

(19)



(11)

EP 2 120 649 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

04.05.2011 Bulletin 2011/18

(51) Int Cl.:

A47C 20/04 (2006.01)

(86) International application number:

PCT/DK2008/000006

(21) Application number: **08700130.1**

(22) Date of filing: **07.01.2008**

(87) International publication number:

WO 2008/083682 (17.07.2008 Gazette 2008/29)

(54) **AN ADJUSTABLE BED WITHOUT OUTER FRAME**

VERSTELLBARES BETT OHNE AUSSENRAHMEN

LIT RÉGLABLE SANS CADRE EXTÉRIEUR

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(72) Inventor: **SCHMIDT, Hans, Erik**

DK-6560 Sommersted (DK)

(30) Priority: **10.01.2007 DK 200700036**

(74) Representative: **Sundien, Thomas et al**

Zacco Denmark A/S

Hans Bekkevolds Allé 7

2900 Hellerup (DK)

(43) Date of publication of application:

25.11.2009 Bulletin 2009/48

(56) References cited:

EP-A- 1 016 360

EP-A- 1 020 171

WO-A-2004/058011

US-A- 6 163 904

(73) Proprietor: **Quilts of Denmark A/S**

6580 Vamdrup (DK)

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 120 649 B1

Description

[0001] The invention relates to a bed with adjustable resting face and without an outer frame, wherein the resting face is structured from a number of mutually hinged face elements to the effect that the face elements can be angled relative to each other.

Background

[0002] In the context of beds with adjustable resting faces and without an outer frame for receiving loads, it is known to provide a number of hinged face elements, for instance comprising a head support, a back support, a thigh support and a foot support, that can be angled relative to each other. The angulation of the individual parts is adjusted by means of actuators.

[0003] Such a bed is known from EP1016360 A1.

[0004] Following adjustment of the angles, the individual parts are to be fixated relative to each other; both such that the angle is maintained when the face element carries the body weight, but also such that the individual parts do not collapse while loaded.

[0005] In the context of the fixation, it is important that the fixation is maintained despite the different and asymmetrical face loads. In that context, a bed is typically exposed to several different impacts - for instance if the user sits down on the bed or merely because the user changes position in his sleep.

[0006] In particular in the context of adjustable beds without outer frame, it may be a challenge to come up with a stable adjustment/fixation system.

[0007] It is moreover of particular interest to provide adjustable beds without outer frame and being of a larger width, but this entails a considerable increase in the weight of the bed, and the requirements to stability also greatly influence this.

Object and description of the invention

[0008] It is the object to provide an adjustable bed without outer frame that complies with the requirements to the adjustment/fixation.

[0009] In accordance with the invention, this is accomplished by a bed according to the features of claim 1.

[0010] By supporting the bed faces in two points underneath the individual face elements, a rather even support of the face elements is accomplished whereby the stability compared to asymmetrical loads is increased. This means ia that simpler and less expensive actuators can be used to perform the adjustment.

[0011] Moreover, it means that the loads relative to the hinging between the individual face elements are reduced considerably, whereby less expensive and simpler hinging principles can be applied.

[0012] Typically, the face elements are structured from a frame with a net arranged within; and the provision of two or more supports of the frame enables fewer require-

ments to the strength of the frame. This means ia that the frame can be made thinner, which in turn leads to a lower weight of the bed.

[0013] According to one embodiment, the face elements are angled relative to each other by the support devices being influenced. The support devices may be configured as two bars, and wherein the respective first ends of the bars are fixedly mounted in two points on the underside of the face elements; and wherein the respective second ends of the bars are connected to an actuator to the effect that it may push or pull the bars and hence modify the mutual angulation of the face elements.

[0014] This is a particularly simple way of performing the adjustment, where a support already mounted is used and hence the need for further fittings on the underside of the face elements is obviated.

[0015] According to one embodiment, the actuator is a rotation actuator that comprises a bar that is able to rotate, and wherein the respective other ends of the support means are connected to the bar to the effect that the mutual angling of the face elements is adjusted by the bar being rotated. Precisely the rotation actuator is an inexpensive and simple actuator which is advantageously used. Thereby one actuator sees to it that the two support means are adjusted. Precisely due to the two support means it is ensured that the rotating bar and hence the actuator are loaded uniformly.

[0016] According to one embodiment, the face elements of the bed are structured as a frame where the opening of the frame is covered in expanded metal. Precisely expanded metal entails that a low weight is imparted to the face elements, since the frames can be made thinner due to the low weight of expanded metal. Moreover expanded metal has a surface structure with good friction properties whereby it fixates both mattress and/or coating.

[0017] According to one embodiment, the hinged face elements of the bed are hinged by means of hinges that are mounted on the frame. This is a particularly simple hinge method which ensures that a closed frame structure is maintained. Moreover the hinges can be arranged along the entire width of the frame, and thereby the position of the hinge means can be optimised - eg relative to the loads.

[0018] According to one embodiment, the bed comprises a face element in the form of a back support in extension of the face element that serves as head support, and wherein the length of the back support is approximately twice that of the head support. This has been found to provide particularly good ergonomic properties.

[0019] According to one embodiment, the bed comprises a face element in the form of a foot support, where the foot support has approximately the same length as the back support. Thereby the foot support has a length that ensures that the feet of the user of the bed do not extend beyond the bed.

[0020] According to one embodiment, a shield is mounted on the underside of at least one of the face

elements. This means that protection is provided against access to mechanics/electronics mounted on the underside of the bed, which provides protection against pinching, electric shocks and the like. Additionally it is ensured that bed coating, if any, is kept away from mechanics/electronics mounted on the underside of the bed, whereby it is avoided that such coating interferes there with. The shield could be made of expanded metal, which provides an easy solution and, at the same time, a solution which, due to the surface structure of expanded metal, fixates a bed coating, if any, particularly well.

[0021] According to one embodiment, the angulation of at least one of the face elements relative to a neighbouring element is restricted by telescopic stop means.

[0022] This is a particular way in which to avoid the risk of pinching in connection with the foot part, between it and the floor. One advantage of precisely the telescopic stop means is the available option of adjusting same following mounting, which makes fewer requirements to accuracy in connection with the mounting. Besides, it is possible to perform adjustment if wear causes asymmetry.

BRIEF DESCRIPTION OF THE DRAWING

[0023] In the following, the invention will be described with reference to the figures, wherein

Figure 1 shows an adjustable bed without outer frame and with face elements that are supported in two points;

Figure 2 shows an adjustable bed without outer frame, seen in a lateral view;

Figure 3 shows two interconnected face elements;

Figure 4 shows a bed with telescopic stop means;

Figure 5 shows a shield mounted on a bed.

DESCRIPTION OF EMBODIMENTS

[0024] Figure 1 shows an adjustable bed without outer frame with face elements that are supported in two points. The bed 101 comprises a number of face elements 103, 104, 105, 106, 107 that are hinged to each other by means of hinges 109, whereby the face elements can be angled relative to each other when the support means are influenced. A support device for a face element 106 is configured as two bars 111, 113, where the respective first ends of the bars are fixedly mounted on the underside of the bed face in points 115, 117, and wherein the second respective ends of the bars are connected to a rotation bar 119 that can be rotated by means of a rotation actuator 121. When the rotation bar is rotated, the bars 111, 113 are either pulled or pushed simultaneously and hence the mutual angulation of the face elements 105,

106, 107 is changed.

[0025] Figure 2 shows the support means in a lateral view. The device comprises two bars, one 121 of which is shown. The first end of the bar is connected to the underside 203 of the face element, and the second end is connected to a rotation bar 205 that can be rotated by means of the rotation actuator 207. When the rotation bar is rotated, the bars (the shown bar 201 and the not-shown bar) are either pulled or pushed and thereby the inclination of the face element 209 is changed relative to the adjacent elements.

[0026] Figure 3 shows two interconnected face elements. Face elements 301, 303 are hingedly connected by hinges 305, 307 that are mounted on the frames 309, 311 of the face elements. The opening of the frames is covered by expanded metal 313, 315.

[0027] Figure 4 shows a bed with a telescopic stop means. The stop means 401 is coupled to the face element 403 that functions as foot support. The stop means comprises two telescopic parts that are telescopically interconnected. The one telescopic part 405 is coupled to the face element 403 and the other telescopic part 407 is securely mounted underneath the bed - eg on the support for the preceding face element. The stop means functions in that the telescopic part 405 is braked within the telescopic part 407 when the bottom thereof is reached. According to one embodiment the bottom of the telescopic part 407 can be raised or lowered, whereby the position in which the telescopic part 405 is braked can be adjusted finely.

[0028] Figure 5 shows a shield 501 mounted on a bed. The shape of the shield is correspondingly the shape desired for the rear side of the bed and may be mounted eg on the support for the preceding face element 503, 505 and underneath the face element 507.

Claims

1. A bed with an adjustable resting face and without outer frame, wherein the resting face is structured from a number of mutually hinged face elements to the effect that the face elements can be hinged relative to each other, and wherein the bed comprises support devices that support the Individual face elements in at least two points at a mutual distance and wherein the angulation of at least one of the face elements is restricted relative to an adjacent element by use of a telescopic stop means comprising two telescopic parts (405, 407) being telescopically interconnected, wherein the stop means (401) functions in that the telescopic part (405) is braked within the telescopic part (407) when the bottom thereof is reached and wherein the bottom of the telescopic part (407) can be raised or lowered, whereby the position in which the telescopic part (405) is braked can be adjusted finely.

2. A bed according to claim 1, wherein the face elements are angled relative to each other by the support means being influenced.
3. A bed according to claims 1-2, wherein the support means are configured as two bars; and wherein the respective first ends of the bars are securely mounted in two points on the underside of the face elements; and wherein the respective second ends of the bars are connected to an actuator, such that it may push or pull the bars and hence change the mutual angulation of the face elements.
4. A bed according to claims 1-3, wherein the actuator is a rotation actuator comprising a bar that is able to rotate; and wherein the respective second ends of the support means are connected to the bar to the effect that the mutual angulation of the face elements is adjusted by the bar being rotated.
5. A bed according to claims 1-4, wherein the face elements of the bed are structured as a frame, where the opening of the frame is covered in expanded metal.
6. A bed according to claims 1-5, wherein the hinged face elements of the bed are hinged by hinges that are mounted on the frame.
7. A bed according to claims 1-6, wherein the bed comprises a face element in the form of a back support in extension of the face element that functions as head support; and wherein the length of the back support is approximately twice as long as that of the head support.
8. A bed according to claims 1-7, wherein the bed comprises a face element in the form of a foot support, wherein the length of the foot support is approximately the same as that of the back support.
9. A bed according to claims 1-8, wherein a shield is mounted on the underside of at least one of the face elements.

Patentansprüche

1. Bett mit einer justierbaren ruhenden Seite und ohne Außenrahmen, wobei die ruhende Seite von einer Anzahl von gegenseitig angelenkten Seitenelementen in dem Sinne strukturiert ist, dass die Seitenelemente im Verhältnis zueinander anlenkbar sind, und wobei das Bett Stützvorrichtungen umfasst, die in zumindest zwei Punkten in einem gegenseitigen Abstand die individuellen Seitelemente unterstützen, und wobei die Angulation mindestens eines der Seitenelemente im Verhältnis zu einem benachbarten

Element durch Verwendung eines teleskopischen Anschlagmittels beschränkt ist, umfassend zwei teleskopische Teile (405, 407), die teleskopisch miteinander verbunden sind, wobei das Anschlagmittel (401) so funktioniert, dass der teleskopische Teil (405) innerhalb des teleskopischen Teils (407) gebremst ist, wenn dessen Boden erreicht ist, und wobei der Boden des teleskopischen Teils (407) anhebbar oder absenkbar ist, wodurch die Position, in welcher der teleskopische Teil (405) gebremst ist, feinjustierbar ist.

2. Bett nach Anspruch 1, wobei die Seitenelemente im Verhältnis zueinander durch die Stützmittel abgewinkelt sind, welche beeinflusst sind.
3. Bett nach den Ansprüchen 1-2, wobei die Stützmittel als zwei Stäbe ausgebildet sind; und wobei die jeweiligen ersten Enden der Stäbe in zwei Punkten auf der Unterseite der Seitenelemente sicher montiert sind; und wobei die jeweiligen zweiten Enden der Stäbe mit einem Auslöser verbunden sind, so dass er die Stäbe drücken oder ziehen und folglich die gegenseitige Angulation der Seitenelemente ändern kann.
4. Bett nach den Ansprüchen 1-3, wobei der Auslöser ein Drehauslöser ist, umfassend einen Stab, der drehbar ist; und wobei die jeweiligen zweiten Enden der Stützmittel mit dem Stab in dem Sinne verbunden sind, dass die gegenseitige Angulation der Seitenelemente durch den Stab justiert ist, der gedreht wird.
5. Bett nach den Ansprüchen 1-4, wobei die Seitenelemente des Betts als ein Rahmen strukturiert sind, in welchem die Öffnung des Rahmens mit erweitertem Metall bedeckt ist.
6. Bett nach den Ansprüchen 1-5, wobei die angelenkten Seitenelemente des Betts durch auf dem Rahmen montierte Gelenke angelenkt sind.
7. Bett nach den Ansprüchen 1-6, wobei das Bett ein Seitenelement in Form einer rückseitigen Stütze in Verlängerung des als eine Kopfstütze funktionierenden Seitenelements umfasst; und wobei die Länge der rückseitigen Stütze ungefähr zweimal so lang wie die der Kopfstütze ist.
8. Bett nach den Ansprüchen 1-7, wobei das Bett ein Seitenelement in Form einer Fußstütze umfasst, wobei die Länge der Fußstütze ungefähr die gleiche wie die der rückseitigen Stütze ist.
9. Bett nach den Ansprüchen 1-8, wobei eine Abschirmung auf der Unterseite mindestens eines der Seitenelemente montiert ist.

Revendications

1. Lit avec une face de repos réglable et sans cadre extérieur, dans lequel la face de repos est structurée d'un nombre d'éléments de face l'un articulé à l'autre si bien que les éléments de face peuvent être articulés l'un par rapport à l'autre, et dans lequel le lit comprend des dispositifs de support qui supportent les éléments de face individuels dans au moins deux points à une distance mutuelle, et dans lequel la forme angulaire d'au moins l'un des éléments de face est limitée par rapport à un élément adjacent par l'usage d'un moyen d'arrêt télescopique comprenant deux parties télescopiques (405, 407) étant reliées télescopiquement l'une à l'autre, dans lequel le moyen d'arrêt (401) agit en ce que la partie télescopique (405) est freinée dans la partie télescopique (407) à l'arrivée au fond de celle-ci, et dans lequel le fond de la partie télescopique (407) peut être soulevé ou abaissé, la position dans laquelle la partie télescopique (405) est freinée étant finement réglable. 5
2. Lit selon la revendication 1, dans lequel les angles des éléments de face sont orientés les uns par rapport aux autres par les moyens de support étant influencés. 10
3. Lit selon les revendications 1 à 2, dans lequel les moyens de support sont configurés en tant que deux barres; et dans lequel les premières extrémités respectives des barres sont solidement montées dans deux points sur la surface inférieure des éléments de face; et dans lequel les deuxièmes extrémités respectives des barres sont reliées à un actionneur, si bien qu'il peut pousser ou tirer les barres et ainsi changer la forme angulaire mutuelle des éléments de face. 15
4. Lit selon les revendications 1 à 3, dans lequel l'actionneur est un actionneur de rotation comprenant une barre qui peut tourner; et dans lequel les deuxièmes extrémités respectives des moyens de support sont reliées à la barre de sorte que la forme angulaire mutuelle des éléments de face soit réglée par la barre étant tournée. 20
5. Lit selon les revendications 1 à 4, dans lequel les éléments de face du lit sont structurés comme un cadre, dans lequel l'ouverture du cadre est couverte en métal déployé. 25
6. Lit selon les revendications 1 à 5, dans lequel les éléments de face articulés du lit sont articulés par des charnières qui sont montées sur le cadre. 30
7. Lit selon les revendications 1 à 6, dans lequel le lit comprend un élément de face dans la forme d'un support de dossier dans le prolongement de l'élément de face qui agit en tant qu'un support de tête; et dans lequel la longueur du support de dossier est approximativement deux fois plus longue que celle du support de tête. 35
8. Lit selon les revendications 1 à 7, dans lequel le lit comprend un élément de face dans la forme d'un support de pied, dans lequel la longueur du support de pied est approximativement la même que celle du support de dossier. 40
9. Lit selon les revendications 1 à 8, dans lequel un tablier est monté sur la surface inférieure d'au moins l'un des éléments de face. 45

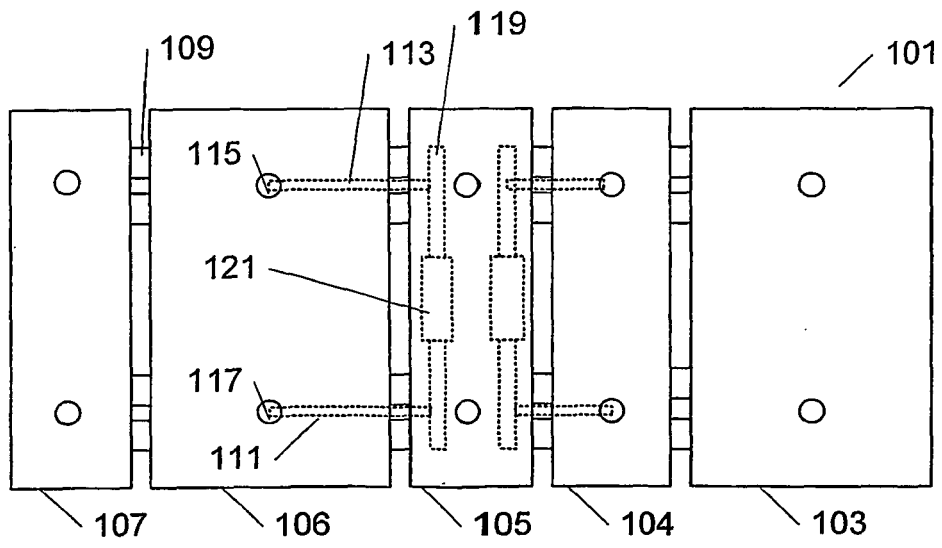


Fig. 1

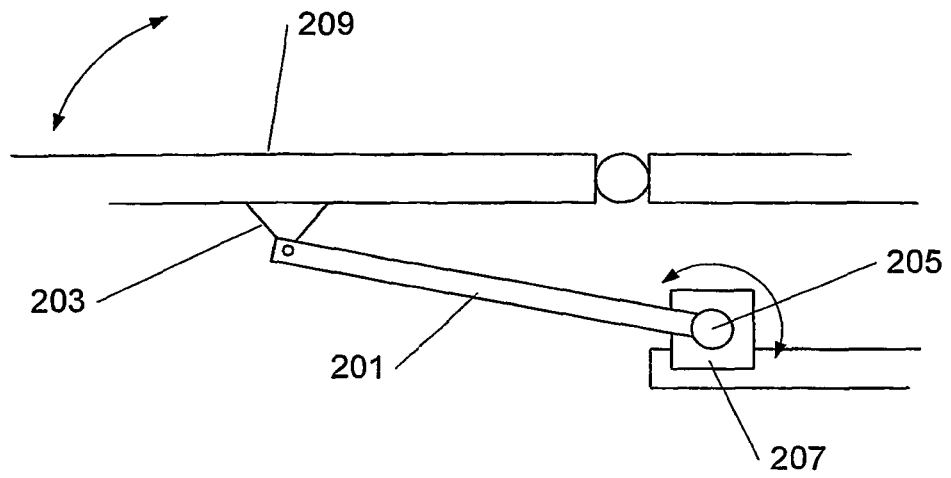


Fig. 2

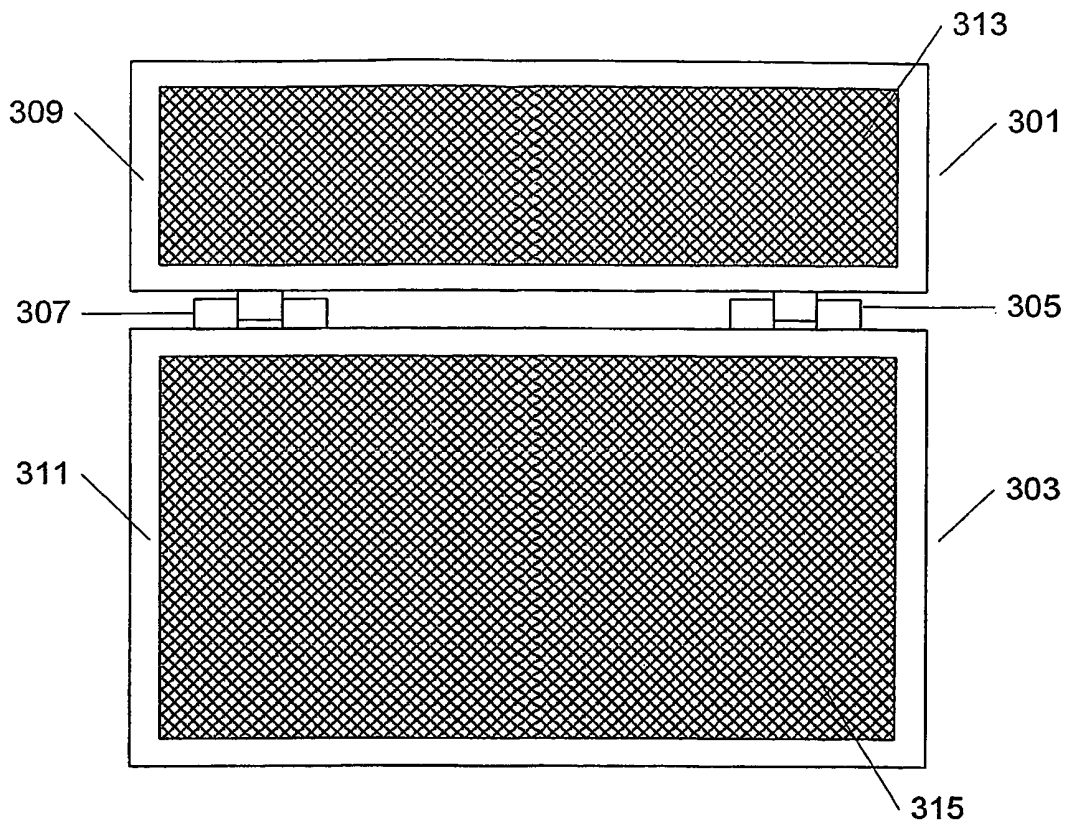


Fig. 3

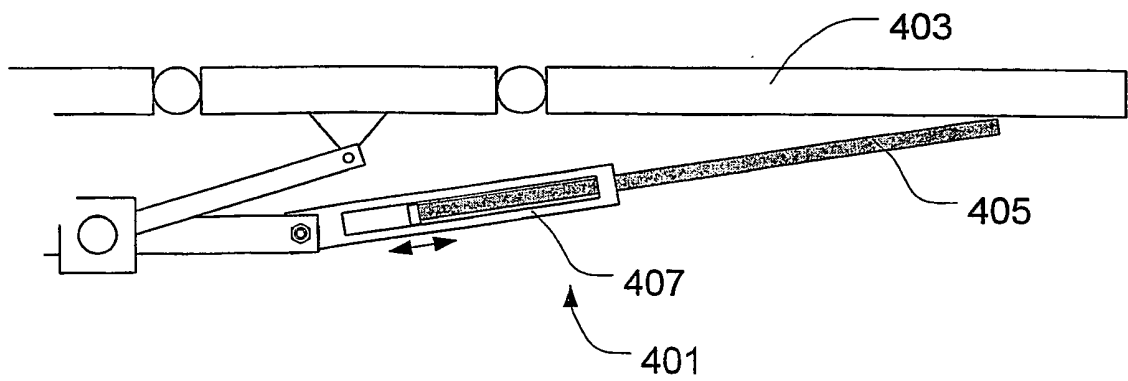


Fig. 4

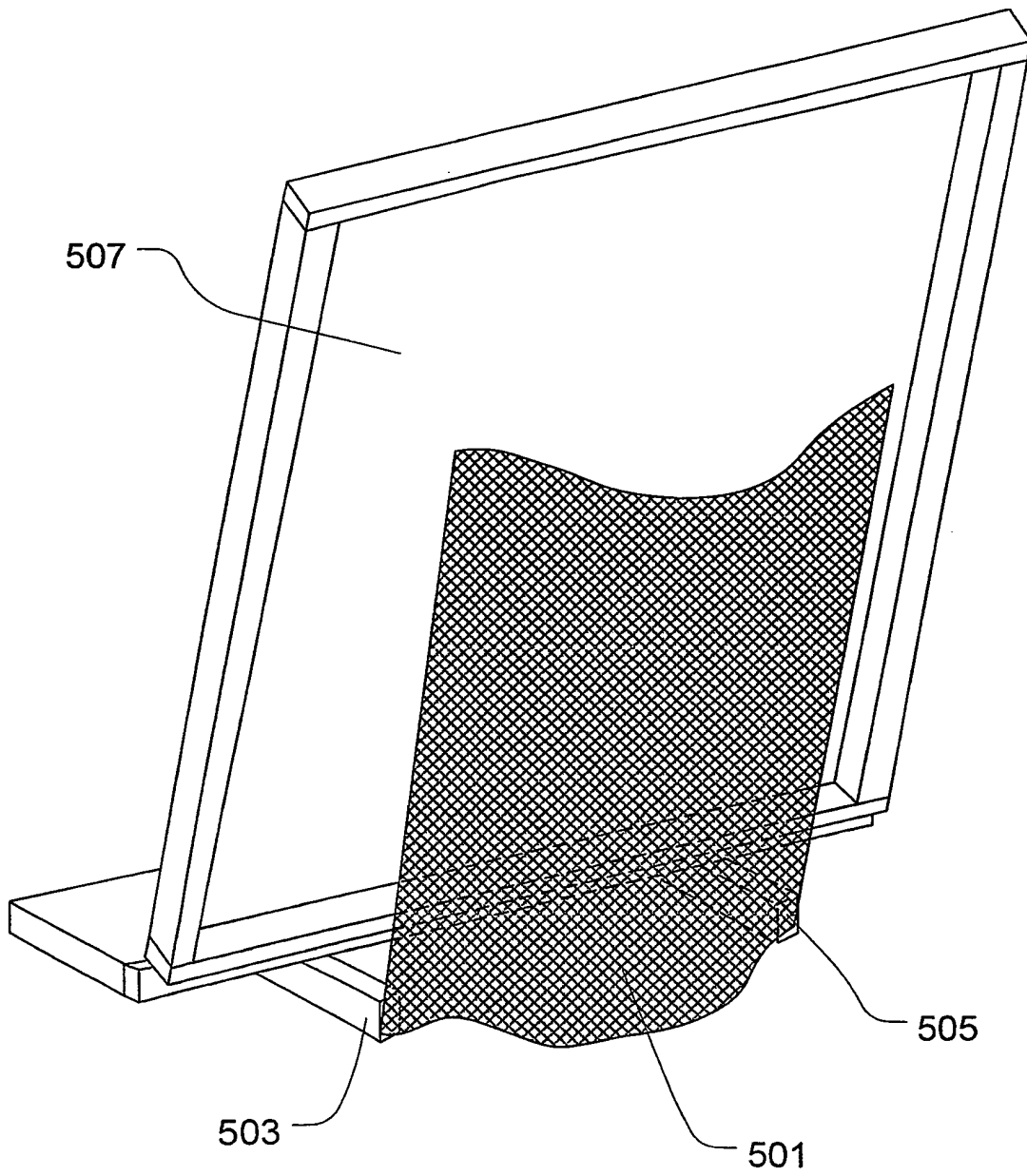


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1016360 A1 [0003]