Dec. 16, 1969 J. P. DAVIES 3,484,050

PACKAGING MECHANISMS FOR TEXTILE MACHINES

Filed Sept. 25, 1967 3 Sheets-Sheet 1

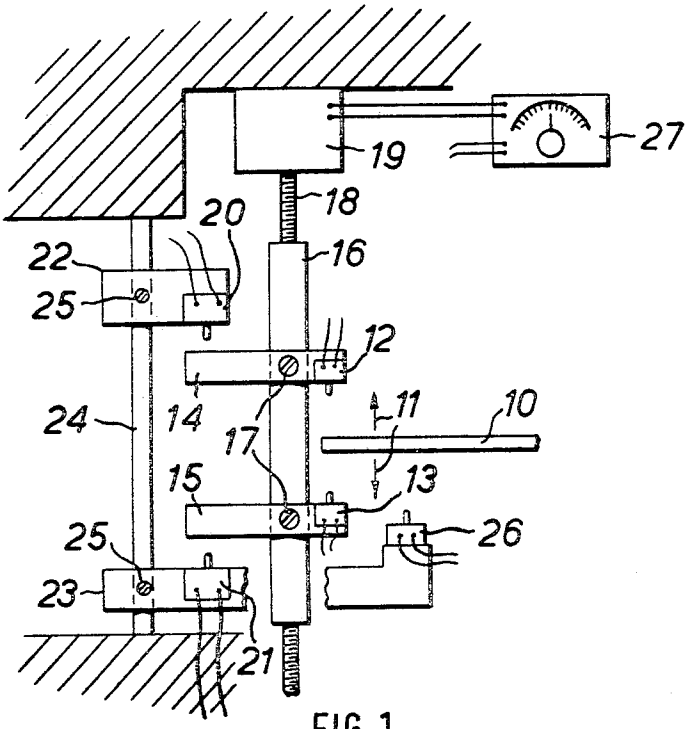


FIG. 1

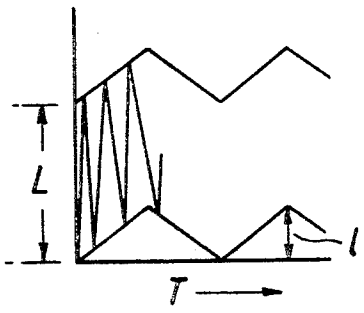


FIG. 2a

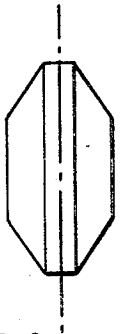


FIG. 2b

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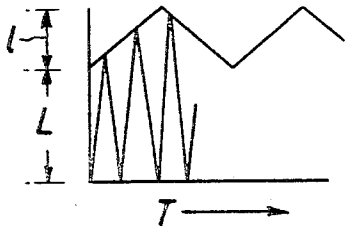


FIG. 3a

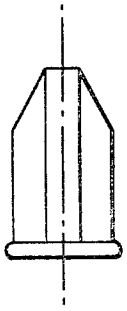


FIG. 3b

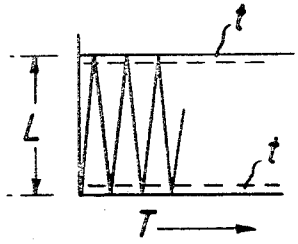


FIG. 4a



FIG. 4b

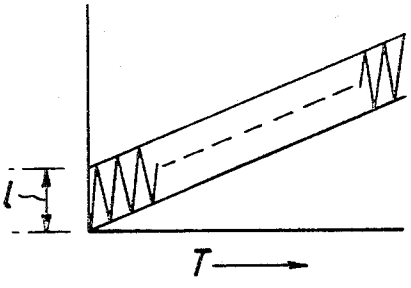


FIG. 5a

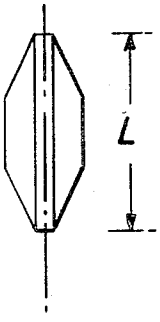


FIG. 5b

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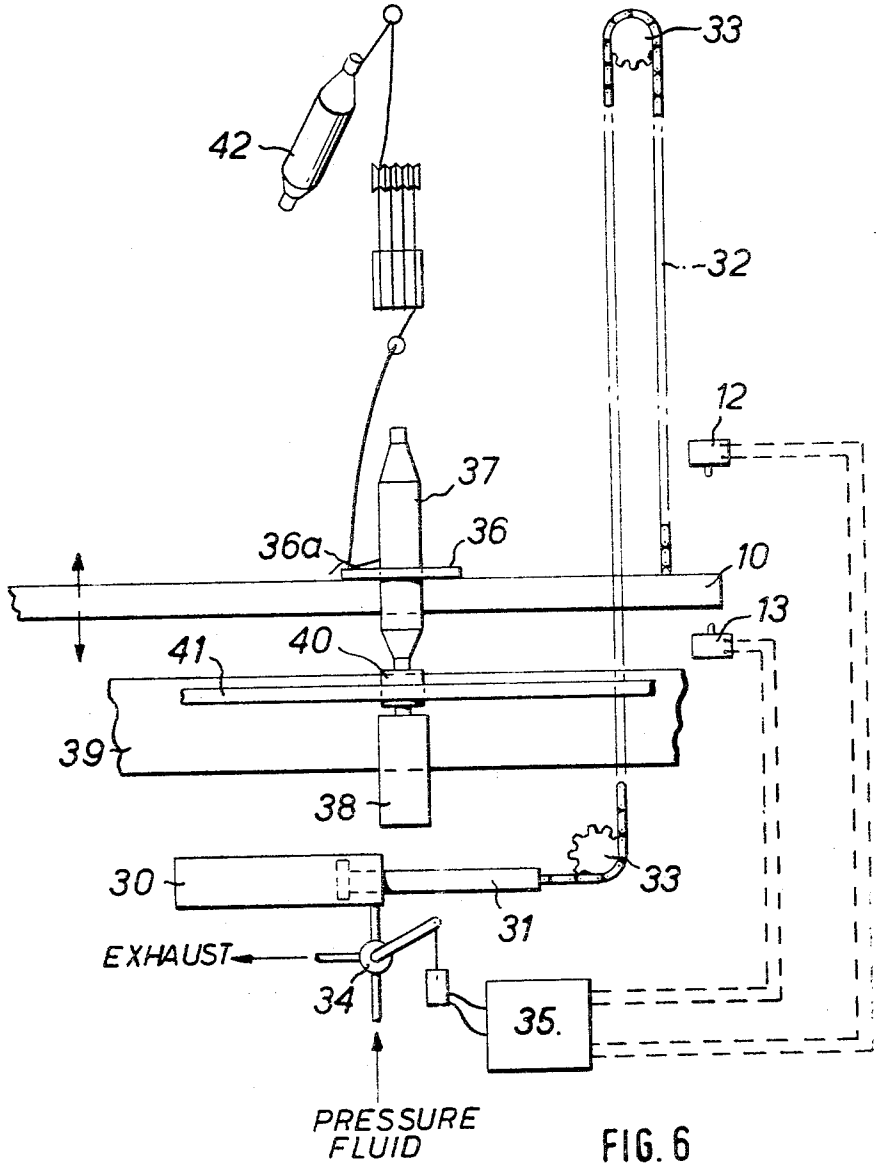


FIG. 6

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3,484,050

PACKAGING MECHANISMS FOR TEXTILE MACHINES

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Claims priority, application Great Britain, Oct. 6, 1966, 44,761/66
Int. Cl. B65h 54/32
U.S. Cl. 242—26.3 7 Claims

ABSTRACT OF THE DISCLOSURE

In the packaging mechanism of a textile machine, reciprocating movement of a yarn guide are variable to permit winding of different types of package under control of first limit switches which are adjustable to vary the length of travel between reversals of the guide and also also under control of second limit switches which permit variations of the positions of the points of reversal relatively to the package being wound, the first limit switches being adjustable along a mount which is movable lengthwise of itself under control of the second limit switches which are themselves adjustable parallel to the mount.

This invention comprises improvements in or relating to packaging mechanisms for textile machines in which yarn is wound on to a rotatively-driven former under control of a guide reciprocable lengthwise of the former which may for example be a plain cylindrical tube, or a bobbin which is flanged at one end only or at both ends. Such a packaging mechanism will be referred to as "a packaging mechanism as specified."

In order to make it possible to produce different types of package, it is necessary to be able to select the way in which either the length of traverse of the guide lengthwise of the former or the lengthwise disposition of the path transversed relatively to the former, or both, are varied during the wind.

According to this invention a packaging mechanism as specified has the length of traverse of the guide determined by a pair of limit switches of which at least one is adjustable along a mount which in operation of the mechanism is itself progressively adjustable sensibly parallel to the adjustment of the limit switch.

The extent of displacement of the mount in operation may itself be determined by pre-settable limit or stop switches, the mount being movable between its limit or stop switches either backwards and forwards as by a reversible motor, or in very short steps in a given direction between the switches.

Preferably, both limit switches for determining the length of traverse of the guide are adjustably supported on the mount, and preferably also one at least of these limit switches is capable of being rendered inoperative.

With apparatus according to the invention it is possible to build many variations of several types of yarn package on a single textile machine.

Usually, a textile machine has a large number of winding stations, the traversing or ring guides being movable together. The traversing control in this case will usually be actuated by a member connected to move in unison with the guides and will affect the drive for this member. For instance, in a ring spinning machine, the control may be actuated by movements of the ring rail, that is the member carrying the ring guides for the travellers, and affect the drive for the rail.

The limit switches can be electric switches, or they can be hydraulic or pneumatic switches.

The accompanying diagrammatic sketches illustrate a form of packaging mechanism of this invention and some forms of package which can be produced with it.

In the drawings,

FIG. 1 illustrates a form of control,

FIGURES 2*a*, 3*a*, 4*a* and 5*a* illustrate, schematically, different paths of traverse; and FIGURES 2*b*, 3*b*, 4*b* and 5*b* illustrate the forms of packages formed by 2*a*, 3*a*, 4*a* and 5*a*, respectively.

FIG. 6 shows diagrammatically the control applied to a ring spinning machine.

The packaging control mechanism illustrated in FIG. 1 controls the reciprocating movement of a member **10** in the direction of arrows **11**. The member **10** may for instance be the ring rail of a ring spinning machine, or a reciprocating member by which the traversing yarn guides of other types of textile machine are moved backwards and forwards lengthwise of the packages.

Thus, as shown in FIG. 6, the member **10** is the ring rail of a ring spinning machine. The rail **10** is raised by a pressure-fluid-operated ram **30** whereof the piston rod **31** is connected to the rail **10** by a chain **32** running over sprockets **33**. The rail **10** is lowered by its own weight, the ram being connected to exhaust to allow this. The pressure fluid supply is controlled by reversing valve **34** which is under control of the packaging control mechnism indicated at **35**.

The rail **10** carries a plurality of ring guides **36** for the travellers **36***a*. The ring guides **36** are reciprocated by the movements of the rail lengthwise of packages **37** each of which is mounted on a rotating spindle. The spindle is mounted in a bolster **38** secured on a spindle rail **39** and carries a whorl **40** contacted by a driving belt **41**. The yarn to be wound on the package **37** is drawn from a supply package **42** and passes over the usual guides.

The packaging control mechanism comprises a pair of limit switches **12, 13** which are carried by strikers **14, 15** adjustable along a mount **16** and are capable of being locked to the mount by set screws **17** so as to determine the spacing of the limit switch contacts. The limit switches **12, 13** are actuated by the member **10**, or by a part which moves in unison with the member.

The mount **16** is displaceable lengthwise of itself by a lead screw **18** which is rotatively driven by a motor **19**. The mount **16** has associated with it a pair of limit switches **20, 21** on carriers **22, 23** respectively, the spacing of which lengthwise of the mount **16** can be selected by adjusting the carriers along a bar **24** and locking them in position by set screws **25**. The limit switches **20, 21** are actuated by the strikers **14, 15** respectively.

The carrier **23** also has mounted on it a limit switch **26** which can be actuated by the ring rail or other member **10**.

The motor **19** may conveniently be a reversible motor which can move continuously, or stepwise under control of a pulse generating unit **27**.

The control mechanism just described enables various forms of package to be wound on one machine.

For instance in order to wind a "wander cop" (FIG. 2*b*), the desired length of traverse of the member **10** is selected by adjusting limit switches **12, 13** along the mount **16** to correspond to the length L (FIG. 2*a*), and by adjusting the carriers **22, 23** to permit a reciprocation of the mount **16** equal to distance *l*. The switches **12, 13** are set to reverse the direction of travel of the member **10** and the switches **20, 21** are set to reverse the running direction of the motor **19**. The motor may either run continuously, or be moved stepwise in which case one or each of the switches **12, 13** may also be arranged to energise the unit **27** so that at each such energization the motor is stepped in the appropriate direction by a number of pulses from

the unit **27** depending upon the desired number of reciprocations of the member **10** per cycle of the mount **16**.

In order to wind a "bottle bobbin" (FIG. 3*b*), the set-up is as for winding a wander cop, except that the limit switch **13** is rendered inoperative and physically moved (as by swivelling on the mount **16**) out of the path of the member **10**, and reversals of the member **10** and energisation of the motor are effected at the corresponding end of travel of the member **10** by the limit switch **26**. Thus although the position, lengthwise of the bobbin, at which reversal of member **10** occurs varies cyclically over a distance *l*, the reversals at the flanged end of the former occur at the same lengthwise position. In this case the yarn guide has a length of travel which varies cyclically between the distances L and L+*l*.

In winding on a double-flange bobbin (FIG. 4*b*), the motor **19** can be rendered inoperative and the winding controlled by limit switches **12, 13** alone to give a traverse L (FIG. 4*a*) equal to the length between the flanges. Alternatively in order to avoid build-up of the yarn into ridges adjacent the flanges of the bobbin, the mount **16** can be moved by the motor cyclically through a short distance so that the reversal points vary cyclically over a distance *t* (FIG. 4*a*); in this operation the control set-up is as for a wander cop except that the "wander" is very much less.

In order to effect pirn winding, the switches **12, 13** are set to give the member **10** a travel *l* (FIG. 5*a*) substantially less than the length L of the former (FIG. 5*b*), and at each actuation of say switch **13**, the pulse unit **27** is brought into operation to control the motor **19** so as to advance the mount **16** a very small distance from one limit of its movement towards the other.

When the member **10** is moved hydraulically as by a reversible ram, the active limit switches can energise solenoids controlling hydraulic reversing valves.

I claim:

1. In or for a textile machine, a packaging mechanism of the class having a yarn guide movable to feed yarn to a rotating former or bobbin to form a package, a reciprocating member connected to move with said yarn guide, power means effecting reciprocation of said yarn guide and said reciprocating member and a control mechanism including limit switches connected to control the power means and actuated by said reciprocating member; a construction of said control mechanism comprising a mount supported to move parallel to the path of reciprocation of said reciprocating member, a first pair of limit switches

carried on said mount to be moved together, said limit switches being independently and selectively settable in position along said mount in the path of the reciprocating member, reversible motor means for moving said mount parallel to said path, and a second pair of limit switches independently and selectively adjustable in position parallel to the direction of movement of the mount, said second pair of limit switches being connected to control reversal of said reversible motor means.

2. A packaging mechanism as claimed in claim **1**, wherein there is a pair of strikes each carrying a respective one of said first pair of limit switches and each independently and selectively adjustable along and lockable to the mount, the said strikers each actuating a respective one of the second pair of limit switches.

3. A packaging mechanism as claimed in claim **1** having one at least of the said first pair of limit switches also settable in an inoperative setting out of the path of said reciprocating member.

4. A packaging mechanism as claimed in claim **3**, wherein there is a further limit switch in the path of said reciprocating member at one end of its travel, the further limit switch being adjustable in position parallel to said path and being rendered operative by rendering inoperative the said one of the limit switches on the mount.

5. A packaging mechanism as claimed in claim **2** wherein there is a further limit switch in the path of the reciprocating member at one end of its travel, the further limit switch being adjustable in position parallel to said path and being rendered operative by rendering inoperative the said one of the limit switches on the mount.

6. A packaging mechanism as claimed in claim **1**, wherein the mount is progressively adjusted by the reversible motor means which is continuously driven.

7. A packaging mechanism as claimed in claim **1**, wherein the mount is moved by the reversible motor means stepwise.

References Cited

UNITED STATES PATENTS

3,245,215	4/1966	Graf	242—26.1 XR
3,302,381	2/1967	Pfeifer	242—26.3 XR
3,343,755	9/1967	Waddington	242—26.3
3,370,799	2/1968	Rogers	242—26.3
3,406,918	10/1968	Ramcke	242—26.3

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