A. E. RHOADES.

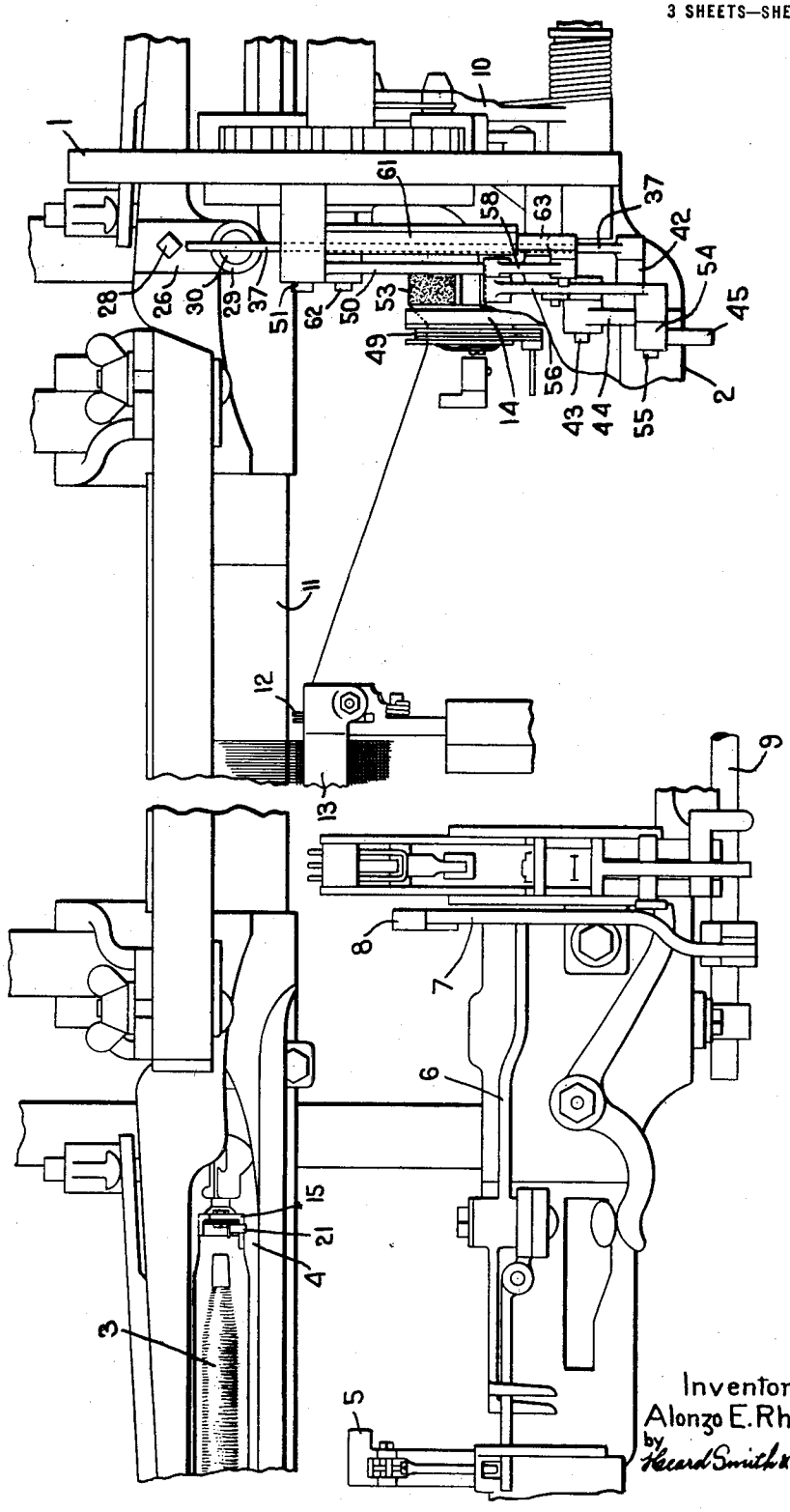
FILLING SEVERING MEANS FOR AUTOMATIC FILLING REPLENISHING LOOMS.

APPLICATION FILED AUG. 5, 1920.

1,395,012. Patented Oct. 25, 1921.

3 SHEETS—SHEET 1.

Fig.1.



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3 SHEETS—SHEET 2.

Fig. 2.

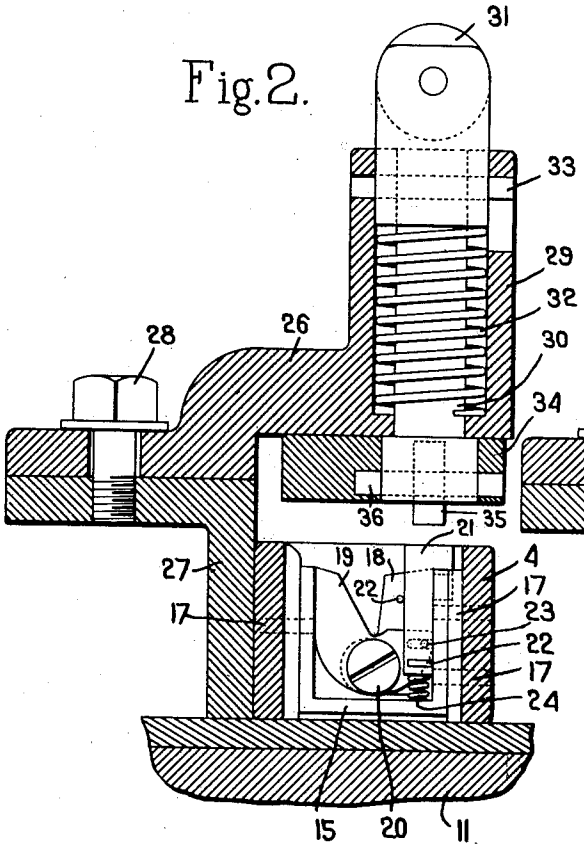


Fig. 3.

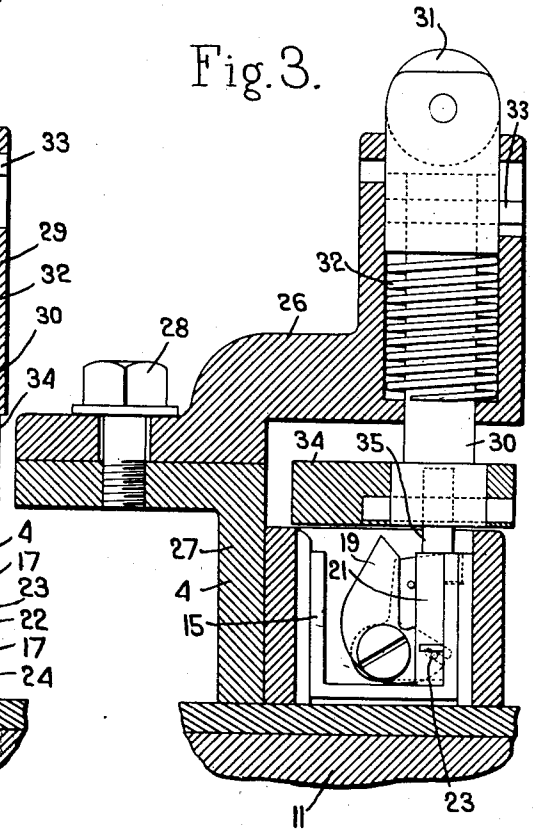
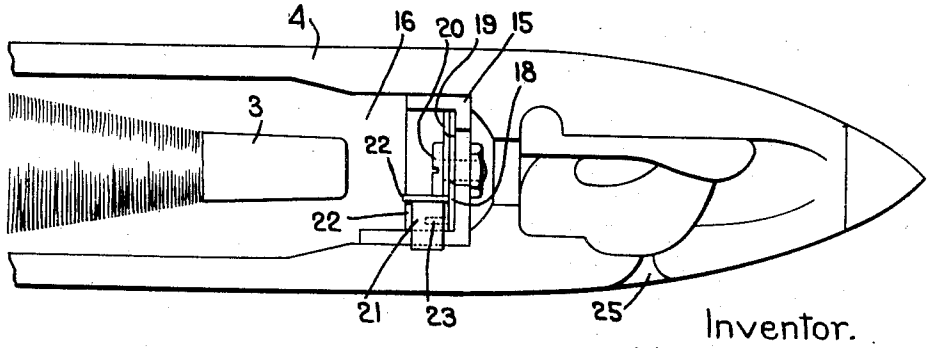


Fig. 4.



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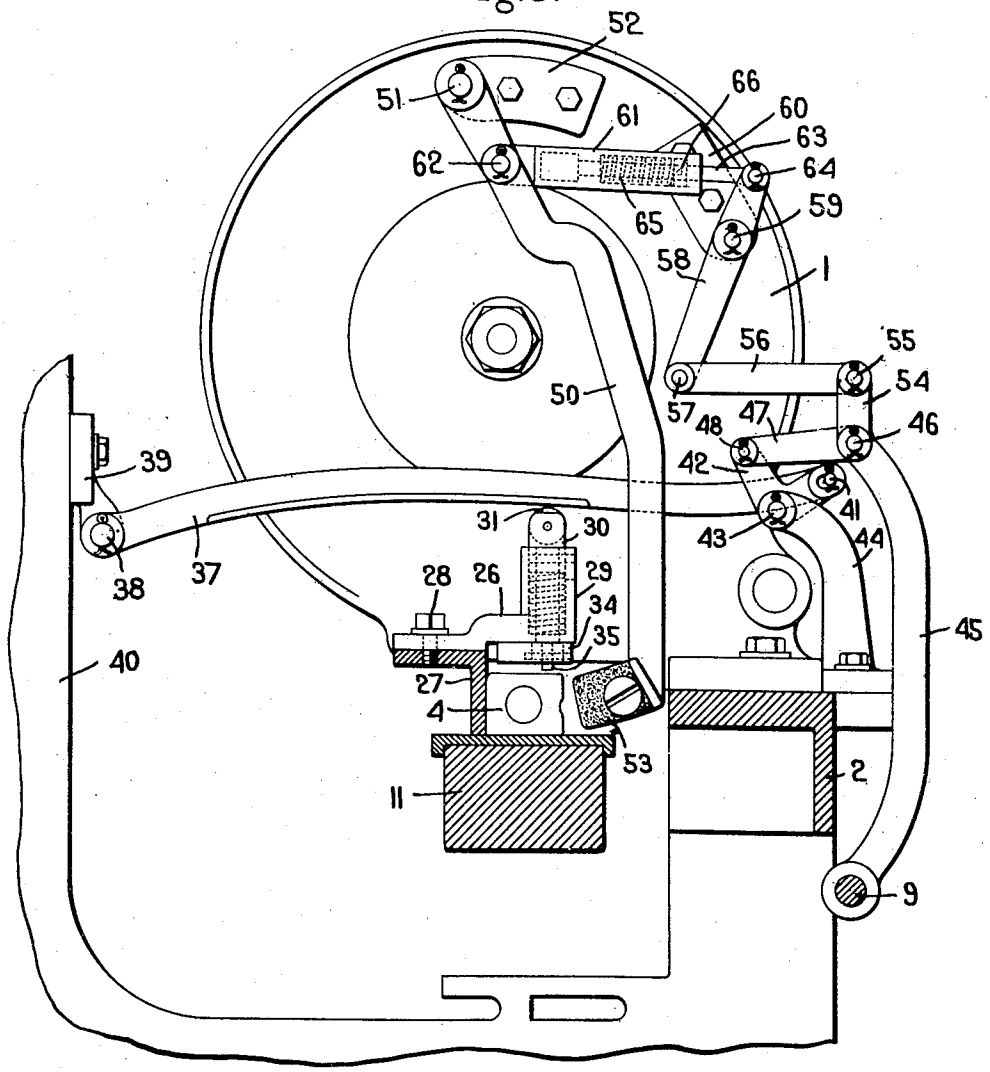
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3 SHEETS—SHEET 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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FILLING-SEVERING MEANS FOR AUTOMATIC FILLING-REPLENISHING LOOMS.

1,395,012. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed August 5, 1920. Serial No. 401,493.

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Filling-Severing Means for Automatic Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to an automatic filling replenishing loom and is particularly concerned with means for severing and controlling the severed ends of the substantially exhausted filling carrier of the running shuttle.

The object of the invention is to sever the filling in the running shuttle when replenishment takes place so that there will be no end extending from the substantially exhausted filling carrier to be caught by the shuttle and carried back, or otherwise carried back, into the shed.

The object of the invention is further to sever the filling in the shuttle by a filling cutter mounted in the shuttle and preferably in the filling carrier recess of the shuttle so that the filling is severed between the shuttle eye and the filling carrier, thus leaving no end extending from the substantially exhausted filling carrier out through the shuttle eye and permitting the filling end, extending from the fell, readily to be withdrawn from the shuttle eye and, preferably, by the action of the shuttle in completing its pick to transferring position at the transfer end of the lay.

The object of the invention is further to provide means for seizing the severed filling end extending from the shuttle eye to the fell and maintaining it in position to be seized by a filling clamping means such as a filling clamping means carried by the usual shuttle feeler.

The object of the invention is further to provide means having a filling-adherent surface, such as felt, preferably controlled by the filling replenishing means or the means for initiating filling replenishment, such for example as the starter rod, for seizing the severed filling end extending from the shuttle eye and maintaining it in position to be seized by the filling clamping means.

The object of the invention is further to provide a simple and efficient form of means for actuating the cutter mounted in the shuttle.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

In the drawings:

Figure 1 is a top plan view of an automatic filling replenishing loom embodying a preferred form of the present invention and with parts thereof unnecessary to a disclosure of the invention broken away.

Fig. 2 is an enlarged transverse section taken through the lay and shuttle showing the actuator for the filling cutter in the shuttle in normal inoperative position.

Fig. 3 is a view similar to Fig. 2 showing the actuator in operative position and having closed or operated the cutter.

Fig. 4 is a top plan view of the end of a shuttle provided with a cutter embodying the invention.

Fig. 5 is a transverse section of the loom shown in Fig. 1 taken immediately to the right of the shuttle feeler and looking toward the right of the loom.

The preferred form of the invention illustrated is shown in connection with an automatic filling replenishing loom of the "Northrop" type and as the construction of the "Northrop" loom is well known and familiar to those skilled in the art no detailed illustration or description of those parts not immediately concerned with the present invention is necessary.

In this type of loom there is provided at one end, known as the transfer end, a supply of fresh filling carriers or bobbins. For this purpose a rotary hopper is provided, the end plate 1 of the hopper stand being shown as mounted on the breast beam 2. At the opposite end, and mounted upon the breast beam, there is provided a suitable feeler mechanism to feel the condition of the filling on the running filling carrier 3 in the shuttle 4 when boxed at the detecting end of the loom. For this purpose a feeler 5 of the familiar type is shown. When the filling in the running shuttle has become substantially exhausted the feeler is moved or positioned to actuate a controller 6 to move

a latch 7 into the path of the weft hammer 8 and effect the actuation or rocking of a starter rod 9 which runs the length of the loom at the front of the breast beam 2. This rocking movement of the starter rod is utilized to initiate the filling replenishing action. When this rod is rocked the transferrer 10 swings downwardly forcing a fresh filling carrier, contained in the hopper 1, into the shuttle then boxed at the transfer end of the lay 11 and discharging from the shuttle the substantially exhausted filling carrier.

It is obvious that the filling extends from the fell of the cloth through the shuttle eye to the filling carrier discharged from the shuttle and much study and attention has been directed to the disposal of this filling end for the purpose of insuring that it shall be properly severed and that no portion of it shall be held or caught by the shuttle or by a moving part of the loom, or by the fresh filling carrier, and thrown or whipped back into the shed, thus causing an imperfection in the cloth being woven.

It has long been common to provide a cutting instrumentality for severing the filling end adjacent the selvage. Such a selvage filling severing means 12 is commonly carried by the temple 13 and acts at each forward beat of the lay to sever any filling coming within its field of operation.

It has also long been common to provide a shuttle feeler 14 which at the time of filling replenishment is thrown rearwardly across the path of the shuttle and which, if the shuttle is not properly boxed at the transfer end of the lay, prevents filling replenishment taking place. This shuttle feeler is commonly utilized to carry a filling clamping and severing means which acts to sever the filling and clamp the end running to the fell and upon its forward movement to carry this end into the path of the temple cutter 12.

The other end of the filling is thus left running for a considerable distance to the eye of the shuttle and thence to the filling carrier in the shuttle so that when this filling carrier is discharged from the shuttle upon replenishment this end has to be drawn by the filling carrier through the shuttle eye. If it is not entirely thus withdrawn it may be, and not infrequently is, held by the shuttle, caught by the fresh filling carrier introduced into the shuttle, or caught by some moving part of the loom and carried by the shuttle upon its return pick into the shed, thus causing an imperfection.

In the present invention a filling severing means is mounted in the shuttle itself and preferably within the recess of the shuttle in which is mounted the filling carrier. This filling severing means is thus located between the eye of the shuttle and the filling carrier in the shuttle. When it is actuated, therefore, to sever the filling, the end running therefrom to the substantially exhausted filling carrier cannot be caught or held by the shuttle and is readily cleared from the shuttle upon the discharge of the filling carrier.

The distance from this filling severing means to the shuttle eye is very short so that the end extending out through the shuttle eye is readily cleared from the shuttle by the filling clamping means or other device employed for handling this end exteriorly of the shuttle. In the preferred form of the invention this filling severing means in the shuttle functions before the shuttle completes its pick. Consequently the end is drawn from the shuttle eye as the shuttle completes its pick and this end is also considerably shorter than if this filling severing means functioned when the shuttle was boxed. Thus the present invention prevents any possibility of the severed ends of the filling, from the substantially exhausted filling carrier, being carried into the shed.

But, it will be seen that the action of a filling clamping means, or a filling clamping and severing means, such as that commonly employed and carried by the shuttle feeler, is dependent upon the filling extending in a definite path, or taut, from the selvage across the path of the filling clamping and severing means. Otherwise this filling clamping means might pass over or under the filling and fail to function. The present invention, therefore, provides a means for seizing the severed filling end extending from the shuttle eye and maintaining it in position to be seized by the filling clamping means. In the preferred form illustrated a device is employed having a filling-adherent surface which clamps this filling end against the face of the shuttle. The shuttle in completing its pick rubs and embeds the end into the filling-adherent surface and the device then swings forwardly carrying the filling end with it.

In the preferred construction illustrated the cutter within the shuttle and the device for seizing and maintaining the filling end in the path of the filling clamping means are both conveniently operated from the starter rod 9.

The cutter for the shuttle is mounted in a frame 15 fitted into the recess 16 preferably transversely of the shuttle and beyond the end of the filling carrier 3. This frame may be pinned in place as by pins 17. The cutter is shown as made in two parts, a fixed blade 18 having a substantially vertical cutting edge and a coöperating pivoted blade 19. A bolt 20, passing through the two blades, secures them together and permits swinging movement of the pivoted blade 19.

A plunger 21 slides against one vertical face of the frame 15 and is guided by pins 22 and by its head sliding in a vertical recess in the side of the frame 15. This plunger has a pin and slot connection 23 with a portion of the movable cutter blade 19 extending at the opposite side of the pivot 20 from the cutting edge and normally projected upwardly to maintain the movable cutter blade open by a helical spring 24. During the ordinary operation of the loom the filling runs from the filling carrier 3 between the cutting blades without contacting therewith and out through the usual shuttle eye 25.

An actuator is provided, mounted upon the lay, for operating the plunger 21 to actuate the cutter in the shuttle. For this purpose a bracket 26 is mounted upon the lay, preferably by being secured to a flange on the shuttle box 27 at the transfer end of the loom, by a bolt 28. This bracket is located near the mouth of the shuttle box so that the actuation of the cutter takes place as the shuttle enters the box or during the conclusion of the pick of the shuttle, so that as the shuttle completes its pick, that portion of the filling end extending from the cutter out through the eye of the shuttle is withdrawn from the shuttle.

The bracket 26 carries a vertical sleeve 29, preferably formed integrally therewith. In this sleeve is mounted a plunger 30 having at its upper end an anti-friction roll 31. This plunger is normally projected upwardly by a helical spring 32 and its upward movement is limited by a pin 33. At its lower end the plunger 30 carries a head 34 in which is journaled a roll 35 on an axis 36 transversely of the lay. This roll 35 is in line with the path of the head of the plunger 21 carried in the shuttle. It will thus be seen that, if the plunger 30 be held downwardly against the action of the spring 32, when the plunger 21, carried by the shuttle, passes during the pick of the shuttle beneath it, it will press the plunger 21 down, thus actuating the cutter to sever the filling. The parts are shown in normal inoperative position in Fig. 2, while in Fig. 3 the plunger 30 is shown thus pressed down and having actuated the cutter to sever the filling.

Suitable means are provided in the preferred form of this invention for positioning the actuator or plunger 30 to effect the actuation of the cutter under the control of the starter rod 9. For this purpose a positioner member in the form of an arm 37 is provided pivoted at 38 to a bracket 39 secured to some fixed portion of the loom frame, such as the arch 40. This positioner arm 37 extends transversely of the loom above the anti-friction roll 31 of the actuator plunger 30 and at its forward end has a pin and slot connection 41 to a bell crank lever 42 pivoted at 43, on a bracket 44 extending up from the breast beam 2. The starter rod 9 is provided with an arm 45 pivotally connected at 46 to a link 47 in turn pivotally connected at 48 to the bell crank lever 42. It will thus be seen that when the filling replenishing action of the loom is initiated, as by the operation of the feeler 5, and the starter rod 9 is rocked, the arm 45 will swing forwardly, thus rocking the bell crank lever 42 and depressing the positioner arm 37. This in turn depresses the actuator plunger 30 and consequently, as the shuttle, containing the substantially exhausted filling carrier, enters the shuttle box at the transfer end of the lay, the cutter within the shuttle is actuated to sever the filling.

But it will be seen that with the filling thus severed, when the shuttle has completed its pick, the filling end extending to the fell would be withdrawn from the shuttle and would be in a loose condition. Consequently, as the shuttle feeler 14 is swung rearwardly, carrying a filling clamping or a filling clamping and parting means 49, this loose filling end might, and probably would, not be in a position to be seized thereby. Consequently, the present invention also provides means for seizing and maintaining this filling end in the path of the filling clamping means, such as that carried by the shuttle feeler.

In the preferred construction illustrated an arm 50 is pivotally mounted at 51 in a bracket 52 secured to the hopper disk 1. This arm is mounted to swing forwardly and rearwardly, preferably adjacent the path of the shuttle feeler 14, and carries at its lower end a block 53 of filling-adherent material, such as felt. Normally, this arm 50 stands in a forward position, but when the replenishing action takes place it is swung rearwardly, bringing the filling-adherent surface of the block 53 against the face of the shuttle, thus clamping the filling thereto. The filling is thus embedded into the filling-adherent material and, preferably, rubbed in as the shuttle completes its pick. The filling is thus held in position so that it will thereupon be seized by the filling clamping means on the shuttle feeler. This arm 50 is also, in the preferred form illustrated, controlled in its actuation by the starter rod 9. For that purpose the arm 45 is prolonged at 54 and the prolongation pivoted at 55 to a link 56. This link is pivoted at 57 to a lever 58 fulcrumed at 59 to a bracket 60 mounted on the hopper disk 1. The lever 58 is connected by a link to the arm 50. Preferably this link is resilient and for that purpose is shown as comprising a cylinder 61 pivoted at 62 to the arm 50 and a plunger 63 pivoted at 64 to the lever 58. A

helical spring 65 is seated in the cylinder 61 and abuts a collar 66 on the plunger. Consequently, when the starter rod 9 is rocked upon the initiation of the filling replenishment, the arm 45 swings forwardly, pulling the link 56 forwardly, rocking the upper end of the lever 58 rearwardly, and thus through the yielding link 61, 63, yieldingly swinging the arm 50 rearwardly to cause the block 53 to clamp the filling against the shuttle.

This device also acts to insure the filling end seized by it being carried forward and dropped at a point where it will be clear of any moving part which might carry it back into the shed. This device functions, also, it will be noted, regardless of the point at which the filling is severed adjacent or in the vicinity of the eye of the shuttle and regardless of the length of the end extending from its adherent surface in the direction of the shuttle eye.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carried upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, and means operated by the movement of the shuttle and controlled by the replenishing means for actuating the cutter to sever the filling in the shuttle.

2. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, and means for actuating the cutter to sever the filling in the shuttle during the conclusion of the pick of the shuttle to the transfer end of the lay whereby the filling extending through the shuttle eye will be withdrawn from the shuttle upon the completion of the pick.

3. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, and means for severing the filling in the shuttle between the shuttle eye and the filling carrier during the conclusion of the pick of the shuttle to the transfer end of the lay whereby the filling extending through the shuttle eye will be withdrawn from the shuttle upon the completion of the pick.

4. An automatic filling replenishing loom comprising the construction defined in claim 2, together with filling clamping means movable toward and from the lay to clamp the filling extending from the fell to the substantially exhausted filling carrier and carry the filling forward into the path of the selvage filling severing means, and means also controlled by the replenishing means and acting to seize the severed filling end extending from the shuttle eye and maintain it in position to be seized by the filling clamping means.

5. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, an actuator for the cutter mounted on the lay at the transfer end, and means controlled by the replenishing means for positioning the actuator to effect the actuation of the cutter during the conclusion of the pick of the shuttle to the transfer end of the lay.

6. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, an actuator for the cutter mounted on the lay at the transfer end, and means actuated upon the initiation of filling replenishment for positioning the actuator to effect the actuation of the cutter during the conclusion of the pick of the shuttle to the transfer end of the lay.

7. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, an actuator for the cutter mounted on the lay at the transfer end, a positioner member mounted on the loom frame, means for initiating the action of the filling replenishing means, and connections from said initiating means to the positioner member acting to position the same in turn to position the actuator to effect the actuation of the cutter during the conclusion of the pick of the shuttle to the transfer end of the lay.

8. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial ex-

haustion of the running filling, a filling cutter mounted in the shuttle, an actuator for the cutter mounted on the lay at the transfer end, a positioner arm pivotally mounted on the loom frame and extending over the path of the actuator, means for initiating the action of the filling replenishing means, and connections from said initiating means to the positioner arm acting to position the same in turn to position the actuator to effect the actuation of the cutter during the conclusion of the pick of the shuttle to the transfer end of the lay.

9. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, a starter rod, which when rocked initiates the action of the filling replenishing means, means for rocking the starter rod upon the occurrence of substantial exhaustion of the running filling, a filling cutter mounted in the shuttle, an actuator for the cutter mounted on the lay at the transfer end and normally held out of actuating position, a positioner arm pivotally mounted on the loom frame and extending over the actuator, and connections from the starter rod to the positioner arm acting upon the rocking of the starter rod to move the actuator into actuating position to cause the actuator to operate the cutter to sever the filling in the shuttle during the conclusion of the pick of the shuttle to the transfer end of the lay.

10. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, means for severing the filling in the shuttle between the shuttle eye and the filling carrier during the conclusion of the pick of the shuttle to the transfer end of the lay for replenishment, selvage filling severing means, filling clamping means movable toward and from the lay to clamp the filling extending from the fell to the substantially exhausted filling carrier and carry the filling forward into the path of the selvage filling severing means, and means acting to seize the severed filling end extending from the shuttle eye and maintain it in position to be seized by the filling clamping means.

11. An automatic filling replenishing loom comprising a lay and a shuttle reciprocable thereon, means for replenishing the shuttle with a fresh filling carrier and discharging from the shuttle the exhausted filling carrier upon the occurrence of substantial exhaustion of the running filling, means for severing the filling in the shuttle between the shuttle eye and the filling carrier during the conclusion of the pick of the shuttle to the transfer end of the lay for replenishment, selvage filling severing means, a shuttle feeler, filling clamping means movable toward and from the lay to clamp the filling extending from the fell to the substantially exhausted filling carrier and carry the filling forward into the path of the selvage filling severing means, and means provided with a filling adhering surface acting to seize the severed filling end extending from the shuttle eye and maintain it in position to be seized by the filling clamping means.

12. An automatic filling replenishing loom comprising the construction defined in claim 5, together with filling clamping means movable toward and from the lay to clamp the filling extending from the fell to the substantially exhausted filling carrier and carry the filling forward into the path of the selvage filling severing means, and means also controlled by the replenishing means and acting to seize the severed filling end extending from the shuttle eye and maintain it in position to be seized by the filling clamping means.

13. An automatic filling replenishing loom comprising the construction defined in claim 7, together with filling clamping means movable toward and from the lay to clamp the filling extending from the fell to the substantially exhausted filling carrier and carry the filling forward into the path of the selvage filling severing means, means acting to seize the severed filling end extending from the shuttle eye and maintain it in position to be seized by the filling clamping means, and connections from said initiating means to the said seizing means to position the same for action.

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

ALONZO E. RHOADES.