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(54) **A foldable wheelchair**

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Fauteuil roulant pliable

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(56) References cited:
EP-A- 0 067 069 **WO-A-95/12514**
GB-A- 2 211 482 **GB-A- 2 224 433**
US-A- 2 850 075 **US-A- 3 076 678**
US-A- 3 833 256 **US-A- 4 917 395**
US-A- 5 060 960

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Description

Background of the invention

[0001] The present invention relates to a foldable wheelchair comprising a pair of spaced main frames extending in a longitudinal direction in parallel to each other, a back supporter laterally spanning the main frames, large wheels detachably coupled to the main frames, and a seat plate supported by the main frames

[0002] In the following description, a term "a user" refers to a person such as a sick patient, an old man or a bodily crippled person who needs to use a wheelchair for travel between two distant spots.

[0003] Further, a term "longitudinal direction" refers to a horizontal direction extending front to rear on a wheelchair whereas a term "lateral direction" refers to a horizontal direction substantially perpendicular to the longitudinal direction.

[0004] A conventional wheelchair includes a pair of main frames spaced in the lateral direction by two or more transverse bars. The rear side of the wheelchair is closed by a back upholstery spanning upright pole sections of the main frames. A pair of large wheels are coupled to both lateral sides of the main frames. A pair of casters are also coupled to the main frames on the front sides of the associated large wheels. A pair of footplates are attached to the front lower ends of the main frames in a side-by-side arrangement whilst projecting forwards.

[0005] For movement of a wheelchair, its user may rotate the large wheels via push rims attached to the large wheels. Alternatively, a helper may push the wheelchair via handgrips attached to the back upholstery.

[0006] In either case, the relatively rigid construction of a wheelchair and presence of large wheels cause much inconveniences in actual use of the wheelchair.

[0007] First, due to presence of the transverse bars spanning two main frames, it is almost impossible to bring the wheelchair as close as possible to the position of a user lying on a bed. So, for transfer of a user between a wheelchair and a bed, two or more helpers need to carry the user manually. This manual transfer not only poses much load on the helpers but, depending on the body condition of the user, caused much physical pains of the user.

[0008] Second, due presence of the two large wheels projecting sideways from the main frame, a wheelchair can go through only a toilet door or a bath door which is designed specially broad enough for allowing its passage. Here again, the user needs assistance by two or more helpers.

[0009] The relatively rigid construction and presence of various accessories such as footplates make a wheelchair very unwieldy and such an unwieldy construction causes some trouble on transportation of a wheelchair.

[0010] Typical examples of wheelchairs are proposed in US patents No. 5,060,960 issued to Branscumb and

3,076,678 issued to Griffin.

[0011] The US-A-5 060 960 document discloses a wheelchair that facilitates the movements of a patient from bed to wheelchair and back. This wheelchair comprises a lifting device and its backrest, which is provided with fasteners such as Velcro strips, may be removed from the frame. The lift assembly of this wheel chair, which permits to the seat panel to raise or lower upon activation, consists of two rearwardly extending foot pedals. However, when the wheelchair is moved very close to a user lying on a bed so that the seat panel is located below this user, these two pedals cannot be properly used, because, in this case, they are located under the bed.

[0012] The US-A-3,076,678 document also concerns a wheelchair with a movable seat permitting to the occupant to elevate himself to a height where he can work. In this realisation, the lifting system depends on a spring mechanism and necessitates for the occupant to partially lift himself by use of his arms and hands on the arm rests. Such a system is quite unsuited for a user lying on a bed.

Summary of the invention

[0013] It is the basic object of the present invention to enable close approach of a wheelchair to a user lying on a bed.

[0014] It is another object of the present invention to enable free passage of a wheelchair even through ordinary door which are not specially designed for wheelchair, this wheelchair being well suited for transportation.

[0015] With this aim, the wheelchair such as defined in the preamble is characterised in that the back supporter is pivotally connected at one end to the rear end of one main frame and detachably connected at the other end to the rear end of the other main frame such that its horizontal swing makes the rear side of the wheelchair fully open, that the seat plate is connected by means of suspension belts to a pair of lifter shafts which are mounted to the main frames in an axially turnable arrangement such that axial turning of these lifter shafts causes vertical displacement of the seat plate, and that the lifter shafts are connected in operation to a driving system for axial turning.

[0016] In the preferred embodiment, the driving system includes lifter arms, each of which being connected to the front end of each lifter shaft in a radial arrangement such that vertical swing of the lifter arms causes the axial turning of the lifter shafts.

[0017] In a variant of realisation, the driving system includes a wheel fixed to the front end of each lifter shaft and a drive source connected in operation to the wheel.

[0018] The main frames are advantageously associated at their front lower ends with a pair of footplates which are united together along a center longitudinal hinge in a foldable arrangement.

Brief description of the drawings

[0019]

Fig. 1 is a perspective view of one embodiment of the foldable wheelchair in accordance with the present invention in the fully assembled state, Fig. 2 is a side view of the foldable wheelchair, Fig. 3 is a top plane view of the foldable wheelchair, Fig. 4 is a fragmentary front view of the foldable wheelchair, Fig. 5 is an enlarged side view of the large wheel unit used for the wheelchair shown in Fig. 1, Fig. 6 is an enlarged side view of the caster unit used for the wheelchair shown in Fig. 1, Fig. 7 is a perspective view of the foldable wheelchair in a partly disassembled state, and Fig. 8 is a perspective view of the foldable wheelchair in a fully folded state, Fig. 9 is a side view of another embodiment of the lifter unit used for the wheelchair of the present invention, Fig. 10 is a top plan view of the same arrangement, Fig. 11 is a front view of the same arrangement, and Fig. 12 is a perspective view of the other embodiment of the lifter unit used for the wheelchair of the present invention.

Description of the preferred embodiments

[0020] A basic embodiment of the foldable wheelchair in accordance with the present invention is shown in Figs. 1 through 4. As major components, the wheelchair includes a pair of main frames 1 extending in the longitudinal direction, a back supporter 6 detachably connecting the main frames 1 at their rear upper ends, a seat unit 2 including a seat plate 21, a lifter unit 3 detachably suspending the seat plate 21 from the main frame 1, a pair of large wheel units 4 detachably coupling large wheels 43 to the main frames 1, a foldable foot unit 7 coupled to the front lower ends of the main frames 1, and a pair of caster units 8 coupled to the rear lower ends of the main frames 1.

[0021] As best seen in Fig. 2, each main frame 1 is made up of a horizontal upper frame 11, a horizontal lower frame 12 and a vertical front frame 13, all connected in one body to each other. The rear side of the main frame 1 is left open. This rear open construction of the main frame 1 is very important for close approach of the wheelchair to a bed on which its user is lying. Near the rear end, the upper frame 11 is provided with an armrest stand 14 and an upper lock 15 for the large wheel unit 4. Further on the rear side, the upper frame 11 is provided with a back support stand 17. Likewise, near the rear end, the lower frame 12 is provided with a lower lock 16 for the large wheel unit 4.

[0022] The lifter unit 3 includes a pair of lifter shafts 31 each extending in parallel to an associated upper

frame 11 of the main frame 1. More specifically, each lifter shaft 31 is held by the associated upper frame 11 via a plurality of bosses 32 which are idly inserted over the upper frame 11. Stated otherwise, the lifter shaft 31 is turnable about the axis of the upper frame 11. At the front end, each lifter shaft 31 is associated with a lifter arm 33 radially connected thereto. Thus, when the lifter arm 33 is manually swung in a vertical plane normal to the longitudinal direction, an associated lifter shaft 31 turn about the axis of the upper frame 11. At distal ends, the pair of lifter arms 33 are provided with buckles 34 for mutual end connection.

[0023] As seen in Figs. 2 and 3, the seat unit 2 includes a flat seat plate 21 preferably provided with a center opening. Near four corners, the seat plate 21 is connected to the lifter shafts 31 of the lifter unit 3 via suspension belts 22. Each suspension belt 22 is provided with a midway buckle 23 so that the seat plate 21 can be detached from the lifter unit 3 by disengaging the buckles 23. The system is adjusted so that, when the seat plate 21 rest at its lower position without lifting by the lifter unit 3, the seat plate 21 should be located at the level of ordinary western style toilet basin.

[0024] Each large wheel unit 4 includes a rim shaft 41 (see Fig. 5). The rim shaft 41 is provided at midway with a wheel bracket 42 which extends forwards in order to carry a large wheel 43. Below the wheel bracket 42, a lock sleeve 44 is idly inserted over the rim shaft 41. At the lower end, the rim shaft 41 is provided with a lock pin 45 extending forwards. At the upper end, the rim shaft 41 is detachably coupled to the rear end of the upper frame 11 of the main frame 1 by assistance of the upper lock 15. Whereas, at the lower end, the rim shaft 41 is also detachably coupled to the rear end of the lower frame 12 of the main frame 1 by assistance of the lower lock 16, the lock pin 45 and the lock sleeve 44. Thus when unlocked at the upper and lower ends, the rim shafts 41 can be detached from associated main frames 1 together with the large wheels 43.

[0025] On each main frame 1, an armrest 5 is preferably pivoted at its rear end to the armrest stand 14 on the upper frame 11 so that it covers the upper frame 11 and the bosses 32 in its lower position. The armrest 5 is swung upwards in order to allow free turning of the lifter shaft 31 about the axis of the associated upper frame 11.

[0026] A curved back supporter 6 spans the rear upper ends of the main frames 1. More specifically, the back supporter 6 is horizontally turnably coupled to one back supporter stand 17 on upper frame 11 at one end. The other end of the back supporter 6 is coupled detachably to the other back supporter stand 17 on the other upper frame 11 by assistance of a lock sleeve 61. When the lock sleeve 61 rests in its lower position, the back supporter 6 is firmly coupled to both main frames 1 to define the lateral distance between the main frames 1. As the lock sleeve 61 is moved upwards, the back supporter 6 is turnable about the one end so that the

other end is detached from the associated rear end of the other upper frame 11.

[0027] The foot unit 7 includes a pair of parallel side plates 71 extending forwards from the rear ends of the lower frames of the main frames 1. Each side plate 71 is connected to a foot plate 72 along a side hinge 74 extending in the longitudinal direction. The two foot plates 72 are connected to each other along a center hinge 73 extending in parallel to the side hinges 74. A transverse lock arm 75 is pivoted at one end to one side plate 71. The other end of the lock arm 75 is detachably fixed to the other side plate 71 by assistance of a lock handle 76 and a lock hole 77 formed in the other side plate 71. When the lock arm 75 rests in its rest position, it holds the footplates 72 in a flat state. As the lock arm 75 is swung to its open position as shown in Fig. 3, it allows folding of the footplates 72 along the hinges 73 and 74. Small wheels 78 are attached to the undersides of the side plates 71.

[0028] The caster unit 8 is shown in detail in Fig. 6. The caster unit 8 is fixed to the underside of the rear end of each lower frame 12 of the main frame 1 via a bifurcate caster frame 85 which sandwiches a caster 81. The caster 81 is rotatably mounted on a transverse caster shaft 82 fixedly carried by the bifurcate caster frame 85. In an arrangement to sandwich the caster frame 85, a bifurcate stand 83 is rotatably mounted to the caster shaft 82. A jack lever 89 is also rotatably mounted to the caster shaft 82 with its proximal end being in engagement with the stand 83. A tension spring 88 is interposed between one spring pin 86 fixed on the caster frame 85 and the other spring pin 87 fixed on the stand 83. Usually, the jack lever 89 is swung upwards by operation of the tension spring 88 and the caster 81 rests on the floor, the stand 83 being held above the floor. As the jack lever 89 is manually swung downwards against the operation of the tension spring 88, the stand 83 rests on the floor and the caster 81 is lifted from the floor. The size of the stand 83 is designed so that the large wheel 43 is also lifted from the floor when it rests on the floor. That is, the large wheel 43 is kept in a lifted position suited for detachment from the main frame 1.

[0029] The wheelchair operates as follows.

[0030] For transfer of a user from a bed to the wheelchair, the large wheels 43 have to be detached from the main frames 1 first. The jack lever 89 is pushed downwards by a helper in order to lift the large wheel 43 from the floor. Next, by loosening the upper and lower locks 15, 16 on the main frame 1, the rim shaft 41 is detached from the main frame 1 together with the large wheel 43 it holds (see Fig. 7). Then, the jack lever 89 is pushed upwards to let the caster 81 rest on the floor.

[0031] The seat plate 21 is detached from the main frames 1 by disengaging the buckles 23 on the four suspension belts 22. The lock sleeve 61 is moved upwards to release the other end of the back supporter 6 which is then swung rearwards to an open position about the back supporter stand 17 holding the other end (the up-

per side end in Fig. 3). Under this condition, the pair of main frames 1 are able to change their intermediate distance.

[0032] The seat plate 21 is inserted below the hip of a user lying on a bed and the upper half of the user's body is raised with the legs extending forwards. Next, the body of the user is turned about 90 degrees and the legs are made to hang down from the bed while facing the wheelchair.

[0033] The wheelchair is then moved towards the bed until the upper frames 11 are located on both sides of the user now sitting on the bed. Nothing hinders this rearward movement of the wheelchair because the rim shafts 41 have already been detached from the main frames 1 and the back supporter 6 has already swung to the open position. The lower frames 12 are now located under the bed. The back supporter 6 is again swung forwards to its closed position to connect the rear ends of the upper frames 11 together. The feet of the user are then placed on the footplates 72.

[0034] The armrests 5 are swung upwards about the respective armrest stands 14 and the seat plate 21 is connected to the lifter shafts 31 via the suspension belts 22. The lifter arms 33 are then swung upwards and connected to each other via the end buckles 34. This causes the lifter shafts 31 to turn about the axes of the associated upper frames 11 of the main frame 1. The seat plate 21 is now lifted from the bed whilst carrying the user thereon. This lifting of the user from the bed requires no strong force of the helper because it makes use of leverage operation of the lifter arms 33.

[0035] The wheelchair is then moved forwards away from the bed. The lifter arms 33 are disengaged from each other and swung downwards so as to turn the lifter shafts 31. The seat plate 21 is now located at its normal level position which is similar to the height of an ordinary western style toilet basin.

[0036] Under this condition of the wheelchair, the user now travels to a toilet by oneself or by assistance of a helper. On arriving at the toilet, the wheelchair can smoothly go through a toilet door of a normal size because the large wheels 43 have already detached from the main frames 1. The seat plate 21 is now located just on a toilet basin because of its adjusted normal level position.

[0037] Folding of the wheelchair is carried out in the following sequence. First, the lock handle 76 of the foot unit 7 is loosened and the lock arm 75 is swung to its open position away from the footplates 72. Next, the back supporter 6 is unlocked and swung to its open position about the back supporter stand 17 on one of the main frames 1. Finally, the footplates 72 are folded together about the hinges 73 and 74. When wanted, the large wheel units 4 may also be detached as shown in Fig. 8.

[0038] Assembly of the wheelchair is carried out in the following sequence. First, the footplates 72 are unfolded about the hinges 73 and 74 to separate the two main

frames 1 from each other and the back supporter 6 is swung to its closed position for locked connection with the main frames 1. Next, the lock arm 75 is swung to its closed position to fix the position of the footplates 72 and the jack levers 89 are pushed down to lift the caster 81 from the floor (see Fig. 7). Finally, the large wheel units 2 are attached to the respective main frames 1 and the jack levers 89 are swung upwards to make the casters 81 and the large wheels 43 descend on the floor.

[0039] Showering by a user is carried out in the following sequence. The user travels to a shower room by oneself or by assistance of a helper after detachment of the large wheel unit 4. In an alternative way, the large wheel unit 4 may be detached on arrival at the shower room. Because of the reduced width of the wheelchair without the large wheel unit 4, the wheelchair can go through a shower room door of a normal size. A simple chair is then placed under the seat plate 21 of the wheelchair and the lifter arms 33 of the lifter unit 3 are swung downwards to make the seat plate 21 descend on the simple chair. The seat plate 21 is then disconnected from the lifter unit and the wheelchair is taken out of the shower room. The user can shower sitting on the simple chair via the seat plate 21.

[0040] In accordance with the present invention, a wheelchair can approach very closely to a user lying on a bed thank to the open rear construction of the wheelchair. The wheelchair can go through various doors of normal sizes, in particular of normal widths, thanks to the detachable construction of the large wheel units. The wheelchair can be transported very easily thanks to its foldable construction. Further, use of the leverage operation for the lifter unit necessitates no strong manual force for lifting a user from a bed. Use of the jack lever system operable by foot action well simplifies attachment and detachment of the large wheel unit.

[0041] Another embodiment of the lifter unit 3 used for the wheelchair of the present invention is shown in Figs. 9 to 11, in which a worm-wheel unit is used for causing axial turning of the lifter shafts of the lifter unit.

[0042] More specifically, a wheel 111 is fixedly mounted to the front end of each lifter shaft 31 in meshing engagement with a worm 112. A driven gear 113 is coaxially connected to the worm 112. The driven gear 113 is connected in operation to a drive gear 115 by a timing belt 114. An operating lever 116 is coaxially fixed to the drive gear 115 for manual rotation of the latter. The gear-belt combination may be replaced by a sprocket-chain combination for transmission of rotation.

[0043] As shown in Fig. 11, the lifter unit is preferably accommodated in a closed housing 118 with the operating lever 116 projecting upwards. The housing 118 is located on the front upper side of the main frames 1 just in front of a user sitting on the seat plate 21. Since a user gets on and off the wheelchair through the rear side of the wheelchair, presence of such a housing on the front upper side of the main frame does not hinder smooth passage of the user into and out of the wheel-

chair.

[0044] For vertical movement of the seat plate 21, the operating lever 116 is rotated by the user in order to drive the lifter shafts 31 for axial turning. By the axial turning, each lifter shaft 31 winds up or winds down the associated suspension belt 22 to cause corresponding vertical movement of the seat plate 21.

[0045] According to the field tests conducted by the inventor, the seat plate 21 was moved up and down only for a distance of about 120 mm, when the lifter arms 33 were swung for about 270 degrees in the case of the first embodiment utilizing the leverage system. When the worm-wheel system of this embodiment was employed, the seat plate could be moved up and down between the floor level and any desired level.

[0046] The driving system for the lifter shafts 31 can be changed from manual to automatic as shown in Fig. 12, in which the drive gear 115 is fixed to the output shaft of a drive motor 117.

[0047] When compared with the lifter arm of the first embodiment, the worm-wheel unit of this embodiment includes no mechanical elements which move greatly. As a consequence, the system can operate quite freely without any influence of space restriction. Since a gear system is used for driving of the lifter shafts, it is possible to move the seat plate vertically with a small driving force by properly designing gear ratios in the system. Further, because a combination of a worm with a wheel is used for driving the seat plate, the seat plate can be stopped at any desired level during its vertical movement.

Claims

1. A foldable wheelchair comprising a pair of spaced main frames (1) extending in a longitudinal direction in parallel to each other, a back supporter (6) laterally spanning the main frames, large wheels (43), and a seat plate (21) supported by the main frames and being connected by means of suspension belts (22) to a pair of lifter shafts (31) which are mounted to the main frames (1) in an axially turnable arrangement such that axial turning of these lifter shafts causes vertical displacement of the seat plate (21), the lifter shafts (31) being connected in operation to a driving system for axial turning, characterized in that the large wheels (43) are detachably coupled to the main frames, and that the back supporter (6) is pivotally connected at one end to the rear end of one main frame (1) and detachably connected at the other end to the rear end of the other main frame (1) such that its horizontal swing makes the rear side of the wheelchair fully open.
2. A foldable wheelchair according to claim 1, characterized in that the driving system includes lifter arms (33), each of which being connected to the front end of each lifter shaft (31) in a radial arrangement such

that vertical swing of the lifter arms (33) causes the axial turning of the lifter shafts (31).

3. A foldable wheelchair according to claim 1, characterized in that the driving system includes a wheel (111) fixed to the front end of each lifter shaft (31) and a drive source connected in operation to the wheel.
4. A foldable wheelchair according to claim 1, characterized in that the main frames (1) are associated at their front lower ends with a pair of footplates (72) which are united together along a center longitudinal hinge (73) in a foldable arrangement.

Patentansprüche

1. Faltbarer Rollstuhl, der ein Paar voneinander beabstandeter Hauptrahmen (1) aufweist, die sich in Längsrichtung parallel zueinander erstrecken, sowie eine Rückenabstützung (6), die seitlich die Hauptrahmen umspannt, große Räder (43) und eine Sitzplatte (21), die von den Hauptrahmen getragen und mittels Aufhängegurten (22) mit einem Paar von Hebewellen (31) verbunden sind, die an den Hauptrahmen (1) in axial drehbarer Anordnung so befestigt sind, daß die axiale Drehbewegung dieser Hebewellen eine vertikale Verlagerung der Sitzplatte (21) verursacht, wobei die Hebewellen (21) kraftschlüssig mit einem Antriebssystem mit axialer Drehbewegung verbunden sind, **dadurch gekennzeichnet**, daß die großen Räder (43) abnehmbar an die Hauptrahmen gekoppelt sind, und daß die Rückenabstützung (6) drehbar am anderen Ende mit dem hinteren Ende eines Hauptrahmens (1) und entfernbar mit dem anderen Ende des anderen Hauptrahmens (1) so verbunden ist, daß ihre horizontale Drehung die Rückseite des Rollstuhls vollständig öffnet.
2. Faltbarer Rollstuhl nach Anspruch 1, **dadurch gekennzeichnet**, daß das Antriebssystem Hebearme (33) umfaßt, von denen jeder mit dem vorderen Ende einer jeden Hebewelle (31) in radialer Anordnung so verbunden ist, daß eine vertikale Drehung der Hebearme (33) die axiale Drehung der Hebewellen (31) veranlaßt.
3. Faltbarer Rollstuhl nach Anspruch 1, **dadurch gekennzeichnet**, daß das Antriebssystem ein Rad (111) aufweist, das an dem vorderen Ende einer jeden Hebewelle (31) befestigt ist, sowie eine Antriebsquelle, die kraftschlüssig mit dem Rad verbunden ist.
4. Faltbarer Rollstuhl nach Anspruch 1, **dadurch gekennzeichnet**, daß

die Hauptrahmen (1) an ihren vorderen unteren Enden mit einem Paar von Fußplatten (72) verbunden sind, die entlang eines mittigen Längsscharniers (73) in faltbarer Anordnung miteinander verbunden sind.

Revendications

1. Fauteuil roulant pliable comprenant une paire de cadres principaux (1) espacés, disposés dans une direction longitudinale et parallèles l'un à l'autre, un support arrière (6) reliant latéralement les cadres principaux, de grandes roues (43), et un siège (21) supporté par les cadres principaux et relié au moyen de courroies de suspension (22) à une paire de tiges de levage (31) qui sont montées sur les cadres principaux (1) de façon axialement pivotante de sorte qu'un pivotement axial de ces tiges de levage provoque un déplacement vertical du siège (21), les tiges de levage (31) étant reliées en fonctionnement à un système d'entraînement en pivotement axial, caractérisé en ce que les grandes roues (43) sont couplées de façon démontable aux cadres principaux, et en ce que le support arrière (6) est relié de façon pivotante, par une extrémité, à l'extrémité arrière d'un cadre principal (1) et est relié de façon démontable, par l'autre extrémité, à l'extrémité arrière de l'autre cadre principal (1) de sorte que son pivotement horizontal rend l'arrière du fauteuil roulant complètement ouvert.
2. Fauteuil roulant pliable selon la revendication 1, caractérisé en ce que le système d'entraînement comprend des bras de levage (33), chacun d'eux étant relié à l'extrémité avant de chaque tige de levage (31) dans une disposition radiale de sorte qu'un pivotement vertical des bras de levage (33) provoque le pivotement axial des tiges de levage (31).
3. Fauteuil roulant pliable selon la revendication 1, caractérisé en ce que le système d'entraînement comprend une roue (111) fixée à l'extrémité avant de chaque tige de levage (31) et des moyens d'entraînement couplés en fonctionnement à la roue.
4. Fauteuil roulant pliable selon la revendication 1, caractérisé en ce que les cadres principaux (1) sont associés à leurs extrémités inférieures avant à une paire de plaques repose-pied (72) qui sont reliées l'une à l'autre, d'une façon pliable, par une charnière centrale longitudinale (73).

FIG. 1

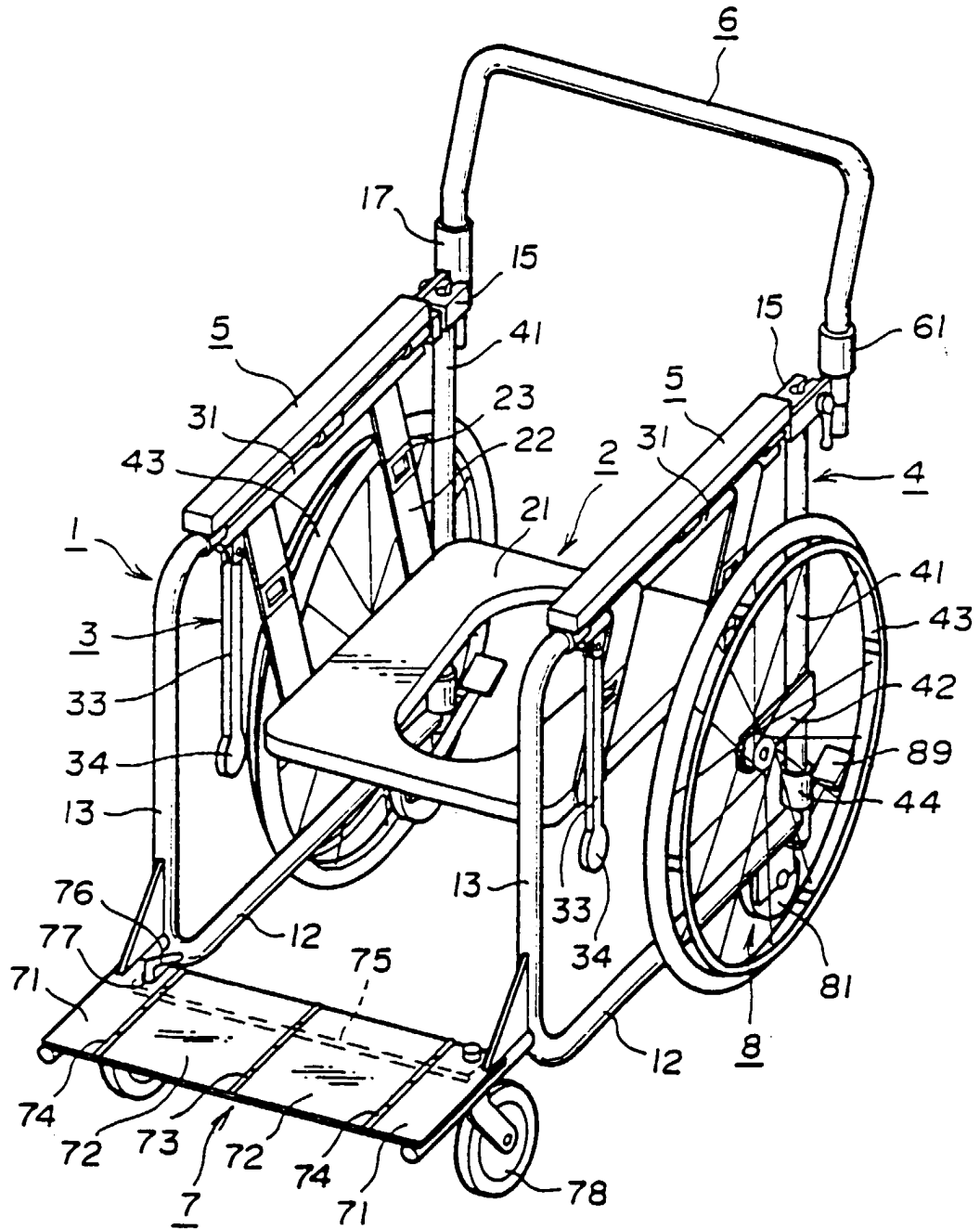


FIG. 3

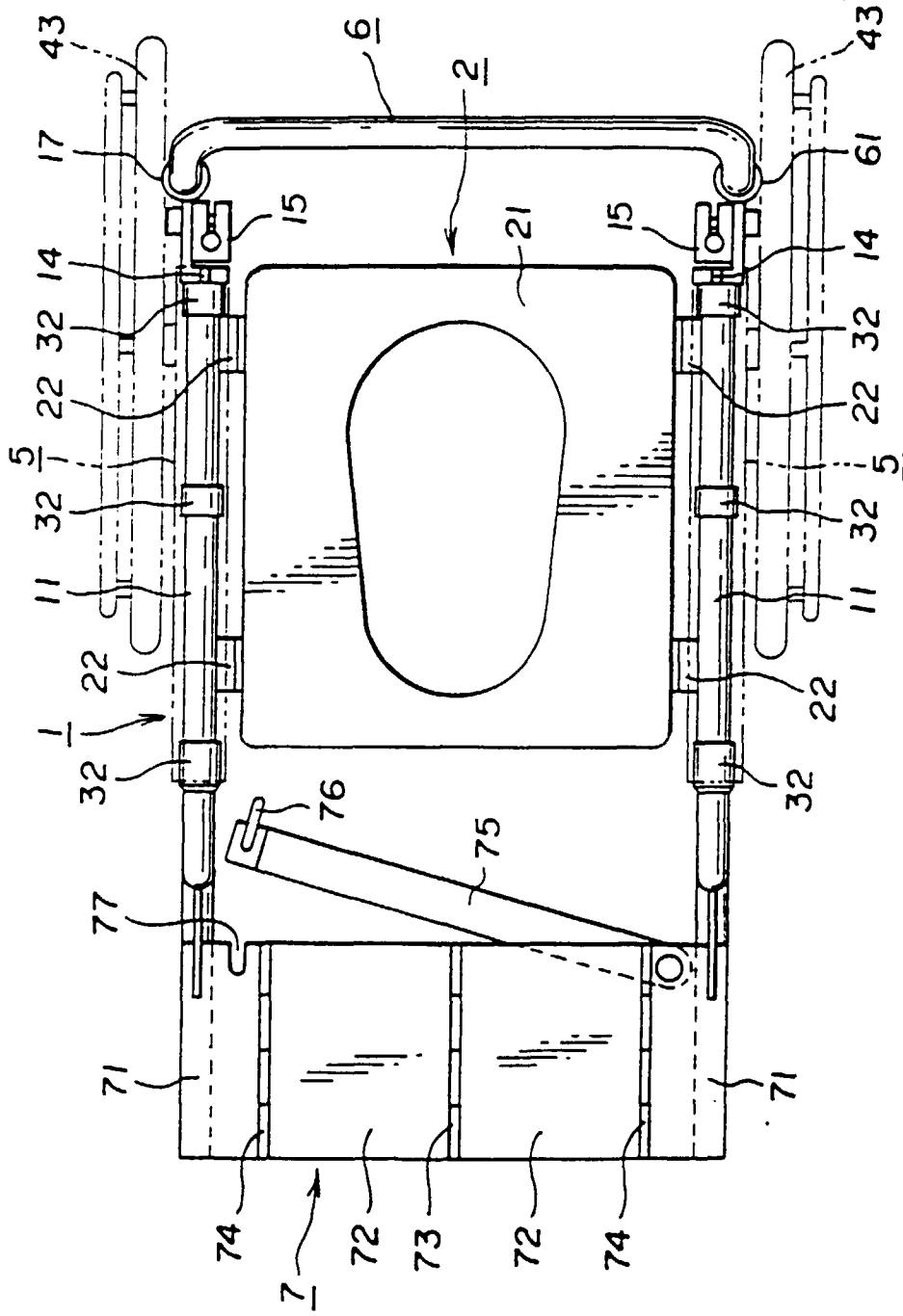


FIG. 4

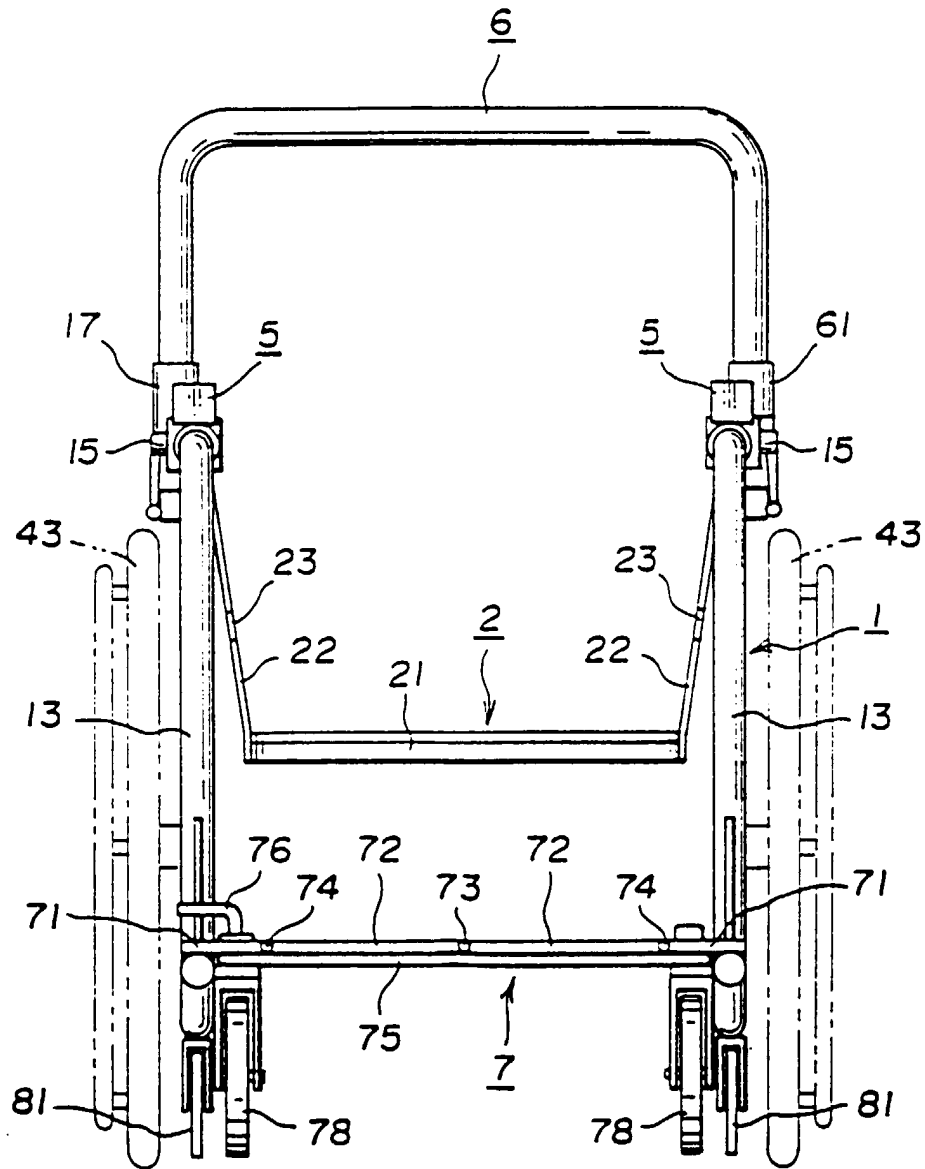


FIG. 5

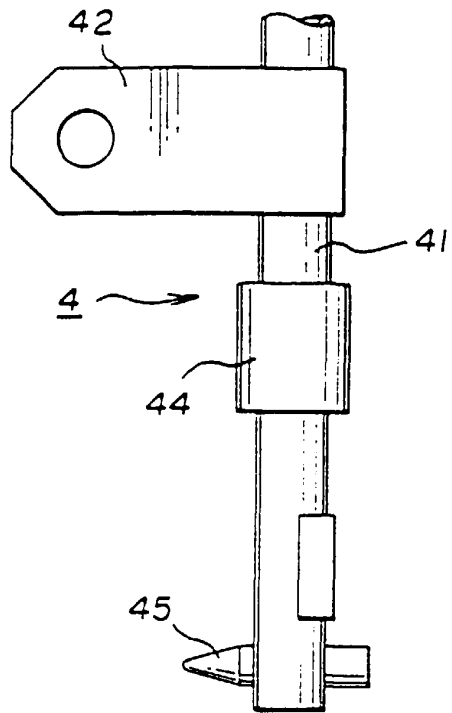


FIG. 6

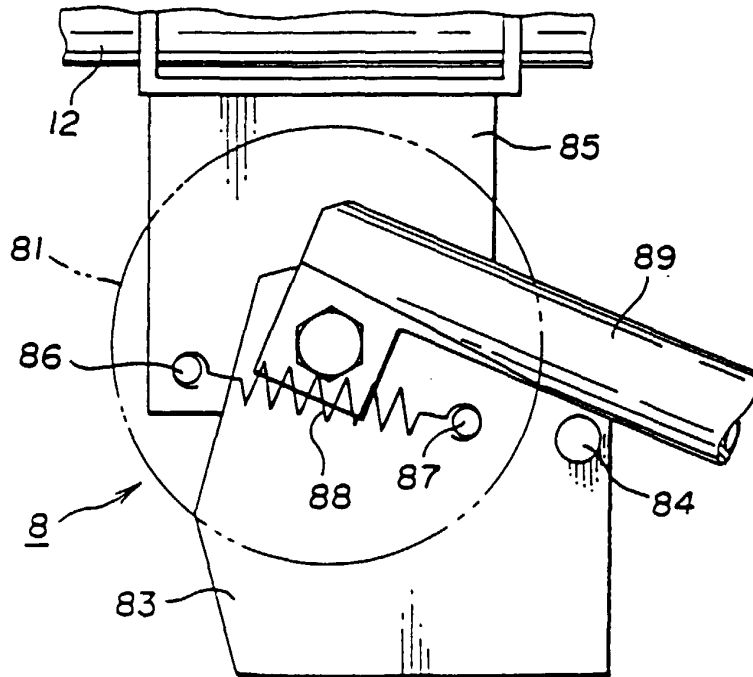


FIG. 7

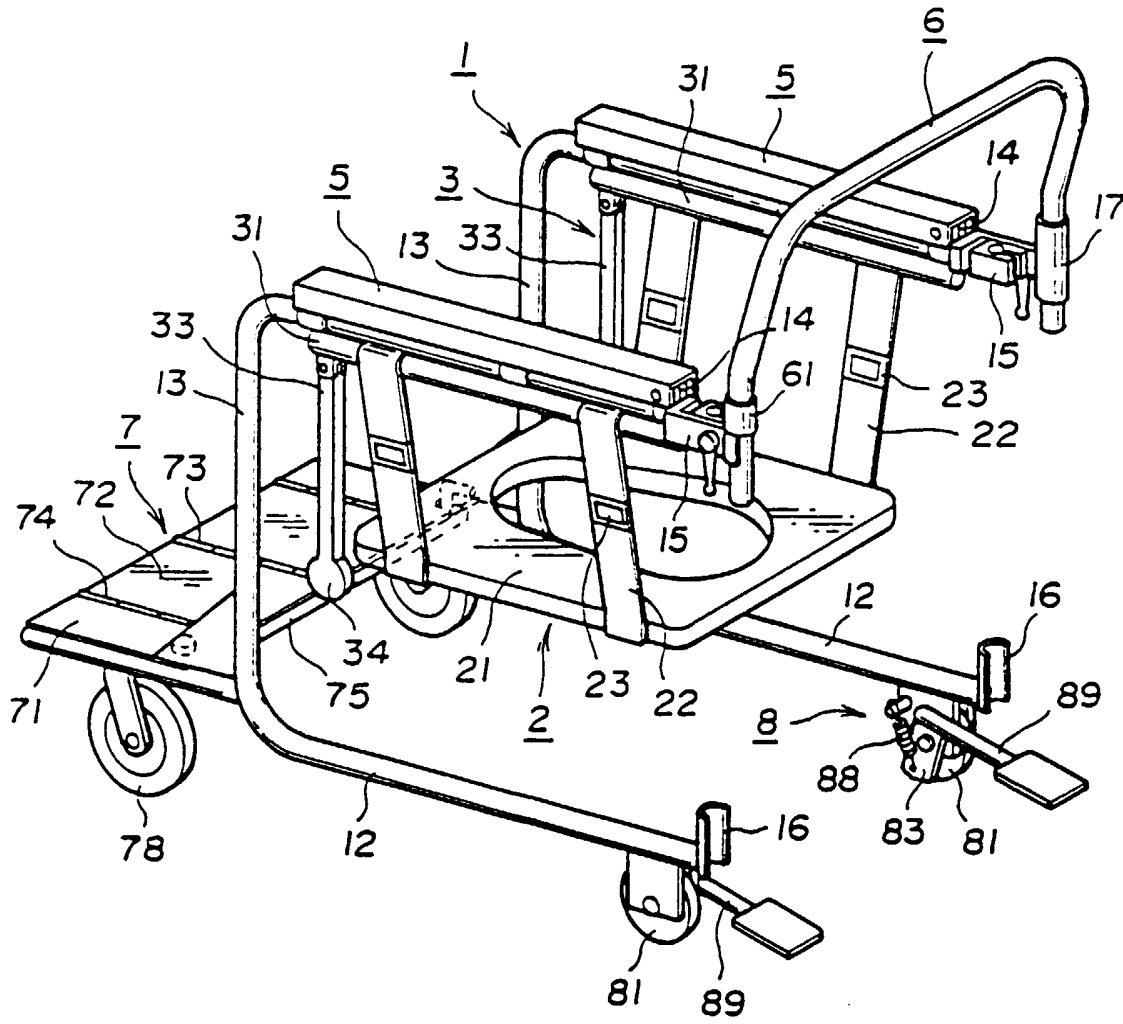


FIG. 8

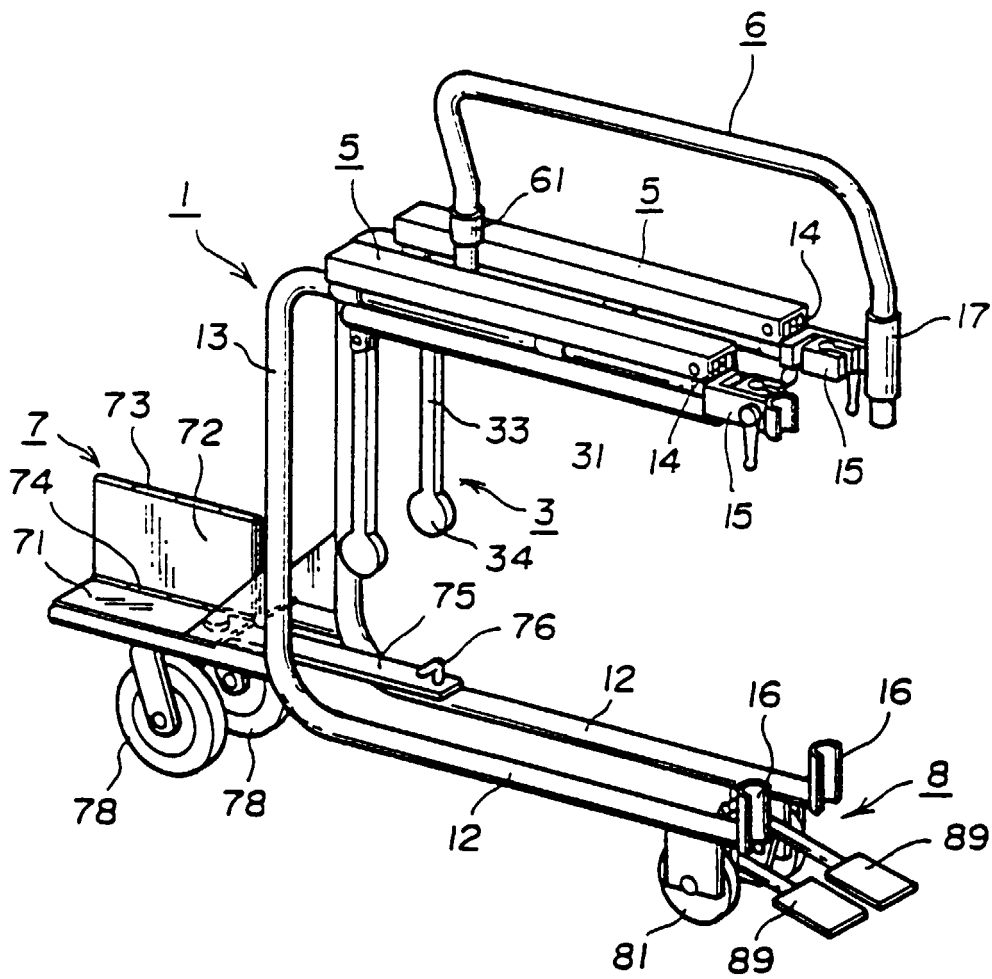


FIG. 9

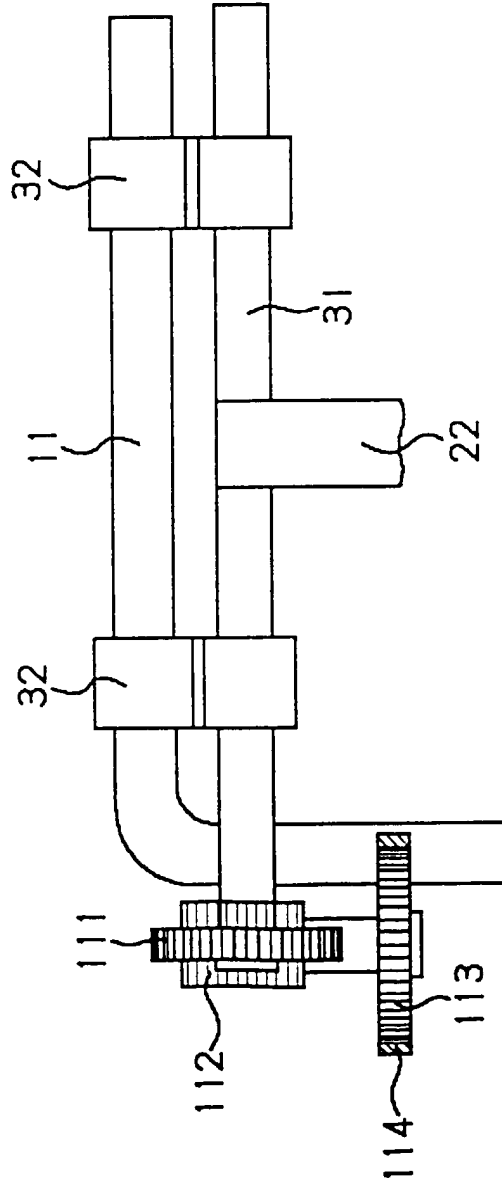


FIG. 10

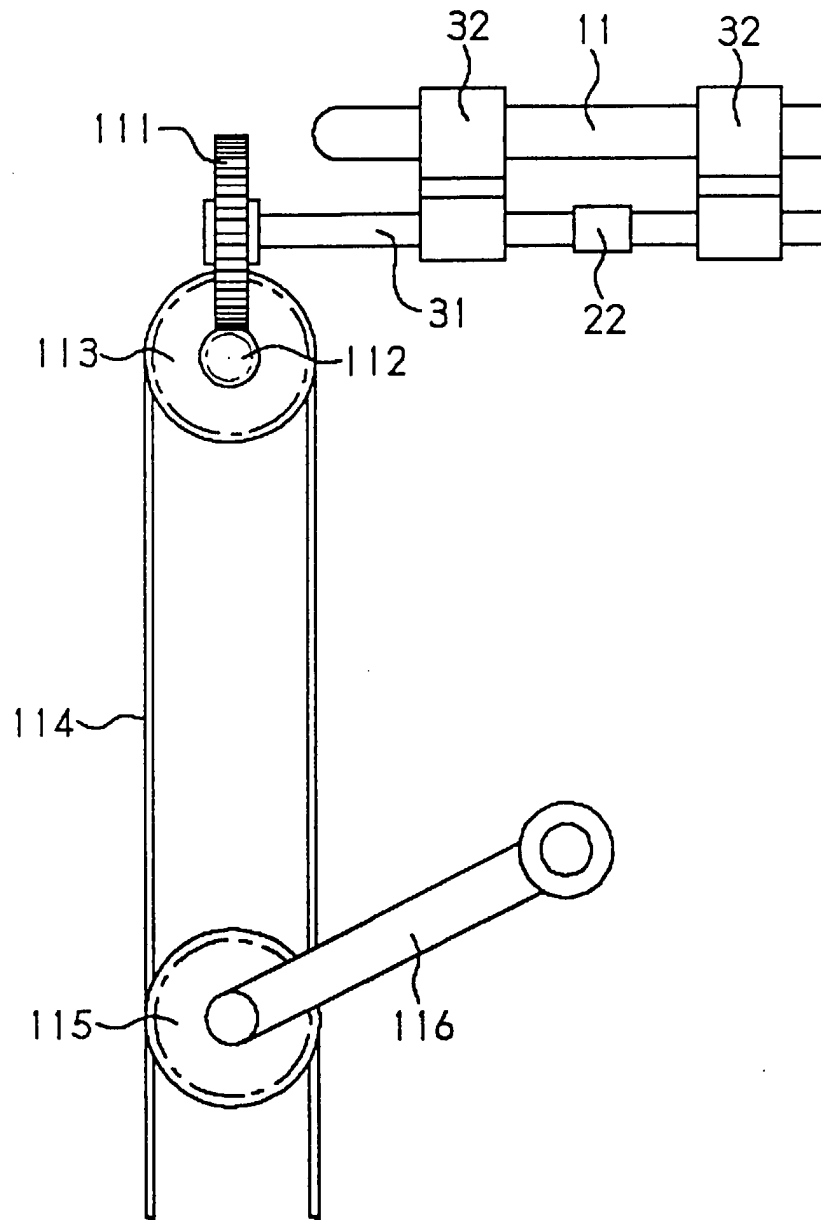


FIG. 11

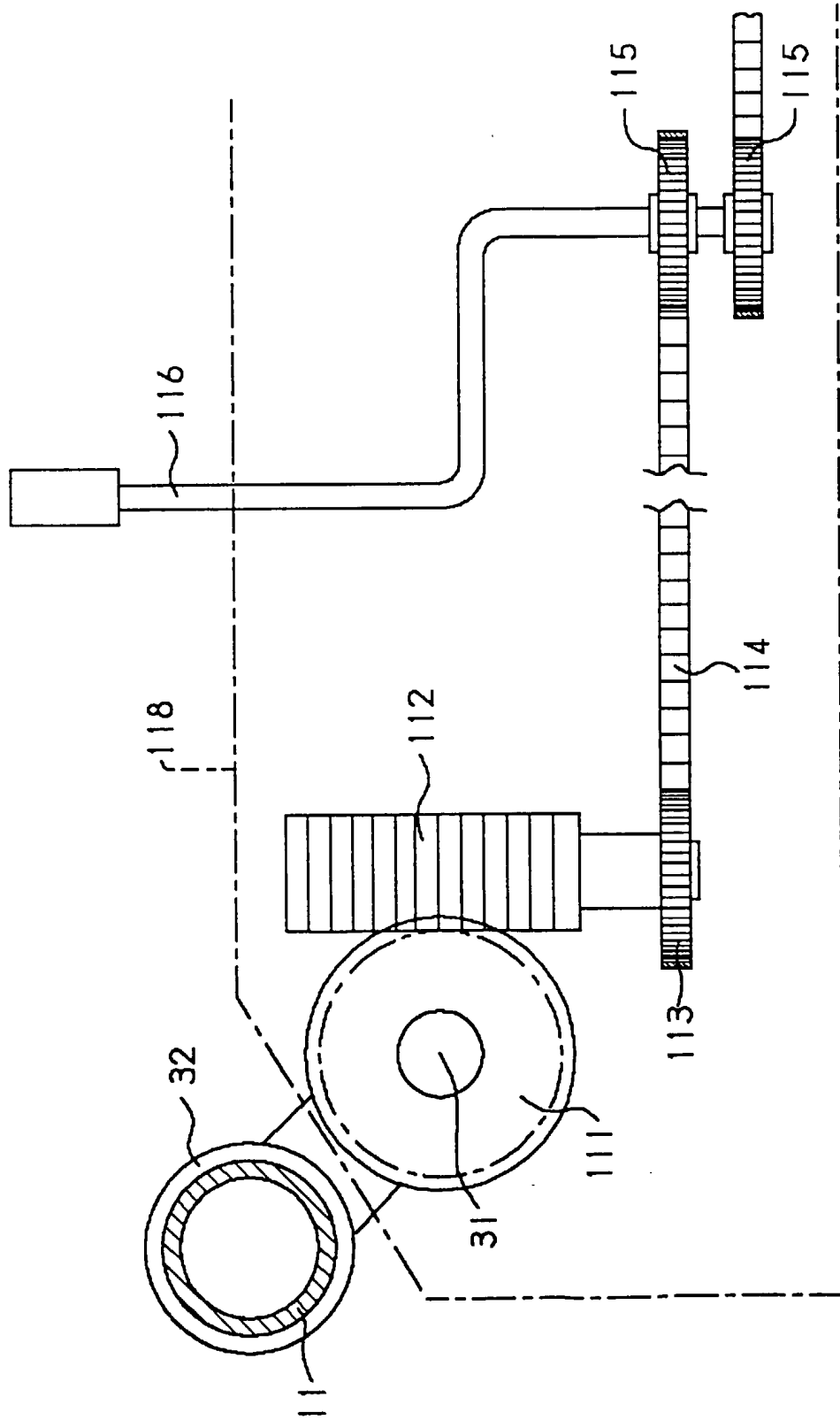


FIG.12

