The present invention relates to a variable weight grip machine for strengthening and developing hand grip and forearm strength. A pair of vertical frame members is provided with a supporting base at the bottom. A carriage is spaced from the frame members and is mounted for vertical reciprocation only on a pair of spaced parallel vertical guide bars extending through the carriage and through a plurality of weights below the carriage. Nylon bushings in the carriage engage the guides. A central shaft is suspended from the carriage lifter bar and extends through a central bore in the weights with any number of weights being detachably connected to the shaft by a transverse pin extending through one of the weights and the shafts.
VARIABLE GRIP AND RESISTANCE EXERCISE MACHINE

FIELD OF THE INVENTION

[0001] The present invention relates to an exercise machine having a variable grip and a variable resistance.

BACKGROUND

[0002] Various weight lifting machines have been provided for exercising and strengthening different portions of the body. Many such machines are complex, large and expensive. What has not been provided in the art is a compact, portable, and adjustable exercise machine specifically directed to improving grip and forearm strength.

[0003] Further, there is a need for a machine that is adaptable to suit the needs of a large variety of individuals having hands of different sizes and different levels of strength and/or flexibility. Moreover, this need applies in a variety of applications, including sports training (e.g., targeted training directed to specific sports such as football, wrestling, and golf), rehabilitation (e.g., from an injury or illness), general fitness and conditioning.

SUMMARY

[0004] Example embodiments of the present invention provide an adaptable exercise machine to improve grip strength by squeezing two grip elements toward each other. The machine is adjustable in both resistance and starting grip distance. The variable starting grip distance, especially in combination with the variable resistance, provides many advantages. For example, users with differently sized hands can adjust the exercise machine to accommodate their particular hand size. Further, differing ranges of motion between the starting or rest position and the fully raised or squeezed position may be desired during exercising, even for a single user. For example, a user may want to select a wider grip distance with a lower selected weight to exercise over a relatively wide range of motion or select a narrower grip distance with a higher selected weight to exercise over a shorter range. In this manner, different exercise routines may be provided, e.g., to target the forearm muscles in different ways. Moreover, some individuals, e.g., the injured, disabled, or elderly, may lack the full range of motion for their given hand size. Thus, they may select a grip position that is closer together in order to obtain the benefits of the exercise device.

[0005] According to an example embodiment of the present invention, a carriage is mounted for vertical reciprocation on a pair of spaced parallel guide members extending through the carriage. Weights are mounted for reciprocation on the guide members and have a central bore to receive a shaft depending from the carriage. A transverse pin is adapted to extend through a selected one of the weights, and the shaft to provide a variable weight load on the carriage. A bar handle is mounted to frame, as a bar handle is mounted to the carriage, for grasping by the user or exerciser to raise and lower the weights. The handle on the lift carriage is variably spaced from the handle mounted to the frame such that the user can place the thumb and thumb position of the palm on the upper grip while the remaining four fingers grip the lower grip. Squeezing the hand with the fingers so positioned causes significant strengthening of the hand grip and forearm.

[0006] According to an example embodiment of the present invention, an exercise machine includes a first handle, a second handle movable between a rest position distal to the first handle and a second position proximal to the first handle, the first and second handles being grippable simultaneously by a single hand of a user when the second handle is in the rest position. The machine further includes a set of weights configured to provide different levels of resistance force when the user grips and squeezes the handles together to move the second handle from the rest position to the second position, the different levels of resistance force each being selectable by the user.

[0007] The distance between the first handle and the second handle in the rest position may be adjustable. In this regard, the maximum distance between the first handle and the second handle in the rest position may be, e.g., five inches. Further, the minimum distance between the first handle and the second handle in the rest position may be, e.g., two inches. For example, the distance between the first handle and the second handle may be adjustable between five inches and two inches in one-inch increments.

[0008] The first handle and the second handle may remain in a parallel orientation as the second handle is moved from the rest position to the second position.

[0009] The first handle may be part of a frame assembly and the second handle may be part of a carriage assembly movable with respect to the frame assembly. The carriage assembly may include a shaft that extends through the set of weights. In this regard, the resistance force may be selectable by securing a selected weight to the shaft such that the selected weight and any weight disposed above the selected weight is lifted when the second handle is moved from the rest position to the second position. Further, the selected weight and/or weights may be secured to the shaft by insertion of a pin into the selected weight and into the shaft, e.g., into one or more of a plurality of transverse bores extending into the shaft and spaced apart along the length of the shaft.

[0010] The distance between the first handle and the second handle in the rest position may be adjustable by moving the carriage upwardly or downwardly and setting the rest position using the same pin used to secure the selected weight to the shaft.

[0011] The carriage assembly may be laterally constrained by one or more, e.g., a pair, of guide rails when the carriage moves, e.g., vertically, with respect to the frame assembly. The guide rails may be parallel and/or vertical.

[0012] The frame assembly may be comprised of various materials including, e.g., metal tubing and/or injection molded plastic and/or any other suitable material.

[0013] All of the components of the carriage assembly may rigidly attached within the carriage assembly.

[0014] The weights used by the exercise device may take any appropriate form, including, e.g., rectangular plates having a length, width, and thickness, a length-to-width ratio being, e.g., between 4:1 and 5:1.

[0015] According to an example embodiment of the present invention, an exercise machine includes a first handle and a second handle movable between a rest position distal to the first handle and a second position proximal to the first handle, the first and second handles being grippable simultaneously by a single hand when the second handle is in the rest position. The second handle is mechanically biased with a selectable level of force toward the distal position to provide a selectable resistance force applied when the user squeezes the handles together to move the second handle from the rest position to
the second position. The distance between the first handle and the second handle in the rest position is adjustable.

[0016] The distance between the first handle and the second handle in the rest position may be adjustable, e.g., by insertion of an adjustment pin.

[0017] According to an example embodiment of the present invention, an exercise apparatus includes a frame having a first handle, a weight stack coupled to the frame and including a plurality of weights vertically movable with respect to the frame, and a carriage having a second handle parallel to the first handle and being selectively securable to one or more of the weights. The carriage is coupled to the frame and vertically movable with respect to the frame between a first position in which the second grip is a first distance from the first grip and a second position in which the second grip is a second distance from the first grip member, the second distance being less than the first distance, wherein the first and second grips are arranged to allow a single hand to grip and squeeze the first and second grips toward each other, thereby moving the second grip from the first position to the second position.

[0018] Further features and aspects of example embodiments of the present invention are described in more detail below with reference to the appended Figures. Additional specific embodiments, aspects and advantages of the present invention are also yielded independently of their combination in claims, without restriction of the generality of exemplary embodiments of the present invention shown below with the aid of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is a perspective view of a variable-grip exercise machine according to an example embodiment of the present invention.

[0020] FIG. 2 is a front elevation of the exercise machine of FIG. 1.

[0021] FIGS. 3a and 3b are respective front and bottom views of an upper frame member or assembly of the exercise machine of FIG. 1.

[0022] FIGS. 4a, 4b, and 4c: top, front, and side views, respectively, of a lift carriage of the exercise machine of FIG. 1.

[0023] FIGS. 5a and 5b are front and side views, respectively, of a carriage shaft of the exercise machine of FIG. 1.

[0024] FIGS. 6a and 6b: top and front views, respectively, of a weight of the exercise machine of FIG. 1.

[0025] FIG. 7 is a top view of an adjustment pin of the exercise machine of FIG. 1.

[0026] FIG. 8 is an elevated front view of an exercise machine according to an example embodiment of the present invention.

DETAILED DESCRIPTION

[0027] Referring now to the drawings in detail, wherein like reference characters indicate like parts throughout the several figures, the reference numeral 5 indicates generally an exercise machine or apparatus in accordance with an example embodiment of the present invention.

[0028] The exercise machine 5 includes a frame assembly 10 including a frame base 11. The frame base 11 includes a longitudinal or main base member 12 and two transverse base members 13 and 14 that extend transversely, in this case in parallel, to the main base member 12. In this regard, each transverse base member 13, 14 extends in opposite directions transversely away from the longitudinal axis of the main base member 12. Thus, the transverse base members 13 and 14 together provide four extensions, or legs, extending away from the main base member 12 to form an H-shaped structure. Since the center of gravity of the exercise machine 5 when in use is above, or approximately above, the main base member 12, the extensions of the transverse base members 13 and 14 provide stability to resist lateral toppling of the exercise machine 5. Further, at or near the end of each of the four lateral extensions provided by the two transverse base members 13 and 14 may be a foot, e.g., a rubber foot, for contacting the floor or surface on which the exercise machine 5 is supported during use.

[0029] The example frame base 11 is formed of rectangular metal tubes welded together. The ends of the transverse base members 13 and 14 may be capped, e.g., with a plug or welding of a cover plate, or left open. Although the frame base 11 is arranged in an H-shaped configuration, it should be appreciated that any appropriate shape for the frame base 11 may be provided in order to support the exercise machine 5. A pair of shock-absorbing pads 15 are mounted to an upper surface of the frame base 11.

[0030] Extending upwardly, in this example vertically, from the frame base 11 are two upright frame members 17 and 18. The upright frame members 17 and 18 are rigidly coupled to the frame base 11 by a welded connection. The upright frame members 17 and 18 in the illustrated example embodiment are formed of the same rectangular metal tubing as the main base member 12 and the transverse base members 13 and 14. It should be understood, however, that any or all of the main base member 12, the transverse base members 13 and 14, and the upright frame members 17 and 18 may be formed of any appropriate structure, e.g., angles or solid pieces, and that the materials used for forming any or all of these components may be any appropriate material, e.g., metal (such as steel or aluminum), wood, a polymer (e.g., injection molded plastic), and/or a composite material.

[0031] Mounted to the upper ends of the upright frame members 17 and 18 is an upper frame structure or member 20. The upper frame member 20 forms a rigid structure extending between the upright frame members 17 and 18. The upper frame member 20 is coupled to the upright frame members 17 and 18 via two oppositely positioned end portions 25. The end portions 25 are each formed of a plurality of welded-together metal plates that together mate with the upper end of one of the upright frame members 17 and 18. In particular, the end portions 25 each include a top plate 30, a pair of side plates 33 extending downwardly from opposed first and second edges or ends of the top plate 30, and an end plate 35 that downwardly extends from a third edge or end of the top plate 30 and laterally extends between the two side plates 33.

[0032] Rigidly extending between the two end portions 25 is a horizontally oriented upper handle member or grip 40. The upper handle member 40 may be, e.g., press-fit into the top plates 30 and/or welded to the top plates 30, or the upper handle member 40 and the top plates 30 may be a single, monolithic component, e.g., machined from a single piece of metal such as steel.

[0033] The upper frame member 20 is attached to the upright frame members 17 and 18 by passing a plurality of bolt connections 45 through, sequentially, a hole in first side plate 33, a hole extending through the upright frame
member 17 or 18, a hold in the opposed second side plate 33. The bolt is then secured with a nut. It should be appreciated, however, that any attachment mechanism may be provided, including e.g., other releasable attachments (e.g., a latching mechanism, or a screws that thread into the upright frame members 17, 18) or permanent/non-releasable attachments (e.g., welding or rivets). Releasable attachments may be preferable, however, since they facilitate disassembly of the exercise machine 5 and/or servicing, cleaning, replacement, addition, and/or removal of components thereof.

[0034] In addition to providing mounting holes, the vertical side plates 33 increase the flexural strength of the upper frame member 20, which helps to limit flexure of the frame member 20 when a downward force is applied to the upper handle member 40 during use. This limits the mechanical stress and fatigue on the upper frame member 20, thereby increasing the reliability and safety of the exercise machine 5.

[0035] A pair of cylindrical guides 50 are arranged in a spaced parallel relation between the upright frame members 13, 14 and are secured at their lower ends to the main base member 12 of the frame base 11. The guides 50 are secured at their upper ends to the upper frame member 20. Although the guides 50 of the illustrated example embodiment are right circular cylinders or shafts, it should be understood that any appropriate geometry for the guides 50 may be provided, e.g., a rectangular, prismatic, and/or irregular geometry. Moreover, although two guides 50 are provided, it should be understood that any appropriate number of guides, including, e.g., a single guide or more than two guides, may be provided. The guides 50 are formed of metal, in particular steel; however, it should be appreciated that the guides 50 may be formed of any other appropriate material.

[0036] The upper ends of the guides 50 are secured in bores formed in upper securement plates 42 of the upper frame member 20, as illustrated in the bottom view of FIG. 3b. The upper securement plates 42 are fixed to respective top plates 30 via, e.g., welding. Similarly, the lower ends of the guides 50 are secured in bores formed in lower securement plates 16 of the frame base 11. The lower securement plates 16 are fixed to the main base member 12 via, e.g., welding. Thus, the upper and lower ends of each guide 50 are laterally held in position by respective securement plates 16, 42. The length of each guide 50 is selected so that the guide 50 is not able to slide in either direction along its longitudinal axis out of the bore of either securement plate 16, 42 when the exercise machine is in its assembled state as illustrated in FIGS. 1 and 2. Further, the guides 50 may be, e.g., press fit, welded, and/or adhered in the bores. Although securement plates 16, 42 are provided, it should be understood that any restraint or securement may be provided. For example, the guides 50 may be received by bores formed directly in the top plates 30 and/or the main base member 12. Moreover, it should be understood that although the exercise device 5 includes two guides 50, any number of guides may be provided, including more than two guides, or only a single guide.

[0037] The shock-absorbing pads 15 are disposed directly above respective lower securement plates 16, each guide 50 extending through a through-hole in a respective shock-absorbing pad 15. This may allow, e.g., the pads 15 to be maintained in their lateral positions even if non-fixedly attached to the frame base 11 during use, thereby facilitating replacement of the pads 15, e.g., when the exercise device 5 is disassembled.

[0038] Referring to FIGS. 1 and 2, a carriage assembly 60 is arranged to slide along the guides 50, thereby translating upwardly/downwardly with respect to the frame assembly 10. A lift carriage 65 of the carriage assembly 60 is illustrated in FIGS. 4a to 4c.

[0039] Referring to FIGS. 4a to 4c, the lift carriage 65 includes a horizontal base plate 70 to which two vertical plates 75 are attached, e.g., welded. Extending between the two vertical plates 75 is a horizontally oriented lower handle member or grip 80. The lower grip 80 may be secured to the vertical plates 75 in any appropriate manner, e.g., press-fitting the grip 80 into bores of the respective plates 75, welding, etc. Providing additional structural strength to each vertical plate 75 are a pair of support plates 73, each of which extends vertically from a side edge of the base plate 70 to a side edge of the vertical plate 75. The support plates 73 may be secured to the base plate 70 and/or the vertical plates 75 by welding.

[0040] To mate the lift carriage 65 to the guides 50, the lift carriage 65 includes a pair of bushings 90 disposed in respective bores at opposite ends of the base plate 70. The bushings 90 have internal bores through with the guides 50 pass. When the lift carriage 65 is thusly mounted on the guides 50, the bushings 90 allow the lift carriage 65 to slide with little friction. The bushings 90 may be formed of any suitable material, e.g., bronze. Moreover, it should be understood that roller bearing assemblies may be provided in place of the bushings 90.

[0041] Referring to FIGS. 1 and 2, the carriage assembly 60 also includes a vertically extending carriage shaft 95. The carriage shaft 95 attaches to the lift carriage 65 by connecting to a clevis or yoke 85 formed on the lower end of the lift carriage 65. The yoke 85 is illustrated in FIGS. 4b and 4c. Referring to FIGS. 5a and 5b, the carriage shaft 95 is provided with an upper flattened portion or tang 96 having an eye 98. The carriage shaft 95 is mounted to the yoke 85 of the lift carriage 65 by placing the tang 96 into the between the two arms of the clevis or yoke 85, aligning the eye 98 with corresponding holes of the arms of the clevis or yoke 85, and inserting a yoke pin or clevis pin 100. The pin 100 is illustrated, e.g., in FIGS. 2 and 4b. The pin attachment between the carriage assembly 60 and the carriage shaft 95 allows, e.g., ease of assembly/disassembly. The carriage shaft 95 further includes a plurality of spaced-apart, parallel, generally horizontal bores 99 extending therethrough.

[0042] Although the carriage shaft 95 is formed from a right circular cylinder, e.g., a round steel bar, it should be appreciated that the shaft may be formed to have any appropriate shape and be formed from any appropriate material.

[0043] When the exercise device 5 is in an assembled state, as illustrated in FIGS. 1 and 2, the carriage shaft 95 extends downwardly from the lift carriage 65 through a plurality of weight plates 110, in the form of elongated rectangular plates. Referring to FIGS. 6a and 6b, the weight plates 110 each have a central bore 115 located approximately in the middle of the elongated body of the weight plate 110. The central bore 115 allows the carriage shaft 95 to pass through the weight plate. Each weight plate 110 also includes a pair of guide bores 120 disposed toward opposite longitudinal ends of the weight plate 110. The guide bores of the weight plate 110 are each configured to receive a respective guide 50 therethrough, thereby laterally supporting the weight plate 110 an allowing the weight plate 110 to slide along the guides 50, e.g., when lifted upwardly, or lowered downwardly.
Each weight plate 110 also includes a securing bore or fastening bore 125, which allows the weight plate 110 to be selectively fastened or secured to the carriage shaft 95 of the carriage assembly 60. In contrast to the vertically extending central bore 115 and guide bores 120, extends horizontally into the weight plate 110 from a front face to a back face of the weight plate 110. Further, the fastening bore 125 is in communication with the central bore 115. Thus, when thefastening bore 125 is aligned with a bore 99 of the carriage shaft 95, an adjustment pin 130, illustrated in FIG. 7, may be inserted through both the fastening bore 125 and the lateral bore 99 of the carriage shaft 95, thereby establishing a mechanical connection between the carriage shaft 95 and the weight plate 110 such that lifting of the lift carriage 65 also lifts the weight plate 110 via the carriage shaft 95. Further any plate 110 disposed above the plate 110 through which the adjustment pin 130 is inserted would be lifted via the selected plate. In this regard, the plates 110 further include markings to indicate the total weight of the respective plate 110 as well as any plates above the respective plate 110 and/or any weight provided by the other components, e.g., the carriage assembly 60 when lifted. Thus, when the particularly marked plate 110 is selected by insertion of the adjustment pin 130 thorough, the marked number will indicate the weight of the total number of plates 110 and/or the weight of the carriage assembly 60 that would be lifted if the carriage assembly 60 were lifted along the guides 50. Thus an adjustable loading of weight for the carriage assembly 60 is provided.

The adjustment pin 130 may be retained in its inserted position by any appropriate mechanism, e.g., a detent. The adjustment pin may be inserted and removed by the user by pushing or pulling a head or knob 132, which is disposed at one end of an elongated or shaft portion 134 of the adjustment pin 130.

In use, the user of the exercise machine 5 performs a gripping exercise by gripping both the upper grip 40 and the lower grip 80 with a single hand, which may be the user’s left or right hand. In particular, the user may place the thumb and hub position of the palm on the upper grip or handle 40 while the remaining four fingers grip the lower grip or handle 80. The user then squeezes the hand with the fingers so positioned to exert a force between the upper grip 40 and the lower grip 80. Since the upper grip 40 is relatively fixed with respect to the frame assembly 10, which is in contact with the floor or surface on which the exercise device 5 is supported, the force exerted between the grips 40 and 80 causes the lower grip 80 to move upwardly toward the upper grip 40. Since the lower grip is fixed to the lift carriage 65, which is in turn secured to the carriage shaft 95, the upward movement of the lower grip 80 also results in upward movement of the lift carriage 65 and the carriage shaft 95. Thus, when a particular weight is selected as indicated above by insertion of the adjustment pin 130 into the securing bore 125 of the selected plate 110 and into the carriage shaft 95, the lifting of the lower grip also lifts the selected plate 110 and all plates 110 disposed above the selected plate 110. Accordingly, the user is able to adjust how much force is required to squeeze the two grips 40 and 80 together.

Prior to squeezing the grips 40 and 80 toward one another, the carriage assembly 60 and any selected weight plates (i.e., any weight plate selected with the pin 130 as well as the weight plates thereabove) are in a rest position. After the grips 40 and 80 have been squeezed together to their closest position (which may, e.g., be limited by a hard or positive stop), the carriage assembly 60 and any selected weight 110 or weights 110 are in a fully raised or uppermost position. After squeezing the grips 40 and 80 together, the user exerts the force applied between the grips 40 and 80 to lower the carriage assembly with the selected weights back to the rest position. Thereafter, additional repetitions may be performed.

In addition to adjusting the weight to be applied, the distance between the upper and lower grips 40 and 80 in the rest position may be adjusted. In this regard, the grip or handle 80 on the lift carriage 65 is variably spaced from the upper grip 40 on the frame assembly 10 such that, for example, users of differing hand sizes may adjust the distance between grips 40 and 80 to allow the user to place the thumb and hub position of the palm on the upper frame grip 12 while the remaining four fingers grip the lower handle 80. Thus, users with larger hands may choose a greater spacing and users with smaller hands may choose a lesser spacing. This allows for a great amount of flexibility and adaptability of the exercise apparatus 5 to differing users.

In order to adjust the rest grip position, the user removes the adjustment pin 130 from whichever plate 110 into which it is inserted, thereby allowing the carriage assembly 60, including the carriage shaft 95 and the lower grip 80, to be raised or lowered with respect to both the frame assembly 10, including the upper grip 40, and the entire stack of weights. After the carriage assembly is raised or lowered until the grips 40 and 80 are at a desired rest position, the adjustment pin 130 is inserted into the plate 110 corresponding to the desired weight and into a corresponding one of the bores 99 of the carriage shaft 95. Thus, for a given desired weight selection, the adjustment pin 130 will engage a different bore 99 of the shaft 95 for each different rest position (i.e., starting position).

The spacing, center-to-center, between the upper and lower grips 40 and 80 in the starting position may be adjusted in one-inch increments between 2 inches, 3 inches, 4 inches, or 5 inches. It should be understood, however, that other increments and/or other maximum and/or minimum spacings may be provided. It should be noted that the increments between adjustments in the example arrangement are set by the distances between adjacent bores 99 in the carriage shaft 95.

Although the adjustment in starting grip distance is determined by the same shaft and pin mechanism used to adjust the amount of weight, it should be understood that a starting grip adjustment mechanism may be provided to use a different mechanism. For example, the top portion shaft 95 may be provided with a telescoping portion and a separate adjusting pin.

The variable positioning of the lower grip with respect to the upper grip provides many advantages. For example, as indicated above, users with differently sized hands can adjust the exercise machine 5 to accommodate their hand size. Further, differing ranges of motion between the rest position and the fully raised position may be desired during exercising, even for a single user. For example, a user may want to select a wider grip with a lower selected weight to exercise over a relatively wide range of motion or select a narrower grip distance with a higher selected weight to exercise over a shorter range. In this manner different exercise routines may be provided, e.g., to target the forearm muscles in different ways. Moreover, some individuals, e.g., the injured, disabled, or elderly, may lack the full range of motion
for their given hand size. Thus, they may select a grip position that is closer together in order to still obtain the benefits of the exercise device.

[0053] The cylindrical grips 40 and 80 may be any appropriate diameter, e.g., one inch or 0.75 inches, or shape. Further, the grips 40 and 80 may differ, e.g., in diameter and/or shape, from each other. The grips 40 and 80 have knurling to improve gripping ability. Further, other grips may be provided, e.g., padded grips such as foam any other grips.

[0054] During use, the guides 50 vertically guide both the lift carriage 65 (along with shaft 34) and weight plates 110, thereby maintaining the lateral positioning of the lift carriage 65 and the weight plates engaged by the shaft 95 via the pin 130 as they are moved between the lower, rest position and the upper, lifted position as the user squeezes the upper grip 40 and the lower grip 80 together. Thus, the weight provided by the engaged plates 37 acts in a vertical manner directly between the two grips.

[0055] Although the lift carriage 65 and the weight plates 110 are guided by the same set of guides 50, it should be appreciated that the lift carriage 65 may be supported by one or more guides other than the one or more guides supporting the weight plates 110.

[0056] Any appropriate weight capacity may be provided and may be catered to the particular type of users targeted (e.g., athletes, rehabilitation patients, elderly, etc.). The applied weights may extend up to, e.g., 200 pounds. Moreover, weight plates 110 may be added or removed by removing the upper frame member 20 from the upright frame members 17 and 18. Further, although the plates 200 are solid metal plates, it should be appreciated that other types of weight plates may be provided, e.g., containers filled with sand, water, or other materials, which may be suitable for portable systems or to lower shipping costs by allowing the user to provide and add water, sand, or other material. However, metal-based plates tend to be more compact.

[0057] Additionally it is noted that the weight plates 110 differ from weight plates of other exercise machines in that they are more elongated. The elongation allows the guide bores 120 to be spaced farther apart. Thus results in a more smooth sliding of the weight plates 110 along the guides 50. They are more narrow and elongated than with other machines. As viewed in FIG. 6a, each weight plate 110 has a length-to-width ratio of between 4:1 and 5:1. It is further noted that the thickness of each plate 110 is approximately one inch. The weights have a weight of ten pounds each. If, as an example, the carriage assembly 60 provides a weight of 15 pounds, the selectable weights may range, in an example, from 25 pounds to 165 pounds by ten-pound increments. Further, if even less weight is provided, it is possible to use the device without inserting the pin 130, thereby lifting only the 15-pound weight of the carriage assembly 60. Although in this example, the weights each have a weight of ten pounds, it should be understood that weight sets of a differing weight and/or non-uniform weight among the weights of the set may be provided.

[0058] Beneath the stack of weights 110 are the pair of shock-absorbing pads 15. These pads, formed of an elastomeric material, e.g., a rubber or polymer, serve to absorb impact when either the entire set of weights 110 is lowered back to the rest position, or a selected group of weights 110 is lowered to the rest position. In the latter case, the lowermost of the selected weights contacts the uppermost of the non-selected weights with the impact force being transmitted through the stack of non-selected weights and into the shock-absorbing pads 15. This may prevent damage to the weights 110 and provide quieter and/or more ergonomic operation. Further, the weights may be provided with, e.g., a rubberized coating to provide further impact resistance.

[0059] FIG. 8 is a front view of an exercise machine 205 according to an example embodiment of the present invention. The exercise machine 205 shares many features in common with the exercise machine 205, but differs in that the side plates 233 of the exercise machine 205 are rectangular and vertically more elongated compared to the side plates 33 of the exercise machine 5, which are shorter and are tapered as they extend from the upright frame members 17 and 18 toward the upper grip 40.

[0060] Any structural materials disclosed herein may be substituted with different materials as may be appropriate. For example, the frame assembly 10 may be constructed of injection molded plastic, e.g., to lower costs. Moreover any portions of the exercise machine 5 may be adapted to be foldable and/or the portions mentioned herein as being fixed, e.g., welded, may be provided as detachable from each other.

[0061] Although the exercise machines disclosed herein utilize adjustable weights as a resistance mechanism or means, it should be appreciated that any other mechanism for providing resistance force between the first and second handles or grips may alternatively or additionally be provided, e.g., adjustable and/or selectable elastic bands and/or springs. Moreover, although the handles are disclosed as being substantially vertically spaced apart, it should be understood that any other orientation may be provided. For example, the handles may lie in an angled or horizontal plane, e.g., where the handle is coupled to other components of the carriage by a pulley.

[0062] As used herein a “rest position” refers to a position to which the apparatus returns or settles in the absence of an external force being applied by a user. For example, the rest position of the second handle is the distal position of the second handle prior to the gripping and squeezing applied by the user, i.e., the second handle’s position in its resting state.

[0063] Although the present invention has been described with reference to particular examples and exemplary embodiments, it should be understood that the foregoing description is in no manner limiting. Moreover, the features described herein may be used in any combination.

What is claimed is:

1. An exercise machine, comprising:
   a first handle;
   a second handle movable between a rest position distal to the first handle and a second position proximal to the first handle, the first and second handles being grippable simultaneously by a single hand of a user when the second handle is in the rest position; and
   a set of weights configured to provide different levels of resistance force when the user grips and squeezes the handles together to move the second handle from the rest position to the second position, the different levels of resistance force each being selectable by the user.

2. The exercise machine of claim 1, wherein the distance between the first handle and the second handle in the rest position is adjustable.

3. The exercise machine of claim 2, wherein the maximum distance between the first handle and the second handle in the rest position is five inches.
4. The exercise machine of claim 3, wherein the minimum distance between the first handle and the second handle in the rest position is two inches.

5. The exercise machine of claim 4, wherein the distance between the first handle and the second handle is adjustable between five inches and two inches in one-inch increments.

6. The exercise machine of claim 1, wherein the first handle and the second handle remain in a parallel orientation as the second handle is moved from the rest position to the second position.

7. The exercise machine of claim 1, wherein the first handle is part of a frame assembly and the second handle is part of a carriage assembly movable with respect to the frame assembly.

8. The exercise machine of claim 7, wherein the carriage assembly includes a shaft that extends through the set of weights.

9. The exercise machine of claim 8, wherein the resistance force is selectable by securing a selected weight to the shaft such that the selected weight and any weight disposed above the selected weight is lifted when the second handle is moved from the rest position to the second position.

10. The exercise machine of claim 9, wherein the selected weight is secured to the shaft by insertion of a pin into the selected weight and into the shaft.

11. The exercise machine of claim 10, wherein the shaft includes a plurality of transverse bores spaced apart along the length of the shaft.

12. The exercise machine of claim 10, wherein the distance between the first handle and the second handle in the rest position is adjustable by moving the carriage upwardly or downwardly and setting the rest position using the same pin used to secure the selected weight to the shaft.

13. The exercise machine of claim 7, wherein the carriage assembly is laterally constrained by a pair of guide rails when the carriage moves with respect to the frame assembly.

14. The exercise machine of claim 13, wherein the guide rails are parallel and vertical.

15. The exercise machine of claim 7, wherein the frame assembly is comprised of metal tubing.

16. The exercise machine of claim 7, wherein the frame assembly is comprised of injection molded plastic.

17. The exercise machine of claim 7, wherein all of the components of the carriage assembly are rigidly attached.

18. The exercise machine of claim 1, wherein each of the weights has a length-to-width ratio between 4:1 and 5:1.

19. An exercise machine, comprising:
   a first handle; and
   a second handle movable between a rest position distal to the first handle and a second position proximal to the first handle, the first and second handles being grippable simultaneously by a single hand when the second handle is in the rest position, the second handle being mechanically biased with a selectable level of force toward the rest position to provide a selectable resistance force applied when a user squeezes the handles together to move the second handle from the rest position to the second position, wherein a distance between the first handle and the second handle in the rest position is adjustable.

20. The exercise machine of claim 19, wherein the distance between the first handle and the second handle in the rest position is adjustable by insertion of an adjustment pin.

21. An exercise apparatus, comprising:
   a frame having a first grip;
   a weight stack coupled to the frame and including a plurality of weights vertically movable with respect to the frame; and
   a carriage having a second grip parallel to the first grip and being selectively securable to one or more of the weights, the carriage coupled to the frame and vertically movable with respect to the frame between a first position in which the second grip is a first distance from the first grip and a second position in which the second grip is a second distance from the first grip, the second distance being less than the first distance, wherein the first and second grips are arranged to allow a single hand to grip and squeeze the first and second grips toward each other, thereby moving the second grip from the first position to the second position.

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