ELASTIC FLAT BAND

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ABSTRACT
An elastic flat band exercise device has two spherically-shaped handles, each approximately the size of a golf ball or slightly larger, with a channel extending through the center of each handle. An elongated elastic flat band extends between the handles. One end section of the flat band is threaded snugly into and through each channel, such that the resistance band fits tightly in the handle, allowing the handle to slide along the band in either direction when pulled by the user, but not move when the band is held vertically. The handles are made of a firm rubber or plastic material which provides inner strength for use in absorbing the resistance band's resilient force, thereby transferring pressure off the user's hand and onto the handles. The handles each include an outer layer that is textured or consists of a foam-like rubber or plastic material to provide comfort, anti-slip grip, and aesthetic appeal.
ELASTIC FLAT BAND
RELATED APPLICATION


FIELD OF THE INVENTION

[0002] This application relates to exercise devices and physical therapy equip utilizing resilient force by means of elastic resistance flat bands having adjustable handles.

BACKGROUND OF THE INVENTION

[0003] Resistance band training which utilizes elastic flat bands and tubing is well known and widely used for strength and cardio conditioning, stretching, physical therapy and injury prevention. Resistance band training provides a total body workout for all fitness levels without having to change weights or equipment. Resistance bands generally consist of latex or non-latitude materials. They are versatile, portable and affordable.

[0004] Resistance bands differ in degree of difficulty based on their thicknesses; that is the more flexible, lighter resistance bands are thinner while the less flexible, heavier resistance bands are thicker. Levels of resistance, including light, medium and heavy, are signified by color, although there is no standard color system in use. Shortening or lengthening the distance between the two points from which the force and counterforce are being applied controls band tension.

[0005] Resistance bands afford a user with a greater range of motion and freedom of movement than other exercise devices. When strength training with machines, the user is restricted to one plane of motion throughout the exercise. Likewise, movements during free weight training are limited because the weight rely on gravity to generate resistance. Because resistance bands rely on resilient force to generate resistance and not a machine or gravity, movements can be multidirectional, on multiple planes and can, therefore, more easily mirror everyday or sports-specific muscular functionality.

[0006] Problems associated with resistance bands training and particularly elastic flat bands are comfort, safety and control of the user's grip. Flat bands are most commonly used without handles, with the user grasping the band directly ("hand-hold"). Gripping the band directly maximizes the freedom of movement that resistance band training affords and allows the user to quickly and conveniently adjust tension by simply grasping the band in the desired location to shorten or lengthen it. However, hand-holds have several disadvantages. Because most flat bands are thin (ranging from 0.15 mm-0.70 mm thick), the user must tightly clench his or her fingers around the band and against the palm in order to hold it. This position becomes more and more uncomfortable as the band is stretched and resistance increases. Likewise, depending on the angle of movement, the user can experience pain and discomfort when the long end of the band puts pressure on and digs into the side of the hand. An example of an exercise where the user can experience pain and discomfort is with bicep curls.

[0007] When performing a bicep curl, the long end of the band is secured to the floor, usually by the user stepping on it. With one arm by his or her side, the user grasps the band so that the short end is towards the pinky finger, with the palm facing forward. The user then pulls upward, bending at the elbow, curling the arm towards the shoulder. As the hand is pulled upward and tension increases, it can uncomfortably put pressure on and dig into the side of the user's hand, between the thumb and index finger's lower knuckles.

Another disadvantage of holding a resistance band directly is safety and control. The combined properties of a band's thinness and the sleek texture of the latex or non-latex materials can make it difficult to hold as the exercise progresses. If the band slips from the user's grip when stretched, whether due to grip fatigue or perspiration, it will snap back to its relaxed state, possibly causing injury to the user. These disadvantages of comfort, safety and control when performing resistance band training are of particular concern with senior conditioning, as older adults can experience decreased finger mobility and hand strength caused by aging or other conditions such as arthritis, etc.

[0008] Some makers of flat resistance bands, including Theraband®, have attempted to address the problem of safety and control by including an instruction manual warning to users which states: "Never exercise with a band . . . unless it is wrapped around your hand." However, wrapped hand-holds, should a user even choose to utilize them, exacerbate the comfort problem. As resistance increases during the movement, the band squeezes the user's hand, digging into both sides of the hand and collapsing knuckles or fingers together. The more the band is stretched, the more pain and discomfort the user will experience.

[0009] In light of the aforementioned disadvantages associated with holding flat resistance bands directly, it would be desirable to have a handle that maintains the convenience of a hand-hold, including the ability to make quick tension adjustments or exercise changes, while relieving grip discomfort. It would also be desirable for such a handle to increase user safety and control both during movements and when the band is fully stretched. Existing approaches take the form of lateral handles.

[0010] Lateral handles are separate devices attached to resistance bands using a buckle or cinching method. Examples of such devices are disclosed U.S. Pat. Nos. 1,832, 633, 1,815,863 and 5,855,356. Theraband® and CanDo® are also well-known manufactures of lateral handles for flat resistance band exercise and physical therapy products. However, lateral handles of the foregoing type fundamentally change the flat band training experience in two distinct ways. First, lateral handles are inconvenient and time consuming to adjust tension or change exercises. Second, because the user is holding a device separate from the band, planes of movement are altered and limited. Simply stated, lateral handles functionally transform a flat resistance band into a tubular resistance band, which is a completely different piece of exercise equipment. There is thus no flat resistance band exercise device having a handle that maintains the inherent advantages of resistance band training, including maximum freedom of movement and ability to make quick tension or exercise changes, while solving known problems of grip discomfort, safety and control.

SUMMARY OF THE INVENTION

[0011] It is thus the object of the present invention to provide an elastic flat band exercise device that addresses the disadvantages and limitations of current elastic flat bands for resistance band training, exercise and physical therapy.

[0012] It is another object of the present invention provide an elastic flat band exercise device that maintains the essence
of holding a flat band directly, complimenting the freedom of movement and range of motion unique to resistance band training.

[0014] It is still another object of the present invention to provide a flat resistance band exercise device that reduces problems of hand pain, grip discomfort, and risk of injury associated with holding resistance bands directly.

[0015] It is a further object of the present invention to provide an elastic flat band exercise device that is quickly and easily adjustable to control band tension or change exercise.

[0016] It is still another object of the present invention to provide an elastic flat band exercise device that has handles, which are comfortable for the user to grip in a variety of different ways for a variety of different resistance band training and physical therapy exercises.

[0017] It is another object of the present invention to provide an elastic flat band exercise device that provides the user with enhanced grip comfort, safety and control both during movement and when the band is fully stretched.

[0018] It is still another object of the present invention to provide an elastic flat band exercise device that is safe to use and effective for both total body exercise and physical therapy by individuals of all ages, as well as individuals with physical limitations.

[0019] It is another object of the present invention to provide an elastic flat band exercise that complements existing advantages of resistance bands, including being inexpensive to manufacture, affordable, readily portable and easy to store.

[0020] These and other objects are accomplished by the present invention, an elastic flat band exercise device having two spherically-shaped handles, each approximately the size of a golf ball or slightly larger, with a channel extending through the center of each handle. An elongated elastic flat band extends between the handles. One end section of the flat band is threaded snugly into and through each channel, such that the resistance band fits tightly in the handle, allowing the handle to slide along the band in either direction when pulled by the user, but not move when the band is held vertically. The handles are made of a firm rubber or plastic material which provides inner strength for use in absorbing the resistance band’s resilient force, thereby transferring pressure off the user’s hand and onto the handles. The handles each include an outer layer that is textured or consists of a foam-like rubber or plastic material to provide comfort, anti-slip grip, and aesthetic appeal.

[0021] The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The invention, itself, however, both as to its design, construction and use, together with additional features and advantages thereof, are best understood upon review of the following detailed description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] FIG. 1A is a top view of a spherical handle in accordance with the present invention.

[0023] FIG. 1B is a side view of the spherical handle in accordance with the present invention.

[0024] FIG. 2 is a sectional side view of the spherical handle taken along the line 14-14 in FIG. 1A.

[0025] FIG. 3 is a front view of a resistance band illustrated vertically, including a pair of the spherical handles such as shown in FIGS. 1A-1B.

[0026] FIG. 4A is a front view illustrating one starting position from which the user may adjust tension or change exercises by sliding the spherical handle along the resistance band to the desired location.

[0027] FIG. 4B is a front view illustrating one manner the user may slide the spherical handle along the resistance band from the starting position in FIG. 4A in order to adjust tension or change exercises.

[0028] FIG. 5A is a top view showing one manner in which the spherical handles may be cupped in the user’s hands with the short end sections of the resistance band towards the thumbs, in order to facilitate one type of direct grip shown in FIG. 5B to be used during exercise.

[0029] FIG. 5B is a front view along lines 18-18 illustrating one type of direct grip in which the resistance band may be held where the user has rotated his and her hands inwards from FIG. 5A and tightly grips the handles, creating tension therebetweent and locking the resistance band in place in preparation for exercise.

[0030] FIG. 6A is a top view of the spherical handle cupped in the user’s right hand, as seen in FIG. 5A, with the short end section of the resistance band towards the thumb in order to facilitate one type of the direct grip shown in FIG. 5B to be used during exercise.

[0031] FIG. 6B is a perspective view of the direct grip shown in FIG. 5B taken along lines 18-18, with the user’s right hand open in order to illustrate the spherical handle’s orientation and fit in the user’s hand between the palm and long end of the resistance band.

[0032] FIG. 6C is a front view taken along lines 18-18 of the right hand as seen in FIG. 5B, illustrating one type of direct grip in which the resistance band may be held wherein the user has rotated the right hand inwards from the FIG. 5A view and tightly grips the handles, locking the resistance band into place in preparation for exercise.

[0033] FIG. 6D is a pinky finger side, perspective view of the direct grip shown in FIG. 5B, illustrating the manner in which the spherical handle is held such that both end sections of the resistance band exit from the thumb side of the user’s hand.

[0034] FIG. 7A is a top view showing another manner in which the spherical handles may be cupped in the user’s hand with the short end sections of the resistance band toward the pinky fingers and long ends wrapped around and across the top of the user’s hands to facilitate one type of the wrapped grip shown in FIG. 7B to be used during exercise.

[0035] FIG. 7B is a front view taken along lines 18-18, illustrating one type of wrapped grip in which the resistance band may be held, wherein the user has rotated his or her hands inwards from the view in FIG. 7A and tightly grips the handles, creating tension therebetweent and locking the resistance band in place in preparation for exercise.

[0036] FIG. 8A is a top view of the spherical handle cupped in the user’s right hand from the view in FIG. 7A with the short end section of the resistance band towards the pinky finger and long end wrapped around and across the top of the user’s hand in order to facilitate one type of wrapped grip as shown in FIG. 7B to be used during exercise.

[0037] FIG. 8B is a perspective view of one wrapped grip as shown in FIG. 7B taken along lines 18-18, with the user’s right hand open in order to illustrate the spherical handle’s orientation and fit in the user’s hand between the palm and long end of the resistance band.
[0038] FIG. 8C is a front view taken along lines 18-18 of the right hand as shown in FIG. 7B, illustrating one wrapped grip in which the resistance band may be held where the user rotated the right hand inwards from the views shown in FIG. 7A and tightly grips the handles, locking the resistance band into place in preparation for exercise.

[0039] FIG. 8D is a pinky finger side, perspective view of the wrapped grip shown in FIG. 7B, illustrating the manner in which the spherical handle is held such that the short end of the resistance band exits the user's hand on the pinky finger side and the long end is wrapped around the top of user's hand and back across the spherical handle, exiting the user's hand on the thumb side.

[0040] FIG. 9 shows a perspective view taken along lines 22-22 of another type of direct grip where the spherical handles are slid together and held such that the short end of the resistance band is tightly compressed between the palm and handles, exiting the top, then down the back of the user's hand and locking resistance band in place in preparation for a single arm exercise.

[0041] FIG. 10 shows a front view taken along lines 22-22 of another type of direct grip, where the short end of the resistance band is tightly compressed between the palm and handle, exiting the pinky finger side of the user's hand and locking the resistance band in place in preparation for exercise.

[0042] FIG. 11 shows a front view taken along lines 22-22 of another type of direct grip, where the user has rotated his or her hand inwards from the position in FIG. 10 such that his or her hand is parallel to the floor and the short end of the resistance band is tightly compressed between the palm and handle, exiting the center of the user's hand and locking the resistance band in place in preparation for exercise.

[0043] FIG. 12 shows a top view of the spherical handle and the manner in which the long end of the resistance band may exit the spherical handle in 360 degrees, compressing against the natural curvature of the handle, thereby transferring resilient force pressure of the user's hand and onto the handle.

DETAILED DESCRIPTION OF THE INVENTION

[0044] Referring to FIGS. 1-3, handles 20 are spherically shaped and slightly larger than a golf ball (approx. 1.65 inches in diameter). However, the size of the spherical handles can be larger to accommodate user hand size. Outer layer 32 of spherical handles 20 can be made of rubber or plastic material having a slightly soft, textured or foam-Feel surface. Such an outer layer 32 provides favorable comfort, anti-slip grip, and aesthetic appeal. Inner construction 28 of spherical handles 20 is molded from a harder rubber or plastic material, thus providing inner strength for use in both grip and absorbing the resistance band's resilient force. It is understood that handles 20 can also be made of one type of rubber or plastic material, so long as the contemplated firmness and grip texture are achieved. Thus, both the contemplated size and construction of spherical handles 20 are intended to make them portable and inexpensive to manufacture, complimenting two existing advantages of resistance bands.

[0045] Handles 20 are to be used with elongated elastic resistance flat band 36 having substantially flat upper and lower surfaces. Band 36 is generally made with elastic or elastomeric material and includes a pair of handles 20 for each band. The resistance bands may be of varying widths ranging from 2-7 inches, varying lengths ranging from 3-7 feet, and varying thickness ranging from 0.15 mm to 0.70 mm. While certain dimensions are referenced herein, it is understood that any shape, length or level resistance band may be used.

[0046] Each spherical handle 20 has channel 24 extending through its center. Resistance flat band 36 extends through and is threaded so that it snugly fits within channel 24 of handle 20, with short end sections 36 extending out of the handle. In this manner, flat band 36 fits tightly into channel 24, such that once in place, handles 20 will not slide when the band is held vertically, as illustrated in FIG. 3. It is anticipated that the diameter of channel 24 will be one half inch, to accommodate a 5-6 inch wide flat band 36. However, depending on the width and thickness of the resistance band, the diameter of channel 24 can be slightly larger or smaller, in order to achieve the contemplated fit.

[0047] Although the above comprises a preferred embodiment of the invention, the features described should not be construed as limiting the scope of the invention. For instance, it is contemplated that the handles can be an oblong-shape, i.e. an egg or a prolite spheroid. Also, different materials can be used to construct the handles, in order to achieve the contemplated firmness and grip texture. In addition, a pipe-like structure or a coating can be used to reinforce channel 24 extending through the handle 20 and the handles could be weighted so as to enhance the exercises performed with the resistance band. The user could also knot the ends of the flat band 36 to ensure that handles 20 are not pulled off of the band when making adjustments or changing exercises.

[0048] With reference to FIGS. 4A-4B, in order to alter the resistance of the band or to change grip position in order to perform different exercises, the user adjusts the distance between handles 20 or the distance between the handles and the fixed point from which band 36 is attached, by sliding the handles along the band. To adjust handle 20, the user simply holds band 36 in one hand and the handle in the other, as illustrated in FIG. 4A, and pulls the handle in the opposite direction, as illustrated in FIG. 4B. Although FIGS. 4A-4B show the user sliding handle 20 to the right, it can also be moved to the left in the same manner. Thus, handles 20 can quickly and easily be slid by the user to the desired location along band 36 to control tension or change exercises. Achieving this rapid method of adjustability, which is inherent to resistance band training, is not possible with existing lateral handle approaches.

[0049] FIGS. 5A-5B illustrate one type of direct grip 40 of band 36 for use during exercise. To perform this direct grip 40, the user cups handles 20 in his or her palms, with short end section 36a of band 36 toward the thumbs, as shown in FIG. 5A. The user then rotates the handles inward and tightly grips handles 20, locking the resistance band in place, as shown in FIG. 5B. Tension is created on the long section 36b of band 36 between handles 20, along lines 18-18, by user supplied force in opposite directions stretching the band during movements. Movements can be on multiple planes and in multiple directions to facilitate a variety of exercises.

[0050] A more detailed view of this type of direct grip 40 and more specifically, handle's 20 function in improving comfort, safety and control during resistance band training, is shown in FIGS. 6A-6B. Because of its shape, size and construction, handle 20 fits comfortably and ergonomically in the palm of the user's hand, as illustrated in FIG. 6A. From this position, with short end section 36a of hand 36 exiting the user's thumb side, the band is rotated inward while gripping handle 20. Referring to FIG. 6B, once the palm is facing
down, handle 20 is positioned between the palm and long section 36b of band 36. When the user engages direct grip 40 during exercise, as shown in FIG. 6C, handle 20 “locks” band 36 into place. This “locking” is achieved because long end section 36b of band 36 is tightly compressed against and wrapped around handle 20 in the opposite direction from Which it emerged. FIG. 6D provides a pinky finger side perspective view of direct grip 40, further illustrating the manner in which handle 20 is positioned between the palm and long end 36b of band 36, such that both ends 36a of the band exit from the thumb side of the user’s hand.

[0051] FIGS. 7A-7B illustrate one type of wrapped grip 44 of band 36 for use during exercise. To perform this type of wrapped grip 44, the user cups handle 20 in his or her palms with short end sections 36a toward the pinky finger and long section 36b wrapped around and across the top of the hands, as illustrated in FIG. 7A. The user then rotates the hands inward and tightly grips handles 20, locking band 36 in place, as shown in FIG. 7B. Tension is created on long section 36b between handles 20 along lines 18-18 by user supplied force in opposite directions stretching the band during movements. Similar to direct grip 40, movements can be on multiple planes and in multiple directions to facilitate a variety of exercises.

[0052] A more detailed view of this type of wrapped grip 44 and, more specifically, handle’s 20 function, is shown in FIGS. 8A-8D. As previously stated, because of the shape, size and construction, handle 20 fits comfortably and ergonomically in the palm of the user’s hand, as illustrated in FIG. 8A. From this position, with the short end section 36a exiting the user’s pinky finger side, the hand is rotated inward while cupping handle 20. Once the palm is facing down, handle 20 is once again positioned between the palm and long section 36b, as illustrated in FIG. 8B. When the user engages wrapped grip 44 during exercise, as shown in FIG. 8C, handle 20 “locks” band 36 into place. FIG. 8D provides a pinky finger side, perspective view of wrapped grip 44, further illustrating the manner in which handle 20 is positioned, this time with short end section 36a exiting from the pinky finger side of the user’s hand.

[0053] FIG. 9 shows another type of direct grip 48 taken along lines 22-22 to be used during single arm exercise. Here, the long end of the band 36b is affixed to a point above the user using a door anchor or other means for attachment to facilitate exercise such as a tricep press. To perform this type of direct grip 48, the spherical handles 20 are first slid together to create a longer gripping area. To lock the band 36 into place, the short end 36a of the band is folded up and tightly compressed between the palm and handles 20, exiting the top of the user’s hand, then down the back of the user’s hand. Thus, the “locking” feature can be achieved both when the spherical handle 20 is positioned between the long end 36b of the band 36 and palm as illustrated in direct grip 40 and wrapped grip 44, or as shown in direct grip 48, where the short end 36a is compressed between the spherical handle 20 and palm. The combined properties of the band’s 36 elasticity and natural curvature of the spherical handles 20 also allow the handles 20 to ergonomically roll against each other 26 within the user’s hand, increasing comfort and control during movements. This flexion is not possible with existing prior art approaches.

[0054] FIG. 10 shows another direct grip 52 taken along lines 22-22. Here, the long end 36b of the band 36 is affixed to a point below the user either by stepping on the band 36 or by other means of attachment. To facilitate direct grip 52, the short end 36a of the resistance band 36 is folded up and tightly compressed between the palm and handle 20, exiting the pinky finger side of the user’s hand and locking the resistance band 36 in place. The position of the user’s hand perpendicular to the floor may be used to perform exercises such as hammer curls.

[0055] FIGS. 10 and 11 differ in the orientation of the user’s hand, which is dictated by user preference or exercise need. In FIG. 11, the user’s hand is rotated inwards such that his or her hand is parallel to the floor, causing the short end 36a of the band 36 to exit from the center of the user’s hand. This type of direct grip 56 may be used to perform exercises such as a straight-arm lateral raise or shoulder press. In both direct grip 52 and 56, the combined properties of the spherical handles’ 20 size, shape and construction improve grip comfort, safety and control during movements.

[0056] It has been found through experimentation that the spherical handle 20 absorbs the band’s resilient three during movements when the long end 36b of the band 36 compresses against the curvature of the handle 60, as illustrated in FIG. 12. It has been further found that the curvature of the handle 20 also facilitates 360 degree mobility, as depicted by the dotted band 36 outlines seen in FIG. 12. These results are the same regardless of whether the handle 20 is positioned between the palm and long end 36b of the band, as shown in direct grip 40 and wrapped grip 44, or when the short end 36a of the band 36 is folded up and tightly compressed between the palm and handle 20, as shown in direct grips 48, 52 and 56. Thus, the combined properties of the handle’s size, shape and construction achieve three important ergonomic functions: locks the band into place; inhibits the band from digging into or squeezing the user’s hands during movements; and facilitates 360 degree mobility.

[0057] A person with knowledge of resistance band exercise and physical therapy will see that the flat band exercise device of the present invention has numerous advantages over existing prior art approaches. The manner in which the handle 20 is thread directly onto the band 36 enables quick tension adjustments and exercise changes not possible with lateral handle attachments. Further, ergonomic design of the handles 20 maximizes range of motion and planes of movement as opposed to limiting them. The combined features of the handles 20 quick adjustability, method of attachment and design also allow the user to perform exercises that require the band to be compressed between user’s palm and the floor, such as resistant push-ups or donkey kicks, without disrupting elasticity function. Such versatility is not possible with existing approaches. Rather than an accessory to the band, the handles 20 seamlessly integrate as part of the resistance band training experience.

[0058] Certain exercises described above should not be construed as limiting the training possibilities of the present invention. The resistance band device is for total body exercise, physical therapy, as well sport-specific training. The device can be used with leg, foot loop or other body attachments. It is further contemplated that the resistance band device of the present invention can be incorporated with exercise regiments including but not limited to yoga, Pilates, barre, TRX® or Spinning®.

[0059] Accordingly, by maintaining the essence of holding a band directly while solving problems of grip comfort, safety and control, the exercise device of the present invention optimizes inherent advantages of flat resistance band training for
The claims of the patent document describe a flat band exercise device comprising:

1. An elastic band exercise device comprising:
   - an elongated elastic flat band having flat upper and lower surfaces and two end sections, said flat bands being adapted to be stretched into a plurality of lengths and configurations; and
   - two spheroid-shaped handles, each of the handles having a channel extending therethrough, one end section of the flat band threaded snugly into and extending through and completely out of the channel of one of the handles such that the end section remains outside the handle, and the second end section of the flat band threaded snugly into and extending through and completely out of the channel of the second handle, such that the second end section remains outside the second handle, the handles being slideable along the flat band to multiple locations along the flat band to allow the handles to be positioned at desired locations along the flat band, whereby gripping the handles permits stretching of the flat band into any of the plurality of lengths and configurations for exercising.

2. The elastic band exercise device as in claim 1 wherein the handles are spherical in shape.

3. The elastic band exercise device as in claim 1 wherein the handles are configured to be held within the palm of a user.

4. The elastic band exercise device as in claim 1 wherein the flat band is made of an elastic or elastomeric material.

5. The elastic band exercise device as in claim 1 wherein the flat band comprises a long section located between the two handles.