



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.10.2003 Bulletin 2003/43

(51) Int Cl.7: **A47C 7/46, B60N 2/44**

(21) Application number: **02252777.4**

(22) Date of filing: **19.04.2002**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

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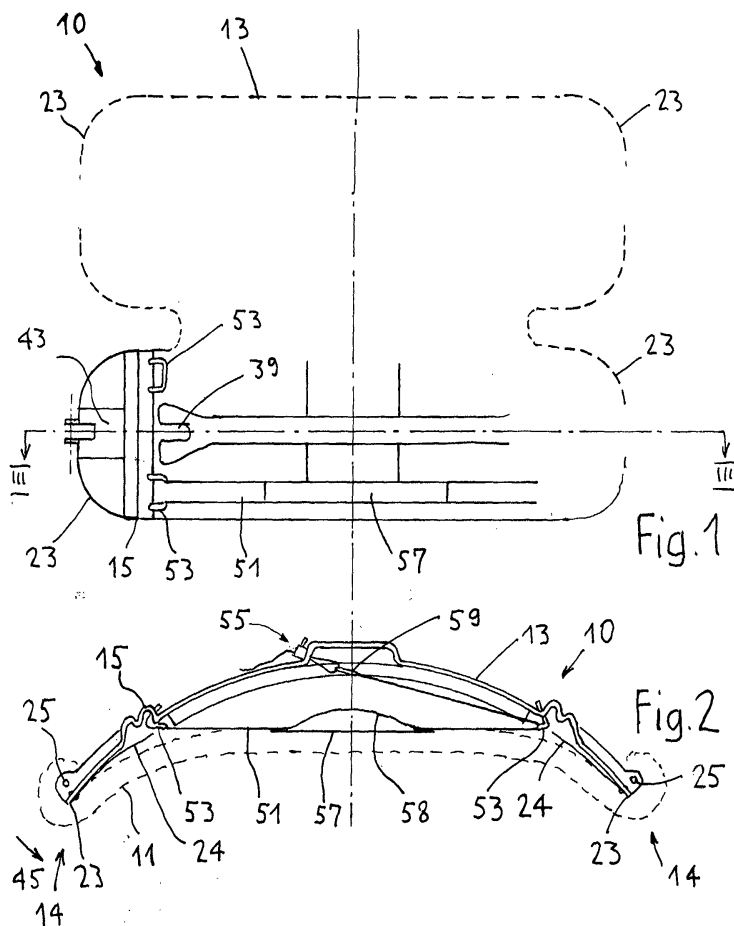
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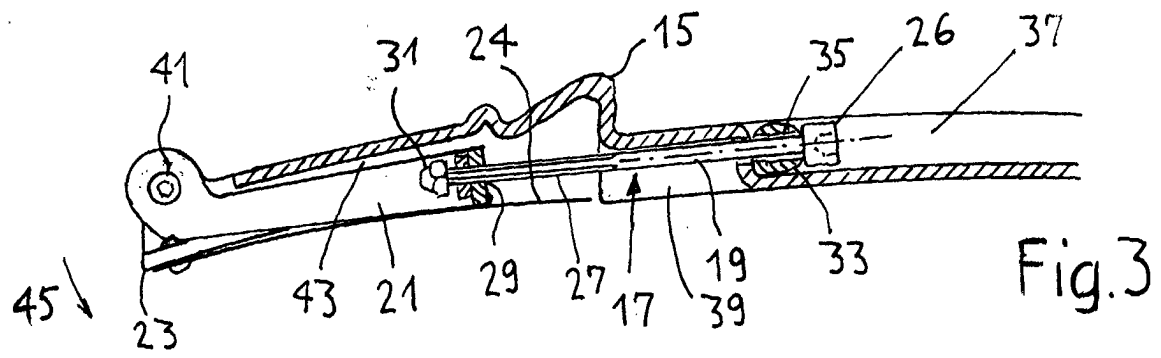
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(54) **Backrest for a chair, in particluar for a wheelchair**

(57) The backrest (10) with wing pads (14) is intended for individuals suffering from spinal deformities, such as scoliosis, or muscular atrophy. The backrest can be used in particular with wheelchairs. The backrest com-

prises a back support (13) and the wing pad (14) comprises a backing plate (23). Back support (13) and backing plate (23) are connected by a hinge (15). Adjusting means (17) allow to adjust the angle of the wing pad (14) with respect to the back support (13).





Description

[0001] This invention relates to a backrest with at least one adjustable wing pad.

[0002] A wheelchair generally has a seat and a backrest that are supported by a pair of side frames. Backrest posts extend upwardly from the rear end of the side frames and turn rearwardly away from the backrest to form handles. Some wheelchairs have collapsible struts positioned between the side frames to maintain the side frames in a parallel, spaced apart orientation when the chair is occupied by a user. When the struts are collapsed, the side frames move together to allow for easy transportation or storage of the wheelchair. Typically the seat and the backrest of such collapsible wheelchairs are constructed from flexible material that easily folds when the wheelchair is collapsed. However, the flexible material of the seat and backrest does not provide optimum support or comfort for the occupant. For this reason contoured backrests have been developed to provide improved support for individuals requiring special support, such as those having spinal deformities or muscular atrophy.

[0003] A very practical contoured backrest is sold under the name "V-TRAK". This backrest is available in different forms, namely as sports backrest, standard backrest, high backrest and segmented backrest. All these backrests have on the rear side in the middle a rail which permits height-adjustable connection to a support. From this support extend two lateral arms having at their end a quick connecting and release device for connecting the backrest assembly to the wheelchair. For this purpose the side frames of the wheelchair are provided with adapters for cooperation with these connecting and release devices. The backrest or each segment of the backrest comprises a back support consisting of a shell of plastic material having a cylindrical curvature. Straps or belts extend from one side of the back support to the other side and to the rear of the back support. These straps can be tensioned from the rear side of the backrest and locked in the desired position. Tensioning the straps elastically deforms the back support. Located over the straps is a cushion. In addition, a cover encloses the assembly both on the front and the back.

[0004] In the WO 99/17636 also a modular backrest system for a wheelchair is described. This backrest system also can be removably attached to the backrest posts of the wheelchair. This backrest can be provided, if desirable, with one or more wing pads. Each wing pad includes a backing plate and a cushion attached to the forwardly presented face of the backing plate. Each wing pad includes a pair of L-shaped support posts. These support posts can be inserted into openings of the back support of the backrest and arrested with screws in the desired position. Therefore, a user suffering, for example from scoliosis, will be laterally supported by one or more wing pads.

[0005] The described backrest with wing pads has the

disadvantage that the wing pads are separate units and require a relatively complicated attachment means. The attachment means permit only a linear adjustment. An angular adjustment is not possible. In addition, the backrest with the wing pad and the protruding parts of the L-shaped support posts does not have a nice appearance. This lets the user appear more invalid than he in reality may be. This may have undesirable psychological consequences for the user.

[0006] Therefore, it is an object of the invention to provide a backrest with at least one adjustable wing pad, but avoiding the described disadvantages of the prior art.

[0007] According to the invention the backrest is characterised in that the wing pad is connected by a hinge to the backrest and in that adjusting means are provided to adjust the angle of the wing pad with respect to the backrest. This permits angular adjustments and has the advantage of a compact design which is also appealing to the eye.

[0008] The backrest preferably comprises a back support, and the wing pad comprises a backing plate, both back support and backing plate consisting of one piece of material having a deformable section providing a hinge portion in between. The back support together with the backing plate of the wing pad are preferably formed of plastic, preferably thermoplastic, sheet material having some elasticity. The hinge may be formed by folds in the sheet material. The use of such sheet material provides for low manufacturing cost.

[0009] The adjusting means preferably comprise a screw tensioning device. This provides for easy adjustment. The screw tensioning device may comprise a screw with a screw thread and a bracket with a tapped hole receiving the screw thread, said screw being mounted in a substantially horizontal direction on the back support of the backrest, and said bracket being pivotally mounted on the backing plate of the wing pad. This provides for adjusting means located in small space. In turn, this permits an appealing design of the backrest without protruding parts.

[0010] A preferable embodiment of the backrest according to the invention comprises a back support and one or more belts for supporting the back of the user, each belt being attached with one end at one lateral portion of the back support and extending on the front side of the back support to an opposite lateral portion of the back support from where it is turned around to an adjusting device. This backrest is characterised in that the belt is elastically stretchable or comprises at least one elastically stretchable section. The adjusting device is preferably a cable binder attached to the back support and engaged an eye attached to the end of belt.

[0011] An embodiment of the invention is shown in the drawings:

Figure 1 shows a schematical drawing of the back support of the backrest as seen from the

front side with one of the four belts attached,

Figure 2 shows a view from the top of the back support shown in figure 1,

Figure 3 shows enlarged a cross-section along the line III-III in figure 1 with the adjusting means for the wing pads added.

[0012] In figure 1 the cushion and the cover of the backrest 10 is not shown, but in figure 2 the cushion 11 is represented by a dotted line. As can be seen, the back support 13 and the backing plates 23 of the wing pads 14 are one piece formed of a sheet of preferably thermoplastic sheet material. However, they could also be made by moulding plastic material. They could even be formed of a resilient metal sheet. While it is preferable for the back support 13 and the backing plates 23 to consist of one piece with a hinge portion 15 in between, it would also be possible for the back support 13 and the backing plate 23 to be separate portions hinged together. In the present embodiment the hinged portion is provided by folds 15 in the sheet material.

[0013] A screw tensioning device 17, as shown in figure 3, serves as adjusting means for adjusting the angle of the wing pad 14 with respect to the back support 13. The screw tensioning device 17 substantially comprises a screw 19 mounted in substantially horizontal direction on the back support 13 and a bracket 21 in form of a U. The bracket 21 is pivotally mounted by a screw 41 on the backing plate 23 of the wing pad 14. In figure 2, where the screw tensioning device has been omitted, the hole 25 for mounting the bracket 21 is seen. As figure 3 shows, the screw 19 has preferably a female hexagon head 26 to permit turning the screw 19 with the socket wrench. The thread 27 of the screw 19 is threaded into a tapped hole 29 of the bracket 21. A screw cap 31 is mounted on the screw 19 to prevent turning the screw 19 out of the tapped hole 29. Instead of a washer a cylindrical piece 33 with a hole 35 is provided. The screw head 26 and the piece 33 are received in a channel 37 on the rear side of the back support 13. Part of the screw 19 extends in a channel 39 of the back support 13. The bracket 21 is received in a channel 43 of the wing pad 14. On the backing plate 23 of the wing pad 14 a cover plate 24 (only shown in figure 3) covers the region of the bracket 21 and the screw 19 in the hinge portion 15 to prevent them contacting the cushion 11.

[0014] As will be evident from figures 2 and 3, tightening of the screw 19 will move the wing pad 14 in direction of the arrow 45 around the hinge 15. On the contrary, loosening the screw 19 will permit the wing pad 14 to return again in direction opposite to the arrow 45.

[0015] The backrest as shown in the drawing may be provided with one or more belts or straps 51 for supporting the back of the user. The embodiment of the backrest as shown in figure 1 is provided with four belts, but only one belt 51 is shown. The belt 51 is attached with the

hook 53 at one lateral portion of the back support 13 and extends on the front side of the back support 13 to a hook 53 the opposite lateral portion. There the belt is turned around in direction to an adjusting device 55. The belt 51 is either elastically stretchable or comprises at least one elastically stretchable section 57. As shown in figure 2, the elastically stretchable section 57 is connected to a loop 58 of the belt. The adjusting device 55 is preferably a cable binder engaged to an eye 59 attached to the end of the belt 51.

[0016] It will be obvious to the man skilled in the art that the invention is applicable to different sizes and forms of the backrest. The invention may also be applied to segmented backrests.

Claims

1. A backrest for a chair, in particular for a wheelchair, said backrest comprising a back support (13) and at least one adjustable wing pad (14), **characterised in that** the wing pad (14) is connected by a hinge (15) to the back support (13) and **in that** adjusting means (17) are provided to adjust the angle of the wing pad (14) with respect to the back support (13).
2. The backrest as claimed in claim 1, **characterised in that** the wing pad (14) comprises the backing plate (23), and that back support (13) and backing plate (23) consist of one piece of material having a deformable section forming a hinge portion (15) between the back support (13) and the wing pad (14).
3. The backrest as claimed in claim 1 or 2, **characterised in that** the back support (13) together with the backing plate (23) of the wing pad (14) are formed of plastic sheet material.
4. The backrest as claimed in one of the claims 1 to 3, **characterised in that** the hinge (15) is formed by folds in the sheet material.
5. The backrest as claimed in one of the claims 1 to 4, **characterised in that** the adjusting means (17) comprise a screw tensioning device.
6. The backrest as claimed in claim 5, **characterised in that** the screw tensioning device (17) comprises a screw (19) and a bracket (21) having a tapped hole (29) receiving the thread (27) of the screw, said screw (19) being mounted in substantially horizontal direction on the back support (13) and said bracket (21) being pivotally mounted on the backing plate (23) of the wing pad (14).
7. The backrest as claimed in claim 6, **characterised in that** channels (37,39,43) are formed in the back

support (13) and the backing plate (23), said channels receiving the screw (19) and the bracket (21).

8. The backrest as claimed in claim 6 or 7, **characterised in that** the screw cap (31) is mounted on the screw thread (27). 5
9. The backrest as claimed in any of the claims 6 to 8, **characterised in that** a cover plate is provided on the backing plate covering the bracket (21) and the screw (19). 10
10. A backrest comprising a back support (13) and one or more belts (51) for supporting the back of the user, each belt (51) being attached at one lateral portion of the back support (13) and extending on the front side of the back support (13) to the opposite lateral portion thereof from where it is deflected and has its end connected to an adjusting device (55), **characterised in that** the belt (51) is elastically stretchable or comprises at least one elastically stretchable section (57). 15 20
11. A backrest as claimed in claim 11, **characterised in that** the adjusting device is a cable binder (55) attached to the back support (13) and engaging an eye (59) attached to the end of the belt (51). 25
12. A backrest as claimed in one of the claims 1 to 9 with the features of claim 10 or 11. 30

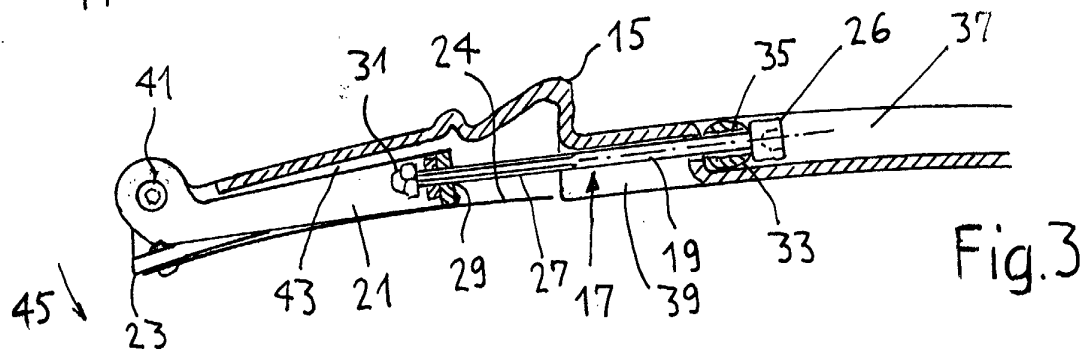
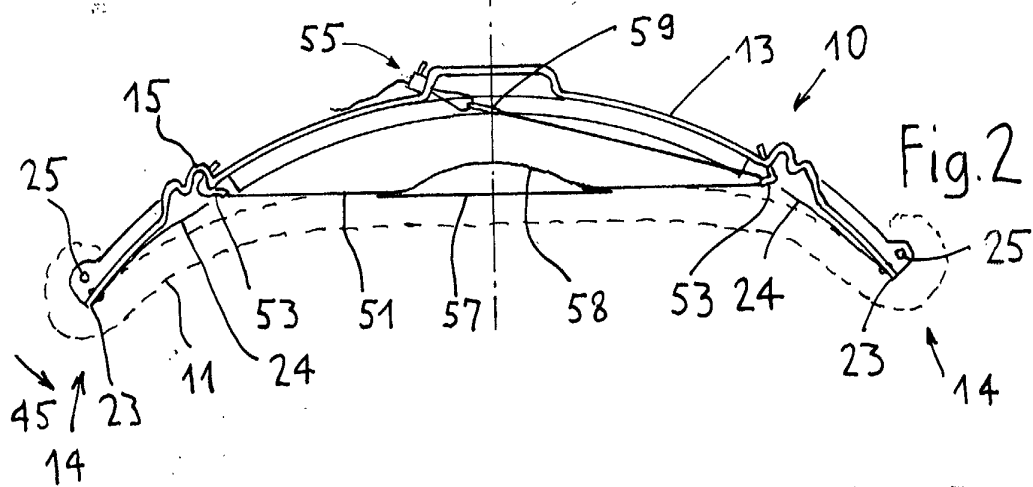
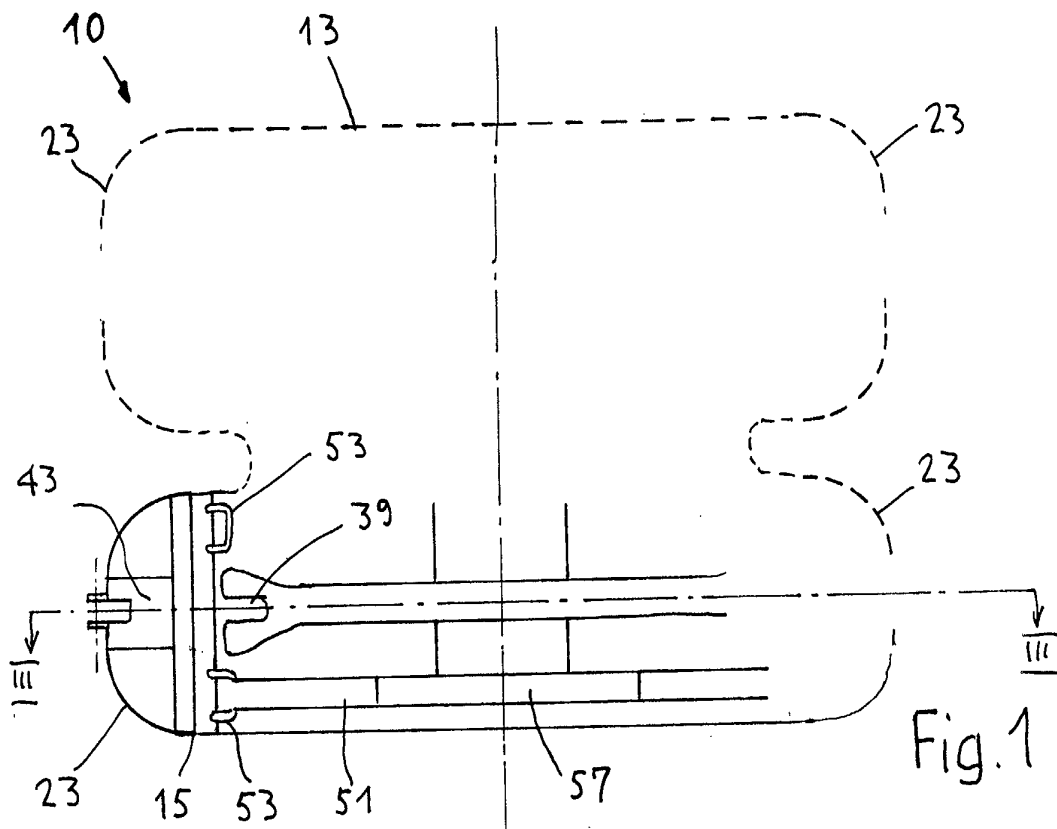
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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 02 25 2777

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A	* figure 1 *	12	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		24 September 2002	Joosting, T
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			

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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