

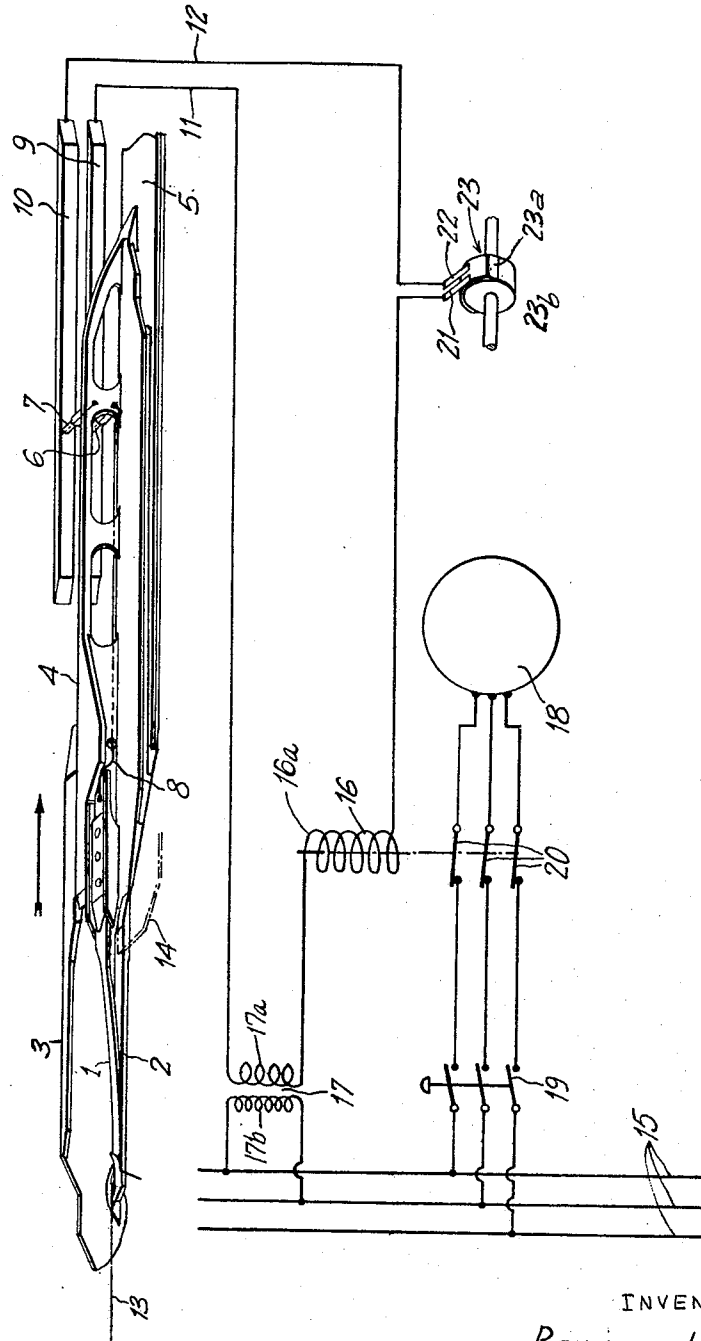
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WEFT DETECTING MEANS FOR SHUTTLELESS LOOMS

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## WEFT DETECTING MEANS FOR SHUTTLELESS LOOMS

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The invention relates to looms having continuously fed weft from large bobbins located outside the shed, of the kind comprising a weft inserted that is positively actuated, or perhaps two oppositely acting weft inserters, of which one conveys the weft as far as the middle of the shed which is then taken over and drawn as far as the selvage by the other. These weft inserters usually comprise, for seizing the weft, a gripper having two metal blades in elastic contact the one with the other, so arranged that this gripper draws the thread by its end or that the thread slides between its blades which in such case act as a stretcher.

In particular the invention has for its purpose to detect the presence of the weft in the gripper of the weft inserter during its movement through the interior of the shed.

The invention has for its object means for detecting, during the whole or part of the insertion phase of the shoot, of the presence of a thread in the metal gripper, having blades in elastic contact, of a weft inserter for looms continuously fed by stationary bobbins, or/and of the tension of said thread drawn by the gripper, these means being characterized by the combination: of wipers provided on the weft inserter; with conductor bars placed outside the shed and located in such manner that they are in the path of the wipers when the weft inserter draws the thread, and connected with a source of current, eventually by the intermediation of an interrupter operated periodically in synchronism with the loom; and with an electrical relay controlling the operation of the loom; the whole assembly being constructed in such a way that if the weft thread is not in the gripper of the moving weft inserter at a moment in the cycle when it should be there or is not sufficiently stretched, an electric circuit is closed by the gripper and that the relay being then excited, causes stoppage of the loom.

In order that the invention may be better understood, one form of construction, applied to a rectilinear needle loom, given by way of a mere example without limitation, is hereinafter described and shown in the single FIGURE of the accompanying drawing.

In this figure, which shows a needle finishing the pulling of a shoot towards the selvage, 1 is the elastic blade and 2 the rigid blade which constitute the elastic gripper for pulling the weft thread, the elastic blade 1 being electrically insulated from the rigid blade 2 outside the gripping zone for the weft; 3 is the guard, 4 the body of the needle on the end of which are mounted the gripper and the guard, 5 the ribbon of insulating material which pulls the body of the needle, the assembly thus defined constituting the needle or weft inserter.

The body 4 of the needle, on its surface facing the reed, has two wipers 6 and 7. The wiper 6 is insulated from the body of the needle and is connected to the elastic blade 1 by a connecting wire 8. The wiper 7 is electrically connected to the rigid blade 2; if the body of the needle is made of metal as is assumed in the drawing, it is sufficient if the wiper 7 is insulated from the said body. If the body of the needle is not a conductor, the wiper 7 is connected to the rigid blade 2 by a connecting wire.

The electrical contacts, or wipers, 6 and 7 at a mo-

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ment in the operational cycle of the loom, respectively come into contact with current conveying means, in the form of conducting bars 9 and 10 placed outside the shed and supported by the slay not shown.

The conducting bars receive a low voltage electrical current by means of the wires 11 and 12.

13 is the weft thread which has been brought by the opposite needle as far as the middle of the shed where it has been taken up again by the gripper 1, 2.

The release of the weft thread, when the needle leaves the shed, is effected, in known manner, by means of the releasing blade 14, of insulating material, mounted on a support, not shown, located beyond the shed, near to the selvage. For the sake of clarity in the drawing, only the end of this blade adjacent to the selvage has been shown in dot-and-dash lines.

In the drawing, the relative positions of the different parts are shown at the moment when the needle moving in the direction of the arrow, has almost completed the insertion of the shoot 13.

The electrical installation is fed from a convenient source of current, such as the three phase mains 15 from which are fed, one part to a relay 16, through a low tension transformer 17, and the other part, to the three phase motor 18 of the loom through a common three pole interrupter 19, for example one that is manually operated, and the contacts 20 of the relay 16. As seen in the drawing, the step down transformer 17 has its primary winding 17b connected to two phases of the three phase power main 15 while the secondary winding 17a is connected to relay winding 16a.

The excitation circuit of the winding of the relay 16 comprises, in series, the secondary winding of the transformer 17, the two metal brushes 21 and 22 of the periodical interrupter 23, the two conducting bars 9 and 10, the two wipers 6 and 7 mounted fixedly on the needle and the two blades 1 and 2 of the gripper.

The operation is as follows:

When the body of the needle leaves the shed, its wipers 6 and 7 come into contact with the bars 9 and 10 which at that time are connected to the source of current. If the weft thread 13 is present between the parts, forming the elastic gripper, the blades 1 and 2, the passage of current is interrupted. If, on the contrary, there is no thread in the gripper, the two blades 1 and 2 are in contact the one with the other and ensure the closing of the circuit in cooperation with the periodical interrupter 23. The relay 16 then is excited, and the motor 18 stops.

The needle continuing its movement in the direction of the arrow, the blades 1 and 2 meet the releasing blade 14 which, by passing between them, separates them and thus causes the release, at the selvage, of the end of the weft thread gripped between them, in the normal way, the insulating blade 14 interrupting the flow of current.

The movement of the needle at this moment is decelerated, then the needle starts off in the reverse direction. But, before the needle leaves the releasing blade 14, it is necessary to interrupt the current at least until the moment when the needle grips a new weft that is brought to it by the opposite needle. This function is assured by the rotary interrupter 23 operated in synchronism with the loom, and which comprises, in known manner, a conducting segment 23a, an insulated segment 23b and the metal brushes 21 and 22.

It is possible to dispense with the periodical interrupter 23 either by moving the conducting bars 9 and 10 away from that part of the passage of the wipers 6 and 7 when the needle again enters the shed, or again by mounting the said conducting bars, or equivalent parts,

not on the sley but on a fixed part of the loom (the position and configuration of the wipers 6 and 7 being modified as may be necessary) and in so arranging that the needle enters into the shed at a moment in the cycle when its position is such that no contact is established between the parts 6 and 7, on the one hand, and the parts 9 and 10 on the other hand.

It is obvious that the wipers 6 and 7 can be placed on any part of the needle as desired, for example on the part behind the protector 3.

In the example shown, in order to detect the presence of the thread in the gripper earlier in the course of the insertion phase, two conductors can be installed in longitudinal grooves formed in the opposite faces of the two strips which usually constitute the ribbon 5, while parts acting as the electrical wipers 6, 7 are located, for example, at the end of the ribbon, these electrical wipers coming into contact with parts equivalent to the bars 9, 10 which can exist at many points of the course followed by the wipers 6, 7, or be continuous. Moreover, the conductors can be fixed or incorporated as a central strip placed between the two strips of the ribbon and the end of which is provided with the electric wipers.

The detection of the thread in the gripper moreover can be carried into effect by using an elastic arrangement, fitted on the elastic blade 1 of such a kind that the correctly strained weft thread 13 is maintained in a determined position and which in the event of abnormal slackness of the thread, indicating, for example, its breakage in the interior of the shed, the said arrangement in returning to its free position, closing the circuit with the rigid blade 2, even though a fragment of thread was left in the gripper, the flow of current then causing the stoppage of the loom.

It is also possible to insulate electrically the elastic blade 1 of the elastic arrangement above mentioned, except the part intended to close the circuit with one or other blade. One of the contacts will be connected to the elastic grippers 1, 2, the other contact being connected to the elastic arrangement.

Also it is possible to insulate electrically the elastic blade 1 of the elastic arrangement above mentioned except the part intended to close the circuit with the said elastic blade. One of the contacts will be connected to the elastic arrangement and to the rigid blade 2, the other contact being connected to the elastic blade 1.

It is to be understood that other variations, improvements in details and employment of equivalent means are able to be imagined, without departing from the spirit of the invention.

What I claim is:

1. Stop motion means for shuttleless looms comprising in combination: a weft inserter; means for drawing the weft inserter through the shed of the loom; weft thread gripping means consisting of a rigid metal blade and an elastic metal blade mounted on the weft inserter said rigid and elastic metal blades being held out of contact with each other by the weft thread gripped therebetween; a first wiper mounted on the weft inserter and electrically connected to the rigid blade; a second wiper mounted on the weft inserter and electrically connected to the elastic blade; a first electrical conductor bar arranged in the path of the first wiper to make electrical contact therewith; a second electrical conductor bar arranged in the path of the second wiper to make electrical contact therewith; a motor driving the loom; an electrical interrupter; an electrical relay controlling the motor driving the loom; the electrical conductor bars, the interrupter and the winding of the relay being connected in electrical series circuit with a source of electrical current to stop the motor if the rigid blade contacts the elastic blade during the weft insertion phase.

2. Stop motion means for shuttleless looms comprising in combination: a weft inserter; means for drawing the weft inserter through the shed of the loom; weft thread

gripping means consisting of a rigid metal blade and an elastic metal blade mounted on the weft inserter said rigid and elastic metal blades being held out of contact with each other by the weft thread gripped therebetween; a first wiper mounted on the weft inserter and electrically connected to the rigid blade; a second wiper mounted on the weft inserter and electrically connected to the elastic blade; a first electrical conductor bar arranged in the path of the first wiper to make electrical contact therewith; a second electrical conductor bar arranged in the path of the second wiper to make electrical contact therewith; a motor driving the loom; an electrical interrupter operated in synchronism with the loom to establish a weft insertion phase; an electrical relay controlling the motor driving the loom; the electrical conductor bars, the interrupter and the winding of the relay being connected in electrical series circuit with a source of electrical current to stop the motor if the rigid blade contacts the elastic blade during the weft insertion phase.

3. Stop motion means for shuttleless looms comprising in combination: a weft inserter; means for drawing the weft inserter through the shed of the loom; weft thread gripping means consisting of a rigid metal blade and an elastic metal blade mounted on the weft inserter said rigid and elastic metal blades being held out of contact with each other by the weft thread gripped therebetween; a stationary blade of insulating material located to pass between the rigid and elastic metal blades to prevent contact therebetween as the weft inserter leaves the loom shed to release the weft thread; a first wiper mounted on the weft inserter and electrically connected to the rigid blade; a second wiper mounted on the weft inserter and electrically connected to the elastic blade; a first electrical conductor bar arranged in the path of the first wiper to make electrical contact therewith; a second electrical conductor bar arranged in the path of the second wiper to make electrical contact therewith; a motor driving the loom; an electrical interrupter; an electrical relay controlling the motor driving the loom; the electrical conductor bars, the interrupter and the winding of the relay being connected in electrical series circuit with a source of electrical current to stop the motor if the rigid blade contacts the elastic blade during the weft insertion phase.

4. Stop motion means for shuttleless looms comprising in combination: a weft inserter; means for drawing the weft inserter through the shed of the loom; weft thread gripping means consisting of a rigid metal blade and an elastic metal blade mounted on the weft inserter said rigid and elastic metal blades being held out of contact with each other by the weft thread gripped therebetween; a stationary blade of insulating material located to pass between the rigid and elastic metal blades to prevent contact therebetween as the weft inserter leaves the loom shed to release the weft thread; a first wiper mounted on the weft inserter and electrically connected to the rigid blade; a second wiper mounted on the weft inserter and electrically connected to the elastic blade; a first electrical conductor bar arranged in the path of the first wiper to make electrical contact therewith; a second electrical conductor bar arranged in the path of the second wiper to make electrical contact therewith; a motor driving the loom; an electrical interrupter operated in synchronism with the loom to establish a weft insertion phase; an electrical relay controlling the motor driving the loom; the electrical conductor bars, the interrupter and the winding of the relay being connected in electrical series circuit with a source of electrical current to stop the motor if the rigid blade contacts the elastic blade during the weft insertion phase.

5. Stop motion means for shuttleless looms comprising in combination: a weft inserter; means for drawing the weft inserter through the shed of the loom; weft thread gripping means consisting of a rigid metal blade and an elastic metal blade, mounted on the weft inserter said

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rigid and elastic metal blades being held out of contact with each other by the weft thread gripped therebetween; a first wiper mounted on the weft inserter and electrically connected to the rigid blade; a second wiper mounted on the weft inserter and electrically connected with the elastic blade; a first electrical conductor bar arranged in the path of the first wiper to make electrical contact therewith; a second electrical conductor bar arranged in the path of the second wiper to make electrical contact therewith; an electrical interrupter operated in synchronism with the loom to establish a weft insertion phase; a three phase motor for driving the loom; an electrical relay controlling the motor driving the loom; a three phase electrical source; a step-down transformer having a primary winding connected to two phases of the electrical source and a secondary winding connected to said relay, the interrupter, electrical relay, three phase electrical source, conductor bars, wipers and gripping blades being connected in series whereby the loom motor is stopped if the rigid blade contacts the elastic blade during the weft insertion phase.

6. Stop motion means for a shuttleless loom having a reciprocating weft inserter with coating gripping means adapted to grip a weft thread for the insertion thereof through the shed in normal operation of the loom, and driving means for driving the loom, said stop means comprising electrical circuit means operative in one condition thereof to render said driving means inoperative, a pair

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of first contact means electrically connected to said gripping means and located in fixed relationship relatively thereto, and a pair of associated contact means carried by the loom and conductively engageable with said first contact means during reciprocation of said weft inserter for operating said electrical circuit means when said gripping means fail to grip the weft thread during at least the terminal stages of the passage of said weft inserter through the shed.

7. Stop motion means for a shuttleless loom as set forth in claim 6 wherein said electrical circuit includes a pair of conducting bars disposed on said loom to lie longitudinally proximate the path traversed by said reciprocating weft inserter, and a pair of wipers carried by said weft inserter and slidably engageable on said conducting bars.

8. Stop motion means for a shuttleless loom as set forth in claim 7 wherein said pair of bars are carried by the loom slay.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |           |               |
|-----------|-----------|---------------|
| 1,734,252 | Goodspeed | Nov. 5, 1929  |
| 1,891,572 | Ott       | Dec. 20, 1932 |
| 2,868,233 | Dewas     | Jan. 13, 1959 |

##### FOREIGN PATENTS

|         |               |               |
|---------|---------------|---------------|
| 815,383 | Great Britain | June 24, 1959 |
|---------|---------------|---------------|