

Jan. 29, 1935.

H. STAUB

1,989,656

STRAND FEEDING MECHANISM

Filed Jan. 18, 1934

4 Sheets-Sheet 1

FIG. 1.

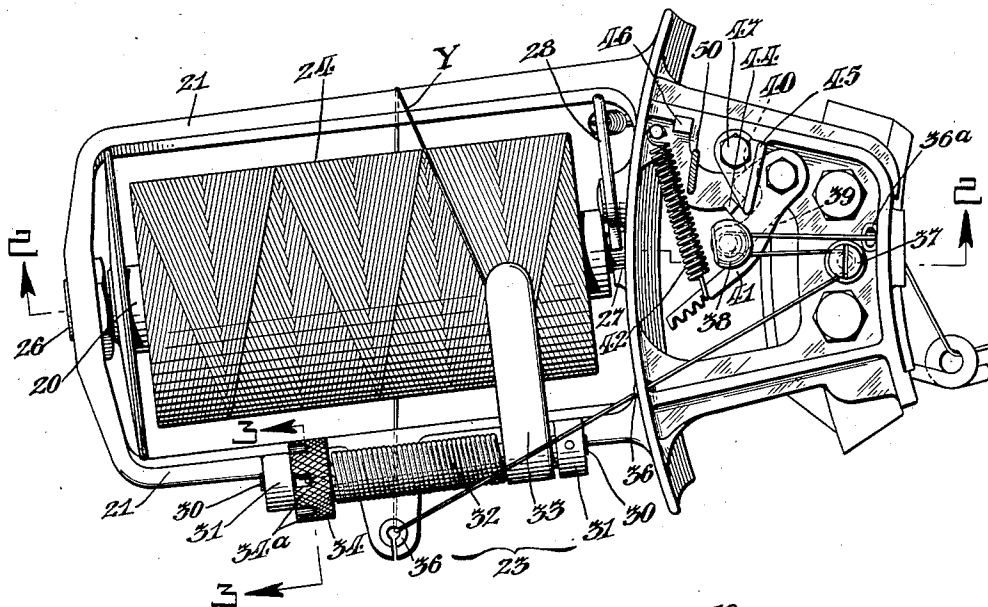


FIG. 2.

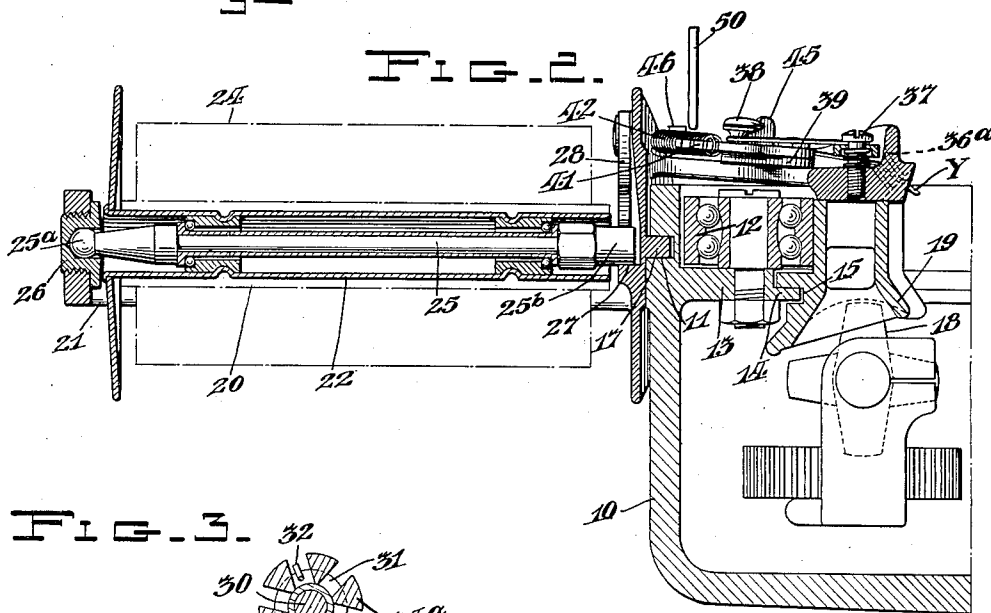
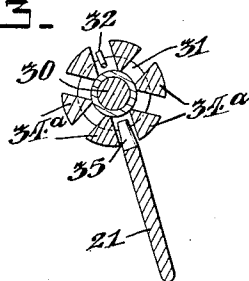


FIG. 3.



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FIG. 4.

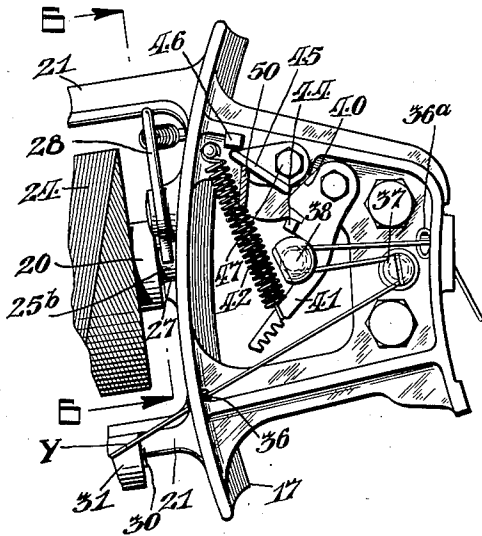


FIG. 5.

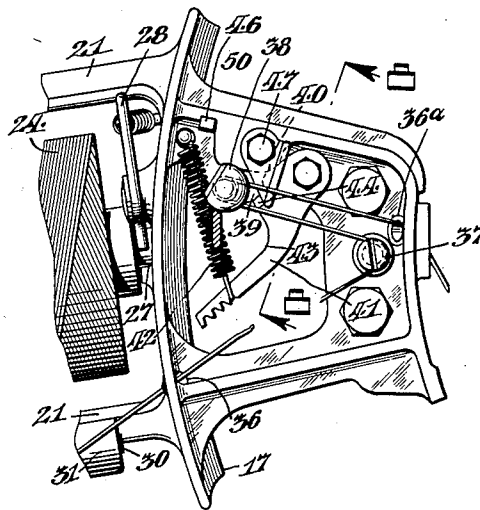


FIG. 6.

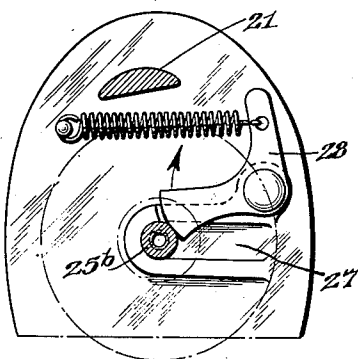


FIG. 7.

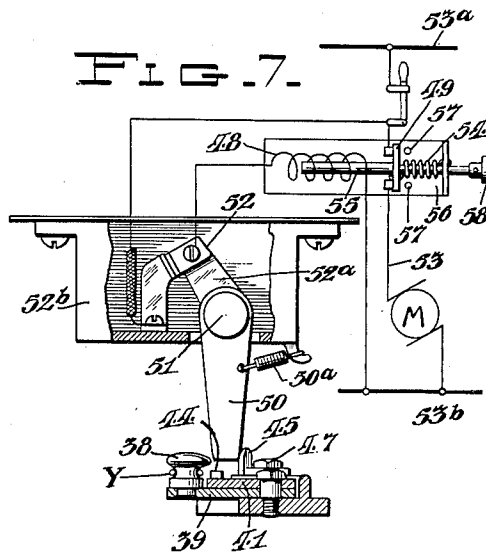
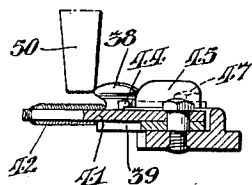


FIG. 8.



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FIG. 9.

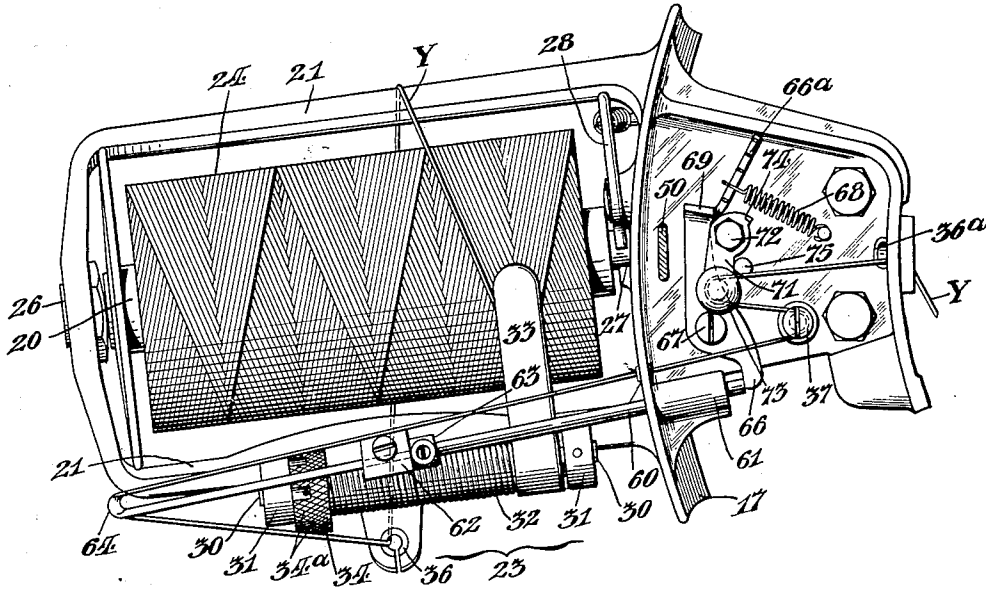
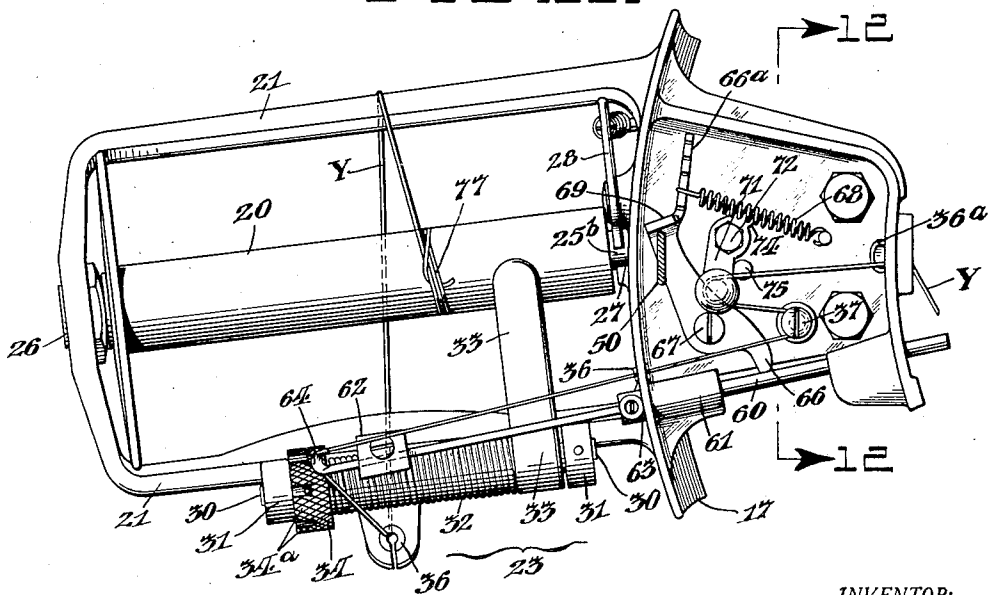


FIG. 10.



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FIG. 11.

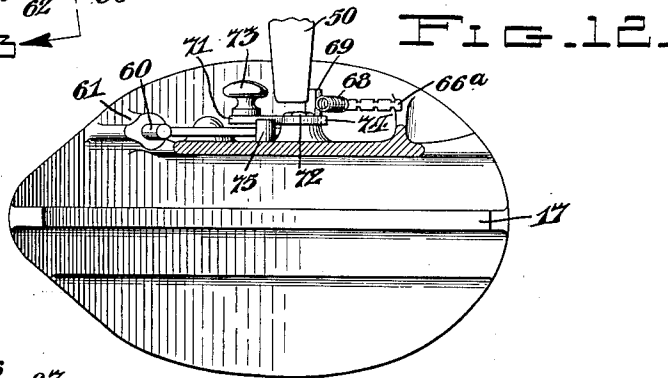
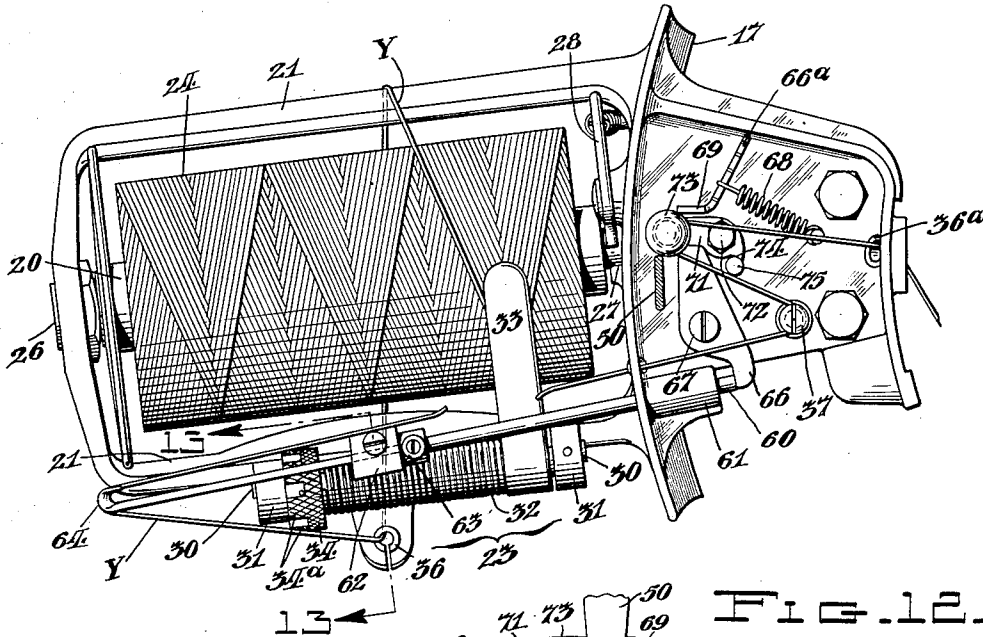


FIG. 14.

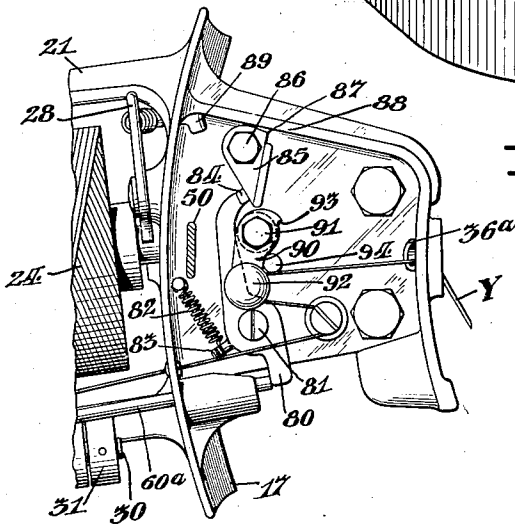
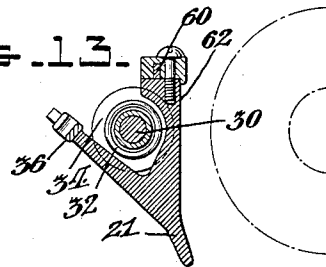


FIG. 13.



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UNITED STATES PATENT OFFICE

1,989,656

STRAND FEEDING MECHANISM

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Application January 18, 1934, Serial No. 707,054

16 Claims. (Cl. 96—19)

This invention relates to improvements in strand feeding mechanism for braiding machines or the like.

One of the objects of the invention is to provide a novel and improved carrier, particularly a traveling carrier, adapted to feed a strand, as of yarn, wire, etc., to various types of machines, for example, braiders, winders, twistors, stranding machines and circular looms, the carrier having one or more actuating members controlled by the strand fed to the machine, and operable by centrifugal force during movement of the carrier and movable from a first position to a second position for actuating mechanism, such as the stopping mechanism of the machine, when a predetermined tension condition on said strand obtains. Specifically, one of the actuating members may be operative when the strand breaks, or when the tension on the strand being fed to the machine falls below a predetermined amount, to actuate the stopping mechanism of the machine; and another such actuating member may be employed to move to an operative position when, due to entanglement of the strand or for any other reason, the tension on the strand becomes excessive or exceeds a predetermined amount for actuating the stopping mechanism of the machine.

Another object of the invention is to provide, in carrier structure adapted for feeding a strand to various types of machines, a member engaged by the strand and movable with movement of the strand a predetermined distance to actuate mechanism for stopping the machine when for any reason the tension on the strand becomes excessive or exceeds a predetermined amount, the member being movable an additional distance by the strand, after the stopping mechanism has been actuated, in a direction to feed a reserve supply of strand to the machine until the latter has stopped, and thereby prevent the strand from breaking.

A further object is to provide a carrier having various features which particularly adapt the carrier for use with high speed rotary braiding machines or the like.

With these and other objects in view, which will become apparent from the following detailed description of the illustrative embodiments of the invention shown in the accompanying drawings, my invention further resides in the novel elements of construction, mechanisms, and combination of parts in cooperative relationship, as hereinafter more particularly pointed out in the claims.

In order to illustrate the principles of my in-

vention, and by way of example only, the invention is shown in the drawings as applied to a high speed rotary braiding machine. For the sake of brevity only those parts of the braiding machine necessary to an understanding of the invention are shown, the remaining parts and their manner of operation being well known in the art. In the drawings:

Fig. 1 is a plan view of a braiding carrier embodying my invention, and illustrating the several parts in their respective operative positions occupied during the normal feeding of the yarn or other strand;

Fig. 2 is a longitudinal section on line 2—2 of Fig. 1, showing a portion of the frame and guiding mechanism of the machine proper;

Fig. 3 is a fragmentary sectional view on line 3—3 of Fig. 1, showing details of certain parts of adjustable spring tensioning means employed;

Fig. 4 is a plan view of one end of the yarn carrier illustrated in Fig. 1, showing certain of the parts in their operative positions when excessive yarn tension conditions obtain;

Fig. 5 is a view similar to Fig. 4, showing the parts in their operative positions when the yarn breaks, or when the tension normally on the yarn is released;

Fig. 6 is a transverse section taken on the line 6—6 of Fig. 4, showing details of the spool retention means;

Fig. 7 is a diagrammatic view of an electric control circuit including a switch member for stopping the braiding machine, and showing control members for actuating the switch under predetermined yarn tension conditions;

Fig. 8 is a fragmentary section taken on line 8—8 of Fig. 5;

Fig. 9 is a plan view of a modified form of braiding carrier illustrating another feature of my invention;

Fig. 10 is a view similar to Fig. 9, showing the operative positions of certain parts when excessive tension is applied to the yarn;

Fig. 11 is a view similar to Fig. 9, showing the positions assumed by the several operating parts when the tension on the yarn is released;

Fig. 12 is a transverse section taken on line 12—12 of Fig. 10;

Fig. 13 is a transverse section taken on line 13—13 of Fig. 11; and

Fig. 14 is a view similar to Fig. 9, showing a modified form of the invention.

In the form of my invention illustrated in Figures 1 to 8 inclusive, and referring especially to Figure 2, a reference numeral 10 designates the

frame of a high speed rotary braiding machine of well known type, having an annular groove 11 therein, and supporting a plurality of roller bearings 12 at required intervals about suitable guiding mechanism. The bearings 12 are mounted on studs which rise from a flange 13, the inner periphery of which furnishes a trackway 14 which coacts with a groove 15 on the carrier head structure for guiding the carriers.

10 The annular groove 11 formed in the frame 10 extends around the outer face thereof and is adapted to receive and guide flanges 17 of the carrier heads. The usual flier mechanism for engaging and driving the carriers about the trackways is shown at 18, and that portion of the carrier head which is engaged thereby is shown at 19.

Each carrier unit comprises a yoke or U-shaped member 21 which forms a support for a spindle assembly 22 and an adjustable tensioning mechanism 23. The spindle 25 is designed to receive the usual form or core 20 upon which the strand supply 24, shown in this instance as a yarn package, is wound. The outer end of the spindle carries a ball structure 25a insertable in a thrust bearing or socket 26, while its inner end 25b is adapted to fit into a centering slot 27, Fig. 6, formed in the carrier frame and to be retained there during delivery of the yarn. A spring controlled pawl 28 keeps the spindle properly seated while the yarn is being unwound, and movement of the pawl (in the direction of the arrow Fig. 6) releases the inner end of the spindle which is movable in an arc about the outer bearing 26 until the inner end clears the adjacent framework, at which time the ball structure 25a may be slid from its socket, thereby permitting quick and easy removal of the spindle assembly 22 for yarn package replacement.

40 The adjustable tension means shown at 23, Fig. 1, comprises a shaft 30 supported by ears 31, 31, and having a coiled spring 32 encircling the shaft or pin 30, one end of the spring being attached to a flat finger or brake member 33 loosely mounted on the shaft 30, while the other end of the spring is anchored in a slotted collar 34 rotatably and slidably mounted on the shaft 30, the lugs 34a of the collar coacting with a lug 35, Fig. 3, extending from one of the ears 31, and retained in position thereby. Tension of the finger 33 against the yarn package 24 can be varied by sliding the collar 34 along the shaft 30, against the thrust of spring 32, until the lugs 34a are out of engagement with the lug or projection 35, turning the collar to the desired position and then reengaging the lug 35 with the nearest slot formed by the lugs 34a of the collar.

Suitable yarn guides 36, 36a are located at various parts of the structure to guide the yarn in a desired path from the package to the delivery point. The yarn Y is drawn from the package 24 thru the guides 36 to a spring tensioned guide member 37 fixedly mounted on the carrier structure. The yarn passes around this tensioned guide and back over an actuating member or stud 38 rotatably carried by a pivotally mounted arm 39, the stud 38 being operable by centrifugal force when the carrier unit is rotated and movable outwardly, when the yarn breaks or when the tension thereon falls below a predetermined amount, into position to coact with a control member or trip lever 50 for stopping the machine in a manner hereinafter described. From stud 75 38 the yarn is carried back to a yarn guide 36a

from which point it is guided to the braiding head (not shown).

A second arm 41 is pivotally mounted on the same stud with and above the arm 39, and is held in the position shown in Figure 1 against a stop or abutment 40 by the action of a spring 42. One end of spring 42 is anchored to the frame, while the opposite end is secured in one of the notches in the outer free end of the arm 41, whereby the tension may be regulated for different kinds or sizes of yarn. The arm 41 is preferably, although not necessarily, provided with a pocket 43, Fig. 5, which is adapted to limit the movement of stud 38 under normal tension conditions of the yarn Y.

A lug 44 carried by the arm 41 acts as a stop to prevent outward movement of a second actuating member or trip finger 45 rotatably mounted on a stud 47 secured to the carrier frame. In the specific form shown, member 45 is operable by centrifugal force when the carrier is rotated and is movable outwardly, when the tension on the yarn exceeds a predetermined amount, into position to coact with the control member 50 for stopping the machine. Under normal yarn tension conditions, member 45 is held in inactive position by the lug 44 on arm 41. A second lug 46 extending from the carrier frame limits the outward movement of the trip finger 45 under the abnormal yarn tension conditions referred to.

In the operation of the device shown in Figures 1 to 3, the parts normally occupy the positions shown in Figures 1 and 2 when the sets of yarn carriers are revolving in their respective orbits, and each thread is drawn off by the usual tension applied beyond the braiding point, causing each separate yarn package to rotate upon its own axis or spindle 22 while delivering yarn. The pressure of the finger 33 is adjusted to keep the yarn sufficiently taut to retain the stud 38 on arm 39 within the pocket formation 43 of arm 41 without effecting movement of the latter against the action of its spring 42. This is the normal feeding position and the several parts continue to occupy these relative positions as long as the tension on the yarn Y remains substantially uniform or within a predetermined range.

Assume now that an imperfection in the form of a knot or an enlargement of the yarn is encountered, or for any other reason the yarn jams and fails to pass the various guides 36 or tensioned guide 37. Immediately the tension on the yarn increases and this pulls the stud 38 against the arm 41 causing the latter to swing on its pivot against the action of spring 42. The lug 44 carried by arm 41 describes an arcuate path and moves out of engagement with the trip finger 45, permitting the finger to fly out into the path of the trip lever 50 under the influence of the centrifugal force set up in the member 45 by the high speed at which the carriers revolve, resulting in the parts moving to the position shown in Figures 4 and 7.

Various types of mechanical tripping or clutch mechanisms operable by a control or trip member, such as the member 50, are well known in the art and may be employed in connection with the invention disclosed herein for stopping the machine when abnormal yarn tension conditions occur. In the specific embodiment shown in Figs. 7 and 8, there is illustrated electrically controlled stopping mechanism in which movement of the control member 50 by either of the actuating members 38 and 45 will effect a change in the condition of an electrical circuit for stopping the machine. The control member 50, pivoted at 51, 75

is normally maintained in the position shown by means of a biasing spring 50a, and in this position of the control member, the switch blade 52a of a switch unit 52, mounted in switch box 52b, remains in closed circuit position and completes the circuit of a solenoid or holding coil 48 of an electromagnetic relay or switch 49 which controls the energizing circuit 53 of the machine driving motor M. The solenoid coil 48 is bridged across the current supply mains 53a, 53b and thus the solenoid plunger 55 is attracted and held by the solenoid coil and maintains the switch blade 49 in closed position against the tension of a contractile spring 54 which is connected at one end to the switch blade 49 and at its other end to the relay supporting base 56. When either of the members 38 or 45 is in a position to move the control member 50 (in a clockwise direction as viewed in Figs. 7 and 8), the switch blade 52a is thereby rotated in the same direction to an open circuit position and thus opens the normally closed circuit of the holding coil 48 of relay 49. Deenergization of the holding coil causes the contractile spring 54 to actuate the switch blade 49 to the right to an open circuit position, against the stop members 57, thus opening the driving motor circuit 53 and stopping the machine. Various braking mechanisms known in the art, effective either upon opening the driving motor circuit, or upon actuation of the relay 49, may be employed to quickly bring the machine to a stop.

The biasing spring 50a returns the control lever 50 to its initial position immediately after the member 38 or 45 has passed so that the motor circuit 53 may be reestablished, either manually or automatically, in any of the various ways known in the art. In the circuit illustrated, this may be effected by manually closing the switch or relay 49, against the tension of the spring 54, by means of a handle 58 connected to the solenoid plunger, the electromagnetic field of the solenoid coil 58 being sufficiently strong to hold the switch 49 in position after it has been closed, although not sufficiently strong to actuate the switch from open to closed position.

The braiding machine is equipped with two separate switch units 52, one for the upper set of yarn carriers and one for the lower set, and may have individual solenoid controls, or may be wired so that either switch will operate upon a common solenoid control, to open the driving motor circuit.

In the event that a yarn thread breaks during the feeding operation, the tension thereon is removed and the stud 38 and arm 39 are no longer under tension control, which results in their moving into the path of switch lever 50 due to centrifugal action. The positioning of the respective parts under this condition are clearly illustrated in Figures 5 and 8. With the tripping of the lever 50 by the stud 38, the action upon the stop mechanism is identical with that present when the lever is operated by trip finger 45.

In practice it was found that an end of yarn from a package was sometimes carried into the braiding machine proper, frequently resulting in breaking other yarns as they were being braided, and causing the attendant a great deal of trouble and loss of time to adjust the machine before it could again be started. This was caused by the momentum of the high speed machine and the continued revolutions of the carriers after the driving power had been discontinued, there being sufficient movement and take-up of thread to carry the end (whether caused by breakage or comprising the end of the yarn on the package) well into the braiding machine, before the yarn carriers came to a stop.

In order to obviate this difficulty, I provide an extended yarn supporting guide 60, shown in Figs. 9 to 11, which is designed to provide a reserve supply of yarn sufficient to compensate for the revolutions of the carriers after power is cut off, and to prevent the end of the yarn from being drawn into the machine prior to stopping of the carrier movement.

Referring to Figure 9 it will be observed the yarn carrier 20 is quite similar in form to that shown in Figure 1, and is designed to revolve in the same manner and feed yarn from a yarn package mounted on the same type spindle as the form shown in the first figure of the drawings. The manner of replacing the yarn package is likewise the same, as is the adjustable tensioned finger 33 in contact with said package. The improved feature lies in the provision of an extended slidable rod or yarn guide 60, the inner end of which is carried by a suitable support 61 on the yarn carrier structure, and outwardly supported by an extension 62 of the yoke frame 21. This guide is adapted to slide within its supports and is provided with a stop 63 which limits its sliding movement in either direction of its travel. The outer free end of the guide 60 lies beyond the support 62 and its outermost tip 64 is shaped to receive and retain the yarn. The inner end of the guide abuts against, and is maintained in relative position by, a spring retained arm 66 corresponding in its action to the arm 41 of the first form of my invention. The arm 66 is pivoted at 67 to the carrier frame, and its end opposite that which abuts against guide 60 is provided with an extension 66a notched to receive and retain one end of a tension spring 68, the opposite end of which is anchored to the carrier frame. By selecting one of the several notches in which to attach the free end of spring 68, varying degrees of tension can be brought to bear upon the end of guide 60. Midway between the pivot 67 and the outer notched end of arm 66 is a right angle extension 69 which is moved into the path of lever 50 upon rotation of the lever 66 by the inward sliding movement of the rod 60 in a manner hereinafter described.

A second arm 71, corresponding to arm 39 hereinbefore described, is pivoted at 72 to the carrier frame and carries on its outer free end a stud 73 similar to stud 38. A projection 74 extends outwardly from the arm 71 from the opposite side of the pivot 72, and is adapted to engage a stop pin 75 on the carrier frame to stop the swing of the arm in one direction (see Figure 11). The swing of the arm in the opposite direction is limited by one side of the arm contacting with the stop 75 (see Figures 10 and 11).

When the yarn packages are prepared or wound for this type of braider, the end of the yarn is first secured to the form 20 upon which it is wound, as at 77, Figure 10. In the operation of this device, the several operating parts are set, and each yarn carrier threaded as shown in Figure 9. The end of pivoted arm 66 is set in contact with the end of yarn guide 60, and will be held in place due to the tension of spring 68 upon the opposite end of the arm, the stop 63 limiting the outward movement of the guide. The yarn is properly tensioned between the yarn package and the tension guide 37 and carried over the tip 64, thence about the stud 73 and into the braiding machine proper. As long as the

parts are in the relative positions shown in this figure, the carriers 20 will revolve without interfering with the lever 50.

In this position the yarn plays out to the braiding point, and barring breakage or other defect will so continue until the end of the yarn is reached. At this time the fastened end 77 will prevent the yarn from further feeding and the tension thereon will be increased to such a degree as to cause the yarn guide 60 to move the arm 66 upon its pivot and bring the extension 69 into the path of the lever 50 resulting in the operation of mechanism for stopping the machine. It will be noted that the arm 66 is moved at the beginning of the travel of yarn guide 60, and that a reserve supply of yarn extending from guide 36 and about the end 64 of the guide is free to be fed to the braider before the inward travel of the yarn guide is stopped. This reserve is sufficient to supply yarn to the braider during the period of time between the actuation of the lever 50 and stopping of the machine, and compensates for the time required to overcome the momentum present in all high speed machines until stopped. Figure 10 illustrates the several parts in their respective positions when the end of the yarn on the package is reached, and shows an end of yarn still available for attaching to the free end of a full package for continued operation. It will be understood that a reserve supply of yarn will also be available if the yarn breaks at any point between the yarn package and the guide 60.

When the new yarn supply is in place upon the spindle 22, the arm 60 is returned by the operator to the position shown in Figure 9, the thread passed is about the tip end 64 and any excess slack taken up by turning the yarn package until the yarn is taut. The yarn carrier is now ready to again start operating and deliver yarn to the braiding machine.

In case the yarn should break, the tension thereon slackens at once and the centrifugal force of the carrier throws the stud end of arm 71 outwardly until the lug 74 rests against stop 75 as shown in Figure 10. In this position the stud 73 is in line with the lever 50, and moves it to actuate the stop mechanism of the machine.

While I have described and illustrated the yarn package as being held in a horizontal position within its carrier, it will be understood that the device will operate in various other positions, and that it is not necessary to have the extended thread support of the second form of the invention parallel to the axis of the yarn package. In the practical application of my device this thread support preferably is arranged at right angles to the axis of the package in the lower set of carriers and functions just as well as the form illustrated in connection with the upper set.

Fig. 14 is a view of a modification of the carrier of Figs. 9 to 13; in the modified form, the inner end of the slidable yarn guide 60a is in contact with one end of an arm or latch lever 80 pivotally mounted at 81 on the carrier frame, the yarn guide 60a being held in place, under normal yarn tension conditions, by means of the tension of a spring 82 having one end anchored to the carrier frame and its free end engaging in one of the several notches of a stud 83 extending from lever 80. The other end of lever 80 has a lug 84 extending upwardly therefrom, and normally locks in inoperative position

a centrifugal trip member 85 pivotally mounted at 86 on the carrier frame. When the tension on the yarn exceeds a predetermined amount, the yarn guide 60a is caused by the yarn Y to slide inwardly, rotating lever 80 in a counterclockwise direction until lug 84 releases the centrifugal member 85 which is then rotated in a clockwise direction by centrifugal force into position to coact with the control member 50 for stopping the machine in the manner above described. The limit of travel of the member 85 in one direction is determined by a portion 87 thereof adapted to abut a web portion 88 of the carrier frame, and in its operative position the outward travel of member 85 is determined by its engagement with a stud 89 on the carrier frame. A second trip lever 90, pivotally mounted at 91 on the carrier frame, has at its free end a stud 92 about which the yarn passes, the normal tension on the yarn retaining the member 90 in an inactive position against a stop pin 94 secured to the carrier frame. In the event that the yarn breaks, or that the tension thereon is released, the member 92 will move outwardly, under the influence of centrifugal force, into a position of engagement with the trip member 50 to stop the machine, the outward limit of travel of centrifugal member 90 being determined by a projection 93 thereon which engages the stop pin 94.

Of course, the improvements specifically shown and described, by which I obtain the above results, can be changed and modified in various ways without departing from the scope of the invention herein disclosed and hereinafter claimed.

I claim:

1. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a first member and a second member each independently operable by centrifugal force and each movable from a first position to a second position for actuating the stopping mechanism of the machine, said members respectively operating when said strand breaks and when the tension on the strand exceeds a predetermined amount.

2. In a braiding machine or the like having a control member for actuating the stopping mechanism of the machine, carrier structure for feeding a strand to the machine, said carrier structure having means controlled by said strand comprising a first member and a second member each independently operable by centrifugal force and selectively movable from a first position to a second position to engage said control member for actuating the stopping mechanism of the machine when the tension on said strand is greater or less than a predetermined range of values.

3. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine and having control means comprising a member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on the strand varies from a predetermined range of values, and means comprising a yarn guide on said centrifugal member engaged by the strand fed from said supply for retaining the centrifugal member in said first position under normal tension conditions on said strand.

4. In a braiding machine or the like, carrier

structure carrying a supply of strand for the machine and having control means comprising a member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine, and a second member controlled by the strand fed from said supply for retaining the first named member in said first position during normal tension conditions on said strand and for releasing the first named member when the tension on said strand exceeds a predetermined amount.

5. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a first member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine, a second member engaging said centrifugal member for normally retaining the latter in said first position, and a third member controlled by said strand for actuating said second member thereby to release the centrifugal member when the tension on said strand exceeds a predetermined amount.

6. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine, spring biased means normally engaging the centrifugal member for retaining the same in said first position, and means actuated by said strand for moving said spring biased means to another position to release said centrifugal member when the tension on said strand exceeds a predetermined amount.

7. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine, a rotatable lever for engaging the centrifugal member to lock the same in said first position, means for biasing said lever in its locking position, and means operable by said strand for actuating said lever to release said centrifugal member when the tension on said strand exceeds a predetermined amount.

8. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a rotatable lever operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on said strand falls below a predetermined amount, said lever having means thereon engaged by said strand for holding the lever in inactive position when normal strand tension conditions obtain.

9. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a plurality of pivotally mounted members each independently operable by centrifugal force and selectively movable from a first position to a second position to actuate the stopping mechanism of the machine when the tension on said strand is greater

or less than a predetermined range of values; and a third member copivotally mounted with one of said centrifugal members and coacting with said centrifugal members for retaining the latter in said first position when normal strand tension conditions obtain.

10. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine, and means controlled by the strand fed from said supply comprising a first member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on said strand exceeds a predetermined amount, a second member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on said strand falls below a predetermined amount, and a third member copivotally mounted with said second member and coacting with said centrifugal members for normally retaining said members in their said first position.

11. Means for feeding a strand from a source of supply to a machine, mechanism for stopping the machine, and means including a member engaged by said strand and movable thereby a predetermined distance to actuate said mechanism for stopping the machine when the tension on said strand exceeds a predetermined amount, said member being movable an additional distance by said strand, after the stopping mechanism is actuated, in a direction to feed a reserve supply of strand to the machine until the latter has stopped.

12. Means for feeding a strand from a source of supply to a machine, mechanism for stopping the machine, and means including a slidable member engaged by said strand and adapted to be slid by the strand a predetermined distance to actuate said mechanism for stopping the machine when the tension on said strand exceeds a predetermined amount, said slidable member being slidably movable an additional distance by said strand, after the stopping mechanism is actuated, in a direction to feed a reserve supply of strand to the machine until the latter has stopped.

13. Means for feeding a strand from a source of supply to a machine, mechanism for stopping the machine, and means including a slidable rod-like member engaged at one end by said strand and slidably movable by the strand a predetermined distance to cause the other end of the member to actuate said mechanism for stopping the machine when the tension on said strand exceeds a predetermined amount, said rod-like member being slidably movable an additional distance by said strand, after the stopping mechanism is actuated, in a direction to feed a reserve supply of strand to the machine until the latter has stopped.

14. Carrier structure for feeding a strand from a source of supply to a machine, mechanism for stopping the machine, and means including a slidable rod-like member having strand guide means at one end thereof engaged by said strand and slidably movable by the strand a predetermined distance to cause the other end of the member to actuate said mechanism for stopping the machine when the tension on said strand exceeds a predetermined amount, said rod-like member being slidably movable an additional distance by said strand, after the stopping mechanism is actuated, in a direction to feed a reserve

supply of strand to the machine until the latter has stopped.

- 15 In a braiding machine or the like, carrier structure for feeding a strand from a source of supply to the machine, said carrier structure having means controlled by said strand comprising a first member movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on said strand falls below a predetermined amount, said means including a second member engaged by said strand and movable thereby a predetermined distance to actuate said stopping mechanism when the tension on said strand exceeds a predetermined amount, said second member being movable an additional distance by said strand, after the stopping mechanism is thus actuated, in a direction to feed a reserve supply of strand to the machine until the latter has stopped.

16. In a braiding machine or the like, carrier structure carrying a supply of strand for the machine and having control means comprising a member operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine, and means including a second member controlled by the strand fed from said supply for retaining the first named member in said first position during normal tension conditions on said strand and for releasing the first named member when the tension on said strand exceeds a predetermined amount, said second member being operable by centrifugal force and movable from a first position to a second position for actuating the stopping mechanism of the machine when the tension on said strand falls below a predetermined amount.

HERMAN STAUB.