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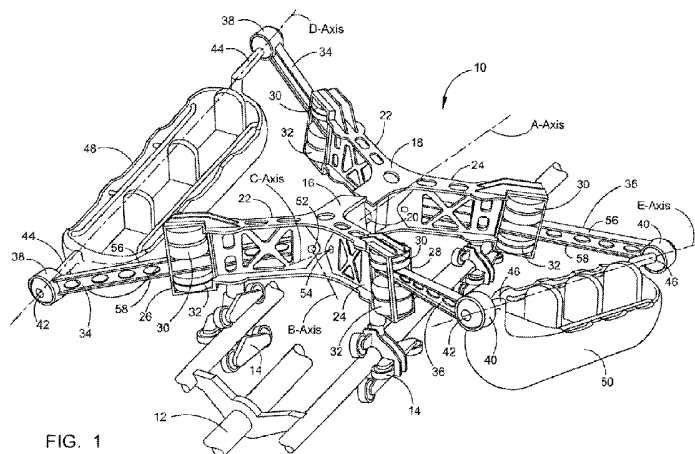


FIG. 1

(57) Abstract: A roller coaster or amusement ride providing a unique free-floating sensation by extending the passenger vehicles out on either side of the central frame structure. The passenger vehicles (48, 50) are supported between two cushioned cantilevered vehicle support arms {34, 36} that pivot while being supported between air bags (30, 32) or springs. The air pressure in the air bags or the tension in the springs can be adjusted to provide a soft, free-floating sensation to the ride. Additional passenger vehicle motions are achieved by the omni-directional ball-swivel joints (38, 40) on the ends of the support arms. The off-center location of the passenger vehicles (48, 50) and the weight of the passengers enable the passenger vehicles to remain in the up-right position even when the central frame structure rotates around the track system. No additional drive systems or passenger controls are required on this unique roller coaster ride.

WO 2009/006480 A1

LONGITUDINALLY SPINNING SUSPENSION ROLLER COASTER

FIELD OF THE INVENTION

The longitudinally spinning suspension roller coaster relates broadly to a dynamic amusement or thrill ride of the type wherein a passenger-carrying ride vehicle is caused to move along a track structure in a generally closed loop with more or less inclined portions and a series of curves and spirals. More particularly, the invention pertains to a cantilevered longitudinally spinning and rocking roller coaster system enhancing the sensation of motion and travel experienced by passengers in the ride vehicles.

BACKGROUND OF THE INVENTION

Amusement parks are enjoying a continuously increasing success throughout the country, as well as throughout the rest of the world. These parks offer their guests a wide range of attractions, the most popular and most spectacular of which is certainly recognized as the roller coaster. Traditionally, roller coasters comprise one or more ride vehicles traveling along rails or tracks in the manner of a train. The passengers appreciate this attraction for the strong impressions it produces beyond the real sensations of acceleration along the path of travel. Traditional roller coasters enable thrilling motions along loops, spirals and curves to be integrated into the ride, although a generally jarring and bumping sensation is very common.

Another type of ride comprises a vehicle supported on and guided along a tubular track structure. The side mounting of the ride vehicle on the track may provide passengers with the sensation that the ride vehicle does not ride on a track structure and seems to be free from any mechanical tether to any visible or predetermined course. However, because of the need to maintain control and safety of the ride vehicles, the most severe spirals and loops designed into traditional roller coasters have not typically been present in these alternate ride systems. As a result, the range of sensations offered to passengers is reduced with the passengers' sensation of motion generally dictated by the velocity, acceleration and positioning of the ride vehicle in direct juxtaposition to its path of travel. When it is technically impossible to increase the ride experience of such ride systems, rides with a theme are used to

present amusing and entertaining backdrops, scenery, lighting, sound and other special effects.

Notwithstanding these attempts to amplify the thrill of a ride in roller coasters and in alternate ride systems, there remains a definite need for an amusement ride that is capable of enhancing the overall sensation of the motion and travel experienced by a passenger as the ride vehicle moves along its particular track structure. That is, it remains desirable to provide an amusement ride, which creates an impression of free flight and keeps the track structure away from the passenger sight line. There also exists a need to provide an amusement ride which permits the ride vehicle to be accelerated in ways uncommon to prior art roller coaster designs.

Numerous innovations for roller coaster rides have been provided in the prior art that are described as follows. Even though these innovations may be suitable for the specific individual purposes to which they address, they differ from the present invention as hereinafter contrasted. The following is a summary of those prior art patents most relevant to the invention at hand, as well as a description outlining the difference between the features of the present invention and those of the prior art.

Patent No. 5,791,254 of John F. Mares et al, describes a roller coaster or amusement park ride that is comprised of a track system capable of directional travel, including horizontal, vertical, angled, curved, curvilinear, and retrograde directions. A carriage in which passengers reside is relatable about the track system, either by programming or by passenger activation, providing for additional freedom of movement. The roller coaster may have a track through a clear tube (e.g., surrounded by water) and multiple, independent rides supported by the same support structure, providing increased excitement for the passengers.

This patent describes a unique track system and passenger carriage but does not provide the free floating sensation derived by when the passenger vehicles are located on the end of the cantilevered air cushioned arms extending out from the central coaster structure using a variety of rotating axis points.

Patent No. 6,047,645 of Joseph M. Cornwell describes an amusement ride system and in particular, amusement ride systems of the roller coaster type. More specifically, the present invention relates to a truss track assembly for use in transporting side-mount passenger vehicles.

5

This patent describes a roller coaster ride system with a unique track assembly using multiple rigidly side mounted vehicles. The ride vehicles or structure has no cushioning capabilities and the movements are limited to the configuration of the track assembly, which at times can produce a jarring sensation.

10

Patent No. 6,098,549 of John F. Mares describes an amusement device comprising a modularized pod, in which one or more riders sit and are restrained, and which spins under power about a horizontal axis according to the passenger's active control. The riders control the spinning of the pod, either forward or backward, by pressing buttons on the passenger's handgrips located inside the pod. The modularized pod may be used in conjunction with many different types of amusement devices, including, but not limited, to roller coasters, carousels, Ferris wheels, virtual reality units, and centrifugal tumblers. The modularized pod may also be used in conjunction with flight and space training and simulation units.

20

This patent describes a modularized pod, with one or more riders, which spins under power about a horizontal axis according to the passenger's active control. It requires additional drive systems and control mechanisms for each passenger and does not have any of the air cushioning capabilities.

25

Patent No. 6,523,479 of Alan Schilke et al. describes amusement rides and methods. The amusement rides of the present invention include roller coaster vehicles that have a controlled spin or controlled rotation in a direction or dimension independent from the track of the roller coaster. The controlled rotation or spin is provided by using displacement of the track configuration to power a proportional rotation of the vehicle

30

This patent describes a roller coaster vehicle having a controlled spin independent from the track, but it has no air bag cushioning capabilities and thus produces a rough ride.

- 5 None of the foregoing prior art teaches or suggests the particular unique features of the longitudinally spinning suspension roller coaster and thus clarifies the need for further improvements in these types of thrill rides.

10 In this respect, before explaining at least one embodiment of the longitudinally spinning suspension roller coaster in detail it is to be understood that the design is not limited in its application to the details of construction and to the arrangement of the components set forth in the following description or illustrated in the drawings. The longitudinally spinning suspension roller coaster is capable of other embodiments and of being practiced and carried out in various
15 ways. In addition, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

SUMMARY OF THE INVENTION

20 The principle advantage of the longitudinally spinning suspension roller coaster is to provide a unique air cushioned floating sensation on a roller coaster ride which spins longitudinally and yet the riders and seats within the passenger vehicle remain in the upright position throughout the ride.

25 Another advantage is to produce a floating sensation with the ride vehicles suspended away from the central rail system on cantilevered spring cushioned or air cushioned support arms.

30 Another advantage is to produce a ride that can be tailored to the age of the individuals using the ride where short small systems will work well for younger children and higher, longer and more articulated systems will work for teens and adults.

And still another advantage is to create a ride where the vehicle is maintained on a general longitudinal axis with the rail system, while allowing a limited spring cushioned or air cushioned rocking motion.

5 A further advantage is to create a ride with cantilevered vehicle support arms, where the amount of possible travel is much greater and the passenger vehicle is allowed to rock yet it is maintained in a general upright position.

And yet a further advantage of this longitudinally spinning suspension roller
10 coaster is to add a new and unique thrill ride to the area of amusement park rides.

These together with other objects, along with the various features of novelty, which characterize the longitudinally spinning suspension roller coaster, are pointed out with particularity in the claims annexed to and forming a part of
15 this disclosure. For a better understanding of the design, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated the preferred embodiments. There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed
20 description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features that will be described hereinafter and which will form the subject matter of the claims appended hereto.

25 The preferred embodiment of the longitudinally spinning suspension roller coaster will consist of a forward structural Y-shaped member and a rear structural Y-shaped member that are joined by the means of a pivotal mechanism rod allowing each member to pivot independently conforming to the distorted configurations of the tubular rail system. The forward structural Y-shaped member and a rear structural Y-
30 shaped member are symmetrical about the central pivotal mechanism rod. Each Y-shaped mechanism has two outboard segments. On the end of each outboard segment is a airbag-supporting structure retaining the upper and lower air bags. Through the center of each of the outboard segments is located the air cushioned cantilevered vehicle support arm with omni-directional ball-swivel joint housings on the ends. An

orifice in the omni-directional ball-swivel joint housings provides a means for the axles on the passenger vehicles to rotate. The air cushioned cantilevered vehicle support arms pivot on pivot pins while being supported on the upper and lower surfaces between the upper and lower air bags. The air pressure in the upper and lower air bags will be adjusted to provide a soft, floating feeling to the ride. The off-center location of the passenger vehicles and the weight of the passengers, maintains the passenger vehicles generally in the up-right position, even if the longitudinally spinning suspension roller coaster rotates 360 degrees around the three-member tubular rail system. The passenger vehicles have the ability to rock up and down by the means of the air cushioned cantilevered vehicle support arms in the forward structural Y-shaped member and a rear structural Y-shaped member and the additional central pivot. This multiple axial combination provides an unmatched free-floating sensation for the passengers within the vehicles that are suspended away from the tubular rail system. The weight of the passengers and any additional movements they make will accentuate the cushioned movements of the passenger vehicles. No additional motion drive mechanisms are required to produce this unique roller coaster ride.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the longitudinally spinning suspension roller coaster, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present design. Therefore, the foregoing is considered as illustrative only of the principles of the design. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the longitudinally spinning suspension roller coaster to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the design features.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form a part of this specification, illustrate embodiments of the longitudinally spinning suspension roller

coaster and together with the description, serve to explain the unique principles of the design.

FIG. 1 depicts a perspective view of the longitudinally spinning suspension roller coaster on a conventional three-member tubular rail system.

FIG. 2 depicts a perspective view of the longitudinally spinning suspension roller coaster with an eagle ornament.

FIG. 3 depicts a perspective view of the forward structural Y-shaped member illustrating the varying pivotal axis points and the spring or air cushioned cantilevered vehicle support arms.

FIG. 4 depicts a side elevation of a portion of a structural Y-shaped member with the spring or air cushioned cantilevered vehicle support arm.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As required, detailed embodiments of the longitudinally spinning suspension roller coaster **10** are disclosed herein, however, it is to be understood that the disclosed embodiments are merely exemplary of the design that may be embodied in various forms. Therefore, specific functional and structural details disclosed herein are not to be interpreted as limiting, but merely as basic for the claims and as a representative basis for teaching one skilled in the art to variously employ the present design in virtually any appropriately detailed structure.

Referring now to the drawings, wherein similar parts of the longitudinally spinning suspension roller coaster **10** are identified by like reference numerals, there is seen in **FIG. 1** a perspective view of the longitudinally spinning suspension roller coaster **10** on a conventional three-member tubular rail system **12**. It must be understood at this time, although the three-member tubular rail system **12** has been depicted, a wide variety of combinations in number and shape of tubular rail systems along with a variety of different conventional tracks and propulsion systems will work well with the longitudinally spinning suspension roller coaster **10** and thus will be covered within the scope of this patent. A variety of conventional roller coaster trucks

14 are used on roller coasters and will work equally as well with the longitudinally spinning suspension roller coaster 10.

A forward structural Y-shaped member 16 and a rear structural Y-shaped member 18 are joined by the means of a pivotal mechanism rod 20 along the central A-Axis allowing each member to pivot independently conforming to the distorted configurations of the three-member tubular rail system 12. The forward structural Y-shaped member 16 and a rear structural Y-shaped member 18 are symmetrical about the pivotal mechanism rod 20 so that a full description of the forward structural Y-shaped member 16 will suffice for the description of the rear structural Y-shaped member 18. There is a structural member outboard segment 22 and 24 on each side of the forward Y-shaped member 16. On the end of each structural member outboard segment 22 and 24 are the airbag supporting structures 26 and 28 retaining the upper air bags 30 and the lower air bags 32. Though the center of the each of the outboard segments 22 and 24 and between the upper airbag 30 and the lower airbag 32 is located, the air cushioned cantilevered vehicle support arms 34 and 36. On the ends of each of the vehicle support arms 34 and 36 are omni-directional ball-swivel joint housings 38 and 40. A ball swivel joint orifice 42 in the omni-directional ball-swivel joint housings 38 and 40 provides a means for the axles 44 and 46 on the passenger vehicles 48 and 50 to rotate about the D and E-Axes.

The air cushioned cantilevered vehicle support arms 34 and 36 pivot about the B and C-Axes on pivot pins 52 and 54 supported on the upper and lower surfaces 56 and 58 between the upper and lower air bags 30 and 32. The air pressure in the upper and lower air bags 30 and 32 will be adjusted to provide a soft, floating feeling to the ride. It is anticipated that other cushioning mechanisms could be employed, such as any springs or spring-like mechanisms suitable for this purpose. Also, it is possible to orient the suspension system in the vertical direction, as well as the horizontal direction (as illustrated), or it could be oriented in the direction of travel on a cantilever arm.

The off-center location of the passenger vehicles 48 and 50, in relation to the D and E-Axes and the weight of the passengers, maintains the passenger vehicles 48 and 50 generally staying in the up-right position, even if the longitudinally spinning

suspension roller coaster **10** rotates 360 degrees around the three-member tubular rail system **12**. It is typical of many roller coaster rides to provide sections of track which twist 360 degrees and thereby guide the passenger vehicle to do a full circle around the track structure. In the present invention, this can occur with the riders remaining
5 in the upright position during and throughout the full circle motion. Therefore, a novel feature of the present invention is that during longitudinal spin the seats in the passenger vehicle remain upright while the chassis rotates around the track.

The passenger vehicles **48** and **50** have the ability to rock up and down by the
10 means of the air cushioned cantilevered vehicle support arms **34** and **36** in the forward structural Y-shaped member **16** and a rear structural Y-shaped member **18**. This multiple axial combination provides an unmatched free-floating sensation for the passengers within the vehicles **48** and **50** that are suspended away from the three-member tubular rail system **12**. The weight of the passengers and any additional
15 movements they make will accentuate the cushioned movements of the passenger vehicles **48** and **50**. No additional motion drive mechanisms are required to produce this unique roller coaster ride.

FIG. 2 depicts a perspective view of the longitudinally spinning suspension
20 roller coaster **10** with an eagle ornament **60**. The free-floating sensation for the passengers within the vehicles **48** and **50** that are suspended away from the three-member tubular rail system **12** easily simulates the flight of a bird. This is where the eagle ornament **60** is used to cover the mechanical structure of the longitudinally spinning suspension roller coaster **10**. A wide variety of differing theme ornaments
25 can be used for this purpose and will still be covered within the scope of this patent.

FIG. 3 depicts a perspective view of the forward structural Y-shaped member
16 illustrating the varying pivotal axis points with the direction of rotation. The forward structural Y-shaped member **16** and a rear structural Y-shaped member **18** are
30 symmetrical about the pivotal mechanism rod **20**. The air cushioned cantilevered vehicle support arms **34** and **36** are clearly displayed within the structural member outboard segments **22** and **24** with the upper surfaces **56** and lower surfaces **58** being supported by the means of the upper airbags **30** and the lower airbags **32**. The up and

down movement of the air cushioned cantilevered vehicle support arms **34** and **36** are illustrated pivoting on the **B** and **C-Axes** by the means of the pivot pins **52** and **54**.

FIG. 4 depicts a side elevation of the structural member outboard segment **24** of the structural Y-shaped member **16** with the air cushioned cantilevered vehicle support arm **36** further depicting the up and down movement compressing the upper and lower airbags **30** and **32** during the roller coaster ride.

The longitudinally spinning suspension roller coaster **10** shown in the drawings and described in detail herein disclose arrangements of elements of particular construction and configuration for illustrating preferred embodiments of structure and method of operation of the present design. It is to be understood, however, that elements of different construction and configuration and other arrangements thereof, other than those illustrated and described may be employed for providing a longitudinally spinning suspension roller coaster **10** in accordance with the spirit of this design, and such changes, alternations and modifications as would occur to those skilled in the art are considered to be within the scope of these design features as broadly defined in the appended claims.

Further, the purpose of the foregoing abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially the scientists, engineers and practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the unique features of the application, which is measured by the claims, nor is it intended to be limiting as to the scope of the design in any way.

Claims

We claim:

- 5 **1.** A longitudinally spinning suspension roller coaster comprising:
- (a) a forward structural Y-shaped members and a rear structural Y-shaped members both attached to a pivotal rod whereby said forward Y-shaped structural member and said rear Y-shaped structural member are symmetrical about said pivotal rod;
- 10 (b) a structural member outboard portion on each side of said forward Y-shaped member and said rear structural Y-shaped member having an airbag supporting structure located at the distal end of each of said structural member outboard portion;
- (c) one or more upper airbags and one or more lower airbags, whereby said
- 15 airbag supporting structures retain both upper airbags and lower airbags therein;
- (d) cantilevered vehicle support arms extending outward from said structural member outboard portions having a proximal end and a distal end, whereby said proximal end of said cantilevered support arms are located between said upper airbags and said lower airbags;
- 20 (e) omni-directional ball-swivel joint housings located on the distal ends of each of said cantilevered vehicle support arms; and
- (f) passenger vehicles having passenger vehicle axles rotatably attached to said omni-directional ball-swivel joint housings whereby said passenger vehicles have the ability to rock up and down by the means of the air cushioned cantilevered vehicle
- 25 support arms in said forward structural Y-shaped member and said rear structural Y-shaped member; and
- whereby the passenger vehicle and the riders therein remain in the upright position regardless of the longitudinal spin of the roller coaster.
- 30 **2.** The longitudinally spinning suspension roller coaster according to claim 1, wherein said structural member outboard portion on each side of said forward Y-shaped member and said rear structural Y-shaped member each support a conventional roller coaster truck which movably attaches to the roller coaster rail system.

3. The longitudinally spinning suspension roller coaster according to claim 1, wherein said one or more upper airbags and one or more lower airbags are replaced with one or more upper springs and one or more lower springs and said airbag supporting structures retain both upper springs and lower springs.

4. The longitudinally spinning suspension roller coaster according to claim 1, wherein said cantilevered vehicle support arms extending outward from said structural member outboard portions are pivotally attached to said structural member outboard portions by pivot pins.

5. The longitudinally spinning suspension roller coaster according to claim 1, wherein said cantilevered vehicle support arms extending outward from said structural member outboard portions pass between said upper airbags and lower airbags to allow for cushioning of said cantilevered vehicle support arms movement.

6. The longitudinally spinning suspension roller coaster according to claim 3, wherein said cantilevered vehicle support arms extending outward from said structural member outboard portions pass between said upper springs and lower springs to allow for cushioning of said cantilevered vehicle support arms movement.

7. The longitudinally spinning suspension roller coaster according to claim 1, wherein said passenger vehicles having passenger vehicle axles rotatably attached to said omni-directional ball-swivel joint housings whereby said passenger vehicles have the ability to rock up and down by the means of the air cushioned cantilevered vehicle support arms in said forward structural Y-shaped member and said rear structural Y-shaped member, and said passenger vehicle remain in the upright position regardless of the longitudinal spin of the roller coaster.

8. The longitudinally spinning suspension roller coaster according to claim 1, wherein said passenger vehicle is oriented in the direction of travel when attached to said cantilevered vehicle support arms.

9. The longitudinally spinning suspension roller coaster according to claim 1, wherein said forward structural Y-shaped members and a rear structural Y-shaped members, said structural member outboard portions and said cantilevered vehicle support arms are partially hidden under an ornamental structure.

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10. The longitudinally spinning suspension roller coaster according to claim 9, wherein said ornamental structure resembles a flying bird.

11. The longitudinally spinning suspension roller coaster according to claim 10, wherein said ornamental structure resembling a flying bird resembles an eagle.

12. A method for making a longitudinally spinning suspension roller coaster, comprising the steps of:

15 (a) providing forward structural Y-shaped members and rear structural Y-shaped members both attached to a pivotal rod whereby said forward Y-shaped structural member and said rear Y-shaped structural member are symmetrical about said pivotal rod;

20 (b) providing a structural member outboard portion on each side of said forward Y-shaped member and said rear structural Y-shaped member having an airbag supporting structure located at the distal end of each of said structural member outboard portion;

25 (c) providing one or more upper airbags and one or more lower airbags, whereby said airbag supporting structures retain both upper airbags and lower airbags therein;

(d) providing cantilevered vehicle support arms extending outward from said structural member outboard portions having a proximal end and a distal end, whereby said proximal end of said cantilevered support arms are located between said upper airbags and said lower airbags;

30 (e) providing omni-directional ball-swivel joint housings located on the distal ends of each of said cantilevered vehicle support arms; and

(f) providing passenger vehicles having passenger vehicle axles rotatably attached to said omni-directional ball-swivel joint housings whereby said passenger vehicles have the ability to rock up and down by the means of the air cushioned

cantilevered vehicle support arms in said forward structural Y-shaped member and said rear structural Y-shaped member; and

whereby the passenger vehicle and the riders therein remain in the upright position regardless of the longitudinal spin of the roller coaster.

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13. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing said structural member outboard portion on each side of said forward Y-shaped member and said rear structural Y-shaped member further includes the step of providing structural member outboard portions that each support a conventional roller coaster truck which movably attaches to the roller coaster rail system.

14. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing one or more upper airbags and one or more lower airbags is deleted and replaced with the step of providing one or more upper springs and one or more lower springs and said airbag supporting structures retain both upper springs and lower springs.

15. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing cantilevered vehicle support arms extending outward from said structural member outboard portions further includes the step of providing cantilevered vehicle support arms that are pivotally attached to said structural member outboard portions by pivot pins.

25

16. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing cantilevered vehicle support arms extending outward from said structural member outboard portions further includes the step of providing cantilevered support vehicle arms that pass between said upper airbags and lower airbags to allow for cushioning of said cantilevered vehicle support arms movement.

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17. The method of making a longitudinally spinning suspension roller coaster, according to claim 14, wherein said step of providing cantilevered vehicle support arms extending outward from said structural member outboard portions further includes the step of providing cantilevered support vehicle arms that pass between said upper springs and lower springs to allow for cushioning of said cantilevered vehicle support arms movement.

18. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing passenger vehicles having passenger vehicle axles rotatably attached to said omni-directional ball-swivel joint housings whereby said passenger vehicles have the ability to rock up and down by the means of the air cushioned cantilevered vehicle support arms in said forward structural Y-shaped member and said rear structural Y-shaped member, further includes the step of providing passenger vehicle axles rotatably attached to said omni-directional ball-swivel joint housings such that said passenger vehicles remain in the upright position regardless of the longitudinal spin of the roller coaster.

19. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said step of providing said passenger vehicles further includes the step of providing passenger vehicles wherein said passenger vehicle is oriented in the direction of travel when attached to said cantilevered vehicle support arms.

20. The method of making a longitudinally spinning suspension roller coaster, according to claim 12, wherein said steps of providing forward structural Y-shaped members and a rear structural Y-shaped members, said structural member outboard portions and said cantilevered vehicle support arms further includes the step of providing forward structural Y-shaped members and a rear structural Y-shaped members, said structural member outboard portions and said cantilevered vehicle support arms that are partially hidden under an ornamental structure.

21. The method of making a longitudinally spinning suspension roller coaster, according to claim 20, wherein said step of providing forward structural

Y-shaped members and a rear structural Y-shaped members, said structural member outboard portions and said cantilevered vehicle support arms that are partially hidden under an ornamental structure, further includes the step of providing an ornamental structure which resembles a flying bird.

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22. The method of making a longitudinally spinning suspension roller coaster, according to claim 21, wherein said step of providing an ornamental structure which resembles a flying bird, further includes the step of providing an ornamental structure which resembles an eagle.

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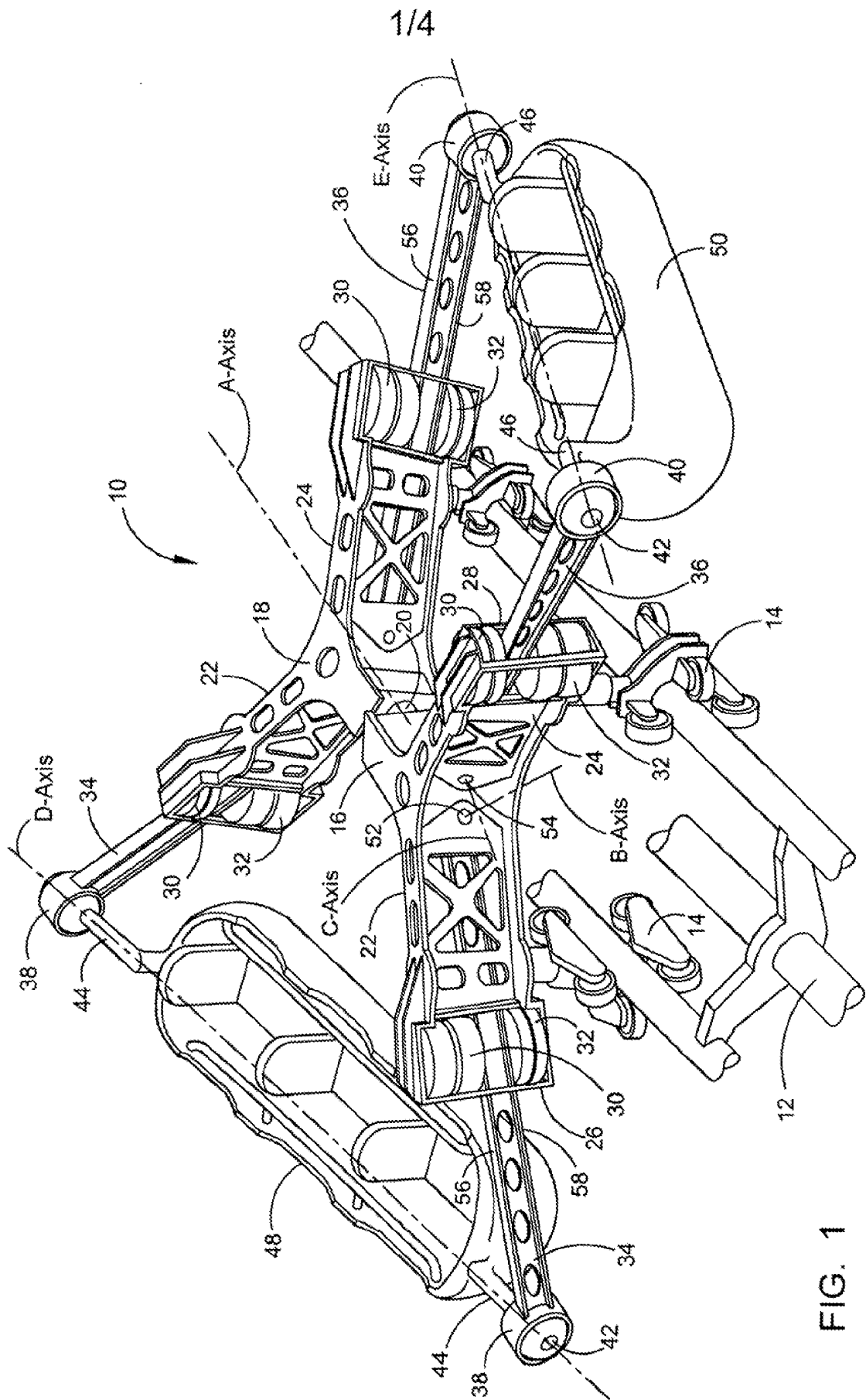


FIG. 1

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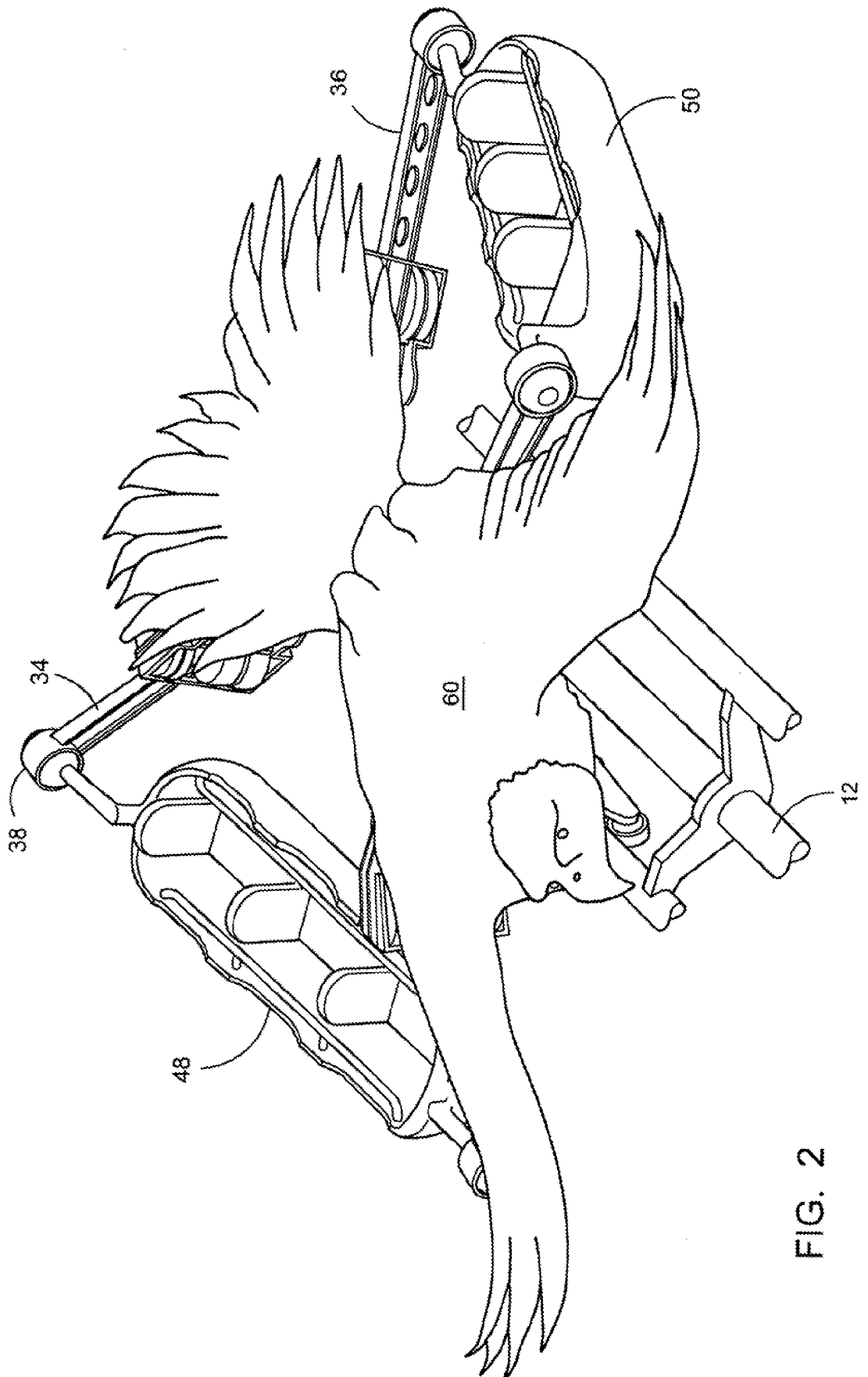


FIG. 2

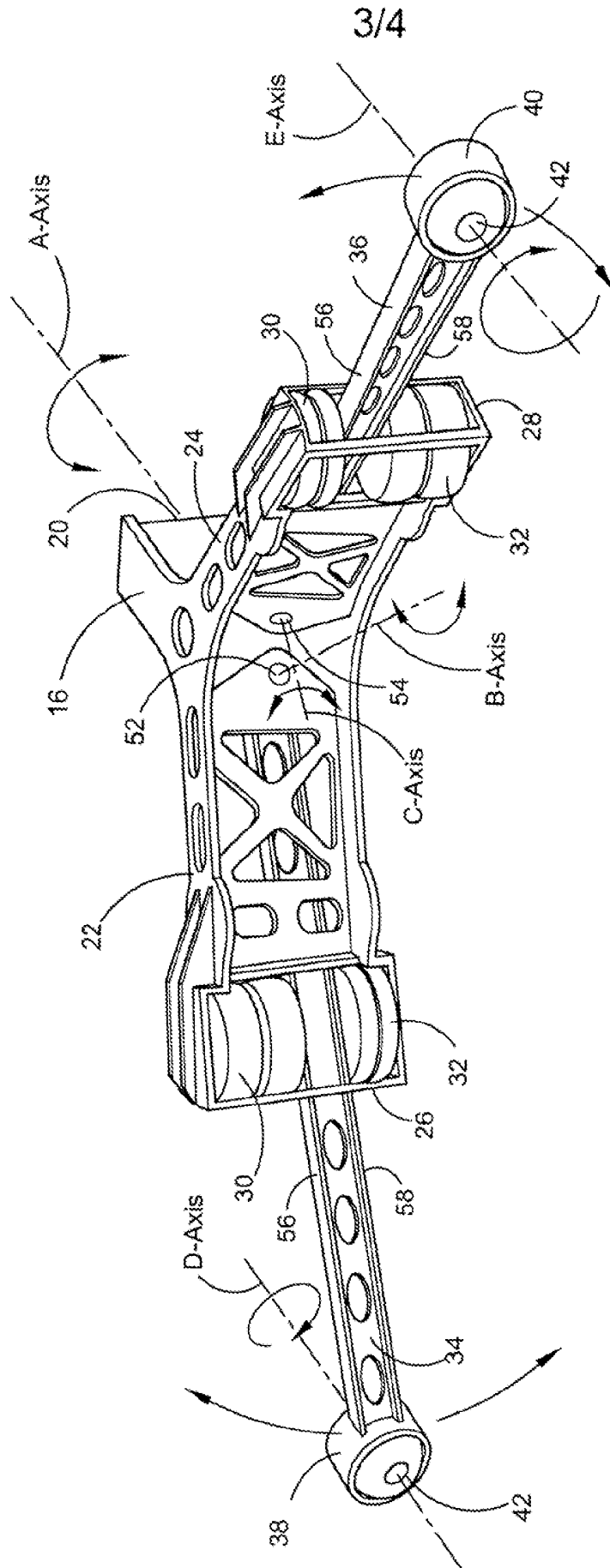


FIG. 3

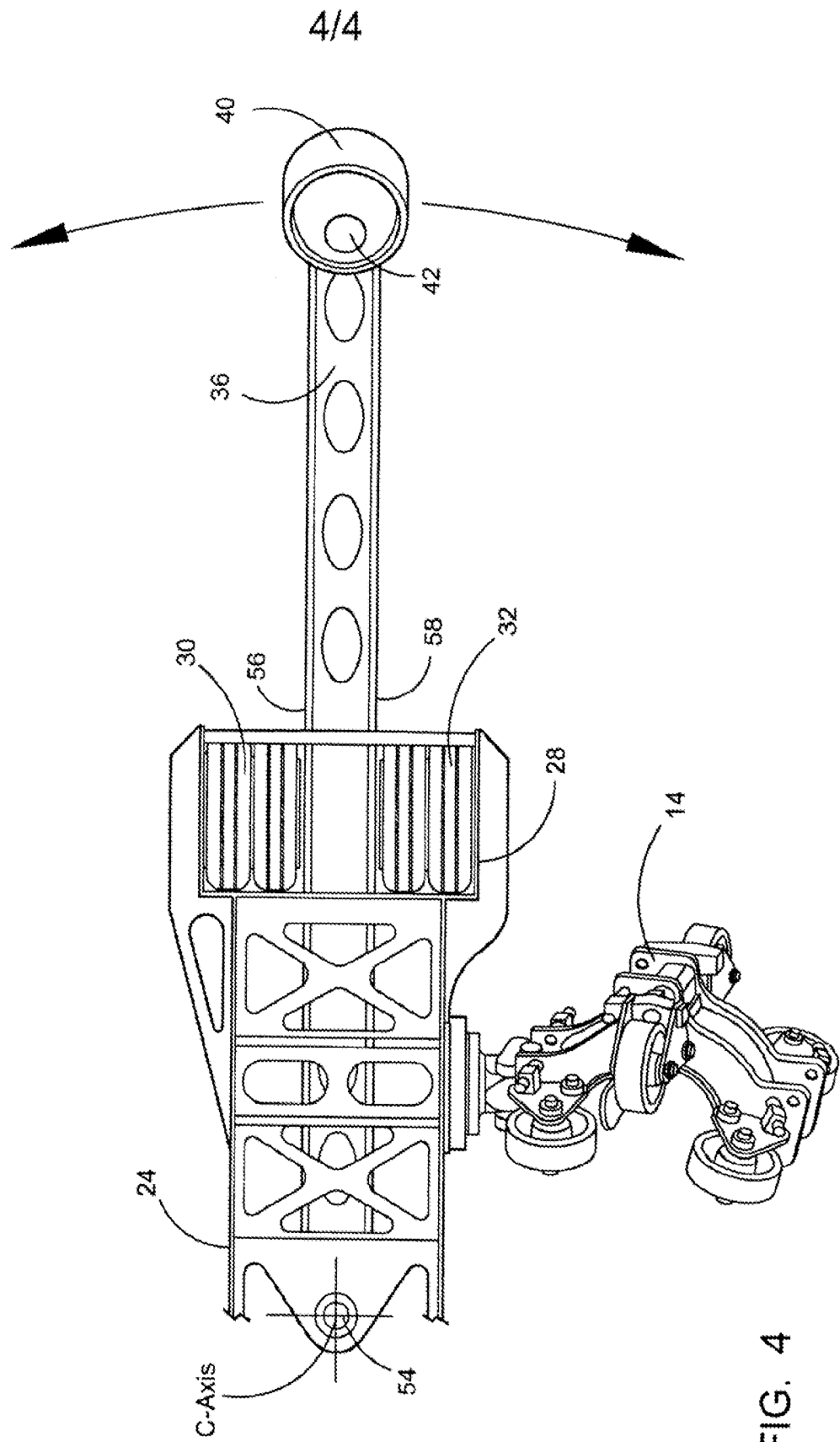


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/68926

| <p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A63G 23/00 (2008.04) USPC - 472/44 According to International Patent Classification (IPC) or to both national classification and IPC</p> | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|---|--|--|--|---|--|--|---|--|---|--|---|------|--|--|----------------|
| <p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC(8): A63G 23/00 (2008.04) USPC: 472/44</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 472/44, 43; 104/53, 63, 79, 80. (see search terms)</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) USPTO - West - DB: PGPB, USPT, EPAB, JPAB Search terms: roller, coaster, ride, airbag, joint, ball, cantilevered, axle, tilting, pivot, Y-shaped, arms and rail.</p> | | | | | | | | | | | | | | | | | | | | |
| <p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>US 3,235,251 A (DESHANO) 15 February 1966 (15.02.1966), figure 1-6; column 1, line 7 to column 3, line 75.</td> <td>1-22</td> </tr> <tr> <td>Y</td> <td>US 2006/0154735 A1 (ZAMPERLA et al.) 13 July 2006 (13.07.2006), figure 1-4; paragraph [0003]-[0030].</td> <td>1-22</td> </tr> <tr> <td>Y</td> <td>US 1,660,012 A (MOORE et al.) 21 February 1928 (21.02.1928), figure 1-12; page 1, column 1, line 4 to page 3, column 2, line</td> <td>1-22</td> </tr> <tr> <td>Y</td> <td>US 6,523,479 A (SCHILKE et al.) 25 February 2003 (25.02.2003), figure 1-7; column 3, line 27 to column 12, line 46.</td> <td>1-22</td> </tr> <tr> <td>Y</td> <td>US 5,403,238 A (BAXTER et al.) 04 August 1995 (04.08.1995), figure 1-38; column 12, line 12 to column 60, line 20.</td> <td>9-11 and 20-22</td> </tr> </tbody> </table> | | | Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | Y | US 3,235,251 A (DESHANO) 15 February 1966 (15.02.1966), figure 1-6; column 1, line 7 to column 3, line 75. | 1-22 | Y | US 2006/0154735 A1 (ZAMPERLA et al.) 13 July 2006 (13.07.2006), figure 1-4; paragraph [0003]-[0030]. | 1-22 | Y | US 1,660,012 A (MOORE et al.) 21 February 1928 (21.02.1928), figure 1-12; page 1, column 1, line 4 to page 3, column 2, line | 1-22 | Y | US 6,523,479 A (SCHILKE et al.) 25 February 2003 (25.02.2003), figure 1-7; column 3, line 27 to column 12, line 46. | 1-22 | Y | US 5,403,238 A (BAXTER et al.) 04 August 1995 (04.08.1995), figure 1-38; column 12, line 12 to column 60, line 20. | 9-11 and 20-22 |
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| <p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/></p> | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td>* Special categories of cited documents:</td> <td>"T"</td> <td>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</td> </tr> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"X"</td> <td>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</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"Y"</td> <td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"&"</td> <td>document member of the same patent family</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td></td> <td></td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table> | | | * 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 | "E" earlier application or patent but published on or after the international filing date | "Y" | document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art | "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" | document member of the same patent family | "O" document referring to an oral disclosure, use, exhibition or other means | | | "P" document published prior to the international filing date but later than the priority date claimed | | |
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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 01 October 2008 (01.10.2008) | | Date of mailing of the international search report <p align="center">09 OCT 2008</p> | | | | | | | | | | | | | | | | | | |
| Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201 | | Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774 | | | | | | | | | | | | | | | | | | |