Aug. 17, 1926. 1,596,567

E. WILDT

YARN WINDING MACHINE

Filed Feb. 6, 1925 3 Sheets-Sheet 1

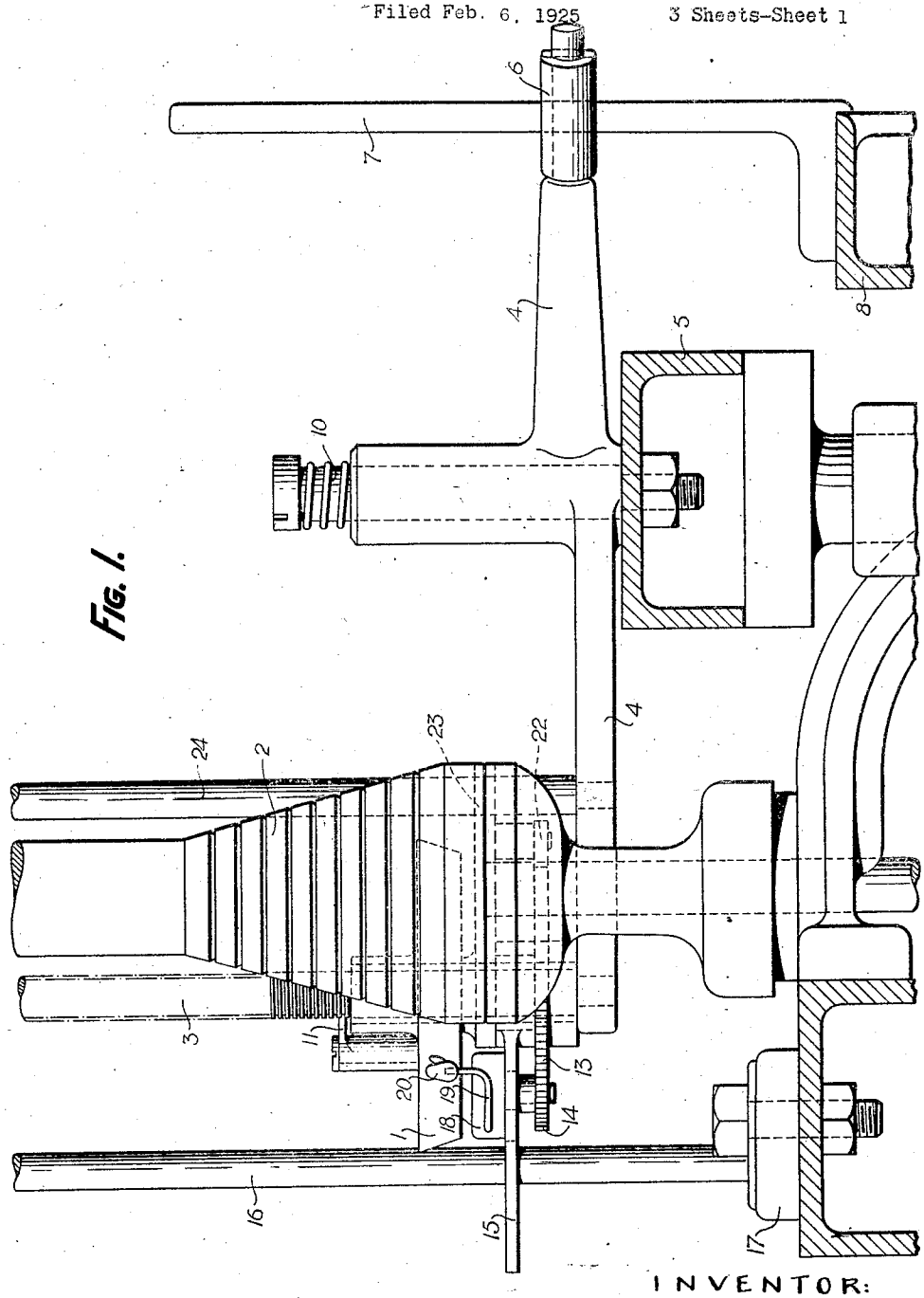

FIG. 1.

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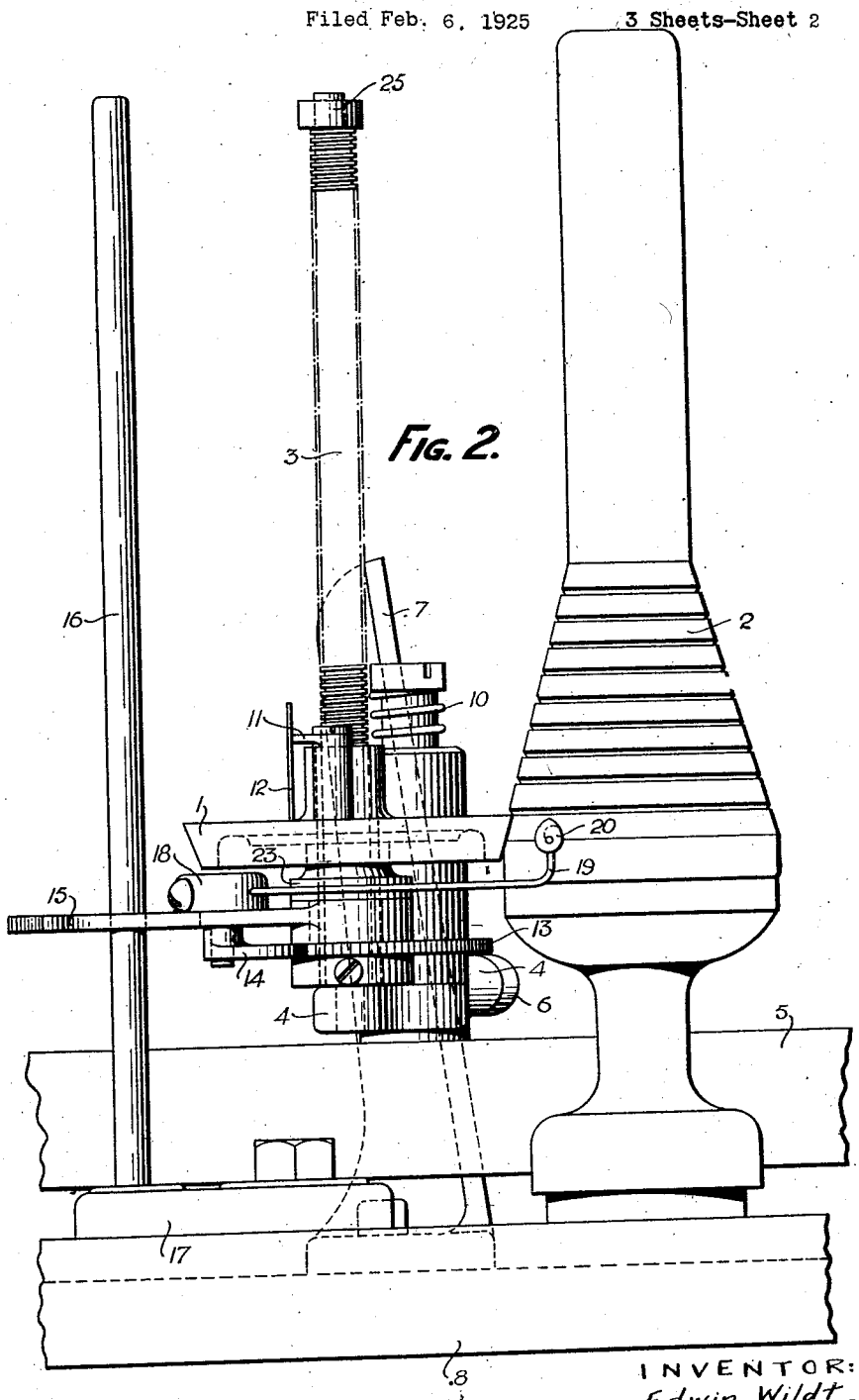

FIG. 2.

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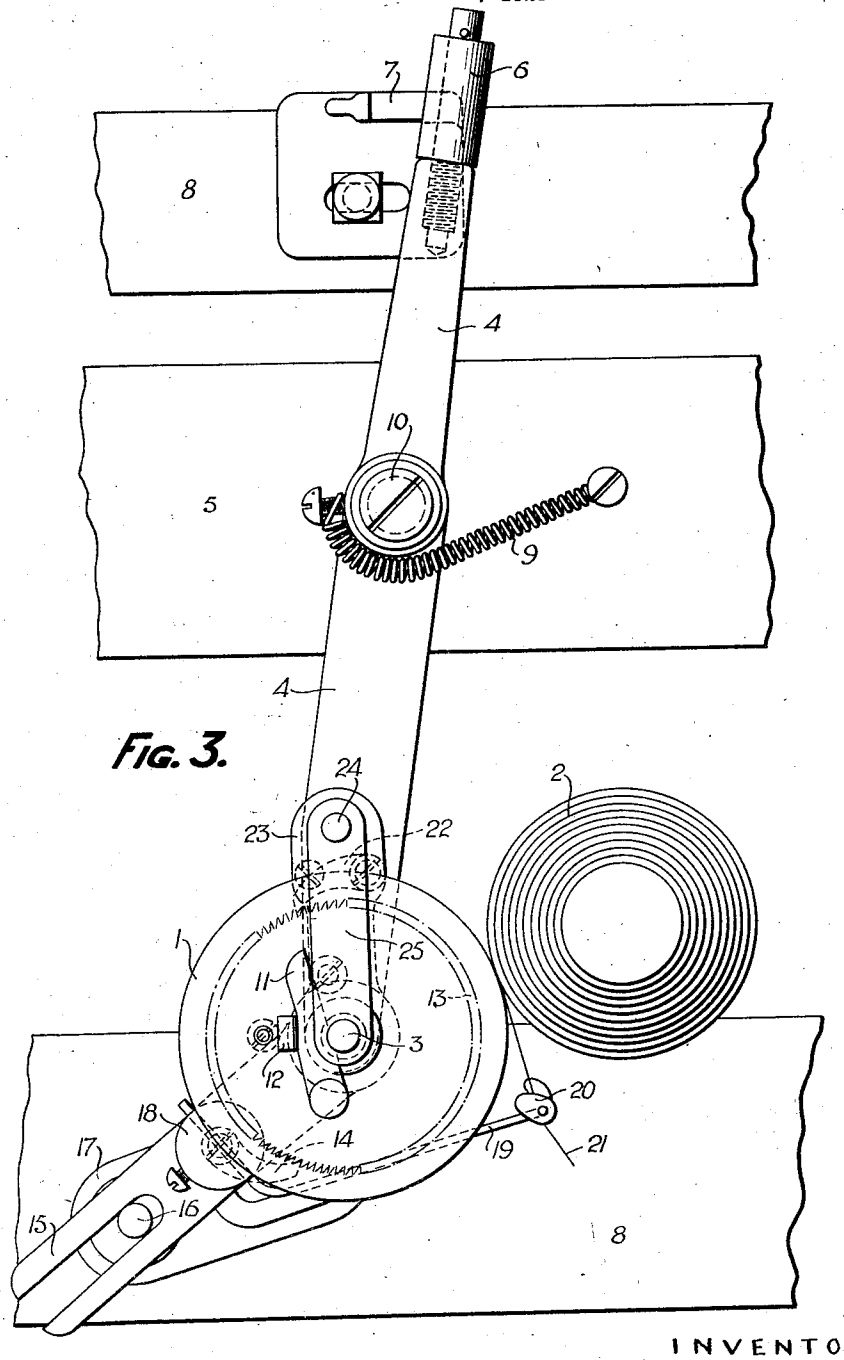

FIG. 3.

INVENTOR:
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Patented Aug. 17, 1926.

1,596,567

UNITED STATES PATENT OFFICE.

EDWIN WILDT, OF LEICESTER, ENGLAND, ASSIGNOR TO WILDT & COMPANY, LIMITED, OF LEICESTER, ENGLAND, A BRITISH COMPANY.

YARN-WINDING MACHINE.

Application filed February 6, 1925, Serial No. 7,221, and in England March 6, 1924.

This invention relates to yarn winding machines and concerns those of the vertical spindle type employed for winding yarns upon conical or bottle bobbins and wherein the winding yarn is laid upon the bobbin by a guide which is traversed up and down, and which is also, as the yarn is built up upon the bobbin, fed upwards on its support so that the yarn becomes wound on the bobbin in a succession of conical layers. In machines of this kind the yarn guide is usually carried by what is usually termed a riser which works up on a screwed rod.

The object of the invention is to provide an improved riser arrangement by reason of which the feed of the riser will always take place in accordance with the thickness of the yarn being wound so that adjustment of the feed for varying counts of yarn can be eliminated.

According to the invention the feed of the riser at each traverse is effected partly by mechanical means and partly by frictional contact of the riser with the wound yarn. By the term "feed" we mean, of course, the movement of the riser along the screwed rod, and by the term "traverse" we mean each successive up and down movement of the screwed rod and riser relatively to the bobbin.

The arrangement is such that the main portion of the feed movement is imparted to the riser by the mechanical means and the remainder of the necessary movement is imparted frictionally by the wound yarn. The movement imparted frictionally is in the nature of a compensating movement which makes up to the required extent the shortness of the movement imparted mechanically and such compensating movement will naturally vary, i. e. it will be greater or less, according to the thickness of the yarns which may be dealt with seeing that the thickness of the yarn determines the extent of the compensating movement.

The invention also includes the provision of means for rendering the mechanical means inoperative upon breakage or failure of the winding yarn.

In further describing the invention reference will be hereinafter made to the accompanying drawings wherein a convenient embodiment of the invention is illustrated.

In the drawings:—

Figure 1 is a sectional side elevation of said embodiment.

Figure 2 is a front view of the same, and

Figure 3 is a plan thereof.

According to the illustrated embodiment of the invention the riser consists of a disc 1 with a bevelled periphery for frictionally engaging the yarn wound on the bobbin 2 which is mounted and driven in the usual manner. The riser 1 is rotatably and slidably mounted on a vertical screwed rod 3 fixed in one end of a lever 4 centrally pivoted on the usual rising and falling bar 5 and provided on its opposite end a cam roller or follower 6 which is maintained in engagement with the inclined edge of a cam member 7 on the machine frame 8 by the action of a spring 9. The lever 4 is pressed down on the bar 5 by a spring 10. Pivotally mounted on the riser 1 is a nut device 11 which is controlled by a flat spring 12 and thereby maintained in engagement with the thread on the screwed rod 3 upon which latter the riser moves when intermittently rotatated thereon. The arrangement is such that the nut device may be easily disengaged from the thread so as to enable the riser to be rapidly moved along the rod 3, when necessary by hand. Situated below and connected to the riser disc is a ratchet wheel 13 engaged by a pawl 14 pivotally mounted on a bifurcated arm 15 which is capable of oscillating movement about the axis of the disc 1. This arm is suitably actuated to impart intermittent rotation to the ratchet wheel 13 through the medium of the pawl 14. In the construction shown in the drawings the bifurcated end of the arm 15 engages and works up and down a vertical rod 16 fixed in a support 17 adjustably attached to the machine frame. As the bar 5 rises and falls during the yarn winding operation the cam roll or follower 6, being under the influence of the spring 9, travels along or follows the inclined edge of the cam member 7 so that an oscillating movement is imparted to the lever 4, and consequently the riser 1 and the parts associated therewith move in company

with said lever. The effect of this is to oscillate the arm 15, since the bifurcated end of the latter engages the fixed rod 16. As the bar 5 rises the pawl 14 slides over the teeth of the wheel 13 without operating the latter, while as said bar falls the pawl operates through said wheel to impart the necessary upward feed of the riser 1 on the screwed rod 3. The ratchet mechanism is arranged so that sufficient rotation is imparted to the riser to feed it up the screwed rod a distance slightly less than that necessary when dealing with the finest yarn, and this rotation may be determined by adjusting the rod 16 relatively to the bifurcated arm 15 so that a greater or less movement may be imparted to the latter according to requirements. In action the contact of the bevelled disc 1 with the wound yarn imparts the necessary additional rotation to the disc to make up for the deficiency of movement imparted by the ratchet mechanism.

The pawl 14 has fast on its pivot a collar 18 from which extends a wire or other finger 19 carrying at its free end a yarn guide 20 which is so arranged in relation to the bobbin 2 and the running yarn, indicated at 21 in Figure 3, that while the yarn continues to run properly the pawl will be kept in engagement with the ratchet wheel, but upon the yarn breaking or ceasing to run for any reason the finger will allow the pawl to pass over without engaging the teeth of the wheel thus causing rotation and consequently upward feed of the riser to cease. Backward movement of the ratchet wheel is prevented by a spring pressed pawl 22 pivoted on an arm 23 freely mounted at one end on the axis of the riser 1 and prevented from rotation by the engagement of its opposite end with a vertical rod 24 fixed in the lever 4 adjacent and parallel to the screwed rod 3. This latter and the rod 24 may, if desired, be connected by a plate 25.

The details of construction may be varied without departing from the scope of the invention.

What I claim is:—

1. For a yarn winding machine of the kind herein described, a riser arrangement comprising, in combination, mechanical means and frictionally acting means which co-operate to impart the necessary feed to the riser at each traverse of the latter relatively to the bobbin whereby each feed movement is effected partly positively and partly frictionally.

2. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, and mechanically acting means for imparting the main portion of said feed to the riser disc prior to the movement imparted frictionally.

3. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, and ratchet mechanism for rotating the riser disc so that the main portion of said feed is imparted to it prior to its contact with the yarn.

4. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, mechanically acting means for imparting the main portion of said feed to the riser disc prior to the movement imparted frictionally, and means for rendering the mechanically acting means inoperative upon breakage or failure of the winding yarn.

5. For a yarn winding machine of the kind herein described a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, ratchet mechanism for rotating the riser disc so that the main portion of feed is imparted to it prior to its contact with the yarn, and means for rendering the ratchet mechanism inoperative upon breakage or failure of the winding yarn.

6. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, an arm adapted to oscillate about the axis of the riser disc, a pawl on said arm, a ratchet wheel connected to the riser disc and normally engaged by the pawl whereby upon actuation of the arm the riser disc is rotated so that the main portion of said feed is imparted to it prior to its contact with the yarn, and means for actuating the arm.

7. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, an arm adapted to oscillate about the axis of the riser disc, a pawl on said arm, a ratchet wheel connected to the riser disc and engaged by the pawl whereby upon actuation of the arm the riser disc is rotated so that the main portion of said feed is imparted to it prior to its contact with the yarn, a yarn laying finger adapted to maintain the pawl in engagement with the ratchet wheel

while the yarn continues to run properly, and means for actuating the arm.

8. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, an arm adapted to oscillate about the axis of the riser disc, a pawl on said arm, a ratchet wheel connected to the riser disc and normally engaged by the pawl whereby upon actuation of the arm the riser disc is rotated so that the main portion of said feed is imparted to it prior to its contact with the yarn, a yarn laying finger adapted to maintain the pawl in engagement with the ratchet wheel while the yarn continues to run properly, a spring controlled cam operated lever, and a fixed rod which is engaged by the arm, said lever and rod cooperating to cause the oscillation of the arm for rotating the riser disc.

9. For a yarn winding machine of the kind herein described, a riser arrangement comprising a riser disc adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed at each traverse is imparted to it, an arm adapted to oscillate about the axis of the riser disc, a pawl on said arm, a ratchet wheel connected to the riser disc and normally engaged by the pawl whereby upon actuation of the arm the riser disc is rotated so that the main portion of said feed is imparted to it prior to its contact with the yarn, a yarn laying finger adapted to maintain the pawl in engagement with the ratchet wheel while the yarn continues to run properly, a spring controlled cam operated lever, a fixed rod which is engaged by the arm, said lever and rod cooperating to cause the oscillation of the arm for rotating the riser disc, and a spring pressed pawl for engaging the ratchet wheel to prevent reverse rotation of said disc.

10. For a yarn winding machine of the kind herein described, a riser arrangement comprising a vertical screwed rod, a riser disc rotatable and slidable on the screwed rod, a spring pressed nut device on the riser disc for engaging the screwed rod, said riser disc being adapted for frictional contact with and rotation by the wound yarn whereby a small portion of its feed upwards on the rod at each traverse is imparted to it, a rising and falling bar, a spring controlled lever, pivoted on said bar and carrying the screwed rod at one end, a cam follower on the opposite end of the lever, a fixed cam engaged by said follower so that oscillation is imparted to the lever upon actuation of the rising and falling bar, a ratchet wheel connected to the riser disc, a bifurcated arm mounted for oscillation about the axis of said disc, a pawl carried by said arm for engaging the ratchet wheel, an adjustable rod engaged by the bifurcated arm whereby upon oscillation of the spring controlled lever the bifurcated arm is also oscillated and the riser disc thereby rotated so that the main portion of said feed is imparted to it prior to its contact with the wound yarn, and a yarn laying finger connected to the pawl and adapted to maintain it in engagement with the ratchet wheel while the yarn continues to run properly, an arm freely mounted on the axis of the riser, a vertical rod carried by the oscillating lever and adapted to engage said arm to prevent rotation of same, and a spring pressed pawl carried by said arm and adapted for engagement with the ratchet wheel to prevent reverse rotation thereof.

In testimony whereof I have signed my name to this specification.

EDWIN WILDT.