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(54) **INVERSION DEVICE**

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(57) **ABSTRACT**

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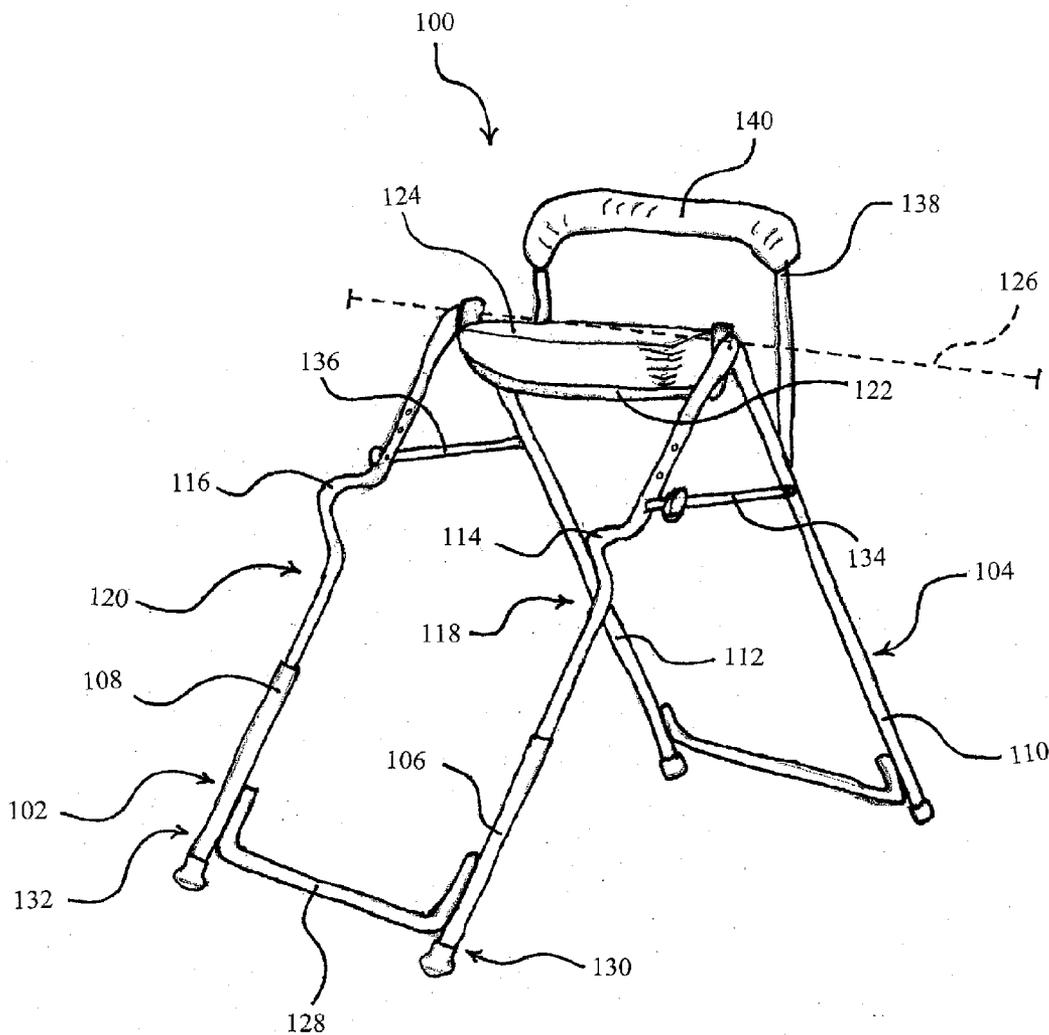
An inversion device for inverting and supporting a person for exercise. There are: first and second support frames, spaced one from the other, each frame including: a front leg member and a rear leg member. The front leg members have a curved handle portion near a middle of the front leg member. In an alternative embodiment of the invention, each front leg member has a handle member coupled near a middle of the front leg member, extending outwardly therefrom. The front and rear leg members are coupled together and have a downwardly divergent relationship. The inversion device further includes: a top cross member coupled to each of the first and second support frames; a thigh pad coupled to the top cross member and rotatable about a long axis of the top cross member; and a bottom cross member coupled to a bottom end of each of the front leg members.

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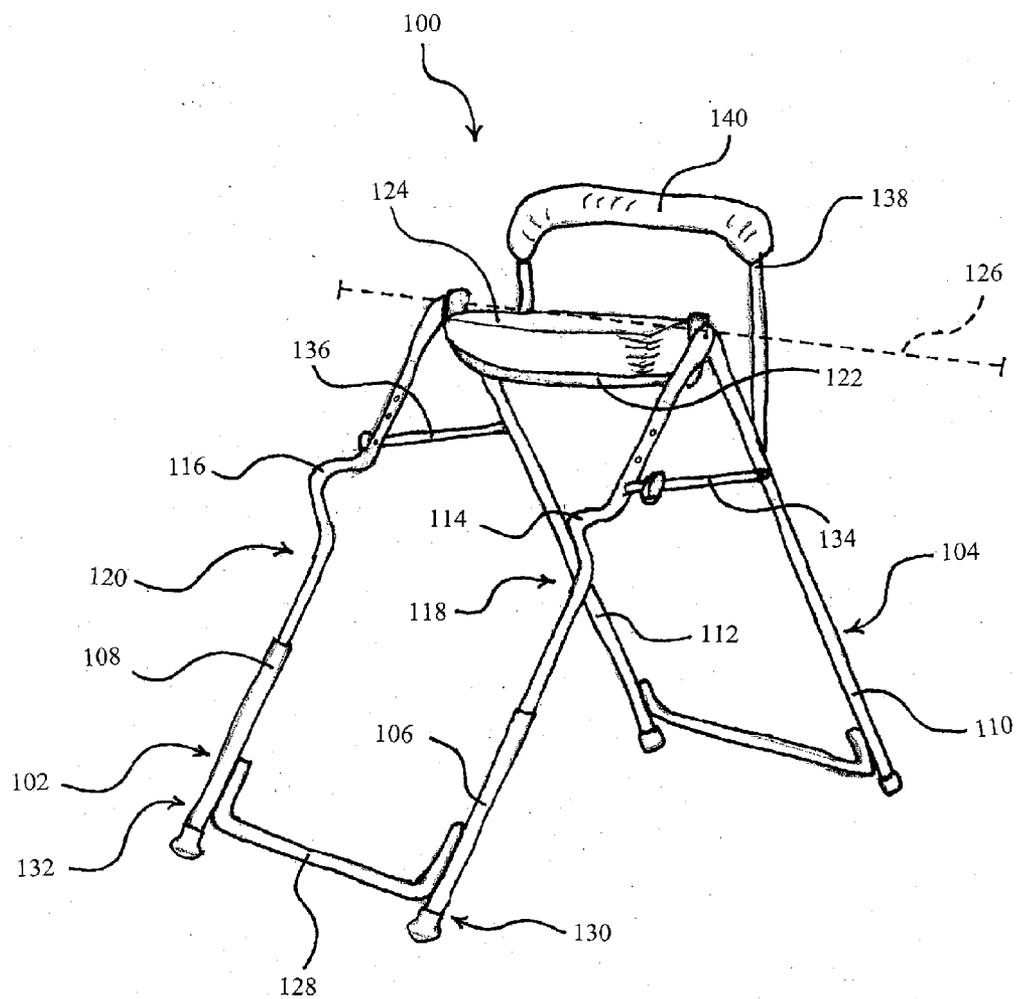


FIG. 1

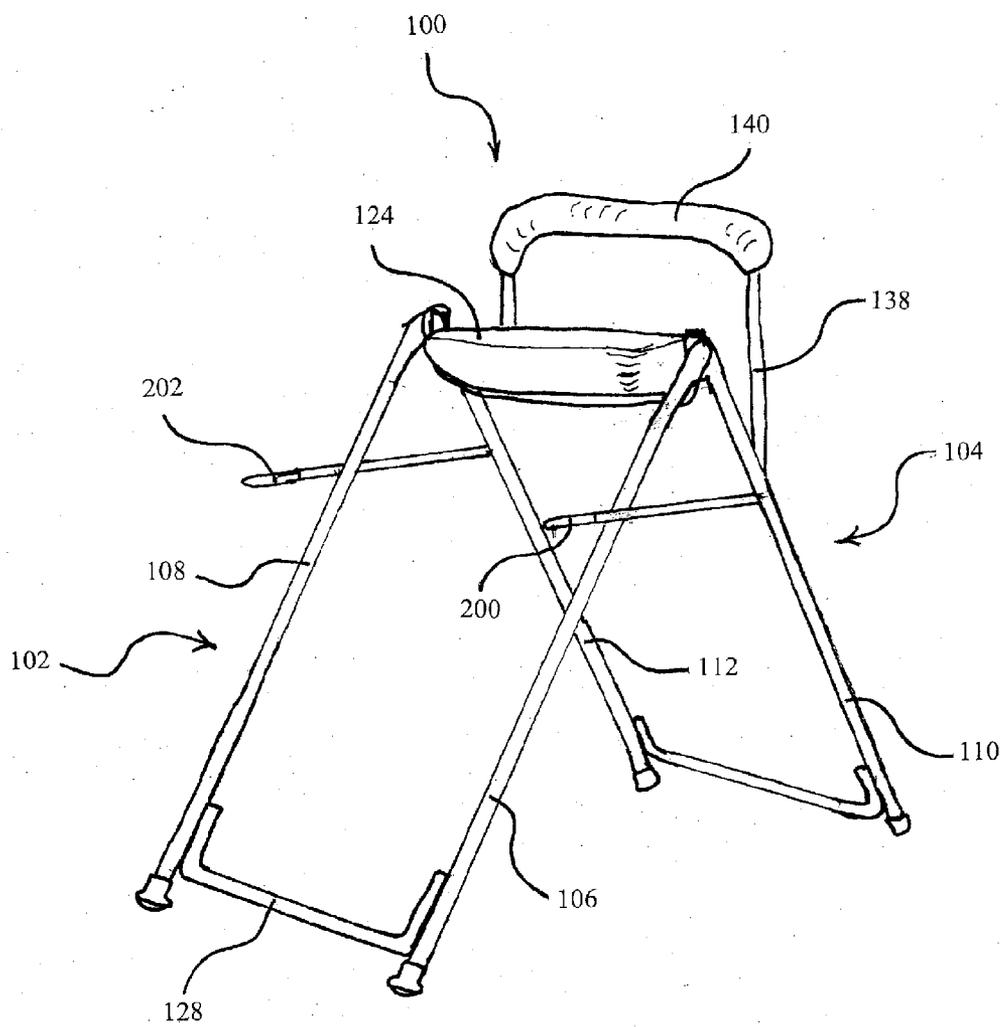


FIG. 2

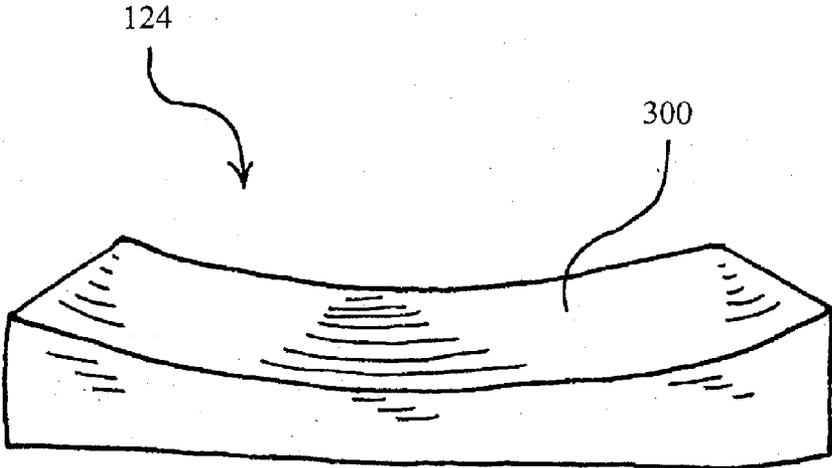


FIG. 3

INVERSION DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to inversion devices, specifically to inversion devices for inverting and supporting a person for exercise.

[0003] 2. Description of the Related Art

[0004] In the related art, inversion devices are often used for inverting a person for exercise and/or health benefits related to the back and spine. Earlier uses of inversion devices for exercise often included hanging oneself from a bar by one's legs and/or using boots fitted with hooks for attachment to suspension bars. Other devices generally comprise a frame and a support pivotally mounted on the frame such that a person may be supported thereon for pivotal movement between an upright position and an inverted position.

[0005] However, such devices failed to provide the convenience and safety required by consumers. For example, the devices generally require a person to pivot themselves in a rearward direction from the upright position to the inverted position such that the person faces upward as they are pivoted. This often results in a situation where the person is pivoted in an uncontrolled manner which may result in injury as there is no fixed support structure within reach of the person as they are pivoted.

[0006] Accordingly, people have endeavored to provide enhanced inversion devices. Some improvements have been made in the field. Examples include but are not limited to the references described below, which references are incorporated by reference herein:

[0007] U.S. Pat. No. 4,214,790, issued to Sieber, discloses an orthopedic reclining chair that is reclinable to a position in which the body of the occupant is substantially inverted, the occupant being retained in the chair by means of a lap belt engaging the upper surface of the thighs whereby to support the weight of the head and torso through the hip joints so as to apply traction to the spine of the occupant. Preferably the heating unit comprises an integral backrest and seat, together with a support for the lower portions of the legs, the seating unit being rockably suspended from a frame relative to which it may be pulled rearwardly from an equilibrium semi-reclining position to its substantially inverted position.

[0008] U.S. Pat. No. 4,410,176, issued to Miller, discloses a tilt bed exercise device for rotating a human into inverted posture that is provided with a pair of pivot bearings holding a rotatable tilt bed comprising a human torso conforming support with a beam extending therefrom and terminating in a rail canted at an angle wherein the proximal end of the rail is anterior of the user's ankles and the distal end is posterior to the user's ankles. A foot supporting means is slidably attached to the canted rail with selectable fixed locations suitable for different size humans. The user's ankles are held by supporting means including a hook on each ankle support engageable with the foot supporting means. A pivot stop is provided for the tilt bed wherein the foot supporting means is rotated past the vertical plane through the axis of the pivot bearings.

[0009] U.S. Pat. No. 4,739,749, issued to Lindley, discloses an orthospinal chair for exercising the spinal column and back muscles by placing tension on the spine through partial inversion. The orthospinal chair allows partial inversion of a person in a supine, bent-knee position at an easily controllable angle. The user of the orthospinal chair is retained in a supine, bent-knee position by a restraining strap secured across the

hip area which allows the person to apply tension while in a partially inverted position to relieve back pain and strengthen back muscles.

[0010] U.S. Pat. No. 4,915,101, issued to Cuccia discloses a rotatable treatment table for effecting extensions and flexions of the spine. The treatment table includes a weighted platform adapted to rest upon a floor. Rigid support elements having upper and lower ends are provided. Further provided is an extensible elevation member having a lower and an upper end, the lower end secured to the platform, in which the rotational movement of the upper end of the extensible elevation member relative to the lower end occurs. Yet further provided is a rectangular supportive frame proportioned to extend beyond the length of the body of a patient. The rigid support is pivotally secured near its center of gravity to the upper end of the rigid elevation member. Further, it is pivotally secured to the upper end of the extensible elevation member. The pivotal securements permit the support frame to define a selectable curved path relative to the platform. Also included in the treatment table is a center and lower back support assembly transversely mounted to the rigid frame near to the upper ends of the extensible elevation members, the center of gravity of the patient being located substantially within the extent of the assembly within the rigid frame.

[0011] U.S. Pat. No. 5,334,123, issued to Rutherford, discloses a rearwardly tilttable chair set sturdily in a frame. The chair allows a user thereof to tilt back and thereby decompress the spine. The user may subsequently engage in exercises that flex, stretch, and strengthen the spine and its accompanying tendons, ligaments and muscles. The user is tilted back to a limited degree so that while the spine is allowed to decompress, blood does not rush to the head. The chair is pivotally held by the frame and tilts easily backward or forward so that the user can easily control his position. In an alternative embodiment, a resistive element is interposed between the back of the chair and the floor so that the user can exercise by pressing back upon the resistive element with the upper torso. A gauge may be coupled to the resistive element to measure the force applied by the user to the resistive element.

[0012] The inventions heretofore known suffer from a number of disadvantages, which include: being difficult for a user to use alone; having dangerous jutting parts; and/or failing to provide sufficient comfort.

[0013] What is needed is an inversion device that solves one or more of the problems described herein and/or one or more problems that may come to the attention of one skilled in the art upon becoming familiar with this specification.

SUMMARY OF THE INVENTION

[0014] The present invention has been developed in response to the present state of the art, and in particular, in response to the problems and needs in the art that have not yet been fully solved by currently available inversion devices, and other exercise devices. Accordingly, the present invention has been developed to provide an inversion device for exercise.

[0015] In one embodiment of the invention, there is an inversion device for inverting and supporting a person, including: first and/or second support frames, spaced one from the other, each frame may include: a front leg member that may have a curved handle portion near a middle of the front leg member and/or providing a handle thereby; and/or a rear leg member. The front and/or rear leg members may be coupled together and/or have a downwardly divergent rela-

tionship. The inversion device also may include: a top cross member that may be coupled to each of the first and/or second support frames and/or spacing the first support frame from the second support frame; a thigh pad that may be coupled to the top cross member and/or rotatable about a long axis of the top cross member with respect to the first and/or second support frames; and/or a bottom cross member that may be fixedly coupled to a bottom end of each of the front leg members.

[0016] In another embodiment of the invention, a top surface of the thigh pad may be substantially curved. In still another embodiment of the invention, the bottom cross member may be U-shaped. In yet another embodiment of the invention, the curved handle portion may be U-shaped and/or may protrude from the respective support frame. In still yet another embodiment of the invention, the inversion device may include: a third U-shaped support frame that may be rotatably coupled to the rear leg members; and/or a calf pad, that may be coupled to the third support frame. In even another embodiment of the invention, the inversion device may further include a pair of leg support members that may be coupled to the front leg members and/or the rear leg members, respectively. In even still another embodiment of the invention, the leg support members may be selectively coupled to the front leg members.

[0017] In even yet another embodiment of the invention, there is an inversion device for inverting and supporting a person, including: first and/or second support frames, spaced one from the other, each frame may include: a front leg member, each front leg member may have a handle member that may be coupled near a middle of the front leg member and/or extending outwardly therefrom providing a handle thereby; and/or a rear leg member. The front and/or rear leg members may be coupled together and/or have a downwardly divergent relationship. The inversion device may also include: a top cross member that may be coupled to each of the first and/or second support frames and/or spacing the first support frame from the second support frame; a thigh pad that may be coupled to the top cross member and/or rotatable about a long axis of the top cross member with respect to the first and/or second support frames; and/or a U-shaped bottom cross member that may be fixedly coupled to a bottom end of each of the front leg members.

[0018] In an additional embodiment of the invention, the handle members may be angularly coupled to the respective front leg members and/or extend upwardly therefrom. In even additional embodiment of the invention, the leg support members may be selectively coupled to the front leg members.

[0019] Reference throughout this specification to features, advantages, or similar language does not imply that all of the features and advantages that may be realized with the present invention should be or are in any single embodiment of the invention. Rather, language referring to the features and advantages is understood to mean that a specific feature, advantage, or characteristic described in connection with an embodiment is included in at least one embodiment of the present invention. Thus, discussion of the features and advantages, and similar language, throughout this specification may, but do not necessarily, refer to the same embodiment.

[0020] Furthermore, the described features, advantages, and characteristics of the invention may be combined in any suitable manner in one or more embodiments. One skilled in the relevant art will recognize that the invention can be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the invention.

[0021] These features and advantages of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] In order for the advantages of the invention to be readily understood, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawing(s). Understanding that these drawing(s) depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawing(s), in which:

[0023] FIG. 1 is a front perspective view of an inversion device, according to one embodiment of the invention;

[0024] FIG. 2 is a front perspective view of an inversion device, according to one embodiment of the invention; and

[0025] FIG. 3 is a front elevational view of a thigh pad, according to one embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the exemplary embodiments illustrated in the drawing(s), and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Any alterations and further modifications of the inventive features illustrated herein, and any additional applications of the principles of the invention as illustrated herein, which would occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

[0027] Reference throughout this specification to “one embodiment,” “an embodiment,” or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases “one embodiment,” “an embodiment,” and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment, different embodiments, or component parts of the same or different illustrated invention. Additionally, reference to the wording “an embodiment,” or the like, for two or more features, elements, etc. does not mean that the features are related, dissimilar, the same, etc. The use of the term “an embodiment,” or similar wording, is merely a convenient phrase to indicate optional features, which may or may not be part of the invention as claimed.

[0028] Each statement of an embodiment is to be considered independent of any other statement of an embodiment despite any use of similar or identical language characterizing each embodiment. Therefore, where one embodiment is identified as “another embodiment,” the identified embodiment is independent of any other embodiments characterized by the language “another embodiment.” The independent embodiments are considered to be able to be combined in whole or in

part one with another as the claims and/or art may direct, either directly or indirectly, implicitly or explicitly.

[0029] Finally, the fact that the wording “an embodiment,” or the like, does not appear at the beginning of every sentence in the specification, such as is the practice of some practitioners, is merely a convenience for the reader’s clarity. However, it is the intention of this application to incorporate by reference the phrasing “an embodiment,” and the like, at the beginning of every sentence herein where logically possible and appropriate.

[0030] As used herein, “comprising,” “including,” “containing,” “is, are,” “characterized by,” and grammatical equivalents thereof are inclusive or open-ended terms that do not exclude additional unrecited elements or method steps. “Comprising” is to be interpreted as including the more restrictive terms “consisting of” and “consisting essentially of.”

[0031] As illustrated by the figures, there is an inversion device **100** for inverting and supporting a person. The inversion device has a first support frame **102** and a second support frame **104**, spaced one from the other. Further, each support frame **102** and **104** has a front leg member **106** and **108**, respectively, and a rear leg member **110** and **112**, respectively. As shown, the front leg members **106** and **108** and the rear leg members **110** and **112** are coupled together, respectively, and have a downwardly divergent relationship. Also, in one embodiment of the invention, the front leg members **106** and **108** each have a curved handle portion **114** and **116**, respectively. As shown the curved handle portions **114** and **116** are U-shaped and protrude from the respective support frame **102** and **104**. Additionally, the curved handle portions **114** and **116** are disposed near a middle **118** and **120** of the front leg members **106** and **108**, respectively, so that the curved handle portions **114** and **116** provide a handle for a person to grasp the first and second support frames **102** and **104** as the person leans forward for becoming inverted.

[0032] The illustrated inversion device **100** also has a top cross member **122** coupled to each of the first support frame **102** and the second support frame **104**. As shown, the top cross member **122** spaces the first support frame **102** from the second support frame **104**. In addition, the inversion device **100** has a thigh pad **124** coupled to the top cross member **122** and rotatable about a long axis **126** of the top cross member **122** with respect to the first support frame **102** and the second support frame **104**. For example, the thigh pad **124** may rotate about a long axis **126** of the top cross member **122** such as the pivot mount of U.S. Pat. No. 6,464,296, issued to Sumner, which is incorporated by reference herein. More, in one embodiment of the invention, a top surface **300** of the thigh pad **124** is substantially curved. Advantageously, the top surface **300** is substantially curved so that the thigh pad **124** conforms to the thighs of a person using the inversion device, thereby providing additional support and/or comfort.

[0033] Further, the illustrated inversion device has a bottom cross member **128** fixedly coupled to a bottom end **130** and **132** of each of the front leg members **106** and **108**, respectively. As shown, the bottom cross member **128** is U-shaped. Advantageously, the bottom cross member **128** is coupled to a bottom end **130** and **132** of each of the front leg members **106** and **108**, respectively, so that the first support frame **102** is free from protrusions which may snag and/or injure a person using the inversion device **100**. In another embodi-

ment of the invention, the inversion device **100** may have additional members for support of the device **100**. For example, the inversion device **100** may have a bottom cross member fixedly coupled to a bottom end of each of the rear leg members **110** and **112**.

[0034] Also, the illustrated inversion device has a pair of leg support members **134** and **136** coupled to the front leg members **106** and **108** and the rear leg members **110** and **112**, respectively. In one embodiment of the invention, the leg support members **134** and **136** are selectively coupled to the front leg members **106** and **108**, respectively, thereby adjusting the downwardly divergent relationship of the first support frame **102** and the second support frame **104**. Furthermore, the inversion device has a third-U-shaped support frame **138** rotatably coupled to the rear leg members, and a calf pad **140** coupled to the third support frame **138**. For example, the third support frame **138** and the calf pad **140** may be such as the restraint bar and pad of the Invertrac, distributed by Lashaw Distributors, LTD., located at 96 31 Baker View Dr., Richmond, British Columbia, V7A2A2, which is incorporated by reference herein. Advantageously, the calf pad **140** provides padding for the calf of a person using the device and/or allows the person to restrain his or her legs when inverted.

[0035] In an alternative embodiment of the invention, each of the front leg members **106** and **108** has a handle member **200** and **202**, respectively, coupled to a middle **118** and **120** of the front leg member **106** and **108**, respectively, and extending outwardly therefrom. In one embodiment of the invention, the handle members **200** and **202** may be angularly coupled to the front leg members **106** and **108**, respectively, and extend upwardly therefrom. Advantageously, the handle members **200** and **202** provide a handle for a person to grasp as the person leans forward for becoming inverted. As shown, the handle members **200** and **202** are coupled to the leg support members **134** and **136**, respectively. Additionally, the handle members **200** and **202**, and the leg support members **134** and **136**, may be one continuous member, such as the handgrips of the Invertrac, distributed by Lashaw Distributors, LTD., located at 96 31 Baker View Dr., Richmond, British Columbia, V7A2A2, which is incorporated by reference herein.

[0036] In operation of one embodiment of the invention, a person to be inverted by an inversion device **100** for exercise steps between a thigh pad **124** and a calf pad **140**. Next, the person leans forward and grips curved handle portions **114** and **116**, and/or handle members **200** and **202**, of a front leg member **106** and **108**, respectively, thereby rotating the thigh pad **124** about a long axis **126** of a cross member **122** with respect to first and second support frames **102** and **104**. Simultaneously, the person bends his or her knees so that the person’s calves rests against the calf pad **140**, thereby lifting a third support frame **138**. Then, the person releases the curved handle portions **114** and **116** and/or the handle members **200** and **202**. Next, the person rotates further about a long axis **126** of a cross member **122** and lifts the third support frame **138** until the person is hanging upside down.

[0037] It is understood that the above-described embodiments are only illustrative of the application of the principles of the present invention. The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiment

is to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

[0038] For example, although the figures illustrate a pair of handle members **200** and **202** coupled near a middle of the front leg members **106** and **108**, respectively, and extending outwardly therefrom, one skilled in the art would appreciate that the inversion device **100** may have any number of handle members disposed along various portions of the device **100**. For example, there may be a second pair of handle members coupled near a bottom of the front leg members **106** and **108**, respectively, extending outwardly therefrom. Similarly, it is envisioned that the curved handle portions **114** and **116**, and/or the handle members **200** and **202**, may be textured and/or have protrusions for gripping. For example, the curved handle portions **114** and **116**, and/or the handle members **200** and **202**, may comprise rubber. Moreover, it is envisioned that the handle members **200** and **202**, and the leg support members **134** and **136** may be coupled to the support frames **102** and **104** at any angle appreciated in the art. For example, the handle members **200** and **202** and the leg support members **134** and **136** may be coupled to the support frames **102** and **104** at angles with respect to a surface on which the inversion device **100** rests, such as, but not limited to: 0 degrees, 45 degrees, 180 degrees, and 225 degrees.

[0039] It is also expected that there could be numerous variations of the design of this invention. For example, one skilled in the art would appreciate that the inversion device may be any size and/or shaped appreciated in the art. For instance, although the figures illustrate a thigh pad **124** which is substantially curved, one skilled in the art would appreciate that the thigh pad **124** may have any size and/or shape appreciated in the art. For example, the thigh pad member **124** may be: rectangular; oblong; T-shaped and/or square.

[0040] It is also envisioned that the inversion device **100** may have an adjustable height. For example, one skilled in the art would appreciate that the leg support members **134** and **146** may be slidably and/or selectively coupled to a front leg member **106** and **108**, respectively, and/or a rear leg member **110** and **112**, respectively, so that the divergence of the front leg members **106** and **108** and the rear leg members **110** and **112** may be adjusted, thereby adjusting a height of the inversion device **100**. Likewise, it is envisioned that the handle members **200** and **202** may have an adjustable height. For example, one skilled in the art would appreciate that a height of the handle members **200** and **202**, may be adjusted by increasing or decreasing a distance from the top cross member **122** to the handle members **200** and **202**.

[0041] Finally, it is envisioned that the components of the inversion device **100** may be constructed of a variety of materials. For example, the inversion device **100** may be constructed of materials, such as, but not limited to: foam, rubber, plastic, metal, and other textiles appreciated in the art.

[0042] Thus, while the present invention has been fully described above with particularity and detail in connection with what is presently deemed to be the most practical and preferred embodiment of the invention, it will be apparent to those of ordinary skill in the art that numerous modifications, including, but not limited to, variations in size, materials, shape, form, function and manner of operation, assembly and

use may be made, without departing from the principles and concepts of the invention as set forth in the claims.

What is claimed is:

1. An inversion device for inverting and supporting a person, comprising:

first and second support frames, spaced one from the other, each frame including:

a front leg member having a curved handle portion near a middle of the front leg member and providing a handle thereby; and

a rear leg member, wherein the front and rear leg members are coupled together and have a downwardly divergent relationship;

a top cross member coupled to each of the first and second support frames and spacing the first support frame from the second support frame;

a thigh pad coupled to the top cross member and rotatable about a long axis of the top cross member with respect to the first and second support frames; and

a bottom cross member fixedly coupled to a bottom end of each of the front leg members.

2. The inversion device of claim 1, wherein a top surface of the thigh pad is substantially curved.

3. The inversion device of claim 1, wherein the bottom cross member is U-shaped.

4. The inversion device of claim 1, wherein the curved handle portion is U-shaped and protrudes from the respective support frame.

5. The inversion device of claim 1, further comprising a pair of leg support members coupled to the front leg members and the rear leg members, respectively.

6. The inversion device of claim 5, wherein the leg support members are selectively coupled to the front leg members.

7. The inversion device of claim 1, further comprising:

a third U-shaped support frame rotatably coupled to the rear leg members; and

a calf pad, coupled to the third support frame.

8. An inversion device for inverting and supporting a person, comprising:

first and second support frames, spaced one from the other, each frame including:

a front leg member, each front leg member having a handle member coupled near a middle the front leg member and extending outwardly therefrom providing a handle thereby; and

a rear leg member, wherein the front and rear leg members are coupled together and have a downwardly divergent relationship;

a top cross member coupled to each of the first and second support frames and spacing the first support frame from the second support frame;

a thigh pad coupled to the top cross member and rotatable about a long axis of the top cross member with respect to the first and second support frames; and

a U-shaped bottom cross member fixedly coupled to a bottom end of each of the front leg members.

9. The inversion device of claim 8, wherein a top surface of the thigh pad is substantially curved.

10. The inversion device of claim **8**, further comprising:
a third U-shaped support frame rotatably coupled to the rear leg members; and
a calf pad, coupled to the third support frame.

11. The inversion device of claim **8**, wherein the handle members are angularly coupled to the respective front leg members and extend upwardly therefrom.

12. The inversion device of claim **8**, further comprising a pair of leg support members coupled to the front leg members and the rear leg members, respectively.

13. The inversion device of claim **12**, wherein the leg support members are selectively coupled to the front leg members.

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