

J. W. WEST.
CONTROLLING DEVICE FOR WINDING MACHINES.
APPLICATION FILED MAY 19, 1911.

1,030,147.

Patented June 18, 1912.

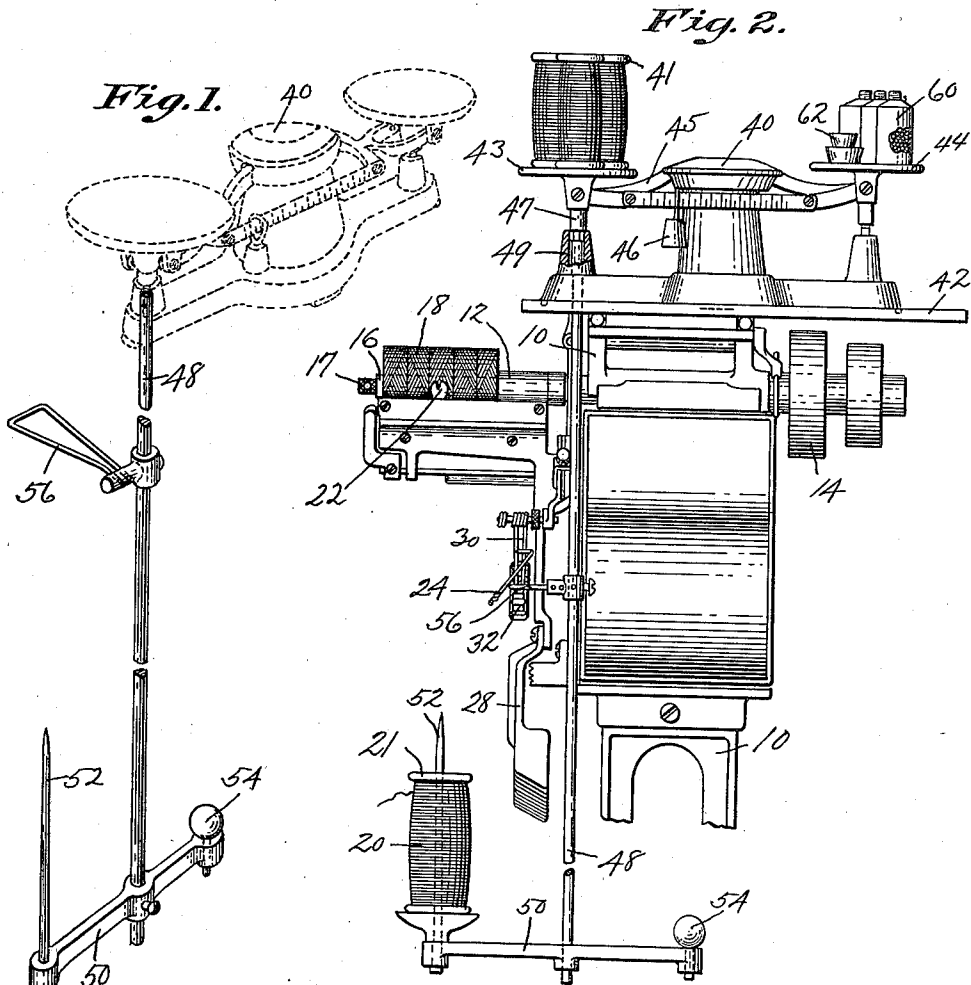
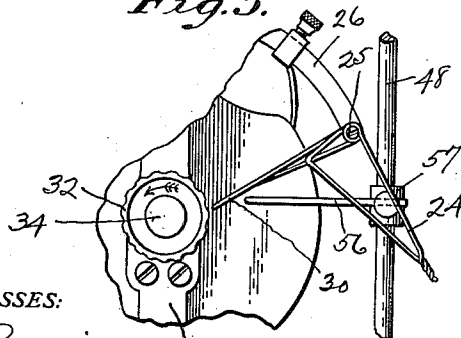


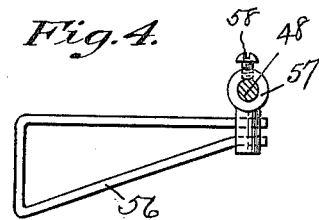
Fig. 3.



WITNESSES:

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Fig. 4.



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CONTROLLING DEVICE FOR WINDING-MACHINES.

1,030,147.

Specification of Letters Patent.

Patented June 18, 1912.

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To all whom it may concern:

Be it known that I, JOHN W. WEST, of Braintree, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Controlling Devices for Winding-Machines, of which the following is a specification.

This invention relates to a device for accurately determining the amount of thread which is wound upon a holder and stopping the winding operation when the required amount of thread has been wound thereon.

The object of the invention is to provide a device which is applicable to a thread winding machine to automatically stop the winding operation when a predetermined amount of thread has been wound upon a holder, such as a tube or spool.

Heretofore it has been practically impossible to accurately measure the amount of thread wound upon large spools or tubes, such for example, as those containing 12,000 yards, by means of the devices commonly employed. When tension devices are employed to measure the thread, they are usually inaccurate owing to changes in atmospheric conditions, or variations in the surface of the thread, or variations in the tightness with which the thread is wound. The variations in the lengths of thread which are thus wound upon the holders often amounts to several hundred yards. It is to overcome this difficulty that the present invention is primarily intended. The winding operation is preferably stopped by stopping the machine, but other ways of stopping the winding operation will readily suggest themselves, the primary purpose being to accurately determine when a predetermined amount of thread has been wound on the holder, and then to stop any further winding of thread thereon.

The invention will be clearly understood from an inspection of the accompanying drawing in which,

Figure 1 is a perspective view showing one embodiment of the invention, Fig. 2 is a side elevation of the invention applied to a so-called "Universal" winding machine, Fig. 3 is a fragmentary view, on an enlarged scale, of the tripping mechanism, and Fig. 4 is a detail view.

The present embodiment of the invention is shown as applied to the well known "Universal" winding machine, which is

illustrated and described in the patent granted to S. W. Wardwell, No. 801,941, dated Oct. 17, 1905, but it should be understood that the invention is also readily applicable to other styles of winding machines.

As illustrated, the winding machine comprises a frame 10, having a winding spindle 12, driven by a pulley 14. The thread holder 16, which may be a tube or a spool, is held on the winding spindle by a nut 17, and upon this holder the cylindrical mass of thread 18 is wound from the supply 20 on the reel 21. The thread passes from the supply 20 to the reciprocating guide 22 over a finger, which is not shown, but is attached to the wire lever 24. The lever 24 is fulcrumed at 25 on a sector 26 of a stop-motion device carried by swinging traverse frame 28. The lever 24 is adapted to be operated by an actuator, and in the present embodiment is formed with a leg 30 composed of a loop of wire, the inner end of which hangs adjacent to the corrugated rim of a wheel or disk 32 carried by a cam-shaft 34 and rotating in the direction indicated by the arrow. The operation of this portion of the machine is the same as that of the patent mentioned above.

In order to accurately control the stopping of the winding operation when a predetermined amount of thread is wound on the holder, I provide means for holding a supply of thread, more than sufficient to fill a holder, which supply of thread is arranged to be balanced. This supply may be divided into two portions, one a storage portion and the other the portion from which the thread is drawn during the winding operation. The means for balancing this supply of thread comprises one or more separately removable, like, net thread weights, each thread weight being equal to the weight of thread which it is desired to wind upon a holder, and adjustable weights in addition to the thread weights, all acting accumulatively to balance the supply. After the thread supply is balanced by the combined net thread weights and adjustable weights, one thread weight, equal to the weight of the thread which is to be wound upon the holder, is removed from the balance. The thread is then wound upon the holder until the predetermined amount is wound thereon. Means are provided under the control of the balancing device for controlling the

operation of a stop-motion device, whereby the winding operation may be automatically stopped. When the predetermined amount of thread has been wound upon the holder, and consequently removed from the supply, the balance is again restored, and the stop-motion device is actuated to stop the winding operation.

A convenient form of balancing device is shown in the drawing, although it is to be understood that the invention is not limited thereto. As shown, the balancing device comprises a pair of scales 40, mounted upon a suitable support or shelf 42 on the top of the machine. In the present instance the scales are composed of pans 43, 44, at the ends of a beam 45, and a sliding weight 46. Below the pan 43 is a boss 47 to which a depending rod 48 is secured, which passes through the boss 49 of the base of the scales, and to the lower end of said rod a support 50 is secured. This support comprises a bar upon one arm of which a spindle 52 is mounted to hold the reel 21, and the other arm of the bar is provided with a weight 54, which counterbalances the weight on the first mentioned arm and thus causes the rod to hang vertically. Attached to the rod 48 in proximity to the leg 30 of the lever 24 is an arm 56 composed of a wire loop carried by a boss 57 held upon the rod by a set screw 58.

The pan 43 is adapted to hold a supply of thread, which may be on reels 41, similar to the reel 21, and these reels 41 and 21 together with the thread thereon are balanced by the weights in the pan 44 and the sliding weight 46. The balancing weight for the thread supply consists of one or more thread weights 60, which may be supplemented by one or more ordinary iron weights 62 and the sliding weight 46 to accurately balance the device, so that the scales will balance and the boss 47 on the under side of the scale pan 43 will be raised out of contact with the top of the boss 49. The iron weights 62 and the sliding weight 46 constitute the adjustable weights which balance the weight of the supports for the thread, the reels, and the surplus or residual thread, over and above what is to be wound upon the holders, as represented by the net thread weights 60.

A convenient form of thread weight consists of a cam containing shot, the whole weighing an amount equal to the weight of the mass of thread 18 which is to be wound upon the holder 16 for a full holder, say for example 12,000 yards. This may conveniently be determined as follows: A length of thread, say 120 yards of the kind about to be wound, is accurately measured on a measuring machine, and this thread is then weighed, and the amount thereof multiplied by one hundred. Then the cans are filled

with shot so that the weight of the can plus the shot equals the weight of 12,000 yards of thread.

When the winding operation is to be commenced, a thread weight 60 is removed from the scale pan 44, whereupon the boss 47 is lowered into contact with the boss 49, and the arm 56 on the rod 48 is lowered to allow the leg 30 of the lever 24 to be free from the wheel 32. A holder 16 is then secured to the winding spindle 12, and the thread secured thereto. The machine is then started up and when running the parts are in the position shown in Fig. 3. When the predetermined amount of thread has been wound upon the holder 16, and consequently drawn off from the supply supported by the balancing device, the balance is again restored and the scale pan 43 rises, and with it the rod 48 and the arm 56. The arm 56 engages the lever leg 30 and carries the extremity of the leg into engagement with the wheel 32, and the rotation of the latter moves the lever 24 bodily upward, raising the sector 26 and operating the stop-motion device to stop the machine, as set forth in said patent.

The present embodiment is adapted to be applied bodily to the so called "Universal" winding machine without changing its construction or the mode of operation of its other instrumentalities.

With the present invention it is necessary to start the winding operation with a supply of thread on the balancing device equal to or greater than the amount which is to be wound upon the holder. With the apparatus shown, the weight of thread wound upon the holder can be determined within a small fraction of an ounce, so that the variation of a number of tubes of thread of a given grade is practically nothing.

While I have illustrated and described one embodiment of my invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction shown and described, but

What I claim is:—

1. The combination with a winding machine having means for winding thread upon a holder, a stop-motion device for stopping the machine comprising an actuator and a controlling lever for the stop-motion adapted to be brought into engagement with said actuator to operate the stop-motion, of a weight-controlled device having an arm adapted to engage said lever when a predetermined weight of thread has been wound upon the holder, to bring said lever into engagement with said actuator.

2. The combination with a winding machine having means for winding thread upon a holder, a stop-motion device for

stopping the machine comprising a rotating actuator and a controlling lever for the stop-motion adapted to be brought into engagement with said actuator to operate the stop-motion, of a weight-controlled device having an arm adapted to engage said lever when a predetermined weight of thread has been wound upon the holder, to bring said lever into engagement with said rotating actuator.

3. The combination with a winding machine having means for winding thread upon a holder, a stop-motion device for stopping the machine comprising a disk having a corrugated rim and a lever adapted to be brought into engagement with said rim to operate the stop-motion, of a weight-controlled device having an arm adapted to engage said lever when a predetermined weight of thread has been wound upon the holder, to operate said stop-motion device.

4. The combination with a winding machine having means for winding a supply of thread upon a holder, and a stop-motion device for stopping the machine, of a balancing device comprising a pair of scale pans, a rod depending from one of said scale pans and provided with a support for a supply of thread, an arm on said rod adapted to cooperate with said stop-motion

device, and means for counterbalancing the balancing device including one or more thread weights supported by the other scale pan, each thread weight being equal to the weight of thread to be wound on the holder, said arm being arranged to operate the stop-motion device when a predetermined amount of thread has been wound on the holder.

5. The combination with a winding machine having means for winding thread upon a holder, and a stop-motion device for stopping the machine, of a balancing device comprising a balancing beam, a rod depending from one end portion of said beam and provided with a support for a supply of thread, means arranged on said rod to control the operation of said stop-motion device, and means for counterbalancing the balancing device including a plurality of separately removable thread weights supported by the other end portion of the beam, each thread weight being equal to the weight of the thread to be wound on the holder.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN W. WEST.

Witnesses:

GROSVENOR CALKINS,
WILLIAM J. SPERL.