Sept. 18, 1934. J. A. ANDERSON 1,974,002

COP HOLDER

Filed Nov. 1, 1932

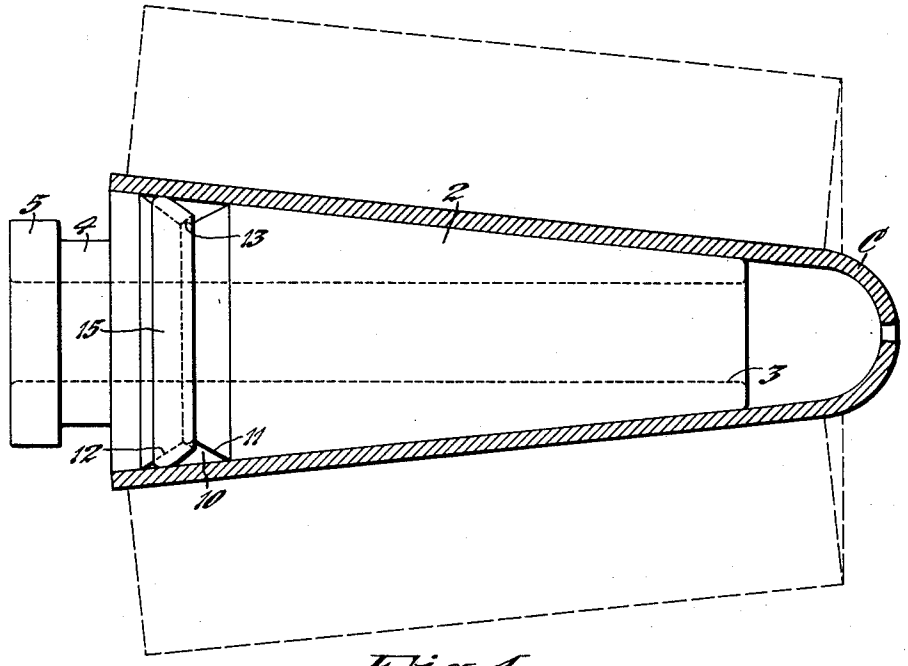


Fig. 1.

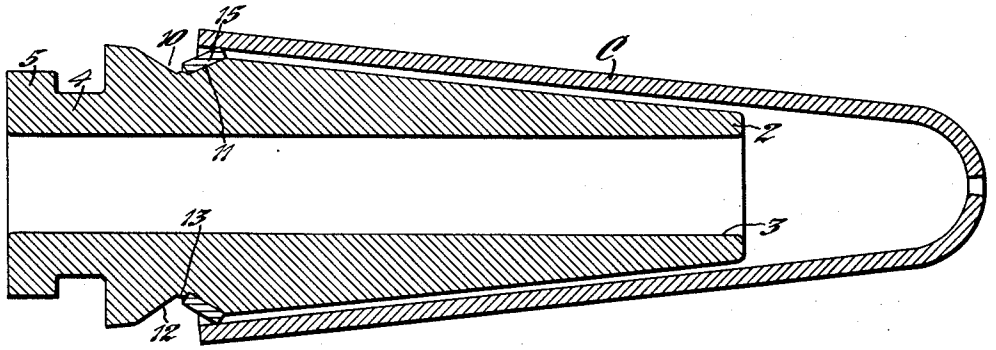


Fig. 2.

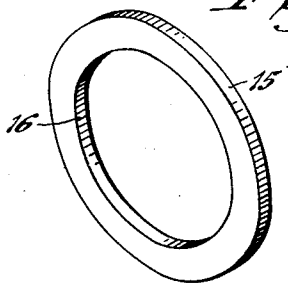


Fig. 3.

Inventor:
Johan A. Anderson
By
Watson, Coit, Morse & Grindle
Attorneys.

Patented Sept. 18, 1934 1,974,002

# UNITED STATES PATENT OFFICE

1,974,002

## COP HOLDER

Johan A. Anderson, Cranston, R. I., assignor to Universal Winding Company, Boston, Mass., a corporation of Massachusetts

Application November 1, 1932, Serial No. 640,686

8 Claims. (Cl. 242—46.3)

This invention relates to cop-holders for use on creels, winding machines and other textile apparatus for supporting packages of yarn, thread and the like.

One object of the invention is to provide a device of the type specified having means for gripping the interior of the tube on which the cop or other package is wound to secure it in place on the holder.

Another object of the invention is to provide a device of the type specified having means for automatically gripping the tube when the latter is placed thereon without requiring the manual operation of levers, dogs or other mechanical means.

Another object of the invention is to provide a device of the type specified capable of holding the cop-tube firmly and securely in place without danger of its accidental release, but adapted to release the tube to allow its removal when a strong pull is exerted thereon.

Another object of the invention is to provide a device of the type specified which is proof against derangement or getting out of order and durable in use over long periods without excessive wear or deterioration.

Another object of the invention is to provide a device of the type specified which is adapted for economical manufacture and easy assembly without the use of screws, rivets, pins or other extraneous parts.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the device, by way of example, as illustrated by the accompanying drawing. In the drawing:

Fig. 1 is a view of the improved cop-holder shown as applied to use for supporting a conical cop-tube illustrated in section;

Fig. 2 is an axial sectional view through the cop-holder illustrating the manner of applying the tube thereto; and

Fig. 3 is a perspective view of the resilient gripping means of the holder.

The present improved cop-holder comprises, in general, an axial support or mandrel adapted for the cop-tube and a resilient annulus held in a V-shaped peripheral groove thereon to adapt it to flex laterally to cause it to assume an inclined position to grip the interior of the tube when the latter is forced onto the mandrel. The resilient annulus is flexed to incline it in one direction to cause it to grip the interior of the cop-tube and flexed to incline it in the opposite direction to release the tube to permit it to be withdrawn from the holder.

Referring to the drawing, 2 designates the central support or mandrel for the cop-tube which may be constructed of metal, wood, fiber or other suitable material and preferably shaped to frusto-conical form. The mandrel 2 is usually provided with an axial bore 3 extending throughout its length to adapt it to be supported on a winding- or creel-spindle. As herein shown the base end of the mandrel is formed with a reduced neck 4 terminating in a circumferential flange 5 for engagement with a latch or detent employed to hold the mandrel in place on its spindle.

Adjacent its base end the mandrel or support 2 is provided with a V-shaped peripheral groove 10 having inclined side faces 11 and 12 disposed at an acute angle to the periphery of the mandrel. The sides 11 and 12 of the groove 10 are joined at their vertex by a raised bead or ridge 13 which, as shown in Fig. 2, is preferably semicircular in cross section.

In accordance with the present invention the gripping means for the cop-tube C takes the form of a flexible ring or annulus 15 which may be constructed of rubber or other resilient material. The elastic annulus 15, shown in detail in Fig. 3, has an opening 16 of appropriate size to adapt it to be stretched around the mandrel 2 and seated in the groove 10 under its inherent contraction. One of the lateral faces of the annulus is thus caused to lie flat against one or the other of the inclined sides 11 and 12 of the groove 10 in accordance with the direction in which the annulus is flexed.

In operation, the cop-tube C is slipped over the holder 2 and slid toward the base end thereof. As the tube C is forced in this direction its interior surface encounters the projecting lateral edge of the rim of the annulus 15 when the latter is contracted against the side 11 of the groove 10 as shown in Fig. 2. Further movement of the tube C in the direction indicated causes the annulus to be flexed to shift or rock it across the center of the groove 10 with its inner rim sliding over the raised bead or ridge 13. The annulus 15, being inherently resilient or elastic, tends to contract during its shifting movement and as it rocks across the center of the groove 10 its lateral face is snugly seated against the side 12 of the groove in the manner illustrated in Fig. 1.

The cop-tubes used on winding machines, creels and other textile apparatus are usually constructed of paper pulp, fiber or similar material with their interior surfaces somewhat rough-

ened. Therefore, when the annulus 15 is positioned against the side 12 of the groove 10 its outer projecting edge will grip the wall of the tube to secure the latter rotatively and longitudinally thereof and prevent its withdrawal from the holder 2 under ordinary conditions of use. It is to be particularly noted that with the annulus 15 gripping the tube C as shown in Fig. 1 the whole width of its flat side is frictionally engaged with the inclined face 12 of the groove 10 to resist compression of the annulus. Moreover, in this position, the annulus 15 is inclined to the inner wall of the tube C at an acute angle so that its thrust thereagainst is in a direction opposed to any force tending to withdraw the tube from its holder. Due to the peculiar and novel arrangement of the parts as above noted the tube is gripped and held much more securely than with similar devices employing resilient gripping means which are capable of radial contraction.

With the gripping means operative in the manner explained to secure the cop-tube fixedly on the holder the latter may be rotated to wind yarn or thread thereon to build a package, for example, a cone such as indicated by dash lines in Fig. 1. When the package is completed in the winding machine the tube C may be removed from the holder 2 in the manner as next explained. A strong pull is exerted on the tube C to cause the resilient annulus 15 to flex in the opposite direction from that first described to rock it across the center of the groove 10 until it comes to rest against the side 11 thereof as illustrated in Fig. 2. With the annulus 15 in this position the tube C may be withdrawn from the holder 2 and a new tube applied in the manner as previously explained.

When the holder 2 is employed as a support for cones or other packages arranged for delivering the yarn from a creel or supply-rack the resilient annulus 15 functions in the manner explained to grip the interior of the tube C to prevent it from pulling off or becoming loosened as the yarn is unwound from the package. Upon exhaustion of the yarn in the package the empty tube may be readily doffed from the holder by exerting a sharp pull thereon to cause the annulus 15 to shift its position to release its grip in the manner as previously explained.

It will be observed from the foregoing that the present invention provides an especially simple and inexpensive device for securing cop-tubes on holders or like supports, and one which is automatic in action without the use of complicated operated mechanism. In the present device the usual springs, levers, dogs or other expansible gripping elements, are dispensed with, the resilient ring or annulus 15 serving as a single gripping or securing means and being practically proof against wear, derangement or getting out of order. Moreover, the device grips and secures the cop-tube to the holder by the simple act of placing the tube thereon and when once gripped the tube is practically proof against accidental removal. At the same time, the tube may be released and removed from the holder by simply exerting a pull thereon without entailing the manipulation of levers or other mechanism and without requiring special skill or expertness on the part of the operator.

While the device is herein shown as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the structure and arrangement of its parts without departing from the spirit or scope of the invention. Therefore, without limiting myself to the precise details of construction and arrangement as herein illustrated and described, I claim:

1. A cop-holder for textile apparatus comprising a mandrel for receiving the cop-tube thereon, and a flexible annulus surrounding the periphery of the mandrel and adapted to rock laterally on a substantially fixed axis at its inner rim when its outer rim is engaged by the interior of the tube to cause it to grip the latter.

2. A cop-holder for textile apparatus comprising a mandrel for receiving the cop-tube thereon, said mandrel formed with a circumferential groove on its periphery, and a flexible annulus held in said groove to restrict its displacement at its inner rim while adapting it to be rocked laterally from one side to the other of the groove when engaged by the interior of the cop-tube to cause it to grip the latter to hold it in place on the mandrel.

3. A device of the type specified comprising a mandrel having a tapered periphery for insertion into a cop-tube or yarn-support, and a flexible annulus surrounding the periphery of the mandrel to adapt it to engage the interior of the tube to be rocked laterally to incline its whole side at an acute angle to the wall of the tube to cause it to securely grip the latter.

4. In a device of the type specified, the combination of a mandrel having a V-shaped groove on its periphery, and a flexible annulus held in said groove to adapt it to rock laterally thereacross to cause its side to seat against one or the other of the inclined walls of the groove.

5. In a device of the type specified, the combination of a mandrel having a V-shaped groove on its periphery with a raised bead at the bottom thereof, and a flexible annulus held in the groove with its interior rim surrounding the bead whereby to adapt said annulus to rock across the center of the groove to lie flat against one or the other side thereof.

6. In a device of the type specified, the combination of a mandrel having a circumferential groove on its periphery, and a flexible annulus seated in said groove, said groove shaped to restrict the lateral movement of the annulus at its inner rim while permitting it to rock from one side to the other thereof to be supported thereby in inclined position with respect to the axis of the mandrel.

7. In a device of the type specified, the combination of a mandrel having a circumferential groove on its periphery with the walls thereof inclined to each other, and a resilient annulus seated in the groove and adapted to flex to lie with its lateral face against one or the other side of the groove.

8. In a device of the type specified, the combination of a mandrel having a circumferential groove on its periphery, and a flexible annulus seated in the bottom of the groove, said groove to restrict its lateral displacement at its inner rim being of greater width than the annulus to adapt the latter to rock laterally therein to assume a position inclined to the longitudinal axis of the mandrel.

JOHAN A. ANDERSON.

# CERTIFICATE OF CORRECTION.

Patent No. 1,974,002. September 18, 1934.

JOHAN A. ANDERSON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 140 and 141, claim 8, strike out the words "to restrict its lateral displacement at its inner rim" and insert the same after "groove" first occurrence in line 140, of said claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of October, A. D. 1934.

Leslie Frazer

(Seal) Acting Commissioner of Patents.