AIR DRIVEN MUSCLE TONING GARMENT

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ABSTRACT

An air driven muscle toning garment including a suit of lightweight, breathable, moderately elastic material that covers the body from just above the knees to just below the neckline and along the arms to the wrists. Low-elasticity supports are integrated into the suit at several places so that attachments can be secured to the suit at key points; these attachments are connected in pairs by pull-through air bladders, which when pressurized pull the pairs of points toward each other, and resist the muscles which oppose the points that are pulled together by the pull-through air bladder mechanisms.
FIG. 2
AIR DRIVEN MUSCLE TONING GARMENT

CROSS-REFERENCE TO RELATED APPLICATIONS


STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

REFERENCE TO A MICROFICHE APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] This invention relates to equipment to be worn by the user to provide a constant, near-uniform level of resistance to muscle movements for the purpose of toning the muscles.

[0005] As a result of the desire for easier, more convenient ways to get in shape and stay in shape, many products have been designed and manufactured to attain the perfect workout. With each new device comes a new workout routine and duration for that routine, with the promise maximum results for minimum effort. A major problem with every exercise machine is that people are required to take time out of every day to use such machines, making it easy to get out of a daily use routine if even as little as one day is missed. Another problem with exercise machines is users are generally not willing to spend the time using machines if results are not relatively immediate, or if results are not commensurate with the effort expended. Also, there are many people who do not have the time or opportunity to participate in exercise activity due to their schedules and/or job demands.

BRIEF SUMMARY OF THE INVENTION

[0006] This invention is directed to a garment that provides constant, near-uniform resistance to voluntary motions of various body parts. The object of the invention is to furnish the user with a comfortable garment which can be worn under normal clothing and which provides physical exercise to muscle groups while in motion or in rest posture, at user-defined amounts of resistance.

[0007] The air driven muscle toning garment comprises a breathable suit made of flexible material, of moderate elasticity, with integrated supports. The supports are to be located at pairs of points, which when connected resist opposing body movements (such as bending the arm). Air bladders, with cable supports on one end and a cable attached to a pull-through plunger leading from the opposite end, are the resistance tools to be attached to the pairs of supports. These air bladders, secured to the supports, pull the supports together and resist the opposing body motion. This keeps the opposing muscles taut, toning them over a period of use.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0008] FIG. 1 is a frontal plan view of the air driven muscle toning garment.

[0009] FIG. 2 is a rear plan view of the air driven muscle toning garment.

[0010] FIG. 3 is a side plan view of the air driven muscle toning garment.

[0011] FIG. 4 is an enlarged plan view of the side of the pull-through air bladder, without fasteners and attachment cords shown.

[0012] FIG. 5 is an enlarged plan view of the leading end of the pull-through air bladder.

[0013] FIG. 6 is an enlarged plan view of the trailing end of the pull-through air bladder.

[0014] FIG. 7 is an enlarged plan view of one of the flat faces of the pull-through air bladder.

[0015] FIG. 8 is a sectional view taken along the line 8-8 of FIG. 6.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Referring to FIG. 1, the air driven muscle toning garment, indicated generally at 23, comprises a suit, made of lightweight and breathable material, divided into two parts. The bottom part of the suit is a pair of shorts which extend from the top of the knees to the waist, with adjustable straps 7 and 7A integrated at the base of the thighs and adjustable straps 6 and 6A integrated just below the buttocks and groin; these straps encircle the legs and provide a means of holding the shorts down in a set position. This serves to keep a support belt 5, which encircles the waist, held in a set position. Attachments 10B and 10C are located on the belt at each hip, and attachments 14B and 14C are located a few inches apart at the base of the back (one on each side of the spine) as shown in FIG. 2. The procedure for donning the shorts is of little consequence (pull-on, zip-up front, etc.) as long as the aforementioned features are present.

[0017] The top portion of the suit is shaped like a long-sleeved T-shirt; it has integrated supports, to provide key attachment points, which include: adjustable straps 1 and 1A at the shoulders; adjustable straps 4 and 4A at the wrists; adjustable straps 3 and 3A around the arms just above the elbows; a support 2 which encircles the ribcage just below the chest muscles and covers most of the skin area above this, ending at the shoulders and just below the neckline (much in the shape of a sports-bra); and as shown in FIG. 2, a pair of straps 20 and 20A which are attached to the upper-body support 2 at the back of the shoulders, and which run from the back of the shoulders to a point approximately 3 inches lower than the back of the shoulders and which run from the back of the shoulders to a point approximately 3 inches lower than the arms. All supports (including the belt 5 and adjustable straps 6, 6A, 7, 7A) are made of low elasticity, non-rigid material (preferably man-made); they can be integrated into the suit by whatever means the manufacturer chooses.

[0019] Referring to FIGS. 4-8, the air driven muscle toning garment employs the use of air bladders 28, essen-
tially flask-shaped, with a hole in each of the ends. The hole in one end has a greater diameter, through which runs a plunger 29; from herein this will be known as the “trailing end” (FIG. 5). The other end of the bladder has a much smaller hole through which runs a lead cable 30; this will be known as the “leading end” (FIG. 6). The air bladder 28 is airtight, with the plunger 29 and leading cable 30 being matched in size and shape to their respective holes in the bladder in order to seal the bladder. The composition of the bladder 28 should be a lightweight, rigid material; or optionally may be made of flexible and non-elastic material, so long as the bladder has a set shape and maximum volume when pressurized. The holes of the bladder 28 are accomplished through the use of rigid tunnels 31 and 32, permanently attached to bladder 28, having round or oval holes passing through them lengthwise and centered on their diameter, the inside surface of each hole being smooth enough to provide an air-tight fit with the plunger 29 or cable 30 passing through it. The plunger 29 is a round or oval cylinder made of a rigid material; flat disks 35 and 43, of greater diameter than the plunger 29, are attached to the flat ends of it. The disks 35 and 43 provide an end-of-travel point in either direction through the trailing end hole of the bladder. The lead cable 30 is also a cylinder, longer than the plunger 29, with a cable 46 passing through its center along the length of the lead cable (to prevent lengthwise stretching), which attaches to the plunger 29 inside the bladder 28 at the center of the plunger’s end. The lead cable 30 is made of semi-rigid material, allowing it to bend, and passes through the hole at the leading end of the bladder 28. The bladder 28 has located on it a one-way valve 33, through which air is pumped to provide positive internal air pressure, and a pressure release valve 34, placement of the valves is unimportant. From herein the air bladder 28, with its plunger 29, lead cable 30, and valves 33 and 34 will be collectively known as the “pull-through air bladder” 45.

When the pull-through air bladder is attached to the rest of the garment by flexible, non-elastic cords 36 and 36A, lead from eyelets 40 and 40A, located on either side of the plunger 29 on the trailing end of the bladder 28, ending at a single fastener 37. One cord 38 leads from the exposed end of the lead cable 30, also ending in a fastener 39.

When the pull-through air bladder is pressurized, the plunger 29 is pushed out of the air bladder 28 in direction 41 by virtue of the fact that the plunger 29 takes up more volume inside the bladder 28 than does the lead cable 30, effectively pulling the lead cable 30 into the bladder 28. The sum effect of this action is that the fastener ends of the attachment cords are pulled closer together.

The pull-through air bladder is secured to pairs of attachment rings located on the outside of the suit, said rings being attached to the integrated supports of the suit at points illustrated in FIGS. 1-3. Referring to FIG. 2, a pull-through air bladder 17 is secured to the attachment rings 15 and 15A on the shoulder supports 1 and 1A of the air-driven muscle toning garment; when pressurized, the pull-through air bladder 17 pulls the shoulders together. This causes the user to flex his/her chest muscles, with an amount of force equal to that exerted by the pull-through air bladder 17, to pull the shoulders forward.

A pair of pull-through air bladders 18 and 18A are attached between the attachments 14 and 14A at the top of the back and the attachments 14B and 14C at the bottom of the back on the support belt 5. These mechanisms span the entire back vertically and in parallel; when pressurized, the pull-through air bladders 18 and 18A pull the top of the back down toward the buttocks in direction 27, causing the stomach muscles to tighten and pull the upper body in direction 26.

Pull-through air bladders 12 and 12A are attached between the attachments 10 and 10A under the armpits and the attachments 10B and 10C on the belt 5 at the hips. Using pull-through air bladder 12 as an example, when pressurized it pulls the shoulder down toward the hip in direction 22A. This causes the muscles on the opposite side from the pull-through air bladder to tighten in order to pull the body back to the upright position in direction 22. This air bladder configuration can only be used on one side of the body at a time, otherwise both sides being used at the same time would cancel each other.

Referring to FIG. 1, pull-through air bladders 11 and 11A are attached between supports 9 and 9A on supports 3 and 3A at the base of the biceps and attachments 9B and 9C on the palm side of the wrist supports 4 and 4A. When pressurized the wrists are pulled toward the biceps (FIG. 3) in direction 24, causing the triceps to flex in order to straighten the arm in direction 25.

Referring to FIG. 2, pull-through air bladders 19 and 19A are attached between supports 16 and 16A at the ends of supports 20 and 20A and attachments 16B and 16C on supports 4 and 4A; in this configuration the trailing ends of the pull-through air bladders 19 and 19A must be situated toward the elbows, with their attachment cords 36 and 36A passing through runs 21A, and 21B (the pairs of runs are part of padded supports 13 and 13A that encircle the elbows; these supports hold the attachment cords in set paths around the points of the elbows). When pressurized the pull-through air bladders 19 and 19A pull the arms straight in direction 25, causing the biceps muscles to flex, pulling the arms in direction 24 to a bent position. The biceps flexing and triceps flexing configurations of pull-through air bladder use may not be employed at the same time on the same arm, or they become self-canceling.

The air driven muscle toning garment is designed so that any or all of the pull-through air bladder configurations may be used at one time, except where they cancel each other. The size and shape of the air bladder 28, the length of the plunger 29, the ratio of plunger 29 to lead cable 30 diameter, the length of attachment cords, and the air pressure used are all variable to the needs and size of the user. The type of fasteners and attachments used is unimportant so long as the location of the attachments and fasteners remains the same. The valves (33 and 34) used can be of whatever type the manufacturer decides as long as their function remains the same. The methods for donning the garment, both for the “shirt” and “shorts” portions of it, can be of whatever means are deemed most efficient so long as the functionality of the supports is not compromised. Any person skilled in the art can stipulate the materials used to fabricate the garment and all other components of the invention. Any person skilled in the art can vary the location, shape and size of the supports. The aforementioned variations do not change the required components of the invention, nor the principles on which they work.
I claim:

1. A garment used to tone muscles of the body comprising: a two-part garment having a long-sleeved, form-fitting shirt portion and a form-fitting waist-down pants portion. Said portions of the garment having integrated, low-elasticity supports that provide stable attachment points for resistance devices; the integrated supports being positioned so that when two supports are pulled toward each other by a contracting resistance device, a motion of the body is counteracted causing the opposed muscles to do more work than was previously required to accomplish the opposed motion.

2. The garment of claim 1, wherein: low-elasticity supports are integrated into the garment, encircling the body parts where attachments for the resistance devices are desired, providing stable and permanent locations for the resistance devices to be attached.

3. The garment of claim 1, wherein: the garment is made of moderately elastic material so that the garment itself does not restrict movement; the purpose of the garment shirt is to hold the integrated supports in their respective positions until the garment is worn. The purpose of the garment shorts is to hold down the support which encircles the waist, providing stable attachments on the shorts portion.

4. The garment of claim 1, wherein: low-elasticity supports are integrated into the garment at locations such as the crotch, having tunnel-like channels located where attachment cables from the resistance devices are desired to travel around a joint.

5. A contracting, air-driven resistance device comprising: an essentially flask-shaped bladder having a cylinder-shaped plunger (not necessarily round) passing through a tunnel-like hole in one end of the bladder and a cylinder shaped lead cable longer than the plunger passing through a tunnel-like hole at the other end of the bladder, with the lead cable and plunger both being matched in size and shape to their respective holes in the bladder to provide an airtight fit when lubricated. The plunger has disks of larger diameter and of the same shape as the ends of the plunger attached to the flat ends of the plunger to provide an end-of-travel point in either direction of travel through its hole in the bladder. The lead cable is attached to the center of the plunger end inside the bladder. A one-way valve is located on the bladder to enable pressurization, and a release valve is located on the bladder for depressurization. An attachment cable is attached to the external end of the lead cable and a pair of attachment cables are attached to eyelets on the bladder on either side of the plunger—this pair of cables ends in a single attachment. The resistance device contracts when pressurized by virtue of the fact that the plunger takes up more space inside the bladder; the plunger is pushed out of the bladder, in turn pulling the lead cable into the bladder and pulling the ends of the attachment cables toward each other and pulling the supports they are attached to toward each other.

6. The resistance device of claim 5, wherein: the bladder has a fixed maximum volume when pressurized.

7. The resistance device of claim 5, wherein: the lead cable is made of flexible material and has a cable passing through the center of it that will not stretch lengthwise, and is also fixed to the end of the plunger along with the lead cable.

8. The resistance device of claim 5, wherein: the lead cable and plunger are lubricated to aid in making the resistance device airtight and also to provide smooth, efficient movement of the lubricated parts.

9. The resistance device of claim 5, wherein: the plunger is of greater diameter than the lead cable, causing the plunger to be pushed out of the bladder when the bladder is pressurized. The greater the diameter (cross-sectional area) size ratio between the plunger and the lead cable, the higher the rate of compression inside the bladder. The lesser the size ratio, the lower the rate of compression inside the bladder, causing the resistance mechanism as a whole to have a more even amount of resistance during use.

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