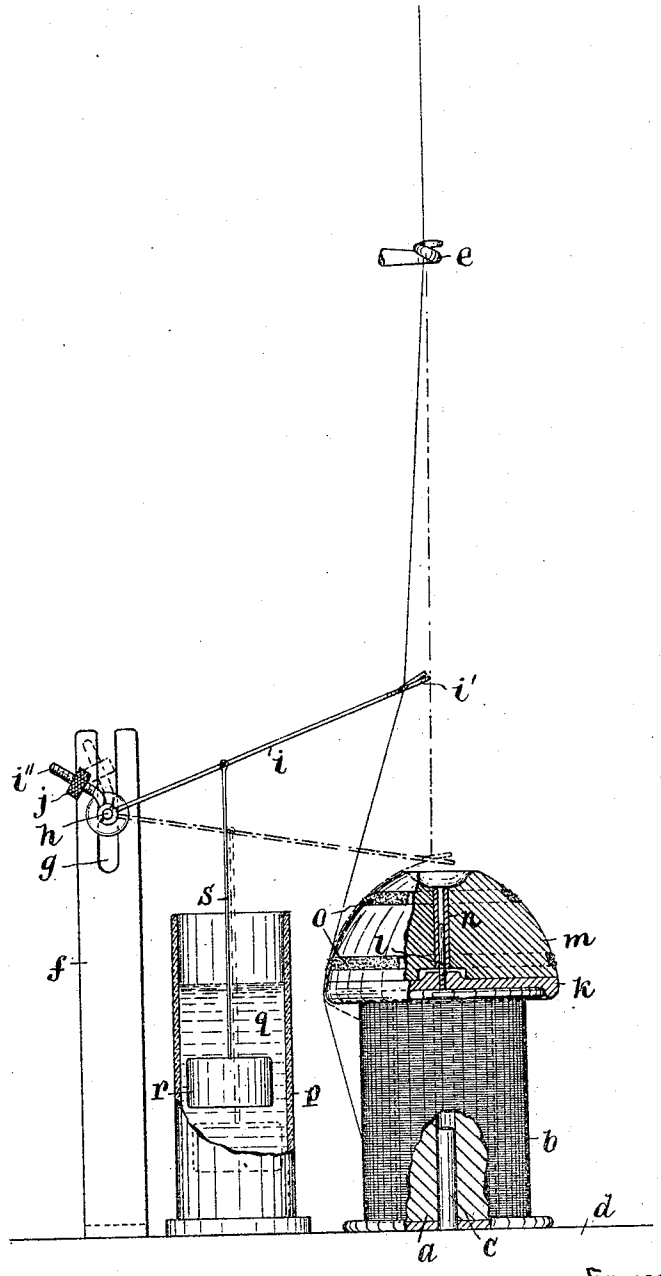
E. J. LIPPS.

TENSION DEVICE.

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WITNESS:

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TENSION DEVICE.

1,209,179. Specification of Letters Patent. Patented Dec. 19, 1916.

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To all whom it may concern:

Be it known that I, EMORY J. LIPPS, a citizen of the United States, residing in the borough of Fountain Hill, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Tension Devices, of which the following is a specification.

This invention relates to tension devices, especially for controlling threads, filaments or the like which are delivered from supply wound packages thereof in the direction of the length of the package windings, and it consists in certain novel means whereby an equable tension may be preserved on the material notwithstanding variations in the resistance opposed to the delivery of the same from the packages, due, for instance, to difference in diameter of the package as between when the delivery starts and when it has progressed more or less (involving more or less disparity in the degrees of angularity of the material around the flange or head of the spool on which the package is wound) or to the actual point of unwinding being at times near and at others remote from the end of the package which adjoins the medium exerting the draft on the material.

I accomplish the purpose in hand, in a way permitting the material to be withdrawn from the package at an exceedingly high rate of speed, by providing a guide for the material which is freely movable toward and from the package and is suitably retained in endwise relation thereto, being normally held, as by gravity, toward the package, with the result that as the resistance to the delivery of the material from the package rises or falls from any cause and tends to produce a corresponding increase or decrease in the tension of the material the guide will recede from or approach the package and by changing the degree of angularity of the material produce a resistance varying inversely to that of the primary resistance. In practice I prefer to employ in connection with the guide a cone-shaped surface over which the material is drawn between the package and guide, which latter as it falls and rises causes the extent of contact of the material and said surface to increase and decrease, respectively; this, while not indispensable, contributes very considerably to the end in view of preserving the tension of the thread uniform, regardless of the diameter of the package at any time, the proximity of the actual point of unwinding from the flange of the spool over which the material is drawn, and other conditions.

The drawing shows my invention partly in side elevation and partly in section.

a designates a bobbin, spool or other support for a wound package *b* having the coils thereof wound around and back and forth lengthwise of a common axis, the same being arranged in the present instance non-rotatively on a pin *c* upstanding from the rail *d* of a doubling or winding machine, and *e* a pigtail or other fixed guide through which the thread or filament is extended from the support *a* to a suitably rotated receiving spool or the like (not shown). On the rail *d* is arranged an upstanding bracket *f* provided with a vertical slot *g* in which is adjustably secured a pivot device *h* affording a fulcrum or pivot for the wire thread-guide *i* freely oscillatory on said pivot device in a vertical plane, its eyelet or thread-guiding portion *i'* being arranged substantially in the axis of the package *b*. The thread-guide is provided with a threaded arm *i''* on which is screwed an adjusting nut *j*.

Between the spool *a* and the thread-guide is preferably arranged a cone whose base adjoins the package and whose conical face is preferably convex. As the material is drawn from the package the primary resistance incident to its delivery therefrom fluctuates from causes hereinbefore explained, resulting in the thread guide *i* rising and falling. This in itself contributes to a certain extent to the end in view, because the change in position of the thread guide, and consequent change in the angularity of the thread, represents a certain amount of compensation for the difference in degree of the primary resistance. But I prefer to employ the cone, which affords increasing or diminishing contact to the thread as the thread-guide falls and rises, and by its frictional action preserves the resistance to the thread-advancing medium much more smooth and regular in character than it would be without the cone, especially if the cone be rounded or convex.

I do not wish to be limited to the exact construction of the cone. In the drawing it is shown as including a metal base *k*, which affords a cap for the spool *a*, and has an upstanding spindle *l*, and a body *m* of suitable material fitted onto a central sleeve *n* which is slipped over the spindle *l;* rings of felt or some other suitable material *o*

which will oppose frictional resistance to the thread are inset in the conical face of the cone in the illustrated form thereof. In the present instance parts *k* and *m* are both non-rotary.

For damping the movement of the thread-guide, I preferably employ the dash-pot controller illustrated, *p* being the cylinder thereof containing a liquid, such as oil *q*, and *r* a piston whose specific gravity about equals that of the oil, being connected with the thread guide by the wire *s*, all with the object and result of causing the movements of the thread guide, up or down, to be slow and smooth rather than quick, jerky or vibratory.

Adjustment of the device to vary the compensating action of the guide as circumstances require is accomplished by setting the pivot device *h* up or down in the slot and, if necessary, then shifting the nut *j* on the arm *i''*.

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

1. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, means, substantially alined with the package axis, to guide the thread withdrawn from the package, a tension guide for the thread having its guiding portion arranged between said means and the package and endwise of the latter and normally held toward but movable by the thread from the package, means to damp the movement of said guide, and means in which said guide is confined to move toward and from the package.

2. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, means, substantially alined with the package axis, to guide the thread withdrawn from the package, a pivoted tension guide for the thread having its guiding portion arranged between said means and the package and endwise of the latter and normally held toward but movable by the thread from the package, means to damp the movement of said guide, and means in which said guide is pivotally movable toward and from the package.

3. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, means, substantially alined with the package axis, to guide the thread withdrawn from the package, and means, adjustable substantially lengthwise of said axis and including a tension guide for the thread having its guiding portion arranged between the first-named means and the package and endwise of the latter and normally held toward but movable by the thread from the package, for controlling the tension of the thread.

4. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, means, substantially alined with the package axis, to guide the thread withdrawn from the package, and means for controlling the tension of the thread including an oscillatory guide for the thread having its guiding portion arranged between the first-named means and the package and endwise of the latter and normally held toward but movable by the thread from the package and adjustable means to control the oscillations of the guide.

5. In combination, a support for a supply wound package, means, spaced from the package, to guide the thread withdrawn therefrom, a tension device normally held bearing against the thread between and spaced from the package and said means, and a dash-pot controlling the tension device.

6. In combination, a support for a wound package having the coils thereof wound around and back and forth lengthwise of a common axis, and means, including a tension guide for the material movable toward and from and having its guiding portion arranged endwise of the package and a dash-pot controller for the guide, for controlling the tension of the material.

7. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, means, substantially alined with the package axis to guide the thread withdrawn from the package, tension means including a guide for the thread having its guiding portion arranged between said first-named means and the package and endwise of and movable toward and from the latter and a dash-pot controller for the tension means.

8. A thread tension mechanism including a thread-guide normally moving in one direction and adapted to be moved in the opposite direction by the thread and a dash-pot controller for the guide operatively connected therewith.

9. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, a guide for the material movable toward and from and having its guiding portion arranged endwise of the package, means in which said guide is confined to move toward and from the package, and a cone between the package and said guiding portion and having its base adjoining the former, the conical surface of the cone affording friction contact to the material.

10. In combination, a support for a supply wound package having the coils thereof wound around and back and forth lengthwise of a common axis, a guide for the material movable toward and from and having its guiding portion arranged endwise of the package, means in which said guide is confined to move toward and from the package, and a cone between the package and said guiding portion and having its base adjoining the former, the conical surface of the cone being convex and affording friction contact to the material.

In testimony whereof I affix my signature.

EMORY J. LIPPS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."