Feb. 9, 1965 W. ZOLLINGER 3,168,992

AUTOMATIC CROSS WINDER INCLUDING YARN-PARAFFINING MEANS

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Fig.1

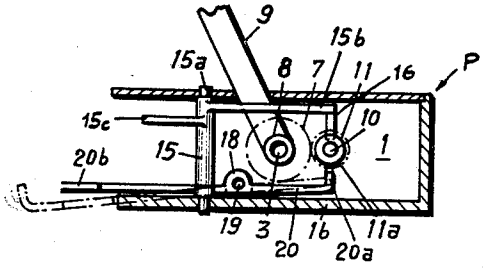


Fig.2

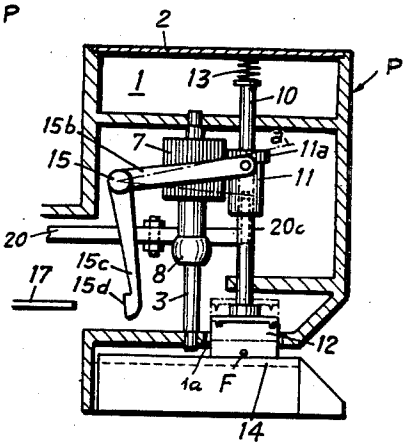


Fig.3

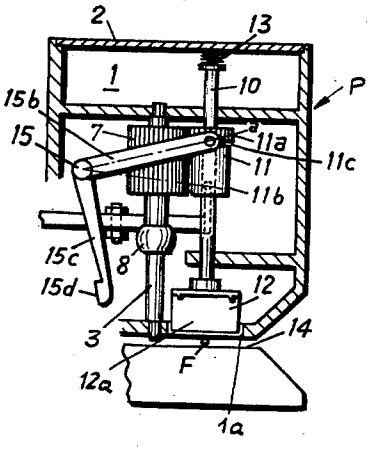


Fig.4

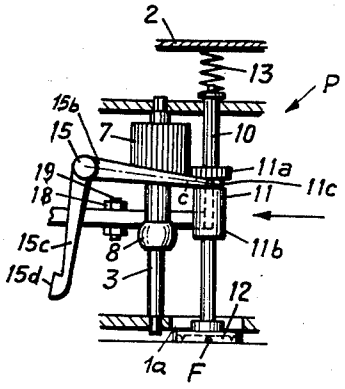
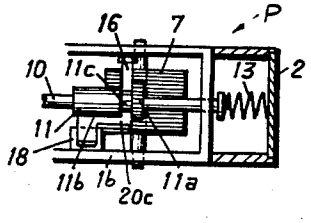


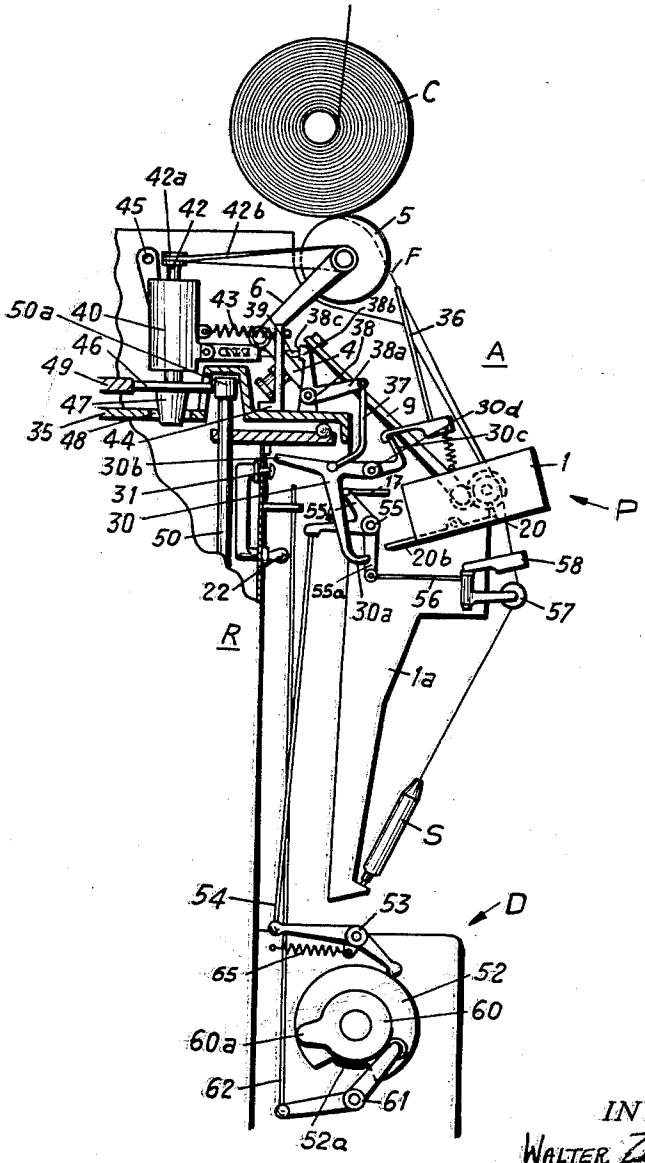
Fig.5



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Fig. 6



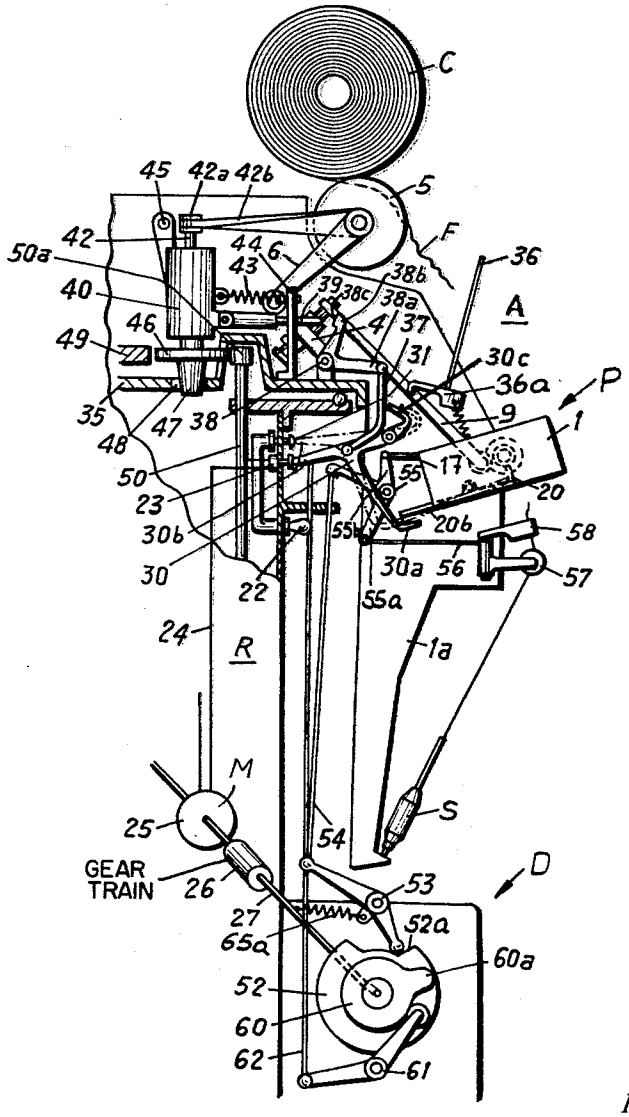
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Fig. 7



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AUTOMATIC CROSS WINDER INCLUDING YARN-PARAFFINING MEANS

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19 Claims. (Cl. 242—35.5)

The present invention generally relates to textile machines such as an automatic cross-winder of the type having a plurality of wind-up bobbins or pirning heads which are served by at least one working unit comprising a knotter, a yarn catching assembly and a device for the replacement of the creel bobbins. More particularly, the teachings of the present invention are concerned with a paraffining device for applying paraffin or the like to the yarn during its movement between the creel bobbin and a wind-up bobbin.

In automatic winders in which the yarn ends are automatically located and knotted in the event of yarn breakage or when the creel bobbin is exhausted, a paraffining device must in many instances be provided besides the yarn cleaner and the yarn brake. The paraffining device either releases the broken yarn by removing the paraffin block or disk from its associated contact or press-on plate, or inserts the knotted new yarn between the paraffin disk and said press-on plate. Additionally, the paraffin disk which is driven during the winding process must be stopped. If the winder assembly is provided with a plurality of winding heads, the paraffining devices associated with each winding head must be independently controlled so that the yarn supply need not be stopped for all winding heads in the event of yarn breakage or exhaustion of a cop or supply bobbin.

In the heretofore known paraffining devices, stoppage of the paraffin disk must be instant in the event of yarn breakage so that the broken yarn end will not be wound about the shaft of the paraffin disk. Such would naturally prevent the yarn ends from being automatically brought together or assembled. For this reason, the known paraffining devices must be driven via a clutch which is stopped and disengaged at the moment of yarn breakage. Even then, if the paraffin disk is not braked it cannot be avoided that the yarn end becomes wound up or entangled despite prompt disengagement of the clutch.

Accordingly, the present invention has for one of its primary objects to provide each of the pirning heads of an automatic winder with a paraffining device controlled by means of the control mechanism of the winding machine so that the actuation of the yarn or thread feeler due to thread breakage or exhaustion not only stops the winding operation of this particular winding unit but also actuates said paraffining device.

Another important object of the present invention is to provide means for positively indicating the wear of the paraffin disk prior to complete consumption while ensuring that the wind-up bobbin is prevented from assuming a further winding operation until the paraffin disk has been replaced.

Still a further important object of the present invention is to provide means for positively and reliably applying paraffin or the like to a yarn as it moves between a supply cop and a pirn or wind-up bobbin.

Yet another important object of the present invention is to provide a paraffining device which upon actuation of an associated thread feeler and when the paraffin mass has reached a critical extent will indicate to an operator that such paraffin mass must be replenished, while simultaneously preventing re-engagement of an associated wind-

up bobbin into its winding position until replenishment of said paraffin mass has occurred.

A further important object of the present invention is to provide a winding machine with a paraffining device which positively applies paraffin or the like to a yarn and prevents entanglement of a yarn end in said paraffining device.

The present invention is characterized by the fact that each pirning head is provided with a paraffin disk which is in constant driving relation with the grooved driving drum or roller of the associated winding unit, and which is arranged so as to float and to be axially displaceable. Moreover, a control device is provided which is operatively associated with the drive of the grooved roller on the one hand, and with a displacing mechanism for the paraffin disk on the other hand. The displacing mechanism is so constructed that it withdraws the paraffin block out of contact with the yarn at such time as yarn breakage or exhaustion occurs. The paraffining device is further provided with a locking lever which locks the floating paraffin shaft to prevent axial movement thereof when the paraffin block has worn down to a critical extent. The locking lever assumes such a position that when yarn breakage or exhaustion occurs, an indicating or warning device is actuated to call to the attention of the machine operator that the paraffin must be replenished. The locking lever maintains this position until such time as the paraffin is renewed and prevents the associated winding unit from starting its winding operation until such has been accomplished. The design of the paraffin device is carried out in such a manner that if the mass of the paraffin block does not fall below the minimum allowed quantity, then the control mechanism for carrying out knotting and renewed winding of the yarn is directly actuated without energizing the warning device.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinatfer; it should be understood, however, that the detailed description and specific example, while indicating a preferred embodiment of the invention, is given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

In the drawings:

FIG. 1 is a front elevational view of the drive arrangement of a paraffining device designed according to the teachings of the present invention and having the front wall of its housing removed in order to reveal the interior thereof;

FIG. 2 is a top plan view of the paraffining device shown in FIG. 1 illustrating the position thereof when a newly replaced paraffin disk or block has been applied into its operating position;

FIG. 3 illustrates the position of the paraffin device shown in FIGS. 1 and 2 during stoppage of the winding operation as for example due to thread breakage or exhaustion;

FIG. 4 is a fragmentary, top plan view of the paraffining device similar to FIG. 2, but showing an exhausted paraffin disk prior to being replaced;

FIG. 5 is a side view taken in the direction of the arrow of FIG. 4 and turned endwise 90 degrees with respect to FIG. 4;

FIG. 6 shows the relationship of the paraffining device of the present invention employed in conjunction with a winding machine during the winding operation; and

FIG. 7 illustrates a fragmentary view of an automatic cross-winder including a winding unit associated with the paraffining device of the present invention, and with said winding unit being in disengaged or inoperative position.

The paraffining device of the present invention has been shown in the drawing in conjunction with an automatic cross-winder of the type provided with a group of winding units arranged on a rotary table which may be successively indexed through one winding unit at a time. The drawings illustrate only enough of the cross-winder structure to assist in illustrating and explaining the manner in which the device may be successfully employed in an automatic cross-winder. For further details of the features of the winding assembly reference is made to the commonly assigned copending United States application Serial No. 28,428, filed May 11, 1960, by Walter Schweiter, now United States Patent 3,062,462, granted November 6, 1962.

Referring now to the drawings and, more particularly, to FIGS. 1–5, there is disclosed a paraffining device P designed according to the teachings of the present invention which is accommodated in a suitable housing **1** arranged at the downwardly extending supporting arm **1***a* provided for each winding unit A of a multi-station, indexable cross-winder. The supporting arms **1***a* are supported on a rotatable table or turret **35** adapted to be indexed through successive winding units A, and is rotatably carried on a stationary tubular upright R. As clearly shown in FIGS. 1–5, the housing member **1** is laterally closed by an endwall **2** and has arranged therein a driving shaft **3** which is driven by the self-winding grooved drum **5** for the individual wind-up bobbins C through the intermediary of a belt member **6** and reduction gear train **4** associated with each winding unit A. Located on the driving shaft **3** is a wide gear **7** and a pulley member **8**, the latter of which is driven by an endless belt member **9**, which in turn is driven by the reduction gearing **4** (see FIGS. 1, 6 and 7).

A pinion member **11***a* which meshes or engages with the wider gear member **7** is provided on the pinion hub or support body **11**. The pinion hub **11** is attached to a floating paraffining shaft **10** which is axially displaceable in the housing **1**. The pinion **11***a* is spaced from the pinion hub portion **11***b* to define recessed annular groove **11***c* therebetween. A suitable mass of paraffin in the form of a disk or block **12** is applied to one end of the paraffin support shaft **10**, and a compression spring **13** or the like is applied to the opposite end of said paraffin shaft. The compression spring **13** is arranged in such a manner as to bear against the lateral end wall **2** of the housing **1** and normally forces the paraffin disk **12** through aperture **1***a* and against a statonary back-up means or plate member **14** when the wind-up bobbin C is operative i.e., is performing its thread or yarn winding operation.

The annular groove **11***c* is constructed in such a manner that it is adapted to retract the paraffin disk **12** into its inoperative or non-engaging thread position (FIG. 3), so that the broken or exhausted yarn end can be removed and the knotted yarn F inserted between the lower frictional face **12***a* of the paraffin block **12** and its cooperating counterplate **14**. The displacement of the paraffin disk **12** into its non-engaging or inoperative position is obtained by means of a rockable pivot lever **15** which is swivelably mounted within the walls of the housing **1** by means of a pivot shaft **15***a*. The rockable lever **15** is designed in the form of a double-arm lever having the laterally extending arm members **15***b* and **15***c*. The arm member **15***b* of the rockable lever **15** is arranged to pass over the gear **7** and is provided at its free end with a vertical extending pin member **16** adapted to engage the groove **11***c* formed between the pinion **11***a* and pinion hub or body portion **11**. As can clearly be seen in FIG. 3, the longitudinal axis of the arm **15***b* assumes the position denoted by reference letter *a* when the paraffin block **12** is brought out of contact with the thread F. The other arm **15***c* of the double-arm pivot lever **15** has its free end provided with a contact or butt-plate **15***d* against which a rod **17** is adapted to rest when the winding operation is discontinued, in a manner which will be more fully described hereinafter.

As soon as one of the winding units A is stopped, the rod member **17** will abut against the contact plate **15***d* of the lever arm **15***c* and rotate the lever arm **15***b* in such a manner that the pin **16** engages the groove **11***c* and returns the paraffining shaft **10** into its initial position *a*, so that the desired space or clearance is obtained between the paraffin disk **12** and the counterplate **14** to enable the yarn or otherwise to be inserted. As soon as the winding operation of the winding unit C recommences, the spring member **13** forces the paraffin disk **12** against the counter plate **14** so as to again clamp the yarn in position of application of paraffin thereto.

If the paraffin disk **12** is almost exhausted as shown in FIG. 4, the arm member **15***b* and pinion body **11** will assume the position *c*. In this position, the paraffining shaft **10** is held as follows: Attached to the bottom wall **1***b* of the housing **1** is a support bracket **18** in which a twin-armed locking lever **20** is pivotably supported by pin means **19**. The right-hand end **20***a* of the locking lever **20** is bent upwards and carries a locking tongue **20***c*. This tongue **20***c* (FIG. 5) rests and slides on the pinion hub portion **11***b*. Before the paraffin disk **12** is worn or abraded to the point where it can no longer be employed, the groove **11***c* is located at point *c* and engages the locking tongue **20***c* so that the paraffining shaft **10** is locked against displacement into position *a*. However, there is still sufficient paraffin available on the block **12** before the next yarn breakage occurs or the next bobbin is exhausted so that no unparaffined yarn portions will appear. In the locking position of the locking lever **20**, the other arm **20***b* which projects from the housing **1** (FIGS. 6 and 7) drops into the position indicated in phantom lines in FIG. 1. In this position the lever arm **20** is prepared to prevent a multi-arm control lever **30** from carrying out its full rotational movement when yarn breakage or exhaustion occurs, and causes a warning device to become actuated which indicates that the paraffin block must be replaced, as will be described more fully hereinafter.

The winding assembly shown in the embodiment according to FIGS. 6 and 7, is an automatic cross-winder of the type described in the aforementioned commonly assigned copending United States application Serial No. 28,428, filed May 11, 1960, by Walter Schweiter, now United States Patent 3,062,462 granted Nov. 6, 1962. This winding assembly comprises a plurality of winding units A including the pirning heads or wind-up bobbins C driven by a common drive **49**, with the winding units supported for rotational movement on a table **35** adapted to be rotated, as will be described in greater detail shortly hereafter. Cooperating with the winding units A in a manner known to the art is at least one stationary unit provided with yarn catching or holding members, a knotter and creel bobbin magazine. The cooperation of the stationary unit with the pirning heads is controlled by an automatic control device. Since the details and provision of the knotter, yarn catch members and creel bobbin replacement is not essential to an understanding of the paraffining device of the present invention, the same has not been described in greater detail. For the sake of completeness, however, the knotter and yarn catch assembly may be of the type disclosed by Walter Schweiter in his copending commonly assigned United States application Serial No. 844,987, filed Oct. 7, 1959, now United States Patent 3,026,054, granted Mar. 20, 1962. The construction of the winding units, drive and automatic control devices shall now be explained insofar as such parts cooperate with the paraffining device and to the extent necessary so that the function thereof will become more readily apparent.

Referring now to FIGS. 6 and 7, it will be seen that cooperating with the holding or locking lever **20** of the paraffin device P is an arm **30***a* of a three-armed control

lever 30 at the time when said locking lever 20 is in the position indicated in phantom lines in FIG. 7. The control lever 30 is pivotable about a pin member 30*d* attached to the supporting arm 1*a* and includes the further arm members 30*b* and 30*c*. The arm member 30*b* is designed to cooperate with a stationary warning or indicating switch 31 associated with the pirning head, i.e., to close such switch 31 when the arm 30*a* comes to rest against the locking lever 20 upon thread breakage or exhaustion and to indicate that the paraffin disk 12 is worn. Actuation of the switch 31 completes the circuit for an indicating lamp 22 supported on the upright member R, which lamp will remain lit until such time as the paraffin disk has been replaced by hand and the locking lever 20 returns into its rest position.

Swivelled to the arm 30*b* of the control lever 30 is a connecting or pull-rod 37, the upper end of which is connected to a lever arm 38*a* of an angle-lever 38. The upper end of the other arm 38*b* of the angle-lever 38 is provided with an abutment plate or nose 38*c*. This abutment plate 38*c* is adapted to contact a spring biased piston rod 39 cooperating with a pivotably mounted individual driven unit 40 which rotatably supports a shaft member 42. The rotatable table 35 of the winding mechanism supports an upright plate or bracket 44 which carries a spring member 43 adapted to pull the individual driven unit 40, which is pivotably supported by the stationary support 45, into its braked or inclined position shown in FIG. 7. The shaft member 42 is provided at its lower end with a friction disk 46 and a braking hub 47, the latter of which is adapted to extend into a respective braking aperture 48 provided in the rotatable table 35. The walls of the aperture 48 define a braking surface which cooperate with the braking hub 47 when the individual driven unit 40 is pivoted to the right of the drawing of FIG. 7, such that the friction disk 46 is disengaged from a main driving unit 49 adapted to simultaneously drive each of the individual driven units 40 provided for the cross-winder assembly.

Each of the support arms 1*a* for each winding unit A carries a cop S which feeds a supply of yarn F for winding about the wind-up bobbin C. It can be seen from FIGS. 6 and 7 that the self-winding grooved drum 5 for driving the wind-up bobbin C receives its power from its associated individual driven unit 40 through the intermediary of a pulley 42*a* and endless belt member 42*b*. In a manner known to the art, a thread sensing element or yarn feeler 36 is associated with the yarn F in order to determine yarn breakage or exhaustion. Thus, if the yarn F is present at the yarn feeler 36 then the latter will be in the position indicated in FIG. 6, and the lever arm 38*b* will contact the rod 39 and force the friction disk 46 of an individual driven unit 40 into driving contact with the main driving disk 49. The main driving disk 49 is continuously driven by a suitable drive motor (not shown) so that the transmission of power from the main driving disk 49 is translated to the grooved roller or drum 5 via the rotatable shaft 42, pulley member 42*a* and belt member 42*b*.

If the yarn F breaks or if its end runs-off the cop or supply bobbin S, they arn feeler or detector 36 will then assume the position shown in FIG. 7. As a result, the three-armed switching or control lever 30 and, more particularly, its arm 30*c* is released from the nose portion 36*a* of said yarn feeler and the control lever 30 will move into the position shown in full lines in FIG. 7. The bent free end of the arm 30*a* of the control lever 30 then extends beneath the arm 20*b* of the locking lever 20 so that the lever arm 30*b* will be able to move freely past the indicating switch 31 for contact with the control actuating switch 23. By means of the connecting link 37 pivotably connected to the lever arm 38*a*, the lever 38 is swung to the right and the tension spring 43 pulls the individual driven unit 40 into its inclined braked position, as indicated in FIG. 7. This causes the individual friction disk

46 to be lifted out of driving engagement with the main driving disk 49. The tension of the spring 43 will then cause the braking hub 47 to be forced against the braking wall surface of the associated aperture 49 provided in the rotary table 35 so that the driving shaft 42 is stopped. Of course, if the paraffin block has become worn to the extent permitted, then the locking lever 20 moves into groove 11*c* and the control lever is blocked from carrying out its complete degree of rotational movement when the yarn feeler 36 is released, so that the arm 30*b* can only move down to an extent enabling it to actuate the warning switch 31. Consequently, the control unit D will not be actuated until such worn paraffin block is replaced.

FIGS. 6 and 7 illustrate the rotatable table 35 in a position where the pirning head or wind-up bobbin C is located in front of the actuating switch 23 for the control unit D designed to eliminate the fault by locating and knotting the yarn ends which may, by way of example, be broken. For locating the yarn end on the wind-up bobbin C, the latter must be rotated backwards so that a certain length of yarn end is unwound. Thus, each control unit D has associated therewith a reversing shaft 50 which carrys at its upper end a reversing friction disk 50*a* which is driven, for example, by the drive motor for the main driving friction disk 49. The reversing shaft 50 may be driven continuously or during the working cycles of the associated control unit D. If a winding unit A where yarn breakage has occurred arrives at a control unit D the latter is started. This is performed as follows:

Arranged at the upright R opposite the unit is the actuating switch 23 for the control unit D which will be actuated by the arm 30*b* of the control lever 30 when the latter is in the position shown in full lines in FIG. 7, due to yarn breakage or exhaustion and as soon as the winding unit head A has reached its position in front of the control unit D. The actuating switch 23 closes an electric circuit 24 for a drive motor 25 which drives a control shaft 27 via a gear train 26. The control shaft 27 supports a plurality of cams, each of which is designed so as to be associated with a certain function in the performance of the work cycle of the winding machine. FIGS. 6 and 7 show only the cams 52 and 60, the others having been removed for the sake of clarity. The cams may be so designed to effect, for example, the starting of the unit or the actuation of the detectors for the yarn ends; or else to actuate the reversing shaft 50 against the friction disk 50*a*, of which the pulley 46 has come to rest so that the wind-up bobbin C is rotated backwards via the grooved roller; or to actuate the knotter unit, or to carry out replacement of the cop S by a new cop or creel bobbin.

These functions may all be initiated or performed by rotation of the control shaft 27 through for example one revolution, and insofar as necessary to render the winding unit A and wind-up bobbin C thereof operational again. At all events, however, the paraffin disk 12 and the yarn brake 57 must be open while the yarn ends are located and knotted so that a yarn end held therebetween can be seized and removed. This opening movement of the paraffin disk into its non-applying position is performed by the cam 52 during rotation of the control shaft 27. To this end, there is provided a rocker arm or follower 53 which is biased to pivot in the clockwise direction by a spring member 65*a*. As a result, the follower 53 engages a recess 52*a* provided on the cam 52, thereby displacing the push rod 54 pivoted to said follower 53 in an upward direction. The rod 54 then swivels a further three-armed control lever 55 in a clockwise direction. A bar 56 pivoted to the arm 55*a* of the control lever 55 causes a yarn brake 57 and a yarn cleaner 58 to open, which are of known design. For example, of the type disclosed in the United States application Serial No. 844,987, previously mentioned, now United States Patent 3,026,054, granted March 20, 1962. On the other hand, the arm 55*b* will swivel the pivot shaft 15 via the rod 17 so that the paraffin disk 12 is raised off the counterplate 14 in the

manner previously described. This enables a yarn end passing through the yarn brake 57, the yarn cleaner 58 and the paraffining device P to be removed by mechanical means, such as a suitable yarn catching hook known to the art. The floating arrangement of the shaft member 10 for the paraffin disk 12 ensures that the yarn end cannot be wound about or become entangled in the paraffining device P so that the necessity of manual intervention is positively eliminated. This advantage is obtained despite the fact that the shaft member 10 of the paraffining device P is continuously in driving connection with the grooved winding drum 5 via the members 6, 4 and 9. As the cam member 52 continues its rotation, the rocker arm or follower 53 is again swivelled back into its initial position so that the push rod 54 will release the three-armed control lever 55, which returns back into its original position, for example, under the action of a suitable spring or counterweight. This, in turn, causes the spring 13 to move the paraffin disk 12 into its normally advanced position for contact with yarn F while the yarn brake 57 and the yarn cleaner 58 are again closed by a reverse movement of the rod 56.

At the end of the working cycle of the control unit D, the cam 60 and nose portion 60*a* thereof become operative. The nose portion 60*a* of the cam 60 swivels a cam follower lever 61 temporarily in the clockwise direction and moves the arm members 30*b* and 30*c* of control lever 30 via the push rod 62 in an upward direction. The control lever 30 in turn swivels the angle lever 38 through the intermediary of the connecting member 37 so that the individual driven unit 40 is rotated about the pivot axis 45, and the friction disk 46 again establishes frictional driving contact with the main driving disk 49. By means of the belt 42*b* and the grooved drum or roller 5, the wind-up bobbin C is now once again driven in the normal direction of winding. The yarn F is first tensioned between the wind-up bobbin C and the yarn brake 57 so that the yarn detector 36 returns into its yarn sensing position, as shown in FIG. 6, and in such a manner that its engaging nose portion 36*a* interlockingly contacts the arm 30*c* of the control lever 30 even if the push rod 62 has returned into its initial position.

When the arm 30*b* of the control lever 30 returns to its initial position shown in FIG. 6, the actuating switch 23 will open. In order to allow the control shaft 27 to nevertheless perform a complete revolution, a further circuit may be provided in parallel with the circuit for actuating switch 23, said further circuit comprising a switch actuated by a cam, e.g. the cam 52. This switch will be opened only when the control shaft 27 has returned to its original position after performing a complete revolution or turn.

It should be apparent that the described operating cycle cannot be performed while the three-armed control lever 30 is kept in the intermediate position indicated by phantom lines in FIG. 7, i.e. when the paraffin disk 12 has been worn to the maximum extent permitted and the locking lever 20 has pivoted to assume its locking position. Even if the winding unit involved, which must have been disturbed, e.g. by yarn breakage in order to release the control lever 30 from its top end position when engaged by the yarn detector or sensor 36, should pass a control unit, the control device D cannot be actuated and the yarn breakage mended before the paraffn disk 12 is renewed. This in turn, ensures that the yarn to be wound will always be perfectly paraffined. Indication of wear by means of a lamp or other suitable warning device associated with each wind-up bobbin or pirning head C enables renewal of the paraffin mass to be performed, virtually in all instances, before the particular winding unit involved reaches the control unit D. In addition to a high degree of operational reliability, the renewal of the paraffin disks will not increase unproductive intervals.

Having thus described the nature of the present invention, what is desired to be secured by United States Letters Patent is:

1. In an automatic cross-winder having a plurality of pirning heads, each of which is provided with a driving roller which can be stopped and reversed independently of the other pirning heads in the event of yarn breakage or exhaustion of an associated creel bobbin; a separate paraffining device for each of said pirning heads including an axially displaceable and rotatable shaft member mounted to provide a floating shaft having a free end adapted to rotatably support a mass of paraffin which is to be applied to yarn moving between a creel bobbin and an associated pirning head, a mass of paraffin carried at said free end, a back-up member confronting said mass of paraffin, with the yarn moving between said paraffin mass and said back-up member, said floating shaft during the winding operation being capable of undertaking both axial displacement and rotation, driving means for driving said shaft member, and means for maintaining said driving means in continuous driving relationship with said associated pirning head.

2. In an automatic cross-winder having a plurality of pirning heads, each of which is provided with a driving roller which can be stopped and reversed independently of the other pirning heads in the event of yarn breakage or exhaustion of an associated creel bobbin; the combination therewith of a separate paraffining device for each of said pirning heads including an axially displaceable and rotatable shaft member mounted to provide a floating shaft having a free end adapted to rotatably support a mass of paraffin thereat which is to be applied to yarn moving between a creel bobbin and an associated pirning head, said floating shaft during the winding operation being capable of undertaking both axial displacement and rotation, driving means for driving said shaft member, and means for locking said shaft member in a predetermined position when said paraffin mass becomes worn to a critical extent.

3. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member mounted to provide a floating shaft having a free end adapted to rotatably support a mass of paraffin thereat which is to be applied to yarn moving between said cop and an associated wind-up bobbin, a mass of paraffin mounted to said free end, back-up means confronting said paraffin mass, with the yarn travelling between said paraffin mass and said back-up means, said floating shaft during the winding operation being capable of both axial displacement and rotation, driving means for driving said shaft member, and displacing means cooperating with said shaft member for axially displacing said floating shaft and said paraffin mass into a non-applying position.

4. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member mounted to provide a floating shaft having a free end adapted to rotatably support a mass of paraffin thereat which is to be applied to yarn moving between said cop and an associated wind-up bobbin, a mass of paraffin mounted to said free end, back-up means confronting said paraffin mass, with the yarn travelling between said paraffin mass and said back-up means, said floating shaft during the winding operation being capable of both axial displacement and rotation, driving means for driving said shaft member, dis-

placing means cooperating with said shaft member for axially displacing said paraffin mass into a non-applying position, means for locking said shaft member in a predetermined position when said paraffin mass becomes worn to a critical extent, and means for maintaining said driving means in continuous driving relationship with said driving drum of an associated wind-up bobbin.

5. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member adapted to rotatably support a mass of paraffin which is to be applied to yarn moving between said cop and an associated wind-up bobbin, driving means for driving said shaft member, displacing means cooperating with said shaft member for axially displacing said paraffin mass into a non-applying position, means for maintaining said driving means in continuous driving relationship with said driving drum of an associated wind-up bobbin, and control means operatively associated with said driving drum and said displacing means for said paraffin mass for at least actuating said displacing means upon yarn breakage or exhaustion.

6. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member adapted to rotatably support a mass of paraffin which is to be applied to yarn moving between said cop and an associated wind-up bobbin, driving means for driving said shaft member, displacing means cooperating with said shaft member adapted for axially displacing said paraffin mass into a non-applying position, means for maintaining said driving means in continuous driving relationship with said driving drum of an associated wind-up bobbin, means for locking said shaft member in a predetermined position when said paraffin mass becomes worn to a critical extent, and control means operatively associated with said driving drum and said displacing means for said paraffin mass for at least actuating said displacing means upon yarn breakage or exhaustion.

7. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member adapted to rotatably support a mass of paraffin which is to be applied to yarn moving between said cop and an associated wind-up bobbin, driving means for driving said shaft member, displacing means cooperating with said shaft member adapted for axially displacing said paraffin mass into a non-applying position, means for maintaining said driving means in continuous driving relationship with said driving drum of an associated wind-up bobbin, means for locking said shaft member in a predetermined position when said paraffin mass becomes worn to a critical extent, said locking means including a pivotable locking lever engageable at one end with said shaft member to disenable the same for axial movement, and control means operatively associated with said driving drum and said displacing means for said paraffin mass for at least actuating said displacing means upon yarn breakage or exhaustion.

8. In an automatic cross-winder according to claim 7; wherein said shaft member is provided with gear means, said gear means being a pinion member and a hub portion spaced from one another to define an annular recess adapted to receive said one end of said pivotable locking lever when said mass of paraffin has reached said critical extent.

9. In an automatic cross-winder according to claim 7; said control means including a multi-arm control lever, said pivotable locking lever at its other end forming a stop against which there is adapted to rest one arm of said control lever when said locking lever is in its locking position, said control lever being pivotably mounted and having a further arm movable between an enabling and disenabling position for said control means.

10. In an automatic cross-winder according to claim 9; including a warning device for indicating that said mass of paraffin has reached said critical extent, said further arm of said control lever actuating said warning device when said one arm thereof rests against said locking lever.

11. In an automatic cross-winder according to claim 10; wherein said further arm of said control lever during contact with said locking lever assumes a position which is intermediate said enabling and disenabling position for said control means.

12. In an automatic cross-winder according to claim 10; wherein said control means includes a control shaft adapted to be rotated, cam means carried by said control shaft, a drive motor for said control shaft, an actuating switch for energizing said drive motor.

13. In an automatic cross-winder according to claim 12; wherein said further arm of said control lever in its enabling position contacts said actuating switch to start said drive motor for said control shaft.

14. In an automatic cross-winder having a plurality of wind-up bobbins, each of which is provided with a driving drum which can be stopped and reversed independently of the other wind-up bobbins in the event of yarn breakage or exhaustion of an associated cop; the combination therewith of a separate paraffining device for each of said wind-up bobbins including an axially displaceable and rotatable shaft member adapted to rotatably support a mass of paraffin which is to be applied to yarn moving between said cop and an associated wind-up bobbin, driving means for driving said shaft member, displacing means cooperating with said shaft member for axially displacing said paraffin mass into a non-applying position, means for maintaining said driving means in continuous driving relationship with said drivng drum of an associated wind-up bobbin means for locking said shaft member in a predetermined position when said paraffin mass becomes worn to a critical extent, and control means operatively associated with said driving drum and said displacing means for said paraffin mass, said control means including a multi-arm control lever, one arm of which is adapted to engage said locking means in its locking position while another arm thereof is adapted to actuate a warning device to indicate that said paraffin block must be replaced, said another arm of said control lever being adapted to contact an actuating switch for operating a control shaft when said locking lever is in its normal non-locking position.

15. In a paraffining device adapted to apply paraffin or the like to a yarn moving between a cop and a wind-up bobbin; an axially displaceable and rotatable shaft member mounted to provide a floating shaft and having a free end adapted to carry a block of paraffin, said floating shaft being capable of both axial displacement and rotation during application of paraffin to the yarn, drive means for driving said shaft member, and means for locking said shaft member in a predetermined position when said paraffin block becomes worn to a critical extent.

16. In a paraffining device adapted to apply paraffin or the like to a yarn moving between a cop and a wind-up bobbin; an axially displaceable and rotatable shaft

member mounted to provide a floating shaft and having a free end adapted to carry a block of paraffin, drive means for driving said shaft member, said floating shaft being capable of both axial displacement and rotation during application of paraffin to the yarn, means for locking said shaft member in a predetermined position when said paraffin block becomes worn to a critical extent, and indicating means adapted to be actuated via said locking means to indicate to an operator that said paraffin block must be replaced.

17. In a paraffining device adapted to apply paraffin or the like to a yarn moving between a cop and a wind-up bobbin; a housing, an axially displaceable and rotatable driven shaft member providing a floating shaft having a free end adapted to carry a block of paraffin thereat and supported by said housing, said floating shaft being capable of both axial displacement and rotation during application of paraffin to the yarn, a driving shaft member arranged in constant driving relation with said driven shaft member, means for locking said driven shaft member in a predetermined position when said paraffin block becomes worn to a critical extent.

18. In a paraffining device adapted to apply paraffin or the like to a yarn moving between a cop and a wind-up bobbin; an axially displaceable and rotatable shaft member having a free end adapted for carrying a block of paraffin, said shaft member being capable of both axial displacement and rotation during application of paraffin to the yarn, drive means for driving said shaft member, means for locking said shaft member in a predetermined position when said paraffin block becomes worn to a critical extent, and displacing means cooperating with said shaft member for axially displacing the latter into a position where paraffin is not applied to said yarn.

19. In a paraffining device adapted to apply paraffin or the like to a yarn moving between a cop and a wind-up bobbin; an axially displaceable and rotatable shaft member adapted for carrying a block of paraffin, drive means for driving said shaft member, said drive means including gear means carried by said shaft member, said gear means being provided with an annular recess adapted to receive a locking lever, a pivotable locking lever engageable with said annular recess for locking said shaft member in a predetermined position when said paraffin block becomes worn to a critical extent, and displacing means engageable with said annular recess for axially displacing said shaft member into a position where said paraffin block is out of contact with said yarn.

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