

ANCHOR BAR AND CARRIAGE STOP ASSEMBLY

BACKGROUND OF THE DISCLOSURE

Field of the Disclosure

[0001] The present disclosure relates to an exercise apparatus used in Pilates type exercises. In particular, this disclosure relates to a new anchor bar and carriage stop assembly for use in a reformer exercise apparatus.

State of the Art

[0002] Exercise machines utilized in the performance of physical exercises originated by Joseph Pilates typically are often performed on a stationary apparatus called a reformer. A reformer typically has a rectangular wood or metal frame having a foot end and a head end. A pair of parallel side rails separates the head and foot ends. A rolling carriage is configured to roll along between the side rails from the foot end to the head end and is biased toward the foot end of the frame by one or more coil springs connected to an anchor bar fastened to the frame near the foot end and to the carriage. A foot bar is fastened to the foot end of the frame. A user typically sits or reclines on the carriage and pushes against the foot bar to move the carriage away from the foot end of the frame during exercise. There are a variety of mechanisms to vary the distance between the carriage and the foot end when the carriage is at a rest position. Exemplary mechanisms are disclosed in our US Patent Nos. 7,163,500 and 11,065,495.

[0003] Some reformers have a member fastened to an inner surface of the side rails to form a track on which the carriage rolls between the head and foot ends of the reformer frame. Typically such reformers may also have a plurality of holes in the members into which a carriage stop block may be placed to maintain a certain distance between the anchor bar and the carriage. Often such anchor bar support assemblies require modification of existing anchor bar support brackets, etc. Thus there is still a need for a simple anchor bar and carriage stop assembly that can be installed on any such reformer.

SUMMARY OF THE DISCLOSURE

[0004] A reformer exercise apparatus in accordance with the present disclosure includes a generally rectangular frame, a carriage on the frame configured for movement back and forth between a head end and a foot end of the frame on parallel tracks, one or more bias members fastened between the carriage and an anchor bar carried at the foot end of the frame for biasing the carriage toward the foot end of the frame on the parallel tracks, a foot bar fastened at or adjacent to a foot end of the frame, and an anchor bar and carriage stop assembly fastened to the frame adjacent the foot end of the frame. The one or more bias members, such as an elongated coil spring, is carried in the anchor bar and carriage stop assembly.

[0005] This anchor bar and carriage stop assembly includes an anchor bar slidably fastened to a pair of elongated plates each of which is fastened to one of the tracks fastened to or constituting a side of the frame. Each elongated plate has an elongated closed slot therein extending parallel to and below the one of the tracks to which the elongated plate is fastened. This elongated slot has a set of spaced apart downwardly extending notches along its length

[0006] The anchor bar is a tubular or solid cylindrical body that has opposite ends, each end having an axle extending through one of the elongated slots and through a proximal end of an elongated spacer member pivotally fastened to the end of the anchor bar. Each elongated spacer member has a distal end carrying a pin fastened thereto extending through the elongated slot in the respective one of the elongated plates. This pin in turn has a carriage stop fastened to the pin.

[0007] When the assembly is mounted to the foot end of a reformer exercise apparatus, the anchor bar may be moved between the notches to position the anchor bar at different distances from the foot end of the frame determined by the notch positions, while at the same time, the carriage stop fastened to the pin also protruding through the elongated closed slot, maintains the carriage at a predetermined minimum distance from the anchor bar at all times. This arrangement permits persons of different heights to use the reformer exercise apparatus appropriately for their particular size while maintaining

proper leg angle orientation with regard to position of the foot support bar or foot support plate.

BRIEF DESCRIPTION OF THE DRAWING

[0008] FIG. 1 is a perspective view of a reformer exercise apparatus having an anchor bar and carriage stop assembly in accordance with the present disclosure.

[0009] FIG. 2 is a perspective view of the foot end of the exercise apparatus shown in FIG. 1 with the frame and foot end shown in phantom.

[0010] FIG. 3 is an exploded view of one side of the assembly in accordance with the present disclosure.

[0011] FIG. 4 is a cross section view of the reformer shown in FIG. 1 taken on the line 4-4 in FIG. 1.

DETAILED DESCRIPTION

[0012] One exemplary embodiment of an anchor bar and carriage stop assembly **100** installed for use on a reformer exercise apparatus **10** in accordance with the present disclosure is shown in FIG. 1. An enlarged view of the anchor bar and carriage stop assembly **100** installed at the foot end portion of the apparatus **10** is shown in FIG. 2 with the sides **12** and foot end **16** shown in phantom lines. The reformer **10** includes a pair of parallel sides **12** that extend parallel between a head end **14** and a foot end **16** of the generally rectangular reformer frame. A carriage **18** rides back and forth between the head end **14** and foot end **16** on tracks **20** that either are integral with or fastened to the sides **12** of the reformer frame. One or more coil springs **22** are typically fastened to and biased between the carriage **18** and the foot end **16**.

[0013] The anchor bar and carriage stop assembly **100** includes a generally cylindrical spring anchor bar **102**, two rectangular guide plates **104** and two spacer members **106**, each attached to an opposite end of the anchor bar **102**. Each of the guide plates **104** has a central elongated longitudinal closed slot therein and is adapted to be fastened to an inside or inner facing surface of one of the tracks **20** of the reformer **10** near the foot end **16** of the reformer **10**. The anchor bar **102**, shaped somewhat like a baker's rolling pin, has opposite ends each having an axle **108** protruding axially from the anchor bar

102. Each axle **108** carries a first bearing bushing or roller **110** that rolls or slides in the elongated closed slot **112** that extends longitudinally in each guide plate **104**.

[0014] Also attached to the distal end of the axle **108** is a connecting arm or spacer member **106** pivotably connected to the axle **108**. This spacer member **106** extends alongside and parallel to the guide plate **104** on an opposite side of the guide plate **104** from the anchor bar **102** and is positioned below the track **20** when the assembly **100** is fastened to the tracks **20** of a reformer **10**. The distal end **116** of the spacer member **106** has a pin member **118** fastened thereto that extends parallel to the anchor bar **102** and carries a second bearing bushing roller **110** that also rides in the same closed slot **112**.

[0015] Attached to the pin member **118** is a carriage stop block **124**. This carriage stop block **124** engages a portion of the carriage **18** to prevent the carriage from getting too close to the anchor bar **102**. This pin member **118** may be removably fastened to the distal end **116** of the spacer member **106** and preferably carries the second bearing roller **110** that also rides in the longitudinal closed slot **112**. Alternatively the pin member **118** may be fastened to a carriage stop block **124** so as to extend through the second bearing roller **110** and the closed slot **112** to the spacer member **106**.

[0016] One end of each of the closed slots **112** has an enlarged aperture **120** sized to receive and retain one portion of each of the bearing rollers **110** therethrough. Each closed slot **112** has a general width less than the enlarged aperture **120** so that, once installed, the bearing rollers **110** are each captured and retained within one of the closed slots **112**. Each closed slot **112** includes a plurality of spaced apart stop notches **122** that extend down generally at a right angle from the longitudinal axis of the closed slot **112** and may optionally be angled at an acute angle from the longitudinal axis of the closed slot **112** so as to inhibit unintentional disengagement of the bearing roller **110** and axle **108** from the notch **122**. Each of these notches **122** corresponds to a predetermined distance from the foot end **16** of the reformer exercise apparatus **10** when the assembly **100** is installed.

[0017] Attached to the pin member **118** is a carriage stop block or cushion cap **124**. This stop block **124** is configured to abut against the carriage **18** to maintain a predetermined

distance between the anchor bar **102** and the carriage **18** while the anchor bar **102** is moved from one stop notch **122** to another along the length of the closed slot **112**.

[0018] This guide plate **104** is configured to be screwed or otherwise fastened to the track **20** of the side rail **12** of the reformer exercise apparatus **10** so that the elongated slot **112** extends alongside and parallel to and below the track **20**. FIG. **4** shows a cross sectional view of one side **12** of the reformer **10** with the assembly **100** installed. Each elongated guide plate **104** of assembly **100** is essentially fastened to one side of the track **20** such that the spacer member **106** and carriage stop block **124** are below and adjacent the track **20**. Not shown is a corner of the carriage **18** that preferably includes a bracket or portion of the carriage **18** that engages the stop block **124**.

[0019] Referring now to FIGS. **3** and **4**, each bearing bushing roller **110** has different inner, middle and outer diameter disc portions. The inner portion of each bearing bushing roller **110** has a first diameter larger than the width of the slot **112** but less than the diameter of the enlarged aperture **120** at one end of the closed slot **112**. The mid or middle diameter disc portion is sized to readily slide along the closed slot **112** without binding. The second or outer disc portion of each bearing roller **110** is greater in diameter for butting against the side of the closed slot **112** and against either the carriage stop block **124** or the anchor bar **102** to which the bearing roller **110** is attached. This essentially captures each of the bearing bushing rollers **110** in its closed slot **112**. Because the spacer member **106** has one end fastened to the axle **108** of the anchor bar **102** and the other end fastened to the pin member **118** carrying the stop block **124**, movement of the anchor bar **102** along the slot **112** necessarily moves the pin member **118** and the stop block **124** along the slot **112**.

[0020] In order to adjust the longitudinal position of an anchor bar **102** with respect to the foot end **16** of the reformer **10**, utilizing the assembly **100** in accordance with the present disclosure, a user simply manually lifts up the anchor bar **102** and slidably moves the anchor bar **102** along the parallel slots **112** in each of the plates **104** from one stop notch **122** to an adjacent stop notch **122** and then lowers the anchor bar **102** into the appropriate stop notch **122**. This automatically also moves the carriage **18** along with the anchor bar **102** thereby maintaining a constant minimum distance between them.

[0021] The assembly **100** in accordance with the present disclosure may be installed in any reformer exercise apparatus and the spring anchor bar will always be kept aligned and parallel, maintaining the same minimum distance from the carriage **18**. The anchor bar **102** in the present assembly **100** cannot rotate down so as to inadvertently release a spring **22** if there is no tension on the spring **22**. Downward and upward rotation of the anchor bar **102** is simply constrained by the height of the particular notch **122** in the slot **112** in which the anchor bar **102** is carried. The arrangement with the stop blocks **124** always being in a fixed orientation with respect to the anchor bar **102** and the spacer member **106** also ensures that the assembly moves only parallel to the tracks **20**, and without binding.

[0022] A number of variations of the above assembly are envisioned. For example, the arrangement or positioning of the bearing bushing rollers **110** on the axles **108** and pins **118** may be reversed, i.e. with the greater second disc diameter portions facing the rail **20**, for example, rather than toward the axle or stop block or bumper. Alternatively a bearing bushing roller **110** may be constructed from three different diameter discs stacked together or constructed from two spaced washers on a common axle for the mid portion instead of providing a mid portion that can roll along the axle. Accordingly, all such alternatives, variations and modifications are intended to be encompassed within the scope of and as defined by the following claims.

CLAIMS

What is claimed is:

1. A reformer exercise apparatus comprising:
 - a frame;
 - a carriage on the frame configured for movement back and forth between a head end and a foot end of the frame on parallel tracks;
 - one or more bias members fastened between the carriage and the foot end of the frame for biasing the carriage toward the foot end of the frame on the parallel tracks;
 - a foot bar fastened at a foot end of the frame; and
 - an anchor bar and carriage stop assembly fastened to the frame adjacent the foot end of the frame having an anchor bar slidably fastened to a pair of elongated plates each fastened to one of the tracks, each plate having an elongated closed slot therein extending parallel to and below the one of the tracks, wherein the anchor bar has opposite ends, each end extending through one of the elongated slots and through an elongated spacer member pivotally fastened to the end of the anchor bar, each elongated spacer member having a distal end carrying a pin fastened thereto extending through the elongated slot, wherein the pin has a carriage stop fastened to the pin.
2. The reformer exercise apparatus according to claim 1 further comprising a first bearing roller fastened to each end of the anchor bar, each first bearing roller having a portion riding in the closed slot.
3. The reformer exercise apparatus according to claim 2 further comprising a second bearing roller fastened to each pin on the distal end of the spacer member, each second bearing roller riding in the elongated closed slot.
4. An anchor bar and carriage stop assembly for use in a reformer exercise apparatus having a rectangular frame and a pair of parallel tracks extending between a

head end and a foot end of the rectangular frame, the anchor bar and carriage stop assembly comprising:

- an anchor bar having opposite ends;

- a pair of elongated spacer members, each pivotally fastened to one of the anchor bar ends;

- a pair of elongated plates, each plate having a central longitudinal closed slot and adapted to be fastened to one of the tracks with the closed slot extending parallel to and below the one of the tracks, each slot receiving one of the anchor bar ends therethrough;

- each slot having an enlarged end aperture sized to receive therethrough and retain a portion of a bearing roller therein, the bearing roller having a first portion having a first diameter, a mid portion and a second portion having a diameter greater than the diameter of the first portion;

- a carriage stop pin fastened to a distal end of each of the elongated spacer members, wherein the carriage stop pin extends through the closed slot; and

- a carriage stop fastened to the carriage stop pin.

5. The anchor bar and carriage stop assembly according to claim 4 wherein the mid portion of each bearing roller is sized to ride only within the central longitudinal closed slot in one of the pair of elongated plates.

6. The anchor bar and carriage stop assembly according to claim 4 wherein each of the opposite ends of the anchor bar includes an axle carrying one of the bearing rollers thereon.

7. The anchor bar and carriage stop assembly according to claim 5 wherein each of the opposite ends of the anchor bar includes an axle carrying one of the bearing rollers thereon.

8. The anchor bar and carriage stop assembly according to claim 7 wherein each carriage stop pin carries another bearing roller thereon, the another bearing roller having

a mid portion carried in the central longitudinal closed slot of one of the pair of elongated plates.

9. The anchor bar and carriage stop assembly according to claim 8 wherein the another bearing roller has a first portion adjacent the mid portion and a second portion adjacent the mid portion, the first portion and second portion each having a diameter greater than a diameter of the mid portion.

10. The anchor bar and carriage stop assembly according to claim 4 wherein each elongated spacer member extends alongside and parallel to one of the elongated plates.

11. The anchor bar and carriage stop assembly according to claim 9 wherein each elongated spacer member extends alongside and parallel to one of the elongated plates.

12. The anchor bar and carriage stop assembly according to claim 11 wherein the mid portions of the bearing roller and the another bearing roller are each captured between the first portions and the second portions of the bearing rollers.

13. The anchor bar and carriage stop assembly according to claim 12 wherein the central longitudinal closed slot of each elongated plate includes a plurality of spaced notches

14. A reformer exercise apparatus comprising:
a frame;
a carriage on the frame configured for movement back and forth between a head end and a foot end of the frame on parallel tracks;
one or more bias members fastened between the carriage and the foot end of the frame for biasing the carriage toward the foot end of the frame on the parallel tracks;
a foot bar fastened at a foot end of the frame;
an anchor bar and carriage stop assembly fastened to the frame adjacent the foot end of the frame having an anchor bar slidably fastened to a pair of elongated plates

each fastened to one of the tracks, each plate having an elongated closed slot therein extending parallel to and below the one of the tracks, wherein the anchor bar has opposite ends, each end including an axle extending through one of the elongated slots and through an elongated spacer member pivotally fastened to the end of the anchor bar, each elongated spacer member having a distal end carrying a pin fastened thereto extending through the one of the elongated slots, wherein the pin has a carriage stop fastened to the pin spacing the carriage stop from the anchor bar;

a bearing roller carried on the axle extending through the one of the elongated slots; and

another bearing roller carried on the pin on the distal end of the elongated spacer member.

15. The reformer exercise apparatus according to claim 14 wherein each bearing roller has a mid portion riding in the elongated closed slot.

16. The reformer exercise apparatus according to claim 15 wherein each bearing roller has a first portion adjacent the mid portion having a larger diameter than the mid portion.

17. The reformer exercise apparatus according to claim 16 wherein each bearing roller has a second portion adjacent the mid portion having a diameter larger than the diameter of the first portion.

18. The reformer exercise apparatus according to claim 17 wherein each elongated closed slot has a plurality of spaced notches extending at a right angle from a longitudinal axis of the elongated closed slot.

19. The reformer exercise apparatus according to claim 14 wherein each elongated closed slot has a plurality of spaced notches extending at an angle from a longitudinal axis of the elongated closed slot.