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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.

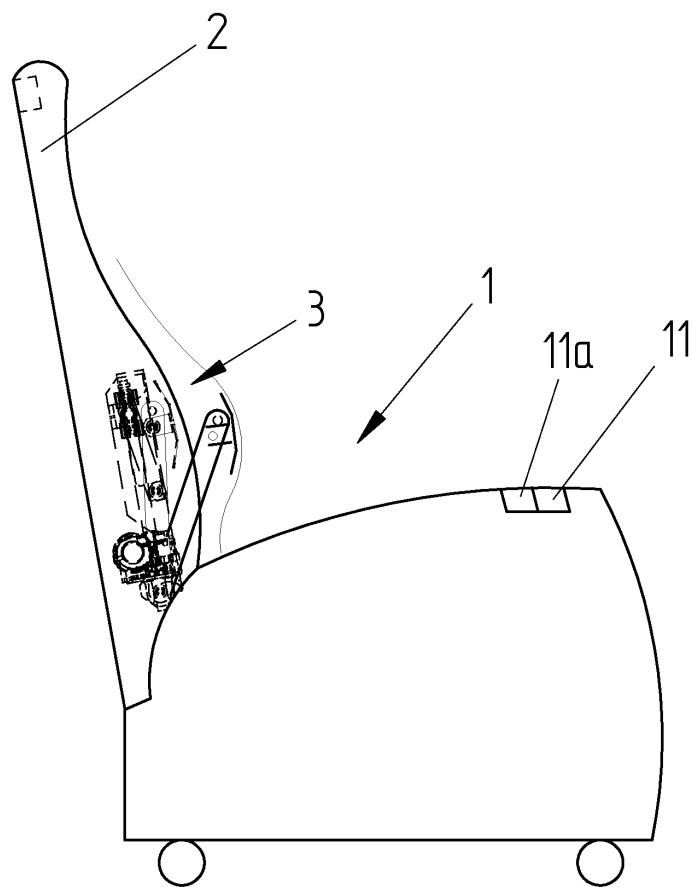


Fig. 1

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

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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

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

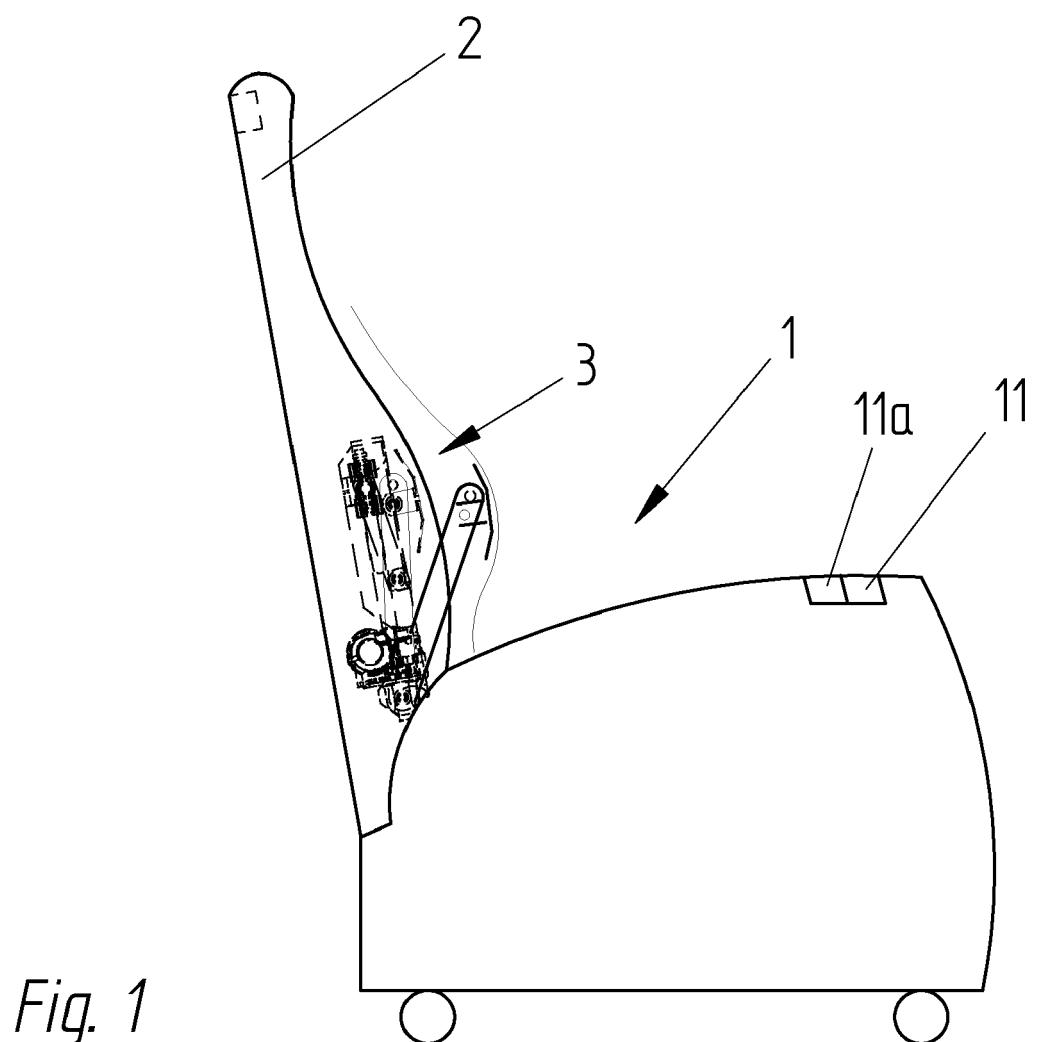
2. Lumbar support according to claim 1, **characterized by** a frame (4) for supporting the motor (6) with the spindle (7) and for providing a pivot point for the toggle linkage (9). 40

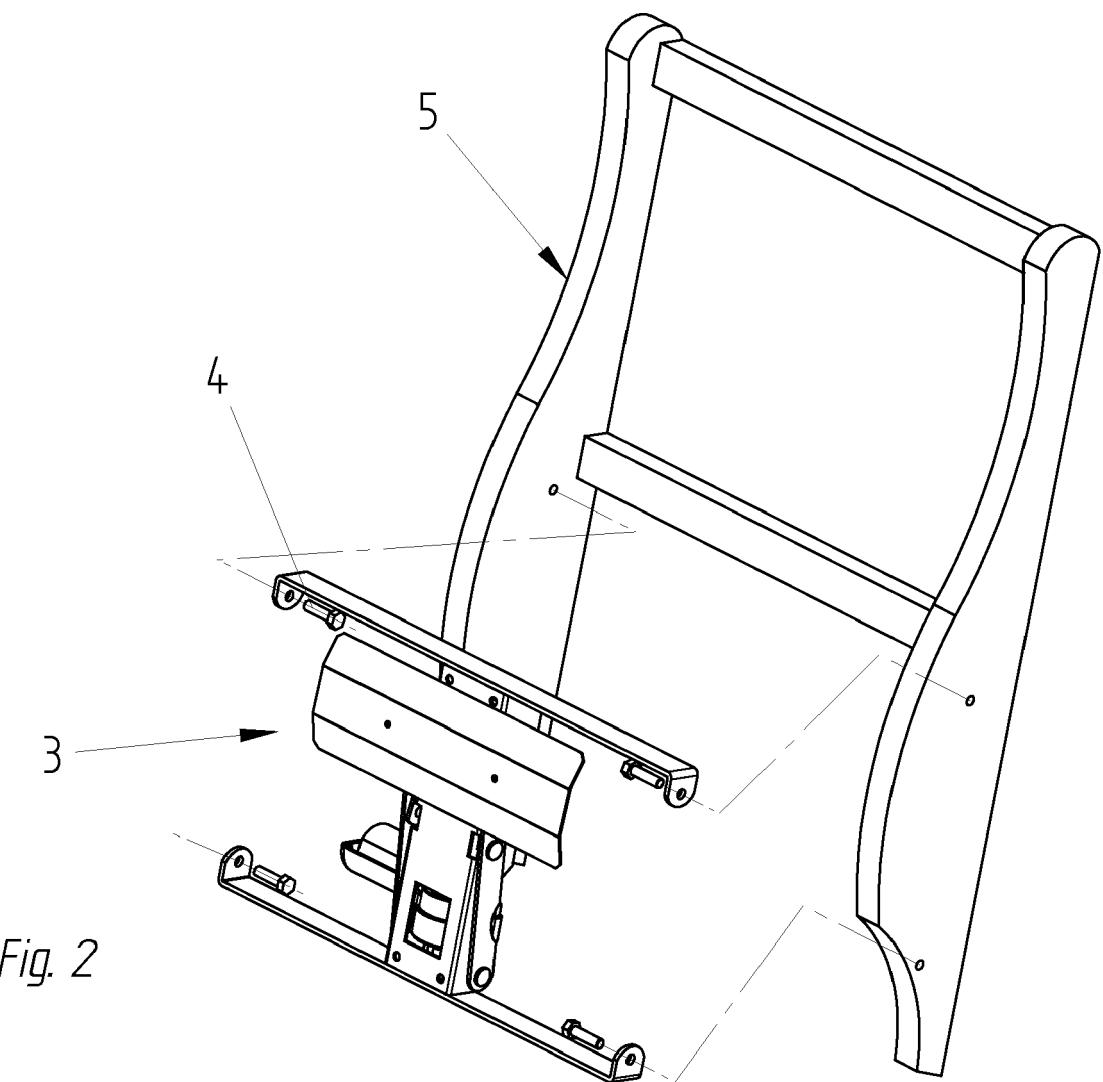
3. Lumbar support according to claim 1, **characterized in that** the link (9b) is coupled to the arm member (9a) in a middle region between the connection of the arm member (9a) to the frame (4) and the connection of the lumbar pad (10) to the arm member (9a). 50

4. Lumbar support according to one or more of the preceding claims, **characterized by** a control unit 55

(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).





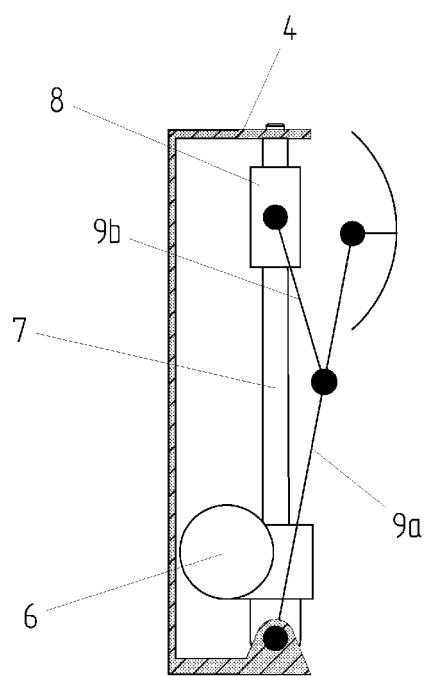


Fig. 3a

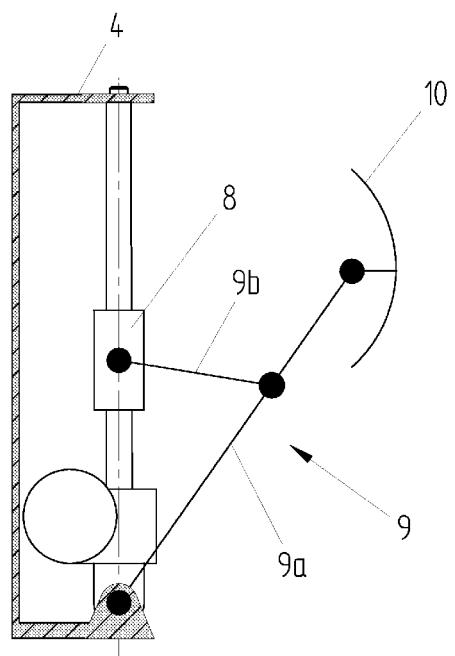


Fig. 3b



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	DE 29 35 352 A1 (STEYR DAIMLER PUCH AG) 27 March 1980 (1980-03-27) * page 6, line 31 - page 7, line 38 * * figures 1-5 * -----	1-3,6	INV. A47C7/46
Y	EP 1 566 119 A (SCHWARZBICH JOERG [DE]) 24 August 2005 (2005-08-24) * abstract * * paragraph [0018] - paragraph [0019] * * figures 1-9 * -----	1	
Y	DE 299 13 855 U1 (LAI YU SHAN [TW]) 2 December 1999 (1999-12-02) * abstract * * figures 4-7 * -----	1	
A	US 4 182 533 A (ARNDT O HAROLD [US] ET AL) 8 January 1980 (1980-01-08) * abstract * * column 1, line 19 - column 1, line 38 * * figures 1-3 * -----	1-7	TECHNICAL FIELDS SEARCHED (IPC)
A	US 2003/094841 A1 (MCMILLEN ROBERT [CA] ET AL) 22 May 2003 (2003-05-22) * abstract * * figures 1-7 * -----	1-7	
The present search report has been drawn up for all claims			
2	Place of search	Date of completion of the search	Examiner
	Munich	7 February 2008	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			
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 07 11 6922

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07-02-2008

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
DE 2935352	A1	27-03-1980	AT	377484 B	25-03-1985	
			AT	642978 A	15-01-1980	
EP 1566119	A	24-08-2005	DE	202004002569 U1	07-07-2005	
			US	2005184200 A1	25-08-2005	
DE 29913855	U1	02-12-1999	US	6095605 A	01-08-2000	
US 4182533	A	08-01-1980		NONE		
US 2003094841	A1	22-05-2003	AU	2002343694 A1	10-06-2003	
			WO	03043849 A1	30-05-2003	
			US	2004113472 A1	17-06-2004	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4182533 A [0002]