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⑧ **Wheel chair for invalids with releasable seat mounting as well as system for transferring an invalid seated in the chair in and out of a vehicle.**

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AU-A- 490 207
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Description

The present invention relates to a wheel chair for invalids of which the seat mounting and the base element after unlocking can be released from each other, the base element having guides which support the seat mounting and in which guiding means are movable to permit the removal of the seat mounting from the base element.

A chair of the above type is known from US—A—4354791, which forms the basis of the preamble of claim 1 and discloses an invalid chair comprising a base element (11) and a seat element (12) which after unlocking may be removed from the base element (see particularly column 2, line 6—column 3, line 7; figures 1—4). The base element carries tracks (36, 37) which receive casters (48) which support the seat element and which are movable along the tracks to permit removal of the seat element from the base element.

Although this device enables transferring the invalid in and out of the vehicle without the invalid having to leave the chair, the objection remains that a rather elaborate lifting system has to be arranged and relatively many steps have to be carried out.

It is a main object of the present invention to provide a wheel chair as above indicated and an associated system wherein the transfer of the invalid seated in the chair in and out a vehicle can be done in a minimum of steps and with the least possible objections. The invention therefore provides a chair for invalids of the above type, constructed so that the releasable seat mounting of the chair for invalids is not only able to slide linearly to the vehicle but can also pivot and rotate so that the legs of the invalid are lifted upwards over the threshold of the vehicle.

Thus the invalid chair of the present invention differs from that as disclosed in the cited US document in that the guiding means (casters) are attached to a plate to which the seat mounting (seat element) is connected in such a way that it is able both to rotate and to tilt in relation to the plate. It would not appear obvious to modify the chair of the US document so as to achieve the chair of the present invention. The present invention thus relates to a chair for invalids of the type mentioned in the preamble characterised in that the seat mounting is connected to a plate and is made able to rotate as well as tilt in relation to said plate, which plate is provided with said guiding means.

The guides preferably consist of tracks or rails and the plate is preferably provided with rollers or wheels which move in said guides.

In a preferred embodiment the chair for invalids according to the invention, in which the seat mounting defines four corners, is characterised in that the plate defines an upper surface, and in that the seat mounting is fixedly, but rotatably connected at a first rear corner to the plate, a second rear corner being rotatable over about the first

rear corner connection over the upper surface of the plate and two front corners of the seat mounting being releasably connected to the plate, preferably by pins which fit into each other. Thus the seat mounting is rotatable about the first mentioned corner, which is stationary in relation to the plate, the said second corner carrying out a movement in the surface of the plate or only mainly in the upper surface and the other remaining corners after unlocking being free from the plate. The first rear corner thus is made in such a way that it permits a rotatable as well as a tiltable movement of the seat mounting which is possible with a hinged pin construction. Other constructions which enable the said combination of movements are also applicable but the simple construction like the said pin construction is preferred. At the second rear corner preferably a stop means is arranged to prevent the seating when returning from shooting through. In the vehicle also a stop may be arranged to indicate when the plate has reached the proper position in the vehicle.

The corner moving in the plate may run in a circular track arranged on the plate, preferably by means of a wheel. Since in use a relatively heavy weight is pressing on this corner it is not strictly necessary to arrange for an added guide in the plate to maintain the wheel on the surface of the plate, because that corner anyway is pressed on the plate by the load present. Moreover, during regular use a guide track will be made in the surface of the plate.

The seat mounting may further be constructed in such a way that the centre of gravity in resting condition is lying as closely as possible before the line of connection of the two rear corners of the seating at the backrailing to facilitate the upwardly directed rotatable movement of the seat mounting with invalid. The same holds for the base element which seen in itself has such a weight distribution that it does not roll away during the said steps. The expert is able to make the construction in such a way that the point of gravity will be situated in the desired area.

The invention also comprises the combined system of a chair for invalids with accessory parts to move an invalid in and out of a vehicle, characterised by a combination of a chair for invalids according to any of claims 1—6 and transverse guides to support the seat mounting and plate in a vehicle, said transverse guides being supported by a base which in turn is mounted on a guiding system to be mounted in the vehicle with the transverse guides positioned transversely to the vehicle, the said transverse guides being equipped with means for limiting the travel of the seat mounting and plate thereon and the said guiding system being equipped with means to connect the seat mounting to the guiding system and means to lock the connection.

When moving the invalid on the chair of invalids into the vehicle the attendant just after unlocking the seat mounting and the plate, thereby the two corners at the front of the seating,

i.e. the side of the seating where the legs of the invalid are freely hanging when the seat is moved upwards, will be released, the seat will tilt backwards and impart at the same time a rotating movement to the seat over the plate by means of the movable rear corner and move the seat through intermediary guides to the vehicle. The tilting and rotating movement enables the legs of the invalid to be lifted over the threshold during further movement of the seating, whereafter the seating may again be brought back in its starting position. The seating which is moved into the vehicle through the intermediary guides will now be locked in the guiding system present in the vehicle. The base element of the chair for invalids as well as the intermediary guides will then be demounted and put into the truck of the vehicle. When moving the invalid from the vehicle the reverse sequence is used. After connecting the intermediary guides with the guide in the vehicle and the base element of the chair of invalids the seat mounting is after unlocking moved out of the vehicle with a rotating as well as tilting movement and again fixed on the base element of the chair.

The invention will now be illustrated by means of the attached drawings, wherein

figures 1a, 1b and 1c sequentially represent a perspective view of the chair of invalids placed before a vehicle, an upper view of the part in the vehicle and an upper view of the base element with wheels, wherein the arrow indicates the direction of rotation of the seat mounting;

figure 2a in perspective shows the moment at which the seat mounting is unlocked and is moved into the vehicle with a tilting and rotating movement, whereas figure 2b shows the same situation in upper view, the arrows indicating the combined movement of the seat mounting, which is represented by broken lines;

figure 3 shows in perspective the situation that the seat mounting of the chair of invalids is moved into the vehicle and as represented by the two arrows is further moved to the front and is locked into means arranged therefor.

In figure 1a 1 generally denotes a chair of invalids which comprises a seat mounting 2, which is solidly fixed to the plate 3, which below will be further illustrated, which plate in turn is fixed to the base element 5 of the chair, of which further the wheels 6 as well as the foot hold 7 with bars 8 and railing 9 are indicated. With reference 11 schematically the threshold of the vehicle is indicated. Plate 3 is movable between guides 4 which can be connected to the intermediary guides 22 which are placed between the chair of invalids 1 and the vehicle 10. During normal practice seat mounting 2 and plate 3 as movable parts are additionally locked, for instance by means of clamps, schematically indicated by 21 through which each arbitrary movement is blocked.

In figure 1b the part in the vehicle is shown consisting of a guiding system 12, on which the transverse guides 14 are arranged which serve for connection with the chair for invalids. With 16

pins are schematically shown which are fitting with pins 15 present in the seat mounting to lock the seat mounting in the vehicle.

In figure 1c schematically the base is shown with guides 4, which are able to mesh into corresponding transverse guides 14 in the vehicle by means of intermediary guides 22. Arrow 18 shows the rotation of the seat mounting while a pin-hinge connection and a wheel are schematically indicated at the corners 19, 20. The seat mounting is rotatable about the fixed pin-hinge connection at corner 19, the wheel at corner 20 being able to rotate in the surface of the plate 3. With 21 schematically clamps are indicated which block any undesirable movement of seat mounting 2 in the plate, for instance if one drives up the pavement, in which case the front wheels have to be lifted as well as rotated. In figure 1a 17 schematically indicates a stop means which restricts the movement of corner 20 and thus the movement of corner 20 outside the plate 3. Furthermore running wheels 23 (bearings) are visible, with which the plate 3 can be moved along the guide profiles which are bent like rails towards the vehicle and can be moved into the vehicle (see also figure 1a).

The seat mounting further contains pins 15, preferably formed as hollow bars, which fit into corresponding pins 16 arranged in the vehicle, through which the seat mounting with plate, when this has been moved into the car, is fixed before the combination is locked. The open door of the vehicle is indicated with a dash-dotline (13).

In figure 2b the connection between the base of the chair of invalids and the vehicle is indicated through the transverse guides 14 and intermediary guides 22. The broken line in figure 2b indicates the seat mounting which is rotated as well as tilted and moved towards the vehicle, of which the pin-hinge connection at corner 19 is able to move over intermediary guide 22 in the direction of the vehicle while the wheel at corner 20 already has been rotated. In the drawn broken position the seat mounting is moved in tilted and rotated condition into the vehicle till the legs of the patient are brought into the vehicle, whereafter the seat mounting again is rotated back into its normal seating position.

In figure 2b three arrows are drawn (26, 27, 28) which respectively indicate the movements which are carried out by the seating in the face of the plate, i.e. a rotating movement, arrow 26 through the wheel at corner 20; a movement towards the car, arrow 27; and a movement along the car forwards, arrow 28, through base 29 when finally the seat with plate is brought into the vehicle, by which last movement the pins 15 and 16 (see above) are fitted together whereafter the combination is locked, such as by clamps. The fourth movement in figure 2b is not indicated, it is the upwardly directed tilting movement necessary to pass over threshold 11.

Finally figure 3 shows the condition wherein the seat mounting of the chair of invalids thus the seat mounting 2 shifted with plate 3, is placed into

the car. The arrows 24 and 25 indicate the last movements of the seat mounting in relation to plate 3 during transfer into the car, namely a proceeding movement according to arrow 24 till the pins 15 present in the seat mounting are fitting with the corresponding pins 16, with which the seat mounting in the car is fixed. With this last movement the seat mounting mostly is somewhat upturned to make movements more easy. With 30 schematically a stop is indicated which marks the extreme position of the seat, while as well clamps not indicated are present which bolt the seat mounting with the plate and secure it.

With the drawings it has been shown how one has to deal during movement of an invalid in a chair of invalids into and out of a vehicle. From these figures it appears that one needs only arrange for a relatively small alteration to the vehicle in the shape of guiding system 12 and transverse guides 14 and base 29. By this construction it is also possible to maintain a seating in the car if no use is made of the chair of invalids without this being disturbing for the other passengers.

An important aspect of the chair of invalids is the provision of the rotatable and tiltable connection at corner 19, which preferably is made in the form of a pin which fits into an opening of plate 3 with hinge. The movable connection at corner 20 preferably consists of a wheel which is able to move over the plate and which can be moved over plate 3 in free condition as well in a guide.

The other two angular corners are provided with releasable connections of the usual type.

The number of steps which has to be taken is restricted and relates to the provision of intermediary guides 22, the unlocking of the seat mounting, as well as the removal of the intermediary guide and the base element of the chair of invalids when the invalid is already in the car. The putting in the car can be made as one continuous movement in the form of a succession of tilting, rotating and progressing movements. Since the base element mainly consists of wheels and bars it is easily transportable and can be placed into the trunk of the vehicle. It is a further advantage that by means of the rails in the car part a front and backward movement in the car itself is possible by which the locking can be simply carried out.

Claims

1. Chair for invalids of which the seat mounting (2) and the base element (5) after unlocking can be released from each other, the base element (5) having guides (4) which support the seat mounting (2) and in which guiding means (23) are movable to permit the removal of the seat mounting (2) from the base element (5), characterised in that the seat mounting (2) is connected to a plate (3) and is made to be able to rotate as well as tilt in relation to said plate, which plate (3) is provided with said guiding means (23).

2. Chair for invalids according to claim 1, in

which the seat mounting (2) defines four corners, characterised in that the plate (3) defines an upper surface, and in that the seat mounting (2) is fixedly but rotatably as well as tiltably connected at a first rear corner (19) to the plate (3), a second rear corner (20) being rotatable about the first rear corner connection over the upper surface of the plate (3) and two front corners of the seat mounting (2) being releasably connected to the plate (3), preferably by pins which fit into each other.

3. Chair for invalids according to claims 1 and 2, characterised in that the connection at the first rear corner (19), which is able to carry out a rotating as well as tilting movement, forms a pin and hinge connection with the plate (3).

4. Chair for invalids according to claims 1—2, characterised in that the rotatable corner (20) is provided with a wheel which is able to carry out a circular movement on the plate (3), a stop (17) being present at the back side.

5. Chair for invalids according to claim 4, characterised in that the rotatable corner wheel is movable along a guide track.

6. Chair for invalids according to claims 3 and 4, comprising a base element (5) with transporting wheels (6), the guiding means consisting of running wheels (23) which fit into guide profiles (4) arranged on the base element (5) of the chair, there being also clamps (21) to lock the combination in its normal use condition.

7. System for a chair for invalids with accessory parts to move an invalid in and out of a vehicle, characterised by a combination of a chair for invalids according to any of claims 1—6, and transverse guides (14) to support the seat mounting (2) and plate (3) in a vehicle, said transverse guides (14) being supported by a base (29) which in turn is mounted on a guiding system (12) to be mounted in the vehicle with the transverse guides (14) positioned transversely to the vehicle, the said transverse guides (14) being equipped with means (30) for limiting the travel of the seat mounting (2) and plate (3) thereon and the said guiding system (12) being equipped with means (16) to connect the seat mounting to the guiding system and means to lock the connection.

Patentansprüche

1. Rollstuhl für Invaliden wovon der Sitzaufbau (2) und das Grundelement (5) nach Entgrenzung voneinander losgemacht werden können, welches Grundelement (5) Leistäbe (4) besitzt, welche den Sitzaufbau (2) stützen und worin Leitorgane (23) beweglich sind in der Weise dass der Sitzaufbau (2) aus dem Grundelement (5) entfernt werden kann, dadurch gekennzeichnet, dass der Sitzaufbau (2) mit einer Platte (3) verbunden ist und in Bezug auf die Platte zum Rotieren sowie Kippen im Stande ist, welche Platte (3) mit den genannten Leitorganen (23) versehen ist.

2. Rollstuhl für Invaliden gemäss Anspruch 1, worin der Sitzaufbau (2) vier Ecken abgrenzt, dadurch gekennzeichnet, dass die Platte (3) eine obere Oberfläche abgrenzt, und dass der Sitzauf-

bau (2) fest aber drehbar sowie kippbar an einer ersten Hinterecke (19) der Platte (3) verbunden ist, wobei eine zweite Hinterecke (20) um die Verbindung der ersten Hinterecke über die Oberfläche der Platte (3) drehbar ist und zwei Vorderecken des Sitzaufbaues (2) lösbar mit der Platte (3), vorzugsweise mit Stiften die in einander passen, verbunden sind.

3. Rollstuhl für Invaliden gemäss Ansprüche 1 und 2, dadurch gekennzeichnet, dass die Verbindung bei der ersten Hinterecke (19), welche eine rotierende sowie eine kippende bewegung ausführen kann, eine Zapfen- und Gelenkverbindung mit der Platte (3) bildet.

4. Rollstuhl für Invaliden gemäss Ansprüche 1—2, dadurch gekennzeichnet, dass die rotierbare Ecke (20) mit einem Rad, dass eine kreisförmige Bewegung auf der Platte ausführen kann, versehen ist, wobei ein Anschlag (17) an der Rückseite anwesend ist.

5. Rollstuhl für Invaliden gemäss Anspruch 4, dadurch gekennzeichnet, dass das rotierbare Eckenrad über eine Leitstrecke beweglich ist.

6. Rollstuhl für Invaliden gemäss Ansprüche 3 und 4, umfassend ein Grundelement (5) mit Transporträdern (6), wobei das Leitorgan aus laufenden Rädern (23), welches in Leitprofile (4) angebracht auf das Grundelement (5) des Stules passen, besteht wobei auch Klauen (21) zur Verriegelung der Kombination in seiner normalen Gebrauchsposition anwesend sind.

7. System für einen Stuhl für Invaliden mit Hilfsteilen womit ein Invalide in einem Fahrzeug hinein oder aus einem Fahrzeug hinaus bewegt werden kann, gekennzeichnet durch eine Kombination eines Stuhles für Invaliden gemäss Ansprüche 1—6, und Querleitstäbe (14) zur Stützung des Sitzaufbaues (2) und der Platte (3) in einem Fahrzeug, welche Querleitstäbe (14) von einem Element (29) dass seinerseits auf einem in das Fahrzeug zu montieren Leitsystem montiert ist, gestützt wird, wobei die Querleitstäbe (14) mit Mitteln (30) zur Begrenzung der Bewegung des Sitzaufbaues (2) und der Platte (3) darauf ausgerüstet sind und wobei dass Leitsystem (12) mit Mitteln (16) welche den besagten Sitzaufbau mit dem Leitsystem verbinden und mit Mitteln diese Verbindung zu lösen ausgerüstet sind.

Revendications

1. Fauteuil d'invalidé, dont le siège (2) et l'élément de base (5) peuvent être séparés l'un de l'autre après déverrouillage, l'élément de base (5) possédant des guides (4) qui supportent le siège (2), et dans lequel un moyen de guidage (23) est mobile pour permettre l'enlèvement du siège (2)

de l'élément de base (5), caractérisé en ce que le siège (2) est relié à une plaque (3) et est réalisé pour pouvoir tourner et s'incliner par rapport à cette plaque, laquelle plaque (3) est pourvue du moyen de guidage (23).

2. Fauteuil d'invalidé selon la revendication 1, dans lequel le siège (2) définit quatre coins, caractérisé en ce que la plaque (3) définit une surface supérieure, et en ce que le siège (2) est fixé, mais de manière rotative et inclinable, par un premier coin arrière (19) à la plaque (3), un second coin arrière (20) pouvant tourner autour de la liaison du premier coin arrière, sur la surface supérieure de la plaque (3), et les deux coins avant du siège (2) étant relié de manière libérable à la plaque (3), de préférence par des broches qui s'ajustent l'une das l'autre.

3. Fauteuil d'invalidé selon les revendications 1 et 2, caractérisé en ce que la liaison au premier coin arrière (19), qui est capable d'effectuer un mouvement de rotation aussi bien qu'un mouvement d'inclinaison, forme une liaison à charnière à broche avec la plaque (3).

4. Fauteuil d'invalidé selon les revendications 1—2, caractérisé en ce que le coin pouvant pivoter (20) est pourvu d'une roue pouvant effectuer un mouvement circulaire sur la plaque (3), une butée (17) étant présente sur le côté arrière.

5. Fauteuil d'invalidé selon la revendication 4, caractérisé en ce que la roue du coin pouvant pivoter est mobile le long d'une voie de guidage.

6. Fauteuil d'invalidé selon les revendications 3 et 4, comprenant un élément de base 5 avec des roues de transport (6), le moyen de guidage consistant en roues de roulement (23) qui s'ajustent dans des profilés de guidage (46 disposés sur l'élément de base (5) du fauteuil, des éléments de fixation (21) étant également prévus pour verrouiller la combinaison dans son état normal d'utilisation.

7. Système pour un fauteuil d'invalidé avec des accessoires pour déplacer un invalide dans et hors d'un véhicule, caractérisé par une combinaison d'un fauteuil d'invalidé selon l'une quelconque des revendications 1—6 et de guides transversaux (14) pour supporter le siège (2) et la plaque (3) dans un véhicule, ces guides transversaux (14) étant supportés par une base (29) qui est à son tour montée sur un système de guidage (12) à monter dans le véhicule, les guides transversaux (14) étant disposés transversalement au véhicule, lesdits guides transversaux (14) étant pourvus de moyens (30) pour limiter le trajet du siège (2) et de la plaque (3) qu'ils portent, et le système de guidage (12) étant pourvu de moyens (16) pour relier le siège au système de guidage, et de moyens pour verrouiller la liaison.

