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(54) Title: STRETCHING BAR

(57) Abstract: A stretching bar that can be used for rehabilitation, medical treatment and fitness. The stretching machine is comprised of a stretching bar and, optionally, a base. The stretching bar allows the user to stretch while in a seated or standing position. The stretching bar is preferably constructed in a telescoping fashion with a plurality of nesting tubes which extend from one or both ends of the outer tube. The stretching bar further includes a means for attaching a handle mechanism to the bar. The attachment means is preferably a port which accepts and retains the handle. The handle may also be mounted such that it rotates or may be slidably mounted. The telescoping stretching bar preferably uses a series of telescoping tubes to achieve a satisfactory length when being used in the extended configuration, but which may be collapsed when not in use to enhance portability.
STRETCHING BAR

CROSS REFERENCE TO RELATED APPLICATION

[01] The present application claims priority from U.S. Provisional Application Ser. No. 60/620,976, filed October 21, 2004.

FIELD OF THE INVENTION

[02] The invention is generally related to an apparatus for safely facilitating stretching exercises and rehabilitation. More particularly, the invention is directed to a stretching apparatus that allows stretching of a wide variety of muscle groups without undue stress.

DESCRIPTION OF RELATED ART

[03] A physically fit person is defined by a combination of strength, endurance, and flexibility. Many individuals concentrate on strength and endurance by engaging in activities such as weight lifting and jogging, but ignore the need to be flexible. However, it is widely recognized by experts in the field that stretching prior to commencing an exercise regimen is of paramount importance to reduce the likelihood of exercise related injuries. Furthermore, lack of flexibility can lead to problems with the lower back, etc., as a person ages.

[04] Stretching is also an important part of any physical therapy regimen practiced by patients undergoing physical rehabilitation following an accident or illness, as well as patients seeking relief from common ailments such as back pain. This type of therapy is commonly supervised by a highly trained physical therapist, and may be conducted in a hospital setting or at the patient’s home. Paraplegic and quadriplegic patients must also have their limbs stretched on a regular basis to avoid further medical complications. For severely impaired patients, the therapist must maneuver the patient’s limbs through a full range of motion while at the same time being careful not to force or over stretch the muscles.

[05] Traditionally, pre-exercise, post-exercise, as well as therapeutic stretching exercises, are performed on the floor using a simple floor mat, or by hanging from a bar. In a typical floor stretching exercise, a person sits with his legs in a straddle position extended out in front of his torso. The person bends his torso into the mat, thereby stretching his legs and back muscles. To maximize the stretch, the person may extend his arms out over his head in
a reaching fashion and the stretch is held for a short period of time. The stretching exercise may be assisted with the help of a partner or therapist. For severely impaired patients, a therapist must individually move each of the patient’s limbs while the patient is on a table or on the floor. In a hanging stretch exercise, the person hangs from a bar, such as, for example, in a chin-up preparation position, and allows the weight of his or her own body to provide a downward stretch. This method is particularly undesirable in a therapeutic environment since the full body weight often provides many times more force than is necessary or desired to accomplish the stretch, thus putting strain on the muscles. Additionally, a patient in therapy often lacks the strength in their hands that is required to support their own body weight.

[06] In the design and manufacture of exercise machines, the trend has been to move away from manual or free-weight apparatuses and to provide more machines which are designed to ensure proper movement of a specific muscle group. Although this trend has been more prevalent for muscle building exercise machines, it is becoming more prevalent for stretching equipment as well.

[07] U.S. Pat. No. 5,108,090 to Reed shows an exercising machine for stretching a user's leg and back muscles, which closely simulates conventional floor exercises. A user sits with his legs extended out and locked in front of his torso. A handgrip is provided at the end of a motorized telescoping arm for the user to grasp. Forward and reverse buttons on the handgrip are used to control the direction of the telescoping arm as it pulls the user to the floor or pushes him back to a sitting position. This machine is mechanically complex and extremely limited in the types of exercises and range of motions that can be accomplished. For example, this type of machine cannot be used in a therapeutic environment where the patient has a back injury and is physically unable to bend at the torso. Additionally, since it is a user operated motorized machine, that is actually stretching the muscles, it would be easy for an inexperienced or overzealous user to go too far and cause muscle hyperextension or some other unhealthy result.

[08] U.S. Pat. No. 4,844,453 to Hestilow shows an example of a stretching machine where a user sits with his legs secured in a pair of leg decks which are longitudinally slidable to accommodate different size users. A hydraulic jack is used to move the leg decks in an arc movement to stretch the user's legs in a spread-eagled fashion. A handle bar is positioned in front of the user in the same plane as the user's legs to aid in front stretches.
[09] U.S. Pat. No. 4,445,684 to Ruff shows a leg stretch machine somewhat similar to the one that is described in Hestilow. A crank and ratchet mechanism is provided which, when turned, moves a pair of spreader arms to split a user's legs apart. A hand-grip is bolted to a central bar in front of the user near the ground. This allows the user to pull his upper body closer to the floor with his legs spread thereby simulating various martial arts positions.

[10] U.S. Pat. No. 5,137,504 to Mangini shows a stretching machine where a seat is provided with pivotally mounted leg platforms extending there from. A user sits in the seat in an upright position with his legs strapped into the leg platforms. The machine employs a steering wheel type crank which, when turned, moves the leg platforms and stretches the user's legs apart. A rod is positioned directly in front of the user. The rod has a left and right hand grip and a cable extending from the center of the rod to the seat backrest. When the user grasps and turns the rod, a ratchet mechanism winds the cable around the rod pulling the backrest forward and causing the user to assume a bent over posture. In this manner, the leg and back muscles are stretched simultaneously.

[11] The aforementioned stretch exercise machines offer significant improvement over conventional floor exercises in that they ensure proper muscle movement and, in most cases, allow for holding the muscles in a stretched position for a period of time. Unfortunately, the stretching machines only allow the user to assume a straight-out, bent over posture and do not permit side-to-side movements or vertical stretch movements, which simulate hanging.

[12] To date few advances have been made in the design of machines which facilitate stretching exercises. Typical examples are U.S Pat. No. 5,421,801 to Davies and U.S Pat. No. 5,529,560 to Davies. These machines are essentially leg stretching machines with an added back stretching bar. The user sits on these machines with their legs positioned outward, resting on a pair of movable leg supports. The user turns a crank to which moves the leg supports outward, away from each other in a jaw like fashion thus stretching the legs apart. The user then positions the stretching beam, captured between the two leg supports in front of him, grasps the handle that rides along the beam and stretches forward thus stretching the users' back. While primitive, this is the finest back stretcher to date. Unfortunately, the stretch machines only allow the user to assume a straight-out, bent over posture and side-to-side stretching is limited by the leg flexibility of the user.

[13] It is important that stretching be carried out with smooth continuous movements, rather than bouncy movements, in order to avoid injuries during the stretching exercise itself.
Ideally, the muscles should be in a relaxed state to maximize the stretch and to avoid undue stress on the muscle, tendons, and skeleton. In addition stretching a wide variety of muscle groups will maximize the benefit to the user. Having a device designed to accomplish these objectives would be advantageous since it would encourage healthy individuals to include stretching in their fitness routine, and would aid in rehabilitation and treatment regimens as well as reduce the cost of therapy.

[14] Accordingly, it is an object of the present invention to provide a stretching apparatus for stretching a wide variety of a user’s muscle groups.

[15] It is an object of this invention to provide a stretching apparatus useful for rehabilitation, medical treatment and fitness.

[16] It is another object of the present invention to provide a stretching apparatus which is convenient and easy to use.

[17] It is another object of the present invention to provide a stretching apparatus which allows for a wide variety of stretches in a wide variety of directions.

[18] It is a further object of the present invention to provide a stretching apparatus which decreases the risk of injury to the user.

[19] It is yet a further object of the present invention to provide a stretching apparatus which allows for smooth and continuous movements by the user.

[20] It is another object of the present invention to provide a stretching apparatus which is portable.

[21] Finally, it is an object of the present invention to accomplish the foregoing objectives in a simple and cost effective manner.

**SUMMARY OF THE INVENTION**

[22] The objects of the present invention are achieved by providing a stretching bar which consists of at least one tubular column and a handle attached thereto, preferably through a releasable attachment. In the preferred embodiment, the stretching bar includes an attachment port which mates with an attachment coupling on the handle member. If desired, the handle member may attach to the stretching bar such that the handle can rotate during use. In the preferred embodiment, the stretching bar includes two or three telescoping tubular columns which slide in relationship to each other. The telescoping sections may be locked in place when the desired length of the stretching bar is achieved. If three telescoping columns
are used, the inner columns may extend from opposite ends of the outermost column or may extend from the same end. In an alternate embodiment, the handle member is attached to the stretching bar by means of a sliding carriage. The handle may be an integral part of the sliding carriage or may be releasable attached to allow different types of handles to be attached. If desired, the stretching bar may also be attached to a base member.

BRIEF DESCRIPTION OF THE DRAWINGS

[23] Figures 1 & 2 are perspective views of the preferred embodiment of the present invention;
[24] Figure 3 is a side view of the preferred embodiment of the present invention;
[25] Figure 4 is a front view of the preferred embodiment of the present invention;
[26] Figure 5 is an exploded view of the preferred embodiment of the present invention;
[27] Figure 6 is a top view of the bar portion of the preferred embodiment of the present invention;
[28] Figure 7 is a back view of the handle portion of the preferred embodiment of the present invention;
[29] Figure 8 is a view of the connection element of the handle portion of the preferred embodiment of the present invention;
[30] Figure 9 is a front view of the handle portion of an alternate embodiment of the present invention;
[31] Figure 10 is a side view of the handle portion of an alternate embodiment of the present invention;
[32] Figure 11 is a perspective view of the handle portion of an alternate embodiment of the present invention;
[33] Figure 12 is a perspective view of an alternate embodiment of the present invention;
[34] Figure 13 is a perspective view of an alternate embodiment of the present invention;
[35] Figure 14 is a front view of an alternate embodiment of the present invention;
[36] Figure 15 is a side view of an alternate embodiment of the present invention in the collapsed or unextended configuration;
[37] Figure 16 is a side view of an alternate embodiment of the present invention in the extended configuration;
[38] Figure 17 is a side view of the preferred embodiment of the present invention in the collapsed or unextended configuration;

[39] Figure 18 is a side view of the preferred embodiment of the present invention in the extended configuration;

[40] Figure 19 is a top view of a handle portion of an alternate embodiment of the present invention;

[41] Figure 20 is a top view of a double handle portion of an alternate embodiment of the present invention;

[42] Figure 21 is a top view of a double handle portion with attachment port connector of an alternate embodiment of the present invention;

[43] Figure 22 is a front view of an alternate embodiment of the present invention;

[44] Figure 23 is a front view of an alternate embodiment of the present invention;

[45] Figure 24 is a front view of an alternate embodiment of the present invention;

[46] Figures 25 and 26 are a perspective views of a gimbal attachment of an alternate embodiment of the present invention; and

[47] Figures 27 and 28 are perspective views of an alternate embodiment of the present invention.

Element list:

[48] 100 attachment port

[49] 102 attachment locking mechanism

[50] 104 attachment port coupling

[51] 106 first telescoping tube

[52] 108 outer tube coupling

[53] 110 bottom end of stretching bar

[54] 112 second telescoping tube

[55] 114 handle

[56] 116 attachment port connector

[57] 118 sliding carriage

[58] 120 locking mechanism

[59] 122 sliding carriage

[60] 124 locking mechanism
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following detailed description is of the best presently contemplated modes of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating general principles of embodiments of the invention.

A stretching bar provides safe and effective stretching of a wide variety of muscle groups while the user is in a relaxed sitting or semi-prone orientation. The stretching bar is capable of stretching the back, arm, leg, and shoulder muscles without using the full weight of the patient to apply the stretching force. The back, arm, leg, shoulder muscles, and joints of a paraplegic can be stretched with the user in a seated position. For example, the user is permitted to stretch above his head as well as towards his or her feet. In addition, the back and arm muscles and joints can be stretched with the user’s torso being turned towards one side or the other, thus, a different set of muscle groups and joints are stretched than when the torso is oriented in a forward direction. By crossing one’s legs while performing the previously described movements the muscles of the legs can be stretched as well. The stretching bar can also include a mechanism for allowing the user to stretch in an arched back position thus allowing additional backstretches. When the user is seated with the stretching bar positioned at his side, or he positions the stretching bar to either side of his torso he can stretch the shoulder joint and the various muscles of his shoulder. In the telescoping embodiment of the invention, there can be as few as two tubes for the telescoping section of the telescoping stretching bar; however, there can be three or more depending on the extension length desired as well as the compressed length desired. The telescoping stretching bar handle may take several forms such as a grip handle, Velcro straps, a T handle, or any other desired design. The telescoping stretching bar may also have a fixed hand grip means at the end or may have an attachment port at the end to accommodate the various handle configurations or other attachments. The hand grip may also be slidably connected to the telescoping section of the stretching bar. A scale similar to that of a yardstick can be added to the telescoping section of the stretching bar for measuring the stretch.

Referring now to the drawings, and more particularly to Figures 1 - 4, there are shown front, side and perspective views of the stretching bar. The frame of the stretching bar is
comprised of a bar which contains a single 112 or, preferably, multiple vertical support members which are preferably made from tubular steel or a similar sturdy material of any desired cross-section, for example, round, square, U-shaped, or other appropriate shape. In the preferred embodiment, the stretching bar is formed from telescoping members. The telescoping stretching bar assembly shown in Figures 1 - 16 consists of two nesting sections 106 and 112 with the lower end 114 preferably including a rubber stop for providing a frictional contact point during use.

[65] The telescoping stretching bar assembly preferably includes a handle 118 connected to its end or may contain an attachment port 100 at its end to accept a variety of attachments which may be locked in place by means of a pin lock 102 or other type of appropriate connection means which connects the handle 118 securely. The handle 118 may take numerous forms such as, for example, rubber or Velcro straps (not shown), a T handle or other suitable means for grasping.

[66] Figures 5 – 8 show a preferred connection means between the handle 118 and the telescoping stretching bar. The telescoping stretching bar includes an attachment port coupling 104 which has an attachment port 100 at its end. The handle 118 includes an attachment port connector 120 which connects to the attachment port 100 on the telescoping stretching bar. An attachment locking mechanism 102 on the attachment port coupling 104 releasably connects the handle 118 to the telescoping stretching bar by means of an internal locking pin.

[67] Figures 9 – 14 show an alternate embodiment in which the handle includes three grip locations. The stretching bar is constructed as shown in Figures 1 – 8. This alternate embodiment includes an alternate handle 118. The three pronged handle 118 shown is one example of an alternate handle. Many other handle designs are contemplated within the scope of this invention.

[68] Figures 15 and 16 show collapsed and extended views of the preferred embodiment of the stretching bar with a single telescoping member 106. As disclosed above, the stretching bar includes an outer tube 112 and a telescoping tube 106 which is slidably disposed within the outer tube 112. The outer tube 112 includes an attachment port coupling 104. An attachment locking mechanism 102 formed in the attachment port coupling 104 acts to retain the telescoping tube 106 in the collapsed orientation as shown in Figure 15 or in the extended
orientation as shown in Figure 16. The telescoping tube 106 can also be releasably locked at positions in between the fully collapsed and fully extended orientations.

[69] Figures 17 and 18 show an alternate embodiment of the present invention in which the stretching bar includes two telescoping members 106 and 116. In this embodiment, each end of the outer tube 112 includes an attachment port coupling 104 which includes an attachment locking mechanism 102. Each telescoping member extends from an opposite end of the outer tube 112 and is held in the collapsed orientation as shown in Figure 17 or in the extended orientation as shown in Figure 18. The telescoping tube 106 can also be releasably locked at locations in between the fully collapsed and fully extended orientations.

[70] Figures 19 – 21 show an alternate embodiment of the handle mechanism in which the handle orientation is adjustable by the user while stretching. In this embodiment, the upper end of the stretching bar is adapted to accept one or more handles 118 having a grip portion and an attachment portion with an opening for mounting the handle 118 on the stretching bar. As shown in Figure 20, two handles 118 can be mounted on the stretching bar. When used in this fashion, the handles 118 can be rotated during use. Additionally, the handles 118 can be oriented at different angles as needed.

[71] Figure 22 shows an alternate embodiment of the stretching bar which has a handle 118 connected to a sliding carriage 122 which is slidable along the length of the stretching bar. The tube 112 may also have an attachment port coupling 104 having an attachment port 100 at the lower end of the stretching bar for attachment to a base or various other attachments. The attachment port 100 includes a locking mechanism 102 for removably connecting handles, bases or other attachments to the stretching bar.

[72] Figure 23 shows an alternate embodiment of the stretching bar which has a handle 118 connected to a sliding carriage 122 which is slidable along the length of the stretching bar and may ratchet or lock by means of a locking mechanism 124 to a desired position along the length of the tube 112. The tube 112 may also have an attachment port coupling 104 having an attachment port 100 at the lower end of the stretching bar for attachment to a base or various other attachments. The attachment ports 100 include locking mechanisms 102 for removably connecting handles, bases or other attachments to the stretching bar.

[73] Figure 24 shows another alternate embodiment of the stretching bar in which the outer tube 112 has a sliding carriage 122 with a locking mechanism 124 and an attachment port coupling 104 having an attachment port 100 for various handle configurations. The tube 112
also has an attachment port coupling 104 having an attachment port 100 at the lower end of the stretching bar for attachment to a base or various other attachments. As described previously, the attachment ports 100 include locking mechanisms 102 for removably connecting handles, bases or other attachments.

[74] Figures 25 and 26 show perspective views of a gimbal base which can be used with the preferred embodiment of the stretching bar as shown in Figures 27 and 28. In this embodiment, the lower end of the telescoping stretching bar includes an attachment port 100. The gimbal base 126 includes an attachment port connector 120 which is inserted into the attachment port 100 and is locked in place using an attachment locking mechanism 102. This embodiment allows controlled movement of the telescoping stretching bar in three-dimensional space.

[75] If desired, a ratchet mechanism, such as that disclosed in co-pending U.S. Patent application 10/933,592 entitled, “Stretching Machine,” hereby incorporated by reference in its entirety, can be built into the telescoping stretching bar to permits telescoping movement only in one direction. While engaged, the handle 118 cannot slip backwards and the telescoping stretching bar may hold the user in a stretched position for any desired period of time. The ratchet mechanism may be designed to click at specific intervals, such as, for example, every centimeter. Indicia may be provided along the length of the telescoping stretching bar to provide positive feedback regarding the distance of the stretch and thereby allow the user to monitor his progress. Since the user may be stretching his arms, back and shoulders on his own initiative and not under the influence of some outside force, there is no danger of muscle hyperextension or other stretching related injury. A release lever is preferably provided to release the ratchet mechanism so that the handle 118 can be lowered for another exercise repetition.

[76] In operation the user grips the telescoping stretching bar by the handle 118 and adjusts the length by releasing the pin lock then extending the telescoping stretching bar to the desired length and then releases the pin lock when the desired length is achieved. The user then places the rubber stop at the bottom 114 of the bar against a surface. The user then begins to stretch by grasping the handle 118 and stretching the desired muscle group. Gravity provides assistance in achieving the desired stretch. The telescoping sections 106 and/or 116 of the telescoping stretching bar now extend in the selected direction under the force of the user.
[77] In addition to the previously described stretches the user may also use the telescoping stretching bar for single arm stretching in the same manner by grasping the handle 118 or other suitable attachment with a single hand. Since, the preferred ratchet mechanism permits movement only in one direction, the handle 118 cannot slip backwards and the bar can hold the user in a stretched position for any desired period of time.

[78] The user may also sit on a seat, positioning himself to have the telescoping stretching bar towards their left arm or their right arm. In this position, the user will operate the telescoping stretching bar in the same manner as before, however the resulting stretch will be focused on the shoulder muscles, ligaments and joints closest to the bar.

[79] While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.
What is claimed is:

1. A stretching bar, comprising:
   2. at least one tubular column;
   3. a handle member; and
   4. an attachment means for attaching the handle member to the tubular column.

2. The stretching bar as set forth in claim 1 wherein the attachment means attaches the handle member to the tubular column in a releasable fashion.

3. The stretching bar as set forth in claim 1 wherein the attachment means comprises:
   3. the tubular member including an attachment port; and
   4. the handle member including an attachment coupling to mate with the attachment port.

4. The stretching bar as set forth in claim 1 wherein the attachment means attaches the handle member to the tubular column such that the handle member may rotate during use.

5. The stretching bar as set forth in claim 1 comprising an outer tubular column and a first inner tubular column wherein the first inner tubular column is capable of sliding within the outer tubular column.

6. The stretching bar as set forth in claim 5 further comprising a locking means for releasably locking the first inner tubular column at a desired location along the length of the outer tubular column.

7. The stretching bar of claim 5 further comprising a second inner tubular column wherein the second inner tubular column is capable of sliding within the outer tubular column.
8. The stretching bar as set forth in claim 7 wherein the first and second inner tubular columns extend from opposite ends of the outer tubular column.

9. The stretching bar as set forth in claim 8 further comprising a first locking means for releasably locking the first inner tubular column at a desired location along the length of the outer tubular column and a second locking means for releasably locking the second inner tubular column at a desired location along the length of the outer tubular column.

10. The stretching bar as set forth in claim 7 wherein the second inner tubular column is capable of sliding within the first inner tubular column and the first and second inner tubular columns extend from the same end of the outer tubular column.

11. The stretching bar as set forth in claim 10 further comprising a first locking means for releasably locking the first inner tubular column at a desired location along the length of the outer tubular column and a second locking means for releasably locking the second inner tubular column at a desired location along the length of the first inner tubular column.

12. The stretching bar as set forth in claim 1 wherein the attachment means for attaching the handle member to the tubular column is a sliding carriage.

13. The stretching bar as set forth in claim 12 wherein the handle member is an integral element of the sliding carriage.

14. The stretching bar as set forth in claim 12 wherein the sliding carriage includes an attachment port and the handle member includes an attachment coupling to mate with the attachment port in a releasable fashion.

15. The stretching bar as set forth in claim 1 further comprising:
   a base member; and
   a base attachment means for attaching the stretching bar to the base member.