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Strap winding device

Abstract

A strap winding device for efficiently and easily winding up a strap such as a cargo strap after use. The strap winding device generally includes a main body which is adapted to rest upon a structure such as a trailer on a vehicle such as a truck. A mount may be connected to the main body, with the mount being removably inserted within an opening on the trailer, such as a trailer stake pocket. A winder is rotatably connected to the mount by a sleeve, with the winder being operable to rotate a reel onto which the strap may be wound. The reel includes a pair of prongs which are tapered towards each other to ease removal of the strap after winding.

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Primary Examiner: Douglas; Steven O*Attorney, Agent or Firm:* Neustel Law Offices**Background/Summary**

CROSS REFERENCE TO RELATED APPLICATIONS (1) The present application is a continuation of U.S. application Ser. No. 17/006,330 filed on Aug. 28, 2020 which issues as U.S. Pat. No. 11,479,160 on Oct. 25, 2022. Each of the aforementioned patent applications is herein incorporated by reference in their entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

(1) Not applicable to this application.

BACKGROUND**Field**

(2) Example embodiments in general relate to a strap winding device for efficiently and easily winding up a strap such as a cargo strap after use.

Related Art

(3) Any discussion of the related art throughout the specification should in no way be considered as an admission that such related art is widely known or forms part of common general knowledge in

the field.

(4) From strapping down pallets in the hold of a cargo aircraft to strapping down a mattress in the bed of a pickup truck, cargo straps have become ubiquitous with shipping and transport of a wide range of loads with a wide range of vehicles. However, cargo straps can present a dilemma after reaching the destination and unloading the cargo. One would prefer not to fumble with winding up a cargo strap after a long day of transporting cargo, particularly during or after unloading the cargo.

(5) Various methods and devices have been offered to assist with winding up a cargo strap after use. A very common method is to simply use one's hands, with the first hand gripping the strap and the other hand winding the strap out the first hand. However, it can be easy to drop or tangle the cargo strap when winding with one's hands in such a manner. Power drills can be used, but typically require a power source such as a wall outlet or a charged battery.

SUMMARY

(6) An example embodiment is directed to a strap winding device. The strap winding device includes a main body which is adapted to rest upon a structure such as a trailer on a vehicle such as a truck. A mount may be connected to the main body, with the mount being removably inserted within an opening on the trailer, such as a trailer stake pocket. A winder is rotatably connected to the mount by a sleeve, with the winder being operable to rotate a reel onto which the strap may be wound. The reel includes a pair of prongs which are tapered towards each other to ease removal of the strap after winding.

(7) There has thus been outlined, rather broadly, some of the embodiments of the strap winding device in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional embodiments of the strap winding device that will be described hereinafter and that will form the subject matter of the claims appended hereto. In this respect, before explaining at least one embodiment of the strap winding device in detail, it is to be understood that the strap winding device is not limited in its application to the details of construction or to the arrangements of the components set forth in the following description or illustrated in the drawings. The strap winding device is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) Example embodiments will become more fully understood from the detailed description given herein below and the accompanying drawings, wherein like elements are represented by like reference characters, which are given by way of illustration only and thus are not limitative of the example embodiments herein.

(2) FIG. 1 is a perspective view of a strap winding device in accordance with an example embodiment.

(3) FIG. 2 is an exploded perspective view of a strap winding device in accordance with an example embodiment.

(4) FIG. 3 is a top view of a strap winding device in accordance with an example embodiment.

(5) FIG. 4 is a bottom view of a strap winding device in accordance with an example embodiment.

(6) FIG. 5 is a side view of a strap winding device in accordance with an example embodiment.

(7) FIG. 6 is a perspective view illustrating a strap winding device aligned for insertion within a trailer of a vehicle in accordance with an example embodiment.

(8) FIG. 7 is a perspective view illustrating a strap winding device inserted within a trailer of a vehicle in accordance with an example embodiment.

(9) FIG. 8 is a perspective view illustrating a strap secured to a strap winding device in accordance with an example embodiment.

(10) FIG. 9 is a perspective view illustrating a strap being wound onto a strap winding device in accordance with an example embodiment.

(11) FIG. 10 is a perspective view illustrating a strap wound onto a strap winding device in accordance with an example embodiment.

DETAILED DESCRIPTION

A. Overview

(12) An example strap winding device **10** generally comprises a main body **20** comprising an upper end **22**, a lower end **23**, a first end **26**, and a second end **28**; a mount **30** connected to the main body **20** so as to extend downwardly with respect to the main body **20**, wherein the mount **30** is connected at or near the second end **28** of the main body **20**; a sleeve **40** connected to the main body **20** at or near the first end **26** of the main body **20**, wherein the sleeve **40** comprises an elongated opening **46**; a winder **50** rotatably connected within the elongated opening **46** of the sleeve **40**, the winder **50** being adapted to freely rotate within the elongated opening **46** of the sleeve **40**, wherein the winder **50** comprises a handle **56** adapted to rotate the winder **50**; and a reel **60** connected to the winder **50**, wherein the reel **60** comprises a first prong **62** and a second prong **66**, wherein the first prong **62** and the second prong **66** are angled towards each other, wherein the first prong **62** and the second prong **66** are each adapted to rotate when the handle **56** is rotated so as to wind a strap **18** around the first prong **62** and the second prong **66**.

(13) The main body **20** may be comprised of a rectangular plate and the sleeve **40** may be comprised of a cylindrical member. The mount **30** may be comprised of a C-channel, wherein the mount **30** is connected to the lower end **24** of the main body **20** at or near the second end **28** of the main body **20**. The mount **30** may be at a right angle with respect to the main body **20** such that the mount **30** extends perpendicularly with respect to the main body **20**.

(14) The winder **50** may comprise a bent rod. The winder **50** may comprise a main portion **52** adapted to be positioned within the elongated opening **46** of the sleeve **40** and a linkage **54** extending at a right angle with respect to the main portion **52**. The handle **56** may extend at a right angle with respect to the linkage **54**. A length of the main body **20** may be greater than a length of the mount **30**. The first prong **62** and the second prong **66** may each be comprised of a rod. The sleeve **40** may comprise a first end **42** and a second end **44**, wherein the reel **60** extends from the first end **42** of the sleeve **40** and wherein the winder **50** extends from the second end **44** of the sleeve **40**.

(15) The reel **60** may comprise a base **61**, wherein the first prong **62** and the second prong **66** each extend outwardly from the base **61**. The first prong **62** may comprise a first end **63** and a second end **64** and the second prong **66** may comprise a first end **67** and a second end **68**, wherein a first distance between the first end **63** of the first prong **62** and the first end **67** of the second prong **66** is greater than a second distance between the second end **64** of the first prong **62** and the second end **68** of the second prong **66**.

(16) Another exemplary embodiment of the strap winding device **10** may comprise a main body **20** comprising an upper end **22**, a lower end **24**, a first end **26**, and a second end **28**; a mount **30** connected to the lower end **24** of the main body **20** so as to extend downwardly from the second end **28** of the main body **20**; a sleeve **40** connected to the first end **26** of the main body **20**, wherein the sleeve **40** comprises an elongated opening **46**; a winder **50** rotatably connected within the elongated opening **46** of the sleeve **40**, the winder **50** being adapted to freely rotate within the elongated opening **46** of the sleeve **40**, wherein the winder **50** comprises a handle **56** adapted to rotate the winder **50**; and a reel **60** connected to the winder **50**, wherein the reel **60** comprises a first prong **62** and a second prong **66**, wherein the first prong **62** and the second prong **66** are angled towards each other, wherein the first prong **62** and the second prong **66** are each adapted to rotate when the handle **56** is rotated so as to wind a strap **18** around the first prong **62** and the second

prong **66**. The mount **30** and the main body **20** may be integrally formed of a unitary structure. The mount **30** may extend perpendicularly with respect to the main body **20**. The mount **30** may comprise an end member **32**, a first side member **34** connected to a first side of the end member **32**, and a second side member **36** connected to a second side of the end member **32**.

(17) Also disclosed is a method of winding a strap **18** using the strap winding device **10**, comprising the steps of: inserting the mount **30** into an opening **15** of a trailer **14** such that the main body **20** extends over the trailer **14**; inserting a distal end of the strap **18** between the first prong **62** and the second prong **66**; rotating the handle **56** so as to rotate the winder **50** and the reel **60**; and winding the strap **18** around the first prong **62** and the second prong **66** of the reel **60**. The opening **15** of the trailer **14** may comprise a trailer stake pocket.

B. Main Body, Mount, and Sleeve

(18) As shown throughout the figures, the strap winding device **10** generally comprises a main body **20** which is adapted to rest upon a surface such as a trailer **14** as shown in FIGS. 7-10. The shape and size of the main body **20** may vary in different embodiments. In the exemplary embodiment shown in FIG. 1, it can be seen that the main body **20** comprises a rectangular member such as an elongated rectangular plate. This exemplary embodiment should not be construed as limiting in scope, however, as the main body **20** could comprise a wide range of shapes.

(19) As shown in FIGS. 1 and 2, the main body **20** comprises an upper end **22**, a lower end **24**, a first end **26**, and a second end **28**. The main body **20** includes an inner edge **27** on its first end **26** which faces the operator when the strap winding device **10** is in use. The main body **20** also includes an outer edge **29** on its second end **28** which faces the trailer **14** when the strap winding device **10** is in use.

(20) Continuing to reference FIGS. 1 and 2, it can be seen that the first end **26** of the main body **20** may include a sleeve **40**. The sleeve **40** may be connected to the main body **20**, or may be integrally formed of a unitary structure therewith. The positioning of the sleeve **40** may vary in different embodiments. In the exemplary embodiment shown in the figures, the sleeve **40** is illustrated as being connected to the inner edge **27** on the first end **26** of the main body **20**. However, the positioning of the sleeve **40** on the main body **20** may vary in different embodiments. In such alternate embodiments, the sleeve **40** may be offset with respect to the inner edge **27** of the main body **20**.

(21) In such embodiments, the sleeve **40** may be connected near the first end **26** of the main body **20**, but not on the inner edge **27** of the main body **20**. By way of example, the sleeve **40** could be connected in some embodiments to the upper end **22** of the main body **20**, at or near the first end **26** of the main body **20**. In other embodiments, the sleeve **40** could be connected to the lower end **24** of the main body **20**, at or near the first end **26** of the main body **20**.

(22) As best shown in FIGS. 1, 2, and 4-10, the second end **28** of the main body **20** includes a mount **30** which is adapted to be removably secured within an opening **15** such as a stake pocket **15** of a trailer **14**. The mount **30** may be connected to the main body **20**, such as by welding, or may be integrally formed of a unitary structure with the main body **20**.

(23) The exemplary embodiment shown in the figures illustrates that the mount **30** is connected to the outer edge **29** of the main body **20** on its second end **28**. However, the positioning of the mount **30** on the main body **20** may vary in different embodiments. In such alternate embodiments, the mount **30** may be offset with respect to the outer edge **29** of the main body **20**. In such embodiments, the mount **30** may be connected near the second end **28** of the main body **20**.

(24) As shown in FIGS. 7-10, the mount **30** is utilized to secure the strap winding device **10** to the mounting point, such as the trailer **14** of a vehicle **12**. More specifically and as shown in FIGS. 7-10, the mount **30** may be utilized to secure the strap winding device **10** within an opening **15** such as a stake pocket in the trailer **14** of the vehicle **12**. While the figures illustrate the mount **30** being removably inserted within such a stake pocket in a trailer **14** of a vehicle **12** comprised of a transport truck, it should be appreciated that the mount **30** may be configured to be removably

inserted in various other types of receiver openings **15**. Further, the strap winding device **10** is not limited for use with any specific type of vehicle **12**, and thus the truck shown in the figures should not be construed as limiting, as it is merely for illustrative purposes.

(25) With reference to FIGS. **1**, **2**, and **4**, it can be seen that the mount **30** may comprise a C-channel structure having an end member **32**, a first side member **34**, and a second side member **36**. The mount **30** may thus comprise a C- or U-shaped configuration as shown in the figures, with the first and second side members **34**, **36** being parallel to each other and perpendicular with respect to the end member **32**.

(26) The manner in which the mount **30** is connected to the main body **20** may vary in different embodiments. In the exemplary embodiment shown in the figures, it can be seen that the mount **30** is connected to the main body **20** at the outer edge **29** of the main body **20**. In some embodiments, the mount **30** may be offset with respect to the outer edge **29** of the main body **20**, such as by being connected near the second end **28** of the main body **20**.

(27) In the figures, the mount **30** is illustrated as being connected to the lower end **24** of the main body **20** adjacent to the outer edge **29** of the main body **20**. In such an embodiment, the end member **32** is connected so as to extend downwardly from the second end **28** of the main body **20**, with the first and second side members **34**, **36** extending from the respective sides of the end member **32** at a perpendicular angle. Thus, the first side member **34** may extend downwardly from a point at or near a first side of the main body **20** and the second side member **36** may extend downwardly from a point at or near a second side of the main body **20**.

(28) It should be appreciated that the manner in which the mount **30** is connected to the main body **20** may vary in different embodiments. In some embodiments, the mount **30** may be connected to the main body **20** by fasteners, adhesives, or welding. In other embodiments, the mount **30** may be integrally formed of a unitary structure with the main body **20**. The end member **32**, first side member **34**, and second side member **36** may similarly be integrally formed of a unitary structure, or may be interconnected, with the first side member **34** being connected to a first side of the end member **32** and the second side member **36** being connected to a second side of the end member **32**.

(29) As shown in FIGS. **1-4**, the strap winding device **10** may include a sleeve **40** within which a winder **50** may be rotatably positioned. The sleeve **40** may comprise a cylindrical member having an elongated opening **46** such as is shown in FIG. **2**. The sleeve **40** includes a first end **42** and a second end **44**, with the opening **46** extending between the first and second ends **42**, **44** of the sleeve **40**. In alternate embodiments, the shape of the sleeve **40** may vary. For example, the sleeve **40** may comprise various cross-sectional shapes, such as triangular or square-shaped. Preferably, the sleeve **40** will comprise a circular cross-section such as shown in the figures.

(30) The sleeve **40** may be positioned at various locations on the main body **20**. In the exemplary embodiment best shown in FIGS. **1** and **2**, the sleeve **40** is illustrated as being connected to the inner edge **27** at the first end **26** of the main body **20**. In different embodiments, the sleeve **40** could be connected to the upper end **22** or the lower end **24** of the main body **20**.

(31) The manner in which the sleeve **40** is connected to the main body **20** may vary in different embodiments. The sleeve **40** may be connected by adhesives, fasteners, or welding to the main body **20**. In other embodiments, the sleeve **40** may be integrally formed of a unitary structure with the main body **20**. In some embodiments, each of the main body **20**, mount **30**, and sleeve **40** may be integrally formed of a unitary structure.

(32) The size of the sleeve **40** may also vary in different embodiments. The length of the sleeve **40** may vary depending on the width of the main body **20**. The figures illustrate an embodiment in which the sleeve **40** is the same width as the main body **20**, with the first end **42** of the sleeve **40** being flush with a first side of the main body **20** and the second end **44** of the sleeve **40** being flush with a second side of the main body **20**. However, in alternate embodiments, the sleeve **40** could be wider, or narrower, than the width of the main body **20**. Thus, the first end **42** and the second end

44 of the sleeve **40** may extend past the respective sides of the main body **20**, or may be offset inwardly from the respective sides of the main body **20**.

C. Winder and Reel

(33) As best shown in FIGS. **1-5**, the strap winding device **10** may include a winder **50** which is rotatably connected to the main body **20** such that the winder **50** may rotate with respect to the main body **20**. In the exemplary embodiment shown in FIGS. **9** and **10**, the winder **50** is illustrated as being rotatably positioned within the sleeve **40**. More specifically, the winder **50** may be rotatably positioned within the elongated opening **46** of the sleeve **40**.

(34) The winder **50** generally includes a reel **60** which is adapted to rotate with the winder **50**. The reel **60** may be connected to the winder **50** or may be integrally formed therewith. Generally, rotation of the winder **50** causes similar rotation in the reel **60** such that a strap **18** may be wound onto the reel **60** through rotation of the winder **50** as discussed herein.

(35) The winder **50** may include a handle **56** which is adapted to be grasped by a user to rotate the winder **50** within the sleeve **40**. The shape, size, and orientation of the handle **56** may vary in different embodiments. In the exemplary embodiment shown in FIGS. **1-4**, the winder **50** may comprise a main portion **52**, a linkage **54**, and a handle **56**.

(36) The main portion **52** of the winder **50** is rotatably positioned within the sleeve **40**. The main portion **52** of the winder **50** generally comprises a rotatable shaft having a circular cross-section such as shown in FIG. **2**. However, the cross-sectional shape of the main portion **52** of the winder **50** may vary in different embodiments. Further, the size of the main portion **52** of the winder **50** may vary in different embodiments. In the embodiment best shown in FIGS. **1** and **2**, the main portion **52** of the winder **50** is slightly longer in than the length of the sleeve **40**. In some embodiments, the main portion **52** of the winder **50** may be substantially longer than the length of the sleeve **40**.

(37) As shown in FIG. **2**, a linkage **54** may extend from a first end of the main portion **52** of the winder **50**. The linkage **54** may be connected to, or integrally formed with, the main portion **52** of the winder **50**. The linkage **54** may comprise a shaft having the same cross-section and size as the main portion **52** such as shown in the figures. In alternate embodiments, the linkage **54** may comprise a different cross-sectional shape than the main portion **52**.

(38) Further, the linkage **54** may comprise various sizes and should not be construed as limited by the exemplary figures. While the figures illustrate that the linkage **54** is approximately the same length as the main portion **54**, in some embodiments the linkage **54** may be longer, or shorter, than the length of the main portion **54**. The linkage **54** offsets the handle **56** from the main portion **52** which extends through the sleeve **40**, and thus offsets the handle **56** from the main body **20** to which the sleeve **40** is connected. This ensures that there is ample room for rotation.

(39) As shown in FIGS. **1-4**, the linkage **54** may extend at a right angle with respect to the main portion **52** of the winder **50**. Thus, the linkage **54** is generally perpendicular with respect to the main portion **52** from which it extends or two which it is connected. The figures illustrate an embodiment in which there is a curve between the main portion **52** and the linkage **54**. In other embodiments, a hard corner may be utilized.

(40) As best shown in FIGS. **1** and **2**, a handle **56** may extend outwardly from the linkage **54**. The handle **56** is adapted to be grasped by an operator of the strap winding device **10** when in use; with the handle **56** being rotated by hand so as to similarly cause the linkage **54** and main portion **52** to rotate in response to rotation of the handle **56**.

(41) The handle **56** may comprise a shaft having the same or similar cross-sectional shape and size as the main portion **52** and linkage **54**. Thus, as shown in FIG. **2**, each of the main portion **52**, linkage **54**, and handle **56** may comprise a shaft having a circular cross-section and each may comprise substantially the same size. In other embodiments, however, the main portion **52**, linkage **54**, and/or handle **56** may differ in size or shape. The handle **56** could be longer or shorter than the length of the main portion **52** or linkage **54**, or may comprise the same length.

(42) The handle **56** may be connected to, or integrally formed with, the linkage **54**. In some embodiments, the entire winder **50**, comprised of the main portion **52**, linkage **54**, and handle **56**, may be integrally formed of a unitary structure. In other embodiments, one or more of the main portion **52**, linkage **54**, and/or handle **56** may be discreetly interconnected rather than integrally formed, such as by welding, fasteners, or adhesives.

(43) Continuing to reference FIG. **2**, it can be seen that the handle **56** extends at a right angle with respect to the linkage **54**. Thus, in the exemplary embodiment shown in the figures, the handle **56** may be perpendicular with respect to the linkage **54**. However, in other embodiments, the angle between the handle **56** and linkage **54** may vary. In some embodiments, the handle **56** may extend diagonally with respect to the linkage **54** via obtuse or acute angles. While the figures illustrate a curve between the linkage **54** and the handle **56**, it should be appreciated that in some embodiments a hard corner may instead be utilized.

(44) The main portion **52**, linkage **54**, and handle **56** are configured so as to offset the handle **56** from the main body **20**. In the exemplary embodiment best shown in FIG. **2**, the main portion **52** and handle **56** are parallel with respect to each other and offset by the main linkage **54**, which is perpendicular to both the main portion **52** and the handle **56**. In other embodiments, different angles other than right angles may be utilized between the main portion **52** and linkage **54**, or between the linkage **54** and the handle **56**.

(45) As best shown in FIGS. **1-5**, the strap winding device **10** may include a reel **60** onto which the strap **18** may be wound and temporarily secured prior to removal from the reel **60**. The reel **60** is rotatable so as to wind the strap onto the reel **60**, with the reel **60** being rotated by rotation of the winder **50**. It should be appreciated that the reel **60** illustrated in the figures is merely for exemplary purposes, and thus should not be construed as limiting in scope with respect to size, shape, orientation, and configuration.

(46) In the exemplary embodiment best shown in FIGS. **1-5**, the reel **60** is illustrated as comprising a first prong **62** and a second prong **66** which work in concert to wind a strap **18** onto the reel **60**. Each of the first prong **62** and second prong **66** may comprise an elongated member such as a rod or shaft which extend outwardly with respect to a side of the main body **20**. In the embodiment shown in the figures, the first prong **62** and second prong **66** are each comprised of the same shape and size. However, in alternate embodiments, the first prong **62** may be comprised of a different shape or size than the second prong **66**.

(47) As best shown in FIGS. **1-5**, the prongs **62**, **66** extend outwardly from the sleeve **40** and the main body **20** of the strap winding device **10**. The prongs **62**, **66** may extend laterally from the sleeve **40** at various angles and at various orientations, and thus should not be construed as limited by the exemplary embodiments shown in the figures. The prongs **62**, **66** are interconnected (indirectly connected) with the handle **56** such that rotation of the handle **56** is operable to similarly rotate the prongs **62**, **66**.

(48) The shape, size, configuration, and orientation of the reel **60** may vary in different embodiments. In the exemplary embodiment shown in the figures, the reel **60** comprises a base **61** from which the prongs **62**, **66** extend. The manner in which the prongs **62**, **66** are connected to the base **61** may vary. By way of example, the prongs **62**, **66** could be connected by welding, fasteners, or adhesives. In other embodiments, the prongs **62**, **66** may be integrally formed of a unitary structure with the base **61**.

(49) As shown in FIGS. **1-5**, the first prong **62** includes a first end **63** and a second end **64** opposite to the first end **63**. The first end **63** of the first prong **62** is positioned near the main body **20** and sleeve **40** and the second end **64** of the first prong **62** is positioned distally with respect to the main body **20** and sleeve **40**. The size of the first prong **62** may vary in different embodiments to suit different types of straps **18**. A wider strap **18** will necessitate a longer first prong **62** while a narrower strap **18** will work with a shorter first prong **62**.

(50) The shape of the first prong **62** may vary in different embodiments to suit different types of

straps **18**. The first prong **62** may be of uniform circumference or width between its first end **63** and second end **64**, or may be tapered. The figures illustrate that the first prong **62** comprises a circular cross-section. However, in other embodiments, different shapes may be utilized for the cross-section of the first prong **62**.

(51) Continuing to reference FIGS. **1-5**, the second prong **66** includes a first end **67** and a second end **68** opposite to the first end **67**. The first end **67** of the second prong **66** is positioned near the main body **20** and sleeve **40** and the second end **68** of the second prong **66** is positioned distally with respect to the main body **20** and sleeve **40**. The size of the second prong **66** may vary in different embodiments to suit different types of straps **18**. A wider strap **18** will necessitate a longer second prong **66** while a narrower strap **18** will work with a shorter second prong **66**.

(52) The shape of the second prong **66** may vary in different embodiments to suit different types of straps **18**. The second prong **66** may be of uniform circumference or width between its first end **63** and second end **64**, or may be tapered. The figures illustrate that the first prong **62** comprises a circular cross-section. However, in other embodiments, different shapes may be utilized for the cross-section of the first prong **62**.

(53) As shown in FIGS. **1-4**, the first and second prongs **62**, **66** each extend outwardly from a base **61**. In some embodiments, the first ends **63**, **67** of the first and second prongs **62**, **66** may simply be connected to each other, such as by welding, fasteners, or adhesives. In the embodiment shown in the figures, a common base **61** is utilized from which the first and second prongs **62**, **66** each extend, with the base **61** being flush against the first end **42** of the sleeve **40**.

(54) As best shown in FIGS. **3** and **4**, the prongs **62**, **66** are preferably angled towards each other so as to assist with removal of a wound strap **18** from the reel **60** after winding the strap **18** onto the reel **60**. The respective angles of the prongs **62**, **66** may vary in different embodiments. In the exemplary embodiment shown in the figures, the first end **63** of the first prong **62** is distally spaced at a first distance from the first end **67** of the second prong **66** and the second end **64** of the first prong **62** is distally spaced at a second distance from the second end **68** of the second prong **66**, wherein the first distance is greater than the second distance such that the prongs **62**, **66** are angled towards each other as shown in the figures.

(55) Each of the prongs **62**, **66** are not parallel with respect to each other, but instead angled towards each other. The first prong **62** and second prong **66** are thus diagonally-oriented towards each other such that a slope is formed; aiding with removal of the wound strap **18** from the reel **60** after the strap **18** has been wound onto the reel **60**. This is particularly beneficial with larger straps **18**, which may become lodged or stuck onto reels **60** which are not so oriented. The angular orientation of the prongs **62**, **66** towards each other creates a sloped surface which aids in sliding the wound strap **18** off of the reel **60** after use. In some embodiments, an operator need only point both prongs **62**, **66** downwardly such that the wound strap **18** will slide off of the reel **60** without any further intervention on the part of the operator.

D. Operation of Preferred Embodiment

(56) FIGS. **6-10** illustrate the strap winding device **10** in use to wind up a cargo strap **18** onto the reel **60**. While the figures illustrate that a trailer **14** is utilized as the mounting point for the strap winding device **10**, it should be appreciated that other structures could be utilized to anchor the strap winding device **10** when winding the strap **18**. Further, the type of strap **18** illustrated should not be construed as limiting, as the reel **60** may be utilized to wind up a wide range of different types of straps **18**.

(57) The systems and methods disclosed herein are particularly useful for Conestoga trailers **14** which are common in the shipping and transport industry but generally lack a structure onto which to clamp a reeling device. The strap winding device **10** is thus configured to be removably inserted and temporarily secured within an opening on the trailer **14**, such as a stake pocket of the trailer **14**.

(58) In use, the strap winding device **10** is used after reaching a destination and removing the strap **18** from the load which the strap **18** is securing. The strap winding device **10** is first oriented and

positioned in alignment with the trailer **14** such as shown in FIG. **6**. An operator may grasp the main body **20** of the strap winding device **10**, which can serve as a gripping point for carrying the strap winding device **10**. With the main body **20** in hand, the operator may align the strap winding device **10** with the trailer **14** for use.

(59) As shown in FIG. **7**, once so aligned, the operator may secure the strap winding device **10** to the trailer **14** of the vehicle **12**. The mount **30** of the strap winding device **10** is positioned within an opening **15** on the trailer **14**, such as a trailer stake pocket as shown in the figures. The mount **30** will easily fit within the opening **15** such as shown in FIG. **7** so as to support the main body **20**, with the main body **20** being of sufficient length to pass over and outwardly from the trailer **14**. The length of the main body **20** is preferably of sufficient length that the winder **50** may be freely rotated without contacting any portion of the trailer **14** such as shown in the figures.

(60) Continuing to reference FIG. **7**, it can be seen that the strap winding device **10** is removably positioned and secured within the opening **15** of the trailer **14**. The mount **30** is configured to “catch” within the opening **15** such that only lifting the mount **30** vertically upward will remove the mount **30** from within the opening **15**. This prevents unintentional or premature expulsion of the mount **30** from within the opening **15**, particularly due to forces imparted upon the strap winding device **10** during rotation of the winder **50** and reel **60**. Thus, pushing downwardly on the main body **20**, for example, will not dislodge the mount **30** from within the opening **15**.

(61) With the mount **30** secured within the opening **15** of the trailer **14**, the strap **18** may be wound onto the reel **60**. As shown in FIG. **8**, the strap **18** is first removably secured to the reel **60** by, for example, inserting a distal end of the strap **18** between the first and second prongs **62**, **66** of the reel **60**. The strap **18** may be passed over the first prong **62** and then allowed to fall between the first and second prongs **62**, **66** as shown in FIG. **8**. With the strap **18** so positioned on the reel **60**, the strap **18** may be wound onto the reel **60**.

(62) FIG. **9** illustrates the strap **18** being wound onto the reel **60** of the strap winding device **10**, with the strap winding device **10** being secured against the trailer **14** by the mount **30** being removably positioned within the opening **15** such as a trailer stake pocket. After the strap **18** has been inserted between the prongs **62**, **66**, an operator may grasp the handle **56** of the winder **50** and rotate the handle **56** in a first direction or a second direction. It should be appreciated that the handle **56** (and winder **50**) may be rotated in either direction to wind the strap **18** onto the reel **60**. Once a direction for winding is selected, the opposite direction of rotation will unwind the strap from the reel **60**.

(63) FIG. **9** illustrates an embodiment in which the strap winding device **10** is connected to the trailer **14** by the mount **30** being inserted within the opening **15** such as a stake pocket of the trailer **14** and remaining therein during winding. The main body **20** rests upon and extends past the outer edge of the trailer **14** at a sufficient length to allow free rotation of the winder **50** without any portion of the winder **50**, such as the handle **56**, from contacting the trailer **14** or any other structure.

(64) The handle **56** is then grasped and rotated by the operator, which rotates the winder **50** within the sleeve **40** of the strap winding device **10**. Rotation of the winder **50** is operable to rotate the reel **60**, with the prongs **62**, **66** of the reel **60** rotating so as to wind the strap **18** onto the reel **60** over the pair of prongs **62**, **66**. In the exemplary embodiment shown in FIG. **9**, the winder **50** is rotated in a direction towards the trailer **14** (clockwise). However, the opposite direction of rotation can be utilized if desired, with the winder **50** instead being rotated in a direction away from the trailer **14** (counter-clockwise). In either case, the same direction of rotation is maintained so as to wind the strap **18** onto the reel **60**.

(65) FIG. **10** illustrates the strap **18** wound onto the reel **60** after the rotation of the winder **50** from FIG. **9**. As can be seen, the strap **18** may be fully wound onto the reel **60**, with the strap **60** extending around both the first and second prongs **62**, **66** in a wound-up manner. The wound strap **18** may then be removed from the reel **60**. The removal of the wound strap **18** from the reel **60** is

eased by the orientation of the prongs **62, 66**, which are angled towards each other such that the wound strap **18** may be easily pulled or dropped off of the reel **60**. The angling of the prongs **62, 66** towards each other creates a natural slope to ease the wound strap **18** off of the reel **60** after use. For example, an operator may simply point the prongs **62, 66** towards a ground surface so that the wound reel strap **18** simply falls off of the reel **60**. In other embodiments, the wound strap **18** may be pulled off of the reel **60** manually by the operator.

(66) After removal of the wound strap **18** from the reel **60**, the strap winding device **10** may be kept in the same opening **15** so as to be in position to wind further straps **18** onto the reel **60**. The same steps described above may be repeated until all straps **18** have been wound up and removed from the reel **60**. Once finished with winding all straps **18**, an operator need only grasp the main body **20** of the strap winding device **10** and lift straight upwardly so as to remove the mount **30** from the opening **15** and thus remove the strap winding device **10** from connection to the trailer **14**. The strap winding device **10** may then be carried away from transport to another location, or stored for future use, such as within the vehicle **12** to which the trailer **14** is attached.

(67) Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs.

Although methods and materials similar to or equivalent to those described herein can be used in the practice or testing of the strap winding device, suitable methods and materials are described above. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety to the extent allowed by applicable law and regulations. The strap winding device may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive. Any headings utilized within the description are for convenience only and have no legal or limiting effect.

Claims

1. A strap winding device, comprising: a main body having a first end and a second end; a mount connected to the main body, wherein the mount is connected at or near the second end of the main body; a winder rotatably connected to the mount at or near the first end of the main body, wherein the winder comprises a handle adapted to rotate the winder; and a reel connected to the winder, wherein the reel comprises a first prong and a second prong, wherein the first prong and the second prong are angled towards each other, wherein the first prong and the second prong are each adapted to rotate when the handle is rotated so as to wind a strap around the first prong and the second prong.
2. The strap winding device of claim 1, wherein the mount is comprised of a C-channel.
3. The strap winding device of claim 1, wherein the mount is at a right angle with respect to the main body such that the mount extends perpendicularly with respect to the main body.
4. The strap winding device of claim 1, wherein the winder comprises a main portion rotatably connected to the main body and a linkage extending at a right angle with respect to the main portion.
5. The strap winding device of claim 4, wherein the handle extends at a right angle with respect to the linkage.
6. The strap winding device of claim 1, wherein a length of the main body is greater than a length of the mount.
7. The strap winding device of claim 1, wherein the first prong and the second prong are each comprised of a rod.
8. The strap winding device of claim 1, wherein the reel comprises a base, wherein the first prong and the second prong each extend outwardly from the base.
9. The strap winding device of claim 1, wherein the first prong comprises an inner end and a distal

end and wherein the second prong comprises an inner end and a distal end, wherein a distance between the inner end of the first prong and the inner end of the second prong is greater than a distance between the distal end of the first prong and the distal end of the second prong.

10. A method of winding a strap using the strap winding device of claim 1, comprising the steps of: inserting a distal end of the strap between the first prong and the second prong; rotating the handle so as to rotate the winder and the reel; and winding the strap around the first prong and the second prong of the reel.

11. A strap winding device, comprising: a main body having a first end and a second end; a mount connected to the main body, wherein the mount is connected at or near the second end of the main body; a winder rotatably connected to the mount at or near the first end of the main body, wherein the winder comprises a handle adapted to rotate the winder; and a reel connected to the winder, wherein the reel comprises a base, a first prong extending from the base and a second prong extending from the base, wherein the first prong and the second prong are angled towards each other, wherein the first prong and the second prong are each adapted to rotate when the handle is rotated so as to wind a strap around the first prong and the second prong; wherein the first prong comprises an inner end and a distal end and wherein the second prong comprises an inner end and a distal end, wherein a distance between the inner end of the first prong and the inner end of the second prong is greater than a distance between the distal end of the first prong and the distal end of the second prong.

12. The strap winding device of claim 11, wherein the mount is comprised of a C-channel.

13. The strap winding device of claim 11, wherein the mount is at a right angle with respect to the main body such that the mount extends perpendicularly with respect to the main body.

14. The strap winding device of claim 11, wherein the winder comprises a main portion rotatably connected to the main body and a linkage extending at a right angle with respect to the main portion.

15. The strap winding device of claim 14, wherein the handle extends at a right angle with respect to the linkage.

16. The strap winding device of claim 11, wherein the first prong and the second prong are each comprised of a rod.

17. A method of winding a strap using the strap winding device of claim 11, comprising the steps of: inserting a distal end of the strap between the first prong and the second prong; rotating the handle so as to rotate the winder and the reel; and winding the strap around the first prong and the second prong of the reel.

18. A strap winding device, comprising: a main body having a first end and a second end; a sleeve connected to the main body at or near the first end of the main body; a winder rotatably connected to the sleeve, wherein the winder comprises a handle adapted to rotate the winder; and a reel connected to the winder, wherein the reel comprises a base, a first prong extending from the base and a second prong extending from the base, wherein the first prong and the second prong are angled towards each other, wherein the first prong and the second prong are each adapted to rotate when the handle is rotated so as to wind a strap around the first prong and the second prong; wherein the first prong comprises an inner end and a distal end and wherein the second prong comprises an inner end and a distal end, wherein a distance between the inner end of the first prong and the inner end of the second prong is greater than a distance between the distal end of the first prong and the distal end of the second prong.

19. The strap winding device of claim 18, wherein the first prong and the second prong are each comprised of a rod.

20. A method of winding a strap using the strap winding device of claim 18, comprising the steps of: inserting a distal end of the strap between the first prong and the second prong; rotating the handle so as to rotate the winder and the reel; and winding the strap around the first prong and the second prong of the reel.

