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STRETCHING DEVICE

Abstract

A stretching device includes a base having a conduit that defines a channel, a back that is pivotable with respect to the base, and an actuator disposed within the conduit. The actuator may be a linear actuator having a piston that translates with respect to the channel and that is coupled to the back when the stretching device is in a pushing configuration and decoupled from the back when the stretching device is in a pulling configuration. A controller operably coupled to the actuator is configured to direct the actuator to extend and retract the piston. When the actuator is in the pushing configuration, extension of the piston causes a pivotal pushing motion of the back relative to the base, and, when the actuator is in the pulling configuration, the piston translates within the channel without causing pivotal motion of the back relative to the base.

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Background/Summary

FIELD

[0001] The disclosure relates to a device used to assist in stretching, and to associated methods.

BACKGROUND

[0002] Stretching devices are useful tools to assist users in performing one or multiple specific stretching maneuvers such as back stretches, leg stretches, foot stretches, and the like. Some such devices are manually operated fully via force exerted by the user. Other such devices are single-function devices intended for use in specialized environments such as therapeutic settings. Desirably, a multifunction stretching device usable in various environments could be provided.

SUMMARY

[0003] Now disclosed is a stretching device that includes an actuator that is operable in either a pushing configuration or a pulling configuration at the option of the user. A user may operate the device to assist with numerous stretching operations. The device may be configured in some embodiments for unsupervised use in a residential environment. Desirably, the seat of the device is supportable by a floor surface when in use, to minimize the size of the device.

[0004] In one embodiment, the stretching device comprises a base having a conduit that defines a channel; a back, the back being pivotable with respect to the base; an actuator disposed within the conduit and having a piston that translates with respect to the channel, the piston being coupled to the back when the stretching device is in a pushing configuration and decoupled from the back when the stretching device is in a pulling configuration; and a controller operably coupled to the actuator, the controller configured to direct the actuator to extend and retract the piston, wherein, when the actuator is in the pushing configuration, extension of the piston causes a pivotal pushing motion of the back relative to the base, and wherein, when the actuator is in the pulling configuration, the piston translates within the channel without causing pivotal motion of the back relative to the base. Desirably, the seat is unsupported such that the seat is supported by a floor or ground surface when in use. The device may be provided in the form of a kit with one or more stretching accessories.

[0005] A stretching method in some cases involves use of the above-described device for stretching. In other cases, a stretching method may comprise providing a stretching device, the device having a base, a back pivotable with respect to the base, an actuator, and a controller operably coupled to the actuator, and a seat, the seat being unsupported, the device being operable in a pushing configuration in which a piston of the actuator is coupled to the back and causes a pivotal pushing movement of the back relative to the base, and a pulling configuration in which a piston of the actuator causes retraction of a portion of the device between the legs of a user, the seat being configured to accommodate such retraction; sitting on the seat of the device while the seat is resting on a floor or ground surface; and actuating the controller to cause a pushing or pulling stretch via either a pivotal pushing movement or a retraction.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** is a perspective view of a stretching device, the device being positioned in a pushing configuration and a piston of the actuator in a fully retracted position, the device resting on a floor surface.

[0007] FIG. **2** is a front elevation of the stretching device of FIG. **1**.

[0008] FIG. **3** is a rear elevation of the stretching device of FIG. **1**.

[0009] FIG. **4** is a first side view of the stretching device shown in FIG. **1**.

[0010] FIG. **5** is a second side view of the stretching device shown in FIG. **1**.
[0011] FIG. **6** is a top plan view of the stretching device shown in FIG. **1**.
[0012] FIG. **7** is a bottom plan view of the stretching device shown in FIG. **1**.
[0013] FIG. **8** is an exploded view of the stretching device shown in FIG. **1**
[0014] FIG. **9** is a perspective view of the stretching device of FIG. **1** in a storage position.
[0015] FIG. **10** is a perspective view of the stretching device of FIG. **1** with the actuator in a pushing configuration and with the piston of the actuator being partially extended.
[0016] FIG. **11** is a perspective view of the stretching device of FIG. **1** with the actuator in a pulling configuration, with the seat pads removed, with an extension strap installed, and with the piston in a partially extended position.
[0017] FIG. **12** is a perspective view of the stretching device as shown in FIG. **10** but with the piston in a fully extended position.
[0018] FIG. **13** is a perspective view of the stretching device of FIG. **1** with a foot pad attachment for a plantar fasciitis stretch.
[0019] FIG. **14** is a front elevation of the foot pad attachment shown in FIG. **13**.
[0020] FIG. **15** is a perspective view of the stretching device of FIG. **1** connected to a split stretch attachment.
[0021] FIG. **16** is a relatively enlarged perspective view of a controller of the stretching device of FIG. **1**.
[0022] FIG. **17** is a front perspective view of another example stretching device, the device being positioned in a pushing configuration and a piston of the actuator in a partially extended position.
[0023] FIG. **18** is a front perspective view of the stretching device of FIG. **17** with the actuator in a pulling configuration and the piston in the fully retracted position.
[0024] FIG. **19** is a perspective view of the stretching device of FIG. **1** with a mounted massage gun.
[0025] FIG. **20** is a first perspective view of the bracket and straps shown in FIG. **19**.
[0026] FIG. **21** is a second perspective view of the bracket and straps shown in FIG. **19**.
[0027] FIG. **22** is a first perspective view of the stretching device of FIG. **1** with a mounted vibration device.
[0028] FIG. **23** is a second perspective view of the stretching device of FIG. **1** with a mounted vibration device.
[0029] FIG. **24** is a perspective view of the bracket in the configuration shown in FIG. **23**.
[0030] FIG. **25** is a perspective view of the stretching device of FIG. **1** with a first embodiment of a heat and vibration pad.
[0031] FIG. **26** is a perspective view of the heat and vibration pad shown in FIG. **25**.
[0032] FIG. **27** is a perspective view of the stretching device of FIG. **1** with a second embodiment of a heat and vibration pad.
[0033] FIG. **28** is a perspective view of the heat and vibration pad shown in FIG. **27**.
[0034] FIG. **29** is a first partial view of the stretching device of FIG. **1** with an alternative hinge and with a stabilizer bar.
[0035] FIG. **30** is a second partial view of the stretching device of FIG. **1** with an alternative hinge and with a stabilizer bar.

DETAILED DESCRIPTION

[0036] With reference to FIGS. **1**-**8**, the illustrated stretching device **100** is modestly sized and is suitable for unsupervised use in a residential environment, but also may be used in a therapeutic environment such as a physical therapy office. The device includes a base **102** having a conduit **104** that defines a channel **106** (first shown in FIG. **2**). The stretching device **100** also includes a back **108** that is pivotable with respect to the base **102** as described further hereinbelow. A linear actuator **110** (first shown in FIG. **8**) is disposed within the conduit **104** and has a piston **112** (first shown in FIG. **2**) that translates with respect to the channel **106** into and out of a housing **114** (first shown in

FIG. **3**) of the linear actuator **110**.
[0037] The piston **112** is coupled to the back **108** when the stretching device **100** is in a pushing configuration and decoupled from the back **108** when the stretching device **100** is in a pulling configuration. In operation, when the stretching device **100** is in the pushing configuration, extension of the piston **112** causes pivotal motion of the back **108** relative to the base **102**, and, when the stretching device **100** is in the pulling configuration, the piston **112** translates within the channel **106** without causing pivotal motion of the back **108** relative to the base **102**. The "pushing" and "pulling" configurations denote the motion of the operative part of the device when in use, it being recognized that the piston may be advanced or retracted in either configuration.
[0038] The linear actuator need take no special form and any device capable of linear actuation of a piston, such as an electric or hydraulic actuator, may be employed. Illustrated is a mechanical linear actuator **110** that is supplied with power via a power conduit **117**. The power conduit **117** can include a plug as shown for wired alternative current configured to interface with a U.S. 110/120V standard electrical outlet. Alternatively, the device may be configured for other power sources such as direct current power supply using a battery or transformer or other supply of direct current. A controller **116** (first shown in FIG. **8**) is operably coupled to the actuator **110** and is configured to direct the linear actuator **110** to extend and retract the piston **112** into and out of the housing **114**. The pushing and pulling motion can also be accomplished through one or more other actuators that are not linear.
[0039] The base **102** includes a carriage sleeve **118** (first shown in FIG. **2**) disposed within the conduit **104**. The carriage sleeve **118** is coupled to the linear actuator **110** when the stretching device **100** is in the pushing configuration and decoupled from the linear actuator **110** when the stretching device **100** is in the pulling configuration. In particular, the carriage sleeve **118** is coupled to the linear actuator **110** via a fastener **120** (first shown in FIG. **2**). As shown, the fastener **120** is a removable pin that passes through an aperture **122** (first shown in FIG. **8**) in the carriage sleeve **118** and an aperture **124** (first shown in FIG. **8**) in the piston **112** to removably couple the linear actuator **110** to the carriage sleeve **118**. The carriage sleeve **118** includes a rider **126**. The rider **126** is captured in a slot **128** of the conduit **104**. An arm **130** is connected at one end **132** to the rider **126** and at another end **134** to the back **108** (see FIG. **8**).
[0040] When the piston **112** is coupled to the carriage sleeve **118**, the arm **130** in turn couples the linear actuator **110** to the back **108** so that the linear translation of the piston **112** into and out of the housing **114** will cause the pivotable motion of the back **108** relative to the base **102**. A central column **142** of the back **108** has formed therein a slot **150** (first shown in FIG. **8**) that receives the end **134** of the arm **130**, which is then secured to the central column **142** via a fastener **152**. The linear actuator **110** is secured to the conduit **104** via a fastener **136**. The fastener **136** is a pin that passes through an aperture **138** (first shown in FIG. **8**) in the conduit **104** and an aperture **140** (first shown in FIG. **8**) in the housing **114**. Fasteners **120**, **140**, **152** may take other forms, such as bolts or screws.
[0041] The back **108** comprises the central column **142** and is coupled to the base **102** via a hinge **144** over the conduit **104**. The central column **142** includes stabilizing legs **146** and **148** (first shown in FIG. **8**) that form a flange that extends down from the central column **142** over sides of the conduit **104** to constrain the central column **142** as the back pivots.
[0042] The back **108** also includes an upper pad arrangement **154** and a lower pad arrangement **156** coupled to the central column **142**. The upper pad arrangement **154** includes cylindrical pads **157** and **158** secured to a shaft **160**. The shaft **160** is in turn secured to the central column **142** via a bracket **162** (first shown in FIG. **2**). Similarly, the lower pad arrangement **156** includes cylindrical pads **164** and **166** secured to a shaft **168**, which is secured to the central column **142** by another bracket **170** (first shown in FIG. **2**). The cylindrical pads **164** and **166** can be the same size or larger or smaller than the cylindrical pads **157** and **158**. In other embodiments, the back may be a solid or cushioned panel. In the illustrated embodiment, the cylindrical pads **164**, **166** can be removed from

the column and used as foam rollers.
[0043] The stretching device **100** also includes a seat that comprises a first seating pad **172** and a second seating pad **174** that are removably coupled to the base **102**. The first seating pad **172** and the second seating pad **174** are joined together via straps **176** and **178** (first shown in FIG. **7**). The strap **176** assists in coupling the first seating pad **172** and a second seating pad **174** to one another and optionally to the conduit **104**, and may be equipped with one portion of a hook-and-loop material to mate with another portion of hook-and-loop material on the conduit. The seating pads otherwise may be coupled via non-permanent adhesive, magnets, or another suitable fastening mechanism.
[0044] Notably, the device is constructed such that the seating pads **172**, **174** are unsupported by any element of the device **100**, excluding any incidental support if a portion of the pads contacts the base **102**. Accordingly, the pads **172** and **174** will be supported at least in part by a floor surface if the device is positioned on the floor, or by the exterior ground surface if used in an exterior environment. This is advantageous when the device is intended for residential use because it allows the seat to be supported in part by the floor or ground surface, such that most of the user's weight is thereby supported. This arrangement obviates the need for additional support structures and therefore saving weight, complexity, and cost. In other embodiments, the device may be provided with support structures (not shown) for elevating the seat when in use.
[0045] As shown in FIG. **9**, the stretching device **100** can be folded into a storage position. When in the storage position, the first seating pad **172** and second seating pad **174** are decoupled from the base **102** and the end **134** of the arm **130** is decoupled from the central column **142** to enable the central column **142** to fold into an essentially flat orientation.
[0046] Alternatively, it is contemplated that the first and second seating pads **172**, **174** might be replaced with one or more vibration plates. For example, each seating pad **172**, **174** might be replaced with a vibration plate (or pad). It has been found that vibration elements help loosen the user's muscles and allow for a deeper stretch. These vibration plates may have the same removable and storable characteristics as mentioned above with respect to seating pads **172**, **174**.
[0047] Further, these vibration plates are capable of vibrating at different frequencies and amplitudes. It is generally contemplated that vibration plates may be selected having desired frequencies and amplitudes that provide certain advantages, such as, for example, helping to increase the flexibility of the user. For instance, these vibration plates could have a specific “stretching” setting, which would be configured to automatically set to the optimum frequency and amplitude for increasing flexibility. Optionally, rather than these vibration plates, a kit that includes the stretching device **100** might further include a hand-held vibration device for the user, which could also have the aforementioned “stretching” setting.
[0048] As shown in FIG. **10**, the stretching device **100** is placed into the pushing configuration when the linear actuator **110** is coupled to the back **108** by coupling the piston **112** to the carriage sleeve **118**. In this configuration, linear movement of the piston **112** in the direction A is translated into a pushing pivotal or rotational movement of the central column **142** along the line B via the arm **130** and movement of the rider **126** within the slot **128**. The pivotal movement of the central column **142** is configured to cause the upper pad arrangement **154** and lower pad arrangement **156** to push against a back of a user sitting on the first seating pad **172** and second seating pad **174** to assist in performing a pushing-type stretch of the user's back. The slot **150** accommodates movement of the arm **130** as the back **108** pivots. The device thus assists the user in a back stretching operation. The upper and lower pad arrangements **154**, **156** alternatively can be used to engage the legs or ankles of the user for a leg-type stretching operation.
[0049] Turning now to FIG. **11**, the stretching device **100** can be transitioned from the pushing configuration shown in FIG. **10** into the pulling configuration shown in FIG. **11** by decoupling the piston **112** from the carriage sleeve **118**. The first seating pad **172** and second seating pad **174** optionally are removed temporarily to enable access to and removal or the fastener **120** to decouple

the piston **112** from the carriage sleeve **118**. In this position, the arm **130** no longer causes pivoting of the back **108** as the piston extends and retracts, but rather the piston extends and retracts within the carriage sleeve **118**.

[0050] When in this pulling configuration, a portion of the device extends between the legs of the user. Specifically, a portion of the piston **112** so extends, and an extender such as extension strap **180** may if desired be coupled to the piston **112**. As shown in FIG. **11**, the extension strap **180** is fabric strip having a pocket or loop **182** at one end and an attachment ring **184** at the opposite end. The loop **182** is sized to fit snuggly around the piston **112** and is secured in place thereon by reinserting the fastener **120** into the piston **112** to oppose movement of the loop **182** off of the piston **112**. The extension strap **180** can be secured to the piston **112** in other ways, and the extender can instead comprise a rigid or semi rigid extension bar or conduit (not shown) that couples to the piston **112** when the stretching device **100** is in the pulling configuration. The piston then may be extended to a more extended position such as the fully extended position shown in in FIG. **12**, and will in this position be ready for mechanically assisted stretching operations by linearly retracting the piston **112** in the direction C. The retraction of the piston **112** operates in conjunction with a stretching accessory such as the one or more accessories described herein to provide different stretching operations for the user.

[0051] The piston **112** in this embodiment translates in a gap between the seat pads **172**, **174**. This again allows the seat pads to rest in part on a floor surface when in use. In other embodiments, a single seat pad could be equipped with a hollow channel (not shown) to accommodate translation of the piston, while still resting on the floor surface. The device need not be used on a floor or ground surface, and if desired the device may be used on a table or bench or otherwise in an elevated position, even though it is capable of use while resting on a floor surface.

[0052] Turning now to FIG. **13**, the stretching device **100** connects to a foot pad attachment **200** for use in the pulling configuration. The foot pad attachment **200** has a portion that retracts as the piston **112** retracts in the pulling configuration. The foot pad attachment **200** comprises a first foot retainer **202** and a second foot retainer **204** as shown in FIGS. **13** and **14**. The first foot retainer **202** and second foot retainer **204** both include leg or ankle straps **206** and **208**, respectively, for securing the feet of the user within the first foot retainer **202** and second foot retainer **204**. A support bar **210** is pivotably coupled to both the first foot retainer **202** and second foot retainer **204** and is removably coupled to the attachment ring **184** of the extension strap **180** by a strap **212**. Each foot retainer **202**, **204** has two straps **214**, **216** at the top, the straps **214**, **216** sliding around the support bar **210**. The support bar **210** has three retention rings **218**, **220**, **222** including first and second rings **218**, **222** at each end and one central ring **220**, which prevent the foot retainer straps from sliding laterally.

[0053] The two foot retainers **202**, **204** can be used to stretch both feet at the same time or, if the user desires to stretch only one foot at a time, one foot retainer may be removed and the remaining foot retainer can slide to the middle of the support bar **210**, with one of its two straps **214**, **216** on one side of the middle retention ring **220** and the remaining strap on the opposing side of the retention ring **220**. This assures that the foot retainer remains in the middle of the support bar **210**, so that it pulls evenly on the single foot retainer. The support bar **210** also ensures that the stretching device pulls evenly across the entire span of the user's toes.

[0054] In operation of the device **100**, the user first secures his or her feet to the first foot retainer **202** and second foot retainer **204** using the leg or ankle straps **206** and leg or ankle straps **208**. Then, the piston **112** is retracted in the direction C as shown in FIG. **12** to pull the strap **180** and excerpt a pulling force on the user's feet as secured within the first foot retainer **202** and second foot retainer **204**, thereby causing a plantar fasciitis stretch. The user's legs are kept as straight as practicable during this operation. If the user desires to cease the stretching operation, the user may extend the piston to remove the pulling force. In an emergency situation, such as loss of power, the user may bend his or her knees to extricate the user from the device.

[0055] Turning now to FIG. **15**, the stretching device **100** connects to a split stretch attachment **300** for use in the pulling configuration. Like the foot pad attachment **200**, the stretch attachment **300** has a portion that retracts as the piston **112** retracts. In particular, the stretch attachment **300** includes a pivot point **302**, a first arm **304** coupled to the pivot point **302**, a second arm **306** coupled to the pivot point **302**, and first and second retainers **308**, **310** connected respectively to the first and second arms **304**, **306**. Each of the first and second retainers **308**, **310** include discs **312** and **314**, respectively, positioned on a bottom thereof, which allows the first and second arms **304**, **306** to slide easily along any flooring surface. The pivot point **302** is removably coupled to the extension strap **180** via the attachment ring **184**.
[0056] In operation, the user secures the user's legs to the arms **304**, **306** by placing his or her ankles adjacent the first and second retainers **308**, **310**. Once secured, the piston **112** is retracted in the direction C as shown in FIG. **12** to pull the strap **180** and excerpt a pulling force on the pivot point **302**. The strap **180** and a portion of the piston retract between the legs of the user. The pivot point **302** converts this pulling force from retraction of the piston **112** at least partially into a pivoting motion of the first arm **304** and the second arm **306** around the pivot point **302** to stretch the user's legs that are secured to the first and second arms **304**, **306**. Again, the user may cease the stretching operation and disengage from the device by retracting the piston or by bending the user's knees.
[0057] The stretching device **100** may be returned to the pushing configuration by first removing the fastener **120**, sliding the loop **182** off of the piston **112**, aligning the piston **112** and the carriage sleeve **118** (e.g., by retracting or extending the piston **112** and/or sliding the carriage sleeve **118**), and reinserting the fastener **120** through the aperture **122** and the aperture **124** to resecure the piston **112** to the carriage sleeve **118**. The stretching device **100** can also be transitioned to the storage position from the pulling configuration decoupling the end **134** of the arm **130** from the central column **142** by removing the fastener **152**. Recoupling the piston **112** to the carriage sleeve **118** is desirably also performed because this can secure the carriage sleeve **118** within the conduit **104** when the stretching device **100** is in the storage position.
[0058] With reference now to FIG. **16**, the controller **116** includes a housing **400** having an extend button **402** and a retract button **404** included therein and an electrical connector **406** for communicating with the linear actuator **110** (connection not shown). In operation, continual depression of the extend button **402** causes the linear actuator **110** to extend the piston **112** out of the housing **114** until a maximum extension is reached or the extend button **402** is no longer being depressed and continual depression of the retract button **404** causes the linear actuator **110** to retract the piston **112** into the housing **114** until the piston **112** is fully retracted or the retract button **404** is no longer being depressed. The actuator or controller may be provided with a stop limit mechanism for the fully extended or retracted positions. As shown in FIG. **16**, the electrical connector **406** is a wired electrical connection to the linear actuator **110**, but wireless connections may be employed. In some embodiments, the linear actuator **110** can be controlled solely or additionally by remote software, such as a software application that operates on a mobile telephone or other computing device (not shown). Via direct or networked communication, such software may interface with the controller **116** or may interface with communication circuitry and processors of the linear actuator **110**. The controller **116** alternatively can be configured such that a single press of the extend button **402** and/or retract button **404** rather than a continual depression thereof will cause extension or retraction of the piston **112** to the limit of the range of travel of the piston **112**.
[0059] Regarding the alternative stretching device **500** shown in FIGS. **17** and **18**, this includes a base **502**, a back **508**, a linear actuator **510**, and a controller **516**. The device **500** also includes a first seating pad **572** and second seating pad **574** removably coupled to the base **502**.
[0060] The back **508** is pivotable with respect to the base **502** via a hinge or pivot **544**. The back **508** comprises a central column **542** that is formed from two parallel plates **543** and **545** and pivots in response to movement of a piston **512** of the linear actuator **510**. An upper pad arrangement **554**

and a lower pad arrangement **556** are coupled to the central column **542**.
[0061] The linear actuator **510** has a housing **514** pivotably coupled to the base **502** via a fastener **536**. The piston **512** is configured for coupling to the back **508** when the alternative stretching device **500** is in a pushing configuration (FIG. **17**) and configured for decoupling from the back **508** and positioning within a channel **506** of the base **502** when the alternative stretching device **500** is in a pulling configuration (FIG. **18**). The linear actuator **510** also includes a power source **517**.
[0062] Like the controller **116**, the controller **516** is configured to direct the actuator **510** to extend and retract the piston **512** from the housing **514**. When the **500** is in the pushing configuration shown in FIG. **17**, operation of the actuator **510** causes pivotal motion of the back **508** relative to the base **502**. When the alternative stretching device **500** is in the pulling configuration as shown in FIG. **18**, operation of the actuator **510** causes relative linear motion of the piston **512** within the channel **506**. Furthermore, when in the pulling configuration as shown in FIG. **18**, the piston **512** can be coupled to the foot pad attachment **200** and the stretch attachment **300** via the extension strap **180** or similar coupler. In other respects, the features and functions of the device **500** may be the same as for device **100**.
[0063] The stretching device **100** or the alternative stretching device **500** can be provided in a kit with the extension strap **180**, the foot pad attachment **200**, and/or the stretch attachment **300**, and optionally other attachments useful for other stretching operations.
[0064] Other optional attachments that may be provided in a kit, alone or in addition to other attachments, are shown in FIGS. **19-28** and are described below. For example, the kit may include a bracket that allows for mounting of a massage device, such as a massage gun **600** or vibrating massager **620**, to the stretching devices **100** or **500**. The massage gun connotes a reciprocating massage device, with or without vibration, while the vibrating massager vibrates but does not reciprocate. In addition, or alternatively, the kit may include a heat and vibration pad **700** or **800** that may be attached, or mounted on, the stretching devices **100** and **500**.
[0065] FIG. **19** shows a massage gun **600** that has been mounted to the stretching device **100**. A bracket **602** is attached to the back **108** to facilitate mounting of the massage gun **600**. It is generally contemplated that bracket **602** is removably attached to the central column **142**, although the bracket **602** may be more permanently affixed. As can be seen, two straps **604** and **606** straps are attached to the bracket **602** and are adjustable to hold the massage gun **600** in position relative to the stretching device **100**. The bracket **602** is preferably attached to the central column **142** of the back **108**. More specifically, the bracket **602** is preferably attached to the central column **142** between the upper pad arrangement **154** and the lower pad arrangement **156** and may be adjustably positioned, as desired, relative to the body of the user.
[0066] With reference to FIGS. **20** and **21**, the bracket **602** is shown when not mounted to the stretching device **100**. The bracket **602** is configured so that it can be firmly and securely mounted about the outside of the central column **142**. The bracket **602** may be in the form of a universal mounting bracket. The bracket **602** may be adjustable in size so as to fit about the central column **142**.
[0067] The illustrated bracket **602** includes two fixed sides **608** and **610**. Each fixed side **608** and **610** includes a base flange **612** and **614** extending outwardly from that fixed side **608** and **610**. The base flanges **612** and **614** each include a slot **616** and **618** therethrough. First base flange **612** includes a first slot **616** for receiving the first strap **604** therethrough, and second base flange **614** includes a second slot **618** for receiving the second strap **606** therethrough. The straps **604** and **606** are preferably removable from the bracket **602** and adjustable in diameter so as to accommodate different types and sizes of massage guns **600**.
[0068] In use, this feature allows a user to access different areas on the user's back with the massage gun **600**. The bracket **602** may hold many different types and sizes of massage guns **600**, so that the user can sit on the stretching device **100** and have the massage gun **600** massage his or

her back, without the need for another person to hold the massage gun **600**. The stretching device **100** may also apply increased pressure to the massage gun **600**, when the controller **116** is actuated to adjust and move the seat back **108**.
[0069] As shown in FIGS. **22** and **23**, this bracket **602** may also be used to hold a
[0070] vibrating massager **620** (although a separate bracket may be used). FIGS. **22** and **23** show the vibrating massager **620** mounted to the central column **142** of the stretching device **100**. In use, the vibrating massager **620** causes the central column **142** and back **108** to vibrate, thus further relaxing the user as he or she stretches.
[0071] With reference to FIG. **24**, the bracket **602** is shown in a configuration for holding the vibrating massager **620** (and without the straps **604** and **606**). As can be seen, the bracket **602** can be shifted between a first configuration for mounting the massage gun **600** (shown in FIGS. **20** and **21**) and a second configuration for mounting the vibrating massager **620** (shown in FIG. **24**). In the first configuration, the bracket **602** is disposed about and engages the central column **142**. In the second configuration, the bracket **602** is disposed about and engages both the central column **142** and the vibrating massager **620**, thereby holding the vibrating massager **620** against the central column **142**.
[0072] The bracket **602** includes an extendable portion **621** to allow movement of the bracket **602** between the first and second configurations. In FIG. **24**, the bracket **602** has been extended from the first configuration to occupy the second configuration. The fixed sides **608** and **610** may form a right angle with respect to one another. The first fixed side **608** includes a recess **622** for receiving an end of the extendable portion **621**. The second fixed side **610** includes a slot **624**, located at the end opposite from the first fixed side **608**, for receiving extendable portion **621**. As can be seen, the size of the bracket **602** may be adjusted between the first and second configurations.
[0073] Another optional feature is shown in FIGS. **25** and **26**. This feature is a heat and vibration pad **700** that can be mounted on the stretching device **100** (or the alternative stretching device **500**). It has been found that the application of heat to muscles aids in stretching those muscles, and the vibration of muscles (such as by a pad **700**) also aids in stretching of those muscles. The pad **700** may engage the legs and back of a user and allow the application of heat to those areas. The illustrated pad **700** is removably mounted to the stretching device **100** (or alternative stretching device **500**). The pad alternatively may be permanently or semi-permanently attached to the stretching device **100** (or alternative stretching device **500**). The cutout **702** is sized to accommodate extension strap **180**. Further, as shown in FIG. **25**, the pad **700** is generally flat and flexible so that it can be positioned to overlie the seating pads **172** and **174** and to engage the upper pad arrangement **154** and the lower pad arrangement **156**. One end of the heat and vibration pad **700**, when mounted, preferably extends over the upper pad arrangement **154**.
[0074] The pad **700** may be powered by a battery power bank **704**. Alternatively, or in addition, it may be powered through a USB plug or other plug into a wall outlet. It is contemplated that the pad **700** may have the ability to vibrate in specific areas or over the entire surface of the pad **700**. This pad **700** may also have the ability to heat specific areas of the pad **700** or to heat the entire surface of the pad **700**. A pad controller may allow the activation and control over the heat and/or vibration.
[0075] An alternative heat and vibration pad **800** is shown in FIGS. **27** and **28**. This pad **800** is a different shape such that it can be wrapped around the user's legs. It includes straps **802** on top of the pad **800** that hold it around the user's legs. The pad **800** is generally flat but is flexible such that the ends of the pad **800** can be held together by straps **802**. The straps **802** allow for adjustment of the pad **800** such that the user can increase or decrease the cross-sectional area of the pad **800**. The user can move the pad **800** to different areas of the user's legs, and possibly to different areas of the user's body.
[0076] It is also contemplated that the stretching device **100** (and stretching device **500**) may include other optional features that may provide additional support to the device **100**. FIGS. **29** and **30** show an alternative hinge mechanism **186** and a stabilizer bar **188** used with stretching device

100. The alternative hinge mechanism **186** is preferably in the form of a relatively thick cylinder **190** with a pin **192** extending therethrough, although other hinge types are also possible. It is contemplated that hinge mechanism **186** will provide a robust folding connection between conduit **104** and central column **142**, thereby leading to extended life and use of the stretching device **100**.
[0077] Optionally, the stretching device **100** (and stretching device **500**) may also include a stabilizer bar **188**. As can be seen from the figures, the stabilizer bar **188** is preferably disposed at the rear of the stretching device **100** at or near one end of conduit **104**. It preferably includes two legs **194** that each extend in a direction generally perpendicular to the conduit **104**, and they help prevent the stretching device **100** from overturning due to external forces. The stabilizer bar **188** may have a rectangular cross-section and may also include an opening **196** that allows the power conduit **117** to extend through the bar **188**. As should be understood, other shapes, sizes, cross-sections, and locations for the stabilizer bar **188** relative to device **100** are possible.
[0078] A stretching method involves use of the stretching device **100** and/or the alternative stretching device **500** in a pushing configuration to enable a back or leg stretch or other suitable stretch, or use of the device in a pulling configuration to enable a plantar fasciitis or split-leg stretch or other suitable stretch. The method may involve beginning with the device in one configuration (pushing or pulling), performing a suitable stretching operation with the device in that configuration, switching the device to the other configuration, and performing a suitable stretch in that other configuration. The method may include removing the device from a storage configuration before use or placing the device into a storage configuration after use. The seat of the device may be supported in whole or part on a floor or ground surface when in use.
[0079] Uses of singular terms such as “a,” “an,” are intended to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms. Any description of certain embodiments as “preferred” embodiments, and other recitation of embodiments, features, or ranges as being preferred, or suggestion that such are preferred, is not deemed to be limiting. The invention is deemed to encompass embodiments that are presently deemed to be less preferred and that may be described herein as such. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended to illuminate the invention and does not pose a limitation on the scope of the invention. Any statement herein as to the nature or benefits of the invention or of the preferred embodiments is not intended to be limiting. This invention includes all modifications and equivalents of the subject matter recited herein as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context. The description herein of any reference or patent, even if identified as “prior,” is not intended to constitute a concession that such reference or patent is available as prior art against the present invention. No unclaimed language should be deemed to limit the invention in scope. Any statements or suggestions herein that certain features constitute a component of the claimed invention are not intended to be limiting unless reflected in the appended claims. Neither the marking of the patent number on any product nor the identification of the patent number in connection with any service should be deemed a representation that all embodiments described herein are incorporated into such product or service.

Claims

1. A stretching device comprising: a base; a back, the back being pivotable with respect to the base; an actuator and having a piston that moves with respect to the base, the piston being coupled to the back when the stretching device is in a pushing configuration and decoupled from the back when

the stretching device is in a pulling configuration; and a controller operably coupled to the actuator, the controller configured to direct the actuator to extend and retract the piston, wherein, when the actuator is in the pushing configuration, extension of the piston causes a pivotal pushing motion of the back relative to the base, and wherein, when the actuator is in the pulling configuration, the piston moves with respect to the base without causing pivotal motion of the back relative to the base.

2. The stretching device of claim 1 wherein the back comprises a central column hingedly coupled to the base.

3. The stretching device of claim 2, including at least one pad coupled to the central column.

4. The stretching device of claim 1, including a carriage configured to be removably coupled to the actuator, the carriage being coupled to the actuator when the stretching device is in the pushing configuration and being decoupled from the actuator when the stretching device is in the pulling configuration.

5. The stretching device of claim 4, the base including a conduit, the carriage including a rider, the rider being captured in a slot of the conduit.

6. The stretching device of claim 5, including an arm connected at one end to the rider and at another end to the back.

7. The stretching device of claim 1 further comprising: a first pad disposed on a first side of the channel; and a second pad disposed on a second side of the channel opposite the first side.

8. The stretching device of claim 7, the first and second pads being unsupported.

9. A kit comprising the stretching device of claim 1 and a foot pad attachment having a portion that retracts as the piston retracts in the pulling configuration, and a connector securable to the foot pad attachment and able to be operably coupled to the piston.

10. The kit according to claim 9, the connector comprising a strap.

11. The kit of claim 10, wherein the foot pad attachment comprises: a support bar configured to removably couple to the strap; a first foot retainer pivotably coupled to the support bar; and a second foot retainer pivotably coupled to the support bar.

12. A kit comprising the stretching device of claim 1 and a split stretch attachment having a portion that retracts as the piston retracts in the pulling configuration.

13. The kit according to claim 12, the split stretch attachment having a pivot point, a first arm coupled to the pivot point, a second arm coupled to the pivot point, and first and second retainers connected respectively to the first and second arms, wherein the split stretch attachment is configured to convert retraction of the piston into a pivoting motion of the first arm and the second arm around the pivot point.

14. A kit comprising the stretching device of claim 1 and a bracket configured for mounting a massage device to the back of the stretching device.

15. The kit according to claim 14, the bracket comprising at least one securement strap.

16. A kit comprising the stretching device of claim 1 and a heat and vibration pad configured for removable mounting to the stretching device.

17. The kit of claim 16 comprising at least one strap engaging an end of the heat and vibration pad.

18. A stretching device comprising: a base; a back, the back being pivotable with respect to the base; an actuator having a housing pivotably coupled to the base and a piston configured for coupling to the back when the device is in a pushing configuration and configured for positioning within a channel of the base when the device is in a pulling configuration; and a controller operably coupled to the actuator, the controller configured to direct the actuator to extend and retract the piston from the housing, wherein, when the device is in the pushing configuration, operation of the actuator causes pivotal motion of the back relative to the base, and wherein, when the device is in the pulling configuration, operation of the actuator causes relative linear motion of the piston within the channel.

19. A stretching method comprising: providing a stretching device, the device having a base, a back

pivotable with respect to the base, an actuator, and a controller operably coupled to the actuator, and a seat, the seat being unsupported, the device being operable in a pushing configuration in which a piston of the actuator is coupled to the back and causes a pivotal pushing movement of the back relative to the base, and a pulling configuration in which a piston of the actuator causes retraction of a portion of the device between the legs of a user, the seat being configured to accommodate such retraction; sitting on the seat of the device while the seat is resting on a floor or ground surface; and actuating the controller to cause a pushing or pulling stretch via either a pivotal pushing movement or a retraction.

20. A stretching device according to claim 1, including an arm operably connecting the actuator to the back when the stretching device is in a pushing configuration but not when the stretching device is in a pulling configuration.

21. A stretching device according to claim 1, the base including a channel, the piston translating within the channel when the device is in a pushing configuration and when the device is in a pulling configuration.

22. A stretching device according to claim 1, the base having a conduit that defines a channel, the actuator disposed within the conduit and having a piston that translates with respect to the channel, wherein, when the actuator is in the pulling configuration, the piston translates within the channel without causing pivotal motion of the back relative to the base.