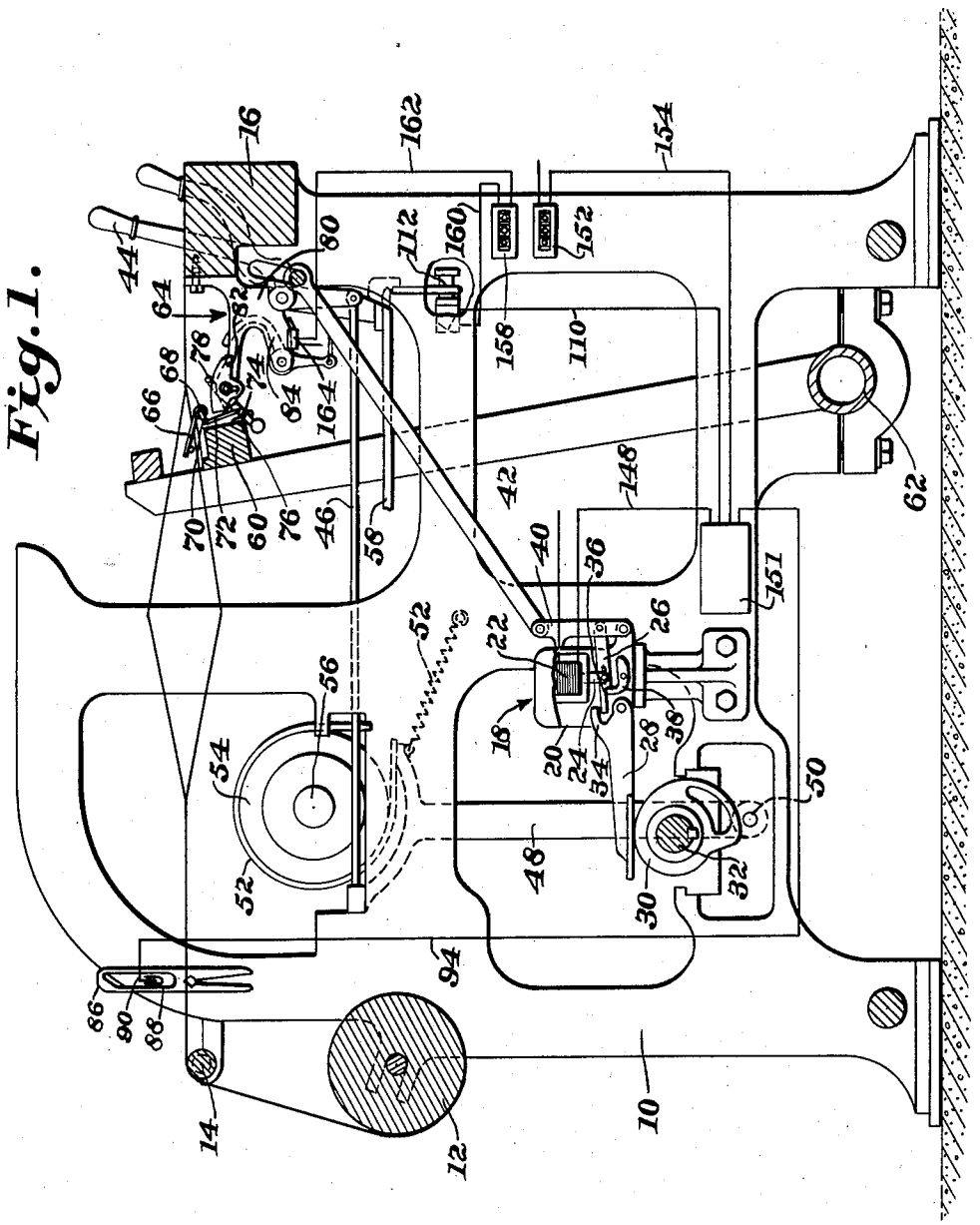
Sept. 29, 1959 W. F. BURGISS 2,906,298

STOP MOTION SYSTEM FOR LOOMS AND THE LIKE

Filed July 3, 1956 2 Sheets-Sheet 1

Fig. 1.



INVENTOR:

Walter F. Burgiss,

BY Cushman, Darby & Cushman

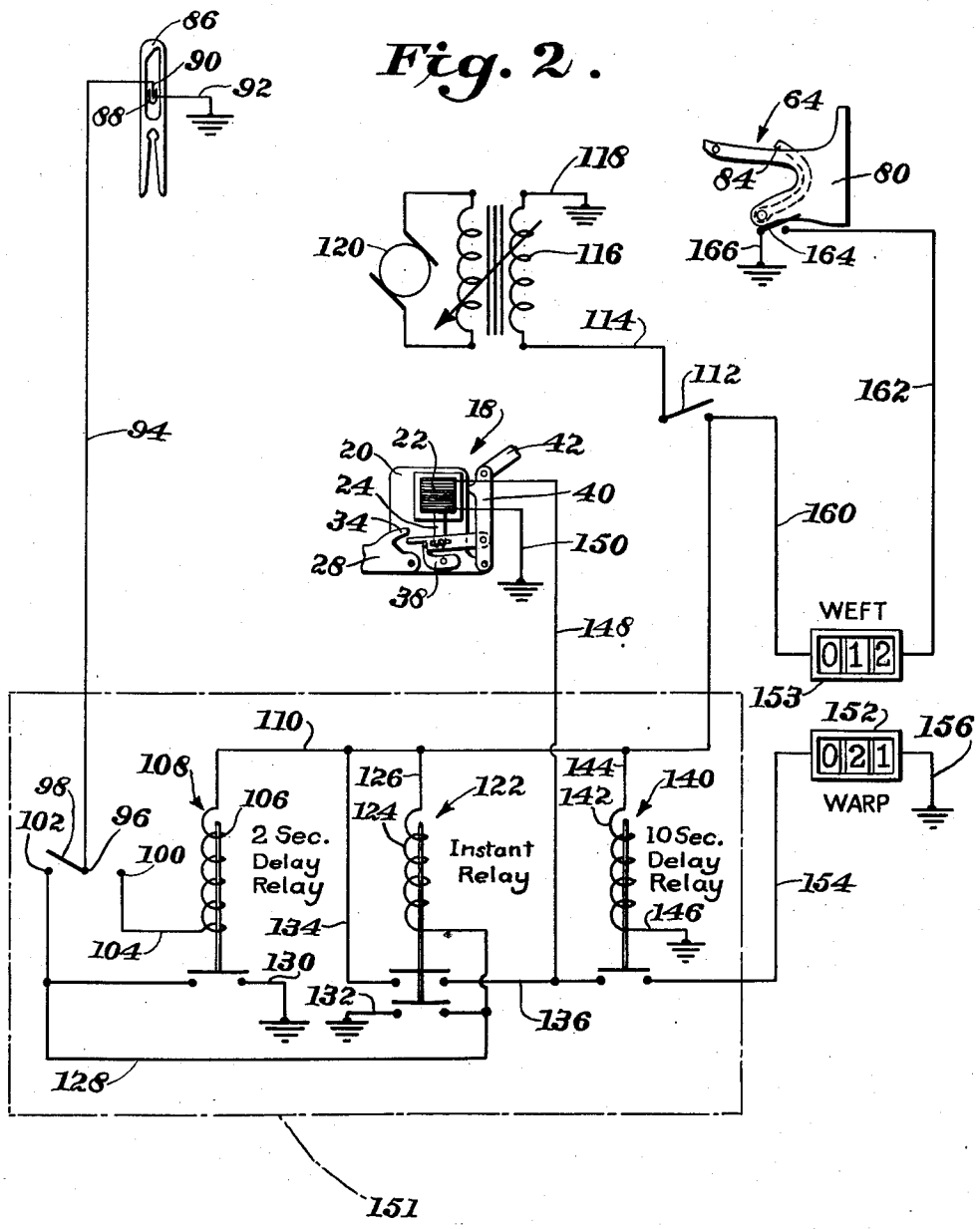
ATTORNEYS.

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Fig. 2.



INVENTOR:

Walter F. Burgiss,

BY Cushman, Darby & Cushman

ATTORNEYS.

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2,906,298

STOP MOTION SYSTEM FOR LOOMS AND THE LIKE

Walter F. Burgiss, Yadkin County, N.C., assignor to Chatham Manufacturing Company, Elkin, N.C., a corporation of North Carolina

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11 Claims. (Cl. 139—353)

This invention relates to power-operated machinery, such as looms or the like, and more particularly to a stop motion mechanism for such machines embodying a novel actuating circuit.

Conventional power-operated looms generally include a stop motion mechanism which is operable to disengage the power to the loom in response to yarn breakage. In the event of a warp yarn break, such mechanism stops the operation of the loom at a predetermined point in its cycle. Moreover, usually a stop motion mechanism is also provided for rendering the loom inoperable in the event that a weft or filling yarn should break. This stop motion mechanism likewise is adapted to stop the loom at a predetermined point in the operation thereof. It will be understood that each time a break in either the warp or weft yarn occurs, the same must be tied, resulting in a flaw in the goods produced.

Accordingly, it is an object of the present invention to provide a stop motion mechanism for a loom or the like embodying improved means for recording the number of times the loom is stopped as a result of yarn breakage so as to obtain data which will allow standards for evaluating various stock numbers and for setting up operational standards for various stocks produced.

Still another object of the present invention is the provision of a stop motion mechanism for a power loom or the like having separate counters embodied therein for recording the number of times the weft and warp yarn breaks respectively.

The conventional stop motion mechanism for rendering a loom inoperable as a result of warp yarn breakage, usually embodies a series of drop wires, each of which is supported in elevated position by a taut warp yarn. These drop wires are adapted to fall and complete an electric circuit which actuates the stop motion mechanism when the associated warp yarn is either slackened or broken. In dealing with spun warp yarn it is imperative that an instantaneous actuation of the stop motion mechanism occur when a drop wire falls, since, with a warp thread down, a delayed stop will cause the broken thread to be pulled into the weave, resulting in a warp-out defect in the goods.

On the other hand, when dealing with filament warp yarn, the same has a tendency to sag during the operation of the loom, thus permitting the drop wires to fall without an actual breakage in the warp yarn occurring. In the conventional system this occurrence results in a substantial loss in loom efficiency since the same is continuously being falsely stopped as a result of slack warp yarn. Moreover, even when dealing with spun warp yarns in weaving certain types of material, such as terry cloth and the like, the warp yarn is made slack during the operation of the loom in order to produce the goods. Here again, an instantaneous actuation of the stop motion mechanism as a result of a drop wire falling renders the loom virtually inoperable in the weaving of goods such as terry cloth or the like.

Accordingly, it is still another object of the present invention to provide a stop motion mechanism having improved means for actuating the same in response to breakage in the warp yarn of the loom, such means including a selective arrangement whereby the stop motion mechanism may be actuated instantaneously upon a breakage of a warp yarn, as when spun warp yarn is utilized, and for delayed actuation of the stop motion mechanism as when filament yarn is being utilized or when terry cloth or the like is being produced.

A further object of the present invention is the provision of an improved stop motion mechanism actuating means of the type described which embodies means for recording the number of times the machine is stopped as a result of the actuation of the stop motion mechanism.

For the reasons indicated above the recording of the number of times the machine is stopped as a result of the actuation of the stop motion mechanism is important for obtaining certain data relating to the goods produced. In addition, such data also is of importance in determining the production of a loom operator. It is the usual practice in the trade, to base the pay of a loom operator on the amount of goods produced by the machines which he is operating. However, in order to offset the effect of loom stoppage on such production, the number of times the loom is stopped as a result of yarn breakage is taken into consideration in determining the operator's pay. It will be understood that for this figure to have any significance with respect to actual number of stops which the machine makes as a result of yarn breakage, it is important to eliminate false stops resulting from slack warp yarn as well as those made inadvertently and intentionally by the operator.

Accordingly, it is another object of the present invention to provide an improved means for actuating the stop motion mechanism of a loom or the like which embodies a counter for recording the number of times the loom is stopped as a result of the actuation of the stop motion mechanism, such counter being operable to record an actuation of the stop motion mechanism only after a predetermined period of time has elapsed after the machine has been again set in motion following a stop.

A further object of the present invention is the provision of an improved stop motion actuating means which includes a circuit having the usual drop wires connected therewith, such circuit providing for a relatively low current flow to the drop wires so as to reduce to a minimum the false starts resulting from sparking of the drop wires.

These and other objects of the present invention will become more apparent during the course of the following detailed description and appended claims.

The invention may best be understood with reference to the accompanying drawings wherein an illustrative embodiment is shown.

In the drawings:

Figure 1 is a side elevational view of a part of a loom embodying the principles of the present invention; and

Figure 2 is a wiring diagram of the stop motion mechanism actuating circuit.

Referring now more particularly to the drawings, there is shown in Figure 1 a conventional loom which includes a loom frame **10** having a warp beam **12** and a whip roll **14**. In the usual way, the warp yarn contained on the beam **12** is fed over the whip roll **14** and extends forwardly toward a breast beam **16** of the loom. The loom also includes the usual warp stop motion mechanism, generally indicated at **18**, which is arranged to render the loom inoperable in response to warp yarn breakage. This stop motion mechanism may take any form and preferably, is of conventional construction.

Briefly, the mechanism includes a housing 20 within which is disposed a solenoid 22 having plunger 24 operable therein. The lower end of the plunger 24 is pivotally connected with a force-transmitting link 26 intermediate its ends. Pivotally mounted on the housing 20 is a lever 28 having its outer end formed to engage a cam 30 fixedly mounted on a shaft 32 for rotation therewith. The shaft 32 constitutes the usual bottom shaft of the loom which preferably is given a complete rotation every other pick of the loom. The lever 28 also includes a shoulder 34 disposed adjacent one end of the force-transmitting link 26. A shoulder 36 is formed on the link 26 intermediate its ends for receiving one end of a counterbalanced dog 38 pivoted to the housing 20. The opposite end of the force-transmitting link 26 is connected with a knock-off lever 40 intermediate its ends. This lever is pivoted at its lower end to the housing and has its upper end pivotally connected with one end of a rod 42, the other end of which is connected with a shipper handle 44 of conventional construction.

The shipper handle 44 is connected, through a brake rod 46 to the upper end of a brake lever 48 pivoted as at 50 on the loom frame. A spring 52 is connected between the loom frame and the lever 48 so as to resiliently urge the latter forwardly. The upper end of the brake lever 48 has one end of a flexible band 52 connected therewith, which extends around a brake wheel 54 and is fixedly secured at its opposite end to the loom frame. The brake wheel 54 is mounted on a shaft 56 which constitutes the usual upper shaft of the loom and which may be operated by any suitable source of power, as, for example, an electric motor (not shown). The shipper lever also has a shipper rod 58 connected therewith which extends to a mechanism (not shown) which is effective to connect and disconnect the drive between the electric motor and the shaft 56.

It will be understood that the stop motion mechanism described above, including the shipper handle 44, is conventional in nature and that any construction thereof may be adopted, the particular embodiment shown being illustrated to exemplify the principles of the present invention. The mechanism operates in the usual manner to disconnect the power to the loom and to brake the same upon actuation of the shipper handle 44. Briefly, the stop motion mechanism is inoperable with the parts disposed in the position shown in Figure 1. Lever 28 is free to oscillate as a result of the rotation of cam 30. Solenoid 22 is energized to actuate the stop motion mechanism as will hereinafter be more fully explained. Plunger 24 is raised when the solenoid is energized which, in turn, moves the outer end of the link 26 into the path of movement of the lever shoulder 34. The dog 38 is counter-balanced to move into a position to retain the link 26 in its raised position so that when the lever 28 is moved by the cam 30, at the prescribed time in the operation of the loom, this movement will be transmitted to the knock-off lever 40 by the link 26. The movement of lever 40 trips the shipper lever 44 through the operation of rod 42. For a more detailed description of the operation of such a stop motion mechanism and the related structure see Payne Patent No. 1,873,465 issued August 23, 1932.

The loom includes the usual lay 60 which is pivoted on the loom frame as at 62 for oscillatory movement thereabout. Any suitable means (not shown) may be provided for effecting the oscillatory movement of the lay in the usual manner. The loom also includes a weft stop motion mechanism, generally indicated at 64, which is arranged to render the loom inoperable in response to breakage in the weft or filling yarn. The stop motion mechanism 64 may also be of conventional construction and, as shown in the drawings, includes a series of feeler fingers 66 pivotally mounted on the lay in a position to be engaged by the weft yarn deposited thereon. The feeler fingers 66 are rigid with a shaft 68 suitably journalled on the lay and an arm 70 extends from one end of the shaft and has its outer end connected to one end of a link 72. The opposite end of the link 72 is pivotally connected to a dagger arm 74 intermediate its ends. The inner end portion of the dagger arm 74 is pivotally connected to the lay, as at 76, and has its outer end turned transversely as indicated at 78.

Mounted on the breast beam 16 of the loom is a bracket 80 which extends toward the lay 60. The outer extremity thereof is provided with an adjustable cam plate 82 having an upper cam surface arranged to receive the end 78 of the dagger arm. Pivotally mounted on the bracket 80 is a tumbler 84 having its upper end extending above the upper surface of the bracket 80 in a position to be engaged by the dagger end 78 as it moves from the cam surface of the plate 82. The tumbler 84 is connected with the shipper handle 44 through a suitable motion-transmitting linkage (not shown). It will be understood that any appropriate linkage may be utilized, as for example, a linkage such as described in the Gagnon patent, No. 1,369,517, issued February 22, 1921.

The operation of the weft stop motion mechanism 64 is also described in detail in the aforesaid Gagnon patent. Briefly, so long as a weft yarn is deposited in the lay during each pick of the shuttle (not shown), the feeler fingers 66 will engage the same so that as the lay advances toward the breast beam 16 the dagger end 78 will be maintained in a position above the upper end of the tumbler 84 through the operation of the arm 70 and the link 72. In the event that the weft yarn breaks, the forward movement of the lay carries with it the dagger end 78 which now is free to engage the upper surface of the bracket and hence, the dagger end will be moved into the upper end of the tumbler 84. Pivotal movement of the tumbler will result in actuation of the shipper handle 44 which, in turn, serves to disconnect the power to the loom and to brake the same in the usual manner.

The stop motion mechanisms 18 and 64 described above are conventional in nature and form no part of the present invention except insofar as they unite with the novel features hereinafter described to form an operative combination. The present invention is more particularly concerned with an electric circuit embodying means for recording the number of times the stop motion mechanisms are actuated. As best shown in Figure 2, the circuit includes a series of drop wires 86 which are mounted on a pair of electrical actuating strips 88 and 90. The strip 88 may be U-shaped in configuration and the strip 90 is mounted in the central portion thereof and suitably insulated therefrom. The drop wires 86 have the warp yarn threaded therethrough in the usual manner and are maintained by the yarn in a raised position with respect to the actuating strips 88 and 90. In the usual manner, slackening or breakage of a warp yarn will result in the associated drop wire 86 falling on the actuating strips and making an electrical contact therebetween. When a drop wire is disposed in an actuating position, the circuit is completed through the actuating strips and serves to actuate the warp stop motion mechanism 16 as will hereinafter be more fully described.

The actuating strip 88 is grounded, as by a wire 92 while the strip 90 is connected, as by wire 94 to the central contact 96 of a double-throw pole switch 98 having selective contacts 100 and 102. The contact 100 of the switch 98 is connected, as by a wire 104, to one end of a coil 106 of a time delay relay, generally indicated at 108. The opposite end of the coil 106 is connected, as by wire 110, to a main control switch 112 which is connected, as by a wire 114, to one end of a variable transformer 116 grounded, as at 118, and suitably connected to a source of electricity, as indicated at 120.

A second relay, generally indicated at 122 has one end of its coil 124 connected, as by a wire 126 to the wire 110 and the opposite end of its coil is connected with the time delay relay 108 as by a wire 128 also connected with

the contact 102 of switch 98. The operation of the time delay relay 108 is such that after a time period of the order of two seconds, the same is operable to complete the circuit through the instant relay coil 124 to the ground through a wire 130. When the coil of instant relay 122 is energized, immediate electrical contact is made through a ground wire 132 so as to render the relay self-holding.

The instant relay also serves to make electrical contact between a wire 134 connected to the wire 110 and a second wire 136 connected with a third relay 140 also of the time delay type. The coil 142 of this relay may be connected to the wire 110 and to the ground through wires 144 and 146 respectively. The wire 136 connected to the time delay relay 140 is connected with another wire 148 which leads to one end of the coil of the solenoid 22 of the stop motion mechanism 18. The opposite end of the solenoid coil is connected to the ground through a wire 150. As indicated in the drawings, the relays 108, 122, and 140 and the switch may be suitably mounted in a housing 151 fixed to the loom frame 10 at a desirable location. The time delay relay 140 is set to be actuated after a time period of the order of 10 seconds when the coil 142 of the same is energized and is arranged to actuate a warp counter 152 through a wire 154 connected to one end of the coil thereof (not shown). The opposite end of the coil may be connected to the ground, as by a wire 156.

The electric circuit also includes a weft counter 158 which is arranged to be actuated as a result of the actuation of the weft stop motion mechanism 64. This counter has one end of its coil (not shown) connected to the wire 110 through a wire 160 and a wire 162 leading from the opposite end of the counter coil is connected to a microswitch 164 disposed in the path of movement of the tumbler so as to be closed when the latter is moved by the dagger end. The normally opened end of the microswitch may be connected to the ground through a wire 166.

Operation

With the operation of the usual stop motion mechanisms in mind, as briefly indicated above, the electric counter circuit of the present invention operates as follows. The main control switch 112 of the circuit is positioned on the loom so as to be opened in response to the operation of either of the stop motion mechanisms. As shown, the control switch 112 may be positioned so that when the shipper handle 44 is knocked-off the same will be opened. This control switch may either be arranged to be closed as a result of the movement of the shipper handle into its operative position or it may be separately actuated along with the shipper handle. When the main control switch 112 is closed in conjunction with the starting of the loom, the weft counter 158 is connected in the circuit so as to be immediately operable to record a count upon actuation of the weft stop motion mechanism 64. As the tumbler 84 is moved to actuate the weft stop motion mechanism, the same closes the microswitch 164 and the counter 158 will be actuated by the circuit completed through wires 160, 162, and 166. It will be noted that the microswitch is closed at the same instant that the tumbler is moved to actuate the stop motion mechanism. As the stop motion mechanism goes through its operation to knock-off the shipper handle 44 and render the loom inoperable, the main control switch 112 will be moved to an open position to thereby open the circuit. Thus, insofar as the weft counter 158 is concerned, the same will record a single count for each time the weft stop motion mechanism 64 is actuated.

With respect to the warp counter 152, it will be noted that there are two possible circuits through which the stop motion mechanism 18 can be actuated as a result of a drop wire 86 falling into contact with the actuating strips 88 and 90. First, it will be noted that the energizing of the coil 124 of the instant relay 122 will result in the energizing of the solenoid coil 22 which actuates the stop motion mechanism. Furthermore, in order to energize the coil of the instant relay, a drop wire must fall onto the actuating strips. When the pole switch 98 is connected to the contact 102 and a drop wire 86 falls, the coil 124 of the relay 122 is instantly energized by the circuit completed through the wires 110, 126, and 128, switch 98, wire 94, the strips 88 and 90, and wire 92. It will be noted also that actuation of the instant relay instantly energizes ground wire 132 so that the current to energize the coil can flow to the ground through this path, thus relieving the current to the drop wire.

With the double pole switch 98 in connection with the contact 100, a falling of a drop wire will first result in an energization of the coil 106 of the time delay relay 108 by the circuit completed through wires 110 and 104, switch 98, wire 94, strips 88 and 90, and wire 92. The coil 124 of the instant relay will not be immediately energized since its circuit is broken at 102. After the coil of the time delay relay 108 has been energized for a time period of the order of 2 seconds, the circuit is completed to the coil 124 of the instant relay through wires 110, 126, 128, and 130. The energization of the instant relay coil results, as before, in the completion of the circuit to the coil of the solenoid 22 which actuates the stop motion mechanism 18 and the completion of the circuit to the ground as at 132 so as to relieve the current going to the drop wire. In this regard, it will be noted that the current to the actuating strips first passes through a coil in either position of the double pole switch. The impedance on these coils, that is, either coil 124 or coil 106, materially reduces the current to the actuating strips which, in turn, minimizes the effect of sparking in the drop wires. In other words, the relative high current necessary to actuate the solenoid 22 of the stop motion mechanism 18 is not transmitted to the drop wire strips, the latter having a reduced current which reduces the effect of sparking.

It will also be noted that when the main control switch is initially closed, as when the loom is restarted, the coil 142 of the time delay relay 140 is immediately energized through the wires 110, 144, and 146. This relay, as was briefly noted above, is arranged to render the warp counter 152 inoperable to record a warp stop motion during a predetermined period of time of the order of 10 seconds, after the closing of the main control switch 112. Thus, in the normal operation of the circuit where no actuation of either stop motion mechanism occurs during the initial 10 seconds of operation, the time delay relay 140 will be energized so as to connect the warp counter 152 in the circuit with the solenoid coil so that when the latter is actuated the counter will also be actuated. Hence, it can be seen that stoppage of the loom as a result of weft breakage will result in a count at any time, since the weft counter 158 is immediately connected in the circuit when the main control switch 112 is closed. On the other hand, the warp counter 152 will not record a count as a result of the actuation of the warp stop motion mechanism 18 until the loom has been in operation for a period of the order of 10 seconds. It will be noted, however, that the drop wires, during this initial 10 seconds are effective, in the event that one should fall, to complete the circuit to the solenoid coil so as to actuate the stop motion mechanism 18 even though the counter has as yet not been connected into the circuit. In this manner, false stops, stops which result from the jogging of the shipper handle, and intentional false stops are not recorded by the warp counter.

The selective feature of the present circuit which enables the operator to have either instantaneous actuation of the stop motion mechanism 18 when a drop wire falls or a time delay actuation of the stop motion mechanism when a drop wire has remained in fallen position for a predetermined period of time renders the loom highly versatile and makes possible weaving with either filament

warp yarn or spun warp yarn. Spun warp yarn necessitates an instantaneous stop motion. With the present arrangement this instantaneous action is ensured and no more than one pick should be made before a stop is effected. Moreover, the arrangement is such that a relative low current is present in the drop wire strips which minimizes false stopping due to sparking drop wires. When utilizing filament warp yarn, the effects of slackening in the warp yarn, which would result in many false stops with instantaneous stop motion actuation, is eliminated merely by selectively utilizing the time delay relay circuit. Thus, with the present arrangement, slackening in the warp yarn does not cause actuation of the stop motion mechanism when the time delay relay circuit is selectively utilized since the stop motion mechanism is actuated only as a result of a drop wire remaining in its fallen or actuating position for a period in the order of 2 seconds or, in other words, when an actual breakage occurs. One specific application for this delayed actuation of the warp stop motion mechanism would be in weaving terry cloth or the like where the warp yarn is periodically slackened and made taut. This is possible since the present arrangement distinguishes between instantaneous falling of the drop wires as a result of slackening and a falling of the drop wires as a result of breakage in the warp yarn.

The provision of the 10 second delay relay prevents the operator from making false counts for personal gain. With the present arrangement it is necessary for the machine to be in operation for at least a period of the order of 10 seconds before a warp count will be recorded. Thus, during this time the machine will have attained full operating speed and an operator will be discouraged from immediately stopping the machine at the end of the 10-second period after the same has just reached its full operating speed. Such a condition would immediately be observed by a supervisor. This 10-second delay in the operation of the counter also prevents recording of a count when the loom lay is being jogged up to a position that the operator desires for making warp break-out repairs.

The operation of the main control switch **112** is such as to positively re-set the entire circuit since it functions to open the same at each loom stop whether accomplished as a result of the warp stop motion mechanism **18** or the weft stop motion mechanism **64**. That is, even though the weft counter **158** is not rendered inoperable during the initial 10 seconds of loom operation as is the warp counter **152** when the left counter is actuated, the main control switch **112** will be opened as a result of the operation of the weft stop motion mechanism and the 10-second delay relay **140** controlling the warp counter will be re-set. Thus, regardless of how or when the machine was stopped, the warp counter will be rendered inoperable during the initial 10 seconds of the operation of the loom when the same is restarted.

The stops recorded by the counters provide a means of obtaining work-loads from the number of breaks in various stocks on various machines with various weavers. These records form a basis of analysis which reflect the efficiency of all the various components of a mill including the stock, the weavers, the looms, and work-loads at any time that is desired.

It will be understood that any commercial and well-known type of time delay relay may be utilized for the relays **108** and **140**. Likewise, the instant relay **122** may be of any conventional commercial design. The latter preferably should be of the self-holding type. One example of a suitable time delay relay is the Siliconetic delay relay AN522 manufactured by the Heinmann Electric Company while one example of an instant relay that may be utilized is the PG2C relay also manufactured by the Heinmann concern. The counters **152** and **158** may also be of any well-known construction as may the drop wires **86** and actuating strips **88** and **90**. Of course, the wiring diagram shown is for illustrative purposes only, it being understood that any number of different electrical hook-ups could be utilized to secure the same results.

It thus will be seen that the objects of this invention have been fully and effectively accomplished. It will be realized, however, that the foregoing specific embodiment has been shown and described only for the purpose of illustrating the principles of this invention and is subject to extensive change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

I claim:

1. In a stop motion, the combination of power operated means for advancing yarn, stop motion drop wires engaging the yarn and arranged to move into an actuating position in response to the slackening or breaking of the yarn, first means for effecting a stoppage of said power operated means in response to a drop wire remaining in said actuating position for a predetermined period of time, second means for effecting a stoppage of said power operated means in response to the movement of a drop wire into said actuating position, and means for selectively operating said first and second means.

2. The combination as defined in claim 1 including means for recording the number of times said power operated means is stopped, and means for rendering said recording means inoperable during a predetermined period of time beginning when said power-operated means is restarted after having been stopped.

3. In a machine of the type described having means for rendering the same inoperable, an electric circuit connected with said means for actuating the same, a counter in said circuit for recording the number of times said means is actuated, a switch for controlling said circuit arranged to be opened by the operation of said means to render the machine inoperable, a time delay relay in said circuit operable in response to the closing of said switch for rendering said counter inoperable for a predetermined period of time, and yarn breakage sensing means in said circuit for completing the same to actuate said first-mentioned means in response to the breakage of yarn in the machine.

4. A machine as defined in claim 3, wherein said electric circuit includes means for instantaneously effecting the actuating of said first-mentioned means in response to the actuation of said yarn breakage sensing means.

5. A machine as defined in claim 3, wherein said electric circuit includes means for preventing actuation of said first-mentioned means by said yarn breakage means until the latter has been continuously actuated for a predetermined period of time.

6. A machine as defined in claim 3, wherein said electric circuit includes a pair of relay circuits for controlling said yarn breakage sensing means, one of said relay circuits having an instantaneously acting relay therein, the other of said relay circuits having a time delay acting relay therein, and means for selectively connecting said relay circuits to control said yarn breakage sensing means.

7. In a power operated loom having a stop motion mechanism for rendering the same inoperable, drop wires engaging the warp yarn of the loom and movable into an actuating position in response to a break in the warp yarn, means for actuating the stop motion mechanism as a result of a drop wire being disposed in said actuating position, means operable as a result of a drop wire being disposed in said actuating position for recording the number of times said stop motion mechanism is actuated, and means for rendering said recording means inoperable to record an actuation of said stop motion mechanism as a result of a drop wire being disposed in said actuating position during a predetermined period of time beginning when said loom is again started in operation after the same has been rendered inoperable.

8. A loom as defined in claim 7 including a second stop motion mechanism for rendering said loom inoper-

able in response to weft yarn breakage, and means operable in response to the actuation of said second stop motion mechanism for recording the number of times the same is actuated.

9. In a power operated loom having a stop motion mechanism for rendering the same inoperable, means on said loom for actuating said stop motion mechanism in response to the breakage of weft yarn therein, an electric circuit having a control switch arranged to be opened by the operation of said stop motion mechanism to render the loom inoperable, a counter in said circuit arranged to be actuated in response to the completion of said circuit thereto, normally open means in said circuit arranged to be closed to complete the circuit to said counter as a result of said actuating means actuating said stop motion mechanism, a second stop motion mechanism for rendering said loom inoperable, means in said circuit for actuating said second stop motion mechanism in response to warp yarn breakage in the loom, a second counter in said circuit arranged to be actuated in response to the actuation of said second stop motion mechanism, and a timed delay relay in said circuit operable in response to the closing of said control switch for rendering said second counter inoperable for a predetermined period of time.

10. A loom as defined in claim 9 wherein said means for actuating said second stop motion mechanism includes drop wires engaging the warp yarn and arranged to move into an actuating position in response to warp yarn breakage; a solenoid for engaging said stop motion mechanism; a pair of relay circuits between said drop wires and said solenoid; one of said relay circuits having an instantaneous relay for actuating said solenoid in response to the movement of a drop wire into said actuating position, the other of said relay circuits having a time relay for actuating said solenoid after a drop wire has been disposed in said actuating position for a predetermined period of time; and a switch for selectively connecting said relay circuits between said drop wires and said solenoid.

11. In a power-operated loom having a stop motion mechanism for rendering the same inoperable, drop wires engaging the warp yarn of the loom and movable into an actuating position in response to a slackening or breaking of the warp yarn, first means for actuating said stop motion mechanism in response to a drop wire remaining in said actuating position for a predetermined period of time, second means for actuating said stop motion in response to the movement of a drop wire into said actuating position, and means for selectively operating said first and second means.

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