(19) Europäisches Patentamt
European Patent Office
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(11) **EP 2 762 214 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.08.2014 Bulletin 2014/32

(51) Int Cl.:
A63G 9/00 *(2006.01)* ***A63G 27/00*** *(2006.01)*

(21) Application number: **14153261.4**

(22) Date of filing: **30.01.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **01.02.2013 NL 2010220**

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(54) Pendulum attraction for amusement rides

(57) The present invention relates to an attraction (1) for amusement rides, such as a fairground attraction or an amusement park attraction. The attraction comprises at least one tower (2) from which a main shaft (3) extends, a pendulum arm (4) rotatably mounted on the main shaft (3), first drive means for moving the pendulum arm in a plane (V) substantially perpendicularly of the main shaft, and at least one passenger gondola (11) mounted on an outer end of the pendulum arm.

According to the invention the pendulum arm comprises two parts (4A, 4B) which are pivotally connected to each other. A first part (4A) is mounted rotatably on the main shaft (3) and a second part (4B) is provided with the passenger gondola (11) on the outer end. Second drive means are provided for moving the second part in a direction substantially perpendicularly of the plane of movement.

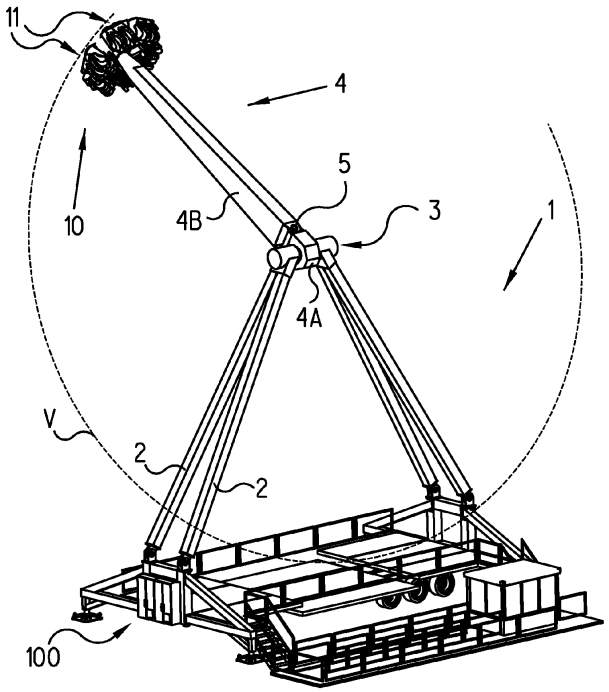

FIg. 2

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Description

[0001] The present invention relates to an attraction for amusement rides, such as a fairground attraction or an amusement park attraction, comprising at least one tower from which a main shaft extends, a pendulum arm rotatably mounted on the main shaft, first drive means for moving the pendulum arm in a plane substantially perpendicularly of the main shaft, and at least one passenger gondola mounted on an outer end of the pendulum arm.

[0002] Such an attraction is known in the field and is marketed in several variants. The known attraction swings the pendulum arm with passenger gondola high in the air, wherein the passengers are subjected to high G-forces during the ride and at the highest point experience a sensational feeling of weightlessness.

[0003] The present invention has for its object to add an additional sensation to an attraction of the type stated in the preamble.

[0004] The attraction according to the invention has for this purpose the feature that the pendulum arm comprises two parts which are pivotally connected to each other, wherein a first part is mounted rotatably on the main shaft and wherein a second part is provided with the passenger gondola on the outer end, wherein second drive means are provided for moving the second part in a direction substantially perpendicularly of the plane of movement.

[0005] The attraction according to the invention provides an additional degree of freedom of movement which provides for a spectacular combination of pivoting movements and offers the passengers a wonderful, unforgettable ride.

[0006] In a first preferred embodiment the second drive means are configured to move the second part in two opposite directions, each running substantially perpendicularly of the plane of movement. The attraction according to the first preferred embodiment provides another additional degree of freedom of movement which provides for an even more spectacular combination of pivoting movements and gives the passengers an intense experience.

[0007] According to a spectacular preferred embodiment, the second drive means are configured to move the passenger gondola along a defined contour, preferably a contour in figure of eight form. The figure eight is a smoothly continuous path of movement with large changes in the direction of movement close to the highest point.

[0008] According to a practical preferred embodiment, the second drive means comprise a number of hydraulic cylinders, preferably two hydraulic cylinders, each acting in opposite direction. According to a further development of the practical preferred embodiment, the second drive means comprise control means for controlling the movement of the hydraulic cylinders.

[0009] The invention will now be described in more detail with reference to the figures.

Figure 1 shows a schematic view of the attraction according to the invention in a first position;

Figure 2 shows a schematic view of the attraction according to the invention in a second position;

Figure 3 shows a schematic top view of the attraction according to the invention; and

Figure 4 shows a part of the attraction according to the invention in more detail.

[0010] The same components are provided in all figures with the same reference numerals.

[0011] Figures 1 and 2 show a preferred embodiment of the attraction according to the invention in two different positions. Figure 1 shows attraction 1 in the lowest position. This is also the starting position and the end position, and thereby the embarkation and disembarkation position. Figure 2 shows attraction 1 during operation in a higher position.

[0012] Attraction 1 comprises four towers 2 placed some distance from each other on a surface. In the shown preferred embodiment attraction 1 takes a mobile form and the surface is formed by a mobile base frame 100. Attraction 1 is mounted on base frame 100 for collapsing to a transport position. Base frame 100 also forms a platform 111 for embarkation and disembarkation of the passengers between rides. Attraction 1 can of course also be assembled at a fixed location, wherein the towers are for instance placed on a platform.

[0013] Towers 2 are disposed in pairs. Each pair of towers is disposed at a slight incline in the direction toward the other pair of towers. Towers 2 support a main shaft 3 which is preferably supported in bearing-mounted manner by upper ends 2A of towers 2. Main shaft 3 will generally extend substantially horizontally during operation. This is not however essential. A pendulum arm 4 is rotatably mounted on main shaft 3. First drive means (not shown) are provided for movement of pendulum arm 4 in a plane V extending substantially perpendicularly of main shaft 3 between towers 2.

[0014] Pendulum arm 4 comprises two parts 4A and 4B which are connected to each other for pivoting about a shaft 5. First part 4A is rotatably mounted on main shaft 3 and second part 4B is provided on the outer end with at least one passenger gondola 11 with seats 12. In the shown preferred embodiment six gondolas 11 are arranged in one gondola cross 10. Each gondola 11 is provided with two seats 12. The capacity per ride amounts in this preferred embodiment to twelve seats.

[0015] Second drive means are provided for the purpose of moving second part 4B of pendulum arm 4 in a direction substantially perpendicularly of the plane of movement. The second drive means are configured to move second part 4B in two opposite directions Z1, Z2. In the preferred embodiment directions Z1, Z2 are each substantially perpendicular to the plane of movement V and to shaft 5. The directions Z1, Z2 each run substantially parallel to main shaft 3. The second drive means are preferably configured to move passenger gondolas

11 along a defined contour or curve C, preferably a contour in figure of eight form. Figure 3 shows a schematic top view of the attraction according to the invention in which the contour C is illustrated. The gondolas move along a path which generally has a figure of eight form and is designated as contour C. As they pass through the path of movement the passenger gondolas perform repetitive forward and rearward pivoting or swinging movements and simultaneous lateral pivoting movements. As a result the passenger gondolas move through angles of approximately 120 degrees.

[0016] A preferred embodiment of the second drive means is shown in figure 4. In the preferred embodiment the second drive means comprise at least one hydraulic cylinder 15 mounted on pendulum arm 4 close to hinge connection 5. In the shown preferred embodiment there are two hydraulic cylinders 15, each mounted on pendulum arm 4 on either side of hinge connection 5. Cylinders 15 provide for the lateral pivoting of arm part 4B relative to arm part 4A in the two opposite directions Z1, Z2. The hydraulic cylinders also limit the lateral movement to a safe maximum value. If necessary, mechanical stops can be fitted in order to guarantee the maximum outward movement of gondola cross 10. As an alternative to the hydraulic cylinders, the second drive means can also take an electrical form with for instance a spindle motor.

[0017] The second drive means also comprise control means for controlling the movement. Suitable control means for hydraulic cylinders 15 are positioned-actuated. In the lowest swing position of the passenger gondola shown in figure 1 it is preferably the case that the resultant force on the passenger gondola in the lateral directions Z1 and Z2 is zero. In the highest swing position of the passenger gondola shown in figure 2 it is preferably the case that the resultant force on the passenger gondola in the lateral direction Z1 or Z2 is at a maximum. The control means preferably take an electronic form. When the spindle motor is applied, the control means are configured in similar manner for proportional control.

[0018] The inventive concept is based on the insight of adding smaller lateral pivoting movements to a large pivoting movement of the passenger gondola. In the preferred embodiment the gondola follows a path of movement in figure of eight form. The path of movement can however also take different forms, such as an X-shape.

[0019] It is noted that suitable first drive means are per se known in the relevant field. Several non-limitative examples are: an internal upper drive with transmission which is accommodated in part 4A or an external upper drive with transmission on towers 2, wherein the two upper drives engage directly on main shaft 3, or a lower drive which engages on and accelerates the gondola. The lower drive can for instance comprise a running wheel which makes contact with the underside of the gondola. The form of the gondola has to be adapted hereto. A suitable form is for instance a ship. The lower drive can be accommodated in base frame 100 or in a fixed platform.

[0020] It will be apparent that the capacity of the attraction according to the invention can be adapted to the conditions. This is possible by adapting the number of seats per gondola, the number of gondolas per gondola cross and the number of gondola crosses per pendulum arm. All these variants lie within reach of a skilled person after reading of this text.

[0021] The invention is not therefore limited to the described and shown preferred embodiment but extends to any embodiment falling within the scope of protection as defined in the claims and as seen in the light of the foregoing description and accompanying drawings.

Claims

1. Attraction for amusement rides, such as a fairground attraction or an amusement park attraction, comprising at least one tower from which a main shaft extends, a pendulum arm rotatably mounted on the main shaft, first drive means for moving the pendulum arm in a plane substantially perpendicularly of the main shaft, and at least one passenger gondola mounted on an outer end of the pendulum arm, **characterized in that** the pendulum arm comprises two parts which are pivotally connected to each other, wherein a first part is mounted rotatably on the main shaft and wherein a second part is provided with the passenger gondola on the outer end, wherein second drive means are provided for moving the second part in a direction substantially perpendicularly of the plane of movement.

2. Attraction as claimed in claim 1, wherein the second drive means are configured to move the second part in two opposite directions, each running substantially perpendicularly of the plane of movement.

3. Attraction as claimed in claim 1 or 2, wherein the second drive means are configured to move the passenger gondola along a defined contour, preferably a contour in figure of eight form.

4. Attraction as claimed in any of the foregoing claims, wherein the second drive means comprise a number of hydraulic cylinders.

5. Attraction as claimed in claim 2, 3 or 4, wherein the second drive means comprise two hydraulic cylinders, each acting in opposite direction.

6. Attraction as claimed in claim 4 or 5, wherein the second drive means comprise control means for controlling the movement of the hydraulic cylinders.

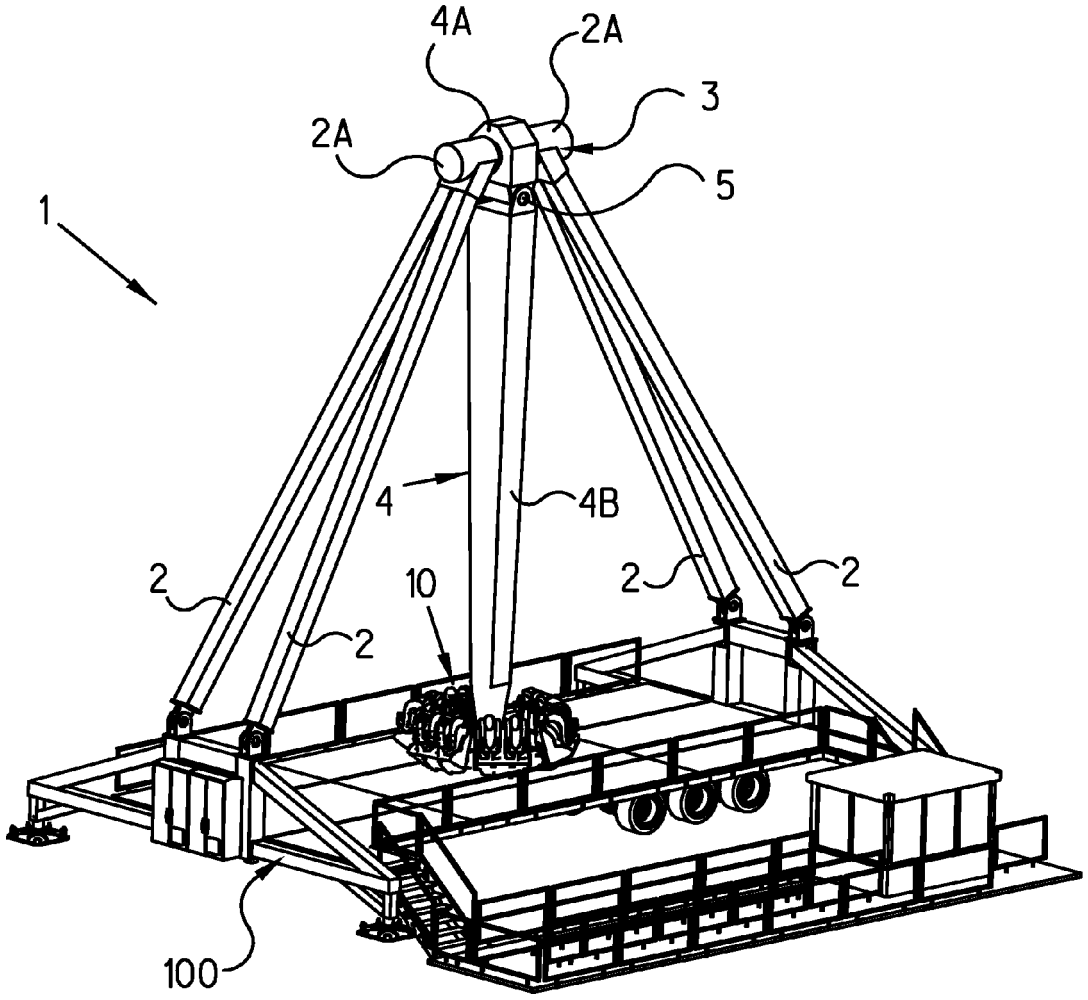

Fig. 1

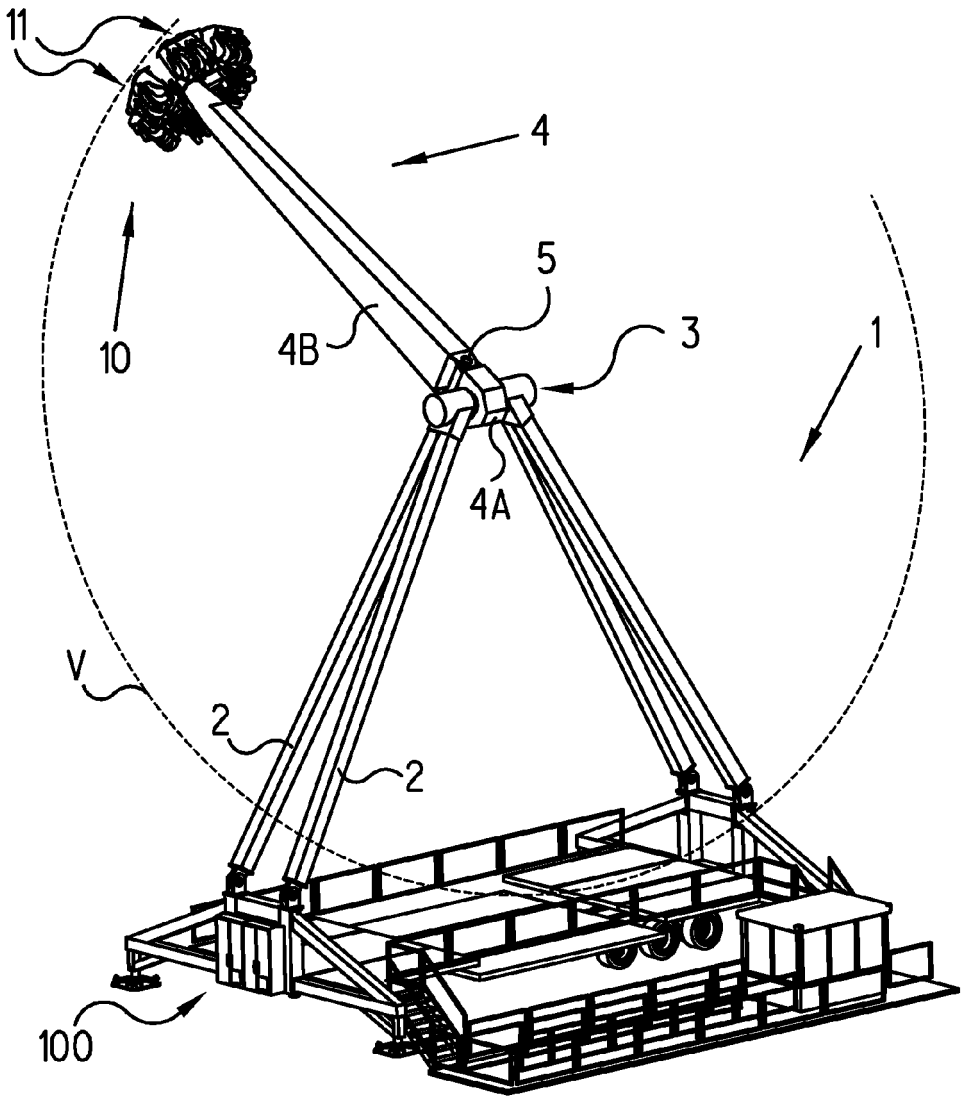

Fig. 2

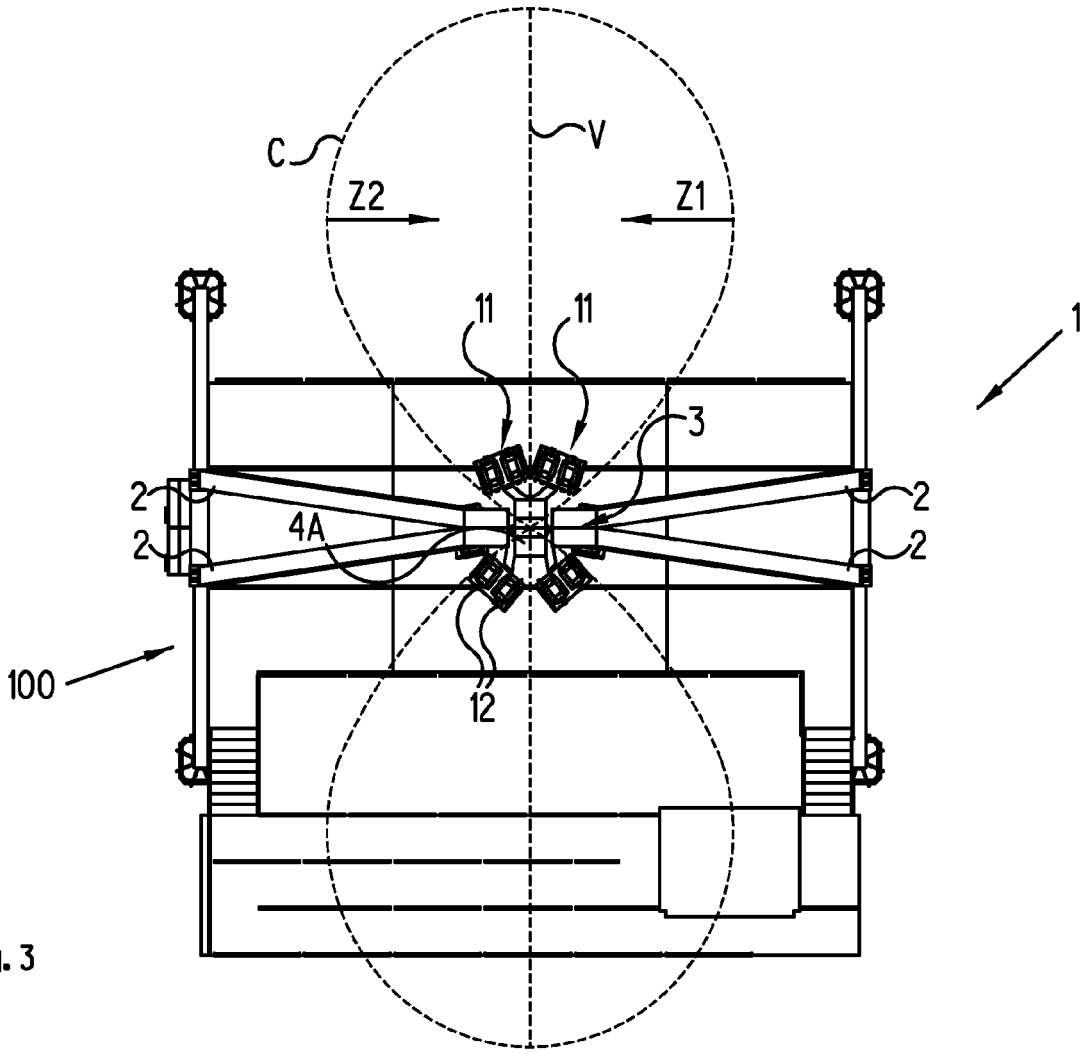

Fig. 3

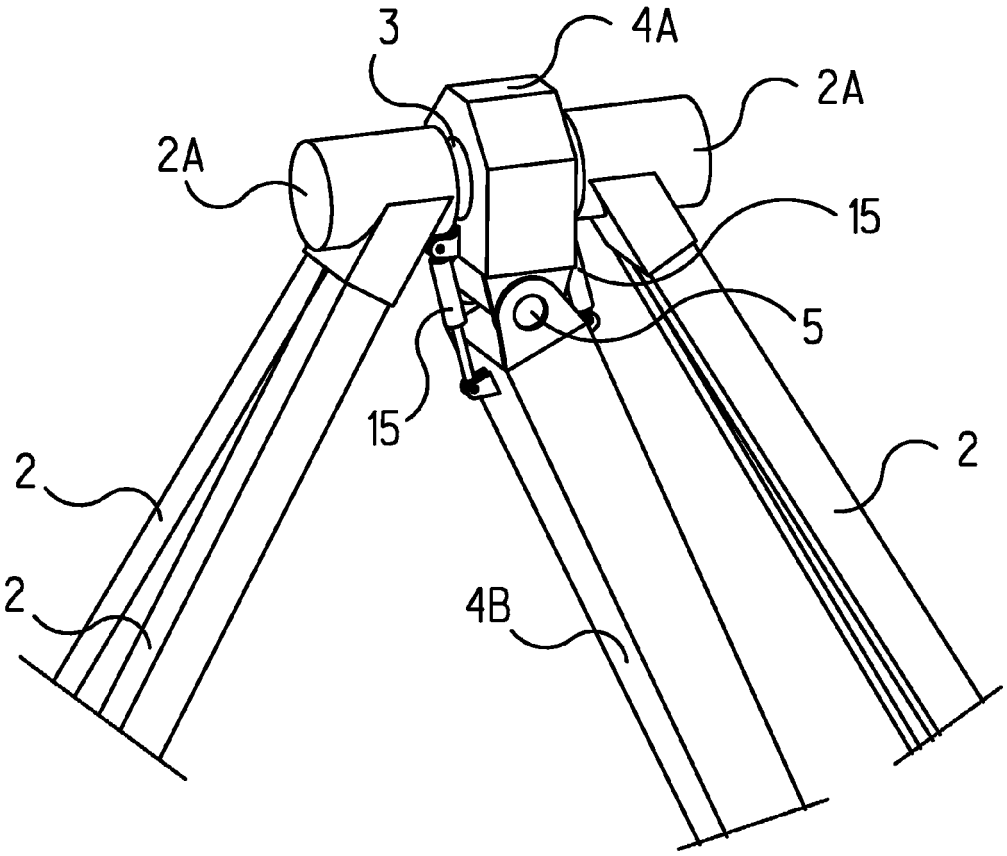

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 3261

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 296 06 585 U1 (EBERHARDT OTTOMAR ERNST [DE]) 1 August 1996 (1996-08-01) * claims 1-25; figures 1-8 *	1-6	INV. A63G9/00 A63G27/00
X	US 2006/035715 A1 (THRELKEL DAVID V [US]) 16 February 2006 (2006-02-16) * paragraph [0034] - paragraph [0038]; figures 1-16 *	1-6	
X	WO 01/95989 A1 (ROBOCOASTER LTD [GB]; KUKA ROBOTER GMBH [DE]; GOL GINO DANIEL DE [GB]) 20 December 2001 (2001-12-20) * claims 1-20; figure 3a *	1-3	
X	US 2 294 166 A (EYERLY LEE U) 25 August 1942 (1942-08-25) * claims 1-5; figures 1,2 *	1-3	
X	GB 520 398 A (LEE ULRIC EYERLY) 23 April 1940 (1940-04-23) * claims 1-6; figures 1-4 *	1-3	

TECHNICAL FIELDS SEARCHED (IPC)
A63G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 April 2014	Shmonin, Vladimir

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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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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24-04-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29606585 U1	01-08-1996	NONE	
US 2006035715 A1	16-02-2006	NONE	
WO 0195989 A1	20-12-2001	AT 281221 T	15-11-2004
		AU 6406301 A	24-12-2001
		DE 60106909 D1	09-12-2004
		DE 60106909 T2	10-11-2005
		EP 1289616 A1	12-03-2003
		ES 2232628 T3	01-06-2005
		GB 2364927 A	13-02-2002
		JP 2004503308 A	05-02-2004
		US 2002183123 A1	05-12-2002
		WO 0195989 A1	20-12-2001
US 2294166 A	25-08-1942	NONE	
GB 520398 A	23-04-1940	NONE	

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