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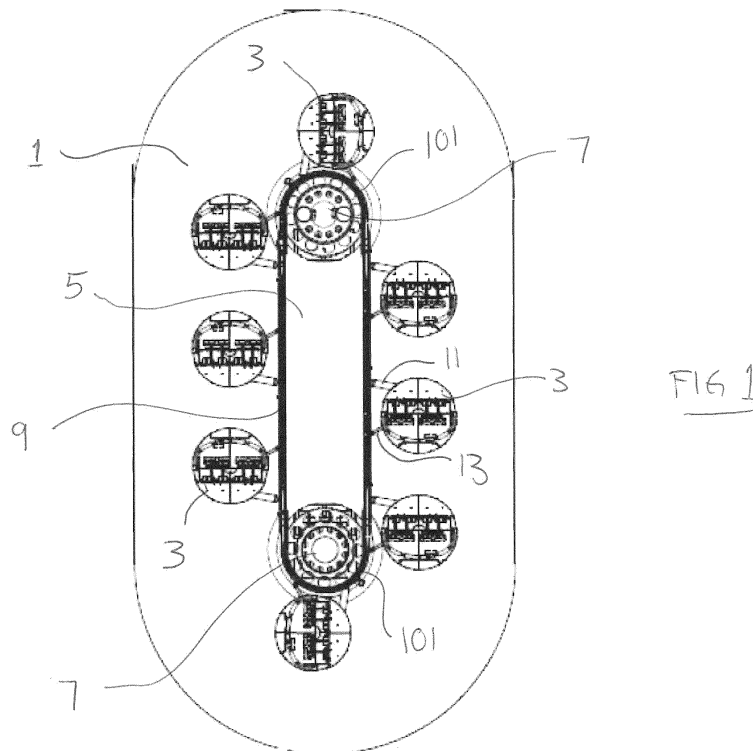
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(54) **FAMILY AMUSEMENT RIDE**

(57) An amusement ride comprises a track having at least one oval portion, at least one vehicle adapted to travel around the track, and a movement mechanism adapted to cause the at least one vehicle to travel around the track. The movement mechanism and the track cause each vehicle to experience an acceleration when the

vehicle reaches a curved end of the oval portion and wherein the acceleration causes a top, carriage portion of the vehicle to rotate with respect to a lower carriage portion of the vehicle, about the vehicle axis. Each vehicle is rotatable around a vehicle axis at all locations about the track, including straight portions.



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Description

TECHNICAL FIELD

[0001] The disclosed invention is directed to a family-type amusement park ride that combines safety features and other features of various types of amusement park rides.

BACKGROUND

[0002] Family rides in amusement parks are designed to provide extreme safety to the riders, so that even small children can safely use them.

[0003] The so called "Whip" ride provides vehicles that travel around and on the side of an oval track. The vehicles travel in a trailing position with respect to a central, ovaly extending driving chain along the straight portions of the track until they "whip", i.e. when they travel along the curved ends of the oval track where they are subjected to a centrifugal force that makes them change their alignment with respect to the track. The vehicles are provided with means that allow them to swivel and partially rotate only when at the curved ends of the track. That is, when the vehicles of the Whip ride travel along the straight portions of the oval track, they generally return to and remain in a relatively fixed rotational position, i.e. they are not rotatable. This ride is known e.g. from US Patent 1,128,890.

[0004] Even for safe, family-type rides, there is an ever-growing desire for innovation to increase the passenger's excitement level in a ride such as a "whip" ride so as to attract various types of riders of all ages.

SUMMARY

[0005] The improvement and advancement in the disclosed amusement ride is the rotatability of the vehicles by 360° at all locations around the track due to a central bearing about which portions of the vehicles rotate. In various embodiments, a two or four-person vehicle travels along an oval shaped track portion. By "oval," it is meant an elongated round shape resembling an elongated circle, for example two semi-circular portions separated by a straight portion.

[0006] The ride of the disclosed invention has a layout which provides for and encourages spinning in all rider configurations. The whipping action at the end of the oval track portion may initiate a spinning of the vehicle containing the seats, such spinning continuing along at least part of the straight sections of the track. More particularly, the whipping turn may initiate a spinning of the rotatable carriage part of the vehicle that contains the seats, such spinning continuing along the straight sections of the track.

[0007] Although disclosed and illustrated with respect to an oval track, the disclosed inventive amusement ride also finds applications in various other track configura-

tions that at least include at least the end part of the track being an oval portion. In one embodiment, the track may be generally L-shaped and contain essentially two orthogonally arranged oval portions. Other suitable track arrangements that include an oval portion or any end portion that causes the vehicles to accelerate and experience a whipping action, may be used in other embodiments.

[0008] In some embodiments, the vehicles are a plurality of gondolas that move around the track whereby the gondola whips outwardly from the ride center at the end of the oval portion of the track. The whipping motion serves to induce rotation about a vertical axis of the top part of the two-part gondola.

[0009] Provided is an amusement ride comprising: a track having at least one oval portion; at least one vehicle adapted to travel around the track; a movement mechanism adapted to cause each vehicle to travel around the track; and each vehicle further adapted to rotate around a vehicle axis of the vehicle at all locations about the track. The movement mechanism and the track cause each vehicle to experience an acceleration when the vehicle reaches a curved end of the oval portion and wherein the acceleration causes a top portion of the vehicle to rotate about the vehicle axis.

[0010] In some aspects, the track includes straight portions and the vehicle is rotatable about the vehicle axis along the straight portions. In some aspects, the movement mechanism includes a chain that engages an arm located in a bottom portion of a corresponding vehicle of the at least one vehicle and wherein a top portion of the vehicle is rotatable with respect to the bottom portion.

[0011] In some aspects, the chain includes a braking member for braking the vehicle at completion of a ride cycle. In some aspects, each vehicle is coupled to the vehicle axis via a bearing. The vehicle may be adapted to rotate 360° about the vehicle axis. In some aspects, each vehicle comprises a gondola with a plurality of seats. In some aspects, each gondola includes wheels and is adapted to travel around the track on the wheels.

[0012] In some aspects, each vehicle comprises a gondola with a single seat extending peripherally about a center of the gondola. According to some aspects, each vehicle comprises a two-part vehicle including a lower chassis part coupled to the movement mechanism and an upper carriage portion that accommodates at least one rider, the upper carriage part rotatable with respect to the lower chassis part about the vehicle axis.

[0013] In some aspects, the upper carriage part is rotatably coupled to the lower chassis part via a bearing and each vehicle comprises a spring member disposed beneath the rotatable upper carriage part, coupled to the lower chassis part, and adapted to stabilize the lower chassis part of the vehicle. The spring member may include an internal guide rod coupled to a chain of the movement mechanism.

[0014] In some aspects, the spring member includes a

slider member disposed between an inner spring portion and an outer spring portion. In some aspects, the internal guide rod includes a slider portion that moves outwardly along the guide rod to compress an outer spring of the spring member which responds by providing a restitution restoring force and according to some aspects, the amusement ride comprises a plurality of oval portions coupled to one another.

[0015] According to another aspect, and amusement ride comprises: an oval track; at least one gondola adapted to travel around the oval track; a movement mechanism adapted to cause the at least one gondola to travel around the oval track; and each the gondola having a lower chassis part coupled to the movement mechanism and an upper carriage part rotatable around an axis of the gondola at all locations about the oval track, the lower chassis part rotatably coupled to the upper carriage part via a bearing. The movement mechanism and the track configuration cause each gondola to experience a whipping motion when the gondola reaches an end section of the oval track and wherein the whipping motion causes the upper carriage part to rotate about the axis.

[0016] In some aspects, each gondola comprises a spring member disposed beneath the rotatable upper carriage part, coupled to the lower chassis part, and adapted to stabilize the lower chassis part of the vehicle, each spring member including an internal guide rod coupled to a chain of the movement mechanism.

[0017] In some aspects, each gondola includes wheels and is adapted to travel around the track on the wheels, the internal guide rod includes a slider portion that moves outwardly along the guide rod to compress an outer spring of the spring member which responds by providing a restitution restoring force.

[0018] In some aspects the movement mechanism comprises a chain that engages an arm located in a bottom portion of a corresponding gondola of the at least one gondola and wherein each gondola is adapted to rotate 360° about the axis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings, which are incorporated herein and form part of the specification, illustrate the present disclosure and, together with the description, further serve to explain the principles of the present disclosure and to enable those skilled in the relevant art(s) to make and use aspects described herein.

FIG. 1 is a plan view showing an embodiment of the amusement ride according to aspects of the present disclosure;

FIG. 2 is a perspective view of a movement mechanism of the amusement ride according to aspects of the present disclosure;

FIG. 3 is a perspective view from beneath an ex-

emplary vehicle of the amusement ride according to aspects of the present disclosure;

FIG. 4 presents a side view of a vehicle with a lower chassis portion and an upper rotatable carriage portion of the amusement ride according to aspects of the present disclosure; and

FIG. 5 is a perspective view showing a section of a carriage portion of the amusement ride coupled to the chain of the movement mechanism according to aspects of the present disclosure.

DETAILED DESCRIPTION

[0020] The aspects described herein, and references in the specification to "one aspect," "an aspect," "an exemplary aspect," "an example aspect," etc., indicate that the aspects described can include a particular feature, structure, or characteristic, but every aspect may not necessarily include the particular feature, structure, or characteristic. The same is true for use of the term embodiment, e.g. "one embodiment," "an embodiment," "an exemplary embodiment," Moreover, such phrases are not necessarily referring to the same aspect. Further, when a particular feature, structure, or characteristic is described in connection with an aspect or embodiment, it is understood that it is within the knowledge of those skilled in the art to effect such feature, structure, or characteristic in connection with other aspects whether or not explicitly described.

[0021] Spatially relative terms, such as "beneath," "below," "lower," "above," "on," "upper" and the like, can be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. The spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. In many embodiments, the apparatus can be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein can likewise be interpreted accordingly.

[0022] Terms such as "about," "approximately," and the like, can be used herein to indicate the value of a given quantity that can vary based on a particular technology. Based on the particular technology, the terms "about," "approximately," and the like can indicate a value of a given quantity that varies within, for example, 10-30% of the value (e.g., $\pm 10\%$, or $\pm 20\%$, or $\pm 30\%$ of the value).

[0023] Enumerative adjectives (e.g., "first," "second," "third," or the like) can be used to distinguish like elements without establishing an order, hierarchy, quantity, or permanent numeric assignment (unless otherwise noted). For example, the terms "first vehicle" and "second vehicle" can be used to facilitate the distinguishing of two vehicles without specifying a particular order, hierarchy, quantity, or immutable numeric correspondence.

[0024] The disclosed amusement ride has a layout that

encourages spinning in all rider configurations. The disclosed amusement ride includes a carriage that travels around an oval track and when the carriage approaches the round ends of the track, a whipping motion initiates spinning of the carriage, such spinning continuing at all locations around the track.

[0025] By "oval," it is meant an elongated round shape resembling an elongated circle, for example two semi-circular portions separated by a straight portion. In other embodiments, the layout of the track of the amusement ride includes one or more curved sections that follow a straight portion but for brevity of description, the configuration of the track will be referred to collectively as "oval".

[0026] The carriage can contain various different seating configurations and may include a brake that locks the vehicles at the end of the ride cycle .

[0027] One embodiment of a layout of the family amusement ride is shown in FIG. 1, which shows oval track 1 and a plurality of vehicles 3 that travel around the track. Vehicles 3 may be gondolas but other suitable vehicles for carrying one or more riders may be used in other embodiments. Movement mechanism 5 includes a main drive with one or more motors. Various suitable motors may be used. The motors may drive the rotational members 7. In some embodiments, the main drive frame of movement mechanism 5 is coupled to the motors and in some embodiments, one rotational member 7 is fixed while the other rotational member 7 is positionally adjustable by jack bolts to properly tension the drive chain. One such embodiment of a layout of a movement mechanism 5 is shown in FIG. 2.

[0028] The illustrated embodiment of FIG. 2 shows movement mechanism 5 with fixed bearing 15 and adjustable jack bearing 17. Movement mechanism 5 also includes frame 19 and chain guides 21. Bull sprockets 23 are associated with fixed bearing 15.

[0029] Referring again to FIG. 1, movement mechanism 5 advantageously includes a chain, not shown in FIG. 1, but which generally travels along trajectory 9. The chain connects movement mechanism 5 to the vehicles 3. The chain may be laterally constrained within a channel along trajectory 9 such as in chain guide 21 of FIG. 2. Both a spring member 13 and the chassis frame 11, alternatively referred to as the trolley frame 11, are coupled to the chain of the movement mechanism 5. The chain runs horizontally and is coupled to vehicle 3 at connection point 29 of chassis frame 11 and a guide rod of a spring member 13 as will be seen more clearly in FIG. 3.

[0030] FIG. 3 is a perspective view from beneath an exemplary vehicle such as vehicle 3 of FIG. 1. In the illustrated embodiment, the vehicle may be a gondola 31 that includes a lower chassis portion 53 and an upper rotatable carriage portion 55. FIG. 3 shows spring member 13 including inner spring portion 35 and an outer spring portion 36. Spring member 13 includes an internal guide rod disposed inside solid portion 37 and inside inner and outer spring portions 35, 36.

[0031] A chain coupled to movement member 5 runs horizontally and is coupled to gondola 31 at connection point 29 of chassis frame 11 and at connection point 39 to the guide rod of spring member 13. Both the spring member 13 and the chassis frame 11, alternatively referred to as the trolley frame 11, are coupled to the chain of movement mechanism 5 at connection points 39, 29 respectively, which each may be spherical pivot connections to the chain. FIG. 3 also illustrates the main bearing 43 above which the rotatable carriage portion of the vehicle is completely and fully rotatable about a central vehicle axis 49. Caster wheels 45 are joined to chassis frame 11 which is part of lower chassis portion 53. In some embodiments, there is a rubber pad between caster wheels 45 and chassis frame 11 of lower chassis portion 53, such that caster wheels 45 are on rubber suspension to smooth out the ride. Spherical connection 51 includes vehicle axis 49 of rotation of gondola 31.

[0032] In some embodiments of the family thrill amusement ride, vehicle 3 may be a two or four-person vehicle that travels along oval track 1 or an oval shaped track portion. Because movement mechanism 5, that imparts motion to vehicle 3, imparts motion to vehicle 3 at a steady speed, the vehicle experiences a whipping action when it reaches the ends of the oval portions such as at end portions 101 (FIG. 1) because vehicle 3 speeds up to cover a greater length of track even though the chain is at a steady speed. In some embodiments a constant speed of movement mechanism 5 causes the vehicle 3 to accelerate when it approaches the ends of the oval sections. The whipping action induces the vehicle to accelerate and begin to rotate because the vehicle is completely rotational about its vertical axis 49. As such, the spinning can continue as the vehicle travels along the straight sections of the track. In some embodiments, as the ride continues, sometimes the turning of the vehicle 3 causes more spinning and sometimes it causes the spinning to slow down depending on the physics such as rider configuration and the position of the seats going into the turn sections, i.e., ends of the oval shaped sections of the track.

[0033] FIG. 4 presents a side view of vehicle 3 also shown in FIG. 3. Vehicle 3 includes lower chassis portion 53 and upper rotatable carriage portion 55. The upper rotatable carriage portion 55 may include a plurality of seats for riders and in some embodiments will include two or four seats. Chassis portion 53 includes wheels 45 and is coupled to chain 57. Various suitable chains may be used and in one embodiment, the chain may include a minimum braking force of 360 kN. Chains of various sizes and using various types of modular links may be used in various embodiments. In one embodiment, the pitch of the chain links may be on the order of 200mm, but other chain pitches may be used in other embodiments. Wheels 45 travel along the surface of track 1. Carriage portion 55 is coupled to lower chassis portion 53 by way of bearing 43, more clearly shown in FIG. 3, and is therefore rotatable about axis 49 and with respect to lower chassis

portion 53. Chain 57 is part of movement mechanism 5 that travels along trajectory 9 of FIG. 1, and that imparts motion to vehicle 3 along track 1.

[0034] FIG. 5 is another perspective view showing a section of gondola 31 of carriage portion 55 of vehicle 3. FIG. 5 shows chain 57 coupled to chassis frame 11 and also to solid portion 37 of spring member 13, via the indicated links at connection points 29 and 39 respectively. A parking brake may be electrically engaged at the conclusion of the ride when vehicle 3 is in the loading and unloading phase.

[0035] The whipping action achieved at the ends of the oval portions of the track, causes vehicle 3 to swing out to the side. This causes the inner spring portion 35 (FIG. 3) to expand, i.e. to move outwardly along the guide rod disposed inside spring member 13. This forces the movement of slider 41 (FIG. 3) outwardly along the guide rod. Slider 41 is coupled to carriage portion 55 / gondola 31 such that the movement of slider 41 due to the spring force, moves carriage portion 55 / gondola 31. In other words, the spring member 13 expands to move slider 41, compressing outer spring portion 36 which responds by providing a restitution restoring force. The mechanism reaches an equilibrium during the whip, but the restoring force of the spring member 13 urges vehicle 3 back as the entire assembly of vehicle 3 reaches the straight section of track 1. The inner spring stabilizes the chassis portion 53 of vehicle 3 into its translational position along the track, before the next turn, while the rotatable carriage portion 55 remains rotatable about the central vehicle axis. Both the inner and outer springs have overtravel stops for redundancy.

[0036] Although discussed with respect to the illustrated embodiment that shows 8 vehicles moving about an oval track, the disclosed invention finds application in various other arrangements that may use various other numbers of vehicles. In various embodiments, the vehicles may include various arrangements of seats. In one embodiment, two or four seats may be disposed side by side and in other embodiments, two or more seats may be disposed facing and across from two or more other seats or there may be 2 sets of seats arranged back-to-back. In still another embodiment, the vehicle may be a gondola with a single seat extending peripherally about a center of the gondola.

[0037] Furthermore, in other embodiments, various movement means may be used to move the chain coupled to the vehicle along the track at a suitable speed.

[0038] It is to be understood that the phraseology or terminology herein is for the purpose of description and not of limitation, such that the terminology or phraseology of the present specification is to be interpreted by those skilled in relevant art(s) in light of the teachings herein.

[0039] The present disclosure has been described above with the aid of functional building blocks illustrating the implementation of specified functions and relationships thereof. The boundaries of these functional building blocks have been arbitrarily defined herein for the con-

venience of the description. Alternate boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed. The foregoing description of specific aspects will so fully reveal the general nature of the present disclosure that others can, by applying knowledge within the skill of the art, readily modify and/or adapt for various applications such specific aspects, without undue experimentation and without departing from the general concept of the present disclosure. Therefore, such adaptations and modifications are intended to be within the meaning and range of equivalents of the disclosed aspects, based on the teaching and guidance presented herein.

[0040] It is to be understood that the Detailed Description section, and not the Summary and Abstract sections, is intended to be used to interpret the claims. The Summary and Abstract sections can set forth one or more, but not necessarily all, aspects of the present disclosure as contemplated by the inventor(s), and thus, are not intended to limit the present disclosure and the appended claims in any way. The breadth and scope of the protected subject matter should not be limited by any of the above-described aspects but should be defined in accordance with the following claims and their equivalents.

Claims

1. An amusement ride comprising:

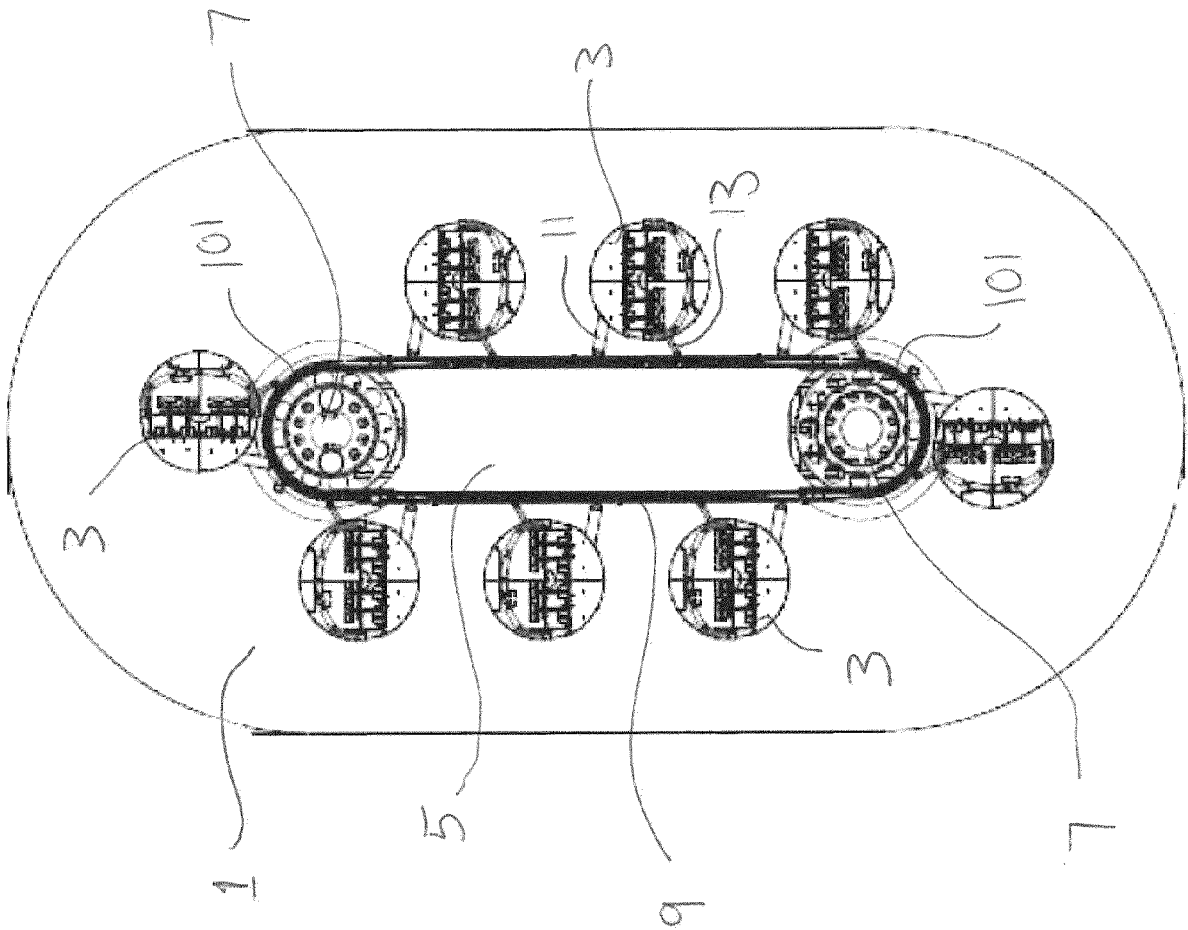
a track having at least one oval portion;
 at least one vehicle adapted to travel around said track;
 a movement mechanism adapted to cause each said at least one vehicle to travel around said track; and
 each said vehicle further adapted to rotate around a vehicle axis of said vehicle at all locations about said track,
 wherein said movement mechanism and said track cause each said vehicle to experience an acceleration when said vehicle reaches a curved end of said oval portion and wherein said acceleration causes a top portion of said vehicle to rotate about said vehicle axis.

2. The amusement ride as in claim 1, wherein said track includes straight portions and said vehicle is rotatable about said vehicle axis along said straight portions.

3. The amusement ride as in claim 1 or 2, wherein said movement mechanism includes a chain that engages an arm located in a bottom portion of a corresponding vehicle of said at least one vehicle and wherein a top portion of the vehicle is rotatable with respect to the bottom portion.

4. The amusement ride as in claim 3, wherein said chain includes a braking member for braking said vehicle at completion of a ride cycle.
5. The amusement ride as in any previous claim, wherein each said vehicle is coupled to said vehicle axis via a bearing. 5
6. The amusement ride as in any previous claim, wherein each said vehicle is adapted to rotate 360° about said vehicle axis. 10
7. The amusement ride as in any previous claim, wherein each said vehicle comprises a gondola with a plurality of seats. 15
8. The amusement ride as in any previous claim, wherein each said gondola includes wheels and is adapted to travel around said track on said wheels. 20
9. The amusement ride as in any previous claim, wherein each said vehicle comprises a gondola with a single seat extending peripherally about a center of said gondola. 25
10. The amusement ride as in any previous claim, wherein each said vehicle comprises a two-part vehicle including a lower chassis part coupled to said movement mechanism and an upper carriage portion that accommodates at least one rider, said upper carriage part being rotatable with respect to said lower chassis part about said vehicle axis. 30
11. The amusement ride as in claim 10, wherein each said vehicle comprises a spring member disposed beneath said rotatable upper carriage part, coupled to said lower chassis part, and adapted to stabilize said lower chassis part of said vehicle. 35
12. The amusement ride as in claim 10 or 11, wherein each said spring member includes an internal guide rod coupled to a chain of said movement mechanism. 40
13. The amusement ride as in claim 12, wherein said spring member includes a slider member disposed between an inner spring portion and an outer spring portion. 45
14. The amusement ride as in claim 12 or 13, wherein said internal guide rod includes a slider portion that moves outwardly along said guide rod to compress an outer spring of said spring member which responds by providing a restitution restoring force. 50
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15. The amusement ride as in any previous claim, wherein said amusement ride comprises a plurality of said oval portions coupled to one another.

FIG 1



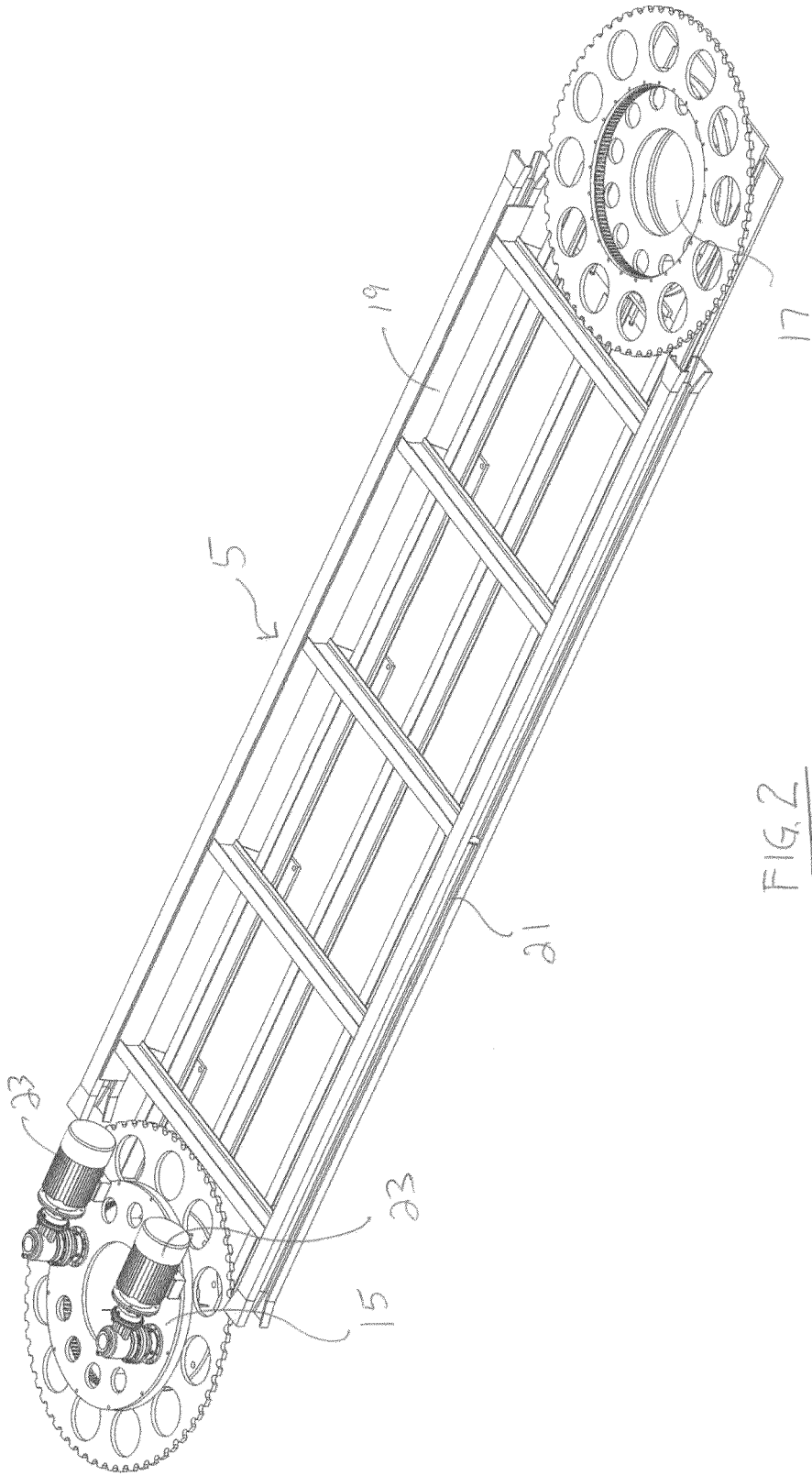
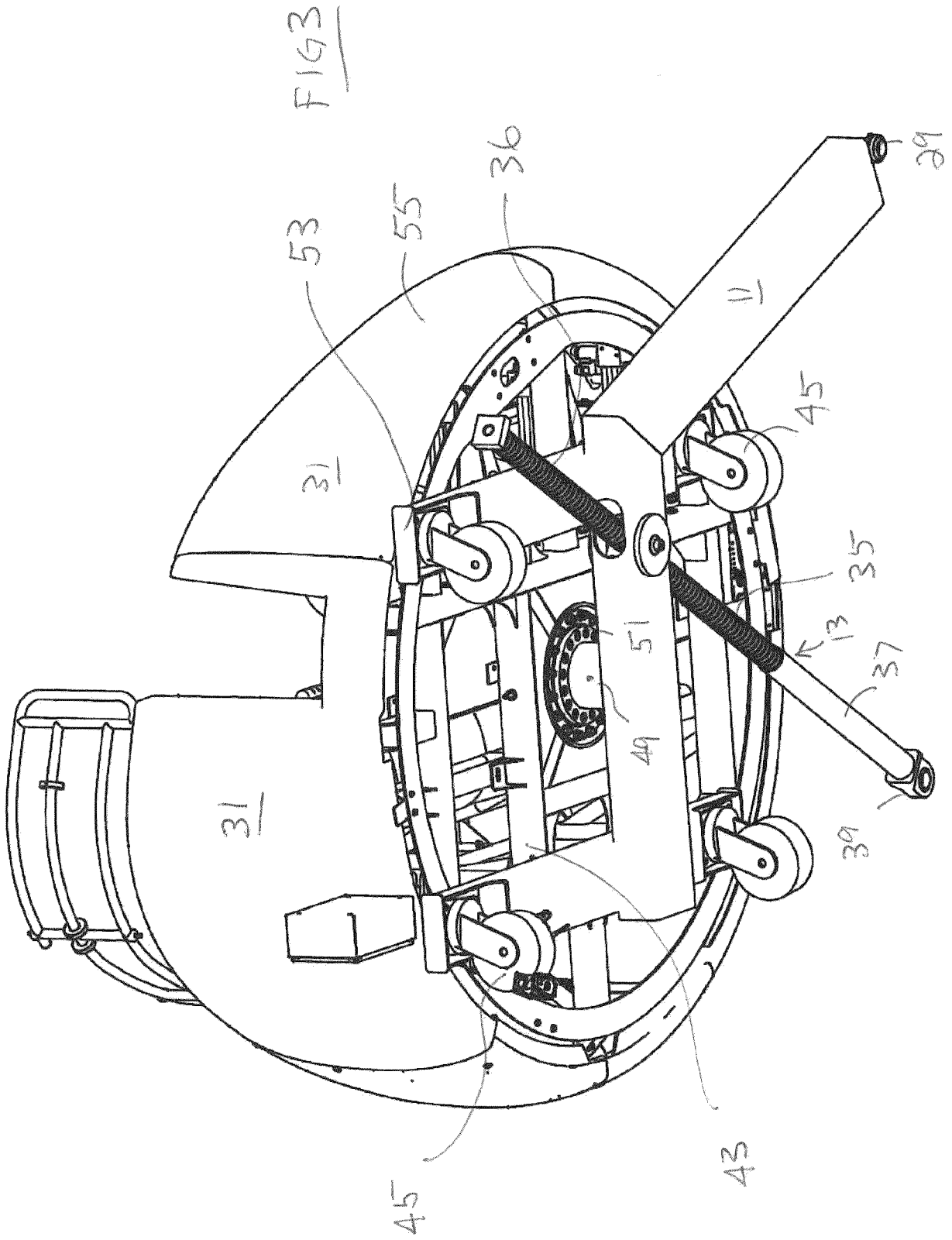


FIG. 2



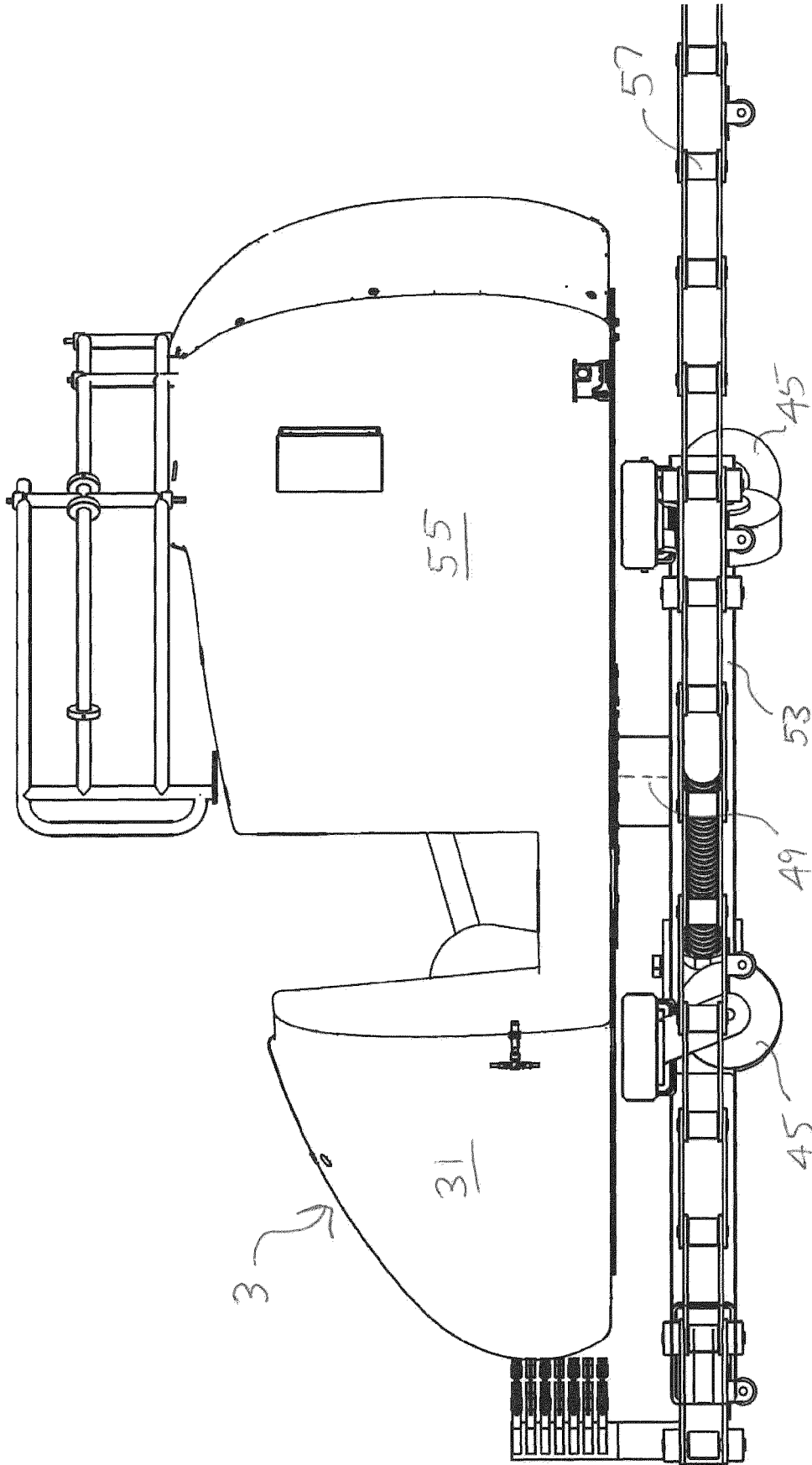
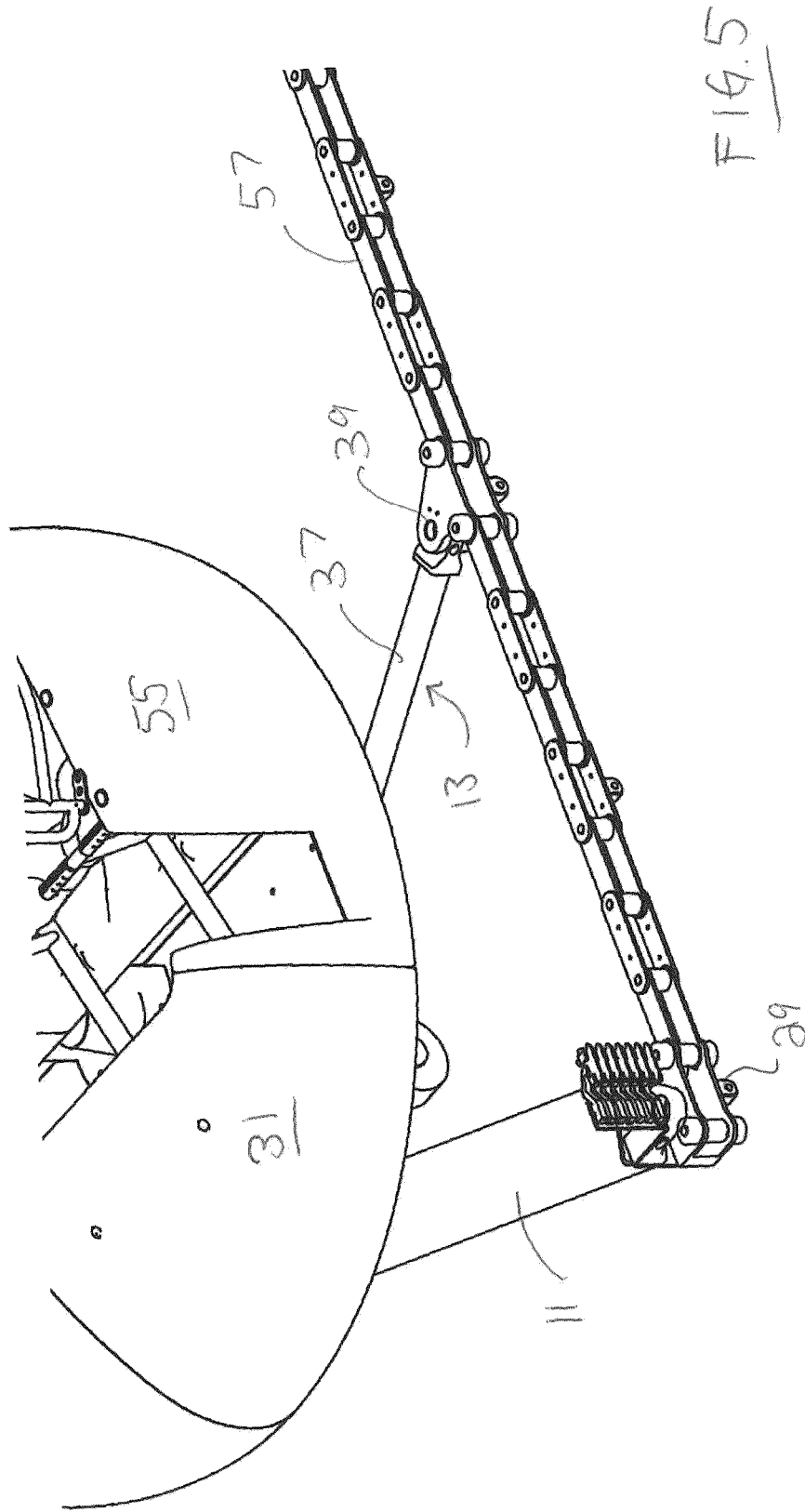


FIG. 4





EUROPEAN SEARCH REPORT

Application Number
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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	US 1 652 975 A (JOSEPH DAVIDSON) 13 December 1927 (1927-12-13) * paragraph [0001] * * paragraph [0025] * * paragraph [0033]; figures 1-8 * * paragraph [0013]; claims 8, 5 * * paragraph [0019] * * paragraph [0010] * * paragraph [0040] - paragraph [0042] * -----	1-15	INV. A63G7/00
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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 19 March 2025	Examiner Schindler-Bauer, P
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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