SELF-CONTAINED CABLE REEL

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ABSTRACT

A self-contained reel unit includes an outer housing having a rotary drum mounted therein. A cable is pulled into the housing and wound upon the drum. A feed screw and cable guide and support member deposits the cable uniformly across the surface of the drum. The feed screw and cable guide reverses to play out the cable as it is unwound from the drum.

4 Claims, 10 Drawing Figures
SELF-CONTAINED CABLE REEL

My invention relates to improvements in cable reels, and more particularly to a mechanically actuated reel for winding and releasing the cable. Reels, winches, windlasses, and the like, are used for winding up and playing out cables. Usually, there is an exposed shaft or drum on which the cable is wound. This may be suitable in many installations where the cable and winch are enclosed within a house, room, or other structure. However, it is not suitable if the winch is exposed under conditions where either people or things are liable to be caught into the cable as it is wound on the winch. Accordingly, there is a need for a self-contained winch which is completely enclosed and causes neither a safety nor a cleanliness hazard.

An object of my invention is to provide a self-contained cable reel device that which winds up or plays out a cable, by means of a double acting drive.

Another object of my invention is to provide a device of the character described, which is provided with an outer housing an inner revolving drum, onto which the cable is wound or played out.

Still another object is to provide a device that is designed to accommodate a screw actuated mechanism for uniformly distributing the cable in layers onto the revolving drum.

A further object of the invention is to construct a cable reel device so it may be mounted either horizontally or vertically to perform its function.

A still further object is to provide a cable reel device that is totally enclosed for safety purposes.

In keeping with an aspect of the invention, a cable actuated mechanism may be used in elevators, hoisting devices, or the like. The cable moves at a predetermined speed while in operation. As it so moves, the cable is pulled into or let out of a cylindrical housing. Inside the housing, it reels over a cable guide and support which lays the cable down in a layered orientation.

Other and further objects of my invention will become more apparent as the description proceeds, when taken in conjunction with the drawings, in which:

FIG. 1 is a fragmentary cross-sectional view of the entire assembled device;
FIG. 2 is a cross-sectional view of the device taken at the line 2—2 in FIG. 1;
FIG. 3 is a cross-section of the device taken at the line 3—3 in FIG. 1;
FIG. 4 is an end view of the cable support unit, in its relation to the cable drum;
FIG. 5 is a cross-sectional view of a cable guide and support;
FIG. 6 is a modified type of cable guide and support equipped with a plurality of rollers to guide the cable;
FIG. 7 is a perspective view of the outside of the end plate supporting the shafts with the gears mounted thereon;
FIG. 8 is a perspective view of the inside of the plate shown in FIG. 7;
FIG. 9 is a perspective view of the inside of the other end plate; and
FIG. 10 is an outside view of the plate shown in FIG. 9.

Similar reference characters indicate corresponding parts and features, throughout the several views. More particularly, the character 10 identifies a drum of cylindrical contour having spider mounting means 11 at either end thereof. A shaft 12, or in any other convenient and efficient means, passes through a bearing at the center of the spider 11. The shaft 12 is journaled on one end in a bearing 13 which is attached to an end plate 14 mounted at the end of an outer cylindrical casing 15, by means of screws 16, or the like. The other end of the shaft 12 is journaled in a bearing 17 attached to another end plate 18, which is also mounted within the outer casing 15, by means of screws 19, or in any other convenient manner.

A threaded rod, or shaft 20 is mounted parallel to the axis of the drum 10 on one end, in a bearing 21 on the plate 18, and the rod 20 extends outward beyond a cover plate 24, fastened at 25 to the casing 15. On the other end, shaft 20 is mounted in a bearing 22 on the plate 14. Obviously all bearings may be of any suitable and conventional design. The threaded rod 20 is attached to a drive gear 23. This rod 20 is actuated and revolved by means of a motor M, or any other suitable and reversible driving means.

The end of the shaft 12, which is supported by the bearing 17 on the plate 18, is equipped with a driven gear 26, in meshing alignment with the drive gear 23. In this manner, the drum motor M both drives shaft 20 and rotates the drum 10 in a direct and fixed ratio, since the peripheral surface of the driven gear 26 is rotated by the drive gear 23.

A cable guide and support unit, generally shown as 27, threadedly engages the rod 20 at 28. This unit consists of a body 29, threadedly driven by the rotation of the threaded rod 20. The body 29 (see FIG. 4), is equipped with a rolling member (such as a ball bearing) 30, or any other contact, member for engagement with the surface of the cable drum 10. The body 29 rotatably supports a pulley 31 on an axis perpendicular to said feed screws, over which the cable 32 passes as it enters or leaves the somewhat rounded, funnel shaped (FIG. 5) guide 33 on the outside of the end plate 14. The longitudinal cross section of the pulley is tangential to the surface of the drum. The guide 33 is attached to plate 14 by rivets 34.

In FIG. 6, I show a cable guide, of modified design, supporting four orthogonally mounted pulleys or rollers 35 for making contact at 36 with the cable 32 as it enters the unit.

By referring to FIG. 1, I show that end of the cable 32 may be inserted into an aperture in the drum 10 at 37. The cable 32 is wrapped and disposed in a layer around the drum 10 as shown at 39. When the rod 20 is rotated, the cable guide and support 27 guides the cable 32 in uniformly layered orientation onto the drum 10 (see FIG. 1). When the rod 20 rotates in a reversed direction, member 27 guides the cable 32, moving it from the drum 10 and outward through the guide 33.

The plates 18 and 24 are shown attached to the outer cylinder 15 and 19 and 25. Together, they provide a cover for the gears 23 and 26. In this manner the entire device is a self-contained unit. There can be no outside contact with the cable being wound on the drum 10.

Although I have shown a specific construction, many changes may be made without effecting the operativeness of the device; therefore, the claims are to be construed to cover all equivalents which fall within the spirit and the scope of my invention.

I claim:
1. A self-contained reel unit including an outer housing having a drum rotatably mounted therein, a feed screw in said housing mounted parallel to the axis of said drum, cable guide and support means mounted on a body threadedly mounted on said feed screw, said drum and feed screw being geared together to turn as a unit at a fixed ratio, entrance means for threading a cable through an end of said housing and holding said cable parallel to said feed screw and non-contiguous to said drum until wound onto said drum, said guide and support means including at least one pulley therein mounted on said body to rotate on an axis perpendicular to the longitudinal axis of said drum and said feed screw, the longitudinal cross section of said at least one pulley being tangential to the surface of said drum, and bearing means for slidingly supporting the said body on the surface of said drum.
2. The unit of claim 1 wherein said bearing surface is a ball bearing rotatably mounted in said body.
3. The unit of claim 2, wherein said entrance means comprises a rounded funnel shaped means.
4. The unit of claim 1 wherein said entrance means comprises four orthogonally mounted pulley wheels.

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