

J. F. DUSTIN.
COP TUBE.

APPLICATION FILED MAY 21, 1909.

1,010,354.

Patented Nov. 28, 1911.

Fig. 1.

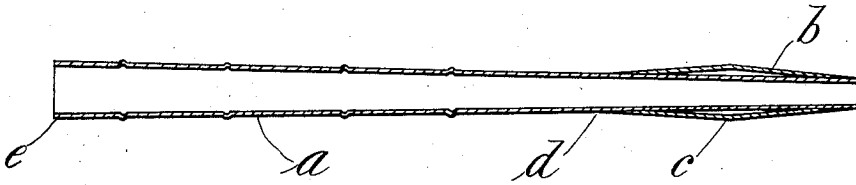


Fig. 2.

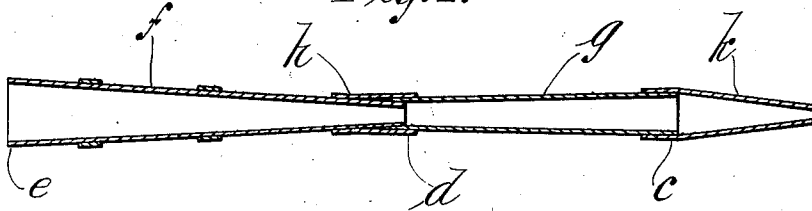
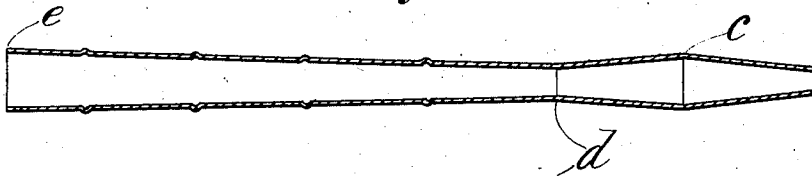


Fig. 3.



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COP-TUBE.

1,010,354.

Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed May 21, 1909. Serial No. 497,454.

To all whom it may concern:

Be it known that I, JOHN F. DUSTIN, a citizen of the United States of America, residing at Fulton, in the county of Oswego and State of New York, have invented new and useful Improvements in Cop-Tubes, of which the following is a specification.

This invention relates to cop-tubes for yarns, the object of the invention being to provide a cop so constructed that a greater quantity of yarn may be wound thereon than is possible with cops as at present generally constructed, the shape of the cop being such that incidental to the characteristic whereby a greater quantity of yarn may be wound thereon, the yarn is so supported because of the novel contour of the cop that no matter how violent may be the endwise shock imparted to the cop in the act of weaving, it will never tumble, as it is called, or overthrow at the ends. This "tumbling" or overthrow is the cause of by far the greater number of breaks in the yarn in weaving. Notwithstanding the very strong retention of the yarn in position on the cop, as set forth, there is nothing in the shape of the cop which will prevent as free a running of the yarn over the end thereof as though the cop were made in the ordinary manner with a straight taper from base to point.

The invention is clearly illustrated in the accompanying drawings, in which,—

Figure 1 is a longitudinal section of a cop embodying the invention in which the desired external contour is obtained by applying a tubular member having oppositely tapered ends to the upper end of a cop of ordinary construction. Fig. 2 is a longitudinal section of a cop having the same general external contour as that shown in Fig. 1, but made up of separate tubular sections telescopically fitted one over the other. Fig. 3 is a longitudinal section of a cop embodying the invention, but molded in one piece from some suitable plastic material.

Cops, as usually constructed, are made by winding a tube of thin paper to the proper thickness on a tapered mandrel, and the cop embodying this invention may be made by that process insofar as it is applicable thereto, or the cop may be made in whole, or in part, by a process of molding from a suitable plastic material.

The novel characteristic of the cop form-

ing the subject matter of this application lies in the construction of a cop, the exterior surface of which tapers from the base of the cop toward the center, and from the point toward the center.

In making the cop shown in Fig. 1, *a* indicates, as a whole, a cop-tube of the ordinary construction having a straight taper from the base to a point thereof, and fitted over the point of the tube is a tubular member *b* whose greatest diameter, as at *c*, is located at some distance back from the point of the tube, as shown, said tubular member tapering from the point of its greatest diameter forward to the point of the cop and back toward the base to a point indicated by *d*, for example, where it merges into the body of the cop-tube *a*.

The position of the point *d* where the end of the tubular member *b* merges into the body of the cop is immaterial, within certain limits, that is to say, it may be situated at the point shown in Fig. 1, or it may be carried back even as far as the center of the cop, as shown in Fig. 2, the material point being that in the finished cop the body shall taper from a point, as at *c*, near the upper end thereof, to some point situated preferably at or forward of the center, where the diameter shall be less than that either at the point *c* or the base *e*.

In making the tubular member *b*, as shown in Fig. 1, this may be either molded to give it the desired contour, or it may be made in the form of a cylindrical tube, and by means of a suitable device (while it is still in a plastic condition) have the center thereof at the point *c* spun outwardly in a suitable former to give it the longitudinal sectional contour shown in said Fig. 1 and when dry it may be applied to a tapered tube *a* by means of glue or any suitable adhesive.

If desired, the cop may be constructed as shown in Fig. 2, that is to say a base section *f* and an upper section *g* reversely tapered, telescopically fitted one to the other in the position shown and secured together by an adhesive; and, if desired, the joint may be encircled by a reinforcing band *h*, the conical head *k* being fitted over and glued to the larger end of the tube section *b*. This, in its general outline, provides a cop similar to that shown in Fig. 1, except that the point of smallest transverse diameter is lo-

cated more nearly at the middle of the cop than in Fig. 1; but, as explained, this is unimportant, or rather a variable position.

Fig. 3 shows a cop having the same external outline as the structure shown in Fig. 1, this cop, however, being shown as made in one piece, and it may be molded from any suitable plastic material to give it the desired external contour shown in the drawing; for example, it may be made of ordinary paper pulp, or papier mâché, or it may be made of rubber and then vulcanized to give it the proper consistency and rigidity. Another way in which this cop may be formed is to wind a tube having a straight taper from end to end, of thin paper well moistened with adhesive, and then before the tube dries, insert a proper tool into the end thereof and spin out the upper end to enlarge the diameter thereof at the point *c*, and taper the wall of the tube from this point in opposite directions, whereby the body of the tube between the point *c* and the base *e* will taper reversely to a point of intersection located preferably at or forward of the center of the cop. When a cop embodying this characteristic has yarn wound upon it, all of that part of the yarn body located forward of the point of smallest diameter, (that is the point *d*) will tend to crowd back toward this point, and all of the yarn body located between the base *e* and the point *d* will have a tendency to crowd in also toward the point *d*. Whereas, with cops as ordinarily constructed, the tendency of the yarn body is always to slide toward the point, since the body of the cop is a straight taper; and, therefore, to prevent "tumbling" or overthrowing of the yarn, it is necessary to give the ring-rail a quick traverse up to the point of the cop

and back toward the center so that the yarn shall be built thereon with a long taper, and thus resist as much as possible the tendency to tumbling. But with a cop constructed as described with a reversely tapered enlargement or head at or near the point thereof, it permits the yarn to be built up at a much more abrupt angle from the point *c* near the head back toward the center of the cop, and yet the external contour of this enlargement or head is such as not to interfere in the slightest degree with the free running of the yarn when the cop is nearly empty. Of course, this feature is one of the objections to the use of a bobbin having a head thereon to retain the yarn,—viz. that the latter will not run off freely when it gets down to within a few courses of the barrel of the bobbin. Furthermore, bobbins are very expensive and very easily damaged, so that the yarn becomes caught in slivers thereby causing great waste and annoyance.

By means of the construction shown and described herein, all of the advantages of the cop are retained and many of the advantages of the bobbin are made available.

What I claim, is:—

A built-up cop-tube comprising a tapering body portion and a double cone-shaped piece slipped onto the point portion of the body portion to produce double cone-shaped surfaces that extend in opposite directions from the meeting points of the tapering body portion and the double cone-shaped slipped on piece.

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Witnesses:

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