July 4, 1939. G. N. TAYLOR 2,165,018

WINDING MACHINE

Filed Feb. 1, 1937 3 Sheets-Sheet 1

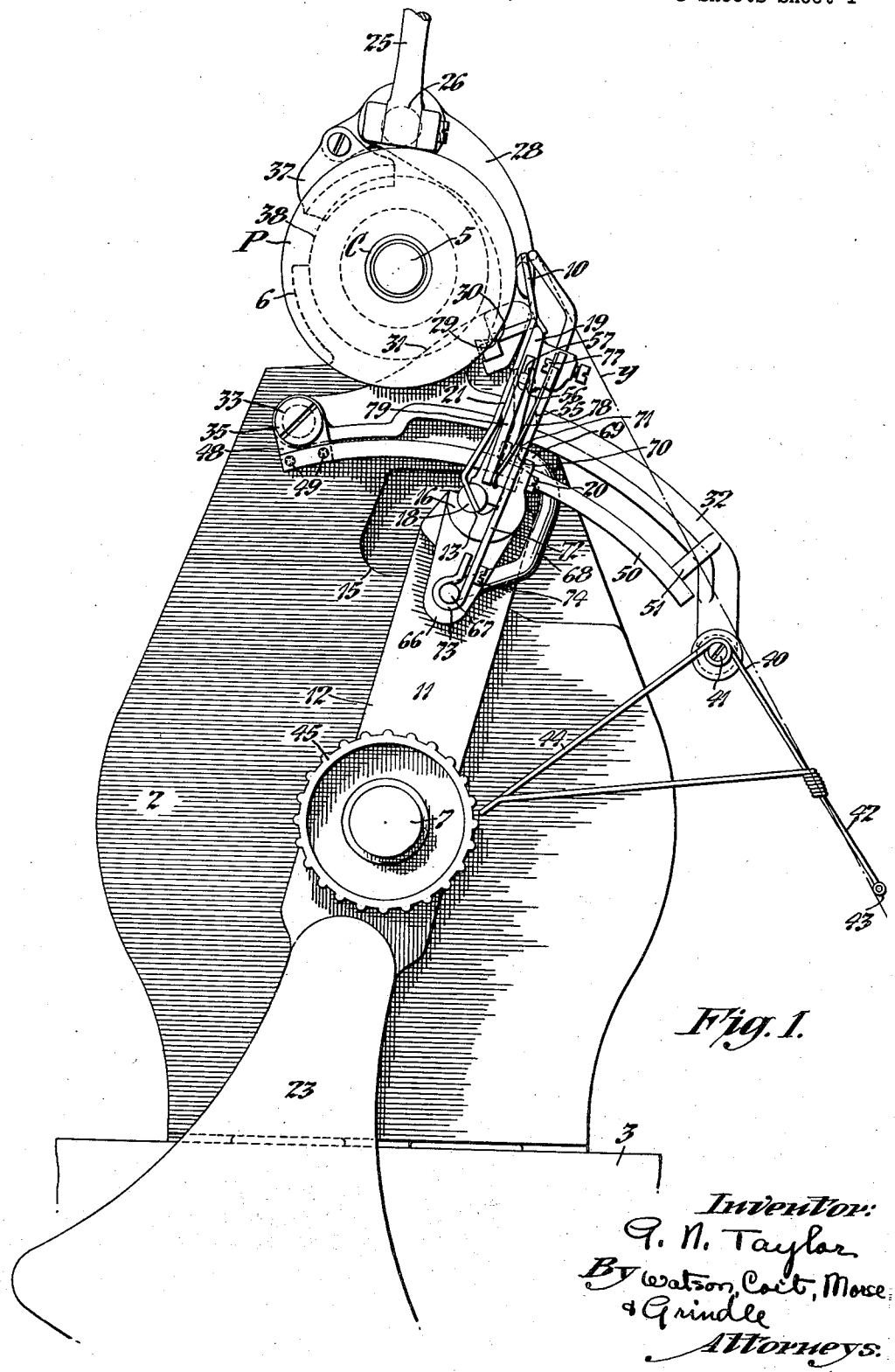


Fig. 1.

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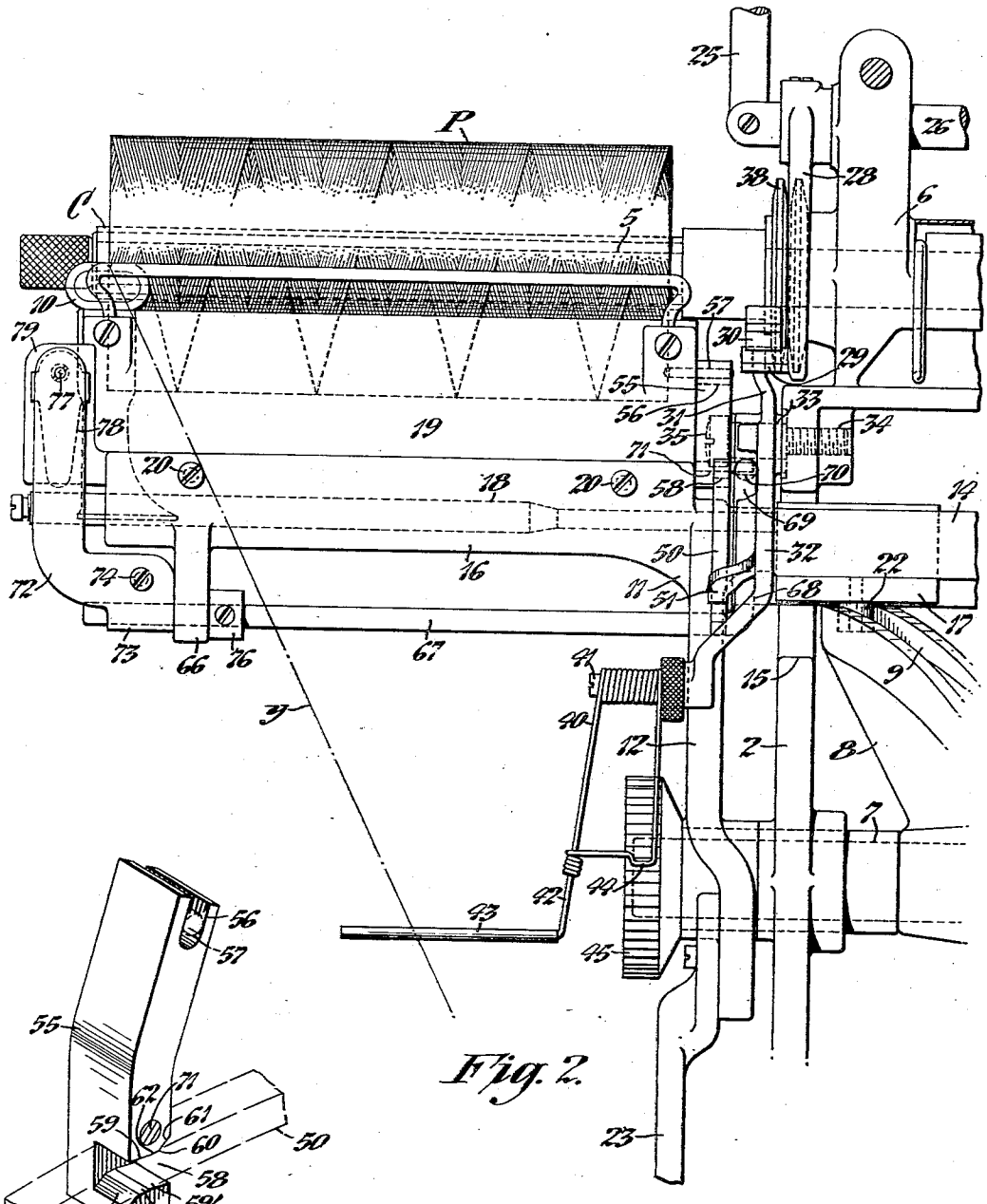


Fig. 2.

Fig. 6.

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WINDING MACHINE

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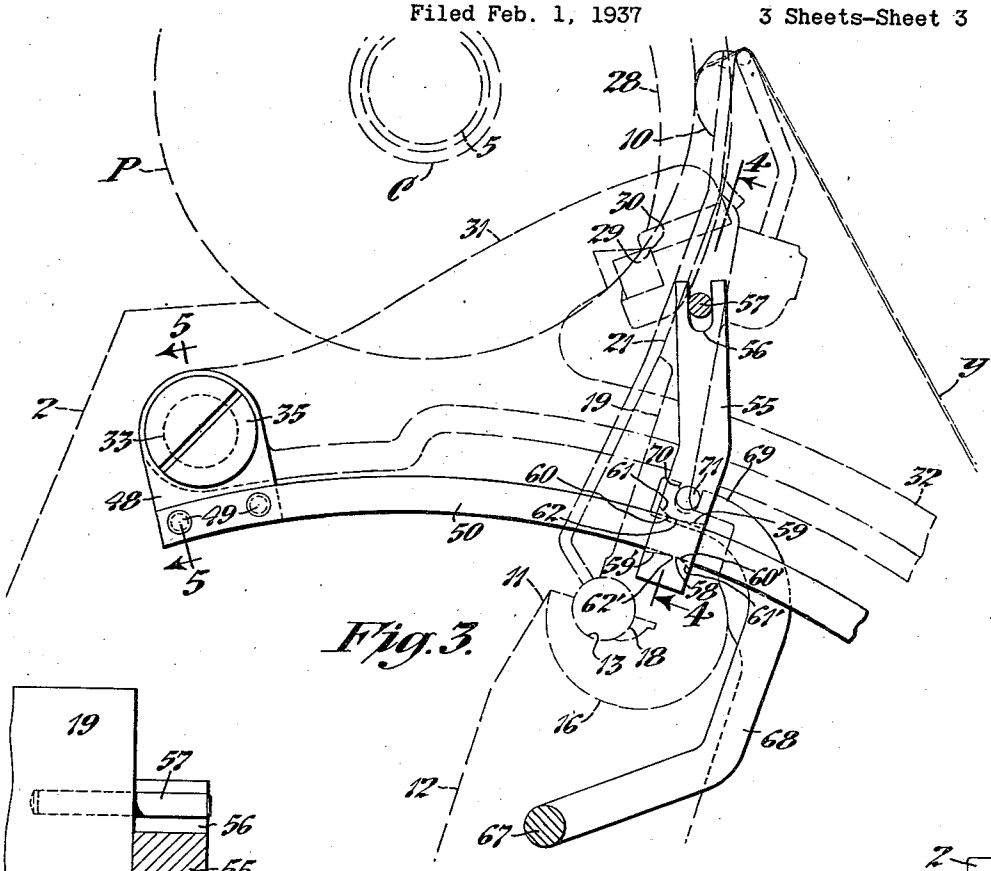


Fig. 3.

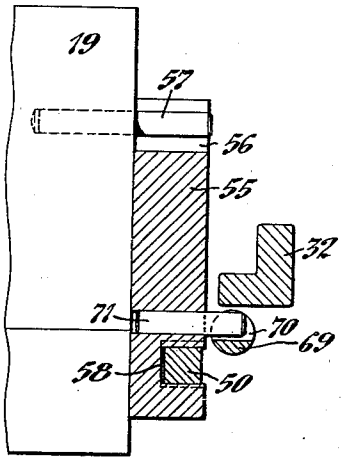


Fig. 4.

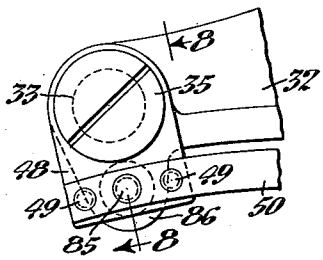


Fig. 7.

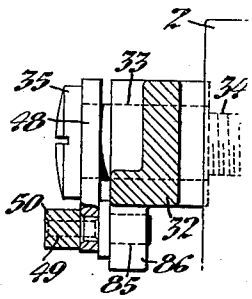


Fig. 8.

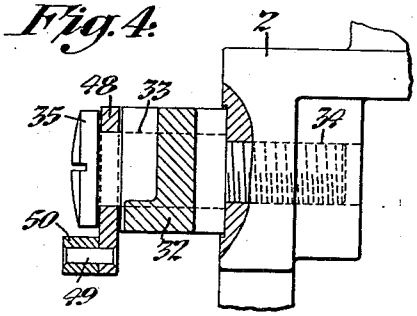


Fig. 5.

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Patented July 4, 1939 2,165,018

UNITED STATES PATENT OFFICE

2,165,018

WINDING MACHINE

George N. Taylor, East Providence, R. I., assignor to Universal Winding Company, Boston, Mass., a corporation of Massachusetts

Application February 1, 1937, Serial No. 123,461

13 Claims. (Cl. 242—18)

This invention relates to winding machines and particularly to an improved dogging device for controlling the separation of the thread-guide and winding-spindle during the winding operation.

In the present specification and claims the term "package" is used in a general sense to indicate any form of wound mass and the term "yarn" is intended to designate any kind of strand material, whether textile or otherwise.

One object of the invention is to provide an improved dogging device which permits the thread-guide to recede from the winding-spindle during the growth of the package while preventing it from moving toward the spindle, whereby to restrain it from jumping or vibrating during the winding operation.

Another object of the invention is to provide a device of the type indicated which is extremely sensitive and positive in performing its intended function and adapted to be manually released to permit the thread-guide to be placed against the cop-tube or package.

Another object of the invention is to provide a device of the type indicated which is self-adjusting to compensate for inaccuracies in the construction of and wear on the parts and one which may be readily applied to winding machines now in use without requiring expert fitting of the parts.

Further objects of the improvement are set forth in the following specification which describes two preferred embodiments of the invention, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a front elevation of a conventional type of winding machine showing the present invention applied to use thereon;

Fig. 2 is a side elevation of the same;

Fig. 3 is an enlarged front elevation of the improved dogging device with the essential parts of the winding machine indicated by dash-lines;

Fig. 4 is a vertical sectional view of the dogging device taken on line 4—4 of Fig. 3;

Fig. 5 is a vertical sectional view of the mounting for the dogging quadrant or track taken on line 5—5 of Fig. 3;

Fig. 6 is an enlarged perspective view of the improved dog;

Fig. 7 is a front view of a modified form of mounting for the dogging quadrant or track; and

Fig. 8 is a vertical sectional view of the same on line 8—8 of Fig. 7.

The winding machine illustrated in the present drawings is of a well-known type comprising the essential elements of a rotating winding-spindle, a reciprocating thread-guide for traversing strand material longitudinally of the spindle, and a swinging traverse-frame which carries the thread-guide to adapt it to bear against the winding and to recede from the spindle as the cop, cone or package is built up thereon. In machines of other forms the winding-spindle may be reciprocated instead of the thread-guide and the present invention is adapted for use therewith with substantially the same method of application.

In the accompanying drawings, 2 designates the main frame of the winding head or unit and 3 the bed or table on which a plurality of the units may be mounted to be supported from the floor by suitable legs, not herein shown. The winding-spindle 5 is rotatively journaled in bearings 6 at the top of the frame 2 and arranged to be driven from a belt-pulley or other suitable power-operated means, not herein shown. The spindle 5 may be of usual form with its end overhanging the front of the frame 2 and adapted to receive a cylindrical paper cop-tube C on which the package P is wound; or it may carry a cone-holder for supporting a tapered or conical cop-tube.

A cam-shaft 7 is journaled in lower bearings in the frame 2 extending parallel with the winding-spindle 5 and connected to be driven therefrom by suitable means such as belt-pulleys and gearing, not herein shown. The cam-shaft 7 carries a helical cam 8 of usual type which is connected to reciprocate the thread-guide 10 to be later described.

The thread-guide 10 is carried on a swinging traverse-frame 11 which is supported by suitable arms 12 pivoted to rock about the cam-shaft 7. Only the forward arm 12 of the traverse-frame 11 is shown in the present drawings, it being understood that a horizontal crossbar 14 extends rearwardly from this arm through an opening 15 in the frame 2 and is joined to a second arm of the same form. Overhanging the front of the frame 11 and forming an extension of the crossbar 14 is a horizontal arm or member 16 which is slotted longitudinally at 13 to provide an extended bearing for the reciprocable traverse-bar 18. The traverse-bar 18 is thus mounted to slide in a path extending substantially parallel to the axis of the winding-spindle 5, being held in its bearing 13 by the lower edge of a traverse-frame back 19. The traverse-bar 18 is connected at its inner end to a slide or crosshead 17 which carries a roller or bowl 22 engaging a helical groove 9 in the traverse-cam 8.

The traverse-frame back 19 is usually constructed as a separate part, being secured to the

overhanging member 16 of the traverse-frame 11 by means of screws 20. The upper portion of the traverse-frame back 19 has a relatively flat face 21 which forms a rest or bearing for the upper portion of the thread-guide 10. The thread-guide 10, as herein shown, comprises a sheet-metal arm having its lower end attached to the traverse-bar 18 and its upper portion formed with a circular head provided with a slot or groove through which the strand *y* of yarn, thread or other material feeds.

The traverse-frame 11 is counterbalanced by a depending, weighted arm 23 which normally tends to swing the upper part of the frame towards the winding-spindle to hold the thread-guide 10 pressed against the surface of the winding. The traverse-frame 11 may also be influenced to hold the thread-guide against the winding by the action of a suitable differential-pressure device of well-known construction, not herein shown. A suitable tension-device is usually provided for applying tension to the strand *y* of yarn as it feeds from its source of supply to the thread-guide 10, such devices being well-known to those versed in the art and therefore not herein shown or described.

The operation of the winding machine is controlled by a starting lever or handle 25 mounted on a rockable rod 26 supported in bearings at the top of the frame 2. The rearward end of the rod 26 carries means, not herein shown, for operating a clutch-device or other instrumentalities which control the application of power to start or arrest the operation of the spindle 5 and the parts driven therefrom. The starting handle 25 is normally rocked into the position illustrated in Fig. 1 of the drawings to start the operation of the machine and is held in this relationship by detent-means as next described. Extending downwardly from the handle 25 is a curved arm 28 provided with a detent-shoulder or lock 29 at its lower end. The lock 29 is adapted to engage with an oppositely facing shoulder or latch 30 carried on the upwardly-projecting arm 31 of an arcuately-shaped quadrant-like lever 32. The quadrant-lever 32 is pivoted on a screw 33 having a shouldered, threaded portion 34 screwed into the side of the frame 2 as shown in Fig. 5; the arcuate portion of the lever 32 extending forwardly from its pivot in concentric relation to the axis of the cam-shaft 7. The latch 30 is normally held engaged with the lock 29 by the weight of the quadrant-lever 32 and by raising the outer end of the quadrant-lever the detents may be disengaged to release the starting lever to permit it to rock under the action of a spring or other suitable means, not herein shown, whereby to effect the disconnection of the driving means, previously referred to. The starting handle 25 carries a brake-shoe 37 which, when the handle is rocked as last explained, engages with a tapered brake-disk 38 on the spindle 5 to bring the latter to a quick stop.

The release of the detent-means to arrest the operation of the machine may be effected automatically by instrumentalities as next described. A suitable stop-member, not herein shown, may be set in position on the quadrant-lever 32 to make contact with an abutment on the traverse-frame 11 after the thread-guide 10 has moved outwardly from the winding-spindle 5 to a predetermined extent; such a sizing mechanism being shown and described in United States Letters Patent No. 1,950,855 dated March 13, 1934. The winding operation may also be arrested automatically upon breakage or exhaustion of the yarn or other material feeding to the machine through the action of a pivoted stop-lever or drop-wire 40 which is normally held suspended by the feeding strand *y*. As herein illustrated, the stop-lever 40 is constructed of wire in triangular form with its upper end pivoted on a screw 41 fastened in the end of the quadrant-lever 32. The lever 40 has an arm 42 reaching downwardly and provided at its end with a cross-bar or finger 43 which normally rests on the strand *y* as it leads from the tension-device to the thread-guide 10. Another leg 44 of the stop-lever 40 reaches rearwardly toward the cam-shaft 7 with its end adapted to engage with the toothed periphery of a stop-wheel 45 which rotates with the cam-shaft 7. When the finger 43 on the lever 40 is released by the breakage or running out of the strand *y* the leg 44 of the lever 40 will be swung against the rim of the wheel 45 under the action of gravity and, through its engagement with the teeth on the wheel, will be forced upwardly to lift the quadrant-lever 32 to release the detents whereby to arrest the winding operation in the manner and for the purpose as previously explained.

Referring now to Figs. 3 and 5 of the drawings, the improved dogging device of the present invention may be embodied in a form of construction as next described. Pivoted on the stud or screw 33 between the hub of the quadrant-lever 32 and the head 35 of the stud is a hinge-plate 48. The plate 48 extends downwardly from the pivot to support the inner end of an arcuate strip or curved track 50 which is secured thereto by rivets 49. The track 50 extends outwardly from the hinge-plate 48 beneath the quadrant-lever 32 in an arc concentric to the axis of the cam-shaft 7 about which the traverse-frame 11 swings. The track 50 is held in position as above explained against a depending stop or abutment 51 on the quadrant-lever 32 by the engagement therewith of a slotted dog 55. The track 50 and dog 55 constitute the main elements of the improved device which controls the separation of the thread-guide and winding-spindle during the winding operation in the manner as later explained.

The dog 55, shown in detail in Fig. 6, comprises an angularly-shaped member having a longitudinal slot 56 at its upper end for receiving a pivot-pin 57 held fast in and projecting rearwardly from the inner end of the traverse-frame back 19, see also Figs. 2 and 4. Through this arrangement the dog 55 is pivotally mounted on the pin 57 while at the same time being adapted for longitudinal movement with respect thereto. Adjacent its lower end the dog 55 is formed in its rearward face with a transverse slot 58 for slidably receiving the arcuate strip or track 50; the slot being of a dimension slightly greater than that of the track to provide a relatively close sliding fit while permitting the dog to rock to a slight degree.

As shown in Figs. 3 and 6, the upper surface of the slot 58 is beveled at a slight angle from the approximate center of the dog 55 toward the left-hand side thereof as viewed in Fig. 6, the bevel being indicated at 59 and at a greater angle from the center to the opposite side forming the inclined face 61. By this form of construction a relatively short off-center bearing surface 62 is provided which is adapted for sliding engagement with the upper surface of the track 50. The angle formed between the bearing portion 62

and the beveled face 61 constitutes an obtuse or blunt shoulder 60 which serves a purpose as later explained. The lower surface of the slot 58 is reversely beveled, being provided with a short lateral bearing portion 62' extending from the center of the dogging member 55 toward the left-hand side as viewed in Fig. 6, and forming a sharply beveled face 61' with an obtuse shoulder 60' offset laterally from or biased with respect to the corresponding shoulder 60 on the upper surface of the slot. At the right-hand side of the bottom of the slot is a slightly beveled surface 59' in opposite offset relation to the face 59 at the top. This particular formation of the slot 58 provides that when the dog 55 is rocked about its pivot 57 in a counterclockwise direction, as viewed in Figs. 1 and 3, the opposite shoulders 60 and 60' of the groove will wedge or cam against the upper and lower curved faces of the track 50 to resist swinging movement of the traverse-frame 11 in a direction toward the winding-spindle 5. When the dog 55 is rocked on its pivot 57 in a clockwise direction, however, the straight bearing portions 62 and 62' aline with the upper and lower faces of the track 50 and the traverse-frame 11 may be swung toward the spindle 5. The means for normally rocking the dogging member 55 into position to cause the shoulders 60 and 60' to wedge or dog against the opposite faces of the track 50 is constructed and arranged as next described.

Rockably mounted in bearings in the forward arm 12 of the traverse-frame 11 and a depending lug 66 at the end of the overhanging portion 16 thereof is a rod 67 formed with a crank-arm 68 at its inner end, see Figs. 1 and 2. The crank-arm 68 reaches outwardly and upwardly around the traverse-frame extension 16 and then curves inwardly to terminate in a portion 69 normal to the rod 67. Its end portion 69 is formed with a notch 70 engaged by a pin 71 projecting rearwardly from the dog 55, see Fig. 4. Referring now to Figs. 1 and 2, a finger-lever 72 is fastened to the forward end of the rod 67 outwardly beyond the lug 66 of the traverse-frame 11, the lever having a loop 73 at its lower end surrounding the rod. A screw 74 passing through one side of the loop 73 with its head abutting thereagainst is threaded into a hole in the opposite side of the loop to secure the finger-lever 72 in place on the rod 67. The finger-lever 72 abuts one side of the lug 66 on the traverse-frame 11 and a collar 76 fastened to the rod 67 at the opposite side of the lug holds the rod axially in place. Secured to the upper free end of the finger-lever 72 by a screw 77 is a leaf-spring 78 the lower end of which bears against a projection 79 of the traverse-frame 11. The spring 78 normally tends to rock the crank-arm 68 in a clockwise direction as viewed in Figs. 1 and 3 to maintain the shoulders 60 and 60' in camming engagement with the track 50. The improved dogging device having been described in detail the method of operation of the complete machine will be next explained.

The machine is prepared for winding by placing a cop-tube C on the winding-spindle or mandrel 5 and leading the strand *y* of yarn or other material through the tension-device, not shown, and across the finger 43 of the stop-lever 40. The strand is then drawn across a wire bail on the traverse-frame back 19, through the groove in the thread-guide 10 and its end attached to the cop-tube. The thread-guide 10 is initially placed in position bearing against the surface of the cop-tube C by pressing the finger-lever 72 inwardly against the action of the spring 78 to cause the crank-arm 68 to turn in a counterclockwise direction as viewed in Figs. 1 and 3. This movement of the arm 68 rocks the dog 55 about the pin 57 in a clockwise direction, thereby bringing the small surfaces 62 and 62' of the slot 58 substantially into alinement with the upper and lower curved faces of the track 50. With the dogging member 55 in this position the traverse-frame 11 may be swung inwardly toward the winding-spindle 5 until the thread-guide 10 rests against the cop-tube C.

After the thread-guide 10 has been placed in contact with the surface of the cop-tube C the finger-lever 72 is released and the spring 78 will turn the rod 67 and crank-arm 68 in a clockwise direction, as viewed in Figs. 1 and 3. Through the engagement of the slot 70 in the upper end 69 of the crank-arm 68 with the pin 71 on the dog 55 the latter is rocked on its pivot-pin 57 in a counterclockwise direction, see Fig. 3, until the shoulders 60 and 60' wedge or cam against the opposite faces of the track 50. Due to the fact that the pivot-pin 57 is offset laterally from the lower straight portion of the dog 55 a very slight rocking motion brings the shoulders 60 and 60' quickly into camming engagement with the track 50. During its pivotal movement the dog 55 is permitted to move longitudinally of the pivot-pin 57 on the traverse-frame back 19 to adapt it to adjust its position automatically to compensate for any variations or irregularities in the concentricity of the track 50.

The winding operation is started by rocking the handle or starting lever 25 into the position shown in Fig. 1 to engage its shoulder 29 with the detent-latch 30 on the quadrant-lever 32; it being understood that normally the shoulder 29 rests on the lower flat side of the latch 30 so that when it is swung downwardly it will slide thereabout to engage with the shoulder at the end of the latch. With the starting lever 25 locked in this position the clutch or other power-applying means is maintained operative to cause the machine to be driven therefrom. The winding-spindle 5 is therefore rotated continuously and the cam-shaft 7 driven therewith to cause the machine to function to wind the material onto the cop-tube C while the thread-guide 10 is reciprocated from the cam 8. The strand *y* of yarn or other material is thus caused to be traversed longitudinally of the winding-spindle as it is directed thereto by the thread-guide 10 and laid on the cop-tube C in a series of helical turns which build up to form the package P. As the layers of yarn or other material build up on the cop-tube C the thread-guide 10 is forced outwardly away from the winding-spindle 5 with the traverse-frame 11 swinging about the axis of the cam-shaft 7.

As the traverse-frame 11 recedes from the winding-spindle 5 the frictional engagement of the shoulders 60 and 60' with the curved faces of the track 50 causes the dog 55 to rock in a clockwise direction, as viewed in Figs. 1 and 3, against the action of the spring-pressed crank-arm 68 to substantially aline the parallel bearing surfaces 62 and 62' of its slot 58 with the arcuate faces of the track whereby to permit free sliding movement of the dog outwardly along the track. Any tendency of the traverse-frame 11 to move back in the opposite direction, however, is resisted by the camming action of the shoulders 60 and 60' against the opposite curved faces of

the track. This camming or dogging action is effected by the rocking motion of the dog 55 on its pivot 57 under the influence of the spring-actuated crank-arm 68. As the shoulders 60 and 60' engage frictionally with the opposite faces of the track 50 they cam thereagainst with considerable force to positively resist any pressure which would tend to move the traverse-frame 11 toward the winding-spindle 5.

The outward movement of the traverse-frame 11 is thus controlled to prevent its retrogression so that the thread-guide will have a smooth, uniform motion without any tendency to jump and vibrate due to irregularities on the surface of the winding. That is to say, when the thread-guide is once forced outwardly, for example, by a high point on the surface of the winding caused by the crossing of the coils or other inequalities it is restrained from movement back again so that jumping and vibration of the guide is prevented. As the thread-guide recedes from the winding-spindle with the growth in the package the differential-pressure mechanism, before mentioned, operates to gradually diminish the resistance to this movement, and concurrently therewith the tension on the strand is relieved in proportion to the increase in lineal speed of the strand being wound. When the cop or package P reaches the desired diameter the traverse-frame 11 engages a stop-member, previously mentioned, on the quadrant-lever 32 to lift the latter and release the detents 29 and 30. The starting lever 25 is thereby rocked to throw the clutch or other device to arrest the operation of the whole machine. Likewise, when the strand breaks or its supply becomes exhausted the stop-lever 40 is released to cause it to be engaged by the stop-wheel 45 to raise the quadrant-lever 32 and release the detents to effect the stopping of the machine. Since the track 50 is independently hinged on the pivot-stud 33 there is no tendency for the track to swing upwardly with the quadrant-lever 32 and the wedging engagement of the dog 55 with the track therefore remains undisturbed.

In winding packages of yarn for use as supplies in knitting machines and other textile apparatus wherein the yarn is drawn off over the end any knotted portions occurring in the strand are placed across the end of the package to insure free delivery of the coils of winding without catching and breaking. To enable the operator of the winding machine to place the trailing end of the yarn across the end of the package it is necessary that the thread-guide be moved away from the periphery of the package so that the strand may be drawn off without hindrance. The present invention therefore contemplates the provision of means for automatically retracting the thread-guide from the surface of the package when the winding operation is arrested. Referring to Figs. 7 and 8, which illustrate a modified form of construction of the device for accomplishing this purpose, the track is fastened to the plate 48 in a manner similar to that previously described, but the plate, instead of being pivoted on the stud 33 independently of the quadrant-lever 32, is rigidly fastened to the lever. A shouldered pin 85 fast in the plate 48 engages in a hole in a lug 86 depending from the hub of the lever to lock the two parts together.

Through the last-described form of construction, when the quadrant lever 32 is rocked upwardly to release the detents 29 and 30 the track 50 is carried upwardly therewith. The dog 55, being held in engagement with the opposite faces of the track 50 by the spring-pressed crank-arm 68, is also moved upwardly with the pins 57 and 71 sliding in the slots 56 and 70 respectively. Since the pin 71 is positioned below the pivot-stud 33 about which the track 50 swings, the pin will move away from the stud simultaneously with its upward movement and through the engagement of the inclined slot 56 with the pin 57 the latter is cammed to the right, as viewed in Fig. 3, to a slight extent. This action of the dog 55, which still remains gripped to the track 50, will force the traverse-frame 11 and thread-guide 10 mounted thereon away from the package to permit the trailing end of the yarn to be readily drawn off therefrom.

It will be observed from the foregoing that the present invention provides a highly efficient device for controlling the relative separation between the thread-guide and winding-spindle during the winding operation. The improved dogging device is quick and positive in action to function in preventing lost motion between the winding elements, while being self-adjusting to compensate for inaccuracies of manufacture and wear on the parts.

Heretofore it has been a common practice to employ an arcuate dog carried by the traverse-frame and arranged to wedge into a groove in the bottom of the curved detent-lever or quadrant 32 which controls the stopping of the machine. With this previous form of construction it has been the experience that the pressure of the dog as influenced by vibration or from its sticking or binding in the groove of the quadrant sometimes causes an unwarranted release of the detents and thus prematurely arrests the operation of the machine. With the present improvement such accidental stopping of the machine is prevented and the dog rendered more efficient in action and less liable to derangement or getting out of order. Moreover, in the present construction the dogging mechanism is reduced to the utmost simplicity and rendered more economical to manufacture and assemble on machines now in use without expert fitting or adjustment.

As another feature of the improvement, it will be observed that when the detent-member or quadrant 32 is lifted by the action of the wheel 45 on the stop-lever 40 to effect the stopping of the winding operation it will have no effect to release the dog 55. That is to say, the dog 55 will still be held in gripping engagement with its track 5[illegible] to maintain the guide in proper relation to the surface of the winding.

While the present improved device is herein shown and described in two preferred forms of construction, it is to be understood that various other modifications may be made in the structure and arrangement of its parts, and in the mechanism of the machine on which it is used, without departing from the spirit or scope of the invention. Therefore, without limitation in this respect, I claim:

1. In a winding machine, the combination of a winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting one of said elements to adapt it to recede from the other element during the growth in the winding, an arcuate track pivoted to a fixed part of the machine and extending concentrically of the pivotal axis of the frame, a dog mounted for pivotal and longitudinal movement on the frame and provided with a slot for receiving the track, said slot formed with biased shoulders on its opposite

sides, and means for normally rocking the dog in a direction to cause its shoulders to cam against the opposite curved faces of the track to resist movement of the frame in one direction only.

2. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted to a fixed part of the machine and arranged concentrically of the pivotal axis of the frame, a dog, means for supporting the dog on the frame to adapt it for pivotal and longitudinal movement thereon, said dog having a slot for receiving the track formed with opposite biased shoulders adapted to bind against the opposite curved faces of the track to resist movement of the frame in one direction only, and means for rocking the dog in a direction to cause its binding action.

3. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted to a fixed part of the machine, a dog mounted for pivotal and longitudinal movement on the frame, said dog having a slot for receiving the track formed with opposite biased shoulders adapted to bind against the opposite curved faces of the track to resist movement of the frame in a direction toward the winding-spindle, means for normally maintaining the shoulders in engagement with the track, and manually-operable means for rocking the dog to release its shoulders from engagement with the track.

4. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted to a fixed part of the machine, a dog, means for mounting the dog for pivotal and longitudinal movement on the frame, said dog having a transverse slot for receiving and supporting the track in concentric relation to the pivotal axis of the frame, said slot formed with opposite biased shoulders adapted to bind against the opposite curved faces of the track to resist movement of the frame in a direction toward the winding-spindle when the dog is rocked in one direction, a resiliently-operated lever connected to the dog for normally rocking the latter into wedging position, and manually-operable means for rocking the dog into position to release its shoulders from the track.

5. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted to a fixed part of the machine, a dog on the frame having a transverse slot for receiving and supporting the track, said slot formed with opposite biased shoulders adapted to bind against the opposite curved faces of the track to resist movement of the frame in a direction toward the winding-spindle, means for mounting the dog on the frame comprising a pin on the frame and a slot in the dog for receiving the pin to adapt the dog for both pivotal and longitudinal movement thereon, and means to rock the dog to cause it to bind against the track.

6. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted on a fixed part of the machine, a dog on the frame having a transverse slot engaging the track and supporting it in concentric relation to the pivotal axis of the frame, said slot formed with opposite biased shoulders adapted to bind against the opposite curved faces of the track to resist movement of the frame in a direction toward the winding-spindle, means for mounting the dog to adapt it to rock and to move substantially radially with respect to the pivotal axis of the frame, and means for rocking the dog to cause its shoulders to bind against the track.

7. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, an arcuate track pivoted to a fixed part of the machine, a dog on the frame, a transverse slot in the dog for supporting the track, said slot formed with opposite biased shoulders adapted to wedge against the opposite curved faces of the track to resist movement of the frame toward the winding-spindle, a pin on the frame, an inclined slot in the dog for receiving the pin to adapt the dog to rock on the pin and to move longitudinally with respect thereto, and resiliently-operated means for rocking the dog into engagement with the track.

8. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, a pivoted quadrant-lever for controlling the stopping mechanism of the machine, an arcuate track pivotally mounted independently of the quadrant-lever, a dog on the frame mounted to rock and to move substantially radially with respect to the pivotal axis of the frame and having a transverse slot for receiving the track, said slot provided with opposite biased shoulders adapted to wedge against the opposite curved faces of the track to resist movement of the frame in a direction toward the winding-spindle, resiliently-operated means for normally rocking the dog to cause its shoulders to engage the track, and manually-operable means for releasing the dog.

9. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, a quadrant-lever pivoted to a fixed part of the machine and adapted to be rocked to initiate the stopping mechanism of the machine, an arcuate track fast with the quadrant-lever, a dog on the frame normally engaged with the track to resist movement of the frame in a direction toward the winding-spindle, and means on the dog acting against the frame when the quadrant-lever and track are rocked to arrest the winding operation whereby to remove the thread-guide from contact with the winding.

10. In a winding machine, the combination of a rotatable winding-spindle, a reciprocable thread-guide, a pivoted frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the wind-

ing, a pivoted quadrant-lever adapted to be rocked when the winding strand breaks or its supply is exhausted to cause arrestment of the winding operation, a track carried by the quadrant-lever, a rockable dog on the frame for engaging the opposite faces of the track to resist movement of the frame in a direction toward the winding-spindle, means for pivotally mounting the dog on the frame comprising a pin on the frame, and an inclined slot in the dog for receiving the pin to adapt the dog to rock thereon and to move longitudinally, said slot being caused to cam against the pin when the quadrant-lever and track are rocked to arrest the winding operation whereby to remove the thread-guide from contact with the winding.

11. In a winding machine, the combination of a rotatable winding-spindle, a thread-guide, means for effecting relative traverse between the winding-spindle and thread-guide, means for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, stopping mechanism for arresting the operation of the machine, means for controlling the movement of the thread-guide away from the winding-spindle during the winding, and means actuated from the stopping mechanism to operate said controlling means to cause it to act positively to move the thread-guide away from the surface of the package when the winding is arrested.

12. In a winding machine, the combination of a rotatable winding-spindle, a thread-guide, means for effecting relative reciprocation between the winding-spindle and thread-guide, means for mounting the thread-guide to adapt it to move away from the winding-spindle during the growth in the winding, means for normally maintaining the thread-guide in close association with the surface of the package during the winding, stopping mechanism for arresting the operation of the machine, and means actuated automatically by the stopping mechanism to cause it to act positively to move the thread-guide away from the surface of the package when the winding is arrested.

13. In a winding machine, the combination of a rotatable winding-spindle, a thread-guide, means for effecting relative reciprocation between the winding-spindle and thread-guide, a frame for supporting the thread-guide to adapt it to recede from the winding-spindle during the growth in the winding, dogging means for controlling the movement of said frame to maintain the thread-guide in close association with the surface of the package being wound while resisting its retrogressive movement toward the winding-spindle, stopping mechanism for arresting the operation of the machine, and means operated by the stopping mechanism to actuate the dogging means to cause it to act positively to move the frame to shift the thread-guide away from the surface of the package when the winding is arrested.

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