

Dec. 16, 1947.

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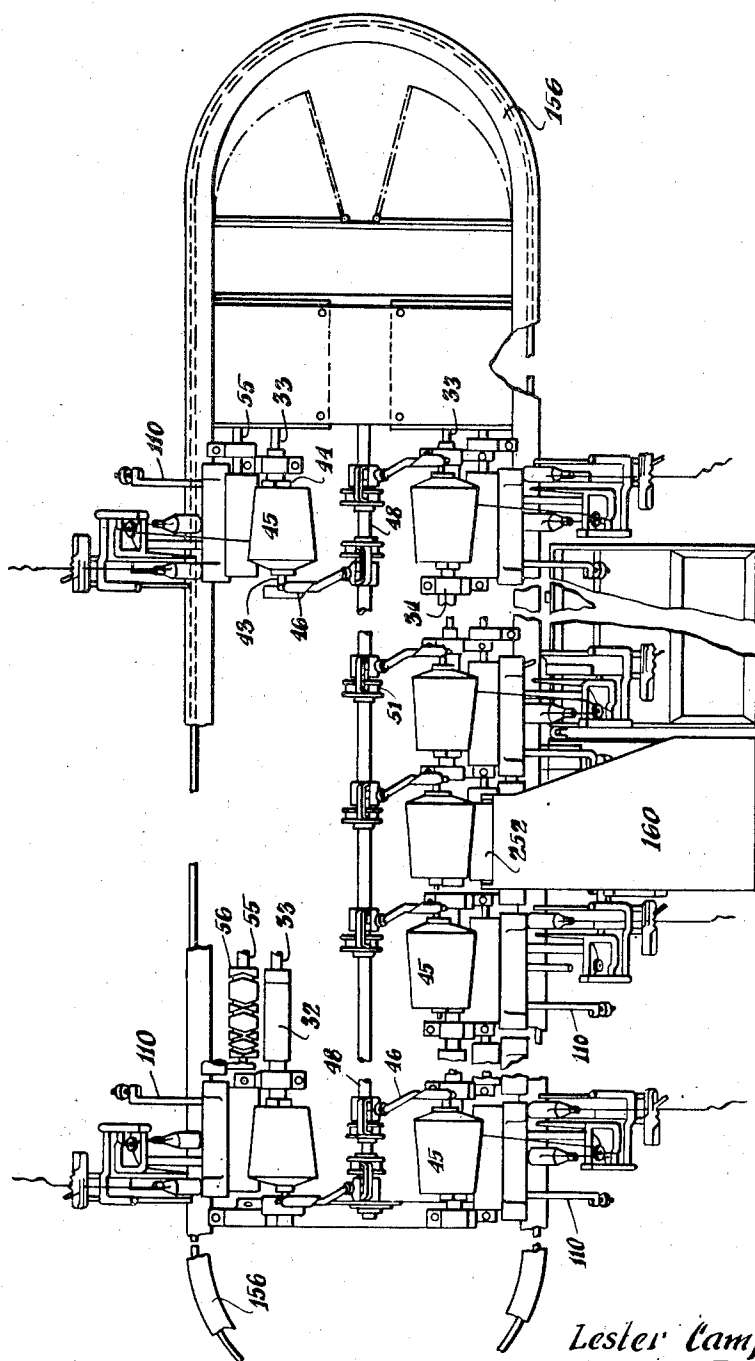
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WINDING MACHINE

Filed July 12, 1945

4 Sheets-Sheet 1

Fig. 1



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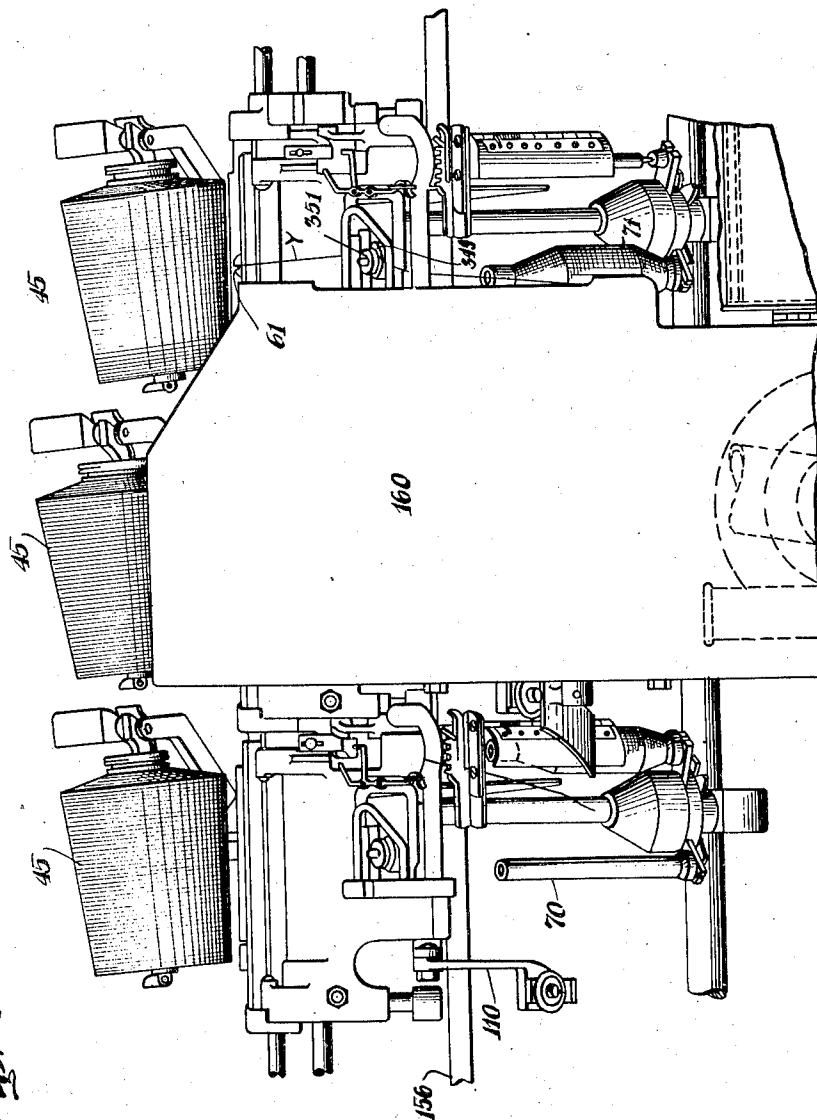


Fig. 2

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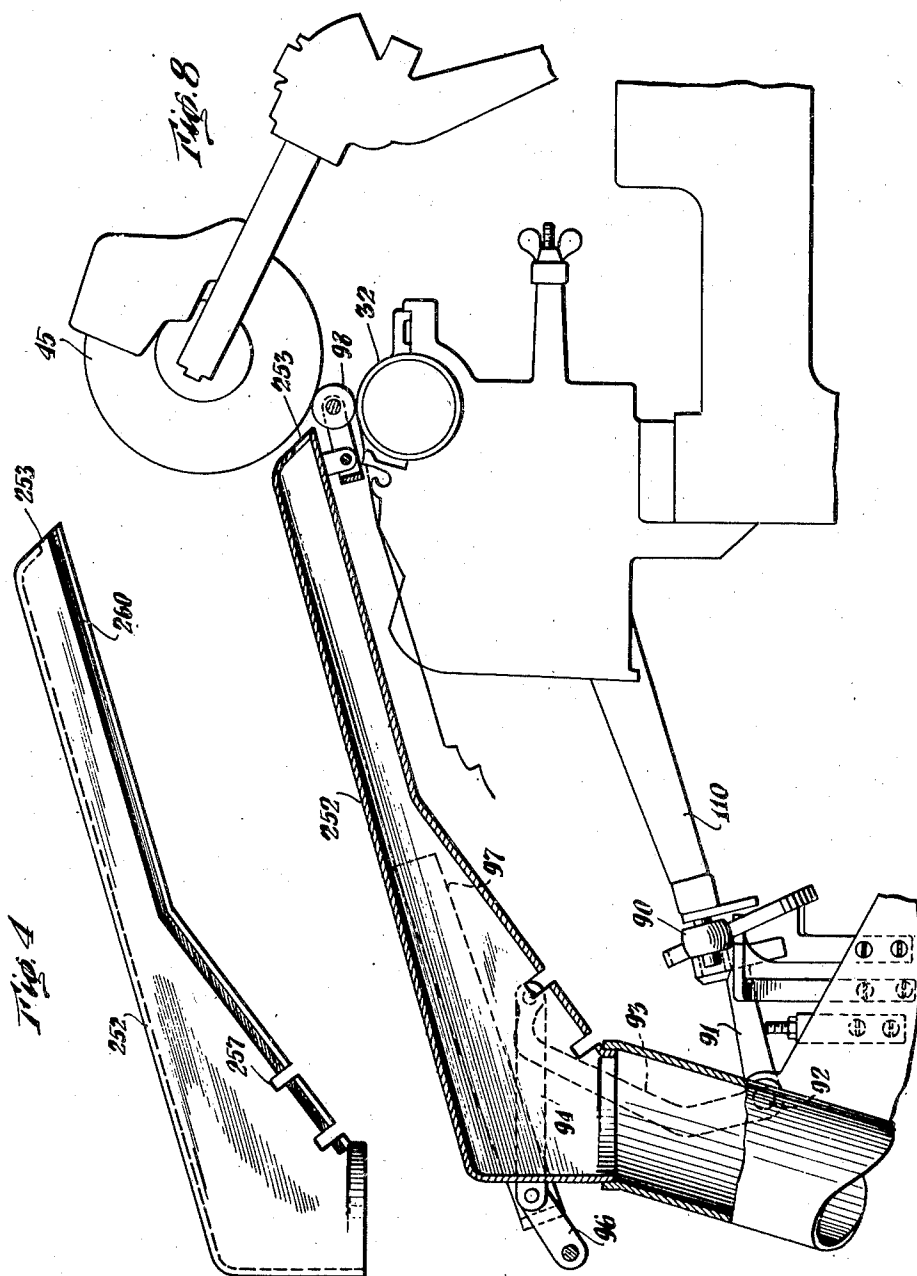
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WINDING MACHINE

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4 Sheets-Sheet 4



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2,432,722

WINDING MACHINE

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Application July 12, 1945, Serial No. 604,579

16 Claims. (Cl. 242—35.6)

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This invention generally relates to new and useful improvements in winding machines for winding packages of yarn from a supply source.

Such winding machines are in many cases semi-automatic in operation and heretofore it has been proposed to provide an aspirator for such winding machines which is adapted to suck off a length of yarn from the package being wound if breakage occurs, for example, and to place this sucked off length of yarn in a position where it can be assembled or knotted with the yarn from the supply source. This same desirable feature of withdrawing a length of yarn from the package automatically is of advantage when more than one supply bobbin is utilized for building up the desired size of package so that when a supply bobbin is exhausted of yarn a length of the yarn on the package can be sucked off by the aspirator and assembled with the starting end of the new supply bobbin.

The present invention specifically relates to the provision of a new and improved form of aspirator for such purposes as defined above.

In copending application, United States Ser. No. 472,862, filed January 19, 1943 now Patent No. 2,407,366, dated September 10, 1946 there is disclosed a semi-automatic yarn winding machine provided with a traveling tender adapted to move past a plurality of winding stations in a continuous path, and the present invention will hereinafter be specifically described with respect to such apparatus and the new and improved aspirator according to this invention will be illustratively embodied upon the traveling tender of such a machine, but it is obvious that the aspirator according to the present invention can be utilized to good effect in any winding machine where it is desired to withdraw a length of yarn from the package.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements hereinshown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate embodiments of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a plan view of a semi-automatic yarn winding machine having a plurality of yarn winding stations, similar to the machine disclosed in the said copending application;

Figure 2 is a fragmentary side elevation of some

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of the winding units and of the traveling tender of the machine of Figure 1;

Figure 3 is a side elevation of one embodiment of the new and improved aspirator in accordance with the present invention and showing its method of operation;

Figure 4 is a fragmentary section longitudinally of the aspirator of Figure 3;

Figure 5 is a bottom view of part of the aspirator of Figure 3 showing the manner of sealing off the pair of slots in the body of the aspirator through which pass suitable devices for picking up the length of yarn drawn into the aspirator from the package being wound;

Figure 6 is a bottom view similar to Figure 5 but showing a modified form of sealing off device when utilizing a single transverse slot through the aspirator and a single device for picking up the length of yarn drawn into the aspirator;

Figure 7 is a cross section through the aspirator on the lines 7—7 of Figure 3; and

Figure 8 is a detailed view of the aspirator according to the present invention in its operating position ready to draw yarn from the package, and particularly when applied to a semi-automatic winding machine as disclosed in said copending application.

The present invention has for an object the provision of a novel and improved form of aspirator for use with any winding machine having a package upon which yarn is wound from a supply source, said aspirator acting to withdraw a length of yarn from the package when this is desired, for instance upon breakage or upon substitution of an additional supply bobbin for an exhausted bobbin.

More specifically, it is an object of the present invention to provide an aspirator of the type defined which is more economical to use, requiring less power for operating the suction device, is of simple form and is highly efficient in drawing the desired length of yarn from the package and placing this in a position to be picked up by a suitable device, to be thereafter assembled with a supply end of yarn.

The aspirator, according to the present invention, is provided with means for sealing off or closing all the orifices, slots or like slits through the body of the aspirator which are necessary to permit the pick-up means to first contact and then pull out the drawn length of thread for the purposes of permitting this length to be knotted to a supply source, these sealing or closing means being adapted to be automatically opened when it is necessary for operation purposes for withdrawing the yarn length sucked from the package.

Means are also provided for making sure that there is positive closure or sealing of the said openings when the aspirator is inoperative and

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is not performing its function of drawing the length of thread, and thereby prevent the sucking into the apertures or slots and slit, fly and lint, suspended in the air about a winding machine. The suction applied will tend to close the closure means for the apertures against positive means to open same, thus effectively assisting the closing thereof and also the sealing off of the apertures when the aspirator is in inoperative position.

The aspirator, according to the present invention, is preferably adapted to be moved with its nozzle or terminal end into close proximity to the surface of the package to be explored for the loose end and to be retained in that extended position until completion of the drawing of the length of thread whereafter the aspirator is retracted to an inoperative position away from the surface of the package. By this means it is desirable to thus maintain the flow of suction continuous without affecting the thread upon the package except when the aspirator is extended into close proximity with the package.

Alternatively, the aspirator may be in fixed position relative to the package and in close proximity to the surface thereof and means may be provided, either manual or automatic, for applying suction to drawing a length of thread when such is needed.

However, in the preferred form of maintaining the suction as constantly operating it is obvious that there is an extreme loss of suction with an aspirator which has various openings for operation of the removal of the thread since these will bleed off a large portion of the suction and thus result in the necessity of a larger amount of power being applied to obtain the same result. By closing off such openings in the aspirator, in accordance with the present invention, it is therefore obvious that a great saving of power is immediately achieved since the power may be much less for the equivalent suction in the closed aspirator and it is only necessary to provide means for opening the sealing or closing means when the openings in the form of slots, slits, or the like, are needed for performance of the function of removing the drawn yarn.

The form of these openings is variable depending on the particular machine in use but inasmuch as a length of yarn is drawn into the body of the aspirator and down its length it is thus necessary to have some longitudinal opening such as a slit through which this yarn may be withdrawn at the right time together with a slot or slots transverse of the aspirator through which may pass a pin or like engaging member or members for seizing upon the yarn drawn into the aspirator and carrying this out of the aspirator through the longitudinal slit and into position to be knotted as previously described.

In the preferred form of the present invention, the means for engaging the yarn drawn within the aspirator are stationary while the aspirator moves relative thereto and in this manner it is possible to utilize a single aspirator for successfully servicing a plurality of winding units each with their individual engaging means. However, if desired, a single aspirator may be provided for each winding unit and this may move relative to the engaging means with either the aspirator or the engaging means stationary.

The method of operating the closing or sealing means for the longitudinal slit may be by relative movement of the aspirator and engaging operative parts, and in the longitudinal slit may con-

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veniently be opened by engagement during this traverse with a fixed member upon a suitable part of the main frame of the machine. In the same manner, conveniently the traverse slot or slots for permitting passage therethrough of a yarn engaging device or plurality thereof may have sealing means therefor opened by pressure contact with the device itself.

As hereinbefore mentioned, in the preferred embodiment of the present invention herein disclosed, the invention is illustratively applied to a multi-unit winding machine having a plurality of surface driven winding units arranged in a continuous series, each winding unit comprising a constantly rotating driving roll, a pivoted arm carrying receiving spindle or shaft for a package core which shaft can be lowered to bring the core into frictional driving relation to the roll, so that yarn or like filaments may be wound on the package by rotation of the roll and core.

Surrounding a plurality of units is a continuous track upon which is mounted a traveling tender, which tender is adapted to successively service each winding unit which requires attention thus making the machine semi-automatic in its operation.

The aspirator, according to the present invention, is mounted in the preferred form on the traveling tender and thus is successively brought into position with each winding unit to cause a predetermined length of yarn to be sucked off from any package which requires this service, due to thread breakage or due to the necessity of replenishment of supply of yarn.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to Figures 1 and 2 of the accompanying drawings which show the type of machine disclosed in the aforesaid copending application, there is disclosed a plurality of packages 45 each mounted upon a package core 44 the core being freely rotatable on a spindle 43. Each spindle 43 is pivotally supported in the end of an arm 46 which is mounted on a shaft 48 common to several units and extending longitudinally of the machine. Each package 45 is driven by an individual driving roll 32 mounted upon a driving shaft 33 suitably driven from a prime mover, the rolls 32 acting by frictional contact to wind yarn upon the package cores 44 to form packages 45.

Means are provided for traversing the yarn throughout the desired distance on the package core including a traverse cam 56 mounted for rotation on a shaft 55 and operating to cause traverse of a thread guide 61. Suitable means are provided for mounting a supply of yarn 71, this being supported on a peg 70 and the yarn Y is thus drawn from the supply bobbin 71 into the package 45 through the traverse means 61.

Tensioning means are provided for applying the desired tension upon the yarn Y as it extends from the supply bobbin 71 to the package 45, comprising an upper disc 351 and a lower disc 349.

Each individual winding unit has a starting and stopping handle 110 which is adapted to be moved into a predetermined position when the supply of yarn runs out or when the yarn breaks, this necessitating the drawing of an end of yarn from the package 45 and the uniting of this with an end of yarn from the supply package.

The winding units are arranged in series on either side of the shaft 48, as shown particularly

In Figure 1, and surrounding all of the units is a continuous trackway 156 upon which a traveling tender 160 is adapted to run, this tender having means to cooperate with the starting handles 110 in the predetermined position of any unit which needs servicing.

In order to facilitate withdrawal from any package 45 of a loose end of yarn upon either breakage or the running out of yarn from the supply 71, an aspirator device is provided in accordance with this invention, this being carried in the illustrated form by the tender 160 and being shown in Figure 1 at 252.

Referring more specifically to Figures 3, 4 and 7, the aspirator according to this invention comprises a relatively long tapering tube having a substantially rectangular cross section and terminating at its forward end in a nozzle 253. At its rearward end the aspirator terminates in a right-angle section 254 of enlarged form having flange 255 on one side thereof to which may be attached a suitable suction tube whereby suction may be applied to the interior of the whole of the aspirator 252 through the port 256. In the form of aspirator illustrated in Figures 3, 4 and 5, yarn engaging members in the form of two pins 257 are provided, pins 257 being mounted adjacent the tension mechanism 349, 351, and extending upwardly from a stationary part of each package winding unit, the pins and aspirator being adapted to move relative to each other so that the pins 257 pass into and through slots 258 transverse of the aspirator whereby a thread 259 drawn by suction from the package 45 through the nozzle 252 will be engaged by the pins 257 during their passage through the aspirator 252 transversely. In order that the thread 259 may be bodily withdrawn from the aspirator 252 by the pins 257 there is a longitudinal opening particularly embodied as a slit 260 substantially the whole length of the main body of the aspirator. Inasmuch as the area of the slit 260 when combined with the area of the slots 258 is quite great it is obvious that if these remain open as heretofore proposed in the prior art, the amount of suction to be applied through the port 256 will be quite great. It is obvious that the slit 260 can be of any desired width and may constitute substantially the whole area of the side wall, if desired.

According to the present invention means are provided for sealing off or closing the slit 260 and for rendering this only openable for operative use when this is required, and for separately closing or sealing off the slots 258 and also rendering these free for the passage of the pins 257 when this is required. To this end there is provided a hinged gate 262 of length equivalent to that of slit 260 which is pivotally supported on hinges 263, gate 262 being normally in closed position sealing off the slit 260 as clearly shown in Figure 7. This sealing off is accomplished by gravity and by the suction within the chamber 264 of the aspirator 252 which will tend to retain the gate in the closed position shown in Figure 7.

As a pin 257 moving through its slot 258, in a direction from right to left in Figure 7, it will engage the yarn 259 lying in the chamber 264 and will then move with the yarn from the dotted position of Figure 7 to the full line position of Figure 7. During said movement, gate 262 will have been pushed open by the pin 257 to permit it to carry the thread 259 out of the longitudinal slit 260. In order that the gate 262 may be prevented from fouling the movement of the pin 257

as it passes through its slot 258 a latch 266 is provided pivotally mounted as at 267 in a bracket 268 upon the casing of the aspirator 252. Latch 266 terminates at its lower end in a hook 269 adapted to engage and hold the edge of gate 262 when lifted up by pin 257 into dotted position as at 270 of Figure 7. Latch 266 has an extension beyond its pivot in the form of an arm 271 which is adapted to be lowered to swing the latch 267 away from the gate at the position 270 to release the gate and allow it to close by gravity and fall to its closed position. This means comprises a stationary tripper 272 having a cam contour projecting toward arm 271, as shown in Figure 3, whereby it will progressively move arm 271 of latch 266 through a cycle of movement depending on its shape to pivot the latch into the positions shown in Figure 7. In order to secure rapid return of the latch 266 to its lowermost position, at which time it will assist in retaining gate 262 closed, a spring 275 is provided surrounding pivot 267 and pressing downwardly upon the body of latch 266.

In Figure 7 the two extreme positions of the gate 262 are illustrated and progressive positions of latch 266 are shown whereby the operation of this latching device is clear and understandable, under urge of tripper 272.

Preferably, tripper 272 operates to perform its function under the movements bodily of the aspirator 252 toward and away from package 45. As the aspirator moves forwardly so that its nozzle 253 is in close proximity of the surface of package 45 the gate 252 will remain closed thereby preserving the maximum of suction for drawing the thread into the body 264 of the aspirator 252.

However, as the aspirator 252 retracts moving away from the package 45 the tripper 272 due to its shaped end acts as a cam upon the extension 271 to progressively raise this so that as the pin 257 moves transversely through slot 258, and the gate 262 closing the slit 260 is slowly raised thereby, the latch 266 is raised until the edge of the gate is held up by latch end 269.

Further and continued retraction of the aspirator 252 will place the extension 271 on the higher part of the curved cam of the tripper 272 and thereafter on the reverse or lowering part so that the latch 266 will be slowly raised to a highest point and then permitted to be progressively lowered, it being borne in mind that the maximum or highest position of the tripper 272 relative to extension 271 is such as to raise the latch end 269 beyond the end of gate 262 and place the latch 266 in the position shown dotted at 273 thus releasing or freeing gate 262 from its position 270 whereby it can drop by gravity to close the slit 260. By that time the pin or pins 257 will have cleared slot or slots 258 carrying the yarn end to position to be suitably united with the supply yarn.

It is obvious that if aspirator 252 is fixed with nozzle 253 in close proximity to the package 45 the identical movements of gate 262 and latch 266 could be obtained by moving the tripper 272 either manually or automatically, it being only necessary to have relative movement between the tripper 272 and the extension 271 to obtain the mechanical result described.

While reference has been made to the use of one pin 257 moving through its slot 258, when two pins 257 are used with two slots 258, the action thereof will be identical.

Having now described the manner in which

the slit 260 is sealed reference is made to Figure 5 specifically as showing the manner in which the two slots 258 are sealed until they are opened actually by the two pins 257. In the bottom view shown in Figure 5 it is seen that each of the slots 258 is closed by a plate 277 apertured as at 278 to permit guided movement bodily of the plate upon studs 279. Movement of the plates on their studs is against the action of a single spring 280 having extending arms 281 and 282 one of each bearing against a plate 277 in such manner that movement of the plates bodily toward each other to thereby open the slots 258 is resiliently resisted. The plates 277 have limited and guided movement due to the shape of the apertures 278 in which the studs 279 operate. The approaching side of each plate covering the slots 258 is bevelled as at 281 and, as the pins 257 enter the slots 258 due to the bodily movement of the aspirator 252 relative to the pins, these pins press against the bevel 281 and thus urge the plates 277 against the spring arms 281 and 282 to open the slots 258 and permit the pins 257 to pass into and ultimately through said slots.

As soon as the pins have passed through the slots completely spring arms 281 and 282 cause an immediate closure thereof by the plates 277.

Normally, as disclosed in the copending application hereinbefore referred to, two such pins 257 are utilized and thereby two slots are needed, but in some instances it is possible to utilize a single slot transversely of the aspirator with a single pin passing therethrough, it being borne in mind that all that is desired is to pass a suitable engaging means transversely through the aspirator to pick up the thread 259 lying therein as shown in Figures 3 and 7.

In Figure 6 this modified form utilizing only one pin and one slot is disclosed where the sealing of the single slot is accomplished in a similar manner to that disclosed above. In this modification the slit 260 would be closed or sealed by its gate 282 as hereinbefore described. The single slot 285 is normally closed by a rotatable disc of suitable material 286 pivotally carried at 287 on the body of the aspirator 252. A single pin 288 is shown as entering the slot 285 and as it approaches the slot it engages with a cut-out 289 of which there are four in the disc 286 one for each quadrant thereof.

The forward movement of pin 288 causes rotation of disc 286 and the length of the cut-out 289 is such as to permit continued rotation of disc 286 through one quadrant during the passage of the pin 288 through the slot 286 transversely of the aspirator from its full line position shown at 288 through its dotted positions shown at 290 and 291. Thus the pin 288 can freely pass through the slot 285 to pick up the thread 259 within the body of the aspirator while at all times the slot 288 is substantially sealed off or closed thereby, preserving the suction applied through port 256.

One manner in which the aspirator 252 may be projected toward and into proximity with the package 45 is illustrated in Figure 8 where it will be seen that the starting handle 110 previously referred to terminates in a cam end 90 which engages with a lever 91 pivoted at 92 and having a second arm 93 moving around said pivot 92 therewith arm 93 is linked by linkage 94, 95 and 96 to a lever 97 attached to the body of the aspirator 252 so that upon raising of arm 91 by cam end 90 of handle 110 the aspirator

252 is rocked forwardly and downwardly to the position shown in Figure 8, where the nozzle 254 is in close proximity to the surface of package 45. In order to assist in the withdrawing of the end of yarn from package 45 a reversing roller 98 carried by the aspirator 252 may be inserted between driving roll 32 and package 45 to cause reverse rotation of the package 45.

The invention in its broader aspects is not limited to the specific mechanism shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A yarn winding machine comprising in combination a spindle for mounting a package core adapted to receive yarn from a supply bobbin, means for rotating said package core, an aspirator having a nozzle in close proximity to the surface of the package on the package core as this builds up, suction means adapted to cause said aspirator to suck off a loose end of yarn from said package when such exists and draw a length of yarn into said aspirator, a longitudinal opening in one wall of said aspirator through which said length of yarn can be removed, sealing means normally closing said opening, a transverse slot through said aspirator to permit entry of yarn engaging means adapted to engage and remove said length of yarn through said slit, and means for opening both said sealing means to permit entry of said engaging means and removal of said length of yarn thereby through said opening.

2. A yarn winding machine comprising in combination a spindle for mounting a package core adapted to receive yarn from a supply bobbin, means for rotating said package core, an aspirator having a nozzle in close proximity to the surface of the package on the package core as this builds up, suction means adapted to cause said aspirator to suck off a loose end of yarn from said package when such exists and draw a length of yarn into said aspirator, a longitudinal slit in one wall of said aspirator through which said length of yarn can be removed, a transverse slot through said aspirator to permit entry of yarn engaging means adapted to engage and remove said length of yarn through said slit, sealing means normally closing said slot, and means for opening said sealing means to permit removal of said length of yarn thereby through said slit.

3. A yarn winding machine comprising in combination a spindle for mounting a package core adapted to receive yarn from a supply bobbin, means for rotating said package core, an aspirator having a nozzle in close proximity to the surface of the package on the package core as this builds up suction means adapted to cause said aspirator to suck off a loose end of yarn from said package when such exists and draw a length of yarn into said aspirator, a longitudinal slit in one wall of said aspirator through which said length of yarn can be removed, sealing means normally closing said slit, a transverse slot through said aspirator to permit entry of yarn engaging means adapted to engage and remove said length of yarn through said slit, sealing means normally closing said slot, and means for opening both said sealing means to permit entry of said engaging means and removal of said length of yarn thereby through said slit.

4. A yarn winding machine comprising in combination means for rotating a package core upon

which yarn is wound thereby from a supply to form a package, an aspirator connected to a suction means and adapted to be periodically moved toward and away from said package to present its nozzle in close proximity to the surface of said package and thereby explore same for a loose end of yarn and suck off a predetermined length into the aspirator, a longitudinal slit in said aspirator through which said length of yarn may be removed by engaging means moving relatively transversely through openings in said aspirator, a gate normally closing said slit, and means controlling the opening and closing of said gate under influence of the movement of the aspirator toward and away from the package.

5. A yarn winding machine comprising in combination means for rotating a package core upon which yarn is wound thereby from a supply to form a package, an aspirator connected to a suction means and adapted to be moved toward and away from said package to present its nozzle in close proximity to the surface of said package and thereby explore same for a loose end of yarn and suck off a length into the aspirator, a longitudinal opening in said aspirator through which said length of yarn may be removed by engaging means, a gate normally closing said opening, and means controlling the opening and closing of said gate under influence of the movement of the aspirator toward and away from the package.

6. A yarn winding machine comprising in combination means for rotating a package core upon which yarn is wound thereby from a supply to form a package, an aspirator connected to a suction means and adapted to be moved toward and away from said package to present its nozzle in close proximity to the surface of said package and thereby explore same for a loose end of yarn and suck off a length into the aspirator, a longitudinal slit in said aspirator through which said length of yarn may be removed by engaging means, a gate normally closing said slit, and means controlling the opening and closing of said gate under influence of the movement of the aspirator toward and away from the package, said engaging means comprising a plurality of yarn engaging pins moving relatively with respect to said aspirator and passing through transverse slots in said aspirator, said slots being normally closed by closure plates and being opened by contact of said pins with said plates during relative movements of said aspirator and said pins.

7. A yarn winding machine comprising in combination means for rotating a package core upon which yarn is wound from a supply to form a package, a suction aspirator adapted to suck off a length of yarn from the package when needed due to yarn breakage or yarn supply replenishment, a normally closed longitudinal slit in the aspirator for permitting removal of the sucked off length of yarn, a normally closed plurality of slots transverse of the aspirator through which may pass yarn engaging members to remove said length of yarn, and means for opening said normally closed slit and said normally closed plurality of slots, after sucking off said length of yarn for permitting engagement and removal thereof through said slit by said members.

8. A yarn winding machine comprising in combination means for rotating a package core upon which yarn is wound from a supply to form a package, a suction aspirator adapted to suck off a length of yarn from the package when needed due to yarn breakage or yarn supply replenishment, a normally closed longitudinal slit in the

aspirator for permitting removal of the sucked off length of yarn, a normally closed plurality of slots transverse of the aspirator through which may pass yarn engaging members to remove said length of yarn, and means for opening said normally closed slit and said normally closed plurality of slots, after sucking off said length of yarn for permitting engagement and removal thereof through said slit by said members, said means being rendered operative by relative movement of said aspirator and said yarn engaging members.

9. A yarn winding machine comprising in combination means for rotating a package core to wind yarn thereon from a supply to form a package, an aspirator comprising a conduit having a nozzle at one end and suction applied at the other end, said conduit being periodically extensible toward and retractible from said package, a longitudinal slit in said conduit for permitting removal of a length of yarn sucked into the conduit from the package, when the conduit is in extended position, a transverse slot in the conduit through which may pass a yarn engaging pin, said slot and slit communicating, closure means for said slit and closure means for said slot, both said closure means being opened by said pin as it passes through said slot, and said closure means for the longitudinal slit being additionally controlled with respect to time of opening and closing by operative means actuated by extending and retracting movements of the conduit.

10. A yarn winding machine comprising in combination means for rotating a package core to wind yarn thereon from a supply to form a package, an aspirator comprising a conduit having a nozzle at one end and suction applied to the other end, said conduit being periodically extensible toward and retractible from said package, a longitudinal slit in said conduit for permitting removal of a length of yarn sucked into the conduit from the package, when the conduit is in extended position, a transverse slot in the conduit through which may pass a yarn engaging pin, said slot and slit communicating, closure means for said slit, and closure means for said slot, both said closure means being opened by said pin as it passes through said slot.

11. A yarn winding machine having a plurality of winding units each having means to rotate a package core to wind yarn thereon from a supply to form a package, a travelling tender moving past the winding units, an aspirator mounted to move with said tender, means to project the nozzle end of the aspirator toward and retract it from each of said packages of the winding units in succession, to draw a length of yarn from any package having a loose end thereon, a longitudinal slit in the aspirator for permitting removal of the length of yarn therefrom, a gate normally closing said slit, a transverse slot in said aspirator, a rotatable plate normally covering said slot, and a stationary pin for each winding unit in position to enter said transverse slot and pick up the length of yarn as the aspirator moves with the tender, said pin temporarily opening said slot by rotating said plate, and also temporarily opening said gate by contact therewith, to permit removal of said drawn length of yarn.

12. A yarn winding machine having a plurality of winding units each having means to rotate a package core to wind yarn thereon from a supply to form a package, a travelling tender moving past the winding units, an aspirator

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mounted to move with said tender, means to project the nozzle end of the aspirator toward and retract it from each of said packages of the winding units in succession, to draw a length of yarn from any package having a loose end thereon, a longitudinal slit in the aspirator for permitting removal of the length of yarn therefrom, a gate normally closing said slit, a pair of transverse slots in said aspirator, a pair of spring urged slidable plates one over each slot normally closing same, and a pair of stationary pins for each winding unit in position for them to enter said transverse slots and pick up the length of yarn as the aspirator moves with the tender, said pins each temporarily opening its slot by sliding a plate against the resiliency of the spring urging means to expose the slot normally covered thereby, said pins also acting by contact with said gate to swing it open to expose said slit and permit removal of the drawn length of yarn therefrom by said pins.

13. A yarn winding machine having a plurality of winding units each having means to rotate a package core to wind yarn thereon from a supply to form a package, a travelling tender moving past the winding units, an aspirator mounted to move with said tender, means to project the nozzle end of the aspirator toward and retract it from each of said packages of the winding units in succession, to draw a length of yarn from any package having a loose end thereon, a longitudinal slit in the aspirator for permitting removal of the length of yarn therefrom, a gate normally closing said slit, a transverse slot in said aspirator, a rotatable plate normally covering said slot, and a stationary pin for each winding unit in position to enter said transverse slot and pick up the length of yarn as the aspirator moves with the tender, said pin temporarily opening said slot by rotating said plate, and also temporarily opening said gate by contact therewith, to permit removal of said drawn length of yarn, said gate being temporarily retained open by a latch member mounted on said aspirator and moving therewith as it is projected toward and retracted from the package, a stationary cam member governing the position of said latch member during such movements, to determine the duration of opened condition of said gate.

14. A yarn winding machine having a plurality of winding units each having means to rotate a package core to wind yarn thereon from a supply to form a package, a travelling tender moving past the winding units, an aspirator mounted to move with said tender, means to project the

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nozzle end of the aspirator toward and retract it from each of said packages of the winding units in succession, to draw a length of yarn from any package having a loose end thereon, a longitudinal slit in the aspirator for permitting removal of the length of yarn therefrom, a gate normally closing said slit, a pair of transverse slots in said aspirator, a pair of spring urged slidable plates one over each slot normally closing same, and a pair of stationary pins for each winding unit in position for them to enter said transverse slots and pick up the length of yarn as the aspirator moves with the tender, said pins each temporarily opening its slot by sliding a plate against the resiliency of the spring urging means to expose the slot normally covered thereby, said pins also acting by contact with said gate to swing it open to expose said slit and permit removal of the drawn length of yarn therefrom by said pins, said gate being temporarily retained open by a latch member mounted on said aspirator and moving therewith as it is projected toward and retracted from the package, a stationary cam member governing the position of said latch member during such movements, to determine the duration of opened condition of said gate.

15. In a yarn winding machine having means for rotating a package core to wind a package of yarn from a supply source, an aspirator for withdrawing a length of yarn by suction from the package when a free end exists thereon, comprising a closed duct having a normally closed longitudinally extending duct and a suction nozzle at one end in proximity to the surface of the package and a suction supply at the other end, and means for temporarily opening normally closed apertures in said duct to permit removal of a length of yarn sucked into the duct through said nozzle.

16. In a yarn winding machine, having rotatory means for winding a package of yarn on a core from a supply, an aspirator for withdrawing a length of yarn by suction from the package when a free end exists thereon comprising a closed duct with a suction inlet in proximity to the package, normally closed apertures in the duct for permitting entrance therein of yarn engaging means and removal therefrom of a sucked length of yarn, means for opening said apertures to permit engagement and removal of the length of yarn, the velocity of flow of air from inlet to outlet within said duct being ineffectual to suck a length of yarn from the package when said apertures are open but being adequate to perform this function when said apertures are closed.

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