Aug. 18, 1970 C. W. BROUWER ET AL 3,524,311

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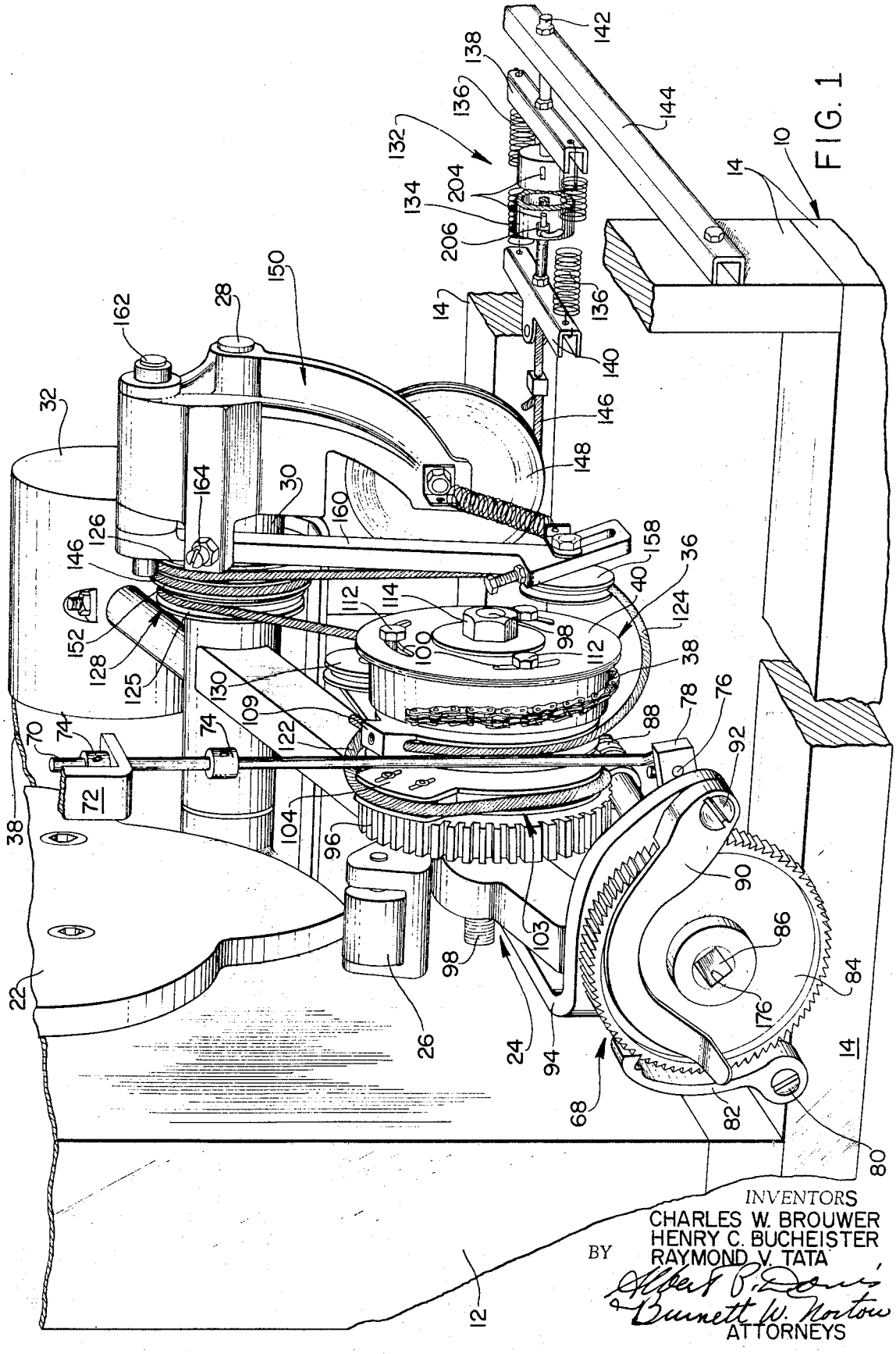


FIG. 1

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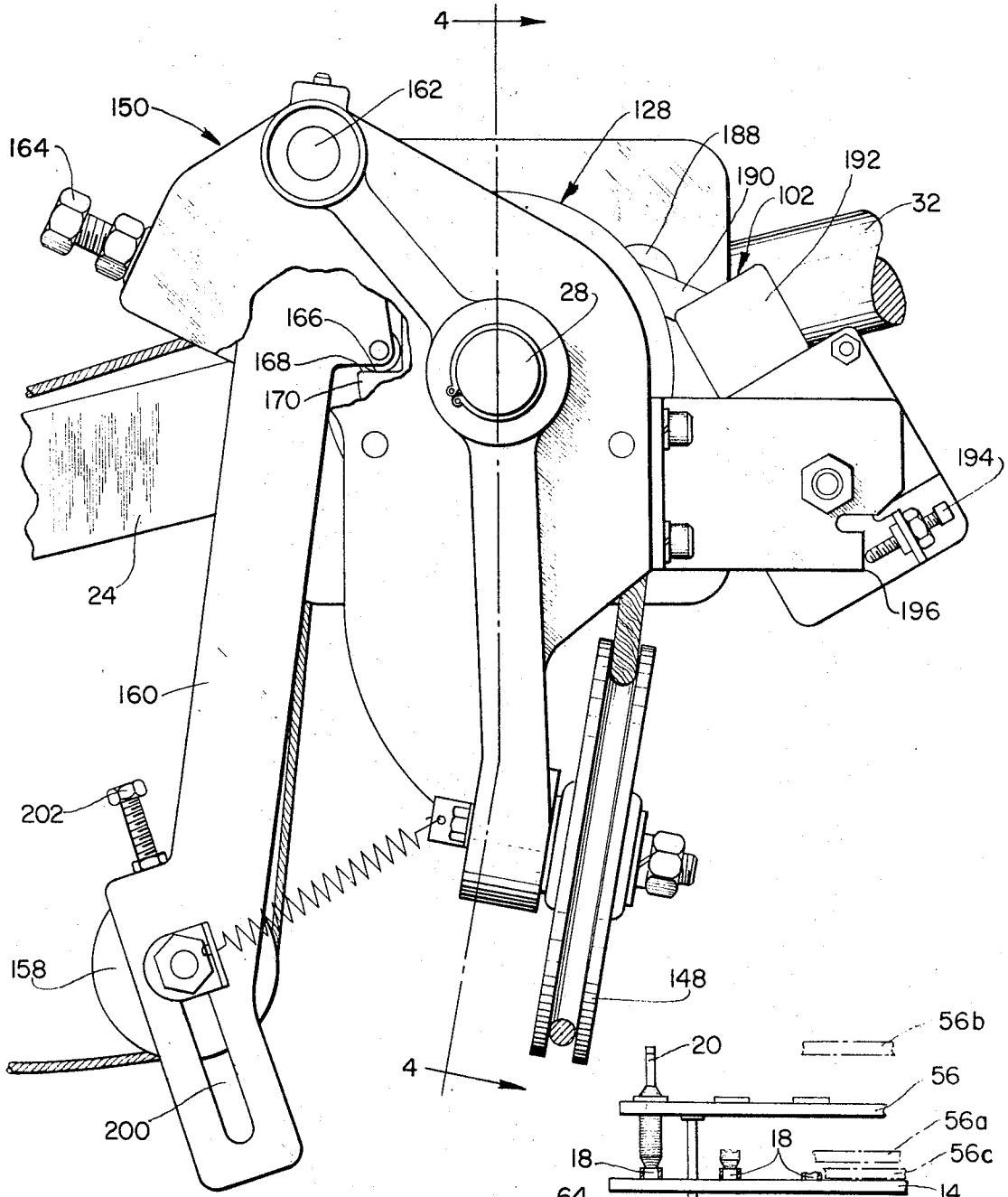


FIG. 3

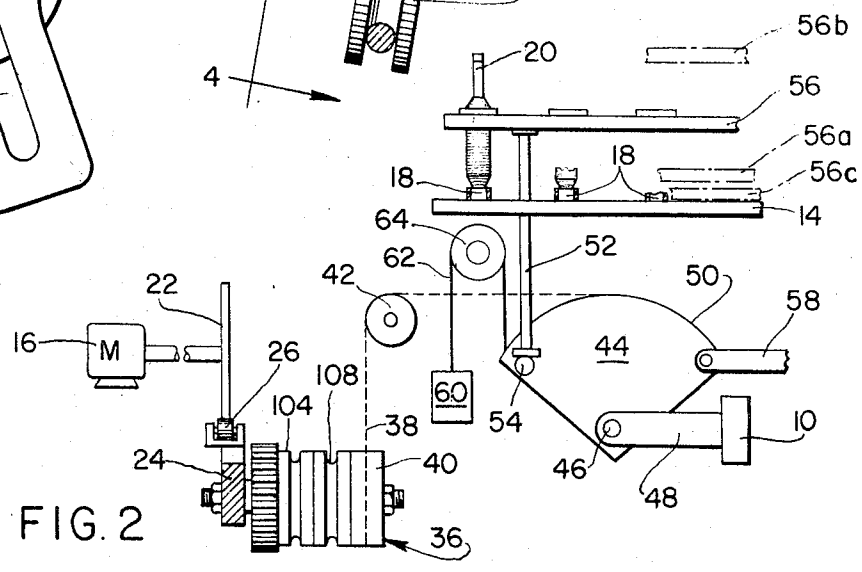


FIG. 2

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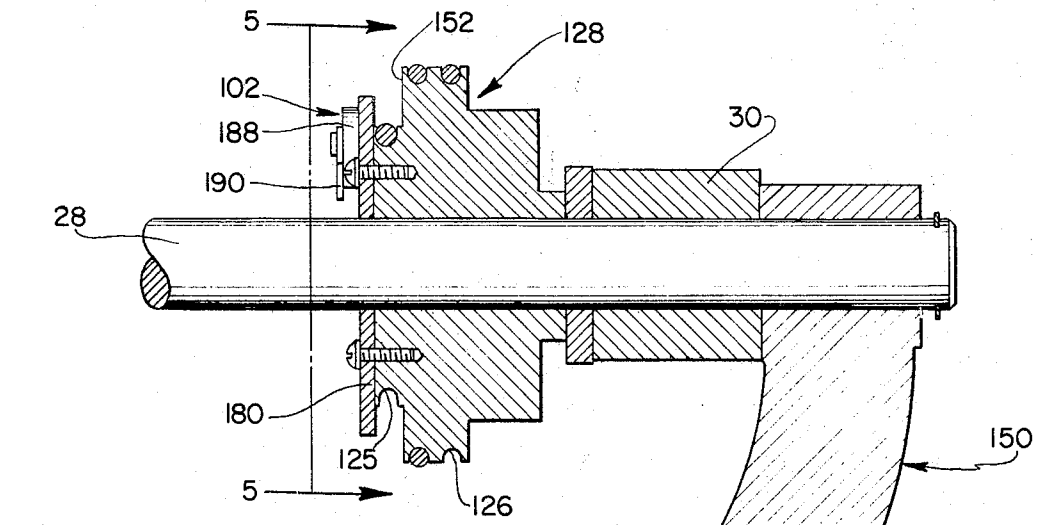


FIG. 4

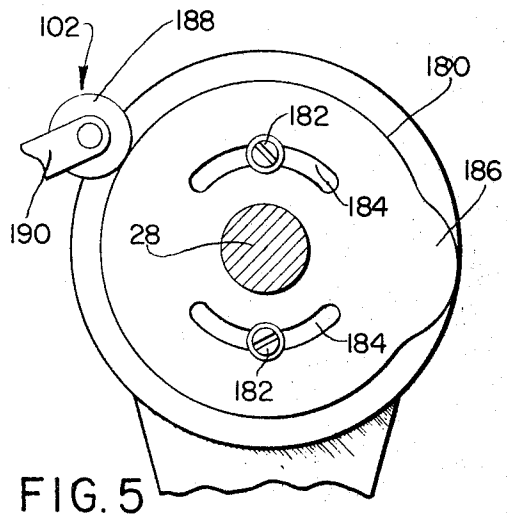


FIG. 5

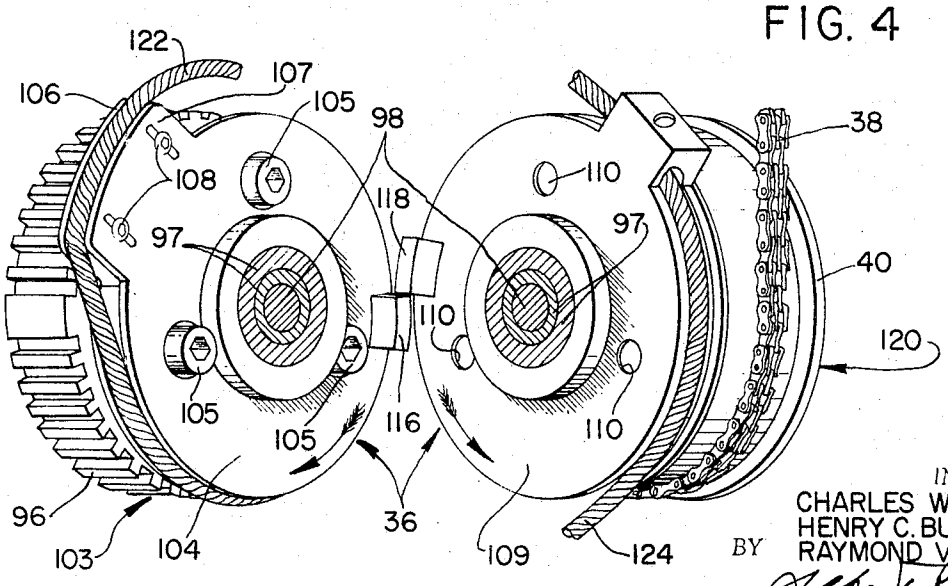


FIG. 6

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TEXTILE EQUIPMENT

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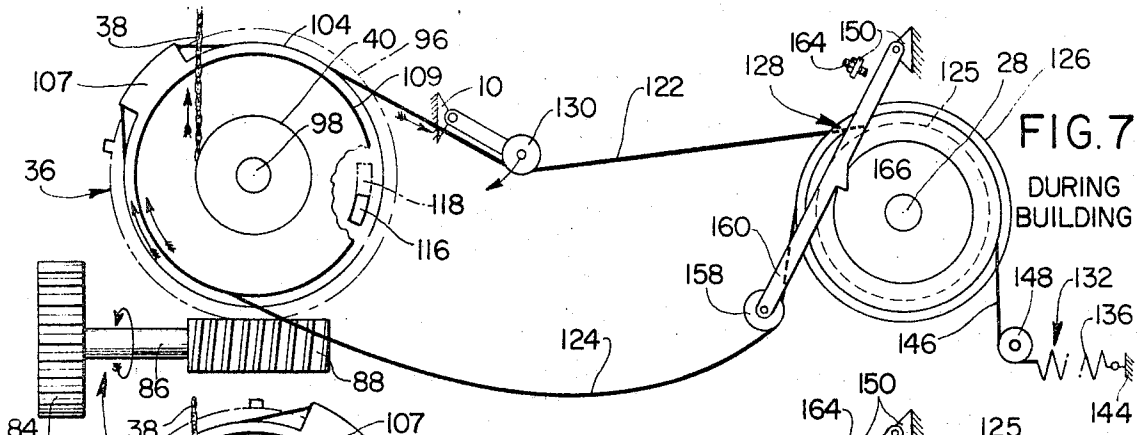


FIG. 7
DURING BUILDING

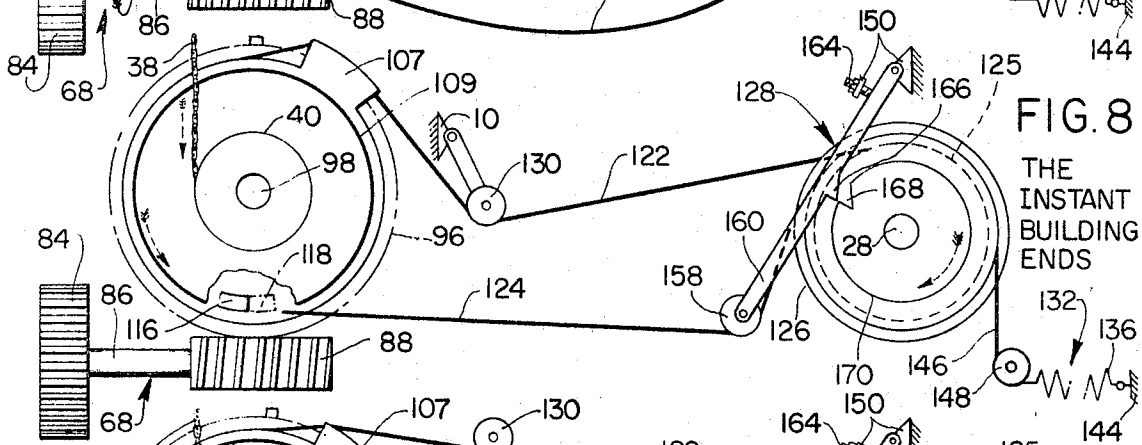


FIG. 8
THE INSTANT BUILDING ENDS

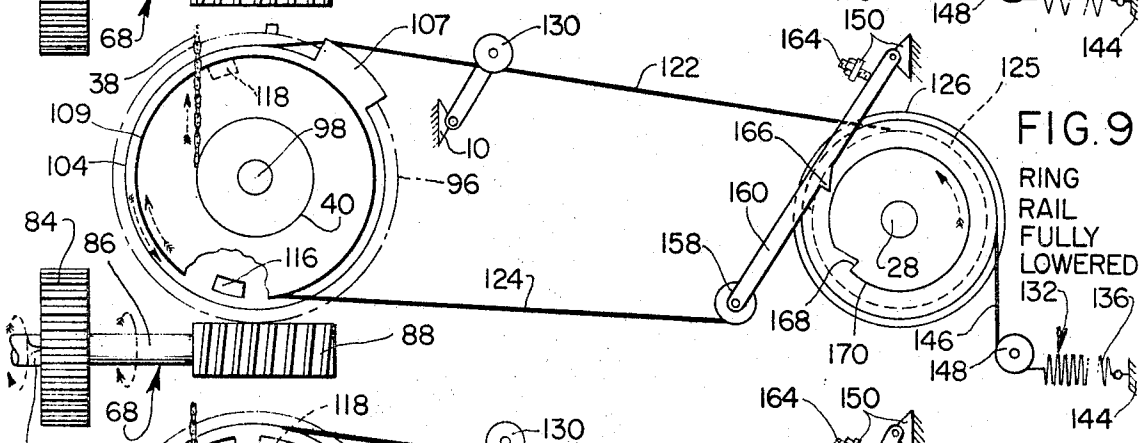


FIG. 9
RING RAIL FULLY LOWERED

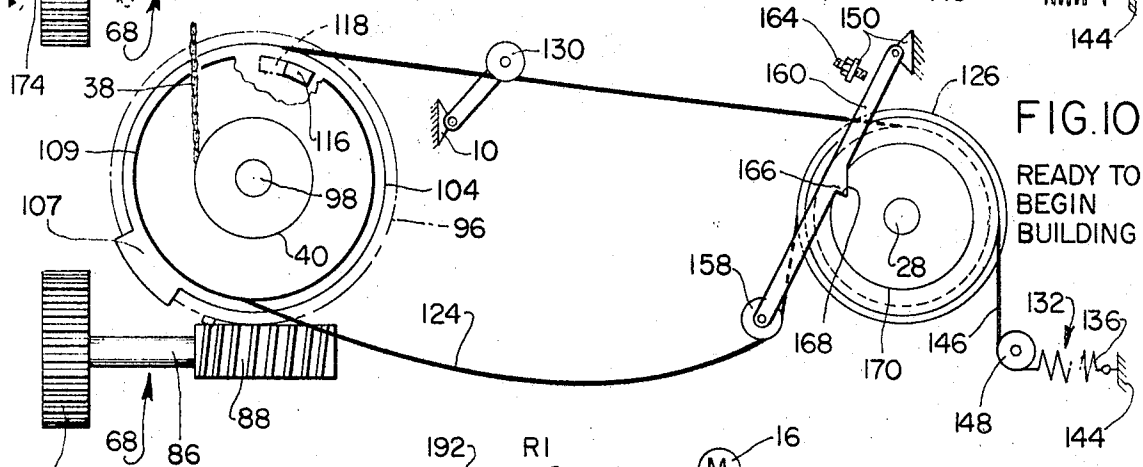


FIG. 10
READY TO BEGIN BUILDING

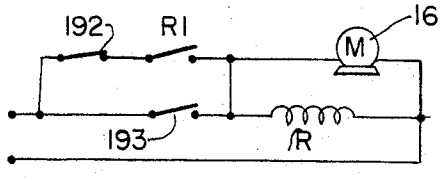


FIG. 11

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3,524,311

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Filed Aug. 9, 1968, Ser. No. 751,594
Int. Cl. D01h 9/14
U.S. Cl. 57—54 16 Claims

ABSTRACT OF THE DISCLOSURE

A spinning frame automatically operable to produce filled yarn packages such as bobbins. The bobbins are filled by building operation of the frame and upon completion of the building a halch and tail coils are formed on the package through operation of a latch to release drive means which store energy and operate through an assembly of pulleys and cables to lower the spinning frame ring rail. The quantity of yarn on the packages may be adjusted as may the halch and tail coils. Existing builder mechanism may be supplemented to provide such automatic operation.

This invention relates to a twisting machine such as a spinning frame or a twister and, more particularly, to an automatically operable machine for producing a complete package, and to portions of such a machine.

As used herein the term "twisting machine" means a spinning frame or a twister or other similar machinery. The term "pulley" includes a sprocket or other wheel-like member on which flexible strandular material or chain may be reeled. The term "bobbin" means any core or other member on which yarn may be wound so that it may be moved from place to place, and to such a member and the yarn when wound thereon. The term "yarn receiver" means a bobbin or bobbin receiving spindle or both. The term "yarn" is employed in a general sense to apply to all kinds of strand material, either textile or otherwise.

Twisting machines such as spinning frames or twisters have a ring rail which guides a strand of yarn onto a rotating yarn receiver such as a bobbin. In one form of spinning frame a bobbin is rotated by a spindle as the ring rail moves longitudinally from the lower end of the bobbin to the upper end while reciprocating in short strokes to wind a strand of yarn on the bobbin. When the bobbin is filled with yarn, a doffer (attendant) concurrently shuts off a motor driving the machine and moves the ring rail back to its starting position at the lower end of the bobbin or yarn receiver to wind a halch (a spiral winding of the yarn extending from the top to the bottom of the bobbin), and to wind tail coils at the bottom of the yarn receivers. Thus, the number of tail coils wound on the yarn receiver depends on two factors, first, the time required for the apparatus to coast to a stop after a drive motor has been shut-off by the attendant, and second, the judgment of the attendant as to when the motor should be shut-off in relationship to the return of the ring rail to the lower end of the bobbin. These variables result in variation in the number of tail coils wound during different runs of the machine. Also, the length of yarn wound on any given run of bobbins depends on how long after starting to wind the bobbins the attendant shuts off the motor and returns the ring rail to the bottom of the yarn receivers. Thus, the length of yarn on similar bobbins produced by any mill may vary substantially. In other machines the ring rail may be vertically stationary and the bobbins moved vertically during winding. In still other machines both the ring rail and the bobbins may move vertically, as is well understood in the art.

Should the doffer fail to shut-off the motor at the proper time, the bobbins will overfill and this results in wasted yarn and excessive shut down time in removing the overfilled bobbins. Proposals for overcoming these difficulties have not received general acceptance in the industry, at least in part because they did not function well or were too expensive, or both.

The invention, in brief, is directed to automatic twisting machines such as spinning frames or twisters, and additionally to mechanism for automating existing machines. The mechanism includes drive means operating through a pulley and cable assembly for automatically preventing overfilling of the yarn receiver and providing substantially identical quantities of yarn and number of tail coils on each yarn receiver for different runs of the machine.

It is a primary object of the invention to provide a new and improved twisting machine such as a spinning frame or twister, and components thereof.

Another object is to provide a new and improved twisting machine for automatically winding a complete package of yarn.

A more specific object is provision of a twisting machine for delivering a strand of yarn to a yarn receiver having opposite ends, the machine having a ring rail mounted for movement between opposite ends of the yarn receiver with a builder mechanism for moving the ring rail from a first of the ends to a second of the ends, and a return mechanism which stores energy for moving the rail from the second end back to the first end, with a control assembly operable responsive to the rail being moved to the second end for operating the return mechanism.

A further object is provision of new and improved apparatus for automating a twisting machine such as a spinning frame or twister. A related object is provision of such apparatus for converting existing equipment to automatic operation, and to the provision of components of such apparatus.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawings. Before proceeding with a description of the figure of the drawings, it should be noted that all figures, with the exception of FIGS. 8–10, show the spinning frame with all parts in the same relative position. In the drawings:

FIG. 1 is a fragmentary perspective view of a portion of a spinning frame during building operation, and illustrates a preferred embodiment of the invention;

FIG. 2 is a fragmentary, schematic elevational view illustrating operating components of the spinning frame;

FIG. 3 is a fragmentary, enlarged view of the rear right end of the apparatus as shown in FIG. 1, with parts broken away for clearer illustration;

FIG. 4 is a fragmentary sectional view taken generally along the line 4—4 in FIG. 3;

FIG. 5 is a fragmentary sectional view taken generally along the line 5—5 in FIG. 4;

FIG. 6 is an exploded view of a front portion of the apparatus shown in FIG. 1, with parts in section;

FIGS. 7–10 are diagrams illustrating progressive phases in the operation of the machine and, as illustrated the relative sizes of certain pulleys have been changed and various parts omitted for clearer illustration, and more particularly:

FIG. 7 is a diagram of the apparatus in the position shown in the earlier figures, during building of the bobbins;

FIG. 8 is a diagram at the instance building ends;

FIG. 9 shows the position of the parts when the ring rail is fully lowered; and

FIG. 10 shows the parts in position ready to being building a new set of bobbins; and

FIG. 11 schematically illustrates an electric circuit.

The invention is illustrated embodied in a Whitin Spinning Frame Model F2 (1937) "Superflex," manufactured by Whitin Machine Works, Whitinsville, Mass. It is to be understood that while the invention is, for purposes of illustration only, shown as embodied in a specific spinning frame, the invention is not to be limited to any particular spinning frame or twister or other twisting machines or similar machinery.

Referring particularly to FIGS. 1 and 2 of the drawings, a spinning frame includes a body **10** having a head end housing **12** and rigidly connected frame members **14**. An electric motor **16** (FIG. 2) rotates (by means of suitable mechanism, not shown) the spinning frame spindles **18** on a frame member **14**. On these spindles are removably mounted yarn receiving bobbins **20**. The motor **16** also rotates a builder cam **22**. This cam **22** oscillates a builder lever **24** up and down during winding or building of the bobbins, and, more particularly, the cam **22** engages a cam roll follower **26** on the builder lever **24** which is pivoted on a stationary builder lever support shaft **28** fixedly secured to the body **10** at the head end **12** of the spinning frame and to a support **30** (FIG. 4) secured to a frame member **14**. A builder lever counter weight **32** is provided and oscillation of the builder lever **24** is transmitted, through a gear and pulley assembly **36** (FIG. 6) on the end of the lever opposite the counter weight **32**, to a builder chain **38** connected to a builder pulley **40** of the assembly **36**. As shown schematically in FIG. 2, the chain **38** passes over a guide pulley **42** and is connected with a quadrant plate **44** connected by a pivot pin **46** to a mounting bracket **48** rigidly secured to the body **10** of the spinning frame. As the builder lever **24** oscillates, the chain **38** reels on and off of an arcuate face **50** of the quadrant plate **44**, causing the plate to oscillate. This oscillation of the quadrant plate **44** reciprocates a vertical rod **52** slidably mounted in a frame member **14** of the body **10** and seated at its lower end on an abutment **54** integral with the plate **44** and at its upper end abutting the spinning frame ring rail **56**. Additional linkages, including a link **58** connected with the quadrant plate **44**, actuate other rods **52** (not shown) spaced along the ring rail. Upward movement of the ring rail **56** is provided by an elevating weight assembly, only one weight **60** of the assembly being shown schematically in FIG. 2. Each such weight is connected with an associated quadrant plate **44** by a cable **62** passing over a guide pulley **64** and, acting through the rod **52** the weight lifts the ring rail **56**. Thus, as the builder chain **38** responds to oscillation of the builder lever **24** it permits the elevating weight assembly **60** to raise the ring rail **56**, and then the chain **38** pulls the ring rail part way down. It should be noted that the above described short stroke reciprocating motion of the ring rail **56** is provided by oscillation of the builder lever **24** and is independent of rotation of the builder pulley **40**.

A second motion is provided the ring rail **56** during building of the bobbins. To this end, the ring rail **56** is caused to move progressively upwardly from a starting position **56A** (in phantom in FIG. 2) ready to begin winding or building of the bobbins (diagram, FIG. 10) to an uppermost position **56B** (also in phantom in FIG. 2) at which the building of the bobbins is completed (diagram, FIG. 8). This progressive movement of the ring rail **56** from its starting position to its uppermost position is provided by a rachet and worm drive assembly **68** (FIGS. 1 and 7–10), in addition to the previously described reciprocating motion, as is understood in the art. The rachet and worm drive assembly **68** includes a take-up rod **70** (FIG. 1) mounted for vertical reciprocating movement through a hole in a flange **72** rigidly secured to a

frame member **14**. A pair of collars **74** are adjustably fixed, as by set screws, to the upper end of the rod **70** and are spaced apart on opposite sides of the flange **72**. The lower end of the rod **70** is pivotedly secured, by means of a stud **76** passing through an eye on the rod and anchored on an end of a rachet pawl lever **78** journalled about a boss (not shown) on the end of the builder lever **24**. A second stud **80** is mounted on an end of the rachet pawl lever **78** opposite the first stud **76** and pivotably carries a releasable rachet pawl **82** which rotates a rachet wheel **84** in a counterclockwise direction as shown in FIG. 1. This rachet wheel is fixed to one end of a rachet-worm shaft **86** journaled in the boss (not shown) and a worm **88** is fixed to an end opposite this wheel. Thus, as the builder lever **24** oscillates up and down, the take-up rod **70** reciprocates up and down and as the collar **74** engages the flange **72** the rachet pawl lever **78** is rotated counterclockwise about the rachet-worm shaft **86** to lower the rachet pawl **82** thus rotating the rachet wheel **84** and worm **88** counterclockwise. The rachet wheel **84** is held in its advanced position and against clockwise rotation by a releasable latch pawl **90** pivoted as by a bolt **92** to an L-shaped bracket **94** on the free end of the builder lever **24**. When the builder lever **24** moves upwardly the lower collar **74** on the take-up rod **70** engages the flange **72**, rotating the rachet pawl lever **78** clockwise and thereby moving the rachet pawl **82** upwardly across the teeth of the rachet wheel **84** and into position to again engage one of the teeth and rotate the rachet wheel another step when the upper collar **74** on the take-up rod **70** again seats on the flange **72**.

Such step by step rotation of the worm **88** rotates a worm gear **96** in a clockwise direction (FIG. 1). The worm gear **96** and the builder pulley **40** are parts of the gear and pulley assembly **36**, both having bushing means **97** (FIG. 6) and thereby rotatably mounted on a gear-pulley shaft **98** fixed to the builder lever **24**. It should be noted that in the Whitin Spinning Frame the worm gear **96** and the builder pulley **40** are separate parts and are fixedly connected to each other by means of bolts extending through arcuate slots **100** (FIG. 1) in the builder pulley **40** and received in threaded apertures in the worm gear **96** to permit adjustment of the pulley **40** relative to the worm gear. During building of the bobbins the builder pulley **40** is rotated step by step in a clockwise direction to reel out the builder chain **38** step by step, thereby permitting the elevating weights **60** (FIG. 2) to progressively raise the ring rail **56** step by step from its starting position **56A** to its uppermost position **56B**.

In order to provide automatic operation of the spinning frame in winding complete bobbins, mechanism is provided for automatically lowering the ring rail **56** (FIG. 2) from its uppermost position **56B** (diagram, FIG. 8) upon completion of building the bobbin, to a tail-coil winding position **56C** (in phantom in FIG. 2, and see the diagram, FIG. 9) below the starting position **56A** (diagram, FIG. 10) at which the ring rail starts winding of new bobbins. After the ring rail **56** has reached its uppermost position **56B** and before it completes its automatic downward travel, the motor **16** is stopped by a cam operated switch assembly **102** (FIGS. 3–5, to be described later), thus permitting the bobbins to coast to a stop. As the ring rail **56** is lowered, the halch (an open spiral winding of yarn extending from the top to the bottom of the bobbin) is wound on the bobbins, and in the lowermost position **56C** the tail coils are wound on the base of the bobbin or on the spindle, or on both the base and the spindle, as desired. After the tail coils are wound, the ring rail **56** may be raised to its starting position **56A**.

Referring particularly to FIGS. 1, 2 and 6, the previously described spinning frame may be modified by removing the bolts attaching the worm gear **96** to the builder chain pulley **40** and then forming a reset-gear

assembly **103** by securing a reset pulley **104** to the worm gear **96** by means of bolts **105** (FIG. 6) extending through holes in this pulley and received in the existing threaded holes in the worm gear **96**. In order to vary the effective diameter of the reset pulley **104**, its grooved periphery is provided with a grooved block **106** adjustably clamped to a radial flange **107** of the reset pulley **104** by means of bolts **108** extending through radially elongated slots in the flange. Such adjustment is desirable to compensate for diameter variation in the pulleys and because there may not be adequate room for a larger pulley on the original spinning frame. Further, a return pulley **109** is provided with threaded holes **110** and suitable bolts **112** extending through the arcuate slots **100** in the builder pulley **40** fixedly secure the builder pulley to the return pulley while retaining adjustment of the builder pulley relative to the return pulley **109** (and therefore relative to the worm gear **96**.) These assemblies of the worm gear **96** and reset pulley **104**, and the return pulley **109** and builder pulley **40** form the gear and pulley assembly **36** mounted on the builder-gear shaft **98** for rotation thereon and are held in position by a suitable nut **114** and washer at the right end of the shaft (FIG. 1).

A reset-gear abutment **116** is fixed on a face of the reset pulley **104** opposite a face of the return pulley which has a return-builder abutment **118**. During building of the bobbins, the return-builder abutment **118** is held against the reset-gear abutment **116** by tension of the builder chain **38** tending to rotate the return pulley **109** and the builder pulley **40**, which form a return-builder assembly **120**, clockwise with the reset-gear abutment **116** engaging the release-builder abutment **118** and holding the return-builder assembly **120** against such rotation and instead rotating this assembly as shown by the arrows in FIG. 6, responsive to clockwise step by step rotation of the worm gear **96**, as previously descried.

A reset cable **122** is attached at one end to the reset pulley **104** and a return cable **124** is attached at one end to the return pulley **109** for reeling on and off of the respective pulleys. The reset cable **122** reels off of the reset pulley **104** during building and onto the reset pulley during manual resetting, and the return cable **124** winds onto the return pulley during building and reels off of the return pulley **109** as the ring rail **56** is lowered.

The other end of the reset cable **122** is connected to a second reset pulley **125** and the opposite end of the return cable is connected to a second return pulley **126**. These pulleys **124** and **126** are part of a cluster **128** rotatably mounted on the stationary builder lever support shaft **28**, with the cables reeling onto the cluster **128** when the cluster is rotated in a clockwise direction (as shown in FIGS. 1 and 7–10) and reeling off of the cluster when it is rotated counterclockwise (as shown in these figures). As shown in FIG. 1 and FIGS. 7–10 an idler pulley **130** on the end of a lever pivoted to the body **10** is provided for the reset cable **122**.

In order to lower the ring rail, drive means **132** (FIGS. 1 and 7–10) is provided in the form of a dash pot **134** and a pair of tension springs **136** having opposite ends secured to bars **138** and **140**. As shown in FIG. 1, a right hand one of these bars **138** is adjustably secured, by means of a stud **142** secured to this bar and slidably extending through a channel member **144** bolted to frame members **14** so that the tension of the springs **136** may be adjusted. A left hand one of these bars **140** is secured to a drive cable **146** passing about a guide pulley **148** (FIGS. 1, 3 and 4) on a bracket **150** fixedly secured to the stationary builder lever shaft **28**. Alternatively, a pneumatic means or a weight may be provided in lieu of the springs **136**. The drive cable **146** is attached to a drive pulley **152** of the cluster **128** to unreel from the cluster and rotate the cluster clockwise (FIGS. 1 and 7–10) when the tension springs **136** contract, and to reel onto the cluster and extend the springs when the cluster is rotated counterclockwise. It should be noted that the builder lever shaft **28** and the bracket **150** are always stationary, and that the builder lever **24** and the cluster **128** rotate on this shaft.

As the ring rail is moving upwardly from its starting position **56A** (FIG. 2 and diagram, FIG. 10) to its uppermost position **56B** (diagram, FIG. 8), the gear and pulley assembly **36** is rotated clockwise step by step responsive to operation of the ratchet and worm drive assembly **68**. More particularly, the reset-gear assembly **103** is rotated clockwise step by step by the form **88** so that its reset-gear abutment **116**, which is in engagement with the release-builder abutment **118** permits the return-builder assembly **120** to rotate clockwise step by step to unreel the builder chain **38** from the builder pulley **40**, thus permitting the ring rail **56** to rise. As the ring rail rises from its starting position **56A** (FIG. 1 and diagram, FIG. 10) the return cable **124** is slack. As the ring rail **56** continues to rise, the return cable **124** is reeled onto the first return pulley **109** (diagram, FIG. 7) which is being rotated step by step in a clockwise direction as indicated by the arrow in FIG. 7. The return cable **124** passes about a pulley **158** on the lower free end of a latch lever **160** which is pivoted by means of a stud **162** at its upper end to the bracket **150**. When the ring rail **56** has reached its uppermost position **56B** (FIG. 2 and diagram, FIG. 8), the return cable **124** becomes taut, and the lever **160** is pivoted clockwise against an adjustable stop bolt **164** on the bracket **150**, releasing a latch member **166** from a notch **168** in a cylindrical surface **170** of the cluster **128**. The latch is shown as an integral protrusion on the lever in the diagrams of FIGS. 7–10 but, as shown in FIG. 3, the latch member is actually a roller pivoted on the latch lever. The cluster **128** is now free to rotate and as the tension springs **136** contract, the drive cable **146** rotates the cluster clockwise as indicated by the dashed arrow in FIG. 8. (The dash arrows in FIGS. 8 and 9 indicate the movement of the parts following their position shown in these figures.)

Clockwise rotation of the cluster **128** reels the reset cable **122** and the return cable **124** onto the cluster, rotating the first return pulley **109** counterclockwise (in the direction indicated by the dashed arrow in FIG. 8) thus reeling the builder chain **38** back onto the builder pulley **40** (which is fixed to the return pulley) until the ring rail **56** is in its fully lowered position **56C** (FIG. 2 and diagram, FIG. 9). The fully lowered position may be adjusted to wind tailing coils on the lower portion of the bobbin or onto the spindle, or both. The return cable **124** remains taut throughout lowering of the ring rail **56** and during this period the return-builder abutment **118** has rotated counterclockwise away from the reset abutment, as shown in FIG. 9.

The ring rail **56** remains in its fully lowered position (FIG. 9) until the worm **88** is rotated by a crank **174** received in a square socket **176** in the ratchet worm shaft **86** (FIG. 1), in reverse of its direction during building, by releasing the ratchet pawl **82** and the latch pawl **90**, whereupon the worm is manually cranked in a clockwise direction (indicated by the dashed arrows in FIG. 9) thus reeling the reset cable **122** back onto the first reset pulley **104** and off of the cluster **128**, thereby rotating the cluster to reel the drive cable **146** back onto the cluster and again tensioning the lowering springs **136**. During this cranking, the reset-gear assembly **103** rotates counterclockwise (dashed arrow FIG. 9) with the reset-gear abutment **116** rotating toward the return-builder abutment **118**. Because the reset cable **122** unreels from a smaller pulley **125** on the cluster **128** than does the return cable **124**, toward the end of the cranking the return cable becomes slack thus permitting its return-builder abutment **118** to rotate clockwise (dashed arrow in FIG. 9) until it is stopped by the reset-gear abutment **116**. When the return cable **124** becomes slack the latch member **166** is free to engage in the notch **168** in the cluster **128**, thus retaining the cluster in position for

winding a new set of bobbins. It is during the period when the return cable 124 becomes slack that the builder chain 38 is unreeled from the builder pulley 40 to permit the ring rail 56 to move from its fully lowered position 56C (FIG. 2 and diagram, FIG. 9) into position ready to start building 56A (diagram, FIG. 10).

Additionally, when the ring rail 56 reaches its uppermost position 56B (diagram, FIG. 8), and the cluster 128 rotates (clockwise in FIG. 5), the cam-switch assembly 102 (FIGS. 3–5) shuts off the motor 16 (FIG. 2) as previously mentioned. More particularly a cam 180 secured to the left end of the cluster 128 (FIGS. 4 and 5) rotates with the cluster. This cam 180 is adjustably mounted on the cluster 128 by means of bolts 182 extending through arcuate slots 184 in the cam and threaded into the body of the cluster 128. Such rotation of the cam 180 causes a lobe 186 (FIG. 5) to move across a cam follower roller 188 on a pivoted switch lever 190 of a normally closed switch 192, to open the switch and therefore a circuit (FIG. 11) to the motor 16. The switch 192 closes as soon as the cam follower 188 rides off the lobe 186 but the circuit remains open until it is closed by momentary closing of a normally open manually operated switch 193 to energize a relay coil R closing its normally open contact R1, which provides a holding circuit for the coil and closes the circuit to the motor 16 since switch 192 is closed. A housing of the switch 192 is pivoted to the bracket 150 and may be adjusted by means of a bolt 194 (FIG. 3) threaded on the switch 192 and engaging an abutment 196 on the bracket 150. Thus, both the cam 180 and switch 192 may be adjusted to shut off the motor 16 and thereby regulate the number of tail coils wound onto the base of the yarn receiver.

The lowermost position 56C (FIG. 2 and diagram, FIG. 9) of the ring rail is adjusted by positioning of the stop bolt 164 to limit backward travel of the lever 160 so that the return cable 124 limits travel of the ring rail, or by locating the ring rail against a low position stop on the body 10. The position at which the ring rail 56 is ready to start building new bobbins 56A (FIG. 2 and diagram, FIG. 10) is adjusted by positioning the builder pulley 40 relative to the worm gear 96 by means of the arcuate slots 100 and the bolts 112 (FIG. 1). The length of reset cable 122 is set so that the latch member 166 engages the notch 168 in the cluster 128 when the rail is at the starting position. The uppermost position 56B (FIG. 2 and diagram, FIG. 8) of the ring rail 56 at which the building stops is adjusted by generally vertical positioning of the idler pulley 158 received in opposed slots 200 (FIG. 3) in the lever 160. To this end an adjusting bolt 202 is provided in the lever 160. The speed with which the ring rail 56 is lowered may be adjusted by means of a metering by-pass 204 (FIG. 1) between opposite ends of the cylindrical dash pot 134, the by-pass having an adjustable metering valve 206.

While this invention has been described with reference to a particular embodiment in a particular environment, various changes may be apparent to one skilled in the art and the invention is therefore not to be limited to such embodiment or environment except as set forth in the appended claims.

What is claimed is:

1. A twisting machine for filling a yarn receiver having opposite ends, comprising an assembly including support means for operatively mounting said yarn receiver, and a ring rail, means mounting said assembly for relative movement of said support means and said ring rail between first and second zone positions corresponding generally to each of the opposite ends of the yarn receiver, builder means operable for providing said relative movement of said assembly from said first zone position to said second zone position, return means operable for providing said relative movement of said assembly from said second zone position to said first zone position and including drive means for storing energy and releasing said stored energy to provide power for said relative movement, said drive means being manually operable for storing the energy, and control means operable responsive to said relative movement of said assembly to said second zone position for operating said return means.

2. A twisting machine for filling a yarn receiver having opposite ends, comprising an assembly including support means for operatively mounting said yarn receiver, and a ring rail, means mounting said assembly for relative movement of said support means and said ring rail between first and second zone positions corresponding generally to each of the opposite ends of the yarn receiver, builder means for providing said relative movement of said assembly from said first zone position to said second zone position, return means operable for providing said relative movement of said assembly and including drive position to said first zone position and including drive means comprising at least one tension spring and a dash pot for storing energy and releasing said stored energy to provide power for said relative movement, and means for adjusting operation of said dash pot to adjust operation of said spring, and control means responsive to said relative movement of said assembly to said second zone position for operating said return means.

3. A twisting machine for filling a yarn receiver having opposite ends, comprising an assembly including support means for operatively mounting said yarn receiver, and a ring rail, means mounting said assembly for relative movement of said support means and said ring rail between first and second zone positions corresponding generally to each of the opposite ends of the yarn receiver, builder means including a builder pulley and means for rotating said builder pulley in a building direction to move said assembly from said first zone position to said second zone position, for providing said relative movement of said assembly from said first zone position to said second zone position, drive means to provide power for said relative movement, and means connecting said drive means with said assembly for moving the assembly from said second zone position to said first zone position, the connecting means including a return pulley, means coupling said return pulley and said builder pulley for rotating said builder pulley in a return direction opposite said building direction responsive to rotation of said return pulley in a return direction for moving said assembly from said second zone position to said first zone position and means connecting said return pulley and said drive means for rotating said return pulley in said return direction responsive to operation of said drive means, and control means responsive to said relative movement of said assembly to said second zone position for operating said drive means.

4. A machine as set forth in claim 3 in which said means connecting said return pulley and said drive means comprises a second return pulley and a drive pulley rotatable together, a return cable connected to wind on and off of both the first and return pulley and said second return pulley, and a drive cable connected to said drive means and connected to wind on and off of said drive pulley.

5. A machine as set forth in claim 4 in which said control means comprises latch means operable for releasably holding said second return pulley and said drive pulley against rotation in said return direction, and means for releasing said latch means when said assembly has moved to its second zone position.

6. A machine as set forth in claim 5 in which the releasing means comprises means responsive to said return cable becoming taut for releasing said latch, and means for tensioning said return cable to release said latch when said assembly moves to said second zone position.

7. A machine as set forth in claim 6 in which said return cable is normally slack and is tensioned as it is wound onto said first return pulley upon rotation of said first return pulley in a building direction opposite said return direction.

8. A machine as set forth in claim 5 in which said drive means is operable through said drive cable upon release of said latch means for rotating said drive pulley and said second return pulley in said return direction, thereby rotating said first return pulley and said builder pulley in said return direction to move said assembly from said second zone position to said first zone position, and said control means includes means for rotating said drive pulley and said second return pulley in a reset direction opposite said return direction to wind said drive cable onto said drive pulley and to unwind said return cable from said first return pulley.

9. A machine as set forth in claim 8 in which the last said means comprises a first reset pulley, a second reset pulley rotatable with said second return pulley and drive pulley, and a reset cable connected for winding onto and off of both of the reset pulleys.

10. A machine as set forth in claim 9 including means coupling said first reset pulley and said first return pulley to regulate rotation of said first return pulley and therefore said builder pulley responsive to rotatation of said first reset pulley in a building direction, and means for rotating said first reset pulley in said building direction and in a return direction corresponding, respectively, to the building and return directions of said first return pulley and said builder pulley.

11. A machine as set forth in claim 10 in which the means coupling said first reset pulley and said first return pulley comprise cooperating abutment means connected with the last said pulleys.

12. A machine as set forth in claim 11 in which the first reset pulley, the first return pulley, the builder pulley, and the abutments are generally concentric.

13. A twisting machine for filling a yarn receiver having opposite ends, comprising an assembly including support means for operatively mounting said yarn receiver, and a ring rail, means mounting said assembly for relative movement of said support means and said ring rail between first and second zone positions corresponding generally to each of the opposite ends of the yarn receiver, builder means including a builder pulley and a driving member, for providing said relative movement of said assembly from said first zone position to said second zone position, return means operable for providing said relative movement of said assembly from said second zone position to said first zone position and including first and second pulleys and drive means to provide power for said relative movement, and means mounting said first and second pulleys for rotation with said builder pulley and said driving member, respectively, and for rotation relative to each other, and control means responsive to said relative movement of said assembly to said second zone position for operating said return means.

14. A machine as set forth in claim 13 in which said return means comprises means for regulating the relative rotation of said first and second pulleys.

15. A machine as set forth in claim 14 in which the last said means comprises cooperating abutments on said first and second pulleys.

16. A twisting machine for filling a yarn receiver having opposite ends, comprising an assembly including support means for operatively mounting said yarn receiver, and a ring rail, means mounting said assembly for relative movement of said support means and said ring rail between first and second zone positions corresponding generally to each of the opposite ends of the yarn receiver, builder means including a builder lever support, a shaft mounted on said support, and a builder lever on said shaft, for providing said relative movement of said assembly from said first zone position to said second zone position, return means operable for providing said relative movement of said assembly from said second zone position to said first zone position and including a cluster on said shaft, latch means for releasably holding said cluster, and drive means to provide power for said relative movement, and control means responsive to said relative movement of said assembly to said second zone position for operating said return means.

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