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(54) A wheelchair structure

(57) The present invention provides a wheelchair structure, which is available with a handle (11), seat (12) and wheel body (13); the handle is provided with an integrated control seat (20), the wheel body is provided with auxiliary drive unit (30) and combined positioning member (50); it is characterized in that, the integrated control seat (20) can be assembled securely onto the wheelchair handles (11) of different diameters and curvatures, and the swinging angle can be adjusted flexibly, thus it is possible to guarantee outstanding adaptability of assembly, efficient and convenient operation with improved applicability.

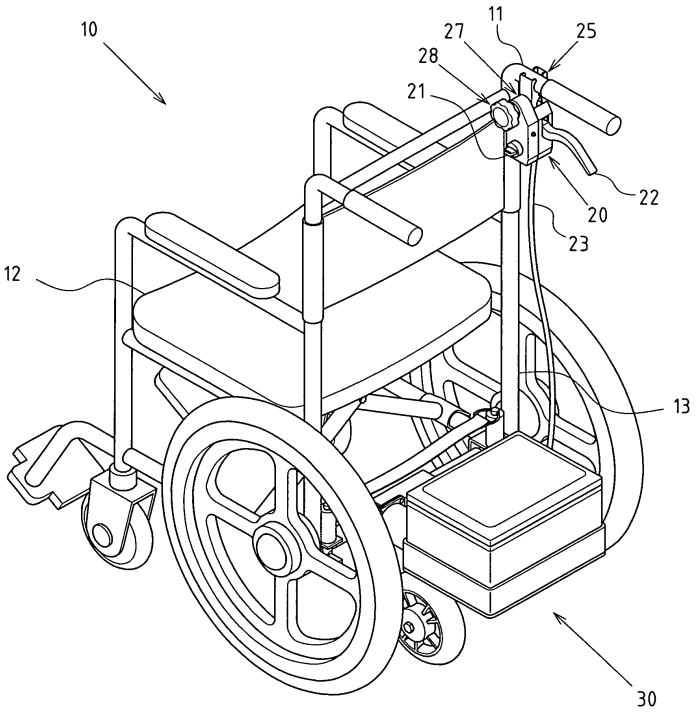

FIG.1

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Description

BACKGROUND OF INVENTION

1. Field of the Invention

[0001] The present invention relates generally to a wheelchair, and more particularly to an innovative one.

2. Description of Related Art

[0002] An independent auxiliary drive unit is already developed in the industry. The auxiliary drive unit is composed of wheel body, drive motor, fuel cell and an integrated control seat; the auxiliary drive unit is mounted at rear side of the wheelchair for driving the wheelchair; the integrated control seat of the auxiliary drive unit is assembled onto the handle of the wheelchair, and also provided with a starting switch and acceleration lever for startup/closing and speed control of the drive unit.

[0003] As for the typical integrated control seat, the coupling portion is often designed according to the specification and shape of the wheelchair handle, so the integrated control seat could only be assembled onto the customized wheelchair handle. Yet, there are currently available with various specifications and shapes of the wheelchair handles, along with different sizes of hands and operating habits of the users. When the user is intended to install an auxiliary drive unit on the wheelchair, he/she may find it difficult for assembly and positioning since the integrated control seat cannot be mated with the wheelchair handle. To this end, this auxiliary drive unit cannot be widely applied.

[0004] Moreover, the shortcoming of the typical auxiliary drive unit lies in inconvenient assembly and disassembly of the drive unit and the wheelchair, making it necessary for further improvement to meet the customer demands.

[0005] Thus, to overcome the aforementioned problems of the prior art, it would be an advancement if the art to provide an improved structure that can significantly improve the efficacy.

[0006] Therefore, the inventor has provided the present invention of practicability after deliberate design and evaluation based on years of experience in the production, development and design of related products.

SUMMARY OF THE INVENTION

[0007]

1. Based upon the innovative design that the assembly end of integrated control seat is provided with adjustable clamp and swinging portion, the integrated control seat can be assembled securely onto the wheelchair handles of different diameters and curvatures, and the swinging angle can be adjusted flexibly, it is possible to guarantee outstanding adaptability of assembly, convenient adjustment and ease-of-operation to meet the diversified customer demands.

2. Based upon the arrangement of the combined positioning member, the assembly frame and the wheel body of wheelchair body can be connected and fixed easily; when it is intended for disassembly, the rings of pulling portion at top of left and right pins are pulled upwards via the connector, so that the assembly frame can be released. This design ensures simple assembly and disassembly of the auxiliary drive unit and wheelchair body for efficient and convenient operation with improved applicability.

[0008] Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 depicts an application perspective view of the present invention that the integrated control seat is adapted onto the existing wheelchair handle.

FIG. 2 depicts a partial exploded perspective view of the integrated control seat of the present invention.

FIG. 3 depicts a partial assembled perspective view of the integrated control seat of the present invention.

FIG. 4 depicts a schematic view of the integrated control seat of the present invention with adjustable swinging angle.

FIG. 5 depicts an application view of the present invention that the integrated control seat is adapted onto another wheelchair handle.

FIG. 6 depicts an exploded perspective view of the wheel body and auxiliary drive unit of the present invention.

FIG. 7 depicts an assembled schematic view of the assembly end of the assembly frame and the connecting slot of the wheelchair frame.

FIG. 8 depicts an operation view of the present invention that the pins at both sides of the wheelchair frame can be driven by the connector.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The features and the advantages of the present invention will be more readily understood upon a thoughtful deliberation of the following detailed description of a preferred embodiment of the present invention with reference to the accompanying drawings.

[0011] FIGS. 1~8 depict preferred embodiments of wheelchair structure of the present invention, which, however, are provided for only explanatory objective for patent claims.

[0012] Said wheelchair structure comprising:

a wheelchair body 10, available with a handle 11, a seat 12 and a wheel body 13;
an integrated control seat 20, used to control the operating state of the auxiliary drive unit 30 installed on the wheelchair body 10; the integrated control seat 20 comprises a starting switch 21 and an acceleration lever 22; an electrical connecting wire 23 is fixed laterally on the integrated control seat 20; the integrated control seat 20 is provided with an assembly end 24 allowing for assembly onto the handle 11 of the wheelchair body 10; the assembly end 24 of the integrated control seat 20 is provided with an adjustable clamp 25, which contains clamping port 26 allowing to change the clamping amplitude; the assembly end 24 of the integrated control seat 20 comprises a swinging portion 27, which enables the integrated control seat 20 to change dynamically the swinging angle, and a control member 28 is assembled to adjust the adjustable positioning or release state of the swinging portion 27; the auxiliary drive unit 30 comprises a wheel body 31, a drive member 32 and a power supply assembly 33;
a assembly frame 40, transversely assembled onto the auxiliary drive unit 30; the assembly frame 40 is defined into two assembly ends 41, and also provided with adjustment member 42 that determines the extension length of two assembly ends 41;
a combined positioning member 50, assembled at left and right sides of the wheel body 13 of wheelchair body 10; the combined positioning member 50 contains a connecting slot 51, which is provided with a lateral guide inlet 52 and an internal retaining wall 53; at top of the connecting slot 51, there is an accommodating seat 54, wherein a groove 55 is used for inserting a pin 56 and elastic member 57; a retaining portion 58 with single-sided oblique guide surface 581 is arranged at bottom of the pin 56; the elastic member 57 is used for supporting downwards the pin 56 normally, enabling the retaining portion 58 to be protruded into the connecting slot 51 for positioning purpose, or enabling the single-sided oblique guide surface 581 to align with the lateral guide inlet 52 of the connecting slot 51; at top of the pin 56, a pulling portion 59 is protruded from the accommodating seat 54 to pull upwards the pin 56 into a release state.

[0013] Based on internal and external plywood 251, 252 arranged symmetrically, the adjustable clamp 25 is screwed at the middle section via a pivot bolt 60; and a torsion spring 61 is assembled at the pivot bolt 60; at inner side of the exterior of internal and external plywood 251, 252, a corresponding arched flange 253 is arranged to form the clamping port 26, of which the interior of the internal plywood 251 is fastened onto the integrated control seat 20 via a bolt 62; the adjustable clamp 25 also comprises a packing locator 63; the packing locator 63 has a screw bolt 632 with rotary knob 631 so that a rotating cylinder 65 with tapped hole 64 is screwed onto the interior of the external plywood 252, and a long through-hole 66 is opened on the inner wall of the internal plywood 251; then, the screw bolt 632 is allowed to penetrate the long through-hole 66, and the tapped hole 64 of the rotating cylinder 65 is abutted into the trough 622 of the bolt head 621 at inner end of the internal plywood 251.

[0014] As for the preferred embodiment of the swinging portion 27 at the assembly end 24 of integrated control seat 20, a protruding seat 241 is formed on the assembly end 24 of the integrated control seat 20; the protruding seat 241 is defined to form an internal wall 242 and external wall 243; the protruding seat 241 is transversely provided with a through-hole 244, so that the inner wall of the internal plywood 251 of aforementioned adjustable clamp 25 is abutted onto the internal wall 242 of the protruding seat 241; the control member 28 is comprised of a rotary knob 282 with a threaded hole 281, and then the bolt 62 is used to penetrate the internal plywood 251 of the adjustable clamp 25, through-hole 244 of the protruding seat 241 and the threaded hole 281 of rotary knob 282, enabling the bolt head 621 of the bolt 62 to be abutted onto the internal plywood 251 of the adjustable clamp 25; the stud of the bolt 62 is screwed onto the threaded hole 281 of the rotary knob 282.

[0015] The assembly end 41 of the assembly frame 40 could be embedded into the lateral guide inlet 52 of the connecting slot 51, then forcibly pushed forwards the single-sided oblique guide surface 581 to cross the retaining portion 58 of the pin 56; next, the assembly end 41 of the assembly frame 40 is limited securely between the internal retaining wall 53 of the connecting slot 51 and the retaining portion 58 of the pin 56; conversely, when the pin 56 is pulled upwards by the pulling portion 59, the retaining portion 58 is disengaged from the connecting slot 51, so the assembly end 41 of the assembly frame 40 could be released from the connecting slot 51.

[0016] A reducing through-hole 551 is arranged at top of the groove 55 of the accommodating seat 54, so that the top of the pin 56 penetrates the reducing through-hole 551 to form the pulling portion 59; rings 70 are arranged on the pulling portion 59; then, the rings 70 at left and right sides of the pin 56 of the wheel body 13 of wheelchair body 10 are linked by a connector 71 (strip, rope, chain, rod) for simultaneous motion.

[0017] Based upon above-specified structural design, the present invention is operated as follows:

One function of the integrated control seat 20 is that, it allows to be assembled onto the wheelchairs of different diameters via the design of adjustable clamp 25. Referring to FIG. 4, the rotary knob 631 of the packing locator 63 could be rotated clockwise or counterclockwise to drive the screw bolt 632 and tapped hole 64 of the rotating cylinder 65 for relative

screwing motion; the rotating cylinder 65 will shift forwards and backwards on the screw bolt 632, thus driving the external plywood 252 to generate swinging behavior, and leading to varied clearance of the clamping port 26 formed between internal and external plywood 251, 252 of the adjustable clamp 25; based on the adjustable design of the clamping port 26 of the adjustable clamp 25 , the integrated control seat 20 could be assembled onto the handle 11 of different diameters, meanwhile the adjustable clamp 25 could be fastened securely with the use of packing locator 63.

[0018] The second function of the integrated control seat 20 is to change the swinging angle of the integrated control seat 20 via the design of the swinging portion 63, so as to adjust the spacing between the acceleration lever 22 and handle 11 for manual operation; referring to FIG. 4, the rotary knob 282 of the control member 28 could be rotated clockwise or counterclockwise to control the positioning or adjustment state of the integrated control seat 20; when the rotary knob 282 is loosened, the internal wall 242 of the protruding seat 241 and the internal plywood 251 of the adjustable clamp 25 will become loosened, so the swinging angle of the integrated control seat 20 can be adjusted; conversely, when the rotary knob 282 is tightened, the internal wall 242 of the protruding seat 241 and the internal plywood 251 of the adjustable clamp 25 will become tightened for positioning the integrated control seat 20.

[0019] Additionally, based on the adjustable swinging characteristics, the integrated control seat 20 can be applied to wheelchair handles of different shapes. Referring to FIG. 4, the adjustable clamp 25 of the integrated control seat 20 is adapted onto the cross-bar section of the handle 11; referring also to FIG. 5, the adjustable clamp 25 of the integrated control seat 20 is adapted onto the curved section of the handle 11B.

[0020] Referring to FIG. 6, the assembly frame 40 is provided with adjustment member 42 that can define the protruding length of two assembly ends 41 in line with the extended width of the wheelchair body 10;

[0021] Referring to FIG. 7, when the assembly end 41 of the assembly frame 40 enters transversely into the lateral guide inlet 52 of the connecting slot 51, the assembly end 41 will slide along the single-sided oblique guide surface 581, so that the retaining portion 58 will push upwards the elastic member 57 and make it accumulate elastic force under the transverse force applied by the assembly end 41; as such, the assembly end 41 can smoothly slide into the connecting slot 51; when the assembly end 41 passes through the retaining portion 58, the elastic member 57 will release the elastic force, then the retaining portion 58 will slide down and protrude from the groove 55; the assembly end 41 is just positioned between the internal retaining wall 53 and retaining portion 58.

[0022] Referring to FIG. 8, the pulling portion 59 is fitted with a ring 70; and the rings 70 at left and right sides of the pin 56 of the wheel body 13 are linked by a connector 71 (strip, rope, chain, rod) for simultaneous motion. When it is intended to be disengaged from the assembly end 41 at both ends of the assembly frame 40, the connector 71 could be pulled so that the pulling portion 59 at top of the pin 56 can protrude simultaneously from the reducing through-hole 551, allowing the retaining portion 58 to recess into the groove 55 and then disengage the assembly end 41 of the assembly frame 40.

Claims

1. A wheelchair structure, comprising:

a wheelchair body, available with a handle, a seat and a wheel body;
an integrated control seat, comprising a starting switch and an acceleration lever; an electrical connecting wire is fixed laterally on the integrated control seat; the integrated control seat is provided with an assembly end allowing for assembly onto the handle of the wheelchair body; the assembly end of the integrated control seat is provided with an adjustable clamp, which contains a clamping port allowing to change the clamping amplitude; the assembly end of the integrated control seat also comprises a swinging portion, which enables the integrated control seat to change dynamically the swinging angle, and a control member is assembled to adjust the adjustable positioning or release state of the swinging portion;
an auxiliary drive unit, comprising a wheel body, a drive member and a power supply assembly;
an assembly frame, transversely assembled onto the auxiliary drive unit; the assembly frame is defined into two assembly ends;
a combined positioning member, assembled at left and right sides of the wheel body of wheelchair body; the combined positioning member contains a connecting slot, which is provided with a lateral guide inlet and an internal retaining wall; at top of the connecting slot, there is an accommodating seat, wherein a groove is used for inserting a pin and elastic member; a retaining portion with single-sided oblique guide surface is arranged at bottom of the pin; the elastic member is used for supporting downwards the pin normally, enabling the retaining portion to be protruded into the connecting slot for positioning purpose, or enabling the single-sided oblique guide surface to align with the lateral guide inlet of the connecting slot; at top of the pin, a pulling portion is protruded from the accommodating seat to pull upwards the pin into a release state.

2. The structure defined in Claim 1, wherein the adjustable clamp is screwed via a pivot bolt at the middle section through symmetrical internal and external plywood via a pivot bolt, and a torsion spring is assembled at the pivot bolt; at inner side of the exterior of internal and external plywood, a corresponding arched flange is arranged to form the clamping port, of which the interior of the internal plywood is fastened onto the integrated control seat via a bolt; the adjustable clamp also comprises a packing locator; the packing locator has a screw bolt with rotary knob so that a rotating cylinder with tapped hole is screwed onto the interior of the external plywood, and a long through-hole is opened on the inner wall of the internal plywood; then, the screw bolt is allowed to penetrate the long through-hole, and the tapped hole of the rotating cylinder is abutted into the trough of the bolt head at inner end of the internal plywood.

3. The structure defined in Claim 1, wherein the preferred embodiment of the swinging portion of the assembly end of integrated control seat is involved; a protruding seat is formed on the assembly end of the integrated control seat; the protruding seat is defined to form internal and external walls; the protruding seat is transversely provided with a through-hole, so that one side of aforementioned adjustable clamp is abutted onto the internal wall of the protruding seat; the control member is comprised of a rotary knob with a threaded hole, and then the bolt is used to penetrate the adjustable clamp, through-hole of the protruding seat and the threaded hole of rotary knob, enabling the bolt head of the bolt to be abutted onto one end of the adjustable clamp; the stud of the bolt is screwed onto the threaded hole of the rotary knob.

4. The structure defined in Claim 1, wherein the assembly end of the assembly frame could be embedded into the lateral guide inlet of the connecting slot, then forcibly pushed forwards the single-sided oblique guide surface, allowing the assembly end to enter into the connecting slot for a positioning state; and the pulling portion is provided with a ring; then, the rings at left and right sides of the pin of the wheel body of wheelchair body are linked by a connector for simultaneous motion.

5. The structure defined in Claim 4, wherein said connector can be strip, rope, chain or rod.

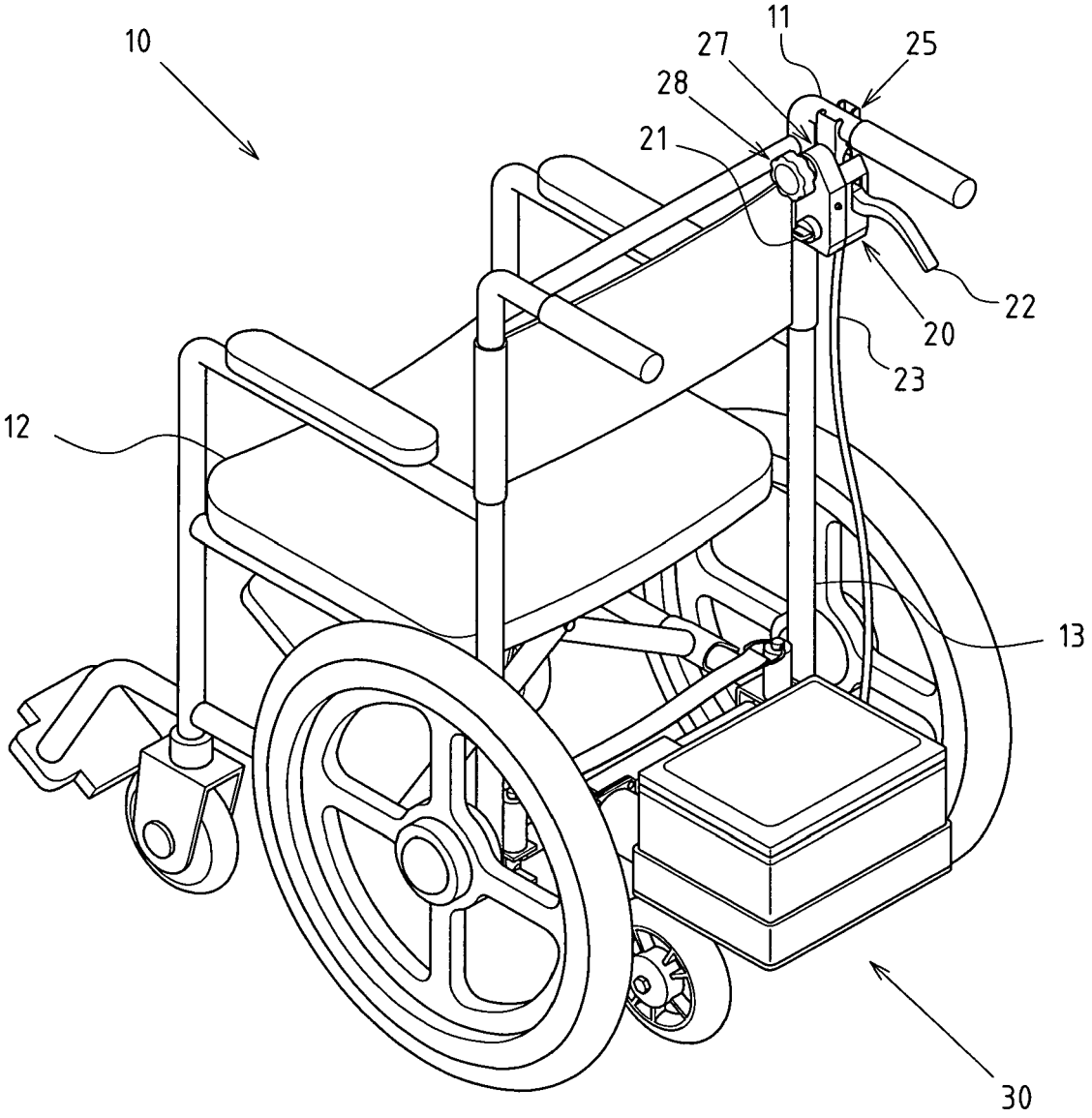

FIG.1

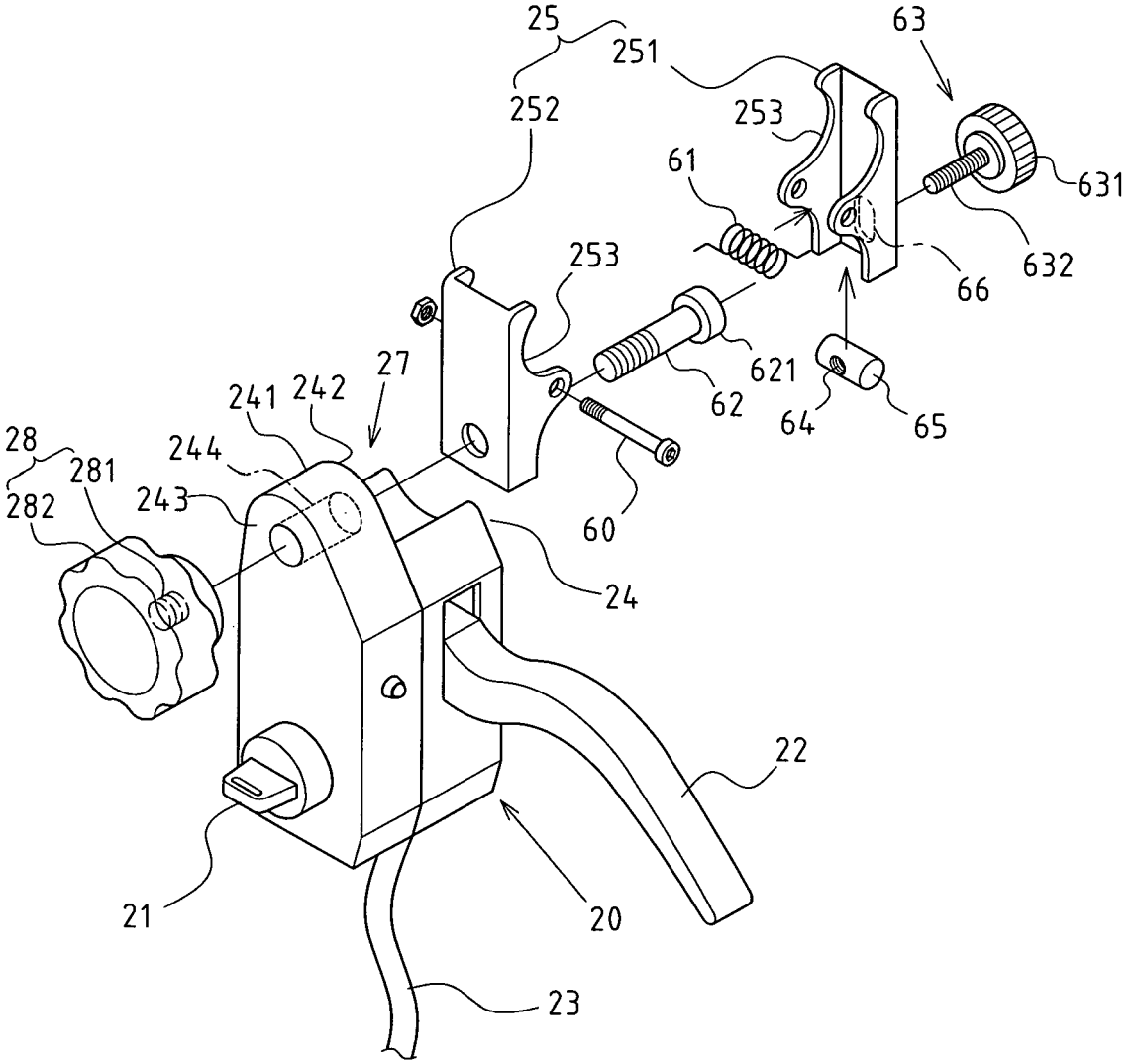
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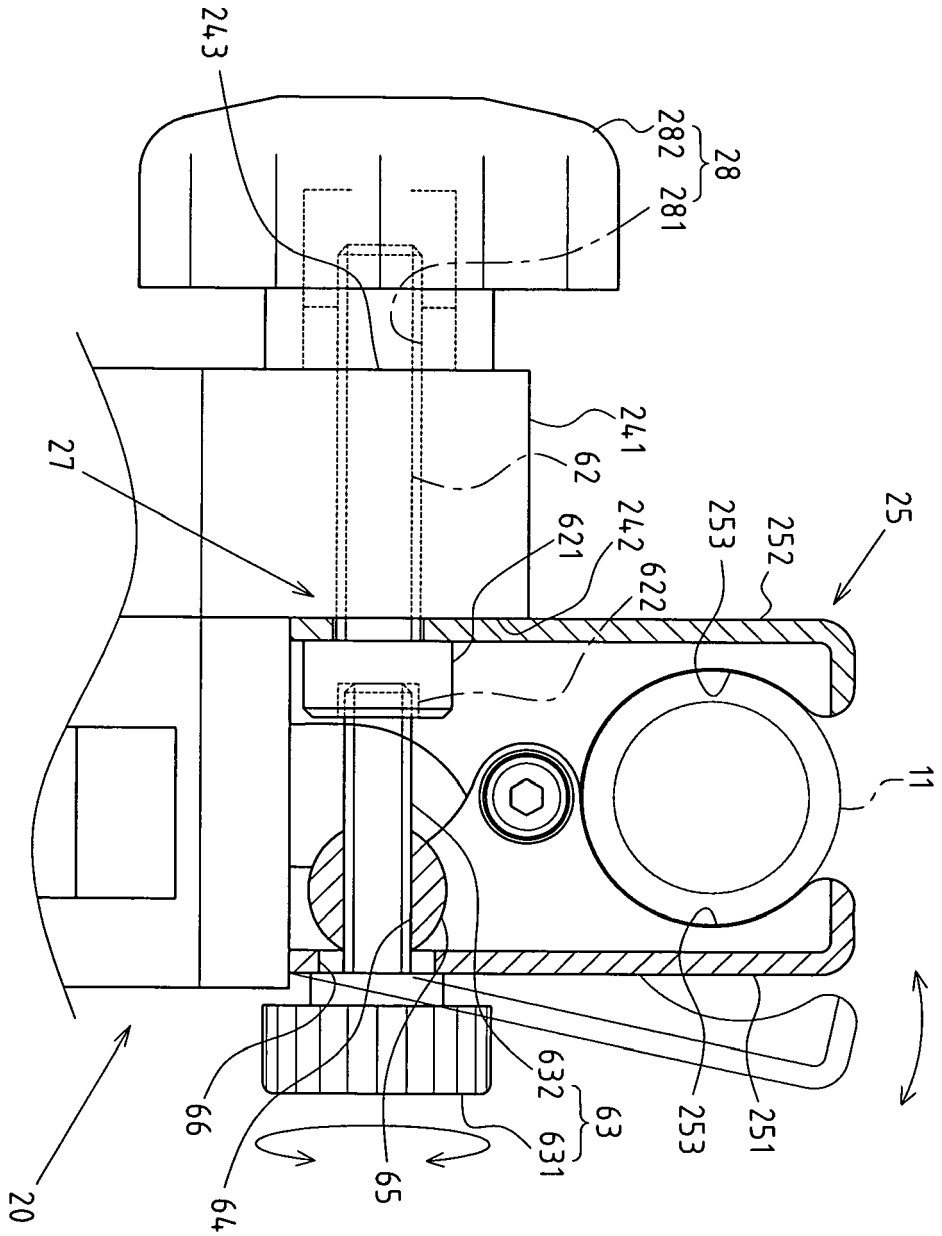
FIG.2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11
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251
20

FIG.3

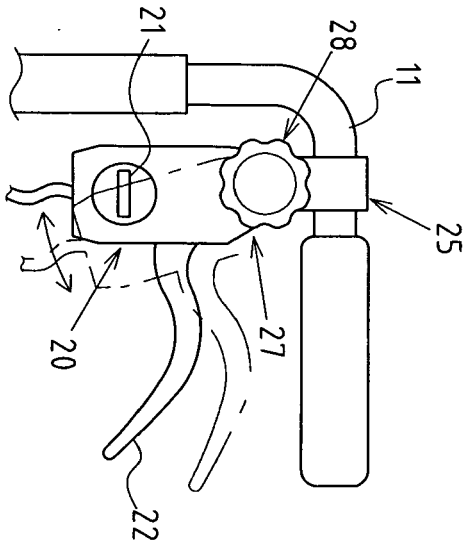

FIG.4

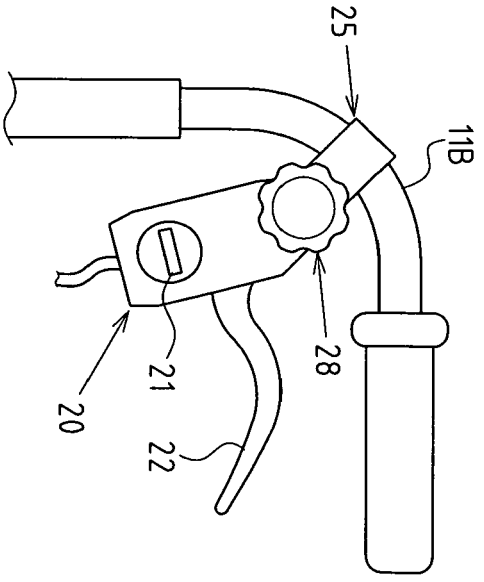

FIG.5

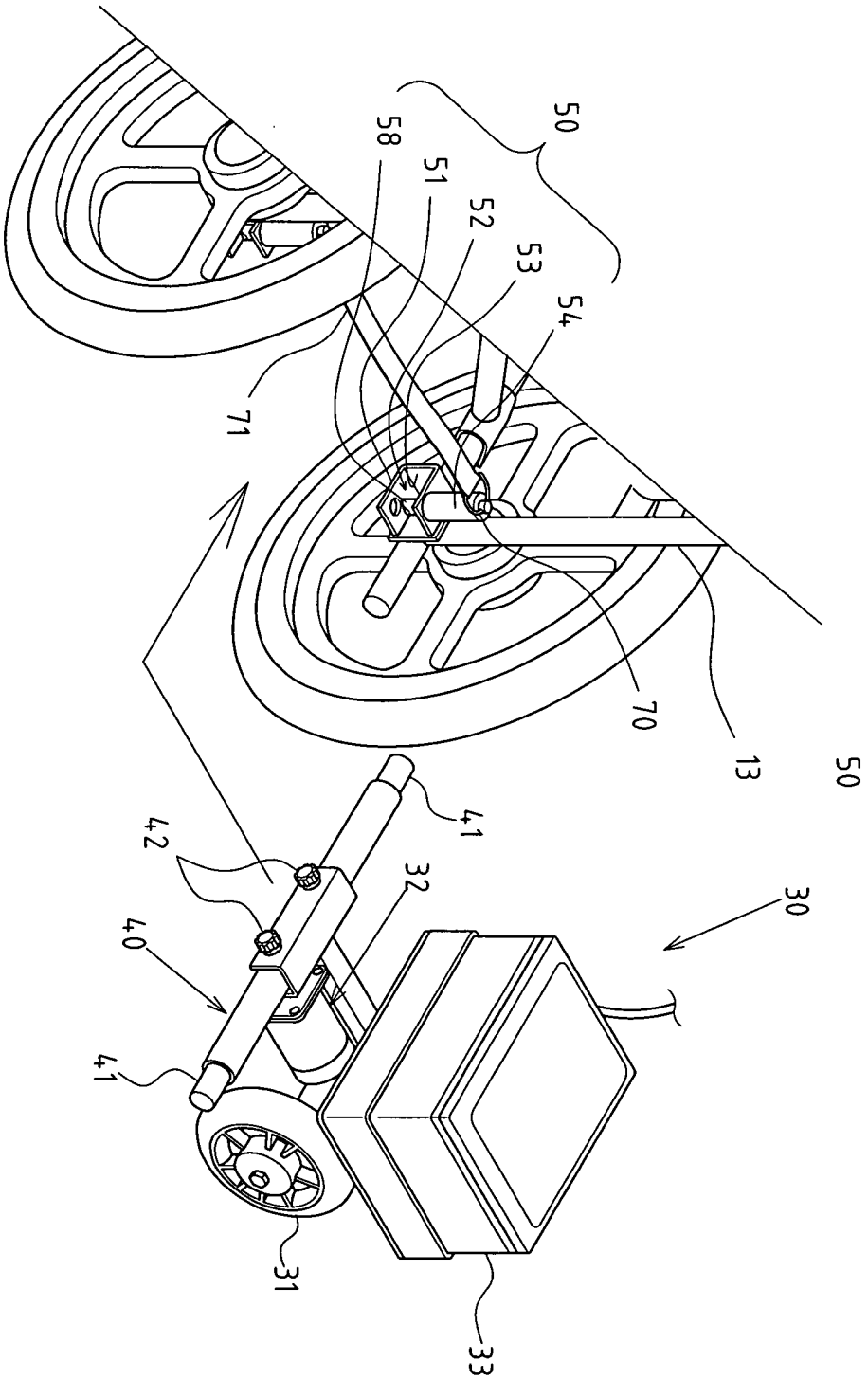

FIG.6

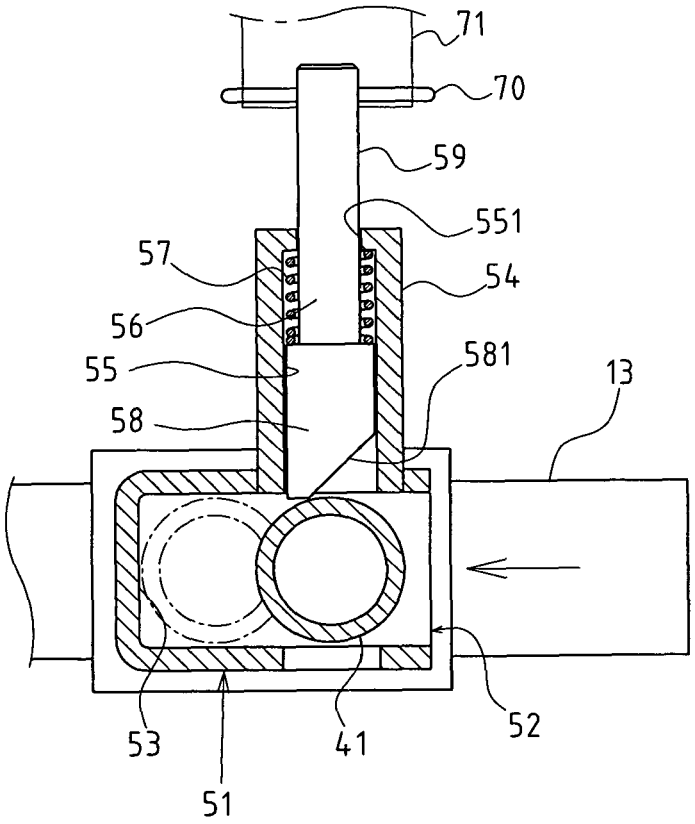

FIG.7

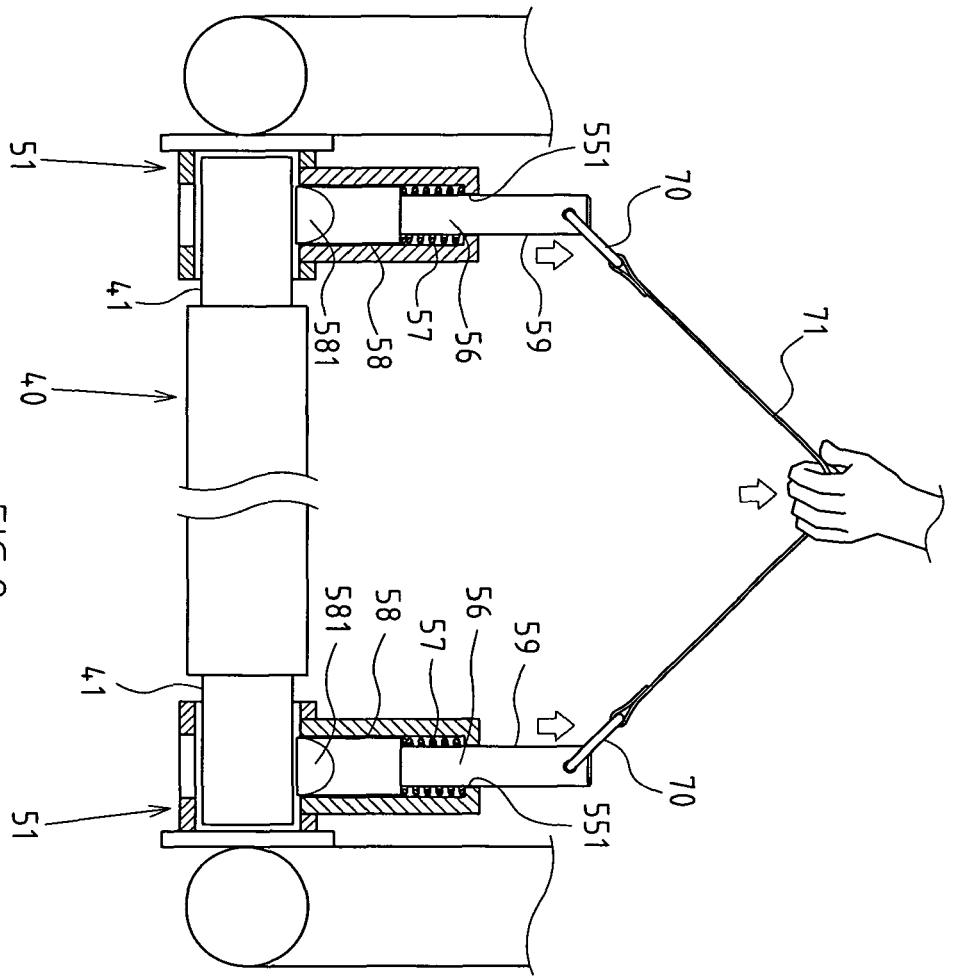

FIG.8

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EUROPEAN SEARCH REPORT

Application Number
EP 08 01 2317

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 281 727 A (FISHER & PAYKEL [NZ]) 15 March 1995 (1995-03-15) * page 1, lines 3-5 * * page 2, lines 1-12 * * page 3, line 13 - page 4, line 21 * * page 5, line 3 - page 6, line 7; figures 2-6,8 *	1	INV. A61G5/04 A61G5/10
A	DE 200 03 481 U1 (REHATECHNIK HEYMER GMBH [DE]) 21 June 2000 (2000-06-21) * figures 1,2,3a,3b,3c,4 *	1	
			TECHNICAL FIELDS SEARCHED (IPC) A61G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 December 2008	Petzold, Jan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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19-12-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2281727 A	15-03-1995	DE 4432733 A1	23-03-1995
		US 5495904 A	05-03-1996
DE 20003481 U1	21-06-2000	DE 19918605 C1	16-03-2000
		EP 1046384 A2	25-10-2000

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