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UNWINDING DEVICE.

APPLICATION FILED AUG. 17, 1910.

1,032,085.

Patented July 9, 1912.

2 SHEETS—SHEET 1.

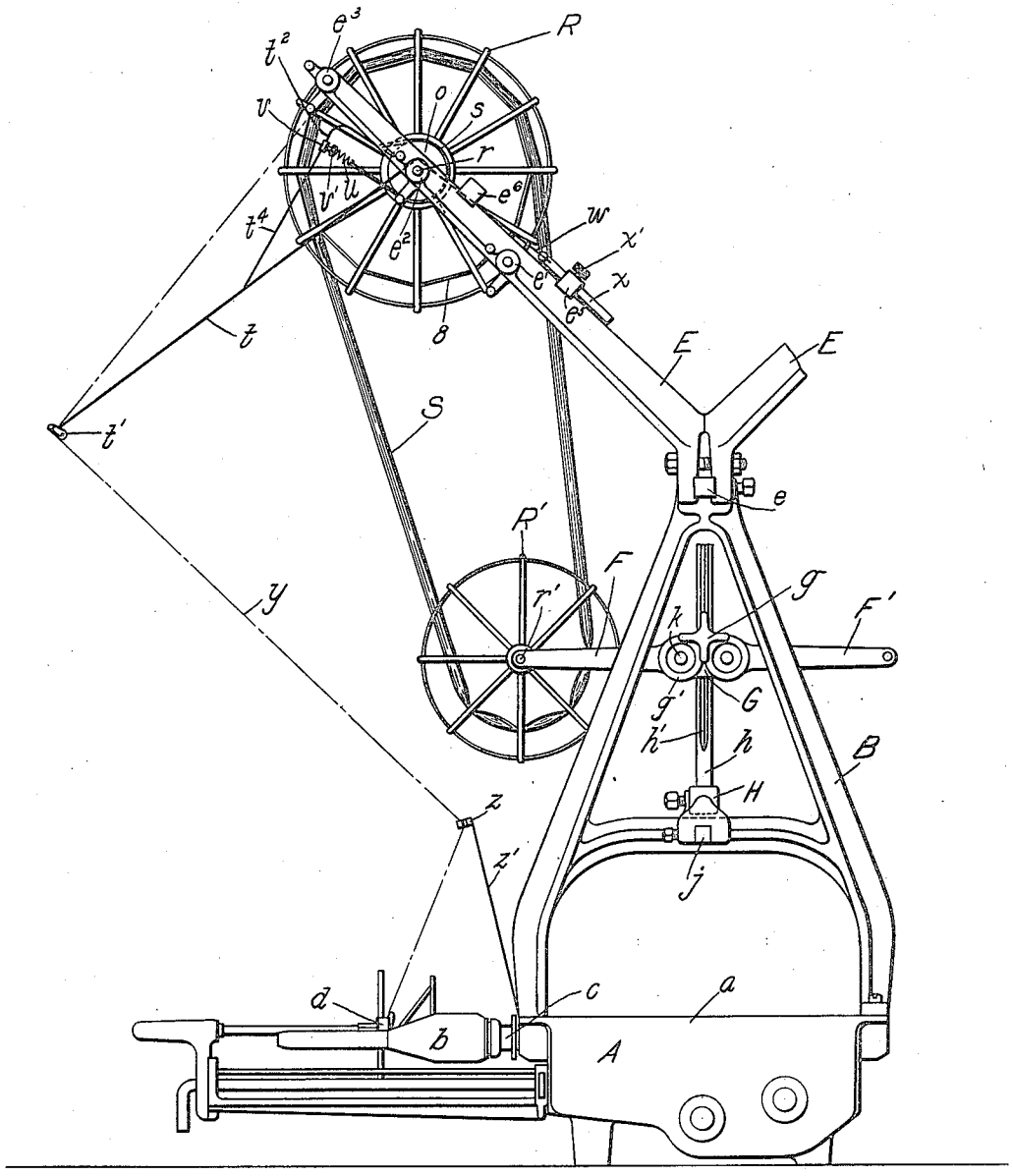

Fig. 1.

WITNESSES

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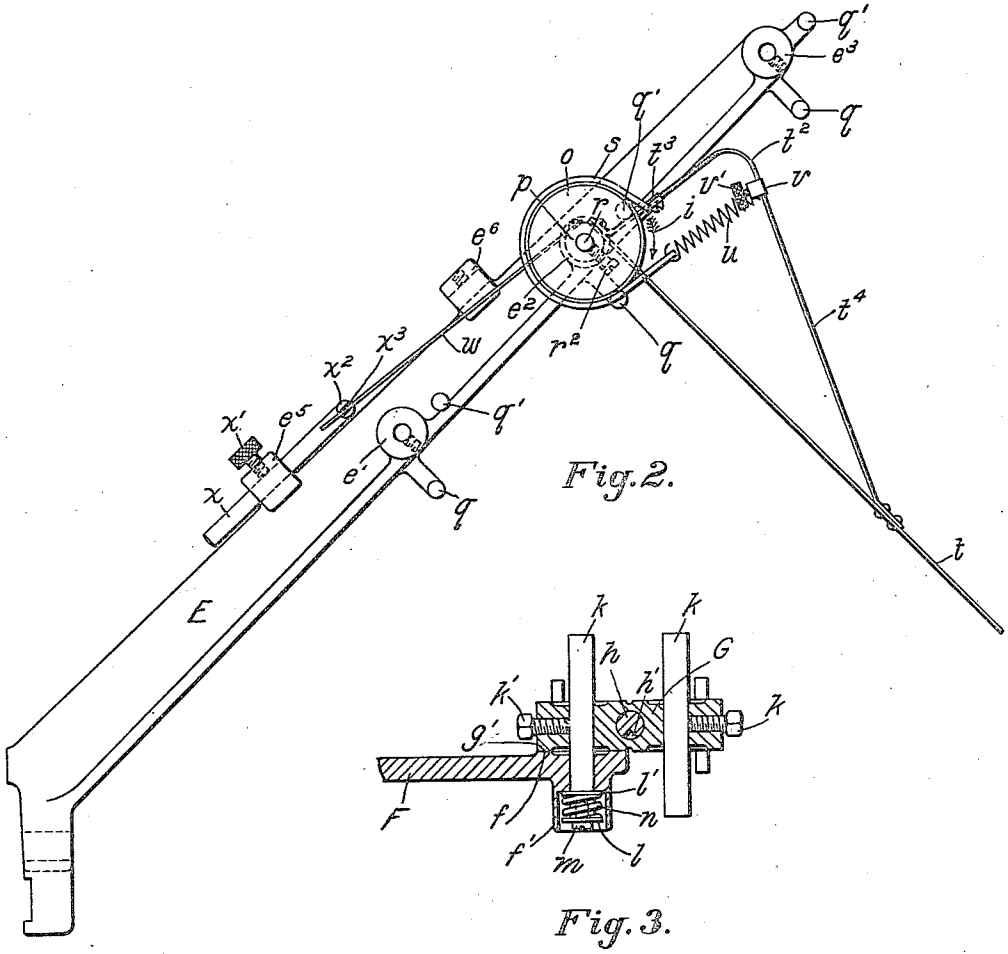

Fig. 2.

Fig. 3.

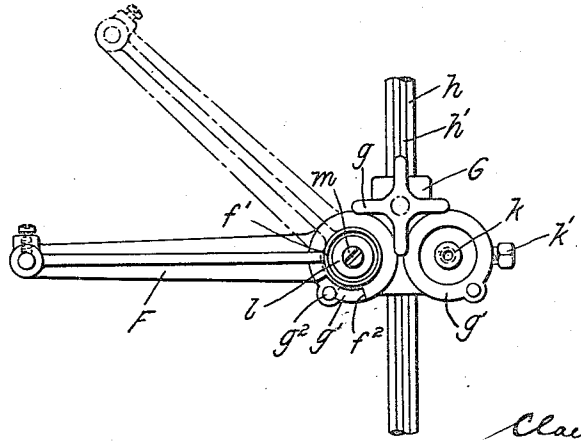

Fig. 4.

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CLAES RYDEN, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO UNIVERSAL WINDING COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

UNWINDING DEVICE.

1,032,085. Specification of Letters Patent. Patented July 9, 1912.

Application filed August 17, 1910. Serial No. 577,597.

To all whom it may concern:

Be it known that I, CLAES RYDEN, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Unwinding Devices, of which the following is a specification.

My invention relates to improvements in devices for controlling the unwinding of thread or yarn from hanks or skeins in delivering it to winding or other machines.

The object of my invention is to improve the controlling device for the swift or reels by simplifying the structure and increasing its efficiency.

The invention is fully set forth in the following specification, illustrated by the accompanying drawings, in which:—

Figure 1 is a side elevation of my new device showing it applied to a winding machine and illustrating the skein delivering its yarn to be wound into bobbins; Fig. 2, an enlarged side elevation of the reel or swift controlling mechanism for regulating the delivery of the yarn; Figs. 3 and 4, detail views of the reel holding mechanism.

Referring to Fig. 1, I have here shown a usual form of winding machine designated A which has horizontally projecting spindles *c* on which the bobbins *b* are wound. The thread-guide *d* traverses opposite the winding spindle to lay the yarn on the bobbin and is adapted to move progressively outward along the bobbin to build up the conical layers of winding. It will be understood that my new device is not limited solely to use in connection with machines of this variety but it might be applied to any style of winding machine or to other textile apparatus to which it is desired to deliver a supply of yarn.

In machines of the particular form here shown, the winding spindles are generally arranged in multiple, projecting horizontally from the sides of the machine and my new device is adapted to be applied with the swifts, reels or other supply-holders carried in brackets either above or below the spindles of the machine. I have preferred to here show the skein unwinding device applied above the machine supported in brackets fastened to the machine frame.

In Fig. 1 the A-shaped bracket B is secured to the frame *a* of the machine and a suitable number of these brackets are used along the length of the frame to support a horizontal square rod or bar *e* held in pockets at the top of the bracket. The bar *e* serves as a means for supporting the arms E which carry the bearings for the reels or swifts and preferably these arms are secured to the bar in pairs. In my previous application for patent, Serial No. 524,196, filed October 23rd, 1909, there is shown a similar form of brackets and arms on which are supported the reels or swifts which hold the skeins. As shown in the application above referred to a usual form of reel or swift consists of a rimless wheel having a hub and spokes radiating therefrom in pairs, with cords connecting the ends of the two parallel spokes of each pair. The skein is stretched over these cords and takes a polygonal form in conformity with the ends of the spokes. My present improvement may be applied to such a form of reel, but in Fig. 1 I have preferred to show a slightly different form of skein-holder applied to the machine as now described: This consists of a pair of relatively small reels R—R′, generally called "runners," arranged some distance apart and adapted to rotate on parallel axes. The hank or skein S is stretched in a loop around the two runners R and R′ and the latter are held apart under tension so as to straighten out the coils of yarn and keep them tight to prevent snarling or tangling. This form of skein-holder is preferable for some uses to the usual swift as it takes up less space on the machine and is less awkward to handle. It is easier to apply the skein to the two runners than to stretch it around a swift and, furthermore, the skein is held stretched with the proper tension to keep the coils from tangling.

The runner R is adapted to rotate on a rod *r* which projects from the arm E and

the runner R′ rotates on a rod r' secured at the end of an arm F. The arm F is hinged at its opposite end on a bracket G, to adapt it to swing to adjust the runner R′ toward and away from the runner R. The bracket G is mounted on a vertical rod h which extends upward from a bracket H, the latter supported on a horizontal bar j. The bar j is held in the cross arms of the brackets B and extends along the machine parallel to the bar e to adapt it to support a series of the brackets H corresponding in number to the pairs of arms E. Referring to Figs. 3 and 4, the bracket G is secured to the rod h by means of a hand-screw g, the end of which engages a groove h' in the rod to keep the bracket from turning. By loosening the screw g the bracket G can be slid up and down on the rod h to adjust the runner R′ for different lengths of skeins. The arm F is pivoted on the bracket G with a friction bearing which provides a resistance to its movement in order to hold the runner R′ in its adjusted position against the tension of the skein. The preferred arrangement for this friction bearing is as follows: Referring to Fig. 3, in the bracket G are secured pins k, held by set-screws k', on which the oppositely extending arms F and F′, see Fig. 1, are pivoted. One bracket is adapted to support four of these arms, but as their arrangement is the same that of only one will be described. The bracket G has a circular bearing boss g' against which the hub f of the arm F bears. The hub f has a cup-shaped extension f' on its outer side and the pin k extends through the hub and into the cavity of this extension. A washer l is secured at the end of the pin by the screw m, and between this and a washer l' is a coiled spring n. The spring n forces the hub f of the arm F against the boss g' on the bracket G and tends to create a resistance to the movement of the arm. A pin g^2, driven into the boss g', is adapted to contact with the ends of a slot f^2 in the hub f to limit the movement of the arm F, see Fig. 4. In placing the skein on the runners R and R′ the arm F is swung up to the position illustrated by dot-and-dash lines, Fig. 4. After the skein is looped around the runners the arm F is pushed down to stretch and straighten the coils of yarn in the skein and the tension of the spring n is sufficient to cause the arm to be held in this position by the frictional contact of its bearing against the bracket G.

As before explained, the runner R rotates on a rod r secured in the arm E. Preferably, the arm E is formed with several bosses e', e^2, e^3, arranged at intervals along its length, and the rod r can be fastened in the bore of any one of these by means of a set-screw r^2. Through this arrangement the runner R can be set at different distances from the runner R′, and as the latter can also be moved by sliding the bracket G up and down on the rod h, the range of adjustment is sufficient to adapt the device to take practically all lengths of skeins. The draft on the yarn as it is taken up by the winding operation causes the two runners R and R′ to rotate, and its delivery from the skein is regulated by controlling the rotation of the larger runner R. The controlling means is similar in general respects to that described in my previous application before referred to, but the present arrangement shows certain improvements and contemplates a simplification of the structure as now described: The end of the hub of the runner R is formed with a brake-drum o on which the braking element acts to control the rotation of the runner, see Figs. 1 and 2. The braking means consists of a flexible, friction band or strap s which is made of leather, fabric, thin steel, or other suitable material. Mounted on the rod r is a cylindrical member or hub p and secured to its periphery is a spring lever or arm t which acts as a take-up element and is controlled by the delivering yarn y, see Fig. 1. The arm t is preferably constructed of flat, sheet metal, tempered to adapt it to bend to act as a spring element. At its outer end the arm carries a loop or "pigtail" t' through which the yarn y leads. A V-shaped truss-like extension t^2 is secured to the upper end of the arm t to serve as a stiffening means, so that the arm will not bend throughout its whole length, and this extension also serves for another purpose as now described: A finger or cross-piece t^3 reaches out from the perpendicularly extending portion of the extension t^2 and to its extremity is secured one end of the brake-band s. The band s extends around the periphery of the brake-drum o and to its opposite end is fastened a coiled spring u. The other end of the spring u is fastened to a clamp v which is slidable on the inclined leg t^4 of the extension t^2. By releasing the set-screw v' the clamp v can be moved down the incline t^4 to relieve the tension on the spring u and also reduce the extent of contact between the brake-band s and the drum o.

A flat, spring-tempered arm w is secured to the hub p and extends downward along the arm E. The end of this arm w is held by a rod x which is adjustable in a lug e^5 on the arm E and is secured by the set screw x'. The rod x is bent in elbow-form and the right-angled portion x^2 is slotted at x^3 to receive the end of the spring arm w. By sliding the rod x in the lug e^5 the spring arm w may be engaged at varying distances from the hub p to change the tension of the spring. When the runner R is used with

the rod r secured in the boss e^3 the rod x is fastened in a lug e^6 located farther up on the arm E; and when the runner R is moved down to the boss e' the rod x is turned the other way in the lug e^5 to extend down in the opposite direction. In this way the rod x can be adjusted to engage the arm w at different points along its length in whichever position the runner R is located on the arm E.

Referring to Fig. 1, the yarn y from the skein S leads down from the runner R through the guiding loop t' on the arm t and thence through an auxiliary guide-eye z on a spring-arm z' secured to the frame a of the winding machine A. From the eye z the yarn leads to the thread-guide d and as the material is wound on to the bobbin its lineal rate of draft will vary according to the difference in diameter of the winding surface from point to base of the conical nose of the bobbin. This variation in draft on the skein is compensated for by the yielding of the spring-arms t and z'. When abnormal resistance to the draft of the yarn is encountered, however, either from the inertia of the skein holders or runners, or from a tangle or snarl in the skein, the arm t will be moved downwardly bodily, and this movement acts through the braking devices to rotate the runner R as more fully explained hereinafter.

The operation of my improved device is as follows: The skein S is stretched over the runners R and R' and the arm F pressed downward to draw the coils of yarn taut. The friction bearing of the arm F maintains the latter in its adjusted position and the yarn y is led from the upper runner R through the loop or guide t' and thence down through the auxiliary guide z to the thread-guide d. When the machine is started the runners R and R' are inert and with fine material the sudden draft is liable to break the yarn before the runners can be started to rotate unless some means is provided to overcome the inertia. With the arrangement as here provided the first quick draft on the yarn pulls the arm t downward bodily and the latter acts through the brake-band s to overcome the inertia and start the rotation of the runner R in the direction indicated by the arrow i. This is accomplished as follows: The movement of the arm t creates a pull on the upper end of the band s against the resistance of the spring u and tightens the band around the brake-drum o. The spring u is adjusted to give a frictional contact of the band on the drum sufficient to rotate the latter and thereby the runner R is rotated to start delivering the yarn. The runner R' is rotated from the contact of the skein as an idler. After the first impulse of rotation is imparted by the movement of the arm t the draft on the yarn is sufficient to keep the runners turning and the arm t moves upward again to its normal position under action of the spring extension w. The band s normally has a contact with the periphery of the brake-drum sufficient to apply a slight braking tendency so that the runner R will not gain impetus and turn too fast; and if a tangle or snarl occurs in the skein, tending to impede the rotation, the arm t will be carried down under influence of the increased tension on the yarn and will act as before explained to assist in the rotation of the runner. In this way the rotation of the runners is controlled and regulated automatically by the tension of draft on the yarn and the skein can be unwound to deliver the yarn as required without break or hindrance.

The movement of the arm t is limited by stops q—q' on the arm E, preferably formed as extensions of the latter. The spring arm w is adjusted to normally maintain the arm t raised with its extension t^2 contacting with the stop q' and the stop q limits its downward movement.

It will be noted that the controlling mechanism for the skein-holder has been simplified and improved over that disclosed in my previous invention relating to the same character of device. By pivoting the arm t on the bearing for the reel I gain compactness and eliminate a number of parts and the whole tension-controlling mechanism is practically self-contained to adapt it to be adjusted to different positions on the bracket E for different lengths of skeins.

Having now described my device in detail and explained its mode of operation what I claim is:—

1. In a device for controlling the unwinding of yarn, the combination with a rotatable supply-holder, of an arm pivoted on the axis of said supply-holder, and means on said arm adapted to act on the supply-holder to impart a positive rotative impulse to the latter when the arm is moved by the draft on the yarn.

2. In a device for controlling the unwinding of yarn, the combination with a rotatable supply-holder, of an arm pivoted on the axis of the supply-holder and adapted to be operated by the draft of the delivering yarn, and means on said arm arranged to act on the supply-holder, said means adapted to impart a rotary impulse to the supply-holder when the arm is moved under the effect of abnormal tension on the yarn.

3. In a device for controlling the delivery of yarn from a rotating supply, the combination with the supply-holder, of a member pivoted on the axis of the supply-holder and operated directly by the tension of the delivering yarn which engages therewith, and

means on said member whereby its movement in one direction imparts a rotative impulse to the supply-holder, and its movement in the opposite direction exerts a braking effect on the supply-holder to check the rotation of the latter.

4. In a device for controlling the delivery of yarn from a rotating supply, the combination with a rotatable supply-holder having a brake-drum, of a movable arm pivoted on the axis of the supply-holder and operated directly by the tension of the delivering yarn which engages therewith, and means on said arm adapted to contact with the brake-drum to cause resistance to the rotation of the supply-holder, said means adapted to be moved by the arm to impart a rotative impulse to the supply-holder to unwind the yarn.

5. The combination with a rotatable supply-holder, of a brake-drum on the supply-holder, a member pivoted on the axis of said supply-holder and adapted to be moved by the variations in tension on the delivering yarn which engages therewith, and a friction band surrounding the brake-drum, said band fixedly secured at one end and resiliently secured at its opposite end to the pivoted member to adapt the band to be moved positively by said member in the direction of rotation of the brake-drum to impart a rotative impulse to the supply-holder to unwind the yarn when the member is moved on its pivot under the effect of a sudden pull on the yarn.

6. The combination with a rotatable supply-holder, of a brake-drum on the supply-holder, an arm pivoted on the axis of the supply-holder and adapted to be controlled by the thread delivering from the supply-holder, an extension on said arm formed as a V-shaped truss with one side extending substantially perpendicularly to the arm, a brake-band secured at one end to the perpendicular side of the extension and adapted to wrap around the periphery of the brake-drum, and means to secure the opposite end of the brake band to be adjusted along the inclined side of the extension to vary the extent of contact of the band on the drum.

7. The combination with a rotatable supply-holder, of a brake-drum on said supply-holder, an arm t pivoted to swing on the axis of the supply-holder and adapted to be controlled by the thread delivering from the supply-holder, said arm formed with an extension t^2, a brake-band s secured at one end to the extension t^2 and wrapped around the brake-drum, a spring u fastened at one end to the opposite end of the band s, and a clamp v for adjustably securing the other end of the spring to the extension t^2.

8. The combination with a rotatable supply-holder, of a brake-drum on said supply-holder, an arm t pivoted on the axis of the supply-holder and adapted to be controlled by the delivering thread, a spring w to control the movement of the arm and a brake-band s secured at both ends to the arm t and engaging the periphery of the brake-drum to rotate the supply-holder when the arm t is moved against the action of the spring w.

9. The combination with a rotatable supply-holder, of an arm t pivoted to swing on the axis of the supply-holder and adapted to be controlled by the delivering thread, means on the arm to control the rotation of the supply-holder, a spring extension w on the arm, and means to hold said spring w to resist the movement of the arm t, said holding means being adjustable along the spring to vary its tension.

10. The combination with a rotatable supply-holder, of an arm t adapted to be operated by the delivering thread to control the rotation of the supply-holder, a spring extension w on said arm, a member x fixedly secured adjacent the spring w and having a slot to engage the spring, and means to adjust the member x to engage the spring at different points along its length to vary the tension of the spring.

11. The combination with a rotatable supply-holder, of a bearing r on which the supply-holder rotates, a hub p mounted on said bearing, an arm t extending from said hub and adapted to be controlled by the delivering thread, means on the arm t for controlling the rotation of the supply-holder, a spring arm w also extending from the hub p, and a rod x fixedly secured adjacent the spring w formed with a slotted end to engage the spring w and adapted to be adjusted along the length of said spring.

12. In an unwinding device, the combination with an arm E, of a bearing rod r, means to mount the rod in different positions along the arm E, a supply-holder rotatable on the rod r, an arm t pivoted to swing on the rod r, and adapted to be operated by the tension of the yarn which engages therewith and means on said arm to control the rotation of the supply-holder.

13. In an unwinding device, the combination with an arm E, of a rod r, means to mount the rod r in different positions along the arm E, a supply-holder rotatable on the rod r and adapted to be controlled by the delivering thread, an arm t pivoted to swing on the rod r, means on the arm t to control the rotation of the supply-holder, a spring arm w on the arm t, and means adjustable on the arm E to engage said spring arm w in whichever position the rod r is located.

14. The combination with the arm E, of a supply-holder rotatably mounted on said arm, an arm t pivoted on the arm E and

adapted to swing to control the rotation of the supply-holder, a spring extension w on the arm t, a rod x having a right-angled portion slotted to engage the spring w, and a bearing on the arm E in which the rod x is adjustable to vary its point of engagement with the spring w.

In testimony whereof I affix my signature in presence of two witnesses.

CLAES RYDEN.

Witnesses:
ARTHUR A. ARMINGTON,
GRACE W. BROWN.