TRAINING ASSIST BRACE

Inventor: Henry Sichau, Morton Grove, Ill.
Assignee: Ballert Orthopedic Corp., Chicago, Ill.

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Primary Examiner—Richard A. Gaudet
Assistant Examiner—J. Yasko
Attorney, Agent, or Firm—Prangley, Dithmar, Vogel, Sandler & Stotland

ABSTRACT

A fully adjustable orthopedic training assist brace comprises a relatively rigid foot member having a heel portion and a stirrup connected thereto, an adjustable Velcro closure ankle strap and two crossing adjustable Velcro closure instep straps for securing the foot member to various size feet, and a pair of adjustable length lower leg members pivotally coupled to the stirrup at the ankle and having adjustable Velcro closure calf bands for attachment to the calf. Also provided is a thigh brace including a modified calf member having outwardly flared knee portions extending above the calf bands, a pair of adjustable length thigh members coupled to the knee portion for limited pivotal movement with respect thereto, and having adjustable Velcro closure thigh bands for attachment to the thigh, and a latch sleeve surrounding the joint between the thigh and calf members to lock them against pivotal movement.

5 Claims, 10 Drawing Figures
TRAINING ASSIST BRACE

In certain diseases, such as poliomyelitis cases, or after certain operations, the legs of the patient frequently become temporarily weakened or paralyzed, and in the treatment of such cases the weakened leg or foot must be supported in a suitable brace which will allow the patient to duplicate the natural movements of the foot and leg during walking, whereby the physical therapist will be able to assist the patient in recovering the greatest degree of mobility of the leg and foot, and also allows the therapist to train the patient to use the brace. It also is desirable that the foot be permitted as much freedom of movement as possible, particularly in the case known as "drop-foot," to allow exercise of the paralyzed or weakened muscles. Such action is of great benefit as it aids in restoring the muscles, it promotes proper circulation of the blood in the temporarily or permanently paralyzed limb and helps to prevent atrophy of the limb.

A primary object of the invention is to provide a training assist brace which finds greatest utility in the use of physical therapy rooms, hospitals and the like, wherein the physical therapist determines that some form of training assist brace is required for use by the patient, and wherein the therapist may see a great number of patients from day to day, the therapist being able to use the instant training assist brace on such great number of patients by making the necessary adjustments in the brace, and thereby eliminate the need for a large number of specialty braces heretofore normally required by the therapist. The present brace also allows the therapist to determine the degree of improvement in the patient and to make a determination as to the nature of the permanent brace to be worn by the patient if such permanent brace is necessary.

Normally the physical therapist at the hospital is required to maintain a substantial stock of various-sized braces because of the different sizes of the numerous patients' legs and feet which the therapist treats. The present invention provides a training assist brace for use by the therapist which is designed to be capable of being readily applied or removed from a patient's leg so that the training assist brace will fit the patient with maximum comfort and is light in weight in order not to unnecessarily fatigue the patient, yet the training assist brace will be usable on numerous patients, with varying size legs and feet.

A further object is to provide a training assist brace which may easily be fitted with an upper leg portion to provide additional leg support above the knee if the therapist deems such support to be required, and wherein the brace and upper leg portion may be adopted to legs of different individuals with the assurance that the knee joint will always be accurately positioned with respect to the patient's knee, thereby to allow proper movement of the leg.

The present invention relates to an orthopedic training assist brace which includes a foot portion adjustable to fit various patients, whether or not the patient is wearing a shoe, and also includes leg portions adjustable longitudinally and circumferentially to accommodate the patient's leg.

It is a general object of the present invention to provide a training assist brace which includes a sandal-type foot member having a plurality of adjustable Velcro fasteners and upper and lower leg members including adjustable Velcro calf and thigh fastening bands.

It is an important object of the present invention to provide an orthopedic training assist brace adjustable readily to fit various patients who have different sizes of feet and legs, the brace comprising a relatively rigid foot member including a heel portion, the heel portion engaging the heel of the foot of the patient and limiting rearward movement thereof with respect to the foot member, adjustable foot attachment means connected to the foot member for extending over the foot forwardly of the ankle to secure the foot to the foot member, a stirrup connected to the foot member and projecting upwardly therefrom adjacent to a side edge thereof, a lower leg member connected to the stirrup for pivotal movement with respect thereto adjacent to the ankle, a calf member adjustable coupled to the lower leg member adjacent to the upper end thereof and generally parallel thereto for varying the combined length of the calf and lower leg members, and adjustable calf attachment means connected to the calf member adjacent to the upper end thereof and extending in use about the calf of the patient for securing the calf member thereto.

In connection with the foregoing object, still another object of this invention is to provide an orthopedic training assist brace of the type set forth, wherein the calf member has a first abutment surface thereon, and further including a lower thigh member having a second abutment surface thereon and being connected to the calf member for pivotal movement with respect thereto adjacent to the knee, the first and second abutment surfaces being engageable with each other when the calf member and the lower thigh member are disposed generally in vertical alignment with each other in a straight-leg configuration for preventing pivotal movement of the thigh member forwardly with respect to the calf member, latch mechanism movable between a latching condition for holding the calf member and the lower thigh member in the straight-leg configuration thereof and a releasing condition accommodating pivotal movement of the calf member and the lower thigh member with respect to each other, an upper thigh member adjustable coupled to the lower thigh member adjacent to the upper end thereof and generally parallel thereto for varying the combined length of the upper and lower thigh members, and adjustable thigh attachment means connected to the upper thigh member adjacent to the upper end thereof and extending in use about the thigh of the patient for securing the upper thigh member thereto.

Further features of the invention pertain to the particular arrangement of the parts of the training assist brace whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawing, in which:

FIG. 1 is a front perspective view of a training assist brace constructed in accordance with and embodying the features of the present invention, showing a first embodiment of the calf member;

FIG. 2 is an enlarged fragmentary view in vertical section of a portion of the calf member of FIG. 1, showing the pivot adjusting means;
FIG. 3 is an exploded view of the stirrup of the training assist brace of FIG. 1; FIG. 4 is an enlarged exploded view of the vertical adjustment means of the training assist brace of FIG. 1;

FIG. 5 is a top-plan view of the calf and fastening means of the training assist brace of FIG. 1; FIG. 6 is an enlarged view in vertical section taken along the line 6—6 in FIG. 5, and showing the fastening means on the calf band; FIG. 7 is a front perspective view of a second embodiment of calf member with attached thigh member constructed in accordance with and embodying the features of the present invention, with the parts shown in a straightleg configuration;

FIG. 8 is an enlarged fragmentary side elevational view in partial section of the knee-joint latch mechanism of the training assist brace of FIG. 7;

FIG. 9 is a view in vertical section taken along the line 9—9 of FIG. 8, showing further details of the knee-joint latch mechanism; and

FIG. 10 is a fragmentary front perspective view of the training assist brace of FIG. 7, shown in the bent-knee configuration thereof.

Referring now more particularly to FIGS. 1 through 6 of the drawings, there is shown a training assist brace, generally designated by the numeral 50, which includes a foot pad 60 and a double-action lower leg brace 80, adapted to have adjustable connected thereto either a calf member 100 or an upper leg assembly 200 (FIG. 7). Secured to the foot pad 60 and forming a rigid spine therefor is a generally conventional caliper stirrup 55 having a foot plate 51 provided adjacent to one end thereof with a pair of transversely extending slots 52 respectively extending inwardly from the opposite sides of the foot plate 51. The conventional stirrup is modified so that the foot plate 51 has a pair of openings or holes 53 extending therethrough and communicating with the slots 52.

A pair of upstanding calipers 54 are also provided, constructed substantially as mirror images of each other, each of the calipers 54 including a relatively short mounting flange 56 integral therewith and extending therefrom substantially normal thereto at one end thereof and shaped and dimensioned to be received in a corresponding one of the slots 52 in the foot plate 51. When the mounting flanges 56 are respectively inserted in the slots 52, they may be secured to the foot plate 51 by rivets or other suitable fasteners 57 which are received through the holes 53 and through any of the attachment flanges 56. Each of the calipers 54 has a part circular upper end provided with a circular opening 58 extending therethrough and having a pair of substantially radially extending abutment surfaces 59 for a purpose to be described more fully below.

The foot pad 60 includes a relatively rigid outer sole 61 which may be constructed of leather or rubber or other suitable material, and an insole 62 fixedly secured to the outer sole 61 and substantially congruent therewith. Preferably, the foot plate 51 of the stirrup 55 is sandwiched between the outer sole 61 and the insole 62 for securely fastening the stirrup 55 to the foot pad 60, with the calipers 54 respectively extending upwardly from the opposite sides of the foot pad 60 adjacent to the rear end thereof to points adjacent to the opposite sides of a patient's ankle. Wrapped around the rear end of the foot pad 60 and secured thereto and extending vertically upwardly therefrom is a heel member 63 for receiving the heel of the foot and limiting rearward movement of the foot with respect to the foot pad 60.

Respectively secured to the heel member 63 of the opposite edges thereof and projecting upwardly and forwardly therefrom are two ankle straps 65 and 66 respectively provided with mating patches 67 of synthetic materials which adhere when pressed together, such as those sold under the trademark "Velcro", for fastening the ankle straps 65 and 66 together, thereby to secure the foot to the foot pad 60 and limit forward and upward movement of the foot with respect to the foot pad 60. More particularly, the Velcro material includes a first patch providing a plurality of monofilament hooks and a second fabric pad which engages the hooks. Each of the ankle straps 65 and 66 is of sufficient length to accommodate a wide range of adjustments in the length of the fastened-together straps, thereby to accommodate a wide range of foot sizes.

Also secured to the foot pad 60 are two pairs of instep straps, generally designated by the numeral 70, each of the pairs of straps 70 including a front strap 71 and a rear strap 72, each having one end thereof fixedly secured between the outer sole 61 and the insole 62. Preferably, the pairs of straps 70 are arranged in a criss-cross relationship, with the front straps 71 being respectively secured to the opposite sides of the foot member 62 adjacent to the front end thereof and with the rear strap 72 being respectively secured to the opposite sides of the foot pad 60 just forwardly of the calipers 54, as is illustrated in FIG. 1. Each pair of straps 71 and 72 is provided with mating Velcro patches 73 thereon for securing the strap ends together above the instep of the foot. Each of the straps 71 and 72 is of sufficient length to provide a wide range of adjustment to accommodate a wide range of foot sizes, whether or not the patient is wearing a shoe. Thus, it will be appreciated that the patient can readily step onto the foot member 60 with or without a shoe, thereby facilitating use of the device 50 as a physical therapy-training assist until the patient is ready for a permanent brace.

Respectively secured to the calipers 54 of the stirrup 55 and to extend upwardly therefrom along the inner and outer sides of the patient's leg are a pair of double-action lower leg brace members, generally designated by the numeral 80, which are constructed substantially as mirror images of each other, whereby only one of the brace members 80 will be described in detail. Each of the brace members 80 includes a control bar 81 having a clevis 82 at the lower end thereof for receiving therein the upper end of the corresponding caliper 54 for pivotal coupling thereto by means of a pivot pin or screw 83 adjacent to the ankle. The control bar 81 is provided with a pair of longitudinally extending bores 84 therethrough, the lower ends of the bores 84 opening between the legs of the clevis 82 and respectively overlying the bearing surfaces 59 on the associated caliper 54. Received in each of the bores 84 is a bearing 84a which rests upon the associated one of the stirrup caliper bearing surfaces 59, as best seen in FIG. 2. Also received in each of the bores 84 is a coil compression spring 85 having the lower end thereof seated on the bearing 84a and having the upper end thereof bearing against a set screw 86 which is threadedly received in the upper end of the bore 84. The upper end of the con-
trol bar 81 is provided with a laterally offset attachment portion 87 extending upwardly therefrom and adapted to be connected by means of rivets or other suitable fasteners 87a to the lower end of an elongated extension bar 88. The extension bar 88 preferably has a slightly outwardly flared upper end having centrally disposed therein an elongated slot 89 extending longitudinally of the bar 88.

The lower leg braces 80 may be connected alternatively to the calf member 100 or to the full upper leg assembly 200, as desired, depending upon the type of leg assist brace required, but the calf member 100 will be described first. The calf member 100 includes a pair of elongated bars 101 constructed as mirror images of each other, each of the bars 101 having a plurality of longitudinally spaced-apart holes 102 therein, each having a diameter substantially equal to the width of the slots 89 in the lower leg brace bars 88. In use, the calf member bars 101 are respectively disposed along the inner surfaces of the bars 88 in overlapping relationship therewith, with the holes 102 disposed in alignment with the holes 89 for receiving therethrough a pair of wire loop type set screws 103 for securing the bars 88 and 101 together. It will be understood that the amount of overlap of the bars 88 and 101 may be varied to adjust the length of the training assist brace 50 to accommodate different length legs. The wire loop type set screws make this adjustment relatively easy to accomplish without additional tools.

Secured to the inner and outer ones of the bars 101 adjacent to the upper end thereof by rivets or other suitable fasteners 104 are an inner calf band 105 and an outer calf band 106, each being of part-cylindrical shape and constructed of a flexible material such as leather. Each of the calf bands 105 and 106 is provided along the outer surface thereof with a pair of circumferentially extending and vertically spaced-apart Velcro patches 107, the outer calf band 106 also being provided on the inner surface thereof with a Velcro patch 108 adapted to mate with the Velcro patches 107.

In use, the free ends of the inner calf band 105 are received within the free ends of the outer calf bands 106 in overlapping relationship therewith, with the mating Velcro patches 107 and 108 being engageable for fastening the calf bands 105 and 106 together about the calf of a patient. Also provided are four Velcro strips 109, respectively adapted to mate with the Velcro patches 107 on the outer surfaces of the calf bands 105 and 106 at the front and rear sides of the calf bands when they are wrapped around the calf of the patient providing more secure closure.

In use, the patient places his foot onto the insole 62 of the foot pad 60 and against the heel member 63 and securely fastens the ankle straps 66 and 67 and the criss-crossing instep straps 71 and 72, firmly to secure the foot to the foot pad 60 and to prevent movement of the foot with respect to the foot pad 60. It will be noted that the calipers 54 are adapted to extend upwardly on the inner and outer sides of the ankle, the length of the calipers 54 being such that the pivotal connection between the calipers 54 and the lower leg brace control rods 81 will be positioned substantially at the patient's ankle to accommodate either dorsiflexion or plantarflexion movements of the foot, depending on the type of movement the therapist deems necessary. While two of the compression springs 85 have been illustrated in FIG. 2, in normal use only one of the springs 85 will be used, the spring 85 being placed in either the front or rear one of the bores 84, respectively to limit either plantarflexion or dorsiflexion. By appropriate adjustment of the set screws 86, the compression of the spring 85 may be varied to adjust the force which opposes and counterbalances the flexion to be limited.

When the overlap of the bars 88 and 101 has been adjusted to the appropriate length of the patient's leg and the set screws 103 have been firmly fastened in place, the calf bands 105 and 106 are respectively wrapped around the inner and outer sides of the calf and are secured together by the Velcro patches 107 and 108 and the Velcro strips 109 in the manner indicated in the drawings, the circumferential lengths of the calf bands 105 and 106 being such as to permit a wide range of overlap, thereby to accommodate a wide range of patient calf sizes.

Referring now also to FIGS. 7 through 10 of the drawings, there is illustrated an upper leg assembly, generally designated by the numeral 200 which may alternatively be attached to the lower leg brace 80, the assembly 200 including a calf brace, generally designated by the numeral 210, a lower thigh brace generally designated by the numeral 220 and an upper thigh brace generally designated by the numeral 240. The calf brace 210 includes a pair of extension bars 211 constructed as mirror images of each other, each of the bars 211 being provided with an outwardly flared upper end 214 and having a plurality of longitudinally aligned spaced-apart openings 213 therein adjacent to the lower end thereof. The bars 211 are respectively adapted to be disposed along the inner surfaces of the bars 88 in overlapping relationship therewith and adjustably secured thereto by the wire loop type set screws 103 in the same manner as was described above with respect to the calf member 100. Respectively secured to the inner and outer ones of the bars 211 by suitable fasteners such as the screws 222 and 224 and with the Velcro strips 209, identical in structure and function to the calf bands 105 and 106 described above, being additionally provided with Velcro straps 209, identical in structure and function to straps 109 described above.

Each of the calf brace bars 211 is provided at the upper end thereof with an inclined bearing surface 215, the bars 211 also having secured thereto adjacent to the upper end thereof a knee strap 216, preferably provided with a buckle 217 and a cushioning pad 218, the pad 218 being provided with loops 219 through which the strap 216 is received. In use, the strap 216 extends around the front of the patient's leg immediately below the knee to limit forward movement of the patient's knee with respect to the bars 211.

A pair of lower thigh brace members 220 are provided, constructed substantially as mirror images of each other, whereby only one of these braces 220 will be described in detail. Each of the lower thigh braces 220 is substantially in the form of an elongated bar having an outwardly flared lower end terminating at the bottom end thereof in a clevis having part-circular shaped legs adapted to receive therewithin the upper end of the corresponding one of the calf brace bars 211 and pivotally secured thereto by a pivot pin or screw 222. Preferably, the part-circular legs of clevis 221 have a diameter slightly greater than the portion of the
lower thigh brace 220 immediately thereabove, for a purpose to be described more fully below.

Formed on the lower thigh brace 220 between the elevis arms is an inclined bearing surface 223 shaped complementary to the bearing surface 215 on the calf brace 210. Disposed in surrounding relationship with the lower thigh brace 220 immediately above the elevis end 221 is a latch sleeve 225 having dimensions sufficient to accommodate sliding movement thereof with respect to the lower thigh brace 222, but insufficient to permit the latch sleeve 225 to pass over the elevis end 221, the sleeve 225 extending longitudinally of the thigh brace 220 a distance substantially equal to the vertical distance between the upper and lower edges of the inclined bearing surface 223. Centrally disposed in the outer surface of the lower thigh brace 220 adjacent to the upper end of the inclined bearing surface 223 is a cylindrical opening or recess 224 receiving therein a coil compression spring 227 of a ball bearing 226, the lip of the opening 224 being peened at 228 to retain the bearing 226 therein. Normally, the compression spring 227 urges the bearing 226 outwardly so that it projects outwardly beyond the outer surface of the lower thigh brace 220 a distance slightly greater than the clearance between the thigh brace 220 and the sleeve 225, as best seen in FIG. 9.

When the calf brace bars 211 and the lower thigh braces 220 are disposed substantially in vertical alignment in the straight-leg configuration illustrated in FIGS. 7 through 9, the inclined bearing surfaces 215 and 223 are disposed parallel to each other and cooperate to prevent further pivotal movement of the thigh brace 220 in a clockwise direction with respect to the calf brace 210, as viewed in FIG. 8. When the sleeve 225 is disposed against the enlarged elevis end 221, as viewed in FIG. 8, it surrounds the region of overlap between the inclined bearing surfaces 215 and 223 for locking the thigh braces and the calf brace members in the straight-leg configuration thereof and preventing pivotal movement thereof with respect to each other. When it is desired to bend the knee to pivot the thigh brace 220 rearwardly with respect to the calf brace 210, the sleeve 225 is moved upwardly along the thigh brace 220, deposing the bearing 226 against the urging of the compression spring 227, until the sleeve 225 is disposed in a releasing position completely above the bearing 226, as shown in broken line in FIG. 8. The sleeve 225 is retained in its releasing position by the bearing 226, whereby there is freely accommodated a rearward pivotal movement of the thigh brace 220 with respect to the calf brace 210 to a bent-knee position illustrated in FIG. 10. The adjustability of the lower brace portions via the set screws 103 permits placement of the pivot pin at the patient's knee joint, regardless of the length of the patient's calf.

Preferably, each of the lower thigh braces 220 has a middle inwardly bent portion immediately above the bearing 226 and an outwardly flared upward portion having centrally disposed therein an elongated slot 229 extending longitudinally of the thigh brace 220. Also secured to the middle portion of the thigh braces 220 is a knee strap 230, preferably provided with a buckle 231 and a cushioning pad 232, the pad 232 having loops 233 therein for accommodating therethrough the strap 230. In use, the strap 230 is fastened about the front portion of the patient's thigh immediately above the knee for cooperation with the strap 216 securely to position the patient's knee with respect to the upper leg assembly 200, the straps 216 and 230 each having a length sufficient to accommodate a wide range of different leg sizes.

The upper thigh brace 240 includes a pair of elongated bars 241 constructed as mirror images of each other, each of the bars 241 having a plurality of longitudinally spaced-apart holes 242 therein, each having a diameter substantially equal to the width of the slots 229. In use, the bars 241 are respectively disposed along the inner surfaces of the lower thigh braces 220 in an overlapping relationship therewith, with the holes 242 in alignment with the slots 229 for receiving therethrough the wire loop set screws 243, adjustably to secure the upper thigh brace 240 to the lower thigh braces 220.

Respectively fixedly secured to the bars 241 adjacent to the upper ends thereof as by rivets or other suitable fasteners 244 are an inner thigh band 245 and an outer thigh band 246, each being substantially part-cylindrical in shape and constructed of a flexible material such as leather or the like. Preferably, the thigh bands 245 and 246 are similar in construction and function to the calf bands 205 and 206, each of the thigh bands 245 and 246 being provided with outer Velcro patches thereon and the outer thigh band 246 having an inner Velcro patch thereon. Also provided are four Velcro strips 249 functioning in the same manner as the Velcro strip 109 described above. The thigh bands 245 and 246 are of sufficient length to accommodate a wide range of patient leg sizes and still provide overlapping of the Velcro patches to fasten the upper thigh brace 240 to the patient's thigh.

In use, the calf bands 205 and 206 and the thigh bands 245 and 246 are securely fastened about the calf and thigh of the patient in the same manner as was described above with respect to the calf bands 105 and 106, and the straps 216 and 230 are then secured across the front of the patient's leg immediately above and below the knee, it being readily appreciated that a wide variety of size adjustments are permitted to accommodate an accurate fit to the patient's leg.

In a preferred constructional example of the training assist brace 50 of the present invention, the outer sole 51 of the foot pad 60 may be of any suitable shoe sole material and may preferably be of the rubber crepe type. The insole 52 may be of any suitable material such as leather, whereby the foot pad 60 is adapted for use with or without the patient's shoe on, adding greater versatility to the brace. The straps 65, 66, 71, 72, 109, 209, 216, 230 and 249 may be formed of any suitable material such as leather or fabric, while the stirrup 55 and the bars 81, 88, 101, 211, 220 and 241 are all formed of metal, preferably duralumin. The rivets or pins 57 are disposed below the rear portion of the upper surfaces 62 of the foot pad 60, and by lifting that portion and removing the rivets or pins 57 it is easy to change the foot pad 60.

From the foregoing, it can be seen that there has been provided a novel orthopedic training assist brace usable whether or not the patient has his shoe on and characterized by maximum adjustability to accommodate a wide variety of patient foot, leg and shoe sizes.

More particularly, there has been provided an orthopedic training assist brace of the character described which includes a sandal-type foot member having
ankle and instep adjustable Velcro straps for accommodating a wide variety of patient foot sizes, whether or not the patient is wearing his shoe, and also provides full vertical adjustability whereby the device has utility as a training assistance device in physical therapy.

In addition, there has been provided an orthopedic training assist brace of the character described, which includes leg portions which are longitudinally and circumferentially adjustable, the circumferential adjustments including calf and thigh bands having Velcro fastening means thereon.

Finally, there has been provided an orthopedic training assist brace which includes a lower leg portion adaptable to be used with either a calf brace or with a full upper leg assembly which includes a calf brace and thigh braces pivotally coupled together in a knee joint. In this connection, there is also provided a novel knee joint latch for locking the knee joint in a straight-leg position.

While there have been described what are at present to be considered the preferred embodiments of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. An orthopedic training assist brace adjustable readily to fit numerous sizes of feet and legs, said brace comprising a relatively rigid foot member including a flat sole pad for readily receiving thereon the foot of the wearer with or without an associated shoe and a heel portion engaging the heel of the foot and limiting rearward movement thereof with respect to said foot member, adjustable ankle straps connected to said heel portion and two pairs of instep attachment straps connected to said foot member for extending over the foot forwardly of the ankle in a cross-criss pattern to secure the foot to said foot member, a stirrup connected to said foot member and projecting upwardly therefrom adjacent to a side edge thereof, a lower leg member connected to said stirrup for pivotal movement with respect thereto adjacent to the ankle, said lower leg member being provided at the upper end thereof with an elongated slot therethrough, adjustable bias means on said lower leg member to provide dorsiflexion and plantarflexion assistance to the foot of the wearer, a calf member having a plurality of longitudinally aligned spaced-apart holes therethrough, said calf member being disposed in use in overlapping relationship with said lower leg member with elected ones of said holes disposed in alignment with said slot, and fastening means receivable through said aligned holes and slot for adjustably coupling said lower leg member to said calf member to vary the combined length of said calf and lower leg members, and adjustable calf attachment means connected to said calf member adjacent to the upper end thereof and extending in use about the calf for securing said calf member thereto.

2. The orthopedic training assist brace set forth in claim 1, and including a pair of said lower leg members respectively disposed along the opposite sides of the leg of the wearer, and a pair of said calf members respectively connected to said leg members, said adjustable calf attachment means comprising a pair of calf bands respectively connected to said calf members and cooperating to surround the calf of the wearer with the free ends of one of said calf bands respectively disposed in overlapping relationship with the free ends of the other of said calf bands, and fastening means for securing together the overlapping ends of said calf bands.

3. An orthopedic training assist brace adjustable readily to fit numerous sizes of feet and legs, said brace comprising a relatively rigid foot member for accommodating a foot thereof and including a heel portion, said heel portion engaging the heel of the foot and limiting rearward movement thereof with respect to said foot member, adjustable foot attachment straps connected to said foot member for extending over the foot forwardly of the ankle to secure the foot to said foot member, a stirrup connected to said foot member and projecting upwardly therefrom adjacent to a side edge thereof, a lower leg member connected to said stirrup for pivotal movement with respect thereto adjacent to the ankle, a calf member having a first abutment surface thereon inclined with respect to the longitudinal axis thereof and being adjustable coupled to said lower leg member adjacent the upper end thereof and generally parallel thereto for varying the combined length of said calf and lower leg members, adjustable calf attachment means connected to said calf member and extending in use about the calf for securing said calf member thereto, a lower thigh member having a second abutment surface thereon inclined with respect to the longitudinal axis thereof and being connected to said calf member for pivotal movement with respect thereto adjacent to the knee, said first and second abutment surfaces being engageable with each other when said calf member and said lower thigh member are disposed substantially parallel to each other in a straight-leg configuration for preventing pivotal movement of said lower thigh member forwardly with respect to said calf member, a sleeve disposed in surrounding relationship with said lower thigh member for sliding movement longitudinally thereof between a latching condition and a relating condition, said sleeve in the latching condition thereof being engageable with the upper end of said calf member along the side edge thereof for preventing pivotal movement of said lower thigh member rearwardly with respect to said calf member thereby to lock said calf member and said lower thigh member in the straight-leg configuration thereof, said sleeve in the releasing condition thereof being out of engagement with said calf member for accommodating pivotal movement of said calf member and said lower thigh member with respect to each other, said lower thigh member having a widened stop portion at the bottom thereof dimensioned to prevent the passage of said sleeve thereover, and a depressible stop member projecting from said lower thigh member adjacent to the lower end of said second abutment surface for yieldably resisting the passage of said sleeve thereover, said sleeve in the latching condition thereof being disposed between said stop member and said widened stop portion and yieldably held in place thereby, said sleeve in the releasing condition thereof being disposed above said stop member and yieldably held out of said latching condition thereby, and two knee straps respectively disposed on said lower thigh member and said calf member immediately above and below the knee for strapping across the front of the leg securely to position the knee with respect to said calf member and said lower thigh member, an upper thigh member adjustable coupled to said lower thigh member adjacent to the upper end thereof and generally parallel thereto for
varying the combined length of said upper and lower thigh members, and adjustable thigh attachment means connected to said upper thigh member adjacent to the upper end thereof and extending in use about the thigh for securing said upper thigh member thereto.

4. The orthopedic training assist brace set forth in claim 3, and including a pair of said upper thigh members respectively disposed along the upper sides of the thigh, said thigh attachment means comprising a pair of calf bands respectively connected to said upper thigh members and cooperating to surround the thigh with the free ends of one of said thigh bands respectively disposed in overlapping relationship with the free ends of the other of said thigh bands, and fastening means for securing together the overlapping ends of said thigh bands.

5. An orthopedic training assist brace adjustable readily to fit numerous sizes of feet and legs, said brace comprising a relatively rigid foot member for accommodating a foot thereon, adjustable foot attachment means connected to said foot member for securing the foot thereto, a stirrup connected to said foot member and projecting upwardly therefrom adjacent to a side edge thereof, elongated lower leg structure connected to said stirrup for pivotal movement with respect thereto adjacent to the ankle, said lower leg structure having a first abutment surface thereon inclined with respect to the longitudinal axis thereof, elongated upper leg structure connected to said lower leg structure for pivotal movement with respect thereto adjacent to the knee, said upper leg structure having a second abutment surface thereon inclined with respect to the longitudinal axis thereof and engageable with said first abutment surface when said upper and lower leg structures are disposed generally in vertical alignment with each other in a straight-leg configuration for preventing pivotal movement of said lower leg structure forwardly with respect to said upper leg structure, a sleeve carried by said upper leg structure for sliding movement longitudinally thereof between a latching condition and a releasing condition, said sleeve in the latching condition thereof being engageable with the upper end of said lower leg structure for preventing pivotal movement thereof with respect to said upper leg structure thereby to lock said upper and lower leg structures in the straight-leg configuration thereof, said sleeve in the releasing condition thereof being out of engagement with said lower leg structure for accommodating pivotal movement of said upper leg structure and said lower leg structure with respect to each other, said upper leg structure having a widened stop portion at the bottom thereof diminished to prevent the passage of said sleeve thereafter, and a depressible stop member projecting from said upper leg structure adjacent to the lower end of said second abutment surface for yieldably resisting the passage of said sleeve therewith, said sleeve in the latching condition thereof being disposed between said stop member and said widened stop portion and yieldably held in place thereby, said sleeve in the releasing condition thereof being disposed above said stop member and yieldably held out of said latching condition thereof, and attachment means connected to said upper and lower leg structures for attachment thereof to the leg.