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(54) **Merry-go-round**

(57) Merry-go-round (1) comprising: a rigid supporting frame (2) which is structured for resting on the ground; a central hub (3) which is fixed in axially rotating manner on the top of the supporting frame (2), so as to be able to rotate about a first substantially vertical reference axis (R); a number of swingable supporting arms (4) which jut out from the central hub (3) in a substantially radial direction, and are hinged to the central hub (3) so as to rotate each about a respective second reference axis (A) substantially horizontal and locally substantially perpen-

dicular to the arm longitudinal axis (L), so as to freely swing while remaining on a substantially vertical lying plane; a number of elastically supporting assemblies (5) each of which is interposed between the central hub (3) and a corresponding supporting arm (4), and is structured so as to elastically maintain the corresponding supporting arm (4) in a substantially horizontal resting position; and a number of passenger-holding vessels (6) which are dimensioned so as to accommodate one or more people, and are hanged in a freely oscillating way each to a corresponding supporting arm (4).

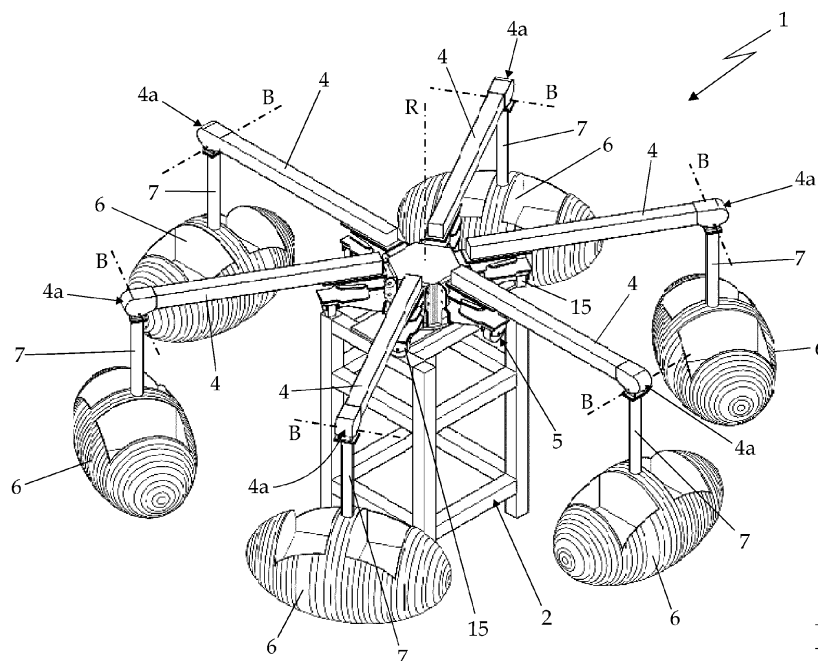


Fig. 1

Description

[0001] More precisely, the present invention relates to a merry-go-round for children, to which the following description will make explicit reference without thereby losing generality.

[0002] As is known some rotating merry-go-rounds for children comprise: a supporting frame which is structured for resting stably anchored on the ground; a central hub which is fixed in an axially rotating manner on the top of the supporting frame, so as to be able to rotate about a substantially vertical reference axis; a number of swingable supporting arms which jut out from the central hub in a radial direction, are angularly equally spaced about the central hub, and are hinged to the central hub so that each arms is able to rotate about a horizontal articulation axis locally perpendicular to the longitudinal axis of the supporting arm, so as to be able to swing while remaining on a vertical lying plane which substantially intersects the hub rotation axis; and a number of passenger-holding gondolas or vessels which are dimensioned so as to accommodate one or more people, and are each rigidly fixed directly to the distal end of a respective supporting arm.

[0003] The merry-go-rounds of the type described above are also provided with an engine unit structured so as to be able, on command, to drive into rotation the central hub about its vertical rotation axis, and with a number of double-acting hydraulic or pneumatic pistons each of which is interposed between the central hub and a corresponding supporting arm so as to be able to rotate, on command, the corresponding supporting arm for raising or lowering the passenger-holding gondola or vessel integral therewith.

[0004] Aim of the present invention is therefore to realize a new model of the merry-go-round for children structurally simpler than those described above.

[0005] In compliance with the above aim, according to the present invention there is provided a merry-go-round as defined in claim 1 and preferably, though not necessarily, in any one of claims dependent thereon.

[0006] The present invention will now be described with reference to the accompanying drawings showing a non-limiting embodiment thereof, wherein:

- Figure 1 is a perspective view of a merry-go-round realized in accordance with the teachings of the present invention, with parts removed for clarity;
- Figure 2 is a front view of the Figure 1 merry-go-round, with parts in section and parts removed for clarity; whereas
- Figure 3 shows in enlarged scale a detail of the upper part of the Figure 2 merry-go-round.

[0007] With reference to Figures 1, 2 and 3, reference number 1 indicates as a whole a merry-go-round preferably, though not necessarily, for children of the type comprising:

- a rigid supporting frame 2 which is structured for resting stably anchored on the ground;
- a central hub 3 which is fixed in axially rotating manner on the top of the supporting frame 2, so as to be able to rotate about a preferably substantially vertical reference axis R;
- a plurality of swingable supporting arms 4 which jut out from the central hub 3 in a substantially radial direction, are angularly equally spaced about the central hub 3, and are hinged to the central hub 3 so as to rotate each about a respective horizontal reference axis A locally substantially perpendicular to the longitudinal axis L of the supporting arm 4, so as to be able to freely swing while remaining on a substantially vertical lying plane which is preferably oriented so as to intersect the rotation axis R of the hub;
- a number of passive elastic supporting assemblies 5, each of which is interposed between the central hub 3 and a corresponding supporting arm 4, and is structured so as to elastically maintain the corresponding supporting arm 4 in a substantially horizontal resting position ; and
- a number of passenger-holding gondolas or vessels 6 which are dimensioned so as to accommodate one or more people, and are hanged each on the distal end 4a of a corresponding supporting arm 4.

[0008] More precisely, each passenger-holding gondola or vessel 6 is hanged down below the distal end 4a of the corresponding supporting arm 4 by means of a substantially vertical connection rod or stem 7, which has the lower end fixed to the body of the passenger-holding gondola or vessel 6, and has the upper end 7a directly hinged on the distal end 4a of the supporting arm 4, so as to allow the connection rod 7 and the passenger-holding gondola or vessels 6 to freely swing about a reference axis B locally substantially parallel to the rotation axis A of the same supporting arm 4, i.e. substantially horizontal and locally substantially perpendicular to the longitudinal axis L of the supporting arm 4.

[0009] In other words, the upper end 7a of the connection rod 7 is fixed on the distal end 4a of the supporting arm 4 by way of an hinge which allows the vertical rod 7 and the relative passenger-holding gondola or vessel 6 to freely swing while remaining substantially parallel to the swinging plane of the corresponding supporting arm 4.

[0010] With reference to Figure 2, the merry-go-round 1 is further provided with an engine unit 8 which is arranged so as to drive into rotation the central hub 3 about its rotation axis R, and with an impulsive lifting mechanism 9 which is structured for momentarily and suddenly pushing each supporting arm 4 upwards when the supporting arm 4 is located in a predetermined angular position of its circular orbit.

[0011] More precisely, in the example shown, the lifting impulsive mechanism 9 is preferably placed on a rigid supporting frame 2, beside the central hub 3, and is struc-

tured so as to temporarily push upwards the supporting arm 4 that, while rotating about the axis R, is momentarily aligned above the same lifting impulsive mechanism 8.

[0012] With reference to Figures 1, 2 and 3, in the example shown, in particular, the rigid supporting frame 2 preferably, though not necessarily, consists of a lattice structured tower 2; whereas the central hub 3 is preferably, though not necessarily, fitted in an axially rotating manner to a horizontal fifth wheel which is rigidly fixed to the top of the lattice structured tower 2, coaxial with the rotation axis R of the hub.

[0013] The engine unit 8 instead preferably, though not necessarily, consists of an electrically-operated geared motor 8 which is fixed in a vertical position to the tower 2 immediately below the fifth wheel that supports the central hub 3, so that the pinion 8a of the electrically-operated geared motor 8 can protrude from the top of the tower 2, to the side of the fifth wheel, and permanently meshing on a ring gear 10 which, in turn, is rigidly fixed to the lower part of the central hub 3, coaxial with the rotation axis R of the hub.

[0014] With reference to Figures 2 and 3, in the example shown each elastic supporting assembly 5 instead preferably comprises:

- a swingable supporting bracket 11 which juts out from the central hub 3 in a substantially horizontal direction, immediately beneath the corresponding supporting arm 4, is oriented so as to be locally substantially parallel to the same supporting arm 4, and is finally hinged to the central hub 3 so as to rotate about an articulation axis C locally substantially parallel to the rotation axis A of the supporting arm 4, so as to freely swing on the same swinging plane of the supporting arm 4;
- a stop bumper 12 positioned on the supporting bracket 11 and/or on the central hub 3 so as to prevent the supporting bracket 11 from being lowered below a substantially horizontal resting position; and
- an elastic suspension member 13 which is stably interposed between the supporting bracket 11 and the immediately overhanging supporting arm 4, and is dimensioned/structured so as to floatingly maintain the supporting arm 4 in its substantially horizontal resting position when the corresponding supporting bracket 11 is in turn arranged in the respective substantially horizontal resting position.

[0015] In the example shown, in particular, the elastic suspension member 13 preferably consists of a bellows pneumatic spring 13, and the elastic supporting assembly 5 is preferably provided with a second stop bumper 14 which is arranged on the supporting bracket 11, beside the bellows pneumatic spring 13, i.e. the elastic suspension member 13, and is dimensioned so as to prevent the supporting arm 4 from violently slamming, while it freely swings about the axis A, onto the supporting bracket 11 after having fully crushed/compressed the bellows

pneumatic spring 13.

[0016] With reference to Figure 2, the impulsive lifting mechanism 9 in the example shown is instead preferably, though not necessarily, formed by a number of free guide wheels 15, each fixed in a freely rotatable manner below a respective supporting bracket 11, preferably near the distal end of the same supporting bracket 11; and by a small ramp or sky jump 16 which is arranged on top of the rigid supporting frame 2, i.e. on the top of the lattice structured tower 2, beside the central hub 3, so as to intersect the circular trajectory followed by the various guide wheels 15 fixed beneath the supporting brackets 11, and is dimensioned/structured so as to force the guide wheel 15 which temporarily crosses the ramp or sky jump 16 while rotating about the rotation axis R of the hub, to suddenly and temporarily push upwards the corresponding supporting bracket 11 so as to launch upwards with force the supporting arm 4 that rests on the same supporting bracket 11 via the elastic suspension member 13.

[0017] With reference to Figures 2 and 3, preferably, though not necessarily, the merry-go-round 1 finally presents, for each swingable supporting arm 4, a respective oscillations limiting device 18 which is structured so as to maintain below a predetermined limit angle the width of the oscillations that the connection rod 7 can make about the axis B, and/or of continuously damping/slowing down the oscillating movement of the connection rod 7 about axis B.

[0018] In the example shown, in particular, the oscillations limiting device 18 preferably comprises a double effect hydraulic damper 19 which is fixed on the supporting arm 4 so as to have its mobile shaft 19a locally substantially parallel to the longitudinal axis L of the arm; and a reaction strut 20 which is adapted to mechanically connect the connection rod 7 to the hydraulic damper 19 so as to transmit the oscillating movement of the connection rod 7 to the mobile shaft 19a of the hydraulic damper 19.

[0019] In other words, the reaction strut 20 is adapted to convert the oscillating movement of the connection rod 7 into a reciprocating rectilinear movement of the mobile shaft 19a, which is systematically counteracted by the hydraulic damper 19.

[0020] More in detail, in the example shown, the reaction strut 20 has a first axial end hinged to the upper end 7a of the connection rod 7 in an eccentric position with respect to the rotation axis B of the same rod, it extends along the supporting arm 4 parallel to the longitudinal axis L of the arm, and finally has the second axial end directly hinged on the mobile shaft 19a of the hydraulic damper 19 so as to transmit the oscillating movement of the connection rod 7 to the mobile shaft 19a.

[0021] The functioning of the merry-go-round 1 can be easily inferred from the above description and does not require further explanation.

[0022] The advantages offered by the particular structure of the merry-go-round 1 are evident. The fact that the passenger-holding gondolas or vessels 6 are able to freely swing with respect to the corresponding supporting

arms 4, together with the fact that each supporting arm 4 continues to freely swing about the resting position during the rotation of the central hub 3 about the rotation axis R, enables the passenger-holding gondolas or vessels 6 to perform particularly pleasing random oscillating movements, without the need of having to lift/lower, on command and in a selective way, the individual supporting shaft 4 by way of special double acting hydraulic or pneumatic cylinders.

[0023] Clearly, changes and variations may be made to the merry-go-round 1 above described as described herein without, however, departing from the scope of the present invention.

[0024] For example, in a first not-shown alternative embodiment, the oscillations limiting device 18 may comprise, in combination with or alternatively to the hydraulic damper 19 and to the reaction strut 20, two stop bumpers made of rubber or other elastically deformable material, which are preferably fixed/positioned on the distal end 4a of the supporting arm 4, on opposite sides of the connection rod 7 on the swinging plane thereof, so as to prevent the tilt angle of the connection rod 7 from exceeding a predetermined threshold value.

[0025] In a second not-shown alternative embodiment, instead, the upper end 7a of the connection rod 7 can be fixed to the distal end 4a of the supporting arm 4 by way of a ball joint or other mechanical member adapted to allow the vertical rod 7 and the relative passenger-holding gondola or vessels 6 to freely swing on any swinging plane, i.e. without necessarily remaining parallel to the swinging plane of the supporting arm 4.

Claims

1. A merry-go-round (1) **characterised by** comprising:

- a rigid supporting frame (2) structured for resting on the ground;
- a central hub (3) which is fixed in axially rotating manner on top of the supporting frame (2), so as to be able to rotate about a first substantially vertical reference axis (R);
- a number of swingable supporting arms (4) which jut out from the central hub (3) in a substantially radial direction, and are hinged to the central hub (3) so as to rotate each about a respective second substantially horizontal reference axis (A) locally substantially perpendicular to the arm longitudinal axis (L), so as to freely oscillate while remaining on a substantially vertical lying plane;
- a series of elastic supporting assemblies (5) each of which is interposed between the central hub (3) and a respective supporting arm (4), and is structured so as to elastically maintain the corresponding supporting arm (4) in a substantially horizontal resting position; and

- a series of passenger-holding vessels (6) which are dimensioned so as to accommodate one or more people, and are each hung down on a respective supporting arm (4).

2. Merry-go-round according to Claim 1, **characterised in that** each passenger-holding vessel (6) is hung down below the corresponding supporting arm (4) by means of a substantially vertical connection rod (7) which has the lower end fixed to the body of the passenger-holding vessel (6) and the upper end (7a) pivotally jointed to the supporting arm (4) so as to allow the passenger-holding vessel (6) to freely swing with respect to the supporting arm (4).
3. Merry-go-round according to Claim 2, **characterised in that** each passenger-holding vessel (6) is hung up below the corresponding supporting arm (4) by means of a substantially vertical connection rod (7) which has the lower end fixed to the body of the passenger-holding vessel (6) and the upper end (7a) hinged to the supporting arm (4) so as to allow the passenger-holding vessel (6) to freely swing at least about a third reference axis (B) substantially horizontal and locally substantially perpendicular to the arm longitudinal axis (L).
4. Merry-go-round according to Claim 2 or 3, **characterised in that** the upper end (7a) of each connection rod (7) is hinged to the distal end (4a) of the corresponding oscillating supporting arm (4).
5. Merry-go-round according to Claim 3 or 4, **characterised by** also comprising, for each supporting arm (4), oscillations limiting means (18) which are structured so as to maintain below a predetermined threshold angle the width of the oscillations that the connection rod (7) can make about the corresponding third reference axis (B), and/or so as to continuously dampen/slow down the oscillating movement of the connection rod (7) about the corresponding third reference axis (B).
6. Merry-go-round according to Claim 5, **characterised in that** the oscillations limiting means (18) comprise a dual-effect hydraulic damper (19) which is fixed on the supporting arm (4) so as to have its mobile shaft (19a) locally substantially parallel to the arm longitudinal axis (L); and a reaction strut (20) which is able to mechanically connect the connection rod (7) to the hydraulic damper (19) so as to transmit the oscillating movement of the connection rod (7) to the mobile shaft (19a) of the hydraulic damper (19).
7. Merry-go-round according to Claim 5 or 6, **characterised in that** the oscillations limiting means (18) comprise two stop bumpers made of elastically de-

formable material, which are fixed/positioned on the supporting arm (4), on opposite sides of the connection rod (7) on the swinging plane of the rod, so as to prevent the tilt angle of the connection rod (7) from exceeding a predetermined threshold value.

8. Merry-go-round according to any one of the preceding claims, **characterised by** also comprising an engine unit (8) which is structured so as to drive into rotation the central hub (3) about said first reference axis (R); and an impulsive lifting mechanism (9) which is structured for momentarily and suddenly push each supporting arm (4) upwards when the supporting arm (4) is located in a predetermined angular position of its circular orbit.
9. Merry-go-round according to claim 8, **characterised in that** the impulsive lifting mechanism (9) is placed on the rigid supporting frame (2), beside the central hub (3), and is structured so as to temporarily push upwards the supporting arm (4) that, while rotating about said first reference axis (R), is momentarily aligned above the same impulsive lifting mechanism (9).
10. Merry-go-round according to any one of the preceding claims, **characterised in that** each elastically supporting assembly (5) comprises:
 - an swingable supporting bracket (11) which juts out from the central hub (3) immediately below the corresponding supporting arm (4), is oriented so as to be locally substantially coplanar to the supporting arm (4), and is finally hinged to the central hub (3) so as to rotate about a corresponding fourth reference axis (C) locally substantially parallel to the second reference axis (A) of said supporting arm (4), so as to freely swing on the same swinging plane of the supporting arm (4);
 - a stop bumper (12) positioned on the supporting bracket (11) and/or on the central hub (3) so as to prevent the supporting bracket (11) from being lowered below a substantially horizontal resting position; and
 - an elastic suspension member (13) which is stably interposed between the supporting bracket (11) and the immediately superjacent supporting arm (4), and is structured/dimensioned so as to floatingly maintain said supporting arm (4) in its substantially horizontal resting position when the corresponding supporting bracket (11) is, in turn, arranged in the relative substantially horizontal resting position.
11. Merry-go-round according to Claim 10, **characterised in that** the impulsive lifting mechanism (9) comprises a number of guide wheels (15) each fixed in

freely rotating manner below a corresponding supporting bracket (11); and a ramp or sky jump (16) which is arranged on the top of the rigid supporting frame (2), beside the central hub (3), so as to intersect the circular trajectory followed by the various guide wheels (15), and is dimensioned/structured so as to force the guide wheel (15) that crosses the ramp or sky jump (16) while rotating about said first reference axis (R), to suddenly and temporarily push upwards the corresponding supporting bracket (11).

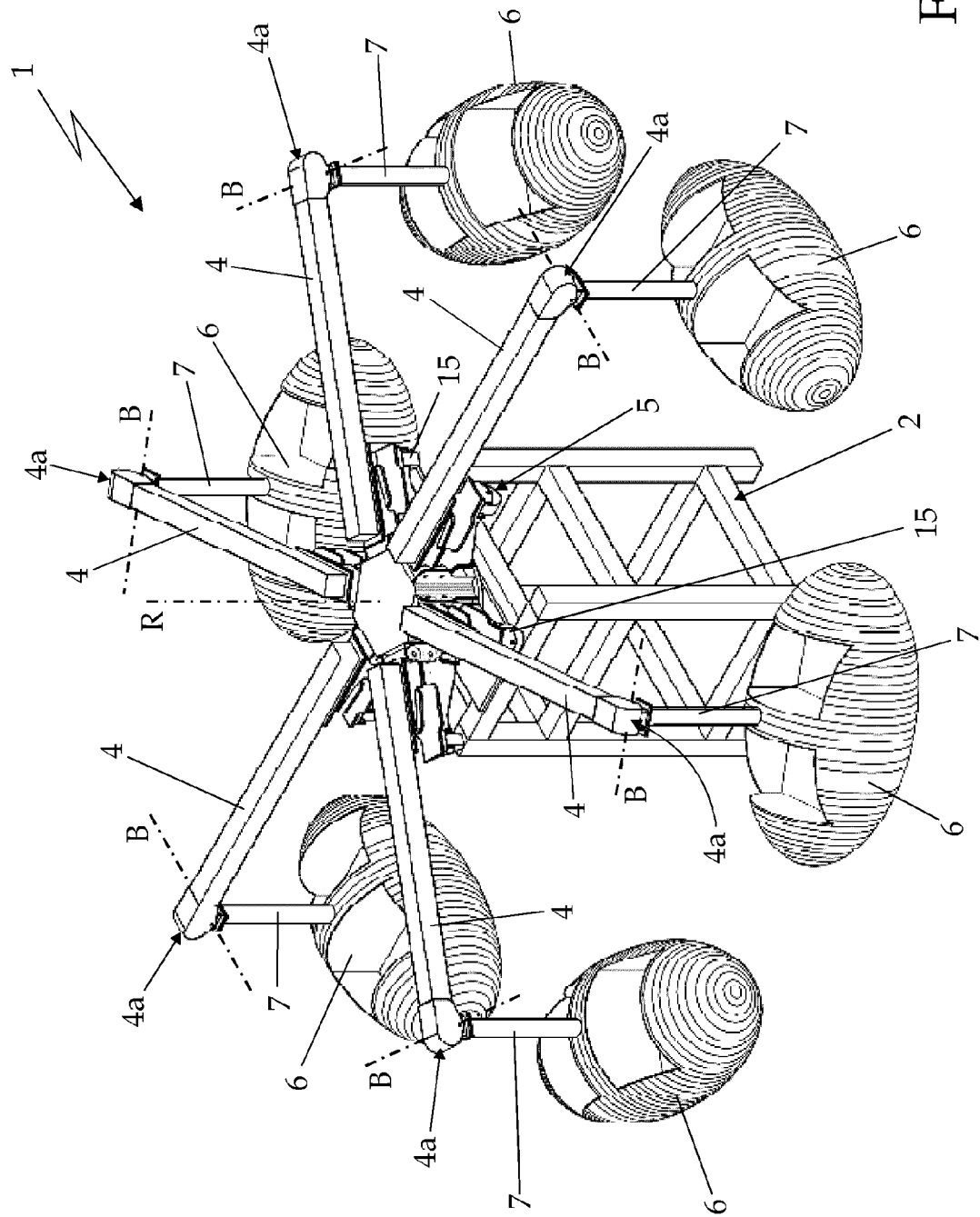


Fig. 1

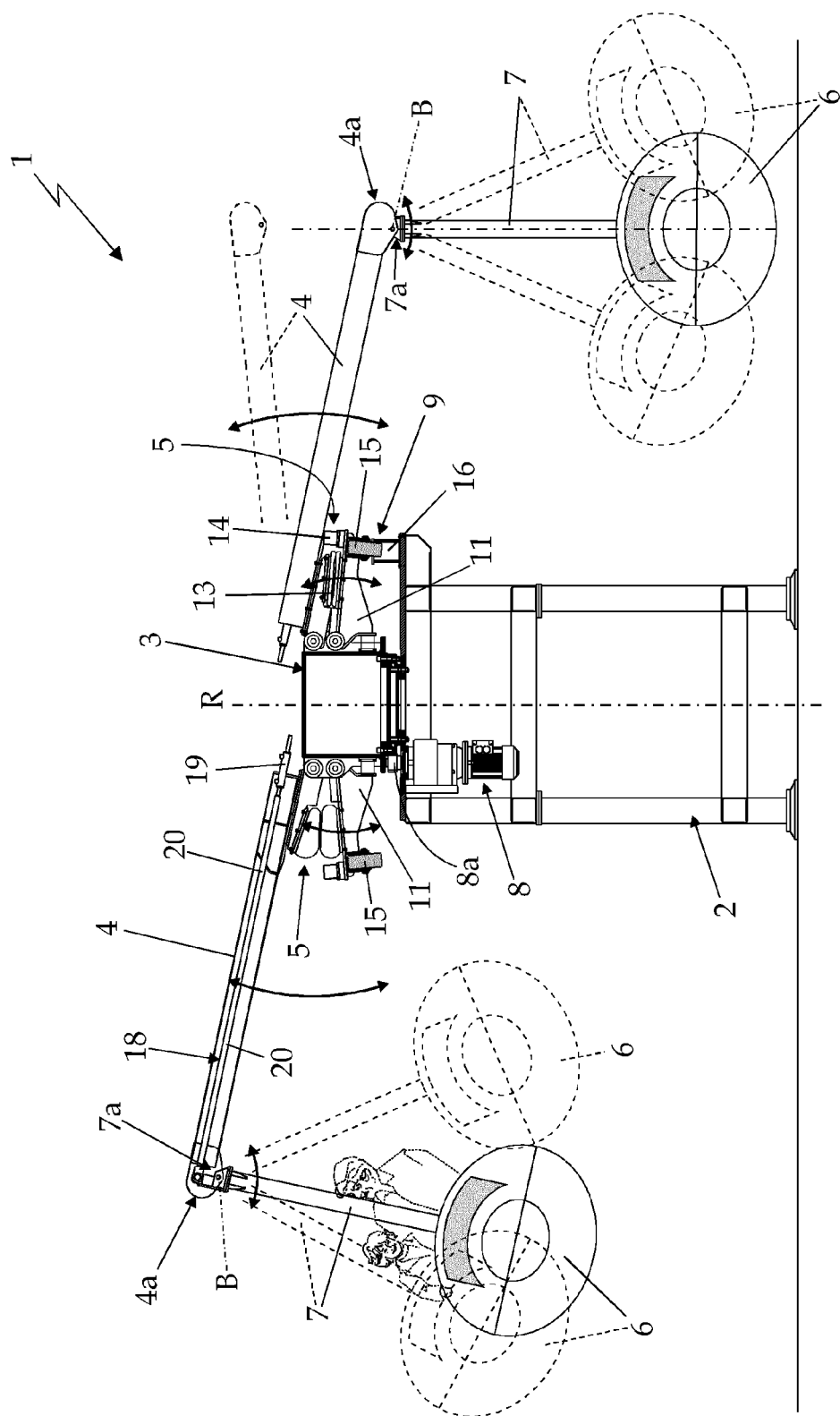


Fig. 2

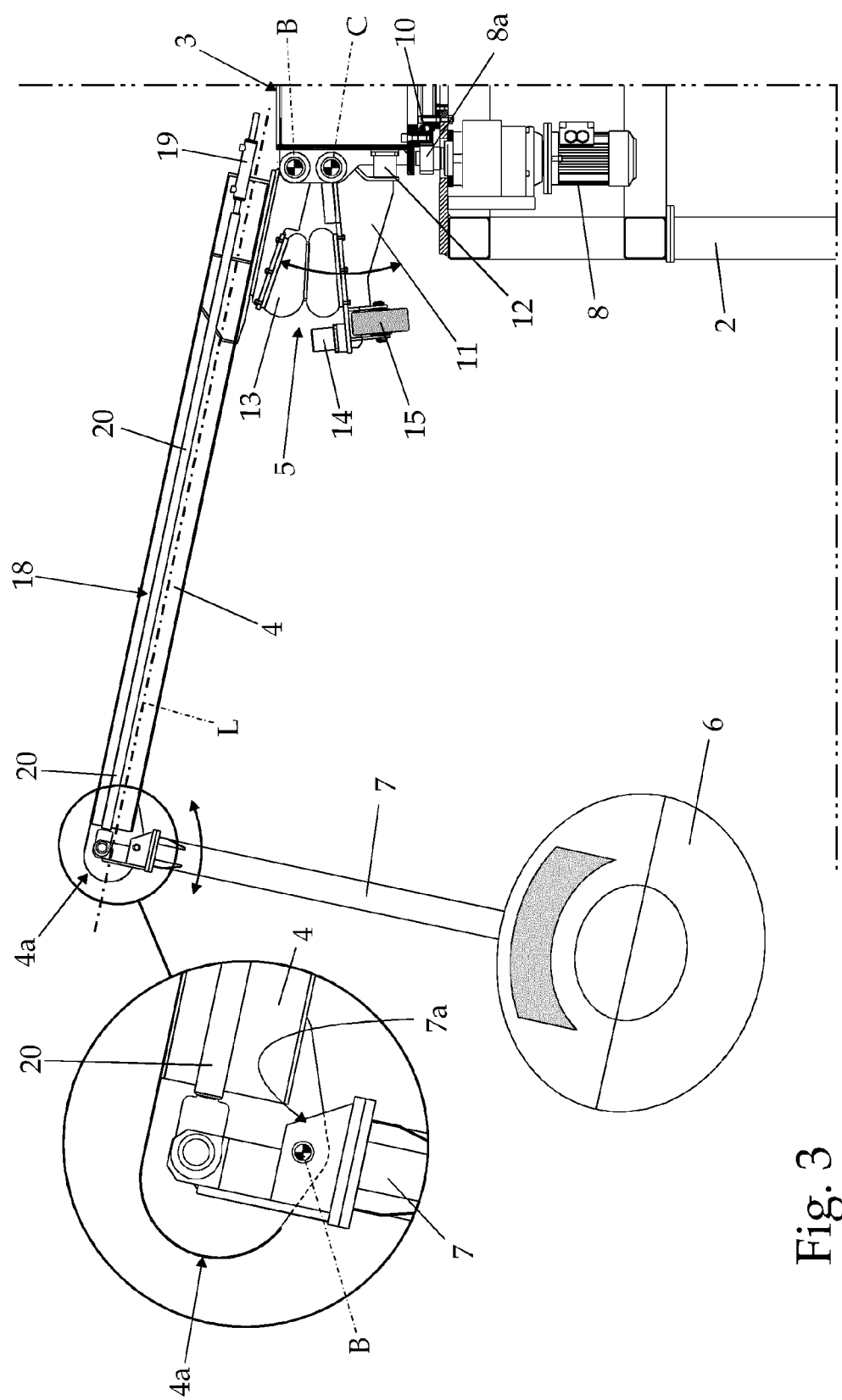


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 12 19 2135

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 February 2013	Examiner Turmo, Robert
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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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