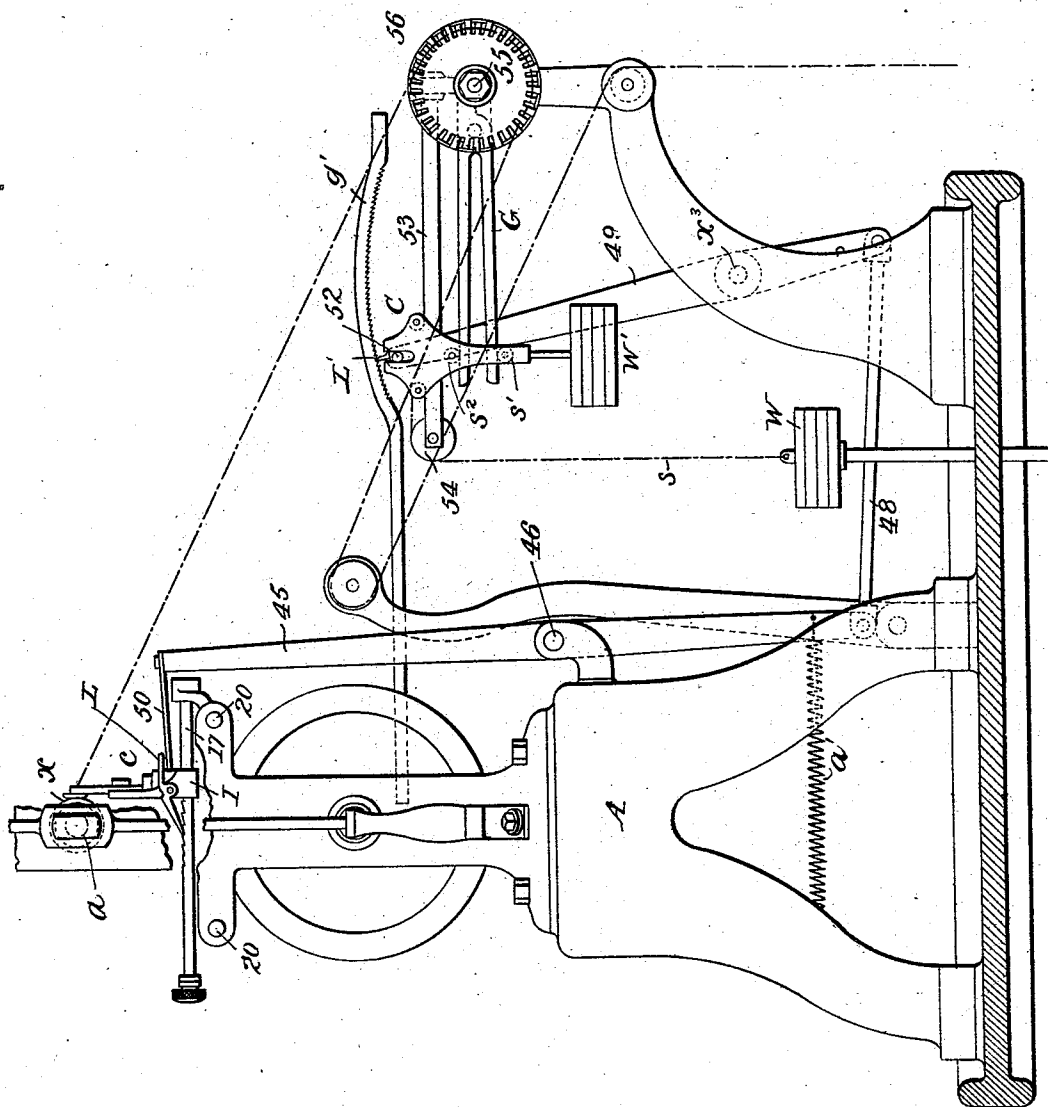


(No Model.)

S. W. WARDWELL, Jr.
THREAD WINDING MACHINE.

No. 531,081.

Patented Dec. 18, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
UNIVERSAL WINDING COMPANY, OF PORTLAND, MAINE.

THREAD-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,081, dated December 18, 1894.

Application filed March 7, 1894. Serial No. 502,775. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Thread-Winding Machines, of which the following is a specification.

My invention relates to that class of winding machines in which a cord or thread is laid upon a spool or bobbin or tube by a reciprocating guide that is moved outward as the cop increases in size; and my invention consists in combining with a guide so arranged and operating certain devices which will permit its free outward movement while preventing a return movement during the winding operations whereby the sure formation of a regular cop, notwithstanding irregularities in the forms of the cop tubes or bobbins.

In the accompanying drawing the figure represents in elevation sufficient of a cop winding machine and its adjuncts to illustrate an embodiment of my invention.

The winding machine of any suitable character is provided with a frame A, supporting a cop holder or shaft a , with means for imparting rotation to the latter, the said holder or shaft being constructed to support the cop tube x . Parallel to the axis of the shaft a travels the thread guides c , to which the thread passes from a tension wheel 56, upon a shaft 55, combined with suitable tension devices. As shown, there is a friction brake consisting of the jaws of tongs G, which clasp the shaft and which extend between two rollers s' , s^2 , the lower roller s' upon a carriage C and the roller s^2 upon a link carried with said carriage and supporting a weight W' . The carriage runs upon a track 53, and as the carriage is moved outward to carry the weight w' nearer the outer ends of the handles of the tongs the weight acts with greater effect and increases the frictional resistance to the movement of the tension wheel 56. A swinging frame 45, pivoted at 46, to the frame A, has an upper cross bar or plate 50 which bears upon the carriage of the guide c , so that as the said carriage is moved backward the frame 45 will swing backward at the top and forward at the bottom thereby drawing for-

ward a rod 48, and the lower end of a lever 49, pivoted at x^3 , and carrying a lug 52, which enters a slot in the carriage C and thereby carries the latter toward the pivot of the tongs. A weight W is connected to a cord s , passing over a pulley 54 and attached to the carriage C, and tends to move the latter forward.

The parts above described are substantially those illustrated in Letters Patent granted to me October 17, 1892, No. 506,959, and operates as set forth in said Letters Patent in such manner that as the cop increases in size and forces back the carriage c , the carriage C is moved toward the pivot of the tongs and reduces the frictional resistance to the movement of the wheel 56 and consequently regularly decreases the tension upon the thread as the cop increases in size.

I have found it extremely difficult to procure cop tubes or spools for bobbins of uniformly cylindrical character. As a general thing the said tubes made of paper, are apt to be flattened at the ends or center or with irregular projections or recesses so that in winding the cops thereon in connection with a guide c , which is pressed continually toward the tube the guide has both a back and forth, as well as a lateral motion and the strain upon the thread is tightened and relaxed and the foundation layers of the cop are irregularly laid resulting in a cop of irregular formation throughout. To overcome these defects without the necessity of molding the cop tubes to an absolutely cylindrical shape I provide means for permitting the guide to be brought against the lowest portion of the cop tube in starting operations and for permitting it to move gradually outward as the cop increases in size, but for preventing it from moving inward toward the cop tube after it has been moved outward in the process of building up the cop. It therefore results that as the guide travels along the face of the cop tube it will be carried out to an extent proportioned to the greatest diameter of the tube at any point and will thereafter move back and forth in a straight line parallel to the axis of the tube without moving inward and moving outward only as the increase in the size of the cop forces it back.

Any suitable means may be employed for

permitting the backward movement of the guide while preventing it from moving forward. Thus, the carriage I of the guide, which moves back and forth upon the rods 17, which have a lateral motion upon the rods 20, may be provided with a pawl L, the end of which will engage a ratchet upon one of the rods 17. The engaging end of the pawl may be lifted by pressing upon the outer end when the weight W, acting through the parts c, 49, 48, 45 and 50, will force the guide c, against the cop tube. After removing the finger from the pawl it will drop and engage the ratchet, and as the guide moves along the cop tube any projection upon the latter will force the guide back, and the pawl will prevent it from moving forward. The cord will thus be laid upon the irregular cop tube and while the first two layers will be somewhat irregular the cop will soon assume a perfectly cylindrical exterior shape and will be wound throughout the greatest portion of its mass with absolute uniformity.

The devices for limiting the inward movement of the guide may be differently arranged to control any of the parts connected with the guide. Thus, the pawl L' may be carried at the end of the lever 49 and engage a curved rack upon an arm g' extending from the frame of the machine.

While I have shown my invention in connection with parts of a winding machine substantially that of the character illustrated in my aforesaid patent, I do not limit myself to the particular construction of winding device shown, nor to any special form of engaging devices for preventing the inward movement of the guide.

I claim as my invention—

1. The combination in a winding machine of a cop holder, a guide movable to and from the axis of said holder, means to reciprocate the guide longitudinally of the axis, and means for preventing the inward movement of the guide after it is moved outward by, and during the formation of, the cop, substantially as set forth.

2. The combination in a cop winding machine, of a cop tube holder, a thread guide and means for reciprocating it opposite to said holder, and devices for carrying the guide against the holder, means for preventing the inward movement of the guide after it is forced outward by and during the building up of the cop, substantially as set forth.

3. The combination of a cop tube holder, a reciprocating guide, and means for carrying it toward the cop, a support for said guide permitting it to move outward solely under the pressure of the increasing size of the cop, and engaging devices for preventing the inward movement of the guide after it has been forced outward, substantially as set forth.

4. The combination of the reciprocating guide, means for carrying it inward and a support permitting the outward movement of the guide, of a pawl and rack arranged to permit the outward movement, under the increasing size of the cop and to restrain the inward movement of the guide, substantially as set forth.

In testimony whereof I, have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL, JR.

Witnesses:

PHILIP E. BRADY,
WM. CASEY.