A multi-exercise machine includes a frame, a resistance system, a seat connected to the frame to be movable from a first seat position to a second seat position, and an inclined post inclined in a selected direction. The configuration of the present invention provides the multi-exercise machine with a movable seat to create more space for correct ergonomic posture of a user in a standing position. The configuration of the present invention also provides the multi-exercise machine with an inclined post to enable correct ergonomic postures of a user in a sitting position. The present invention enables a user to perform a variety of exercises in both sitting and standing positions.
MULTI-EXERCISE APPARATUS

BACKGROUND

[0001] This invention relates to an exercise apparatus, more particularly to a multi-exercise machine which enables a user to perform a variety of exercises in both sitting and standing positions.

[0002] Single function exercise machines have been developed for several decades. It is common for an exercise club to arrange different single function exercise machines for users to perform different exercises. With a trend of home exercise, it is not proper for home users to arrange different single function exercise machines in their limited floor space. Some prior arts try to disclose some multi-exercise machines in which a user can perform different exercises without shifting to different single function machines.

[0003] Some multi-exercise machine such as U.S. Pat. No. 6,488,612, are designed to be performed by a user in a standing position. The '612 patent discloses a multi-exercise machine comprising a general upright, an elongated arm mechanism, and a cable interconnected to a handle. In such a machine, a user can not perform a lot of exercises which are usually performed by a user in a seated position. Other multi-exercise machines such as U.S.2003/0027696, may have a seat connected to a multi-exercise machine for a user to perform some exercises in a sitting position. With the way the seat is connected to the multi-exercise machine, a user has a problem when he/she wants to perform exercises in a standing position because the seat may interfere with some movements of the user. A user needs to straddle the seat in order to perform some exercises in a standing position. By straddling the seat, a user could be in a wrong ergonomic posture because of an interference of the seat. As a result, the existence of the seat could decrease the variety of exercises possible using the multi-exercise machine.

[0004] Some multi-exercise machines such as US D502, 515, try to increase the variety of exercises in a sitting position by having different frame configurations. For example, the configuration has two uprights and two corresponding sliding handles for performing different exercises while the handles are positioned in different levels on the uprights. Because of the frame configuration of the prior art, some exercises may be limited due to the frame configuration, especially a user performing a biceps curl or chest press in a sitting position.

[0005] For the foregoing reasons, there exists a need for a multi-exercise machine having a simple configuration to allow a user to perform a variety of exercises in both sitting and standing positions.

SUMMARY

[0006] The present invention is directed to a device that satisfies this need for a multi-exercise machine having a simple configuration to allow a user to perform a variety of exercises in both sitting and standing positions.

[0007] In the preferred embodiment, the exercise machine of the present invention includes a base frame having an upright extending upward from the base frame, a weight stack, a plurality of pulleys, a cable system connected to the weight stack, a gripping handle connected the cable system, and a seat connected to the frame to be movable from the first seat position to the second seat position.

[0008] One object of the present invention is to provide a multi-exercise machine which enables a user to perform a variety of exercises in both sitting and standing positions.

[0009] Another object of the present invention is to provide a multi-exercise machine with a seat to be movable from a first seat position to a second seat position in order to create more space for correct ergonomic posture of a user in a standing position.

[0010] Another object of the present invention is to provide a multi-exercise machine with an inclined post configuration to enable correct ergonomic postures of a user in a sitting position.

[0011] Another object of the present invention is to provide a multi-exercise machine with an inclined post configuration to decrease interference between the elbow of a user and the exercise machine while the user is in a sitting position.

[0012] The reader is advised that this summary is not meant to be exhaustive. Further features, aspects, and advantages of the present invention will become better understood with reference to the following description, accompanying drawings and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] For a better understanding of the present invention, reference may be made to drawings, in which:

[0014] FIG. 1 is a perspective view of a preferred embodiment of the present invention;

[0015] FIG. 2 is a front view of the preferred embodiment of the present invention;

[0016] FIG. 3 is a side view of the preferred embodiment of the present invention;

[0017] FIG. 4 is a top view of the preferred embodiment of the present invention;

[0018] FIG. 5 is a perspective view of a bar assembly of the present invention;

[0019] FIG. 6 is a perspective view of a seat assembly of the present invention;

[0020] FIG. 7 is a perspective view of the preferred embodiment of the present invention with a seat in a second seat position;

[0021] FIG. 8 is a perspective view of a preferred embodiment of a seat back assembly of the present invention;

[0022] FIG. 9 is a side view of the preferred embodiment of the present invention while the gripping handle located in a lower position;

[0023] FIG. 10 is a front view of the preferred embodiment of the present invention while the gripping handle located in a lower position;

[0024] FIG. 11 is a side view of the preferred embodiment of the present invention while the gripping handle located in an upper position;
FIG. 12 is a front view of the preferred embodiment of the present invention while the gripping handle located in an upper position; and,

FIG. 13 is a side view of the preferred embodiment of the present invention with the seat in the second seat position.

DESCRIPTION

Referring now specifically to the figures, in which identical or similar parts are designated by the same reference numerals throughout, a detailed description of the present invention is given. It should be understood that the following detailed description relates to the best presently known embodiment of the invention. However, the present invention can assume numerous other embodiments, as will become apparent to those skilled in the art, without departing from the appended claims.

DETAILED DESCRIPTION

Referring now to FIGS. 1-3, a multi-exercise machine of a preferred embodiment is disclosed and designated by reference character 10. The exercise machine 10 comprises base frames 20 and 20' designed to be supported by a floor surface, a connecting frame 21 for connecting the base frames 20 and 20' and uprights 22 and 23 extending vertically upward from the connecting frame 21. The exercise machine 10 includes inclined posts 24 and 24' respectively extending upward from the base frames 20 and 20' and a connecting frame 25 for connecting the upper ends of the inclined posts 24 and 24'. The inclined posts 24 and 24' are designed to be inclined in a selected direction to create ergonomic advantages of a user when a user is in a sitting position. The selected direction of the inclined posts 24 and 24' will be described in detail thereafter. The exercise machine 10 includes a resistance system 40 comprising a pair of guide rods 45 extending upward from the connecting frame 21, a weight stack 41 having a plurality of weight plate 411 slidably positioned between the guide rods 45 for providing different levels of training resistance to a user, a plurality of pulleys, and a cable system 42 routed around the plurality of pulleys. A user can select desired training resistance by relocating a locking pin, not shown but well known by people skilled in the art, into a bayonet 38. It is known by people skilled in the art that some alternative embodiments of the resistance system 40 such as resilient rope system or eddy current brake system could be also utilized for providing training resistance to a user.

The exercise machine 10 of the present invention further includes sliding assemblies 30 and 30' which can be relocated at different locations along the respective inclined posts 24 and 24'. The sliding assemblies 30 and 30' respectively comprise positioning handles 32 and 32', sliding tubes 31 and 31' slidably mounted on respective inclined posts 24 and 24', swivel brace 33 and 33' pivoted to respective sliding tubes 31 and 31', pulleys 34 and 34' fixed on the upper ends of the respective swivel braces 33 and 33', and pulleys 35 and 35' fixed on the lower ends of the respective swivel braces 33 and 33'. A user can relocate the assembly 30 into different positions by releasing a locking pin (not shown) inside the positioning handle 32, sliding the positioning handle 32 along the inclined post 24, and fixing the locking pin into a selected aperture 241 on the inclined post 24. With the design of the positioning handle 32, a user can easily relocate the sliding assembly 30 along the inclined post 24 by one-hand operation. The sliding assembly 30 could be operated by a user by the same way as the sliding assembly 30.

The exercise machine 10 comprises a seat assembly 50 and a seat back assembly 60 attached to the upright 20. In a embodiment of the present invention shown in FIG. 6, the seat assembly 50 comprises a seat 53 attached to a seat frame 52, a fixed plate 54 having apertures 542 and 544 attached to the seat frame 52, a brace 56 attached to a sliding tube 51 for supporting the seat 53 and the seat frame 52, and a locking pin 512 attached to the brace 56 for locking the seat 53 into different seat positions. The seat 53 is pivoted to the sliding tube 51 through a pivoting axis 521 which is substantially perpendicular to the floor surface. Therefore, the seat 53 can be rotated into different seat positions along the pivoting axis 521. While the seat 53 is rotated and the locking pin 512 is positioned into the aperture 542, the seat 53 is in a first seat position as shown in FIGS. 1-4. In a same way, the seat 53 is in a second seat position while the seat 53 is rotated and the locking pin 512 is positioned into the aperture 544 as shown in FIG. 7. In a preferred embodiment, the seat 53 has a reference plan A therein as shown in FIGS. 2 and 3. The reference A has a fixed angle related to the top surface of the seat 53. The reference A is substantially parallel to the floor surface while the seat 53 is moved by a user from the first seat position to the second seat position.

Another embodiment of the seat assembly 50 is that the seat 53 is slidable connected to the sliding tube 51 or the upright 22. In this embodiment, the pivoting axis 521 is replaced by a pair sliding members and a pair of substantial horizontal rails which are adapted to support the sliding members for a substantial horizontal sliding movement of the seat assembly 50. In a potential energy perspective, the potential energy of the seat 53 of the present invention is substantially unchanged when the seat 53 is moved from the first seat position to the second seat position. In other word, a user only needs to apply an actuating force which is for a purpose to overcome a friction force between the seat assembly 50 and the upright 22 in order to move the seat 53 from the first seat position to the second seat position. If the seat is pivoted to the upright 22, the friction force is caused by the cylinder surface of the pivoting axis 521. If the seat is slidably mounted to the upright 22, the friction force is caused by the surface of the horizontal rails. It is understood that the actuating force is minimal and convenient for a user to move the seat 53 from the first seat position to the second seat position.

Referring to FIGS. 1, 2, 3 and 9, the exercise machine 10 of the present invention includes a cable 421 which is routed around a series of pulleys 426-432 having an end 424 connected to a gripping handle 43 (FIG. 9) and the other end connected to the sliding assembly 30. A cable 421' which is routed around a series of pulleys 426'-432' has an end 424' connected to a gripping handle 43' and the other end connected to the sliding assembly 30. As showed in FIG. 9, the exercise machine 10 includes a cable 428 which is first routed around a series of pulleys 434-437, then a pulley 438 which is connected to the weight stack 41 and a series of pulleys 434'-437'. The both ends of the cable 428 are
connected to a cable 441 which is routed around pulleys 439 and 440. The cable 441 has an end 425 positioned in front of a footplate 211.

[0033] Now referring to FIGS. 9 and 11, the sliding assembly 30 is positioned in different positions, a lower position in FIG. 9 and an upper position in FIG. 11. The inclined post 24 is extended upward from the base frame 20. It should be noticed that the inclined post 24 is designed to be inclined in a selected direction to create ergonomic advantage of a user when a user is in a sitting position. In a preferred embodiment as shown in FIG. 9, the inclined post 24 is inclined backward in an orientation of a user in a sitting position. There are two symbiosis advantages of the backward incline. Both the upper and lower positions of the sliding assembly 30 are in their ergonomically correct positions. Because of the backward incline, a backward distance L1 is created when the sliding assembly 30 is moved from the lower position to the upper position.

[0034] With the backward distance L1, the sliding assembly 30 is in back of the shoulder and elbow of the user. That means the sliding assembly 30 in the upper position could have an ergonomically correct position when a user starting to operate an exercise such as chest press or pectoral fly in a sitting position as shown in FIG. 11. In a traditional upright post configuration which does not incline the upright post backward, the sliding assembly 30 can only have an ergonomically correct position in either the lower position or the upper position. For example, the upper position of the sliding assembly 30 could be too near the elbow of a user if the upright post is designed to have a better ergonomic position while the sliding assembly 30 is in the lower position. The backward distance L1 can decrease interference between the swivel brace 33 and the elbow of a user when a user performing exercises such as chest press or pectoral fly in a sitting position with the sliding assembly 30 in the upper position. Because the swivel brace 33 is pivoted to the sliding tube 31, the swivel brace 33 could be swiveled forward when the cable end 424 is pulled forward. Although the sliding assembly 30 can not be seen in FIGS. 9 and 11, it is easy to understand that the sliding assembly 30 may have same character and operation as the sliding assembly 30.

[0035] FIG. 10 shows a front view of the present invention with the sliding assemblies 30 and 30' respectively positioned in the lower positions. It is shown that the inclined posts 24 and 24' extending upward from the base frame 20 and 20' are inclined inward to each other. FIG. 12 shows a front view of the present invention with the sliding assemblies 30 and 30' respectively positioned in the upper positions. With an inward incline of the inclined posts 24 and 24', an inward distance L2 is created when the sliding assembly 30 or 30' is moved from the lower position to the upper position. The inward distance L2 creates some ergonomic advantage for the user to perform exercises such as chest press or pectoral fly in a sitting position. The sliding assembly 30 is near the shoulder of the user when the sliding assembly 30 is in the upper position and it is comfortable for the user to grab the gripping handle 43. Because of symmetric character of the preferred embodiment of the present invention, the inclined post 24' and sliding assembly 30' have similar or same configuration, operation and advantages.

[0036] Referring now to FIG. 5, a gripping handle 43L is an alternative embodiment of the gripping handle 43 and 43'. The gripping handle 43L is in an elongated configuration having two ends and an inner portion. The gripping handle 43L includes outer connectors 431 respectively mounted on the ends of the gripping handle 43L. It should be noticed that the outer connectors 431 are rotatable around the gripping handle 43L. The gripping handle 43L further includes inner connectors 432 which are also rotatably mounted on the inner portion of the gripping handle 43L. In one operation condition, the sliding assemblies 30 and 30' are positioned in the highest portions of the inclined posts 24 and 24' and the cable ends 424 and 424' are respectively connected to the inner connectors 432. By connecting the inner connectors 432, a user can perform an exercise such as a lat pull-down exercise. In another operation condition, the sliding assemblies 30 and 30' are respectively positioned in the lower positions of the inclined posts 24 and 24' and the cable end 424 and 424' are respectively connected to the outer connectors 431. By connecting the outer connectors 431, a user can perform an exercise such as a low bar curl shown in FIG. 13. Because the inner or outer connectors 431 and 432 are rotatably mounted on the gripping handle 43L, there is no rotating torque produced on the gripping handle 43L. It is smooth to use the gripping handle 43L disclosed to perform the exercises mentioned above.

[0037] Now referring to FIG. 8, detail structures of the seat back assembly 60 is disclosed. The seat back assembly 60 includes a back frame 62 having several apertures 615 thereon attached to a seat back 63, a sliding tube 612 having a locking pin 621, a sliding tube 611 having a locking pin 611 attached to the sliding tube 612. The back frame 62 is slidably mounted on the sliding tube 612. Therefore, positions of the seat back 63 could be adjusted by relocating the locking pin 621 into different locations of the apertures 615.

[0038] Now referring to FIGS. 9 and 13, different exercises of the exercise machine 10 are demonstrated. FIG. 9 shows a user in a sitting position performing a sitting biceps curl exercise. It is known by people skilled in the art that the exercise is not limited to a biceps curl exercise. The seat 53 is currently in the first seat position. The sliding assembly 30 is positioned in the lower position and the gripping handle 43 is also in its respective lower position. A user puts down forearms to grab the gripping handles 43 and then curls up forearms to overcome the resistance of the weight stack 41 as the phantom line shown in FIG. 9. FIG. 13 shows a user in a standing position to operate a low bar curl exercise. In a conventional configuration of a seat unit, a user needs to straddle the seat unit in order to perform an exercise in a standing position. It is sometimes uncomfortable for a user to perform some exercises in a straddling position. There is interference between the seat unit and the user legs. With teaching of the present invention, the seat 53 could be movable between the first seat position and the second seat position. Therefore, a user does not need to straddle the seat assembly 50 to perform some exercises in a standing position and a user can perform some exercises in a standing position without interference of the seat assembly 50.

[0039] Because the seat 53 can be pivotally connected to the upright 22 and the pivoting axis 521 is substantially perpendicular to the floor surface, the actuating force needed to rotate the seat 53 from the first seat position to the second seat position is minimal. A user only needs to overcome a
friction force caused by the pivoting axis 521. It is easy and convenient for a user to move the seat from the first seat position to the second seat position. The reference plan A shown in FIGS. 2 and 3 is substantially parallel to the floor surface while the seat is rotated from the first seat position to the second seat position. In other words, potential energy of the seat 53 and the seat frame 52 is substantially unchanged while the seat is rotated from the first seat position to the second seat position.

[0040] In the preferred embodiment, the seat 53 is not occupied in the second seat position but it is still under a scope of the present invention if a user sits on the seat 53 in the second seat position performing some exercises. In other words, the seat assembly 50 disclosed in the present invention could be utilized in a conventional multi-station exercise equipment. The conventional multi-station exercise equipment usually has several separated seat units in front of each station. With teaching of the present invention, the seat assembly 50 could be mounted to the conventional multi-station exercise equipment. The seat assembly 50 could be rotated into different stations for performing different exercises. The seat assembly numbers can be increased and it is also highly cost efficient applying a rotatable seat assembly in the conventional multi-station exercise equipment.

[0041] While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretations and equivalent arrangements.

Closing

[0042] Although the present invention has been described in considerable detail with reference to certain preferred versions thereof, other versions are possible. Therefore, the spirit and scope of the appended claims should not be limited to the description of the preferred versions contained herein.

We claim:

1. An exercise machine comprising:
   a frame having a base supported by a floor surface;
   a resistance system mounted on said frame to provide training resistance to a user; and
   a seat connected to said frame having a first seat position and a second seat position wherein said seat is movable from said first seat position in which a first exercise is operated by said user in a sitting posture to said second seat position in which a second exercise is operated by said user in a standing posture.

2. The exercise machine as claimed in claim 1, wherein an actuating force required moving said seat from said first seat position to said second seat position is designated to overcome a friction force between said frame and said seat.

3. The exercise machine as claimed in claim 2, said resistance system further comprising a weight stack positioned on said base; a plurality of pulleys mounted on said frame; at least a gripping handle; and a cable system routed around said plurality of pulleys having a first portion engaged to said weight stack and a second portion connected said gripping handle.

4. The exercise machine as claimed in claim 1, wherein said seat is substantially vertically pivoted to said frame in a direction related to said floor surface.

5. The exercise machine as claimed in claim 4, further comprising a fixed plate connected to said seat having two apertures therein.

6. The exercise machine as claimed in claim 5, further comprising a brace connected to said frame; and a locking pin attached to said brace to position said locking pin into one of said apertures of said fixed plate.

7. An exercise machine comprising:
   a frame having a base supported by a floor surface;
   a resistance system mounted on said frame to provide training resistance to a user; and
   a seat connected to said frame to be movable from a first seat position in which a first exercise is operated by a user to a second seat position in which a second exercise is operated by said user wherein said seat further comprises a reference plane which is substantially parallel to said floor surface when said seat moved from said first seat position to said second seat position.

8. The exercise machine as claimed in claim 7, said resistance system further comprising a weight stack positioned on said base; a plurality of pulleys mounted on said frame; at least a gripping handle; and a cable system routed around said plurality of pulleys having a first portion engaged to said weight stack and a second portion connected said gripping handle.

9. The exercise machine as claimed in claim 8, wherein said second exercise is operated by said user while said user is in a sitting condition.

10. The exercise machine as claimed in claim 9, wherein said seat is horizontally slidably connected to said frame in a direction related to said floor surface.

11. The exercise machine as claimed in claim 10, wherein an actuating force required moving said seat from said first seat position to said second seat position is designated to overcome a friction force between said frame and said seat.

12. The exercise machine as claimed in claim 11, wherein said seat is substantially vertically pivoted to said frame in a direction related to said floor surface.

13. An exercise machine comprising:
   a frame having a base supported by a floor surface;
   a weight stack positioned on said frame;
   a plurality of pulleys mounted on said frame;
   at least a gripping handle;
   a cable system routed around said plurality of pulleys having a first portion engaged to said weight stack and a second portion connected said gripping handle; and
   a seat pivotally connected to said frame through a pivoting axis to be movable from a first seat position in which a first exercise is operated by a user to a second seat position in which a second exercise is operated by said user wherein said pivoting axis is substantially perpendicular to said floor surface.
15. The exercise machine as claimed in claim 14, wherein said second exercise is operated by said user while said user is in a standing condition.

16. An exercise machine comprising:

a frame having a base supported by a floor surface and at least a inclined post extending upward from said base;

a plurality of pulleys mounted on said frame;

at least a gripping handle;

a cable system routed around said plurality of pulleys having a first portion engaged to said weight stack and a second portion connected said gripping handle;

a seat connected to said frame; and

at least a sliding assembly slidably connected to said inclined post to relocate said gripping handle from a lower position to upper position wherein said sliding assembly is moved at a horizontally backward distance from said lower position to said upper position.

17. The exercise machine as claimed in claim 16, wherein said sliding assembly includes a positioning handle and at least an exit pulley pivoted to said positioning handle.

18. The exercise machine as claimed in claim 17, wherein said exit pulley is in back of the shoulder joint of a user in a sitting condition while said sliding assembly located at said upper position.

19. The exercise machine as claimed in claim 17, further comprising a seat pivotally connected to said frame through a pivoting axis to be movable from a first seat position in which a first exercise is operated by said user to a second seat position in which a second exercise is operated by said user wherein said pivoting axis is substantially perpendicular to said floor surface.

* * * * *