G. N. TAYLOR.

UNWINDING DEVICE.

APPLICATION FILED MAY 31, 1911.

1,031,487. Patented July 2, 1912.

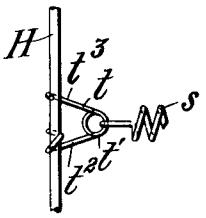

Fig. 4.

Fig. 2.

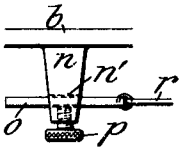

Fig. 3.

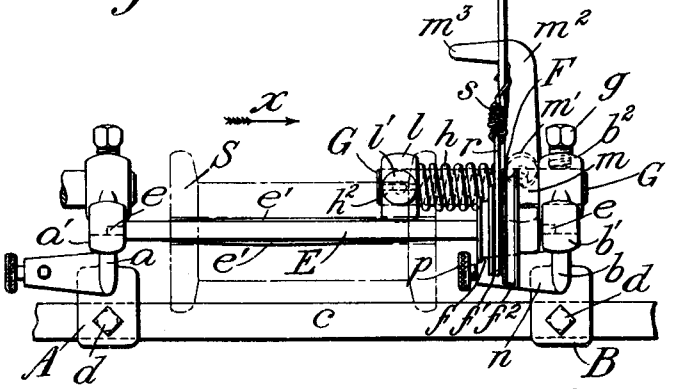

Fig. 1.

WITNESSES

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GEORGE N. TAYLOR, OF EAST PROVIDENCE, RHODE ISLAND, ASSIGNOR TO UNIVERSAL WINDING COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

UNWINDING DEVICE.

1,031,487. Specification of Letters Patent. Patented July 2, 1912.

Application filed May 31, 1911. Serial No. 630,397.

To all whom it may concern:

Be it known that I, GEORGE N. TAYLOR, a citizen of the United States, residing at East Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Unwinding Devices, of which the following is a specification.

My invention relates to unwinding devices for regulating the delivery of thread, yarn or other attenuated materials in unwinding the same from rotating supplies, such as spools, cops, bobbins, cheeses, roquets, etc.

The invention consists of improvements in the means for controlling the rotation of the spool or other supply-holder, its object being to neutralize the shock of the sudden pull on the thread in starting its delivery, and to prevent the spool from overrunning when the thread breaks or its draft is arrested; so that fine, delicate materials may be unwound at high speed without undue strain or breakage.

The invention is fully described in the following specification, illustrated by the accompanying drawings, in which:

Figure 1 is a longitudinal elevation of the device showing the spool represented by dot-and-dash lines; Fig. 2, an end elevation looking in the direction indicated by the arrow *x*, Fig. 1, with the left hand spindle-supporting arm removed; Figs. 3 and 4, detail views of the brake-band fastening devices.

Referring to Figs. 1 and 2, A and B are two brackets mounted on the horizontal rod *c* and held in position by the set-screws *d*, *d*. The brackets A and B are formed with laterally extending arms *a* and *b* at the extremities of which are socketed bearings *a'* and *b'* adapted to receive the gudgeons *e*, *e* at the ends of the spool spindle E. The spindle E is adapted to be thrust through the bore of the spool S or other supply package and is preferably constructed with splines, such as the spring wires *e'*, *e'*, etc., which frictionally engage the spool with the spindle to hold it rotatively thereon. At one end the spindle E carries a brake-wheel F fast thereon, and preferably formed as a stepped pulley to provide peripheral grooves *f*, *f'* and f^2 of different diameters for a purpose as hereinafter specified. Secured in the bearing b^2 of the bracket B is a short, horizontal rod G held by the set-screw *g*. Mounted on the rod G is a coiled spring *h* having one end extending in the arm H which I term the compensator arm. The arm H is bowed at *h'* and carries at its end a thread-guide or eye *k* through which the thread or yarn *y* leads from the spool S. The end h^2 of the spring *h* is held in a transverse bore in the collar *l* which is fastened on the rod G by a thumb-screw *l'*. Also mounted on the rod G is a collar *m* secured in position by the thumb-screw *m'*. Extending upwardly from the collar *m* is an arm m^2 formed at its end with the laterally extending finger or lug m^3. The finger m^3 is adapted to engage the compensator arm H and restrain it from swinging upward under action of its spring *h* as more fully explained hereinafter. Projecting from the side of the arm *b* is a lug *n* having a transverse bore *n'* in which is held a square rod *o* secured by the thumb-screw *p*, see Fig. 3. Secured to the end of the rod *o* is a cord or strap *r* of leather, woven or braded banding, or any other suitable material, adapted to wrap around the brake-wheel F and serving as a frictional brake-band therefor. To the opposite end of the brake-band *r* is fastened a coiled spring *s*, and the other end of the spring, in turn, is secured to the compensator arm H by a clip *t*. Referring to Fig. 4, the clip *t* is preferably formed of wire, coiled on itself to form an eye *t'*, and having two extensions or legs t^2 and t^3 for gripping the wire arm H. One leg t^2 is coiled around the arm H and the other t^3 merely hooked over the wire of the arm. The coiled portion *t'* of the clip acts as a spring, tending to force the legs t^2 and t^3 apart to bind them on the wire H and by simply pinching the legs together the gripping tendency is overcome and the clip can be slid on the arm to adjust the position of the brake-band *r* in relation to the brake-wheel F.

The operation of the whole arrangement is as follows: The collar *m* is adjusted rotatively on the rod G to bring the finger m^3 in position to hold the arm H slightly tilted from the vertical. The collar *l* is then turned on the rod G to wind up the spring *h* so that the arm H is held against the finger m^3 under tension. The amount of such tension can be regulated by winding up the spring to a greater or less extent and in this

way the resistance to the movement of the arm H can be varied as required for different varieties of material or different sizes of spools. The clip *t* is slid up or down on the arm H to regulate the extent of wrap of the brake-band *r* around the brake-wheel F according to the amount of friction required to control the rotation of the spool. The adjustment of the clip *t* along the arm H also regulates the quickness of action of the brake-band; the farther away the latter's point of connection with the arm H being from the arm's pivot the quicker the slack of the band is taken up. In other words, as the clip *t* is adjusted upwardly on the arm H the brake-band becomes more sensitive to the movement of the arm and quicker braking action is effected. The brake-band is applied to any one of the grooves *f*, *f'*, *f²*, depending on whether greater or less braking action is required for different sizes and weights of spools and the length of the band is adjusted in accordance therewith by sliding the rod *o* in its lug *n*. Preferably the rod *o* is fixed in a position such that when the arm H is back against its limiting finger m^3 the spring *s* is stretched out slightly against its tension; it being understood that the spring *h* is stronger than the spring *s*. With the elements adjusted in position as described above, the thread or yarn *y* is drawn up from the under side of the spool S, as shown in Fig. 2, and led through the thread-guide *k*. From the guide *k* the thread leads down to the winding, spooling or other machine to which it is to be delivered and when taken up thereby the device operates as follows: When the machine is started it causes a sharp pull on the yarn *y* and this sudden draft acts to depress the arm H and release the brake-band *r* from the brake-wheel F. As the arm H moves downward toward the spool the pull of the yarn on the spool will become stronger and stronger and finally, the inertia of the spool is overcome and it starts to rotate; slowly at first but with gradually accelerated speed. As the spool starts to rotate the tension of the yarn on the arm H is gradually lessened and, under influence of its spring *h*, the arm is carried upward toward the limiting finger m^3. Before it reaches the position illustrated by full lines in Fig. 2, however, the brake-band is drawn taut on the periphery of the brake-wheel and the spool is checked from running ahead to deliver its material too freely. Under normal conditions, during the delivery of the thread, the arm H assumes substantially the position illustrated by dash lines in Fig. 2 and the brake-band is so adjusted as to provide a resistance to the rotation of the spool according to the amount of tension desired on the thread. When any abnormal resistance to the delivery of the thread is encountered, however, such as the catching or snarling of the thread on the spool, the arm H will be pulled rapidly downward to release the brake-band from the brake-wheel so that the rotation of the spool is not impeded and thus, the unwinding of the thread is assisted. Should the momentum of the spool cause it to run ahead and deliver too freely the tension of the thread on the arm H will be relieved and the latter will fly back to check the rotation of the spool. It has been found, however, that the checking of the spool must not be accomplished too suddenly or it will cause an intermittent, irregular rotation liable to strain and break the thread. To provide against this the spring *s* is interposed between the end of the band *r* and the arm H, its mode of action being as follows: As the arm H swings back under action of the spring *h* it creates a sharp pull on the end of the spring *s*, but the pull on the brake-band is neutralized through the resiliency of the spring. In this way the action of the band on the brake-wheel is rendered more inductive and sudden stopping of the spool is avoided and strain on the thread prevented.

My improved device is particularly adapted for use with machines employed for winding cops or bobbins. In such machines the thread is wound on the tapered nose of the cop or bobbin, traversing up and down a conical surface from a small to a large diameter, and vice versa. It will be obvious, therefore, that the thread will have a constantly varying speed of draft as it traverses from one diameter to another and the tendency will be for it to draw from the spool in jerks. This jerky, irregular pull on the spool is prevented by the operation of the compensator arm H which is adapted to vibrate up and down with each decrease and increase in speed of draft on the yarn to compensate for the variations in the take-up of the cop. In this way the rotation of the spool is maintained at a substantially constant speed and the tension of the thread remains uniform throughout its delivery.

It is obvious that various modifications might be made in the structure and arrangement of the mechanism without departing from the spirit or scope of the invention.

Therefore, without limiting myself to the exact construction shown, what I claim is:—

1. In an unwinding device, the combination with a rotatable spool-holder, of a brake-wheel rotatable therewith, a movable compensator arm operated by the draft on the thread delivering from the spool, a brake-band engaging the brake-wheel with one end fixedly secured in relation thereto, and resilient means for securing the opposite end of the brake-band to the compensator arm.

2. In an unwinding-device, the combina-

tion with a rotatable spool-holder, of a brake-wheel rotatable therewith, a movable compensator arm operated by the tension on the delivering thread, a brake-band fixedly secured at one end and adapted to engage the brake-wheel, a spring attached to the opposite end of the brake-band, and means to attach the end of the spring to the compensator arm, said means adjustable along the arm.

3. In an unwinding-device, the combination with supporting brackets, of a rotatable spool-holder mounted in bearings on said brackets, a brake-wheel rotatable with the spool-holder, a compensator arm adapted to be operated by the delivering thread, a brake-band engaging the brake-wheel, resilient means to connect the band with the arm, and a rod connected to the end of the brake-band and adjustable longitudinally in a bearing on one of the brackets to vary the operative length of the brake-band.

4. In an unwinding-device, the combination with the spool-holder, of a brake-wheel thereon, a brake-band engaging said brake-wheel, a swinging compensator arm H, and a clip t for attaching the brake-band to the arm, said clip constructed of wire bent in a circular coil t' and extending in legs t^2, t^3, one leg t^2 coiled around the arm H and the other leg t^3 hooked over the arm in the manner and for the purpose specified.

5. In an unwinding-device, the combination with a spool-holder E, of a brake-wheel F carried thereby, a brake-band r engaging said brake-wheel, a rod G mounted adjacent the brake-wheel, a spring arm H pivoted on the rod G, and a collar m formed with a finger m^3 adapted to engage the arm to limit its swinging movement, said collar adjustable rotatably on the rod G.

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

GEORGE N. TAYLOR.

Witnesses:
ARTHUR A. ARMINGTON,
GRACE B. HOOKER.