



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.06.2008 Bulletin 2008/25

(51) Int Cl.:
B66B 9/08 (2006.01)

(21) Application number: **06425842.9**

(22) Date of filing: **15.12.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) **Stair-lift and process for its production**

(57) A stairlift, of the type cantilever mountable on a rail or other support, is provided with a first base structure (1) comprising motorized means (4), means of attachment (3) of the base structure to the support (2) and means of attachment (5,6) to attach to it at least one

additional structure comprising a seat (15) or a platform (24) or other means of supporting the user, selected from a plurality of additional structures (15,24; 25,26) each different from the others and mountable on the base structure (1).

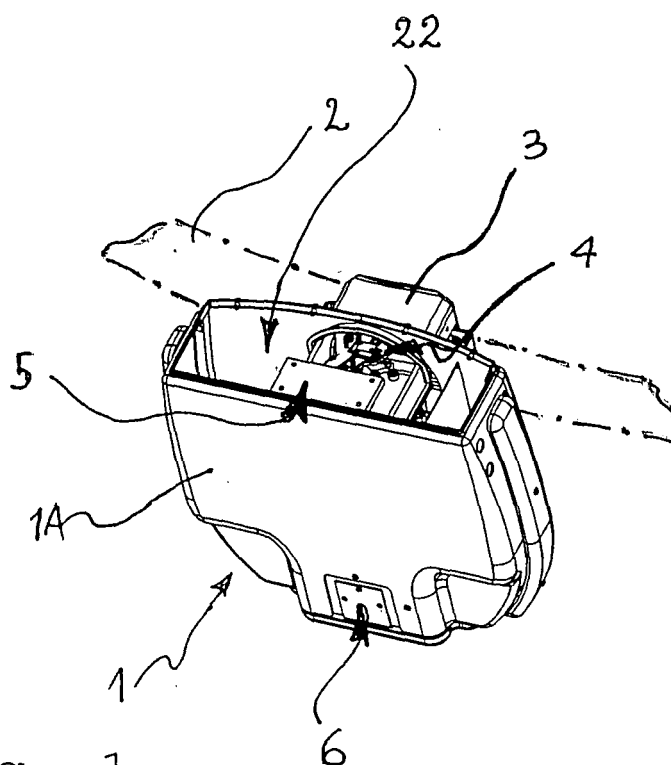


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The object of the present invention is a stairlift and a process for its production. In particular, the object of the invention is a device to support and transport the user along a rail fixed to a wall or other support, and the process to produce the same.

STATE OF THE ART

[0002] Rail stairlifts are structures for the movement along staircases of people with mobility problems, for instance in the absence of - or substituting - elevators and lifting platforms. Such structures provide a rail fixed to the wall (or equivalent support) adjacent to the staircase and a user supporting device cantilever mounted on the rail to support the user and motorized in order to move along it.

[0003] The support for the user is generally chosen between a platform to hold a wheelchair and a seat or chair (generally a seating element) on which the user can sit.

[0004] One problem of the known stairlifts is that they are made to measure for each individual case: the rail has to follow the inclination and the direction of the staircase to which it is being applied. Furthermore, the supporting device must be chosen on the basis of the individual user. This translates into high costs of production and installation.

DESCRIPTION OF THE INVENTION

[0005] One purpose of the present invention is to solve the problems mentioned above and reduce the production costs of the rail stairlift.

[0006] Another purpose of the invention is to reduce the costs of installation of the said stairlift.

[0007] These purposes are achieved by the present invention that relates to a supporting device for rail stairlift, of the type cantilever mounted to said rail and provided with motorized means to move the device along said rail, characterized by comprising a first structure provided with said motorized means and with means of attachment to said rail, said structure being fixed in a movable way on said rail, and provided with means of attaching at least one second structure to it comprising means of supporting the user.

[0008] The invention relates furthermore to a process for the production of a rail stairlift according to Claim 9.

[0009] Preferably, the means of attachment are provided both above and below said first structure and allow the attachment of at least one additional structure chosen from a plurality of structures. Preferably, there are two additional structures, attached above and below the first structure, i.e. the basic structure, to produce a form of stairlift according to the requirements of the final user.

[0010] For instance, in a possible embodiment the second structure is a seat and is mounted above the first structure that is bound to the rail; moreover, in this embodiment there is preferably also a footrest or analogous means of supporting the feet of the user, said footrest being mounted on a means of attachment provided below the first structure.

[0011] In another embodiment of the invention, the second structure is a folding platform for wheelchairs that is mounted lower down said first structure; the platform incorporates safety arms mounted on the upper part of said first structure.

[0012] In view of the above, it is evident that the supporting device for rail stairlift according to the invention is particularly advantageous. In fact, it allows the production costs of the same to be considerably reduced, as the first or base structure is identical for all the stairlifts independently of the final use. To such structure one, generally two, additional structures must be added, i.e. modules that complete the basic structure on the basis of the required use, like, for instance, a seat in place of a wheelchair platform. In this way, it is enough to choose the required modular structures and to assemble them on the basic structure in order to get the required device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention will now be described in more detail with reference to the enclosed drawings, which are by way of example and not limiting, in which:

- Fig.1 is a perspective view of the first structure according to the invention;
- Figures 2-5 are perspective views of further additional structures which can be mounted on the first structure;
- Fig.6 is an enlarged perspective view of a supporting stud incorporated into the first structure of the invention;
- Fig.7 is a perspective view of a component of the structure shown in Fig.5;
- Fig.8 is a perspective view of a further component of the structure shown in Fig.5;
- Fig.9 and Fig.10 are perspective views of the first structure completed with different additional structures to form two different devices according to the invention.

[0014] With reference initially to Figure 1, the stairlift according to the invention comprises a first structure 1, cantilever mounted in a way known in the art and with means of attachment generically indicated by reference 3, to a suitable rail indicated by the dashed line 2. The structure 1 moves along the rail 2, in both direction. According to the invention, the first structure 1 has the function of base structure on which are attached one or more additional structures chosen from a plurality of second and third structures during the production of the device,

depending on its required use. Examples of additional structures used to complete the base structure 1 are shown in Figures 2-5.

[0015] To this end, the structure 1 is provided with means of attachment for mounting on it at least one additional structure. In the preferential embodiment shown, such means are present both on the upper and lower part of the base structure 1. In the upper part, there are present means of attachment 5 and in the lower portion there are present means of attachment 6. In the shown embodiment, seen better in Fig.6, the means 5 and 6 are realized by a stud 7 which is integral with the traction group and is extended vertically.

[0016] The stud 7 comprises a fixing plate 8 provided on the upper extremity of the stud, perpendicular to it, to form the means of attachment 5. The plate 8 projects from the stud toward the inside of the structure 1 and presents a plurality of holes 9 for the attachment, for instance, by screws or nuts and bolts, of an additional structure that - once fixed in position - will cover and close the upper portion of structure 1. A pair of stirrups 10 ensures the necessary rigidity of the system. To enable access to stud 7 during the attachment of the given device, i.e. during the attachment to structure 1 of the other additional structures, at least the wall 1A of the carter, or cover, of structure 1 is removable.

[0017] The means of attachment 6, provided on the lower part of the structure 1, is formed by a plurality of holes 11 and 12 found respectively on the face and sides of the extremity of the stud 7 opposite the extremity carrying the plate 8.

[0018] The stud 7 comprises furthermore two holes 13 for the fixing of the stud to a support structure for the motorized traction group and a slot 14 for fixing the same motorized group to the stud 7.

[0019] Fig.2 shows a possible additional structure 15 to be fixed to the means 5, i.e. above structure 1. The second additional structure 15 comprises a seating means formed by the seat 16, a back 17 and a pair of arms 18, preferably but not necessarily swiveling upward as shown by arrow F to improve accessibility to the seat 16. The arms 18 carry the controls 19 for moving the device along the rail 2; a lever 20, set at the base of the seat, controls in a way already known the locking and unlocking of the rotation of the seat between the transporting position and that of the user accessing and leaving the seat. The seat 16 is attached to the plate 8 by, for instance, screws or nuts and bolts fixing a complementary plate integral with the seat 16 (not shown) to the plate 8. Furthermore, there is a cover 21 below the seat 16 that closes the opening 22 on the upper extremity of the basic structure 1, such opening being necessary to access the plate 8 and the connectors (not shown) to control the motorization of the seat.

[0020] The stairlift comprising the structure of Fig.2 attached to structure 1 is completed by the further additional structure of Fig.4, a footrest, i.e. a support platform for the feet of the user. The footrest 24 is hinged to a

plate 23 that serves to attach the footrest to the lower extremity of the stud 7, corresponding to the holes 11. The footrest 24 moves from a vertical position adjacent to the stud, to a horizontal position perpendicular to the stud.

[0021] The device complete with the two additional structures, i.e. seat 15 and footrest 24, is shown in Fig.10.

[0022] Fig.3 and Fig.5 show two further additional structures that can be used instead of the of seat 15 and footrest 24 structures.

[0023] Fig.5 shows a platform structure 25 for the support and the transport of a user for instance in a wheelchair. The platform of Fig.5 is completed by the upper structure of Fig.3, that shows a cover 26 on which are provided the controls for the stairlift, fitted with safety arms 28 swiveling as shown by the arrow F from a vertical position to a horizontal position during the use of the device, to prevent the user from falling from the platform 25.

[0024] Platform 25 can also rotate and can be lowered from a vertical rest position to a horizontal working position. The lowering is carried out in an automatic way and to balance such lowering, gas operated extending pistons 29 (Fig.5) are provided that link arms 30 integral with the platform 25 to pivots 31 on a plate 32 fixed to stud 7 (Fig.5).

[0025] The platform is furthermore provided, in a way already known, with ramps 33 also mobile between a raised position (for the transport) and a lowered position, for access to the platform 25. Furthermore, a safety ridge 34 is provided longitudinally to the platform and rising vertically from the same.

[0026] Plate 32 is shown in more detail in Fig.7. To fix plate 32 to the lower portion of the stud, there are two or more holes 32A that correspond to the holes 11 of the stud 7, as well as holes 35A on the shoulders 35 of the plate 32, that correspond to the holes 12 on the sides of the stud 7. The plate 32 can be made integral to the stud 7 with screws and if necessary, nuts and bolts. Two of the fixing screws for attaching the plate 32 to the stud 7 via the holes 12 in the sides are shown with the reference 36 in Fig.5. Fig.7 also shows stiffening webs 37 (indicated by broken lines) on the platform 25.

[0027] Fig.10 shows structure 1 complete with the additional structures of platform 25 and control group 26.

[0028] It is therefore evident that the device according to the invention allows a stairlift structure to be produced in a simple, fast and economical way.

Claims

1. Stairlift device, of the type cantilever mounted to a support (2) and provided with motorized means (4) to move the device along said support, **characterized by** comprising a first base structure (1) provided with the said motorized means (4) and with means of attachment (3) to said support (2) and provided furthermore with means of attachment (5, 6) to attach

to it at least one additional structure comprising the means of supporting the user, said at least one structure being chosen from a plurality of additional structures (15,24; 25,26) each different from the others and mountable on said base structure (1).

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2. Device according to Claim 1, in which said means of attachment are provided on the upper (5) and lower (6) part of said first structure.

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3. Device according to Claim 2, comprising a stud (7) fixed to the said first structure (1), said stud extending vertically and being provided on the upper (5) and lower (6) part with the said means of attachment.

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4. Device according to Claim 2 or 3, in which said additional structure is a seat (16) and is attached on the upper part of said first base structure (1).

5. Device according to Claim 4, comprising furthermore a further additional structure comprising a footrest (24) or analogous means of supporting the feet of the user, attached to the lower part of said first structure.

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6. Device according to Claim 2 or 3, in which said second structure is a platform (24) for transporting wheelchairs and is attached below said first structure.

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7. Device according to Claim 6, comprising furthermore safety arms (28) attached to the upper part of said first structure.

8. Device according to Claim 3, in which said means of attachment comprise a plate (8) projecting perpendicularly from the upper extremity of the said stud (7) and a plurality of holes for screws and/or bolts (11,12) provided in the lower part of said stud.

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9. Process for the production of a stairlift, **characterized by** comprising the phases of separately producing a basic structure (1) provided with means (3) of cantilever mounting to a rail (2) or analogous support and means of moving (4) along said rail; producing a plurality of additional structures (15,24; 25,26), each different from the others and alternatively mountable on said base structure.

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10. Process according to Claim 9, in which two additional structures (15,24; 25,26) are attached to said base structure, positioned above and below the said base structure (1).

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11. Rail stairlift device according to Claim 1, comprising, furthermore, one or more characteristics as described and illustrated in the description and in the drawings of the present application.

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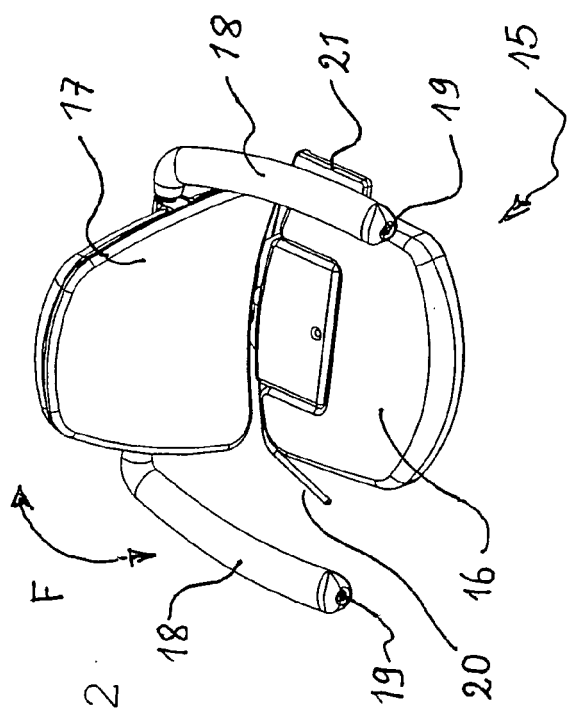


Fig. 2

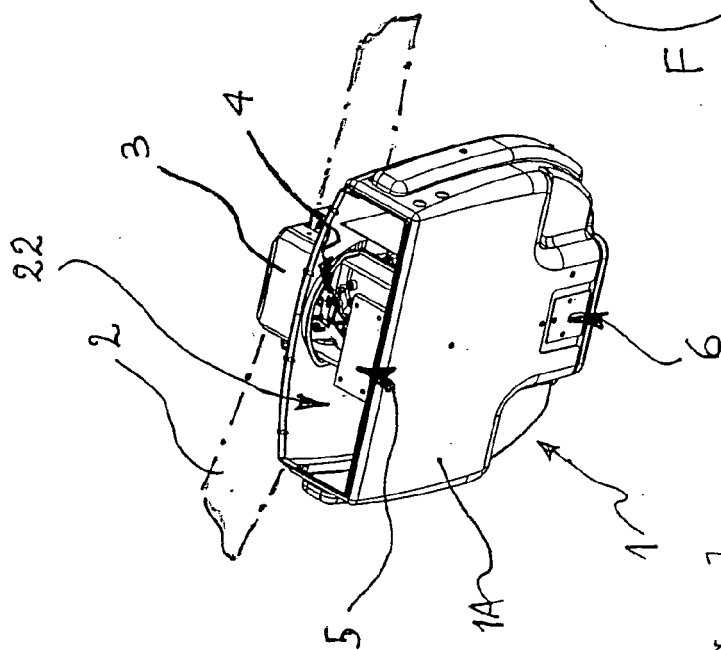


Fig. 1

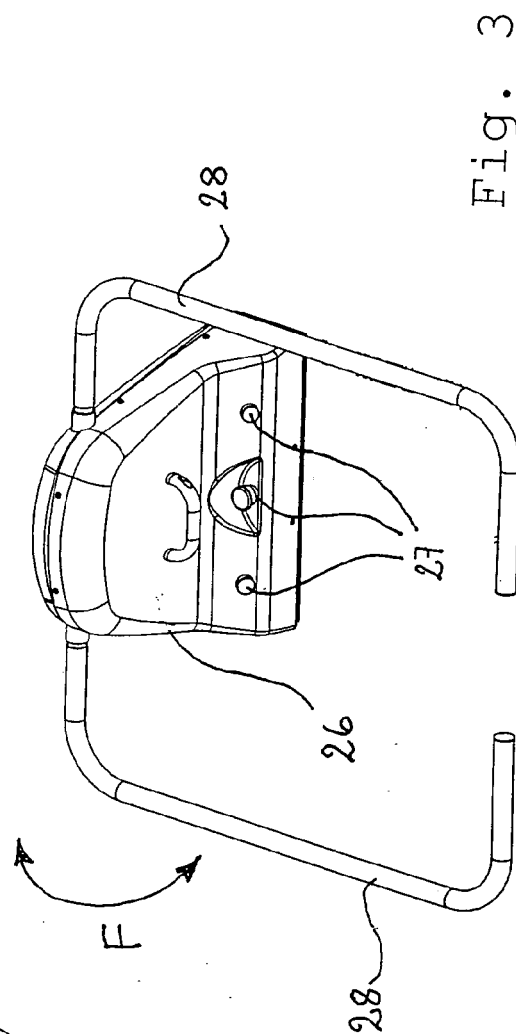


Fig. 3

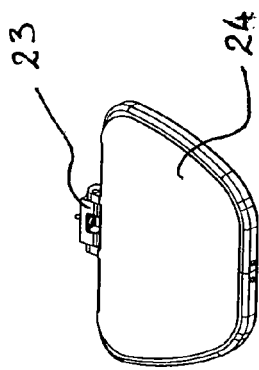


Fig. 4

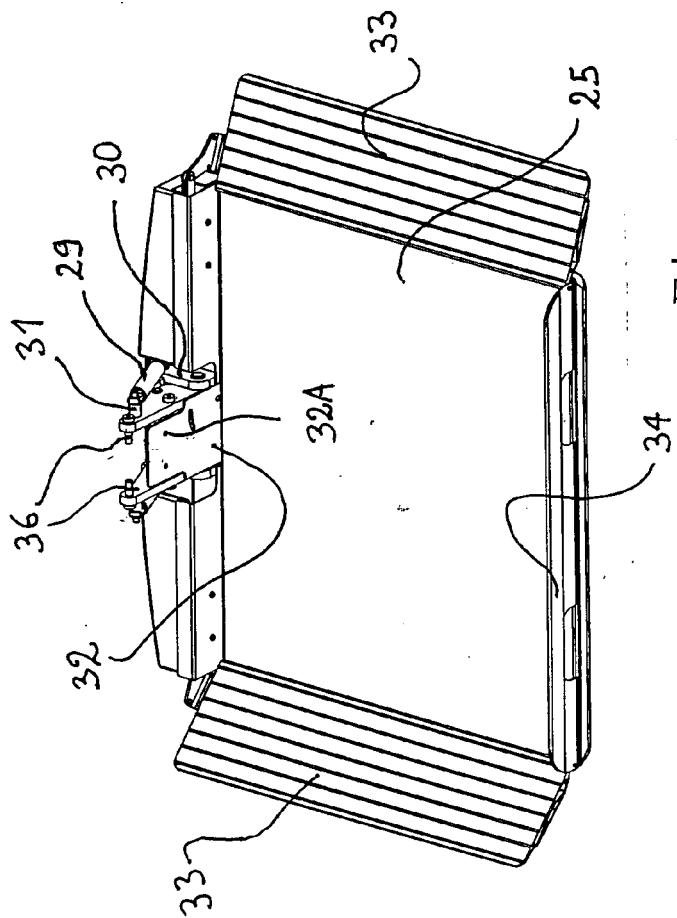


Fig. 5

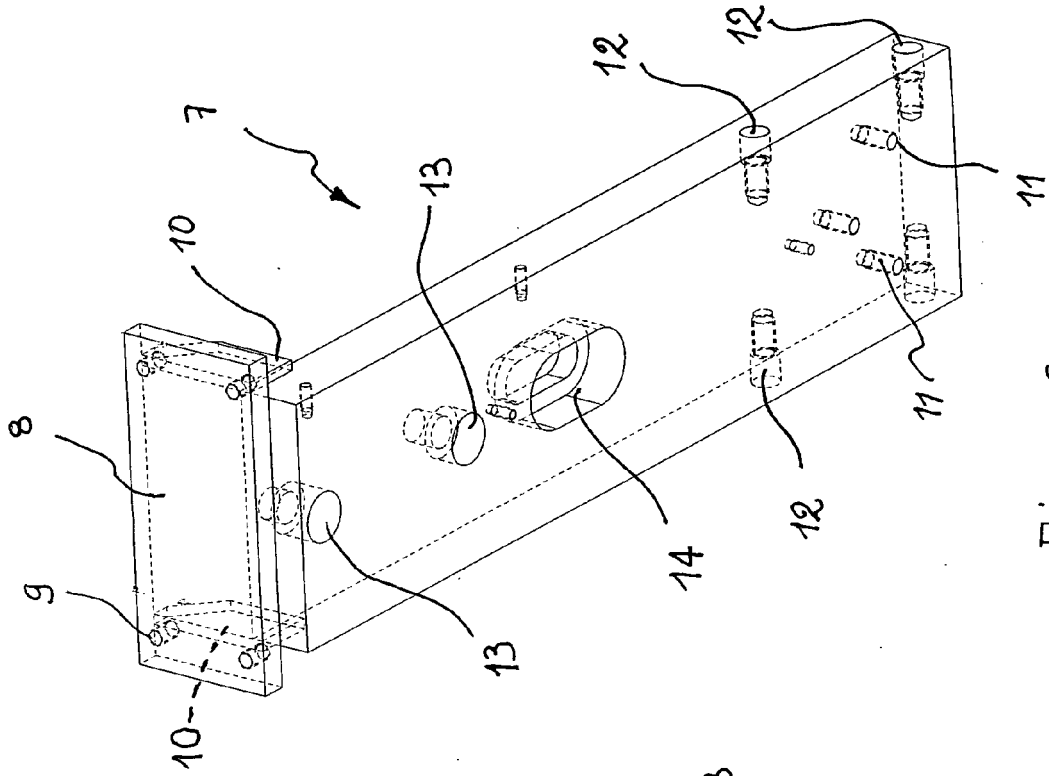


Fig. 6

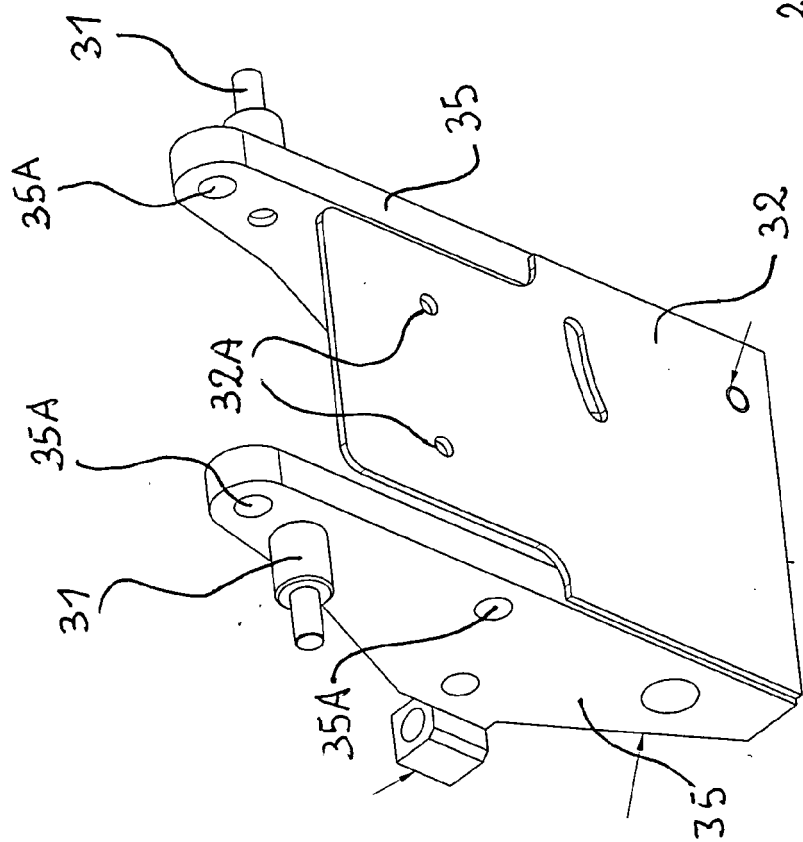
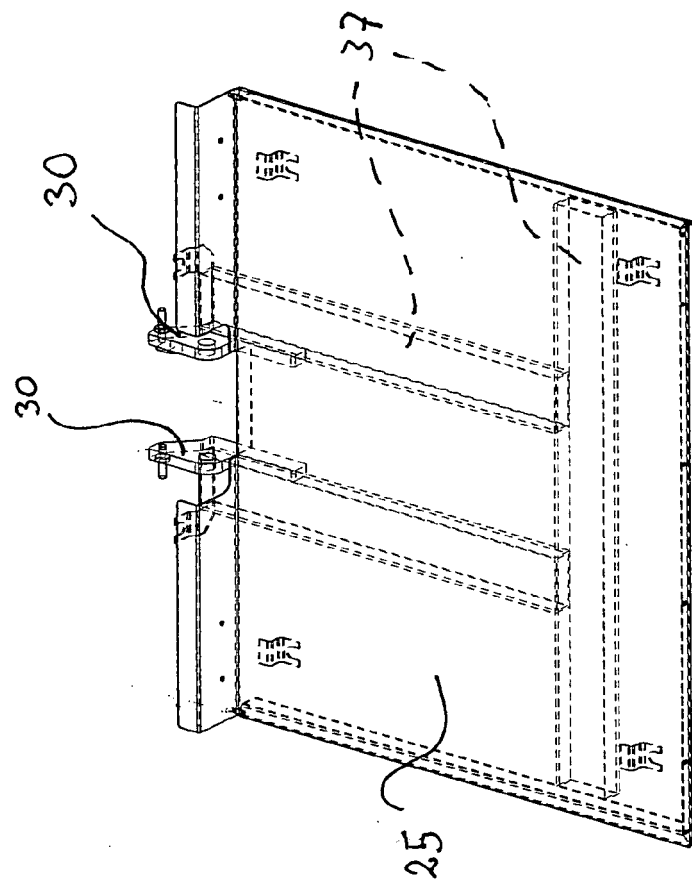


Fig. 7

Fig. 8



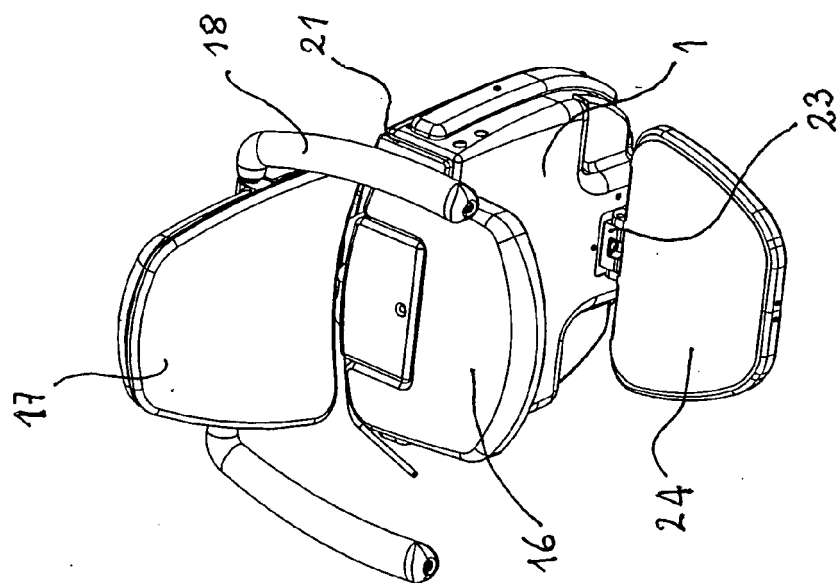


Fig. 9

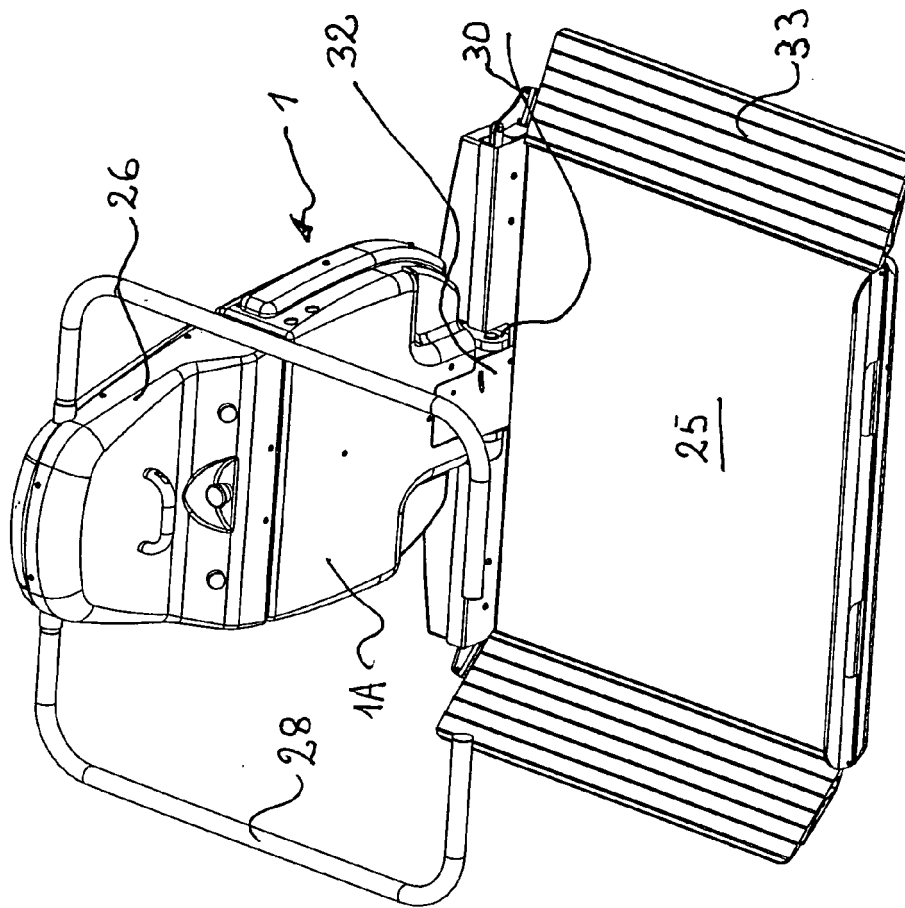


Fig. 10



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5842

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 May 2007	Examiner Oosterom, Marcel
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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08-05-2007

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