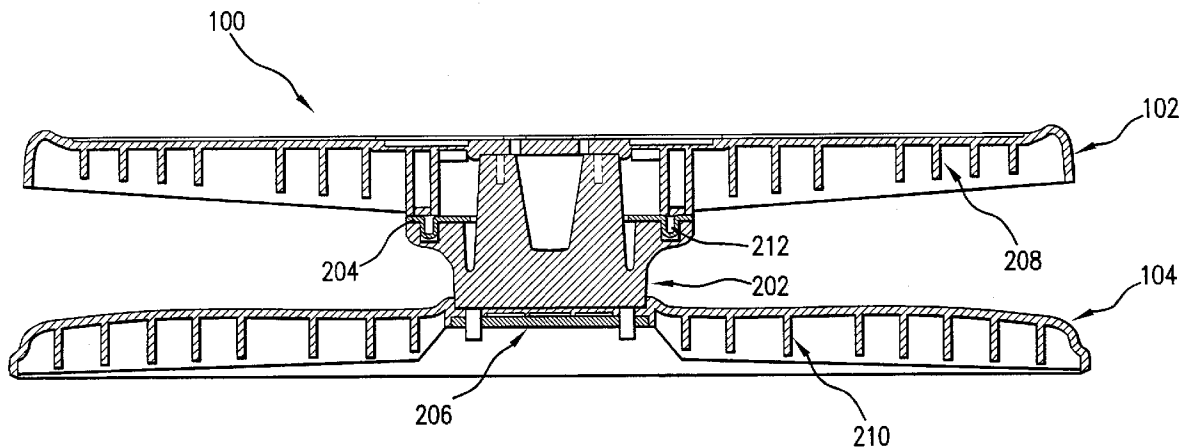


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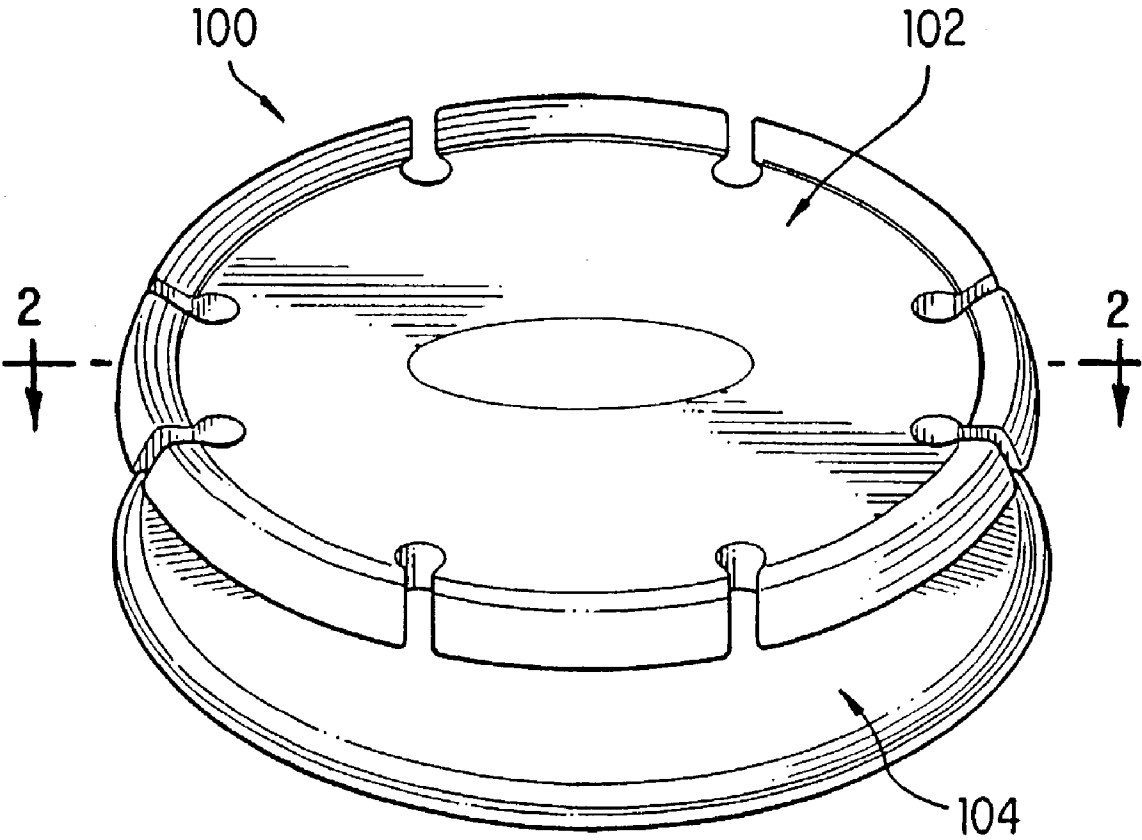


FIG. 1

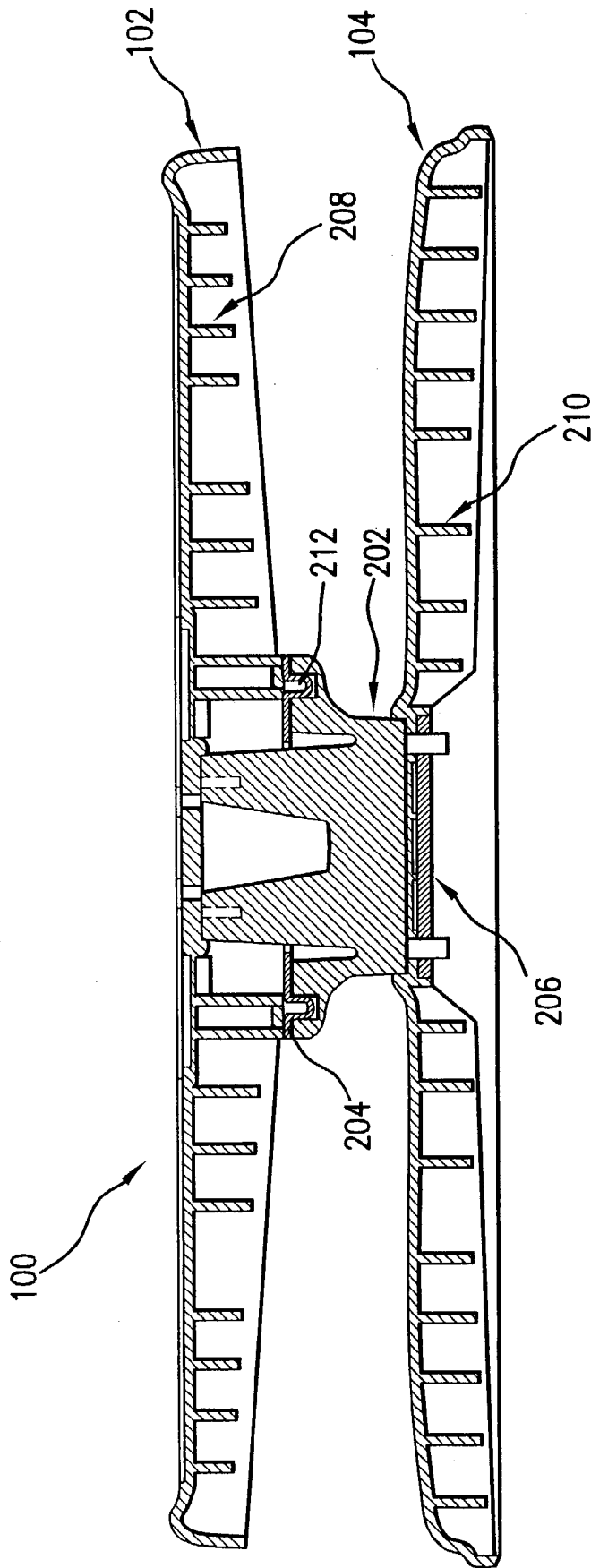


FIG. 2

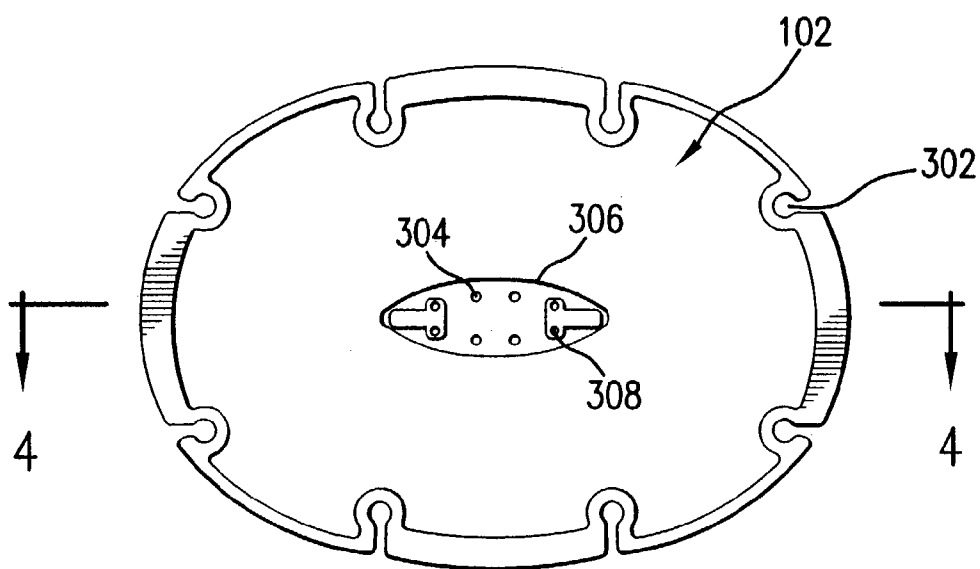


FIG. 3

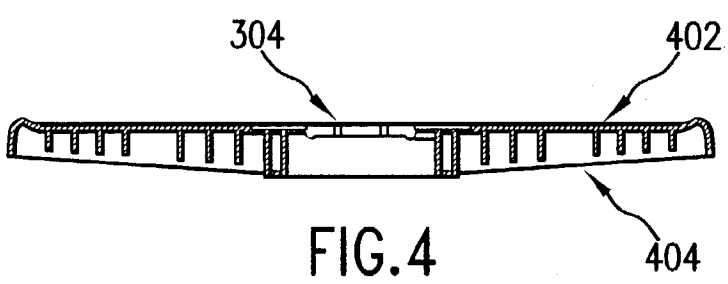


FIG. 4

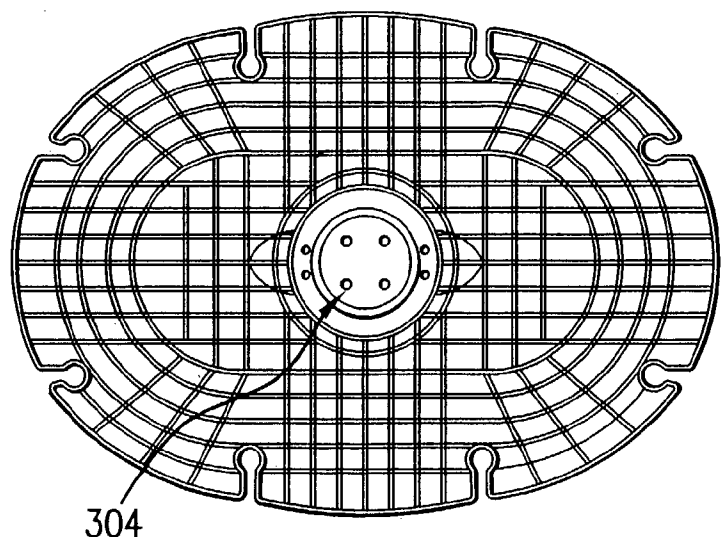


FIG. 5

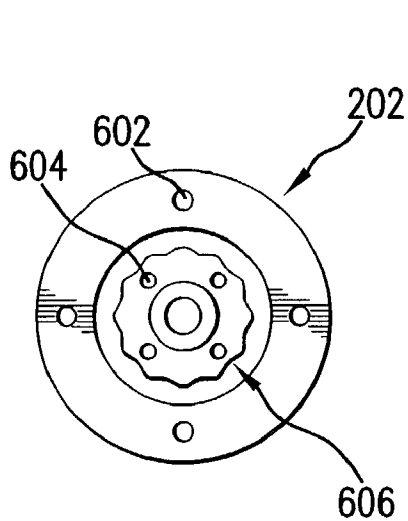


FIG. 6B

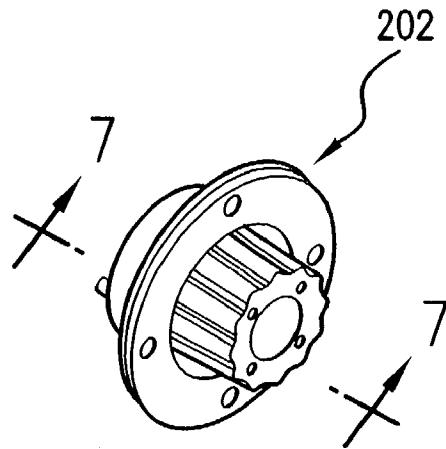


FIG. 6A

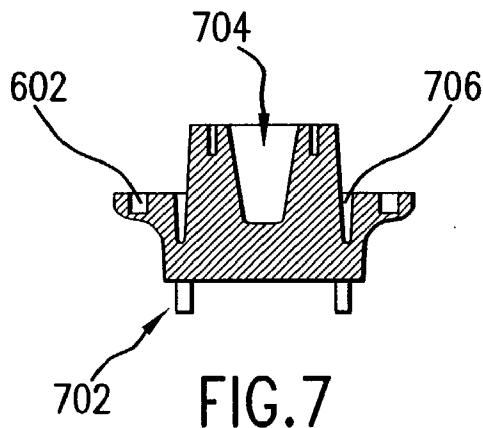


FIG. 7

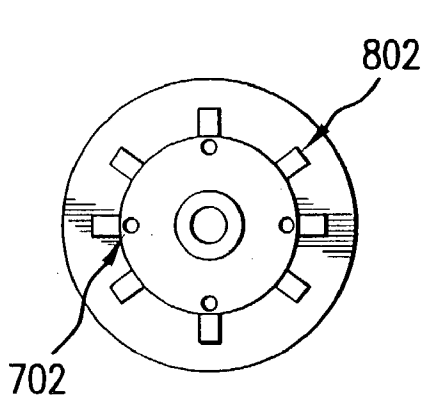


FIG. 8B

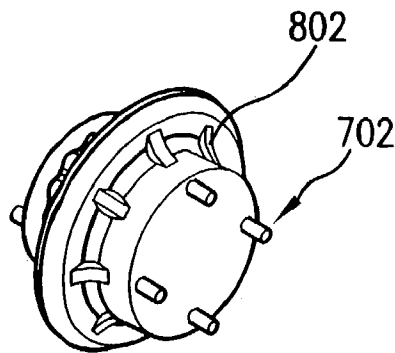


FIG. 8A

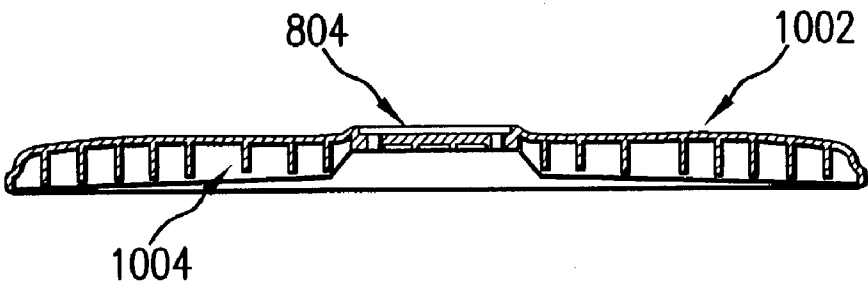


FIG.10

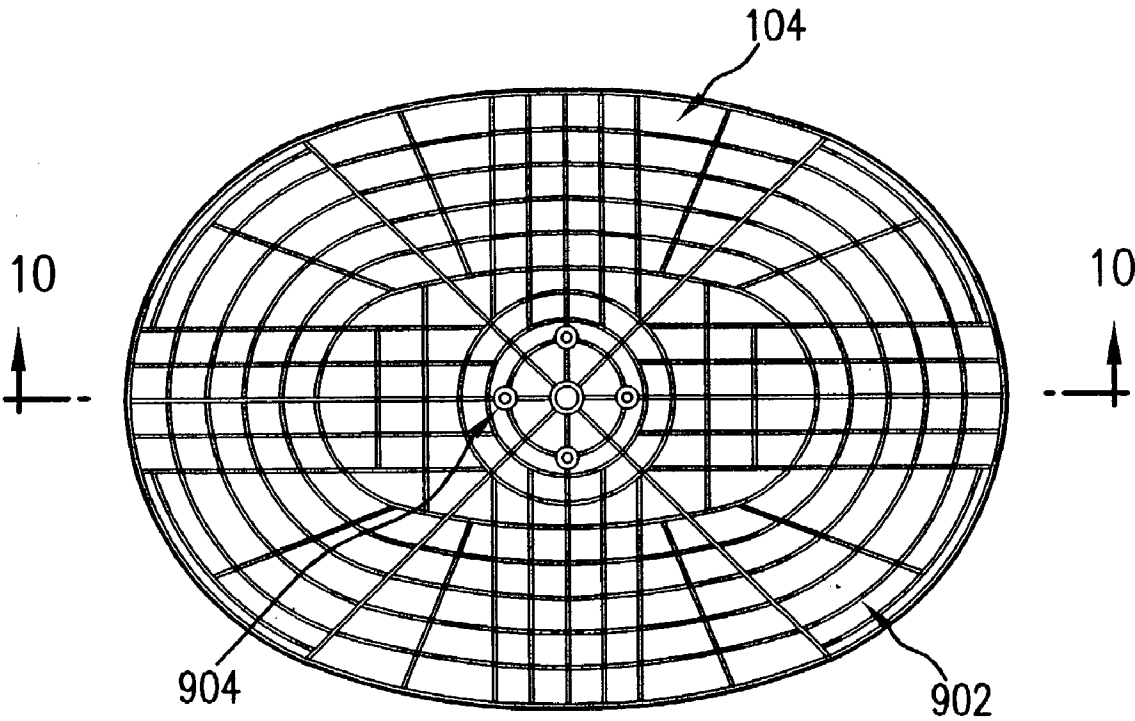


FIG.9

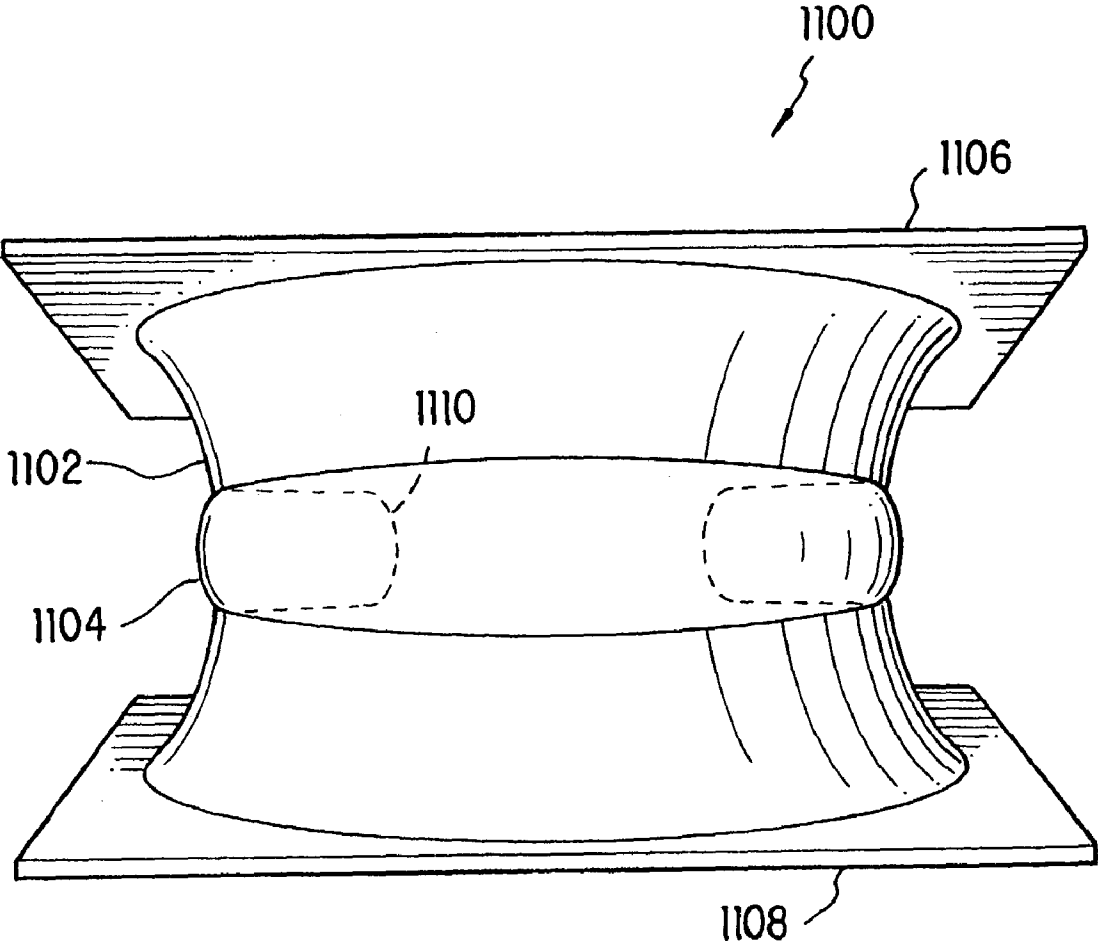


FIG. 11

TORSION EXERCISE APPARATUS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to the field of exercise equipment, and, in particular, to an adjustable exercise apparatus for increasing an individual's strength, agility and balance as well as for providing a cardiovascular workout.

[0003] 2. Background Art

[0004] There are many different activities in daily life which require individuals to use their strength, agility and balance. Furthermore, many of today's sports require even more developed abilities. In order to improve upon the skills needed for these activities many people have turned to various forms of exercise equipment designed to isolate and target the areas of the body used in these activities.

[0005] The initial movement in this area of exercise equipment led to the design of several different apparatuses concentrated on balancing. Similar designs have also been developed in the area of physical therapy. Several relevant patents in this area are: U.S. Pat. Nos. 5,522,783 and 5,667,462 to Gordon, U.S. Pat. No. 5,062,629 to Vaughan and U.S. Pat. No. 4,905,994 to Hartz. While many of these designs promote the development of the user's muscles and abilities, the extent of such development is eventually limited to the basic design of the board. Not only is there a limit to the amount of improvement which can be achieved, but eventual lack of further challenge often results in a lack of interest of the user.

[0006] What is needed is an exercise apparatus which allows for adjustment in the level of difficulty, as well as optional involvement of other areas of the body, for a total body workout.

BRIEF SUMMARY OF THE INVENTION

[0007] The present invention provides an exercise apparatus having a base, a platform with notches placed along its perimeter, and a resilient member located between the base and the platform. The exercise apparatus allows rotation about at least two axes of rotation. In an alternate embodiment of the invention, the resilient member may be modified by the attachment of a collar. The apparatus may also have a non-slip surface disposed on the top of the platform. Both the platform and the base may have support members disposed on their respective bottom surfaces to add support and stability and furthermore these support members may form a grid-like pattern. Also the resilient member may have both cavities and flanges to provide twisting and bending functionality as well as support to the exercise apparatus.

BRIEF DESCRIPTION OF THE FIGURES

[0008] FIG. 1 is a top perspective view of the apparatus of the present invention.

[0009] FIG. 2 is a cross-sectional view of the exercise apparatus taken along a line 2-2 of FIG. 1.

[0010] FIG. 3 is a top view of a platform of the apparatus of FIG. 1.

[0011] FIG. 4 is a cross-sectional view of the platform taken along a line 4-4 of FIG. 3.

[0012] FIG. 5 is a bottom view of the platform of FIG. 3.

[0013] FIG. 6A is a top perspective view of a resilient member.

[0014] FIG. 6B is a top plan view of the resilient member of FIG. 6A.

[0015] FIG. 7 is a cross-sectional view of the resilient member of FIG. 6A taken along a line 7-7.

[0016] FIG. 8A is a bottom perspective view the resilient member of FIG. 6A.

[0017] FIG. 8B is a bottom plan view of the resilient member of FIG. 8A.

[0018] FIG. 9 is a bottom, plan view of a base of the apparatus of FIG. 1.

[0019] FIG. 10 is a cross-sectional view of the base of FIG. 9, taken along a line 10-10.

[0020] FIG. 11 is a front view of an alternate embodiment of the resilient member of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Referring to the drawings, FIG. 1 shows a top perspective view of an exercise apparatus 100 of the present invention, in which a platform 102 is disposed above a base 104. In one embodiment, platform 102 and base 104 are composed of an aluminum honeycomb material, thereby making apparatus 100 light-weight and strong. In this embodiment a composite is formed from a aluminum honeycomb core laminated on both sides with sheet aluminum through a process of heat and pressure.

[0022] In another embodiment, platform 102 is molded of a high strength plastic material. Alternatively, platform 102 can be formed from a fiberglass core with a Kevlar skin, or from carbon fiber. As shown in FIG. 2, platform 102 can be formed to include support members 208 on a bottom surface of platform 102. Platform support members 208, in one embodiment, are downwardly projecting extensions on the bottom surface of platform 102, which form a grid-like pattern. It would be apparent to one skilled in the relevant art that other support structures could also be used to provide added stability and rigidity to platform 102.

[0023] Similarly, base 104 can also be molded from a high strength plastic or similar materials as platform 102. Base 104 can further be formed with base support members 210 on a bottom surface of base 104. Base support members 210, in one embodiment, are downwardly projecting extensions on the bottom surface of base 104, which form a grid-like pattern. It would be apparent to one skilled in the relevant art that other support structures could also be used to provide added stability and rigidity to base 104.

[0024] FIG. 2 shows a cross-sectional view of apparatus 100, in which a resilient member 202 connects platform 102 to base 104. A resilient member platform plate 204, preferably made from steel, is located between resilient member 202 and platform 102 and is used to attach resilient member 202 to platform 102 using bolts (not shown) or other attachment mechanisms, as would be apparent to one skilled in the relevant art. A resilient member base plate 206, also preferably made from steel, is located between resilient

member **202** and base **104** and is also used to attach resilient member **202** to base **104**. Resilient member platform plate **204** and resilient member base plate **206** also assist in weight distribution of the user from the platform **104** through the resilient member **202** and then onto base **104**. In one embodiment, resilient member **202** is composed of a natural rubber material having a maximum static load of 770 lbs. and a spring rate of 850 lbs./in. while in shear and a maximum static load of 3870 lbs. and a spring rate of 5100 lbs./in. while in compression. Such a resilient member **202** is available commercially from the Lord Corporation as Part No. J14056-4 and can be composed of an elastomer. In one embodiment, the elastomer is a self-lubricating elastomer. In another embodiment, the elastomer is a self-lubricating, natural rubber. However, it would be apparent to one skilled in the relevant art that any of a variety of materials could be used to construct resilient member **202** such that resilient member **202** is capable of twisting about its vertical axis and bending along all directions of its horizontal axis. Resilient member **202** will be discussed in further detail below.

[0025] Platform **102** is shown in further detail in FIGS. 3-5. Notches **106** are located around the perimeter of platform **102**. Notches **106** allow a user to attach rope or rubber hosing to apparatus **100** so as to permit the inclusion of arm movements into the exercise performed on the apparatus. In one embodiment, notches **106** are shaped as a key hole in order to hold a rope, elastic resistance tubing, or the like in position during use of apparatus **100**. It would be apparent to one skilled in the relevant art that other shapes, such as "L"-shaped slots, could be used for notches **106**. In still a further embodiment, a rope or tubing or the like could be attached, either removably or permanently, to the apparatus, and the notches **106** could be used simply as guides. Still further, handles could be attached to the ends of the rope or tubing. Also, a mechanism could be attached to the apparatus to retract the rope or tubing when not in use.

[0026] Platform **102** includes platform bolt holes **204** to attach platform **102** to resilient member **202**. A cover recess **306** is located at the center of the platform **102** and allows for a cover (not shown) to be attached to platform **102** to provide a flat surface unaffected by the attachment bolts. Cover plate bolt holes **308** are used to attach the cover to platform **102**. In one embodiment, upper surface **402** of platform **102** is constructed from a non-skid elastomeric material. In another embodiment a non-slip material, such as an elastomeric material, is stretched across upper surface **402** of platform **102**. In another embodiment, a non-slip material is inlaid into a recess formed on the upper surface **402** of platform **102**. In still another embodiment, the non-slip material is glued onto upper surface **402** of platform **102**. It would be apparent to one skilled in the art that various coverings could be placed over upper surface **402** of platform **102** to alter both its texture and appearance. As discussed above, a rigid grid-like structure is formed by support members **208** on a lower surface **404** of platform **102**, as visible in FIGS. 4 and 5.

[0027] FIGS. 6A, 6B, 7, 8A and 8B show one embodiment of resilient member **202**. A top view of resilient member **202** shows resilient member pin holes **602** which align with platform pins **212** to provide proper alignment of resilient member **202** to platform **102**. Resilient member **202** also has resilient member bolt holes **604** formed therein to allow attachment of resilient member **202** to platform **102** by

bolts (not shown). Ridges **606** are provided around the outer perimeter of a top portion of resilient member **202** to connect resilient member **202** to platform **102** so that the twisting resistance provided by resilient member **202** can be evenly transferred to platform **102** and to prevent slippage. Resilient member pins **214** are used to help lock (attach) resilient member **202** to base **104**.

[0028] Resilient member **202** has a cavity **704** and cut outs **706** formed therein to allow sufficient twisting and bending in accordance with the exercise being performed. It would be apparent to one skilled in the art that the size and shape of cavity **704** and/or cut outs **706** could be modified to produce different twisting and bending properties of resilient member **202**. In another embodiment, resilient member **202** could be made as a solid piece of material. Flanges **802** are provided on a bottom surface of resilient member **202** to provide added support to resilient member **202**.

[0029] FIGS. 9 and 10 show more detailed views of base **104**. A base bottom surface **902** has base pin holes **904** formed therein for receiving resilient member pins **214** therein. Base bottom surface **902** or a ground-contacting perimeter thereon may be comprised of or coated with a material to prevent slippage of apparatus **100** during use. In another embodiment, base **104** may contain holes for securely attaching or bolting apparatus **100** to a ground surface. Resilient member base plate **206** is attached to a base top surface **1002** of base **104**. In another embodiment, base **104** is comprised of legs (not shown) extending out from a central structure where resilient member **202** is attached. As discussed above, a rigid grid-like structure is formed by support members **210** on a lower surface **1004** of base **104**, as visible in FIGS. 9 and 10.

[0030] FIG. 11 shows a front plan view of an alternate embodiment of a resilient member component **1100** comprising a resilient member **1102**, a collar **1104**, a resilient member platform plate **1106** and a resilient member base plate **1108**. In this embodiment, resilient member **1102** has a groove **1110** around its center portion which allows collar **1104** to be placed around the resilient member **1102**.

[0031] In one example, resilient member **1102** is a natural rubber cylinder with a diameter of 2 $\frac{3}{4}$ inches. In one embodiment, groove **1110** has an outside height of 1 $\frac{1}{4}$ inches, and an inside height of $\frac{3}{4}$ inches, with a $\frac{3}{4}$ inch radius. Resilient member **1102** can be made of any of a variety of materials, as discussed above with respect to resilient member **202**. The dimensions of the cylinder of resilient member **1102** will vary depending on the material used to construct resilient member **1102**.

[0032] Collar **1104** may be comprised of an elastomer or polymer of various resiliency. One example of a material for collar **1104** is a material containing polytetrafluoroethylene (PTFE), such as Teflon, Fluoron or nylon. Alternately, collar **1104** can be made of any variety of other materials, as would be apparent to one skilled in the art. The addition of collar **1104** allows the user to control the degree of difficulty of use of the apparatus. In one embodiment, the material used for collar **1104** is more rigid than the material used for resilient member **1102**. In another embodiment, the material used for collar **1104** is less rigid than the material used for resilient member **1102**. Collar **1104** can be removable and replaceable such that overall resistance of resilient member **1102** may be modified depending on the relative resiliency of

collar **1104**. For example, collar **1104** may be hinged on one side with a bolt or clamp on the other allowing it to be opened, placed around groove **1110** of resilient member **1102** and then closed and secured in place. Alternatively, collar **1104** may be comprised of two separate pieces with flanges such that the two can be secured together around groove **1110** of resilient member **1102** with bolts. Other attachment means would be apparent to one skilled in the relevant art. In an alternate embodiment, collar **1104** could be cast in place, if it were intended to be permanently attached to resilient member **1102**. When in place, collar **1004** bends and twists along with resilient member **1102**.

EXAMPLES OF USE

[**0033**] There are several different levels of exercise which can be achieved with apparatus **100**. Such differing levels of workout or rehabilitation are achieved both through modification of the resistance levels of the apparatus **100** as well as the actual movements performed in coordination with the apparatus **100**.

[**0034**] Strength and flexibility training can be achieved through a yoga-inspired workout which combines integrated muscle conditioning exercises and flexibility training. These exercises are designed to develop strength, flexibility, balance, stability and mobility. A user may be either standing or lying on the apparatus during this mode of exercise and must maintain balance while performing controlled stretching movements.

[**0035**] Interval training can be achieved through work efforts combined to be performed at intense levels. These interval exercises develop overall fitness and muscular endurance as well as improve balance and agility. A user may be either standing or lying on the apparatus during this mode of exercise and must maintain balance while performing repetitive movements over intervals.

[**0036**] Sports training can be achieved through a series of athletic circuits and muscle conditioning exercises that will push performance. Sports drills from football, basketball, tennis, baseball and boxing are combined with the integrated strength training to develop overall fitness, muscle strength and endurance as well as balance, stability, agility and mobility. A user may be either standing or lying on the apparatus during this mode of exercise and must maintain balance while performing movements specifically designed to mimic those of various sports activities.

[**0037**] The apparatus **100** can also be used to develop a specific exercise program to meet the individual needs of a specific user. New exercises can be introduced as required by different individuals and sports activities.

[**0038**] While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

DESCRIPTION OF EXERCISES

[**0039**] Hip Hinge

[**0040**] Areas Exercised: Hip extensors, erector spinae

[**0041**] 1) Start with feet together in the center of the board in the ready position and with soft knees. Place hands on hips.

[**0042**] 2) Hinge forward from the hips (forward flexion), keeping the spine neutral and knees slightly bent. Do not bend past 90 degrees. Engage the glutes and return to the starting position without rounding the back.

[**0043**] 3) For a greater challenge, lift one leg as you hinge forward making the hip joint to pivot point. You will be off center so try to maintain your balance, while keeping the knee on your balance leg slightly bent and the core muscles engaged throughout.

[**0044**] Squats

[**0045**] Areas Exercised: Hip stabilizers, gluteal, hamstrings, quads

[**0046**] 1) Stand in the center of the board, with the feet hip-width apart in the ready position.

[**0047**] 2) Slowly bend at the hips and knees to lower buttocks towards the floor, keeping the chest up, shoulders down and with a neutral spine (imagine sitting in a chair). Press into the board with your feet and return to starting position.

[**0048**] 3) For a greater challenge, start with both feet off to one side and step off the side of the board as you squat, maintaining alignment and even weight between both feet. At no time should your knees be in front of your feet.

[**0049**] Lunges

[**0050**] Areas Exercised: Hip stabilizers, gluteals, hamstrings, quads, hip adductors, hip abductors (lateral lunges)

[**0051**] 1) Stand with both feet on the board, left and right of the center of the board.

[**0052**] 2) Step forward or backwards off the back of the board, keeping the front knee over the ankle and not flexing either knee past 90 degrees.

[**0053**] 3) For a greater challenge, start with both feet off of the board and step onto the board, performing the lunge. Each time you step onto the board, step on a different area of the board keeping your core muscles engaged throughout the movement.

[**0054**] Push-Ups

[**0055**] Areas Exercised: Shoulder girdle stabilizers, pectoral muscles, triceps

[**0056**] 1) Start with hand on the board, legs extended behind you, feet together, and maintain a neutral spine. For a modified position, start with knees on the floor.

- [0057] 2) Slowly lower the body towards the board maintaining alignment with the core muscles engaged. Press back up to start position.
- [0058] 3) For a greater challenge lift one leg up as you lower your body towards the board.
- [0059] Seated Exercises
- [0060] Areas Exercised: Abdominal stabilizers, trunk rotators
- [0061] 1) Start seated a little forward of the center of the board with knees bent, feet together and back straight.
- [0062] 2) Holding a dowel or a towel between both hands, lean back slightly and begin rotating the torso right and left. Keep your abs pulled in and don't allow your back to arch.
- [0063] 3) For a greater challenge move the knees in the opposite direction as you rotate the torso.
- [0064] Bridges
- [0065] Areas Exercised: Hip stabilizers, hip extensor, hamstrings
- [0066] 1) Lie on your back with your feet hip-width apart on the board and hands by your sides.
- [0067] 2) Execute a hip extension by lifting the hips off ground and extending hips toward the ceiling. Keep the core muscles engaged and the ribs soft. Roll down one vertebra at a time.
- [0068] 3) For a greater challenge, move one foot to the center of the board and extend the other up to the ceiling. Execute the hip extension on one leg.
- [0069] Quadruped Exercises
- [0070] Areas Exercised: Abdominal, lumbar and shoulder stabilizers, shoulder extensors, hip extensors
- [0071] 1) Start with both hands wide on the board and knees on the floor.
- [0072] 2) Lift one leg off the floor to complete extension and hold parallel to the floor. Hold for a three count, return to the floor and alternate legs.
- [0073] 3) For a greater challenge, lift one arm and the opposite leg and hold for three breaths, making sure to keep the spine neutral and the core muscles engaged. Lower to the starting position and repeat on the other side.
- [0074] Back Extensions
- [0075] Areas Exercised: Lumbar, back extensors
- [0076] 1) Start lying face down on the board with your hands resting lightly behind your head and toes pointed.
- [0077] 2) Slowly lift your chest off the board while maintaining balance and then lower your chest.
- [0078] 3) For a greater challenge and to make it more difficult to balance, as you lift your chest off the ground, simultaneously lift your feet off the ground.

[0079] Side Lying Exercise

[0080] Areas Exercised: Quadratus lumborum, gluteus medius

[0081] 1) Start with the elbow and forearm on the board, hips on the floor with the knees bent and the legs stacked—one on top of the other.

[0082] 2) Slowly lift the hips off the floor keep the spine neutral and the core muscles engaged. Lower down to start position.

[0083] 3) For a greater challenge, keep legs straight, but not locked. To increase difficulty again, raise your arm to the ceiling and/or lift up your top leg six inches. Remember to engage your core muscles throughout.

What is claimed is:

1. An exercise device comprising:
 - a base;
 - a platform for supporting a user;
 - wherein the platform has notches placed along a perimeter thereof;
 - a resilient member disposed between the support member and the platform,
 - wherein the resilient member is fixedly connected to the base and the platform, and
 - wherein the resilient member allows rotation of the platform about at least two axes of rotation.
2. An exercise device as set forth in claim 1, wherein a non-slip material is disposed on the platform.
3. An exercise device as set forth in claim 1, wherein a collar is placed around the resilient member.
4. An exercise device as set forth in claim 1, wherein the base has base support members disposed on a bottom surface of the base.
5. An exercise device as set forth in claim 1, wherein the platform has platform support members disposed on a bottom surface of the platform.
6. The exercise device as set forth in claim 4, wherein the base support members form a grid-like pattern.
7. The exercise device as set forth in claim 5, wherein the platform support members form a grid-like pattern.
8. The exercise device as set forth in claim 1, wherein the resilient member has a cavity formed therein.
9. The exercise device as set forth in claim 1, wherein the resilient member is formed of a solid piece of material.
10. An exercise device comprising:
 - a base;
 - a platform for supporting a user;
 - a resilient member disposed between the support member and the platform, wherein the resilient member is fixedly connected to the base and the platform, and wherein the resilient member allows rotation of the platform about at least two axes of rotation; and
 - a collar attached about a circumference of the resilient member.
11. An exercise device as set forth in claim 10, wherein a non-slip material is disposed on the platform.

12. An exercise device as set forth in claim 10, wherein the base has base support members disposed on a bottom surface of the base.

13. An exercise device as set forth in claim 10, wherein the platform has platform support members disposed on a bottom surface of the platform.

14. The exercise device as set forth in claim 12, wherein the base support members form a grid-like pattern.

15. The exercise device as set forth in claim 13, wherein the platform support members form a grid-like pattern.

16. The exercise device as set forth in claim 10, wherein the resilient member has a cavity formed therein.

17. The exercise device as set forth in claim 10, wherein the resilient member is formed of a solid piece of material.

18. The exercise device as set forth in claim 10, wherein the platform comprises notches disposed around the perimeter thereof.

* * * * *