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(71) Applicant *(for all designated States except US)*: **CHANGWON NATIONAL UNIVERSITY INDUSTRY ACADEMY COOPERATION CORPS** [KR/KR]; in Changwon National Univ, #9, Sarim, Changwon 641-773 (KR).

(72) Inventors: **SONG, Jung Il**; #206-1804, Daedong Whangtobang 2cha Apt., 201-208, Daebang-dong, Changwon 641-913 (KR). **MOON, Jae Cheol**; #114-1704, Union Village 2cha Apt., 101-117, Seongju-dong, Changwon 641-939 (KR). **PARK, Seung Kwen**; #414-202, Yeonggot Maeul Poongrim Apt., 872-1, Jeongja-dong Jangan-gu, Suwon 440-300 (KR).

(74) Agent: **LEE, Min Young**; #301, Gaya Bldg, LMY Law & Patent office, 84-1, Sapa-dong, Changwon 641-550 (KR).

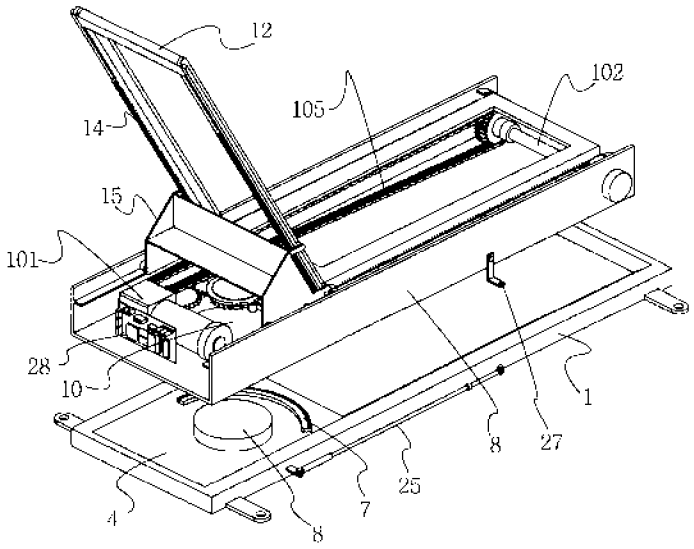
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(54) Title: ELECTRIC ROTATING SEAT FOR VEHICLE

[Fig. 1]



(57) Abstract: The present invention relates to an electric rotating seat for a vehicle, and more particularly, to an electric rotating seat for a vehicle, in which a horizontal transfer frame is installed within a rectangular rim-shaped support frame so as to reciprocate linearly, so that after an upper rotation frame is rotated about a central shaft of a fixed round plate installed on the horizontal transfer frame, a vertical transfer frame installed above the rotation frame is moved linearly by the drive of a chain, and rack gears installed at the bottom surface portion and the rear surface portion of the vertical transfer frame are geared engagement with a pinion gear, which rotates with respect to a rotation shaft installed at the front portion of the rotation frame to cause the vertical transfer frame to move upwardly and downwardly naturally.

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Description

ELECTRIC ROTATING SEAT FOR VEHICLE

Technical Field

[1] The present invention relates to an electric rotating seat for a vehicle, and more particularly, to an electric rotating seat for a vehicle, in which a horizontal transfer frame is installed within a rectangular rim-shaped support frame so as to reciprocate linearly, so that after an upper rotation frame is rotated about a central shaft of a fixed round plate installed on the horizontal transfer frame, a vertical transfer frame installed above the rotation frame is moved linearly by the drive of a chain, and rack gears installed at the bottom surface portion and the rear surface portion of the vertical transfer frame are geared engagement with a pinion gear, which rotates with respect to a rotation shaft installed at the front portion of the rotation frame to cause the vertical transfer frame to move upwardly and downwardly naturally.

Background Art

[2] Conventionally, all the vehicles for the handicapped, who are physically disabled, are individually reconstructed, and particularly, almost all of them are reconstructed in terms of an option or a construction to accomplish the convenience of the driving in the vehicle.

[3] However, means for assisting the handicapped when getting on or off the vehicle has not been developed.

[4] Gradually, means for assisting the handicapped, who utilizes a wheel-chair in the mass traffic, has been widely spread.

Disclosure of Invention

Technical Problem

[5] Accordingly, the present invention has been made to provide an electric rotating seat for a vehicle, which can assist the handicapped to easily get on or off a vehicle so that they can actively utilize the vehicles as transportation means naturally in the travel, and participate in the economic activity, especially in the attendance at work and leaving of the office.

[6] In addition, the present invention has been made to solve such conventional problems, and an object of the present invention is to provide an electric rotating seat for a vehicle, which can assist the handicapped to easily get on or off a vehicle so that they can actively utilize the vehicles as transportation means naturally in the travel, and participate in the economic activity.

Technical Solution

[7] To achieve the above object, the present invention provides an electric rotating seat

for a vehicle, in which a horizontal transfer frame is installed within a rectangular rim-shaped support frame so as to reciprocate linearly, so that after an upper rotation frame is rotated about a central shaft of a fixed round plate installed on the horizontal transfer frame, a vertical transfer frame installed above the rotation frame is moved linearly by the drive of a chain, and rack gears installed at the bottom surface portion and the rear surface portion of the vertical transfer frame are geared engagement with a pinion gear, which rotates with respect to a rotation shaft installed at the front portion of the rotation frame to cause the vertical transfer frame to move upwardly and downwardly naturally.

Advantageous Effects

[8] As described above, according to the present invention, since the electric rotating seat for a vehicle can be installed at the inside of a seat of the entire vehicle, and is installed at the lower portion of the seat when the vehicle for the handicapped is manufactured, it is possible to support the handicapped, and wide manufacture and spread of the electric rotating seat for the vehicle of the present invention will induce active participation of the handicapped in the economic activities as well as the active participation of the employer.

Brief Description of the Drawings

[9] FIG. 1 is a perspective view showing whole shape of an electric rotating seat for a vehicle.

[10] FIG. 2 is a perspective view showing engagement relationship of a horizontal transfer frame and a support frame of an electric rotating seat of a vehicle.

[11] FIG. 3 is a plane view of a horizontal transfer frame shown from the top side.

[12] FIG. 4 is a perspective view showing an engagement relationship of a rotating frame after the engagement of the horizontal transfer frame.

[13] FIG. 5 is a perspective view showing a correlation of a toothed gear and a transfer gear of the horizontal transfer frame.

[14] FIG. 6 is a view schematically showing a correlation of the geared engagement.

[15] FIG. 7 is a perspective view showing an engagement relationship of a vertical transfer frame after the engagement of the rotating frame.

[16] FIG. 8 is a partial enlarged perspective view showing an engagement relationship of a chain gear and a pinion gear.

[17] FIG. 9 is a perspective view showing a first operation of an electric rotating seat for a vehicle.

[18] FIG. 10 is a perspective view showing a second operation of an electric rotating seat for a vehicle.

[19] FIG. 11 is a perspective view showing a third operation of an electric rotating seat for

a vehicle.

[20] FIG. 12 is a view schematically showing a correlation of a rack gear and a pinion gear of the lower rear portion of the vertical transfer frame.

[21] FIG. 13 is a partial enlarged perspective view showing a vertical transfer guide surface of the vertical transfer frame.

[22] FIG. 14 is a perspective view of an electric rotating seat for a vehicle shown from other side.

[23] FIG. 15 is a perspective view of an electric rotating seat for a vehicle shown from still other side.

Mode for the Invention

[24] Hereinafter, the preferred embodiment of the present invention will be described in detail with reference to the appended drawings.

[25] FIG. 1 is a perspective view showing a whole shape of an electric rotating seat for a vehicle.

[26] As shown in FIG. 1, an electric rotating seat for a vehicle comprises a support frame 1 having a rectangular rim shape, the support frame being formed with wheel grooves 2 for seating wheels 5 at inside surfaces of a longitudinal rim and a first horizontal transfer guide surface 3 for guiding the wheels 5 linearly;

[27] a horizontal transfer frame 4 adapted to move linearly and having a rectangular plate shape, the horizontal transfer frame having a disc-like fixed round plate 6 and a fixed toothed gear 7 of a round frame shape mounted at the top surface thereof, the fixed toothed gear being spaced apart by a predetermined interval from the fixed round plate 6 with respect to a center portion of the fixed round plate, and having wheels 5 mounted at the outside surfaces thereof so as to be seated in wheel grooves 2 formed at the inside surfaces of the support frame 1;

[28] a rotating frame 8 adapted to rotate with respect to the fixed round plate 6, the rotating frame being formed with a seating member 9 of a rectangular plate shape having a control portion 28 and a driving motor 101 installed thereon so that both side surfaces thereof having a predetermined height extend in the front side by a pre-determined length, and a cover shaped housing 10 formed on the seating member 9 for covering an upper portion of the fixed round plate 6 formed at the top surface of the horizontal transfer frame 4;

[29] a driving portion 100 including a rotation shaft 102 installed at both insides extending by a predetermined length at the seating member 9 so that it traverse lengthwise, chain gears 103 respectively formed at the driving motor 101 seated on the seating member, a chain 105 for interconnecting two chain gears, and two pinion gears 104 for rotating together with the rotation shaft 102; and

[30] a "L" shaped vertical transfer frame 12 formed with rack gears 14 at the bottom surface portion and the rear surface portion thereof so that it moves linearly along a second horizontal transfer guide surface 12 formed at the inside of the rotation frame 8 by the gear-engagement of the pinion gear 104 with the rack gear 14 formed at the bottom surface portion of the vertical transfer frame and the wheels 5 installed at the both sides of the horizontal transfer frame 4, and then moves upwardly and downwardly by the gear-engagement of the pinion gear 104 with the rack gear 14 installed at the rear surface portion of the vertical transfer frame.

[31] FIG. 14 and FIG. 15 are perspective views of an electric rotating seat for a vehicle, each shown from different sides.

[32] Referring to FIG. 14 and FIG. 15, it is possible to easily understand parts not shown in the description of the construction of FIG. 1.

[33] Hereinafter, the engagement relationship between the constitutional elements will be explained to facilitate understanding of the whole constitution as described above.

[34] FIG. 2 is a perspective view showing an engagement relationship between the support frame and the horizontal transfer frame of the electric rotating seat for a vehicle.

[35] At first, a rectangular shaped support frame 1 is installed at the lowest portion and wheel grooves 2 are formed at the longitudinal insides of the support frame 1 for seating the wheels 5.

[36] In addition, a bottom surface of the wheel groove 2 is a surface extending toward the inside and formed with the first horizontal transfer guide surface 3 for guiding the horizontal transfer frame 4.

[37] While it is possible to guide the horizontal transfer frame only by the wheel grooves 2, the first horizontal transfer guide surface 3 is further formed by extending the bottom surface so that higher safety can be accomplished by supporting the weight of the horizontal transfer frame 4, and the like.

[38] Also, the horizontal transfer frame 4 is provided at both sides with wheels 5 seated in the wheel grooves 2 formed at the insides of the rotation frame 8 to facilitate the horizontal transfer, and is also installed at the upper surface of the horizontal transfer frame 4 with a fixed round plate 6 projecting upward and an arc shaped toothed gear 7 also installed with respect to the fixed round plate 6 to be spaced apart by a pre-determined interval.

[39] FIG. 3 is a plane view of a horizontal transfer frame shown from the upper side.

[40] The center of the fixed round plate 6 is positioned below an arbitrary point dividing the horizontal transfer frame 4 into two upper and lower portions horizontally as shown in FIG. 3, and it is preferable for the arc of the toothed gear 7 to form 130 degrees so that manufacturing cost can be economized without affecting the action of

the toothed gear 7, and it has been shown to be most appropriate in the simulation experiment of the manufacturing process in consideration of the position relations between other constituting elements on the upper surface of the horizontal transfer frame 4.

[41] In addition, the fixed round plate 6 should have a proper area so that it can support the load of the rotation frame 8.

[42] FIG. 4 is a perspective view showing an engagement relationship of the rotation frame after the engagement of the horizontal transfer frame.

[43] As shown in FIG. 4, the rectangular shaped seating member 9 for seating several constituting elements thereon is formed at both sides with side surfaces, which are constructed to be thicker than a thickness of the seating member 9, so that it extends longer than that of the seating member 9, and the seating member 9 is provided with a cover shaped housing 10 having a space and an area enough to cover the fixed round plate 6.

[44] Accordingly, the rotation frame 8 is constructed to rotate with respect to the fixed round plate 6.

[45] Of course, bearings are inserted and installed between the fixed round plate 6 and the housing 10 for facilitating the smooth rotation, but they are not shown in the drawings as they are general elements.

[46] FIG. 5 is a perspective view showing a correlation of the toothed gear and the transfer gear of the horizontal transfer frame, and FIG. 6 is a schematic view showing a correlation of a geared engagement.

[47] As shown in FIG. 5, since the toothed gear 7 installed on the upper surface of the horizontal transfer frame 4 is fixed at a place spaced apart by a predetermined interval as an arc shape from the center portion of the fixed round plate 6, a pair of transfer gears 21, 22 installed at one center shaft by means of the geared engagement with the toothed gear 7, moves along the arc.

[48] In the above description, the center shaft connecting the pair of transfer gears 21, 22 is inserted into a hole formed at the rotation frame 8, so that the transfer gear 21 is positioned at the upper side and the transfer gear 22 is positioned at the lower side on the basis of the seating member 9 of the rotation frame 8.

[49] In addition, it is constructed that power is transmitted to the lower transfer gear 22, which is not engaged with the toothed gear 7, indirectly by means of an idle gear 20 positioned between the geared motor 19 and the lower transfer gear 22 so that rotation power can be transmitted to it by the driving of the geared motor 19 at the seating member 9.

[50] Herein, as shown in FIG. 6, when a first reset lever 23 installed at the side of the rotation frame 8 is rotated to thereby apply force in the “A”direction so that the idle

gear 20 applies force to one side of a sea-saw shaped bar 24, if required, the other side is moved to the "B"direction, which is opposite to the "A"direction, with respect to the center shaft of the transfer gears 21, 22, so that the idle gear 20 intercepts the gear engagement with the geared motor 19 and the power of the geared motor 19 is not transmitted to the transfer gears 21, 22.

[51] When the geared engagement is intercepted, it is possible to reset the rotation frame 8 to its original position by the manual operation at the emergency circumstance, since the power of the geared motor 19 cannot be transmitted to the rotation frame 8 rotating with the transfer gears 21, 22.

[52] Moreover, a rotation guide lever 25, whose both distal ends are hinge-engaged by an engagement member 27 with the outer side of the support frame 1 and the outer side of the rotation frame 8, is installed to guide the rotation frame 8 formed integrally with the transfer gears 21, 22 and rotating with respect to the fixed round plate 6, so that the rotation frame can rotate easily, as the transfer gears 21, 22 move along the arc of the toothed gear 7.

[53] In FIG. 6, the geared motor 19 is shown simply to facilitate the understanding, and the geared motor 19 shown in FIG. 4 as an outer sheath, so the gear is encased at the inside of the sheath.

[54] Also, since the sea-saw bar 24 is substantially installed at the lower side of the gear, while it cannot be shown from the plane view, it is shown in FIG. 6 to facilitate the understanding.

[55] In the description of the horizontal transfer frame 4 as shown in FIG. 3, the reason of the center of the fixed round plate 6 being positioned at the lower side of the rectangular and not at the center thereof is that the transfer gears 21, 22 can move linearly for some instant to a predetermined distance by the effect of the horizontal transfer frame 4, and then rotate, when the rotation frame 8 could not rotate at its original position and the transfer gears 21, 22 moves along the arc of the toothed gear 7.

[56] FIG. 7 is a perspective view showing an engagement relationship of the vertical transfer frame after the engagement of the rotation frame, and FIG. 8 is a partially enlarged perspective view showing an engagement relationship between a chain gear and a pinion gear.

[57] As shown in FIG. 7, the seating member 9 is provided with a driving motor 101, a geared motor 19, an idle gear 20, and transfer gears 21, 22 respectively, and it is constructed that the chain gear 103 rotated by the driving of the driving motor 101 and the chain gear 103 positioned to traverse lengthwise at the front portion of the rotation frame 8 so that it can rotate on the rotation shaft 102, constitute one pair, and a pair of the chains 103 are constructed that power is transmitted to the pair of chains 103 by the

engagement of the chain 105.

[58] Also, as shown in FIG. 8, a pair of pinion gears 104 is installed at the edge side of the rotation shaft 102, and any one of the pair of pinion gears 104 is formed integrally with the chain gear 103 by the key engagement.

[59] Furthermore, the vertical transfer frame 12 provided with rack gears 14 at the bottom surface portion and the rear surface portion thereof, is seated because it can be gear-engaged with the pinion gear 104.

[60] Herein, in order to prevent the separation from an auxiliary frame 15, a stopper 16 is installed at the side of the edge, which contacts with a vertical portion and a horizontal portion of the "L"shaped vertical transfer frame 12, and a guide wheel 29 is provided at the side of the stopper 16 and seated at the second horizontal transfer guide surface 11 formed at the inside of the rotation frame 8, so that stability can be accomplished by the uniform distribution of the weight of the vertical transfer frame 12, when the vertical transfer frame 12 moves horizontally.

[61] The vertical transfer frame 12 is formed with vertical transfer guide surfaces 13 at both sides to assist the vertical movement of the vertical transfer frame 12.

[62] When a second reset lever 106 installed at the side of the rotation frame 8 is rotated, the key engagement between the pinion gear 104 and the integrally formed chain gear 103 is separated, and the pinion gear 104 is rotated manually without the power transmission from the chain gear 103.

[63] Accordingly, it is possible to reset the vertical transfer frame 12 engaged with the pinion gear 104 to its original position by the manual operation at the emergency time.

[64] An auxiliary frame 15 is installed at the rear side of the vertical transfer frame 12, where the horizontal portion and the vertical portion contacts with each other, to support the movement of the vertical transfer frame 12, and the auxiliary frame 15 is provided with a horizontal transfer guide bearing 17 at the outer side for supporting the horizontal movement, and a vertical transfer guide bearing 18 at the inner side of the auxiliary frame 15 for guiding the vertical movement.

[65] FIG. 9, FIG. 10, and FIG. 11 are perspective views, each showing respective operation step of the electric rotation seat for a vehicle of the present invention.

[66] At first, when a signal is received from the control portion 28, as shown in FIG. 9, the rotation frame 8 and the vertical transfer frame 12 installed above the horizontal transfer frame 4 are moved linearly by a predetermined distance together with the horizontal transfer frame 4, and then rotated, as described about an operation principle of the horizontal transfer frame 4, such that they rotate by 90 together with the guide of the rotation guide lever 25 installed at the side of the support frame 1 and the rotation frame 8 by means of a hinge.

[67] As a second step, as shown in FIG. 10, the chain gear 103 is driven by the driving of

the driving motor 101 installed above the seating member 9, and the driving of the chain gear 103 rotates the pinion gear 104 installed above the rotation shaft 102 provided lengthwise at the front portion of the rotation frame 8, and then the rotation of the pinion gear 104 moves the rack gear 14 installed at the bottom surface portion of the vertical transfer frame 12 linearly, thereby moving the vertical transfer frame 12 linearly toward a front portion.

[68] Then, as a third step, as shown in FIG. 11, when the geared engagement of the rack gear 14 installed at the bottom surface portion of the vertical transfer frame 12 is separated, the geared engagement with the rack gear 14 installed at the rear surface portion of the vertical transfer frame 12 is accomplished continuously thereby moving the vertical transfer frame 12 to the lower side.

[69] The linear movement, the rotation movement, and the vertical ascending and descending movement as described above can be controlled in respect of their length of operation and rotation radius by the installing of the limit switches at proper position, and a general limit switch is used as the limit switch. In this regard, the limit switch is not shown in the drawings, because the positions thereof can be adjusted according to the circumstances. However, it is expected that about four limit switches are required for the electric rotating seat for a vehicle of the present invention.

[70] The return process is performed as described in FIG. 11, FIG. 10, and FIG. 9.

[71] It is possible to secure dual stabilities by the installing of the stopper 16 at a contact portion of the horizontal portion and the vertical portion of the vertical transfer frame 12 in addition to the limit switch restricting the moving range, so that the vertical transfer frame 12 is not outranged from the engagement portion of the auxiliary frame 15 when the vertical transfer frame 12 moves upwardly and downwardly as shown in FIG. 11.

[72] FIG. 12 is a schematic view showing a correlation between the rack gear and the pinion gear installed at the bottom surface portion and the rear surface portion of the vertical transfer frame 12.

[73] As shown in FIG. 12, since a vertical portion of the "L"shaped portion of the vertical transfer frame 12 is inclined to the rear side to form an obtuse angle, the rack gears 14 installed at the rear surface portion and the bottom surface portion of the vertical transfer frame 12 can be moved upwardly and downwardly naturally due to natural gear-engagement with the pinion gear 104.

[74] It is proved that the rear surface angle is preferably to be 120° as a result of simulation experiment.

[75] FIG. 13 is a partially enlarged perspective view showing the vertical transfer guide surface of the vertical transfer frame.

[76] As shown in FIG. 13, the auxiliary frame 15 is constructed to move in the horizontal

direction together with the vertical transfer frame 12 and also move in the vertical direction, and since it is devised to induce more stable ascending and descending movement of the vertical transfer frame 12, the vertical transfer frame 12 moves vertically together with the contact of the vertical transfer guide surfaces 13 formed at both sides of the vertical transfer frame 12 with the vertical transfer guide bearing 18 installed at the inner side of the auxiliary frame 15.

Industrial Applicability

[77] As described above, according to the present invention, since the electric rotating seat for a vehicle can be installed at the inside of the seat of the entire vehicle and installed at the lower portion of the seat when the vehicle for the handicapped is manufactured, it is possible to support the handicapped, and wide manufacture and spread of the electric rotating seat for the vehicle of the present invention will induce active participation of the handicapped in the economic activities as well as the active participation of the employer.

Claims

[1] An electric rotating seat for a vehicle, which is installed under a seat of the vehicle, the electric rotating seat comprising:
a support frame 1 having a rectangular rim shape, the support frame being formed with wheel grooves 2 for seating wheels 5 at inside surfaces of a longitudinal rim and a first horizontal transfer guide surface 3 for guiding the wheels 5 linearly;
a horizontal transfer frame 4 adapted to move linearly and having a rectangular plate shape, the horizontal transfer frame having a disc-like fixed round plate 6 and a fixed toothed gear 7 of a round frame shape mounted at the top surface thereof, the fixed toothed gear being spaced apart by a predetermined interval from the fixed round plate 6 with respect to a center portion of the fixed round plate, and having wheels 5 mounted at the outside surfaces thereof so as to be seated in wheel grooves 2 formed at the inside surfaces of the support frame 1;
a rotating frame 8 adapted to rotate with respect to the fixed round plate 6, the rotating frame being formed with a seating member 9 of a rectangular plate shape having a control portion 28 and a driving motor 101 installed thereon so that both side surfaces thereof having a predetermined height extend in the front side by a predetermined length, and a cover shaped housing 10 formed on the seating member 9 for covering an upper portion of the fixed round plate 6 formed at the top surface of the horizontal transfer frame 4;
a driving portion 100 including a rotation shaft 102 installed at both insides extending by a predetermined length at the seating member 9 so that it traverse lengthwise, chain gears 103 respectively formed at the driving motor 101 seated on the seating member, a chain 105 for interconnecting two chain gears, and two pinion gears 104 for rotating together with the rotation shaft 102; and
a "L"shaped vertical transfer frame 12 formed with rack gears 14 at the bottom surface portion and the rear surface portion thereof so that it moves linearly along a second horizontal transfer guide surface 12 formed at the inside of the rotation frame 8 by the gear-engagement of the pinion gear 104 with the rack gear 14 formed at the bottom surface portion of the vertical transfer frame and the wheels 5 installed at the both sides of the horizontal transfer frame 4, and then moves upwardly and downwardly by the gear-engagement of the pinion gear 104 with the rack gear 14 installed at the rear surface portion of the vertical transfer frame.

[2] The electric rotating seat according to claim 1, wherein the "L"shaped vertical transfer frame 12 is inclined at a vertical portion to form an obtuse angle so that

the rack gears 14 installed at the bottom surface portion and the rear surface of the vertical transfer frame 12 can move upwardly and downwardly naturally due to the geared engagement.

[3] The electric rotating seat according to claim 1, further comprising an auxiliary frame 15 at a rear side where a vertical portion and a horizontal portion of the vertical transfer frame 12 contact with each other to assist the horizontal movement and vertical ascending and descending movement of the vertical transfer frame 12.

[4] The electric rotating seat according to claim 3, wherein the auxiliary frame 15 is provided with a horizontal transfer guide bearing 17 moving along the second horizontal transfer guide surface 11 when the vertical transfer frame 12 moves horizontally, and a vertical transfer guide bearing 18 for guiding the vertical movement by the contact with the vertical transfer guide surface 13 formed at both sides of the vertical portion of the vertical transfer frame 12 to be rotated at its original place, at the vertical movement.

[5] The electric rotating seat according to claim 1, wherein the fixed round plate 6 installed at the upper surface of the horizontal transfer frame 4 is constructed to be off from a real center of the horizontal transfer frame 4.

[6] The electric rotating seat according to claim 1, wherein a pair of transfer gears 21, 22, which is installed at one center shaft due to the geared engagement with the toothed gear 7, is constructed to move along the arc, as the toothed gear 7 installed at the upper surface of the horizontal transfer frame 4 is fixed as an arc shape at a place spaced apart by a predetermined interval from the center portion of the fixed round plate 6, for the rotation power be transmitted.

[7] The electric rotating seat according to claim 6, wherein the transfer gear 22 of the pair of transfer gears 21, 22, which is not engaged with the toothed gear 7, is constructed that power is transmitted indirectly by means of the idle gear 20 installed between the geared motor 19 and the transfer gear 22 so that rotation power can be transmitted by the driving of the geared motor 19 on the seating member 9.

[8] The electric rotating seat according to claim 7, wherein the idle gear 20 is constructed to intercept the geared engagement with the geared motor 19 by the first reset lever 23 installed at the side of the rotation frame 8.

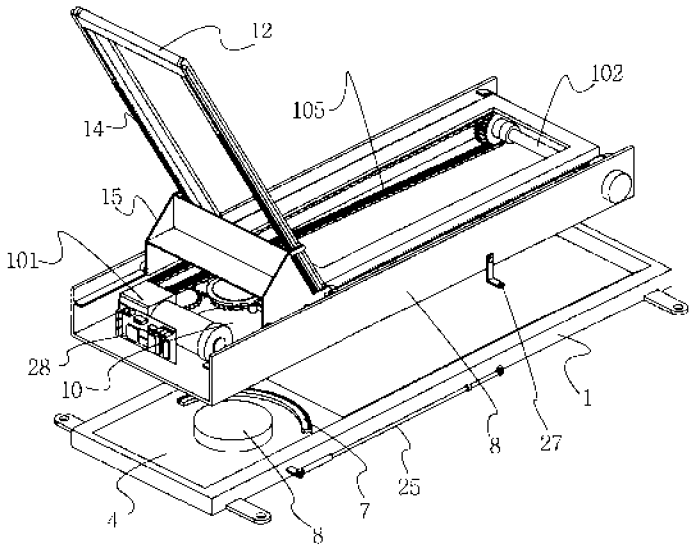
[9] The electric rotating seat according to claim 6, further including rotation guide levers 25 installed at an outer side of the support frame 1 and at an outer side of the rotation frame 8, both distal ends thereof being hinge-engaged with each other, so that the rotation frame 8, which rotates with respect to the fixed round plate 6 and constructed integrally with the transfer gears 21, 22, can be guided to

easily rotate, as the transfer gears 21, 22 move along the arc of the toothed gear 7.

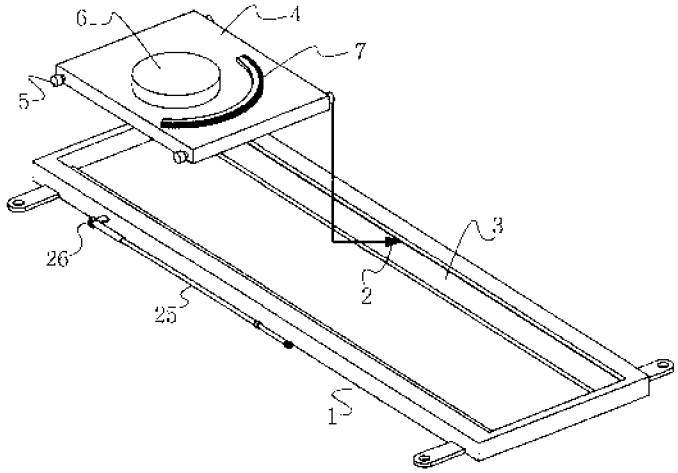
[10] The electric rotating seat according to claim 1, wherein any one of the two chain gears 103 installed at the rotation shaft 102 is integrally formed with the pinion gear 104 by means of the key engagement.

[11] The electric rotating seat according to claim 10, wherein the integrally formed chain gear 103 and the pinion gear 104 are joined and separated from the key engagement by means of the second reset lever 106.

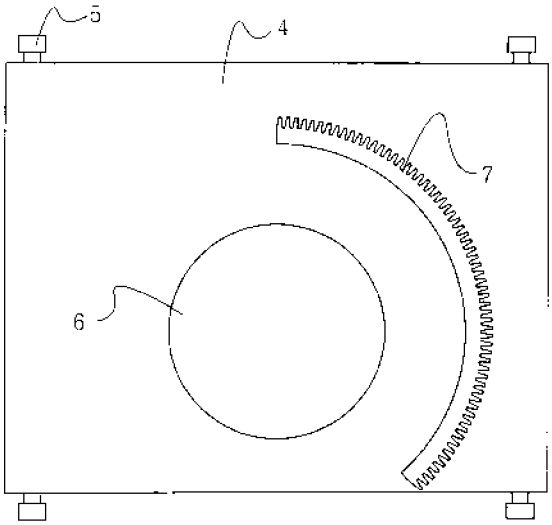
[Fig. 1]



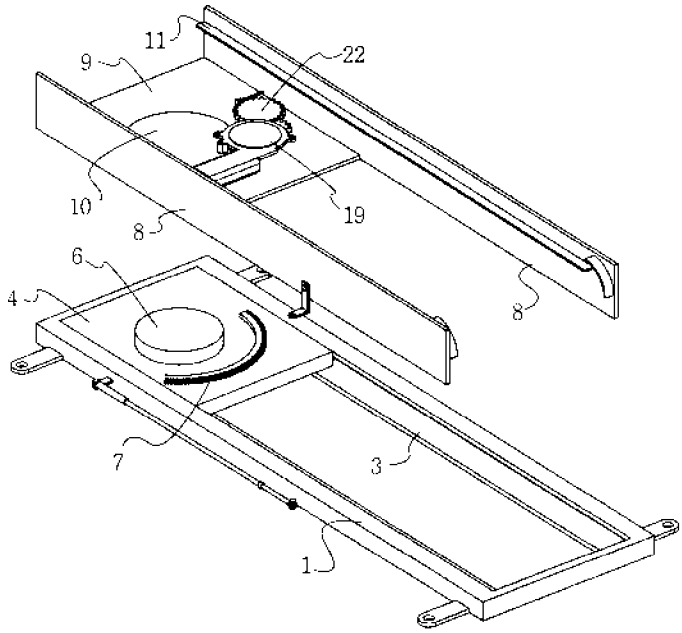
[Fig. 2]



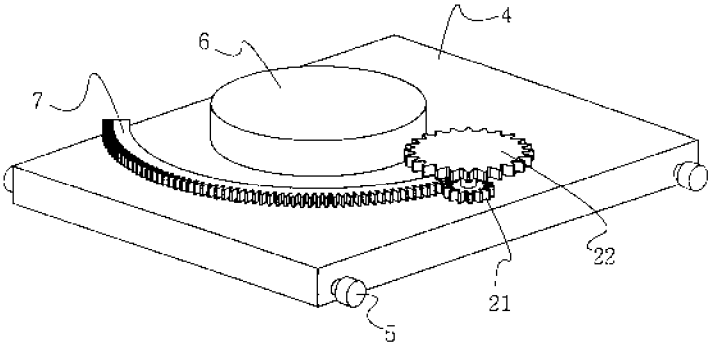
[Fig. 3]



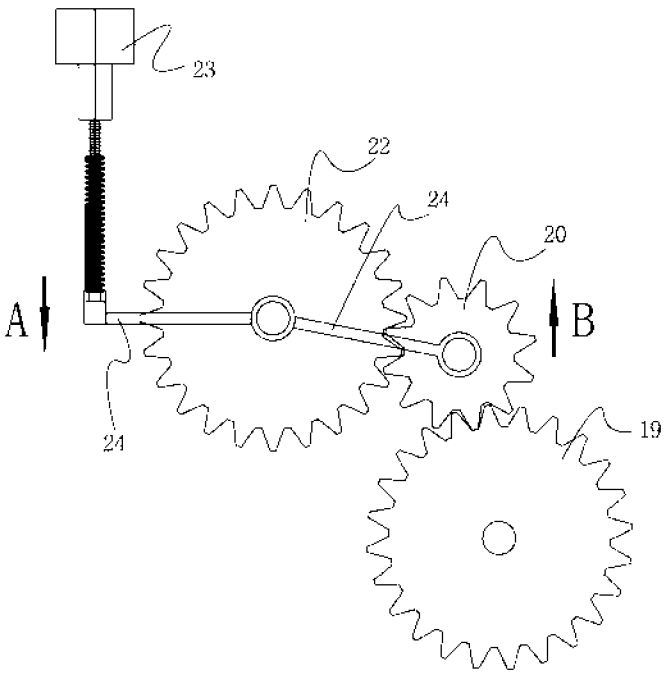
[Fig. 4]



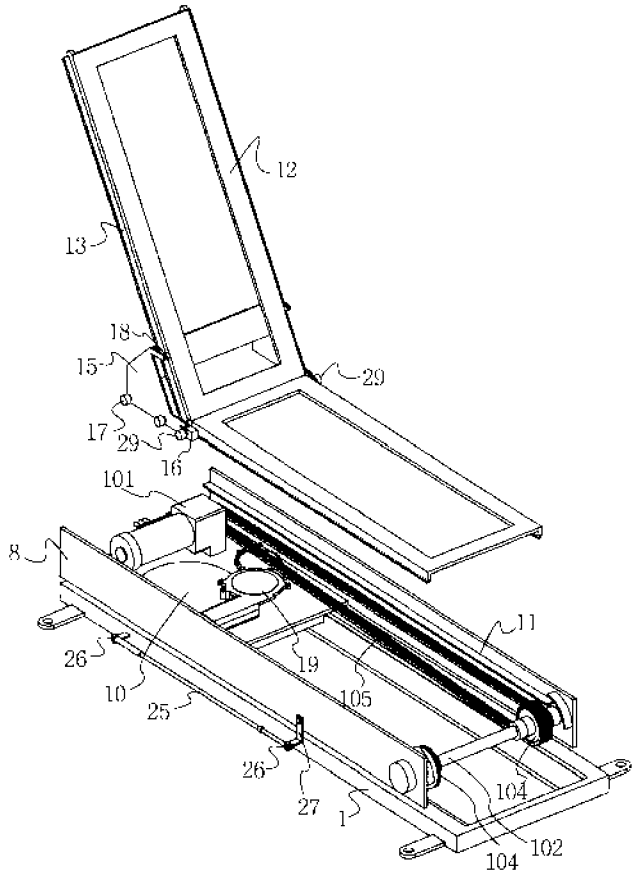
[Fig. 5]



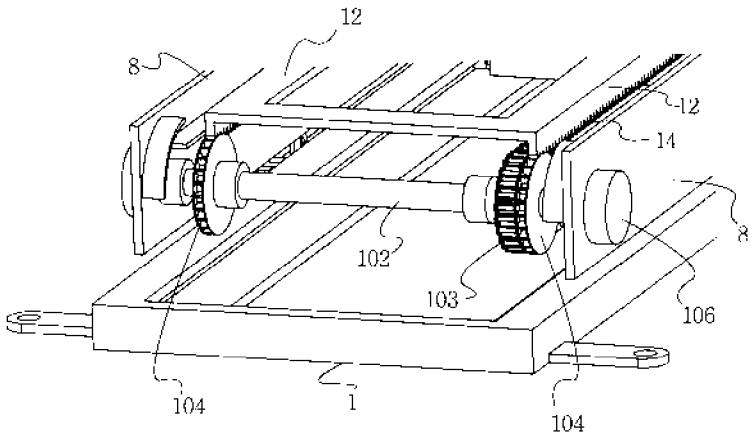
[Fig. 6]



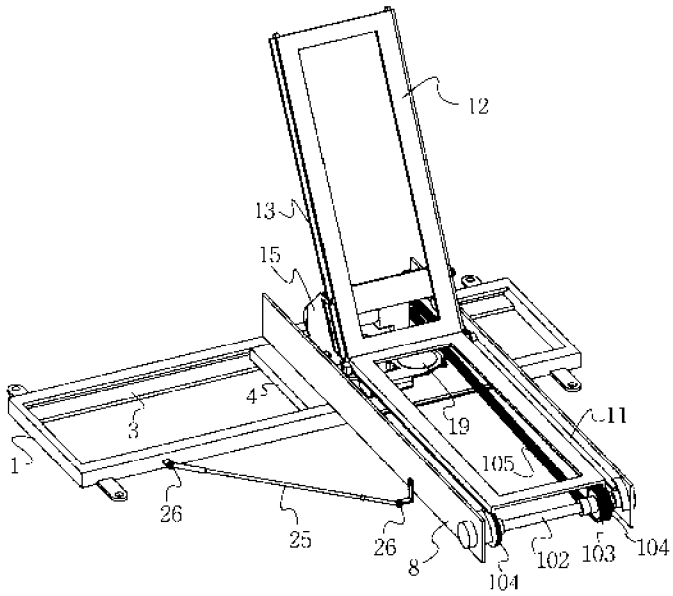
[Fig. 7]


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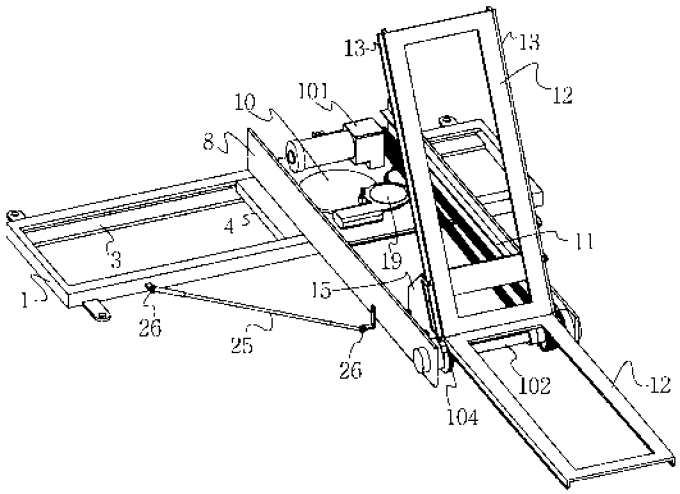
[Fig. 8]


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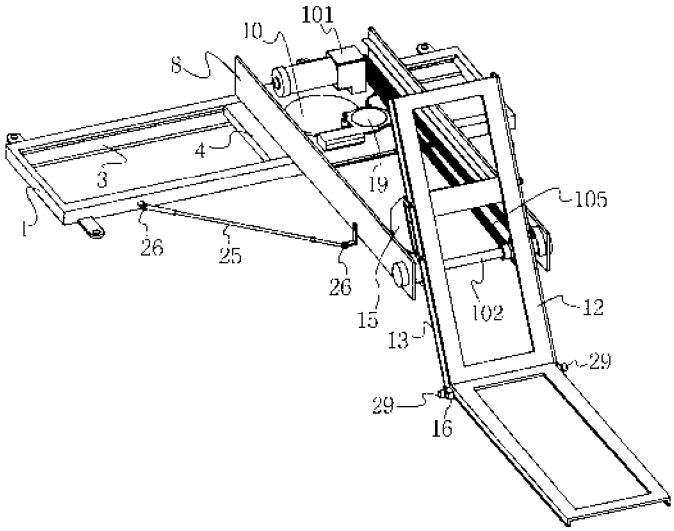
[Fig. 9]



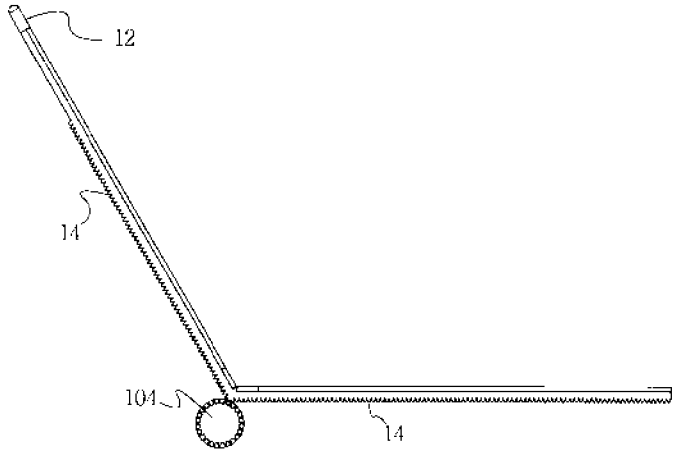
[Fig. 10]



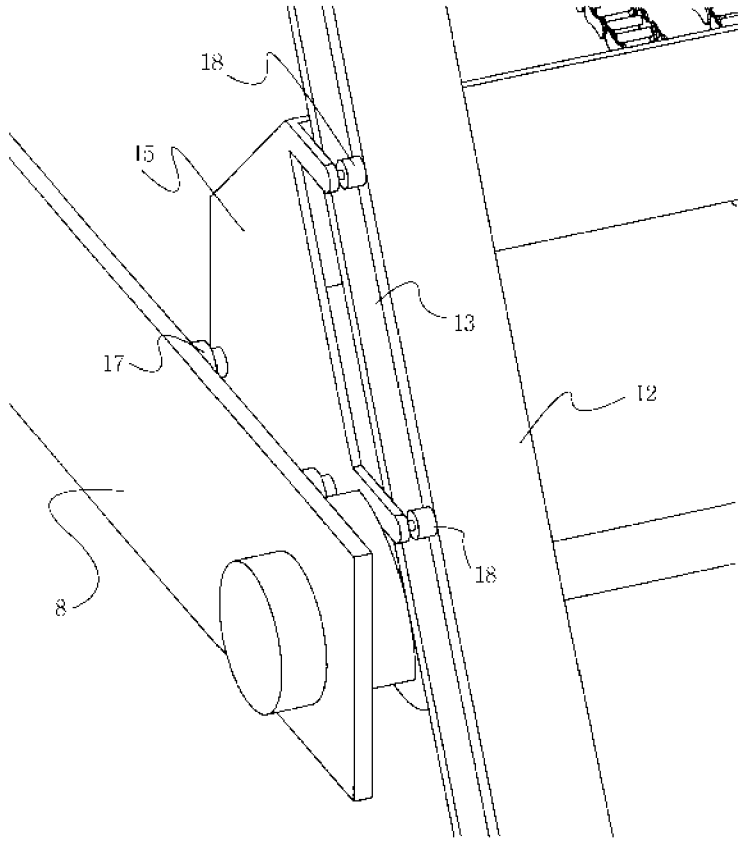
[Fig. 11]



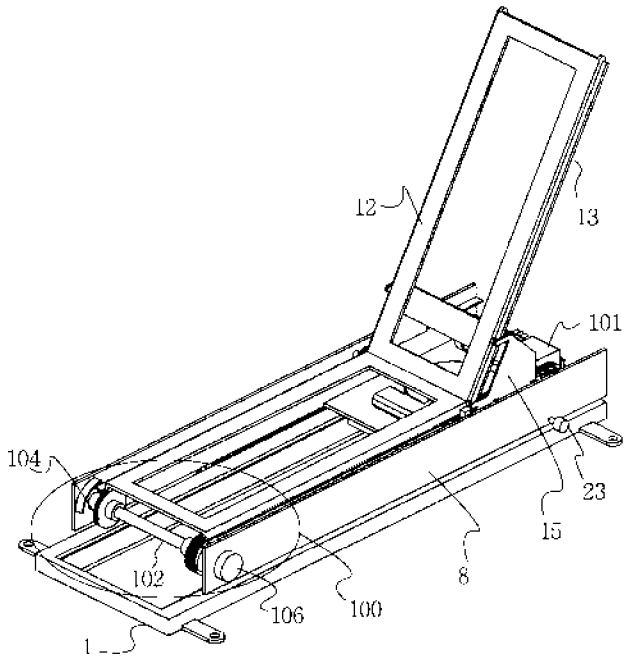
[Fig. 12]



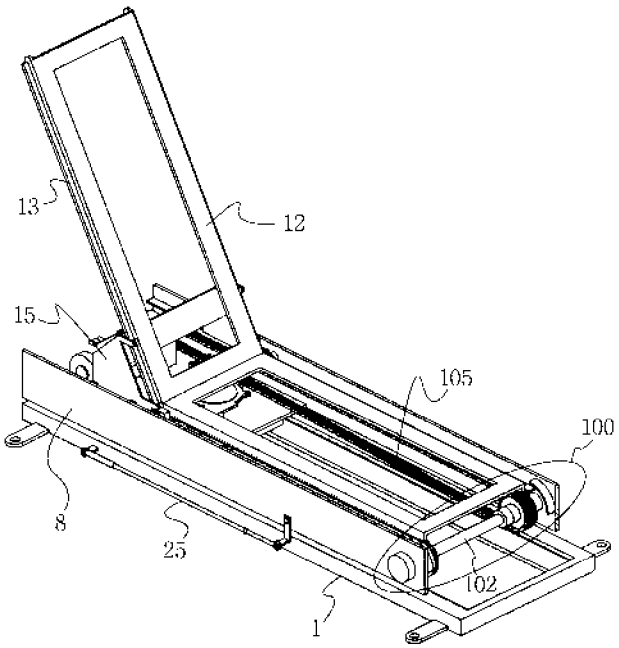
[Fig. 13]



[Fig. 14]



[Fig. 15]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2007/005391

A. CLASSIFICATION OF SUBJECT MATTER

B60N 2/14(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 : B60N 2/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975.
Japanese utility models and applications for utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) & keywords : "handicap", "vehicle", "seat", "motor", "guide", "gear", "support"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7,036,883 B1 (THOMPSON, J. L. et al.) 2 May 2006 See column 3, line 43 - column 5, line 14, and figures 1 and 2.	1-11
A	US 6,962,383 B2 (TAKENOSHITA, T. et al.) 8 November 2005 See column 4, line 35 - column 23, line 11, and figures 9, 12, 13, 15 and 18.	1-11
A	US 6,572,172 B1 (NINOMIYA, M. et al.) 3 June 2003 See column 3, line 65 - column 19, line 19, and figure 9.	1-11

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 MAY 2008 (09.05.2008)	**09 MAY 2008 (09.05.2008)**

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Facsimile No. 82-42-472-7140

Authorized officer

KIM, DONG JIN

Telephone No. 82-42-481-5415

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2007/005391

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7,036,883 B1	02.05.2006.	None	
US 6,962,383 B2	08.11.2005.	None	
US 6,572,172 B1	03.06.2003.	DE69930465T2	30.11.2006
		EP00985576B1	22.03.2006
		JP12085422	28.03.2000
		JP2000326775A2	28.11.2000
		US6572172BA	03.06.2003