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of second upper tubular portion **68** is connected to first flange **202A** such that tubular portion **68** is connected to outlet tube **62** via the passageway of first extendable tube **220A**.

Universal winder

Pat. 9,643,814 U.S. class B65H 75/30 Int. class B65H 75/30

Inventor: Mark Charles Feffer, Annapolis, MD.

Assignee: Mark Charles Feffer, Annapolis, MD.

Many long, slender, and flexible items, such as wire, rope, string, webbing, hose, cord, etc., are used every day for a variety of purposes. These items may be wound around a spool for neat and compact storage. The systems and methods described herein provide a universal winder which may be capable of winding any such item around spools of many different sizes. As described in greater detail below, a universal winder may be a hand-held and manually operated device which may allow a user to quickly and easily wind an item around a spool.

Figure 10 is a perspective view of a winder **100** and spool **200** according to an embodiment of the invention. Figure 11 is a side elevation view of the winder **100**, and figure 12 is an overhead elevation view of the winder **100**. The winder **100** may include a handle **110** and enclosure **120**, which may be regarded as a winder **100** body. In some embodiments, the handle **110** may include a grip surface **115** which may be configured to conform to a user's hand as shown. Other embodiments may have handles **110** with different shapes or designs. The enclosure **120** may house a cord **130** wound around the base of a spindle **140**. The enclosure **120** may also house a coil spring **145**. The cord **130** may exit the enclosure through a hole **125**. The cord **130** may include a pull handle **135**, which may be pulled by a user to unwind the cord **130** against spring pressure caused by unwinding the

coil spring **145**. Unwinding the cord in this manner may spin the spindle **140**. The cord **130** may be allowed to retract in response to recoil pressure from coil spring **145**. The enclosure **120** may be attached to or integrally formed with a handle **110**. The winder **100** may also include a trigger **150**. Actuating the trigger **150** may cause friction to slow or stop the rotation of spindle **140**. In other embodiments, other devices (e.g., a button or switch) may be used in place of a trigger **150** and the location may be varied to accommodate thumb or forefinger actuation. Trigger **150** is shown in a configuration accommodating forefinger actuation, although other placements may be possible.

The spool **200** may be used for winding items, such as wire, rope, string, webbing, hose, tubing, cord, and/or any other elongated and flexible object capable of being wound. In the following discussion, string is used as an example for ease of explanation. The spool **200** may include a shaft **210** and flanges **220**. The shaft **210** may be partially or completely hollow, with an interior cavity **240** which may be shaped to fit onto the spindle **140** of the winder **100**. In the example of figure 10, the spindle **140** and cavity **240** have corresponding star-shaped patterns. However, other patterns may be possible (e.g., square, hex, Phillips-shaped, etc.). When the spool **200** is mounted on the spindle **140**, rotating the spindle **140** (e.g., by pulling the cord **130**) may cause the spindle **140**, and thus the spool **200**, to rotate.

In other embodiments, the spool **200** may be attached to the spindle **140** in some other way, for example by locking or fastening in place. In some embodiments, the shaft **210** may be open on both ends, so that the spool **200** can be rotated 180 degrees and inserted on the spindle **140** in either direc-

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