

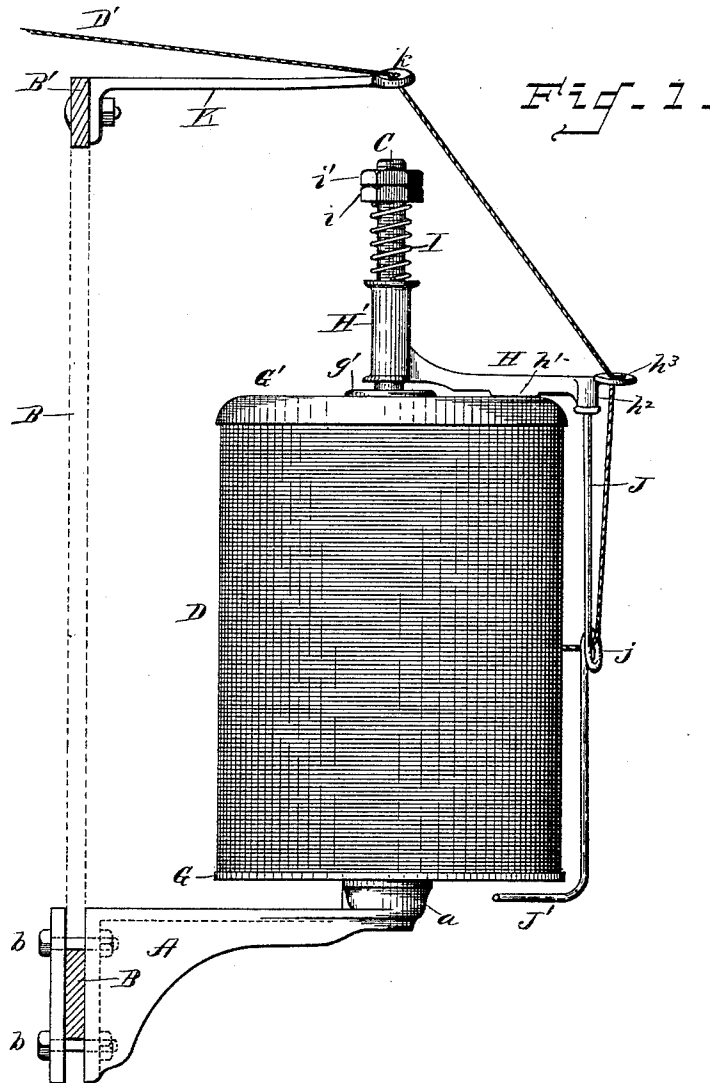
(No Model.)

2 Sheets—Sheet 1.

W. A. KIRBY & A. McKAIN.
TENSION DEVICE.

No. 450,837.

Patented Apr. 21, 1891.



Witnesses:

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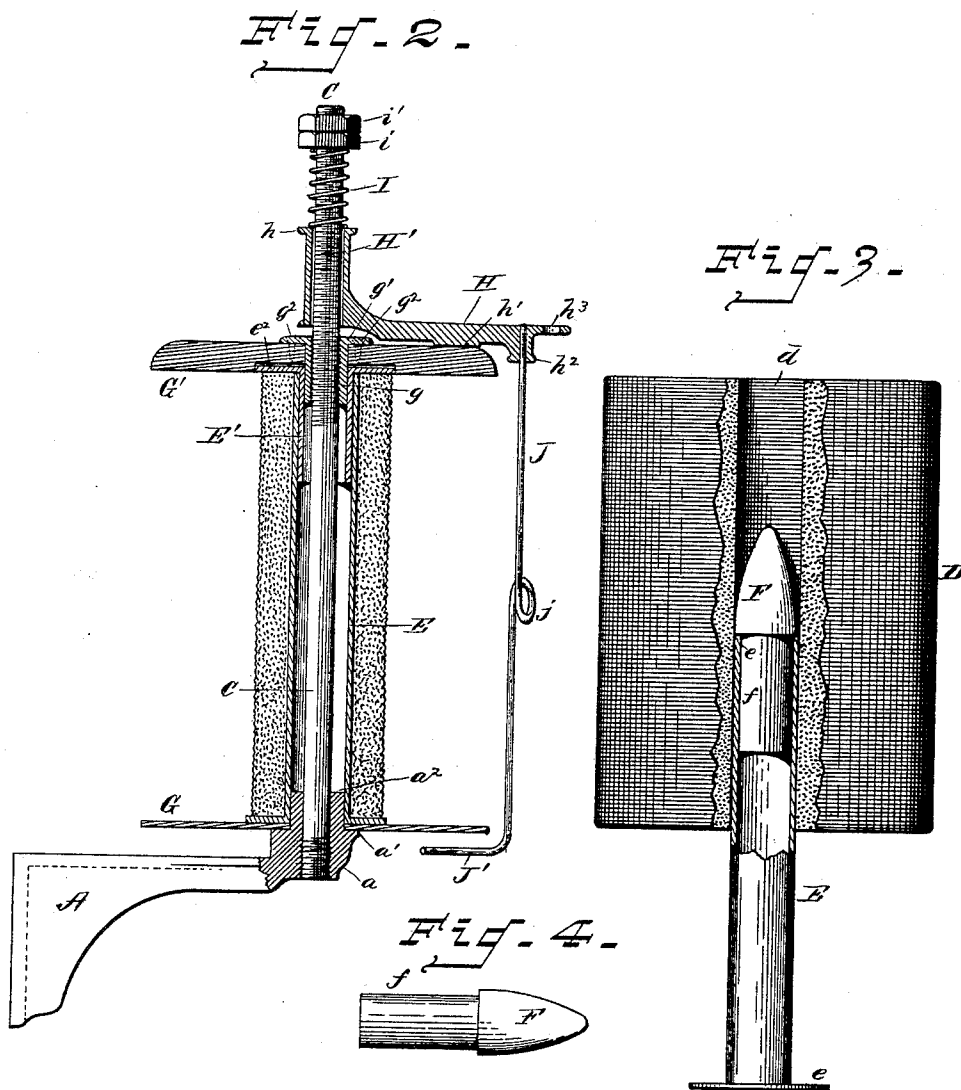
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UNITED STATES PATENT OFFICE.

WILLIAM A. KIRBY AND ALLEN MCKAIN, OF AUBURN, NEW YORK; SAID
MCKAIN ASSIGNOR TO SAID KIRBY.

TENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 450,837, dated April 21, 1891.

Application filed February 17, 1890. Serial No. 340,733. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. KIRBY and ALLEN MCKAIN, both citizens of the United States, and residents of Auburn, county of Cayuga, and State of New York, have invented a new and useful Improvement in Tension Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to means for regulating the tension upon and facilitating the unwinding of cord from balls or rolls, the object being to effect an easy and free delivery of the cord under substantially uniform tension from the outer surface of balls, rolls, &c., as they come from the factory, and thus to obviate the necessity for and the expense of rewinding the cord into balls, from which it is taken from the inner side in the ordinary manner of using it. It will be best understood from the following description and claims, reference being had to the drawings, in which—

Figure 1 represents our improved tension device in side elevation with the ball or bobbin applied. Fig. 2 represents a vertical section through the ball or roll, spool, and flier-guide arm. Fig. 3 is a side elevation, partly in section, of a ball or roll of cord and the tubular spindle or spool partly inserted therein; and Fig. 4 is a side view of the removable point, by the aid of which the tubular spindle is inserted in the ball or roll.

A indicates a bracket or suitable support for the ball and its spool and the tension device; B, a portion of a frame to which said bracket is secured, and *b b* bolts for uniting said bracket to said frame. The outer end of the bracket terminates in a hub or boss *a*, having a central screw-threaded perforation, in which is secured a pin or rod C, screw-threaded at one end to engage said hub, and also at its opposite or outer end, for a purpose which will appear. The outer end of the hub or boss *a* is cylindrical in form, and is reduced in diameter to form a shoulder at *a*, and outside thereof a stud-shaft *a*², on which the ball is journaled through its inserted central sleeve or spool.

D indicates the ball or roll of cord, wound

in the ordinary manner upon a mandrel, leaving the central longitudinal perforation (indicated at *d*) from which the mandrel has been removed, leaving the ball or roll in the usual form for market. To this ball we apply a spool or hollow sleeve E, having an annular flange *e* formed upon one of its ends and provided at its other end with a removable pointed and shouldered plug or point F, the shank *f* of which is inserted in the unflanged end *e'* of the sleeve E, and which facilitates its insertion in the ball through the central perforation in a manner indicated at Fig. 3. After the sleeve E has been thus passed into the ball or roll the plug or point F is removed, and in lieu thereof a short sleeve or part E' of a divided spool is inserted, as shown in Fig. 2, said sleeve being provided on its outer end with an annular flange *e*², the sleeve E' being made of sufficiently reduced diameter as compared with sleeve E to fit within and snugly fill the end of the latter, as shown.

G indicates a disk having a central perforation matching and fitting over the stud-shaft *a*², said disk resting on the shoulder *a'*. The ball D with the spool applied, as described, is then placed on the spindle C, and the lower flanged end of the part E fits and is adapted to turn on the stud-shaft *a*².

G' is the cap plate or disk, having a central perforation, in which is secured a short sleeve *g*, of less diameter than the sleeve E', and which passes through the disk G', fitting within the said sleeve and also fitting over the spindle C, as shown in Fig. 2. The outer end of this sleeve is provided with an annular flange *g'*, through which it is secured to the disk G by screws *g*², as shown, or in other suitable manner.

H indicates the flier-guide arm, the inner end of which is provided with a short sleeve H', fitting over and adapted to turn freely on the rod or spindle C. The sleeve H' is shown provided on its ends with peripheral ribs, the outer one *h* forming a seat for a spiral spring I, surrounding the rod or spindle C outside of or above the sleeve H', and held in place, pressing against the end of said sleeve with any required force, by means of a nut *i* and jam-nut *i'*. The arm H is provided with an inwardly-projecting lip *h'*, which rests in fric-

tional contact with the disk G' near the outer edge or periphery of the latter, as shown, and extending beyond the periphery of the disk G the arm H is provided with an inwardly-projecting boss or short sleeve or eye h^2 , within which is secured a rod or wire J , and outside of said sleeve h^2 the arm H has a cord-guide eye h^3 formed in it, through which the cord passes from the ball or roll in use. The rod or wire J referred to has one end secured in the sleeve h^2 , and extends along by the side of the roll or ball D substantially parallel therewith to its opposite end, where it is bent substantially at a right angle, its bent end J' extending under or on the inner side of the disk G in sufficiently close proximity thereto to prevent the cord when left slack from any cause from dropping off the ball and becoming entangled or caught upon some part of the machine upon which the cord is being used. Said end is, however, left free, for a purpose which will appear. The rod J is bent at or near the center of the length of the ball or roll to form a guide loop or eye j , through which the cord passes from the outer face of the ball or roll.

To a frame-bar, (indicated at B'), or, if preferred, it may be to a standard, (indicated in dotted lines in Fig. 1,) attached in any suitable manner to the bracket A , is secured an arm or bracket K , the outer end of which overhangs the outer or upper end of the rod or spindle C , and is provided in line with said rod extended, or nearly so, with a guide-eye at k , through which the cord passes in use. The disk G' is shown recessed on its inner face to receive the annular flange e^2 , set in substantially flush with said face, and the disk G may be similarly recessed to receive the flange e' , or the latter may rest directly on the inner face of the disk G , as shown.

With the parts constructed and put together, as described, the outer end of the cord of the ball or roll is released and passed through the eye j of the rod J , thence through the eye h^3 in the outer end of the flier-guide H , and out or up into line with the rod or spindle C and through the eye k to the desired point for use. The lip h' rests with a slight frictional resistance, regulated by the adjustment of the nuts i and i' on the disk G' , tending to prevent relative rotation of the arm and disk until the end of the cord (indicated at D') is drawn upon for use, when the tension upon the cord passing through the eyes j and h^3 tends to lift or move the arm H outward away from the disk G , thereby leaving the arm free to swing around the rod or spindle C , and so to unwind the cord from the outer surface of the ball or roll until the tension on the cord is removed, when the arm H instantly drops on the disk G' and further unwinding of the cord is checked. The weight of the ball when full will ordinarily be sufficient to hold it stationary, while the arm or flier-guide swings freely around, unwrapping the cord from the ball or roll; but when the size

of the ball is materially reduced, as indicated in Fig. 2, or when the diameter of the ball is reduced to the size of the heads of the spool, the ball may rotate on its spindle instead of said arm for unwinding the cord, when the arm is raised by tension on the cord, or both may rotate, one in one direction and the other in an opposite direction, governed by the frictional resistance offered by them, respectively, to such movement.

By the construction and arrangement of parts described we are enabled to use balls or rolls of cord, with the mandrel upon which they are wound removed, just as they come from the factory, using the cord from the outer side inward until all is used without waste, and thereby to obviate the necessity for and expense of rewinding the cord from the rolls or spools into balls, from which it is ordinarily used from the inner side outward, and in which, from the liability of the outer shell to collapse, there is frequently considerable loss of cord, aside from the loss of time and annoyance consequent on the entanglement of the cord. By leaving the end J' of the flier-guide rod J free or unsupported, as described, the flier-guide is left free to rise on the spindle C under the tension on the cord and so to relieve itself from friction on the disk G' .

The removable divided spool is designed to fit and snugly fill the perforation or central opening through the ball or roll and so to replace the mandrel upon which the cord was wound, and by the construction described is adapted to be readily inserted for use, so that as soon as one ball or roll is exhausted it may be quickly applied to another, and the cord can be as readily unwound therefrom as from the original mandrel, modified only by the adjustable resistance of the spring applied to its supporting-spindle, and the frictional resistance of the flier-guide to relative movement of said arm and the ball or roll.

We have shown the sleeve g secured to the spindle C by being screwed thereon; but it may be fastened thereto to be held stationary by a set-screw or in any convenient manner.

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

1. A two-part separable spool, each part of which is formed with a head, in combination with a pointed plug adapted to be applied to one part of said spool for permitting the latter to be inserted in the ball, substantially as specified.

2. The combination, in a tension device, of the divided spool adapted to be inserted in the ball of cord, the bracket having a stud-shaft on which said spool is journaled, the stationary rod or spindle secured to said bracket, and an outer disk provided with a central sleeve fitting within the spool and around the spindle and stationary on said spindle, substantially as described.

3. The stationary spindle on which the

spool and its ball or roll are journaled, screw-threaded on its outer end, in combination with the flier-guide arm provided with the collar surrounding said spindle and having the friction-lips *h'*, the spring surrounding said spindle and pressing upon said flier-guide, and the adjusting-nut on said spindle for regulating the pressure of said spring, substantially as described.

10 4. The combination, in a tension device, of the divided spool, the stationary stud on which said spool is journaled, the long spindle extending entirely through and beyond the spool, the flier-guide journaled on said spindle and provided with the guide-eye on its
15 swinging end, the pendent rod carried by said

flier-guide and having also a cord-guide eye and the inwardly-projecting lower extremity *J'*, a fixed cord-guide in line with the stationary spindle, the spring on said spindle, 20 and the nut also on said spindle for adjusting the tension of the spring, substantially as described.

In testimony whereof we have hereunto set our hands this 13th day of February, A. D. 25 1890.

WILLIAM A. KIRBY.
ALLEN McKAIN.

Witnesses:

GEORGE B. PARKS,
WALTER H. BECK.