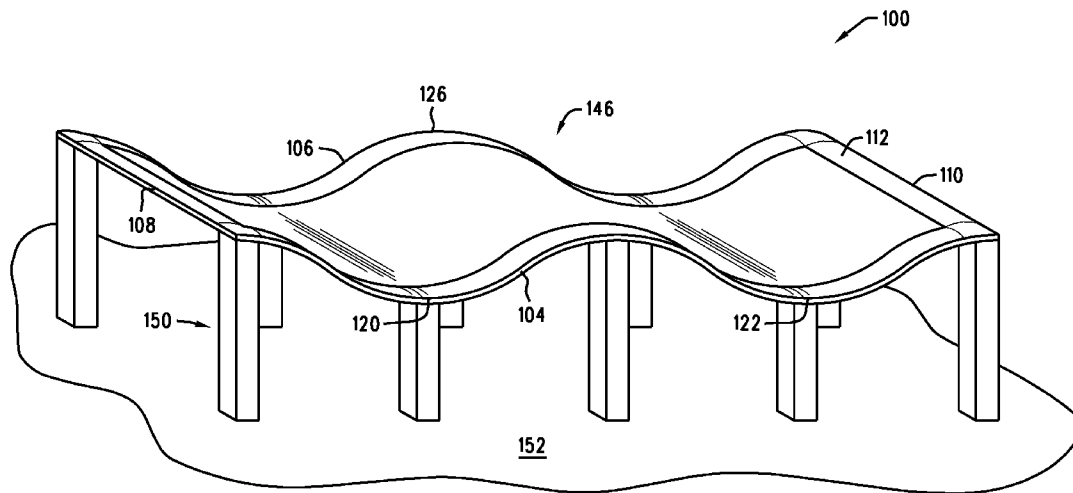




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(19) **United States**(12) **Patent Application Publication**
Brooks et al.(10) **Pub. No.: US 2012/0244996 A1**(43) **Pub. Date: Sep. 27, 2012**(54) **WAVE TRAMPOLINE****Publication Classification**(76) Inventors: **Martin Brooks**, Las Vegas, NV
(US); **Timothy Crawford**, Golden,
CO (US)(51) **Int. Cl.**
A63B 5/11 (2006.01)(52) **U.S. Cl.** **482/27**(57) **ABSTRACT**(21) Appl. No.: **13/072,218**(22) Filed: **Mar. 25, 2011**

A trampoline is disclosed herein. An embodiment of the trampoline has a first end and a second end. A first side and a second side extend between the first end and the second end. A trampoline mat at least partially covers the area between the first end, the second end, the first side, and the second side. The first side is at least partially wave-shaped.



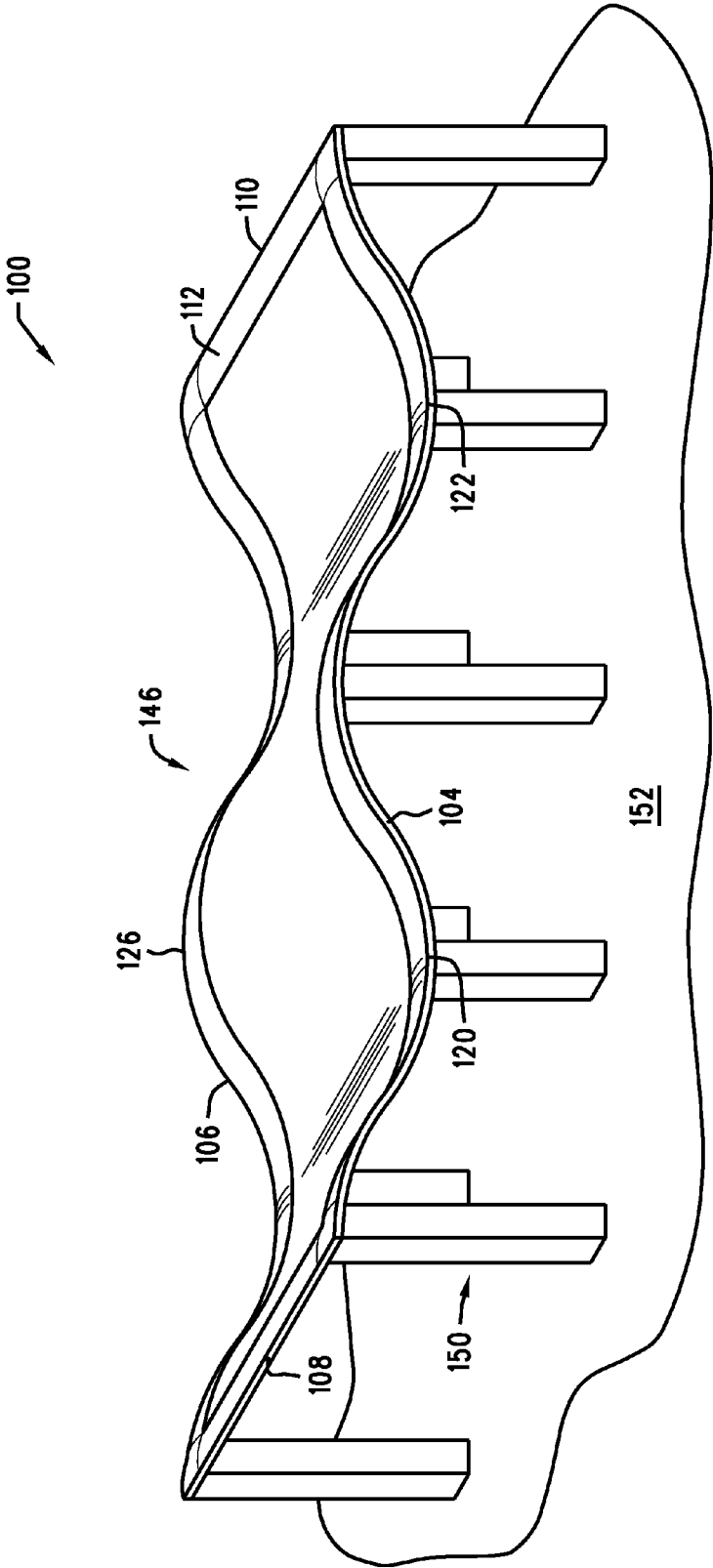


FIG. 1

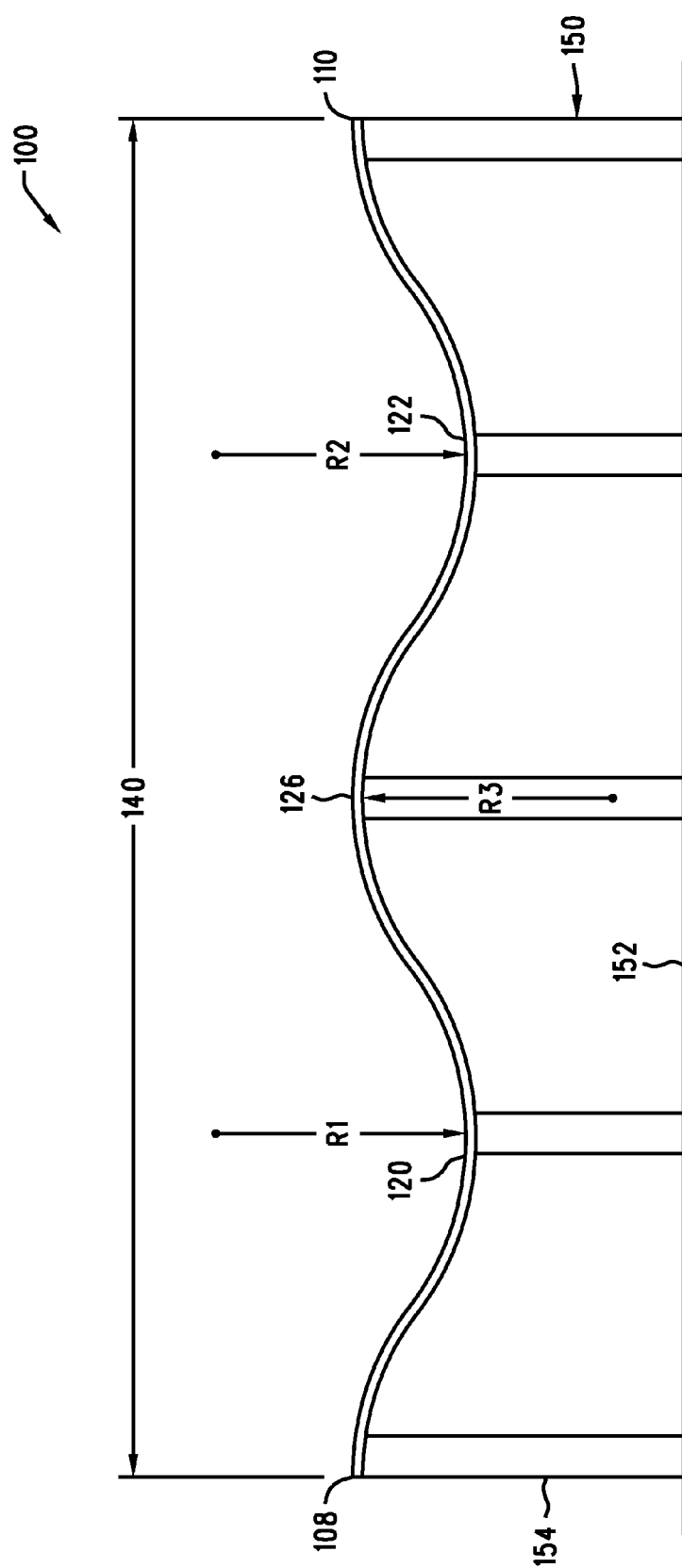


FIG. 2

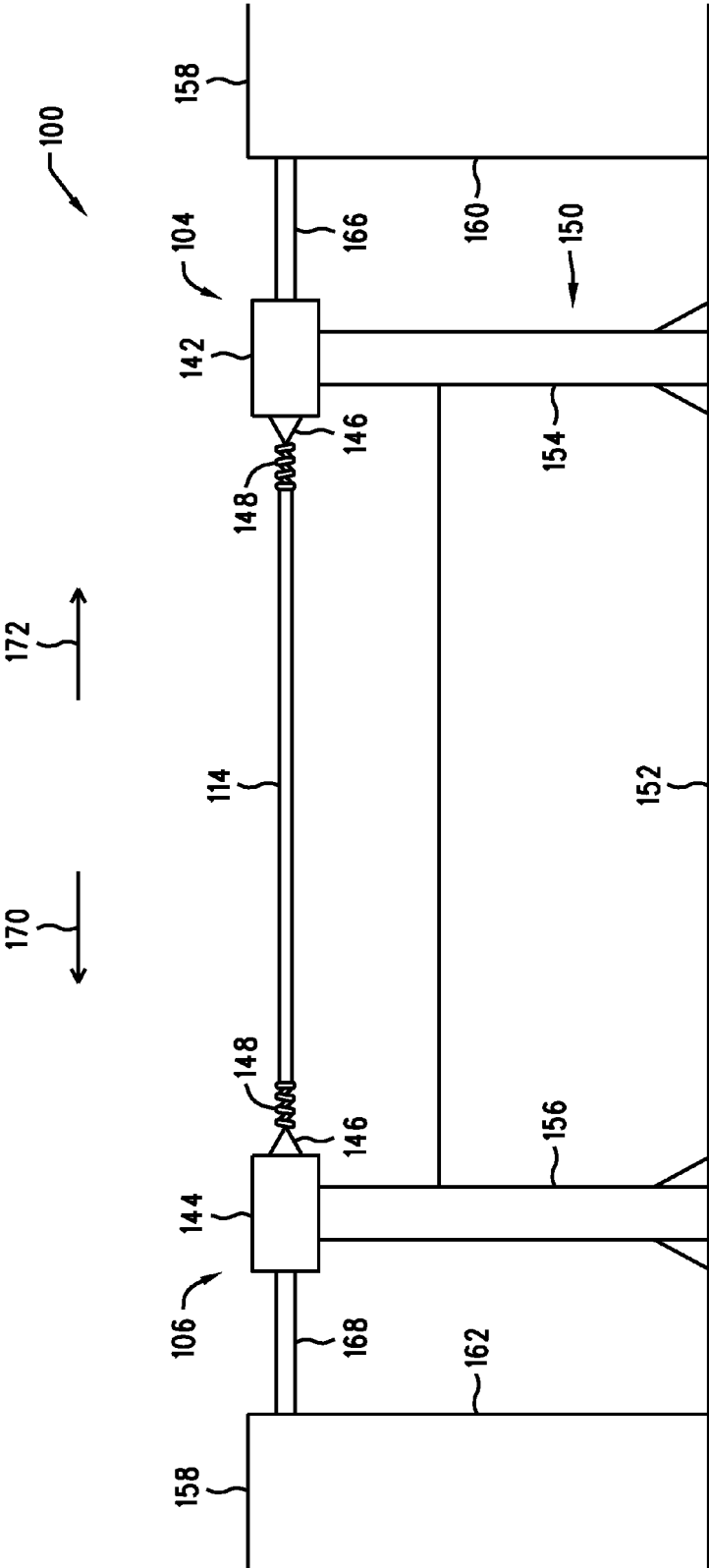


FIG. 3

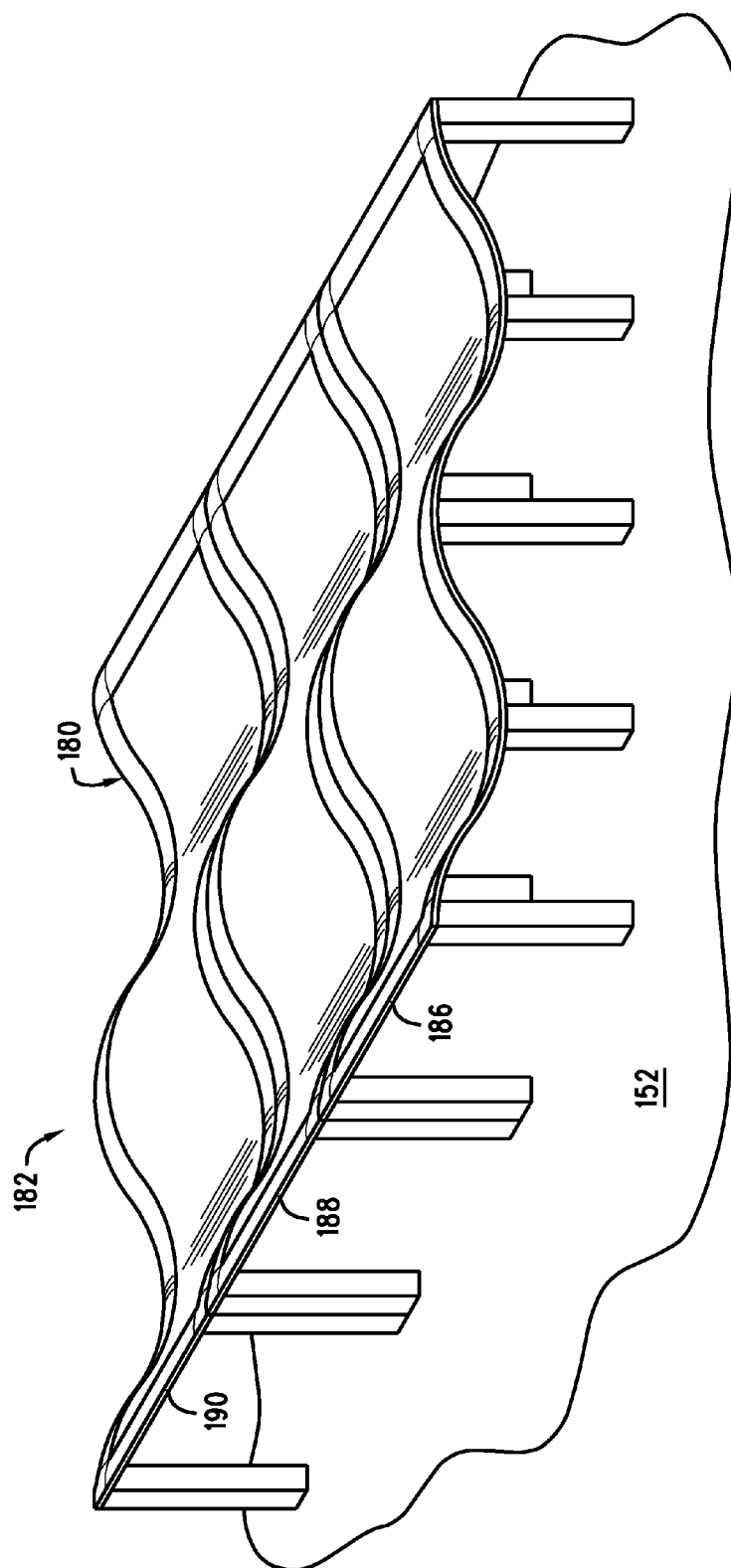


FIG. 4

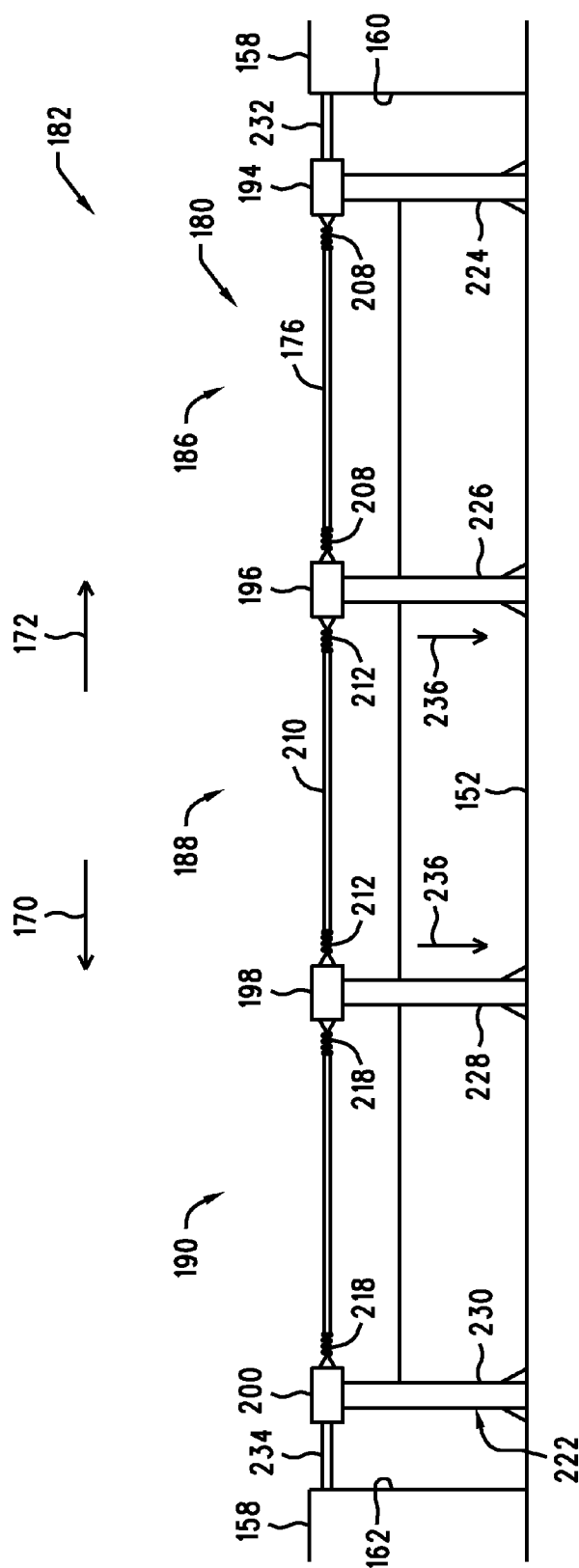


FIG. 5

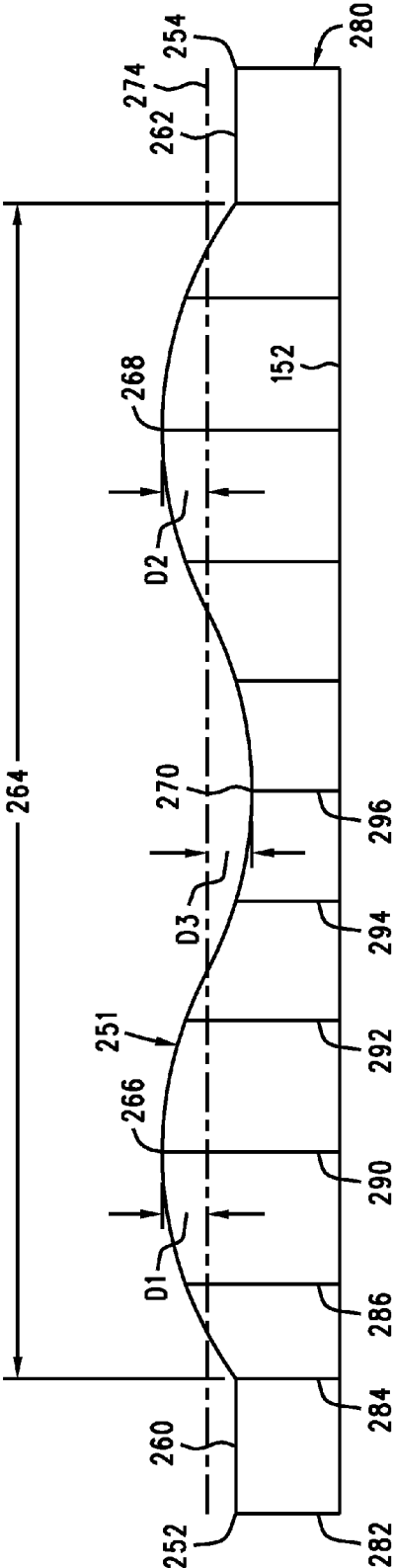


FIG. 6

WAVE TRAMPOLINE

BACKGROUND

[0001] Trampolines typically have substantially planar jump surfaces. These substantially planar surfaces provide for a consistent and predictable bounce. Trampolines may be put together to form trampoline courts. Some trampoline courts have planar trampolines that are substantially horizontal. These trampolines are intersected by other planar trampolines that are not horizontal. However, all the trampolines are substantially planar.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] FIG. 1 is a side perspective view of an embodiment of a wave-shaped trampoline.

[0003] FIG. 2 is a side view of the trampoline of FIG. 1.

[0004] FIG. 3 is a side cutaway view of an embodiment of an end of the trampoline of FIG. 1.

[0005] FIG. 4 is a side perspective view of an embodiment of a trampoline court using a plurality of the trampolines of FIG. 1.

[0006] FIG. 5 is a side cutaway view of an embodiment of the trampoline court of FIG. 4.

[0007] FIG. 6 is a side view of another embodiment of a wave shape for a trampoline.

DETAILED DESCRIPTION

[0008] An embodiment of a wave-shaped trampoline 100 is shown in FIG. 1. The trampoline 100 has a first side 104, a second side 106, a first end 108 and a second end 110. A trampoline mat (sometimes referred to herein simply as the mat) 114 is at least partially located in the area defined by the boundaries of the first side 104, the second side 106, the first end 108, and the second end 110. As described in greater detail below, the mat 114 may be attached to the sides 104, 106 and ends 108, 110 by a plurality of springs or spring devices (not shown in FIG. 1). A cushion 112 may cover the spring devices and/or rigid structures in the trampoline 100 in order to prevent users from being injured by the springs and/or rigid structures.

[0009] The sides 104, 106 of the trampoline 100 are wave-shaped or at least partially wave-shaped. For example, when the sides 104, 106 are viewed from the side, they are wave-shaped. In some embodiments, the sides 104, 106 are sinusoidal. A wave-shaped trampoline includes one that when viewed from the side has a crest and/or a trough. In some embodiments, a radius is associated with a trough and/or a crest. In some embodiments, the troughs and crests are parabolic and may not have specific radii associated with them. In other embodiments, the crests and/or troughs are at least partially sinusoidal. When moving along a side 104, 106, the wave shape has high points and low points. A trough is a low point and a crest is a high point. In some embodiments, the crests and troughs are referred to as portions of the side or portions of the mat 114.

[0010] The wave-shaped trampoline of FIGS. 1 and 2 includes two troughs and one crest between the first end 108 and the second end 110. The troughs are referred to individually as a first trough 120 and a second trough 122. The crest is referred to as crest 126 and is located between the first trough 120 and the second trough 122. It is noted that both the first end 108 and the second end 110 may be considered as being crests. The first trough 120 has a radius R1, the second trough

has a radius R2, and the crest 126 has a radius R3. The radii R1, R2, and R3 may only be associated with a portion of the troughs 120, 122 and the crest 126 because they may be parabolic or have other shapes that are not conducive to fixed extended radii. By using the crest 126 and troughs 120, 122, the trampoline users are kept somewhat isolated and are less likely to interfere with each other. In addition, the rise to the crest 126 will dissipate the force caused when a user in a trough bounces. Accordingly, a second user in another trough is less likely to be affected by the first user.

[0011] The trampoline 100 has a length 140 extending between the first end 108 and the second end 110. The length 140 may be long enough to accommodate several users or jumpers on the trampoline 100. In one embodiment, the length 140 is approximately eighty-six feet. The length 140 is a design choice and may be varied depending on the application of the trampoline 100.

[0012] The sides 104, 106 and ends 108, 110 of the trampoline 100 may include rigid structures such as steel members that serve to counter the forces exerted by the mat 114 when a user is bouncing on the mat 114. As described above, springs or spring devices connect between the mat 114 and the sides 104, 106 and ends 108, 110. Accordingly, the springs may be connected between the mat 114 and the rigid structures. An embodiment of such a configuration is shown in FIG. 3 which is a cutaway view of an embodiment of the first end 108 of the trampoline 100. The first side 104 has a rigid support or rail 142 associated therewith and the second side 106 has a rigid support or rail 144 associated therewith. It is noted that FIG. 3 shows a cross sectional view of the rails 142, 144. In some embodiments, the rails 142, 144 define the boundaries of the sides 104, 106 of the trampoline 100.

[0013] The rails 142, 144 may be steel rails that extend the length of the trampoline 100. Rails may also be associated with the ends 108, 110 of the trampoline. The rails 142, 144 may be wave-shaped in order to provide the wave shape of the trampoline 100 as shown in FIGS. 1 and 2.

[0014] The rails 142, 144 each have hooks 146 attached thereto. Springs 148 are connected between the hooks 146 and the mat 114 and provide the bounce for the users of the trampoline 100. Although coil springs are shown in FIG. 2, spring devices or materials having spring-like characteristics may be used instead of the coil springs of FIG. 3. The number of springs 148 and the spring constants of the springs 148 are design choices that depend on the size of the trampoline 100, the weights of the users, and other variables.

[0015] As shown in FIGS. 1-3 a plurality of supports 150 may support the trampoline 100 above a floor 152. In the view of FIG. 3, a first support 154 is connected between the first rail 142 and the floor 152. A second support 156 is connected between the second rail 144 and the floor 152. The supports 150 maintain the first rail 142 and the second rail 144 above the floor 152. The lengths of the individual supports 150 establishes the troughs and crests. For example, long supports 150 are used to create crests and shorter supports 150 are used to create troughs.

[0016] The floor 152 may be recessed from a user floor 158. A first wall 160 and a second wall 162 extend between the user floor 158 and the floor 152. The recessed floor scheme enables users of the trampoline 100 to walk from the user floor 158 onto portions of the trampoline 100 without having to climb a ladder or other device. The user floor 158 may be the same height as a certain portion of the trampoline 100. For example, it may be the same height as a trough or horizontal

portion in order to enable users to walk onto the trampoline 100. Although not shown, netting or other devices may be used to prevent users from falling from a portion of the trampoline 100, such as a crest portion of the trampoline 100, onto the user floor 158.

[0017] The walls 160, 162 may be substantially rigid so as to maintain the rails 142, 144 from moving side to side as described below. More specifically, a first member 166 may be connected between the first wall 160 and the first rail 142 and a second member 168 may be connected between the second wall 162 and the second rail 144. When a user bounces on the mat 114, a force acts on the first rail 142 and first support 154 in a direction 170. An opposite force in the direction 172 acts on the second rail 144 and second support 156. These forces are countered by the members 166, 168 so that the supports 154, 156 remain stable. In turn, the rails 142, 144 remain stable. Without the members 166, 168 a tremendous torque would be applied between the supports 154, 156 and the floor 152. Costly reinforcements would be required to anchor the supports 154, 156 to the floor 152.

[0018] Having described the trampoline 100 as a stand alone device, it will now be described as being used in a trampoline court. FIG. 4 shows several wave-shaped trampolines 180 that are located proximate each other to form a trampoline court 182. In the embodiment of FIG. 4, the trampoline court 182 has three trampolines 180, which are referred to individually as a first trampoline 186, a second trampoline 188, and a third trampoline 190. The use of the trampoline court 182 enables users to bounce on a single trampoline or on the plurality of trampolines 180. The court also provides structural integrity between the trampolines 180 as described in greater detail below.

[0019] A side cutaway view of a trampoline court 182 is shown in FIG. 5. The configuration of the individual trampolines 180 is similar to the trampoline 100 of FIG. 1 described above. However, when several trampolines 180 are used in the trampoline court 182, they share rails as described below. It is noted that the view of FIG. 5 is a cut away view of the rails. The first trampoline 186 extends between a first rail 194 and a second rail 196. The second trampoline 188 extends between the second rail 196 and a third rail 198. The third trampoline 190 extends between the third rail 198 and a fourth rail 200.

[0020] As with the trampoline 100 described above, the trampolines 180 have mats that connect to the rails via springs or spring devices. The first trampoline 186 has a mat 206 that is connected via springs 208 to the first and second rails 194, 196. It is noted that the springs 208 may connect to the rails 194, 196 by way of hooks or other devices attached to the rails 194, 196 and as described with the trampoline 100 above. The second trampoline 188 has a mat 210 that is connected via springs 212 to the second rail 196 and the third rail 198. The third trampoline 190 has a mat 216 that is connected to the third rail 198 and the fourth rail 200 via springs 218. It is noted that the use of the term springs implies various springs or spring devices that may be used in trampolines. Cushions or the like may be used to cover the rails and the springs in order to minimize injuries caused to users should they land on the springs or rails during the bouncing.

[0021] The rails are supported by a plurality of supports 222. A first support 224 supports the first rail 194, a second support 226 supports the second rail 196, a third support 228 supports the third rail 198, and a fourth support 230 supports the fourth rail 200. The supports 222 may be made of steel or

other rigid materials that are strong enough to support the trampolines 180 and the respective users.

[0022] As with the trampoline 100, the trampoline court 182 may be recessed. A portion of the trampolines 180 may be the same height as a user floor 158 and the trampolines 180 may sit on a floor 152. A first wall 160 and a second wall 162 exist between the floor 152 and the user floor 158. As with the trampoline 100, a member 232 may secure the first rail 192 to the first wall 160 and a member 234 may secure the fourth rail 200 to the second wall 162.

[0023] By sharing a single rail between adjacent trampolines, the cost of the trampoline court 182 is reduced and fewer structural components are required relative to a trampoline court that does not share rails. For example, the first trampoline 186 and the second trampoline 188 share the second rail 196. Therefore, only one rail (the second rail 196) has to be manufactured for the two trampolines 186, 188 instead of two rails.

[0024] All of the trampolines 180 pull on the rails by way of their springs 208, 212, 218. Because the trampolines 180 share the rails, the forces exerted by the springs are in equilibrium. Accordingly, there is no torque or very little torque applied between the supports 222 and the floor 152. It follows that the forces are not in equilibrium when a user bounces on one of the trampolines 180. The trampoline court 182 has to be structurally able to counter those forces caused by the bouncing. However, the forces applied to the trampoline court 182 when no users are bouncing is minimal. For example, forces 236 are applied to the supports 222. These forces 236 are the weight of the trampoline court 182 in addition to downward vectors as a result of users bouncing on the trampolines 180. Very little torque between the supports 222 and the floor 152 exists.

[0025] Having described the structure of the trampoline 100, FIG. 1, and the trampoline court 182, different variations on the shape of the trampolines will now be described.

[0026] Referring briefly to FIG. 1 again, one embodiment of the trampoline has two troughs 120, 122 or trough portions with a crest 126 or crest portion located between the troughs 120, 122. The ends 108, 110 of the trampoline 100 are elevated. The trampoline 100 may have an average height above the floor 152 wherein the troughs 120, 122 are below the average height and the crest 126 is above the average height.

[0027] Another embodiment of a trampoline 250 is shown in FIG. 6, which is a view a side 251 of the trampoline 250. The trampoline 250 may be a single trampoline used in a trampoline court that has several trampolines 250. The trampoline 250 has a first end 252 and a second end 254. The distance between the first end 252 and the second end 254 may be approximately eighty-six feet. A first deck 260 may extend from the first end 252 and a second deck 262 may extend from the second end 254. In one embodiment, the decks 260, 262 extend approximately five feet. The decks 260, 262 are substantially flat or horizontal portions of the trampoline 250 and provide a user the ability to be on a substantially horizontal portion of the trampoline 250. In some embodiments, wave-shaped trampolines may have decks located in mid sections between crests and troughs.

[0028] The wave-shaped portion 264 of the trampoline 250 extends between the first deck 260 and the second deck 262. The wave-shaped portion 264 may include a wave shape, a sinusoidal shape, a parabolic shape, or a shape that is curved when viewed from the side as shown in FIG. 6. The wave-

shaped portion **264** includes a first crest or crest portion **266** and a second crest or crest portion **268**. Between the crests **266, 268** is a trough or trough portion **270**. A centerline **274** is used as a reference for the wave-shaped portion **264**. The centerline **274** is the medium between the height of the crests **266, 268** and the depth of the trough **270**. The distance **D1** between the centerline **274** and the first crest **266** may be approximately six feet. Likewise the distance **D2** between the center line **274** and the second crest **268** may be approximately six feet. The distance **D3** between the centerline **274** and the trough **270** may also be approximately six feet. In this embodiment, the height between a crest and trough is approximately twelve feet.

[0029] The trampoline **250** has a plurality of supports **280** that hold the side **251** above the floor **152** so as to form the crests **266, 268** and trough **270**. As with the previous trampolines, the side **251** may have a rail or the like associated therewith which defines the contour of the side **251**. The spacing of the supports **280** is made to offer structural integrity without excessive costs. In the embodiment of FIG. 6, the spacing between a first support **282** and a second support **284** defining the first deck **260** may be approximately sixty-three inches. As the wave portion **264** starts from the first deck **260**, a third support **286** is located relatively close to the second support **284**. In one embodiment, the distance between the second support **284** and the third support **286** is about forty inches. A fourth support **290** is located proximate the first crest **266** and may be approximately one-hundred two inches from the third support. A fifth support **292** and a sixth support **294** may be located on the downward slope of the area between the first crest **266** and the trough **270**. The distance between the fourth support **290** and the fifth support **292** along with the distance between the fifth support **292** and the sixth support **294** may be about one-hundred two inches. A seventh support **296** may be located proximate the trough **270**. The distance between the six support **294** and the seventh support **296** may be approximately eighty-five inches. The arrangement of the supports **280** may be symmetric about the seventh support **296**, so the remaining supports may be configured substantially similar to the first seven supports.

[0030] It is noted that other embodiments of the trampolines may exist. For example, at least one deck may be above the center line **274**. In some embodiments, there may be more than one trough and/or decks may be located throughout the trampoline. In the embodiments, however, at least a portion of the trampoline is wave-shaped when viewed from the side as shown in FIGS. 2 and 6.

[0031] While illustrative and presently preferred embodiments of the invention have been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed and that the appended claims are intended to be construed to include such variations except insofar as limited by the prior art.

What is claimed is:

1. A trampoline comprising:
 - a first end and a second end;
 - a first side extending between said first end and said second end;
 - a second side extending between said first end and said second end;
 - a trampoline mat at least partially covering the area between said first end, said second end, said first side, and said second side;
 - wherein said first side is at least partially wave-shaped.

2. The trampoline of claim 1, wherein said wave shape includes at least one trough.

3. The trampoline of claim 1, wherein said wave shape includes at least one crest.

4. The trampoline of claim 1, wherein said wave shape includes at least one parabolic shape.

5. The trampoline of claim 1, wherein said first side comprises a substantially horizontal portion proximate said first end.

6. The trampoline of claim 5, wherein said first side comprises a substantially horizontal portion proximate said second end.

7. The trampoline of claim 1, wherein said second side has a shape that is substantially the same as said first side.

8. The trampoline of claim 1, wherein said first side comprises at least one crest and at least one trough.

9. The trampoline of claim 8, wherein the vertical distance between said at least one trough and said at least one crest is approximately twelve feet.

10. The trampoline of claim 1, wherein said wave shape comprises a first horizontal portion located adjacent said first end, a first crest located adjacent said first horizontal portion, a trough located adjacent said first crest, a second crest located adjacent said trough, and a second horizontal portion located adjacent said second crest.

11. A trampoline court comprising:

- a first trampoline comprising:

- a first end and a second end;

- a first rail extending between said first end and said second end;

- a second rail extending between said first end and said second end;

- a first trampoline mat at least partially covering the area between said first end, said second end, said first rail, and said second rail;

- wherein said first rail is at least partially wave-shaped when viewed from a side

- a second trampoline located adjacent said first trampoline, said second trampoline comprising:

- a first end and a second end;

- a third rail extending between said first end and said second end,

- wherein said second trampoline is at least partially bound by said first end and said second end of said second trampoline, said third rail, and said first rail;

- a second trampoline mat at least partially covering the area between said first end and said second end of said second trampoline, said first rail, and said third rail.

12. The trampoline court of claim 11, wherein said first rail, said second rail, and said third rail all have substantially the same shape.

13. The trampoline court of claim 11, wherein the wave shape has at least one trough and at least one crest between said first end and said second end.

14. The trampoline of claim 11, wherein the wave shape has a substantially horizontal portion located proximate said first end.

15. The trampoline of claim 14, wherein the wave shape has a substantially horizontal portion located proximate said second end.

16. The trampoline of claim 11, wherein the wave shape comprises two crests surrounding one trough.

17. The trampoline of claim 11, wherein the wave shape comprises a first horizontal portion located adjacent said first

end, a first crest located adjacent said first horizontal portion, a trough located adjacent said first crest, a second crest located adjacent said trough, and a second horizontal portion located adjacent said second crest.

18. The trampoline court of claim **11** and further comprising a first floor and a second floor, said first floor being lower than said second floor, said first trampoline and said second trampoline setting on said first floor and wherein at least a portion of said first trampoline mat is the same height as said second floor.

19. A trampoline comprising:

a first end and a second end,

a first rail extending between said first end and said second end;

a second rail extending between said first end and said second end, said first rail and said second rail being at least partially wave-shaped;

a trampoline mat extending at least partially in the area defined by said first end, said second end, said first rail, and said second rail;

a support structure adapted to contact a first floor surface and to maintain said first rail and said second rail above

said first floor surface, wherein said first rail has an average height above said first floor surface.

20. The trampoline of claim **19**, wherein the wave shape includes a crest, the height of said crest above said first floor surface being greater than said average height above said first floor surface.

21. The trampoline of claim **19**, wherein the wave shape includes a trough, the height of said trough above said first floor surface being less than said average height above said first floor surface.

22. The trampoline of claim **19**, wherein the wave shape comprises a first horizontal portion located adjacent said first end, a first crest located adjacent said first horizontal portion, a trough located adjacent said first crest, a second crest located adjacent said trough, and a second horizontal portion located adjacent said second crest.

23. The trampoline of claim **19** and further comprising a second floor surface, said first floor surface being lower than said second floor surface, wherein at least a portion of said trampoline mat is the same height as said second floor surface.

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