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(54) **ERGONOMIC LEG STANDS**

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(57) **ABSTRACT**

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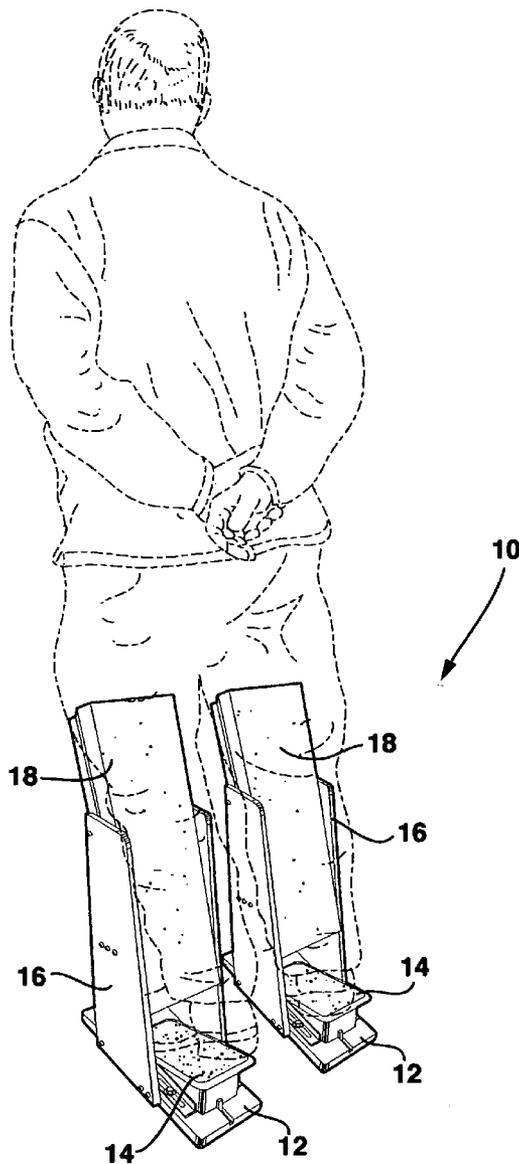
The present invention in one embodiment is a device to provide a comfortable or restful stance or both for a standing person. The invention in this embodiment includes a sole plate upon which the user places his or her foot. The sole plate is substantially planar and is oriented at an angle from the floor. The invention also includes a leg contacting member that is oriented at an angle from vertical. The user places his or her foot on the sole plate and leans forward so that the front part of their lower leg contacts the leg contacting member. The leg contacting member supports the user. In another embodiment, the invention is a method to provide comfort or rest or both to a standing person.

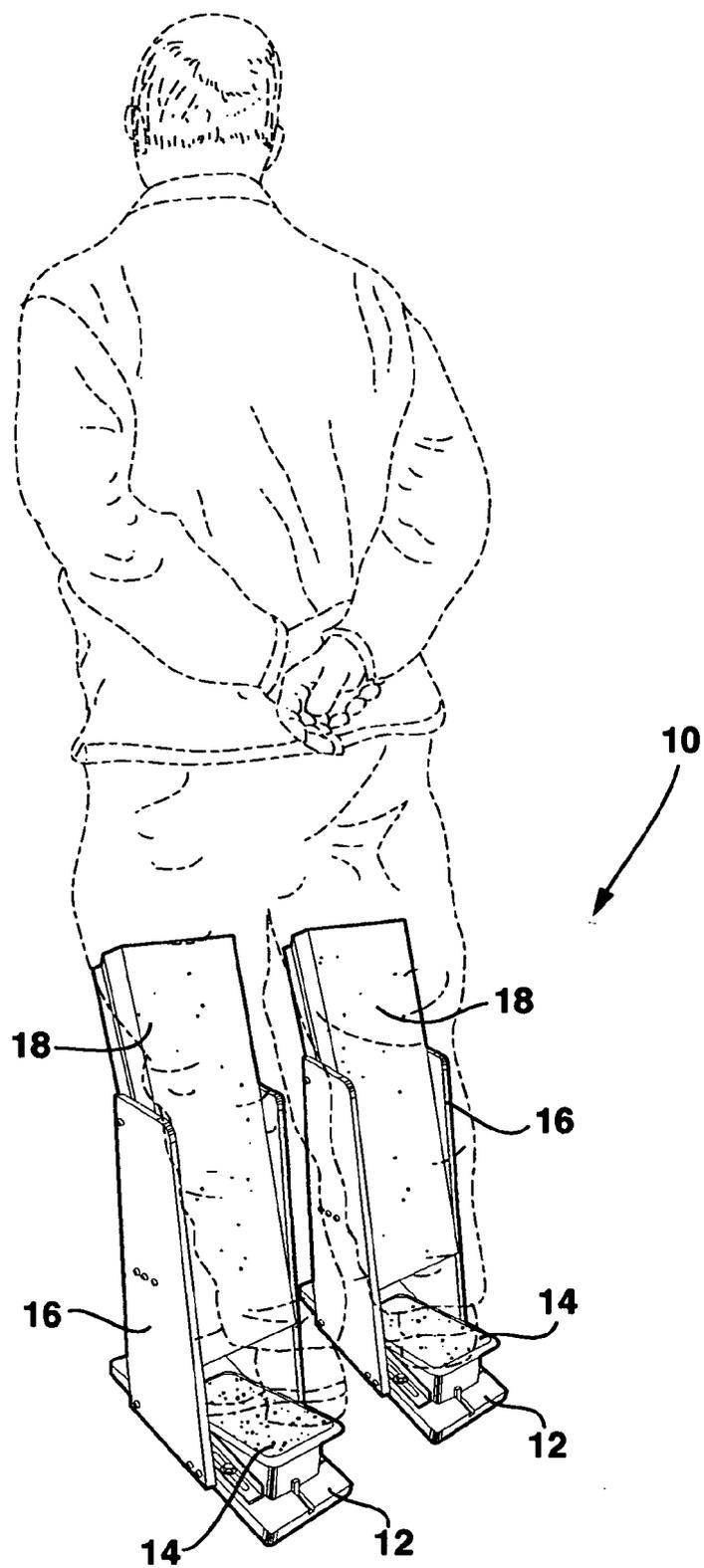
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**FIG. 1**

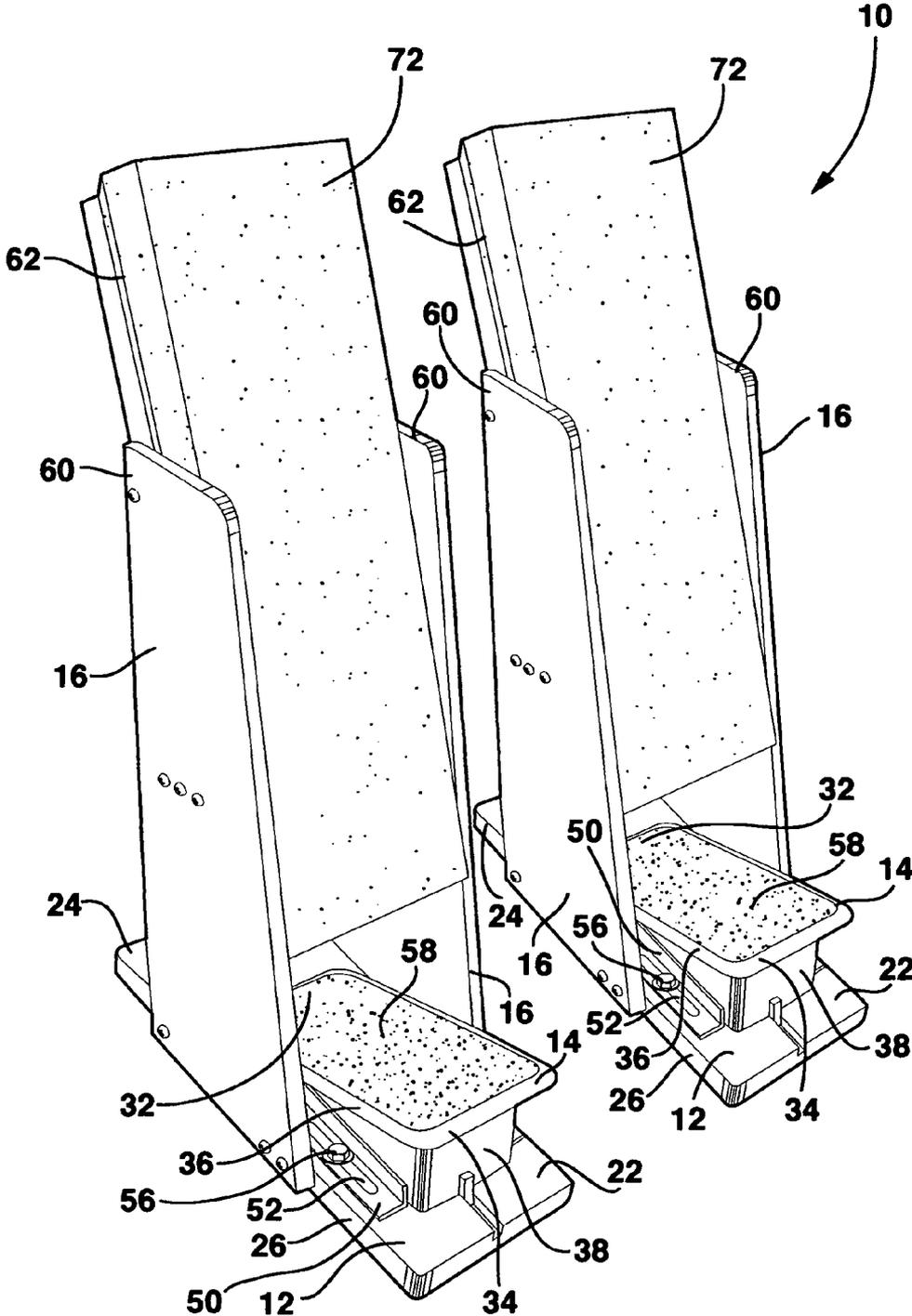
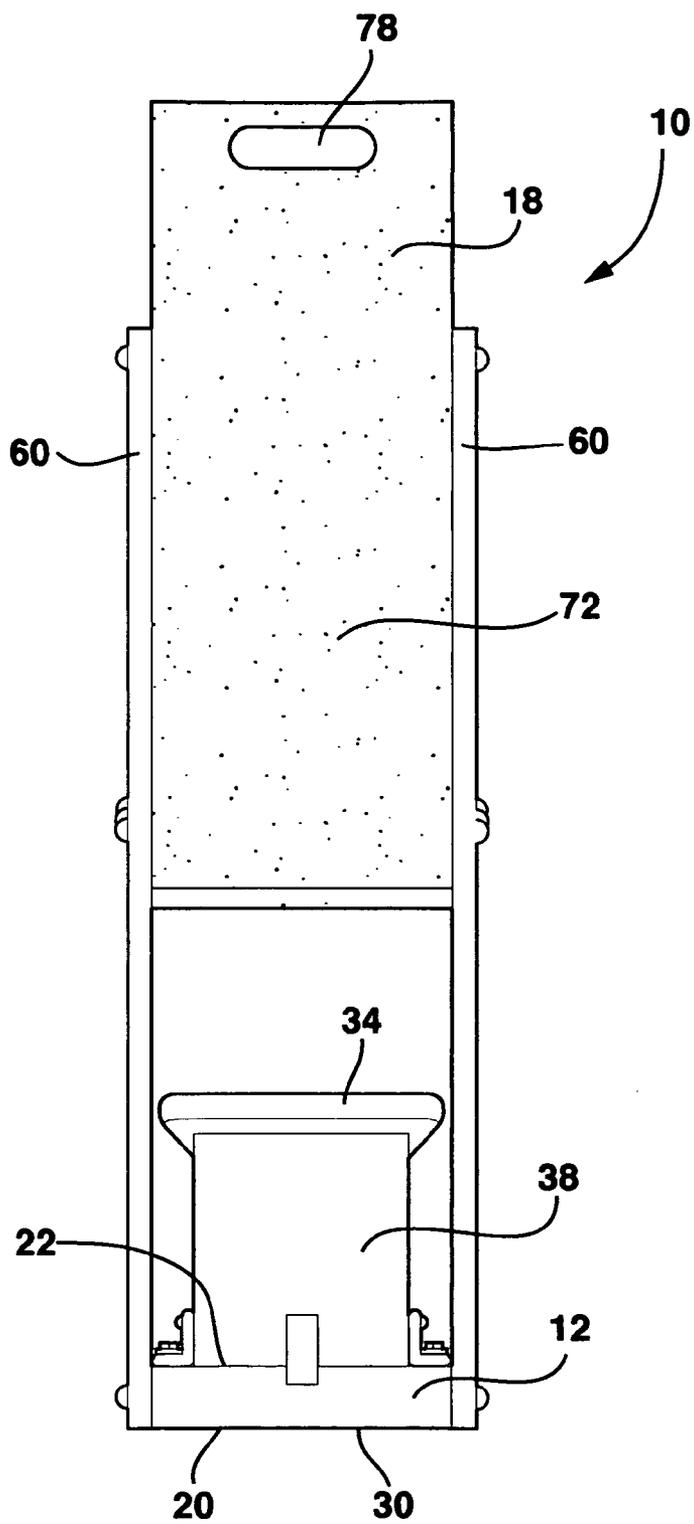


FIG. 2



**FIG. 3**

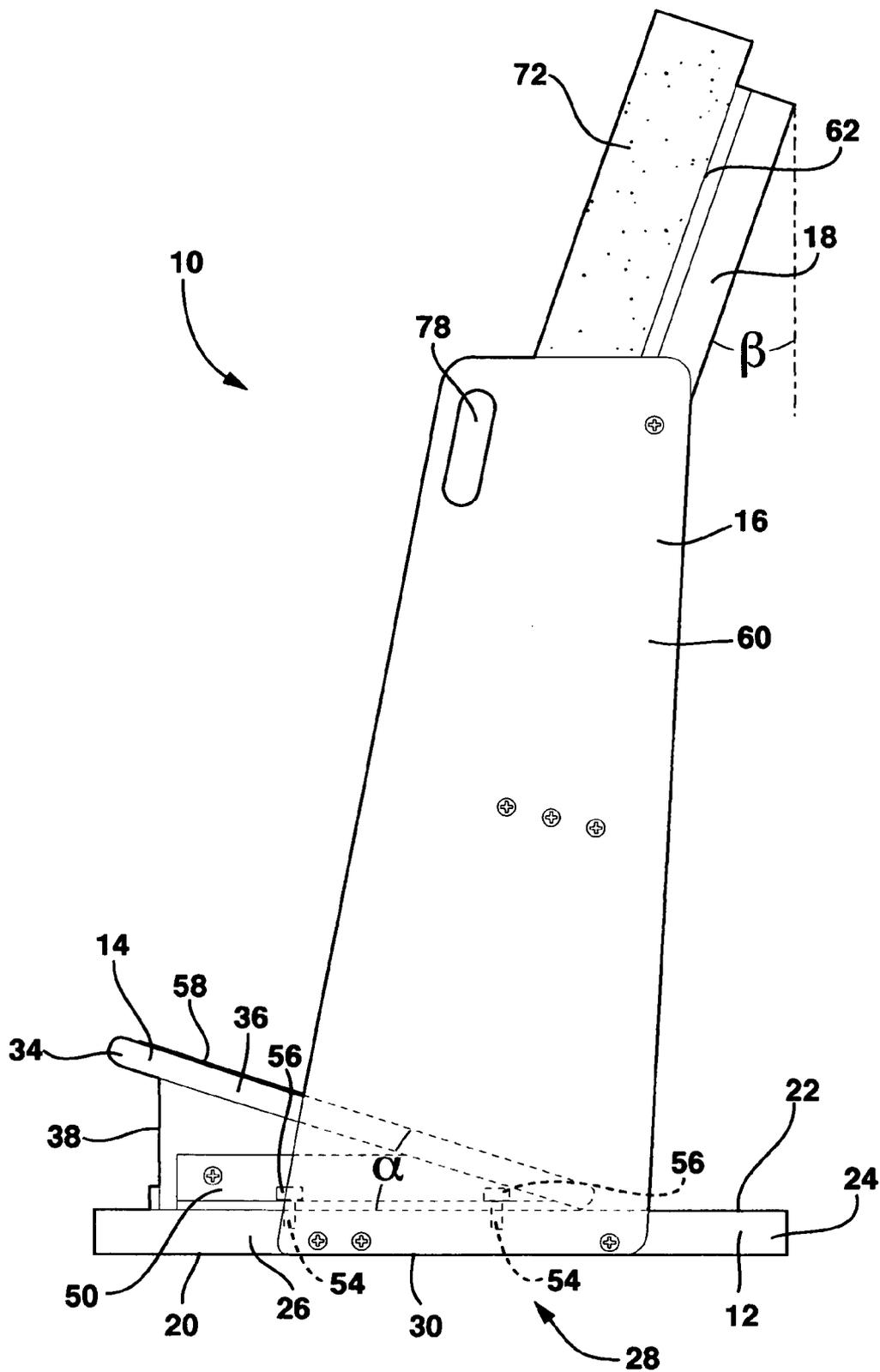


FIG. 4

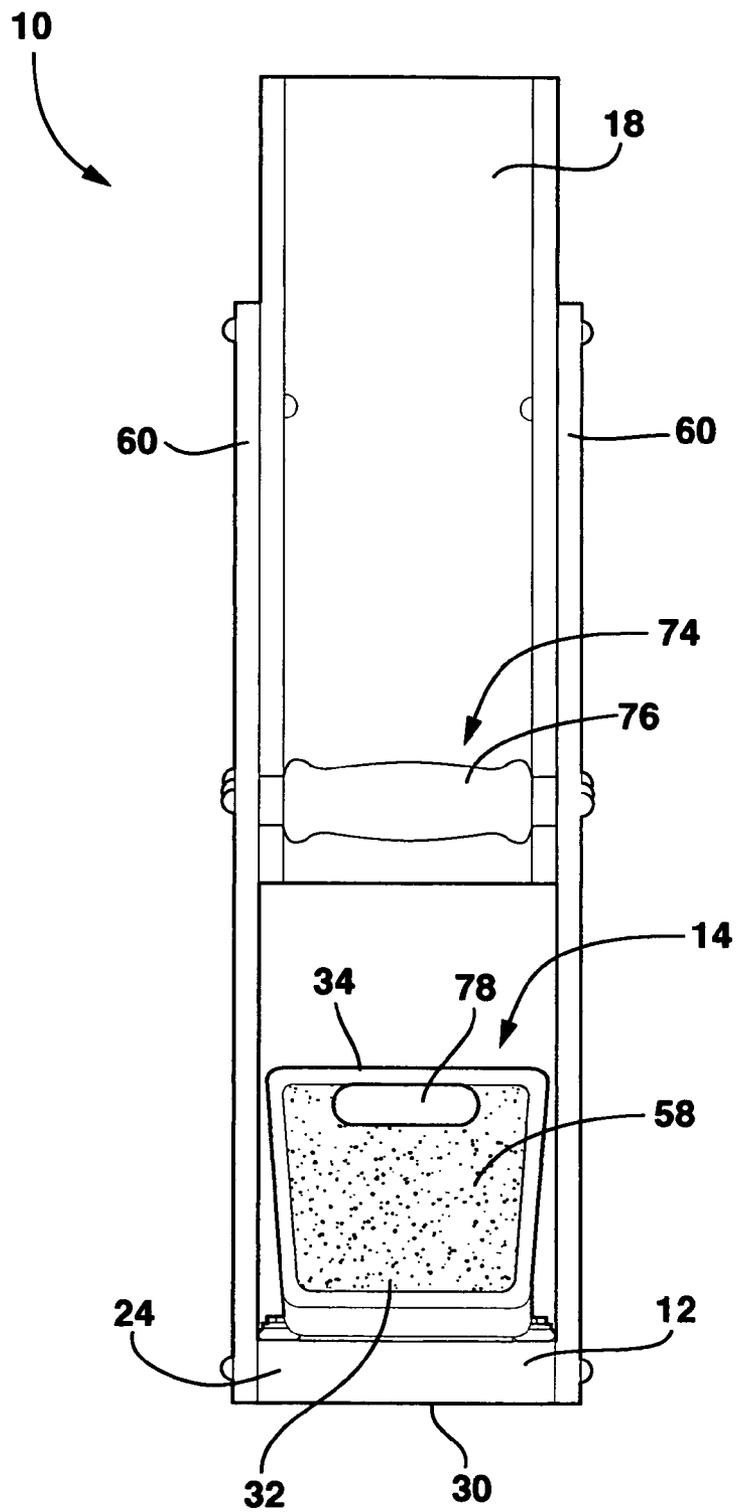
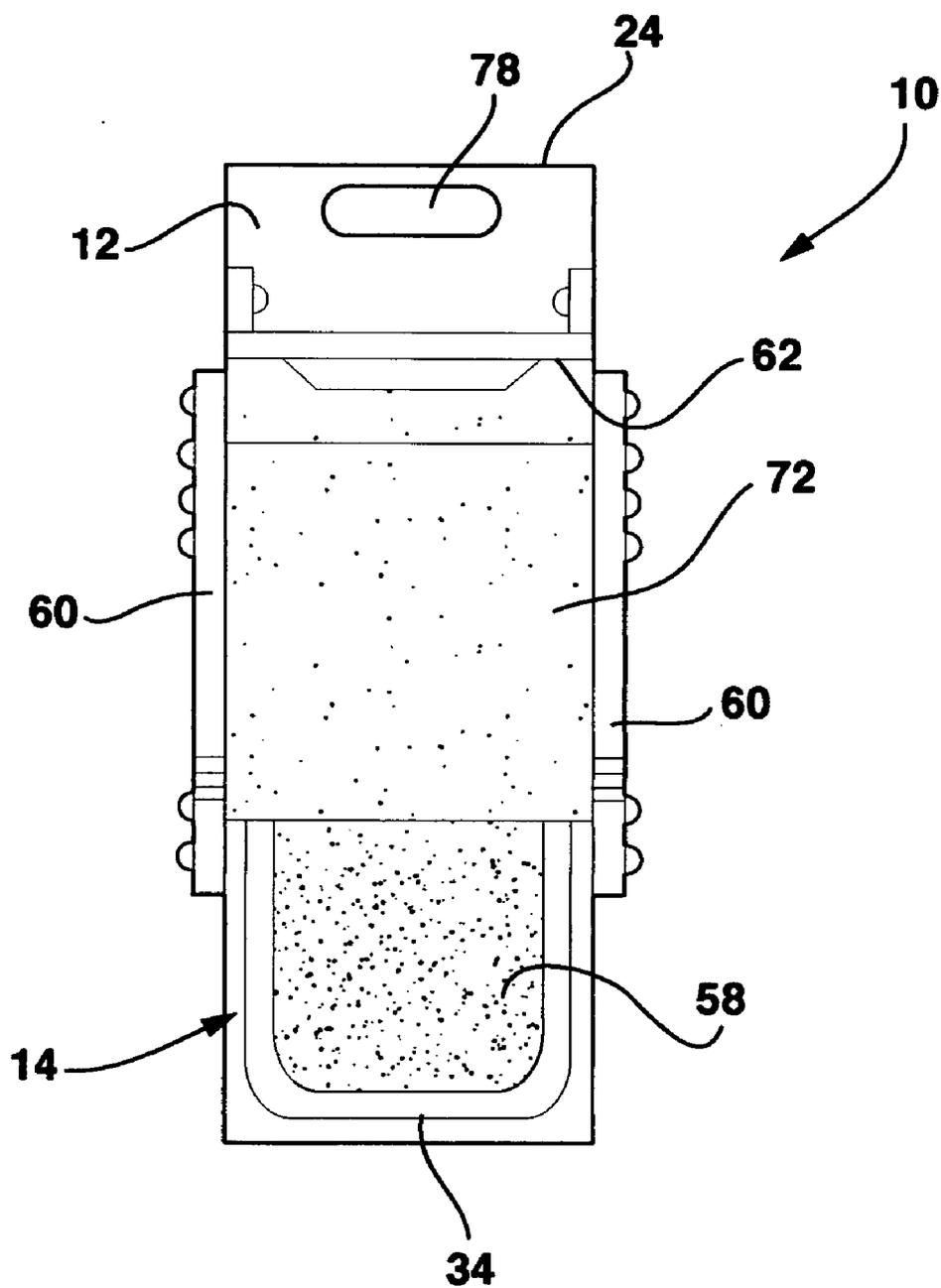
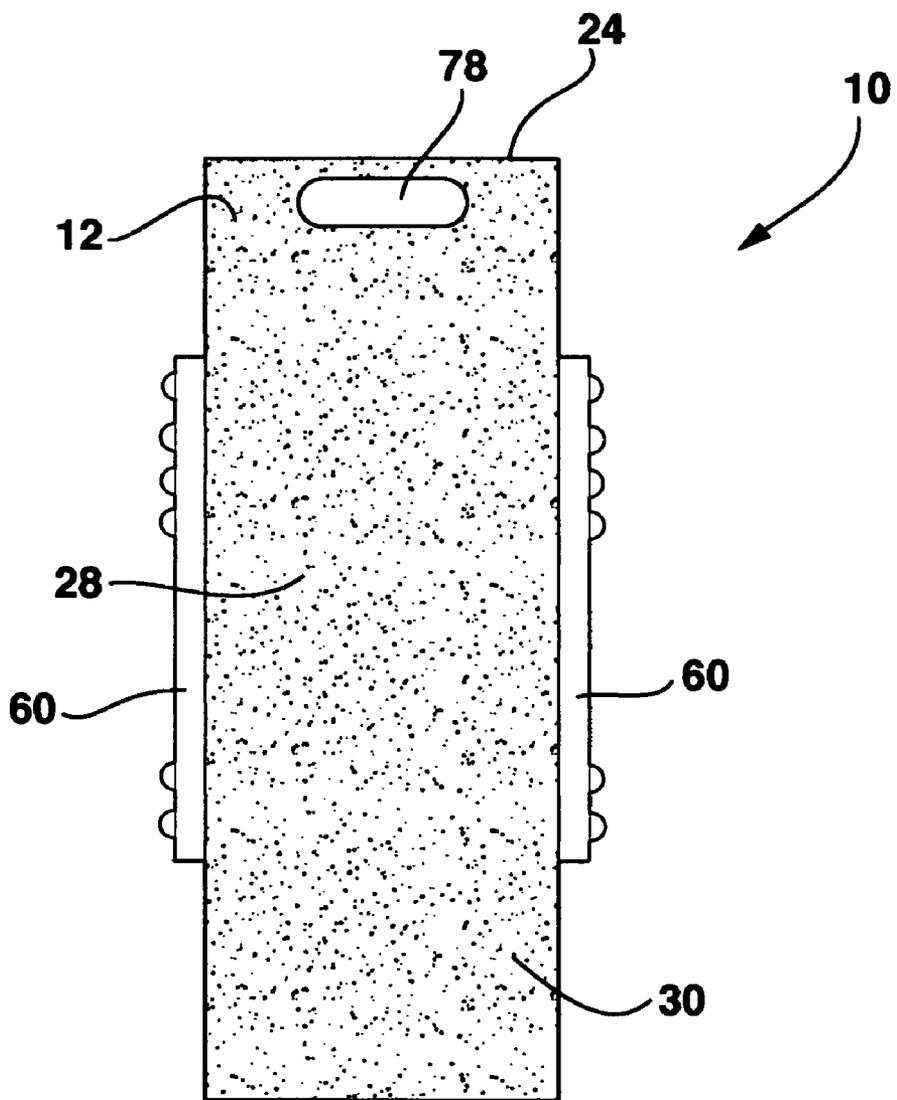


FIG. 5



**FIG. 6**



**FIG. 7**

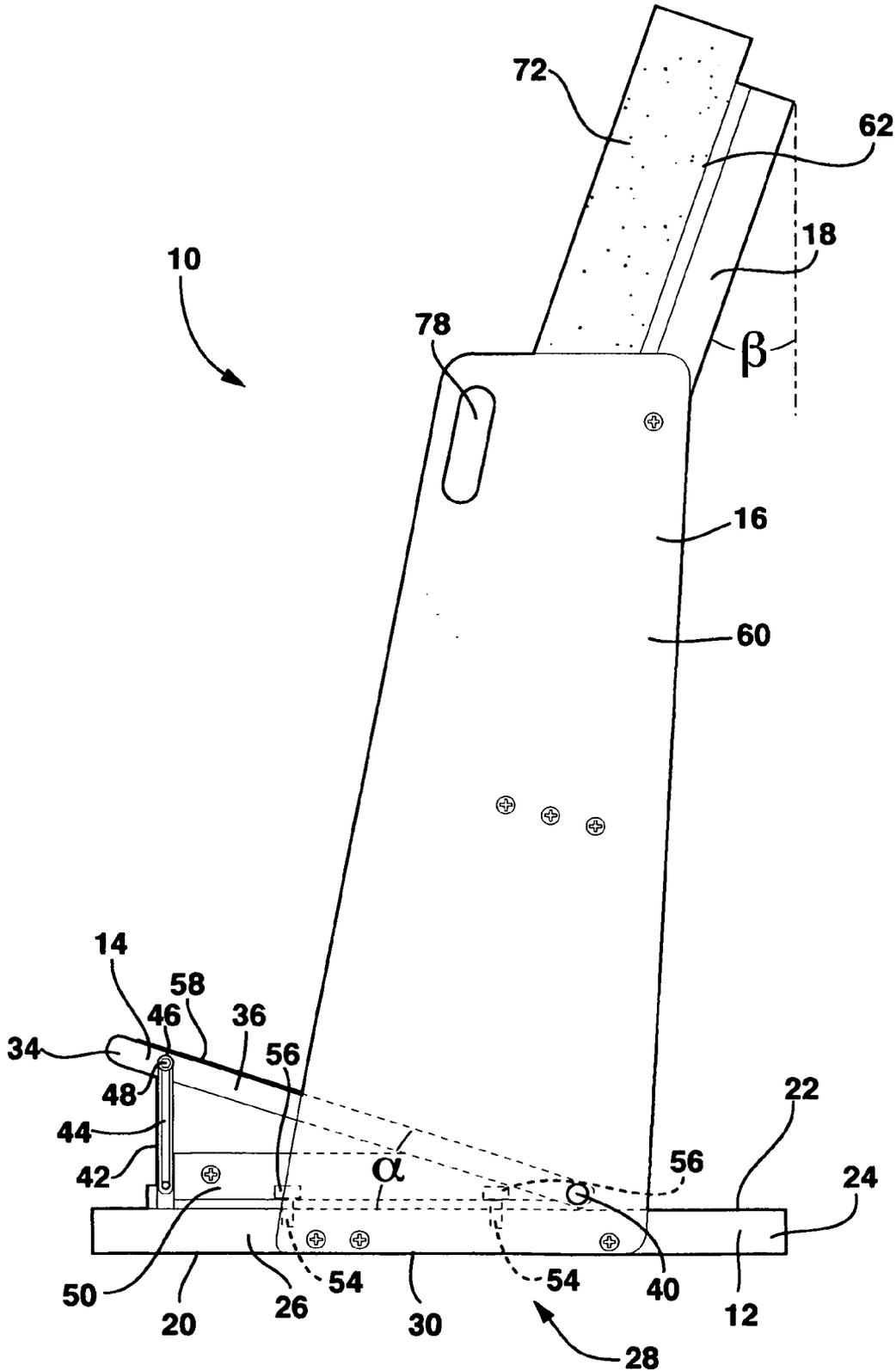


FIG. 8

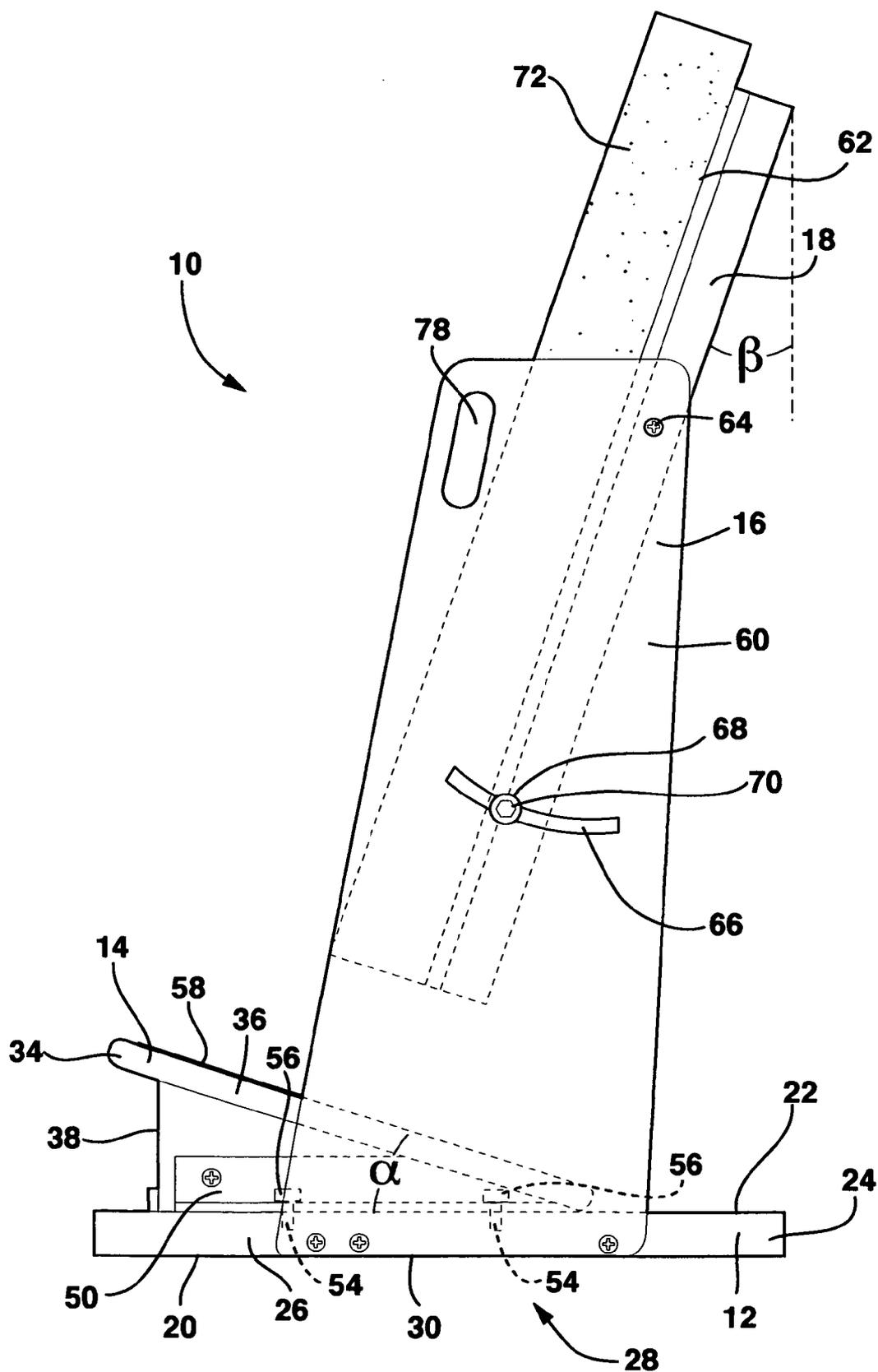


FIG. 9



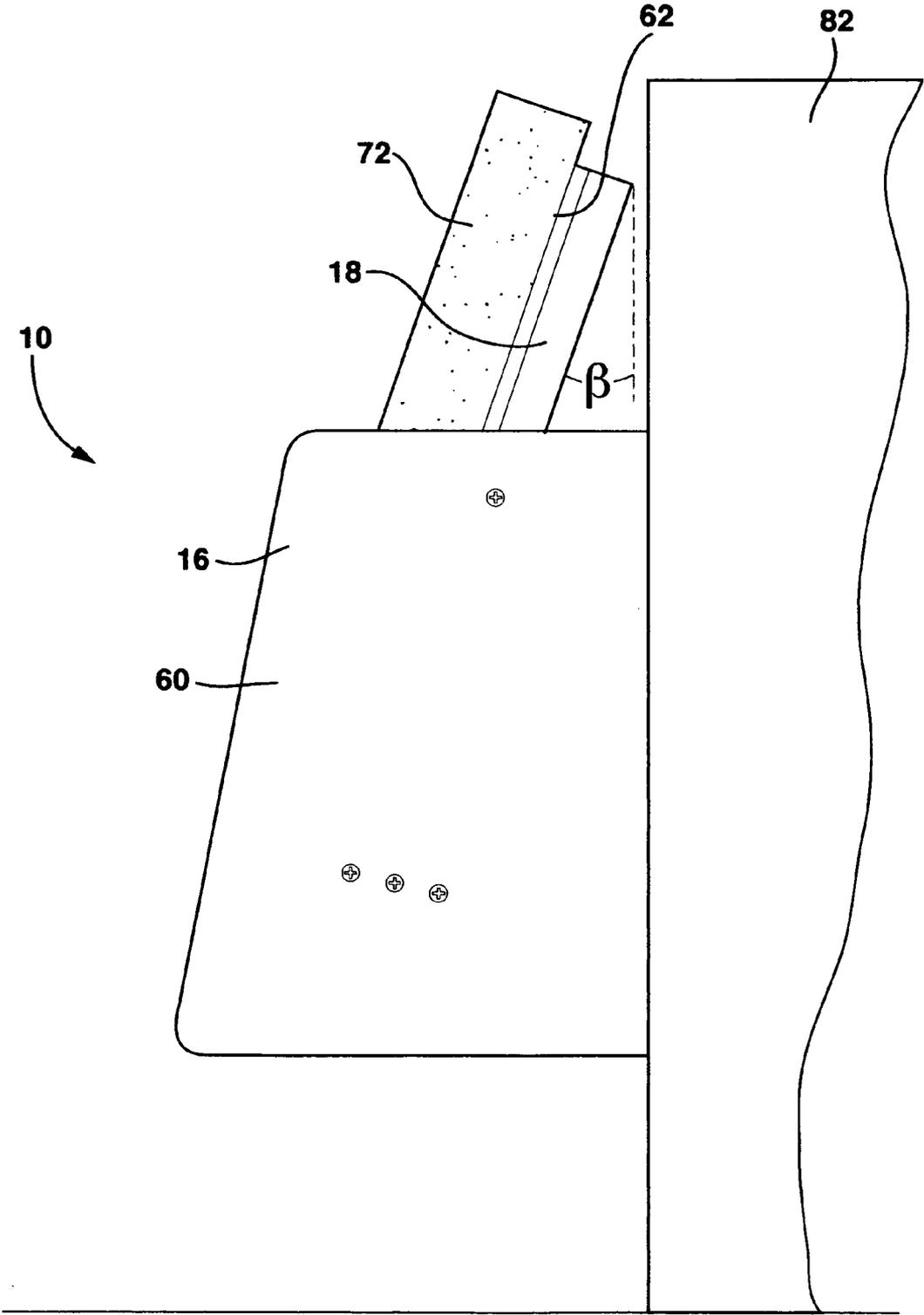


FIG. 11

**ERGONOMIC LEG STANDS**

**BACKGROUND OF THE INVENTION**

**[0001]** 1. Field of the Invention

**[0002]** The present invention is directed to a device and method for reducing stress and strain on a user's legs and back from standing.

**[0003]** 2. Description of Related Art

**[0004]** Many people have occupations or hobbies that require them to stand for long periods of time. These people often experience discomfort or pain in their legs or lower back as a result. Besides this discomfort or pain being particularly debilitating or annoying to the person experiencing the discomfort or pain, the collective cost to the US and world economy from such discomfort and pain is extremely large.

**[0005]** Humans, when standing, usually have their legs in a straight position, that is, with their knees locked. However, this knees locked configuration often becomes uncomfortable when standing for even more than a short time. A large part of this discomfort is believed to be due to continuous muscular contractions of the muscles of the lower extremities and back. Konz S. (1983) Work Design: Industrial Ergonomics. 2<sup>nd</sup> ed. New York: John Wiley & Sons. The National Institute for Occupational Safety and Health has recommended that "In operations where a standing workplace is used for a majority of the shift, it is desirable to avoid static postures requiring muscle contraction." Health Hazard Evaluation Report 90-251

**[0006]** In an attempt to provide more comfort when standing, people often try to change their posture to alleviate the continuous muscular contractions of the lower extremities and back. For example, if there is an object available such as a wall or post, the person often leans against the wall or post to take the strain off of the person's legs and muscles.

**[0007]** In addition, after standing for an extended period of time, a person will often stand, usually briefly, with their knees slightly bent in order to take some of the strain off of the person's legs and back. Unfortunately, human anatomy does not allow a person to maintain this position for long periods of time.

**[0008]** In view of the foregoing, it is desirable to produce a device that allows a human to change their posture while standing and thereby obtain relief from pain or discomfort or obtain rest or all of these.

**SUMMARY OF THE INVENTION**

**[0009]** The present invention in one embodiment is a device to provide a comfortable or restful stance or both for a standing person. The invention in this embodiment includes a sole plate upon which the user places his or her foot. The sole plate is substantially planar and is oriented at an angle from the floor. The invention also includes a leg contacting member that is oriented at an angle from vertical. The user places his or her foot on the sole plate and leans forward so that the front part of their lower leg contacts the leg contacting member. The leg contacting member supports the user. In another embodiment, the invention is a method to provide comfort or rest or both to a standing person.

**[0010]** There are many objects of the present invention in its various embodiments that may be addressed individually or in combinations and permutations. Each embodiment may address one or several of the following objectives.

**[0011]** An object of this invention in one embodiment or variant of the invention is to produce a device that reduces strain on a standing person's back or lower extremities.

**[0012]** Another object of this invention in one embodiment or variant of the invention is to produce a device that reduces strain on a standing person's lower extremities.

**[0013]** Another object of this invention in one embodiment or variant of the invention is to produce a device that reduces continuous muscular contractions of the muscles of the lower extremities and back.

**[0014]** Another object of this invention in one embodiment or variant of the invention is to produce a device that allows a person to rest while standing.

**[0015]** These and other objects and advantages of the invention will be clear in view of the following description to the invention including the associated drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0016]** The invention will be described hereafter in detail with particular reference to the drawings. Throughout this description, like elements, in whatever embodiment described, refer to common elements wherever referred to and referenced by the same reference number. The characteristics, attributes, functions, interrelations ascribed to a particular element in one location apply to that element when referred to by the same reference number in another location unless specifically stated otherwise. All Figures are drawn for ease of explanation of the basic teachings of the present invention only; the extensions of the Figures with respect to number, position, relationship, and dimensions of the parts to form the preferred embodiment will be explained or will be within the skill of the art after the following description has been read and understood. Further, the exact dimensions and dimensional proportions to conform to specific force, weight, strength and similar requirements will likewise be within the skill of the art after the following description has been read and understood.

**[0017]** FIG. 1 is a perspective view of the leg stands of one embodiment of the invention in use.

**[0018]** FIG. 2 is a perspective view of the leg stand of the embodiment of the invention of FIG. 1.

**[0019]** FIG. 3 is a front view of the leg stands of FIGS. 1 and 2.

**[0020]** FIG. 4 is a side view of the leg stands of FIGS. 1 and 2.

**[0021]** FIG. 5 is a back view of the leg stands of FIGS. 1 and 2.

**[0022]** FIG. 6 is a top view of the leg stands of FIGS. 1 and 2.

**[0023]** FIG. 7 is a bottom view of the leg stands of FIGS. 1 and 2.

**[0024]** FIG. 8 is a side view of an alternate embodiment of the leg stands of the invention.

**[0025]** FIG. 9 is a side view of an alternate embodiment of the leg stands of the invention.

**[0026]** FIG. 10 is a perspective view of the leg stand of the embodiment of the invention of FIG. 1 with a binding.

**[0027]** FIG. 11 is a perspective view of an alternate embodiment of the leg stand of the invention.

**DETAILED DESCRIPTION OF THE INVENTION**

**[0028]** A leg stand of the present invention in one embodiment is shown in FIGS. 1-6 generally labeled 10. Each leg

stand 10 is intended to hold a leg of the user. Since most people have two legs, the user will typically use two leg stands 10. Typically, each leg stand 10 used by a user will be identical. As a result, a typical leg stand 10 will be described hereafter. But, as mentioned above, it is intended that a typical user will use two such leg stands 10.

[0029] The leg stand 10 in a preferred embodiment has a base 12, a sole plate 14, a leg contacting member support 16 and a leg contacting member 18. The base 12 has a lower side 20, an upper side 22, a base front end 24 and opposed sides 26. The base 12 is located at the bottom 28 of the leg stand 10 so that the lower side 20 contacts the floor that the user will be standing on. It is preferable that the lower side 20 have a high friction surface 30 (FIG. 7) so that the lower side 20, when in contact with the floor, will be retained in a selected position on the floor by friction between the friction surface 30 on the lower side 20 and the floor. This high friction surface 30 may result from the material itself used to make the lower side 20, a pattern cut, etched or molded into the lower side 20 or by the addition of a high friction material to the lower side 20 such as a spray on material like that sold under the trademark CODIT® and tape sold under the trademark 310 SAFETY-WALK® and 610 SAFETY-WALK® all sold by 3M Company Corporation in St. Paul, Minn. Other methods of making the friction surface 30 of the lower side 20 will occur to those skilled in the art and may be used so long as the lower side 20 holds the base 12 in a selected location on the floor.

[0030] The upper side 22 is directed upward from the floor and provides a support for the sole plate 14. The sole plate 14 provides a surface on which the user places the sole of his or her shoe. As a result, the sole plate 14 should be sized to allow substantially the entire sole of the user's shoe to be supported by the sole plate 14. The sole plate 14 is preferably substantially planar and has a sole plate front end 32, a sole plate back end 34 and opposed sides 36. The sole plate front end 32 is slightly lower (i.e., closer to the base 12) than the sole plate back end 34 for a purpose to be described hereafter. As a result, the sole plate 14 has a substantially wedge shaped configuration with respect to the base 12.

[0031] The sole plate 14 may itself be wedge shaped and rest on the upper side 22 of the base 12 or may rest on a wedge 38 (FIG. 2) that is attached to the upper side 22 and also to the sole plate 14. As mentioned above, the sole plate front end 32 is slightly lower than the sole plate back end 34 thereby producing the wedge shape described above. As a result of this configuration, the plane of the sole plate 14 will have an angular displacement  $\alpha$  from the base 12 of preferably between about 10 and 30 degrees. Although the preferred angular displacement  $\alpha$  of the sole plate 14 from the base 12 is between about 10 to 30 degrees, the angular displacement  $\alpha$  of the sole plate 14 from the base 12 may be less than 10 degrees or more than 30 degrees.

[0032] As mentioned, the sole plate 14 has an angular displacement  $\alpha$  with respect to the base 12 preferably between about 10 and 30 degrees. However, it is desirable in one embodiment of the leg stand 10 shown in FIG. 8 that the angular displacement  $\alpha$  be variable so that the sole plate 14 may be moved to an optimum angular displacement with respect to the base 12. This is accomplished in one embodiment of the leg stand 10 by having the sole plate 14 be connected to and pivot around a pivot 40 at the sole plate front end 32 and then by locking the sole plate back end 34 in a fixed and desired angular configuration with respect to the base 12.

[0033] The sole plate back end 34 may be locked in this fixed and desired angular configuration by, for example, attaching an elevation track 42 substantially vertically between the upper side 22 of the base 12 and along the opposed sides 36 of the sole plate 14 at the sole plate back end 34. The elevation track 42 has an elongated slot 44 through which one or more fastening screws 46 having a head 48 larger than the width of the slot 44 are placed. The fastening screws 46 pass through the slot 44 and are screwed into the opposed sides 36 of the sole plate 14. As the fastening screws 46 are loosened, the sole plate 14 may be moved upward or downwards around the pivot 40 to the most desirable position angular configuration  $\alpha$ . Thereafter, the fastening screws 46 are screwed into the sole plate 14 so that compressive and frictional contact between the head 48 and the elevation track 42 holds the sole plate 14 in the fixed configuration with respect to the base 12. Other methods for allowing the sole plate 14 to pivot upward or downwards with respect to the base 12 and then be held in position once a desired configuration has been established will occur to those skilled in the art and are intended to be part of this disclosure.

[0034] It is desirable in one embodiment of the leg stand 10 that the sole plate 14 be able to be moved toward or away from the base front end 24 in order to provide a comfortable position of the sole plate 14 for the user. This may be accomplished as shown in FIGS. 2-4 by attaching a linear motion track 50 along opposed sides 36 of the sole plate 14 or the wedge 28. The linear motion track 50 has an elongated linear motion track slot 52 through which one or more fastening screws 54 having a head 56 larger than the width of the linear motion track slot 52 are placed. The fastening screws 54 pass through the linear motion track slot 52 and are screwed into the upper side 22 of the base 12. As the fastening screws 54 are loosened, the sole plate 14 may be moved forward or backwards on the base 12 to the most desirable position. Thereafter, the fastening screws 54 are screwed into the base 12 so that compressive and frictional contact between the head 56 and the linear motion track 50 holds the linear motion track 50, and by extension the sole plate 14, in the fixed configuration on the base 12. Other methods for allowing the sole plate 14 to move forward or backwards on the base 12 and then be held in position once a desired configuration has been established, include but are not limited to a linear ratchet system, a cog and rail system or a rack and pinion system as will occur to those skilled in the art and are intended to be part of this disclosure.

[0035] Because the sole plate 14 will come in contact with the sole of the user's shoe, it is desirable that the sole plate 14 also have a high friction surface 58 in order to prevent the user's shoe from unintentionally moving once in contact with the sole plate 14. Once again, this high friction surface 58 may result from the material used to make the sole plate 14, a pattern cut, etched or molded into the sole plate 14 or by the addition of a high friction material to the sole plate 14 such as a spray on material like that sold under the trademark CODIT® and tape sold under the trademark 310 SAFETY-WALK® and 610 SAFETY-WALK® all sold by 3M Company Corporation in St. Paul, Minn. Other methods of making the sole plate 14 have a high friction surface 58, as will occur to those skilled in the art, may be used so long as the sole plate 14 holds a user's shoe in a nonmoving position on the sole plate 14.

[0036] A leg contacting member support 16 is attached to and extends upward from the base 12. The function of the leg

contacting member support 16 is to position and support the leg contacting member 18 and transfer any forces applied by contact between the user's leg and leg contacting member 18 to the base 12 as will be described hereafter. In one embodiment of the leg contacting member support 16 shown in FIGS. 1-5, the leg contacting member support 16 is made up of two side panels 60 that are attached to opposed sides 26 of the base 12 and extend upward from the base 12.

[0037] A leg contacting member 18 is attached to the leg contacting member support 16. The leg contacting member 18 has an inside surface 62 and a length such that the inside surface 62 contacts substantially all of a user's lower leg (i.e., the portion of the user's lower leg between the knee and ankle). In addition, the leg contacting member 18 preferably extends around the user's lower leg so that the user's lower leg is cradled in the leg contacting member 18. Although it is preferable that the leg contacting member 18 cradle the user's lower leg, this is not essential for the design of the leg contacting member.

[0038] In one embodiment of the leg stand 10, the leg contacting member 18 is rigidly attached to the leg contacting member support 16 so that the leg contacting member 18 is oriented at a slight angle  $\beta$  from the vertical. As a result of this configuration, the plane of the leg contacting member 18 will have an angular displacement  $\beta$  from the vertical of preferably between about 10 and 30 degrees. Although the preferred angular displacement  $\beta$  of the leg contacting member 18 from the vertical is between about 10 to 30 degrees, the angular displacement  $\beta$  of the leg contacting member 18 from the vertical may be less than 10 degrees or more than 30 degrees.

[0039] This is accomplished by placing the leg contacting member 18 between the two side panels 60 at the desired angle  $\beta$  and then securing the leg contacting member 18 to the side panels 60 by means such as screws, welds, mechanical contact, adhesives or other means well understood in the art. Further, the leg contacting member 18 and leg contacting member support 16 may be molded or formed in a single integral piece producing the desired angle  $\beta$  for the leg contacting member 18 and then be attached to the base 12 as described above. In a further variant of the leg stand 10, the leg contacting member 18, leg contacting member support 16 and base 12 may all be molded or formed in a single integral piece. In yet a further variant of the leg stand 10, the leg contacting member 18, leg contacting member support 16, base 12, sole plate 14 and wedge 38 may all be molded or formed in a single integral piece.

[0040] In one embodiment of the leg stand 10, the angle  $\beta$  is preferably about equal to the angle  $\alpha$  that the sole plate 14 makes with respect to the base 12. However, it may be desirable that angle  $\beta$  be different than the angle  $\alpha$  in order to provide optimal comfort for the user of the leg stand 10.

[0041] In another embodiment of the leg stand 10 shown in FIG. 9 the leg contacting member 18 is attached to the leg contacting member support 16 so that the angle  $\beta$  may be adjustable. In this embodiment of the leg stand 10, the leg contacting member 18 is attached to the side panels 60 through a pivot 64 that extends between the side panels 60 to allow the leg contacting member 18 to assume a wide variety of angles  $\beta$  with respect to the vertical. In this embodiment of the leg stand 10, once the desired angle  $\beta$  has been established for the leg contacting member 18, the leg contacting member 18 must be secured to the side panels 60 to preserve the angle  $\beta$  and to support the user's leg as will be described hereafter. This is accomplished by forming a securing slot 66 in at least

one of the side panels 60 and by placing a securing screw 68 having a head 70 through the securing slot 66 into the material of the leg contacting member 18. The curvature of the securing slot 66 corresponds to the arc made by rotating the securing screw 68 around the pivot 64 as the leg contacting member 18 rotates around the pivot 64.

[0042] Once the leg contacting member 18 is moved into the desired configuration thereby forming the desired angle  $\beta$ , the securing screw 68 is tightened so that frictional and compressive contact between the head 70 of the securing screw 68 and a side panel 60 retains the leg contacting member 18 in this desired angular configuration  $\beta$ .

[0043] As described above, the sole plate 14 rests on the base 12 and supports the sole of the user's shoe. As a result, the base 12 preferably has a width sufficient to allow the sole plate 14 to be placed between the two side panels 60 so that the sole of the user's shoe may be comfortably placed on the sole plate 14 between the two side panels 60. The base 12 also preferably has a length such that the base 12 extends forward beyond the center of gravity produced in the user by contact between the user's leg and the leg contacting member 18 as will be described hereafter.

[0044] As the user uses the leg stand 10 as will be described hereafter, the user's lower leg bears against the leg contacting member 18. Because the leg contacting member 18 forms an angle  $\beta$  with the vertical, the user's body will lean forward thereby moving the user's center of gravity forward. This will produce a forward pressure against the leg contacting member 18 that will be transferred to the base 12 by the leg contacting member support 16. This forward pressure will cause the base 12 to want to move or tip forward which might cause the user to lose his or her balance and fall. But, with the base front end 24 extending sufficiently far forward (i.e., more forward than the center of gravity of the user as the user's lower leg contacts the leg contacting member 18), the leg stand 10 is prevented from tipping forward so that the user is comfortably supported in the leg stand 10 by contact between the user's lower leg and the leg contacting member 18. Because the user is comfortably supported in the leg stand 10, the user will not maintain the continuous muscular contractions of the muscles of the lower extremities and back that would ordinarily result from standing and as a result will experience less fatigue or pain and may in fact rest while standing in the leg stand 10.

[0045] In use, as will be described hereafter, the user's leg will contact the inside surface 62 of the leg contacting member 18 when the user places his or her foot on the sole plate 14 and leans forward (FIG. 1). As a result, at least a portion of the user's weight is pressed against this inside surface 62. Therefore, in order to provide comfort to the user, the inside surface 62 preferably has a padded surface 72 to provide a cushion between the user's leg and the inside surface 62. This padded surface 72 is preferably a somewhat compressible material such as an open or closed cell foam, urethane or other material having the property of being somewhat compressive yet being capable of supporting and cushioning contact with a user's leg.

[0046] The leg stands 10 of the present invention are intended to be rugged and durable and provide a safe, comfortable and long-lasting support for the user. As a result, the materials of the leg stand 10 should be chosen to be strong and durable. Further, it is anticipated that the leg stand 10 will be moved from place to place as needed. As a result, it is also preferable that the materials used in making the leg stand 10

be fairly light weight in order to assist in moving the leg stand from place to place. Examples of the material used to form the base **12**, sole plate **14**, the leg contacting member support **16** and leg contacting member **18** include, but are not limited to, polycarbonate plastic (e.g., polycarbonate plastic sold under the trademark LEXAN® by Saudi Basic Industries Corp of Saudi Arabia), ABS plastic, carbon fiber, wood including plywood, aluminum and other materials as will occur to those skilled in the art.

[0047] As mentioned herein, it is preferable that the leg stand **10** be able to be moved from place to place so as to be used by the user wherever the user finds it necessary to stand. As a result, in one embodiment of the leg stand **10**, a handle **74** (FIG. 5) is placed between the side panels **60** in order to allow the user to grasp the handle and thereby move the leg stand **10** from place to place. In a preferred embodiment of the handle **74**, the handle **74** includes a padded outer surface **76** in order to make it easier for the user to heft the leg stand **10** by using the handle **74**. Further, a handle may be formed, for example, as a slot **78** in the leg contacting member **18** (FIG. 3), side panel **38** (FIG. 4), sole plate **14** or base **12** (FIG. 6) or any combination of these.

[0048] In use, the user first establishes the angle  $\alpha$  of the sole plate **14** and the angle  $\beta$  of the leg contacting member **18** in those embodiments of the leg stand **10** allowing these adjustments to be made. In these embodiments, the fastening screws **46** and the securing screw **68** are loosened and the sole plate **14** and leg contacting member **18** moved into their desired configurations. Then the fastening screws **46** and the securing screw **68** are tightened into the sole plate **14** and leg contacting member **18**, respectively, to hold the sole plate **14** and leg contacting member **18** in the established and desired configurations.

[0049] In the embodiments of the leg stand **10** where the sole plate **14** and the leg contacting member **18** are not adjustable, or after the proper adjusted proper and desired adjustments have been made to the sole plate **14** and leg contacting member **18**, the user steps onto the sole plate **14** so that the sole of the user's shoe rests on the sole plate **14**. Then, the user allows his or her leg to come into contact with the padded surface **72** of the leg contacting member **18**. In this position, a portion of the user's weight will bear against the padded surface **72** of the leg contacting member **18** and be transferred through the interaction of the leg contacting member **18** with the side panels **60** to the base **12**.

[0050] As described above, the center of gravity of the user produced by contact between the user's leg and the leg contacting member **18** will be rearward of the base front end **24** of the plate **12** so that the leg stand **10** will not tip forward but will instead provide a support to the user. In this way, the user will be comfortably and securely supported by the leg stand **10** thereby reducing stress and strain on the user's leg and back and also providing rest for the user.

[0051] In one embodiment of the leg stands **10**, it is desirable that the user be able to move the leg stands **10** while the user is using the leg stands **10**. In other words, it may be desirable to move the leg stands **10** while the user is standing on the sole plate **14** with his or her leg against the leg contacting member **18**. This is accomplished in one embodiment by placing a binding **80** on the sole plate **14** so that the user's foot is removably attached to the sole plate **14**. This binding **80** is the type of well-known binding used on snowboards to allow a snowboard user to removably attach his or her foot to the snowboard. In this way, as the user moves his or her foot

in a motion more or less like walking, the leg stand **10** will move with the user's foot. As a result, the user will be able to move the leg stand **10** from place to place.

[0052] The leg stand **10** of the present invention has been described as having a leg contacting member **18** connected to a base **12**. However, another embodiment of the leg stand **10** has the leg contacting member **18** connected to some other stationary object **82** such as a bench, table, wall, counter, stands, partitions or similar structure (FIG. 10). In this embodiment, the leg contacting member **18** is connected directly to the bench, table, wall, counters, stands, partitions or similar structure that will securely position and support the leg contacting member **18** but still is oriented so that the leg contacting member **18** is oriented at a slight angle  $\beta$  from the vertical. In this way, the force transmitted to the leg contacting member **18** as the user leans forward into contact with the leg contacting member **18** is transmitted directly to the bench, table, wall, counters, stands, partitions or similar structure. Also in this embodiment, the sole plate **14** may also be attached directly to the bench, table, wall, counter, stand, partition or similar structure or may be attached directly to the floor at a position so that the user, when placing his or her shoe on the sole plate **14**, may then comfortably lean forward into contact with the leg contacting member **18**.

[0053] The present invention also includes a method of providing support to a standing user. This method comprises the steps of:

[0054] (a) supporting the sole of a user's shoe at an angle  $\alpha$  with respect to the floor; and

[0055] (b) supporting, at an angle  $\beta$  with respect to the vertical, the front of a user's leg when the user is supported in step (a).

[0056] A variant of this method comprises the steps of:

[0057] (a) providing a base contacting a floor;

[0058] (b) providing a support for the sole of a user's shoe that is attached to the base of step (a) which support forms an angle  $\alpha$  with respect to the floor; and

[0059] (c) providing a leg contacting member forming an angle  $\beta$  with respect to the vertical, the leg contacting member capable of being in contact with the front of a users leg when the user is standing on the support of step (a) and transferring the force of the user's weight from the leg contacting member to the base when the front of a user's leg is in contact with the leg contacting member.

[0060] It is not necessary that all of the steps in either method be done precisely in the order depicted. For example, all the steps may be performed at the same time or the steps may be done in any order. Other additions to or modifications to the disclosed process will occur to those skilled in the art.

[0061] In view the foregoing, a leg stand **10** is described that provides comfort, relief or rest to a user. The leg stand **10** has been described in connection with several embodiments, configurations and relative dimensions. However, the description above is not to be construed as being limited to the particular disclosed embodiments. It is to be understood that the description given herein has been given for the purpose of explaining and illustrating the invention and is not intended to limit the scope of the invention. For example, the specific form, size and material of the base **12**, sole plate **14**, leg contacting member support **16**, leg contacting member **18** and wedge **38** may be varied according to the desire of the user. Further, other means for adjusting the angles  $\alpha$  and  $\beta$  may be used so long as the function of variably supporting the sole of the user's shoe on the sole plate **14** and changing the angle that

the user's lower leg contacts the leg contacting member **18**, respectively, are accomplished. Also, in a particular embodiment, two leg stands **10** may be joined together to accommodate both legs of a user at the same time.

**[0062]** In addition, it is clear than an almost infinite number of minor variations to the form and function of the disclosed inventions could be made and also still be within the scope of the invention. Consequently, it is not intended that the inventions be limited to the specific embodiments and variants of the inventions disclosed. It is to be further understood that changes and modifications to the descriptions given herein will occur to those skilled in the art. Therefore, the scope of the inventions should be limited only by the scope of the claims.

I claim:

- 1.** A leg stand comprising:
  - a base having a lower side, an upper side, a base front end and base opposed sides wherein the lower side contacts the floor;
  - a sole plate having a sole plate front end, a sole plate back end and sole plate opposed sides, the sole plate connected to the base;
  - a leg contacting member support attached to and extending upward from the base; and
  - a leg contacting member attached to the leg contacting member support so that the leg contacting member is oriented at an angle from the vertical, the leg contacting member having an inside surface and a length such that the inside surface contacts a user's lower leg;
 whereby the leg contacting member support positions and supports the leg contacting member and transfers any forces applied by contact between the user's leg and the leg contacting member to the base.
- 2.** The leg stand of claim **1** wherein the lower side has a high friction surface whereby the lower side, when in contact with the floor, is retained in a selected position on the floor by friction between the friction surface on the lower side and the floor.
- 3.** The leg stand of claim **1** wherein the sole plate is sized to allow substantially the entire sole of the user's shoe to be supported by the sole plate.
- 4.** The leg stand of claim **1** wherein the sole plate is substantially planar.
- 5.** The leg stand of claim **1** wherein the sole plate front end is closer to the base than the sole plate back end.
- 6.** The leg stand of claim **5** wherein the sole plate is itself wedge shaped and rests on the upper side of the base.
- 7.** The leg stand of claim **5** further comprising a wedge that is attached to the upper side of the base and also to the sole plate so that the sole plate front end is closer to the base than the sole plate back end.
- 8.** The leg stand of claim **5** wherein the sole plate has an angular displacement from the base of between about 10 and 30 degrees.
- 9.** The leg stand of claim **5** wherein the sole plate has a variable angular displacement with respect to the base of between about 10 and 30 degrees.
- 10.** The leg stand of claim **9** further comprising:
  - a pivot connecting the sole plate at the sole plate front end to the base around which the sole plate rotates; and
  - means for locking the sole plate in a fixed and desired angular configuration with respect to the base.
- 11.** The leg stand of claim **10** wherein the means for locking comprises:

an elevation track attached substantially vertically between the upper side of the base and the sole plate back end, the elevation track having an elongated slot;

at least one fastening screw having a head larger than the width of the slot, the fastening screw capable of passing through the elongated slot;

whereby the at least one fastening screw passes through the slot and is screwed into the sole plate so that as the at least one fastening screw is loosened, the sole plate may be moved upward or downwards around the pivot to a most desirable angular configuration and thereafter, the at least one fastening screw is screwed into the sole plate so that compressive and frictional contact between the head and the elevation track holds the sole plate in the fixed configuration with respect to the base.

**12.** The leg stand of claim **1** further comprising means for moving the sole plate toward or away from the base front end in order to provide a comfortable position of the sole plate for the user.

**13.** The leg stand of claim **12** wherein the means for moving the sole plate toward or away from the base front end comprises:

a linear movement track functionally connected to the sole plate, the linear movement track having an elongated linear motion track slot;

at least one fastening screw having a head larger than the width of the linear motion track slot;

whereby, the at least one fastening screw passes through the linear motion track slot and is screwed into the upper side of the base so that as the at least one fastening screw is loosened, the sole plate may be moved forward or backwards on the base to a most desirable position and thereafter, the at least one fastening screws is screwed into the base so that compressive and frictional contact between the head and the linear movement track holds the linear movement track, and by extension the sole plate, in the fixed configuration on the base.

**14.** The leg stand of claim **1** wherein the sole plate has a high friction surface in order to prevent the user's shoe from unintentionally moving once in contact with the sole plate.

**15.** The leg stand of claim **1** wherein the leg contacting member support comprises two side panels attached to opposed sides of the base and extending upward from the base.

**16.** The leg stand of claim **1** wherein the leg contacting member extends around the user's lower leg so that the user's lower leg is cradled in the leg contacting member.

**17.** The leg stand of claim **1** wherein the leg contacting member is rigidly attached to the leg contacting member support.

**18.** The leg stand of claim **17** wherein the leg contacting member support comprises two side panels attached to opposed sides of the base and extending upward from the base and wherein the leg contacting member is placed between the two side panels at a desired angle and then secured to the side panels.

**19.** The leg stand of claim **17** wherein the leg contacting member and leg contacting member support are formed in a single integral piece producing the desired angle for the leg contacting member.

**20.** The leg stand of claim **17** wherein the leg contacting member, leg contacting member support and base are all formed in a single integral piece.

21. The leg stand of claim 17 wherein the leg contacting member is attached to the leg contacting member support at an angle so that the leg contacting member has an angular displacement from the vertical of between about 10 and 30 degrees.

22. The leg stand of claim 1 wherein the leg contacting member is attached to the leg contacting member support through means whereby the angle the leg contacting member makes with the vertical is adjustable.

23. The leg stand of claim 22 wherein the leg contacting member support comprises two side panels attached to opposed sides of the base and extending upward from the base and further comprising:

a pivot extending between the side panels and attaching the leg contacting member to the side panels so that the leg contacting member pivots around the pivot to assume a wide variety of angles with respect to the vertical; and means for securing the leg contacting member is a configuration producing a desired angle for the leg contacting member with respect to the vertical.

24. The leg stand of claim 23 wherein the means for securing comprises:

a securing slot formed in at least one of the side panels, the securing slot being curved;

at least one securing screw having a head placed through the securing slot into the material of the leg contacting member;

wherein the curvature of the securing slot corresponds to the arc made by rotating the securing screw around the pivot as the leg contacting member rotates around the pivot; and

wherein once the leg contacting member is moved into the desired configuration thereby forming the desired angle with respect to the vertical, the securing screw is tightened so that frictional and compressive contact between the head of the securing screw and a side panel retains the leg contacting member in this desired angular configuration.

25. The leg stand of claim 1 wherein the leg contacting member, leg contacting member support, base, sole plate and wedge are all formed in a single integral piece.

26. The leg stand of claim 1 wherein the leg contacting member support comprises two side panels attached to opposed sides of the base and extending upward from the base and wherein the base has a width sufficient to allow the sole plate to be placed between the two side panels so that the sole of the user's shoe may be comfortably placed on the sole plate between the two side panels.

27. The leg stand of claim 1 wherein the base has a length such that the base extends forward beyond the center of gravity produced in a user by contact between the user's leg and the leg contacting member.

28. The leg stand of claim 1 further comprising a padded surface attached to the inside surface of the leg contacting member.

29. The leg stand of claim 1 wherein the leg contacting member support comprises two side panels attached to

opposed sides of the base and extending upward from the base and further comprising a handle placed between the side panels in order to allow the user to grasp the handle and thereby move the leg stand from place to place.

30. The leg stand of claim 1 further comprising a handle formed as a slot in the leg contacting member, side panel, sole plate or base.

31. The leg stand of claim 1 further comprising a binding attached to the sole plate to removably attach the user's foot to the sole plate.

32. The leg stand of claim 1 wherein two leg stands are joined together to accommodate both legs of a user at the same time.

33. A leg stand comprising:

a leg contacting member support attached to a stationary object; and

a leg contacting member attached to the leg contacting member support so that the leg contacting member is oriented at an angle from the vertical, the leg contacting member having an inside surface and a length such that the inside surface contacts a user's lower leg;

whereby the leg contacting member support positions and supports the leg contacting member and transfers any forces applied by contact between the user's leg and the leg contacting member to stationary object.

34. The leg stand of claim 33 further comprising a sole plate attached directly to the stationary object.

35. The leg stand of claim 33 further comprising a sole plate attached directly to the floor at a position so that the user, when placing his or her shoe on the sole plate, may then comfortably lean forward into contact with the leg contacting member.

36. A method of providing support to a standing user comprising the steps of:

(a) supporting the sole of a user's shoe at an angle with respect to the floor; and

(b) supporting, at an angle with respect to the vertical, the front of a user's leg when the user is supported in step (a).

37. A method of providing support to a standing user comprising the steps of:

(a) providing a base contacting a floor;

(b) providing a support for the sole of a user's shoe that is attached to the base of step (a) which support forms an angle with respect to the floor; and

(c) providing a leg contacting member forming an angle with respect to the vertical, the leg contacting member capable of being in contact with the front of a users leg when the user is standing on the support of step (a) and transferring the force of the user's weight from the leg contacting member to the base when the front of a user's leg is in contact with the leg contacting member.

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