WEIGHTED EXERCISE CHAPS AND METHOD

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Application No.: 11/747,638
Filed: May 11, 2007

Publication Classification

Int. Cl. A63B 21/065 (2006.01)

ABSTRACT

An exercise device and method for the lower body. The device includes a belt and weighted chaps system which hold one or more individual weight inserts. The device includes removable section: a thigh section connected to the belt section and the option of a calf section connected to the thigh section. The device includes pockets on the weighted chaps and belts to adjust the position of weight, and flexible solid weight inserts that are held between a non stretch support and a stretch pocket layer secured against the leg which conform to the contours of the leg, the weights are preferably made of dense material suspended in a flexible matrix. The method includes positioning and storing weights, the connection to external resistance, and exercise to increase muscle strength, stamina, jump height, bone density, circulation, and to treat nervous system disorders.
FIG. 6
FIG. 17
WEIGHTED EXERCISE CHAPS AND METHOD

FIELD OF THE INVENTION

[0001] The present invention is related to exercise weights. More specifically, the present invention is related to adjustable exercise weights for the lower body.

CROSS REFERENCE TO RELATED APPLICATIONS

[0002] Not Applicable

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0003] Not Applicable

SEQUENCE OR COMPUTER PROGRAM LISTING, TABLE, OR CD

[0004] Not Applicable

BACKGROUND OF THE INVENTION

[0005] Exercise equipment is commonly used by the multitude of people who exercise. There exists an enormous collection of equipment for exercises. The present invention relates to exercise leg and thigh weights. More particularly to exercise thigh weights which include a belt and surround the thigh.

[0006] Richard G. Walsh Jr. from Boulder Colo. in U.S. Pat. No. 4,305,239 issued Dec. 1, 1981 titled “Thigh Weights” discloses thigh weight constructed of canvas or vinyl coated nylon which have sewn in pockets. The pockets contain tubes of canvas or vinyl coated nylon filled with metal shot or sand. The thigh weights are secured to a belt and held on the legs with straps made of webbing material such as nylon or cotton. The thigh weights slide along the belt section through a slotted holder. Buckles are used to slide thru and attach the straps to hook and loop fasteners.

[0007] Mark Cebo-Johnson from United Kingdom in U.S. Pat. No. 5,553,322 issued Sep. 10, 1996 titled “Weighted Exercise Garment” discloses a one piece flexible garment that covers the upper and lower portions of the user as part of a kit which includes arm and leg weights. Over different areas on the garment are pieces of loop fastener material. Solid flat metal bars of lead are sewn into weight pockets made of hook material such that the weight packs can be stuck to the loop material on the garment.

[0008] David E. Spletzer of Brooklyn in N.Y. U.S. Pat. No. 5,868,652 issued Feb. 9, 1999 titled “Exercise Thigh Weight System” and U.S. Pat. No. 6,039,677 Mar. 21, 2000 “Exercise Thigh Weight System” discloses thigh weights which consist of a belt connected to a strap or rod which goes down the thigh, which is connected first to an unweighted strap which goes around the top of the users thigh and then is connected to another strap which holds weight made of solid metal around the bottom of the thigh.

[0009] Adding weight to the lower body is difficult to do without creating problems for the user. The prior art has used bags filled with metal shot or sand held on with rigid straps. These weights sag and constantly change shape as the user moves, while the solid strapping systems blocks and interferes with the users muscle and body movement. The jarring movement of the weights is also dangerous to the users joints. Many designs use solid plates or rods which also bounce, push into the user, and block their movements. These products can be very dangerous to the wear especially in case of a fall. Other designs incorporate complete pants instead of rigid straps to hold the weights. These designs must be custom made to fit different sizes and they are very restrictive and cause the wearer to overheat quickly. For all of these reasons weighted pants have only had very limited use as an exercise and sports training tool until now.

[0010] The present invention offers improved comfort, ease of use, adjustability and compactness to the exerciser to make exercising more convenient and easier for the exerciser to achieve the desired training for a given muscle or muscle group. The present invention provides less movement of the weights, the ability to fit a wide range of sizes, does not block the movement or expansion of muscles, and allows for more air flow to the lower body to help keep the user cooler.

SUMMARY OF THE INVENTION

[0011] The object of the invention is a safe system for putting small to large amounts of weight on the lower body without restricting movement of the users body or airflow to the users’ body.

[0012] The present invention pertains to a system for weighting the legs for exercise. The system comprises an adjustable weighting system. The system comprises a mechanism for comfortably holding the weighting system to the leg and body of the user. The system incorporates both rigid and stretchable fabrics to both secure the weights while still letting the user move.

[0013] The present invention pertains to a method for exercising. The method comprises the steps of inserting semi-solid weights into pockets, then there is the step of securing the belt section on the hips, adjusting the position on the legs with the adjustment mechanisms, next there is the step of pulling one or more flexible expansion straps around the user’s leg to secure the chap to each leg of the user, next there is the step of moving the weighted legs.

[0014] The present invention pertains to a weighted chaps system. The system comprises a first adjustable belt section, which secures about a user’s waist and can be weighted, a second chap section, which can be secured to a user’s thigh, can be weighted and is attachable to the first section. The system also comprises a third section which is attachable to the second section and is secured to a user’s lower leg and calf muscle area and can be weighted.

[0015] The present invention does not block air flow between the legs and allows complete natural range of motion for the users legs.

[0016] The present invention pertains to weighted belt and chap system which can be connected to external resistance through connection points on the belt and leg sections.

[0017] The present invention pertains to the use of semi-solid weights and a system to causes the weights to contour to the shape of the user’s waist and legs. The system causes the weights not to move or bounce during exercise.

[0018] The present invention pertains to an exercise apparatus. The apparatus comprises a weight. The apparatus comprises a holder for a weight. The holder has a pocket which holds the weight. Preferably the pocket has a stretch slot through which the weight is placed into or removed from the pocket. The pocket is secured against the user’s waist and legs. The pocket includes stretch material and the pocket has a smooth outer surface with no protrusions or flaps or zippers.
to press into the user’s tissue. The use of rigid and stretch layers allows the system to support the weight but still allows the system to bend and move with the user.

[0019] The present invention pertains to an exercise apparatus. The apparatus comprises stretch pockets which have a slot on one side. Weights are inserted into the pocket by stretching the slot and pocket materials such that the weight goes into the pocket and is held securely on all sides. Next there is the option of inserting more than one weight into the same pocket by additional stretching of the fabric.

[0020] The present invention pertains to the use of wide stretchable expansion strips to secure the system to the users body to distribute the forces required to hold the weights over a large area.

[0021] The present invention pertains to a support system which distributes the load evenly between the belt and leg sections with a wide flexible supporting mechanism.

[0022] The present invention solves all the problems of the prior art and provides the user with a system which holds the weights securely, does not cause tissue damage, provide for good air flow, a wide range of sizes, easy adjustability, and is safe to wear.

[0023] The present invention may be worn comfortably directly on the skin or over clothing and one size will fit the majority of population.

DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0024] In the accompanying drawings, the preferred embodiment of the invention and the preferred methods of practicing the invention are illustrated in which:

[0025] FIG. 1 is a schematic representation of weighted chaps of the present invention.

[0026] FIG. 2 is a schematic representation of weighted chaps with removable calf weights of the present invention.

[0027] FIG. 3 is a schematic representation of weighted chaps with removable thigh weights of the present invention.

[0028] FIG. 4 is a schematic representation of weighted chaps with height adjustable thigh weights of the present invention.

[0029] FIG. 5 is a schematic representation of weighted chaps with adjustable positioning straps of the present invention.

[0030] FIG. 6 is a schematic representation of weighted chaps with assembly details of the support belt of the present invention.

[0031] FIG. 7 is a schematic representation of weighted chaps with the belt section enlarged of the present invention.

[0032] FIG. 8 is a schematic representation of weighted chaps with the belt section with a buckle of the present invention.

[0033] FIG. 9 is a schematic representation of weighted chaps with slide loops on the belt section of the present invention.

[0034] FIG. 10 is a schematic representation of weighted chaps with thigh straps of the present invention.

[0035] FIG. 11 is a schematic representation of weighted chaps with weight pockets on the inside of the present invention.

[0036] FIG. 12 is a schematic representation of weighted chaps with weight pockets on the belt section of the present invention.

[0037] FIG. 13 is a schematic representation of weighted chaps with a support layer and a stretch pocket layer of the present invention.

[0038] FIGS. 14A, 14B, and 14C are a schematic representation of weights of the present invention.

[0039] FIG. 15 is a schematic representation of weighted chaps connected to a weight vest of the present invention.

[0040] FIG. 16 is a schematic representation of weighted chaps connected to support straps of the present invention.

[0041] FIG. 17 is a schematic representation of weighted chaps connected to resistance bands of the present invention.

[0042] FIG. 18 is a schematic representation of weighted chaps connected to a pulling strap of the present invention.

[0043] FIG. 19 is a schematic representation of weighted chaps connected to a series of resistance bands of the present invention.

[0044] FIG. 20 is a schematic representation of weighted chaps where the legs are connected in the front and the calf section support is on both sides of the knees with a hole for the knee of the present invention.

[0045] FIG. 21 is a schematic representation of weighted chaps connected on the side to a support panel and the calf system supported by a semi-flexible fabric to the thigh section of the present invention.

[0046] FIG. 22 is a schematic representation of weighted chaps of the present invention in which the support layer is a mesh fabric.

[0047] FIG. 23 is a schematic representation of weighted chaps of the present invention where there is a slotted stretchable section for inserting and removing weights.

[0048] FIGS. 24A and 24B are schematic representation of one side of the weighted chaps positioned on a sized grid to show size and angles of the different elements.

DETAILED DESCRIPTION

[0049] Referring now to the drawings wherein like reference numerals refer to similar or identical parts throughout the several views, and more specifically to FIG. 1 to 13 and FIG. 15-24 there is shown a weighted chaps system 10, and FIG. 14 shows weight inserts 8. The weighted chaps system 10 comprises a belt section 1, thigh section 2, and calf section 3. The weighted chaps system 10 comprises an adjustable weight system 5. The weight chaps system 10 comprises a mechanism 16 for holding the adjustable weight system 5 to the body of the user.

[0050] Preferably, the adjustable weight system 5 includes pockets 7 in which individual weight inserts 8 are held. The belt section 1 is designed to be positioned about the waist and hips of the user. The belt section 1 helps to support and position the thigh section 2 and the calf section 3.

[0051] In one preferred embodiment shown in FIG. 1 the belt section 1 has a connector 9 to connect the right leg 11 and the left leg 12 together. Each side of the belt section 1 is composed of a right and a left side and also includes front adjustment straps 13 and back adjustment straps 14 to adjust the belt section 1 to fit on a wide variety of waist sizes. In this embodiment the major adjustment is done by the back adjustment straps 14. The belt section 1 is connected to the thigh section 2 in the front of the user.

[0052] The thigh section 2 includes pockets 7 to hold individual weight inserts 8 that can be added or removed to change the amount of weight and the location of weight. The thigh section 2 includes an unweighted portion 15 that has very limited to no stretch but is flexible and allows for move-
ment of the user’s leg in relationship to a user’s waist or hips. The unweighted portion 15 transmits the load to the belt section 1 which allows the user hips in back to support the position of the weighted chaps system 10 and thigh section 2. The wider the unweighted portion 15 is, the more it supports and keeps the thigh section 2 from twisting preferably the un-weighted section 15 wider than one inch but less than ten inches, more preferably no less than two inches in the narrowest area. The pockets 7 are positioned mainly on the front of the user’s leg with two rows of pockets 7 in front and one set of pockets 7 wrapping around a user’s thigh. The thigh section 2 includes a strap mechanism 16 to secure the thigh section 2 against the thigh. The weighted chaps 10 include a calf section 3 attached to the thigh section 2 in one or more places preferably on the side of the user’s legs. The calf section 3 includes a limited to no stretch flexible support 17 that allows the user’s leg to bend at the knee. The calf section 3 includes pockets 7 and one or more strap mechanisms 18 to secure the calf section about the lower leg. Preferably the strap mechanisms 18 secures above and below the user’s calf muscle. Although the securing locations shown are preferred other securing locations around the user’s leg are also possible.

In the embodiment as shown in FIG. 2 the thigh section 2 and the calf section 3 may be separated or connected with a connection mechanism 20. Many different connection types may be used such as buttons, snaps, hooks, and loop fasteners. In this embodiment the connection mechanism 20 is a separating zipper 21. The calf section 3 may be disconnected and reconnected by the user depending on their needs, or different calf sections 3 may be connected.

FIG. 3 shows the embodiment where the thigh section 2 may be separated or connected with a connection mechanism 25. Many different connection types may be used such as button, snaps, hooks, and hook and loop fasteners. In this embodiment the connection mechanism 25 is a separating zipper 26 where one half stays on the belt section 1 and the other on the thigh section 2.

FIG. 4 shows the embodiment where the thigh section 2 includes a height adjustment strap 30. The height adjustment strap 30 folds over the belt section 1, to connect to the belt section 1. The height adjustment strap 30 includes hook 31 and loop 32 fasteners to allow the length of the thigh section 2 to be changed to fit the user and to allow the thigh section 2 to be removed or connected to the desired height by the user to the belt section 1.

FIG. 5 shows the front adjustment straps 13 and the back adjustment strap 14. In this embodiment the front adjustment straps 13 slide through the connector 9 to adjust the size to fit a user. The front adjustment straps 13 include hook 35 and loop 36 fasteners to secure the front adjustment straps 13 in the correct position. The back adjustment strap 14 which does most of the adjustment to fit different size waists also includes a hook 37 that connects to the loop 36 to secure its position.

FIG. 6 shows the construction of the belt section 1. Preferably the belt section 1 has an inner support 40 such as a semi-rigid soft foam such as used on weight lifting belts for support. The inner support 40 is covered with an outer support fabric 41 to protect the inner support 40 and to provide the strength necessary to support the thigh section 2 and the calf section 3. The outer support fabric 41 preferably is a woven fabric such as a woven nylon or other strong fabric. The belt section 1 also includes a front adjustment strap 13 and a back adjustment strap 14; preferably these are a woven material such as nylon webbing 42 which can be sewn to the belt section 1 through the outer support fabric 41 through the inner support 40. The belt section 1 front adjustment strap 13 may continue and also act as the back adjustment strap 14. The back adjustment strap 14 preferably includes a ring 43 for adjusting the size of the belt section 1.

FIG. 7 shows the front adjustment strap 13 and the back adjustment strap 14 lengthened to allow for a larger waist size. FIG. 8 shows that after the size has been adjusted the connector 9 may be used to take the belt section 1 off or put the belt section 1 on the user. Preferably the connector 9 is a buckle 45 which is secure but easily opens and closes. The buckle 45 includes adjustment slots 46 that allow the front adjustment strap 13 to slide through for adjustment.

In the embodiment shown in FIG. 9 the belt section 1 includes loops 50 through which a belt strap 51 may slide. In the embodiment the belt strap 51 is not sewn to the outer support fabric 40 and no back adjustment strap 14 is used. The belt strap 51 wraps around the users waist and is adjustable at the connector 9. The weighted chaps 10 are positioned by sliding along the belt strap 51.

FIG. 10 shows the thigh section 2 which includes securing strap 16 which wrap around the user thigh above the knee. Preferably the securing strap 16 includes an elastic section 55 which stretch and provide tension to hold when the thigh of the user is moving. The securing strap 16 also includes hook 56 and loop 57 fastener to secure the securing strap 16 at different adjustments. Preferably the outer surface 58 of the thigh section 2 is a limited to no stretch support fabric such as woven nylon which is connected to the elastic section 55. The outer surface 58 used to support the weight inserts 8 in the pockets 7. The elastic section 55 can be rubber, elastic fabric or other elastic material preferably fabric covered neoprene. Preferably the securing strap 16 is one to six millimeters thick neoprene and two to ten inches wide, more preferably the neoprene is two to three millimeters thick and three to six inches in width and tapers towards the end. Preferably the outer surface 58 is one piece from the belt section 1 to the bottom of the users thigh.

FIG. 11 shows the inside surface 60 of the weighted chaps 10 which is against the user. The inside surface 60 against the user includes pockets 7. Preferably the inside surface 60 is a soft stretch material 61 such as sponex or fabric covered neoprene as used in diving suits. The pockets 7 are formed by sewing the limited to no stretch outer surface 58 to the stretchable inside surface 60. Slots 62 in the inner surface stretch open to allow weight inserts 8 to slide into the pockets 7. When the weight inserts 8 are inserted the inside surface 60 stretches to allow the weight insert 8 to fit into the pocket 7. The inside surface 60 soft stretch material 61 holds the weight securely on all sides and against the outer surface 58 which keeps the weight inserts 8 from moving. The pocket 7 may be sized to hold one or more weight inserts securely by stretching the stretch material 61. By having the pockets 7 against the user the body it keeps the weight inserts 8 in the pockets 7, the weight insert 8 are held securely on all sides. This prevents the weight inserts 8 from shaking loose during rigorous exercise. The slots 62 preferably have circles cut at the ends or are stitched at the ends or both to prevent tearing when the slot 62 is stretched open to allow the weight insert 8 to be inserted or removed.

FIG. 12 shows an embodiment where there are pockets 7 which can hold weight inserts 8 in the belt section
1. Pockets 7 on the belt section 1 can hold additional weight inserts 8 to add weight to the weight chap system 10 or they can be used to hold weight inserts 8 that are removed from other locations such as the thigh section 2 or the calf section 3. With this method of exercise the weight inserts 8 can be moved around to different pockets as desired for specific exercise requirements. If, for example, more resistance is needed to work the calf muscles weight inserts 8 can be taken from the belt section 1, or if there is too much weight on the thigh then weight inserts 8 may be removed from the thigh section 2 and inserted into the belt section 1. Preferably pockets 7 are used to hold the weight inserts 8, however straps, magnets, hooks and loop fasteners and other securing mechanisms may be used. Pockets are preferably on the inside, however everything could be reversed and pockets could be on the outside.

FIG. 13 shows the weight inserts 8 are sandwiched between the outer surface 58 and the soft stretch material 61. The weight inserts 8 could be made of any high density material such as a heavy polymer, steel bars, lead, sand, metal shot, clay, or stone, but preferably the weight inserts 8 are a semi solid material such as a single pieces of soft flexible composite material 80 as shown in FIGS. 14A, 14B, and 14C. Weight inserts 8 can then form to the shape of the user’s body when attached and act as padding in case of a fall. The flexible composite material 80 can be secured tighter to the user without bruising or damaging the user’s tissue as can easily happen when trying to secure solid metal weights.

To make the weight inserts 8 easier to insert into the pockets 7 the flexible material is covered with fabric, preferably the weight inserts 8 are inserted into a stretchable sleeve 65. The sleeve 65 is then stretched and sewn closed. The stretchable sleeve 65 may be made of many materials; preferably Lycra and Spandex material are used.

Preferably the soft flexible material 80 is a composite 70 comprising high density material 71 surrounded by a matrix of soft pliable material 72.

Materials for the weights are also described in U.S. Pat. No. 6,005,041 filed Nov. 9, 1995 titled “REINFORCED THERMOPLASTIC ELASTOMER GEL” incorporated by reference herein.

High density material 71 may consist of metal, stone, ceramic, forms of carbon as well as different chemicals containing forms of metal, oxides, and ceramic molecules suspended in a flexible matrix of pliable material 72. The pliable material 72 may consist of clay, natural or synthetic rubber or plastic, organic or inorganic gel such as gelatin or gelatin or other pliable material. Preferably the weight inserts 8 are composed of a polymer composite consisting of plastic where by the high density material 71 consists of particles suspended between the polymer chains. Preferably the composite is a soft flexible material 80 with a durometer of equal to or less than 50 shore A. Preferably the matrix includes a flexible material such as natural or synthetic rubber, and more preferably a thermoplastic elastomer and the particles are a solid piece of high density material with a particle size greater or equal to 1 to 300 microns.

Preferably the weight inserts 8 are about 0.125 to 1 inch thick and weigh 0.125 to 1 pound. Many sizes can be used from over 12x12 slabs to very small pieces, preferably they are about two inches wide and four inches high and can be stacked together inside a pocket 7.

The weighted chap system 10 can hold one or more weight inserts 8 and preferably in 8-10 pockets 7 in each thigh section 2 for a total of 16 to 20 pockets 7 on the user’s thighs. Preferably the pockets 7 stretch to a single or stack of weight inserts 8 up to one inch high or one pound per pocket 7. This results in less than 1 pound to over 16 to 20 pounds of weight on the user’s thigh which the user must lift to move their legs.

Preferably the individual calf section 3 has 4 to 10 pockets on each calf for a total of 8 to 20 pockets for a total of 8 to 20 pounds on the calf section 3 of the user’s legs. This results in less than 1 pound to over 8 to 20 pounds of weight on the calf area of the legs which must be lifted for the user to move their legs.

FIG. 15 shows a weighted vest 85 described in U.S. Pat. No. 6,554,752 titled “WEIGHTED EXERCISE APPARATUS AND METHOD” incorporated by reference here in, the weighted vest 85 is connected to the weighted chap system 10 such that they help to support the locations of each even when the user is upside down.

An attachment mechanism 86 connects the weighted vest 85 and the weighted chap system 10 together. Preferably a weighted vest 85 may be used to help support the weighted chaps 10, however the attachment mechanism 86 may connect to any type of clothing to provide additional support such as a shirt, jacket, vest, overalls, or pants.

Preferably the belt section 1 includes attachment loops 87 or other connection hardware. The loops 87 can be directly hooked in or rings 88 can be inserted into the loops 87. Preferably a hook 89 and a stiff elastic strap 90 connect the weighted vest 85 or other support clothing to the weighted chap system 10. Preferably the strap 91 includes an adjustment mechanism 91 to adjust the length and tension of the strap 91.

FIG. 16 shows a support system 95 connected to the weighted chap system 10. The support system 95 includes shoulder straps 96 which extend over the users shoulders to help support the weighted chap system 10 and hold the weighted chap system 10 in position on the user. Preferably the support system 95 includes shoulder straps 96 with shoulder pads 97 and a strap adjustment system 98 to change the length and tension on the shoulder straps 96. Preferably the shoulder straps 96 include at least one section of stiff elastic 99 to allow the user to head over.

The weighted chap system 10 can be worn while doing a wide variety of exercises from simple leg lifts, to walking, running, stairs, in the water exercises, jumping, and playing sports to increase the strength of the legs while increasing the strength of the rest of the bodies supporting systems including bone density, joint strength, whole cardiovascular system and the heart. The added weight causes more calories to be burned for a specific movement and therefore can improve weight loss while building muscle and system strength.

The weighted chap system 10 can also be worn for treatment of physical disorders to correct the balance and to make the wearer aware of parts of their body which they have lost connection with, such as occurrences with M.S. and other nervous system disorders. This may be used directly on problem muscle groups or indirectly by treating the surrounding muscle groups.

The weighted chap system may also be used to improve bone density by increasing impact and increasing blood flow to the legs thereby simulating both increases in bone density as well as improving circulation and muscle condition.
The weighted chap system 10 has been designed to fit a wide range of body styles and can be worn over most clothing, and is simple to take on and off and to adjust the weight on the different sections of the legs.

FIG. 16 shows additional loops 87. These loops 87 are designed to be connected to other devices to provide additional resistance.

FIG. 17 shows a person 100 wearing the weighted chap system 10 where the weighted chap system 10 is connected to stretch bands 101. The stretch bands 101 are connected to additional resistance such as weights 102. The connection to the stretch bands 101 provides additional resistance for jumping exercises used for example to increase a person's jump height and stamina.

FIG. 18 shows a person wearing the weighted chap system 10 where the belt section 1 is connected to a resistance strap 110 such that additional resistance can be applied such as by a trainer to help build muscle strength and stamina.

FIG. 19 shows resistance strap 110 connected to the belt section 1 and resistance strap 111, and resistance calf straps 112 each used to provide additional resistance by connecting to the belt section 1, thigh section 2, and calf section 3.

FIG. 20 shows an alternative embodiment of the weighted chap system 200 where the belt 201 connects on the user's waist and the chap legs left 202 and chap leg right 203 are connected in front. Preferably this embodiment includes an opening 205 on calf support section 206 to allow knee of the user to move freely.

FIG. 21 shows an alternative embodiment of the weighted chap system 300 where there is a front chap 301 and a rear support 302. The weight system 300 includes a connecting system 303 to connect the front chap 301 to the rear support 302. Preferably the weighted chap system 300 includes a belt 304 to secure the weighted chap system 300 to the user's waist. Preferably the connecting system 303 includes adjustment straps 304 with hook and loop fasteners. This embodiment shows an elastic support section 310 made out of a heavy elastic fabric, such as fabric covered neoprene, to support the calf section 311 while still allowing full flexibility of the user's knee and leg.

FIG. 22 shows an alternative embodiment of the weighted chap system 400 where the outer support layer 401 is a breathable mesh fabric, to help keep the user cool.

FIG. 23 shows the side against the users legs of the weighted chap system 400 where there is an inner support layer 403 of breathable mesh. Weight inserts 8 are inserted into pockets formed between the outer support layer 401 and the inner support layer 403 through slots 404 in the stretch slot strip 402 sewn into the inner support layer 403. The slot strip 402 is preferably made of fabric covered neoprene. The weighted chap system 400 provides airflow to the users legs and the stretch slot strip 402 provides a secure closure with minimal air blockage and minimal pressure points against the user's leg. Other closure systems may be used such as, hook and loop, zippers, and other systems create higher points but these create pressure points on the users legs. The breathable mesh may be many fabrics, preferably athletic mesh with holes equal or larger than ¼ inch in diameter to provide support and maximum air flow.

FIGS. 24A and 24B show the front and back side of the left of the weighted chaps 10 positioned flat on a grid 500 of one inch by one inch squares 501, to show the size and angles of all the elements of the thigh section 2 and belt section 3. FIG. 24A shows two rows of weight pockets 7 three pockets 7 on top and six pockets 7 below. The pockets 7 are positioned on the user 11 leg such that the axis of the weights is parallel to the axis of the user's leg. To position the weight inserts 8 in the pockets 7 at this comfortable position the belt section 1 should angled upward toward the user 11 hips and back. The angle 502 is more than 15 degrees, preferably the angle is degrees. The strap mechanism 16 is also angled 503 in the opposite direction to accommodate the tapered nature of the user 11 thigh. The angle is more than one degree but less than four degrees and preferably degrees. The outer surface 58 may be sewn to the inside surface 60 around the edges and then turned inside out or preferably the inside surface 60 and the outer surface 58 are connected around the edge with a binding 504. The thigh securing strap 505 is preferably elastic and may be part of the stretch material 61 shown in FIG. 24B which has the slots 62 to slide the weight inserts 8 through into the pockets 7.

In addition, the thigh section 2 and calf section 3 may be attached to the legs to resist movement and the thigh section 2 and calf section 3 may be unattached from the user's legs and allowed to hang supported by the belt section 1. This allows the user of the system 10 to benefit from the weight but allows the thigh and calf muscles to rest without removing the whole weighted chap system 10. This is important for field training such as long marches or runs.

The invention includes a lower body exercise system comprising; a belt system connected around a user's waist; and a weighted chap system connected around a user's legs; with a support system, which connects the weighted chap system to the belt system to maintain the position of the weighted chap system on the leg during exercise.

A system where the weighted chap system may include a weighted thigh section connected about the user's thigh between the waist and knee.

A system where the weighted chap system may be connected about the user's calf between the knee and the foot.

A system where the support system may include a system which connects the calf system to the thigh system to maintain the position calf system on the user's leg.

A system where the weight in the weight system may be adjustable.

A system where the connection system may include a mechanism for removing and attaching the weighted chap system.

A system where the connection system may include a mechanism for adjusting the location of the weight system on the user's leg.

A system where the support system may connect the weighted chap system to the belt system on the front side of the user.

A system where the weighted chap system may include pockets to hold individual weight inserts.

A system where the weight inserts may be flexible solid and have a durometer of less than or equal to 50 shore A.

A system where the weight inserts may be a composite material made up of dense particles in a flexible matrix.

A system where the matrix may be a polymer and the particles may be a form of metal, stone, ceramic, or carbon from less than 1 micron to more than 300 microns in diameter.

A system where the weight inserts may be covered with a fabric shell.
[0098] A system where the weight inserts may be less than 0.25 to more than 1 inch in thickness, less than 1 to more than 3 inches wide and less than 2 to more than 6 inches in length.

[0099] A system where the belt system may include a storage mechanism to hold weight inserts.

[0100] A system where the storage mechanism may be stretch pockets.

[0101] A system where the belt system may adjust to fit different waist sizes.

[0102] A system where the belt size adjustments may be made in the front of the user.

[0103] A system where the belt size adjustments may be made in the back of the user.

[0104] A system where the weighted chap system may include a non stretch support layer and a stretch pocket layer.

[0105] A system where the non stretch support layer may be on the outside with the stretch pocket layer on the inside against the user.

[0106] A system where the stretch pocket layer may contain one or more pockets, each pocket having a slot.

[0107] A system where the slot may be shorter than the width of the weight insert and stretches to allow the weight insert to fit into the pocket.

[0108] A system where the pocket may stretch to fit the weight insert and hold the weight securely on all sides.

[0109] A system where the pocket may stretch to accommodate more than one weight insert.

[0110] A system where the stretch pocket layer may be a stretch fabric.

[0111] A system where the stretch pocket layer may be a laminate.

[0112] A system where the laminate may be a fabric covered rubber.

[0113] A system where the rubber may be neoprene.

[0114] A system where the weighted thigh system and weighted calf system may include a connection mechanism to secure the weighted thigh system to the thigh.

[0115] A system where the connection mechanism may include a stretchable strap.

[0116] A system where the stretchable strap may be made of fabric laminated to neoprene and secured with hook and loop fasteners.

[0117] A system where the stretchable strap may be greater than the one inch and less than 12 inches wide. Preferably 2 to 8 inches wide.

[0118] A where the weight inserts may be held against the user by the connection mechanism and bend to fit the contour of the user’s leg.

[0119] A system where the weighted calf system may include a system that connects the weighted thigh system on one or both sides of the knee.

[0120] A system where the weighted calf system may be connected to the weighted thigh system with a stretch support fabric which goes over the user’s knee.

[0121] A system where the belt system may include connection mechanisms for connecting resistance devices.

[0122] A system where the weighted chap system may include connection mechanisms for connecting resistance devices.

[0123] A resistance system which may include elastic material.

[0124] A lower body system for exercise comprising a belt system connected around a user’s waist and a weight system connected around the users legs which is connected to the belt system; and the weight system containing flexible solid weight inserts.

[0125] A weight insert where the weight insert may be a dumbbell of equal to or less than 50 shore A.

[0126] A weight insert where the weight insert may be comprised of clay.

[0127] A weight insert where the weight insert may include dense material suspended in a flexible matrix.

[0128] A method of exercise comprising the steps of wearing weights on the legs of a user, connecting the user to external resistance, and having the user move so as to move the weights while additional resistance is applied.

[0129] A method of exercise comprising the steps of wearing weights on the waist of a user, connecting the user to external resistance, and having the user move so as to move the weights while additional resistance is applied.

[0130] A method of exercising comprising the steps of: inserting weight inserts into pockets, attaching the belt to a user’s waist and weighted chap system to the user’s leg, moving the user’s legs to move the weighted chap system.

[0131] A method of exercise where the user moves the weight inserts into different pockets.

[0132] A method of exercise where the user stores weights from the weighted chap system in the belt.

[0133] A method of exercise which may include connecting additional resistance devices to a lower body weight system.

[0134] An exercise system comprising: a leg section supported in place by a belt section each section may contain pockets to hold one or more weight inserts, weight inserts which can be inserted and remove from the pockets to add or remove resistance to movement.

[0135] A method for treating nervous system disorders to increase the connection between the user’s brain and movement of parts of the user’s body including the steps of weighting portions of the user’s lower body, having the user move the weighted section, moving the weighted section to different locations on the lower body. Weighting of one area may improve connection to that area or connection with another area. For example if the user has problems moving the right leg improvement may occur by weighting sections of the right leg or instead by weighting sections of the left leg. Adding resistance to the left leg in this case may cause a balancing affect by making it easier to move the right leg. The result is that the user may have less problems walking and the additional use of the right leg helps to improve condition of that leg. Ultimately by use of weights at different locations the right leg may improve enough so that weights are no longer required.

[0136] A method of treatment for increasing bone density and improve circulation including the steps of wearing weights on the lower body to increase impact and increase blood flow during exercises.

[0137] A method for increasing bone density and circulation where the weights may be worn on the waist.

[0138] A method for increasing bone density and circulation where the weights may be worn on the thigh.

[0139] A method for increasing bone density and circulation where the weights may be worn on the calf.

[0140] A lower body system of exercise comprising: an outer support system comprising a breathable mesh, an inner support system comprising a breathable mesh, to hold weight pockets formed between the inner and outer support layer.
A system wherein the support layer includes a strip with slots through which weights can be inserted.

A system wherein the weights are a semi-solid material with a hardness equal to or less than 50 shore A.

A system where the belt section is angled from 1 to 15 degrees.

A system where the weight securing strap is angled from 1 to 45 degrees.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made there in by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

What is claimed is:

1. A lower body exercise system comprising:
   a belt system connected around a user’s waist; and
   a weighted chap system connected around a user’s leg; and
   a support system, which connects the weighted chap system to the belt system to maintain the position of the weighted chap system on the leg during exercise.

2. A system as described in claim 1 wherein the weighted chap system includes a weighted thigh system connected about the user’s thigh between the waist and knee.

3. A system as described in claim 1 wherein the weighted chap system includes a weighted calf system connected about the user’s calf between the knee and the foot.

4. A system as described in claim 1 wherein the support system includes a system which connects the calf system to the thigh system to maintain the position of the calf system on the user’s leg.

5. A system as described in claim 1 wherein the weight in the weight system is adjustable.

6. A system as described in claim 1 wherein the connection system includes a mechanism for removing and attaching the weighted chap system.

7. A system as described in claim 1 wherein the connection system includes a mechanism for adjusting the location of the weight system on the user’s leg.

8. A system as described in claim 1 wherein the support system connects the weighted chap system to the belt system on the front of the user.

9. A system as described in claim 1 wherein the weighted chap system includes pockets to hold individual weight inserts.

10. A system as described in claim 9 wherein the weight inserts are a flexible solid and have a durometer of less than or equal to 50 shore A.

11. A system as described in claim 10 wherein the weight inserts are a composite material made up of dense particles in a flexible matrix.

12. A system as described in claim 11 wherein the matrix is a polymer and the particles are a form of metal, stone, ceramic, or carbon from 1 micron to more than 300 microns in diameter.

13. A system as described in claim 9 wherein the weight inserts are covered with a fabric shell.

14. A system as described in claim 9 wherein the weight inserts are less than 0.25 to more than 1 inch in thickness, less than 1 to more than 3 inches wide and less than 2 to more than 6 inches in length.

15. A system as described in claim 1 wherein the belt system includes a storage mechanism to hold weight inserts.

16. A system as described in claim 15 wherein the storage mechanism is stretch pockets.

17. A system as described in claim 1 wherein the belt system adjusts to fit different waist sizes wherein the size adjustments are made at the back of the user.

18. A system as described in claim 1 wherein the weighted chap system includes a non stretch support layer and a stretch pocket layer.

19. A system as described in claim 19 wherein the non stretch support layer is on the outside and the stretch pocket layer is on the inside against the user.

20. A system as described in claim 20 wherein the stretch pocket layer contains one or more pockets, each pocket having a slot.

21. A system as described in claim 21 wherein the slot is shorter than the width of the weight insert and stretches to allow the weight insert to fit into the pocket.

22. A system as described in claim 22 wherein the pocket stretches to fit the weight insert and hold the weight securely on all sides.

23. A system as described in claim 23 wherein the pocket can stretch to accommodate more than one weight insert.

24. A system as described in claim 24 wherein the stretch pocket layer is a stretch fabric.

25. A system as described in claim 25 wherein the stretch pocket layer is a laminate.

26. A system as described in claim 26 wherein the laminate is a fabric covered rubber.

27. A system as described in claim 27 wherein the rubber is neoprene.

28. A system as described in claim 3 wherein the weighted thigh system and weighted calf system include a connection mechanism to secure the weighted thigh system to the thigh.

29. A system as described in claim 29 wherein the connection mechanism includes a stretchable strap.

30. A system as described in claim 30 wherein the stretchable strap is made of fabric laminated to rubber and secured with hook and loop fasteners.

31. A system as described in claim 31 wherein the stretchable strap is equal to or greater than 1 to 10 inches wide.

32. A system as described in claim 32 wherein the weight inserts are held against the user by the connection mechanism and bend to fit the contour of the user’s leg.

33. A system as described in claim 33 wherein the weight inserts are held against the user by the connection mechanism and bend to fit the contour of the user’s leg.

34. A system as described in claim 4 wherein the weighted calf system includes a system that connects the weighted thigh system on one or both sides of the knee.

35. A system as described in claim 4 wherein the weighted calf system is connected to the weighted thigh system with a stretch support fabric which goes over the user’s knee.

36. A system as described in claim 1 wherein the belt system includes connection mechanisms for connecting resistance devices.

37. A system as described in claim 1 wherein the belt system includes connection mechanisms for connecting resistance devices.

38. A system as described in claim 36 which includes elastic material.

39. A system as described in claim 1 wherein the weighted chap system includes suspenders which go over the shoulders.
40. A lower body system for exercise comprising: a belt system connected around a user's waist; and a weight system connected around the user's legs which is connected to the belt system; and the weight system containing flexible solid weight inserts.

41. A weight insert as described in claim 40 where the weight insert has a durometer of equal to or less than 50 shore A.

42. A weight insert as described in claim 41 where the weight insert is comprised of clay.

43. A weight insert as described in claim 42 where the weight insert includes dense material suspended in a flexible matrix.

44. A method of exercise comprising: the steps of wearing weights on the legs of a user; and connecting the user to external resistance, and having the user move so as to move the weights while additional resistance is applied.

45. A method of exercising as described in claim 44 including the steps of: inserting weight inserts into pockets, and connecting the belt to a user's waist and weighted chap system to the user's leg, and moving the user's legs to move the weighted chap system.

46. A method of exercise as described in claim 45 where the user moves the weight inserts into different pockets.

47. A method of exercise as described in claim 46 where the user stores weights from the weighted chap system in the belt.

48. A method for treating nervous system disorders to increase the connection between the user's brain and movement of parts of the user's body including:

weighting portions of the user's lower body and having the user move the weighted section; and having the user move less weighted sections of the users body.

49. A method for increasing bone density and blood circulation including the steps of wearing weights on the lower body; and moving the lower body to increase impact when the foot touches the ground; and increase blood flow to the leg muscles to move the lower body.

50. A method for increasing bone density and circulation as described in claim 49 wherein the weights are worn on the waist.

51. A method for increasing bone density and circulation as described in claim 49 wherein the weights are worn on the thigh.

52. A method for increasing bone density and circulation as described in claim 49 wherein the weights are worn on the calf.

53. A lower body system as described in claim 1 wherein: an outer support system comprising a breathable mesh; and an inner support system comprising a breathable mesh; and connected together to form weight pockets between the inner and outer support layer.

54. A system as described in claim 53 wherein one support layer includes a strip of stretchable material with slots through which weights can be inserted.

55. A system as described in claim 53 where the weights are semi-solid material with a hardness equal to or less than 50 shore A.

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