A. E. RHOADES.

MISTHREADING DEVICE FOR LOOMS.

APPLICATION FILED JAN. 22, 1917.

1,285,385.

Patented Nov. 19, 1918.

3 SHEETS—SHEET 1.

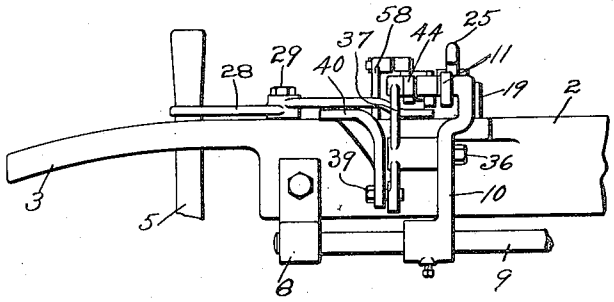


Fig 2

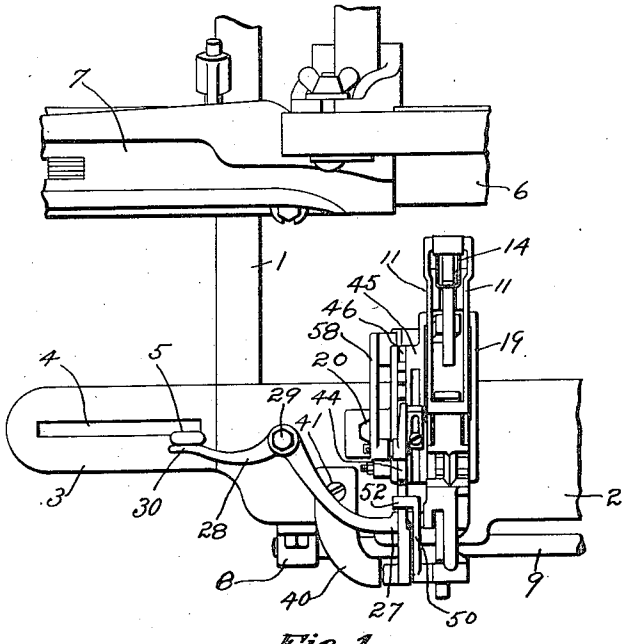


Fig 1

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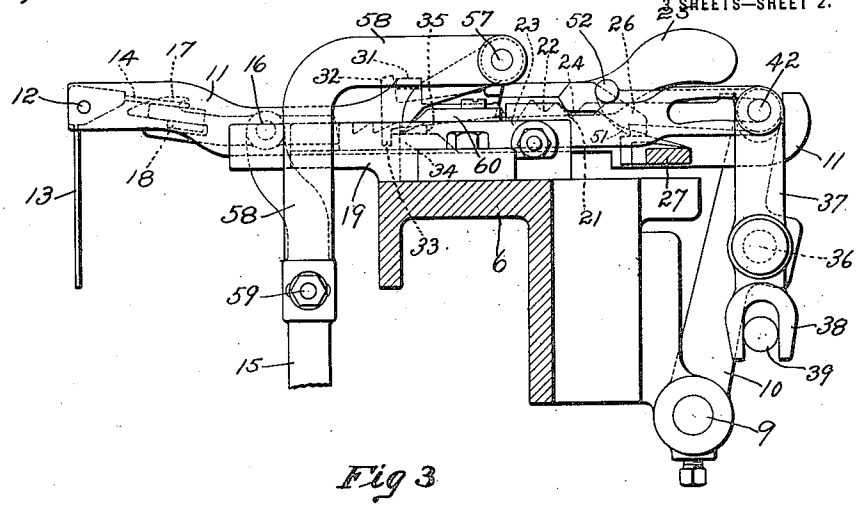


Fig 3

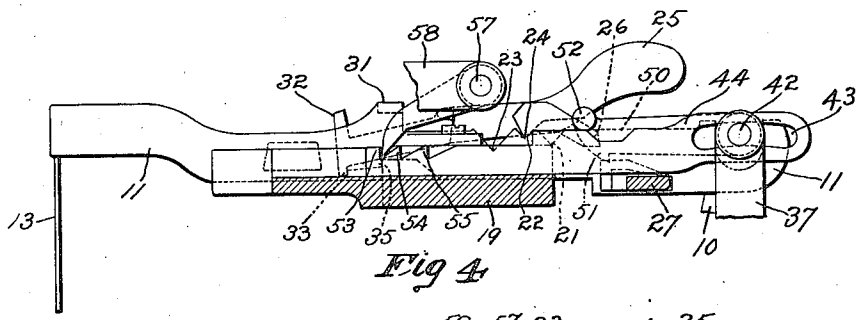


Fig 4

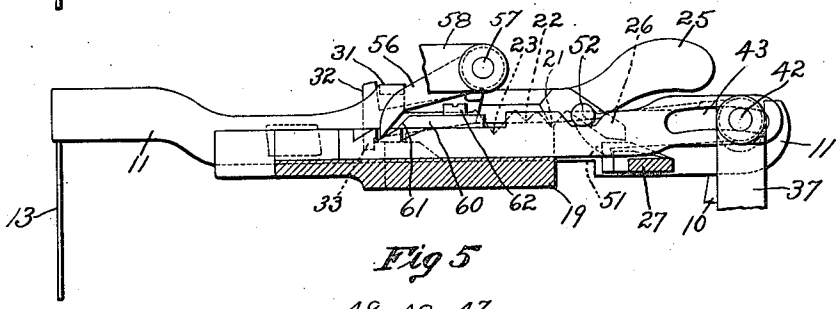


Fig 5

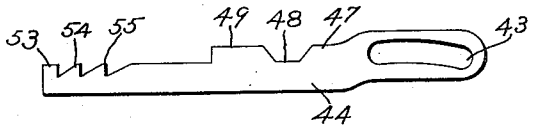


Fig 6

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3 SHEETS—SHEET 3.

Fig. 7

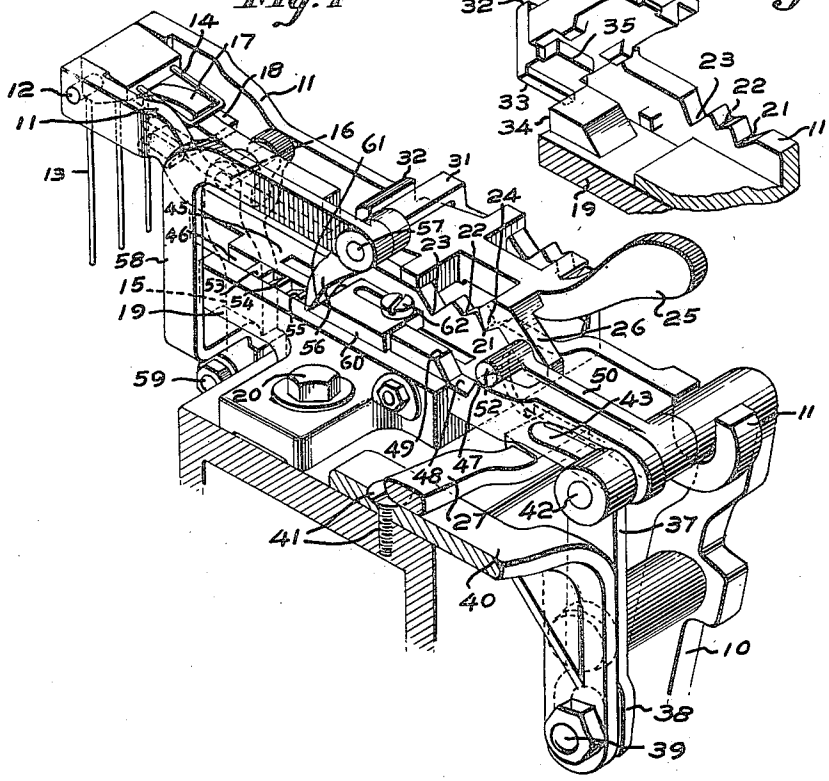


Fig. 8

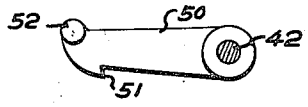


Fig. 9

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UNITED STATES PATENT OFFICE.

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MISTHREADING DEVICE FOR LOOMS.

1,285,385. Specification of Letters Patent. Patented Nov. 19, 1918.

Application filed January 22, 1917. Serial No. 143,583.

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, residing at Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Misthreading Devices for Looms, of which the following description in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The present invention relates to filling replenishing looms, and more particularly to the misthreading devices now frequently used in such looms.

In looms of the filling replenishing type, means are provided to replenish the filling in the shuttle, when, during weaving, the filling breaks from any cause. As the fresh supply is transferred to the shuttle, or as the shuttle is picked after receiving the fresh supply, the filling is liable to be and often is broken. This is commonly known as a "hopper misthread", and upon the return of the shuttle to the replenishing side of the loom, a fresh supply is transferred to the shuttle. Manifestly, if this condition is continued the hopper will soon become exhausted, so it has heretofore been proposed to stop the loom on the occurrence of two hopper misthreads in succession.

It may happen that the filling will not be broken when the new supply is transferred to the shuttle or when the shuttle is picked after receiving the fresh supply, but the shuttle may fail to be threaded, that is, the filling leading from the shuttle may not pass into the thread guide or opening in the shuttle as the latter is picked after being furnished with a fresh supply of filling, so that on the return of the shuttle to the replenishing side of the loom the filling will be broken. This is commonly known as a "real misthread" and it has been proposed heretofore to stop the loom on its occurrence.

An important feature of the present invention consists in means for stopping the loom on the repeated occurrence of hopper misthreads, or on the occurrence of a real misthread which shall be simple in construction and efficient in operation.

In carrying this feature of the invention into practical effect, loom stoppage is secured by the action of two slide members and appropriate knock-off latches or fingers, one controlled by each of said members; and intermediate means between the slide members, whereby movement of one upon detection of filling failure initiates movement of the other.

Another important feature of the invention consists in effecting loom stoppage by sliding movement of one of the slide members upon the occurrence of two hopper misthreads, and by sliding movement of the other of the slide members upon the occurrence of a real misthread.

In addition to the features of the invention above mentioned, other novel characteristics and constructions thereof will be hereinafter described in connection with the accompanying drawings which illustrate a good, practical embodiment thereof, and the various features of the invention will then be clearly pointed out by the claims.

In the drawings:—

Figure 1 is a plan view of one side of a loom provided with the present invention, showing sufficient portions thereof to make clear the construction and operation of the invention;

Fig. 2 is a front view at the same side of the loom;

Fig. 3 is a side view on an enlarged scale, showing more particularly the misthreading device with the parts in normal position just prior to frontward movement after the detection of filling failure;

Fig. 4 is a similar side view showing the relative position of parts after the weft hammer has gone forward and back following an indication of filling failure;

Fig. 5 is a similar view showing the relation of parts after the next detecting movement when the filling has been present after a first absence; and

Fig. 6 is a detached view in side elevation of the real misthread slide.

Fig. 7 is a perspective view on an enlarged scale, showing the misthreading device with the parts in assembled relation, some parts being in section;

Fig. 8 is a detached detail view of the latch carrier and the parts beneath;

Fig. 9 is a detached view of the hooked arm.

The loom frame 1; the breast beam 2; the shipper stand 3 having the usual slot 4 for the shipper 5, Fig. 1; the lay 6 and shuttle-box 7, may be of usual construction.

Mounted in suitable bearings 8 secured to the breast beam 2 or other convenient support is the change or rock shaft 9 which extends across the loom to the filling replenishing side for positioning a train of mechanism to effect filling replenishment when the shuttle, after an indication of filling failure, returns to that side of the loom. This train of mechanism may be of any usual or desired character well understood by those skilled in the art, and need not be here described. Secured to and rising from the transverse or rock shaft 9 is an arm 10, the upper portion of which is connected to the front end of the filling fork slide 11 to which is pivoted at 12 the filling fork 13 having the tail 14, the construction being such that should the filling be laid in rear of the filling fork, as the shuttle passes from the replenishing to the detecting side of the loom, the filling fork will be tilted as the lay beats up, thereby moving the tail 14, Fig. 3, out of the path of the weft hammer, and the slide 11 will remain at rest. If the filling is not laid in rear of the weft fork when the shuttle passes into the adjacent shuttle-box, which will occur when the filling is either broken or exhausted, the filling fork will not be tilted as the lay beats up, and the tail 14 thereof will remain in position to be engaged by the weft hammer, as the latter moves frontward, so that the filling fork slide 11 will be moved frontward, thereby rocking the shaft 9 in opposition to its usual holding spring (not shown) and initiating filling replenishment.

In the present instance of the invention, the weft hammer or cam follower, as it is sometimes called, comprises an arm 15 having pivoted thereto at 16 a hook 17 suitably guided by a bridge-piece 18 extending between the side portions of the filling fork slide, the construction being such that should the filling fork be not tilted as the hook 17 moves frontward, it will be engaged thereby and cause frontward movement of the filling fork slide. The filling fork slide 11 may be mounted, as usual, in a stand 19 properly secured in position by suitable means, such as the bolt 20, Fig. 1.

The side members of the filling fork slide 11 are provided with two shallow recesses 21 and 22, and a deeper recess 23 in any one of which is adapted to be received the projection 24 extending from a latch carrier 25. The latch carrier 25 has secured thereto or formed integral therewith, a latch 26 which, when the projection 24 is supported in either of the recesses 21 or 22, is normally above the end 27 of the shipper lever 28. The shipper lever 28 may be of appropriate character, but as indicated in Fig. 1, is formed as a lever pivoted at 29 and having its end 30 adapted to rest upon the shipper 5 and move it from its holding notch in the shipper stand when the end 27 of the shipper is moved frontwardly. When the projection 24 of the latch carrier is supported in the deeper notch 23, the latch 26 will be correspondingly lowered to bring its end in rear of end portion 27 of the shipper lever, and if at such time, the latch carrier 25 is moved frontwardly, the shipper lever will be actuated to disengage the shipper from its holding notch and cause loom stoppage.

Extending transversely of the side members of the filling fork slide 11 is a bridge 31 which acts as a stop bar to contact with a shouldered portion 32 at the rear portion of the latch carrier 25 and to position the latch carrier with the projection 24 in the front notch 21 of the filling fork slide 11 when the parts are in normal position, substantially as indicated in Fig. 3.

Extending downwardly from the latch carrier 25 at its rear portion is a projection 33 which when the latch carrier is moved frontwardly by the filling fork slide 11, as hereinbefore described, will engage a stop 34 on the filling fork stand and arrest frontward movement of the latch carrier 25 to cause the projection 24 to move from the front notch 21 into the middle notch 22 of the filling fork slide, the parts then taking position as indicated in Fig. 4, when the weft hammer has moved backwardly. The latch carrier 25 is provided also with a second stop 35 somewhat farther to the front than the stop 33, so that when the parts are in position of Fig. 4, should a hopper misthread occur, and the filling fork slide be moved frontwardly by the weft hammer or cam follower, the latch carrier will engage the stop 34 and cause the carrier 25 to be arrested as the filling fork slide moves frontwardly, thereby dropping the projection 24 of the latch carrier 25 into the deep recess 23 in the filling fork slide and positioning the latch 26 for engagement with the end 27 of the shipper lever, should a second hopper misthread occur and the filling fork slide be again moved frontwardly. The construction of filling fork slide 11 and latch carrier 25 may be substantially as fully described in the patent to Northrop, No. 789,291, dated May 9, 1905, the construction being such that upon the occurrence of two hopper misthreads in succession, the loom will be stopped.

It is desirable, however, to stop the loom, should a real misthread occur; and the present invention contemplates combining with the filling fork slide and its connected mechanism as described for stopping the loom on the occurrence of two hopper misthreads, a second slide, which, for identification, may be known as the real misthread slide for controlling the means for stopping the loom upon the occurrence of a real misthread.

Pivotally connected at 36 to the arm 10

rising from the transverse or rock shaft 9, is an arm 37, the lower portion 38 of which is bifurcated to engage a fixed stud 39, Fig. 3. The stud 39 may be conveniently supported from any fixed part of the loom, but in the present instance is carried by an arm 40, Fig. 1, secured to the breast beam 2 by suitable means such as the screw 41, the end portion of the arm 40 extending over the front of the breast beam and downwardly, as indicated in Fig. 2, for supporting the fixed pin or bolt 39. The upper end of the arm 37 carries a pin 42 which is received in a slot 43 of the real misthread slide 44. In order to guide the reciprocating movements of the real misthread slide 44, the filling fork stand 19 has a side extension portion 45, Fig. 1, provided with a groove 46 in which the slide 44 is supported for reciprocating movement toward and from the front of the loom.

The real misthread slide 44, as more clearly indicated in Fig. 6, is provided with a shouldered portion 47 at the front of a recess 48 and a corresponding shoulder 49 at the rear of said recess for a purpose which will presently appear.

Pivotally connected to and movable with the filling fork slide 11 is a hooked arm 50, the hook 51 of which is adapted to engage the end 27 of the shipper lever when the hook is allowed to assume its lowered position. In the present instance of the invention, the hooked arm 50, which as hereinbefore stated is connected to the feeler slide 11 to move therewith, is pivotally carried at the upper end of the arm 10 secured to the transverse or rock shaft 9, substantially as indicated in Fig. 1, and has a side projecting stud 52 adapted to ride upon the top portion of the real misthread slide 44, the construction being such that when the parts are in normal position as indicated in Fig. 3, the stud 52 projecting from the hooked arm 50 rests upon the front shoulder 47 of the real misthread slide, thereby holding the hooked portion 51 thereof above the end 27 of the knock-off lever.

The real misthread slide 44 at its rear portion has a series of teeth 53, 54 and 55, adapted under certain conditions, to be hereinafter described, to be engaged by the end of a pawl 56 pivotally mounted at 57 upon the arm 58 secured at 59 to the weft fork hammer or cam follower 15, Fig. 3, the construction being such that in normal working condition of the parts, as the weft hammer or cam follower makes its frontward and rearward stroke, the pawl 56 will ride in the recessed portion of the front tooth 55 without, however, moving the real misthread slide.

Upon the occurrence of filling failure or breakage of filling from any cause during weaving, the filling fork 13 will not be tilted, and the filling fork slide 11 will, as hereinbefore described, be moved frontwardly, thereby turning the transverse or rock shaft 9 against the action of its usual holding spring and initiate filling replenishment. As the arm 10 connecting the filling fork slide 11 and the rock shaft 9 moves frontwardly, it causes the arm 37, Fig. 3, to move the real misthread slide 44 to the front, and, owing to the differential movement of the arm 37, with respect to the arm 10, the real misthread slide will be carried from position indicated in Fig. 3, where the pin 52 rests upon the front shoulder 47 of the slide, to the position indicated in Fig. 4, where the pin rests upon the rear shoulder 49 of the slide, the pin 52 having traversed the slot 48 and up the inclined end portion thereof onto the shoulder 49. When the filling fork slide returns to its rearward position as usual, and thereby carries with it the arm 37, the pin 42 in the arm 37 will travel in the slot 43 of the real misthread slide and the parts will assume the position indicated in Fig. 4. At this time the projection 24 of the latch carrier rests in the middle shallow recess 22 of the filling fork slide, and the pin 52 of the hooked arm 50 rests upon the rear shoulder 49 of the real misthread slide, while the end of the pawl 56 engages the rear tooth 53 of the real misthread slide. Should the filling be absent on the next detecting beat, this being the first hopper misthread, the filling fork slide will again be moved frontwardly, and as fully described in the Northrop patent hereinbefore mentioned, the latch carrier will be positioned with the projection 24 in the deeper recess 23 of the filling fork slide, thereby positioning the latch 26 in the rear of the end 27 of the knock-off lever as the weft hammer or cam follower moves backwardly. Should the filling be absent on the next detecting beat, a second hopper misthread, the filling fork slide will again be moved frontwardly, and since the latch 26 is then positioned to engage the end 27 of the knock-off lever, the loom will be stopped as the weft fork hammer or cam follower moves to the front. This stoppage will preferably occur after the filling has been replenished in the shuttle.

Should the filling be present after the parts have assumed the position shown by Fig. 4, which is that following a first failure or breakage of filling, the weft fork slide will not be moved frontwardly as the lay moves frontwardly, and as the weft hammer or cam follower moves frontwardly, it will engage the rear end portion of the latch carrier and move it to initial position as indicated in Fig. 5. As the weft hammer or cam follower moves backwardly, the pawl 56 by engagement with the rear tooth 53 of the real misthread slide, will move the latter backwardly to bring the recessed portion 48 of

this slide beneath the pin 52 of the hooked arm 50 to the position indicated in Fig. 5, with the result that the hook 51 thereof will be lowered into position for engagement with the end 27 of the knock-off lever. Should the filling be absent on the next detecting beat, this indicating a real misthread, the filling fork slide will again be moved frontwardly, thereby turning the arm 10 as hereinbefore described, and through the arm 37 moving the real misthread slide frontwardly from the position indicated in Fig. 5, while the hooked arm 50 remains in depressed position, thereby moving the knock-off lever and effecting loom stoppage.

Having investigated the cause of the loom stoppage, and cured the defect, the attendant thereupon will start the loom and in the next two succeeding rearward movements of the weft hammer the pawl 56, by engagement with the teeth 54 and 55 of the real misthread slide, will return the latter to its initial position as indicated in Fig. 3. If regular weaving follows after the real misthread slide has assumed the position shown in Fig. 5, the next rearward movement of the weft hammer will bring the parts to the normal position shown in Fig. 3.

It may be desirable at times to adjust the action of the pawl 56, and to this end a pawl lifter 60 consisting preferably of a piece of metal having a bevel rearward edge 61, may be adjustably secured by a screw 62 to the filling fork stand.

The adjustment should be such that when the parts are in normal position as indicated in Fig. 3, the pawl 56 will ride out of the front tooth 55 of the real misthread slide as the weft hammer or cam follower moves frontwardly, and on its rearward movement, the pawl 56 will approach the rearward end of the tooth 55, without, however, moving the real misthread slide, the parts then remaining in the normal position, as indicated in Fig. 3.

What is claimed is:—

1. In a loom, the combination of loom stopping means, a slide, means for moving it frontwardly when the filling is absent on a detecting beat, two members movable with the slide to effect loom stoppage, means for operatively positioning one of said members relative to the stopping means to effect loom stoppage on the recurrence of hopper misthreads, and means for operatively positioning the other member relative to the stopping means to effect loom stoppage on the occurrence of a real misthread.

2. In a loom, the combination of stopping means, a filling fork slide movable frontwardly on detection of filling failure or absence, two independent members movable with the slide to act through the stopping means and effect loom stoppage, means for positioning one of said members to stop the loom on the occurrence of two hopper misthreads, and independent means for positioning the other of said members to stop the loom on the occurrence of a real misthread.

3. A misthreading device for looms, comprising, in combination, stopping means for the loom, two slides, separate means independently controlled as to their operative relation with the stopping means by said two slides, and means for effecting movement of the slides to effect loom stoppage on the occurrence of either a double hopper misthread or a real misthread.

4. A misthreading device for looms, comprising, in combination, stopping means for the loom, detecting means for detecting the presence or absence of filling on a detecting beat of the lay, two slides, means controlled by one of said slides for effecting loom stoppage on the occurrence of two hopper misthreads, independent means controlled by the other slide for effecting loom stoppage on the occurrence of a real misthread, and means for operating the slides.

5. In a loom, the combination of stopping means, filling supply operating means, a filling detector, means for effecting loom stoppage on the occurrence of a double hopper misthread, and devices separate from said means on the same side of the loom for effecting loom stoppage upon the occurrence of a real misthread.

6. In a loom, the combination of stopping means, filling supply operating means, a filling detector, a slide movable through the filling detector upon absence of filling on a detecting beat, means controlled by the slide for stopping the loom on the occurrence of two hopper misthreads, a second slide movable independent of the first-named slide, and means controlled by the second slide to effect loom stoppage upon the occurrence of a real misthread.

7. In a loom, the combination of stopping means, filling supply initiating means, a filling detector, a slide movable to effect a change of filling on detection of filling absence, means positioned by the slide on second absence of filling to stop the loom on the third absence, a second slide, means for moving the second slide, and means movable with the first-named slide and positioned by the second slide to effect loom stoppage on the occurrence of a real misthread.

8. An automatic loom, having, in combination, a filling detector, stopping means, a slide movable to effect a change of filling on detection of filling absence, a second slide, means movable with the first-named slide and positioned by the second slide to effect loom stoppage on the occurrence of a real misthread.

9. An automatic loom, having, in combination, a filling detector, stopping means, a

slide movable to effect a change of filling on detection of filling absence, a knock-off member movable with the slide, a real misthread slide having portions to position the knock-off member operatively with respect to the stopping means and effect loom stoppage when the filling is absent on one detecting beat, present on the second, and absent on the third detecting beats.

10. In a loom, the combination of a filling detector, stopping means, means to effect a change of filling when the filling is absent on a detecting beat, a part movable with said means and adapted to actuate the stopping means, a controlling member for determining the position of said part, and means for moving the controlling member to its extreme position in one direction on the first absence of filling and to an intermediate position should the filling be present on the next detecting beat to relate said part operatively with respect to the stopping means and effect loom stopping should the filling be absent on the next detecting beat.

11. In a loom, the combination of a filling fork slide and a filling fork to effect a change of filling when filling is absent on a detecting beat, stopping means, a latch positioned and movable through the filling fork slide to stop the loom on the occurrence of a double hopper misthread, a real misthread slide, a member movable with the filling fork slide and positioned by the real misthread slide to stop the loom on a real misthread.

12. In a loom, the combination of a filling fork slide and a filling fork to effect a change of filling when filling is absent on a detecting beat, stopping means, a latch positioned and movable through the filling fork slide to stop the loom on the occurrence of a double hopper misthread, a real misthread slide, means for moving the real misthread slide with and independent of the filling fork slide, a member movable with the filling fork slide and controlled by the real misthread slide to effect loom stoppage on the occurrence of a real misthread.

13. In a loom, the combination of a filling fork slide and its filling fork, stopping means, a member movable with the filling fork slide and adapted to operate the stopping means, a real misthread slide having portions for controlling the position of said member relative to the stopping means, and means for moving the real misthread slide to operatively position said member with relation to the stopping means that it may effect loom stoppage on the occurrence of a real misthread.

14. In a loom, the combination of a filling fork and its slide, a cam follower for moving the filling fork slide frontwardly when the filling is absent on a detecting beat to effect change of filling, a real misthread slide movable frontwardly with the filling fork slide, means connected to the cam follower for moving the real misthread slide rearwardly, and means movable with the filling fork slide and positioned by the real misthread slide to stop the loom on the occurrence of a real misthread.

15. In a loom, the combination of a detector, movable means for effecting a change of filling when the detector finds the filling absent on a detecting beat, stopping means, a member movable with the movable means, a real misthread slide for controlling the position of the said member, and means for moving the real misthread slide to operatively position the member that it may effect operation of the stopping means on the occurrence of a real misthread.

In testimony whereof, I have signed my name to this specification.

ALONZO E. RHOADES.