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Remarks:

Amended claims in accordance with Rule 137(2) EPC.

(54) **Lumbar Support**

(57) The invention relates to a lumbar support (3) for a seat backrest (2) with a lumbar pad (10) and a toggle linkage (9) to adjust the position of the lumbar pad. Fur-

thermore, there is a motor (6) with a spindle and a nut (8), wherein the motor rotates the spindle (7) to move the nut along the spindle and wherein the nut is coupled to the toggle linkage.

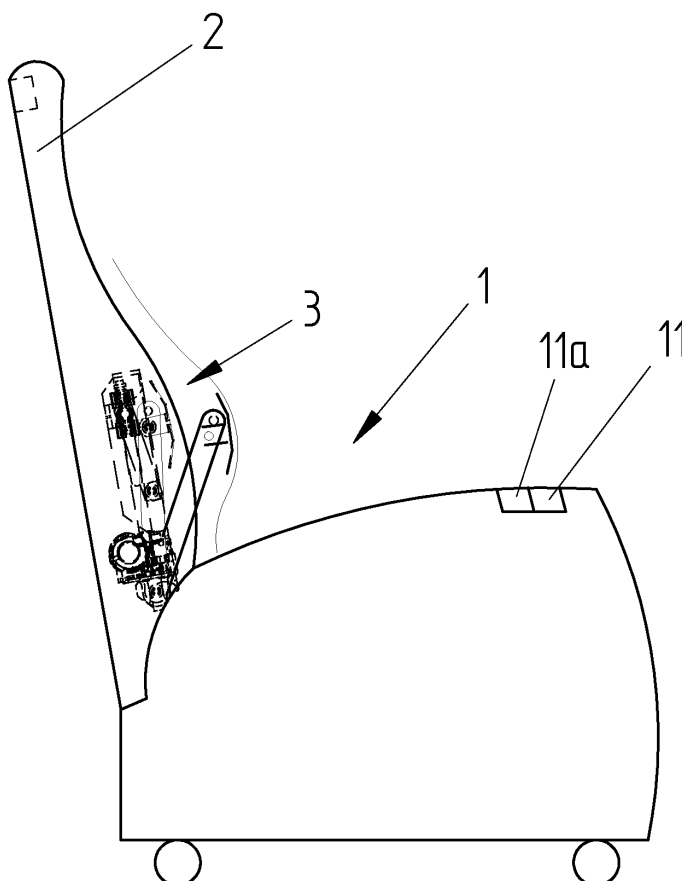


Fig. 1

Description

[0001] The invention refers to a lumbar support for a seat backrest with a lumbar pad and a toggle linkage to adjust the position of the lumbar pad.

[0002] US 4,182,533 discloses a seat backrest having an upholstered cushion portion supported by a rigid frame portion including means to produce a desired supporting contour in the lumbar region of the seat occupant. The contour-producing means includes a lumbar pad resiliently biased pivoted arm members connecting the lumbar pad to the frame through a toggle linkage, and handle means operable from the side of the backrest for adjustably positioning the lumbar pad in a plurality of fixed positions forward of the frame.

[0003] The object of the invention is to improve the adjustment of the lumbar support.

[0004] According to the invention, that object is achieved by the features of claim 1.

[0005] The lumbar support for a seat backrest according to the invention has a lumbar pad and a toggle linkage to adjust the position of the lumbar pad. Furthermore, it comprises a motor with a spindle and a nut, wherein the motor rotates the spindle to move the nut along the spindle and wherein the nut is coupled to the toggle linkage.

[0006] The motor driven lumbar support allows an adjustment of the lumbar pad while the user is sitting in his normal position. In addition, the position of the lumbar pad is not limited to fixed positions.

[0007] Further embodiments of the invention are the subject matter of the subordinate claims.

[0008] In one embodiment of the invention, the lumbar support comprises a frame for supporting the motor with the spindle and provides a pivot point for the toggle linkage. The toggle linkage may include an arm member which is pivotably connected to the frame and bears the lumbar pad. In addition, the toggle linkage may comprise a link coupled to the nut and the arm member. Preferably, the link is coupled to the arm member in a middle region between the connection of the arm member to the frame and the connection of the lumbar pad to the arm member.

[0009] Furthermore, the lumbar support has a control unit to move the lumbar pad by actuating the motor. According to a preferred embodiment of the invention, the control unit has a time setting device to set a time period for periodically activating the motor to move the nut in order to change the position of the lumbar pad. This function has a very positive influence on the spinal column because the sitting position of the user changes periodically.

[0010] Further advantages and embodiments of the invention will be explained by the following description and the drawings.

[0011] In the drawings

Fig. 1 shows a side elevation of a seat furniture with a lumbar support,

Fig. 2

shows a three dimensional view of the seat frame and the lumbar support and

Fig. 3a and 3b

show a side elevation of the lumbar support in two different positions of the lumbar pad.

[0012] Fig. 1 discloses a seat furniture 1 with a seat backrest 2 having a lumbar support 3.

[0013] As can be seen in Figs. 2, 3a, and 3b, the lumbar support 3 has a frame 4 which is fixed to a backrest frame 5 of the seat backrest 2. The lumbar support 3 further comprises an actuator with a motor 6, a spindle 7, and a nut 8 wherein the motor rotates the spindle to move the nut along the spindle. Furthermore, the lumbar support has a toggle linkage 9 which comprises an arm member 9a which is pivotably connected to the frame 4 and a link 9b coupled to the nut 8 and the arm member 9a.

[0014] The arm member 9a is coupled to frame 4 at one end and bears a lumbar pad 10 at the other end. The link 9b is coupled to the arm member 9a in a middle region between the connection of the arm member to the frame 4 and the connection of the lumbar pad 10 to the arm member.

[0015] As can be seen from Figs. 3 and 3b, it is possible to change the position of the lumbar pad 10 by moving the nut 8 by rotation of the spindle 7. For actuating the motor 6 a control unit 11 is provided, which may be integrated in the seat furniture 1 (see Fig. 1). However, it is also possible to use a remote control or a control unit which is connected to the motor via a cable.

[0016] In a preferred embodiment of the invention, the control unit comprises a time setting device 11a to set a time period for periodically activating the motor to move the nut in order to change the position of the lumbar. Accordingly, it is possible to set a time period of, for instance, two minutes and as a consequence, the position of the lumbar pad will be changed every two minutes a little bit. This has the effect that the position of the user changes every two minutes which has a positive influence on the spinal column of the user.

Claims

1. Lumbar support (3) for a seat backrest (2) with a lumbar pad (10) and a toggle linkage (9) to adjust the position of the lumbar pad,
characterized by a motor (6) with a spindle (7) and a nut (8), wherein the motor rotates the spindle to move the nut along the spindle and wherein the nut is coupled to the toggle linkage.
2. Lumbar support according to claim 1, **characterized by** a frame (4) for supporting the motor (6) with the spindle (7) and for providing a pivot point for the toggle linkage (9).

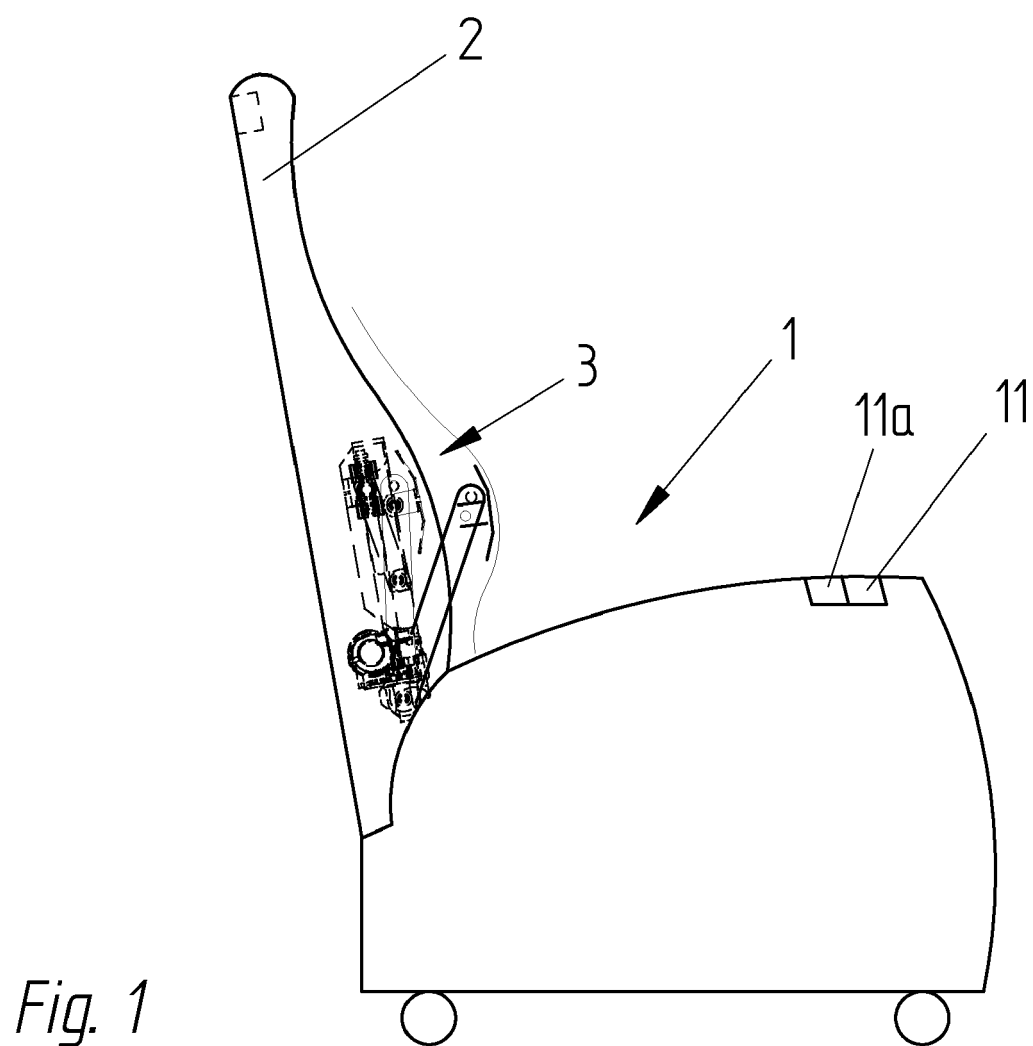
3. Lumbar support according to claim 1, **characterized in that** the toggle linkage (9) includes an arm member (9a) which is pivotably connected to a frame (4) and bears the lumbar pad (10). 5
4. Lumbar support according to claim 1, **characterized in that** the toggle linkage (9) further comprises a link (9b) coupled to the nut (8) and the arm member (9a). 10
5. Lumbar support according to claim 4, **characterized in that** the link (9b) is coupled to the arm member (9a) in a middle region between the connection of the arm member (9a) to the frame (4) and the connection of the lumbar pad (10) to the arm member (9a). 15
6. Lumbar support according to one or more of the preceding claims, **characterized by** a control unit (11) to move the lumbar pad (10) by actuating the motor (6). 20
7. Lumbar support according to claim 6, **characterized in that** control unit (11) has a time setting device (11a) to set at time period for periodically activating the motor (6) to move the nut (8) in order to change the position of the lumbar pad (10). 25

(11) to move the lumbar pad (10) by actuating the motor (6).

5. Lumbar support according to claim 4, **characterized in that** control unit (11) has a time setting device (11a) to set at time period for periodically activating the motor (6) to move the nut (8) in order to change the position of the lumbar pad (10).

Amended claims in accordance with Rule 137(2) EPC. 30

1. Lumbar support (3) for a seat backrest (2) with a lumbar pad (10), a linkage (9) to adjust the position of the lumbar pad and a motor (6) with a spindle (7) and a nut (8), wherein the motor rotates the spindle to move the nut along the spindle and wherein the nut is coupled to the linkage, **characterized in that** the linkage is a toggle linkage (9) including an arm member (9a) which is pivotably connected to a frame (4) and bears the lumbar pad (10) and a link (9b) coupled to the nut (8) and the arm member (9a). 35 40
2. Lumbar support according to claim 1, **characterized by** a frame (4) for supporting the motor (6) with the spindle (7) and for providing a pivot point for the toggle linkage (9). 45
3. Lumbar support according to claim 1, **characterized in that** the link (9b) is coupled to the arm member (9a) in a middle region between the connection of the arm member (9a) to the frame (4) and the connection of the lumbar pad (10) to the arm member (9a). 50 55
4. Lumbar support according to one or more of the preceding claims, **characterized by** a control unit



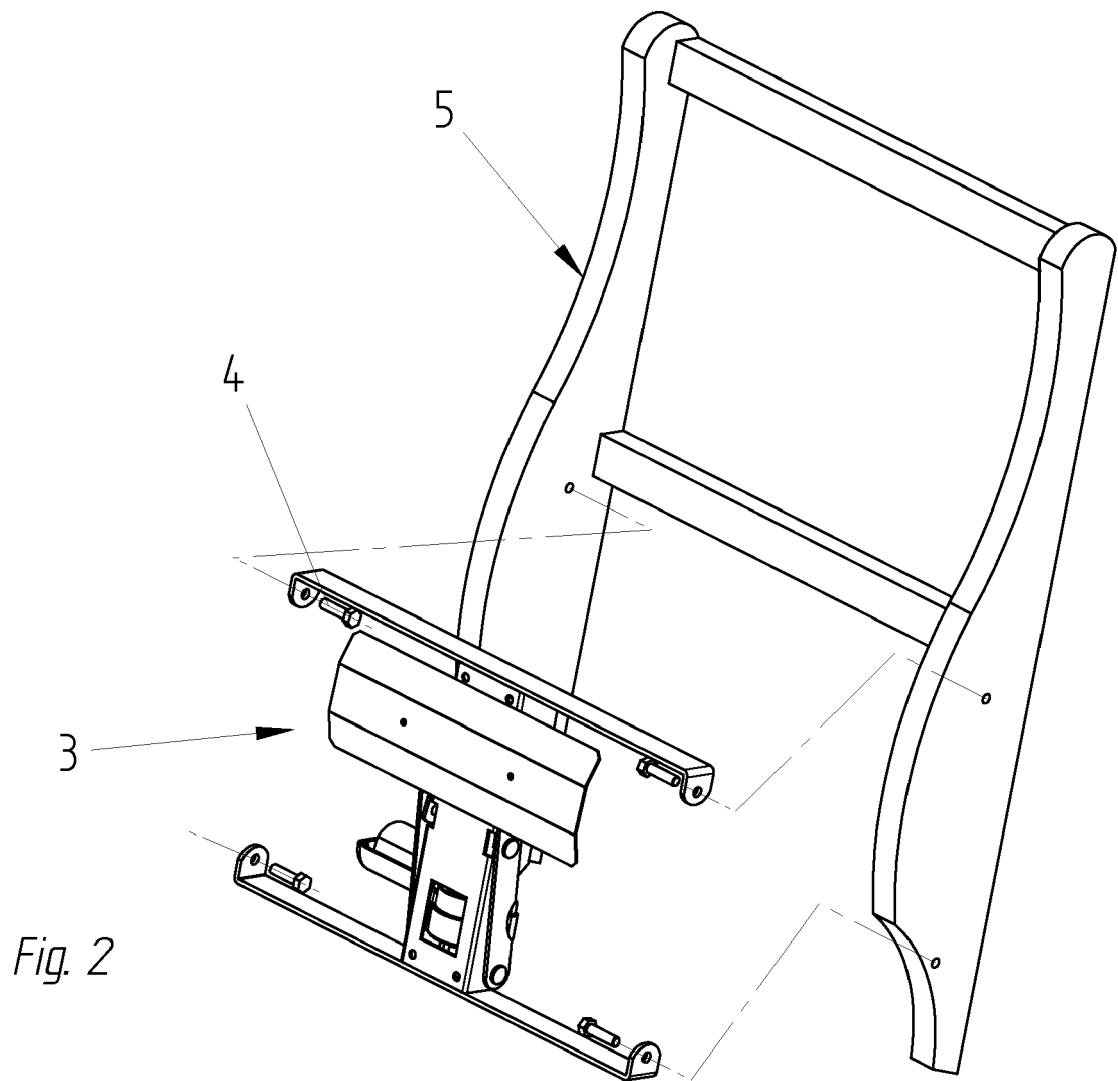


Fig. 2

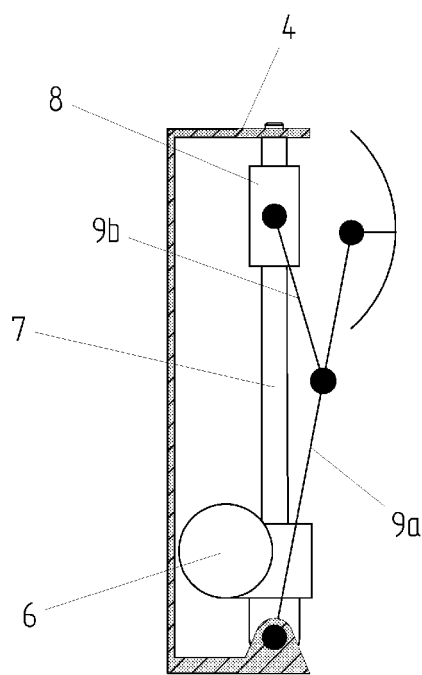


Fig. 3a

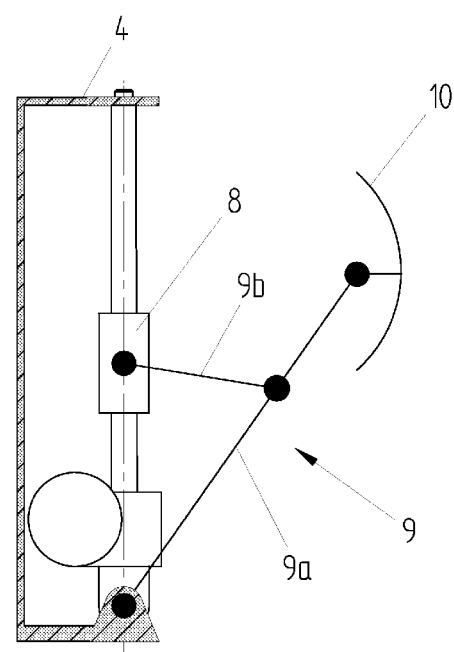


Fig. 3b



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 6922

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) A47C B60N
Place of search Munich		Date of completion of the search 7 February 2008	Examiner MacCormick, Duncan
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 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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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