Improvement in Thread Measuring Apparatus.

To all whom it may concern:

Be it known that I, LEONARD F. DUNN, of Oneida Community, Oneida, in the county of Madison and State of New York, have invented certain new and useful Improvements in Apparatus for Measuring Silk and other Threads; and I do hereby declare that the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a plan, and Figs. 2 and 3 side elevations, at right angles to each other, of an apparatus constructed in accordance with my invention, the measuring devices being drawn to a scale of about three-fourths full size.

Similar letters of reference indicate corresponding parts throughout the several figures.

My improved apparatus is designed for the measuring of silk and other threads put up on spools, and is applicable either as an appendage to a spooling machine for measuring the thread as it is wound on the spool, or as a separate device for measuring by unwinding the thread from the spool. The invention consists in a combination, with the revolving spindle which carries the spool, of a friction-wheel, connected with the registering mechanism, provided with a stop for arresting the motion of the wheel when releasing it from contact with the spool; likewise a combination of devices whereby the spool-spindle and friction-wheel, driven by the thread on the spool, are automatically and simultaneously stopped, for the purpose of securing accuracy in measurement of the thread.

In the accompanying drawing, A represents a bed or top of a table or bench, on which is mounted a bed-plate, B, provided with side up-rights or cheeks C C that serve to carry the rotating spool-spindle D. This spindle has one of its ends arranged to overhang, and is constructed or fitted with a cone to allow of the spool E being slipped on or off the spindle, and to provide for the driving of the spool by the spindle when on the latter. Said spindle, when the apparatus is used in connection with a spooling-machine, is driven by belt through a loose pulley, S, and friction-clutch, F, which latter may be of any suitable construction, and is here arranged so that accordingly as the clutch is slid in one direction or the other along the spindle, the pulley S is made to establish or break frictional contact with said clutch and a fixed collar, G, of the spindle, for the purpose of starting or arresting the motion of the latter, as required. H is the friction-wheel, by which motion is communicated to the registering mechanism by contact of the body of thread on the spool with said wheel at its periphery. This wheel, the axis of which is parallel with that of the spool-spindle, may either be arranged to lie under the spool, over it, or to one side thereof, as desired, and may either be fed up automatically or separately, by hand, against the body of thread on the spool, with freedom to change its axial distance from the spool to suit different diameters of spools, and to adapt itself to varying quantities of thread on the spool. It is here shown, however, as being adjusted toward or from the spool automatically, for which purpose the spindle I, on which said wheel is secured, has its bearing b b in side arms of a swinging-frame, J, pivoted as at c, and pressed upward by a spring, K, or otherwise by a weight, to force the periphery of the wheel H against the body of thread on the spool, and to cause the wheel to adapt itself to increase or diminution in the quantity of thread on the spool. Said wheel is altogether removed from contact with the spool by means of a treads, arranged and operating by means of a spring under it to bear up on the one end of a lever, L, which, at its other end, bears down on a rod, M, that straddles a cross-bar of the frame J to hold the wheel H from contact with the spool, and against a friction-pad or stop, N, the use of which will be hereinafter explained. This release of the wheel H from contact with the thread on the spool E is its normal condition, and it is only put into frictional contact with the spool by the action of the foot of the operator on the treadle. O is the dial of the registering device, the mechanism of which is in gear with a pinion, a, on the spindle I, for communicating motion, as desired, from frictional contact of the wheel H with the body of thread on the spool, and whereby the measuring of the thread is effected. This action is the same, both when the apparatus is used in connection with a spooling-machine, by passing the thread over an ordinary traverse guide, P, Fig. 3, for laying the thread on the spool as the spindle of the latter is rotated to wind the thread on the spool; also, when the apparatus is used to measure the quantity of thread previously wound on a spool by rotating a spool-spindle to
unwind the thread from the spool through draft on the loose end of the thread, as illustrated by the dotted line x in Fig. 3. The width of the wheel H on its periphery may be varied; thus, it may be equal to the length of the body of the spool, or be much narrower, and, if desired, may have a reciprocating motion across the face of the spool to prevent the wheel's creasing or marking the final layer of silk or thread on the spool. For this latter purpose the spindle I, which carries the wheel, is represented as capable of sliding longitudinally in its bearings b b, and the pinion d is suitably elongated to remain in gear with the registering mechanism during the longitudinal movement of the spindle. Said spindle may be moved or reciprocated longitudinally either by mechanism in a positive manner, by hand, or automatically by the thread as it is wound on the spool, acting alternately against opposite edges of the periphery of the wheel, accordingly as the thread is wound to the right or to the left in successive layers on the spool.

To secure accuracy of measurement it is important, when the apparatus is applied to a spooling-machine, that, simultaneous with the stoppage of the winding of the thread on the spool, or as the spool ceases to revolve, the wheel H should not only be moved away from the spool, but its momentum be instantaneously arrested; also, that when starting the apparatus there should be no winding take place on the spool till the wheel H is in contact with the body thereof. For these purposes the stopping and starting of the spool-

spindle is made automatic with the setting of the wheel H up to or from the spool, by connecting the bell-cranked lever R, which operates the friction-clutch F, with the lever L that serves to move the wheel away from the spool, and the friction-pad or stop N serves to instantaneously arrest the momentum of the wheel H, and to hold it from turning when moved away from the spool. What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the stop N with the friction-wheel H, a movable frame carrying said wheel, subject to control by a weight or spring, as described, the spool-spindle D, and registering mechanism set in motion by the friction-wheel, essentially as herein set forth.

2. The combination with the lever L, which serves to control the contact of the wheel H with the spool, of the clutch-operating lever R, the friction-clutch F, and loose pulley S on the spool-spindle, whereby an automatic and synchronous action is obtained for the spool and friction-wheel H, substantially as specified.

3. The combination, with the spool-spindle D, of the friction-wheel H, hung so as to be self-adjusting toward or from the spool, when said wheel or its shaft I is arranged to reciprocate in direction of the length of their axes, essentially as described.

Witnesses:

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