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(54) Title: HIGH ANGLE TETHERED SLIDE WITH FREEFALL DROP AND VARIABLE RADIUS SWING

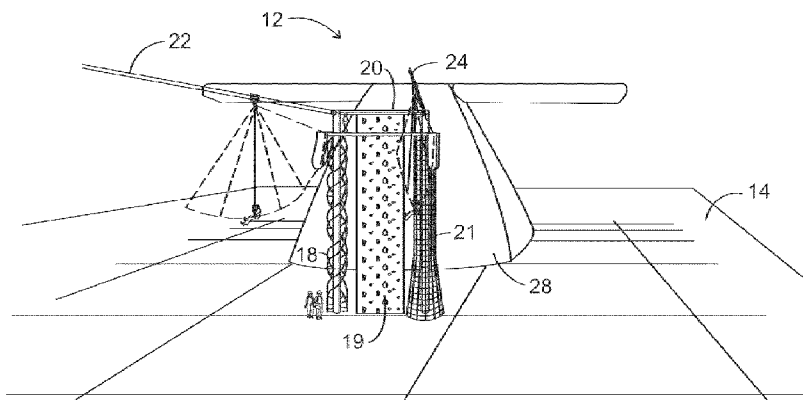


FIG. 2

(57) Abstract: An amusement ride is formed from a self-equalizing dual line affixed to a pulley at its upper end and to pulley and counterweight system at its lower end. An upper platform at the upper dual line end launches a rider who is connected via a line to a pulley riding on the dual line. A slide is carried by the upper platform from which the rider is launched, resulting in the rider swinging in an arcuate motion about the pulley. A belay, carried by the dual line, is movable to confront the pulley as the rider is carried down the dual lines and to enhance the arcuate swinging of the rider. A lower landing permits the rider to demount the amusement ride.



WO 2016/090457 A1

HIGH ANGLE TETHERED SLIDE WITH FREEFALL DROP AND VARIABLE RADIUS SWING

BACKGROUND

This disclosure generally relates to the amusement field and more specifically to amusement or recreational rides. Certain settings are space limited and do not permit large entertainment rides. Moreover, some settings have limited access to power. For such settings, compact amusement rides requiring little to no power are required. Such settings can be in remote locations away from the electrical grid, such as aboard a luxury cruise liner.

Modern cruise liners offer a variety of entertainment, which now includes amusement-type rides, such as water slides. There is, thus, a need to provide an amusement ride that can successfully operate in a limited area (small footprint) using little to no power, while providing a high thrill value to the rider. It is to such need that the disclosed apparatus is addressed.

An improved canopy tour ride is disclosed in U.S. Patent No. 8,505,462. The dual safety line disclosed therein can be used in the presently disclosed ride.

BRIEF SUMMARY

This disclosed apparatus was developed initially to provide an amusement ride in a limited area using nothing more than human power, while providing a multitude of sensory experiences in rapid succession in a high angle environment safely and with a minimum number of operators.

An amusement ride is formed from a height/climbing component, which could be in the form of a tower with various assisted and unassisted ascension methods, such as, for example, a climbing wall, a climbing net, and a spiral staircase. Once at height, there are 2 systems for getting down from the activity deck. The first is a static or dynamic synthetic rope or tether attached to a participant, which rope passes through a pulley or other non-binding pivot or redirection device at a fixed point in front of and above the deck where the participant is located. The attachment point for this system can be any fixed point in front of and at/above head height of a slide, for example. The attachment point even can be a pole, as shown in the drawings, then back to the system operator who has control of the cable/rope, as it passes through a brake/belay device. The operator adds tension to the cable/rope pulling the participant off the deck. The participant then falls and swings freely in a pendular motion from the anchor point. The operator then lowers the participant to a lower ship's deck, the ground, into a pool, a net, a barrel of balls, shaving cream, or

any other landing option.

The disclosed system can be augmented by adding a baffle device which, when hung in front of the activity deck, adds excitement by shrouding the passenger in darkness as they fall through it, while at the same time, creating noise and disorientation as they travel within the baffle device, adding to the experience, but also adding a secondary benefit of slowing down the descent and directing the participant into a smaller and more controlled arc, as well as adding a sudden free-fall style drop at the end of the baffle experience.

A second system adds a traverse component and end swing to the primary drop component and includes a single traverse line or a self-equalizing dual line safety system, as previously described in U.S. Patent No. 8,505,264. The participant is attached to a carriage with a determined length of rope/cable tether. From an end of an upper platform, the operator pushes the carriage system, which causes the passenger to be pulled off the deck and down into a baffle system. The baffle system causes the same effect described above, shrouding the participant in darkness while slowing the participant down and changing their vector so that, upon exiting from the baffle system, the participant is caused to make a short and controlled drop with required forward momentum in order to complete the traverse at the required velocity.

The second system can be further improved by reconfiguring the dual line safety system to be a continuous loop that incorporates counterweights located inside anchor towers at either or both extremities of the traverse, which counterweights move the actual cable within the dual line system in such a way as to cause stop blocks to be positioned at either a loading or operating position.

The participant's weight also becomes part of the actuation of the system, as when the participant hits the lower extremity of the system in the locked position, the participant swings in a pendular motion until the operator decides to unlock the system at which time the participant's weight, along with that of the lower counterbalance, moves the blocks into the loading position as the participant is lowered to a disembarkation deck.

At this time, coincident with the motion of the lower block moving to the disembarkation position, the upper block moves in to the loading position. Once the participant is loaded, the system then is activated to move into the launching position, as the upper block moves down towards the end of the system and while pulling the participant's tether taut; The lower stop block moves into the stopping limit position, causing the participant to stop short of the end of the system so they may swing freely to dissipate kinetic energy and avoid collision with the end anchor pole. When

the lower operator decides that the participant is ready to be disembarked, the lower operator unlocks the system, allowing the participant to move to the unloading deck and resetting the system for the next participant.

Both disclosed systems can be improved further with the addition of (1) a
5 roller seat on the activity deck, which is a "chair" made of rollers that has two positions. Position 1 is in the shape of a chair and when activated, the seat flattens out into a slide launching the passenger; or (2) an articulated launch tube device where the passenger is drawn down a tube by the tether to a point at the edge of the platform where there is a pivot point in the tube and, as the passenger passes over
10 the pivot point, the passenger's weight causes the tube to change orientation from horizontal to vertical, resulting in dropping/launching the passenger.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and advantages of the present
15 apparatus and method, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a side view of the amusement ride embodiment aboard a cruise liner;

Fig. 2 is a forward view of the amusement ride of Fig. 1;

Fig. 3 is an isometric view of embodiment of the amusement ride of Fig. 1;

20 Fig. 4 is a side view showing how the rider is launched to experience the first amusement ride embodiment;

Fig. 5 is a side view showing the rider approaching the end of the first amusement ride embodiment;

Fig. 6 is an isometric view of a second embodiment amusement ride that can
25 be located aboard the same tower as shown for the previous embodiment;

Fig. 7 is an isometric view of the first amusement ride embodiment using a drop seat to launch the participant;

Fig. 8 is a side view of the drop chair shown in Fig. 7;

Fig. 9 is an isometric view of an alternative view of a transverse tether canal
30 for launching a participant; and

Fig. 10 is a side view of the transverse tether canal of Fig. 9.

The drawings will be described in greater detail below.

DETAILED DESCRIPTION

35 Referring initially to Fig. 1, a cruise ship, **10**, is seen on the sea. Since space is limited aboard cruise ship **10**, cruise ship operators are constantly seeking additional activities for its passengers, especially, if such activities do not take

additional deck space. A traverse ride, **12**, is seen extending above ship **10** giving the passengers a thrill with its vertical height and amazing views from such height, while taking up no deck space, causing any congestion, or detracting from deck activities already aboard ship **10**. It should be noted, however, that the disclosed system and its variants could be installed at a beach location, rooftop, inside a mall, or at just about any desired location where an operator can provide thrill and excitement to customers. The limited space aboard a ship created certain challenges in the design of the disclosed system. Once the system was designed for use aboard a ship, other locations became relatively easy to adapt. Thus, much of the following description will be with reference to installation and use of the system aboard a ship. Such description is by way of illustration and not by way of limitation.

Referring additionally to Figs. 2 and 3, it will be observed that ride **12** is positioned atop an upper deck, **14**, at its start and ends atop another upper deck, **16** (see Fig. 1). The beginning and ending of ride **12** can be several hundred feet apart with the elevation of ride **12** being higher at the start than it is at the ending; thus, permitting gravity to provide the main mode of power to the traverse ride **12**.

In this embodiment in the drawings, a pair of generally parallel lines permits two different riders to experience ride **12** at the same time. It will be appreciated that additional such lines could be established depending up space requirements.

The fixed base at the start could be a tree, tower, building, or virtually any structure that can support the rise. Virtually any height can be used by the disclosed amusement ride. Because of the small footprint of the ride, a cruise ship is an ideal location for the disclosed amusement rides. The height of the amusement ride can be static or dynamic.

The participant is outfitted in a harness and other required safety equipment, *i.e.*, helmet, gloves, *etc.* The participant can access the ride using a spiral staircase, **18**, up to a launch platform, **20**, or alternatively a vertically oriented climbing wall (conveyor), **19**, or net, **21**, or combination. Staircase **18** can be a simple helix configuration or in a double helix configuration to increase the number of participants that can move up to the beginning of the amusement ride. Climbing wall **19** can be a continuous loop around rollers at the top and at the bottom and being connected to a power source so that it moves like a conveyor belt. In this fashion, the rider, if able, can climb the entire height of wall **19**; or just a portion of the height with the wall then being activated to ferry the rider the rest of the way up to platform **20**; or the entire height from deck **14** to deck **20** if the rider is unable to climb the wall, but wants the experience of going up a climbing wall. These various means of accessing platform **20** merely adds to the excitement of the amusement. Moreover, such continuously

moving climbing wall is capable of rotating to different angles in order to stage an opportunity for a photograph or digital image or video to be taken of the person ascending the climbing wall. Such opportunities are created for all the various the modes of ascension, as part of the entertainment package disclosed herein.

5 Dual lines, **22** and **24**, upon which the participant rides, passes through a pulley, **26** (see Figs. 4 and 5), for line **24** with a similar pulley not shown for line **22**. Pulley **26** is affixed to a pole, **42** (see Fig. 6), at the beginning and to a pole, **30** (see Fig. 1 also), at the end of the ride. One or more operators are stationed on platform **20**, as is necessary or desirable for safety. Chutes, **32** and **34**, extend away from
10 platform **20** and provide the entry for the participants to start the ride.

The participant is seated at the throat of the slide and prepares for launch. The participant wears a harness that is attached to a pulley, **23**. The rider then scoots forward and down the chute and/or the operator gives the participant a slight push to start the slide down the chute. The slide radius is such that the tether
15 becomes slightly slack as the participant proceeds down the slide. The participant then, reaching the end of the slide, continues in a forward motion caused by the arc of the slide creating a momentary free-fall. Then, as the participant reaches the extent of the length of the tether, which in most applications is a dynamic climbing rope used to absorb shock, the participant swings forward in the arc of the tether
20 (see Figs. 3 and 4).

Figs. 4 and 5 illustrate the ride in greater detail. In particular, the operator at either the end of the ride, releases some slack in line **24**, allowing a weight, **32**, to pull a block or stop, **36**, forward and, therefore, the rider into the slide (chute). Simultaneous with the forward action of upper block **36** pulling the rider into the chute,
25 another block or stop, **34**, at the lower end moves forward and up the traverse an equal distance to a secondary position and locks in place. The action of which will stop the rider a safe distance from the end allowing the rider to swing and dissipate forward momentum. Once the rider has dissipated enough momentum to be lowered safely, the operator releases the lock mechanism, which allows for the weight of the
30 rider to reset the mechanism as the rider is lowered to the disembarkment point. At the same time a stop, **34**, at the bottom of the ride is moved up the line to stop the rider allowing the rider to swing some more when contacting the stop. When the rider stops swinging the operator pulls on line **24** lowering the rider to the landing platform and at the same time the pulling stop, **36**, at the top of the ride is moving back so the
35 ride can reset for the next rider.

The counterweight system can be located at either the upper end or the lower end, and in some circumstances, at both ends. Fig. 4 illustrates the ride with the

participant on the platform ready for launch. Fig. 5 illustrates the passenger at the terminus of the ride where pulley **23** hits stop **34**, resulting in the participant swinging back and forth in an arcing motion.

The embodiment shown in Fig. 6 eliminates the dual cables of the first
5 embodiment, but retains the remainder of the experience. That is, the participant can access platform **20** in the same manner described above using spiral staircase **18**, moving climbing wall **19**, or next **21**. Once the participant is located on upper platform or deck **20**, the participant puts on the same harness system and is hooked to a tether, **25**, that runs through a pulley, **46**, located at the end of an extend arm system, **44**, located atop a pair of columns, **40** and **42**, that each are supported by
10 deck **20**.

The participant is seated at the throat of slide **32** and prepares for launch. The operator pulls on tether **25** through a belay device, **49**, which shortens the distance between the participant and fixed pulley **46**. The radius of slide **32** is such
15 that tether **25** becomes slightly slack as the participant proceeds down slide **32**. The slide can be formed from polymeric material or fabric and suspended by flexible members, such as cable or fiberglass reinforced rods or other semi-rigid material. An optional shroud or baffle, **33**, can be located at the lower end of slide **32**. The participant is in darkness inside shroud **33** until emerging from the discharge end of
20 shroud **33**. Shroud **33** creates a tunnel-like effect, such that the participant has the sensation of falling in the dark. Shroud **33** also absorbs kinetic energy some of which is converted to sound energy by the rider sliding against the shroud material and some energy is absorbed by the supporting tether system. Such loss of energy
25 puts the participant into a lower and more controllable arc and drop combination. Once the rider has dropped from the end of the slide/baffle and swung in an arc for a period of time, the operator can lower the rider onto a lower deck, crash mat, swimming pool, pit filled with balls or beans, air bag, or just about any safety amusement landing area. Without the shroud, the swing of the passenger may be uncontrollable and unsafe.

Referring now to Figs. 7 and 8, a drop seat is illustrated for use with the first
30 described embodiment; although, it can be used with both embodiments disclosed herein. In particular, the participant is hooked up to a harness system, gloves, *etc.*, as described above. In this embodiment, however, the participant is seated in a drop chair assembly, **52**, composed of a back, **54**, fitted with a series of rollers, **56**, and a
35 seat, **58**, also fitted with a series of rollers, **60**. Drop chair assembly **52** is attached to a conveyor belt or similar mover, **62**, that moves drop chair assembly **52** to move from an initial or home position where the rider first sits upon it to a launch position

(shown in phantom in Fig. 8 with prime numbers for the corresponding parts described above). Upright back **54** of drop chair assembly **52** is pivotally connected to seat **58** of drop chair assembly **52**. The operator can simply push drop chair assembly **52** to move it from the home position to the launch position shown in phantom. When the rider gets to the launch end, the chair suddenly tips forward by the weight of the rider sitting upon seat **58**, permitting the rider to suddenly free-fall drop and the start swinging. The operator controls the ride from here as described above for the second embodiment.

An alternative launch design to that of slide **32** shown in Fig. 6, is launch tube assembly, **70**, shown in Figs. 9 and 10. In particular, the participant enters launch tube assembly **70** from platform **20** at a proximal opening of a launch tube, **72**. The participant is in a reclined position and wears a harness tethered to pulley **23**. An opening, **74**, permits the operator to speak with the participant to determine that the participant is ready to be launched. An opening on the topside of tube **72** permits the tether to run between the harnessed participant and slide pulley **23**. Tube **72** also has an opening at its distal end. A pivot, **76**, attaches slide **72** to platform **20** via a clamp, **78**. The harnessed participant scoots forward in tube **72** until the weight of the participant causes the distal end of tube **72** to rotate about pivot **76** to launch the participant, who immediately drops downwardly and then slidingly down line **24**.

While the amusement ride has been described with reference to various embodiments, those skilled in the art will understand that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope and essence of the disclosure. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the disclosure without departing from the essential scope thereof. Therefore, it is intended that the disclosure not be limited to the particular embodiments disclosed, but that the disclosure will include all embodiments falling within the scope of the appended claims. In this application all units are in the metric system and all amounts and percentages are by weight, unless otherwise expressly indicated. Also, all citations referred herein are expressly incorporated herein by reference.

CLAIMS

1. An amusement ride, which comprises:
 - (a) an upper platform at the upper dual line end for launching a tethered rider who is connected via a line to a pulley riding on the dual line;
 - (b) a slide carried by the upper platform from which the rider is launched, resulting in the rider swinging in an arcuate motion about the pulley and then carried by gravity down the dual lines;
 - (c) a counterweight system for controllably letting slack into the dual lines prior to rider launch and for tightening the dual lines for rider launch; and
 - (d) a lower landing for the rider to demount the amusement ride at a lower platform.
2. The amusement ride of claim 1, wherein a chute extends from said upper platform from which the rider is launched.
3. The amusement ride of claim 1 or 2, wherein two parallel dual lines permit two different riders to use the amusement ride at the same time.
4. The amusement ride of claim 2, wherein a fabric baffle is fitted to the end of the chute and through which the rider passes.
5. The amusement ride of claim 1, 2, 3 or 4 wherein the rider accesses said upper platform by climbing up one or more of a double helix ladder, a moving climbing wall, or a net.
6. The amusement ride of claim 1 or 2, wherein the dual line contains an upper stop block and a lower stop block.
7. The amusement ride of any one of claims 1 to 6, which is located aboard a cruise liner.
8. The amusement ride of any one of claims 1 to 7, which additionally includes a trap chair configured to receive the tethered rider and movable from a home position to a launch position wherein the chair pivots for launching the tethered rider.

9. An amusement ride, which comprises:
 - (a) an upper platform located above a deck;
 - (b) a tether line running from a belay device through a pulley and to a rider; wherein the belay device is located at the upper platform, the pulley is located a distance away from the upper platform and above the platform, and the rider is located on the platform;
 - (c) a chute extending away and downwardly from the upper platform and configured to receive a rider; and
 - (d) a lower platform.wherein the tethered rider slides down the chute and swings in an arcuate motion away from the platform and thereafter is lowered to the lower platform.
10. The amusement ride of claim 9, wherein a chute extends from said upper platform from which the rider is launched.
11. The amusement ride of claim 10, wherein a fabric baffle is fitted to the end of the chute and through which the rider passes and wherein the tether line running from a belay device through a pulley and to a rider is such length that the rider initially drops vertically upon emerging from said fabric baffle before swing in an arcuate motion.
12. The amusement ride of claim 9, 10 or 11 wherein the rider accesses said upper platform by climbing up one or more of a helix ladder, a moving climbing wall, or a net.
13. The amusement ride of claim 9, 10, 11, or 12 which is located aboard a cruise liner.
14. The amusement ride of claim 9, 10, 11, 12 or 13 which additionally includes a trap chair configured to receive the tethered rider and movable from a home position to a launch position wherein the chair pivots for launching the tethered rider.
15. The amusement ride of claim 9, 10, 11, 12, 13 or 14 which is attached to a pole to which is also attached the amusement ride of claim 1.

16. In an amusement ride wherein the participant is required to ascend to the beginning of the amusement ride, the improvement which comprises a double helix ladder for participants to ascend.

17. In an amusement ride wherein a participant is required to ascend to the beginning of the amusement ride, the improvement which comprises a vertically oriented moving climbing wall conveyor wherein participants ascend on the moving climbing wall conveyor while the participants are tethered for safety.

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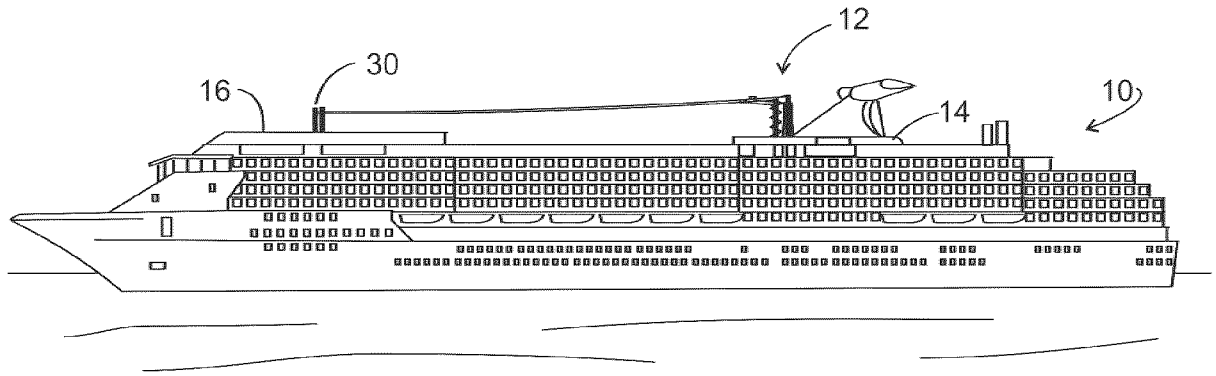


FIG. 1

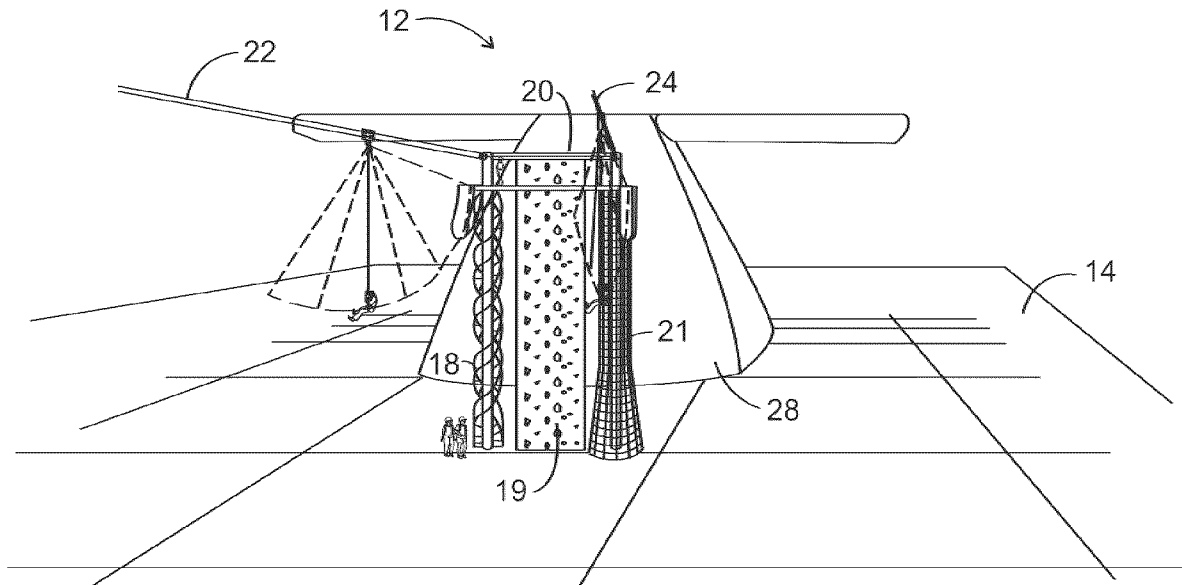
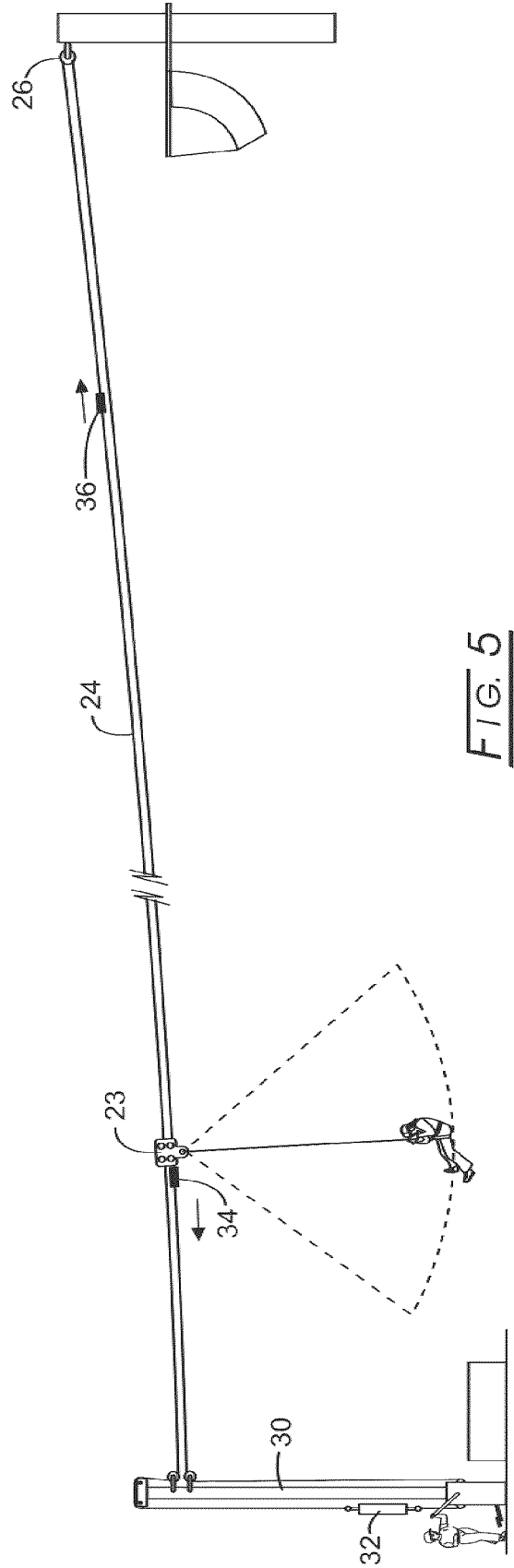
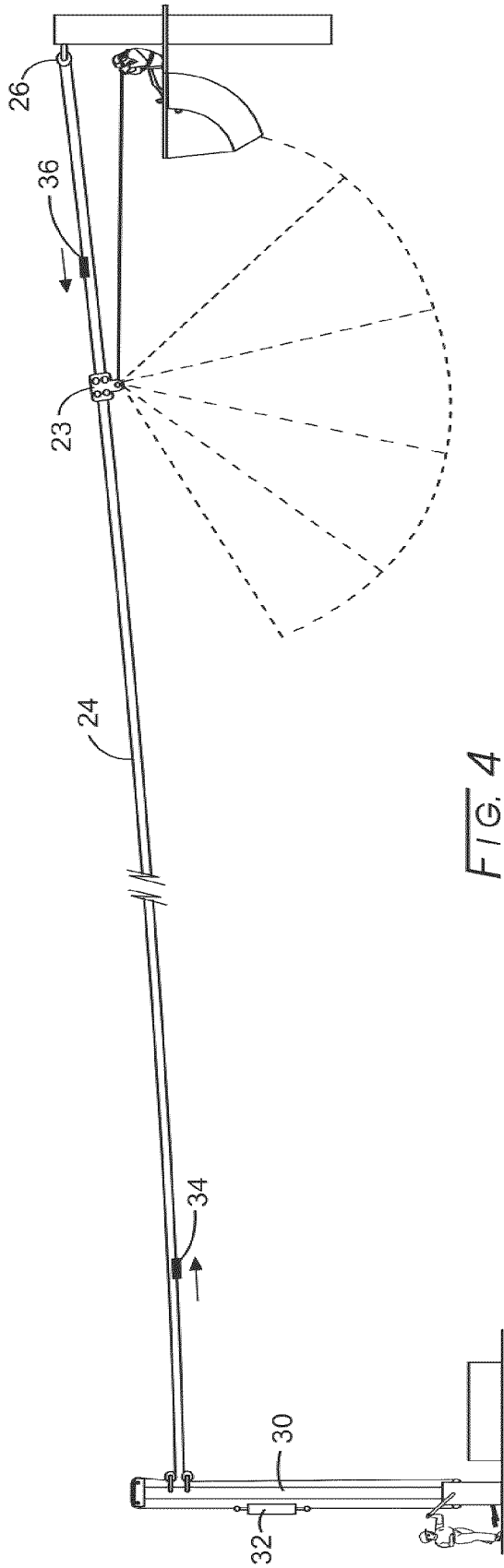


FIG. 2



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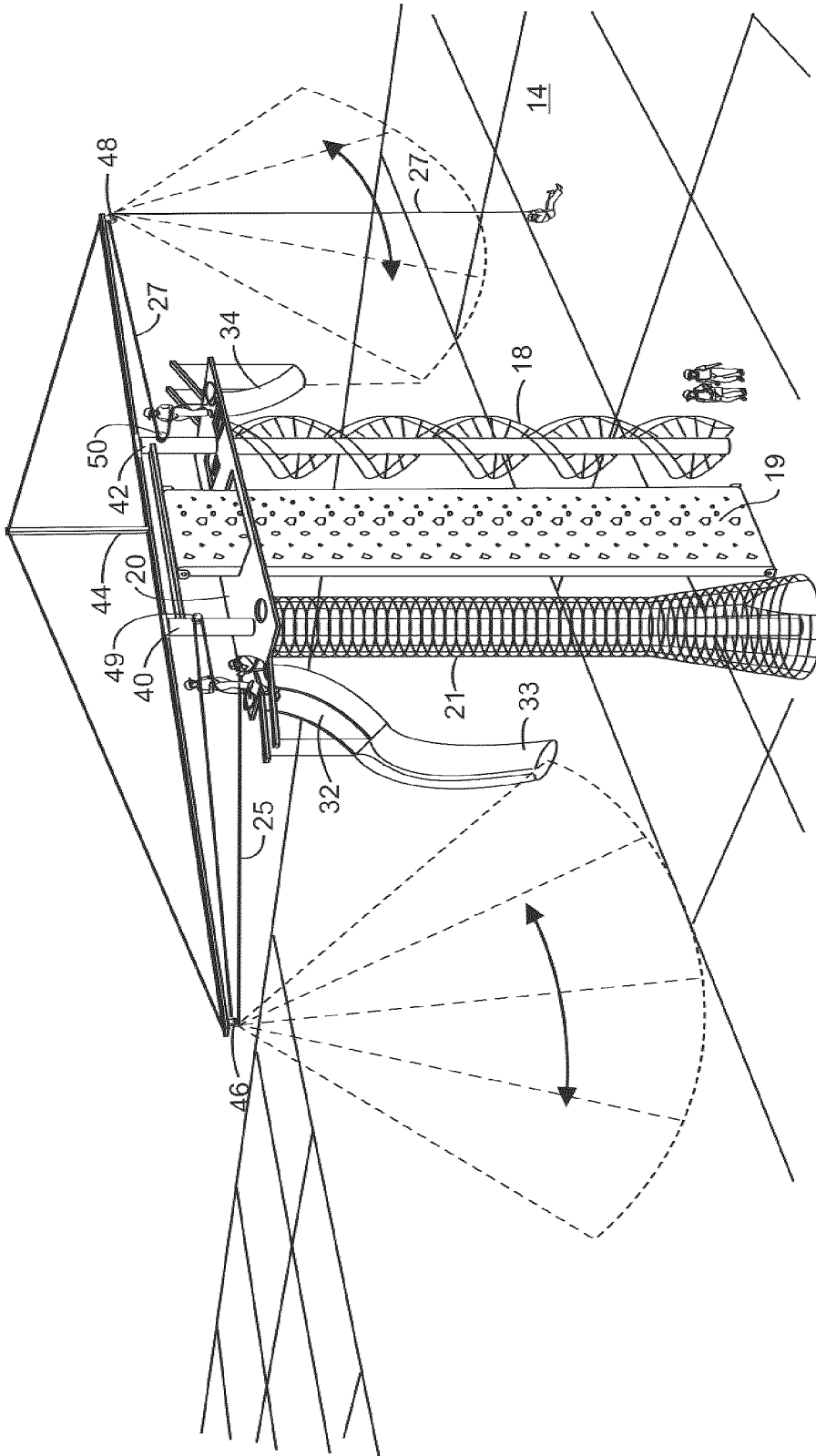


FIG. 6

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FIG. 7

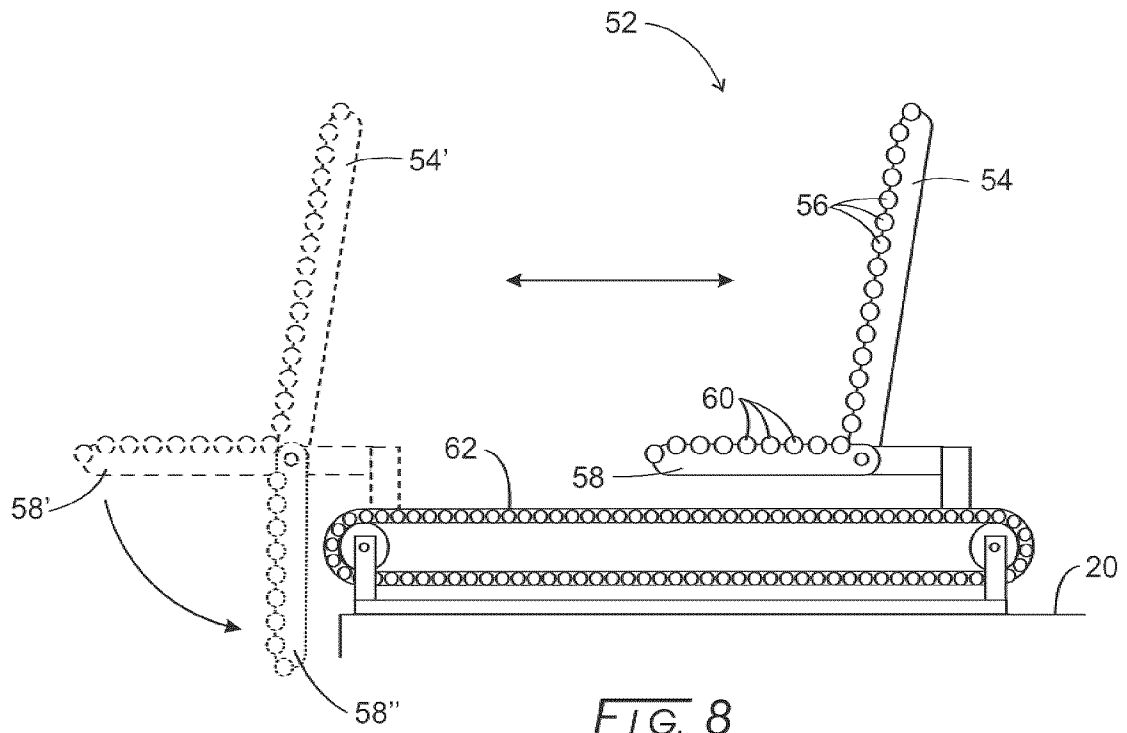
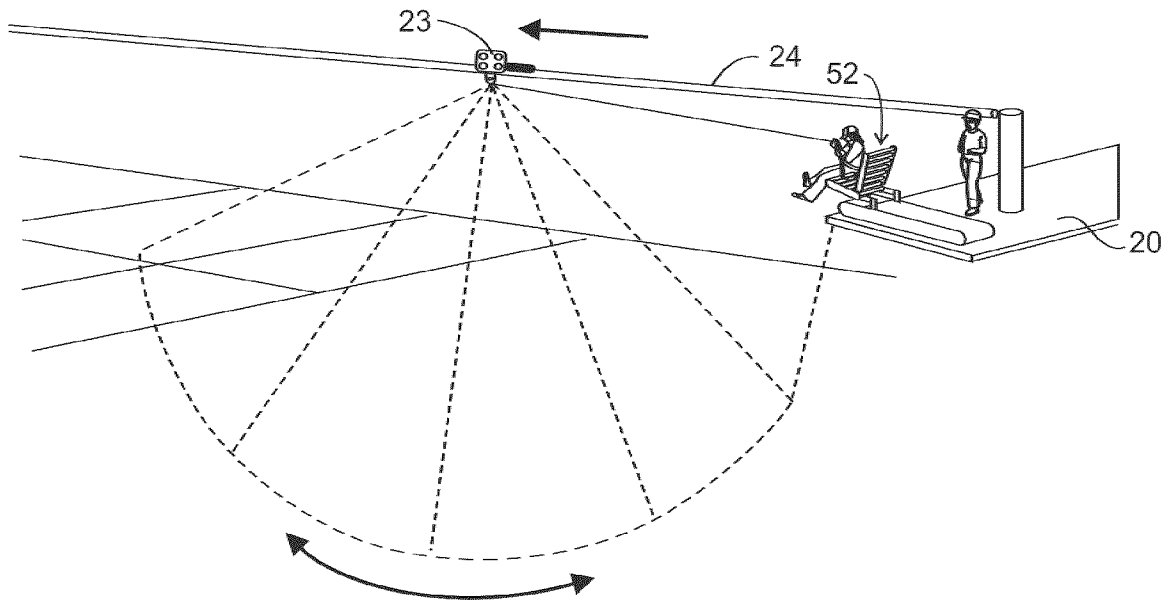
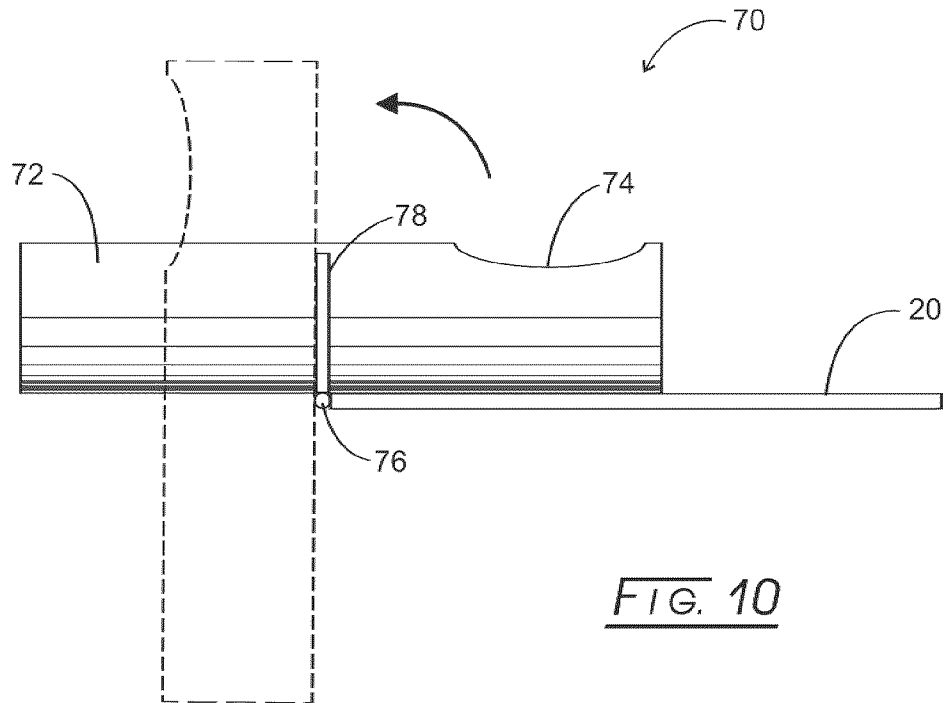
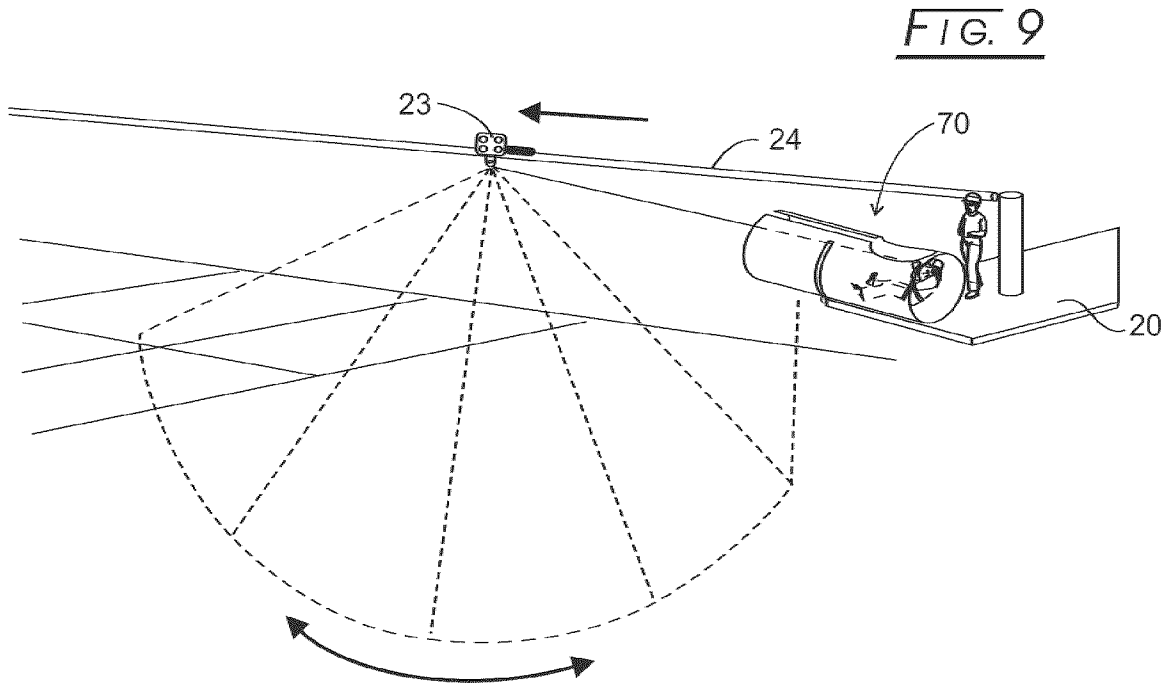


FIG. 8

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2014/051196

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: **A63G 31/00** (2006.01), **B61B 12/00** (2006.01), **B61B 12/02** (2006.01), **B61B 7/00** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC: A63G (2006.01); B61B (2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
 Canadian Patent Database, Google Patents, Questel-Orbit

Keywords: amusement, ride, platform, tether, line, slack, slide, swing, chute, counterweight, ladder, net, wall

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US5853331 A (Ishikawa M. et al.) 29 December 1998 (29-12-1998) *Fig's. 2 and 9; col. 7, lines 1-36*	1-3 5, 6, 8-10, 12, 14, 15
Y	US2009/0255436 A1 (Buckman R. B.) 15 October 2009 (15-10-2009) *par. 0005, 0061, Figures*	6
Y	CA2691610 A1 (Steele C. Z. et al.) 31 December 2008 (31-12-2008) *par. 0035, 0036*	8
Y	US5267906 A (Kitchen W. J. et al.) 07 December 1993 (07-12-1993)*see whole document*	9, 10, 14, 15
Y	US5853332 A (Briggs R. A.) 29 December 1998 (29-12-1998)*col. 6, lines 6-18*	5, 12

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
 13 August 2015 (13-08-2015)

Date of mailing of the international search report
 26 August 2015 (26-08-2015)

Name and mailing address of the ISA/CA
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
(see extra sheet)

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos.:

1-15

- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2014/051196

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US5853331A	29 December 1998 (29-12-1998)	None	
US2009255436A1	15 October 2009 (15-10-2009)	US2009255436A1 US2009049946A1	15 October 2009 (15-10-2009) 26 February 2009 (26-02-2009)
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The claims are directed to a plurality of inventive concepts as follows:

Group A - Claims 1-15 are directed to an amusement ride comprising an upper and lower platforms, a slide, a counterweight system and a tethered ride;

Group B - Claim 16 is directed to a double helix ladder used in an amusement ride to ascend participants; and

Group C - Claim 17 is directed to a vertically oriented moving climbing wall conveyor used in an amusement ride to ascend participants.

The claims must be limited to one inventive concept as set out in Rule 13 of the PCT.