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(54) **RAMP FOR A TOY VEHICLE**

Related U.S. Application Data

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(52) **U.S. Cl.** **446/444**
(57) **ABSTRACT**

A ramp for toy vehicles is provided comprising a base including a plurality of interaction sites and a ramp member joined to the base. The ramp member may include a flexible first driving surface. The ramp may further include a first support arm attached to the ramp member, the first support arm having a tip that is positionable at one of the plurality of interaction sites.

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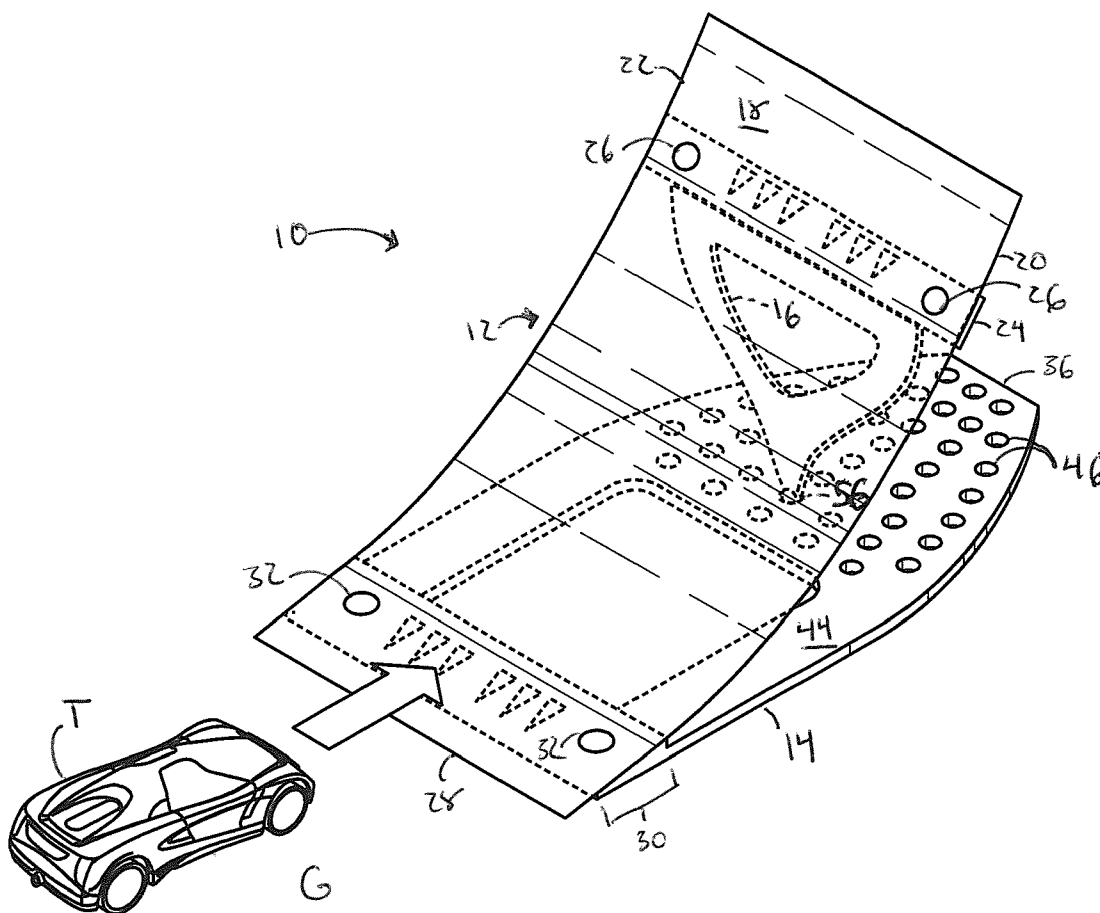


Fig. 1

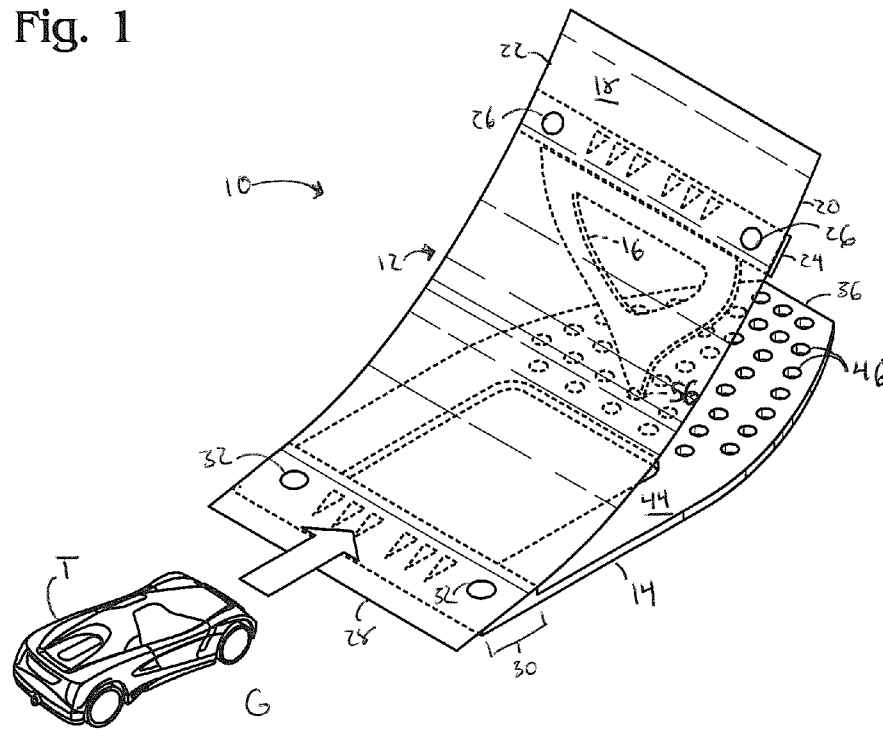


Fig. 2

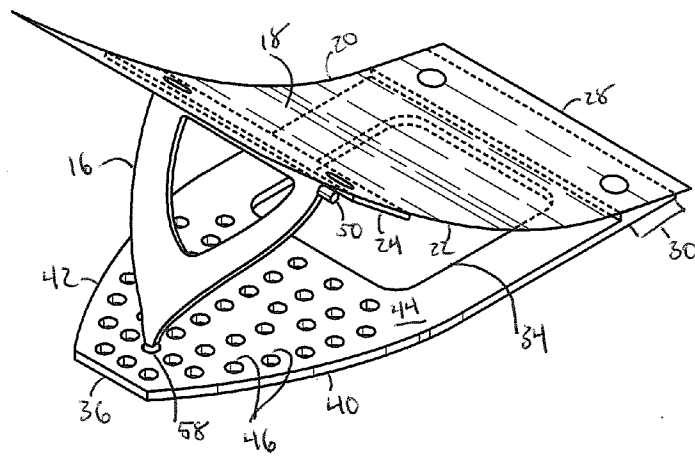


Fig. 3

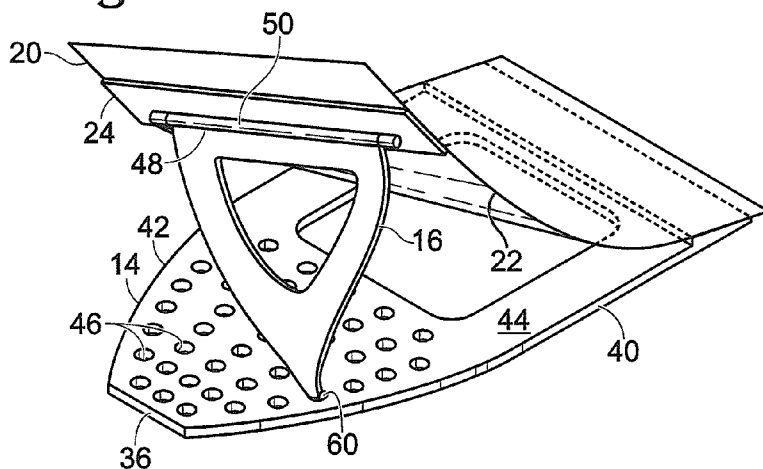


Fig. 5

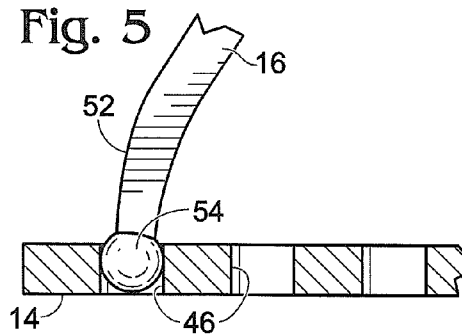
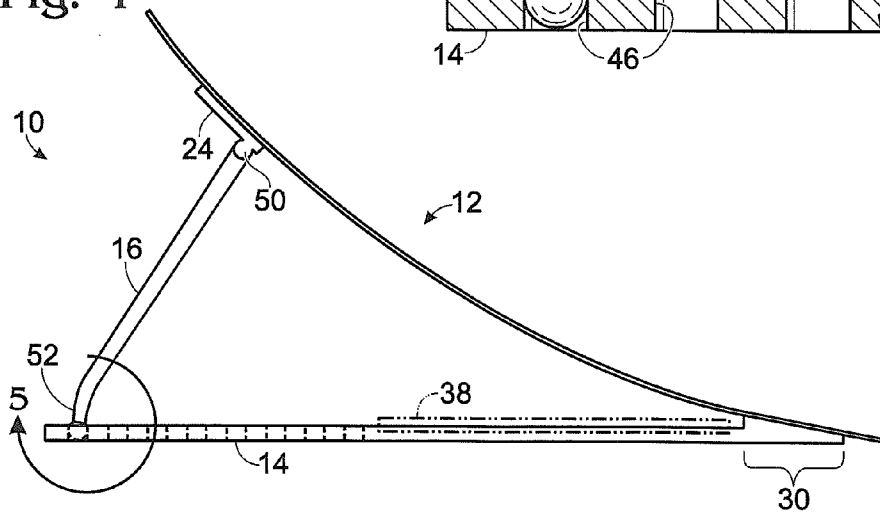


Fig. 4



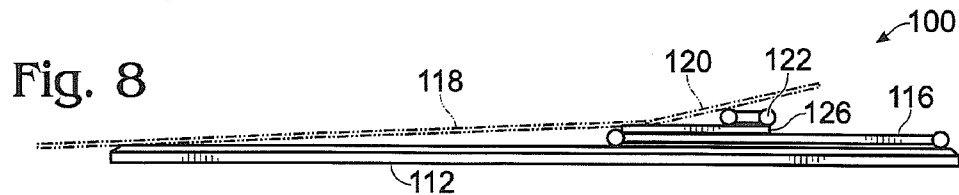
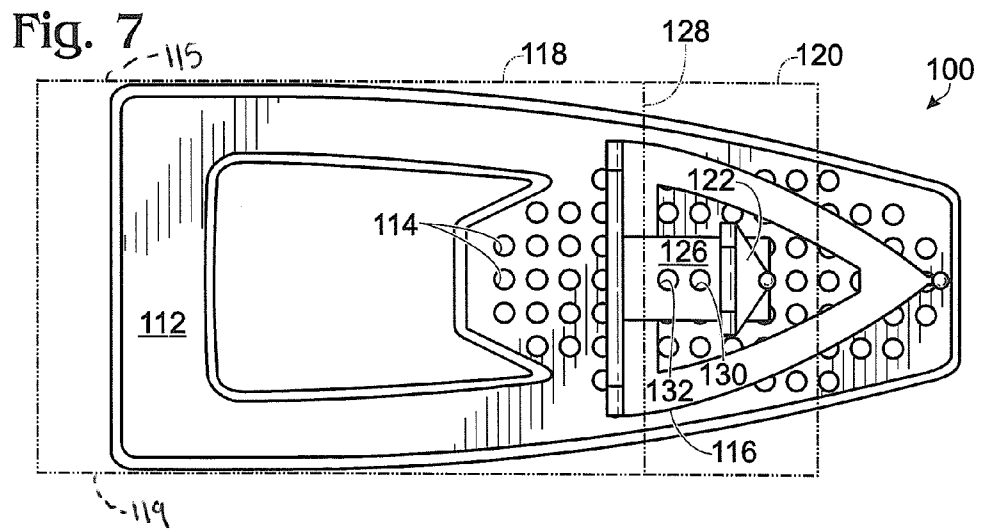
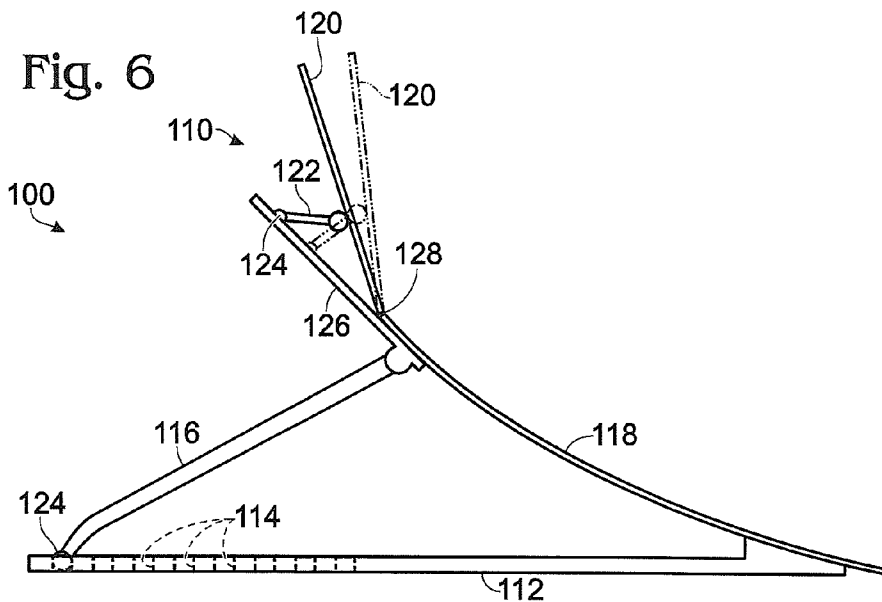


Fig. 9

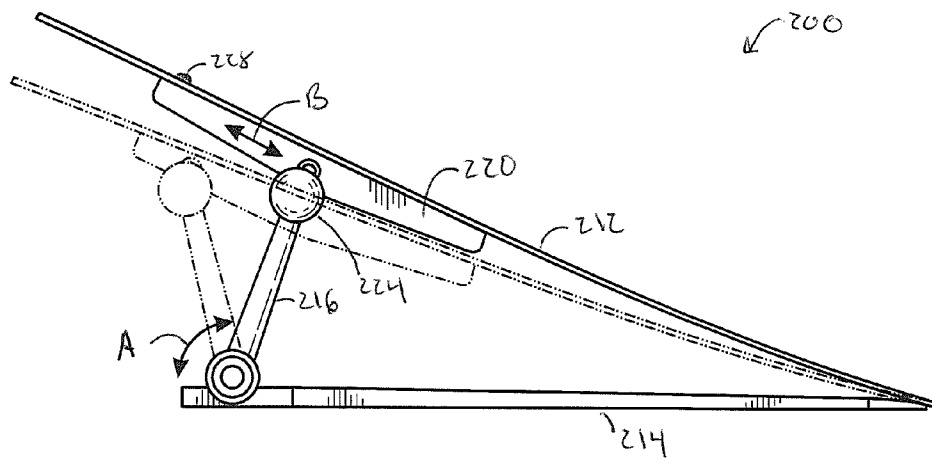
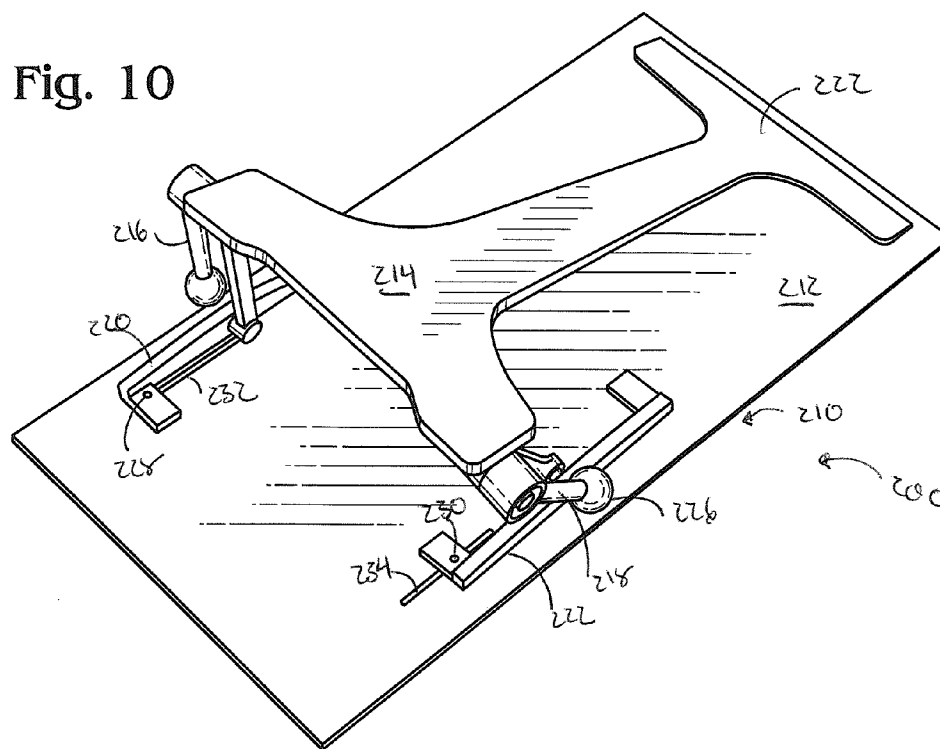


Fig. 10



RAMP FOR A TOY VEHICLE

RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application Ser. No. 61/271,732, which was filed on Jul. 23, 2009 and is entitled "ADJUSTABLE LAUNCH RAMP FOR TOY VEHICLES". The complete disclosure of the above-identified patent application is hereby incorporated by reference for all purposes.

BACKGROUND

[0002] The present disclosure is directed generally to ramps for toy vehicles and more particularly to ramps for toy vehicles incorporating one or more adjustable components. The adjustable components allow a user to adjust a pathway and/or a launch trajectory of a toy vehicle traveling up the ramp. Examples of ramps for toy vehicles, including adjustable ramps, are found in U.S. Pat. Nos. and Application Nos. U.S. Pat. No. 4,129,916, U.S. Pat. No. 6,921,339, U.S. Pat. No. 7,225,492, U.S. Pat. No. 7,233,488, US20050191938, and US20050287919. The disclosures of all of the patents, patent applications, and publications recited herein are incorporated by reference for all purposes.

SUMMARY

[0003] A ramp for a toy vehicle is provided having a base including a plurality of interaction sites and a ramp member joined to the base, the ramp member including a flexible first driving surface. The ramp may further include a first support arm attached to the ramp member, the first support arm having a tip that is positionable at one of the plurality of interaction sites.

[0004] Also in accordance with the present disclosure, a ramp for a toy vehicle is provided comprising a base and a ramp member joined to the base. The ramp member may include a flexible driving surface having a first side edge and a second side edge. The ramp may further include a support arm joined to the ramp member, the support arm having a distal free end that is centered between the first and second side edges of the driving surface, wherein the free end is positionable on the base such that the degree of curvature of the first side edge is different than the degree of curvature of the second side edge. The base may include a top surface defining a plurality of interaction sites upon which the free end is positionable.

[0005] Also in accordance with the present disclosure a ramp for a toy vehicle is provided comprising a base including a top surface defining a plurality of depressions, a flexible sheet joined to the base, the flexible sheet having a first side edge and a second side edge and a support seat attached to the sheet to operatively support the first and second side edge. The ramp may further include a support arm hingedly attached to the support seat, the support arm having a narrow distal tip, wherein the tip is positionable in any one of the plurality of depressions such that at least one of the degree of curvature and the degree of torsion of the flexible sheet is variable.

[0006] The advantages of the present disclosure will be more readily understood after considering the drawings and the Detailed Description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a front perspective view of a ramp for a toy vehicle, showing a base including a plurality of interaction

sites, a ramp member joined to the base and a support arm, in relief, having a tip positioned in a first interaction site.

[0008] FIG. 2 is a rear perspective view of the ramp of FIG. 1, showing the tip of the support arm in a second interaction site.

[0009] FIG. 3 is a rear perspective view of the ramp of FIG. 1, showing the tip of the support arm in a third interaction site.

[0010] FIG. 4 is a side view of the ramp of FIG. 1, showing the tip of the support arm in a fourth interaction site.

[0011] FIG. 5 is a cross-sectional view of the base of FIG. 4, showing the tip having a ball joint in the fourth interaction site.

[0012] FIG. 6 is a side view of a ramp for a toy vehicle, showing a ramp member including a first driving surface and a second driving surface.

[0013] FIG. 7 is a top view of the ramp of FIG. 6 in a collapsed position.

[0014] FIG. 8 is a side view of the ramp of FIG. 7.

[0015] FIG. 9 is a side view of a ramp for a toy vehicle, showing a base, a ramp member and a first independently moveable support arm.

[0016] FIG. 10 is a bottom perspective view of the ramp of FIG. 9, showing the base, the ramp member, the first independently moveable support arm and a second independently moveable support arm.

DETAILED DESCRIPTION

[0017] FIGS. 1-5 show an embodiment of a ramp for toy vehicles 10, including a ramp member 12, a base 14 and a support arm 16, one or all of which may be adjustable by a user. Ramp member 12 may include a driving surface 18, also referred to as a first or primary driving surface, that is adjustable relative to base 14 such that one or all of the curvature, steepness, the torsion, and/or the twist of the driving surface 18 relative to the base 14 may be varied by the user, depending on his or her preference and desired trajectory of a toy vehicle T.

[0018] Driving surface 18 is preferably smooth, such that toy vehicle T may travel easily along the surface and may include at least a portion that is flexible, also referred to as semi-flexible, such that a position of driving surface 18 relative to base 14 may be easily adjusted. As shown in FIGS. 1-4, the flexible nature of driving surface 18 allows driving surface 18 to assume a bowed (or concave) geometry. Likewise, as explained in further detail below, the flexibility of driving surface 18 allows the user to add a moderate twist to driving surface 18, thereby altering a launch trajectory for toy vehicle T traveling along driving surface 18 (see for example FIG. 3).

[0019] In some embodiments, driving surface 18 may include a continuous and/or uniformly flexible sheet, such as a continuous and/or uniformly flexible sheet of plastic material. Driving surface 18 may include a first side edge 20 and a second side edge 22. Ramp member 12 may include a support seat 24 attached to the underside of driving surface 18 to operatively support first side and second side edge 20, 22 of driving surface 18. Support seat 24 may have a substantially rectangular shape and/or may include a curved shape along a side length. Support seat 24 may include one or more directional arrows to guide the user in aiming toy vehicle T at ramp 10 and may be substantially rigid.

[0020] Attachment means 26 between support seat 24 and driving surface 18 may be configured such that attachment means 26 are flush with driving surface 18. For example, attachment means 26 may include a pin, such as a metal pin

and ramp member 12 may include a hole having a recessed area on driving surface 18. Additionally and/or alternatively, ramp member 12 may include a punched-out hole that is substantially cone-shaped and the attachment means 26 may include a pin having a cone-shaped head.

[0021] A lower portion of ramp member 12 may be attached to base 14 such that a bottom edge 28 or part of the lower portion of ramp member 12 extends past base 14 along ground G to create a smooth transition from ground G to ramp member 12. Base 14 may include a ramp member attachment area 30 having an inclined portion configured to stabilize and support ramp member 12. Ramp member attachment area 30 may also include one or more directional arrows to guide the user in aiming toy vehicle T at ramp 10.

[0022] Attachment means 32 between base 14 and ramp member 12 may be configured such that attachment means 32 are flush with driving surface 18. For example, attachment means 32 may include a pin, such as a metal pin and ramp member 12 may include a hole having a recessed area on driving surface 18. Additionally and/or alternatively, ramp member 12 may include a punched-out hole that is substantially cone-shaped and attachment means 32 may include a pin having a cone-shaped head.

[0023] Base 14 may be substantially rigid and configured such that the underside of base 14 lies flat on ground G. Base 14 may include a cavity 34 between ramp member attachment area 30 and distal end 36. Cavity 34 may have any shape, such as a substantially rectangular shape, and may provide a handle for easy transportation of ramp 10 and/or may reduce the weight of base 14 for easy transportation of ramp 10. Base 14 may also include one or more reinforcement ribs 38, shown in relief in FIG. 4. Reinforcement ribs 38 may line the length of a first and a second side edge 40, 42 of base 14, the entire perimeter of base 14 or may only line a portion of the perimeter of base 14 adjacent to cavity.

[0024] Base 14 may include a top surface 44 defining a plurality of interaction sites 46, also referred to as an array of interaction sites. Plurality of interaction sites 46 may include one or more depressions and/or one or more apertures in top surface 44. One or more of interaction sites 46 may have a substantially circular shape. Additionally and/or alternatively the plurality of interaction sites 46 may include any one or more of a divot, lip, fin, hole, orifice, opening, cavity, magnet, hook and eye means or other structure or releasable attachment means configured to engage support arm 16 as described in further detail below.

[0025] Plurality of interaction sites 46 may span across the entire area of top surface 44. Alternatively, plurality of interaction sites 46 may be situated on approximately half of the area of top surface 44 adjacent a tapered end 36 of base 14. Plurality of interaction sites 46 may have any configuration, including but not limited to parallel rows of interaction sites 46 extending across a length of top surface 44 and/or parallel rows of interaction sites extending across a width of top surface 44. Additionally and/or alternatively, a row of interaction sites 46 may extend along a curved perimeter of base 14. The number of plurality interaction sites 46 in a row may vary, for example between 3-14 interaction sites per row, depending on the size of the interaction site and top surface.

[0026] As shown in FIGS. 1-5, support arm 16, also referred to as first or primary support arm, may be configured to be positionable in one of plurality of interaction sites 46. Support arm 16 may be joined to an underside of ramp member 12 and may be substantially rigid. For example, support

arm 16 may be hingedly joined to support seat 24 and/or the underside of driving surface 18. A top width 48 of support arm 16 joined to ramp member 12 may span a majority of the width of the ramp member 12 between first side edge 20 and second side edge 22. Support arm 16 may be joined to ramp member 12 via any connection means including a hinge connection means 50 such as an elongated rod member that threads through cylinder(s) in support arm 16 and/or ramp member 12.

[0027] Support arm 16 may include a triangular frame shape; however, other shapes or versions of support arm 16 may be substituted for a triangular support arm 16. Support arm 16 may include a tip 52, also referred to as a free end, that is distal to top width 48 of support arm 16 joined to ramp member 12. Tip 52 may extend from the center of ramp member 12 between first and second side edge 20, 22. As best shown in FIG. 5, tip 52 may be positionable on base 14, for example on and/or in one of plurality of interaction sites 46, and may include a ball joint 54. All or a portion of support arm 16 may include a curvature, for example an area of curvature adjacent the tip 52.

[0028] Plurality of interaction sites 46 may be configured to receive and releasably hold support arm 16. In operation, placing support arm 16 in a different one of plurality of interaction sites 46 allows a user to adjust driving surface 18 to various configurations. Depending on where the user positions support arm 16, ramp member 12 may be raised, lowered and/or twisted to varying degrees. Such adjustments allow the user to vary the launch trajectory of the toy vehicle T as demonstrated by comparing the positions of ramp 10 shown in FIGS. 1-4.

[0029] For example, as shown in FIG. 1, support arm 16 may be positioned on a first interaction site 56 located approximately at the center between first and second side edge 40, 42 of base 14 and approximately at the center between ramp member attachment area 30 and tapered end 36 of base 14. Alternatively, as shown in FIG. 2, support arm 16 may be positioned on a second interaction site 58 located approximately at the center between first and second side edge 40, 42 of base 14, distal ramp member attachment area 30 and/or adjacent tapered end 36 of base 14. The degrees of curvature of ramp member 12 shown in FIGS. 1 and 2 may be uniform across the width of driving surface 18 between side edges 20, 22.

[0030] The degree of curvature of driving surface 18 in FIG. 1 may be greater than the degree of curvature of driving surface 18 in FIG. 2. In other words, driving surface 18 may be steeper in FIG. 1 than in FIG. 2. Accordingly, assuming the same launch speed, the toy vehicle T launched off of driving surface 18 in FIG. 1 may go a further distance vertically with respect to ground G than the toy vehicle T launched off of driving surface 18 in FIG. 2. Again assuming the same launch speed, the toy vehicle T launched off of driving surface 18 in FIG. 2 may go a further distance horizontally with respect to ground G than the toy vehicle T launched off of driving surface 18 in FIG. 1.

[0031] Turning now to FIG. 3, support arm 16 may be positioned on a third interaction site 60 adjacent first side edge 40 of base 14, such that driving surface 18 may have a degree of torsion, also referred to as twist. In other words, support arm 16 may be positionable on base 14 such that the degree of curvature of first side edge 20 of driving surface 18 is different than the degree of curvature of second side edge

22. The toy vehicle T launched off of driving surface 18 in FIG. 3 may be directed to a target off to the side of ramp 10.

[0032] As shown in FIGS. 6-8 and in accordance with the present disclosure, some embodiments of a ramp for a toy vehicle 100 may include a ramp member 110 joined to a base 112 having a plurality of interaction sites 114 and a first support arm 116. Ramp member 110 may include a first driving surface 118 and a second driving surface 120, also referred to as a kicker. First support arm 116 may be hingedly joined to the underside of first driving surface 118. The free end of first support arm 116 may extend from the center of the width of first driving surface 118 between side edges 115 and 119 and may be positionable in one of the plurality of interaction sites 114.

[0033] Second driving surface 120 may be lengthen a toy vehicle's pathway and/or allow for more adjustments of the toy vehicle's launch trajectory. Second driving surface 120 may be rigid or flexible and may be attached to an upper end of first driving surface 118. Second driving surface 120 may be supported by a rigid second support arm 122, joined to an underside of the second driving surface 120. Second support arm 122 may have a ball tip 124 attached distal to a portion of second support arm 122 joined to the underside of the second driving surface 120.

[0034] Embodiments which include second driving surface 120 may also include a rigid extension 126 from an upper end 128 of first driving surface 118. Extension 126 may include a number of interaction sites 130, 132. Tip 124 on the second support arm 122 may be positioned in any of interaction sites 130, 132 to adjust a position of second driving surface 120 relative to base 112 and/or first driving surface 118.

[0035] Second support arm 122 may vary in shape in different embodiments of ramp 100, including but not limited to a triangular shape. Secondary interaction sites 130, 132 may include holes, receptacles, dimples, apertures or any other form of hole, depression and/or extensions suitable for receiving and holding tip 124 in place. Secondary interaction sites 130, 132 may include two or more interaction sites in a row at the center of extension 126.

[0036] For example, as shown in FIG. 6, second support arm 122 may be moveable from a first position, in which tip is positioned in secondary interaction site 130 distal upper end 128 of first driving surface 118, to a second position, shown in relief, in which tip is positioned in a secondary interaction site 132 adjacent upper end 128 of first driving surface 118. In other words, the angle between extension 126 and secondary support surface 120 may be greater in the second position than in the first position.

[0037] As shown in FIG. 8, the various components of ramp 100 are joined in a way that allows ramp 100 to collapse and fold to a substantially planar configuration when not in use. This facilitates compact packaging, storage, and transport of ramp 100.

[0038] As shown in FIGS. 9 and 10 and in accordance with the present disclosure, some embodiments of a ramp for a toy vehicle 200 may include a ramp member 210 having a substantially flexible driving surface 212 joined to a base 214. Base 214 may have a substantially "I" shape and may be substantially rigid.

[0039] Ramp 200 may further include dual independently moveable support arms 216, 218 pivotally joined to base 214 distal from an end 222 of the base 214 joined to driving surface 212. The pivotal movement of independently moveable support arm 216 is shown by directional arrow A in FIG.

9. Each independent support arm 216, 218 may be attached to a sliding member 220, 222 by a rotatable fastener 224, 226, such as a screw, post, or other device. Sliding members 220, 222 may in turn be attached to driving surface 212 by additional fasteners 228 and 230 which pass through two slits 232, 234 traversing driving surface 212.

[0040] Ramp 200 allows each independent support arm 216, 218 to be adjusted independently by positioning the attached sliding members 220, 222 at various positions along the long slits 232, 234. The sliding movement of sliding member 220 is shown by directional arrow B in FIG. 9. Depending on where a user positions the sliding members 220, 222, the primary driving surface 212 may be elevated, lowered, and/or twisted to varying degrees. Such adjustments allow the user to vary the launch trajectory of the toy vehicle as demonstrated by the positions of the adjustable launch ramp 10 shown in FIG. 9.

[0041] The various embodiments of a ramp for a toy vehicle, and the various components, if present, may be fabricated from any suitable material, or combination of materials, such as plastic, transparent plastic, foamed plastic, wood, cardboard, pressed paper, metal, or the like. A suitable material may be selected to provide a desirable combination of weight, strength, durability, flexibility, cost, manufacturability, appearance, safety, and the like.

[0042] It is believed that the disclosure set forth above encompasses multiple distinct inventions with independent utility. While each of these inventions has been disclosed in its preferred form, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense as numerous variations are possible. The subject matter of the inventions includes all novel and non-obvious combinations and subcombinations of the various elements, features, functions and/or properties disclosed herein. Similarly, where the claims recite "a" or "a first" element or the equivalent thereof, such claims should be understood to include incorporation of one or more such elements, neither requiring nor excluding two or more such elements.

[0043] Inventions embodied in various combinations and subcombinations of features, functions, elements, and/or properties may be claimed through presentation of new claims in a related application. Such new claims, whether they are directed to a different invention or directed to the same invention, whether different, broader, narrower or equal in scope to the original claims, are also regarded as included within the subject matter of the inventions of the present disclosure.

1. A ramp for a toy vehicle, comprising:
 - a base including a plurality of interaction sites;
 - a ramp member joined to the base, the ramp member including a flexible first driving surface; and
 - a first support arm attached to the ramp member, the first support arm having a tip that is positionable at one of the plurality of interaction sites.
2. The ramp of claim 1, wherein the plurality of interaction sites includes at least two interaction sites along a length of the base.
3. The ramp of claim 1, wherein the plurality of interaction sites includes at least two interaction sites along a width of the base.
4. The ramp of claim 1, wherein first support arm is attached to the ramp member such that the tip is approximately centered between a first side edge and a second side edge of the first driving surface.

5. The ramp of claim 4, wherein the first support arm has a width that spans the majority of the flexible first driving surface between the first side edge and the second side edge.

6. The ramp of claim 5, wherein the first support arm has a triangular shape.

7. The ramp of claim 1, wherein the plurality of interaction sites are defined by a plurality of circular depressions on a top surface of the base and the tip includes a ball.

8. The ramp of claim 1, wherein the ramp member includes a support seat spanning a width of the first driving surface and the first support arm is hingedly attached to the support seat.

9. The ramp of claim 1, wherein the ramp member includes a second driving surface attached to an upper end of the first driving surface.

10. The ramp of claim 9, wherein the ramp member includes a substantially rigid extension extending from the upper end of the first driving surface, the rigid extension including a plurality of interaction sites, and a second support arm hingedly attached to the second driving surface, the second support arm having a tip that is positionable at one of the plurality of interaction sites.

11. The ramp of claim 1, wherein the base, the first support arm and the ramp member are collapsible into a substantially planar configuration.

12. A ramp for a toy vehicle, comprising:
a base;
a ramp member joined to the base, the ramp member including a flexible driving surface having a first side edge and a second side edge; and
a support arm joined to the ramp member, the support arm having a distal free end that is centered between the first and second side edges of the driving surface;
wherein the free end is positionable on the base such that the degree of curvature of the first side edge is different than the degree of curvature of the second side edge.

13. The ramp of claim 12, wherein the base includes a top surface defining a plurality of interaction sites upon which the free end is positionable.

14. The ramp of claim 12, wherein the support arm has a width that spans the majority of the flexible driving surface between the first side edge and the second side edge.

15. The ramp of claim 12, wherein the base, the support arm and the ramp member are collapsible into a substantially planar configuration.

16. A ramp for a toy vehicle, comprising:
a base including a top surface defining a plurality of depressions;
a flexible sheet joined to the base, the flexible sheet having a first side edge and a second side edge;
a support seat attached to the sheet to operatively support the first and second side edge; and
a support arm hingedly attached to the support seat, the support arm having a narrow distal tip;
wherein the tip is positionable in any one of the plurality of depressions such that at least one of the degree of curvature and the degree of torsion of the flexible sheet is variable.

17. The ramp of claim 16, wherein the plurality of depressions includes one or more apertures in the base.

18. The ramp of claim 16, wherein the tip includes a ball.

19. The ramp of claim 16, wherein the distal tip extends from the center of the sheet between a first sheet side edge and a second sheet side edge.

20. The ramp of claim 16, wherein the base, the sheet, the support seat and the support arm are collapsible into a substantially planar configuration.

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