of furniture, which can, as it is well known, reach a considerable size, such as in the case of a multiple-seat, king-sized sofa.

[0029] It is understood that all the annexed claims are an integral part of the present description and that each one of the technical features claimed therein is possibly independent and usable autonomously from the other aspects of the invention.

[0030] It is immediately clear that many changes can be made to what described (for instance about the shape, dimensions, arrangements and parts with equivalent functionalities) without departing from the scope of protection of the invention as claimed in the annexed claims.

[0031] Further advantageous characteristics will be more clear from the following description of preferred but not exclusive embodiments, provided merely by way of example and not as a limitation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] All the features of the present invention will become clear from the following description of a preferred embodiment given by way of non-limiting example, with reference to the annexed drawings in which:

Fig. 1 illustrates a side view of an upholstered item of furniture with a known traditional mechanism designed to move the backrest/headrest and the footrest, in the closed position;

Fig. 1A illustrates, by means of broken lines, the semi-circular movement of which a known traditional headrest (also called "ratchet" headrest) is capable;

Fig. 2 illustrates a side view of an upholstered item of furniture with a known traditional mechanism designed to move the backrest and the footrest, wherein the backrest is reclined and the footrest is extended;

Fig. 3 illustrates a known constructive hypothesis wherein the extension of the footrest is not followed by a reclining of the backrest in order to avoid the gap at the rear;

Fig. 4 illustrates the known traditional so-called "ratchet" headrest system and shows, by means of broken lines, the semi-circular movements of which it is capable;

Fig. 4A illustrates the system according to the present invention and shows, by means of dotted lines, the longitudinal movement of which the backrest according to the present invention is capable;

Fig. 5 illustrates a side view of an upholstered item of furniture that implements the device according to the present invention in the backrest, said upholstered item of furniture also having a loin rest and a seat with a footrest;

Fig. 5A illustrates a side view of an upholstered item of furniture that implements the device according to the present invention, in which the backrest is moved

upwards, the footrest is extended, the seat is moved forward and the loin rest is reclined;

Fig. 6 illustrates an exploded perspective view of the device according to the present invention comprising an upper frame, a rail system comprising guides and sliding bodies, a lower frame that serves as a base and comprises two clamps to be fixed on the guides of the rail system;

Fig. 7 illustrates a perspective view of the device according to the present invention forming a single frame assembled with an electric linear actuator piston fixed to both the upper and the lower frames; and Fig. 8 illustrates a perspective view of the device according to the present invention wherein the electric linear actuator piston is elongated, having driven the upper frame along the rail system.

DETAILED DESCRIPTION OF THE INVENTION

[0033] While the invention is susceptible of various modifications and alternative forms, some disclosed relevant embodiments are shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific embodiment disclosed, but, on the contrary, the intention of the invention is to cover all modifications, alternative forms, and equivalents falling within the scope of the invention as defined in the claims.

[0034] The use of "for example", "etc.", "or" indicates non-exclusive alternatives without limitation unless otherwise defined. The use of "including" means "including, but not limited to," unless otherwise defined.

[0035] According to a first aspect of the present invention, possibly independent and usable autonomously from the other aspects of the invention, a device suitable to be mounted on an upholstered item of furniture is disclosed, said upholstered item of furniture having a base, a seat with a footrest, a backrest also serving as a headrest and a loin rest.

[0036] The inventive principle of the present invention lies in that said device is designed to move the backrest/headrest longitudinally, or lengthwise, with respect to the base of the upholstered item of furniture and entirely independently of the seat and of the loin rest.

[0037] In particular, what is disclosed herein is a device 101 designed to move, longitudinally with respect to the base of an upholstered item of furniture 100 on which it is mounted, the backrest 51 of said upholstered item of furniture 100, which upholstered item of furniture 100 also includes a loin rest 50 and a seat 52 with a footrest 53, which backrest 51 also serves as a headrest, entirely independently of the seat 52 and loin rest 50 and designed to move vertically, and comprising: an upper frame 60, two rail systems, a frame that serves as a base 64, an electric linear actuator piston 70, wherein the upper frame is joined to the frame that serves as a base by means of a pair of rail systems, the guides 61, 61a of the rail systems being joined to said upper frame and the

sliding bodies 62, 62a of the rail systems being joined to the clamps 63, 63a of the frame that serves as a base, the upper frame being designed to move longitudinally along the axis of the rail system driven by an electric linear actuator piston 70, which electric actuator is joined to the upper frame and to the frame that serves as a base by means of two holed brackets 65 and 66, said frames 60, 64 constituting a single frame 80, which single frame upon which the actuator is mounted is designed to be inserted inside the backrest of the upholstered item of furniture being designed to generate the vertical movement of the backrest of the upholstered item of furniture entirely independently of the movement of the seat 52 and of the loin rest 50, both the seat 52 and the loin rest 50 being separate from the backrest and the mechanisms designed to move the loin rest 50 and the seat 52 being separate from the frame 80.

[0038] Moreover, the present device 101 is characterised by the fact that the single assembled frame 80 is designed to be inserted into the upholstered item of furniture's backrest 51, said backrest 51 being not joined to the loin rest 50 and not joined to the seat 52, the loin rest 50 being merely leaning against said backrest 51.

[0039] Moreover, the present device 101 is characterised by the fact that the single assembled frame 80 is designed to be inserted into the upholstered item of furniture's backrest 51, said single frame being not joined to the mechanism designed to move the loin rest 50 and not joined to the mechanism designed to move the seat 52. According to another aspect of the present invention, possibly independent and usable autonomously from the other aspects of the invention, an upholstered item of furniture is disclosed, said upholstered item of furniture having a base, a seat with a footrest, a backrest also serving as a headrest and a loin rest and also incorporating a device able to move the backrest/headrest longitudinally, or lengthwise, with respect to the base of the upholstered item of furniture and entirely independently of the seat and of the loin rest.

[0040] In particular, what is disclosed herein is an upholstered item of furniture 100 comprising a backrest 51, a loin rest 50 and a seat with a footrest 52, said backrest serving also as a headrest, characterised by the fact that it also comprises a device designed to move, longitudinally with respect to the base of the upholstered item of furniture on which it is mounted, the backrest of said upholstered item of furniture, entirely independently of the seat and loin rest and designed to move vertically, and comprising: an upper frame 60, two rail systems 61, 61a, a frame that serves as a base 64, an electric linear actuator piston 70, wherein the upper frame is joined to the frame that serves as a base by means of a pair of rail systems, the guides of the rail systems being joined to the said upper frame and the sliding bodies 62, 62a of the rail systems being joined to the clamps 63, 63a of the frame that serves as a base, the upper frame being designed to move longitudinally along the axis of the rail system driven by an electric linear actuator piston

70, which electric actuator is joined to the upper frame and to the frame that serves as a base by means of two holed brackets 65 and 66, said frames 60, 64 constituting a single frame 80 which single frame upon which the actuator is mounted is designed to be inserted inside the backrest of the upholstered item of furniture being designed to generate the vertical movement of the backrest of the upholstered item of furniture entirely independently of the movement of the seat 52 and of the loin rest 50, both the seat 52 and the loin rest 50 being separate from the backrest and the mechanisms designed to move the loin rest 50 and the seat 52 being separate from the frame 80.

[0041] Moreover, the present upholstered item of furniture 100 is characterised by the fact that the single frame 80 is designed to be inserted into the upholstered item of furniture's backrest 51, said backrest 51 being not joined to the loin rest 50 and not joined to the seat 52, the loin rest 50 being merely leaning against said backrest (51). Moreover, the present upholstered item of furniture 100 is characterised by the fact that the single frame 80 is designed to be inserted into the upholstered item of furniture's backrest 51, said single frame being not joined to the mechanism designed to move the loin rest 50 and not joined to the mechanism designed to move the seat 52.

[0042] With reference to Fig. 4A, an upholstered item of furniture 100 incorporating the device of the present invention is shown; in particular it is visible that, due to the specific construction and assembly characteristics of said device, the upholstered item of furniture 100 occupies a space that is substantially smaller than that occupied by the traditional furniture shown in Fig. 4, i.e. said upholstered item of furniture 100 of the invention having a depth of about 10 cm less than traditional products.

[0043] With reference to Fig. 5, the upholstered item of furniture 100 comprises a supporting base 54, a seat 52 with a footrest 53, a backrest 51 (also acting as a headrest) and a loin rest 50, all the elements being in a "closed", or sitting position; Fig. 5A shows the attractive appearance of the lines and shapes, the comfort of the seat and the ergonomics that are ensured by the introduction of the lower loin rest 50 that, while the backrest 51 remains motionless, moves forward with the seat 52, and reclines.

[0044] In particular, the upholstered item of furniture 100 comprising a backrest 51 serving also as a headrest, a loin rest 50 and a seat 52 with a footrest 53 is characterised by the fact that it also comprises a device 101 designed to move vertically and designed to move said backrest 51 longitudinally, or lengthwise, with respect to the supporting base 54 of the upholstered item of furniture 100 on which it is mounted and entirely independently of the seat 52 and of the loin rest 50.

[0045] The movement above described is made possible by the device 101 of the present invention that, once inserted into the upholstered item of furniture 100, is able to longitudinally move the backrest 51 - in such a way,

i.e. lengthwise, that it also acts as a headrest - and completely independently with respect to the seat 52, thus eliminating the need to provide a fissure at the back of the upholstered item of furniture 100 and therefore improving the appearance of the upholstered item of furniture 100, reducing the overall size of the upholstered item of furniture and therefore allowing a more efficient use of construction materials.

[0046] With reference to Fig. 6, the device 101 of the present invention is shown.

[0047] Said device 101 comprises an upper first frame 60 comprising two first sides 60a, 60b; at least a pair of rail systems each constituted by a guide 61, 61a and by a sliding body 62, 62a; a lower second frame 64 comprising two clamps 63, 63a.

[0048] The guides 61, 61a of the rail systems are joined to the upper frame 60 and the sliding bodies 62, 62a are joined to the clamps 63, 63a of the second frame that serves as a base 64.

[0049] Said upper frame 60 is designed to move longitudinally, or lengthwise, along the axis of the rail systems being driven by an electric linear actuator piston 70, which is visible in Fig. 7 and in Fig. 8; said electric linear actuator piston 70 is attached to the upper frame 60 and to the lower frame 64 by means of two systems of holed brackets 65 and 66 respectively.

[0050] As visible in Fig. 7 and in Fig. 8; said upper 60 and lower 64 frames form a single assembled frame 80, which can be inserted into the backrest 51 of the upholstered item of furniture 100 and which allows, once inserted, longitudinal, or lengthwise, movement of the backrest 51 of the upholstered item of furniture 100 that is substantially independent of the movement of the seat 52 and of the loin rest 50.

[0051] It is to be noticed that the loin rest 50 is included in the upholstered item of furniture 100 to ensure the comfort and ergonomics of the sitting/relaxing position.

[0052] The features of the mechanism described above permit the realisation of the upholstered furniture 100 shown in Fig. 5 and Fig. 5A, equipped with an extendable footrest 53, a reclining loin rest 50 and a backrest 51 that, being able to be raised and to be lowered, also acts as a headrest.

[0053] Upon extension of the footrest 53, the seat 52 moves forward - as in traditional systems - with the particularity that said seat 52 is not joined to the backrest 51 but it is joined to the loin rest 50 - physically and mechanically separate from the backrest/headrest 51 - designed to recline by following the movement of the seat 52 and the extension of the footrest 53, leaving upright the backrest 51, the height of which can be adjusted, as shown in Fig. 4A, for a comfortable support of the user's head.

[0054] As can also be seen from a comparison of Fig. 5 and Fig. 5A, on the one hand, and Fig. 1 and Fig. 2, on the other hand, the present invention allows the realisation of absolutely superior aesthetic forms, avoiding the formation of the gap 16 of the prior art, reducing the overall dimensions of the known headrests (so-called "ratch-

et" headrests) and allowing its realisation with the use of less material compared to that needed to realise the mechanisms known in the art.

[0055] A presently preferred embodiment for the realisation and implementation of the present invention is described hereinafter; this preferred embodiment is described in detail only for exemplary purposes, since the invention may be realised in any size, or in different proportions from those listed, and with different materials and construction techniques.

[0056] In the preferred embodiment, the invention comprises an electric linear actuator piston 70; a first upper frame 60 having a width of 730 mm with two first sides 60a, 60b each having a length of 390 mm; a second lower frame 64 having a width of 730 mm with two clamps 63, 63a each having a length of 160 mm; two guides 61, 61a each 360 mm long.

[0057] The two guides 61, 61a are firmly joined to the upper frame 60 by means of welding. The sliding bodies 62, 62a are connected to the lower frame 64 by means of four pins having a diameter of 6 mm each.

[0058] The electric linear actuator piston 70 is joined to the two frames 60, 64 by means of two systems of holed brackets 65, 66; the holed brackets 65 of the upper frame 60 are parallel to each other, each 30 mm long and 30 mm distant from each other.

[0059] Lastly, the electromechanical device 101, specifically the electric linear actuator piston 70, is suitable to be connected - and it is connected during operation - to a switch (not shown in figures), powered by an electric cable connected to the mains power supply or by a lithium battery or by a different known power source, that allows the operation of the said device 101.

[0060] As visible in Fig. 8, the activation of the electric linear actuator piston 70 will cause the upper frame 60 to slide upwards by vertically moving the backrest/headrest 51 of the upholstered item of furniture 100.

[0061] Therefore from the description above it is clear how the device of the present invention and the relevant upholstered item of furniture incorporating said device allow the above objects to be achieved.

[0062] It is also clear, for a person skilled in the art, that it is possible to make changes and further variants to the solution described, without for this reason departing from the teaching of the present invention, and from the scope of protection as defined in the annexed claims.

Claims

1. A device (101) suitable to be mounted on an upholstered item of furniture (100), which upholstered item of furniture (100) comprises a loin rest (50), a backrest (51) that also acts as a headrest, a seat (52), a footrest (53) and a supporting base (54), wherein said device (101) comprises an upper first frame (60), two rail systems comprising two guides (61, 61a) and two corresponding sliding bodies (62, 62a),

a lower second frame (64) that serves as a base and comprises two clamps (63, 63a) and an electric linear actuator piston (70),

and wherein said upper first frame (60) is joined to said lower second frame (64) by means of said two rail systems, the guides (61, 61a) of the rail systems being joined to said upper first frame (60) and the sliding bodies (62, 62a) of the rail systems being joined to the clamps (63, 63a) of said lower second frame (64), said upper first frame (60) being designed to move longitudinally along the axis of the rail system driven by said electric linear actuator piston (70), which electric linear actuator piston (70) is joined to the upper first frame (60) and to the lower second frame (64) by means of holed brackets (65, 66),

and wherein said upper first (60) and said lower second (64) frames form a single assembled frame (80) upon which said electric linear actuator piston (70) is mounted, **characterised in that** said device (101) is adapted to be inserted inside said backrest/headrest (51) of said upholstered item of furniture (100) and, when inserted therein, is able to generate the vertical movement of said backrest/headrest (51) of said upholstered item of furniture (100) entirely independently of the movement of said loin rest (50) and of said seat (52),

and **in that** said backrest/headrest (51), when operated by said device (101), moves vertically, longitudinally with respect to the supporting base (54) of said upholstered item of furniture (100), and entirely independently of said loin rest (50) and of said seat (52),

and **in that** both said loin rest (50) and said seat (52) are separate from said backrest/headrest (51) and the mechanisms designed to move the loin rest (50) and the seat (52) are separate from the single assembled frame (80) of said device (101).

2. A device according to claim 1, **characterised in that** said backrest (51) is joined neither to the loin rest (50) nor to the seat (52), the loin rest (50) being merely leaning against said backrest (51).

3. A device according to claims 1 and 2, **characterised in that** said single assembled frame (80) is joined neither to the mechanism designed to move the loin rest (50) nor to the mechanism designed to move the seat (52).

4. A device according to any claims 1 to 3, **characterised in that** said first upper frame (60) has a width of 730 mm with two first sides (60a, 60b) each having a length of 390 mm; said second lower frame (64) has a width of 730 mm with said two clamps (63, 63a) each having a length of 160 mm; said two guides (61, 61a) are each 360 mm long.

5. An upholstered item of furniture (100) comprising a loin rest (50), a backrest (51) that also acts as a headrest, a seat (52), a footrest (53) and a supporting base (54), **characterised in that** it also comprises a device (101) inserted inside said backrest/headrest (51),

wherein said device (101) comprises an upper first frame (60), two rail systems comprising two guides (61, 61a) and two corresponding sliding bodies (62, 62a), a lower second frame (64) that serves as a base and comprises two clamps (63, 63a) and an electric linear actuator piston (70), and wherein said upper first frame (60) is joined to said lower second frame (64) by means of said two rail systems, the guides (61, 61a) of the rail systems being joined to said upper first frame (60) and the sliding bodies (62, 62a) of the rail systems being joined to the clamps (63, 63a) of said lower second frame (64), said upper first frame (60) being designed to move longitudinally along the axis of the rail system driven by said electric linear actuator piston (70), which electric linear actuator piston (70) is joined to the upper first frame (60) and to the lower second frame (64) by means of holed brackets (65, 66), and wherein said upper first (60) and said lower second (64) frames form a single assembled frame (80) upon which said electric linear actuator piston (70) is mounted,

and **in that** said device (101) inserted inside said backrest/headrest (51) of said upholstered item of furniture (100) is able to generate the vertical movement of said backrest/headrest (51) of said upholstered item of furniture (100) entirely independently of the movement of said loin rest (50) and of said seat (52),

and **in that** said backrest/headrest (51), when operated by said device (101), moves vertically, longitudinally with respect to the supporting base (54) of said upholstered item of furniture (100), and entirely independently of said loin rest (50) and of said seat (52),

and **in that** both said loin rest (50) and said seat (52) are separate from said backrest/headrest (51) and the mechanisms designed to move the loin rest (50) and the seat (52) are separate from the single assembled frame (80) of said device (101).

6. An upholstered item of furniture (100) according to claim 5, **characterised in that** said single assembled frame (80) is inserted inside the upholstered item of furniture's backrest (51), said backrest (51) being joined neither to the loin rest (50) nor to the seat (52), the loin rest (50) being merely leaning against said backrest (51).

7. An upholstered item of furniture (100) according to claims 5 and 6, **characterised in that** said single assembled frame (80) is joined neither to the mechanism designed to move the loin rest (50) nor to the mechanism designed to move the seat (52). 5
8. An upholstered item of furniture (100) according to any claims 5 to 7, **characterised in that**, being said device (101) consistently small, it is able to save over 10 cm in depth. 10

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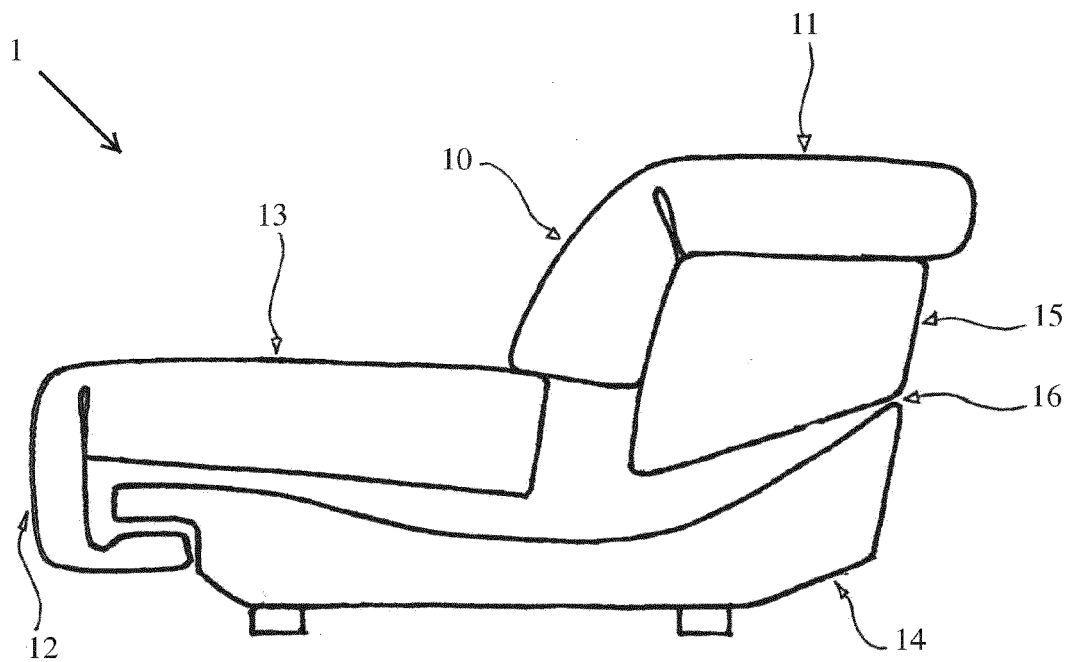


Fig.1
PRIOR ART

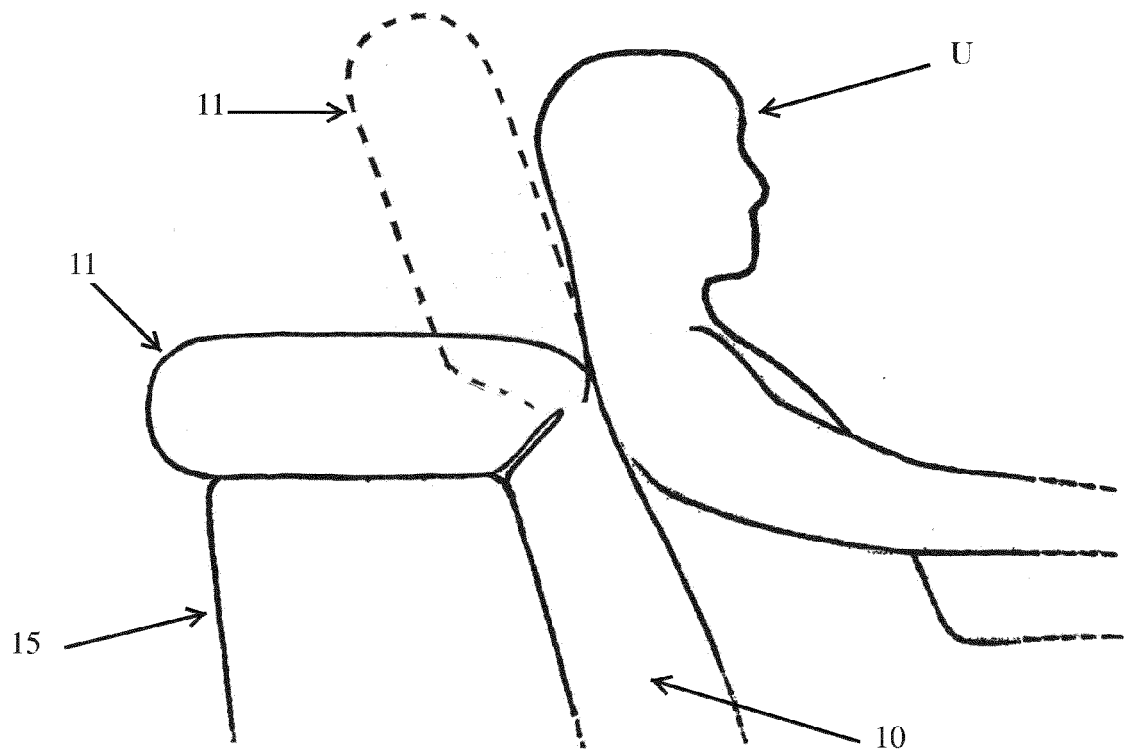


Fig. 1 A
PRIOR ART

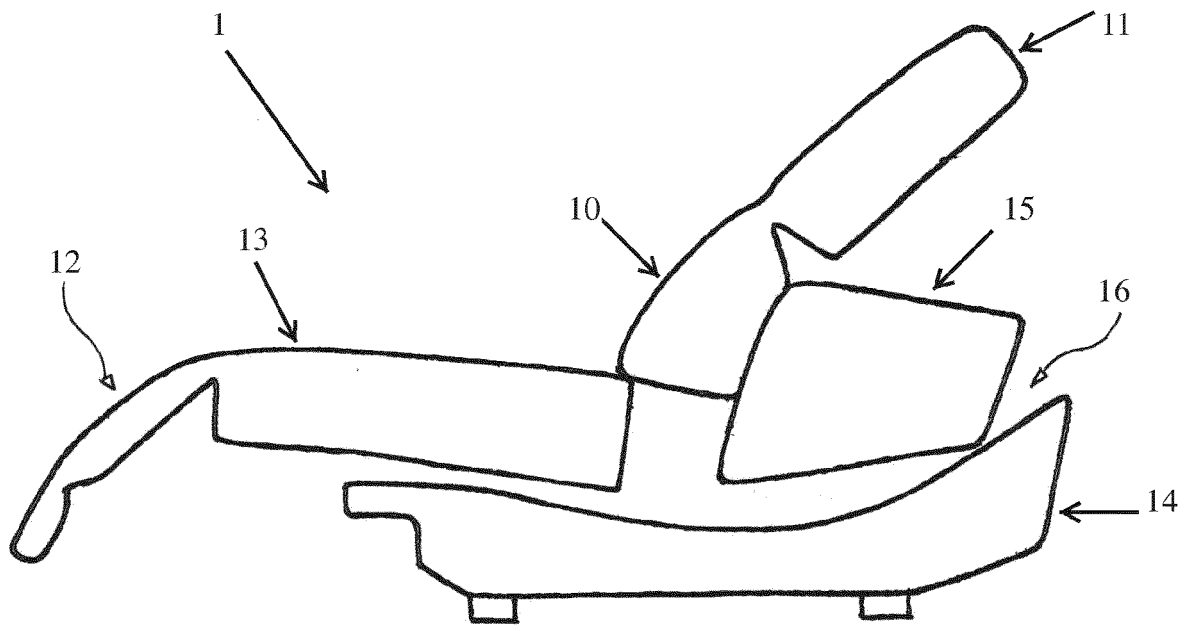


Fig. 2
PRIOR ART

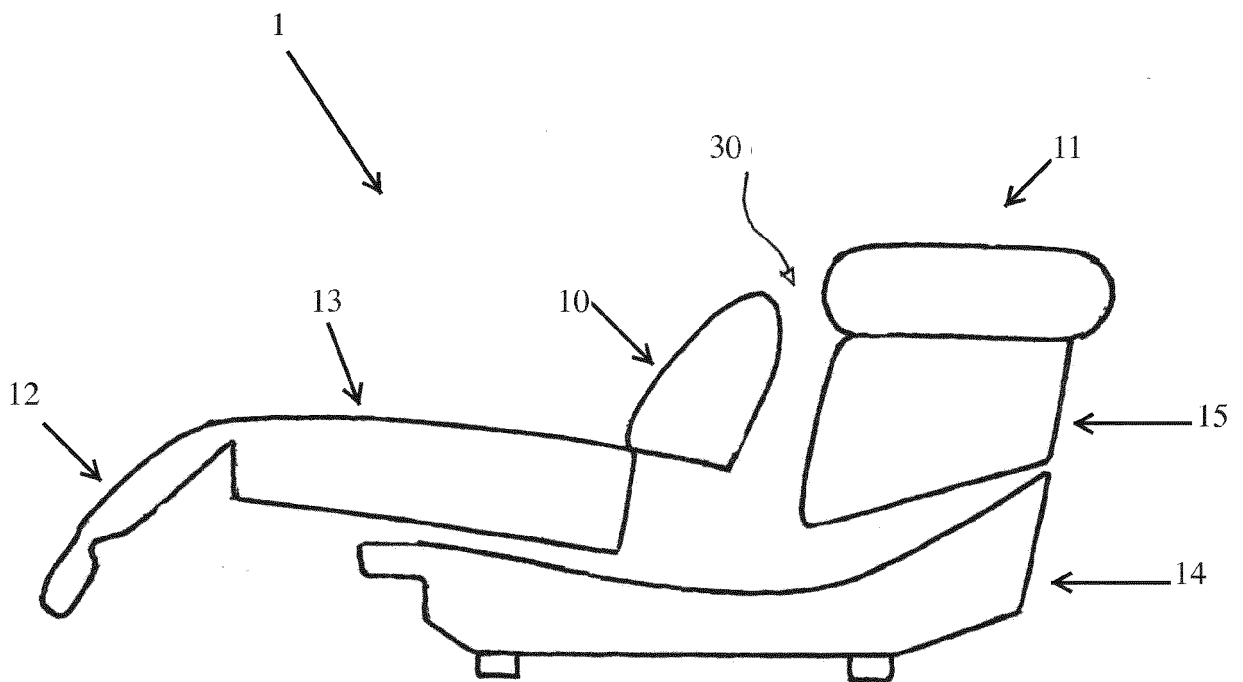


Fig. 3
PRIOR ART

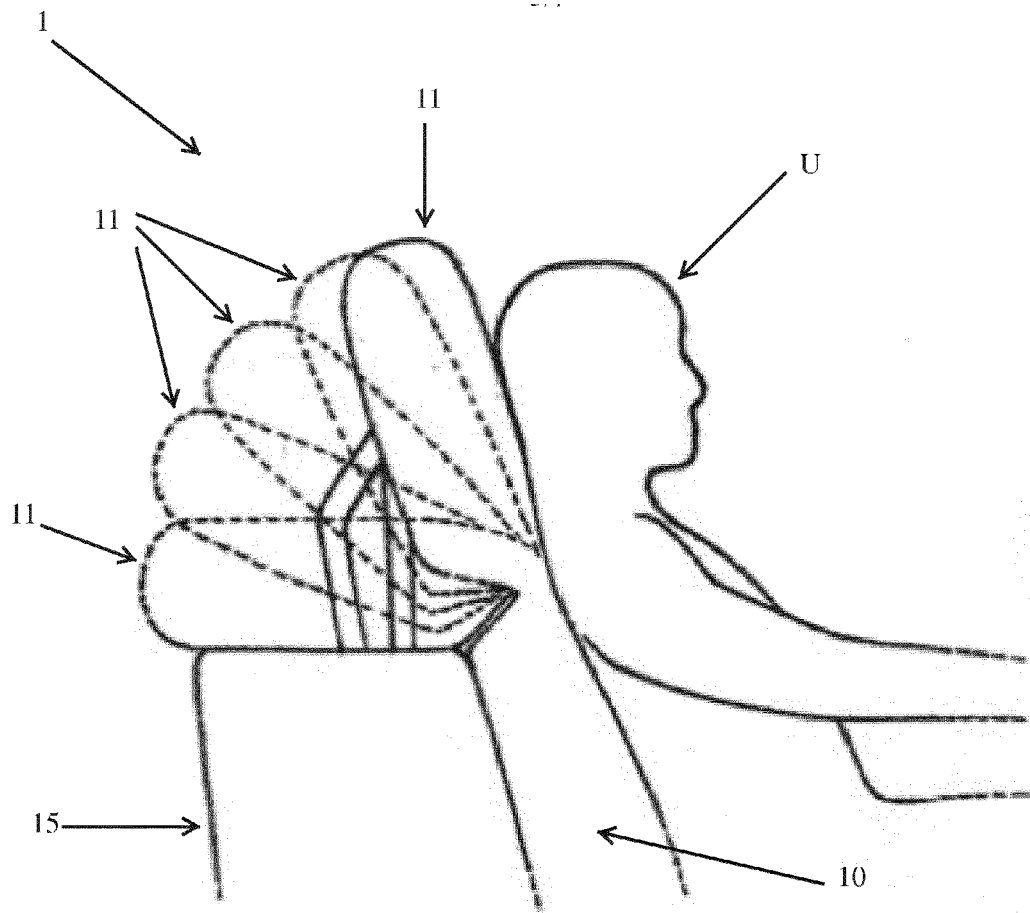


Fig. 4
PRIOR ART

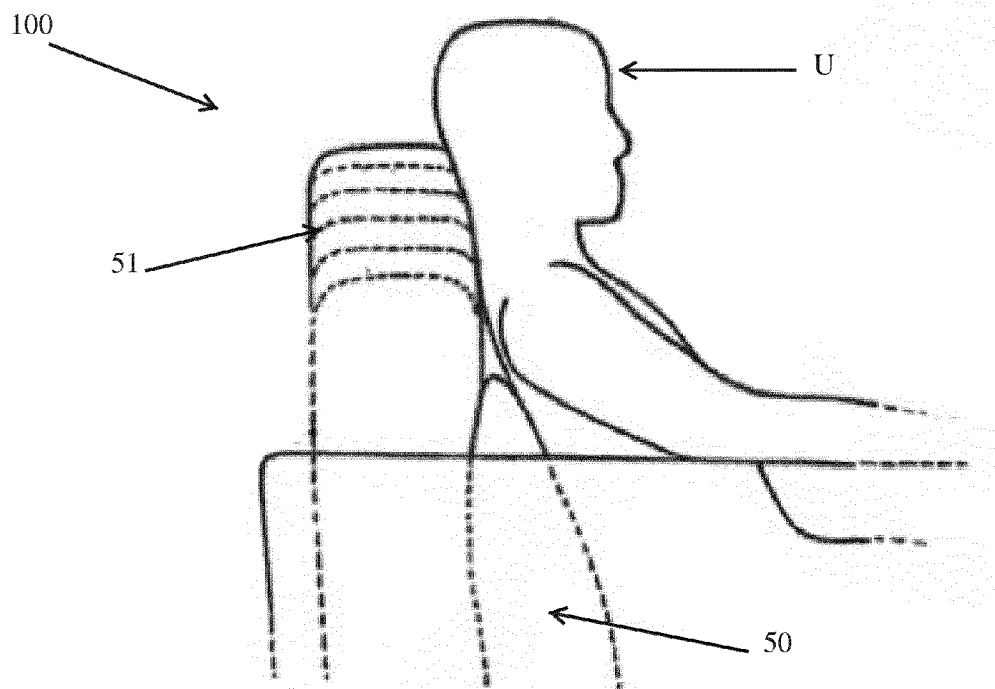


Fig. 4 A

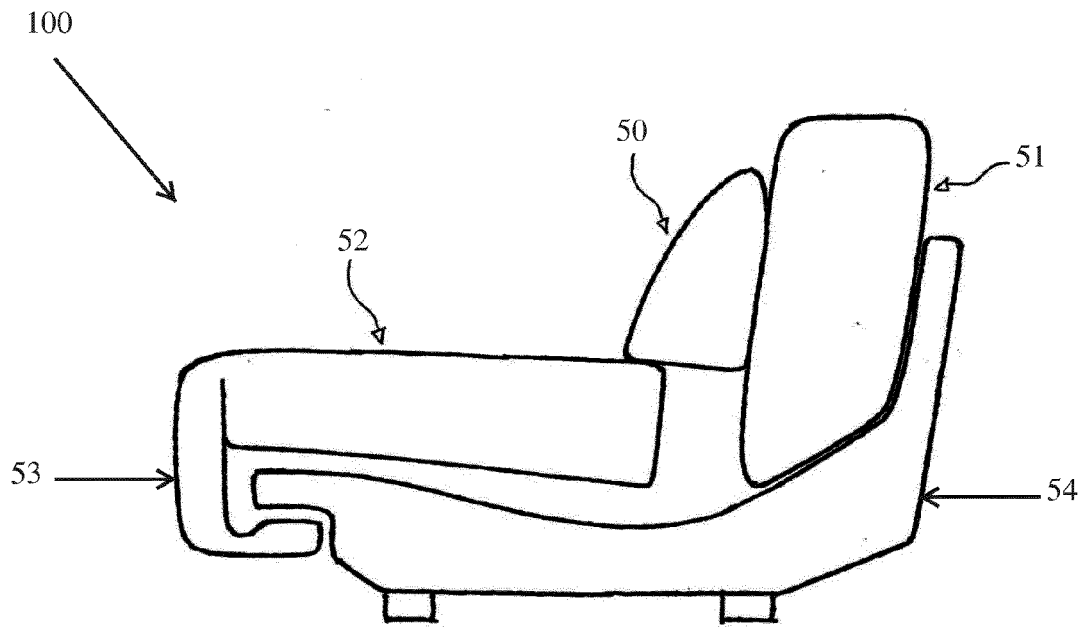


Fig. 5

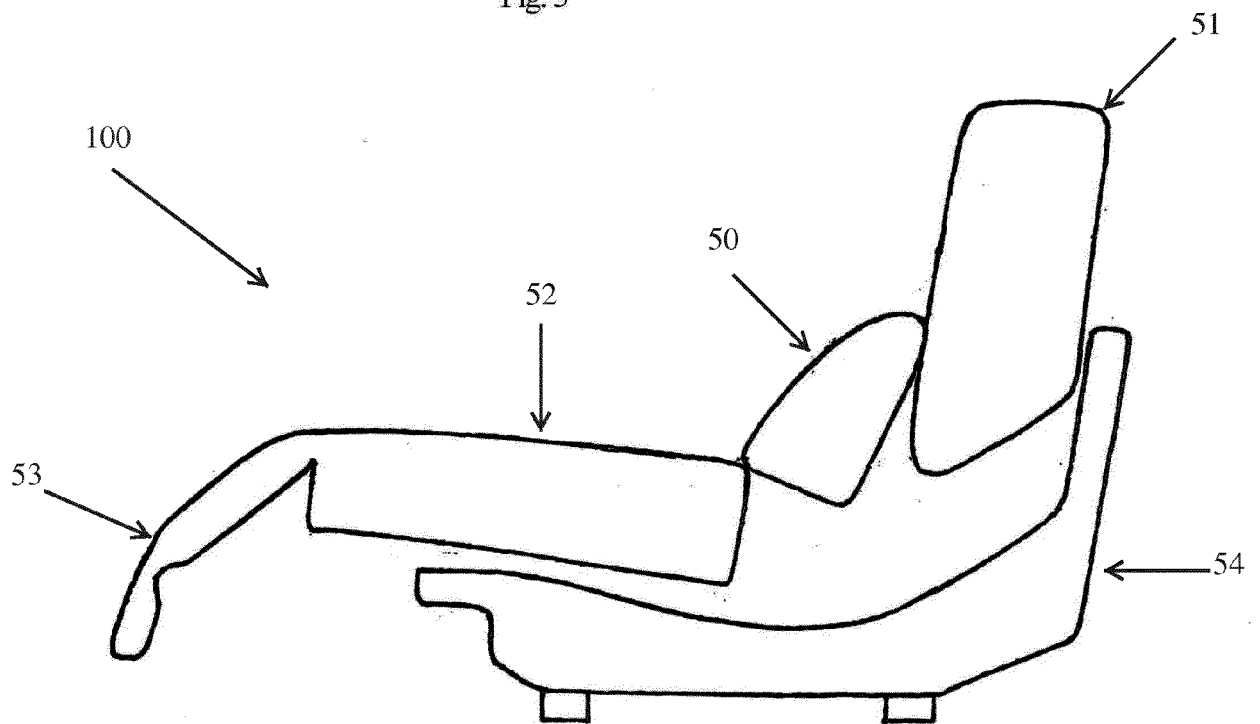


Fig. 5 A

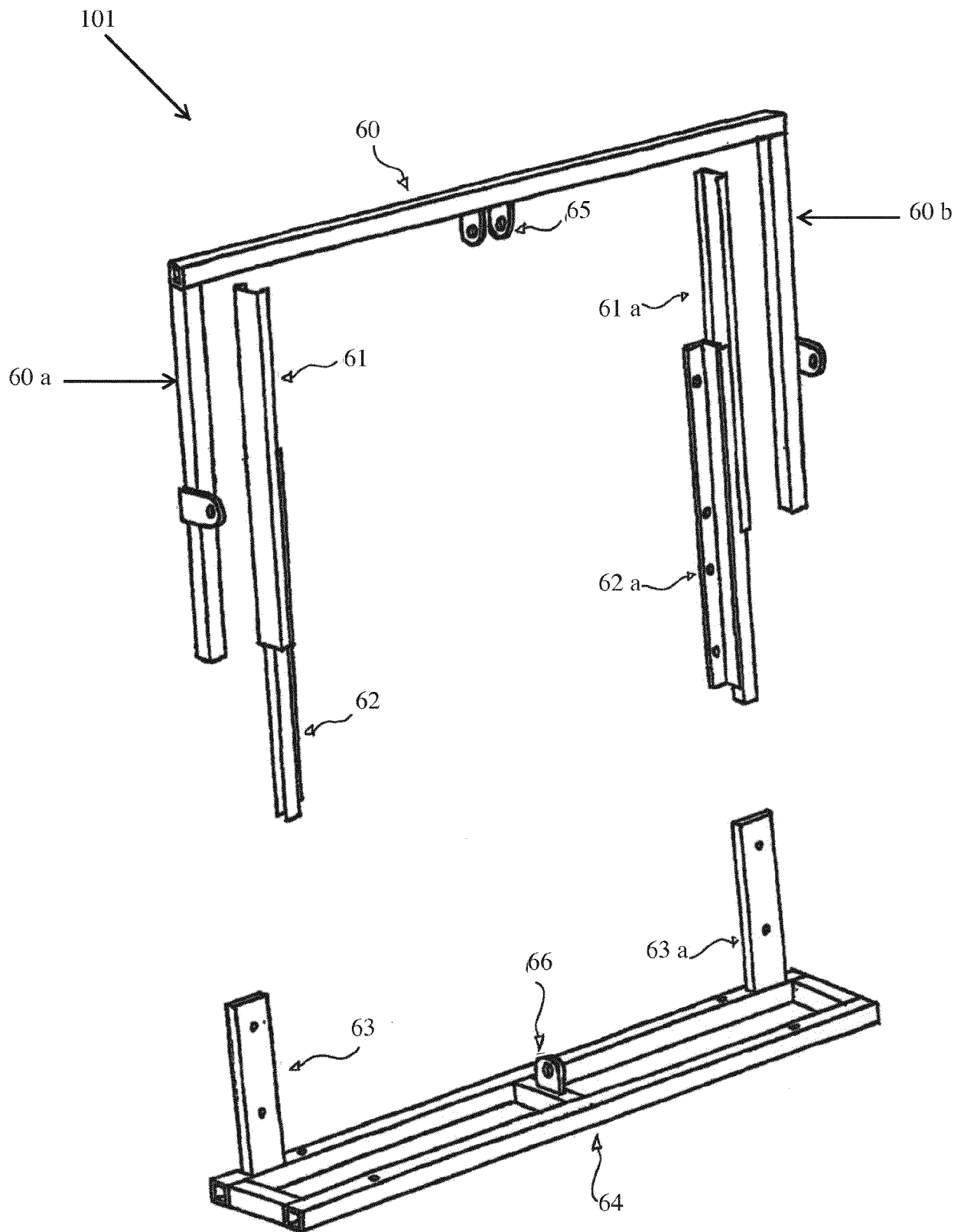
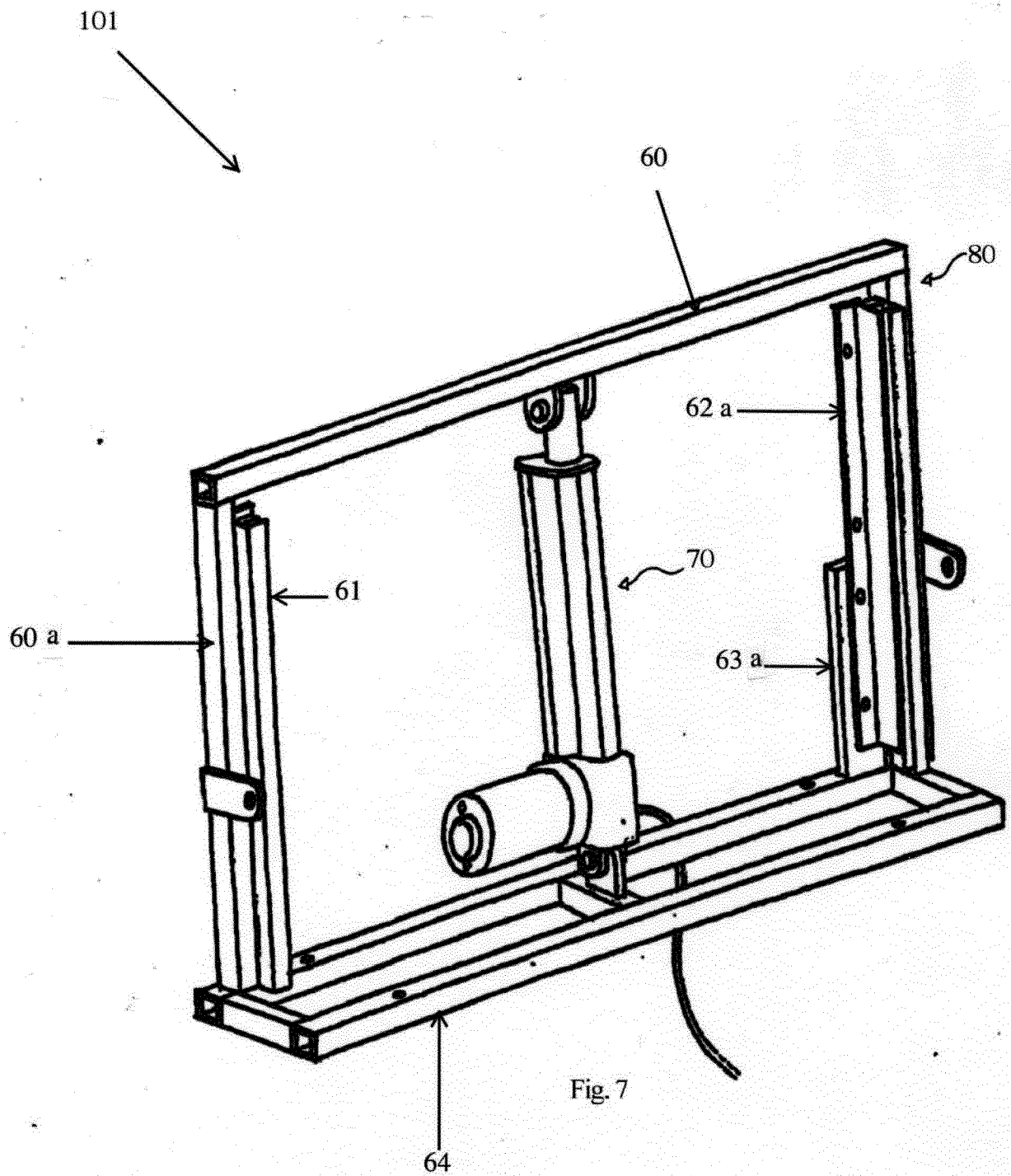
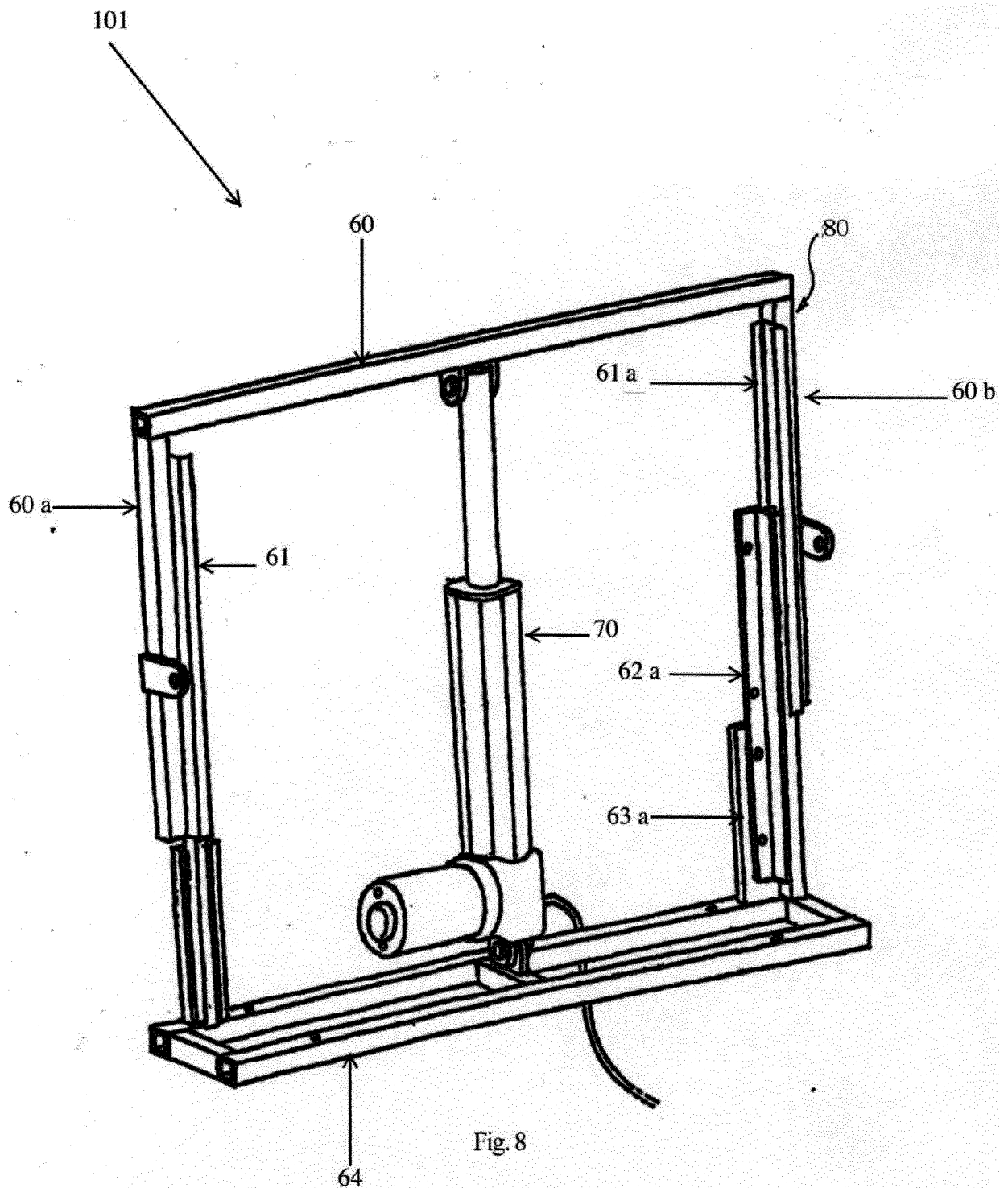


Fig. 6







EUROPEAN SEARCH REPORT

 Application Number
 EP 16 19 5301

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 3 738 706 A (CALDEMEYER D) 12 June 1973 (1973-06-12) * column 2, line 34 - column 7, line 57; figures 1-16 *	1-8	INV. A47C1/036 A47C7/38
Y	DE 20 2008 015960 U1 (FLEX GMBH [DE]) 19 March 2009 (2009-03-19) * paragraph [0018] - paragraph [0041]; figures 1-9 *	1-8	
A	GB 1 218 541 A (SLUMBERLAND GROUP LTD) 6 January 1971 (1971-01-06) * page 1, line 74 - page 2, line 3; figures 1-3 *	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 27 March 2017	Examiner Lehe, Jörn
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 19 5301

5 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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27-03-2017

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REFERENCES CITED IN THE DESCRIPTION

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