(No Model.)

W. DUCHEMIN.

COP.

No. 460,745. Patented Oct. 6, 1891.

FIG. 1.

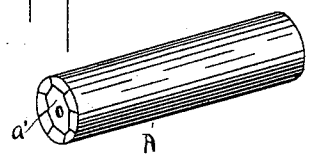


FIG. 2.

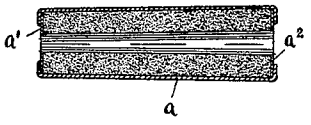
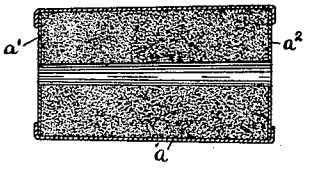


FIG. 3.

FIG. 4.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM DUCHEMIN, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HENRY W. BLAIR, OF MANCHESTER, NEW HAMPSHIRE.

COP.

SPECIFICATION forming part of Letters Patent No. 460,745, dated October 6, 1891.

Application filed August 4, 1890. Serial No. 360,958. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DUCHEMIN, residing at Newburyport, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Cops; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in cops for use in sewing-machines and looms that produce narrow fabric, and in which metal shuttles are employed; and the objects of my improvements are to provide a cop that will give out the thread from the interior in a reliable manner and that can be packed and handled for mercantile and other purposes without injuring its working qualities. I attain these objects by the mechanical construction described in the specification and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the cop. Fig. 2 is a longitudinal sectional view thereof, showing the central vent therein. Fig. 3 is an end view thereof, showing the disk in position in the case; and Fig. 4 a longitudinal view of a larger-sized cop.

Fig. 1 represents the finished cop, which is constructed as follows: It is tapering in form and wound in the manner set forth in my application for Letters Patent for a machine for winding cops, bearing even date with this and serially numbered 360,959, which method consists, briefly, as follows: The coils of thread are wound as closely together as may be without touching, except at the commencement of each layer, at which juncture they are wound more open to prevent the crowding of the end coils and thus insure even winding. The thread is prepared during the winding by passing over a roller having a felt surface, said roller being so constructed that water is introduced into the interior thereof in the proper quantity to moisten the thread just enough to soften the fiber and the original sizing or finishing preparation. This operation prepares the thread to be so compressed by winding that a slight pull will be necessary to uncoil each spiral without disarranging the others, thus insuring against the entangling of the thread by the premature disarrangement of the coils, and also rendering firmer winding and preventing in case of accidental dampness the disarrangement of the thread by the swelling of the fiber thereof.

The case a, which is intended to so strengthen the cop externally as to prevent the disarrangement of the coils by ordinary handling or packing, is tapering in form and has in its front or smaller end a disk a'. The disk a' is secured in the case a during the formation thereof, and is provided with a central hole for the exit of the thread. The case a is placed on the cop before it is removed from the winding-spindle. The rear disk a^2 is placed in position in the case a after the cop has been removed from said winding-spindle. Both disks, however, may be perforated, in which case they are placed on the winding-spindle, the thread wound between them, and the tube of the case a placed over the cop and secured to the disks a' and a^2 before the cop is removed from the spindle; but when the tube is thus placed on the cop the disks of the winding-machine must be made a trifle smaller than the disks of the case a to allow the required margin to secure the tube thereto, and the hole in the rear disk a^2 would have to be made proportionately larger to suit the taper of the spindle.

The value of the improvements reside especially in the form of the cop and case, and the fact that the thread being drawn continually from the center is prevented from coming in contact with the surface of the spirals that constitute the next layer, thus preventing their premature uncoiling and consequent entanglement, while the disks lying directly against the end coils (which are the most easily disturbed) keep them firmly in position to the end of the process of unwinding and enables the cop to be removed from the shuttle or machine at any stage of the unwinding as safely and quickly as the ordinary spools or bobbins. I have found by practical experience that they cannot be reliably used in any other form.

The cop, which may be properly termed a "cocoon-bobbin," because it is unwound from within, may be used with safety, containing

from five hundred yards of thread down in paper cases. In cops containing a greater amount the central hole in the disk would require to be protected against the action of the thread by a metal eyelet.

The advantage derived by using my cocoon-bobbins in sewing-machines is that as the thread is given out with the same freedom from beginning to end the tension of both machine and shuttle may be continuously uniform, which is a practical result that cannot be attained by the use of spools in sewing-machines or bobbins in the shuttles thereof, by reason of the decreasing of their diameters caused by the unwinding of the thread and consequent loss of leverage, which creates a gradually-increasing heavier tension. These defects I have found by practical tests are entirely remedied by the use of my cocoon-bobbin, by the use of which sewing can be done in which the stitches are two or more inches in length, as easily and perfectly as the finest stitch needed for sewing purposes.

In practice the cop is unwound from the smallest end, and as the coils have no lateral connection and the coil operated on being drawn in a direct central line when the necessary slight pull is given, the coil that is being drawn out will naturally incline in the direction of the pull and so the following coil remains untouched, and being held wedged in by the inward incline of the wall of thread formed by the succeeding layer of coils it remains intact until it is operated on by the direct action of the thread. In this manner the coils are protected against all ordinary causes for the premature loosening or breaking down thereof and perfect unwinding is assured.

It will be understood that I do not claim the cop, broadly, but simply as improved in the form and manner herein set forth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A taper cop for use in sewing-machines, having a central longitudinal vent therein of the same taper as the exterior of the cop for the exit of the thread therefrom, wound in the form and manner herein set forth, and provided with a tight-fitting case a, having the disks a' a^2 perforated, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM DUCHEMIN.

Witnesses:
L. A. CONNER, Jr.,
ARCH. M. CATLIN.