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(54) **DOWNHILL ZIP LINE THRILL RIDE
SYSTEM**

(52) **U.S. Cl.** 472/49

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(57) **ABSTRACT**

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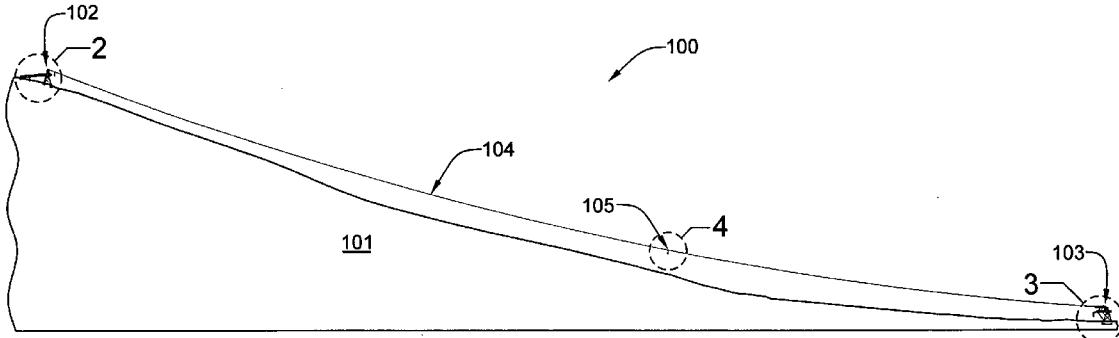
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filed on Mar. 10, 2003, now Pat. No. 6,666,773.

Publication Classification

(51) **Int. Cl.⁷** **A63G 31/00**

A zip line thrill ride system includes a cable suspended between a upper cable support tower and platform which, together, function as the harnessing, loading, and take-off point for the ride, and a lower cable support tower and platform which, together, function as the landing, unloading and unharnessing point of the ride. Multiple, substantially identical trolleys are designed to quickly engage and disengage the cable. The trolley includes a frame of generally I-beam cross section, a generally tubular brake retainer, having a longitudinal slit therein, is welded to an upper rear portion of the frame. A grooved, generally cylindrical brake fabricated from a durable polymeric material is rotatably affixed within the tubular brake retainer. When the trolley is affixed to the suspended cable by sliding the cable into the slit and rotating the brake, the grooved insert rides against the suspended cable and generates friction.



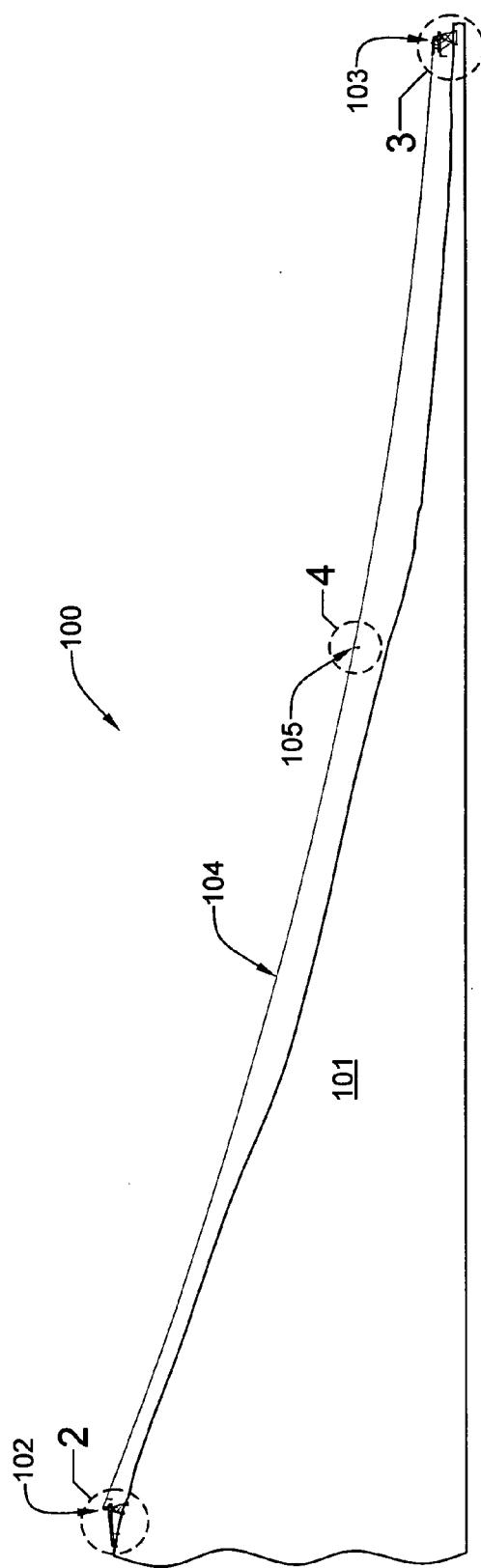


FIG. 1

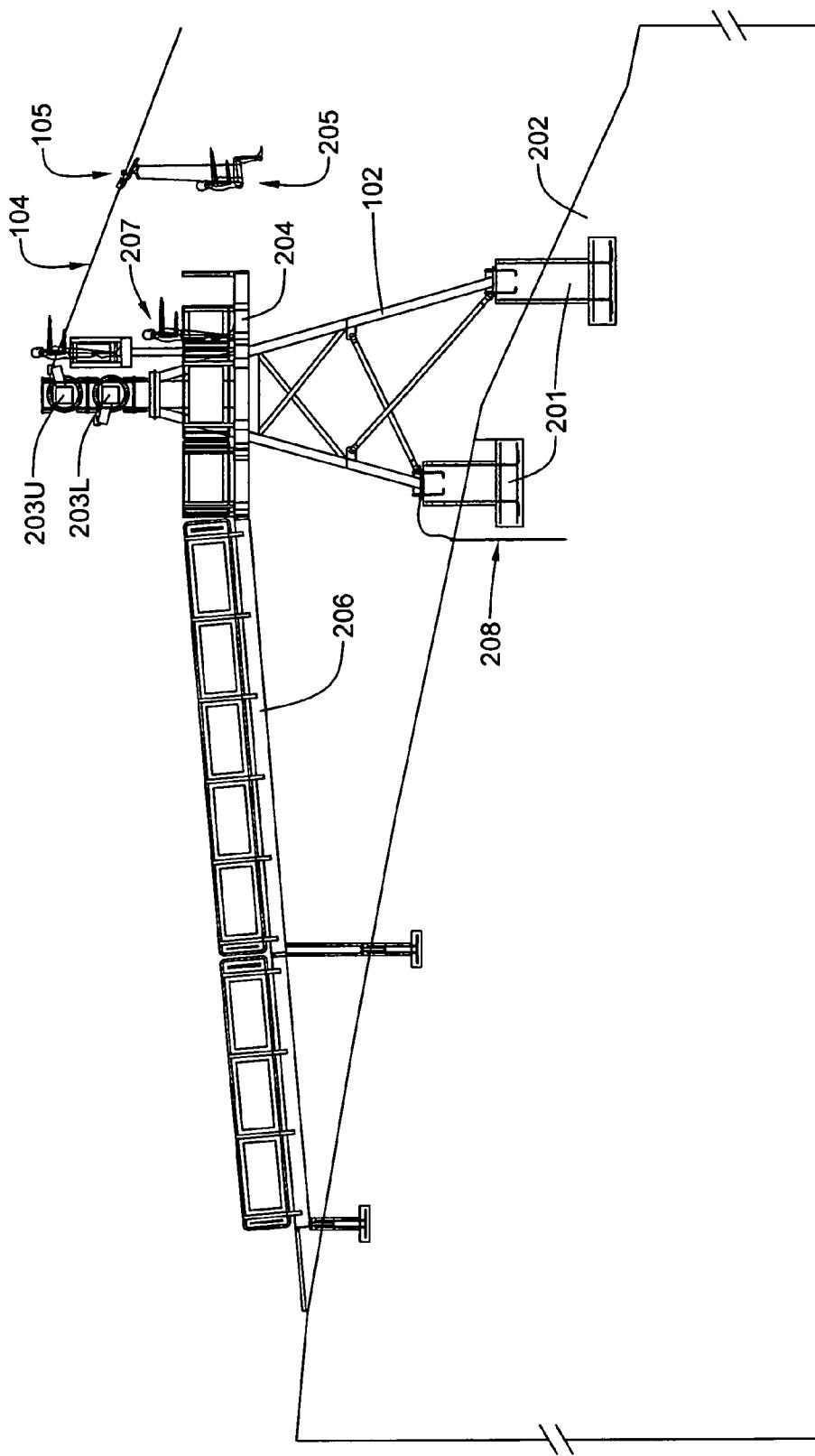


FIG. 2

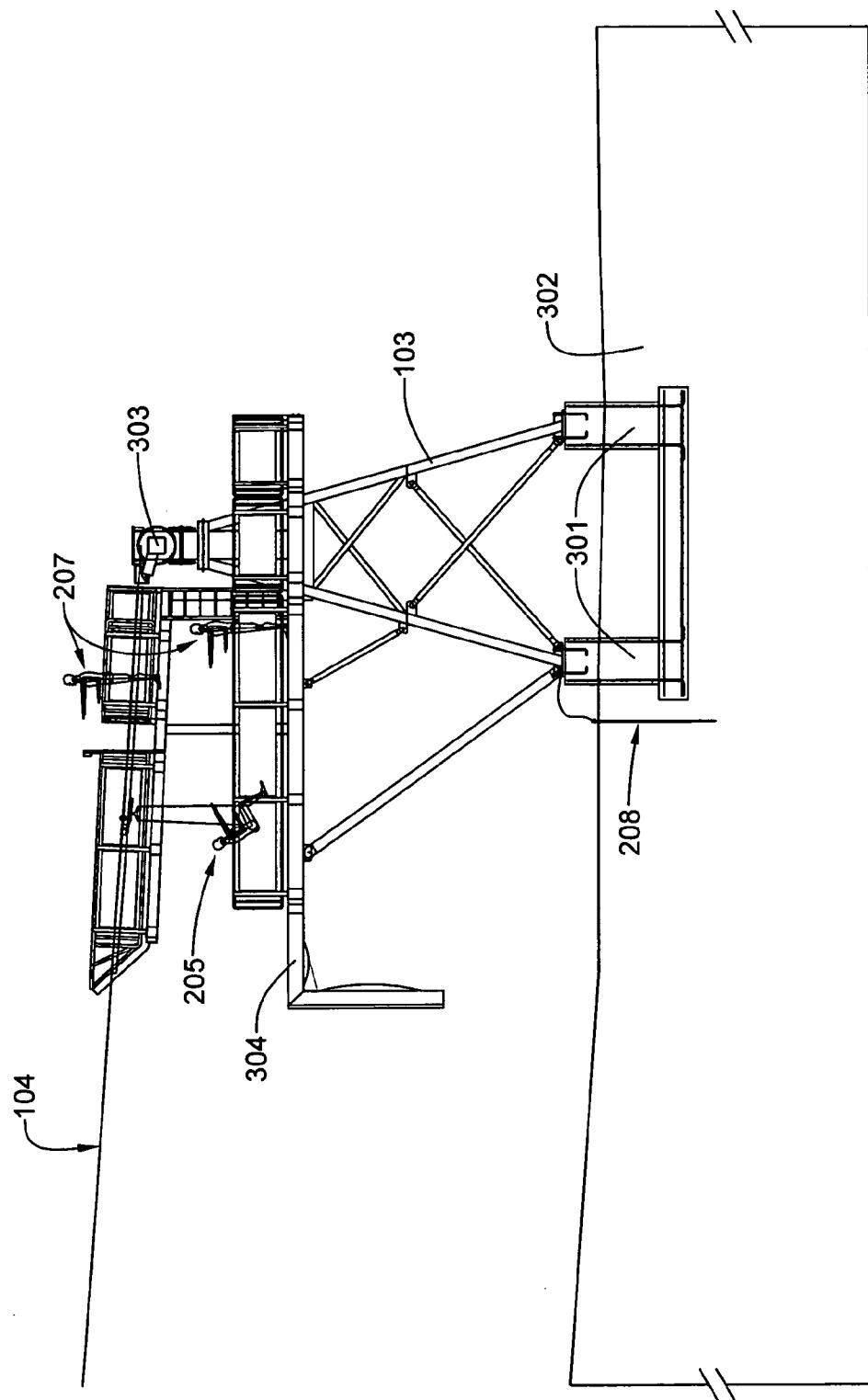


FIG. 3

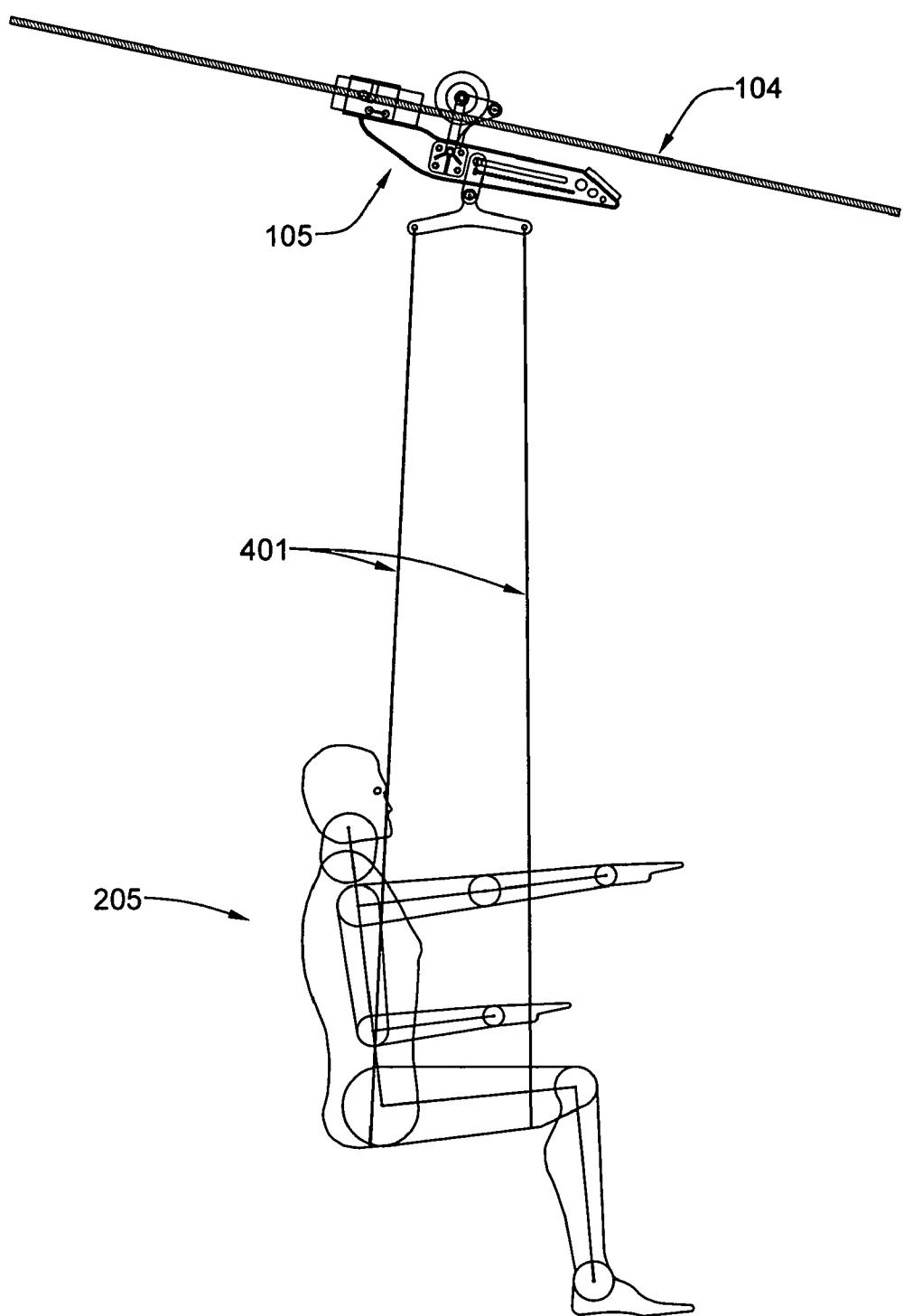


FIG. 4

FIG. 6

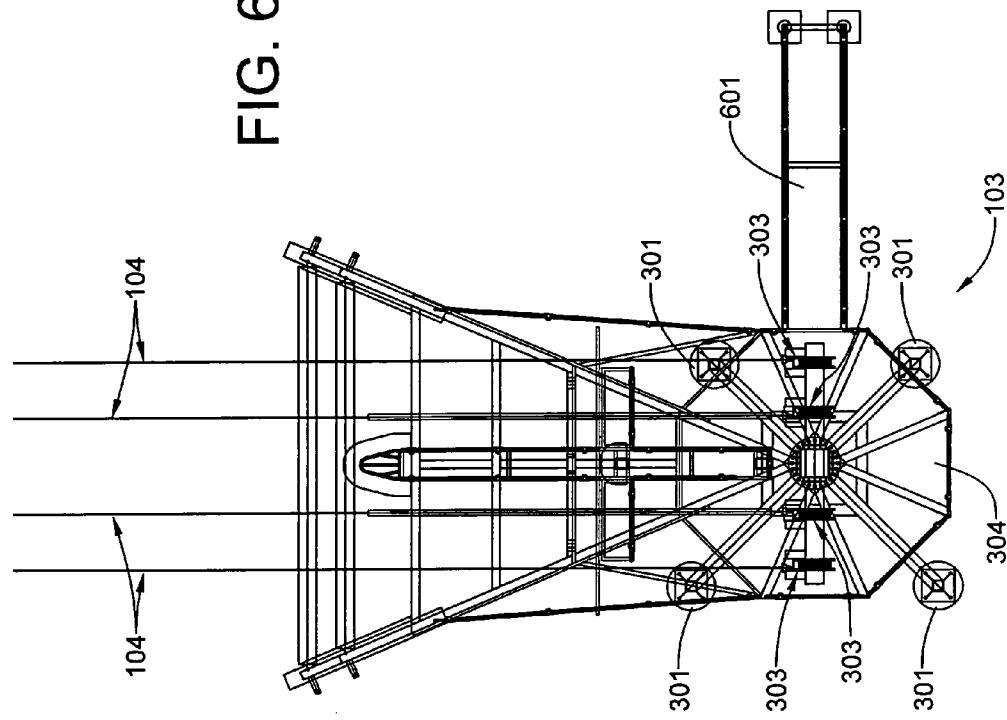
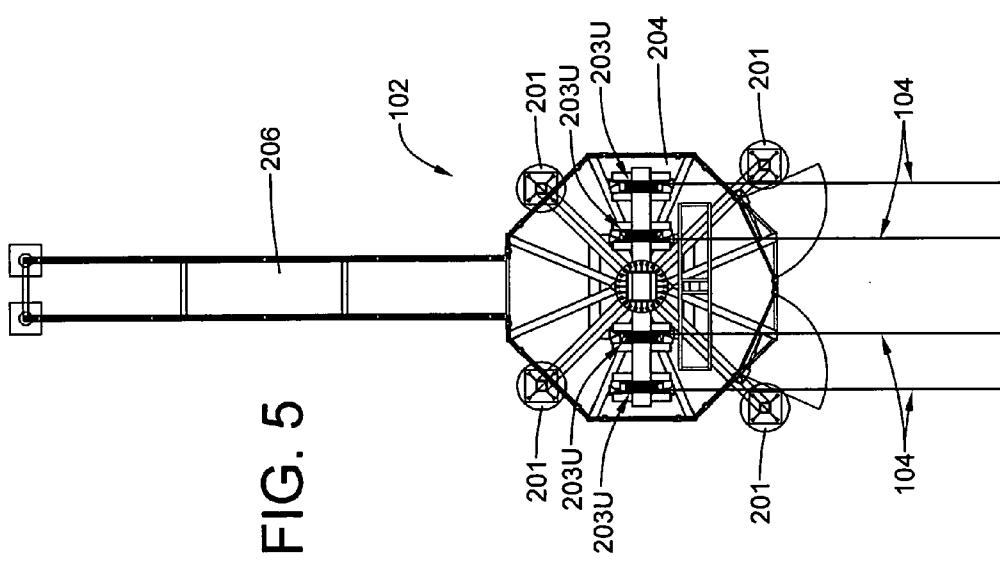
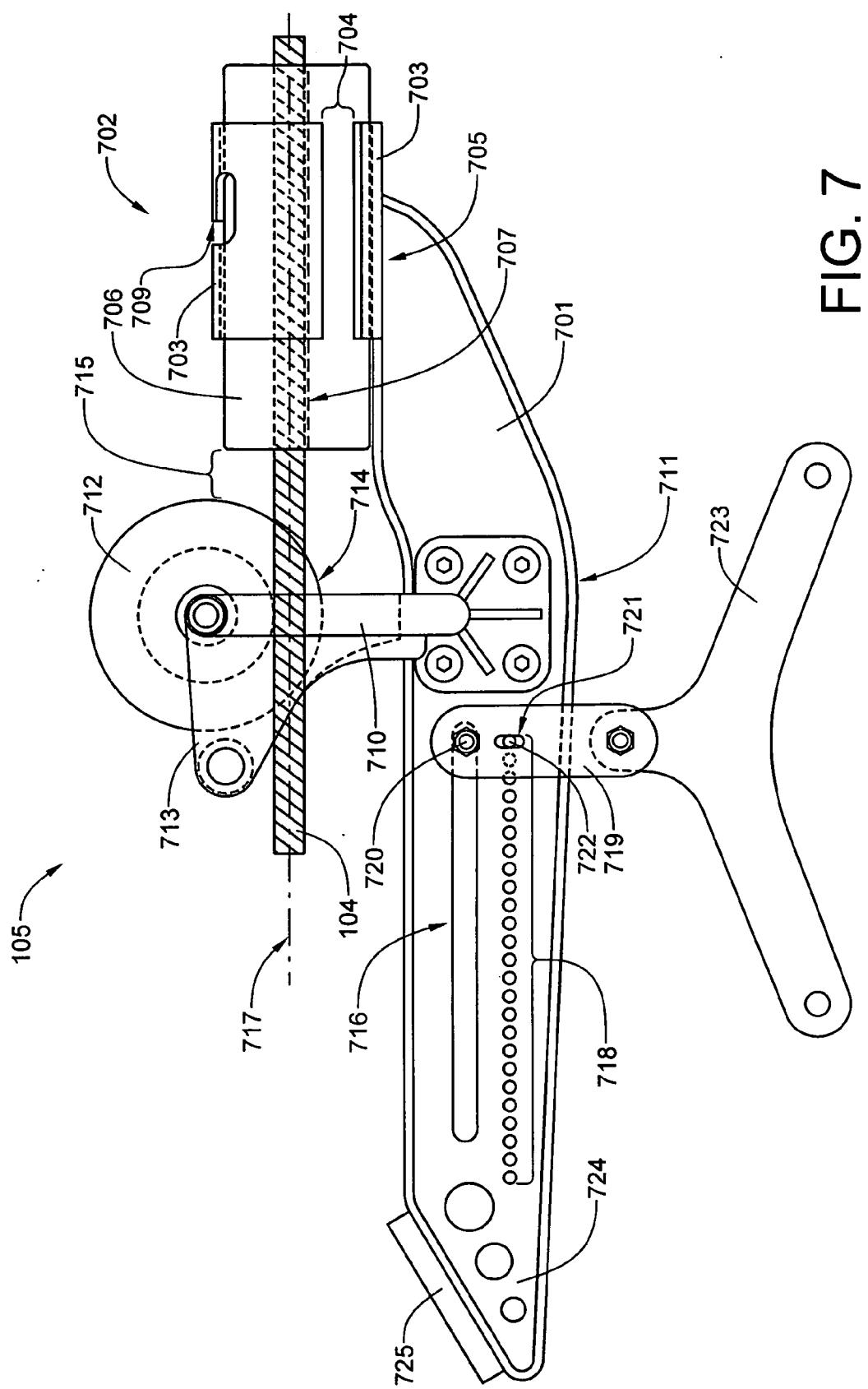
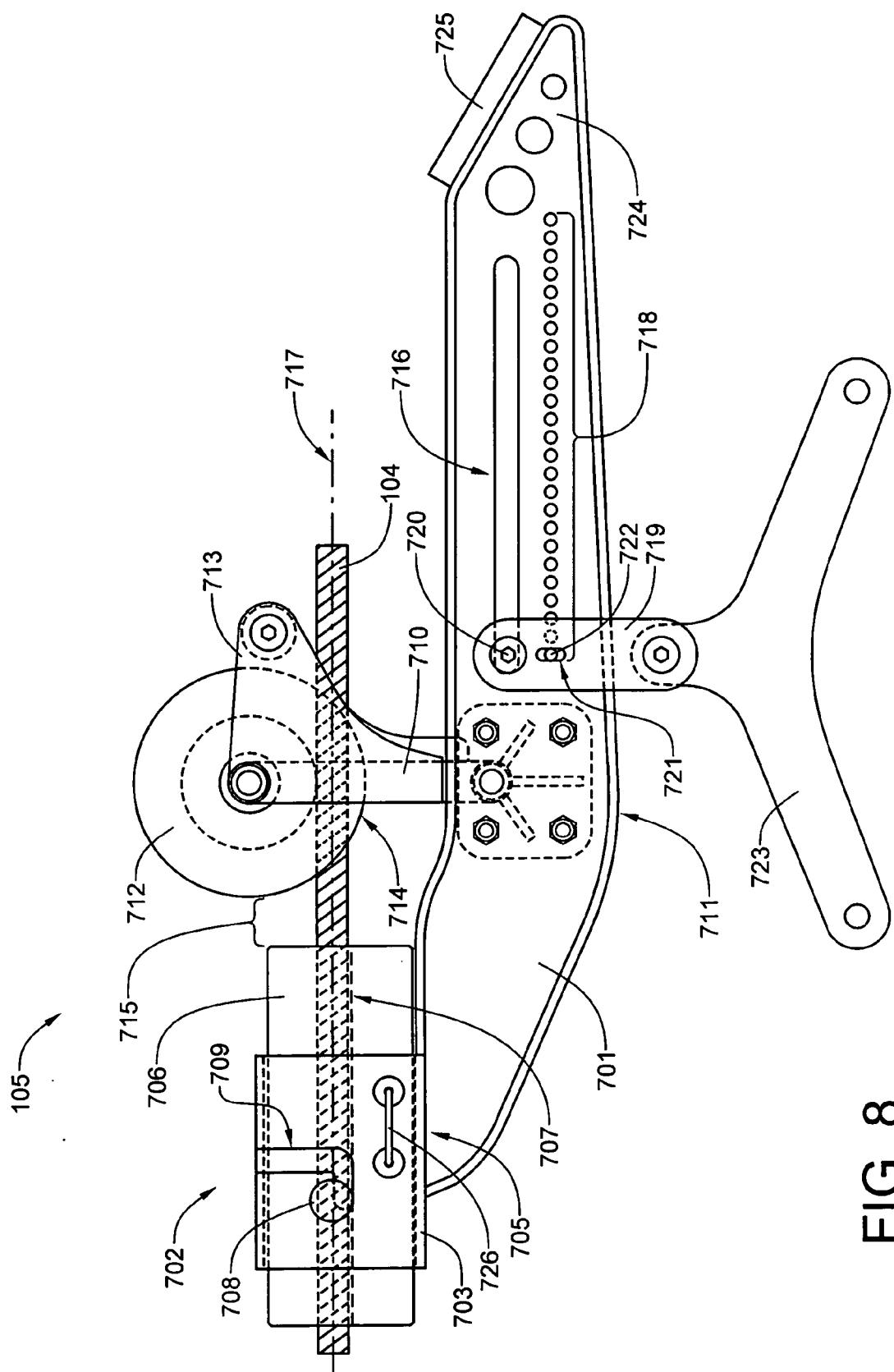


FIG. 5







8
FIG.

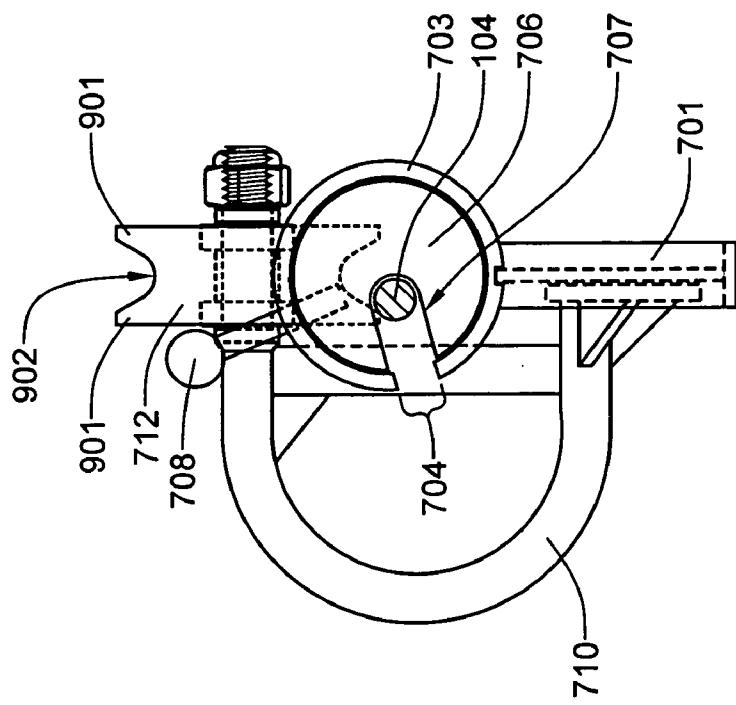


FIG. 10

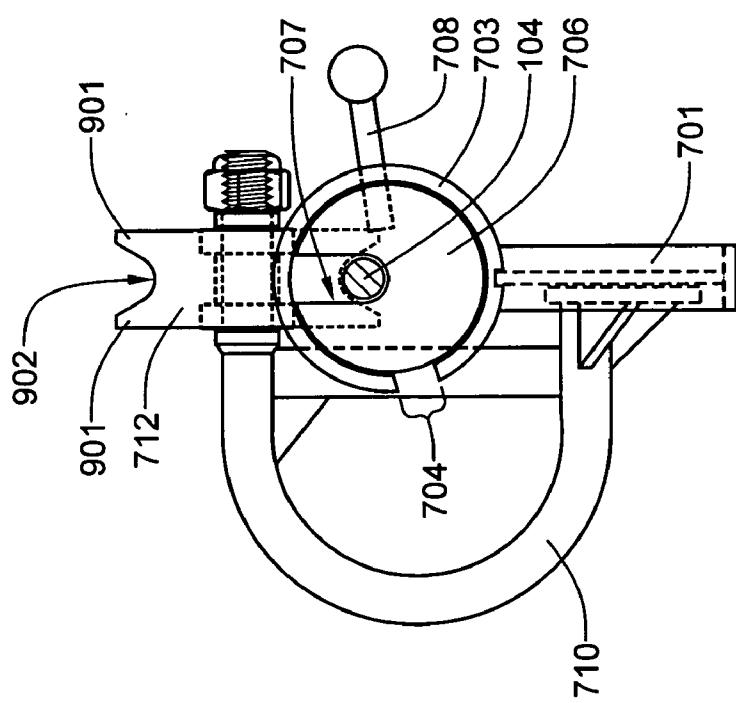


FIG. 9

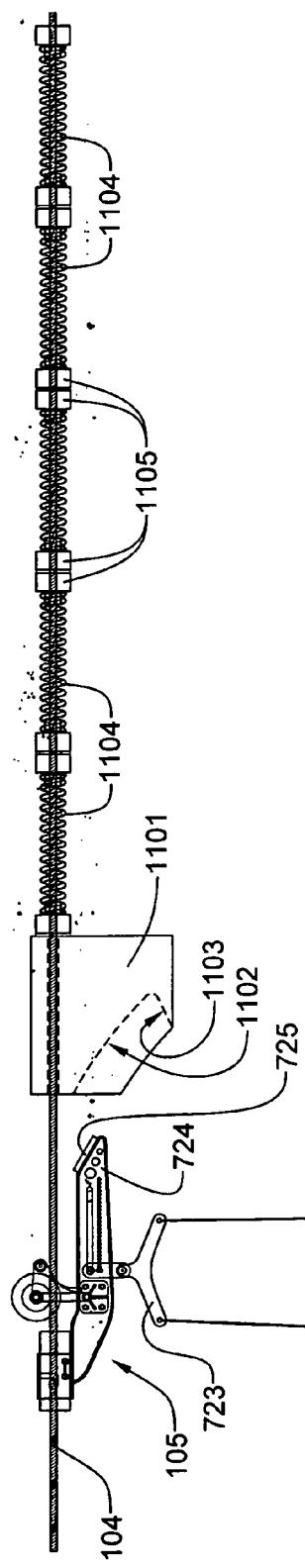


FIG. 11

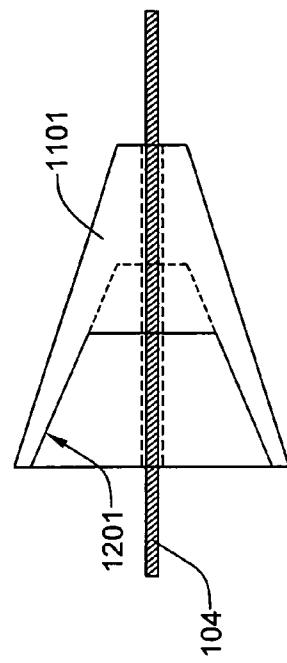
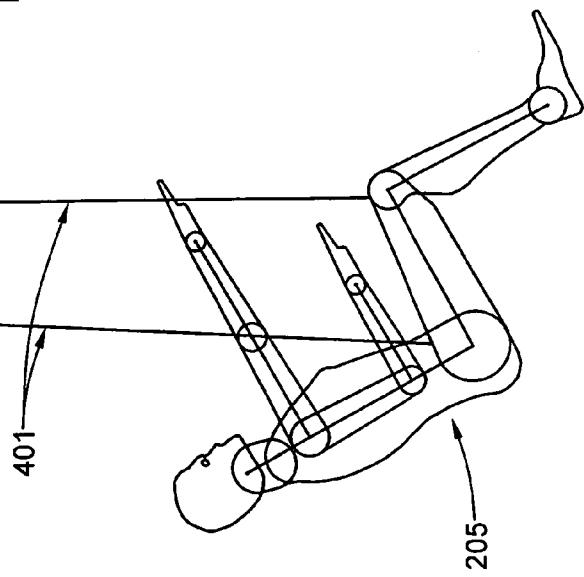


FIG. 12



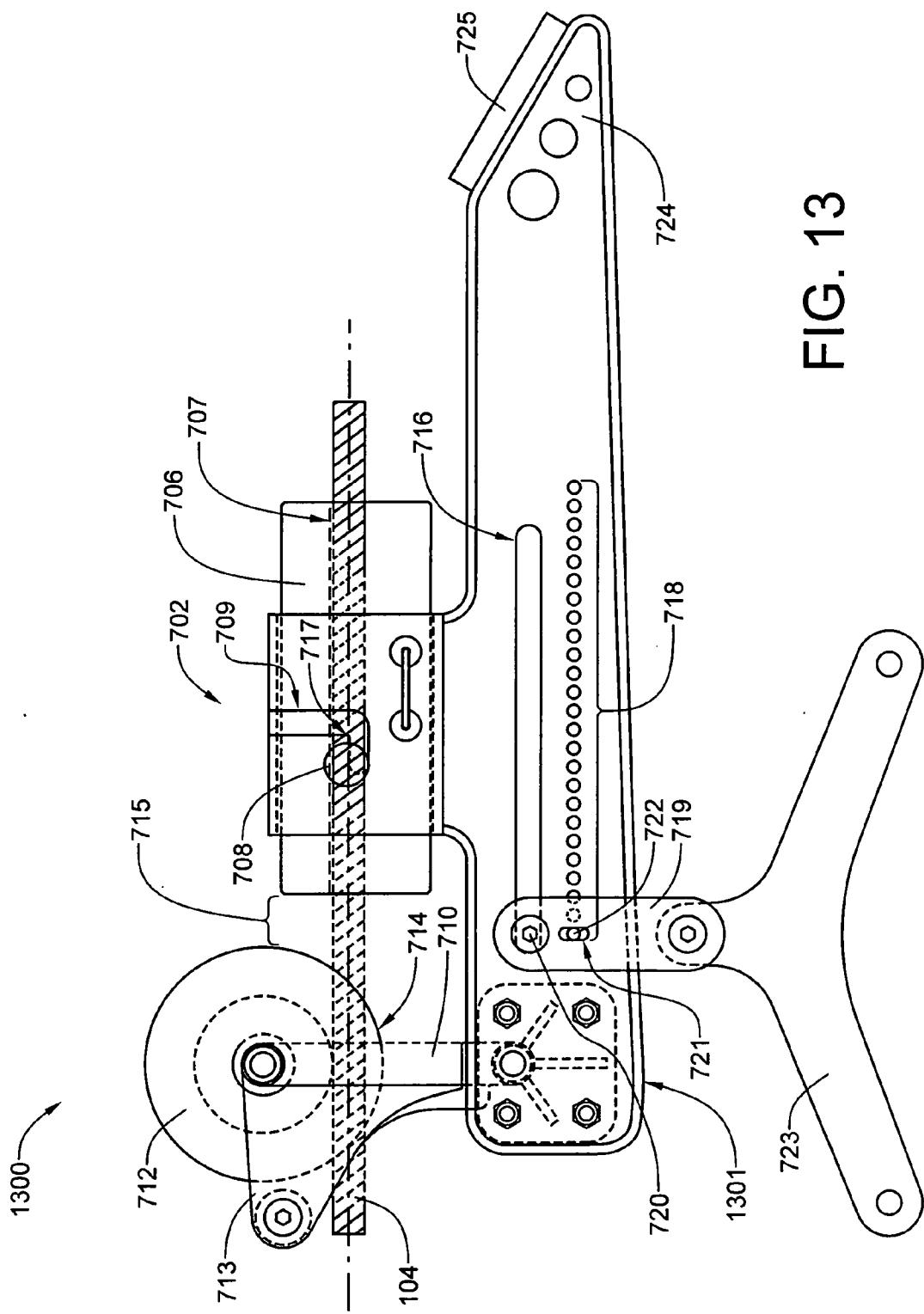


FIG. 13

FIG. 15

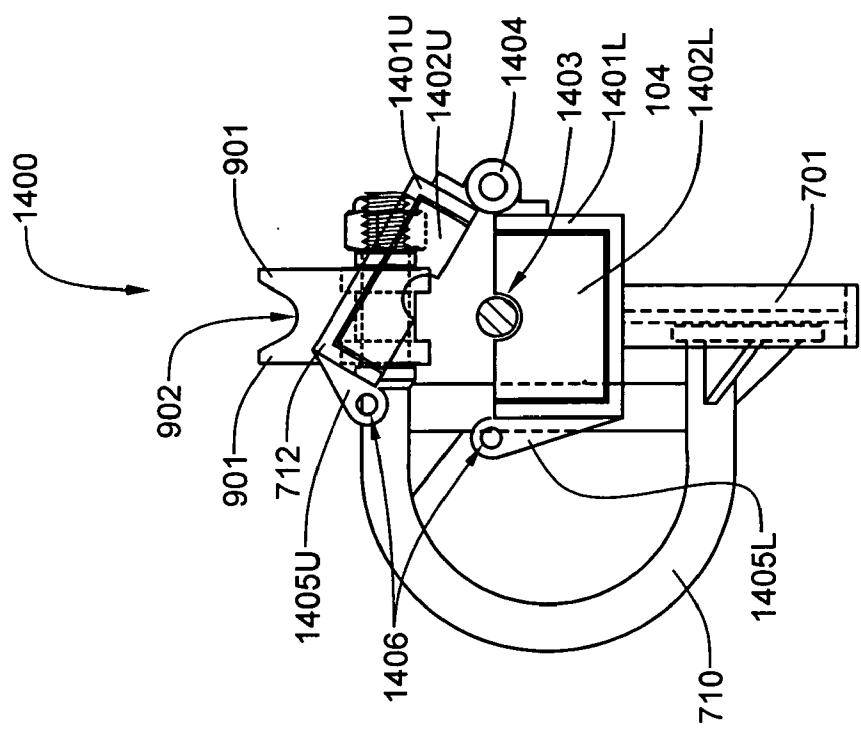
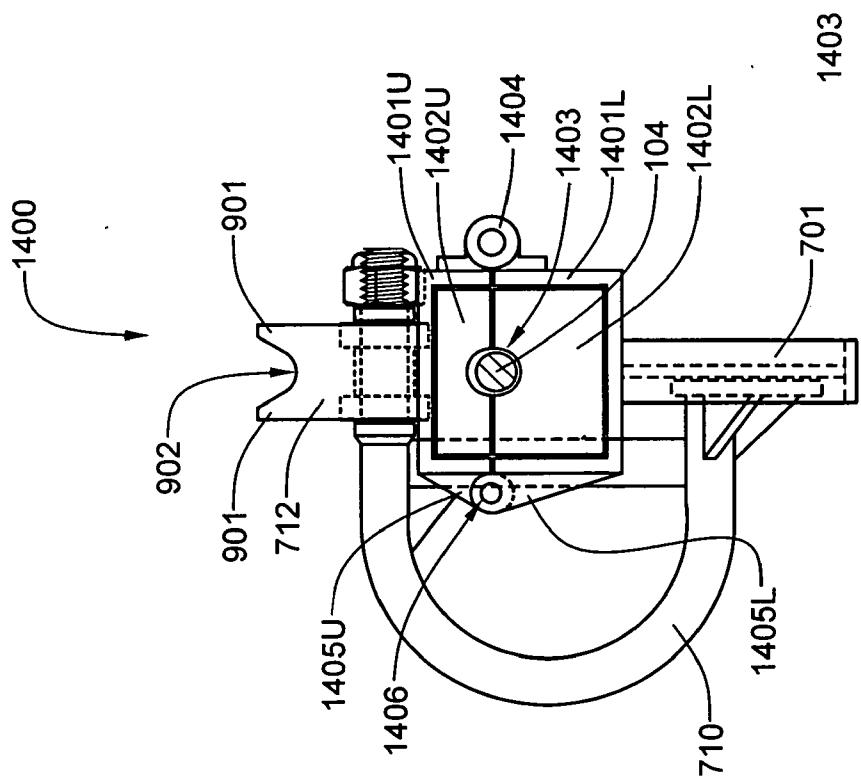


FIG. 14



DOWNSHILL ZIP LINE THRILL RIDE SYSTEM

[0001] This is a continuation-in-part of application Ser. No. 10/385,903, which was filed on Mar. 10, 2003 and issued on Dec. 23, 2003 as U.S. Pat. No. 6,666,773.

FIELD OF THE INVENTION

[0002] This invention relates, generally, to suspended cable transport systems commonly known as zip lines and, more particularly, to trolleys for downhill zip line systems which are securely attached to the suspended cable and are designed to control maximum descent speed within a safe range.

BACKGROUND OF THE INVENTION

[0003] Transport systems involving a trolley slidable along a suspended length of cable have been known in the art for many years. Commonly known as zip lines, such systems are extensively used for rescue work on ski lift equipment. They are also available as backyard toys for children and adults. Spring Swings, Inc. of Riviera Beach, Fla. manufactures a Fun Ride Deluxe Zip Line kit which can be installed between two trees or other suitable cable supports. The kit includes enough stranded steel aircraft cable for a ride of about 21 meters (70 feet) in length, cable tensioning devices, and a "super tough" double-pulley plastic trolley which travels bidirectionally on the suspended cable. The kit retails for less than \$100.

[0004] Within the past decade, zip lines have become part of the "extreme sports" scene. One particular zip line installed on a hill in the Costa Rican jungle has been given rave reviews. The Costa Rican system is really quite primitive, having a trolley with a single deep-groove nylon pulley riding on the suspended cable. In order to slow his descent, a rider must twist the trolley, thereby causing the flanges of the pulley to rub against the cable and generate friction. Kinetic energy is, thus, dissipated as heat. Riders who are particularly heavy may generate so much friction and related heat that the trolley pulley may fail prematurely. Such a system is potentially dangerous, as the riders, themselves, must take responsibility for maintaining their descent speeds within a safe range, in order to avoid smashing into the lower cable support tower. In the absence of a legal system which demands that even the most risk-inclined, incompetent and moronic individuals be protected from themselves, such a zip line system might operate in perpetuity. However, in a country such as the U.S., the slip and fall plaintiffs' bar would kill it almost immediately.

[0005] Within the past year, a sophisticated, safe, and thoroughly-engineered zip line thrill ride was installed on a steep hill at Park City, Utah. The suspended cable is about 805 meters in length (0.5 mile), and the vertical drop is approximately 183 meters (600 feet). Although maximum speeds in excess of 90 m.p.h. are attainable on the system, the maximum speed experienced by paying riders is automatically limited by the equipment to no more than about 55 m.p.h. Certain components and features of this modern zip line system are the subjects of this patent.

SUMMARY OF THE INVENTION

[0006] The zip line thrill ride system that is the focus of this invention includes a cable suspended between a upper

cable support tower and platform which, together, function as the harnessing, loading, and take-off point for the ride, and a lower cable support tower and platform which, together, function as the landing, unloading and unharnessing point of the ride. Multiple, substantially identical trolleys are designed to quickly engage and disengage the cable. A safety lock actuated by ride operator personnel at the loading point prevents the trolley from being removed from the cable until it is unlocked at the unloading point by ride operator personnel at the landing point. The trolley, the structural components of which are fabricated almost entirely from stainless steel, includes a frame of generally I-beam cross section fabricated from metal plate stock. A generally tubular brake retainer, having a longitudinal slit therein, is welded to an upper rear portion of the frame. A grooved, generally cylindrical brake fabricated from a durable polymeric material, such as Teflon®, nylon, or high-density polyethylene, high density polyethylene (HDPE) brake, is rotatably affixed within the tubular brake retainer. When the trolley is affixed to the suspended cable, the grooved insert rides against the suspended cable and functions as a brake. A clevis/handle assembly is bolted to a central portion of the frame. A pulley is rotatably mounted within the clevis. The clevis bracket of the clevis/handle assembly is positioned so that a lower portion of the pulley is exposed.

[0007] In order to attach the trolley to the suspended cable, the brake is rotated so that its groove coincides with the slit of the tubular brake retainer. The trolley is then positioned below and oblique or perpendicular to the suspended cable. The trolley is then elevated so that the cable enters the gap between the brake retainer and the clevis/handle assembly. Once the cable is positioned below the level of the pulley flanges, the trolley is rotated so that the cable enters the slit of the brake retainer and the groove of the brake and the pulley is positioned over the cable. The trolley is then lowered to seat the pulley on the cable. The brake is then rotated so that the groove therein faces upward, thereby locking the suspended cable within the tubular brake retainer.

[0008] The frame also includes a longitudinal slot forward of the clevis/handle assembly mounting point that is generally parallel to the axis of the tubular brake retainer. The frame also includes a linear array of evenly-spaced apertures that is beneath and parallel to the longitudinal slot. A lever arm adjustment bracket is attached to the frame with a retainer pin that passes through both arms of the U-shaped suspension bracket, allowing the lever arm adjustment bracket to be moved back and forth within the longitudinal slot. The suspension bracket has a pair of locking apertures, which are alignable with any of the apertures in the linear array. The lever arm adjustment bracket may be locked in place by inserting a locking pin through the pair of locking apertures and through one of the apertures in the linear array. The farther forward the lever arm adjustment bracket is located, the greater the pressure applied by the brake to the suspension cable. The position of the lever arm adjustment bracket is selected in accordance with the weight of the rider and the maximum desired speed of the ride. Thus, for any rider, the closer the lever arm adjustment bracket is to the handle/clevis assembly, the greater the maximum speed. Conversely, the farther the lever arm adjustment bracket is from the handle/clevis assembly, the slower the maximum speed.

[0009] The nose of the frame is downwardly slanted and has mounted thereon a bumper made of a durable polymeric material such as Teflon®, nylon, or high-density polyethylene. At the end of the ride, the nose engages a V-shaped trap that is slidable on the suspended cable against one or more unloaded coil springs that are concentrically installed on weighted bushings on the suspended cable. As the nose of the frame engages the V-shaped trap, it is pushed down, thereby increasing the pressure between the brake and the suspended cable and, at the same time, accelerating the weighted bushings and compressing the coil springs. These features ensure that even if the pressure of the brake against the suspended cable is not properly adjusted before the ride begins, the rider will stop safely before reaching the end of the suspended cable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] **FIG. 1** is a side elevational view of the new zip line system of **FIG. 1**;

[0011] **FIG. 2** is an enlarged side elevational view of the upper cable support tower that is shown in region 2 of **FIG. 1**;

[0012] **FIG. 3** is an enlarged side elevational view of the lower cable support tower that is shown in region 3 of **FIG. 1**;

[0013] **FIG. 4** is an enlarged side elevational view of the rider shown in region 4 of **FIG. 1**, the rider being coupled to the suspended cable via a trolley;

[0014] **FIG. 5** is a top plan view of the upper cable support tower of **FIG. 2**;

[0015] **FIG. 6** is a top plan view of the lower cable support tower of **FIG. 3**;

[0016] **FIG. 7** is a right-side elevational view of a trolley fabricated in accordance with the present invention;

[0017] **FIG. 8** is a left-side elevational view of the trolley of **FIG. 7**;

[0018] **FIG. 9** is a rear elevational view of the trolley of **FIG. 7**;

[0019] **FIG. 10** is a front elevational view of the trolley of **FIG. 7**;

[0020] **FIG. 11** is a side elevational view of a trolley, trap and coil spring assemblies installed on the suspended cable near the lower end thereof;

[0021] **FIG. 12** is a bottom planar view of the trap;

[0022] **FIG. 13** is a first alternative embodiment trolley having the brake assembly in front of the pulley;

[0023] **FIG. 14** is a second alternative embodiment trolley having a brake assembly of square cross section; and

[0024] **FIG. 15** is the second alternative embodiment trolley with the brake assembly open.

PREFERRED EMBODIMENT OF THE INVENTION

[0025] The zip line thrill ride system will now be described with reference to the accompanying drawing figures. It is to be understood that the drawing figures are

meant to be only illustrative, that they are not necessarily drawn to scale, and that some details, which would be obvious to those of ordinary skill in the art, may have been omitted in the interest of simplification and brevity.

[0026] Referring now to **FIG. 1**, a new zip line thrill ride system **100** has been built on a steep hill at Park City, Utah. This drawing figure shows the approximate topography of the terrain **101** on which the ride is built. The zip line thrill ride system includes an upper cable support tower **102**, a lower cable support tower **103**, at least one cable **104** that is suspended between the upper cable support tower **102** and the lower cable support tower **103**, and a plurality of trolleys **105** which may be reversably coupled to the cable **104**. Each of the suspended cables **104** of the Park City, Utah zip ride is about 805 meters in length (0.5 mile), and the vertical drop is approximately 183 meters (600 feet). Although maximum speeds in excess of 90 m.p.h. are attainable on the system, the maximum speed experienced by paying riders is automatically limited by the equipment to no more than about 70 m.p.h. Certain components and features of the zip line thrill ride system **100** are the subjects of this patent.

[0027] Referring now to **FIG. 2**, the upper cable support tower **102** is erected on concrete piers **201** which are embedded in the hillside **202**. The upper cable support tower **102** incorporates upper and lower cable anchor spools **203U** and **203L**, around which the upper end of cable **104** is wrapped and secured. The cable support tower **102** also incorporates a launching platform **204**, from which riders **205** are launched on the ride. A high-elevation access ramp **206** is connected to the launching platform **204**, and permits both ride operators **207** and riders **205** to easily ascend to and descend from the launching platform **204**. It will be noted that a lightning rod **208** couples the upper cable support tower **102** to the ground, and protects the ride operators **207** and riders **205** from lightning which may strike either the upper cable support tower **102**, the lower cable support tower **103**, or the cable **104**.

[0028] Referring now to **FIG. 3**, the lower cable support tower **103** is erected on concrete piers **301** which are embedded in the ground **302**. The lower cable support tower **103** incorporates single cable anchor spools **303**, around which the lower end of cable **104** is wrapped and secured. The lower cable support tower **103** also incorporates a unloading platform **304**, on which riders **205** are deposited at the end of the ride. A low-elevation access ramp (see **FIG. 5**) is connected to the unloading platform **304**, and permits both ride operators **207** and riders **205** to easily ascend to and descend from the unloading platform **304**. As with the upper cable support tower **102**, a lightning rod **208** provides a solid ground connection as a protection against lightning strikes.

[0029] Referring now to **FIG. 4**, a rider **205** is suspended by support cables **401** from a trolley **105**. A rear harness (not shown) supports the rider's buttocks, while a forward harness (also not shown) supports the rider's legs near the knee joint.

[0030] Referring now to **FIGS. 5 and 6**, it will be noted that both the upper cable support tower **102** and the lower cable support tower **103** are equipped to support four suspended cables **104**, thereby permitting four riders to careen simultaneously down the hillside **202**.

[0031] Referring now specifically to **FIG. 5**, the high-elevation access ramp **206** is clearly visible in this drawing figure, as are the four piers **201** which support the upper cable support tower **102**.

[0032] Referring now specifically to **FIG. 6**, the low-elevation access ramp **601**, which is coupled to the side of the unloading platform **304** of the lower cable support tower **103**, is clearly visible in this view.

[0033] Referring now to **FIGS. 7 through 10**, the trolley **105** is designed to quickly engage and disengage the cable **104**. Structural components of the trolley **105**, which are fabricated almost entirely from stainless steel, includes a frame **701** of generally I-beam cross section fabricated from metal plate stock. A brake assembly **702** includes a generally tubular brake retainer **703**, having a longitudinal slit **704** therein, that is welded to an upper rear portion **705** of the frame **701**. The brake assembly **702** also includes a generally cylindrical brake **706**, fabricated from a durable polymeric material, such as Teflon®, nylon, or high-density polyethylene (HDPE), and having a longitudinal groove **707**. The cylindrical brake **706** is rotatably affixed within the tubular brake retainer **703** by means of a retainer bolt **708**. The retainer bolt **708** slides within a arcuate slit **709**, which permits the cylindrical brake **706** to be rotated through an arc of within a range of 90 to 120 degrees. The preferred angle is presently deemed to be about 105 degrees. When the trolley **105** is affixed to the suspended cable **104**, the bottom of longitudinal groove **707** rides against the lower surface of the suspended cable **104** and generates friction, which maintains ride speeds within safe limits. A clevis/handle assembly **710** is bolted to a central portion **711** of the frame **701**. A pulley **712** is rotatably mounted within the clevis/handle assembly **710**. A clevis bracket **713** of the clevis/handle assembly **710** is positioned so that a lower portion **714** of the pulley **712** is exposed.

[0034] In order to attach the trolley **105** to the suspended cable **104**, the brake **706** is rotated so that its longitudinal groove **707** coincides with the longitudinal slit **704** of the tubular brake retainer **703**. The trolley **105** is then positioned below and oblique or perpendicular to the suspended cable **104**. The trolley **105** is then elevated so that the suspended cable **104** enters a gap **715** between the tubular brake retainer **703** and the clevis/handle assembly **710**. Once the suspended cable **104** is positioned below the pulley **712**, the trolley **105** is rotated in a horizontal plane so that the cable **104** enters the longitudinal slit **704** of the tubular brake retainer **703** and the longitudinal groove **707** of the brake **706** and the pulley **712** is positioned over the suspended cable **104**. The trolley **105** is then lowered to seat the pulley **712** on the cable **104**. The brake **706** is then rotated so that its longitudinal groove **707** faces upward, thereby locking the suspended cable **104** within the tubular brake retainer **703**.

[0035] The frame **701** also includes a longitudinal slot **716**, forward of the clevis/handle assembly **710**, that is generally parallel to the axis **717** of the tubular brake retainer **703**. The frame **701** also includes a linear array of evenly-spaced apertures **718** that is beneath and parallel to the longitudinal slot **716**. A lever arm adjustment bracket **719** is permanently attached to the frame **701** with a retainer pin **720** that passes from one side of the lever arm adjustment bracket **719** to the other, and through the longitudinal slot

716, thereby allowing the lever arm adjustment bracket **719** to be adjustably moved back and forth within the longitudinal slot **716**. The lever arm adjustment bracket **719** also has a pair of locking apertures **721** below the retainer pin **720**, which are alignable with any of the evenly-spaced apertures **718** of the linear array. The lever arm adjustment bracket **719** may be locked in place by inserting a removable locking pin **722** through the pair of locking apertures **721** and through one of the evenly-spaced apertures **718** in the linear array. For a given rider load on the lever arm adjustment bracket **719**, the farther forward the lever arm adjustment bracket **719** is located, the greater the pressure applied by the brake **706** to the suspended cable **104**. The position of the lever arm adjustment bracket **719** is selected in accordance with the weight of the rider and the maximum desired speed of the ride. Thus, for any rider, the closer the lever arm adjustment bracket is to the handle/clevis assembly **710**, the greater the maximum speed attained by a rider **205**. Conversely, the farther the lever arm adjustment bracket **719** is from the handle/clevis assembly **710**, the slower the maximum speed. A rider suspension bracket **723** is coupled to the lever arm adjustment bracket **719**. The frame **701** has a downwardly slanted nose **724** on which is mounted a bumper **725** made of a durable polymeric material such as Teflon®, nylon, or high-density polyethylene (HDPE).

[0036] Referring now to **FIG. 11**, at the end of the thrill ride, the nose **724** of the frame **701** engages a V-shaped trap **1101** that is slidably mounted on the suspended cable **104**. The interior surface **1102** of the trap **1101** is downwardly sloped to a stop **1103** that limits maximum downward travel of the nose **724**. As the nose **724** engages the V-shaped trap **1101**, the bumper **725** is pushed down by the interior surface **1102**, thereby increasing the pressure between the brake **706** and the suspended cable **104**. The trap **1101** is driven into one or more unloaded coil springs **1104** that are concentrically installed on weighted bushings **1105** on the suspended cable **104**, simultaneously accelerating the weighted bushings **1105** and compressing the coil springs **1104**. These features ensure that even if the pressure of the brake **706** against the suspended cable **104** is not properly adjusted before the ride begins, the rider **205** will stop safely before reaching the end of the suspended cable **104**.

[0037] Referring now to **FIG. 12**, it will be noted that the opening **1201** seen by the nose **724** of the frame **701** is V-shaped so that the nose **724**, when it reaches the interior surface **1102** of the trap **1101**, is centered below the suspended cable **104**.

[0038] Referring now to **FIG. 13**, a first alternative embodiment trolley **1300** has the brake assembly **702** in front of the pulley **712**, rather than behind it. Instead of riding on the bottom of the brake groove **707**, it rides on the top of the groove **707**, which has been axially rotated 180 degrees. The trolley frame **1301** has been modified to implement the repositioning of the brake assembly. All other features are essentially identical to those of trolley **105**.

[0039] Referring now to **FIG. 14**, a second alternative embodiment trolley **1400** features a brake assembly of generally square cross section. The brake assembly includes a brake retainer having a lower portion **1401 L** secured to the frame **701** and an upper portion **1401 U** that is coupled to the lower portion **1401 L** via a hinge **1404**. A brake has upper

and lower portions **1402U** and **1402L**, respectively. The brake retainer may be secured around the cable **104** by placing a locking pin (not shown) through the aligned holes of lower tab **1405L** and upper tab **1405U**.

[0040] Referring now to **FIG. 15**, the upper brake retainer portion **1401U** has been rotated upwardly in order to either insert or remove the cable from the groove **1403**.

[0041] Although only several embodiments of the improved downhill zip line thrill ride system have been heretofore described, it will be obvious to those having ordinary skill in the art that changes and modifications may be made thereto without departing from the scope and the spirit of the invention as hereinafter claimed.

What is claimed is:

1. A zip line transport system comprising:
upper and lower support towers;
a cable suspended between said upper and lower support towers;
at least one trolley longitudinally slidable along the cable, said trolley comprising:
a frame;
a brake retainer secured to said frame;
an abrasion-resistant brake secured within said brake retainer, said brake having a longitudinal groove through which the cable passes as the trolley moves along the cable, a portion of said linear groove sliding against said cable, said cable being lockable within said brake retainer;
a pulley rotatably mounted on said frame and longitudinally spaced from said brake retainer, said pulley having both a circumferential groove that engages an upper surface of said cable, and an axis of rotation that is generally horizontal and transverse to the cable when the trolley is slidably mounted thereon; and
a lever arm adjustment bracket affixed to said frame, said bracket supporting at least a portion of a rider's weight, and being positionable fore and aft to adjust an amount of pressure between the longitudinal groove and said cable.
2. The zip line transport system of claim 1, wherein said brake is fabricated from a durable, abrasion-resistant material selected from the group consisting of Teflon®, nylon, high-density polyethylene, and composites.
3. The zip line transport system of claim 1, wherein:
said brake retainer is generally tubularly shaped, having a central axis and first and second open ends and a primary longitudinal slit in a lateral portion thereof, said primary longitudinal slit extending from said first open end to said second open end; and
said brake is rotatably and concentrically installed within said tubular brake retainer, said brake longitudinal groove is both centered about a plane passing through the central axis, and alignable with the primary longitudinal slit, said cable being insertable through said primary longitudinal slit and into said longitudinal groove, said cable being locked within said brake retainer by arcuate rotation of said brake.

4. The zip line transport system of claim 3, wherein:
said brake retainer also has an arcuate slit which does not intersect the longitudinal slit, said arcuate slit having an arc within a range of 90 to 120 degrees; and

said trolley further comprises a bolt that passes through the arcuate slit and is secured within said brake, thereby securing said brake within the brake retainer and limiting rotational movement of the brake to arcuate movement within a range of 90 to 120 degrees.

5. The zip line transport system of claim 4, wherein the arcuate slit intersects a locking longitudinal slit, said locking longitudinal slit being spaced apart from both ends of said brake retainer.

6. The zip line transport system of claim 1, wherein said frame is of generally I-beam cross-section, being fabricated from metal plate stock.

7. The zip line transport system of claim 1, which further comprises:

a trap, having an internal ramp, that is slidably mounted on the cable near the lower cable support tower; and
at least one coil spring assembly having a weighted bushing installed within each end thereof and concentrically installed on the cable between the trap and the lower support tower; and

wherein said frame has a downwardly-slanted nose, on which is mounted a bumper made of a durable abrasion resistant material, said nose engaging the trap and being forced by the internal ramp to a lower level as the trolley travels down the cable and enters the trap, thereby increasing the pressure between the brake and the cable and, at the same time, transferring momentum to the trap and accelerating the weighted bushings and compressing the coil spring of said at least one coil spring assembly, as the trap slams into it.

8. The zip line transport system of claim 1, wherein the trolley is installable on the cable by:

rotating the brake so that its longitudinal groove coincides with the slit of the tubular brake retainer;

positioning the trolley so that the frame is below and oblique or perpendicular to the cable;

elevating the trolley so that the cable enters the gap between the brake retainer and the pulley;

aligning the body with the cable so that the cable enters the longitudinal slit in of the brake retainer and the longitudinal groove of the brake and the circumferential groove of the pulley is positioned directly above the cable;

seating the circumferential groove of the pulley on the upper surface of the cable; and

rotating the brake to lock the cable within the brake retainer.

9. A zip line transport system comprising:
upper and lower support towers;
a cable suspended between said upper and lower support towers;
at least one trolley slidable along the cable, said trolley comprising:

a frame;

a brake retainer secured to a rear portion of the frame;

an abrasion-resistant brake secured within said brake retainer, said brake having a longitudinal groove through which the cable passes as the trolley moves along the cable, a bottom portion of said linear groove sliding against a lower surface of said cable, said cable being lockable within said brake retainer;

a pulley rotatably mounted above a middle portion of said frame, said pulley having both a circumferential groove that rides on the upper surface of the cable, and an axis of rotation that is generally horizontal and perpendicular to the cable when the trolley is slidable thereon; and

a lever arm adjustment bracket affixed to a front portion of said frame, said bracket supporting at least a portion of a rider's weight, and being positionable fore and aft to adjust an amount of pressure between the bottom portion of the longitudinal groove and the lower surface of said cable.

10. The zip line transport system of claim 9, wherein said front portion of said frame includes:

a longitudinal adjustment slot, to which said lever arm adjustment bracket is slidably affixed;

a linear array of evenly-spaced apertures that is beneath and parallel to the longitudinal slot; and

wherein said lever arm adjustment bracket is slidably affixed to the longitudinal adjustment slot and securable to any one of the apertures of the linear array with a removable locking pin.

11. The zip line transport system of claim 9, wherein said brake assembly comprises:

a generally tubular brake retainer having a central axis and first and second open ends secured to a rear portion of the frame, said brake retainer having a primary longitudinal slit in a lateral portion thereof, said primary longitudinal slit extending from said first open end to said second open end; and

a generally cylindrical, abrasion-resistant brake rotatably and concentrically installed within said tubular brake retainer, said brake having a linear longitudinal groove through which the cable passes, said linear longitudinal groove being centered about a plane passing through the central axis, said longitudinal groove being also alignable with the primary longitudinal slit, said brake being fabricated from a durable, abrasion-resistant material, said brake being affixed within the tubular brake retainer and rotatable about the central axis;

wherein said cable is positionable within the circumferential groove of said pulley below its axis of rotation and insertable through said primary longitudinal slit and into the longitudinal groove of the brake, said brake then being rotatable to lock said cable within said brake retainer.

12. The zip line transport system of claim 11, wherein said brake retainer also has an arcuate slit which does not intersect the longitudinal slit, said arcuate slit having an arc within a range of 90 to 120 degrees.

13. The zip line transport system of claim 12, wherein said trolley further comprises a bolt that passes through the arcuate slit and is secured within said brake, thereby securing said brake within the brake retainer and limiting rotational movement of the brake to arcuate movement within a range of 90 to 120 degrees.

14. The zip line transport system of claim 12, wherein the arcuate slit intersects a locking longitudinal slit, said locking longitudinal slit being spaced apart from both ends of said brake retainer.

15. A zip line transport system comprising:

upper and lower support towers;

a cable suspended between said upper and lower support towers;

at least one trolley comprising:

a frame;

a brake assembly affixed to a rear portion of said frame, said brake assembly having an abrasion-resistant brake with a longitudinal linear groove, through which the cable passes as the trolley moves along the cable, a bottom portion of said linear groove sliding against a lower surface of said cable;

a pulley rotatably mounted to a middle portion of said frame, said pulley having a circumferential groove that rides on an upper surface of the cable; and

a lever arm adjustment bracket positioned on a front portion of said frame, the rider mounting bracket being positionable fore and aft to adjust an amount of pressure between the bottom portion of the linear groove and the lower surface of said cable.

16. The zip line transport system of claim 15, wherein said abrasion-resistant brake is fabricated from a material is selected from the group consisting of Teflon®, nylon, high-density polyethylene, and composites.

17. An amusement ride comprising:

upper and lower earth-mounted cable support structures positioned such that said upper cable support structure is at a higher terrain elevation than said lower support structure;

a static tensioned riding cable connected between said upper and lower support structures;

a rolling device adapted for removable rolling engagement with said riding cable, said rolling device being further adapted to support a harnessed rider suspended therefrom, said rolling device comprising a brake arm and a cable wheel assembly connected to said brake arm so as to extend upwardly therefrom, said cable wheel assembly comprising a cable wheel adapted for rolling engagement with said riding cable, said rolling device further comprising a generally cylindrical brake assembly mounted atop said brake arm proximate a rear end thereof, said brake assembly having a central longitudinal axis generally aligned with said cable wheel, said brake assembly further comprising a generally cylindrical brake pad removably positioned therein, said brake pad having a radial cable slot longitudinally formed therein, said brake assembly having a longitudinal aperture in a cylindrical wall thereof, said brake assembly further comprising a brake

pad stop at a rear opening thereof for retaining said brake pad within said brake assembly during operation of the amusement ride, said brake assembly further comprising means for rotating said brake pad positioned therein between an unlocked position in which said cable slot in said brake pad is radially aligned with said aperture in said cylindrical wall of said brake assembly to thereby permit entry of said riding cable into said cable groove and a locked position in which said cable slot faces upwardly within said brake assembly to thereby retain said riding cable within said brake assembly.

18. An amusement ride as in claim 17, wherein said means for rotating said brake pad comprises a brake pad locking pin inserted into said brake pad and extending outwardly through a brake pad locking guide formed in said cylindrical wall of said brake assembly, said brake pad locking pin being movable within said brake pad locking guide between points therein that define said locked and unlocked positions.

19. An amusement ride as in claim 18, further comprising one or more brake pad plunger pins removably insertable through an opening in said cylindrical wall of said brake assembly into an aligned radial opening in said brake pad for maintaining said brake pad in said locked position.

20. An amusement ride as in claim 17, wherein said cable wheel is adapted for removable attachment to said cable wheel assembly to facilitate the engagement and disengagement of said rolling device with said riding cable.

21. An amusement ride as in claim 17, further comprising a terminal brake assembly, coaxially positioned over said riding cable proximate said lower support structure, said terminal brake assembly comprising a dampening system comprising a longitudinal alternating series of springs and weights attached to each other and coaxially positioned over said riding cable at a terminal end thereof proximate said lower support structure, said terminal brake assembly being operative for safely decelerating a runaway rider approaching the terminal end of said riding cable.

22. An amusement ride as in claim 21, wherein said terminal brake assembly further comprises a terminal brake acceptor positioned at a leading end of said dampening system and having a depending inverted v-shaped guide member for receiving a leading end of said brake arm of an approaching rolling device having a rider suspended therefrom, said guide member being operative for forcing said leading end of said brake arm downwardly to thereby increasingly force said brake pad upwardly against said riding cable and thus further slow said approaching rolling device.

23. An amusement ride as in claim 18, further comprising one or more additional static tensioned riding and safety cables connected between said upper and lower support structures and corresponding additional ones of said rolling device to accommodate additional riders.

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