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Groves

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(54) **HOISTING AND LOWERING DEVICE**

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(22) Filed: **Jun. 15, 2017**

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Related U.S. Application Data

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(60) Provisional application No. 61/572,608, filed on Jul. 19, 2011.

(51) **Int. Cl.**
B66D 3/04 (2006.01)

(52) **U.S. Cl.**
CPC ***B66D 3/046*** (2013.01); ***B66D 3/04*** (2013.01)

(58) **Field of Classification Search**
CPC B66D 3/04; B66D 3/046
See application file for complete search history.

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(57) **ABSTRACT**

A device, system and method are used for hoisting and lowering a load. The device has a front plate that may be displaced to reveal a sheave. The device also has a friction accessory. The friction accessory is arranged to create friction between a rope and the device when a load is suspended from the device using the rope and where the device is secured to a support structure. The system may be prepared by an operator, having ascended to an elevated location, and further allows the operator to lower the load from the elevated location prior to descending.

7 Claims, 9 Drawing Sheets

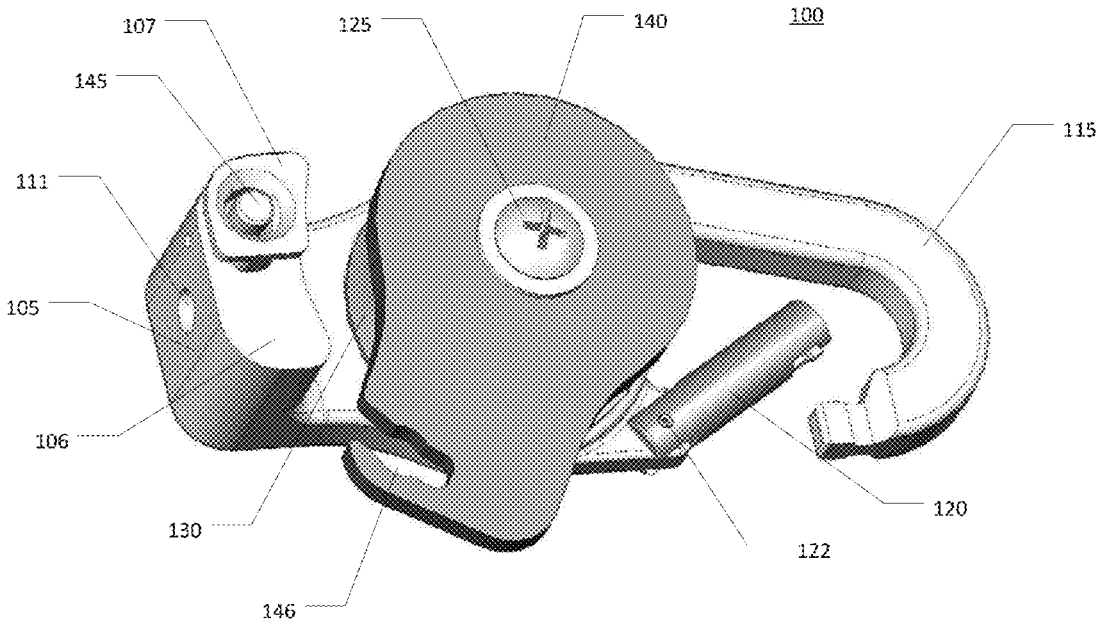
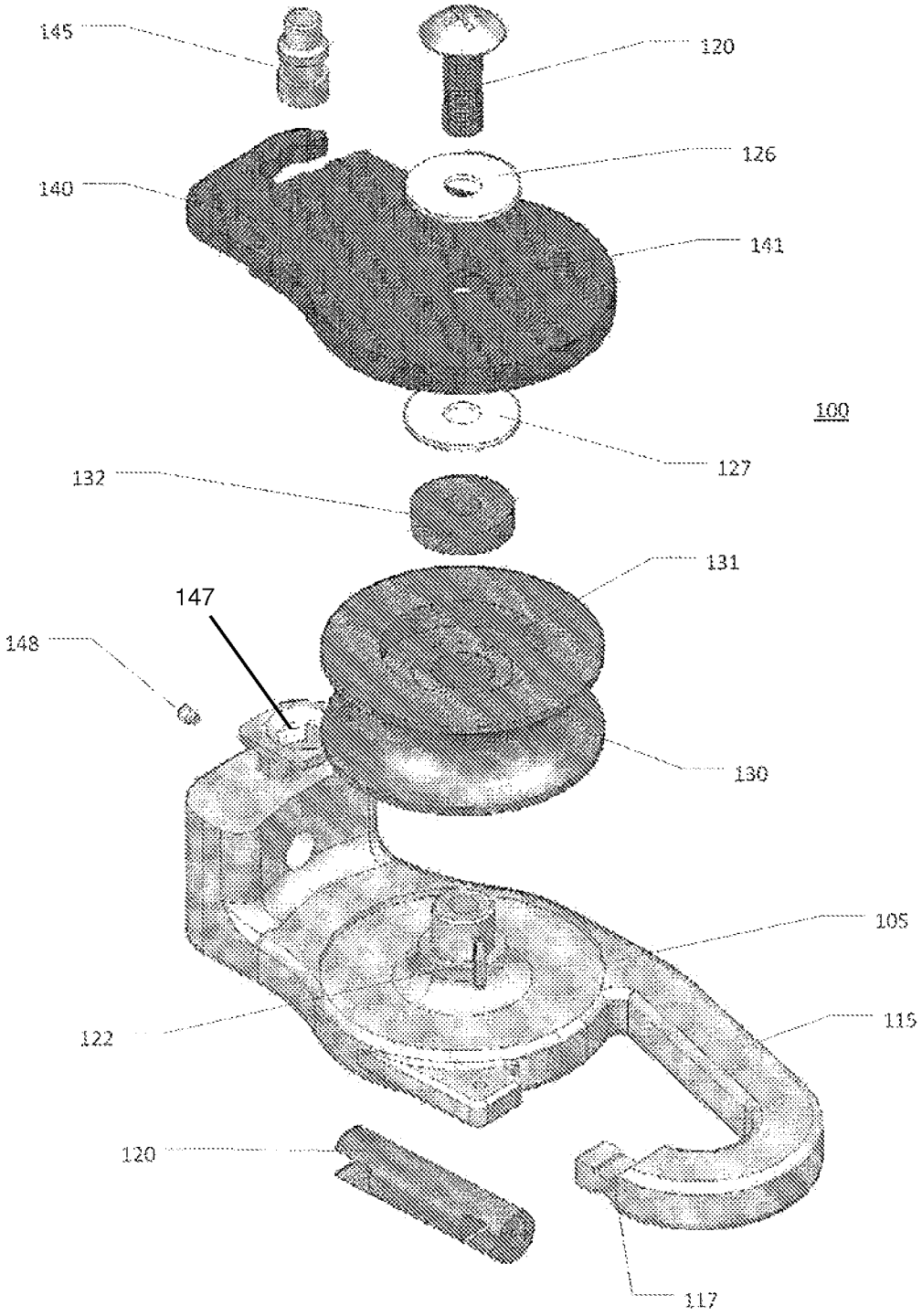


FIG. 1


145
120
126
140
141
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127
132
131
147
148
130
105
122
115
120
117

FIG. 2A

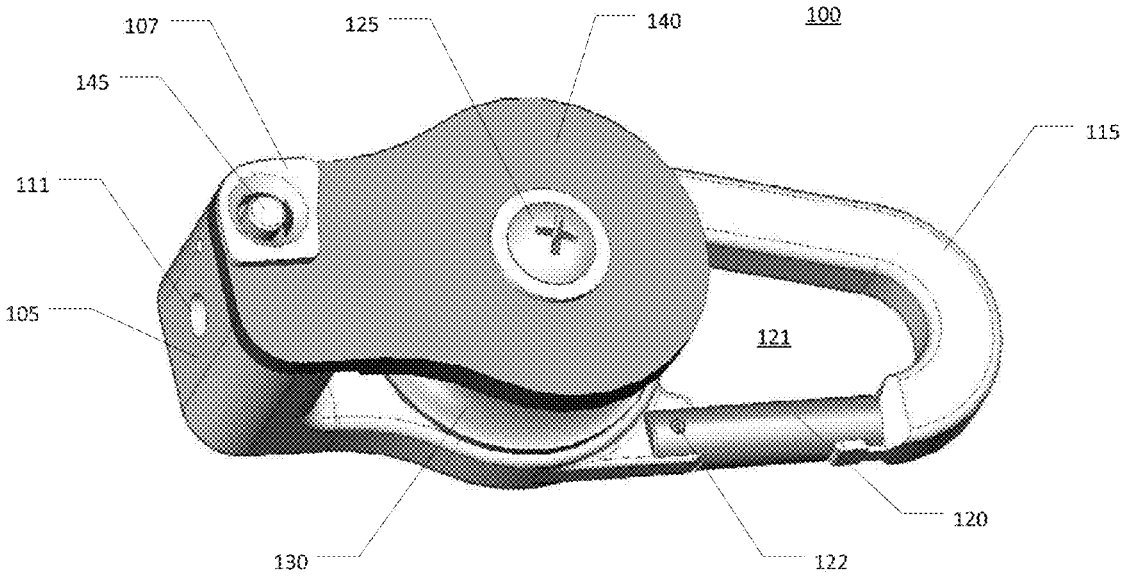
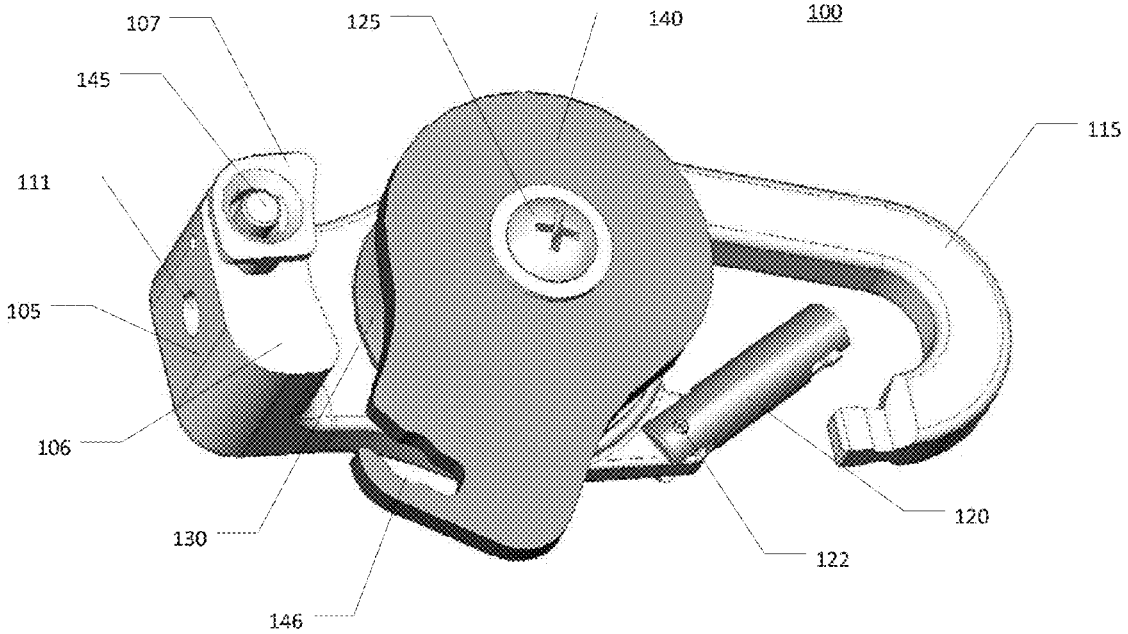

107
125
140
100
145
115
111
105
121
120
130
122

FIG. 2B


107
125
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146

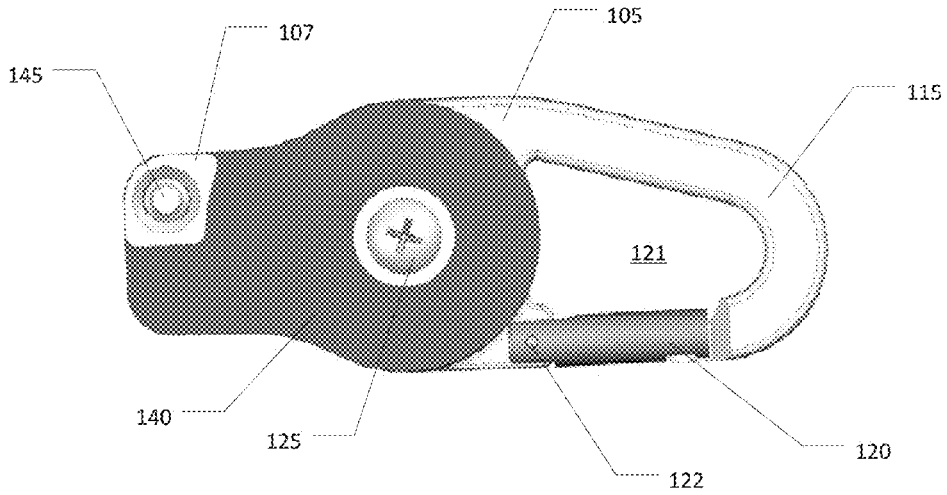


FIG. 3A

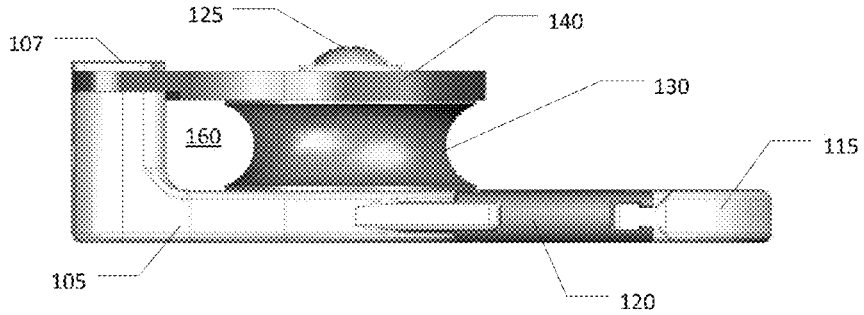


FIG. 3B

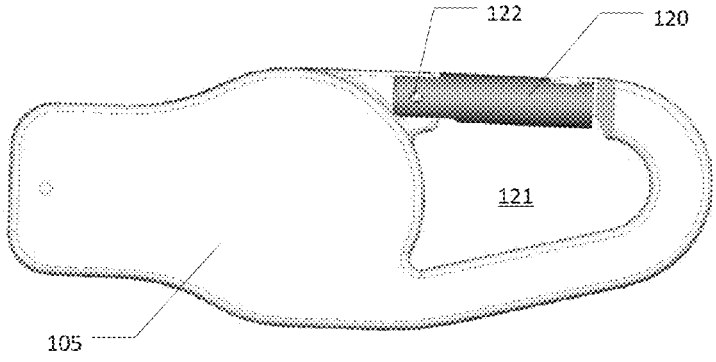


FIG. 3C

FIG. 4

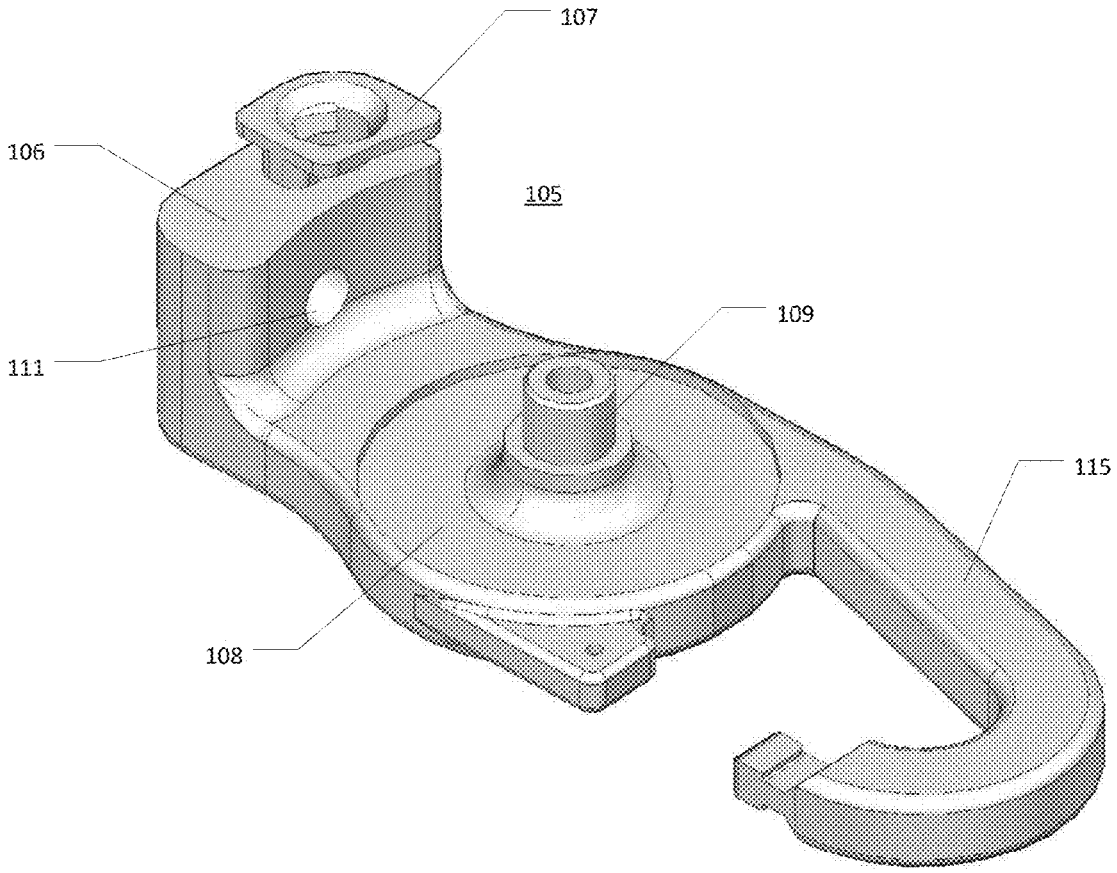


FIG. 5

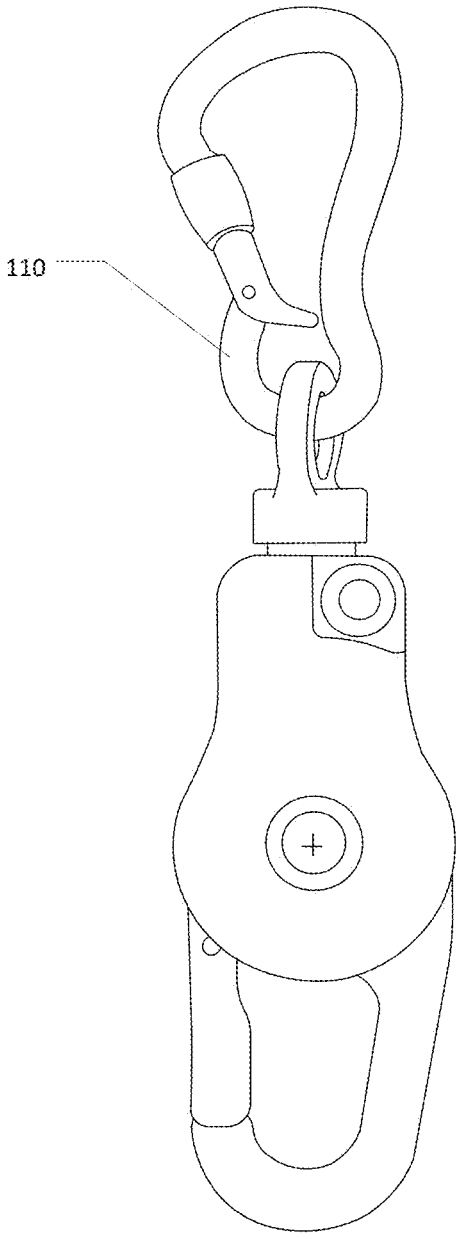


FIG. 6

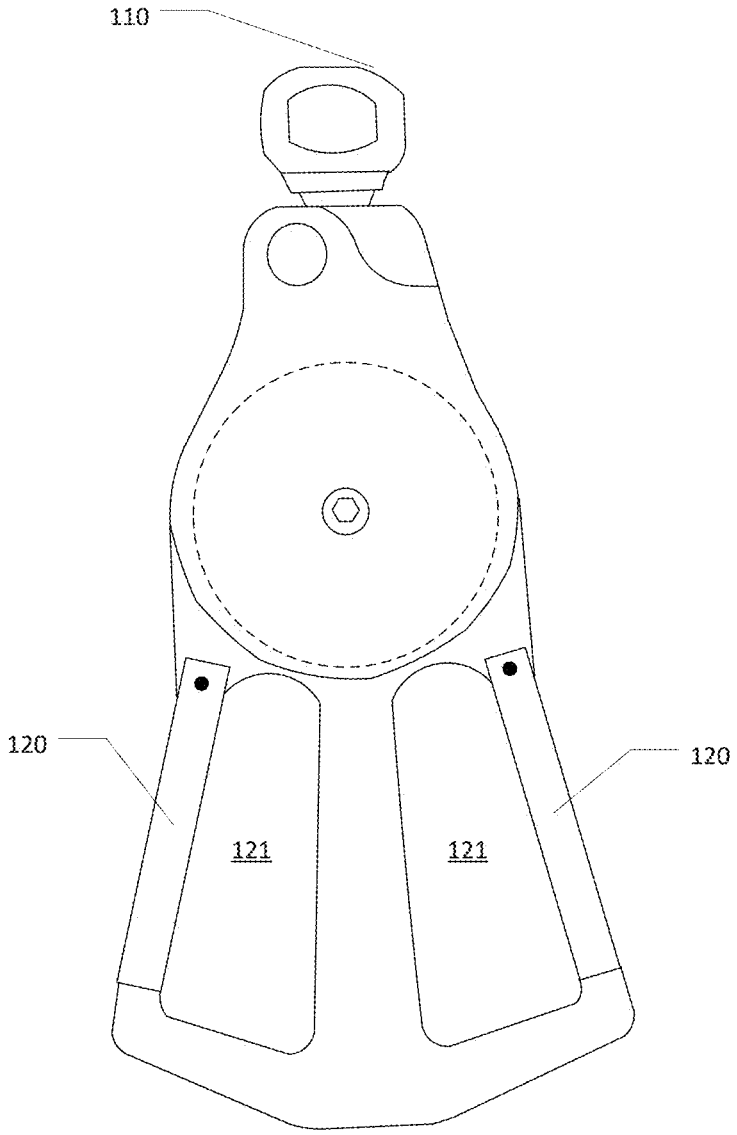


FIG. 7A

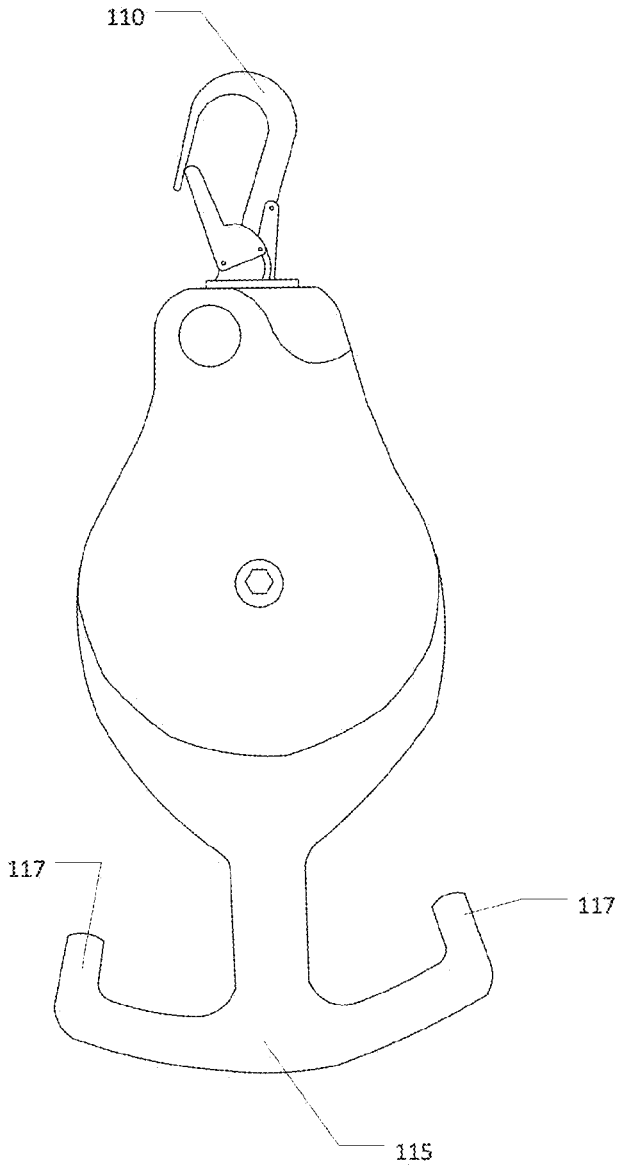


FIG. 7B

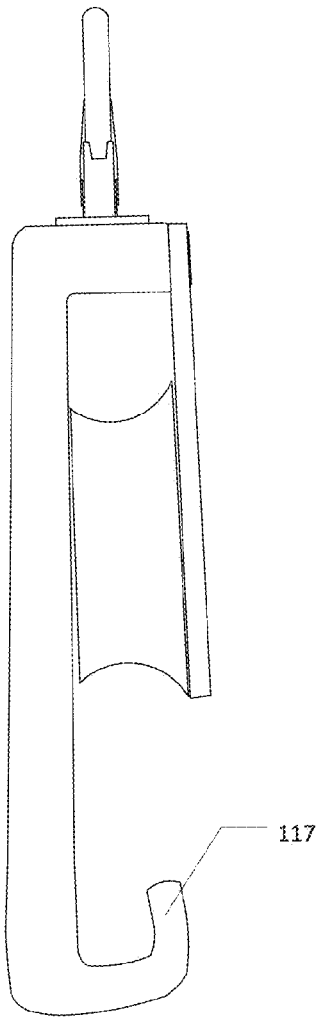


FIG. 8

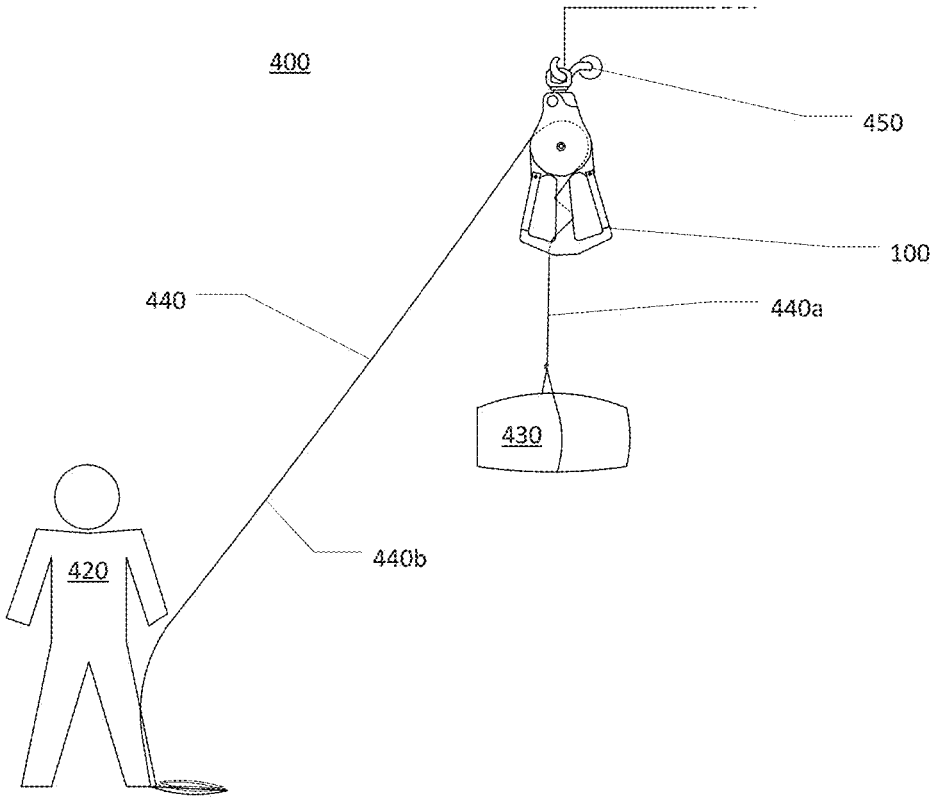
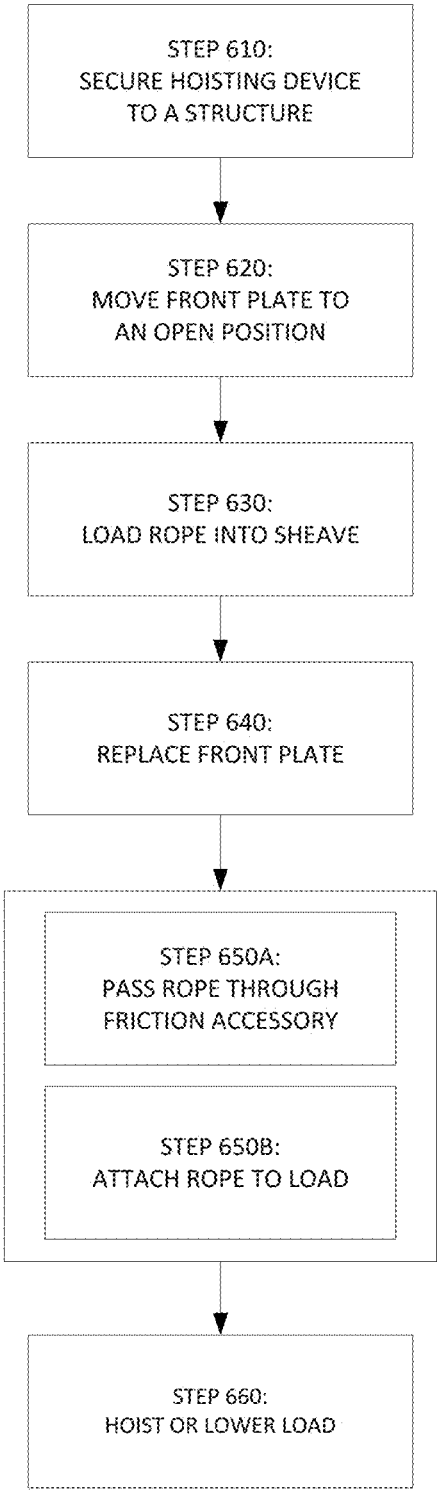


FIG. 9


STEP 610:
SECURE HOISTING DEVICE
TO A STRUCTURE
STEP 620:
MOVE FRONT PLATE TO
AN OPEN POSITION
STEP 630:
LOAD ROPE INTO SHEAVE
STEP 640:
REPLACE FRONT PLATE
STEP 650A:
PASS ROPE THROUGH
FRICTION ACCESSORY
STEP 650B:
ATTACH ROPE TO LOAD
STEP 660:
HOIST OR LOWER LOAD

HOISTING AND LOWERING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/553,641, filed Jul. 19, 2012, which claims priority from U.S. provisional application Ser. No. 61/572,608, filed Jul. 19, 2011.

FIELD

The present disclosure relates to device and method for hoisting or lowering a load. More specifically, the present disclosure relates to a life-saving rescue device that may be used to lower an injured person from an elevated location.

BACKGROUND

Pulleys are often used to hoist and/or lower loads in connection with a rope or cable, as generally known in the art. A pulley typically comprises a wheel or sheave that turns on an axis. When used in connection with a rope, a pulley can be used to change the direction of a tension force placed on the rope.

Pulleys are used in several configurations and for various purposes. One example is a block and tackle arrangement in which two pulleys work in unison, one pulley being fixed and another free to move with the load. This simple device may be used to create a mechanical advantage, wherein the tension force required to lift a load is decreased by a factor of two or more, in exchange for a decrease in the speed at which the load ascends. Some sophisticated examples of modern block and tackle arrangements use pulleys in combination with braking and/or clutch devices.

In general, block and tackle systems often require a significant amount of time to prepare for use. The time and effort spent in arranging the elements of a block and tackle system are problematic where the location of the load is remote or where the need to move a load becomes urgent. One example in which a block and tackle arrangement is often impractical is a rescue situation. For example, it is not practical to arrange a block and tackle system where a person has been injured while working in an elevated space, such as where a person has lost consciousness while working on a power line and remains suspended from the power pole.

As an example of the prior art, U.S. Pat. No. 4,220,315 discloses a pulley having an auxiliary braking system, enabling the operator (e.g., rescue personnel) to quickly assemble the device and lower the injured person in a short amount of time. The auxiliary braking system of the prior art comprises a spindle in a chamber, the path of the rope through the chamber comprises a loop of greater than 180°. The load bearing portion of the rope is suspended directly from the sheave, while the operator controls the rope entering the chamber of the auxiliary braking system. The spindle is arranged such that the axis of the spindle may move laterally within the chamber, enabling the operator to control the braking function, in part, by manipulating the angle of the rope entering the chamber.

Disadvantages of this and other existing solutions include that the braking system of currently available devices must frequently be operated from below the device. Further, the amount of complexity involved in arranging the rope in an auxiliary braking system remains high for an operator in view of the expected stress of a rescue effort.

SUMMARY

The present disclosure provides a device, system and method for hoisting and lowering a load that provides significant advantages over the prior art. For example, the aspects of the present disclosure may be used to significantly reduce the amount of preparation time required, while also providing the operator (i.e., user) with enough resistance to have a substantial control when lowering a heavy load, even where circumstances place the operator in a precarious position, such as where the operator is at an elevated position and is working within a limited space or surface area, thereby decreasing the amount of leverage available. The system of the present disclosure may be prepared by an operator at an elevated location and allows the operator to lower the load from the elevated location prior to descending. Thus, the system of the present disclosure provides significant advantages in time and simplicity in comparison with the prior art, without sacrificing the security of the load.

One aspect of the present disclosure provides a device for hoisting or lowering a load, comprising a friction accessory attached to a pulley, the pulley comprising a main body, a sheave, and a front plate. The front plate is configured to have a closed position and an open position, the open position exposing a chamber between the sheave and the main body. The friction accessory may be a hook-shaped appendage extending from the bottom of the pulley, and formed integral therewith.

In another aspect of the present disclosure, the device described herein is used as a component of a system, wherein a cord may be connected to the device and attached to a load, and the device may be attached to a support structure. The device is oriented such that the weight of the load creates friction between the cord and the device. In some embodiments the load may be a victim, such as an injured person.

Yet another aspect of the present disclosure provides a method for rescuing a victim using the device and system described herein. The device is secured to a support structure. The rope is placed in the device, for example, by moving the front plate to an open position, loading the rope into the chamber, and replacing the front plate to the closed position. The rope is then placed through the friction accessory and attached to the victim. Finally, the victim is hoisted or lowered as necessary to complete the rescue.

Other systems, methods, features, and advantages of the present disclosure will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. The features, functions and advantages that have been discussed can be achieved independently in various embodiments of the present invention or may be combined in yet other embodiments further details of which can be seen with reference to the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. **1** is an exploded view of a device for hoisting and lowering a load according to one embodiment of the present disclosure;

FIGS. **2**A and **2**B are drawings depicting a perspective view of the device for hoisting and lowering a load in accordance with the embodiment shown in FIG. **1**, wherein the front plate and gate thereof are shown in closed and open positions in FIGS. **2**A and **2**B, respectively;

FIGS. **3**A-C are drawings depicting, respectively, a front view, a side view, and a rear view of the device for hoisting and lowering a load in accordance with the embodiment shown in FIG. **1**;

FIG. **4** is a drawing depicting the main body of the device for hoisting and lowering a load in accordance with the embodiment shown in FIG. **1**;

FIG. **5** is a drawing depicting a device for hoisting and lowering a load in accordance with another embodiment of the present disclosure;

FIG. **6** is a drawing depicting a device for hoisting and lowering a load in accordance with another embodiment of the present disclosure;

FIGS. **7**A and **7**B are drawings depicting, respectively, a front view and a side view of a device for hoisting or lowering a load in accordance with another embodiment the present disclosure;

FIG. **8** is a schematic drawing depicting a system for hoisting or lowering a load in accordance with one embodiment the present disclosure; and

FIG. **9** is a flowchart depicting a method for hoisting or lowering a load in accordance with one embodiment the present disclosure.

DETAILED DESCRIPTION

In the following description, reference is made to the accompanying drawings, which form a part hereof, and in which is shown, by way of illustration, various embodiments of the present disclosure. It is understood that other embodiments may be utilized and changes may be made without departing from the scope of the present invention.

FIGS. **1-4** illustrate one embodiment of a device **100** for hoisting or lowering a load, comprising a pulley. The device **100** has a main body **105**, a sheave **130**, and a front plate **140**. The pulley is held together by a bolt **125**, which goes through an axial hole **141** in the front plate and through a center **131** of the sheave **130** and anchors in the main body **105**. Both the front plate **140** and the sheave **130** are configured to rotate about the bolt **125**. As shown in FIG. **1**, device **100** further comprises spacers **126**, **127** and **132**, which allow the sheave **130** and the front plate **140** to turn. A friction accessory **115** extends from the bottom of the main body **105**. A gate **120** connects a distal end **117** of the friction accessory **115** to the main body **105**. The gate **120** is anchored by a pin **122** in the main body **105** and, when closed, forms an enclosed space **121** between the friction accessory **115** and the main body **105**. Referring to FIG. **4**, the main body **105** of the pulley comprises a depression **108** and a hub **109** for accommodating the sheave **130** when assembled. The main body **105** further comprises a top hole **111**, which accommodates a fastener **110** (See FIGS. **5-7**). A front face **107** of the main body **105** is visible on the front of the device **100** when assembled and a recess **106** of the main body **105** is set back from the front of the device **100** and the front face **107** to accommodate the front plate **140**. The front plate **140** is held in a closed position by releasable clasp **145**, located in front face **107**. The front plate **140** also comprises an opening **146** which intersects the releasable clasp **145**. The device **100** further comprises a space between the sheave **130**, the main body **105**, the front plate **140** (when closed), forming a chamber **160** (see FIG. **3**B).

The device **100** is designed to withstand significant stresses placed upon it as a load is hoisted or lowered. In particular, the main body **105** is be configured to withstand the greatest portion of the stresses caused by the weight of the load. As seen in FIG. **3**B, where the device **100** is viewed from the left side, the main body **105** extends along a back side of the device **100**, opposite front plate **140**. In this example, the thickness of the main body **105** is notably thicker than the front plate **140** because the main body **105** is designed to carry a significant majority of the load. The main body **105** may be formed of steel or another structurally appropriate material, as known in the art. Further, the main body **105** may be manufactured by machining the chosen material or may be formed in a cast. Other appropriate manufacturing methods known in the art may also be used.

The friction accessory **115** is designed to create a significant amount of friction between a cord (e.g., a rope or cable) and the device **100**, without causing damage to the cord. The friction accessory is attached to the main body **105** and comprises an elongated appendage which may have one or more turns or twists therein, such as the hook shape shown in FIGS. **1-5**. The friction accessory may be formed as a trunk and one or more appendages, such as shown in FIGS. **6-7**.

In some embodiments, the friction accessory **115** is also connected to the main body **105** by one or more gates **120** that extend from the main body **105** and contact an end **117** of a corresponding arm when in a closed position. For example, FIGS. **2**A and **2**B show the gate **120** connected to the main body **105** with the pin **122**. The gate **120** is free to rotate about the pin, wherein the gate **120** is biased towards a closed position. The biasing feature of the gate **120** may result, for example, from using a spring pin as the pin **122**.

The present disclosure further contemplates various alternative designs of the friction accessory **115**, wherein the friction accessory **115** may have a more constricting enclosed area **121**. Other configurations of the friction accessory **115** may comprise the enclosed area **121** with an adjustable width, (e.g., a pinching device), such that the amount of friction resulting from the friction accessory **115** may be adjusted for a particular application.

In some embodiments, the friction accessory **115** may be assembled without a gate, as in the embodiment illustrated in FIGS. **7**A and **7**B. In this instance, the friction accessory **115** comprises the trunk and two appendages, wherein the distal ends **117** of the appendages are turned upwards to prevent a cord from falling out of the friction accessory **115**.

The sheave **130** of the device **100** may comprise a substantially cylindrical structure, wherein the bolt **125** passes approximately through the axis thereof. In some examples, the sheave **130** is configured to rotate a bout the bolt **125**, facilitating the movement of a cord in hoisting or lowering a load. The sheave **130** may be formed having a concave profile along the periphery of the cylinder, to accommodate a cord. The material of the sheave **130**, the structural strength, and other features may be chosen according to general specifications for sheaves and pulleys, as known in the art.

The front plate **140** is located at a distal end of the bolt **125** (i.e., at the end of the bolt **125** furthest from the main body **105**). In some embodiments, as shown in FIG. **2**B, the front plate **140** may be configured to rotate as a whole around the bolt **125**. Alternatively, the front plate **140** may be comprised

of two portions, wherein one is fixed and the other is able to be opened. The front plate **140**, or a portion thereof, moves to provide access to a chamber **160** located between the sheave **130** and the main body **105**. This allows the operator to place a bight (a middle portion) of cord into the device **100** without having to thread one end of the cord into the chamber **160** from the side of the device **100**.

In each of the illustrated examples, the front plate **140** is configured to rotate about the bolt **125**. The front plate **140** may alternatively be configured to reveal a side of the chamber **160** by rotating about a hinge or folding upon itself. The chamber **160** is open at each end thereof between the front plate **140** and the main body **105**. In some embodiments, where the front plate **140** rotates about the bolt **125**, the main body **105** is formed having the front comprising the recess **106** and the front face **107**. The recess **106** is set back from the front face **107**, and is formed to have a shape corresponding to the shape of the front plate **140**. In this configuration, the recess **106** allows the front plate **140** to reach a closed position abutting a portion of the front face **107** and the main body **105**. This arrangement constrains the rotation of the front plate **140** such that the rotation will occur in only one direction from the closed position. Limiting the movement of the front plate **140** to one direction provides a predictable movement for the operator, and therefore aids the operator in quickly preparing the device **100** to operate as part of a system for hoisting and lowering a load. Such a feature is an important consideration, where, for example, one of the embodiments discussed herein contemplates the use of the device in a rescue situation by an operator that may be wearing heavy, electrically-insulated gloves.

To hold the front plate **140** in the closed position, some embodiments comprise the releasable clasp **145**. The releasable clasp **145** holds the front plate **140** in the closed position and allows the operator to control the opening of the front plate **140**, thereby controlling access to the chamber **160**. The releasable clasp **145** may be located between the main body **105** and the front plate **140** at any point where the two are adjacent when in the closed position. For example, the releasable clasp **145** may be located within the area of the recess **106** (as shown in FIGS. **6**, **7**A and **7**B). The releasable clasp **145** may be placed in the area of the front face **107** (as shown in FIGS. **2**A and **2**B). Alternatively, the clasp **145** may be placed at or near the bolt **125**, preventing the rotation of the front plate **145** from the closed position until disengaged by the operator.

In some embodiments, the releasable clasp **145** is configured attach the front plate **140** to the main body **105** by latching onto a physical feature of the front plate. For example, in FIG. **2**B the front plate **140** comprises the opening **146** in the form of a gap, which has a shape that corresponds to the interface between the front face **107** and the recess **106**. Alternatively, the opening **146** may comprise a hole, as in the embodiments illustrated in FIGS. **6** and **7**

The releasable clasp **145** may comprise any suitable clasp or brake that performs the function described above, as may be known in the art. For example, the releasable clasp **145** may comprise a release button. In some examples, such as the embodiment illustrated in FIGS. **2**A and **2**B, the releasable clasp **145** may comprise a release button **147** that is arranged to have an outer surface that is flush with an outer surface of the front plate **140**. This configuration provides an advantage where the releasable button **147** may otherwise be disengaged unintentionally. In some examples, the release button **147** is biased towards a position where the outer surface is flush with the outer surface of the front plate **140** by a spring. Other features of the front plate **140** and the releasable clasp **145** may be added without departing from the scope of the present disclosure, as will be apparent to one with skill in the art.

In some embodiments, the device **100** further comprises the fastener **110** that can be used to secure the device **100** to a support structure (see FIGS. **5**-**7**). The fastener **110** may be formed as a unitary piece with the main body **105**. One example is provided in FIGS. **1**-**4**, wherein the main body **105** comprises a top hole **111**, which allows the fastener **110** to be attached to the main body **105** of the device **100**. The fastener **110** may comprise, for example, an eye (FIG. **6**), a hook, a gated hook (FIGS. **7**A-**7**B), an eye and a carabiner in combination (FIG. **5**), or any other suitable fastener.

Another aspect of the present disclosure, an embodiment of which is illustrated in FIG. **8**, provides a system **400** for hoisting or lowering a load. The system **400** comprises the device **100**, attached to a support structure **450**, arranged with a cord **440** having a load bearing portion **440***a* and a restraining portion **440***b*. The load bearing portion **440***a* of the cord **440** runs from the friction assembly **115** of the device **100** to a load **430**, located directly below the device **100**. The restraining portion **440***b* of the cord **440** runs from the sheave **130** of the device **100** to an operator **420**.

The system **400** of the present disclosure is intended to allow the operator **420** to hoist or lower the load **430** with minimal effort. In particular, the system **400** of the present disclosure may be used to significantly reduce the amount of preparation time, while also providing the operator **420** (i.e., user) with enough resistance to have a substantial control when lowering a heavy load, even where circumstances place the operator **420** in a precarious position, such as where the operator **420** is at an elevated position and is working within a limited space or surface area, thereby decreasing the amount of leverage available.

Referring to the description of the device above, the cord **440** is arranged relative to the device **100** such that the load bearing portion **440***a* descends from a friction accessory **115** of the device. Accordingly, the restraining portion **440***b* of the cord **440** is in contact with the sheave **130** at a point within chamber **160**. This arrangement is simple to complete, even for an operator **420** located at an elevated location, equal to or higher than the device **100**. In comparison to the prior art, the system may be prepared by an operator **420**, having ascended to an elevated location for example where an injured person is suspended, and further allows the operator **420** to lower the load **430** from the elevated location.

The operator **420** may be in any orientation relative to the device **410**. In situations where the system **400** is used to hoist the load **430** and where the operator **420** is located directly above the device **100**, such that the restraining portion **440***b* is substantially vertical, the device **100** could potentially turn to one side or the other and place the cord **440** in a position relative to the device **100** that very little friction is created between the device **100** and the cord **440**. Referring to the description of the device above, one example of a solution is to provide the device **100** with a second fastener, such as on the back of the main body **105** or connected to the friction device, thereby connecting the device **410** of system **400** to the support structure **450** in at least two places, thereby fixing the orientation of the device **410**. Alternatively, the main body **105** of the device may be constructed to have a narrow top portion above the sheave **130**, thereby allowing the rope **440** to come in contact with the sheave **130** from a variety of angles without causing undue stress on the main body **105**.

The manner in which the cord **440** is engaged with the friction accessory **115** may have a large impact on the amount of friction, and can be adjusted accordingly to manage the weight of the load **430**. In some examples, the cord **440** is wrapped around a vertical portion of the friction accessory **115**, as shown in FIG. **8**. It is estimated that one 360° wrap of the cord **440** around the friction accessory **115** will reduce the amount of force required to stabilize the load by a factor of 10. Two wraps (720°) will reduce the amount of force required by an approximate factor of 50.

The operator **420** may be a person, as depicted in FIG. **8**, or may be a machine. Some examples of machines that may perform or aid in the performance of the function of the operator **420** include: cranking mechanisms, (e.g., winch, spinning reels, ratcheting devices, jacks, etc.); industrial machinery, (e.g., forklifts, vehicles, cranes); and other machines, (e.g., levers, etc.). This list is not meant to be exhaustive and should not be construed as limiting the scope of the present disclosure.

The load **430** that is hoisted or lowered by the system **400** may be any item that requires hoisting or lowering. The system **400** is particularly useful in connection with lowering a heavy load where the situation provides very little time or resources for preparing a lowering mechanism. In an alternative example, the device **100** is used to lower the load **430**, where the load **430** comprises an injured person, from an elevated location. Some other examples of the load **430**, where expediency may be required, include hazardous materials, heavy equipment, or another item having an impact on safety. Further, various embodiments of the system **400** of the present disclosure may be employed to avoid the negative impact of an externality, such as a thunderstorm or other natural or man-made emergency.

The system **400** is described above as comprising the cord **440**, but the rope may be a cable or wire rope. The cord (e.g., rope or cable) of the system may be manufactured from any suitable material for the application. Durability and strength are key factors in determining what cord to use in any particular application. Such choices are within the scope of those knowledgeable in the art.

The system **400** is useful to hoist or lower the load **430** where the device **410** is attached to the support structure **450**. The support structure **450** may comprise a building, a wall, a fence, a vehicle, a scaffold, a power pole, or any other structure capable of support the weight of the load **430**. The support structure **450** may further comprise a device for connecting the device **410** to the support structure **450**, such as a hook or a cable connected to the support structure **450**.

Other embodiments of the system may be arranged to create a mechanical advantage. One example of a system with a mechanical advantage similar to a set-of-fours is constructed with the device, secured to a support structure, and a cord. The cord is loaded into the chamber, the cord comprising an end with a loop or an eye. The loop or eye is then placed over an end of the friction accessory. A bight of the cord, between the device and the loop or eye, is then passed through an eye or other opening of a fastener attached to the load. The bight of cord is then placed over an end of the friction accessory, similar to the loop or eye in the end of the cord. The result is an arrangement whereby the operator can use the restraining portion of the cord to hoist the load using a mechanical advantage of 2 to 1, ignoring friction.

In operation, the device and system of the present disclosure may be employed as part of a method for hoisting and/or lowering a load. FIG. **9** illustrates one embodiment of a method according to the present disclosure. The order of the various steps described below may be changed without departing from the scope of the invention.

The hoisting device is first secured to a structure. (STEP **610**). The device may be any example of a device in accordance with the present disclosure. The structure may be any structure capable of supporting the load that is being lifted, and may comprise a person. The structure may further comprise a device or feature that enables the attachment of the device to the structure, such as a hook or a harness.

The device is prepared for use by moving the front plate to an open position. (STEP **620**). In some embodiments, this step is performed by disengaging the releasable clasp and swiveling the front plate from the closed position to an open position, thereby opening the chamber and gaining general access to the sheave. Once the front plate is placed in an open position, a bight of cord may be loaded into the sheave. (STEP **630**). Once the cord is in position against the sheave, the front plate may be returned to the closed position and the releasable clasp engaged. (STEP **640**).

The method of the present disclosure further provides a step of passing the cord through the friction accessory. (STEP **650**A). The rope is placed in the friction accessory in a manner that will roughly create the desired amount of friction. In some instances, the operator may choose to wrap the cord around a portion of the friction accessory more than once, so long as the cord is still capable of moving against the friction accessory in hoisting or lowering the load.

Another step comprises attaching the cord to the load. (STEP **650**B). The step of attaching the cord to the load may include tying a knot around the load, attaching an end of the cord to a fastener, or any other method known in the art. While the steps of the method described in the present disclosure are not strictly limited by a particular order, many of the steps have a relative order that aids in the performance of the method. The respective steps of placing the rope in the friction accessory and attaching the cord to the load are particularly interchangeable, depending on the circumstances. Where the load is partially suspended prior to using this method, the method is best employed by engaging the cord with the friction accessory prior to attaching the rope to the load.

With the rope and device in place, the operator may then perform the step of hoisting or lowering the load. (STEP **660**). As explained above, the method of the present disclosure provides particular advantages when lowering a load because the friction created will tend to reduce the amount of force required to keep the load suspended from the device. Still, the method of the present disclosure does provide some advantages in hoisting a device as well. In particular, while the friction works against the operator when lifting, the friction provides the operator with some security against dropping the load and allows the operator to pause while hoisting the load without losing progress, so long as some tension is continuously placed on the cord.

It should be emphasized that the above-described embodiments of the present apparatus and process are merely possible examples of implementations and merely set forth for a clear understanding of the principles of the disclosure. Many different embodiments of the disclosure described herein may be designed and/or fabricated without departing from the spirit and scope of the disclosure. All these and other such modifications and variations are intended to be included herein within the scope of this disclosure and protected by the following claims. Therefore the scope of the disclosure is not intended to be limited except as indicated in the appended claims.

The invention claimed is:

1. A device for controlling the hoisting and/or lowering of loads through the use of friction applied to a cable, the device comprising:

a main body having a rear wall, a cylindrical post extending forwardly from the rear wall, the main body having a boss that also extends forward from the rear wall, the boss having a front surface, a height of the boss being defined from the rear wall of the main body to the front surface of the boss;

a sheave supported on the cylindrical post for rotation relative to the main body and being positioned adjacent to the boss of the main body, the sheave including a front face and a rear face, the rear face of the sheave being adjacent to the rear wall of the main body, a thickness of the sheave being defined between the front face and the rear face of the sheave, the thickness of the sheave being less than the height of the boss, the sheave also including an outer circumferential groove, the outer circumferential groove sized and configured to accommodate a portion of an outer surface of a cable, a bolt securing the sheave to the main body, the bolt being threadedly engaged with the cylindrical post of the main body;

a front plate overlaying the front face of the sheave and selectively overlaying the front surface of the boss of the main body, the front plate comprising a first opening, the bolt extending through the first opening, the bolt defining a rotational axis for the front plate, the front plate including a second opening, the second opening being defined as a slot, the slot selectively engageable by a releasable clasp, the releasable clasp being secured to the boss and being axially movable relative to the boss, a front surface of the releasable clasp defining a push-button that causes axial translation of the releasable clasp, the releasable clasp selectively restraining the front plate against rotation relative to the main body; and

a friction accessory extending away from the sheave, the friction accessory being offset from the thickness of the sheave such that, when viewed from the side, a plane defined by the rear face of the sheave does not intersect the friction accessory, the friction accessory being unitary and monolithic with the main body, the friction accessory including a gate that is pivotally secured to the main body, and the friction accessory and the gate defining an enclosed space that is configured to capture an entire diameter of at least a portion of the cable when the cable is wrapped at least one time around at least a portion of the friction accessory.

2. The device of claim 1, wherein the friction accessory extends tangentially away from the sheave.

3. The device of claim 2, wherein the friction accessory comprises a first portion that extends tangentially away from an outer circumference of the sheave, the first portion terminating at a hook-shaped end that bends back towards the sheave.

4. The device of claim 3, wherein the gate extends tangentially away from the sheave.

5. The device of claim 4, wherein the gate comprises a recess that receives a distal end of the hook-shaped end of the first portion of the friction accessory.

6. The device of claim 3, wherein a portion of the front plate is covered by a portion of the boss when the front plate is restrained against movement by the releasable clasp.

7. The device of claim 6, wherein the releasable clasp comprises a circumferential recess that, when axially aligned with the front plate, releases the front plate from engagement with the releasable clasp.

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