BALL TRACK SET

Inventors: James Russell Hornsby, Tampa, FL (US); Joseph L. McGowan, St. Charles, MO (US); Ryan William Alexander Lee, St. Louis, MO (US)

Publication Classification

Int. Cl. A63F 7/00 (2006.01)

US Cl. USPC .......................................................... 273/118 R

ABSTRACT

A track set includes track sections having parallel first and second rail edges on which a ball travels. Each track section includes a first upstanding sidewall projecting from the first rail edge having a first guide rail positioned a sufficient distance radially outward of the first rail edge. Each track section further includes a second upstanding sidewall projecting from the second rail edge having a second guide rail positioned a sufficient distance radially outward of the second rail edge. A connection member includes a resilient retaining portion configured to be inserted and retained between two spaced-apart pillar supports on at least one other track section to attach thereto. The track sections accommodate a derailed ball using a guide rail positioned a sufficient distance from an adjacent rail edge, to support the derailed ball via the guide rail and one rail edge when the ball rolls off the first and second rail edges.
BALL TRACK SET

FIELD

[0001] The present disclosure relates to toy games and more particularly to a descending ball game apparatus of the type including a ball and a plurality of track sections.

BACKGROUND

[0002] This section provides background information related to the present disclosure which is not necessarily prior art.

[0003] Toys are known in the art for providing amusement, education and entertainment, particularly for children. One form of amusement of great interest to children is that of a descending ball game, which is enjoyable, which are configured to be inserted and retained between two spaced-apart pillar supports on at least one other track section, to attach thereto. When connected to a mating track section, the track sections are configured to retain a derailed ball that rolls off the first and second rail edges, due to said guide rail being positioned a sufficient distance from an adjacent rail edge so as to support the rolling ball via said guide rail and one rail edge, to thereby minimize rolling resistance while retaining the rolling ball on the track.

[0005] Further areas of applicability will become apparent from the description provided herein. The description and specific examples in this summary are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

[0006] The drawings described herein are for illustrative purposes only of selected embodiments and not all possible implementations, and are not intended to limit the scope of the present disclosure.

[0007] FIG. 1 is a top perspective view of one embodiment of a track section, in accordance with the principles of the present disclosure;

[0008] FIG. 2 is a top perspective view of a second embodiment of a track section, in accordance with the principles of the present disclosure.

[0009] FIG. 3 is a bottom perspective view of the track section in FIG. 2, shown with a portion of a mating track section;

[0010] FIG. 4 is a cross-sectional view of the track section in FIG. 2; and

[0011] FIG. 5 is a top perspective view of one embodiment of a track set comprising one or more of the disclosed track sections.

[0012] Corresponding reference numerals indicate corresponding parts throughout the several views of the drawings.

DETAILED DESCRIPTION

[0013] The following description is merely exemplary in nature and is not intended to limit the present disclosure, application, or uses. It should be understood that throughout the drawings, corresponding reference numerals indicate like or corresponding parts and features. Example embodiments will now be described more fully with reference to the accompanying drawings.

[0014] Exemplary embodiments of the present disclosure relate to a track set with two or more track sections having parallel first and second rail edges on which a ball travels. Each track section includes a first upstanding sidewall projecting from the first rail edge. The first rail section has an upper portian defining a first guide rail positioned a sufficient distance radially outward of the first rail edge, for supporting a rolling ball via two points of contact established by the first rail edge and the first guide rail when the ball rolls off the first and second rail edges. Each track section further includes a second upstanding sidewall projecting from the second rail edge. The second sidewall has an upper portion defining a second guide rail positioned a sufficient distance radially outward of the second rail edge, for supporting a rolling ball via two points of contact established by the second rail edge and guide rail when the ball rolls off the first and second rail edges. A connecting member is disposed on a distal end of at least one track section. The connection member has a resilient retaining portion configured to be inserted and retained between two spaced-apart pillar supports on at least one other track section, to attach thereto. When connected to a mating track section, the track sections are configured to retain a derailed ball that rolls off the first and second rail edges, due to said guide rail being positioned a sufficient distance from an adjacent rail edge so as to support the rolling ball via said guide rail and one rail edge, to thereby minimize rolling resistance while retaining the rolling ball on the track.

[0015] Referring to FIG. 1, one embodiment of a track section is shown generally at 20. The track section includes parallel first and second rail edges 22, 24 on which a rolling ball travels. The track section 20 includes a first upstanding sidewall 32 projecting from the first rail edge 22, which has an upper portion defining a first guide rail 42 positioned a sufficient distance radially outward of the first rail edge 22, which supports a rolling ball via two points of contact established by the first rail edge 22 and the first guide rail 42. The track section 20 further includes a second upstanding sidewall 34 projecting from the second rail edge 24, having an upper...
portion defining a second guide rail 44 positioned a sufficient distance radially outward of the second rail edge 24, which supports a rolling ball via two points of contact established by the second rail edge 24 and the second guide rail 44.

[0016] In the first embodiment of a track section shown in FIG. 1, the parallel spaced-apart rail edges 44 comprise a pair of rectilinear beams connected by one or more curved portions 26 that maintain the pair of rectilinear beams in a parallel spaced-apart configuration. The first embodiment of a track section includes first and second upstanding sidewalls 32, 34 that comprise a plurality of upstanding rib portions (e.g., 34A) projecting upwardly to the guide rail surface (e.g., 44), which extends longitudinally along the length of the track section 20. The first and second guide rails 42, 44 may comprise a continuous surface extending longitudinally along the length of the track section 20, as shown in FIG. 1. Alternatively, the first and second rail edges and upstanding sidewalk may comprise other configurations, as explained below.

[0017] Referring to FIG. 2, a second embodiment of a track section is shown generally at 20. The track section includes parallel first and second rail edges 22, 24 on which a rolling ball travels. The track section 20 includes a first upstanding sidewall 32 projecting from the first rail edge 22, having an upper portion defining a first guide rail 42 positioned a sufficient distance radially outward of the first rail edge 22, which supports a rolling ball via a pair of points of contact established by the first rail edge 22 and first guide rail 42. The track section 20 further includes a second upstanding sidewall 34 projecting from the second rail edge 24, having an upper portion defining a second guide rail 44 positioned a sufficient distance radially outward of the second rail edge 24, which also supports a rolling ball. These guide rails 42, 44 are positioned radially outward or away from the travel path between the first and second rail edges.

[0018] In the second embodiment of a track section shown in FIG. 2, the parallel spaced-apart rail edges comprise first and second spaced-apart radially corner edges 22 and 24, on which a ball suitably travels. The first and second guide rails 42, 44 have an alternate construction from that in FIG. 1, and comprise first and second radially corner edges 42, 44 on the upper portion of the first and second upstanding sidewalls 32, 34. In the second embodiment shown in FIG. 2, the track section 20 includes a plurality of openings 28 in the bottom of the track, and the first and second upstanding sidewalls 32, 34 may also include a plurality of openings therethrough. The track section 20 further includes first and second aligning tabs 36 on the distal end of the track section 20, which are configured to fit within recesses 38 in an end of a mating track section to align with the mating track section. The track section 20 further includes a clamp support surface 30 depending from at least one of the first and second upstanding sidewalls 32, 34. The track section 20 includes an aperture 40 disposed between first and second track support pillars 42, 44, where the aperture 40 receives a connecting member 46, as described below.

[0019] Referring to FIG. 3, a bottom perspective view of the track section 20 is provided and shown with a portion of a mating track section. The track section 20 includes first and second spaced apart track support pillars 46 and 48, depending from the proximal end of the track section 20. A connecting member 50 is disposed on a distal end of at least one track section 20. The track section 20 preferably includes an aperture 40 disposed between the centerlines of the first and second track support pillars 46, 48, which aperture 40 receives the connecting member 50. The connection member 50 has a resilient retaining portion 52 with a slot between a pair of bars, which is configured to be compressibly inserted and retained between the two spaced-apart pillar supports 46, 48 on at least one other mating track section 20 to attach thereto in a manner that permits the track sections to flex over a length of track on which a single rail edge (e.g., edge 24 in FIG. 4) and an adjacent-ously positioned guide rail (e.g., guide rail 44 in FIG. 4) support a rolling ball via two points of contact.

[0020] The connection member 50 provides longitudinal alignment of the center-line of the track sections 20 and 20 to each other, while allowing the track sections 20, 20 to flex in a transverse direction. The connection member 50 and first and second guide rails 42, 44 are novel and unique, because the assembled track sections 20 can flex as a result of the connection member 50 while the track’s guide rails address alignment imperfections that may cause the ball to roll off rail edges 22, 24. The track section 20 can retain a ball that rolls off rail the edges 22 and 24, due to the guide rails 42, 44 being positioned a sufficient distance outward of the rail edges so as to support the rolling ball via two points to maintain rapid rolling speed along the track, as explained below.

[0021] Referring to FIG. 4, a ball is depicted for illustration purposes on cross-sectional views of the track section 20 in FIG. 2. As illustrated in FIG. 4, track section 20 is configured for use with different size diameter balls 60 and 62. The track section 20 is also configured to mate with other track sections to form a contiguous track set, which preferably includes a ball (e.g., 60) that is configured to be positioned on and roll along the first and second rail edges 22 and 24 that are spaced apart by a DISTANCE D1 (preferably between 0.5 and 0.875 inches).

[0022] When ball 60 travels rapidly across track section connections or through curves, the ball 60 may roll off the rail edges 22 and 24 to position 60’. The upstanding sidewall 34 projecting from the second rail edge 24 has an upper portion including a second guide rail 44 positioned a sufficient distance radially outward of the second rail edge 24, which supports a ‘derailed’ rolling ball 60’ via two points of contact P1, P2 established by the second rail edge 24 and second guide rail 44 (when the ball rolls off the first and second edges 22, 24). It should be noted that the second guide rail 44 is positioned a sufficient distance radially outward of the second rail edge 24 at a predetermined distance that is sufficient to retain the rolling ball 60’ on the track and provide only two points of contact with the ball 60’. Preferably, the second guide rail 44 is positioned a sufficient distance radially outward of the second rail edge 24 at a DISTANCE D2 that is at least 80 percent of DISTANCE D1 and preferably not more than DISTANCE D1. Likewise, the first guide rail 44 is positioned a sufficient distance radially outward of the first rail edge 24, at the same DISTANCE D2, which is at least 80 percent of DISTANCE D1. Furthermore, the distance between the first guide rail 42 and the second guide rail 44 is at least 10 percent greater than the ball diameter.

[0023] Accordingly, the track sections disclosed above are configured to retain a derailed ball that rolls off the first and second rail edges 22, 24 due to said guide rail (e.g., 44) being positioned a sufficient distance from one adjacent rail edge (e.g., 24) so as to support the rolling ball via two points of contact when the ball rolls off the first and second rail edges
22, 24, to thereby minimize rolling resistance while retaining the rolling ball on the track set. The guide rails positioned a sufficient distance from adjacent rail edges ideally retain and support a “derailed” rolling ball via two points of contact where the distance between the first guide rail 42 positioned radially outward of the first rail edge 22, and the distance between the second guide rail 44 positioned radially outward of the second rail edge 24, is a distance that is at least 80 percent of the distance between the first and second rail edges 22, 24.

[0024] The track section 20 is unique in that the first and second guide rails 42, 44 and connection member 50 provide better reliability and assembly, because the assembled track sections 20 can flex as a result of the connection member 50 while also addressing alignment imperfections that may cause the ball to roll off rail edges 22 and 24 by incorporating sufficiently spaced guide rails 42, 44 that support the rolling ball on two points in a manner that maintains rapid rolling speed. When the distance between the first guide rail positioned radially outward of the first rail edge, and the distance between the second guide rail positioned radially outward of the second rail edge, is a distance that is at least 80 percent of the distance between the first and second rail edges, the track set results in improved reliability in retaining a rolling ball. One such track set is illustrated in FIG. 5, which shows a perspective view of one embodiment of a track set 100 with at least two track sections 20. It should be noted that the various track sections 20 may be either rectilinear or curvilinear in shape.

[0025] Accordingly, in another aspect of the present disclosure, various embodiments of a track section for a track set are provided. In one embodiment, a track section is provided that includes parallel first and second rail edges on which a rolling ball travels. Each track section further includes a first upstanding sidewall projecting from the first rail edge, having an upper portion defining a first guide rail positioned a sufficient distance radially outward of the first rail edge to support a rolling ball via two points of contact established by the first rail edge and the first guide rail when the ball rolls off the first and second rail edges, and a second upstanding sidewall projecting from the second rail edge, having an upper portion defining a second guide rail positioned a sufficient distance radially outward of the second rail edge to support a rolling ball via two points of contact established by the second rail edge and second guide rail when the ball rolls off the first and second rail edges. The distance between the first guide rail positioned radially outward of the first rail edge, and the distance between the second guide rail positioned radially outward of the second rail edge, is a distance that is at least 80 percent of the distance between the first rail edge and the second rail edge.

[0026] The track section further includes first and second spaced apart pillar supports depending from the proximal end of the track section, and a connecting member depending from the distal end of the track section. The connecting member has a resilient retaining portion configured to be inserted and retained between two spaced-apart track support pillars on at least one other track section to attach thereto in a manner that permits track sections to flex. The track section is configured to retain a derailed ball that rolls off the first and second rail edges, due to said guide rail being positioned a sufficient distance from an adjacent rail edge so as to support the rolling ball via said guide rail and one rail edge, to thereby minimize rolling resistance while retaining the rolling ball on the track. Preferably, the first and second rail edges comprise first and second spaced-apart radius corner edges, and the first and second guide rails preferably comprise first and second radius corner edges on the upper portion of the first and second upstanding sidewalls.

[0027] Further areas of applicability will become apparent from the description provided herein. The foregoing description of the embodiments has been provided for purposes of illustration and description, and is not intended to be exhaustive or to limit the scope of the present disclosure. Individual elements or features of a particular embodiment are generally not limited to that particular embodiment, but, where applicable, are interchangeable and can be used in a selected embodiment, even if not specifically shown or described. Such variations are not to be regarded as a departure from the invention, and all such modifications are intended to be included within the scope of the invention.

[0028] Example embodiments are provided so that this disclosure will be thorough, and will fully convey the scope to those who are skilled in the art. Numerous specific details are set forth such as examples of specific components, devices, and methods, to provide a thorough understanding of embodiments of the present disclosure. It will be apparent to those skilled in the art that specific details need not be employed, that example embodiments may be embodied in many different forms and that neither should be construed to limit the scope of the disclosure. In some example embodiments, well-known processes, well-known device structures, and well-known technologies are not described in detail.

[0029] The terminology used herein is for the purpose of describing particular example embodiments only and is not intended to be limiting. As used herein, the singular forms “a,” “an,” and “the” may be intended to include the plural forms as well, unless the context clearly indicates otherwise. The terms “comprises,” “comprising,” “including,” and “having,” are inclusive and therefore specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features thereof. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., “between” versus “directly between,” “adjacent” versus “directly adjacent,” etc.). As used herein, the term “aid/or” includes any and all combinations of one or more of the associated listed items.

[0030] Although the terms first, second, third, etc. may be used herein to describe various elements, components and/or sections, these elements, components, and/or sections should not be limited by these terms. These terms may be only used to distinguish one element, component or section from another section. Terms such as “first,” “second,” and other numerical terms when used herein do not imply a sequence or order unless clearly indicated by the context. Thus, a first element, component or section discussed below could be termed a second element, component or section without departing from the teachings of the example embodiments.

[0031] Spatially relative terms, such as “inner,” “outer,” “beneath,” “below,” “lower,” “above,” and the like, may 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. Spatially relative terms may be intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as “below” or
“beneath” other elements or features would then be oriented “above” the other elements or features. Thus, the example term “below” can encompass both an orientation of above and below. The device may be otherwise oriented and the spatially relative descriptors used herein interpreted accordingly.

What is claimed is:

1. A track set, comprising:
   two or more track sections having a proximal and a distal end, each track section including:
   parallel first and second rail edges on which a rolling ball travels;
   a first upstanding sidewall projecting from the first rail edge, having an upper portion defining a first guide rail positioned a sufficient distance radially outward of the first rail edge to support a rolling ball via two points of contact established by the first rail edge and the first guide rail when the ball rolls off the first and second rail edges; and
   a connector member disposed on a distal end of at least one track section, having a resilient retaining portion configured to be inserted and retained between two spaced-apart track support pillars on at least one other track section, to attach thereto in a manner that permits the connected track sections to flex;
   wherein the track sections are configured to retain a derailed ball that rolls off the first and second rail edges due to said guide rail being positioned a sufficient distance from an adjacent rail edge so as to support the rolling ball via said guide rail and one rail edge, to thereby minimize rolling resistance while retaining the rolling ball on the track.

2. A track set, comprising:
   two or more track sections having a proximal and a distal end, each track section including:
   parallel first and second rail edges on which a rolling ball travels;
   a first upstanding sidewall projecting from the first rail edge, having an upper portion defining a first guide rail positioned a sufficient distance radially outward of the first rail edge to support a rolling ball via two points of contact established by the first rail edge and the first guide rail when the ball rolls off the first and second rail edges;
   a second upstanding sidewall projecting from the second rail edge, having an upper portion defining a second guide rail positioned a sufficient distance radially outward of the second rail edge to support a rolling ball via two points of contact established by the second rail edge and second guide rail when the ball rolls off the first and second rail edges;
   wherein the distance between the first guide rail positioned radially outward of the first rail edge, and the distance between the second guide rail positioned radially outward of the second rail edge, is a distance that is at least 80 percent of the distance between the first and second rail edges;
ward of the second rail edge to support a rolling ball via two points of contact established by the second rail edge and second guide rail when the ball rolls off the first and second rail edges; wherein the distance between the first guide rail positioned radially outward of the first rail edge, and the distance between the second guide rail positioned radially outward of the second rail edge, is a distance that is at least 80 percent of the distance between the first and second rail edges first and second spaced apart pillar supports depending from the proximal end of the track section; and a connecting member depending from the distal end of the track section, having a retaining portion configured to be inserted and retained between the first and second spaced apart pillar supports of a mating track section, to attach thereto in a manner that permits the track sections to flex; wherein the track section is configured to retain a derailed ball that rolls off the first and second rail edges due to said guide rail being positioned a sufficient distance from an adjacent rail edge so as to support the rolling ball via said guide rail and one rail edge, to thereby minimize rolling resistance while retaining the rolling ball on the track.

14. The track set of claim 13, further comprising a ball configured to be positioned on and roll along the first and second rail edges.

15. The track set of claim 14, wherein the first and second rail edges comprise first and second spaced-apart radiused corner edges.

16. The track set of claim 15, wherein the first and second guide rails comprise first and second radiused corner edges on the upper portion of the first and second upstanding sidewalls.

17. The track set of claim 16, wherein at least one track section includes an aperture disposed between the first and second track support pillars, the aperture being configured to receive the connecting member therein.

18. The track set of claim 17, further including first and second aligning tabs on the distal end of the track section, being configured to fit within recesses in an end of a mating track section.

19. The track set of claim 18, further including a clamp support surface depending from at least one of the first and second upstanding sidewalls.

20. The track set of claim 19, wherein the first and second upstanding sidewalls each include a plurality of openings therethrough.

* * * * *