W. H. BAKER.

FILLING REPLENISHING LOOM.

APPLICATION FILED APR. 28, 1915.

. 1,277,357.

Patented Sept. 3, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

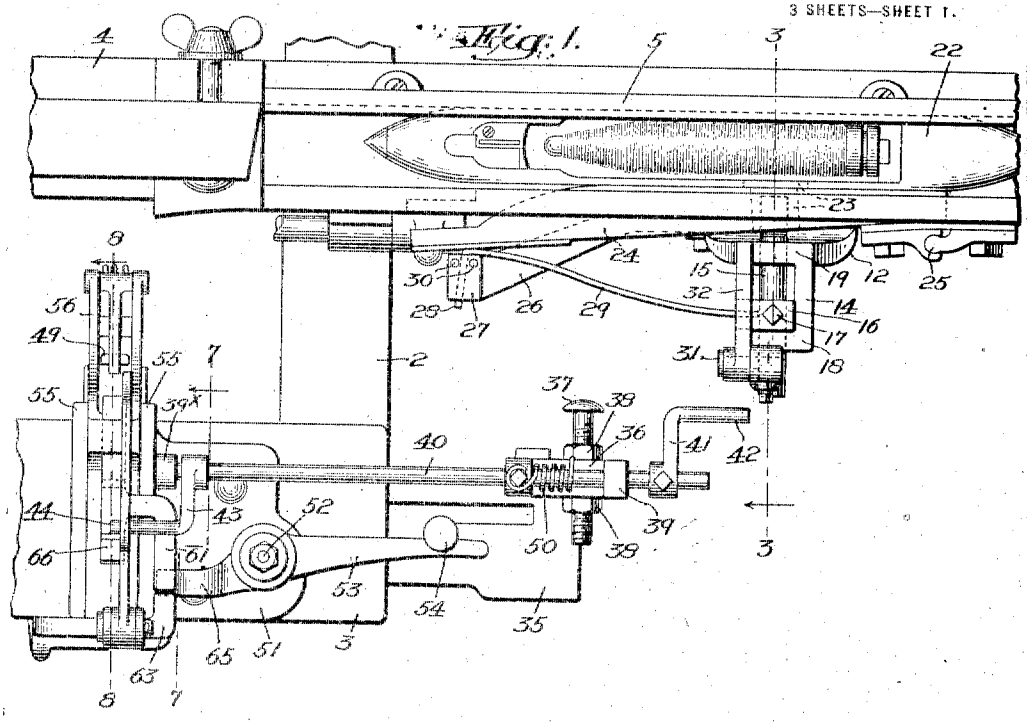
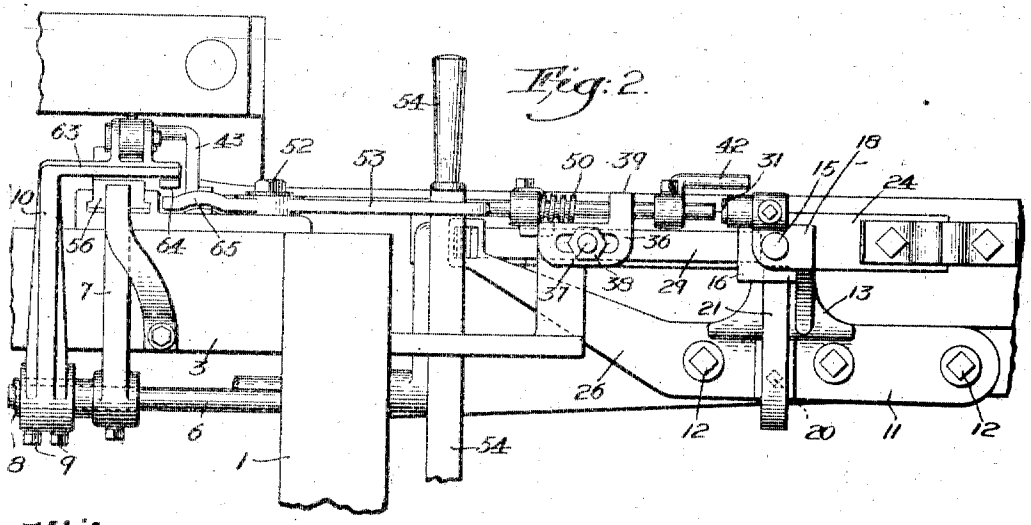


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

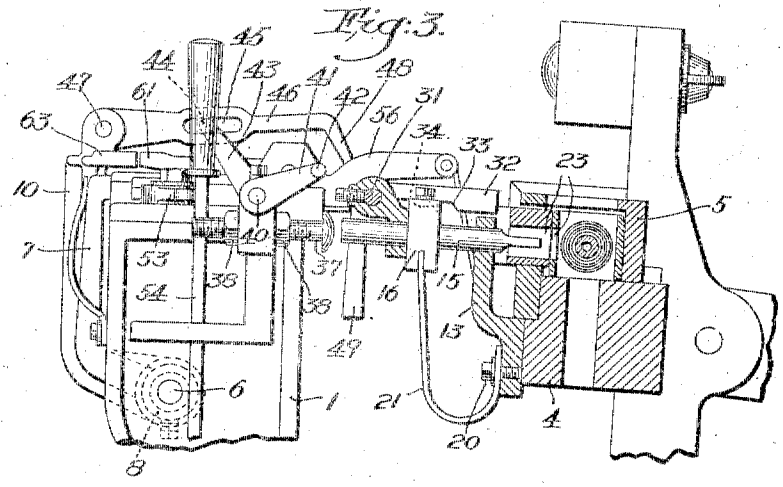


Fig. 4.

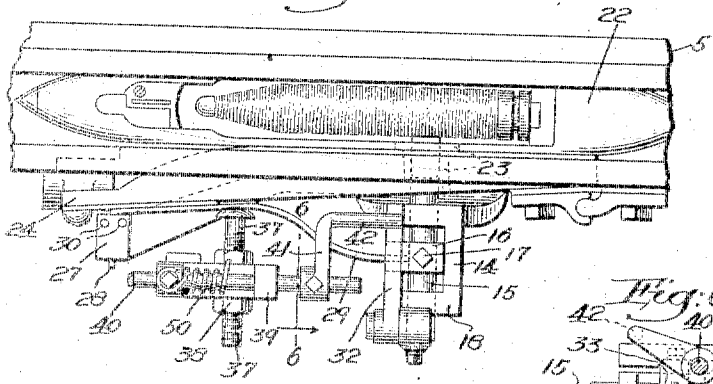


Fig. 6.

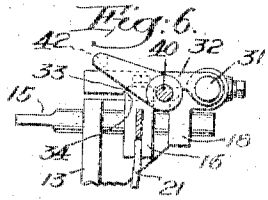
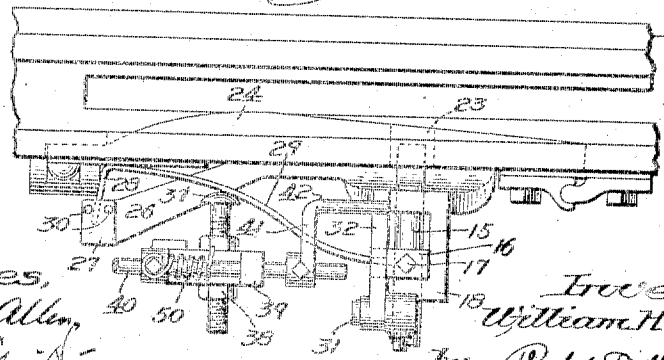


Fig. 5.



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3 SHEETS—SHEET 3.

Fig: 7

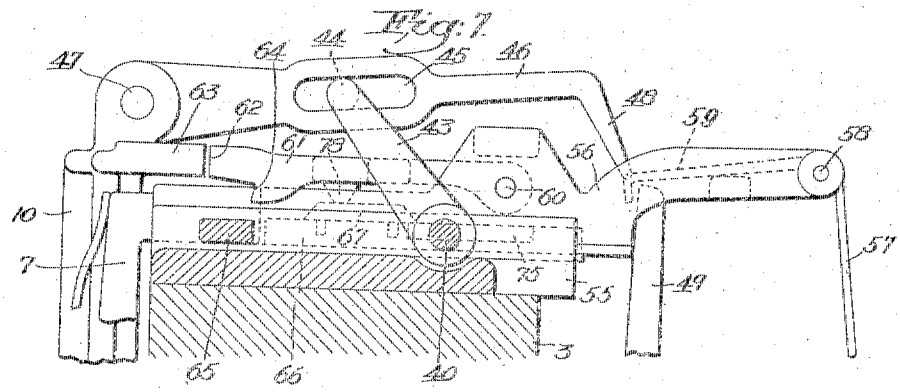


Fig: 8.

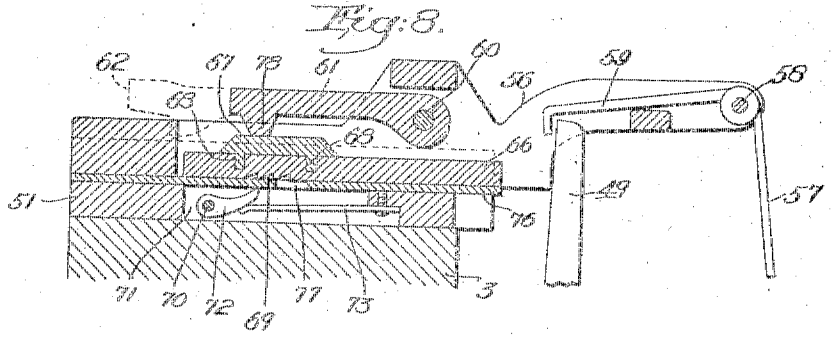
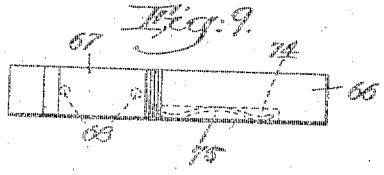


Fig: 9.



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UNITED STATES PATENT OFFICE.

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FILLING-REPLENISHING LOOM.

1,277,357. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed April 28, 1915. Serial No. 24,587.

To all whom it may concern:

Be it known that I, WILLIAM H. BAKER, a citizen of the United States, residing at Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to looms of the filling replenishing type.

In weaving cloth wherein the fine texture requires that each pick of filling laid shall extend the full width of the fabric, it has heretofore been common to provide feeler mechanism to effect filling replenishment prior to complete exhaustion of the filling in the shuttle. In the case of coarser goods, wherein the presence of a partial length or even a double filling in a pick is not objectionable, it has been common to provide means for effecting replenishment of the filling either on breakage or when it has become completely exhausted. In the first case, wherein the feeler mechanism alone is employed to effect filling replenishment, the loom has been stopped by the usual filling fork mechanism upon breakage or complete exhaustion of the filling to enable any partial pick to be removed. By this system perfect cloth can be produced, but at the expense of relatively small production, as compared with the second of the above-mentioned systems, wherein upon breakage or complete exhaustion of filling, replenishment is effected.

It is desirable, however, that the same loom may be adapted to weave either kind of cloth, and in the patent to Stimpson, No. 662,320, November 20, 1900, means were provided which could be so adjusted that the loom would stop automatically whenever the filling broke or ran out, as when weaving fine goods, or filling change could be effected automatically when the filling broke or ran out and also prior to complete exhaustion.

When the feeler mechanism is employed to replenish the filling prior to complete exhaustion of the filling in the shuttle, regardless of whether loom stoppage or replenishment occurs upon breakage, considerable waste is occasioned by the discharge of the filling carrier while it yet contains filling. In weaving the coarser cloths, where partial picks are of no serious objection, economy dictates that such waste be eliminated.

With the above generally-stated facts in mind, the present invention aims to provide a filling replenishing loom, wherein by slight changes or adjustment in the relation of parts, the same loom may be adapted to a variety of operative conditions, which may be generally set forth as follows:—

It may be adapted to cause filling replenishment by the feeler mechanism alone prior to complete exhaustion of the filling in the shuttle and to stop when the filling breaks or fails. By this adaptation the loom will produce perfect cloth.

It may be adapted to cause filling replenishment only when the filling breaks or fails, in which there will result a maximum production and economy of waste at the expense of quality in goods produced.

It may be adapted to cause filling replenishment prior to complete exhaustion of the filling in the shuttle, and also whenever the filling breaks or fails, in which case there will result a maximum production with low percentage of imperfect cloth woven.

It may be adapted to operate as an ordinary non-replenishing loom which will stop when the filling breaks or entirely fails.

An important feature of the present invention is the adaptation to the purposes stated of a loom having a feeler mechanism and a single filling detector or weft fork mechanism at one side of the loom. Further objects of the present invention are to provide an improved construction of feeler mechanism and detector or filling fork mechanism, and to combine said mechanisms in such manner as to readily adapt the loom to the various operations described. The construction of feeler and detector mechanisms, and the various other features of the present invention will best be made clear from the following description and accompanying drawings of one form of means for carrying the invention into practical effect, it being understood that changes may be made in the details without departing from the present invention as defined by the claims.

In the drawings:—

Figure 1 is a plan view at one side of the loom, showing only sufficient parts to make

clear the relation of the present invention therewith;

Fig. 2 is a front elevation at the same side of the loom as Fig. 1, some of the parts being broken away;

Fig. 3 is a section on the line 3—3, Fig. 1;

Fig. 4 is a detached detail view in plan, showing the feeler mechanism and the relation of parts when the shuttle is at the feeler side of the loom;

Fig. 5 is a view similar to that of Fig. 4 when the shuttle is at the opposite or filling replenishing side of the loom;

Fig. 6 is a sectional detail on the line 6—6, Fig. 4;

Fig. 7 is an enlarged section on the line 7—7, Fig. 1;

Fig. 8 is an enlarged section on the line 8—8, Fig. 1;

Fig. 9 is a detached detail in plan of the slide bar.

In illustration of the present invention, it has not been deemed necessary to show the filling replenishing side of the loom, and the replenishing mechanism itself, because the present invention is not concerned with the particulars of such mechanism which may be of any desired character to effect a change of filling, as fully understood by those skilled in the art.

The loom frame may be of usual or any desired character, and as shown, comprises the uprights 1, side frames 2, and breast beam 3. The lay 4 having the shuttle-box 5 may be also of any usual or preferred construction and mounted upon the loom frame is the usual back latch rod 6, Fig. 2, carrying the back latch arm 7 for lifting the back latch or pawl to stop take-up whenever the loom is stopped. These parts may be as usual in looms, and being well understood by those familiar with the art, need no further elucidation.

Mounted loosely on the rod 6 is a sleeve 8, Fig. 2, which is moved or rocked upon the rod whenever it is required to operate the filling replenishing mechanism by any of the means hereinafter described, and such sleeve 8 is connected by suitable mechanism, not here shown, as usual, at the opposite side of the loom to initiate filling replenishment through the filling changing mechanism. These parts and their arrangement form no essentials of the present invention, and being of usual character and well understood by those skilled in the art, further description and illustration is unnecessary. Rising from the sleeve 8 and secured thereto by suitable means, as the set screws 9, is the arm 10, which, when moved to the front by any of the means hereinafter described, will rock the sleeve 8 and initiate filling replenishment.

The present invention contemplates that the feeler mechanism shall feel for the filling in the shuttle when the latter is at the side of the loom opposite the filling replenishing mechanism. The feeler mechanism is of such construction that it may, when desired, be rendered ineffective, and it is preferably so contrived that it shall discharge its feeling function only when the shuttle is in the box adjacent the feeler mechanism, such feeler mechanism at other times being rendered inactive. In carrying this feature of the invention into effect, the feeler which feels for the filling in the shuttle, is preferably mounted upon the lay, and performs its feeling function by entering through the front wall of the shuttle box and shuttle.

Mounted upon the lay is a bracket 11 which may be appropriately secured in place preferably at the front of the lay by bolts 12, Fig. 2. Rising from the bracket 11 is an arm 13 carrying a guiding portion 14 in which is guided the feeler 15, Figs. 1, 2, 3, and 4, said feeler carrying a block 16 secured thereto as by a bolt 17. The portion 14 of the arm 13 is preferably provided with the front and rear guiding side extensions 18 and 19 through suitable perforations of which the feeler 15 may reciprocate. Secured to the bracket 11, as by the bolt 20, Figs. 2 and 3, is a leaf spring 21, the outer or free end portion of which engages a suitable recess in the block 16, and normally acts to move the feeler away from the shuttle box. The shuttle box 5 and the side wall of the shuttle 22 are each provided with suitable openings 23, as indicated in Fig. 1, for the entrance of the feeler to feel for the filling in the shuttle. In the present form of the invention, the front wall of the shuttle box is preferably provided with a swell or binder 24 pivotally mounted to the shuttle box at 25, Fig. 1, and adapted when the shuttle enters the box, to be moved outwardly.

The bracket 11 has projecting therefrom, to the left, as shown in Figs. 1 and 2, an arm 26 carrying a head portion 27 in which is loosely mounted the end 28 of a spring 29, the bent end 28 of which passes between suitable confining pins 30 in the head 27, while the other end of the spring is connected to the block 16, substantially as indicated in Fig. 1. The relative actions of the springs 21 and 29 are such that when the shuttle is not in the box at the feeler side of the loom, and also when the shuttle is in said box prior to the beatup movement of the lay, the said springs will act to hold the feeler 15 in its retracted or non-feeling position.

Pivotally mounted at 31 to the arm 13 rising from the bracket 11, is a controller 32 having an inclined portion 33 which is adapted to be engaged and lifted by an inclined portion 34 on the side of the block

16 secured to the feeler, when said feeler detects substantial exhaustion of the filling in the shuttle, the construction of the parts being such that when a sufficient supply of filling is present in the shuttle for working conditions, and the feeler 15 feels for the filling, it will not enter the shuttle sufficiently far to permit the inclined portion 34 on the block 16 to engage the inclined portion 33 of the controller 32; but when the filling has been exhausted to a predetermined extent and the feeler enters the shuttle, the inclined portion 34 of the block 16 will have been moved sufficiently toward the shuttle box to engage the inclined portion 33 of the controller and lift the same.

In order to effect the feeling action of the feeler, when the shuttle is in the box at the feeler side of the loom, the present invention contemplates that the spring 29 shall be put under increased tension to overcome thereby the action of the spring 21 and move the feeler into feeling position. As one means to this end, there is mounted upon the usual stand 35, projecting from the end of the loom, a bracket 36 in which is adjustably secured a bunter 37 by means of the adjusting nuts 38, Figs. 1 and 3, the construction being such that upon forward movement of the lay when the shuttle is in the box at the feeler side of the loom, and the binder or swell 24 is therefore moved to its outer position as indicated in Figs. 1 and 4, the end portion 28 of the spring 29 will be forced forward between its confining pins 30 and as the lay beats up, the spring 29 will meet the bunter 37 which will press the same between the ends thereof toward the shuttle box, substantially as indicated in Fig. 4, thereby placing sufficiently increased tension upon the spring 29 to force the feeler into the shuttle to perform its feeling function. When the shuttle leaves the box at the feeler side of the loom, the swell or binder 24 moves inward, thereby permitting the end portion 28 of the spring 29 to move inward likewise, the construction being such that upon the beatup movement of the lay when the shuttle is not at the feeler side of the loom, the bunter 37 will meet the spring 29 and move the end of the spring 28 backward without thereby putting sufficient tension on the spring to force the feeler to feeling position within the shuttle, substantially as indicated in Fig. 5.

Suitably mounted for rotative movement in the bearing portions 39 of the bracket 36 and in the bearing 39^x, is a rock shaft 40 having secured at the end adjacent the feeler, an arm 41, the portion 42 of which will ride over the top of the controller 32, as the lay beats up. The rock-shaft 40 near its end opposite the arm 41, is provided with a crank arm 43, the pin portion 44 of which engages a slot 45 in a finger 46 pivoted at 47 to the outer portion of the arm 10 rising from the sleeve 8. The finger 46 has a downturned end portion 48 which is adapted at times to engage the weft hammer 49 on the forward movement thereof and by such engagement be moved frontward to turn the sleeve 8 and initiate filling replenishment.

The rock shaft 40 is under control of a spring 50, Figs. 1 and 2, which normally acts to turn the rock shaft clockwise, viewing Fig. 3, and thereby normally hold the finger 46 in its raised or inoperative position with respect to the weft hammer 49.

From the construction described, it will be apparent that when the filling in the shuttle has become exhausted to a predetermined extent, the feeler will be permitted to move a greater distance into the shuttle in response to the demands of the spring 29, and thereupon the inclined shoulder 34 of the block 16 will engage the inclined shoulder 33 of the controller 32, which, as the lay beats up, will contact with the portion 42 of the arm 41 and turn the rock shaft 40 contra-clockwise, or in a direction to depress the finger 46 into operative relation with the weft hammer 49, which will thereupon move the finger 46 frontward and turn the arm 10 and sleeve 8 to initiate filling replenishment. Under normal operation of the loom, therefore, while sufficient filling is in the shuttle for working conditions, the finger 46 will be held in inoperative relation with the weft hammer and will be brought into operative relation therewith when the filling has been exhausted to a predetermined extent.

In order that the feeling action of the feeler may be suspended permanently when the loom is to be controlled through the filling fork, as will hereinafter be described, it is necessary only to remove the bunter 37 so that on forward movement of the lay, even when the shuttle is in the box at the feeler side, sufficient increased tension will not be given to the spring 29 to cause the feeler to act.

Mounted on the breast beam 3 is the bracket plate 51 to which is pivoted at 52 the knock-off lever 53, the outer end portion of which bears as usual against the shipper 54 held by the usual notch in the slotted plate 35.

The plate 51 has provided the usual guiding portions 55 in which slides the filling fork carrier 56 having the filling fork 57 pivotally mounted thereto at 58, the filling fork being provided with an arm 59 adapted to engage the weft hammer 49 when the filling fork fails to be tilted, due to the absence of the filling thread on the detecting beat of the lay. Pivotally mounted at 60 to the filling fork slide, is the actuator 61, the front end portion 62 of which is adapted when the

said actuator is in raised position, as indicated by Figs. 7 and 8, to engage the end portion 63 of the arm 10 connected to the filling replenishing mechanism. The actuator 61 is also provided with a shouldered portion 64 which, when the actuator is allowed to drop, is adapted to engage the underlying end 65 of the knock-off lever, the construction being such that when the actuator is in raised position and the filling fork slide 56 is moved to the front upon failure of filling, said actuator will initiate filling replenishment; but when said actuator is allowed to drop to its lowest position, as will hereinafter be explained, the shoulder 64 is adapted to engage the end 65 of the knock-off lever and on forward movement of the filling fork slide, stop the loom, without at the same time, effecting replenishment.

One of the purposes of the present invention is that filling replenishment may be effected upon breakage or failure of filling, and should such breakage or failure occur a plural number of times in succession, to thereupon stop the loom. It is also a feature of the present invention that upon breakage or failure of filling, the loom may be stopped at once; and to these ends, means are provided for controlling the actuator 61, as will now be described.

In a suitable slideway formed in the filling fork carrier or slide 56, is the slide-bar 66, Fig. 8, on which is detachably mounted the block 67. As shown in the present form of the invention, the block 67 is provided with pins 68, which engage suitable recesses in the slide-bar 66, the construction being such that upon movement of the slide-bar the block 67 will be moved, and yet the block 67 may be readily detached from its connection with the slide-bar. It is these two parts acting in conjunction with the actuator 61 which select, according to the requirements, whether the loom is to be stopped or the filling replenishing mechanism operated.

In the bottom of the slide-bar 66 is provided a series of notches or teeth 69, said notches being preferably three in number, as indicated, but any other desired number may be employed. Pivoted at 70 in a suitable notch or recess 71 of the plate 51, is a pawl 72 normally under the influence of a spring 73, Fig. 8, tending to move the end of the pawl upward. As hereinbefore noted, the slide-bar 66 is loosely mounted on the filling fork carrier 56 and to prevent accidental disturbance of its position by vibration of the loom, it is provided with a recess 74, Fig. 9, in which is seated a light spring 75 adapted to bear against one of the guide walls between which the slide bar moves.

Secured to the bottom of the filling fork carrier 56, is a plate 76 having an opening 77 through which the end of the pawl 72 is adapted to project and engage one of the notches in the slide-bar positioned above the same, as the filling fork carrier moves to the front. The end portions of the block 67 are preferably inclined, as shown in Fig. 8, and the actuator 61 is provided with a toe 78 adapted to coöperate with said block.

In Fig. 8 the parts are shown in the position they occupy when the filling fork has detected an absence of filling and the hammer 49 is about to engage the filling fork to move the filling fork carrier or slide 56 to the front. As the carrier 56 is thus moved, the opening 77 permits the pawl 72 to engage the first tooth or notch in the slide-bar 66 and prevent further movement of the slide-bar to the front as the carrier 56 completes its frontward movement. The actuator 61, on the occurrence of first breakage or failure of filling, therefore, is held in raised position, and its end 62 engages the end 63 of the arm 10 and initiates filling replenishment. Should the filling replenishing operation be properly effected and the filling be properly laid on the next detecting beat, the filling fork carrier 56 would not be moved to the front, but the hammer 49 would then engage the rearward end of the slide 66 and move it to initial position. Should, however, the filling not have been properly replenished, or have broken or failed on the next detecting beat, then the filling fork slide 56 would again be moved to the front by the weft hammer, and the pawl 72 would pass through the opening 77 and engage the second one of the notches in the slide-bar 66 as the filling carrier 56 moves to the front in completing its forward movement. Since the actuator 61 is still held raised by the block 67, filling replenishment would be effected on such second failure of filling. Should a third failure of filling occur, the pawl 72 would engage the third notch in the slide-bar 66 and a third cycle of operation be negotiated, which would result in moving the slide-bar so far rearward as to carry the block 67 from under the toe 78 of the actuator 61 and allow said actuator to swing downward out of the plane of the end 63 of the upwardly-extending arm 10 and into position to engage the end 65 of the shipper lever, whereupon the next or fourth detecting beat or frontward movement of the filling fork carrier 56 would effect loom stoppage.

The loom having been stopped in the manner stated, and the operative having again started the loom with a properly threaded shuttle, and a filling thread being properly laid, the hammer 49 on its first beatup or frontward movement, will impinge on the rearward end of the slide-bar and move it in the slideway of the filling carrier 56 to initial position, as indicated in Fig. 8.

The slide-bar 66 has been indicated as

provided with three notches 69, but obviously the number of notches may be varied, and the number of filling replenishments due to filling failure be varied prior to effecting loom stoppage.

As hereinbefore noted, it may be desirable at times to operate the loom to effect filling replenishment prior to complete exhaustion of the filling and to effect loom stoppage at once upon a single failure or breakage of filling. To inaugurate this operation, it is necessary only to lift the block 67 from the slide-bar 66 and to retain the feeler mechanism in its operative condition, as hereinbefore pointed out. Likewise, it may be desirable in some cases to effect filling replenishment only upon breakage or failure of filling, and to effect such replenishment a plural number of times before stopping the loom, in which case it is necessary only to remove the bunter 37. Should it be desired to temporarily suspend both the feeler and the filling fork replenishing operations, the bunter 37 and the block 67 can be readily removed, whereupon the loom will operate as an ordinary loom, and stop on the occurrence of filling breakage or failure.

What is claimed is:—

1. In a filling replenishing loom, the combination of feeler mechanism for initiating filling replenishment prior to complete exhaustion of the filling in the shuttle, detecting mechanism for initiating filling replenishment upon breakage or failure of filling, and means rendered effective by entrance of the shuttle into the shuttle-box to cause the feeler to feel for the filling in the shuttle, and devices for rendering said means ineffective and the feeler mechanism inoperative that the loom may run under control of the detecting mechanism alone.

2. A feeler motion for looms, comprising, in combination, a feeler, spring means normally acting to hold the feeler in non-feeling position, means connected to the feeler and acting through said spring means on a detecting beat when the shuttle is in the detecting box to move the feeler or feel for the filling in the shuttle and effect filling replenishment when the filling has been exhausted to a predetermined extent, stopping mechanism, detecting mechanism for effecting loom stoppage when the filling breaks or fails, and devices for rendering the means connected to the feeler ineffective to produce filling feeler movement.

3. In a filling replenishing loom, the combination of a feeler, mounted for reciprocating movement toward and from the front of the loom, means normally acting to hold the feeler in non-feeling position, and means rendered effective to move the feeler to feeling position in opposition to the said normally acting means when the shuttle enters the box adjacent the feeler.

4. In a loom of the character described, the combination of a feeler mounted for reciprocating movement toward and from the front of the loom, a detecting mechanism, devices acting normally to hold the feeler in non-feeling position, means rendered effective to move the feeler to feeling position by entrance of the shuttle into the box adjacent the feeler, manual means for rendering the feeler non-responsive to said means, and means for rendering the detecting mechanism operative or inoperative at will to effect replenishment of filling or loom stoppage.

5. In a loom of the character described, a feeler, means for normally holding said feeler retracted from feeling position, means rendered effective to move the feeler toward feeling position by entrance of the shuttle in the box adjacent the feeler, means for causing the normally holding means to become permanently effective to hold the feeler from feeling position, detecting mechanism, means for rendering the detecting mechanism operative or inoperative to effect replenishment, and means operated by the detecting mechanism to effect loom stoppage.

6. In a filling replenishing loom, the combination of the lay and shuttle boxes, a feeler mechanism having a feeler movable with the lay and adapted to assume its feeling position only when the shuttle is in the box adjacent the feeler, a normally inoperative finger adapted to initiate filling replenishment when the filling in the shuttle has become practically exhausted, the weft hammer, and means between the finger and feeler to move the finger into operative relation with the weft hammer when the filling has become practically exhausted, and means to stop the loom when the filling breaks or fails.

7. In a filling replenishing loom, the combination of the lay and shuttle boxes, a feeler mounted on the lay, a spring connected with the feeler, and means for causing the spring to move the feeler in the performance of its feeling function as the lay beats up with the shuttle in the shuttle box adjacent the feeler, and means for effecting filling replenishment when the filling in the shuttle is substantially exhausted.

8. A feeler motion for looms, comprising, in combination, a feeler, spring means normally acting to hold the feeler retracted from feeling position, and yielding means rendered effective to move the feeler to feeling position on a detecting beat by entrance of the shuttle into the box adjacent the feeler.

9. In a filling replenishing loom, the combination of the lay, a shuttle box having a wall adapted to be moved outward by the shuttle as it enters the box, a feeler to feel for the filling in the shuttle, and means in-

cluding a yielding element operative only when the wall of the shuttle box is moved outward to cause the feeler to perform its feeling function.

10. In a filling replenishing loom, the combination of the lay and shuttle boxes, a feeler, means operative only when the shuttle is in the box adjacent the feeler to cause the feeler to feel for the filling in the shuttle as the lay beats up, a controller carried by the lay, means for changing the position of the controller when the feeler indicates substantial exhaustion of filling in the shuttle, and normally inoperative means rendered operative by the controller as the lay beats up to initiate filling replenishment.

11. In a filling replenishing loom, the combination of the lay and shuttle boxes, a feeler mounted on the lay to feel through the wall of the shuttle-box for the filling in the shuttle, a controller movable with the lay and adapted to be moved from inoperative to operative position when the feeler finds the filling substantially exhausted, means for normally retaining the feeler in retracted or non-feeling position, means rendered effective on the forward movement of the lay when the shuttle is in the box adjacent the feeler for giving the feeler its feeling movement, and means normally in inoperative position and moved to operative position to effect filling replenishment when the controller is operatively positioned by the feeler.

12. In a filling replenishing loom, the combination of the lay, a shuttle box having a front wall adapted to be moved outward by the shuttle as it enters the box, a feeler mounted on the lay and normally held in retracted or non-feeling position, a spring connected to the feeler and adapted to be engaged by the front wall of the shuttle box when it is moved outward by the shuttle, and means to act upon said spring as the lay beats up to impart to the feeler its feeling movement.

13. In a filling replenishing loom, the combination of the lay, a shuttle box having a front wall adapted to be moved outward by the shuttle as it enters the box, a feeler mounted on the lay and normally held in retracted or non-feeling position, a spring connected to the feeler and adapted to be engaged by the front wall of the shuttle box when it is moved outward by the shuttle, and an adjustable bunter to act upon the spring as the lay beats up to impart to the feeler its feeling movement.

14. In a filling replenishing loom, the combination of a feeler, yielding means acting normally to hold the feeler in non-feeling position, and means rendered effective for exerting yielding pressure upon the feeler in the opposite direction to cause the feeler to perform its feeling function by entrance of the shuttle into the box adjacent the feeler on a detecting beat.

15. In a filling replenishing loom, the lay and shuttle boxes, a feeler mounted on the lay and normally held in retracted or non-feeling position, a member carried by the lay and connected to the feeler, a bunter for engaging said member as the lay beats up, and means for rendering the engagement of the said member and bunter effective to impart the feeling function to the feeler only when the shuttle is in the box adjacent the feeler.

16. In a filling replenishing loom, the lay and shuttle boxes, a feeler mounted on the lay and normally held in retracted or non-feeling position, a member carried by the lay and connected to the feeler, a bunter for engaging said member as the lay beats up, means for rendering the engagement of the said member and bunter effective to impart the feeling function to the feeler only when the shuttle is in the box adjacent the feeler, and means permitting the bunter to be moved to an inoperative relation with said member to thereby render the feeler inoperative.

17. In a filling replenishing loom, the combination of a feeler mounted on the lay, means for causing the feeler to feel through the front wall of the shuttle box for the filling in the shuttle only when the shuttle is in the box adjacent the feeler, a filling detector mounted on the loom frame to detect the absence of filling, means common to the feeler and detector mechanisms for initiating filling replenishment upon exhaustion of the filling to a predetermined extent and upon breakage or failure of filling, means for throwing the feeler mechanism out of operation when it is desired to replenish by the detector mechanism alone, means for throwing the detector mechanism out of operative condition for effecting filling replenishment when it is desired to replenish by the feeler mechanism alone.

18. In a filling replenishing loom, the combination of the lay and shuttle box, a bracket mounted on the lay, a feeler mounted for rectilinear movement on said bracket, and normally held retracted frontwardly from feeler position, means acting to move the feeler backwardly to feeler position when the shuttle is in the adjacent shuttle box, a controller movable with the lay and adapted to be moved by the feeler when the filling has become exhausted to a predetermined extent, a finger normally held in inoperative position, the weft hammer, and means between the controller and finger to move the latter into operative position with relation to the weft hammer when the controller has been moved by the feeler.

19. In a filling replenishing loom, the combination of the lay and shuttle box,

a bracket mounted on the lay, a feeler mounted for rectilinear movement on said bracket, means normally acting to hold the feeler in retracted or non-feeling position, means for moving the feeler to feel for the filling through the wall of the shuttle box when the shuttle is in the box adjacent the feeler, a controller pivoted on said bracket and adapted to be moved by the feeler when substantial exhaustion of the filling permits the feeler to move an increased distance into the shuttle, and means positioned by the controller to cause initiation of filling replenishment.

20. In a filling replenishing loom, the combination of a feeler mounted to pass through the front wall of the shuttle and shuttle-box and feel for the filling, means normally acting to hold the feeler in non-feeling position, and a part carried by the lay and moved by entrance of the shuttle into the box adjacent the feeler to render the feeler operative to feel for the filling.

21. In a filling replenishing loom, the combination of a feeler mounted for movement toward the rear of the loom in the performance of its feeling function, a spring acting normally to hold the feeler in frontward non-feeling position, a second spring connected to the feeler, and means including a part moved by the entrance of the shuttle into the shuttle-box for placing the second spring under tension to overcome the force of the normally acting spring and yieldingly move the feeler rearwardly to feeling position on a detecting beat.

22. In a filling replenishing loom, the combination of a feeler, a bunter and cooperating means to yieldingly move the feeler to cause it to perform its feeling function on a detecting beat, a detector and its slide to detect the absence of filling, a slide bar carried by the detector slide and having a block, an actuator controlled in its position by said block to cause filling replenishment or loom stoppage, and means for detachably securing the block on the slide bar.

23. In a filling replenishing loom, a detector slide carrying a filling detector, a controller carried by the slide, a slide bar mounted on the slide, and having a series of teeth on its under side, a block detachably secured to the slide bar, and a pawl below the slide bar adapted to act upon the series of teeth when the slide is moved.

24. In a filling replenishing loom, the combination of a feeler to feel for the filling in the shuttle, a spring normally acting to hold the feeler in non-feeling position, the lay having a shuttle-box provided with a wall adapted to be moved outward by entrance of the shuttle into the shuttle-box, means connected to the feeler and made effective to move the feeler by outward movement of the shuttle-box wall, and a device for actuating said means on a detecting beat when said means has been rendered effective.

25. In a filling replenishing loom, the combination of the lay and shuttle-box, a feeler mounted on and movable with the lay for effecting filling replenishment when the filling is substantially exhausted, stopping mechanism, detecting mechanism mounted independently of the lay for effecting loom stoppage when the filling breaks or fails, and means for rendering the feeler inoperative at will.

26. In a filling replenishing loom, the combination of the lay and shuttle-box provided with a movable shuttle binder, a feeler to feel for the filling in the shuttle, means for normally maintaining the feeler inoperative, and means rendered operative by outward movement of the shuttle-binder as the shuttle enters the box for imparting to the feeler its feeling function on a detecting beat.

27. In a filling replenishing loom, the combination of the lay, the shuttle-box having a binder adapted to be moved outwardly as the shuttle enters the shuttle-box, a feeler, means rendered operative by outward movement of the binder to move the feeler to feel for the filling in the shuttle, and a device for operating said means when on a detecting beat the said means has been rendered operative by outward movement of the binder.

28. In a filling replenishing loom, the combination of the lay and shuttle-box, a feeler normally held in non-feeling position and movable rearwardly to enter the side of the shuttle and feel for the filling, and means rendered operative to cause the feeler to enter the side of the shuttle by entrance of the shuttle into the shuttle-box.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM H. BAKER.

Witnesses:
S. R. A. ALLEN,
G. M. MORELAND.