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(54) **EXERCISE EQUIPMENT**

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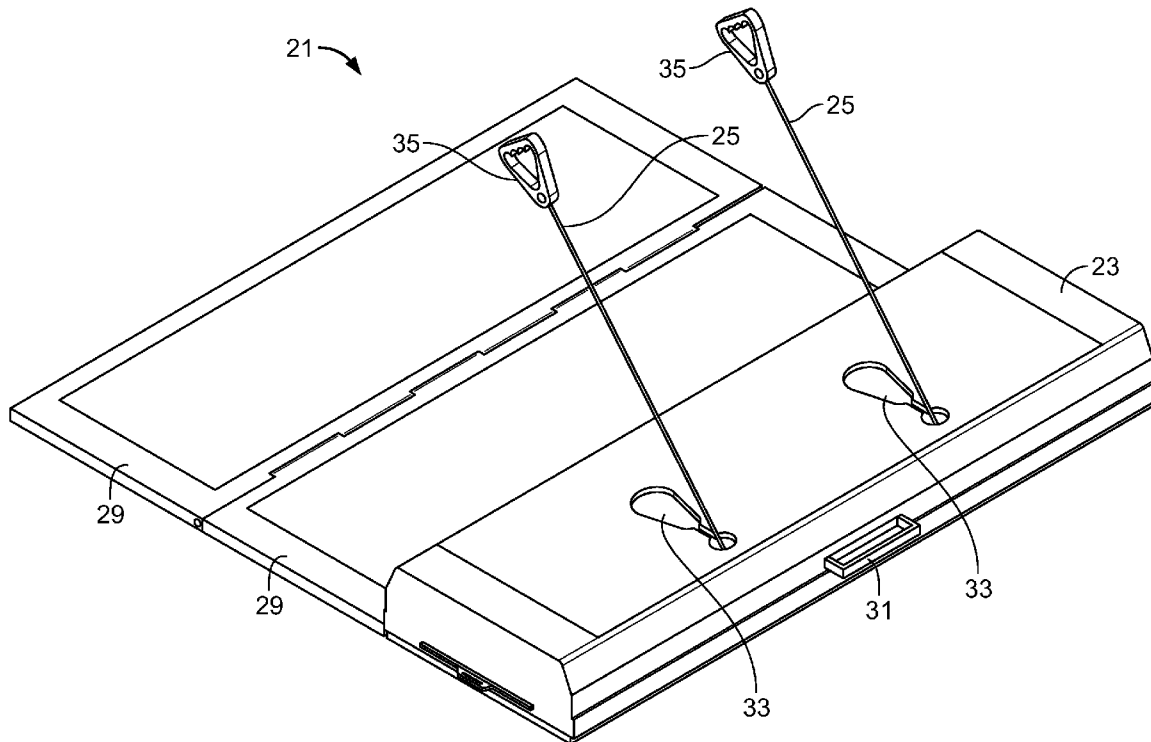
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(57) **ABSTRACT**

An exercise device includes: a step housing structured to support the weight of a user; one or more cables at least partially contained within the step housing; a variable resistance mechanism controlling resistance applied to the one or more cables; and a panel comprising a substantially planar member with a first broad face, the substantially planar member attached to the housing, the panel having a deployed position in which the first broad face of the panel is spaced apart from the housing.



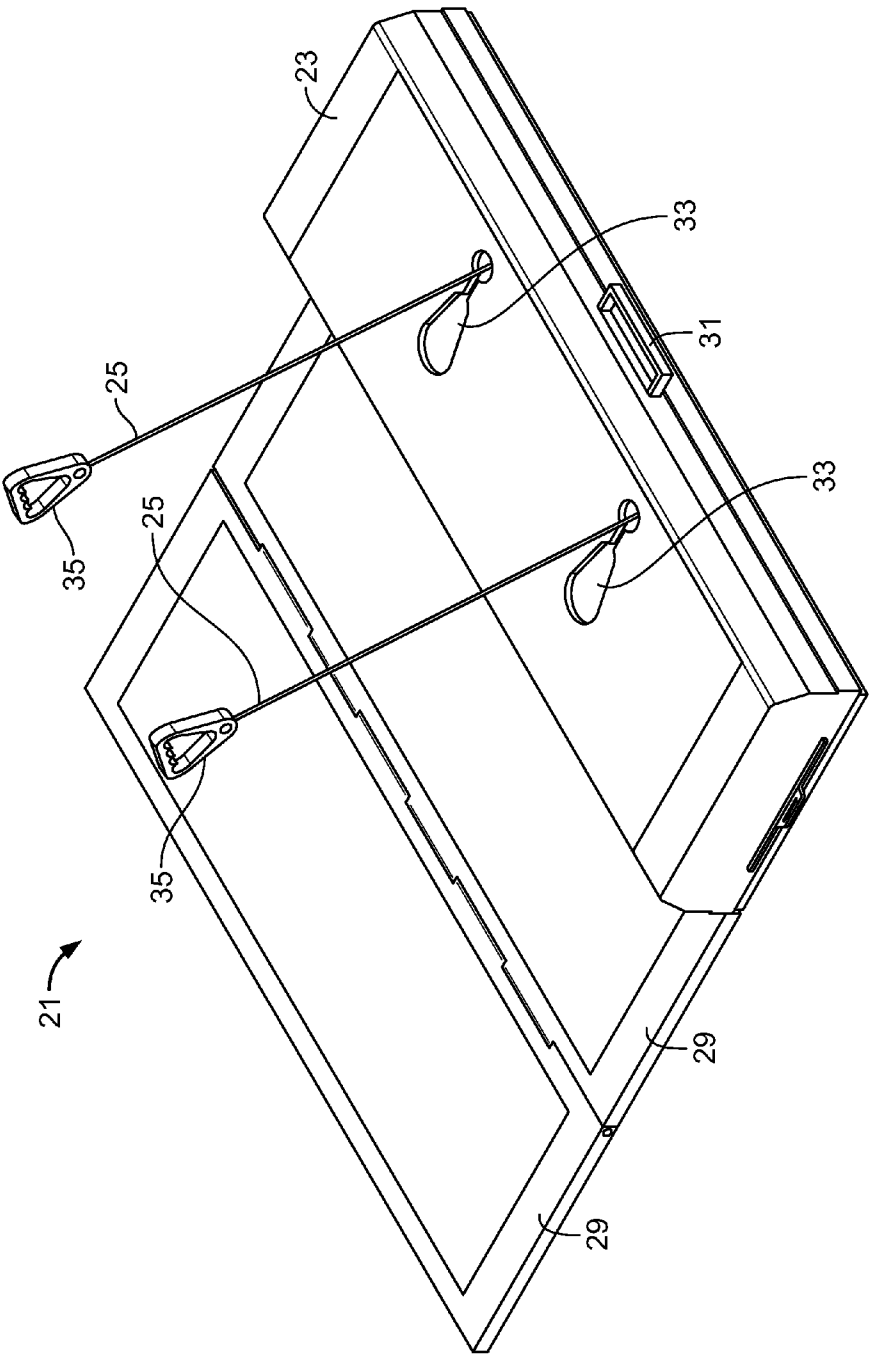
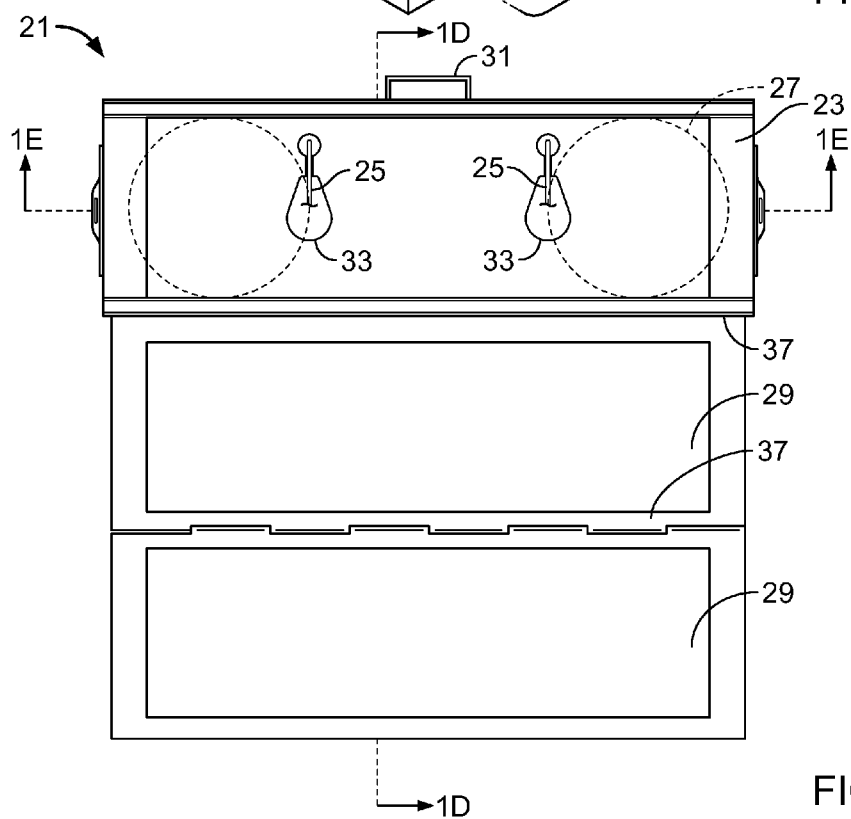
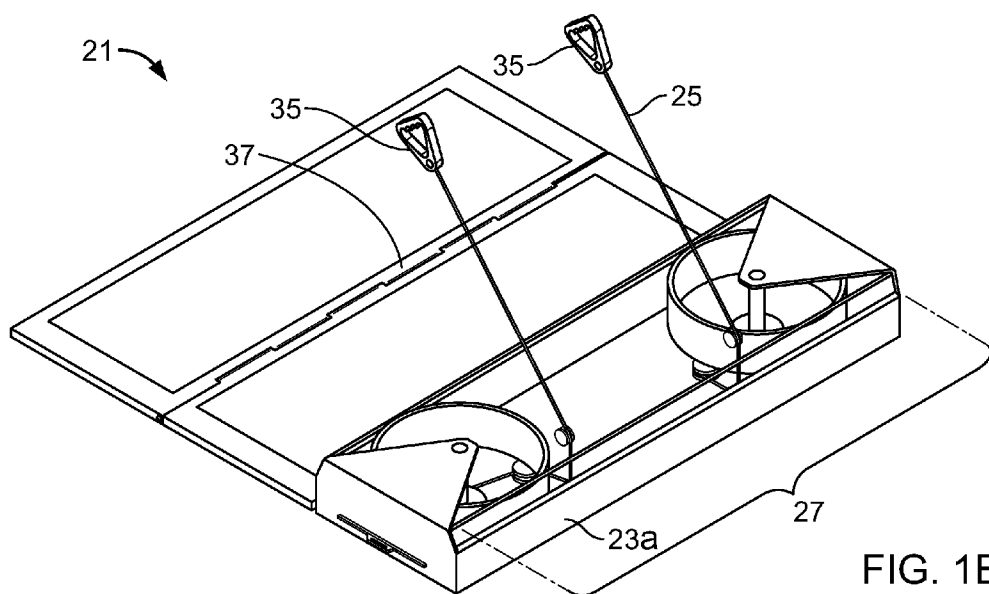


FIG. 1A



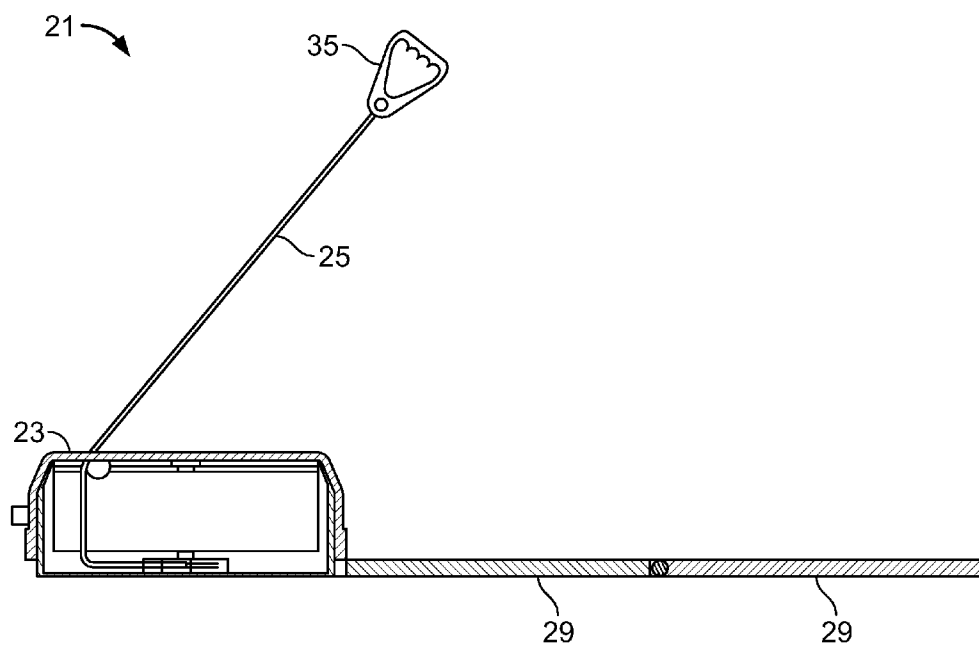


FIG. 1D

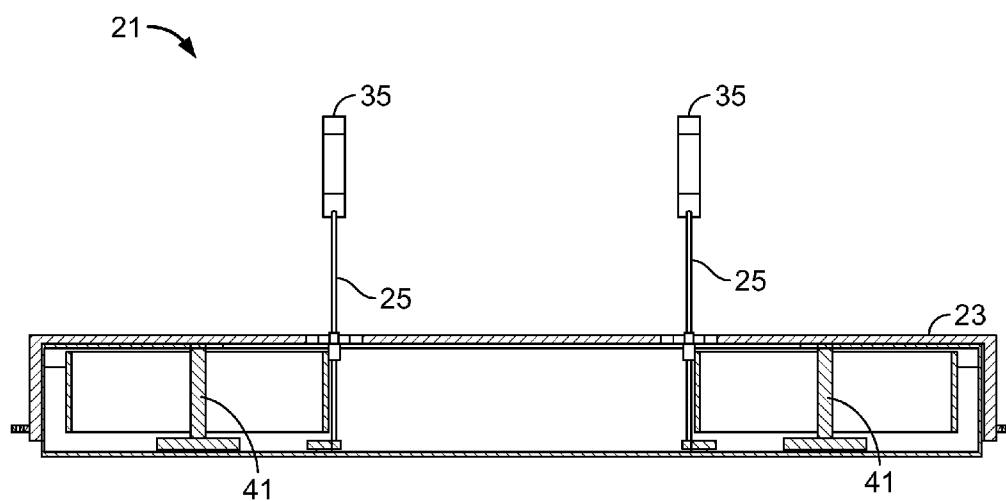


FIG. 1E

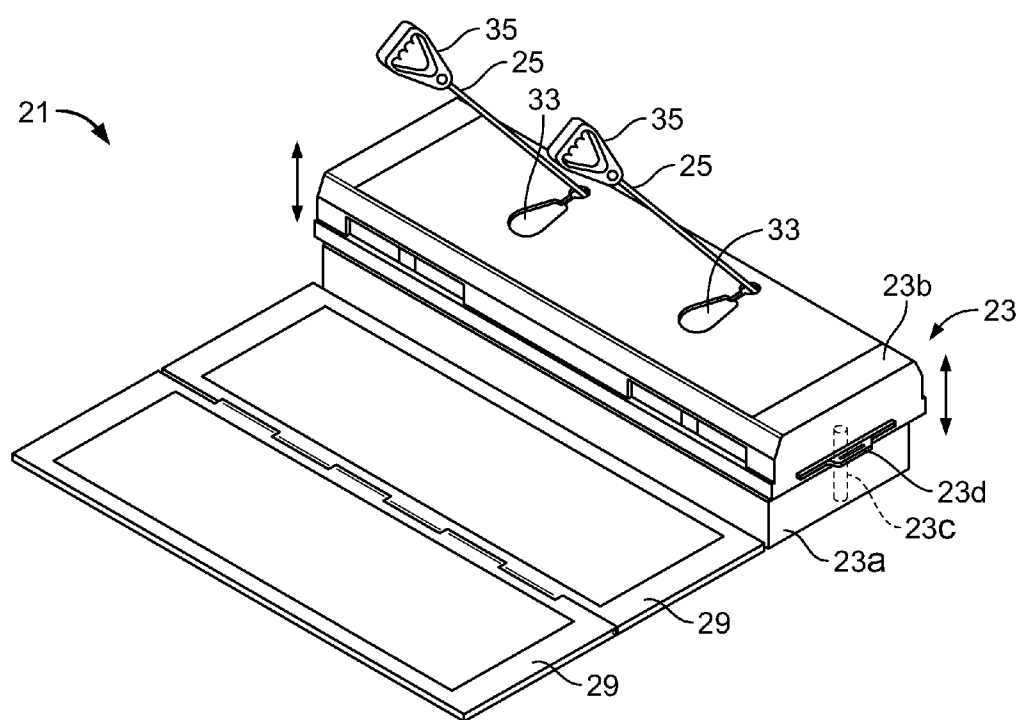


FIG. 1F

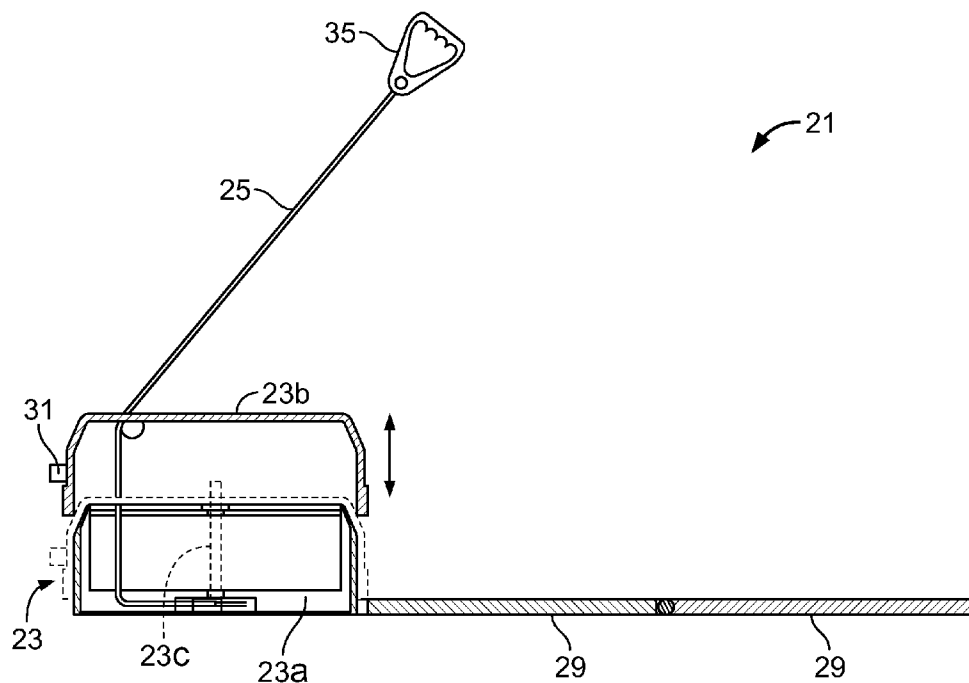


FIG. 1G

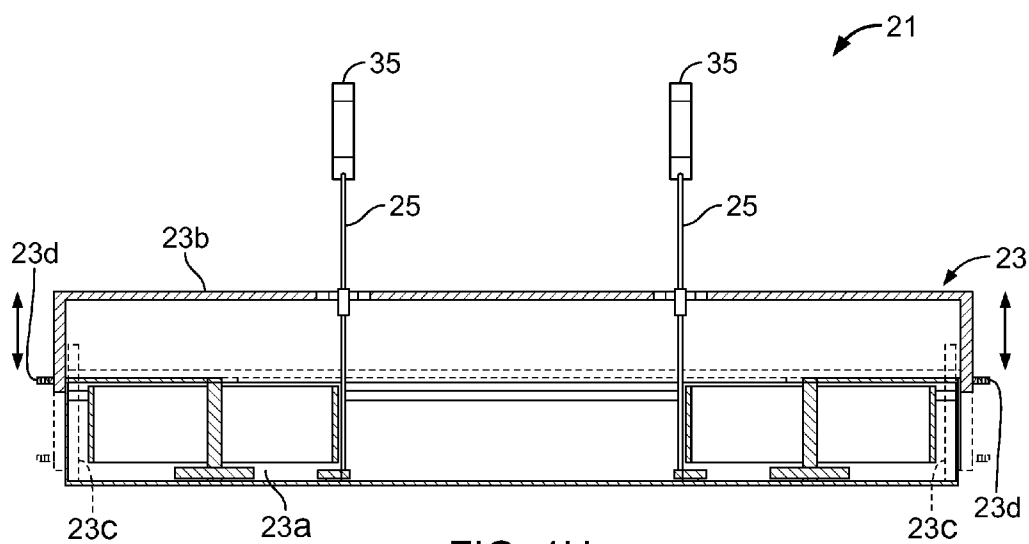


FIG. 1H

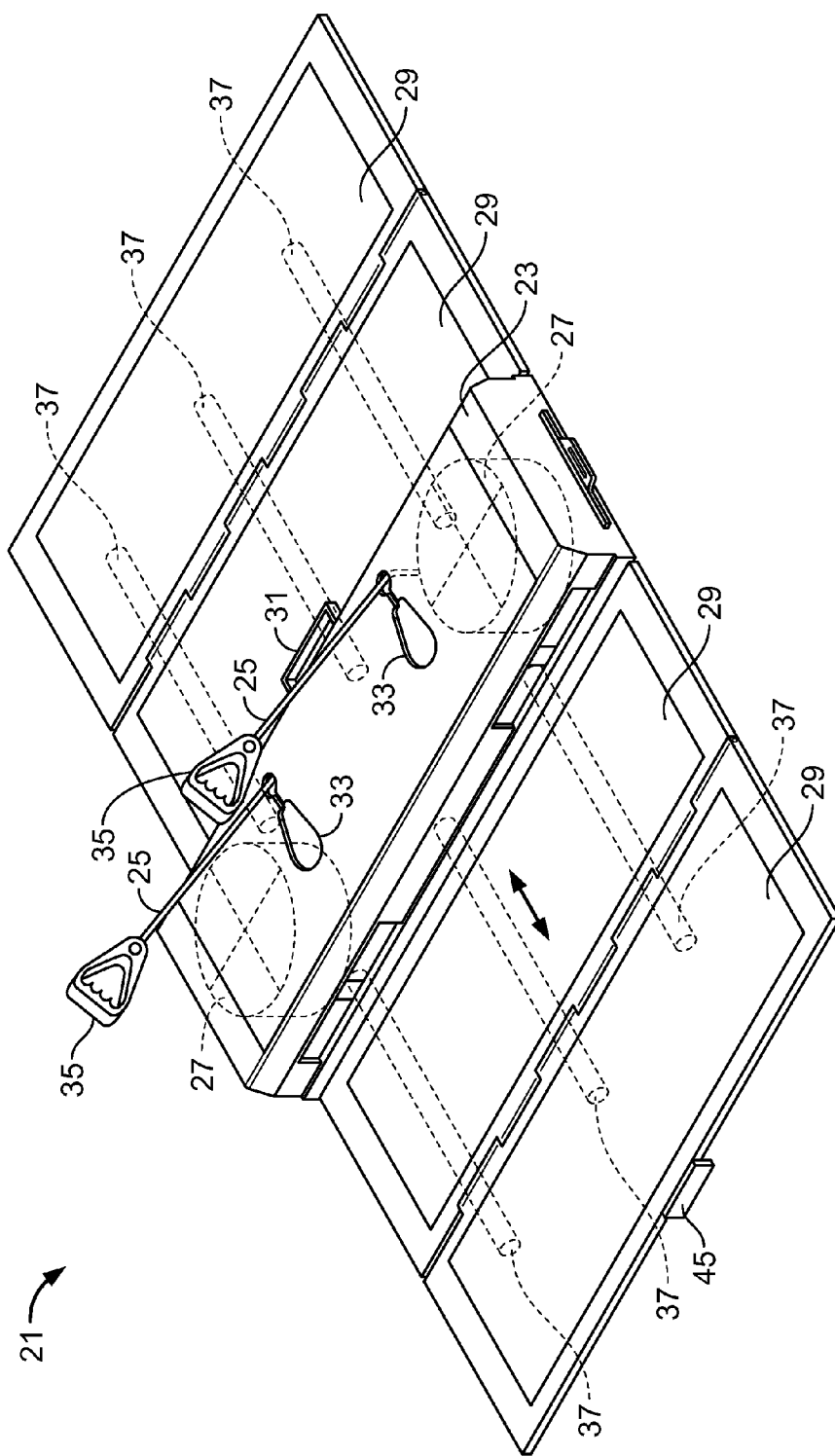


FIG. 2

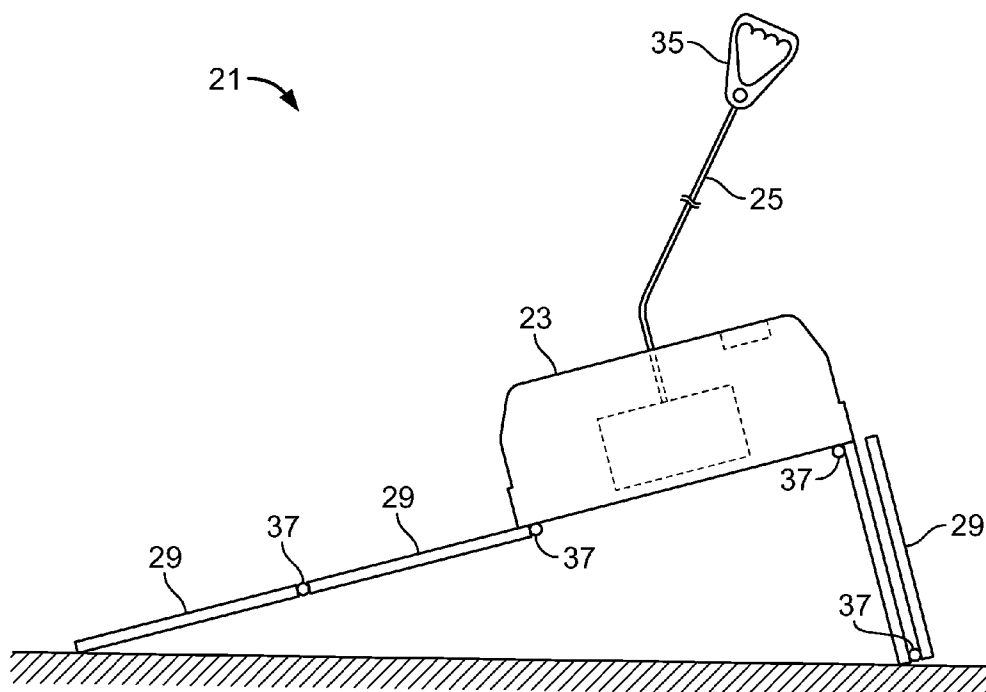


FIG. 3

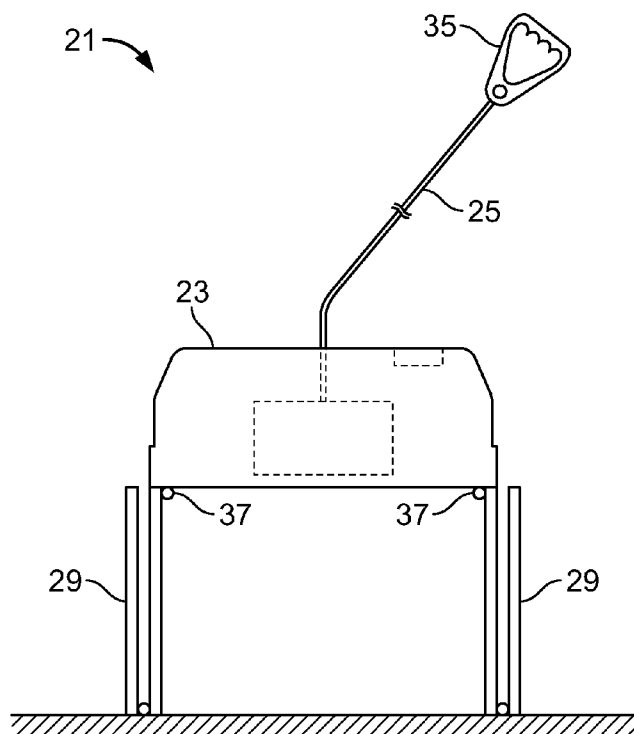


FIG. 4

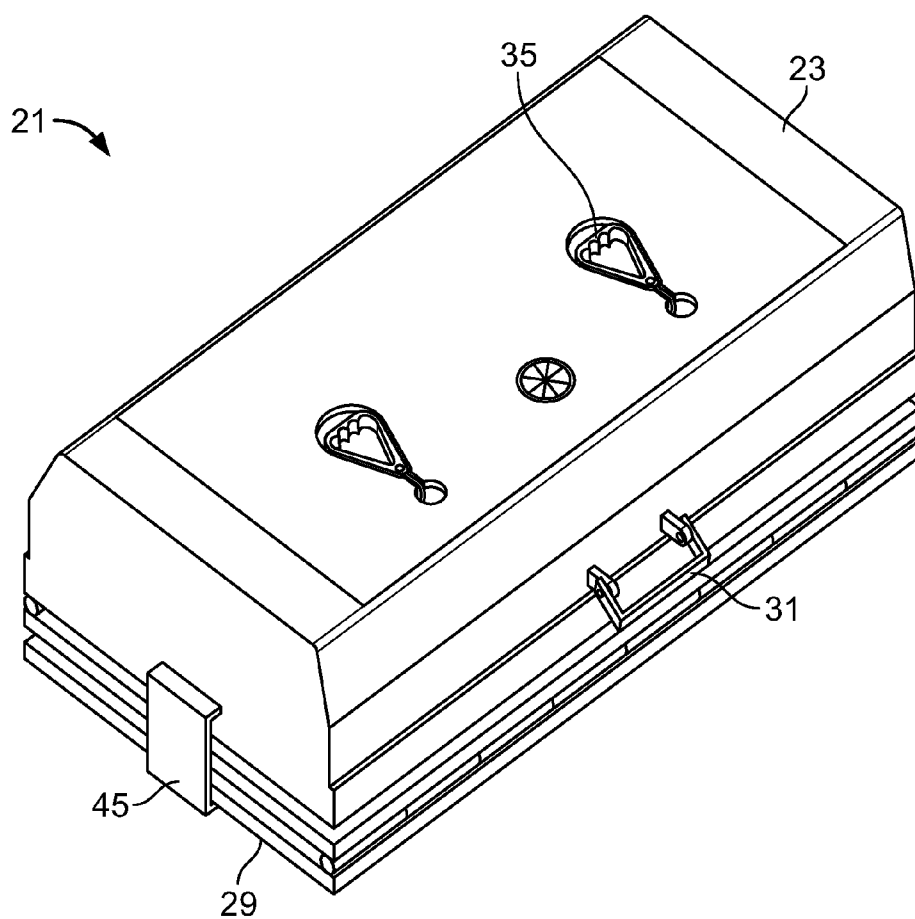


FIG. 5

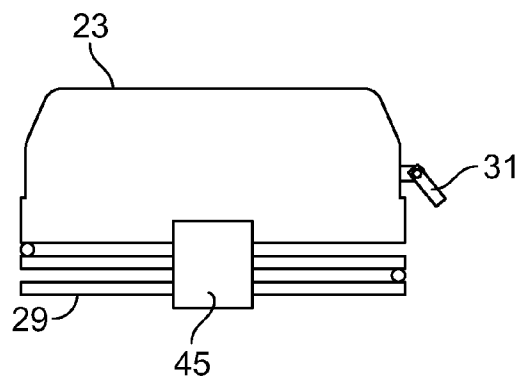
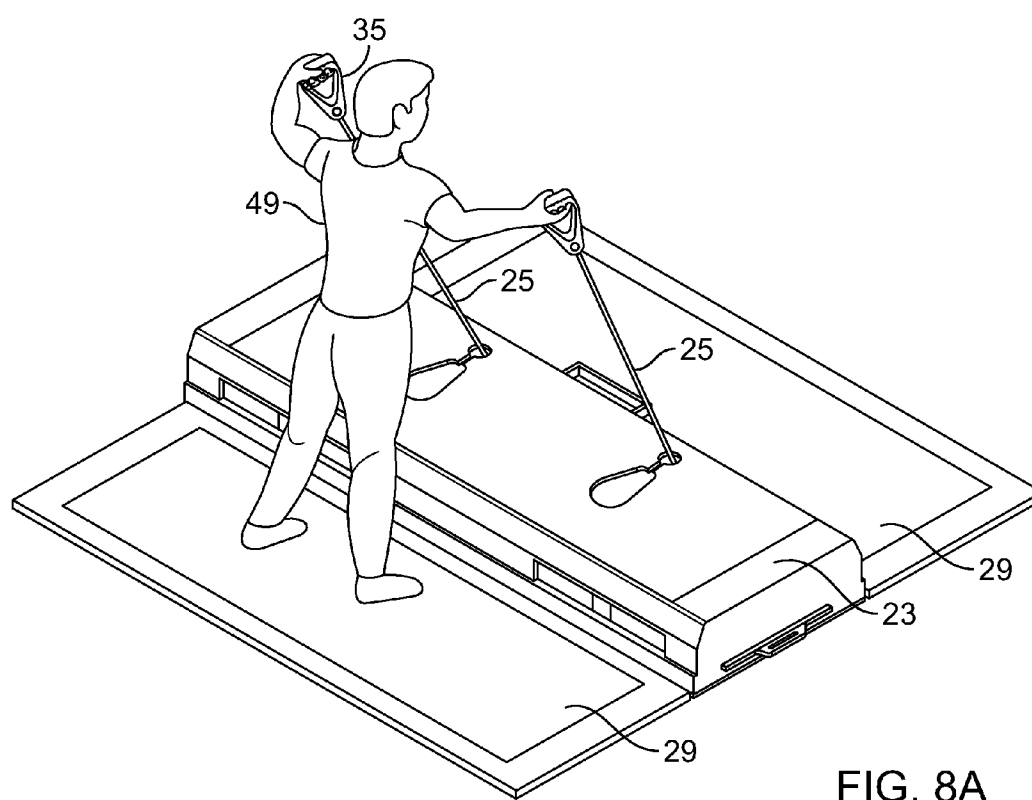
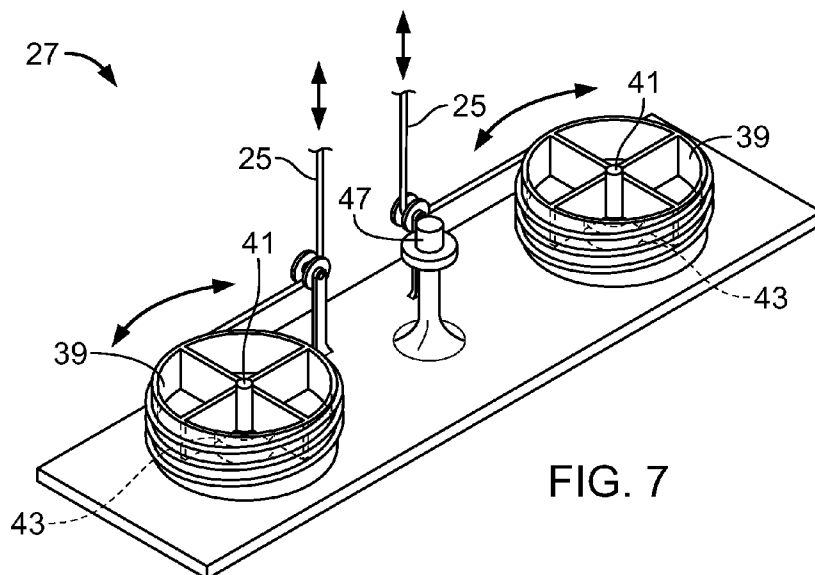


FIG. 6



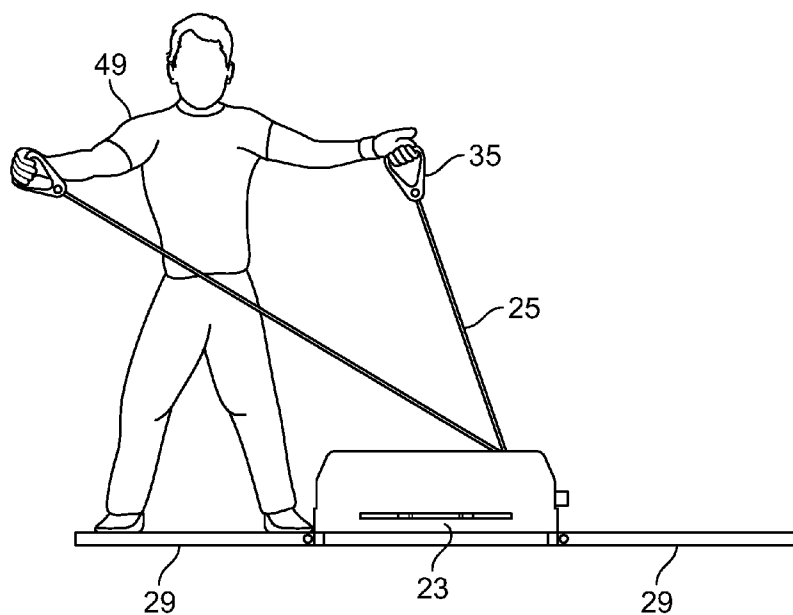


FIG. 8B

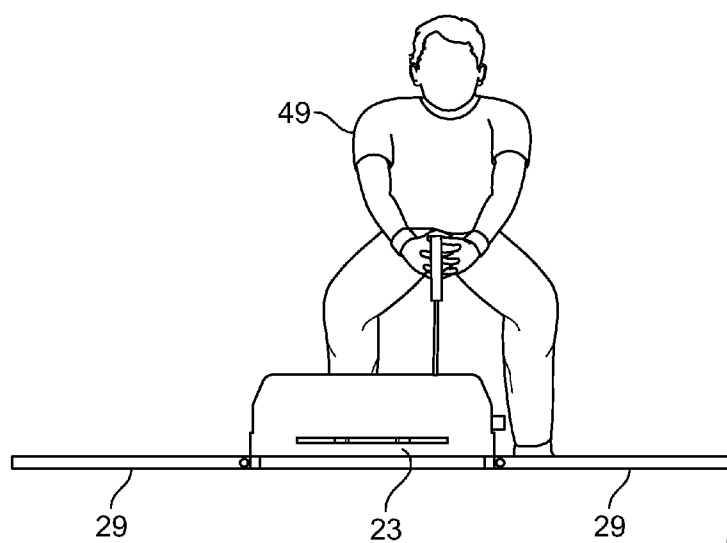


FIG. 8C

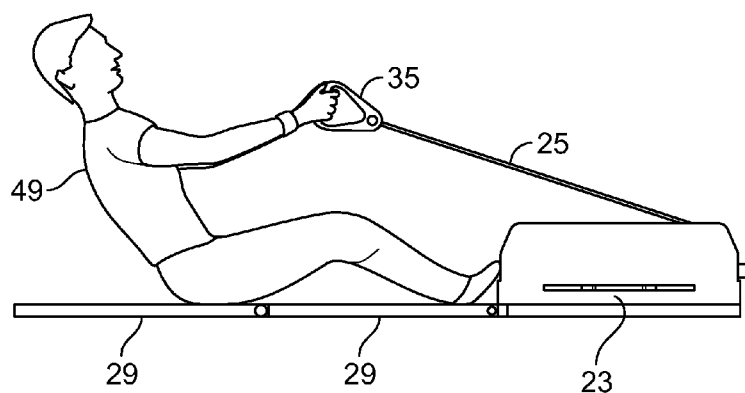


FIG. 8D

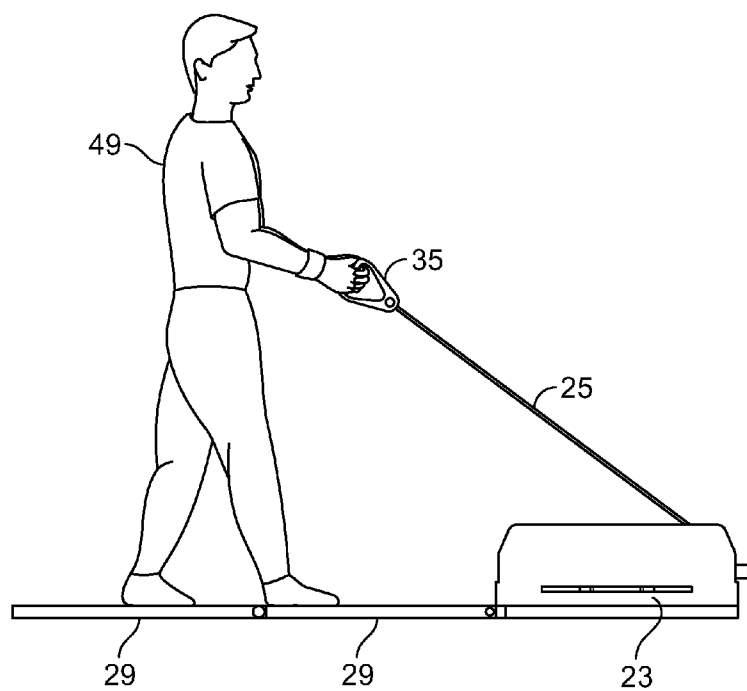


FIG. 8E

EXERCISE EQUIPMENT

TECHNICAL FIELD

[0001] This invention relates to sporting equipment, and more particularly to exercise equipment.

BACKGROUND

[0002] A number of exercise devices are currently used by a wide range of users for a variety of intended results. Conventional exercise methods practiced to obtain a full body workout typically involve using multiple devices to perform multiple exercises. In order to use such a variety of devices to obtain a full body workout, users generally incur large investment expenses or pay high membership fees to gyms.

SUMMARY

[0003] In some aspects, exercise devices include: a step housing structured to support the weight of a user; one or more cables at least partially contained within the step housing; a variable resistance mechanism controlling resistance applied to the one or more cables; and a panel comprising a substantially planar member with a first broad face, the substantially planar member attached to the housing, the panel having a deployed position in which the first broad face of the panel is spaced apart from the housing. Embodiments can include one or more of the following features.

[0004] In some embodiments, the one or more panels are disposed substantially flat along a plane parallel to a top or bottom surface of the step housing when the panel is in the deployed position.

[0005] In some embodiments, at least one of the one or more panels is disposed at an angle of 70 degrees to 110 degrees from a top surface of the step housing to position a top surface of the step housing at a non-parallel angle with respect to a ground surface when the panels are in the deployed position.

[0006] In some embodiments, the device includes at least two panels and a first of the at least two panels is disposed on a first side of the step housing and a second of the at least two panels is disposed on a second side of the step housing, disposed at an angle of 70 degrees to 110 degrees from a top surface of the step housing to position a top surface of the step housing at an elevated height position that is substantially parallel to its original position when the panels are in the deployed position.

[0007] In some embodiments, devices also include a carrying handle attached to the step housing.

[0008] In some embodiments, the variable resistance mechanism includes one or more rotating devices to apply resistance to the cables.

[0009] In some embodiments, the variable resistance mechanism applies 0 to 15 lbs of resistive force to the one or more cables.

[0010] In some embodiments, devices also include a resistance selector connected to the variable resistance mechanism to change the resistive force applied to the one or more cables.

[0011] In some embodiments, the variable resistance mechanism applies different amounts resistive forces to different cables.

[0012] In some embodiments, the one or more cables pass through openings on a top surface of the step housing.

[0013] In some embodiments, the device also includes a translating mechanism to elevate a top surface of the step housing.

[0014] In some embodiments, the step housing and the panel comprise an anti-slip surface.

[0015] In some embodiments, the one or more cables include cable handles. In some cases, multiple cables are connected to one cable handle.

[0016] In some embodiments, the step housing comprises recessed portions to receive the one or more cables. In some cases, devices also include cable retaining mechanisms to secure the cable to inside the recessed portions.

[0017] In some embodiments, devices also include a closure mechanism to secure the panel to the step housing.

[0018] In some embodiments, a resistance trainer as described can provide a versatile piece of exercise equipment that can be compact and easy to transport and store. The resistance trainer can include features and mechanisms that allow a user to carry the resistance trainer to various locations in a stowed state. Once in a desired location, the resistance trainer can then be deployed for use to perform a wide variety of exercises.

[0019] In some embodiments, the resistance trainer can reduce or eliminate a user's need to purchase and main large amounts of exercise equipment by providing the user with the ability to perform many exercises with only one piece of equipment.

[0020] In some embodiments, the resistance trainer includes a mat in the form of multiple panels that use the user's weight to hold the device in place during use and to maintain contact with a ground surface on which the device is used.

[0021] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0022] FIG. 1A is a perspective view of an embodiment of resistance trainer in a deployed position.

[0023] FIG. 1B is a cutaway perspective view of the resistance trainer of FIG. 1A.

[0024] FIG. 1C is a top view of the resistance trainer of FIG. 1A.

[0025] FIG. 1D is a cross sectional side view of the resistance trainer of FIG. 1A.

[0026] FIG. 1E is a cross sectional front view of a step housing of the resistance trainer of FIG. 1A.

[0027] FIG. 1F is a perspective view of the resistance trainer of 1A in a deployed position with the step housing in an elevated position.

[0028] FIG. 1G is a cross sectional side view of the resistance trainer of FIG. 1A with the step housing in an elevated position.

[0029] FIG. 1H is a cross sectional front view of a step housing of the resistance trainer of FIG. 1A with the step housing in an elevated position.

[0030] FIG. 2 is a perspective view of a resistance trainer in a deployed position.

[0031] FIG. 3 is a side view of a resistance trainer in an inclined deployed position.

[0032] FIG. 4 is a side view of a resistance trainer in an elevated deployed position.

[0033] FIG. 5 is a perspective view of a resistance trainer in a stowed position.

[0034] FIG. 6 is a side view of a resistance trainer in a stowed position.

[0035] FIG. 7 is a perspective view of a variable resistance mechanism.

[0036] FIGS. 8A-8E are schematic views of exercises being performed using examples of a resistance trainer.

[0037] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0038] A resistance trainer can provide a versatile piece of exercise equipment that can be compact and easy to transport and store. The resistance trainer can include features and mechanisms that allow a user to carry the resistance trainer to various locations in a stowed state. Once in a desired location, the resistance trainer can then be deployed for use to perform a wide variety of exercises.

[0039] The resistance trainer can reduce or eliminate a user's need to purchase and main large amounts of exercise equipment by providing the user with the ability to perform many exercises with only one piece of equipment.

[0040] As shown in FIGS. 1A-1H, a resistance trainer 21 includes a step housing 23, one or more cables 25, a variable resistance mechanism 27, and one or more panels 29.

Step Housing

[0041] The step housing 23 acts as a structural chassis for mounting and protecting some of the other components (e.g., cables 25, variable resistance mechanism 27 and/or panels 29) of the resistance trainer 21.

[0042] The step housing 23 is a multi-piece component having a base 23a and a step shell 23b. In the embodiment illustrated in FIGS. 1F-1H, the step housing 23 includes a translating slide 23c that allows the step shell 23b to slide up and down to an elevated height and a step lock 23d that secures the step shell at the elevated height. Other approaches are implemented in some resistance trainers. In some embodiments, the translating slide 23c includes various types of mechanical or electromechanical devices such as slides, actuators (linear or rotational), gear systems, leadscrew systems, or similar devices. However, not all step housings 23 are multi-piece components including separate base 23a and step shell 23b components. In some embodiments, the step housing 23 is a single molded or machined component.

[0043] The size and shape of the step housing 23 can depend on the targeted end user's requirements. As shown in FIGS. 1A-1H, the step housing 23 is substantially rectangular shaped, and approximately 40 to 50 inches (e.g., 46 inches) wide, 4 to 10 inches (e.g., 5 inches) high, and 10 to 20 inches (e.g., 15 inches) deep. The step housing can be expected to support a wide range of users and can typically support the weight of a user ranging up to 250 lbs during use. In some embodiments, the step housing is larger or smaller than the illustrated embodiment. In some embodiments, the step housing is 15 to 60 inches (e.g., 30 inches) wide, 1 to 20 inches (e.g., 3 inches) high, and 6 to 30 inches (e.g., 12 inches) deep.

[0044] In some embodiments, the step housing 23 is formed to have an outer profile shape substantially similar to a suitcase on at least one side, such that if carried by a user, the resistance trainer could be carried without undue levels of effort and/or discomfort.

[0045] The step housing 23 can be formed by various material forming processes (e.g., molding, machining, and welding) using various materials. In the illustrated embodiment, the step housing base 23a is made of metal materials and the step shell 23b is made of plastic materials. In some embodiments, the step housing is made of other materials such as plastics (e.g., thermoset or thermoplastics), metal materials (e.g., aluminum alloys or steels), composite materials (e.g., fiberglass or carbon fiber), or a combination of such materials.

[0046] Since users sometimes stand on the step housing 23 during use, the step housing 23 can include features or properties to decrease the likelihood that a user could slip on the step housing 23 during use. The illustrated embodiment includes non-skid tape applied to upper surfaces of the step housing 23. Some embodiments include certain 3-dimensional surface profiles applied to the step housing such as a waffle surface, diamond plate-style surfaces, or the surface can have ridges or similar features and/or slip-resistant surface coatings such as a rubberized surface or a slip-resistant sand paper-type surface. However, not all step housings include such slip-resistant features and/or materials.

[0047] The step housing 23 includes a retractable carrying handle 31 attached to one of the outer surfaces of the step housing 23. In the illustrated embodiment, the carrying handle 31 is attached to the step housing 23 by hinges and the step housing defines a recessed portion in which the carrying handle 31 is stored (e.g., folded down into) during use of the resistance trainer. In some embodiments, the carrying handle 31 is attached to the step housing 23 using other devices such as, for example, slide mechanisms. Although the illustrated embodiment includes a carry handle 31, not all resistance trainers 21 include a carrying handle 31.

[0048] As discussed in greater detail below, the cables 25 and the variable resistance mechanism 27 are housed inside of the step housing 23, and the step housing 23 includes holes through its top surface to allow the cables 25 to pass through during use. Holes are positioned on the top surface of the step shell 23b so that the step shell 23b can be elevated from the base 23a without having to reposition the cables 25 exiting the step housing 23 due to cable interference.

[0049] As shown, the step housing 23 includes recessed portions 33 to accept or to provide storage regions for cable handles 35 that are attached to the cables 25. The recessed portions 33 are positioned near, or extending into the holes disposed along step housing surfaces through which cables 25 pass. In some embodiments, the step housing 23 includes one or more handle retaining mechanisms, such as clips or folding/sliding doors that conceal, partially cover, or otherwise prevent the cable handles 35 from being inadvertently pulled from the step housing 23 while the resistance trainer is not in use. Alternatively, using handle retaining mechanisms, a portion of the cable handles 35 (e.g., one cable 25 and cable handle 35 of a resistance trainer having two sets of cables and handle) can be secured during use to perform particular exercises where it can be desired to pull only one cable (e.g., a one arm curl or a leg extension).

[0050] As discussed above, the resistance trainer 21 has a compact, stowed state that increases the ease with which a user can carry or store the resistance trainer. In the stowed state, as shown in FIGS. 5 and 6, panels 29 are in a stowed position that can typically be defined as a position in which a broad face of a panel is positioned along a surface (e.g., the bottom surface) of the step housing. Then when a user is ready to use the resistance trainer 21, it can be deployed to a

deployed state for use. In the deployed state, panels 29 are in one or more deployed positions that can typically be defined as a position in which the broad faces of the panel is spaced apart from the step housing.

Deployment Mechanism

[0051] As shown in FIG. 1A, in a deployed state, the resistance trainer 21 has two panels 29 deployed to provide a standing and/or seating surface on which the user can perform various exercises. In order to move, rotate, and/or translate the panels 29 from a stowed state to a deployed state, the resistance trainer 21 includes a deployment mechanism 37. In the illustrated embodiment, the deployment mechanism 37 includes multiple hinges that connect the panels 29 to each other and to connect the panels 29 to the step housing 23. The hinges and/or panels 29 include features that prevent the hinges from rotating beyond the desired deployed position (e.g., such features allow a user to stand or sit on a panel 29 and pull on the cables without lifting the step housing 23 or another panel 29 off of the ground).

[0052] The deployment mechanism 37 can be of various types depending on several factors such as the size of the resistance trainer, the types of materials chosen for the step housing 23 or the panels 29, the number of panels 29 included, and the types of exercises desired by a user (e.g., the deployment mechanism can influence the types of positions in which the resistance trainer can be used). In some embodiments, the deployment mechanism 37 includes one or more of several types of devices to deploy panels such as hinges (e.g., standard rotating hinges or accordion style hinges), slide devices, actuator devices, cam devices, or a combination of multiple types of devices.

[0053] In some embodiments, as shown in FIG. 2, the resistance trainer 21 includes more than one panel 29 (e.g., two panels 29 on each side of the step housing 23) to provide the user with greater options of exercises to perform. In such embodiments, the resistance trainer 21 includes one deployment mechanism 37 to deploy the multiple panels 29 (e.g., one hinge, slide, or similar mechanism used to deploy all of the appropriate panels for the exercise). Alternatively, some embodiments include individual deployment mechanisms 37 for each panel 29 included in the resistance trainer 21 (e.g., each panel is attached to an individual hinge or slide).

[0054] In the illustrated embodiment, the panels 29 are deployed by a user manually by unfolding the panels 29 from underneath the step housing 23. In some embodiments, the deployment mechanism 37 is operated by mechanical means (e.g., a mechanical release button or lever) or by electromechanical means (e.g., an electrical switch) that release the deployment mechanism 37 to move the panels from the stowed position to the deployed position.

[0055] To facilitate the set-up, the deployment mechanism 37 of some resistance trainers 21 is designed such that the resistance trainer 21 can be placed on a ground surface and automatically deployed the appropriate panel configuration needed for the user to perform a desired exercise (i.e., instead of the user having lift or turn over the resistance trainer to manually deploy the panels and then place the resistance trainer in the location of use).

[0056] In addition to deploying all of the panels 29 at once as described above, in some embodiments, the resistance trainer 21 is designed such a user can selective deploy one or more particular panels 29 needed to perform particular exercises. Such selective deployment of panels 29 can also be

used in environments where the user does not have ample floor space to deploy all of the panels 29, but would still like to use the resistance trainer 21 for perform some exercises.

[0057] Although FIGS. 1A-1H show the panels 29 deployed straight outward from the resistance trainer 21 (e.g., along the same plane as the bottom surface of the step housing), other deployed positions are possible. As shown in FIGS. 3 and 4, in some embodiments, the panels 29 are deployed to multiple positions relative to the step housing 23 (e.g., pointed downward perpendicular from the bottom surface of the step housing or at a non-perpendicular or parallel angle from the bottom surface of the step housing), as will be discussed in greater detail below with regards to FIGS. 3 and 4. In such embodiments, the deployment mechanism 37 has features to lock or secure the panels 29 in various deployed positions.

Panels

[0058] As discussed above, the resistance trainer 21 includes panels 29 that are deployed to provide a platform for a user. The panels 29 are broad members made of, for example, as plastics (e.g., thermoset and thermoplastics). In some embodiments, panels are made of various other materials, metal materials (e.g., aluminum alloys, steels), composite materials (e.g., fiberglass or carbon fiber), or a combination of such materials.

[0059] Similar to the surface of the step housing 23, the panels 29 provide a standing and/or seating surface for a user and therefore include features or properties to decrease the likelihood that a user could slip during use. The illustrated embodiment includes non-skid tape applied to upper surfaces of the panels 29. Some embodiments include certain 3-dimensional surface profiles applied to the panels 29, such as a waffle-like surface, diamond plate-style surfaces, or the surface can have ridges or similar features and/or slip-resistant surface coatings such as a rubberized surface, a slip resistance sand paper-type type surface. However, not all panels include such features.

[0060] The bottom surface of the panels 29 (e.g., the surface that is typically in contact with a ground surface during use) also includes slip-resistant features in the form of non-skid tape. Such features ensure that when a user stands on a panel 29, the panel 29 typically does not substantially move or slide around during use. However, some embodiments do not include a surface treatment on the lower side of the panels 29 and the user's weight provides sufficient force to prevent sliding of the panels 29.

[0061] As discussed above, the panels 29 are stowed for various reasons (e.g., to make the resistance trainer easier to transport and/or store). Therefore, in some embodiments, one or more of the panels 29 includes a closure mechanism 45 to secure the panels 29 to each other, and in some cases to secure the panels 29 to the step housing 23 while the panels 29 are in a stowed position. The closure mechanism 45 can include, for example, a magnetic or mechanical clamp in or attached to the end panel 29 and operable to secure the panels 29 to the step housing 23. In some embodiments, the closure mechanism 45 includes various types of devices, such as clasps, latches, magnetic contacts, or similar devices.

[0062] As discussed above with regards to the deployment mechanism 37, in some embodiments, the panels 29 include features to prevent panels 29 from rotating or extending beyond desired deployed positions. In some deployed positions the step housing 23 and some of the panels 29 can be

elevated from the ground surface (e.g., in an inclined deployed position), and thus the panels include additional support to maintain correct alignment for a particular deployed position. For example, in embodiments where the panels 29 are connected with hinges, features such as recessed portion or overlapping panel portions can be included to provide force from one panel to an adjacent panel to keep the panels substantially flat along a common plane. In some embodiments, the panels do not include such features and the deployment mechanism 37 holds the panels 29 and step housing 23 in the desired deployed position without additional features included on the panels 29.

Cables

[0063] To perform various exercises, the resistance trainer 21 includes two cables 25 that provide resistance when pulled by a user. Some embodiments include more or fewer cables (e.g., one, three, four, etc.), depending on the intended use and the possible exercises desired. Depending on the use requirements, the cables 25 can include many different types of materials. In the illustrated embodiment, the cables are connected to the variable resistance device 27.

[0064] In some embodiments, the cables include other materials that do not substantially stretch when pulled during exercise use (e.g., metal cables, PVC or plastic coated metal cables, ropes, cords, or similar cables) that are used in the same manner discussed above (e.g., the cable are attached to a variable resistance mechanism).

[0065] Some embodiments include cables that substantially stretch when pulled during exercise use (e.g., resistance exercise stretch cables, bungee cord, or similar cable types) that are mounted to a fixed position within the step housing. In such embodiments, the user can pull on the cables 25 to feel resistance from the cables throughout the range of motion of the exercise instead of utilizing a variable resistance mechanism.

Cable Handles

[0066] As shown in FIGS. 1A-1H, the resistance trainer 21 include cable handles 35 in the form of D-shaped handles that are attached to the cables 25 to allow a user to grip and pull each cable 25 with one hand. The D-shaped handles 35 are foam-covered plastic handles.

[0067] Since the resistance trainer 21 can typically be used to perform many types of exercises (e.g., leg exercise, core exercises, and/or arms/upper body exercises) using one or more combinations of limbs (e.g., one hand, one leg, two hands, or similar combination), the resistance trainer 21 can include other types of cable handles 35 to permit a user to perform the various exercises. Handles to be typically gripped by one hand include a round handle, a rectangular handle, a D-shaped handle, or a similar handle. Handles to be typically gripped by two hands include a machine bar, a double D-shaped handle, a tricep pressdown bar, a tricep rope, a pro-style bar, or similar handles. Handles to typically receive a user's foot during leg exercises include handles in the form of nylon straps, D-shaped loops for feet, or similar handles.

[0068] Although the cable handles 35 in the illustrated embodiment are permanently attached to the cables 25, in some embodiments, the cable handles 35 are temporarily attached to the cable 25 to perform exercises and then changed to attach a different type of cable handle 35 to the cable 25 to perform a different type of the exercise. To tem-

porarily attach the cable handles 35 to the cables 25, the cables 25 and/or the cable handles 35 include attachment mechanisms (e.g., latches or carabiners-type devices) to which different cable handles 35 can be attached at different times.

[0069] To provide additional versatility during use, in some embodiments, a cable handle 35 attaches to more than one cable 25 so that during use the user can utilize the resistance of both cables during an exercise.

Variable Resistance Mechanism

[0070] To allow a user to apply different levels of resistance to the cables 25 during use, the variable resistance mechanism 27 is provided with the resistance trainer 21. The variable resistance mechanism 27 is positioned within the step housing 23 and has connections to which the cables 25 are attached. As shown in FIG. 7, the variable resistance mechanism 27 is in the form of two flywheels 39 positioned inside the step housing 23. Each flywheel is mounted to an axle or pivot 41 and includes a surface around which a cable 25 is wound.

[0071] Each flywheel includes a re-coil mechanism 43 so that when the cable 25 is released by a user, the flywheel 39 rotates to wind the cable 25 around the flywheel 39. To rotate the flywheel and retract the cable, the re-coil mechanism 43 includes resilient members.

[0072] The variable resistance mechanism 27 includes a resistance selector 47 used to adjust the resistance provided to the cables 27 by the variable resistance mechanism. In the illustrated embodiment, the resistance selector 47 has 10 settings that can provide up to 15 pounds of resistive forces to the cables when pulled. In some embodiments, the resistance to the cables 25 is adjusted using various devices such as variable spring devices connected to the flywheels 39 and/or the re-coil mechanisms 27 to vary the torque required to rotate the flywheel 39 and/or the re-coil mechanisms 27 during use. In some embodiments, the resistance to the cables is adjusted using several mechanical means (e.g., gears, adjustable spring, or other devices) or electromechanical means (e.g., electromagnetic motors).

[0073] The degree of adjustment and number of different resistance levels included by the variable resistance mechanism 27 can depend on the intended use. In some embodiments, the variable resistance mechanism 27 has a discrete number of different resistance settings, such as a high resistance setting and a low resistance setting or a number of different settings (e.g., 2, 3, 4, 5, 6, 7, 8, 9, 10, etc. settings) that provide increasing amounts of resistance. In other embodiments, the variable resistance mechanism 27 includes a continuous range of resistance settings. In some cases, different resistance settings are associated with particular weights (e.g., to simulate lifting a certain weight).

[0074] In some embodiments, the flywheels 39 included in the resistance trainer 21 are operated independent from each other to provide a user with greater control over desired exercises. In some embodiments, independently operating flywheels 39 have separate resistance selectors 47 such that a cable 25 connected to one flywheel 39 can have a different resistive force than a cable 25 connected to another flywheel 39.

[0075] In some embodiments, flywheels 39 are connected or linked together such that the same force is applied to the cables 25 connected to each of the flywheels 39 and the cables 25 travel the same distance when pulled.

[0076] Alternatively or in addition to using flywheels 39, in some embodiments, the variable resistance mechanism includes a system of different sized pulleys (e.g., to apply different levels of resistance) around which the cables travel to rotate the pulleys. In such embodiments, the variable resistance mechanism 27 includes a device to move a cable from one pulley to another pulley, such as derailleur-type device.

Different Deployment Positions

[0077] FIG. 3 shows an example of a resistance trainer 21 in an inclined deployed position. As shown, panels 29 on one side of the step housing 23 are deployed outward laterally from the step housing 23 such that the panels are substantially co-planar with a top and/or bottom surface of the step housing. The panels 29 on the other side of step housing 23 are deployed downward from the step housing 23 such that they are substantially perpendicular to either the top surface of the step housing or a ground surface and therefore the resistance trainer 21 is positioned at an incline with respect to the ground surface.

[0078] FIG. 4 shows the resistance trainer 21 deployed in an elevated position. As shown, panels 29 on both sides of the step housing 23 are deployed downward, away from a bottom surface of the step housing (e.g., to be substantially perpendicular to a top surface of the step housing) to elevate the step housing 23 from a ground surface.

[0079] FIGS. 5 and 6 show the resistance trainer 21 in a stowed position. In the stowed position, panels 29 are retracted so that the resistance trainer 21 can be carried and/or stored more easily by a user. As shown in the illustrated embodiment, in a stowed position, panels 29 fold to overlap one another (e.g., a broad face of one panel is in contact with a broad face of another panel). In embodiments where the resistance trainer 21 includes smaller panels 29, in a stowed position, panels 29 are folded inward from both sides of the step housing 23 to be positioned end to end from one another.

[0080] For added transportation capabilities, in some embodiments, the resistance trainer 21 with the panels in a stowed position is sized appropriately to meet various requirements to be brought onto an airplane, such as “carry-on” luggage size requirements (e.g., the current maximum size carry-on bag for most airlines is 45 linear inches (the total of the height, width, and depth of the bag cannot exceed 45 inches)).

[0081] As discussed above, in some embodiments, the resistance trainer 21 includes a closure mechanism 45 to secure the panels 29 to the step housing 23 when in a stowed position.

Exemplary Exercises

[0082] FIGS. 8A-8E show several examples of exercises that can be performed using the resistance trainer. Due to the wide variety of components and features included in different embodiments of the resistance trainer (e.g., the number of panels included and the way in which they can be deployed), many different types of exercises can be performed using the resistance trainer.

[0083] FIG. 8A shows a schematic view of a user 49 performing a chest fly exercise. While performing such an exercise, the user 49 stands on one or more deployed panels 29 with their back facing the step housing 23 and pull the cables 25 forward. As discussed above, in some embodiments, the

user 49 need not stand directly on the step housing 23 during use to keep the step housing 23 in place during use.

[0084] FIG. 8B shows a schematic view of a user 49 performing a lunge curl exercise. While performing such an exercise, the user 49 stands with one foot on a deployed panel 29 and the other foot on the step housing 23 and simulate walking lunge motions while pulling on the cables 25.

[0085] FIG. 8C shows a schematic view of a user 49 performing a straddle squat exercise. While performing such an exercise, the user 49 stands with one foot on a deployed panel 29 on one side of the step housing 23 and the other foot on a deployed panel 29 on the other side of the step housing 23. To perform the exercise, the user 49 squats down to grab one or both cables 25 between their legs stand upward to pull the cables 25.

[0086] FIG. 8D shows a schematic view of a user 49 performing a seated row exercise. During such an exercise the user 49 sits on a deployed panel 29 and places their feet on the step housing 23 and/or another panel 29 connected to the step housing 23. To perform the exercise, the user 49 leans forward to grab cables 25 and lean backward while pulling the cables 25.

[0087] FIG. 8E shows a schematic view of a user 49 performing a wood chop exercise. To perform such an exercise, the user 49 stands with one foot on a first deployed panel 29 connected to the step housing 23 and the other foot on a second deployed panel 29 extending from the first panel 29, such that the step housing 23 is to the user's side. The user then rotates their upper body toward the step housing 23 to grasp a cable handle 25 and rotates their upper body away from the step housing 23 (e.g., to simulate the motion of chopping wood).

[0088] It is to be understood that while the invention has been described in conjunction with the detailed description thereof, the foregoing description is intended to illustrate and not limit the scope of the invention, which is defined by the scope of the appended claims. Other aspects, advantages, and modifications are within the scope of the following claims

What is claimed is:

1. An exercise device comprising:

- a step housing structured to support the weight of a user; one or more cables at least partially contained within the step housing;
- a variable resistance mechanism controlling resistance applied to the one or more cables; and
- a panel comprising a substantially planar member with a first broad face, the substantially planar member attached to the housing, the panel having a deployed position in which the first broad face of the panel is spaced apart from the housing.

2. The exercise device of claim 1, wherein the one or more panels are disposed substantially flat along a plane parallel to a top or bottom surface of the step housing when the panel is in the deployed position.

3. The exercise device of claim 1, wherein at least one of the one or more panels is disposed at an angle of 70 degrees to 110 degrees from a top surface of the step housing to position a top surface of the step housing at a non-parallel angle with respect to a ground surface when the panels are in the deployed position.

4. The exercise device of claim 1, wherein the device includes at least two panels and a first of the at least two panels is disposed on a first side of the step housing and a second of the at least two panels is disposed on a second side of the step

housing, disposed at an angle of 70 degrees to 110 degrees from a top surface of the step housing to position a top surface of the step housing at an elevated height position that is substantially parallel to its original position when the panels are in the deployed position.

5. The exercise device of claim 1, further comprising a carrying handle attached to the step housing.

6. The exercise device of claim 1, wherein the variable resistance mechanism includes one or more rotating devices to apply resistance to the cables.

7. The exercise device of claim 1, wherein the variable resistance mechanism applies 0 to 15 lbs of resistive force to the one or more cables.

8. The exercise device of claim 1, further comprising a resistance selector connected to the variable resistance mechanism to change the resistive force applied to the one or more cables.

9. The exercise device of claim 1, wherein the variable resistance mechanism applies different amounts resistive forces to different cables.

10. The exercise device of claim 1, wherein the one or more cables pass through openings on a top surface of the step housing.

11. The exercise device of claim 1, further comprising a translating mechanism to elevate a top surface of the step housing.

12. The exercise device of claim 1, wherein the step housing and the panel comprise an anti-slip surface.

13. The exercise device of claim 1, wherein the one or more cables include cable handles.

14. The exercise device of claim 13, wherein multiple cables are connected to one cable handle.

15. The exercise device of claim 1, wherein the step housing comprises recessed portions to receive the one or more cables.

16. The exercise device of claim 15, further comprising cable retaining mechanisms to secure the cable to inside the recessed portions.

17. The exercise device of claim 1, further comprising a closure mechanism to secure the panel to the step housing.

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