**RESISTANCE FITNESS SUIT**

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**ABSTRACT**

A fitness system including a suit, a fixation system, and attachment locations on the fixation system. The attachment locations are located at the neck, shoulders, chest, waist, and knees. The fitness system also includes bands that are attached to the attachment points on the upper and lower torso. The upper torso band traverses behind the neck or posterior shoulders to the front waist to engage the rear deltoid, the upper back and the lower back. The upper torso band may also traverse under the armpit to the rear waist to engage the front deltoid, the chest, and the abdominals. The lower torso band traverses the rear waist over the front of each thigh to below the knee to engage the gluteus, the hamstring and the flexion of the upper leg, or under the thigh to below the knee to engage the quadriceps and the extension of the upper leg.
FIG. 2
RESISTANCE FITNESS SUIT
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation-in-part of U.S. patent application Ser. No. 10/791,931, filed on Mar. 3, 2004, which claims priority to U.S. patent application Ser. No. 60/451,725, filed on Mar. 4, 2003, the disclosures of which are incorporated herein in their entirety.

BACKGROUND OF THE INVENTION

[0002] Poor fitness, weight gain, and obesity are interrelated health killers. They may soon cancel out almost all major gains in medical treatment, quality of life, and longer lifespan over the past fifty years. The invention, in an exemplary embodiment called The BodySculptor™ offers a radical, novel solution to this worldwide epidemic, fast becoming the major worldwide quality of life and health care crisis. Type 2 Diabetes is the illness most directly linked to obesity. A condition that often leads to heart disease and kidney failure, it is blamed for more than 3 million deaths a year. It afflicts 154 million people—nearly four times the number who have HIV or AIDS—and the WHO forecasts more than twice as many people will develop diabetes in the next 25 years. People spend more time sitting in the car, at the computer and especially in front of the television—an average of 1,669 hours a year in the United States, a habit that is extending internationally, further eroding fitness levels as a social and culturally entrenched limitation on a global scale. About 1.7 billion people should lose weight, according to the International Obesity Task Force. The global trend toward weight gain and its associated illnesses is not restricted to the well off. High-fat, high-starch foods tend to be cheaper, so poor people eat more of them.

[0003] Dieting is the most common means to assert some form of weight control, but is extremely ineffective in most cases for multiple reasons. Even in instances when successful, it results in significant fat and protein (muscle) weight loss. Muscle loss reduces strength and creates a more ‘gaunt’ appearance. More desirable would be primarily fat loss while retaining muscle, which increases an index known as lean body mass. It looks great and feels great—creating a vigorous, fit, more youthful appearance. Intake of 600 calories or more per day results in some protein sparing, but weight loss in excess of a few pounds per month only significantly spares protein if it includes exercise. It takes nearly twice as much weight loss via dieting alone to equal the same amount of fat lost in conjunction with vigorous exercise. Weight lost via diet alone is associated with a decrease in the resting metabolic rate (RMR), because the body adapts to reduced caloric intake to prepare for what it interprets as upcoming famine or true starvation. Retaining weight loss is therefore more difficult when a diet ends, whereas weight lost in conjunction with exercise is not. A recent study determined it took about 80 minutes of moderate activity per day, or 35 minutes of vigorous activity for women within three months of achieving their target weight loss of about 40 lbs, just to maintain it. While exercise forms a natural part of a healthy lifestyle, a further challenge is obtaining both overall aerobic and muscular fitness from exercise. Many forms of exercise offer one or the other, but frequently both are difficult to achieve. Strength, toning, endurance and overall fitness benefit from both aerobic and weight training.

[0004] Nevertheless, dieting and or at a minimum nutritional discipline along with exercise are great concepts for maintaining fitness and weight control but usually fail over the long term because finding the time, will power, and stamina to make a single hour of exercise every other day a part of one’s lifestyle is challenging; and where diet is involved even more vigorous exercise is necessary just to maintain weight loss after the diet has ended. Injury and or reduced resistance while trying to get in shape eventually derail most even with the best of intentions, particularly per decade of age.

[0005] Prior art attempts to induce fitness via exercise benefits with suits, abdominal trainers, home gymnasiums, treadmills, trackers, other physical training aids, aerobicizing programs, such as kickboxing, dance, and other related workout programs require near Herculean discipline with repeat regular focused time and effort to do so, and suffer from the catch-22 disadvantage of requiring high levels of exertion over relatively short periods of time on a regular basis, with attendant risk of injury due to excessive focal stress points on the body, risk of illness due to reduced body resistance from fatigue, and requirement of high levels of energy and free available time several days per week. While jogging, running, swimming, bicycling, rowing, aerobicizing, basketball and other athletic pursuits offer considerable fitness potential with repeat regular use the time commitment, energy required and fitness level needed to maintain a significant activity level are prohibitive for most individuals. Even brisk walking, which comes closest to the distributed slow caloric burn of the present invention, requires inordinate free time to effect enough cumulative exercise to be truly beneficial.

SUMMARY OF THE INVENTION

[0006] In the first aspect, the present invention is a fitness system comprising a fixation system, a plurality of attachment locations on the fixation system, and a resistive band, wherein the band attaches to two of the plurality of the attachment locations.

[0007] According to one embodiment, the system further includes attachment locations that are aligned along a region. According to another embodiment, the region is a region which tolerates resistive tightening well. The region may be a joint, a major muscle group, or a region selected from the group consisting of the rib cage, the upper torso, the lower back, the abdomen, the thigh, and the leg of a user. According to another embodiment, the attachment locations are located at the shoulders, the chest, the pelvic girdle, the waist, the elbow, or the knee of a user. According to one embodiment, the band is stretched by movement involving the region. The band may increase the energy expenditure by the user to maintain a normal posture.

[0008] According to another embodiment, the band traverses the upper cervical region, down across the anterior deltoid and attaches to attachment locations either along the anterior pelvic girdle or behind the axilla to the posterior side of the body of a user. According to another embodiment, the band traverses the pelvic girdle, down across the thigh, and attaches to attachment locations below the knee. The system may further comprise a circumferential band overlying the sternum and the rib cage of a user, a pad associated with the band, or a suit to which the fitness system is
incorporated. The circumferential band may be positioned from about 2 inches to about 3 inches above the sternum to about 2 inches to about 3 inches below the sternum and may increase the amount of gas exchange during exhalation and increases the amount of energy expended during each breath by the user. The suit may further comprises a fabric tunnel to prevent said band from moving out of alignment. The fixation system associated with the knee comprises at least two circumferential portions.

[0009] According to another aspect, the fitness system comprises a suit; a fixation system; attachment locations on said fixation system, wherein said attachment locations are located at the neck, shoulders, chest, waist, and knees; and bands, wherein said bands are attached to the attachment points on the upper and lower torso; such that the upper torso band traverses behind the neck or posterior shoulders to the front waist to engage the rear deltoid, the upper back and the lower back, or under the arm pit to the rear waist to engage the front deltoid, the chest, and the abdominals; and the lower torso band traverses the rear waist over the front of each thigh to below the knee to engage the gluteus, the hamstring and the flexion of the upper leg, or under the thigh to below the knee to engage the quadriceps and the extension of the upper leg.

[0010] According to another embodiment, the upper band and the lower band create a substantially symmetrical force relative to the user. According to another embodiment, the upper band and the lower band create a minimal resistive force sufficient to increase the energy expenditure of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating the principles of the invention.

[0012] FIG. 1 is a schematic representation of the fitness system with respect to a user according to an illustrative embodiment of the invention.

[0013] FIG. 2 is a schematic representation of the pelvic girdle portion of the fitness system with respect to a user according to an illustrative embodiment of the invention.

[0014] FIG. 3A is a schematic representation of a band and an attachment location of the fitness system according to an illustrative embodiment of the invention.

[0015] FIG. 3B is a schematic representation of a band connected to an attachment location of the fitness system according to an illustrative embodiment of the invention.

[0016] FIG. 4 is a schematic representation of an upper band and a lower band attached to a belt of the fitness system according to an illustrative embodiment of the invention.

[0017] FIG. 5 is a schematic representation of a fitness system including attachment locations, bands, and a suit according to an illustrative embodiment of the invention.

[0018] FIG. 6A is a schematic representation of a below the knee attachment location according to an illustrative embodiment of the invention.

[0019] FIG. 6B is a schematic representation of a below the knee attachment location according to another illustrative embodiment of the invention.

[0020] FIG. 6C is a schematic representation of a below the knee attachment location according to another illustrative embodiment of the invention.

[0021] FIG. 6D is a schematic representation of a below the knee attachment location including dual cinch bands according to another illustrative embodiment of the invention.

[0022] FIG. 7 is a schematic representation of a fitness system including pads and fabric tunnels according to an illustrative embodiment of the invention.

[0023] FIG. 8 is a schematic representation of a fitness system including attachment locations according to an illustrative embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0024] This invention relates to a lifestyle altering ‘fitness suit’ that augments multiple body systems including cardiovascular; pulmonary; musculoskeletal including posture; mental health including emotion and anxiety control; increased lean body mass and weight control; improved metabolism; immune system function; and general fitness and well being by inducing a slow, prolonged, increased calorie burn by increasing the energy of maintaining posture, breathing, and of routine body movements in infinite combination while worn during routine daily activity either as an underwear under work clothing or as a workout suit. It allows for spectacular levels of fitness to be achieved just by commitment to wearing it regularly even for unfit out of shape individuals with poor metabolism and high percent body fat. It consists of a thin, wickable, breathable conforms to the outer ‘skin’ over most of the torso; a network of nonstretch fixation points attached thereto; and muscular, pulmonary and posture improving resistance bands with various points of attachment to the network of fixation points; and where such resistive bands are designed and oriented to minimize torque or pull on the outer skin of the suit for optimal comfort including the specific attachment of cushioning materials at key points such as the back of the neck, along the arm pit, and just under band insertion below the knee. The unique form of exertion induced by routine regular wear distributes the calorie burn diffusely as to allow prolonged wear with massive calorie expenditure even without any specific exercise regimen, with minimal fatigue, quick recovery, and reduced focial stress and injury risk. The essence of the suit’s concept is that increased caloric expenditure via extra induced effort with routine body movement and position such as breathing, posture, and generalized limb and torso movement adding up to a fraction of a calorie per second will achieve long term fitness benefits that can lead to breakthrough never before achievable levels of fitness. Further support for this concept is from recent studies using specialized sensors in undergarments that have demonstrated that individuals who “fidget” can generate several hundred calories per day over those with more sedentary non-fidgeting when at rest body positions.

[0025] The present invention provides a simple fitness garment or undergarment that is not cumbersome, is in fact easy to wear, wicks, breathes, minimizes microbial accumulation, yet increases caloric expenditure during routine activity, and does so in a manner with multi body-system benefits from its novel form of extended time-frame, low
resistance user adjustable, distributed endurance training. This invention in an exemplary embodiment describes a means of simultaneously improving diaphragmatic breathing; posture; and exercising muscle groups of the upper and lower body in a manner where movement of the upper body enhances the workout of the lower and vice versa with most types of routine motion, such as a stride in walking.

[0026] FIG. 1 is a schematic representation of the fitness system 10 with respect to a user according to an illustrative embodiment of the invention. The fitness system 10 includes a pelvic fixation system 30 and a knee fixation system 32, 32' below the joint of each knee. The fitness system 10 includes an upper resistive band 20 and a lower resistive band 22. The upper resistive band 20 is attached to the pelvic fixation system 30 at two attachment points 42, 42'. The lower resistive band 22 is attached both to the pelvic fixation system 30 at a dorsal attachment point (not shown) and to the knee fixation system 32, 32' at knee attachment points 40, 40'.

[0027] With continued reference to FIG. 1, the exemplary embodiment of the invention included key attachment locations 40, 42 for the fixation system 30, 32. This combination of attachment locations 40, 42 allows a “slingshot” resistance band to stretch at the body’s resting position. The upper resistive band 20, according to this exemplary embodiment, is shown in a modified dead lift function connection. The upper resistive band 20 may cross or connect to the ipsilateral to the pelvic girdle fixation system 30. Alternatively, the upper resistive band 20 may wrap under the armpit to connect along the rear waist for an alternate abdominal workout. Additionally, the lower resistive band 22 may be connected to emphasize the hamstrings and the gluts. Moreover, the fixation system 30, 32 may be fabricated from a nonstretch or minimal stretch compressive material.

[0028] FIG. 2 is a schematic representation of the pelvic girdle portion of the fitness system 10 with respect to a user according to an illustrative embodiment of the invention. According to this exemplary embodiment of the invention, the fitness system 10 includes a pelvic fixation system 30 in the form of pelvic girdle. The pelvic fixation system 30 includes two attachment points 42, 42', one attachment point on each of the left and right side of the fixation system 30.

[0029] With continued reference to FIG. 2, the pelvic fixation system 30 rests substantially upon the iliac crest, a key anatomical location. The iliac crest location resists the upward pull of the sling-shot paired attachment locations 42, 42' of the upper resistive band 20. While the pelvic fixation system 30 includes the waist, it particularly takes advantage of the iliac crest, which lies approximately three inches below the navel.

[0030] FIG. 3A is a schematic representation of a resistive band 24 and an attachment location 44 of the fitness system 10 according to an illustrative embodiment of the invention. The exemplary resistive band 24 includes a portion of interlocking material 36. The exemplary attachment location 44 of the fitness system 10 also includes a portion of interlocking material 38. It is contemplated that the two portions of interlocking material 36, 38 may interlock to connect the resistive band 24 to the attachment location 44. Additionally, the fitness system 10 may include a fabric tunnel 34, maintaining the resistive band 24 in proper orientation and reducing the likelihood of injury from unanticipated release of the resistive band 24 from the attachment location 44. FIG. 3B is a schematic representation of a resistive band 24 connected to an attachment location 44 of the fitness system 10 according to another illustrative embodiment of the invention.

[0031] With continued reference to FIGS. 3A and 3B, the interlocking material 36, 38 of the attachment location 44 may be fabricated from an interlocking material, for example, Velcro or Snakeskin, or another material including a hook and loop or mushroom and loop configuration. According to this exemplary embodiment of the invention, the female portion of the interlocking material 36, 38 on one side adjoins the surface area of the male portion of the interlocking material 36, 38 on the other side. This attachment configuration provides great support and adjustability of the resistive band 24. This exemplary embodiment does not require metal or plastic hooks, improving usability and reducing the risk of user injury.

[0032] With further reference to FIGS. 3A and 3B, the interlocking material 36, 38 of the attachment location 44 may be adjusted by the user. According to one exemplary embodiment (not shown) the attachment location 44 may include an opening, for example, a loop or D-ring. The resistive band 24 and/or the interlocking material 36, 38 may be threaded through the opening and cinched back over itself. This embodiment may be further secured by an additional piece of interlocking material (not shown) wrapped around the interlocked interlocking material 36, 38.

[0033] FIG. 4 is a schematic representation of an upper resistive band 20 and a lower resistive band 22 attached to a belt 31 of the fitness system 10 according to an illustrative embodiment of the invention. According to one exemplary embodiment, the upper resistive band 20 attaches to the belt 31 in the front. According to another exemplary embodiment, the upper resistive band 20 attaches to the belt 31 in the back. Similarly, the lower resistive band 22 may attach to the belt 31 either in the front or the back, according to additional exemplary embodiments.

[0034] FIG. 5 is a schematic representation of a fitness system 10 including attachment locations 44, resistive bands 20, 22, and a suit 60 according to an illustrative embodiment of the invention. The fitness system 10 includes a pelvic fixation system 30 and a knee fixation system 32, 32' below the joint of each knee. The fitness system 10 includes an upper resistive band 20 and a lower resistive band 22. The upper resistive band 20 is attached to the pelvic fixation system 30 at attachment locations 42, 42'. The upper resistive band 20 may either cross the upper body or remain ipsilateral. The lower resistive band 22 is attached both to the pelvic fixation system 30 at a rear attachment location 46 and to the knee fixation system 32, 32' at knee attachment locations 40, 40'. The lower resistive band 22 may either cross the lower body or remain ipsilateral.

[0035] With continued reference to FIG. 5, according to one exemplary embodiment, the upper resistive band 20 attaches to the pelvic fixation system 30 in the front. According to another exemplary embodiment, the upper resistive band 20 attaches to the pelvic fixation system 30 in the back. Similarly, the lower resistive band 22 may attach to the pelvic fixation system 30 either in the front or the back, according to additional exemplary embodiments.
Additionally, the upper resistive band 20 may attach either at an attachment location on the shoulder 54 or across the back (not shown).

[0036] FIG. 6A is a schematic representation of a below the knee attachment location 40 according to an illustrative embodiment of the invention. The knee attachment location 40 may attach to a resistive band (not shown) through an interlocking material (not shown); one portion of the interlocking material connected to the resistive band and the other portion of the interlocking material connected to the knee attachment location 40. FIG. 6B is a schematic representation of a below the knee attachment location 40 including reinforcing webbing 48 according to another illustrative embodiment of the invention. Additionally, the knee attachment location 40 may also have a reinforcing interior layer of non-slip, elastic or rubber-like threading 48 to maintain the knee attachment location 40 in position. FIG. 6C is a schematic representation of a below the knee attachment location 44 according to another illustrative embodiment of the invention.

[0037] FIG. 6D is a schematic representation of a below the knee attachment location 40 including a first cinch band 52 and a second cinch band 54 according to another illustrative embodiment of the invention. This exemplary embodiment of the invention, including a double-cinch band, secures the knee fixation system 32 and the fitness system 10 below the knee without torque or sliding. The below the knee attachment location 40 is located on the knee fixation system 32. Additionally, according to another exemplary embodiment, the knee fixation system 32 may include a gusset (not shown) to maintain the fitness suit (not shown) in position below the knee. The gusset may be fabricated of a non-stretch or compressive material. Furthermore, the knee fixation system 32 may include a pad (not shown) to cushion the knee fixation system 32 and prevent friction against the skin of the user.

[0038] FIG. 7 is a schematic representation of a fitness system 10 including pads 37 and fabric tunnels 34 according to an illustrative embodiment of the invention. The fitness system 10 may include one or a plurality of fabric tunnels 34 positioned at various locations, for example, the shoulders, the waist, the thighs, and the interior of the knee. It is contemplated that the fabric tunnels 34 may be positioned at any location where the resistive bands 20, 22 are located. The fabric tunnels 34 maintain the resistive bands 20, 22 in the proper orientation and prevent movement of the resistive bands 20, 22 out of alignment. The fitness system 10 may also include pads 37 between the resistive bands 20, 22 and the user to prevent roughening or irritation of the skin caused by friction between the resistive bands 20, 22 and the skin. It is contemplated that the pads 37 may be positioned at any location where the resistive bands 20, 22 are located.

[0039] FIG. 8 is a schematic representation of a fitness system 10 including attachment locations according to an illustrative embodiment of the invention. The fitness system 10 includes a pelvic fixation system 30 and a knee fixation system 32, 329 below the joint of each knee. The fitness system 10 includes an upper resistive band 20 and a lower resistive band 22. The upper resistive band 20 is attached to the pelvic fixation system 30 at two attachment locations, either the front upper attachment locations 42, 42, or the rear upper attachment locations 46, 46. The lower resistive band 22 is attached both to the pelvic fixation system 30 at a rear attachment location 46, 469 and to the knee fixation system 32, 329 at knee attachment locations 40, 40. The fitness system 10 may also include pads 37 to prevent friction between the resistive bands 20, 22 and the skin of the user. The exemplary embodiment of the fitness system 10 also includes a circumferential upper body band 80 overlerying the sternum and the rib cage of a user.

[0040] The key limitations to prior art fitness suits include 1) lack of an effective means for stabilizing garment material so that there is no significant torque or undue sliding when a resistance element is in place and a muscle contracts against it to gain exercise benefit, especially lack of proper fixation use of the pelvic girdle, particularly highlighting region just below iliac crest rather than waist; and particularly highlighting region and means for securing just below knee—as compared to the fixed skeleton “harness” system of the present invention; 2) no means for gaining increased caloric burn from the simple repetitive motions of daily living including breathing and maintaining posture (even when sitting)—as compared to the breathing and upper torso bands of the present invention; 3) no satisfactory means for securing resistance on stretch even without body movement, with comfort, to provide great cumulative effect with wear without requiring high caloric burn exercise—as with the “sling shot” resistance band configurations of the present invention utilizing the back of the neck and back of the waist as the central symmetry of stretch, and harness fixation to the pelvic girdle and hips respectively for the sling shot “ends” paired attachments for the upper and lower body bands respectively; 4) no strategic placement of cushioning relative to resistance materials—as with the closed cell foam of the present invention; 5) not easily worn under work clothes due to cumbersome resistance tubing—unlike the flat bands of the current invention; and 6) other differences in attachment of some of the fixation elements and adjustment of the resistance bands described for an exemplary embodiment below, as well as breathability and easy washing of the entire garment.

[0041] The point at which resistance elements attach to a fitness suit creates point source tension/torque against the skin underlying the suit as well as a rotation or twisting of the garment at that point, and therefore discomfort, particularly with wear for more than a few minutes as would be desirable for such a suit with prior art as sufficient fixation stabilization for long term use is lacking. The knee fixation for the lower band utilizes a novel paired set of cinched bands just below each knee to provide fixation without torque from the attached lower body bands, not described in prior art.

[0042] Prior art efforts to induce short term high resistance workouts similar to that with weight training reduce the long-term potential of these fitness suit designs compared with the present invention, where the distribution of muscle groups stimulated is over most of the body, and slight increased second to second caloric expenditure becomes cumulatively impressive, comparable to traditional high exertion forms of exercise, though the wearer can optionally induce higher resistance as fitness and shorter duration workout goals dictate. The u-shaped “sling shot” resistance of the upper and lower torso bands is unique to the present invention and add many unique novel features of wear, including comfort via the central torso providing stretch
with underlying closed cell foam for added comfort; adjustment of either band to front or rear insertion working a variety of muscle groups including for the upper body band simply maintaining posture even while sitting being a workout, and either a form of dead lift or abdominal "crunch" depending on front insertion at the waist (dead lift) or rear insertion under the armpits (foam protected) and at the central rear waist (ab crunch). The lower band provides exertion similar to dragging a weight with the legs, either on forward or rear gait, depending on front or rear thigh insertion of the lower torso band. The circumferential chest band provides a novel method for inducing resistive breathing, whereby increased resistance to inhalation results. This promotes diaphragmatic over rib cage expansion per breath cycle, with greater oxygen exchange, and increases the caloric burn per breath. Studies have shown resistive breathing confers health benefits to the heart and lungs. The invention results in a novel and almost paradoxical effect of leveraged cumulative caloric increase which over the extended hours of a workday time frame produces a daily near equivalent of a strong hour run and massive caloric expenditure much more safely and easily accomplished with regular repeat wear of the invention. Just sitting at a computer and keeping the shoulders from hunching forward via the forward setting of the upper torso band is a unique workout, the work of breathing, further accentuated by any normal or exercise activity which exponentially increases the caloric expenditure over use of the body absent the device. This benefit of increased caloric expenditure without exercise via the present invention is in direct counterpoint to prior art and unanticipated by it.

[0043] Diet and nutritional discipline simply are not sufficient in a world of technical innovation leading to increasingly nonphysiological time demands. Forced nutritional deprivation and dragging oneself body for several hours of exhaustive muscular or aerobic workout per week do not work well for most. The body interprets dieting as starvation, and loses both fat and muscle mass. The loss of muscle and low caloric intake mean much lower metabolism than with the present invention in which lean mass increases—muscle is less likely to be lost and in fact will often be gained due to the benefit of resistance training as fat is lost from the cumulative aerobic component and massive caloric expenditure over time. The solution of the present invention is to get fit naturally, almost effortlessly by wearing a device—the present invention—during routine daily activity at home, while at work, or performing errands. The natural physiologic changes induced by the distributed low resistance endurance training of the suit results in greater fitness and eventually a higher percentage of lean body mass, greater endorphin release, better body and body image biofeedback and as a result greater muscular strength, endurance, core strength, aerobic fitness, and better portion control and nutritional selection. All a function of wearing the suit, not force feeding fitness through suffering and deprivation as with traditional fitness devices.

[0044] Exercise increases lean mass—and lean mass requires more calories ingested to maintain, so one can take in more calories without weight gain the greater percentage of lean mass they have. A single hour of exercise per day, combined with moderate dietary control has been associated with dramatic weight loss (in 12 weeks) vs. dieting alone, and increases lean mass. Achieving that "single hour" of exercise per day as part of one's lifestyle is quite a challenge however. The invention is a lightweight, breathable fitness suit technology that per day worn will far exceed that hour of exercise needed (e.g., under work clothes) for an entire workday. A wearer goes through their daily routine, sleeps better each night due to greater oxygen debt and CO2 in their bloodstream.

[0045] The invention for the first time allows an individual to take advantage of the infinite variety of body motions that are part of every person's daily routines—like movements of the torso, gait, even breathing, and converts these physiologic movements into increased exertion per second to generate a whole new, powerful, extended form of exercise. The average individual takes over 10,000 breaths per day burning 900 calories simply by breathing; over 2,000 strides per day, moves their torso many thousands of times, etc. A small fraction of a calorie more energy expended per second for each of these routine movements—and over the course of each day that can add up to hundreds of extra calories burned almost effortlessly, similar to an hours hard run, but with the exertion distributed throughout our bodies and the effect feeling more like a slow walk. For example, increasing energy expended by 0.017 cal per second (1% of a calorie) is about 1 calorie per minute, or about 600 calories total, with this caloric burn distributed almost evenly throughout the body every time the invention is worn for a 10-hour day.

[0046] The invention takes advantage of advances in materials technology and a revolutionary design to create this new fitness paradigm. It finally offers a solution to the seeming paradox of how to achieve spectacular levels of fitness without setting aside large blocks of time and without requiring the energy for Herculean moments of intense effort. Accepting the challenge of today’s limits on personal time, the invention requires simply making the lifestyle decision to wear it regularly, preferably a few days per week and slowly resculpt the body into a leaner high endurance higher metabolism fitness machine. Over time the increased distributed lean mass, calories burned, and extra endurance will create a level of fitness unrivaled except by world-class athletes. In fact worn a few times per week it gives the caloric burn of nearly a marathon running program, with much less physical stress on the body and distributed lean muscle mass conditioning.

[0047] The effective 'workout', with slight increase in exertion every second of each workday worn is not possible previously, and offers a more comprehensive, physiologic (natural) means of working the muscular, cardiovascular, pulmonary, and skeletal systems. It generates results—greater mental and physical well being—by powerfully working the body in a manner that allows for reduced focal stress and injury risk, and quicker recovery, so it can be continued indefinitely. Lifestyle change is key to greater fitness, leaner body mass, and greater weight control, and with the invention becomes possible. The increased fitness will drive better nutritional choices, weight control and benefits overall health.

[0048] Better nutrition becomes a natural byproduct of a more fit body because the greater sense of well being via higher endorphin levels associated with highest levels of fitness contribute to better eating choices naturally. But with prior art it was an almost impossible 'Catch-22' to get that 'ultra-fit'. This problem with diets and workout programs is
an overwhelming obstacle to making them lifelong full-time disciplines, the key to any successful combined nutritional and exercise program.

[0049] Studies indicate 2,000 calories per week of exercise induced calorie burn off has dramatic health benefits. In fact, the Harvard Alumni Study demonstrated increasing physical activity from 500 calories per week to 2,000 calories per week improved cardiovascular fitness and decreased the risk of heart attack—with men who are the least fit 8.5 times more likely to die of a heart attack than men who are the most fit.5

[0050] If an exercise program were to result in calorie burn of about 600 calories per day used it would be the equivalent of jogging 6-8 miles in about an hour depending on ones weight. Repeated four times a week a net of about 2,500 calories per week would result from about 28 miles of jogging. After 12 weeks 25,000 to 40,000 additional calories will have been expended, powerfully contributing to a tremendous decrease in retained calories. The net effect would approach the fitness and training regimen of a competitive marathon runner running 24 to 36 miles per week.

[0051] Achieving this level of fitness jogging—as a lifetime commitment—would be virtually impossible for most individuals, due to the intensity of effort and training time needed, as well as the eventual wear and tear on most of our bodies—particularly feet and knees. While few would argue that such exercise is beneficial, there is clearly a reason so many individuals are not really fit, are overweight, or obese. If one were in shape, exercise could be easy, fun, and motivating. If one is out of shape, is overweight, or has little time for it, they likely lack the energy to perform a vigorous workout several days per week, would be more injury prone if they did so, or would get sick from lowered resistance if they try too hard too soon. These setbacks take their toll, and lead to ultimate failure. Resignation results, and individuals are fated to then watch their bodies bloat as they age, slowly growing waistslines not infrequently that become quite massive over the years.

[0052] There is very little to no chance of jump-starting a dramatically effective, long-term, lifestyle transforming exercise program for the majority of overweight or unfit individuals without the present Invention or some other breakthrough like it. The reduced energy from being unfit, the lack of stamina, the likelihood of injury all eventually take their toll before a high level of fitness can be achieved. To further complicate matters, as previously stated, since fat mass is higher than desired in such individuals, it takes even less metabolism to maintain weight, meaning such individuals are prone to weight gain, not loss. Getting unfit, overweight, or obese individuals to a high index of lean mass, which might radically reverse their internal desire to ingest calories and control their weight gain is virtually unachiev-

[0054] *1 hr @ 11 min./mile=550 calories for a 125 lb person; 660 for a 150 lb person; 962 for a 200 lb person

[0055] When the invention becomes a part of one's lifestyle it does not just retool the body, as any true high level athlete can attest it becomes self-acting, fulfilling, and drives further effort to maintain this state of well being. It revitalizes ones inner self. While this is said of exercise in general, it only becomes true when an individual overcomes the inertia of a sedentary lifestyle, the muscular and overall endurance weakness of their body, and attains sufficient levels of fitness. Because of the unique nature of the fitness and exercise characteristics of the present invention this improvement is both marked and more comprehensive than otherwise possible for most individuals. Without liposuction, steroids, growth hormone, skin peels, botox, lifts, Viagra, stimulants, anti-anxiety, or mood control drugs the wearers loss of fat with protein retention contributes to looking and feeling years younger, with more endorphins to reinvigorate naturally and provide a more placid steady demeanor. A more fit and vigorous persona tends to result, with greater energy ready to be directed as needed. Achieving greater cardiovascular, pulmonary and musculoskeletal fitness; sleeping deeper; eating better; more energy for the family; and a natural endorphin drug-free boost for a more fulfilling sex life all derive as cumulative benefits from the fundamental novelty of the spectacular levels of fitness achievable for the first time simply by wearing regularly the invention. The unique second to second fitness benefit of wearing the invention easily for extended time periods leads to day to week to month to life benefits due to its design for daily wear and repeated use. The invention transforms the body over time much like running water reshapes even the hardest rock. The Invention is the driving force, the wearer's body mass a granitic slab so to speak slowly but powerfully being reshaped over time.

[0056] Generating 600+ calories per day of calorie burn four to six times a week (about 10,000 calories per month)—without jogging, or massive time devoted specifically to exercise has never been achievable through any modified exercise plan or prior art invention.

[0057] The proprietary “key” to the Invention, is derived from its fundamental fitness “axioms”, for which no prior art invention exists or has been designed to incorporate:

[0058] Axiom 1: A subtle, prolonged increase in energy expended over extended hours (e.g. about 10) results in a more powerful form of exercise that can be easily leveraged than massive concentrated exertion for an hour.

[0059] Axiom 2: Distributing low resistance endurance training throughout the body (D.E.T.) allows for less wear and tear and quicker recovery, allowing the body to thrive on massive caloric expenditure.
Axioms 1 and 2, described above, led to the powerful novel concept of the present invention called D.E.T. There is one more equally powerful axiom, one that follows from D.E.T. Axiom 1 and 2 lead directly to another key fitness principle of the present invention:

Axiom 3: The invention (through D.E.T.) increases lean body mass, and increases metabolism with less fatigue, diffuse involvement of most major muscle groups, and quicker recovery than conventional exercise; it creates a sense of well-being associated with higher levels of fitness via endorphin release; and triggers modification of nutritional cravings toward healthier choices with better portion control naturally—without the starvation, discipline and deprivation associated with dieting.

This is the well kept secret of most of those rare fit individuals who seem so disciplined when they eat. They already have the endorphin high of being in shape. Its not suffering and diet that gets them there, but vice versa. This is one of the least appreciated/most misunderstood aspects of fitness—how nutrition is driven by level of fitness rather than vice versa. It is the final of the three axioms that makes the Invention so physiologic—so natural and so unique. While it is very difficult to force our bodies to eat in ways we do not crave day after day month after month and year after year—as in virtually any diet or nutritional discipline that requires virtually imploding our zest for life to unnaturally ’sacrifice’ to do it; it is clearly easy to maintain healthy nutrition when one’s body literally craves it. Plus the massive calorie expenditure of lifestyle use of the present invention allows a more balanced enjoyment of a variety of less ideal for one’s health taste bud cravings without the as great a negative consequence.

D.E.T. can be somewhat better understood from some real life exercise situations most are familiar with. Walking briskly for about three hours burns the same number of calories and confers virtually all the health benefits of jogging for one hour, and in fact is less stressful on ones body, but unfortunately is an impractical time commitment given the necessity of cyclical almost daily repeat performance. Spread out over an eight to ten hour workday with the present invention the effect of D.E.T. is even more powerful and leveraged. The second to second effort required to generate 600 calories of energy expended over an 8 to 10 hr workday, 4 days per week is a barely noticeable fraction needed to achieve the same calorie burn as jogging 20-30 miles per week in 4-6 hours of running per week.

Doing the math one more time: An increase in your energy expended of about 0.0166 calories per second (V/0,000^6) spread out over an 8 to 10 hr day=1 calorie per minute=60 calories per hour=600 calories per 10 hr day=244+ miles jogging per week over 4 1 hr sessions: near marathon level fitness.

Axiom 4: Weight lost via diet alone is associated with a decrease in the resting metabolic rate (RMR), since your body thinks your starving, making retaining such weight loss more difficult when a diet ends.

Axiom 5: Exercise increases lean mass, the ratio of muscle to fat; lean mass requires more calories ingested just to maintain than does fat—so it—particularly D.E.T.—results in a boost in metabolism.

Axiom 6: It is the depth of sleep time not length of sleep that determines sleep quality; so short rest at very deep sleep (D.E.T. Sculptor™ induced) can be more restful, beneficial sleep.

Axiom 7: Diaphragm (vs. chest expansion) breathing via the Sculptor™ promotes relaxation; during sleep it promotes a sense of well being, as well as better oxygen exchange per breath.

Axiom 8: Our daily life style does not allow enough physical activity to induce the elevated CO2 levels of the end of the day oxygen debt that leads to “fall through the mattress” deep seated sleep D.E.T. via the Sculptor™ does.

Nearly ⅓ of Americans are overweight, and nearly ⅓ obese—many children and adolescents—making excess weight the likely future #1 health risk in America® as well as worldwide. From fast food convenience to massive work-weeks, the U.S., and increasingly the industrialized world is a global village that has achieving and maintaining fitness the number one challenge to quality of life and better health.

Prior art does not provide for exercise benefit via breathing and posture, key advantages of the current design which can provide a workout while simply sitting at a computer, watching TV, or driving a car. None of the prior art exercise or fitness suits offer these advantages. Through its novel harness system, upper and lower “sling shot” style torso bands of a exemplary embodiment, breathing band, closed cell EVA cushioning system, and breathable antimicrobial treated outer shell a very comfortable fitness suit that can be worn under clothing or as outer wear is for the first time available for use during all routine daily activity or for leveraged benefit during formal exercise.

The Invention, through its novel distributed form of endurance training (called D.E.T., see below) creates its novel benefit by increasing caloric output by a fraction of a calorie per second. Just as those who “fidget” have recently been shown to burn hundreds more calories per day, those who work harder to breathe, maintain posture, and perform simple movements of their torso and legs will experience similar though much more extensive and profound benefit. No prior art suit was designed to work according to these principles. This could mean countless savings in lives, quality of life, less time lost to work, and major health cost savings. The Invention is a unique fitness suit that generates an overall sense of well being, improved fitness, lean body mass and weight control, and many other health benefits while worn . . . a novel fitness paradigm not described or predicted by prior art that for the first time takes fitness training to the next level simply with routine wear of the invention.

The Invention provides for a novel, sophisticated, time and energy leveraged, safe, powerful, and easily achievable form of exercise. This unique workout has been descriptively termed “distributed endurance training (D.E.T.):

With D.E.T. nearly the entire body is naturally working harder in virtually infinite combinations, but it’s just barely noticeable on a second to second basis. Natural activities like breathing, walking, retaining posture, and exercising specific muscle groups during normal movement now occurs at slight added per second effort as part of your normal daily activity. Yes—the wearer will fatigue at first by
the end of each day—but it’s a ‘delicious’ kind of tired that helps assist sleep—the wearer is likely to ‘sink through the pillow’ for an improved nights rest.

By distributing the energy expended throughout the body at a slight per second increase one achieves D.E.T., a training regimen unique to the present invention. It is an explosive intense training effect driven and maintained by simply wearing the Invention at repeat, regular intervals; preferably a few days per week. Worn four times per week D.E.T. achieves about the same caloric burn as nearly 20-30 miles of jogging per week, but with the effort spread out over time and utilizing nearly your entire body. Invigorating, powerful, and more effective weight loss and body sculpting to melt fat, decrease cellulite and increase lean body mass—all, with much easier recovery.

Low impact, low resistance distributed endurance training, if combined with routine normal motions of every day life to add an additional 0.017 cal/second of energy expended per alternate workday, offers the most potent form of exercise ever devised. Achieving nearly unimaginable levels of fitness safely and powerfully almost regardless of current fitness and weight, with dramatic weight loss, increase in lean over fat mass, and maximizing injury-free cardiovascular, musculoskeletal and pulmonary health becomes possible, without the injuries and lack of time making this a near impossibility otherwise. Because of the leveraged power of spreading out a workout over an infinite variety of routine movements in a parallel path with a normal workday several days per week, the previously impossible becomes . . . reality.

By spreading a workout over a normal workday simultaneous with our normal activity—that is, work and workout designed to occur simultaneously—a tremendous health and fitness breakthrough is achieved. Time is no longer a factor, injury not a problem, and the cycle of only the fit able to maintain fitness is broken. Breaking through to the ultimate fitness levels currently possible for only the greatest athletes is within reach of almost anyone committed to long-term use of the Invention, a life-transforming achievement because every minute of work becomes simultaneously a minute of working-out several days a week.

Fixed Skeletal “Harness” System

Pelvic Girdle (Iliac crest)—Waist: The fitness suit in a exemplary embodiment is cinched around the chest, pelvic girdle including waist and knees where nonstretch materials such as a breathable nylon are affixed. The pelvic girdle encompasses in particular cinching just below the iliac crest (hip pointer area), taking advantage of the reduced skeletal circumference below this level to resist the upward forces on the upper body band at its point of attachment on the nonstretch material along the pelvic girdle. The upper torso band traverses from behind the neck and or rear deltoids on either side to either the front waist and or under the armpits to the rear waist, to alternate workout of the opposing surface muscle groups (back muscles for front insertion and vice versa). In a exemplary embodiment a flat resistance band is exemplary, and around the neck cushioning under the band is provided by added thickness of material such as soft or rigid closed cell EVA foam or commercial foam products such as Poron® to distribute tension evenly and comfortably. The lower band traverses from the rear waist to across either the front or rear thigh to work the alternate side muscle groups, then connecting below the knee.

Below Knee: The connection below the knee minimizes point torque or stress by attachment in a exemplary embodiment of dual encircling bands—1) a circular band below the knee cinched along the lower hem, preferably with a gusset underneath; and 2) a second encircling band about 1” above the knee hem but below the knee cap (0.5 to 3” range exemplary) where Velcro® or mushroom hook and loop material such as #810 (Aplich Fasteners Inc., 4714 Christie Drive, Beamsville, Ontario) are cinched with a male female connection of attachment to the suit and band over the encircling region and a second male female connection attached to this band to allow resistance band attachments. This dual band cinched closure below the knee allows the structure of the knee itself on the opposing side and throughout the circumference of the knee to spread the force of attachment and to provide most of the structural support and counter the resistance of the band attachment to either its anterior or posterior (actually the band runs posterior and attaches medially) on each side, reducing or eliminating the sensation of torque, and resisting undesirable rotation of the suit points of connection.

Resistance Band and Connections: The connections of the resistance bands in a exemplary embodiment add critical safety and adjustability features essential to allow individual comfort and customization of the workout by varying the resistance. These connections consist of a paired set of flat bands, conjoined along one end in the embodiment, with a singular flat band of loop hook mating that inserts into its opposite as a paired conjoined band. The inner surface of the paired end and of the centrally inserting single band are either hook and loop or mushroom and loop (Velcro®, Snakess®) or other similar fabric binding method, such that the paired end contains either the male or female configuration along both inner surfaces and the single central inserting band the opposite on both sides. In a exemplary embodiment the male ends are attached to the bands and female ends on the suit. By making the female paired ends @ 5” long and the male 4.5” this allows for the user to adjust placement by up to 2 to 2.5” per side; or nearly 5” of length adjustment per band. Optionally an encircling hook loop closure around the sandwiched male and female elements maintains firm connection pressure of the mated combination further securing the strength of connection when only 2” of male is inserted in the paired female closure. Optionally an elastic connection to the female ends allows for adjustment of the angle of the female connections. See “Means of Attaching Resistance Bands For Optimal Safety and Adjustability II”. In a second exemplary embodiment a stretch rubber or elastic band located at the beginning of the male end is then rolled over the completed male female connection to ensure tight closer.

A novel feature of a exemplary embodiment of the suit is the orientation of the upper and lower body bands, one each for the upper and lower torso. The upper band pulls the shoulders forward or backwards, either via a band running behind the neck and then connecting to the front waist (forward shoulder pull) or rear waist (backward shoulder pull); or via connection to nonstretch material directly over the shoulders connecting to either front or rear waist. The lower band runs behind the waist to connect in various
configurations down the leg and under or over the thigh to connect to the double cinched knee hem and knee band described above. In an exemplary embodiment one such attachment runs from behind the waist to below the thigh and around to insert on the anterior surface just below the knee ipsilaterally on each side. The result is increased resistance to knee flexion as well as forward striding of either leg. Even sitting requires work by the hamstrings in this configuration to prevent the leg from being extended by the resistance band. By placing attachments along various points of the knee band other geometries can be fashioned to work other parts of the glutes and upper thigh. One other such combination runs across the upper thigh anteriorly to connect mediially to the knee cap, working powerfully the gluteus and backward striding of the leg.

[0083] To review: Every individual takes about 7,000 breaths during a ten-hour period, takes about 1,000 strides or more, and has well over 5,000 total movements of their arms, back and upper torso. If most of these normal actions had an increased energy expenditure that totaled about 1 calorie per minute, or 900th of 1 calorie per second—0.017 cal, it would be barely discernible on a second to second basis . . . but the caloric expenditure would be about 600 calories over a ten hour time frame per day. That is virtually the same expenditure running about 7 miles at an 11 min per mile pace would accomplish.

[0084] A exemplary embodiment called The BodySculptor™ fitness suit is a breakthrough in fitness technology allowing the wearer, without any intentional effort, to perform extra ‘work’ while doing routine daily tasks, including sitting at a computer or driving. On a second to second basis it is nevertheless a pleasant, vitalizing effort, much like a long, lazy or brisk walk—depending on the personal suit resistance preference settings selected. With regular repeat use the body undergoes the equivalent of near marathon training, but done gradually with considerable comfort. This is a smarter and more physiologic way to workout because it’s not only leveraged in terms of time, during ones daily routine, but also in terms of workout effect. Even sedentary individuals will benefit, and it can be performed virtually for ones lifetime. Children, adolescents, many who are physically challenged or impaired, and seniors with more fragile body structures and reduced energy can benefit from the unique benefits of the invention. Runners, athletes, military personnel and others in training who wear the suit will dramatically leverage their workout, but this becomes more option than necessity for achieving great fit. Even special environmental situations, such as that of astronauts, with their special needs to maintain muscle tone and bone density at reduced or absent gravity could benefit.

[0085] Linkage of Upper and Lower Torso Bands To Amplify and Synchronize Resistance: The upward force vector on the lower legs creates a downward force vector on the suit along waist where this upward pull is resisted. This is the next effect of the lower torso band in a exemplary embodiment. An upper torso band has just the opposite effect, pulling downward on the neck and or upward at the insertion at the waist. By placing the insertion of the upper band and waistband of the lower band in proximity to each other a net cancellation of force vectors on the suit results. Further, striding increases this downward pull on the lower band, adding additional resistance to the lower band when the two bands in an exemplary embodiment are so linked positionally (insertion of the upper in proximity to waist band of the lower). The same occurs in reverse when postural change or other upper torso movement increases resistance in the upper band, it translates to increased resistance in the lower. Thus many activities amplify the effects of the linked upper and lower torso bands in an exemplary embodiment.

[0086] Distributed Endurance Training (D.E.T.): The present invention’s unique form of fitness training for the first time makes long duration resistance endurance training, distributed over most major muscle groups of the body, easily achieved. We call this unique workout “Distributed Endurance Training” (D.E.T.).

[0087] With D.E.T. nearly the entire body is working harder, naturally, in infinite coordinated combinations—but it’s just barely noticeable on a second to second basis. One should ideally generate D.E.T. for prolonged hours of time per day, and the benefit is amplified, explosively, with regular use. Natural activities like breathing, walking, moving, retaining posture, and exercising specific muscle groups during normal movement now occur at slight added per second effort as part of your normal daily activity. You still fatigue by the end of each day, but it’s a ‘delicious’ kind of tired that helps you sink through the pillow for a great nights rest.

[0088] By distributing the energy expended throughout the body at a slight per second increase over extended times of wear you achieve D.E.T. It is an explosive intense training effect maintained by wearing The present invention in parallel with your daily routines a few days a week. There is no other realistic option given the time required to get the full D.E.T. effect (ultra fitness):

[0089] 1 Endorphin release; 2 Massive caloric expenditure, 3 Increased lean body mass and metabolism; 4 Natural nutrition optimization; 5 HI peak core endurance; 6 other health benefits (see below).

[0090] By spreading a relatively low resistance (you set it) prolonged endurance workout over a normal workday simultaneous with your normal activity—that is, work and workout designed to occur in parallel—a tremendous health and fitness breakthrough is achieved. Time is no longer a factor, injury not a problem, and the cycle of only the fit able to maintain fitness is broken. Every minute of wear becomes simultaneously a component of an “ultra-fit” power workout, where the sum effect is the most advanced professional health & fitness-training program ever. It makes even the most well intended diet and health club training program seem like ‘amateur hour’.

[0091] Like the power of water to sculpt rock, regular wear of Present invention unleashes this force to steadily and relentlessly positively transform and evolve your body, no matter what shape you start from, until you feel like you literally are defying if not reversing aging.

[0092] Aging and Distributed Endurance Training: Aging sabotages fitness for most individuals, primarily because of the slow degradation in ability of the body’s soft tissues to withstand the rigors of exercise and sport without injury. Muscle can be no stronger than its connected tendon, and joints no more mobile than their surrounding ligaments. Losing tensile strength of tendons and ligaments—even gradually with age—requires special adjustments in exercise
and fitness training to allow optimal benefits. With age exercise is associated with more frequent micro and/or macro tears in tendons and ligaments that may fail to heal well due to poor circulation with age in these soft tissues. Joint injury, particularly back and knee, adds prolonged periods of restricted activity or total inactivity to achieve even partial healing. With every passing decade these injuries accumulate, reaching disastrous levels as we become more sedentary by typically our fifth decade. Quality of life suffers as we approach this point of no return and is seriously reduced beyond, making vigorous exercise and sports participation, and eventually even simple activities like sitting on the floor and getting up, or walking up and down stairs easily, limited in scope at best.

[0093] D.E.T. forces the body, through powerful, gentle, injury free wave after wave of its unique endurance training, to stimulate and reshape tendons, ligaments and muscle, over and over—so they ever so gradually get progressively thicker and increased tensile strength, without the stress contact sports and periods of intense hourly exertion create. With long term use this amounts to virtually defying the typical effects of aging as muscle, tendons and joints gradually are able to withstand tremendously increased strain without pain or injury, prolonging quality of life, as well as playing contact sports like basketball and tennis or the like more vigorously.

[0094] Sedentary Lifestyles and Distributed Endurance Training: Some individuals are much more active than others. Those with sedentary lifestyles involving hours of inactivity, such as working on computers, watching television, or reading for example, clearly have greater challenges to maintain fitness. The Present invention confers a unique benefit—burning considerably increased calories even with sedentary lifestyles. Sitting in it for example burns added calories via breathing, from the effort necessary to maintain a sitting posture and shoulder position, and in certain leg band configurations in keeping the knee flexed.

Exemplary Embodiment

[0095] The exemplary embodiment is designed with lightweight, highly breathable, antimicrobial materials so it can be worn in place of underwear or as outerwear to workout. It is actually higher quality and more breathable, odor resistant and comfortable than most undergarments.

[0096] From the moment you put on The present invention you know you are about to undergo a revolutionary experience. Because of its tight yet comfortable stretch-like fit it even feels powerful and enhances your appearance: figure flattering for women via uplifted breasts, slimming waist, thighs and butt; and a more sculpted look for men with well defined shoulders, and flat chest; a cross between a surfer suit and ‘superman’.

[0097] Special components designed into The Present invention let you vary your settings so that breathing, posture, torso movement and simple walking all provide just the right energy expenditure to deliver its proprietary D.E.T. The key is to learn to set the resistance low enough to allow for wear over the full period of time available.

[0098] Breathing (Respiratory Resistance) Band: The average person has a respiratory rate of about 12 breaths per minute, or well over 7,000 cycles of inhalation and exhalation in a 10-hour day, every one of which will be at increased caloric burn, greater oxygen exchange, and more “tension busting” diaphragmatic breathing.

[0099] The Present invention’s proprietary breathing belt (adjustable respiratory resistance) built right into the suit does this by subtly increasing the resistance per breathing cycle; adding resistance to chest expansion encouraging more diaphragmatic breathing relative to chest expansion breathing; and allowing more oxygen exchange per breath via more complete expiration.

[0100] The average person with a 1700 calorie metabolism burns over 800 calories just breathing. The reason is while it seems so effortless, other than the beat of our hearts it is the most repeated activity we do per day. The average person breathes sub optimally via “nervous breathing” by expanding their chest more and using their diaphragm less, with less complete inhalation and exhalation. You simply adjust the band and deliver the increased resistance on inspiration and enhanced more complete expiration that is right for you. The initial resistance promotes diaphragmatic breathing, critical to optimal physiologic working of your body, while improving your oxygen intake by more air exchange per breath. You can breathe deeper and slower and take in more oxygen. This adds an added fraction of a calorie more resistance per second, varying depending on your personal comfort setting and physique.

[0101] Postural Resistance: Unless lying down we have evolved to naturally maintain equilibrium with vertical balance of our upper torso; it’s what makes us a bipedal species. The Present invention induces a forward or backward upper torso ‘lean’ you set, that increases the required effort to maintain this necessary balance. This is nearly effortless on a second to second basis, but powerfully leveraged to make a huge difference over time, all while strengthening the powerful muscles of posture to sculpt rear shoulders and upper & lower back; or front shoulders, chest and abs (you choose which each day worn).

[0102] The exemplary embodiment of the present invention provides this benefit through setting of its proprietary adjustable resistance Upper Torso Band that provides forward upper torso lean (Setting 1, front waist); or backward of vertical upper torso lean (Setting 2, rear waist).

[0103] When wearing the suit you select which lean for that day, depending on your setting placement of the upper torso band, which should be alternated every day worn. As a result, your body will be constantly maintaining a vertical upper torso against this resistance lean every second the suit is worn. Remember, not only do you select the lean for that day but also the resistance you are comfortable maintaining. Even the slightest lean will over hours of wear confer powerful, leveraged and amplified muscular and postural health benefits.

[0104] Torso Resistance: The exemplary embodiment of the present invention takes advantage of the fact we make thousands of upper torso movements in a ten hour day, and use the lower torso to take an average of over 2,000 strides during that time via its:

[0105] Upper torso band: The Upper Torso band not only provides the vertical lean (above) but does so by creating a powerful workout with two of the most effective exercises known but in a new and more powerful D.E.T. format. These
two exercises are a modified dead lift function (adjustable setting 1) or a modified abdominal crunch function (adjustable setting 2).

[0106] By setting the upper torso band on the front vs. rear waist immediate powerful postural resistance is put into effect, strengthening the selected muscles of posture and not only sculpting and burning calories, but providing a much needed health benefit. These muscles of posture get very little tone and endurance due to restrictions on our physical activity that just do not promote postural muscle maintenance and/or development. Dead lifts and abs crunches are two of the most important exercises for restoring and maintaining our core, key to an ultra fit body. Yet conventional workouts offer too much weight and or too little repetition. They lack the subtle prolonged resistance benefit of The Present invention™ which is exactly what these powerful muscle groups really need.

[0107] When set to the front waist (modified dead lift function) the entire upper torso is subtlety and adjustably pulled forward, requiring the muscles of the upper shoulders and upper and lower back to continuously resist to maintain balance. Vice versa for setting 2, when the torso is pulled back of vertical by the resistance band placement behind the waist, forcing the front shoulder, pectoral, and abdominal musculature to fire for the entire time the suit is worn. These workouts are more potent than anything you can achieve in a gym or with other fitness equipment because only these offer D.E.T.—sustained effort over hours with low resistance that sculpts and defines these muscles like no other exercise ever could. And every single day is another easy opportunity to get more fit—just wear it.

[0108] Lower torso band: The Lower Torsos band has two settings, providing two powerful alternating workouts for the butt and upper legs. Setting 1: behind waist to over the thigh to the inner knee) works the butt, particularly the gluts and upper hamstrings. Setting 2: under the thigh to the inner or outer knee works the powerful quadriceps muscles of the upper thigh. However, unlike squatting, leg extensions, or reverse leg curls, the use of low resistance over hours of wear resculpts these muscles much more powerfully, creating greater endurance than any conventional hour per day of exercise could.

[0109] Customizing resistance of the upper and lower torso bands: The upper and lower torso bands allow total customization of the D.E.T. workout. Because of the length of wear it is possible necessary to allow for a large range of resistance; with higher resistance options only to be used after determining no undue soreness from use of lesser resistances with prolonged wear.

[0110] The exemplary embodiment of the present invention offers two means for adjusting resistance:

[0111] Varying the degree of tension on each band: Varying the degree of tension is made simple, placement of a 4.5" male 820 hook and loop material into its female 5" connection allows each band end to be placed anywhere from completely within to as little as only 2.5" depth. This means a 5" to 5.5" range of pull on each band by adjusting the depth of connection of each end.

[0112] Interchangeably using an Elie® (low resistance); Supra® (moderate resistance) Force® (high resistance); or Ultra® (highest resistance) band.

[0113] The Elite™ upper and lower torso bands utilize a thick layer of elastic material to create a modest but significant resistance—which given the duration of wear possible allows for prolonged wear with excellent fitness benefit and no to minimal discomfort.

[0114] The Supra™ uses a proprietary blend of rubber to create considerably increased resistance over the Elite® band. Only individuals with good conditioning should consider wearing the Supra® bands for more than a few hours.

[0115] The Force™ and Ultra™ bands offer highest levels of resistance. Individuals with excellent fitness who have worn the Supra® bands for prolonged periods of time will find these bands offer considerably greater resistance to more exhaustive D.E.T. endurance and strength training, particularly when only shorter intervals of wear are possible. Wearing this band without previous training at lower band settings could cause significant discomfort and possibly injury if worn for a prolonged period. Because the full effects of band usage may not be felt until the next day, wearing these highest resistance bands for more than 30 min. initially—with 30 min. of increase in wearing time per session maximum—could result in serious injury.

[0116] Each band has an attachment fabric tunnel (upper torso band behind neck; lower torso band behind waist) from which it can easily be removed and a different level resistance band inserted in its place.

[0117] Overall Effect Of Lifestyle Commitment To Wear of the Exemplary Embodiment: Virtually all of us seek a trim waistline, cut abs, and a lean, well defined (or shapely), energized body. But few appreciate how destructive dieting is to realizing this goal. With every pound of fat we lose dieting, as much as 0.6 to 1 pound of muscle is lost as well:

[0118] A 195 pound male with 17% body fat has a waistline of about 35.8 inches. He has a fitness and cosmetic goal of 12% body fat, or about a 33.4" waistline. Through diet alone he loses at least 3 lbs of muscle for every 7 lbs of fat—more in most cases. As a result to hit 12% body fat and achieve a 2.5" waistline reduction he must lose nearly 19 pounds—12 pounds fat loss and 7 pounds muscle loss, to 176 pounds. His body thinks he is starving and slows its metabolism due to the reduced muscle mass (muscle burns more calories than fat), so it is nearly impossible to maintain this % body fat.

[0119] Compare this to losing fat while gaining muscle via the Sculptor®. Through Sculptor® D.E.T training he achieves fat loss from massive caloric burn and aerobic exercise, and muscle gain through long duration resistance training. He achieves the same waistline, but with only 5.2 pounds of weight loss. Wow?? By losing about 10 pounds of fat while gaining about 5 pounds of muscle (including abs). His body increases its metabolism, (greater muscle mass) and more easily maintains the new weight at approximately the same total % body fat and waistline as 19 lbs of dieting. See Diet Vs. Sculptor® Fitness & Weight Loss Calculator.

[0120] Systemic (Total Body) Benefits: There is not any exercise equipment or program that even remotely delivers on the power of The present invention to deliver its proprietary D.E.T. training. While burning massive amounts of calories, strengthening back, abdominal, glut, quad, and hamstring musculature in new ways and strengthening tendons and ligaments are all powerful features of The Present
invention, the effects of its regular wear on the overall health of our bodies and mind are equally important, and potentially spectacular. These include cardio-pulmonary, lean body mass and metabolism, nutrition and portion control, sleep, and emotional and mental health.

[0121] Cardio-pulmonary Benefits: The increased second to second effort of simply wearing The Present invention promotes greater cardio-pulmonary fitness, and does so in the most natural healthy way: the benefit and increased endurance of less calorie burn-off through the equivalent of slow to brisk walks, slightly but powerfully increasing heart rate over the time of wear, amplified by the specific targeted workouts that are occurring to your muscles of respiration and upper and lower body musculature simultaneously.

[0122] Studies indicate 2,000 calories per week of exercise induced calorie burn off has dramatic health benefits. In fact, the Harvard Alumni Study demonstrated increasing physical activity from 500 calories per week to 2,000 calories per week improved cardiovascular fitness and decreased the risk of heart attack—with men who are the least fit 8.5 times more likely to die of a heart attack than men who are the most fit.

[0123] Increased Lean Body Mass and Metabolism: Weight lost via diet alone is associated with a decrease in the resting metabolic rate (RMR), since your body thinks you are starving, making retaining such weight loss more difficult when a diet ends, whereas weight lost in conjunction with exercise is not.

[0124] Dieting alone results in significant fat and protein (muscle) weight loss. Muscle loss reduces strength and creates a more ‘gaunt’ appearance. Fat loss while retaining muscle increases lean body mass. It looks great and feels great—creating a vigorous, fit, more youthful appearance. Intake of 600 calories or more per day results in some protein sparing, but weight loss in excess of a few pounds per month only significantly spares protein if it includes exercise. In fact you have to lose nearly twice as much weight via dieting alone to equal the same amount of fat lost in conjunction with vigorous exercise. Measuring your waistline reduction is a more important parameter of fitness than weight loss measured on a scale.

[0125] Exercise increases lean mass—the ratio of muscle to fat—and lean mass requires more calories ingested just to maintain than does fat, so your metabolism increases; meaning for an equivalent weight more lean mass lets you ingest more calories without weight gain.

[0126] Combining moderate dietary control—a diet low in fat, high in protein, and with moderate but primarily fiber-rich carbohydrates (fruits, vegetables); with either moderate to vigorous aerobic activity provides an optimal program for increasing lean mass and reducing body fat. A single hour of exercise per day, combined with moderate dietary control has been associated with dramatic weight loss (in 12 weeks) vs. dieting alone, and increases lean mass.

[0127] Achieving that “single hour” of exercise per day as part of one’s life-style is quite a challenge however. “A single hour of exercise per day . . . induces dramatic weight loss and increases lean over fat mass in as little as 12 weeks . . . but is a challenging life style commitment for almost anyone to maintain.

[0128] Dieting with exercise is a great concept, but usually fails in actual practice over the long term. Not only is finding the time, will power, and stamina to make a single hour of exercise even every other day a part of your lifestyle challenging, so is the fact more vigorous exercise is necessary just to maintain weight loss after a diet has ended. A recent study determined it took about 80 minutes of moderate activity per day, or 35 minutes of vigorous activity for women within three months of achieving their target weight loss of about 40 lbs, just to maintain it.

[0129] Improved Nutrition and Portion Control: For those individuals who have achieved the rarified level of ultra-fitness known primarily to Olympic class athletes, nutrition and portion control become entirely different considerations. Their fitness usually drives their nutritional choices and portion cravings easily. This is the secret of those rare fit individuals who seem so disciplined when they eat. They already have the positive body biofeedback and endorphin high of being ultra-fit. Food cravings and portion are naturally adjusted by the needs of their bodies over time. This is one of the most misunderstood aspects of fitness—how nutrition is driven by level of fitness rather than vice versa. While it is very difficult to force our bodies to eat in ways we do not crave day after day month after month and year after year—as in virtually any diet or nutritional discipline that requires immoding our zest for life to do it—it is clearly easy to maintain healthy nutrition when our bodies crave it. Only the massive calorie expenditure and core endurance benefit of D.E.T. are potent enough to achieve this nutritional modulation for those starting with reduced levels of fitness, and even let you enjoy some sweeter balance for your taste buds occasionally without negative consequence.

[0130] “D.E.T. ultra-fitness” achieves endorphin highs and positive body muscle biofeedback that drive diet and nutrition choices and instill what appears to be fierce discipline easily and naturally—not vice versa. That is the secret of rare fit individuals who seem so effortlessly disciplined at the table. Endorphins floating around a fit body are exemplary over a massively bloated stomach at the end of a meal, so we achieve portion control and nutritional discipline from the point of view of an outsider viewing us. If we gain lean muscle we crave more protein, less fat. If our body is well regulated (lower fat, more lean mass) it craves more fiber—more complex carbohydrates like fruits and vegetables, etc. Dieting and Herculean workouts approach the entire problem from the wrong direction—trying to get fit through forced deprivation and or overkill workouts is tough. Sooner or later even the slowest metabolism and sedentary pattern will respond to the ceaseless wave after wave long term sculpting of the increased D.E.T. burn.

[0131] Improved Quality of Sleep: Quality of sleep remains one of the most critical yet poorly controlled aspects of achieving a rested, healthy pattern of living. In fact it could be said without exaggeration that it is quality of sleep that is one of the key indicators of our emotional and physical well being. Several aspects of the exemplary embodiment of the present invention design and function are based on the following sleep axioms:

Depth of restful sleep# of hours slept=Sleep benefit.

[0132] In other words: 12 hours of poor quality of sleep may be less valuable than 5 hours of deep "through the mattress" blissful rest.
Diaphragm breathing—while awake and during sleep—promotes a sense of well being, as well as better oxygen exchange per breath. However during sleep it is impossible to voluntarily control whether breathing is diaphragmatic vs. chest expansion—it’s almost impossible to do during waking hours.

The average human being cannot get enough physical activity to induce the elevated CO2 levels (hypercapnea) and/or the drop in the carotid oxygen that leads to “fall through the mattress” deep seated sleep ideally desired. The exemplary embodiment design facilitates breathing and specifically sleep induced breathing in several ways. First, while worn the Present invention breathing band design allows for preferential diaphragmatic breathing at the lower resistance breathing option (still with plenty of added caloric burn) & helps the body get used to this exemplary style of breathing. Second, by wearing Present invention more than 10 and preferably more than 20 hours per week the caloric burn and oxygen expenditure becomes dramatically greater, with an oxygen debt requiring added oxygen intake overnight. There is an overall muscular fatigue that contributes to deeper diaphragmatic sleep as well. This is a spectacular, diaphragmatic stimulating achievement compared to the 0 oxygen debt at night based on sedentary activity most of us experience due to our physically reduced levels of activity all day. It is well known that increase in carbon dioxide and/or decrease in oxygen pressure in the blood stream are both inducers of REM sleep (the exemplary sleeping pattern) and stimulate MORE diaphragmatic activity.

Better emotional and mental health: Endorphins are those famous feel-good chemicals produced by each and every one of us, though with great variation in amount and timing of release. Exemplary embodiment design facilitates endorphin release in several ways. One of the greatest and most prolonged aerobic activities, lasting for as many hours as the exemplary embodiment of the present invention is worn. Easy to do regularly, even daily—simply wear the suit. Greater lean body mass and positive body biofeedback. Greater overall endurance and energy level. Allows a non-athlete to achieve workouts with endorphin release potential similar to that until now restricted only to near Olympic or world class athletes. Allows athletes to hit endorphin highs much more readily, with more concentrated benefit per time spent jogging, running, etc.

Endorphins are compounds made up of a natural morphine-like substance that is produced by the body, and was thus named endorphin or “morphine within”. They are polypeptides, which are naturally occurring in the brain, that bind to pain receptors and so block pain sensation. Prolonged, continuous exercise contributes to an increased production and release of endorphins, resulting in a sense of euphoria that has been popularly labeled “runner’s high”. Often referred to as natural opiates, endorphins are most readily produced in the body at the onset of such stimuli as pain, eating, sex, fear, exercise, certain music and meditation.

One of the greatest ways to produce high levels of endorphins is through daily aerobic exercise (e.g. running, cycling or swimming) lasting at least thirty minutes—like D.E.T. It has been shown that this stimulus has a more potent effect on endorphin production in the body than laughing, meditation, or even eating. You are more likely to experience an endorphin high if the exercise performed is one that is familiar to you and your body—regular of the exemplary embodiment of the present invention wear. By following an exercise program on a regular basis, one will find that their body will produce a greater level of endorphins. Regular wear of the BodySculptor is key to unleashing its potential.

As well as having pain-relieving properties, endorphins enhance our immune system, help improve memory, and even have anti-ageing effects. Researchers have found that they also regulate blood pressure and body temperature. And since they are anti-stress hormones, they can cause a temporary loss of pain in stressful situations. With an increased production of endorphins following daily aerobic exercise, one would be safe to assume that they will experience a greater satisfaction with life and be better prepared to cope with life’s challenges. Not only does high levels of fitness provide some protection from obesity, heart disease, cancer etc., but it has been shown to “boost your emotional and mental outlook” on life. For instance, as a result of increased endorphin production and a healthy lifestyle, scientists have found the risk of panic attacks among exercisers to be small.

Endorphins are a strong analgesic (20-30 times more powerful than morphine), they give a pervasive sense of happiness. Some people find the rush from endorphins addictive, and may exercise excessively. The post-exercise surge in endorphins helps to explain why many exercisers seem to become addicted to their sport. Their workouts become ‘fixes’ which mask the pain of everyday living, and even injuries or illnesses can’t stop the training process because the athlete is relentlessly searching for endorphin-induced mood elevations. The risk of injury is always a concern associated with any high-impact and/or high-intensity physical activity. The BodySculptor offers a new form of high endorphin release exercise without the injury risk of running and other traditional high impact sports.

Without the exemplary embodiment/present invention fitness system endorphin release is achieved only sporadically with anything less than extreme high impact workouts that require regular sustained highest stress exercise. Simply wearing the exemplary embodiment regularly however is all that is needed to promote powerful, sustained, low risk, endorphin release as your body responds to the prolonged distributed resistance endurance training regimen.

Possible Level of Fitness: Achieving a fitness level approaching ultra-fitness, is virtually impossible for most individuals. Due to the intensity of effort and training time needed to generate highest levels of fitness, there is the “catch-22” of: 1) limited available time and energy to get into such shape; 2) the wear and tear and fatigue on our bodies with high impact exercise attempting to do so; and 3) the injuries—shin splints and planter fasciitis (marathons, triathlons), knee tendinitis (basketball, tennis), shoulder injuries (tennis, baseball) and others; all of which effectively put this level of fitness out of reach.

While few would argue that exercise is beneficial, there is a reason so many of us are not really fit, are overweight, or obese, and repeat the same New Years resolutions year after year. If one were in shape, exercise could be easy, fun, and motivating. If one is out of shape, is overweight, or has little time for it, they likely lack the energy to perform a vigorous workout several days per
week, would be more injury prone if they did so, or would get sick from lowered resistance if they try too hard too soon. These setbacks take their toll, and lead to ultimate failure for most of us. We give up and watch our bodies slowly grow over the years (horizontally).

[0143] Consider the realistic amount of exercise most can hope to achieve as a weekly average by the third to fourth decade of life. Typically less than or equal to one (rarely two) of the following:

[0144] 1. Moderate 1 hr workouts: weightlifting, treadmill, aerobics, etc: 3 hrs per wk or less; OR

[0145] 2. Contact sports e.g. basketball @ reduced activity: 1.5 hrs total per wk; OR

[0146] 3. Tennis, primarily doubles: 2 hrs per wk or less; OR

[0147] 4. Walking, jogging, and swimming—probably the best sports or activities to promote endorphin release as we age; but the time commitment to really maximize the potential is prohibitive. (typically 2 hours per week or less); (10+ hrs marathon, triathletes)

[0148] All the above physical activity has value, but other than marathon training regimens (difficult to sustain due to hi impact hi injury risk) does little to retard the 2 lb per year battle of the bulge, much less achieve ultra-fitness. Unless one is a professional or Olympic caliber athlete there is no real chance of jump-starting a dramatically effective, lifestyle transforming exercise program like D.E.T.; other than using the exemplary embodiment of the present invention. Since the % fat mass is for most higher than desired and burns fewer calories than the same weight as lean mass, you are prone to easy weight gain and reduced fitness that over the years will kill your quality of life (if not you)—start reversing the trend now.

[0149] Only the present invention can reverse this aging slump our bodies drift into as early as the third decade of life. Because only the present invention can provide 15, 20, even 30+ hours of incredibly vigorous life altering D.E.T. exercise benefit every single week . . . for the rest of your life. Remember: to burn 1500+ cal per week & achieve D.E.T. via just wearing the suit, month after month, year after year, is more effective than jogging 20+ miles a week at an 11 min./mile pace.

[0150] It is clearly intended that modifications of the present invention, consistent with this disclosure are to be considered extensions thereof. Upper torso garments with resistance bands that alter the vertebral column, increase resistance to breathing are examples of such. Lower torso garments in which forward or rear pull on the thigh is created in a manner utilizing the principles of this disclosure would be similarly considered to be extensions of the present invention, as would devices for attachment to garments, where such devices would act in accordance to these principles.

What we claim is:

1. A fitness system comprising a fixation system, a plurality of attachment locations on said fixation system, and a resistive band, wherein said band attaches to two of said plurality of said attachment locations.

2. The system of claim 1 wherein said attachment locations are aligned along a region.

3. The system of claim 2 wherein the region is a region which tolerates resistive tightening well.

4. The system of claim 2 wherein the region is a joint.

5. The system of claim 2 wherein the region is a major muscle group.

6. The system of claim 2 wherein the region is selected from the group consisting of the rib cage, the upper torso, the lower back, the abdomen, the thigh, and the leg of a user.

7. The system of claim 2 wherein the band is stretched by movement involving said region.

8. The system of claim 1 wherein the attachment locations are located at the shoulders, the chest, the pelvic girdle, the waist, the elbow, or the knee of a user. (Note this implies all these locations.)

9. The system of claim 1 wherein the band traverses the upper cervical region, down across the anterior deltoid and attaches to attachment locations either along the anterior pelvic girdle or behind the axilla to the posterior side of the body of a user.

10. The system of claim 9 wherein the band increases energy expenditure by the user to maintain normal posture.

11. The system of claim 1 wherein the band traverses the pelvic girdle, down across the thigh, and attaches to attachment locations below the knee.

12. The system of claim 1 further comprising a circumferential band overlying the sternum and the rib cage of a user.

13. The system of claim 1 wherein the circumferential band increases an amount of gas exchange during exhalation and increases an amount of energy expended during each breath by the user.

14. The system of claim 13 wherein the circumferential band is positioned from about 2 inches to about 3 inches above the sternum and from about 2 inches to about 3 inches below the sternum.

15. The system of claim 1 further comprising a pad associated with the band.

16. The system of claim 1 further comprising a pad to which the fitness system is incorporated.

17. The system of claim 15 wherein the suit further comprises a fabric tunnel to prevent said band from moving out of alignment.

18. The system of claim 1 wherein the fixation system associated with the knee comprises at least two circumferential portions.

19. A fitness system comprising a suit; a fixation system; attachment locations on said fixation system, wherein said attachment locations are located at the neck, shoulders, chest, waist, and knees; and bands, wherein said bands are attached to the attachment points on the upper and lower torso; such that the upper band traverses behind the neck or posterior shoulders to the front waist to engage the rear deltoid, the upper back and the lower back, or under the armpit to the rear waist to engage the front deltoid, the chest, and the abdominals; and the lower band traverses the rear waist over the front of each thigh to below the knee to engage the gluteus, the hamstring and the flexion of the upper leg, or under the thigh to below the knee to engage the quadriceps and the extension of the upper leg.

20. The system of claim 19 wherein the upper band and the lower band create a minimal resistive force sufficient to increase the energy expenditure of the user.