M. O. CLAUSS.

WINDING DEVICE.

APPLICATION FILED APR. 2, 1918.

1,409,671

Patented Mar. 14, 1922.

Fig:1.

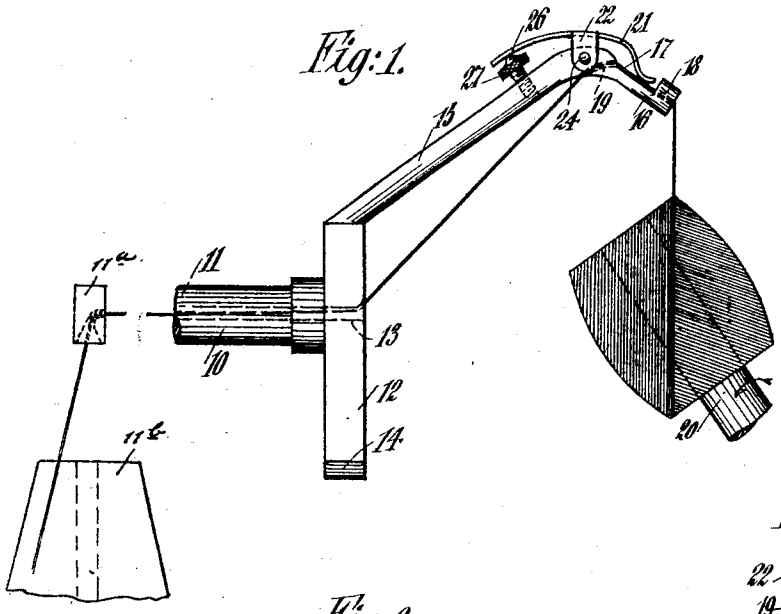



Fig:2.




Fig:3.

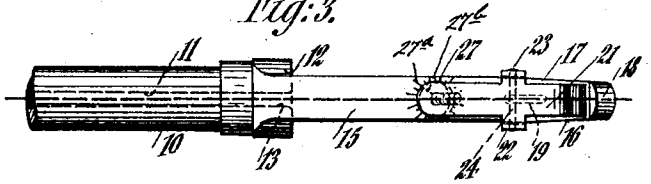



Fig:4.

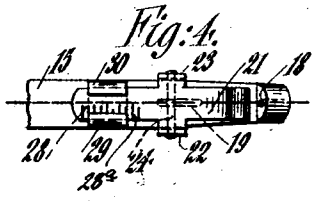



Fig:7.

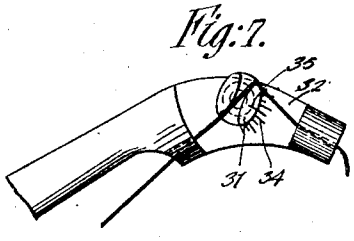



Fig:5.

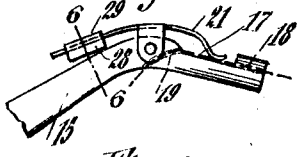



Fig:8.

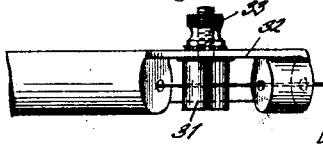



Fig:6.




INVENTOR

Max O. Clauss

BY Earl P. Cooper

ATTORNEY

# UNITED STATES PATENT OFFICE.

MAX OTTO CLAUSS, OF NEW YORK, N. Y.

## WINDING DEVICE.

1,409,671. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed April 2, 1918. Serial No. 226,173.

*To all whom it may concern:*

Be it known that I, MAX OTTO CLAUSS, a citizen of the United States, and resident of the borough and county of the Bronx, city and State of New York, have invented certain new and useful Improvements in Winding Devices, of which the following is a specification.

The present invention relates to improvements in winding devices, particularly for winding yarns or other threads into balls, and has for an object to provide in such a device improved tension means by means of which the winding may be carried on in a uniform and reliable manner.

Heretofore, the tension means employed in such devices caused variation in the tension, with the result that the winding was not uniform, and there was constant danger of the thread breaking, necessitating stopping of the work, much delay and great waste. Also the uneven tension frequently caused the balls being wound to fly off of the ball spindles. In the present device, I propose to obviate these disadvantages, to the end that a uniform winding results, and the device may be operated with greater efficiency as to time, labor and material.

A further object is to provide improved means for accurately adjusting the tension.

With these and other objects in view, embodiments of my invention are shown in the accompanying drawings, and these embodiments will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the accompanying drawings;

Figure 1 is a side view of an embodiment of my invention;

Figure 2 is a front view of the same;

Figure 3 is a plan view thereof;

Figure 4 is a plan view of a slightly modified form of tension means;

Figure 5 is a side view thereof;

Figure 6 is a sectional view taken along the line 6—6 of Figure 4;

Figure 7 is a side view of a further modified form of tension means; and

Figure 8 is a plan view thereof.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, and more particularly to Figures 1 to 3 thereof, the embodiment of my invention shown therein comprises a shaft 10 rotatable in the direction of the arrow, and provided with a thread guide passage 11 therethrough, through which the thread passes from an eyelet $11^a$ and a core $11^b$, or other source of supply. Upon the end of the shaft 10 there is secured a face plate 12 having a passage 13 therein, continuous with the passage 11, the said plate extending considerably below the shaft to form a counterweight as at 14, and provided upon its short end with a flier arm 15, projecting forwardly in an upwardly inclined direction.

The end of the arm 15 is bent downwardly as at 16, and is provided with a cut out 17 forming a flat bearing surface, a thread passage 18 extending from one end wall of said cut out to the end of the arm, and another thread guide passage 19 extending from the other end wall diagonally through the arm to the underside thereof. The thread to be wound passes from the passage 12, 13 to the passage 19 across the cut out 17, and through the passage 18 to the inclined ball spindle 20, which rotates intermittently in the direction of the arrow, the vertical plane of rotation of the thread passing diagonally through the said shaft. The thread is thereby wound into a "ball" upon the shaft 20.

Upon the upper side of the flier arm there is provided a leaf spring 21, having downwardly turned lugs 22 and 23 pivoted at 24 to the arm, the forward up-turned end 25 thereof pressing upon the thread as it moves over the bearing surfaces 17, while the other end is engaged at the underside by the peak 26 of an adjustable set screw 27 provided in the arm. Uniform tension is thereby produced upon the thread, and this may be accurately adjusted by the set screw, a scale $27^a$ and index $27^b$ being provided to indicate the amount of tension. By having the tension means or the end of the flier arm at a considerable distance from the supply core $11^b$, the changing shape of the core has no effect whatever upon the tension, but on the other hand, the thread may move freely from the source of supply, and danger of breakage due to tension is entirely eliminated.

In Figures 4 to 6, I have shown a slightly modified form of construction, in which a slideweight 28 is provided upon the flexible arm of the spring, the slideweight being adjustable with respect to a scale $28^a$ upon the arm. As the slide is moved away from or toward the pivot point of the spring, the cen-

trifugal throw of the weight causes the tension to be increased or diminished upon the thread. Thus the adjustment may be very accurately made to suit the particular thread being wound. The portions 29 and 30 extending over the top of the arm are preferably spring-like so as to tightly grip the arm during rotation of the flier arm, but at the same time permit the same being adjusted manually. Other fastening means may be provided if desired.

In Figures 7 and 8, I have illustrated a still further form of tension means, consisting of a forked or slotted member 31 rotatably secured upon the side plate 32 by means of a set screw 33. The thread is carried through the fork, and by adjusting the fork the functional tension may be increased or diminished as desired. A scale 34 and index 35 are provided to indicate the tension according to predetermined standards.

I have illustrated preferred and satisfactory embodiments of my invention, but it is obvious that changes may be made therein within the spirit and scope thereof, as defined in the appended claims.

I claim:—

1. In a thread winding device, a flier consisting of a flier arm, thread guiding means thereon at the end thereof for guiding the thread longitudinally of said flier arm and in a path that is a single, simple curve from the point at which the thread enters the guiding means to the point of exit therefrom, and an adjustable pivoted tension member having one end bearing upon said thread during its passage longitudinally over said flier arm and adjacent to the point where the thread leaves the flier arm for creating tension on the thread as it leaves the flier arm.

2. In a thread winding device, a flier consisting of a flier arm having thread guiding means at the end of the flier arm comprising a bearing surface adapted to guide the thread longitudinally of the arm as it passes over such bearing surface, a guide passage at one end of the bearing surface for the incoming thread, a guide passage at the other and outermost end of the bearing surface for outgoing thread, the thread passing through the incoming guide passage over the bearing surface and through the outgoing guide passage in a generally curved path, the path being a single, simple curve, and an adjustable tension device adapted to create tension on the thread passing over the bearing surface at a point adjacent the outgoing passage.

3. In a thread winding device, the combination with a balling spindle, of a flier arm, thread guiding means thereon for guiding the thread in a single continuous unidirectional passage that follows a generally simple curve, the exit of the passage being over the end of the flier arm, the passage being only longitudinally of the arm, and thread tension means on said flier arm acting on the thread while it passes over the flier arm and near the outlet end of said thread as it leaves the flier arm, the end of the flier arm adapted to rotate in spaced relation about the ball formed on the balling spindle by the thread under the tension of the tension device on the flier arm.

4. In a winding device, a rotating flier, means to receive the winding thread axially of the center of rotation of the flier and to lead the thread within the circle of rotation of the flier, said flier having thread passages near its free end, the winding thread being received through one of the passages to the outside of the flier after passing freely and uninterruptedly from the point of its axial exit, the thread being led inwardly from the other passage at the extremity of the flier to a balling spindle, and means upon the thread as it passes between the passages for creating tension near the outer part of the flier and near the balling spindle.

5. In a winding device, a rotating shaft having a thread guide therethrough adapted to receive a winding thread from a source of supply, the thread guide passing axially through the shaft, a flier arm mounted on said shaft and turning axially with the thread passage, said arm being elongated and extending diagonally from the shaft and having a pair of closely assembled thread passages near its outer free end, said outer free end being curved inwardly toward the axis of rotation of the flier arm, the thread from the thread guide passing axially within the circle of rotation of the flier arm and extending directly to the initial thread passage in the arm, said initial thread passage being curved outwardly and toward the bend given the free end of the flier arm, the winding thread extending in a curved path from its point of entrance to the receiving passage to the point of exit from the other thread passage of the arm, said flier arm having a flat surface between the two thread passages, and adjustable friction means bearing upon the thread upon this flat surface to create tension thereon just prior to the thread leaving the flier arm.

In testimony that I claim the foregoing as my invention, I have signed my name.

MAX OTTO CLAUSS.