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(54) STAIRLIFT CARRIAGE

(57) Stairlift carriage comprising:
- a frame (2);
- a seating (9) or support means for a wheelchair, said seating (9) or said support means for a wheelchair being associated with/integrated into the frame (2); the frame (2) comprising a front (21) and a back (22), opposite to one another, said seating (9) being placed on the front (21) or the support means defining a housing for the wheelchair on the front (21);
-stairlift means (6) constrained to the frame (2); the stairlift means (6) comprising at least a first motorized track (60) and a second motorized track (600); the first and the second motorized track (60, 600) being mounted on the back (22) of the frame (2);
- motorized means (5) for driving the first and the second motorized track (60, 600) at mutually distinct speeds and/or according to mutually distinct displacement directions.

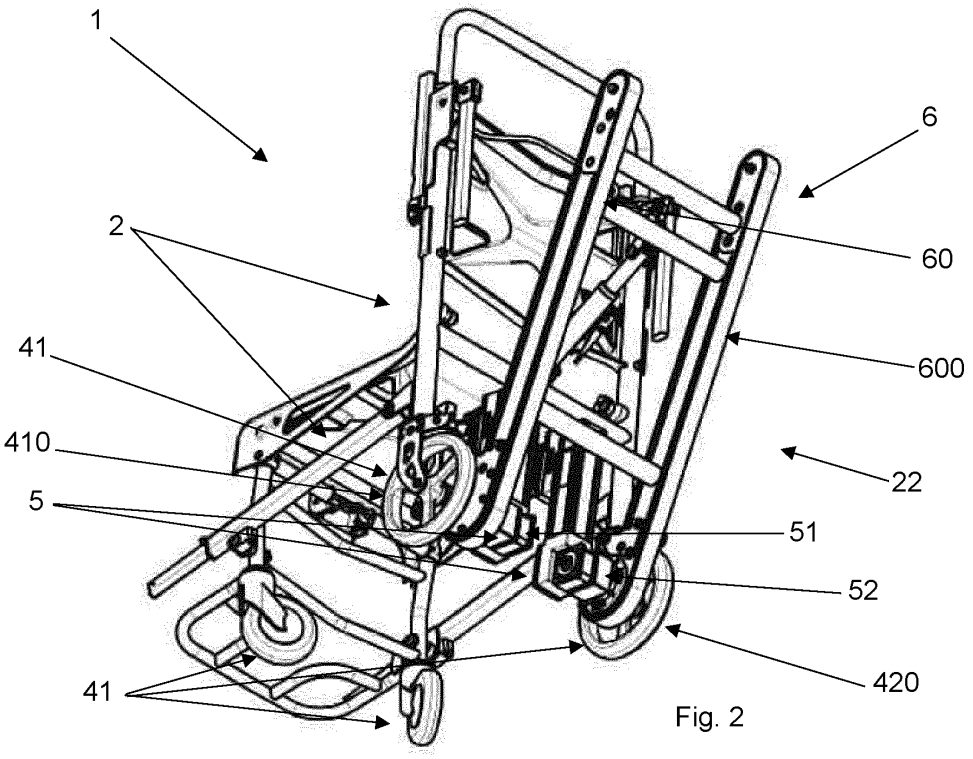

Fig. 2

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Description

[0001] The present invention relates to a stairlift carriage.

[0002] Stairlift carriages are known which comprise a housing platform on the front for housing a wheelchair. Furthermore, they are provided with wheels below which allow the displacement of the carriage. This is in order to allow to easily move the wheelchair on a horizontal plane. Furthermore, in order to facilitate the ascent or descent of stairs, there are motorized tracked vehicles on the back. Thereby, tilting the carriage, the tracked means come to rest on the edges defined by a plurality of steps. As the tracked means are motorized, this allows to ascend or descend stairs without any effort. At the end of a ramp, the stairlift is straightened and is moved along a horizontal plane by means of the wheels described above.

[0003] In this context, the technical task underpinning the present invention is to propose a stairlift carriage which allows to facilitate the displacement of the carriage, in particular along stairs provided with landings or platforms.

[0004] The technical task set and the objects specified are substantially attained by a carriage comprising the technical features as set out in one or more of the appended claims.

[0005] Further features and advantages of the present invention will become more apparent from the approximate and thus non-limiting description of a preferred, but not exclusive, embodiment of a carriage, as illustrated in the accompanying drawings, in which:

- figures 1 and 2 show perspective views from different angles of the stairlift carriage according to the present invention;
- figure 3 shows a lateral view of the stairlift carriage of figure 1;
- figure 4 shows a rear view of the stairlift carriage of figure 1;
- figures 5 and 6 show in perspective view a folded configuration of the stairlift carriage of figure 1.

[0006] A stairlift carriage is indicated by the reference number 1 in the accompanying drawings.

[0007] The carriage 1 comprises a frame 2. The frame 2 is a sustaining and support structure. Suitably, the frame 2 comprises a front and a back which are opposite. Furthermore, it comprises two lateral sides. Preferably, the frame 2 has a main extension between the top and the bottom.

[0008] The front and back identify two opposite areas of the carriage 1. Usually during the ascent or descent of a ramp, the back is facing the steps.

[0009] The carriage 1 further comprises support means for a wheelchair associated with/integrated in the frame 2. Such a wheelchair is typically a wheelchair for the elderly and/or people with reduced mobility in the lower limbs.

[0010] Wheelchair is intended as a chair with wheels. They can be self-propelled or not. Suitably the support means comprise a platform in which a wheelchair can be positioned. Possibly the support means, alternatively to the platform, can comprise brackets or other support elements of the wheelchair. The support means define a housing of the wheelchair on the front 21.

[0011] In an alternative solution exemplified in the accompanying drawings, the carriage 1 comprises a seating 9. The seating 9 is intended for an elderly person or a person with motor difficulties. Suitably, the seating 9 is alternative to the support means of the wheelchair.

[0012] Suitably, the carriage 1 is movable between an operating configuration (figures 1-4) and a folded rest configuration (figures 5 and 6).

[0013] Advantageously, in the folded configuration, the seat is overturned.

[0014] Suitably, the carriage 1 comprises displacement means 41 for displacing the carriage 1 with respect to a resting plane of the carriage 1. They are intended to come into contact with the ground at least when the carriage 1 moves on a flat surface. Suitably, the displacement means 41 for displacing the carriage 1 are rotatable about corresponding, substantially horizontal rotation axes. For example, the displacement means 41 are placed respectively at two opposite lateral sides of the frame 2.

[0015] The means 41 for sliding the carriage 1 are placed at a lower portion of the frame 2.

[0016] The means 41 for sliding the carriage comprise a plurality of wheels 410, 420. Suitably, the wheels are idle. Typically there are four wheels, two front and two rear. Advantageously, the front wheels are pivoting.

[0017] In particular, the sliding means 41 comprise a first and a second wheel 410, 420. Typically, the first and the second wheel 410, 420 are the rear wheels.

[0018] The first and the second wheel 410, 420 are mutually coaxial. The first and the second wheel 410, 420 are not keyed on the same shaft. In fact, the first wheel 410 is keyed on a first shaft and the second wheel is keyed on a second shaft which is distinct from the first. Suitably, the first and the second wheel 410, 420 are not pivoting. Suitably, the first and the second wheel 410, 420 always remain coaxial. Suitably the rotation axis of the first and the second wheel 410, 420 is fixed with respect to at least one point of the frame 2.

[0019] Suitably, the carriage 1 comprises stairlift means 6. The stairlift means 6 also allow to descend the stairs. The stairlift means 6 are directly or indirectly constrained to the frame 2. Advantageously, the stairlift means 6 are distinct from the displacement means 41.

[0020] For example, the stairlift means 6 comprise a first motorized track 60 mounted on the back 22 of the frame 2. Preferably, the first track 60 is movable between a rest configuration and an operating configuration. In the rest configuration it is closer to the frame 2. In the operating configuration it protrudes further away from the frame 2. Suitably, the displacement of the first track 60

occurs by means of an actuator, typically fluid dynamic.

[0021] In particular, the first track 60 can be tilted between at least one unfolded position (operating configuration) and a folded position (rest configuration).

[0022] In the operating configuration an upper end of the first track 60 is further away from the frame 2 than in the rest position. The lower end of the first track 60 instead lies in substantially the same position. In the operating configuration, the first track 60 is intended to come into contact with the edges of the steps.

[0023] The stairlift means 6 comprise a first motorized track 600 mounted on the back 22 of the frame 2. What is described with reference to the first track 60 can be repeated for the second track 600. Suitably, the first and the second track 60, 600 are side by side with each other. Suitably, the first and the second track 60, 600 are mutually parallel. The carriage 1 comprises motorized means 5 for driving the first and the second track 60, 600 at mutually different speeds (one may also be zero) and/or according to mutually distinct displacement directions (i.e., according to opposite rotation directions). The motorized means 5 thus allow the carriage to turn. This makes the stairlift means 6 and more generally the carriage 1 steering.

[0024] Possibly the motorized means 5 also allow the carriage 1 to translate forward or backward (typically during the displacement along a ramp). In such a case, the first and the second track 60, 600 move synchronized with each other. In particular, they move forward or backward with the same speed. The possibility of separately driving the first and the second track 60, 600 allows the carriage 1 to complete turns. This facilitates the motorized displacement for example in landings connecting different flights of stairs.

[0025] Advantageously, the motorized means 5 comprise a first motor 51 driving the first track 60.

[0026] The motorized means 5 comprise a second motor 52 driving the second track 600.

[0027] The first motor 51 can be driven independently of the second motor 52.

[0028] Suitably, there are means for synchronizing the first and the second motor 51, 52 which at least in an operating mode allow mutually distinct speeds and/or according to mutually distinct displacement directions. A rotation of the first motor 51 corresponds to a movement of the first track 60. A rotation of the second motor 52 corresponds to a movement of the second track 600.

[0029] A rotation of the first motor 51 in one direction corresponds to a rotation of the first track 60 in the same direction; if the first motor 51 reverses the direction of rotation, the first track 60 also reverses the direction of rotation.

[0030] The first and the second motor 51, 52 have a rotating rotor.

[0031] The first and the second motor 51, 52 can rotate at speeds and/or directions of rotation (of the rotor) which are independent of each other.

[0032] Suitably, the first and the second motor 51, 52 could rotate in opposite directions or in the same direction at different speeds (and one of such speeds could also be zero).

[0033] Suitably, the first and the second motor 51, 52 are electric motors, in particular brushless electric motors.

[0034] In an alternative solution, the motorized means 5 could comprise a single motor which through kinematics modifiable on the basis of input from a user allows to transmit a motion to the first track 60 which is different from the motion (by speed module and/or by direction of rotation) transmitted to the second track 600.

[0035] Advantageously, the carriage 1 comprises a user interface 7. The interface 7 could for example comprise a first selector 71 for driving the first motor 51 and a second selector 72 for driving the second motor 52. One or more of said selectors can be a physical selector or a selector operable by means of a display. The physical selector could be a button or a lever, etc. The physical selector could also comprise a joystick which, as a function of the orientation assumed, adjusts the displacement of the carriage 1.

[0036] Therefore, the present invention relates to a method for ascending stairs by means of a stairlift carriage 1. The stairlift carriage 1 advantageously comprises one or more of the features described above. The method comprises the steps of:

- moving the stairlift carriage 1 along a ramp of the stairs; this occurs by exploiting the motorized stairlift means; advantageously, this occurs by tilting the carriage 1 to bring the first and the second motorized track 60, 600 into contact with the steps and moving the first and the second track 60, 600 (in this case the first and the second track 60, 600 are moved with the same speed and direction);
- moving the motorized means 5 for driving the first and the second track at mutually different speeds and/or according to mutually different displacement directions along a flat surface (placed at the end or at the beginning of the ramp). Thereby, a motor-assisted turn can be executed.

[0037] The present invention achieves important advantages.

[0038] Firstly, it allows to facilitate the movement of the carriage in restricted spaces where it is necessary to make turns, for example at landings between ramps of successive stairs.

[0039] In fact, the carriage with a wheelchair (with person) on board can be very heavy and difficult to move.

[0040] The invention as it is conceived is susceptible to numerous modifications and variants, all falling within the scope of the inventive concept characterised thereby. Further, all the details can be replaced with other technically equivalent elements. In practice, all the materials used, as well as the dimensions, can be any whatsoever, according to need.

Claims

1. A stairlift carriage comprising:

   - a frame (2);
   - a seating (9) or support means for a wheelchair, said seating (9) or said support means for a wheelchair being associated with/integrated into the frame (2); the frame (2) comprising a front (21) and a back (22), opposite to one another, said seating (9) being placed on the front (21) or the support means defining a housing for the wheelchair on the front (21);
   - stairlift means (6) constrained to the frame (2); the stairlift means (6) comprising at least a first motorized track (60) and a second motorized track (600); the first and the second motorized track (60, 600) being mounted on the back (22) of the frame (2);

   characterized in that it comprises motorized means (5) for driving the first and the second motorized track (60, 600) at mutually distinct speeds and/or according to mutually distinct displacement directions.

2. The carriage according to claim 1, **characterized in that** the motorized means (5) comprise:

   - a first motor (51) driving the first track (60);
   - a second motor (52) driving the second track (600).

3. The carriage according to claim 2, **characterized in that** the first motor (51) can be driven with speed and/or direction of rotation independent of the second motor (52).

4. The carriage according to claim 2 or 3, **characterized in that** it comprises a user interface (7) comprising a first selector (71) for driving the first motor (51) and a second selector (72) for driving the second motor (52).

5. The carriage according to any one of the preceding claims, **characterized in that** the first track (60) is movable between a rest configuration and an operating configuration, in the operating configuration it protrudes further away from the frame (2) than the rest configuration.

6. The carriage according to any one of the preceding claims, **characterized in that** it comprises means (41) for sliding the carriage (1) with respect to a rest plane of the carriage (1); said means (41) for sliding the carriage (1) being:

   - placed at a lower portion of the frame (2);
   - distinct from the first and the second track (60, 600).

7. The carriage according to claim 6, **characterized in that** the means (41) for sliding the carriage comprise a plurality of idle wheels (410, 420).

8. The carriage according to claim 6 or 7, **characterized in that** the sliding means (41) comprise a first and a second wheel (410, 420); an end of the first track (60) being placed at the first wheel (410); an end of the second track (600) being placed at the second wheel (420).

9. The carriage according to claims 6, 7, 8, **characterized in that** the first and the second wheel (410, 420) are mutually coaxial.

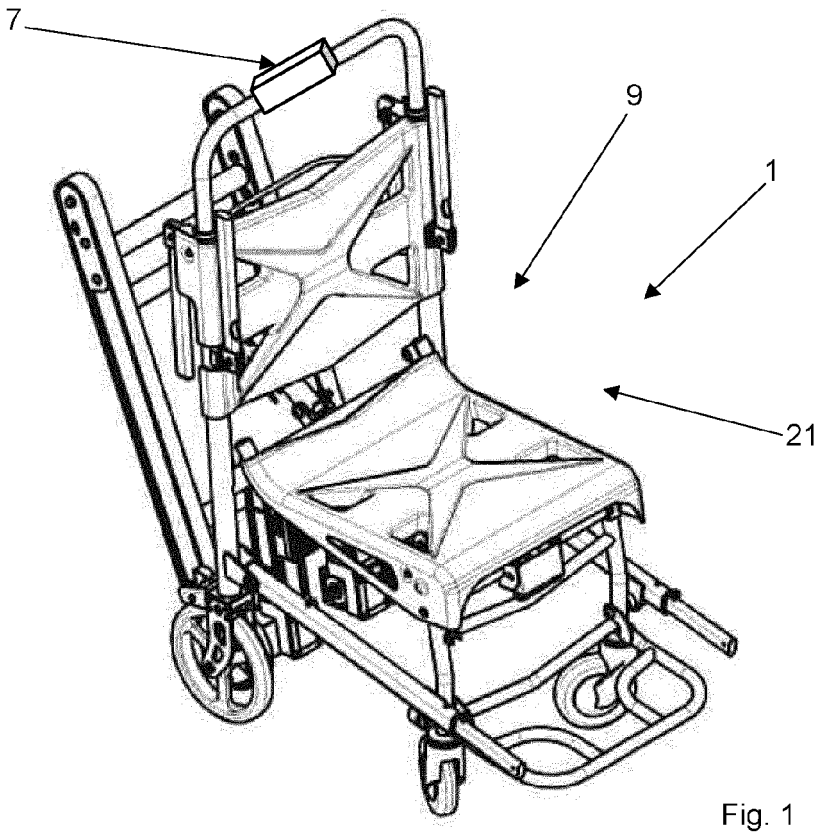

Fig. 1

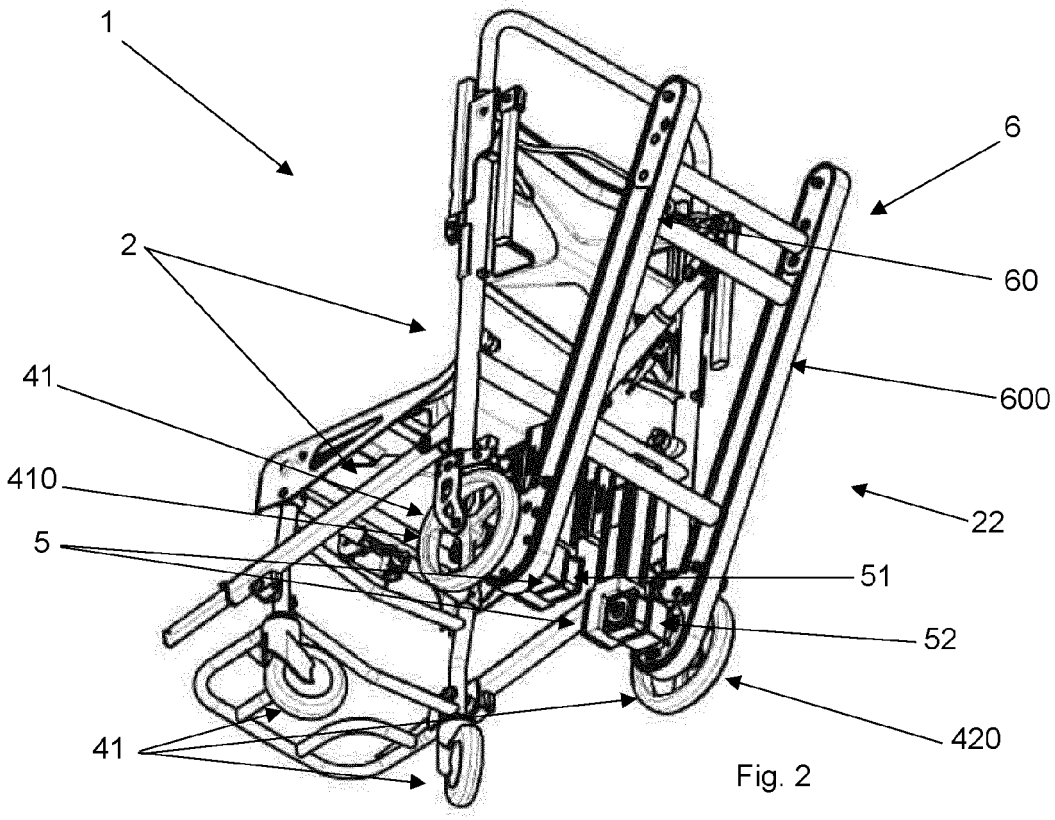

Fig. 2

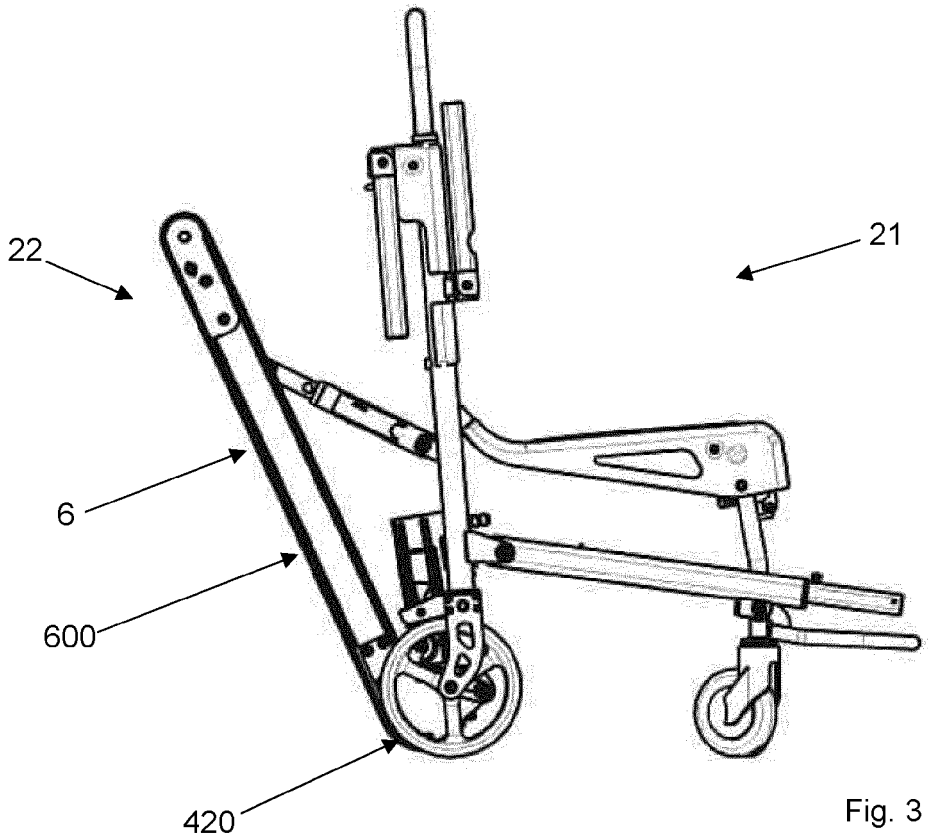

Fig. 3

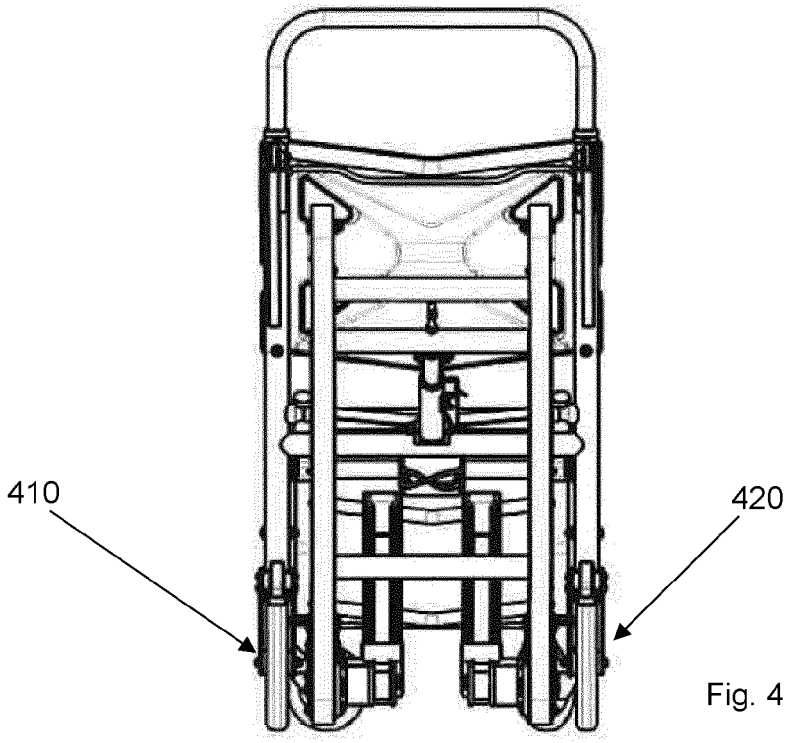

Fig. 4

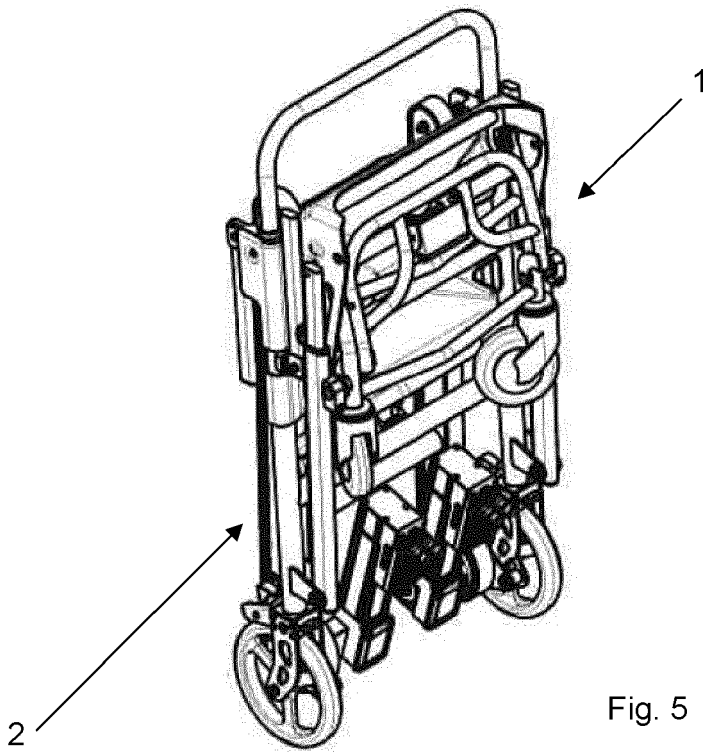

Fig. 5

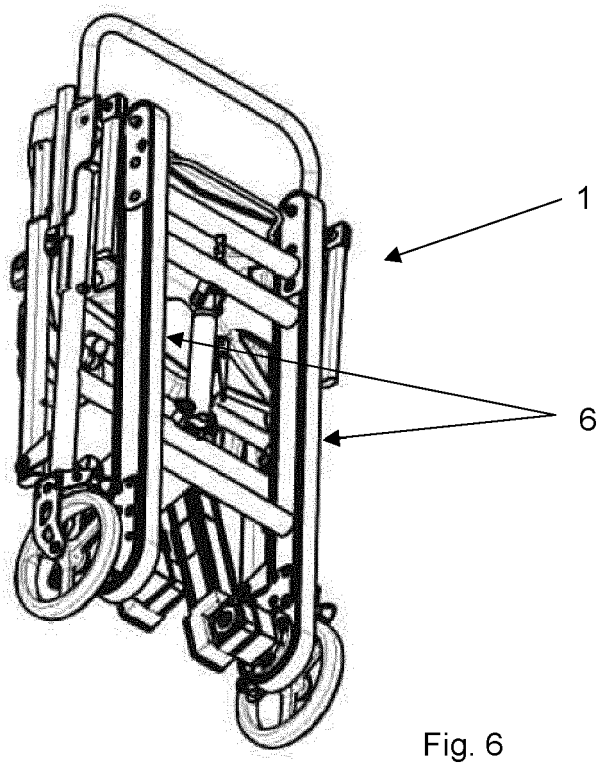

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 23 18 7631

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A	GB 2 351 268 A (PARAID LTD [GB]) 27 December 2000 (2000-12-27) * paragraph [0024] - paragraph [0033] * * figures 1-9 *	1-9	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	15 November 2023	Schiffmann, Rudolf

CATEGORY OF CITED DOCUMENTS

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