



(19) **United States**

(12) **Patent Application Publication**

Lin et al.

(10) **Pub. No.: US 2008/0096732 A1**

(43) **Pub. Date: Apr. 24, 2008**

(54) **STILTS**

Publication Classification

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(51) **Int. Cl.**
A63B 25/00 (2006.01)
A44B 11/00 (2006.01)
(52) **U.S. Cl.** **482/75; 24/191**

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(57) **ABSTRACT**

A nonflaccid brace for construction stilts is disclosed. In one embodiment, the brace is employed as a lower leg brace. In another embodiment, the brace is employed as an ankle brace. In another embodiment, the brace is employed with one or more nonflaccid closures. An ankle brace for construction stilts is disclosed. In one embodiment, the ankle brace is positioned across the foot pad from the upright carrying the leg brace. A quick connect coupling for stilts is disclosed. The coupling can be employed to close the leg brace, the ankle brace, and/or the foot straps of the stilts.

(21) Appl. No.: **12/001,732**

(22) Filed: **Dec. 12, 2007**

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/396,896, filed on Apr. 3, 2006, now abandoned.

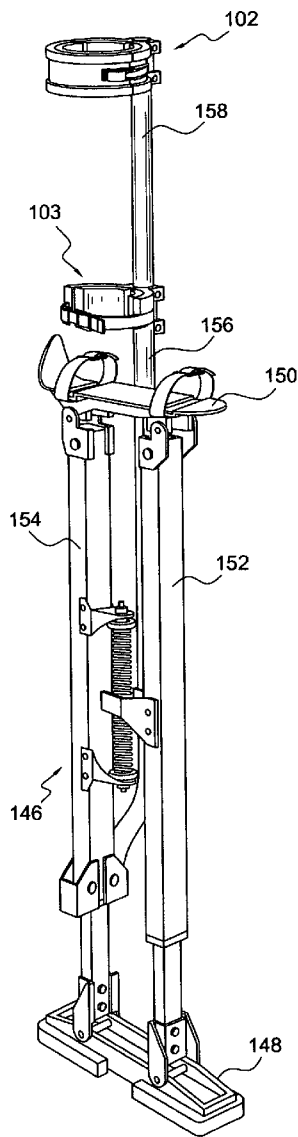


FIG. 1

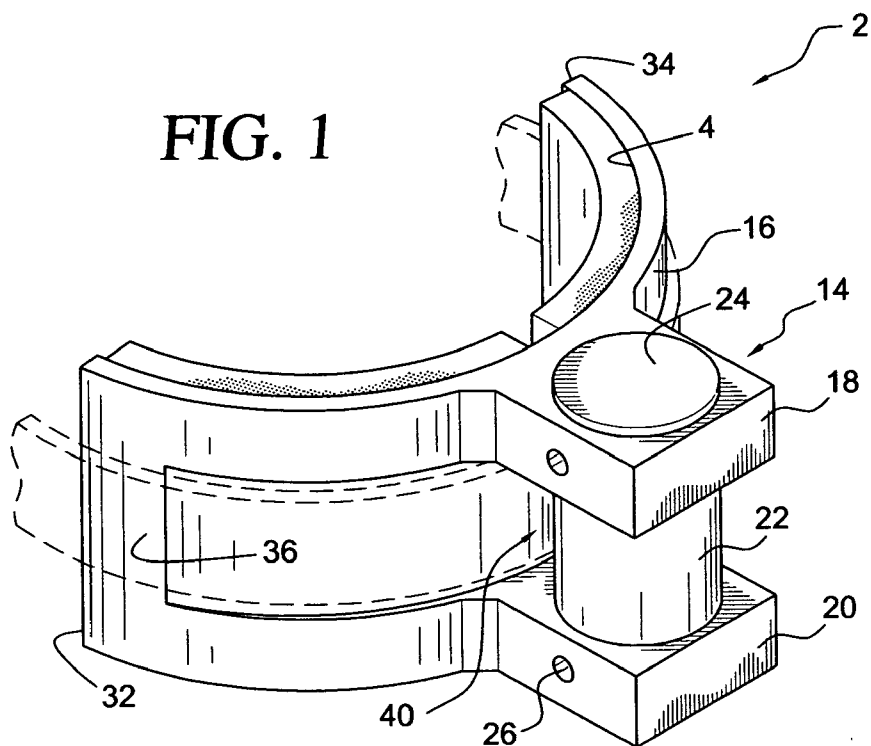
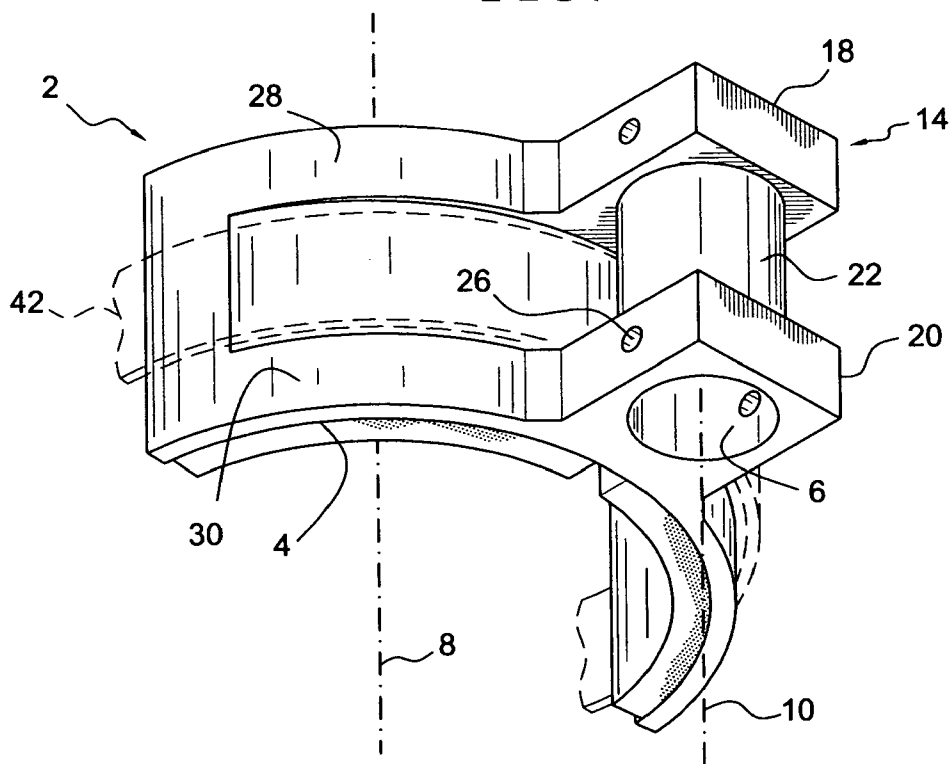


FIG. 2



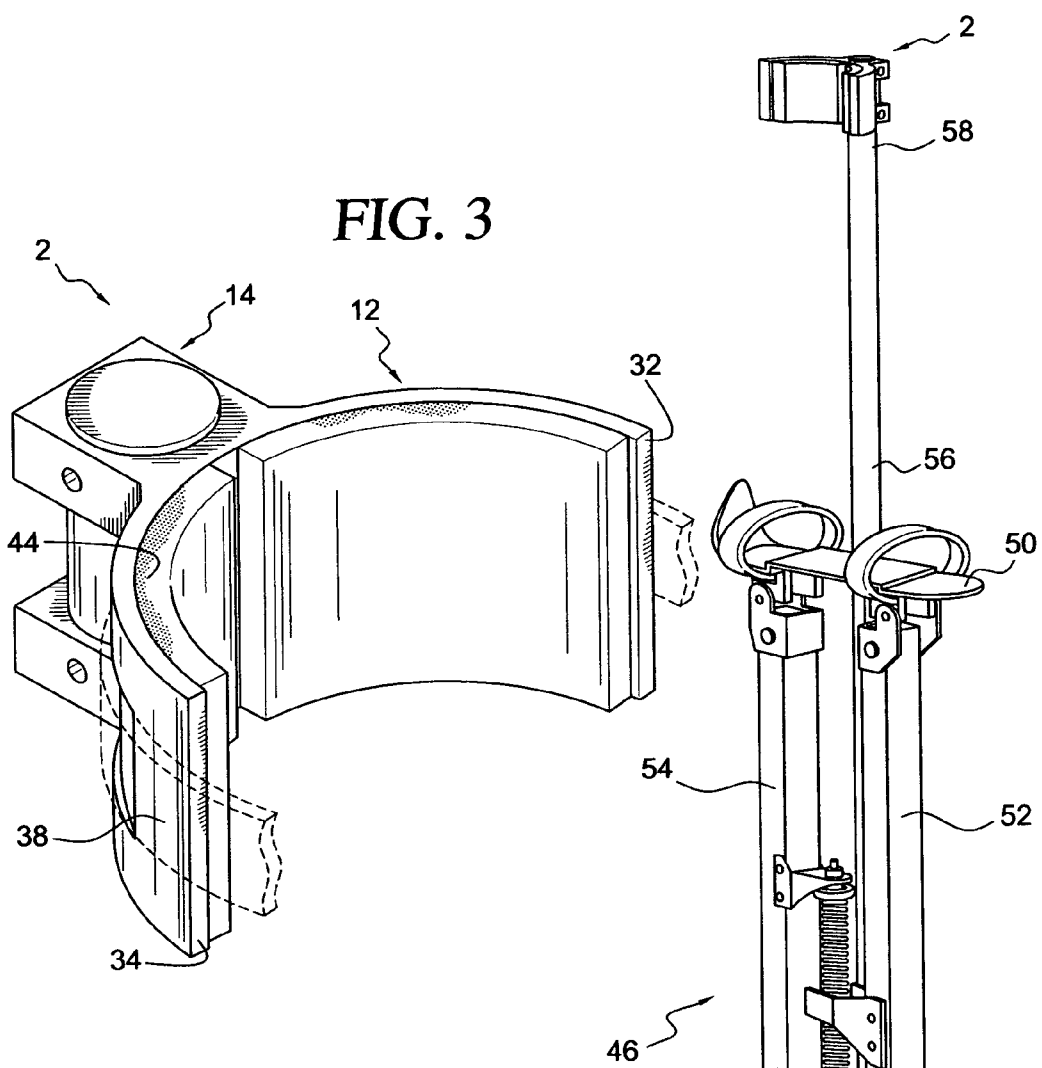
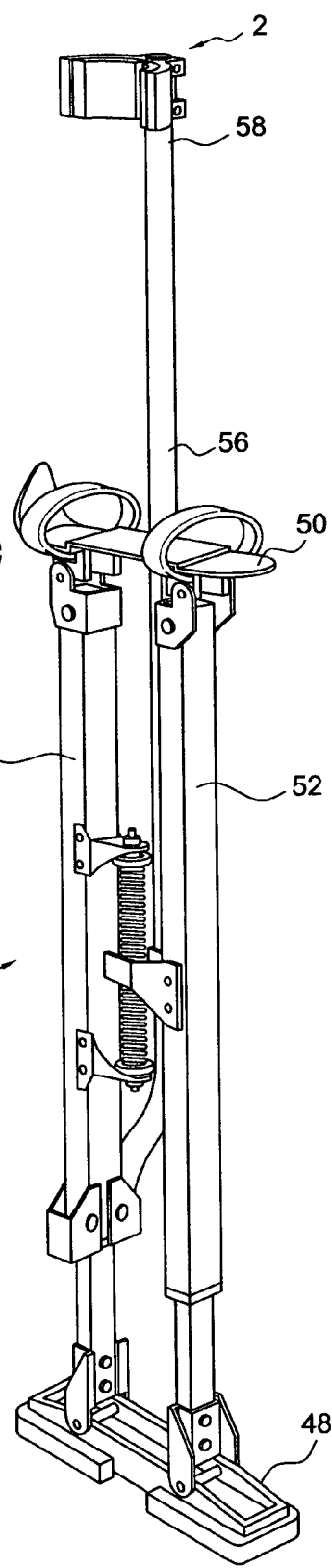
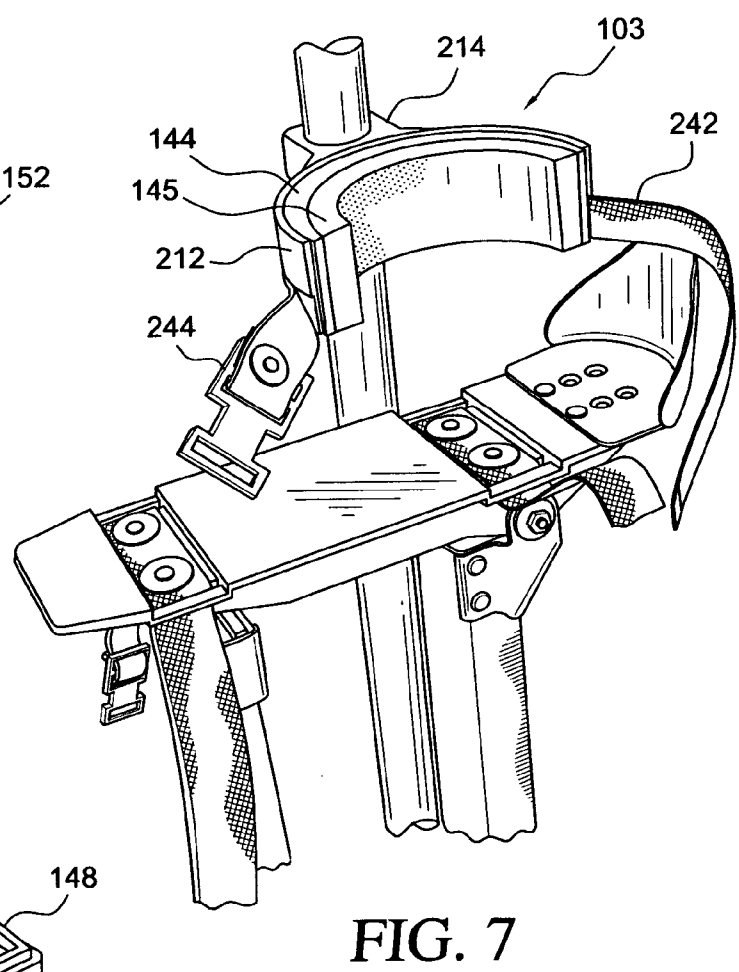
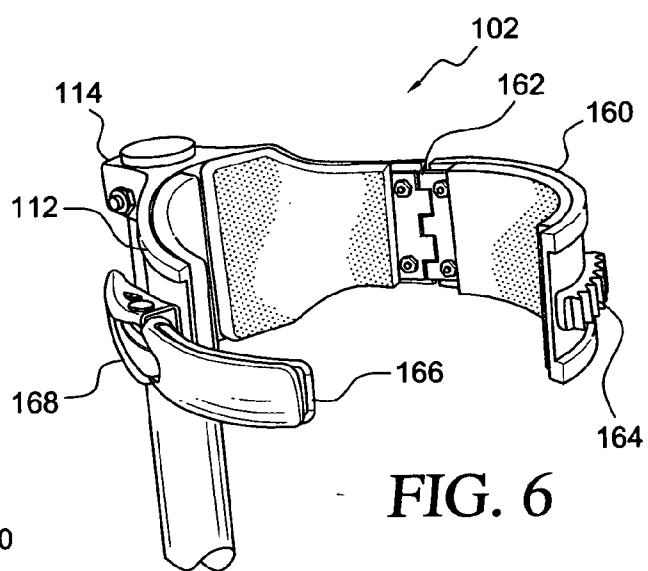
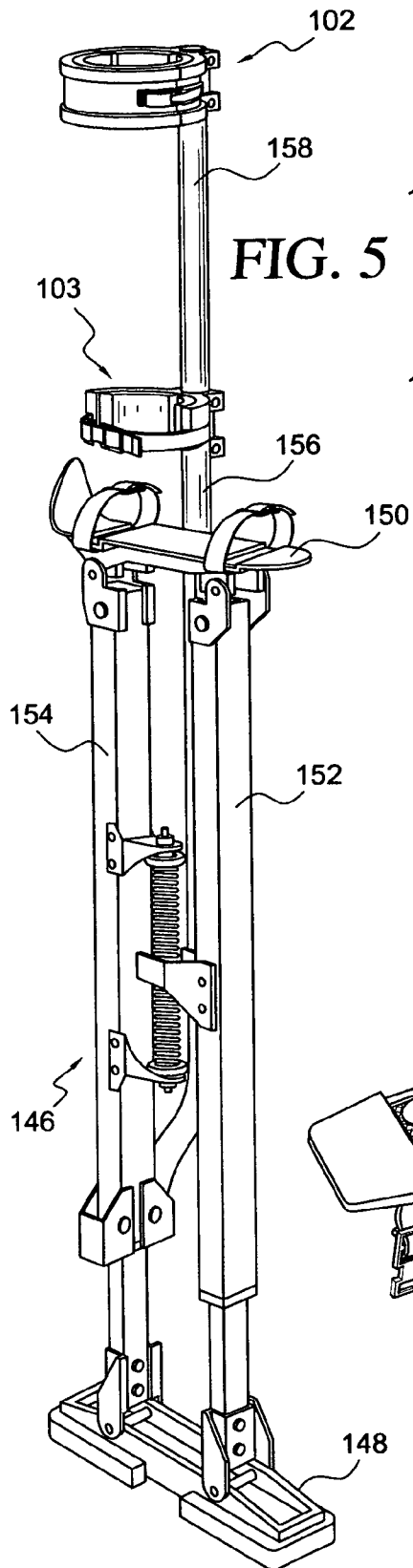


FIG. 4





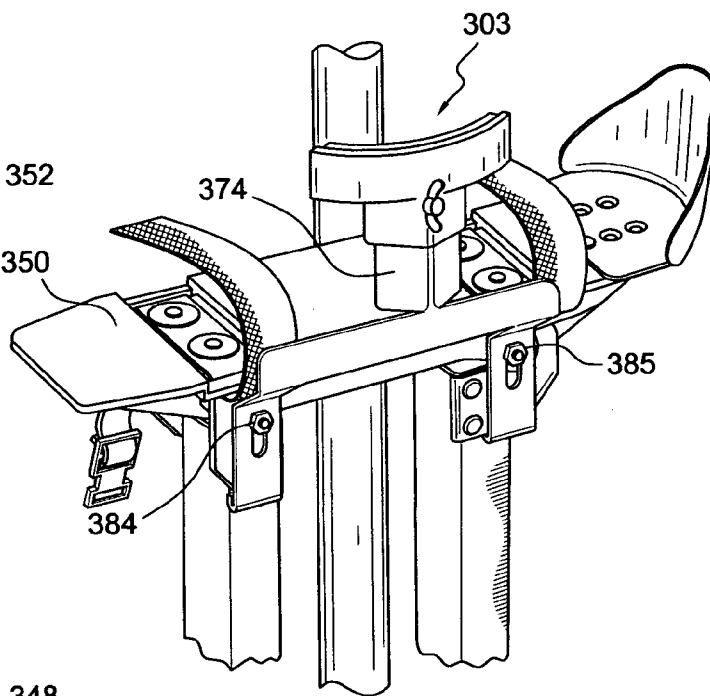
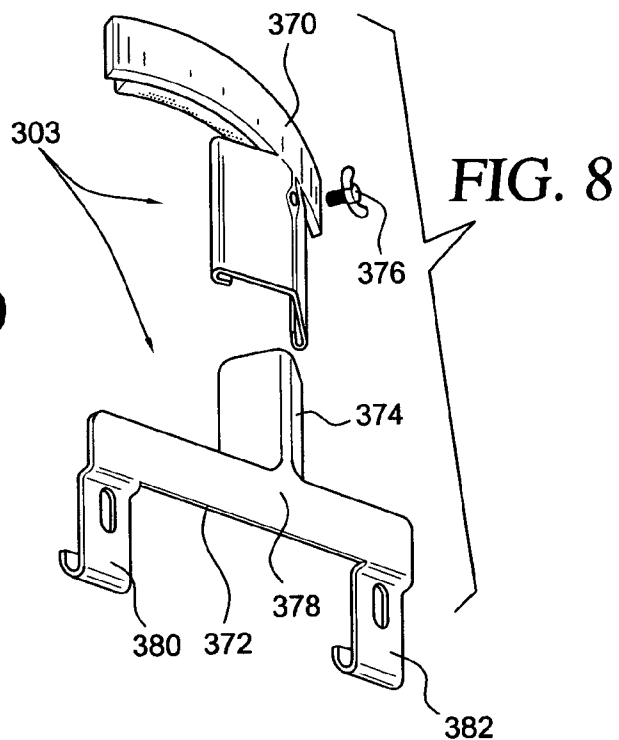
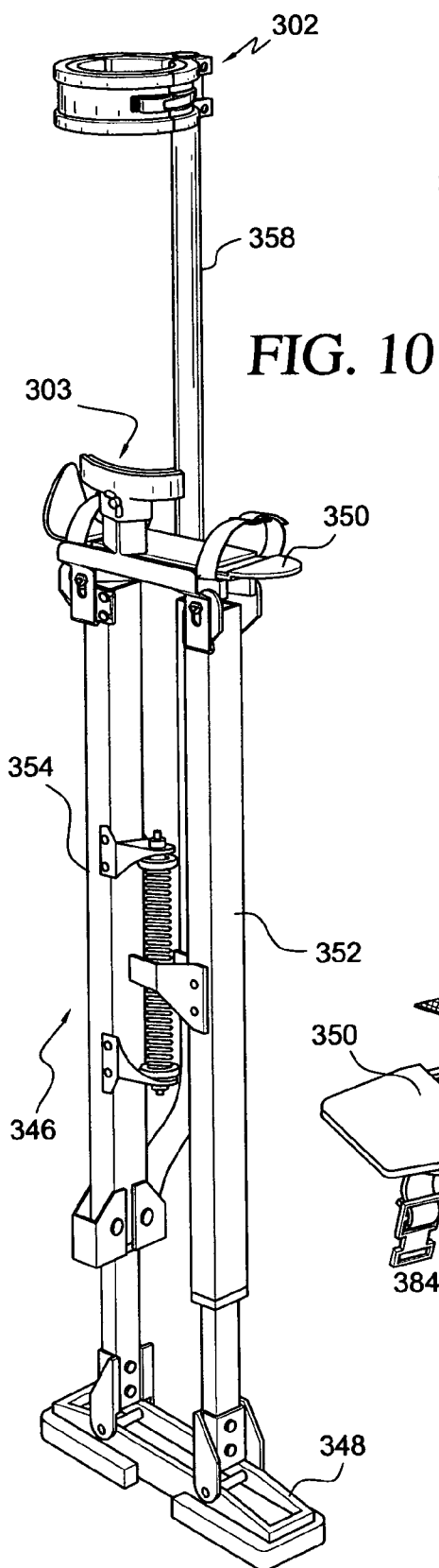


FIG. 9

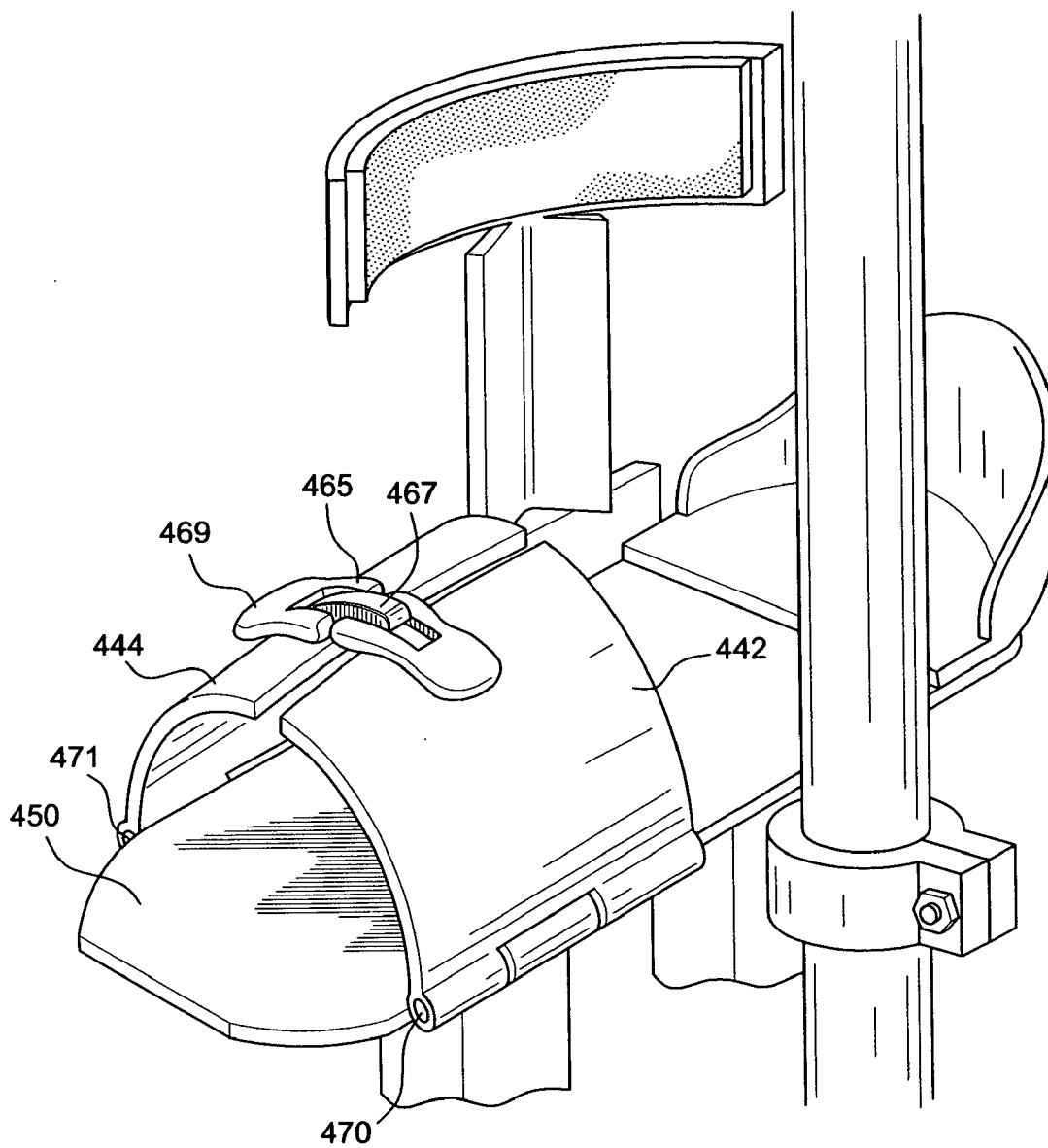


FIG. 11

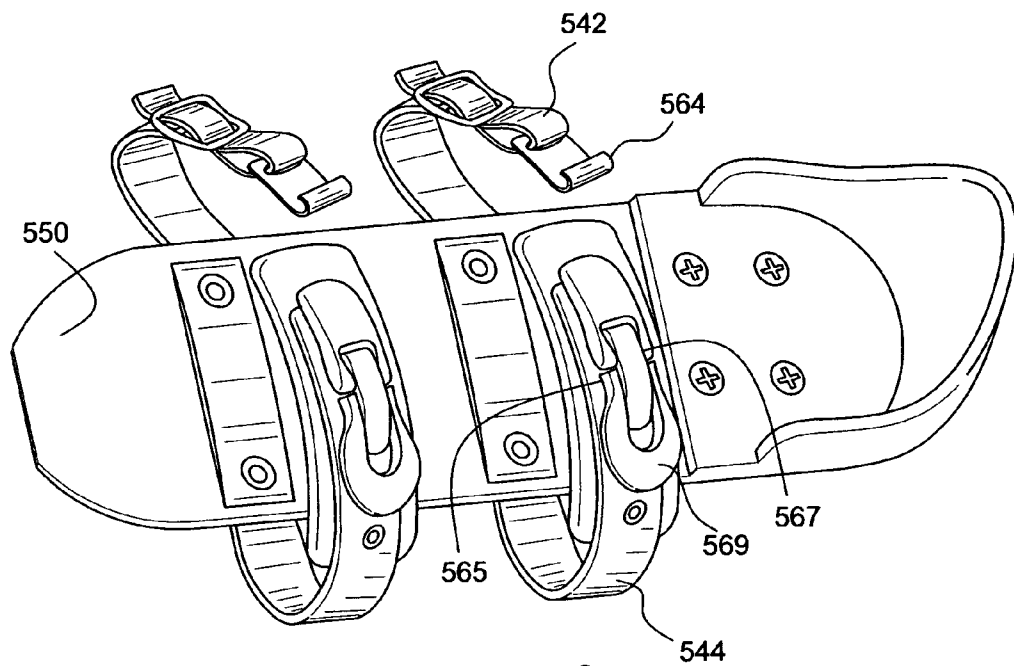


FIG. 12

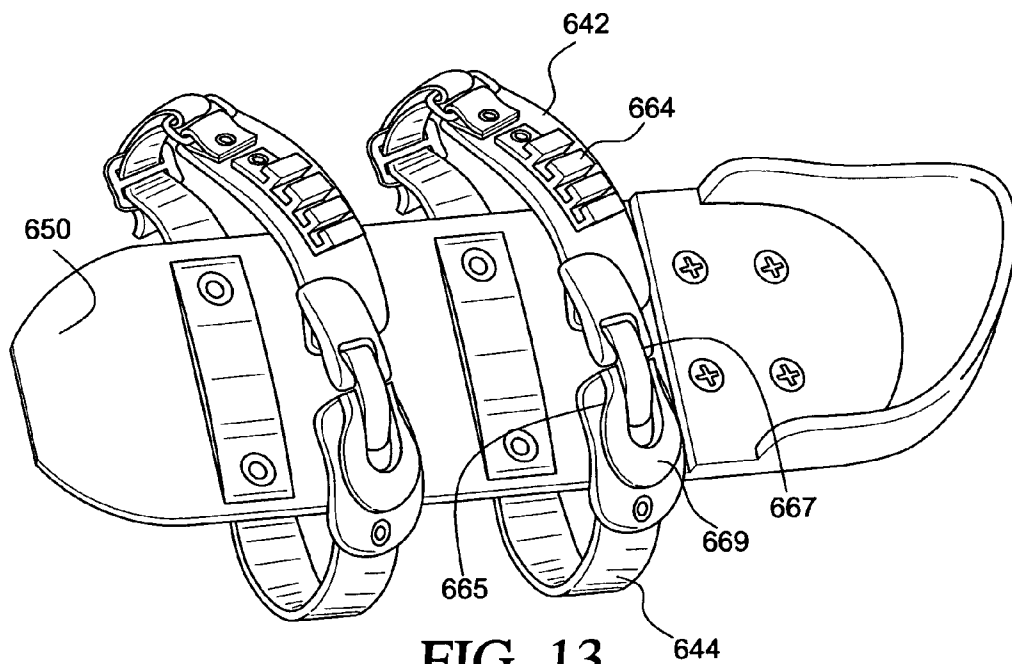


FIG. 13

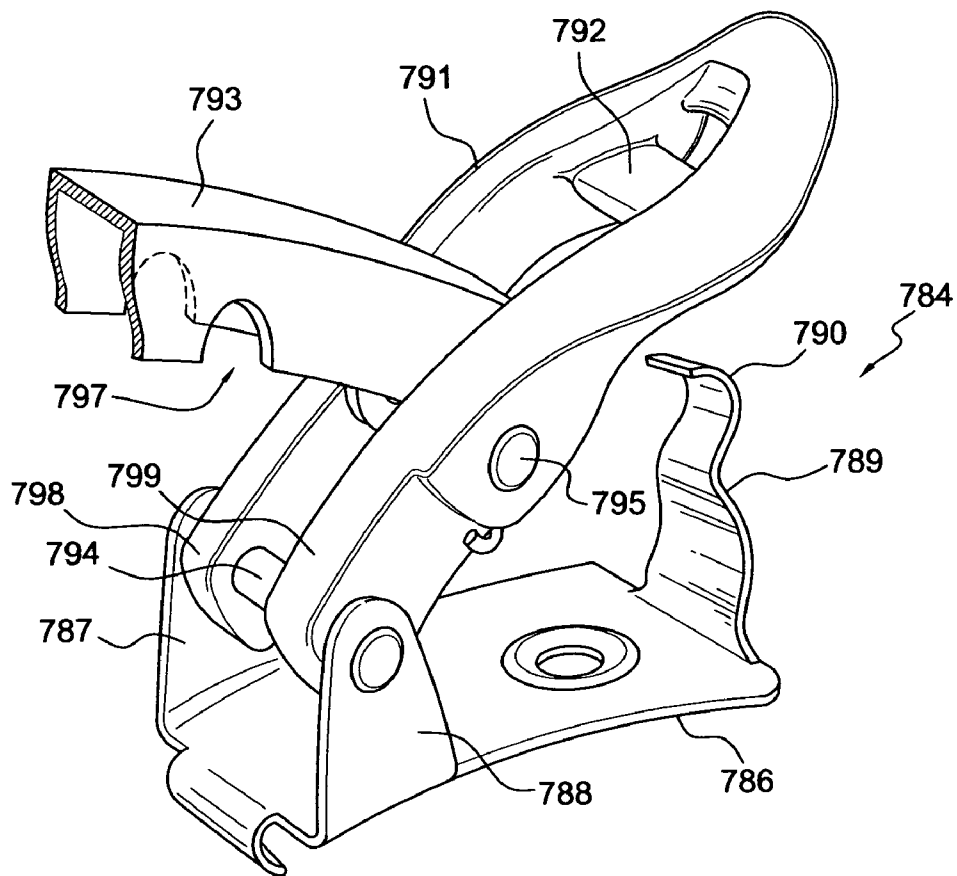


FIG. 14

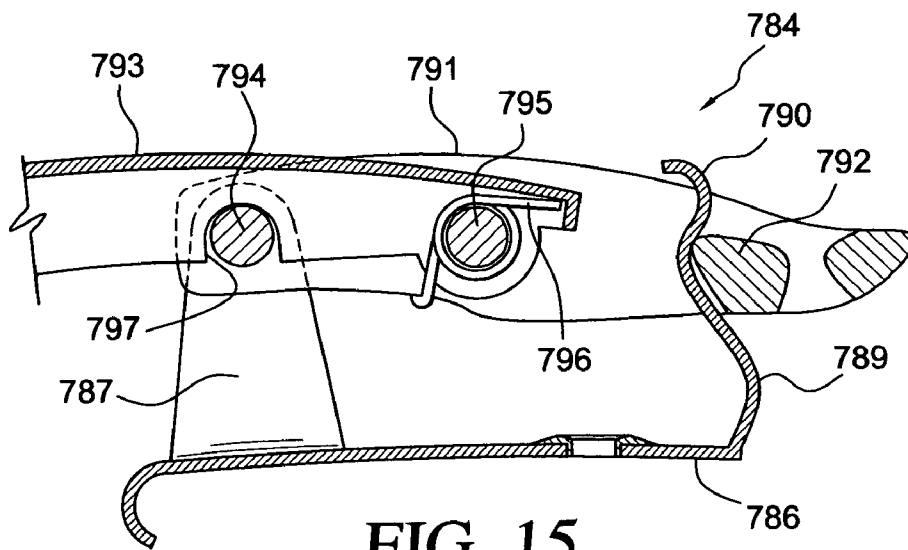
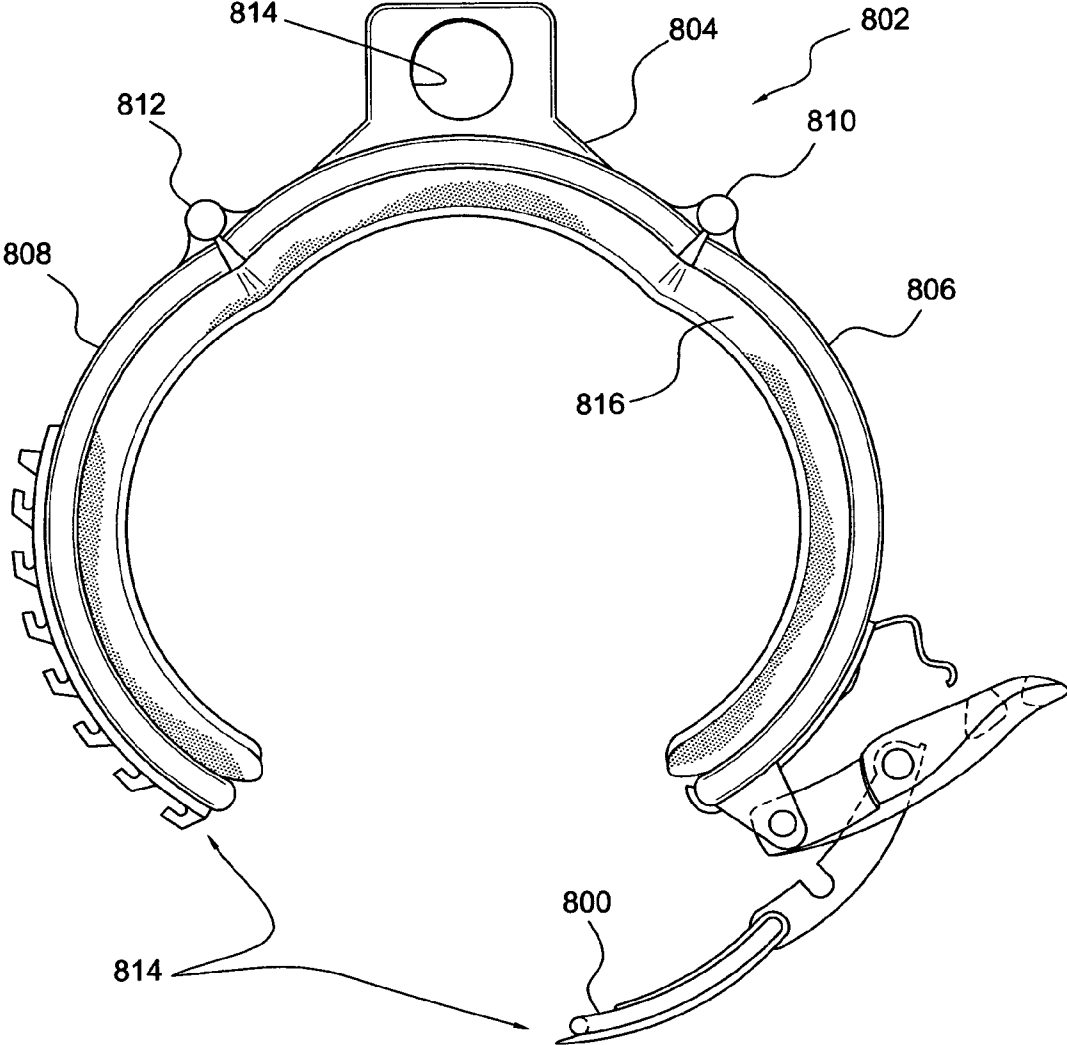


FIG. 15

FIG. 16



STILTS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation in part of application Ser. No. 11/396,896 filed Apr. 3, 2006, now Ser. No. _____, and claims the benefit thereof.

FIELD OF THE INVENTION

[0002] In one aspect, this invention relates to improved lower leg braces for stilts, particularly stilts employed in the construction industry to facilitate overhead work, such as accessing and hanging suspended ceiling structures or overhead electrical or duct work. In another aspect, this invention relates to providing such stilts with an ankle brace. In a further aspect, this invention relates to improved foot retainers for such stilts. In an additional aspect, this invention relates to an improved fastener assembly for fastening such stilts to the user's body.

BACKGROUND OF THE INVENTION

[0003] U.S. Pat. No. 5,645,515, the disclosure of which is incorporated by reference herein, is an example of one type of stilt employed by the construction industry. It utilizes a single upright post extending above the shoe platform and having a calf brace near the upper end to provide stability to the user. The calf brace attaches to the side of the post and is solely dependent on the retention of the fasteners for safety.

[0004] The calf brace in described in U.S. Pat. No. 5,645,515 is constructed of metal and is expensive to produce. A calf brace that could be produced inexpensively would be desirable.

[0005] Also, metallic calf braces are subject to fatigue cracks over time, and are not easy to straighten if bent by accident or abuse. Constructing the braces out of a material that resists fatigue and damage would enhance their durability.

[0006] Also, the calf brace in U.S. Pat. No. 5,645,515 presents an inherent safety hazard during falls because of its metallic construction. A brace construction less likely to result in a cut during a fall would be very desirable.

[0007] Further, additional redundancy against failure of the stilt due to loss of the calf brace retaining bolts would be desirable.

[0008] The stilt described in U.S. Pat. No. 5,645,515 attaches to the user's calf and foot. A stilt that further contacts the user's ankle would permit the user to employ more muscle groups to move the stilt, and could be used with greater control and less fatigue.

[0009] The increased control provided by an ankle fixture would also permit the user to wear the stilt without attaching the fasteners so tightly, to provide greater comfort.

[0010] Providing an ankle fixture would also provide the user with greater ability to control the stilt in the event of failure of the calf or foot attachment, and thus greater safety.

[0011] The calf brace in described in U.S. Pat. No. 5,645,515 relies on straps for attachment to the user's leg. Employing a nonflaccid closure structure to embrace the user's leg

would provide greater comfort for the user, and permit better control over the stilt without inflicting discomfort on the user. A quicker fastening system to attach the stilts to the user's body would also be desirable.

OBJECTS OF THE INVENTION

[0012] An object of the invention is to provide improvements to stilts that overcome the above noted deficiencies.

SUMMARY OF THE INVENTION

[0013] One embodiment of the invention is provided in the form of a non-flaccid leg brace element for a stilt. The leg brace element comprises a nonflaccid body. The nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting a stilt user's leg, and a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt.

[0014] In another aspect of the invention, the lower leg brace is provided in the form of a multipiece, hinged, nonflaccid cuff, which, when closed, substantially encircles the lower leg of the user.

[0015] In one embodiment, the multipiece cuff comprises a first nonflaccid body and a second nonflaccid body connected by a hinge and a fastener assembly. The first nonflaccid body has a first lateral end and a second lateral end and defines a generally semi-cylindrical concave inside surface for supporting a stilt user's leg and a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt. The second nonflaccid body forms a nonflaccid arcuate closure having a first lateral end and a second lateral end. The hinge connects the first lateral end of the arcuate closure with the first lateral end of the first nonflaccid body. The fastener assembly connects the second lateral end of the arcuate closure with the second lateral end of the first nonflaccid body.

[0016] In another embodiment, the multi-piece cuff comprises a first nonflaccid body, a second nonflaccid body, a third nonflaccid body, a first hinge, and a second hinge. The first nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting a lateral area on a stilt user's lower leg, and a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt. The second nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting a posterior area on a stilt user's lower leg. The first hinge connects the first nonflaccid body and the second nonflaccid body. The third nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting an anterior area on a stilt user's lower leg. The second hinge connects the first nonflaccid body to the third nonflaccid body.

[0017] These embodiments of the invention can be used to provide a releasable cuff on the stilt user's lower leg which is more secure and comfortable than is provided by straps.

[0018] In another aspect of the invention, a stilt is further provided with an ankle brace, which can be situated on the same side of the stilt as the lower leg brace, or on the opposite side.

[0019] In one embodiment of the ankle brace invention, a stilt is provided with both a lower leg brace and an ankle

brace. The apparatus comprises a floor platform, a shoe platform, and a pair of substantially vertically mounted supports pivotally connecting the floor platform and the shoe platform in a parallel configuration. The vertical supports are spring-biased so as to urge the vertical supports and the platforms toward a rectangular configuration. A leg support is mounted to one of the vertically mounted supports and extends upwardly above the shoe platform. The leg support has an upper end section. The lower leg brace is positioned on the upper end section of the leg support in superposition with respect to the shoe platform. The ankle brace is positioned on the leg support between the lower leg brace and the shoe platform in superposition with respect to the shoe platform.

[0020] In another embodiment of the ankle brace invention, the ankle brace is spaced across the shoe platform from the leg support. The stilt comprises a floor platform, a shoe platform, and a pair of substantially vertically mounted supports pivotally connecting the floor platform and the shoe platform in a parallelogram configuration. The vertical supports are spring-biased so as to urge the vertical supports and the platforms towards a rectangular configuration. A leg support is mounted to one of the vertically mounted supports and extends upwardly above the shoe platform. The leg support has an upper end section. A lower leg brace is positioned on the upper end section of the leg support in superposition with respect to the shoe platform. An ankle brace element is mounted to the shoe platform and extends upwardly parallel to the leg support. The ankle brace element is positioned across the shoe platform from the leg support.

[0021] The ankle brace provides greater ease of use of the stilt, because it permits the bottom end of the stilt to be moved without excessive reliance on the muscles of the foot.

[0022] In a further embodiment of the invention, there is provided a fastener assembly for use with stilts comprising a cross-piece protruding from an outer surface of a first strap end or a first nonflaccid body, a drag link extending from an end edge of a second strap end or a second nonflaccid body for engaging the cross-piece, and a lever arm mounted on an outside surface of second strap end or second nonflaccid body for retracting the drag link and pulling the first strap end or first nonflaccid body into a closed position.

[0023] In a further embodiment of the invention, there is provided a buckle for the fastener assembly. The buckle comprises an elongated base plate having a pair of spaced apart parallel ears extending normally therefrom and a tang extending generally normally therefrom at a location spaced apart from the ears. The tang is positioned in a plane generally normal to the planes of the ears. The tang has a "C" shaped bend near an upper end thereof facing generally toward the ears. The lever arm has a first end and a second end. The first end of the lever arm is pivotally connected to the ears of the base plate. The lever arm has a length which is greater than a distance between the ears and the tang on the base plate and has an inside cross piece positioned to ride over an outer surface of the "C" shaped bend of the tang and snap the lever arm into a locked position in which the elongated base plate and the lever arm are generally parallel. A portion of the "C" shaped bend of the tang protrudes above an upper surface of the lever arm to permit the tang to be manually moved and the lever arm to be unlocked. The

drag link has a first end and a second end. The first end of the drag link is pivotally connected to the lever arm at a location between the first end of the lever arm and the cross piece. The second end of the drag link is fitted with a hook or loop for engaging the item to be pulled toward the buckle. The tang provides a redundant locking mechanism to prevent the stilt attachment to the user to be accidentally undone.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a pictorial illustration of a pair of lower leg braces constructed according to one embodiment of the invention from an upper perspective.

[0025] FIG. 2 is a pictorial illustration of one of the lower leg braces shown in FIG. 1 from a lower perspective.

[0026] FIG. 3 is a pictorial illustration of a lower leg brace as shown in FIG. 1 from an additional perspective.

[0027] FIG. 4 is a pictorial illustration of a stilt fitted with a lower leg brace according to an embodiment of the invention.

[0028] FIG. 5 is a pictorial illustration of a stilt fitted with an improved lower leg brace and further with an ankle brace according to another embodiment of the invention.

[0029] FIG. 6 is a pictorial illustration of a portion of a stilt as shown in FIG. 5 showing additional details of the improved lower leg brace.

[0030] FIG. 7 is a pictorial illustration of a portion of a stilt as shown in FIG. 5 showing additional details of the ankle brace.

[0031] FIG. 8 is an exploded pictorial view of another ankle brace according to a further embodiment of the invention.

[0032] FIG. 9 is a pictorial view of an ankle brace as in FIG. 8 deployed on the foot plate of a right hand stilt.

[0033] FIG. 10 is a pictorial view of an ankle brace as in FIG. 8 deployed on a left hand stilt.

[0034] FIG. 11 is a pictorial view of a user securement strap according to an embodiment of the invention.

[0035] FIG. 12 is a pictorial view of another user securement strap according to an embodiment of the invention.

[0036] FIG. 13 is a pictorial view of a further foot strap according to an embodiment of the invention.

[0037] FIG. 14 is a pictorial view of a buckle for securing stilt straps according to an embodiment of the invention.

[0038] FIG. 15 is a cross sectional view of the buckle of FIG. 14, in a closed position.

[0039] FIG. 16 is a top plan view of a stilt lower leg brace according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0040] With reference to FIGS. 1 and 2, there is shown a non-flaccid lower leg brace element 2 for a stilt. The leg brace element comprises a nonflaccid body. The nonflaccid body defines a generally semi-cylindrical concave inside surface 4 for supporting a lateral side of a stilt user's leg, and

a passage 6 spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt.

[0041] A wide range of nonflaccid material is suitable for construction of the brace element 2. For cost and speed of production, a thermoplastic would be preferred. For strength, a fiber reinforced thermoplastic would be preferred. For durability, an engineering thermoplastic would be preferred. Short glass fiber reinforced polyetheretherketone (PEEK) is a suitable material, for example, as well as other nonflaccid items shown herein. The brace element 2, as well as the other nonflaccid items shown herein, is preferably produced by an injection molding process. More preferably, the nonflaccid items disclosed herein are of unitary structure.

[0042] The generally semi-cylindrical concave inside surface is positioned around a longitudinal axis 8. A longitudinal axis 10 of the passage is generally parallel to the longitudinal axis 8.

[0043] The brace element can be described as comprising a first portion 12 and a second portion 14. The first portion is a generally saddle-shaped structure having an inner surface which defines the generally cylindrical inside surface and an outer surface 16. Preferably, the length of the saddle, as measured axially, is at least ¼ of the width, as measured circumferentially. The second portion protrudes from the outer surface of the first portion and is longitudinally elongated and defines the passage.

[0044] The second portion is positioned between a first half of the outer surface of the first portion and a second half of the outer surface of the first portion. The outer surface of the first portion has an upper end and a lower end. The second portion preferably comprises an upper ear element 18 protruding from the upper end of the outer surface of the first portion, and a lower ear element 20 protruding from the lower end of the outer surface of the first portion. A tubular element 22 extends between the upper ear element and the lower ear element and defines a portion of the passage. Preferably, an upper end of the passage is closed by a portion 24 of the upper ear element, so that the lower leg brace cannot slide down during use.

[0045] The passage is preferably configured to closely accept the upper end of the stilt upright on which it will be positioned. A circular cross section is preferred for uprights constructed of round tubing.

[0046] The second portion preferably further defines at least one transverse borehole 26 in communication with the passage suitable for receiving a fastener to fasten the leg brace element to a stilt leg support received by the passage. Pins fitted with a retention device or bolts with nuts and a locking mechanism would be suitable. In the illustrated embodiment, the upper ear defines a first transverse borehole and the lower ear defines a second transverse borehole. Each of the boreholes is in communication with the passage and is suitable for receiving a fastener to fasten the leg brace element to a stilt leg support received by the passage.

[0047] Preferably, the first portion further defines outwardly protruding reinforcing bands extending circumferentially from the upper ear and the lower ear. In the illustrated embodiment, an upper band 28 is positioned adjacent to the upper end of the outer surface of the first portion and a lower band 30 is positioned adjacent to the

lower end of the outer surface of the first portion. The first portion has a first lateral end 32 and a second lateral end 34 and further defines a first bridge structure 36 connecting the upper band to the lower band near the first lateral end and a second bridge structure 38 connecting the upper band to the lower band near the second lateral end. The tubular element is spaced apart from the outer surface of the first portion to define a passage 40. The brace element defines a location for receipt of a user safety strap 42 between the upper and lower reinforcing bands and extending between the tubular element and the first and second bridge structures and the outer surface of the first portion. A layer 44 of cushioning is further positioned on the generally cylindrical inside surface in the preferred embodiment. Foam fastened with adhesive is suitable.

[0048] FIG. 4 illustrates one embodiment of the lower leg support aspect of the invention as can be deployed on a stilt 46 of the general type shown in U.S. Pat. No. 5,645,515. The stilt comprises a floor platform 48 and a shoe platform 50. A pair of substantially vertically mounted supports 52, 54 pivotally connect the floor platform and the shoe platform in a parallelogram configuration. The vertical supports are spring-biased so as to urge the vertical supports and the platforms toward a rectangular configuration. A leg support 56 is mounted to one of the vertically mounted supports and extends upwardly above the shoe platform. The leg support has an upper end section 58. The upper end section of the leg support is retained in the passage of the leg brace element 2 in superposition with respect to the shoe platform. A user safety strap can be received in the location defined for receipt of a user safety strap for securing the stilt to the user.

[0049] FIG. 5 illustrates an embodiment of the invention employing an ankle brace as well as a lower leg brace with closure. The stilt apparatus 146, as in FIG. 4, is of the general type shown in U.S. Pat. No. 5,645,515. The stilt comprises a floor platform 148 and a shoe platform 150. A pair of substantially vertically mounted supports 152, 154 pivotally connect the floor platform and the shoe platform in a parallelogram configuration. The vertical supports are spring-biased so as to urge the vertical supports and the platforms toward a rectangular configuration. A leg support 156 is mounted to one of the vertically mounted supports and extends upwardly above the shoe platform. The leg support has an upper end section 158. A lower leg brace element 102 is positioned on the upper end section of the leg support in superposition with respect to the shoe platform. An ankle brace element 103 is positioned on the leg support between the lower leg brace and the shoe platform in superposition with respect to the shoe platform.

[0050] The ankle brace element preferably comprises a nonflaccid body defining a generally semi-cylindrical concave inside surface for supporting a stilt user's ankle, and a passage spaced apart from the generally semi-cylindrical concave inside surface receiving a leg support of the stilt. The generally semi-cylindrical concave inside surface is positioned around a longitudinal axis, and the passage is generally parallel to the longitudinal axis. The brace is preferably strapped to the user's ankle for use, although it could be provided with one or more nonflaccid closure elements as described elsewhere herein.

[0051] More preferably, the ankle brace element comprises a first portion 212 and a second portion 214. The first

portion is a generally saddle-shaped structure having an inner surface and an outer surface, with the inner surface defining the generally cylindrical inside surface. Preferably, the length of the saddle, as measured axially, is at least $\frac{1}{4}$ of the width, as measured circumferentially. The second portion protrudes from the outer surface of the first portion and is longitudinally elongated and defines the passage. The second portion is positioned between a first half of the outer surface of the first portion and a second half of the outer surface of the first portion. The outer surface of the first portion has an upper end and a lower end and the second portion comprises an upper ear element protruding from the upper end of the outer surface of the first portion and a tubular element extending downwardly from the upper ear element and defining a portion of the passage. The brace can be secured to the upright by one or more pins through the ear and/or tube. Preferably, the brace is adjustably secured to the upright for longitudinal movement, so it can be adjusted to the user's preferences. For use, a user safety strap having a buckle end **244** and a tongue end **242** is secured to the ankle brace and passes between the tubular element and the outer surface of the first portion. Alternatively, the brace can be secured to the user with one or more arcuate closures as described elsewhere herein. Multiple layers **144**, **145** of cushioning are preferably positioned on the generally cylindrical inside surface of the ankle brace, to position the brace snugly and comfortably on the user's ankle.

[0052] The lower leg brace element **102** shown in FIGS. **5** and **6** comprises a first nonflaccid body and a second nonflaccid body, joined together with a hinge and a fastener assembly. The first nonflaccid body has a first lateral end and a second lateral end and has a first portion **112** which defines a generally semi-cylindrical concave inside surface for supporting a lateral part of the stilt user's lower leg and a second portion **114** which defines a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt. The first nonflaccid body is preferably structured substantially as described herein above with respect to FIGS. **1-4**. The second nonflaccid body forms a nonflaccid arcuate closure **160** having a first lateral end and a second lateral end and supports a medial area on the stilt user's lower leg. A hinge **162** connects the first lateral end of the arcuate closure with the first lateral end of the first nonflaccid body. A fastener assembly connects the second lateral end of the arcuate closure with the second lateral end of the first nonflaccid body. Preferably, an inner surface of the nonflaccid arcuate closure defines a generally semi-cylindrical concave surface, and, when in a closed position, together with the generally semi-cylindrical surface of the first nonflaccid body, forms a passage for receiving the user's leg, so that the user's leg is supported by a padded, nonflaccid cuff. Preferably, each of the first and second nonflaccid bodies form saddles having a length of the saddle, as measured axially, which is at least $\frac{1}{4}$ of the width, as measured circumferentially.

[0053] The fastener assembly preferably comprises an arcuate toothed rack **164** protruding from an outer surface of the nonflaccid arcuate closure, a drag link **166** extending from the second lateral end of the first nonflaccid body for engaging a tooth on the arcuate toothed rack, and a lever arm **168** mounted on an outside surface of first nonflaccid body near the second lateral end for retracting the drag link and pulling the lower leg brace into the closed position.

[0054] In the embodiment of the invention illustrated in FIGS. **8-10**, the ankle brace is spaced across the shoe platform from the leg support. The stilt **346** illustrated comprises a floor platform **348**, a shoe platform **350**, a pair of substantially vertically mounted supports **352**, **354** pivotally connecting the floor platform and the shoe platform in a parallelogram configuration. The vertical supports are spring-biased so as to urge the vertical supports and the platforms towards a rectangular configuration. A leg support **358** is mounted to one of the vertically mounted supports and extends upwardly above the shoe platform. The leg support has an upper end section. A lower leg brace **302** is positioned on the upper end section of the leg support in superposition with respect to the shoe platform. An ankle brace element **303** is mounted to the shoe platform and extends upwardly parallel to the leg support. The ankle brace element is positioned across the shoe platform from the leg support.

[0055] Preferably, the ankle brace element comprises an upper portion **370** and a lower portion **372**. The upper portion includes a concave arcuate surface facing the leg support. The lower portion is secured to the shoe platform and includes an upright post **374** connected to the upper portion. Preferably, the upper portion of the ankle brace element is connected to the lower portion of the ankle brace element with a sliding joint. The ankle brace element further includes means, such as screw **376**, for immobilizing the sliding joint.

[0056] In the illustrated embodiment, the sliding joint comprises a telescoping joint. The upper portion of the ankle brace element has a downwardly depending connector which receives the upright post, although it could be vice versa. The downwardly depending connector and the upright post can each have a "Y" shaped cross section, such configuration permitting fabrication by stamping and folding of sheet metal.

[0057] The lower portion of the ankle brace element in the illustrated embodiment includes an elongated cross-plate **378** connected to a lower end of the upright post. The cross-plate has a first end and a second end. A pair of downwardly extending tabs **380**, **382** are positioned near the ends of the cross-plate. The downwardly extending tabs are parallel to the upright post. The tabs have an upper end and a lower end and a bend near the upper end attached to the cross-plate, the tabs being positioned in a plane which is offset and parallel to the plane of the cross plate, to permit contact with the foot plate substructure. The tabs have a J bend at their lower ends, for hooking under the foot plate substructure, and an aperture between the upper end and lower end carrying a fastener **384**, **385** for securing the ankle brace element to the foot plate.

[0058] The ankle brace of FIGS. **8-10** nests against the inside of the user's ankle, and doesn't need to be strapped to the user, which makes the stilts carrying the brace quick and easy to put on.

[0059] Because the most common movement for sheet-rock installers is side to side, the ankle brace enables the user to push the stilt with the leg, rather than drag the stilt with the calf strap and shoe strap, which provides a leverage advantage and greater ease of use. The ankle brace also provides greater stability for the user when reaching forward or sideways. Stilts provided with the ankle brace are more

comfortable, and can be used with less flexing of the toes, feet and calf muscles, when working, walking forward, backwards, or standing. The “feel” of the stilts is also more natural, and gives the user a better chance for averting falls by using natural reaction tendencies.

[0060] In the embodiments of the invention illustrated in FIGS. 11-13, user securement strap(s) for stilts are secured with quick lever coupling ski-boot type fastener assemblies. Although this aspect of the invention as shown is depicted as a foot strap, it is to be understood that the fastening system illustrated can be employed anywhere on the stilt that a strap is present. It can be used to pull together the leg and ankle braces, for example, by mounting the straps, for example with rivets, on the outside of the saddles. An elongated foot plate 450, 550, 650 is provided having a top side, a first lateral side and a second lateral side. A first band end portion 442, 542, 642 comes up from the first lateral side of the foot plate. A second band end portion 444, 544, 644 comes up from the second lateral side of the foot plate. A cross-piece element 564, 664 is carried on the first band end portion. A buckle 465, 565, 665 is carried on the second band end portion. The buckle and cross piece element can be riveted to their respective straps. The buckle includes a drag link 467, 567, 667 for engaging the cross piece element and a lever arm 469, 569, 669 for actuating the drag link.

[0061] In the FIG. 11 embodiment, the first band end portion is formed from a nonflaccid material and is attached to the first lateral side of the foot plate with a hinge connection 470. The second band end portion is formed from a nonflaccid material and is attached to the second lateral side of the foot plate with a second hinge connection 471. The first band end portion and the second band end portion arch over the top side of the foot plate when the drag link is engaged with the cross piece. In FIG. 12, the cross-piece element comprises a transversely elongated hook. In FIG. 13, the cross-piece element comprises a tooth on an arcuate rack having a plurality of teeth.

[0062] The details of a buckle 784 according to certain aspects of the invention are shown in FIGS. 14 and 15. The buckle comprises an elongated base plate 786, a lever arm 791, and a drag link 793.

[0063] The elongated base plate 786 has a pair of spaced apart parallel ears 787, 788 extending normally upwardly therefrom and a tang 789 extending generally normally upwardly therefrom at a location spaced apart from the ears. The tang is positioned in a plane generally normal to the planes of the ears. The tang has a “C” shaped bend 790 (when viewed in cross section) near an upper end thereof, with the open side of the C facing generally toward the ears.

[0064] The lever arm 791 has a first end and a second end. The first end of the lever arm is pivotally connected to the ears of the base plate. The lever arm has a length which is greater than a distance between the ears and the tang on the base plate and has an inside cross piece 792 positioned to ride over an outer surface of the “C” shaped bend of the tang and snap the lever arm into a locked position in which the elongated base plate and the lever arm are generally parallel. See FIG. 15. The lever arm displaces the tang as it rides over it and the tang returns to near its original position once the lever arm has cleared. A portion of the “C” shaped bend of the tang protrudes above an upper surface of the lever arm to permit the tang to be manually moved and the lever arm to be unlocked.

[0065] The drag link 793 has a first end and a second end. The first end of the drag link is pivotally connected to the lever arm at a location between the first end of the lever arm and the cross piece.

[0066] The buckle preferably further comprises a first pin 794 extending through the ears of the base plate and mounting the lever arm to the base plate and a second pin 795 extending through the lever arm and connecting the drag link to the lever arm.

[0067] The drag link is preferably arcuately shaped and has a groove 797 across a lower surface thereof which receives the first pin when the lever arm is in the locked position. See FIG. 15. The first end of the lever arm is preferably formed from a pair of generally parallel legs 798, 799 which extend to the cross piece. The first end of the drag link is sized to be received between the legs.

[0068] The base plate is preferably stamped sheet metal and the tang is urged towards the cross piece of the lever arm when the lever arm is in the locked position. A spring 796 is preferably positioned around the second pin and biases the drag link toward a down position. Preferably, a second end portion of the drag link is sized similarly to a width of the first end of the lever arm and the second end portion of the drag link is positioned closely adjacent to the first end of the lever arm when the lever arm is in the locked position. The drag link preferably carries a wire loop 800, as shown in FIG. 16, for example. The wire loop is preferably carried in lateral grooves formed in the drag link and crosses underneath an outside surface of the drag link near the second end thereof FIG. 16 shows another embodiment of the lower leg brace aspect of the invention. In FIG. 16, a lower leg brace element 802 for a stilt comprises a first nonflaccid body 804, a second nonflaccid body 806, a third nonflaccid body 808, a first hinge 810, and a second hinge 812.

[0069] The first nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting a lateral area on a stilt user's lower leg, and a passage 814 spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt. The second nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting a posterior area on a stilt user's lower leg. The first hinge connects the first nonflaccid body and the second nonflaccid body. The third nonflaccid body defines a generally semi-cylindrical concave inside surface for supporting an anterior area on a stilt user's lower leg. The second hinge connects the first nonflaccid body to the third nonflaccid body.

[0070] A fastening assembly 814 is provided for bridging a gap between the second nonflaccid body and the third nonflaccid body and completing encirclement of a user's lower leg with the brace element. A padded liner 816 is preferably positioned across the concave surfaces of each of the first nonflaccid body, the second nonflaccid body, and the third nonflaccid body and biases the brace element towards an open position. Each of the nonflaccid bodies spans an angle in the range of 45 degrees to 120 degrees. Preferably, each of the first, second and third nonflaccid bodies are saddle-shaped, with the length of the saddle, as measured axially, being at least ¼ of the width, as measured circumferentially.

[0071] The nonflaccid bodies forming the leg brace preferably substantially encircle the user's leg to form a cuff

when in the closed position. Because the contact area is larger, as compared to a strapped on brace, pressure points are reduced and the brace can be comfortably worn for long periods of time. It can also be worn more loosely, without loss of control of the stilt. When a quick-connect coupling is used as the fastening assembly, putting on stilts is simpler and safer, because of absence of straps to adjust or thread.

[0072] While certain preferred embodiments of the invention have been described herein, the invention is not to be construed as being so limited, except to the extent that such limitations are found in the claims.

What is claimed is:

- 1. A leg brace element for a stilt,
 - said leg brace element comprising
 - a nonflaccid body defining
 - a generally semi-cylindrical concave inside surface for supporting a stilt user's leg, and
 - a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt,
 - wherein
 - the generally semi-cylindrical concave inside surface is positioned around a longitudinal axis, and the passage is generally parallel to said longitudinal axis,
 - wherein
 - the leg brace element comprises a first portion and a second portion,
 - the first portion being a generally saddle-shaped structure having an inner surface and an outer surface, the inner surface defining the generally cylindrical inside surface,
 - the second portion protruding from the outer surface of the first portion and being longitudinally elongated and defining the passage
 - wherein
 - the second portion is positioned between a first half of the outer surface of the first portion and a second half of the outer surface of the first portion
 - wherein
 - the outer surface of the first portion has an upper end and a lower end, and the second portion comprises
 - an upper ear element protruding from the upper end of the outer surface of the first portion,
 - a lower ear element protruding from the lower end of the outer surface of the first portion, and
 - a tubular element extending between the upper ear element and the lower ear element and defining a portion of the passage.
- 2. A leg brace element for a stilt as in claim 1 wherein an upper end of the passage is closed by a portion of the upper ear element.
- 3. A leg brace element for a stilt as in claim 1 wherein the tubular element is spaced apart from the outer surface of the first portion to define a location for receipt of a

user safety strap between the tubular element and the outer surface of the first portion, and further comprising, in combination, a layer of cushioning positioned on the generally cylindrical inside surface.

- 4. A leg brace element for a stilt as in claim 1 further comprising, in combination,
 - a floor platform,
 - a shoe platform,
 - a pair of substantially vertically mounted supports pivotally connecting said floor platform and said shoe platform in a parallelogram configuration, said vertical supports spring-biased so as to urge said vertical supports and said platforms toward a rectangular configuration, and
 - a leg support mounted to one of said vertically mounted supports and extending upwardly above said shoe platform, said leg support having an upper end section, wherein the upper end section of said leg support is retained in the passage of the leg brace element in superposition with respect to the shoe platform.
- 5. A combination as in claim 4 wherein the leg brace element comprises a lower leg brace element, said combination further comprising,
 - an ankle brace element positioned on the leg support between the lower leg brace element and the shoe platform.
- 6. A combination as in claim 5 wherein the ankle brace element comprises
 - a nonflaccid body defining
 - a generally semi-cylindrical concave inside surface for supporting a stilt user's ankle, and
 - a passage spaced apart from the generally semi-cylindrical concave inside surface receiving a leg support of the stilt,
 - wherein
 - the generally semi-cylindrical concave inside surface is positioned around a longitudinal axis, and the passage is generally parallel to said longitudinal axis.
- 7. A leg brace element for a stilt as in claim 1, further comprising, in combination,
 - a nonflaccid arcuate closure having a first lateral end and a second lateral end,
 - a hinge connecting the first lateral end of the arcuate closure with a first lateral end of the first portion of the leg brace element, and
 - a fastener assembly connecting the second lateral end of the arcuate closure with a second lateral end of the first portion of the leg brace element.
- 8. A leg brace element for a stilt as in claim 7 wherein an inner surface of the nonflaccid arcuate closure defines a generally cylindrical surface, and the fastener assembly comprises
 - an arcuate toothed rack protruding from an outer surface of the nonflaccid arcuate closure,

a drag link extending from the second lateral end of the first portion of the leg brace element for engaging a tooth on the arcuate toothed rack, and

a lever arm mounted on an outside surface of the leg brace element near the second end for retracting the drag link.

9. A leg brace element for a stilt as in claim 8 further comprising, in combination,

- a floor platform,
- a shoe platform,
- a pair of substantially vertically mounted supports pivotally connecting said floor platform and said shoe platform in a parallelogram configuration, said vertical supports spring-biased so as to urge said vertical supports and said platforms towards a rectangular configuration, and
- a leg support mounted to one of said vertically mounted supports and extending upwardly above said shoe platform, said leg support having an upper end section, wherein the upper end section of said leg support is retained in the passage of the leg brace element in superposition with respect to the shoe platform.

10. Apparatus comprising

- a floor platform,
- a shoe platform,
- a pair of substantially vertically mounted supports pivotally connecting said floor platform and said shoe platform in a parallelogram configuration, said vertical supports spring-biased so as to urge said vertical supports and said platforms towards a rectangular configuration, and
- a leg support mounted to one of said vertically mounted supports and extending upwardly above said shoe platform, said leg support having an upper end section,
- a lower leg brace positioned on the upper end section of said leg support in superposition with respect to the shoe platform, and
- an ankle brace positioned on the leg support between the lower leg brace and the shoe platform in superposition with respect to the shoe platform.

11. Apparatus as in claim 10 wherein

the ankle brace element comprises

- a nonflaccid body defining
- a generally semi-cylindrical concave inside surface for supporting a stilt user's ankle, and
- a passage spaced apart from the generally semi-cylindrical concave inside surface receiving
- a leg support of the stilt,

wherein

the generally semi-cylindrical concave inside surface is positioned around a longitudinal axis, and the passage is generally parallel to said longitudinal axis.

12. Apparatus as in claim 11 wherein the lower leg brace comprises a nonflaccid body defining

- a generally semi-cylindrical concave inside surface for supporting a stilt user's leg, and

- a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving
- a leg support of the stilt.

13. A leg brace element for a stilt,

said leg brace element comprising

- a first nonflaccid body, a second nonflaccid body, a hinge, and a fastener assembly,
- said first nonflaccid body having a first lateral end and a second lateral end and defining
- a generally semi-cylindrical concave inside surface for supporting a stilt user's leg and a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt,
- said second nonflaccid body forming
- a nonflaccid arcuate closure having a first lateral end and a second lateral end,

wherein the hinge connects the first lateral end of the arcuate closure with the first lateral end of the first nonflaccid body, and

the fastener assembly connects the second lateral end of the arcuate closure with the second lateral end of the first nonflaccid body.

14. Apparatus comprising

- a floor platform,
- a shoe platform,
- a pair of substantially vertically mounted supports pivotally connecting said floor platform and said shoe platform in a parallelogram configuration, said vertical supports spring-biased so as to urge said vertical supports and said platforms towards a rectangular configuration, and
- a leg support mounted to one of said vertically mounted supports and extending upwardly above said shoe platform, said leg support having an upper end section,
- a lower leg brace positioned on the upper end section of said leg support in superposition with respect to the shoe platform, and
- an ankle brace element positioned across the shoe platform from the leg support.

15. Apparatus as in claim 14 wherein

the ankle brace element comprises

- an upper portion and a lower portion, the upper portion including a concave arcuate surface facing the leg support, the lower portion being secured to the shoe platform and including an upright post connected to the upper portion.

16. Apparatus as in claim 15 wherein the upper portion of the ankle brace element is connected to the lower portion of the ankle brace element with a sliding joint, wherein the ankle brace element further includes means for immobilizing the sliding joint.

17. Apparatus comprising

- a first band end portion
- a second band end portion
- a cross-piece element carried on the first band end portion,

a buckle carried on the second band end portion, said buckle including a drag link for engaging the cross piece element and a lever arm for actuating the drag link.

18. Apparatus as in claim 17 wherein

the first band end portion is carried on a first saddle body, the second band end portion is carried on a second saddle body, and

actuation of the lever arm when the drag link is engaged with the cross-piece element pulls the saddle bodies towards each other.

19. Apparatus as in claim 17 further comprising

an elongated foot plate having a top side, a first lateral side and a second lateral side,

wherein the first band end portion comes up from the first lateral side of the foot plate,

wherein the second band end portion comes up from the second lateral side of the foot plate,

the first band end portion is formed from a nonflaccid material and is attached to the first lateral side of the foot plate with a hinge connection, and

the second band end portion is formed from a nonflaccid material and is attached to the second lateral side of the foot plate with a hinge connection,

and the first band end portion and the second band end portion arch over the top side of the foot plate when the drag link is engaged with the cross piece.

20. A buckle comprising

an elongated base plate having a pair of spaced apart parallel ears extending normally therefrom and a tang extending generally normally therefrom at a location spaced apart from the ears, said tang being positioned in a plane generally normal to the planes of the ears, said tang having a "C" shaped bend near an upper end thereof facing generally towards the ears,

a lever arm having a first end and a second end, the first end of the lever arm being pivotally connected to the ears of the base plate, said lever arm having a length which is greater than a distance between the ears and the tang on the base plate and having an inside cross piece positioned to ride over an outer surface of the "C" shaped bend of the tang and snap the lever arm into a locked position in which the elongated base plate and the lever arm are generally parallel, a portion of the "C" shaped bend of the tang protruding above an upper surface of the lever arm to permit the tang to be manually moved and the lever arm to be unlocked, and

a drag link having a first end and a second end, the first end of the drag link being pivotally connected to the lever arm at a location between the first end of the lever arm and the cross piece.

21. A buckle as in claim 20 wherein the first end of the lever arm is formed from a pair of generally parallel legs which extend to the cross piece and the first end of the drag link is sized to be received between the legs.

22. A buckle as in claim 20 wherein the base plate is stamped sheet metal and the tang is urged towards the cross piece of the lever arm when the lever arm is in the locked position.

23. A buckle as in claim 20 wherein the drag link carries a wire loop.

24. A lower leg brace element for a stilt, said lower leg brace element comprising

a first nonflaccid body defining a generally semi-cylindrical concave inside surface for supporting lateral area on a stilt user's lower leg, and a passage spaced apart from the generally semi-cylindrical concave inside surface for receiving a leg support of the stilt,

a second nonflaccid body defining a generally semi-cylindrical concave inside surface for supporting a posterior area on a stilt user's lower leg,

a first hinge connecting the first nonflaccid body and the second nonflaccid body,

a third nonflaccid body defining a generally semi-cylindrical concave inside surface for supporting an anterior area on a stilt user's lower leg, and

a second hinge connecting the first nonflaccid body to the third nonflaccid body.

25. A lower leg brace element as in claim 24 further comprising

a fastening assembly for bridging a gap between the second nonflaccid body and the third nonflaccid body and completing encirclement of a user's lower leg with the brace element.

26. A lower leg brace element as in claim 24 further comprising

a padded liner positioned across the concave surfaces of each of the first nonflaccid body, the second nonflaccid body, and the third nonflaccid body which biases the brace element towards an open position.

27. A lower leg brace element as in claim 24 wherein each of the nonflaccid bodies spans an angle in the range of 45 degrees to 120 degrees.

28. Apparatus comprising

a floor platform,

a shoe platform,

a pair of substantially vertically mounted supports pivotally connecting said floor platform and said shoe platform in a parallelogram configuration, said vertical supports spring-biased so as to urge said vertical supports and said platforms towards a rectangular configuration, and

a leg support mounted to one of said vertically mounted supports and extending upwardly above said shoe platform, said leg support having an upper end section,

a lower leg brace positioned on the leg support in superposition with respect to the shoe platform, and

an ankle brace positioned between the lower leg brace and the shoe platform.

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