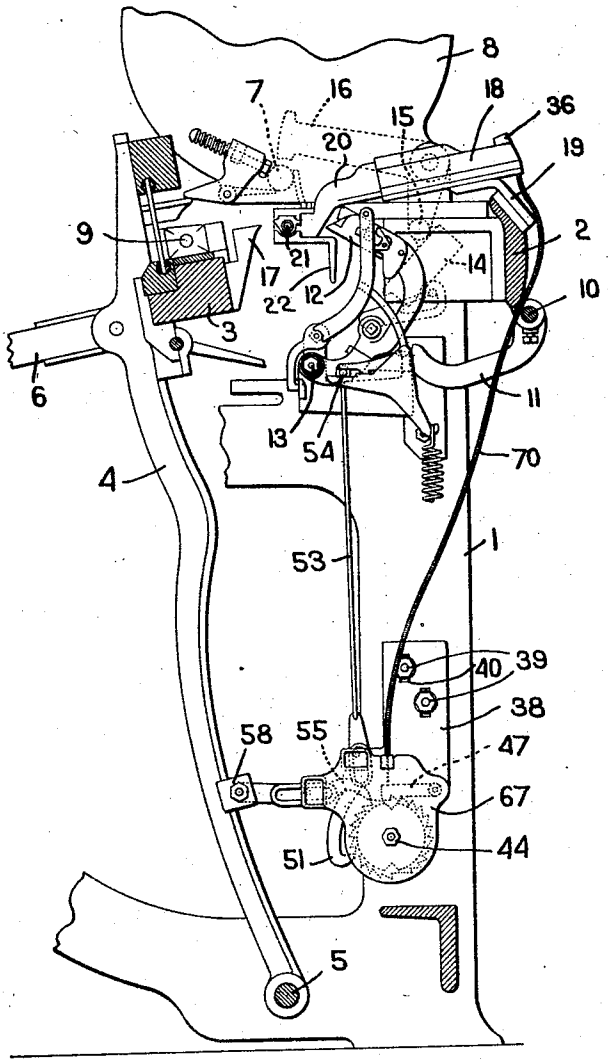
Sept. 1, 1925. 1,552,016

E. S. STIMPSON

THREAD CUTTING TEMPLE FOR LOOMS

Filed Sept. 19, 1924 3 Sheets-Sheet 1

Fig. 1.



Inventor.

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By Wallace I. Stimpson, executor

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Fig.2.

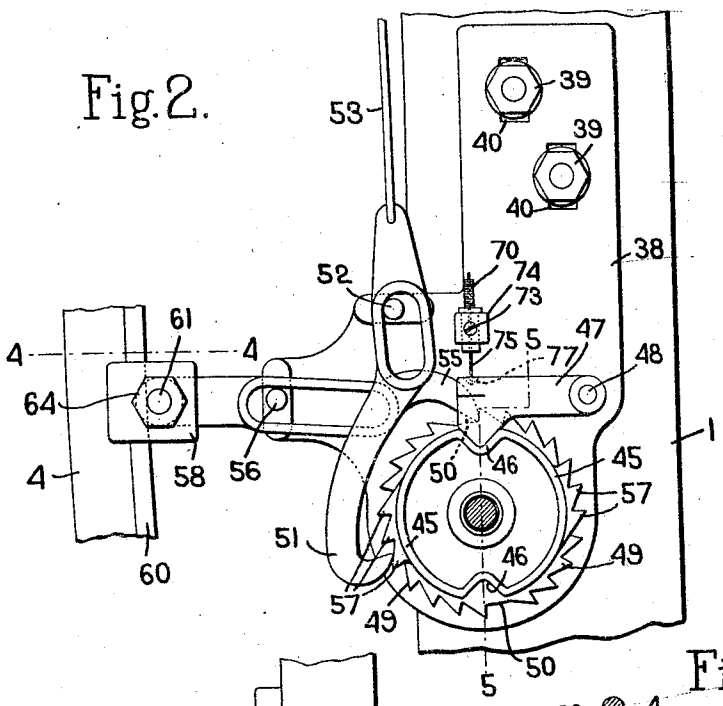

Fig.3.

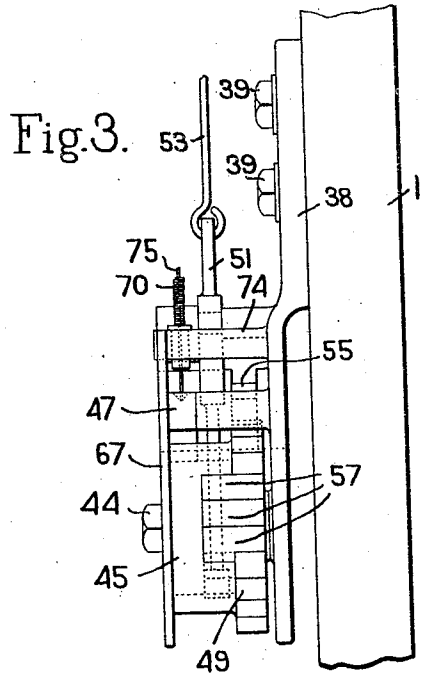

Fig.4.

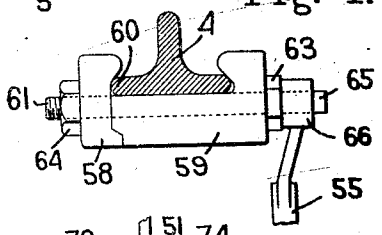

Fig.5.

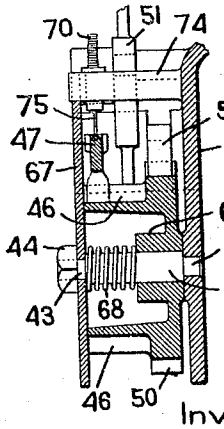

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Fig.6.

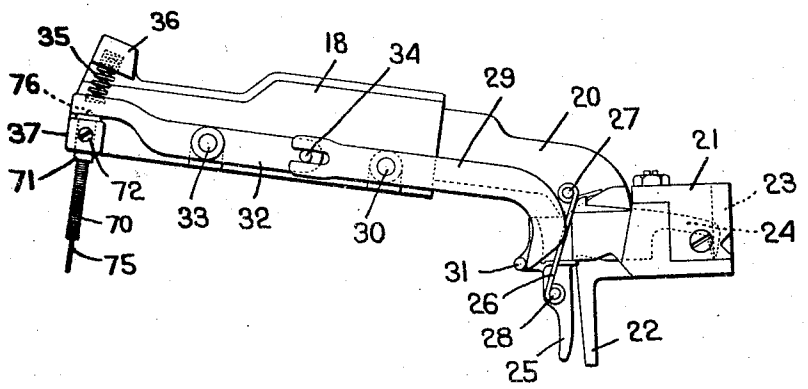
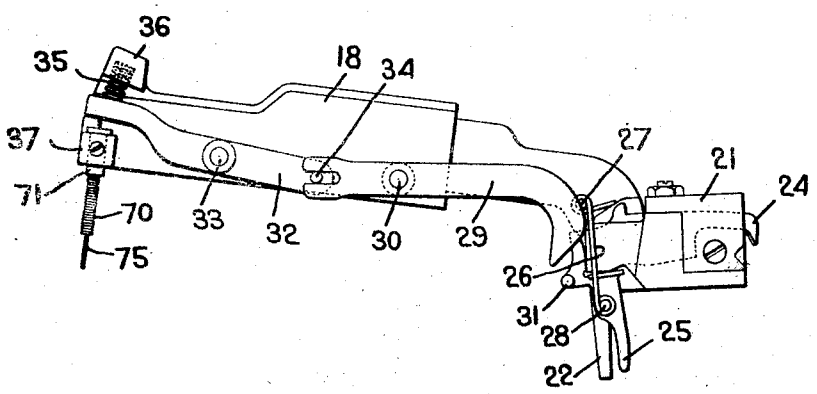


Fig.7.



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Patented Sept. 1, 1925. 1,552,016

UNITED STATES PATENT OFFICE.

EDWARD S. STIMPSON, DECEASED, LATE OF HOPEDALE, MASSAÇHUSETTS; BY WALLACE I. STIMPSON, EXECUTOR, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

THREAD-CUTTING TEMPLE FOR LOOMS.

Application filed September 19, 1924. Serial No. 738,682.

To all whom it may concern:

Be it known that EDWARD S. STIMPSON, deceased, late of Hopedale, Massachusetts, did invent an Improvement in Thread-Cutting Temples for 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 a thread cutting temple for looms of the automatic filling replenishing type.

The object of the invention is to provide such a temple in which the thread cutting mechanism shall be operative for a predetermined period after the operation of the filling replenishing mechanism and shall then be rendered inoperative until the next call for filling replenishment, or in other words, an intermittently operative thread cutting temple.

The well-known purpose of the thread cutting temple is to cut off close to the selvage the filling ends left after replenishment of the filling. One end is left by the discharged filling carrier and another end is left extending from the first pick made by the fresh filling carrier. Notwithstanding the fact that replenishment of filling only takes place occasionally during the operation of the loom, it is the usual practice for the cutting mechanism carried by the temple to be operated at each beat up of the lay. Hence the cutting mechanism is subject to a large amount of unnecessary wear. While means have heretofore been provided for rendering the operation of the cutting mechanism intermittent so as to act only for short periods after replenishment, or after the call for replenishment, such means have been associated so closely with the temple itself as to render it necessary to provide a comparatively small and more or less delicate mechanism.

The main object of this invention is to provide a mechanism which shall be made relatively large and rugged and of such nature so as to stand up under the wear and shock of the loom operation.

This main object of the invention is secured by mounting a controller or controlling mechanism on a fixed part of the loom. This enables it to be placed at any convenient position and to be made of large size and of rugged construction. This controller has an operative effecting position and an inoperative effecting position, and it is movable when in, and without affecting, the operative effecting position. Suitable means are provided actuated by or through the movement of the replenishing mechanism to shift this controller from its inoperative effecting position to its operative effecting position. Means are also provided actuated by a moving part of the loom, such as the lay, to move the controller gradually through its operative effecting position into its inoperative effecting position. Thus both of these means may be made of a relatively large size and of rugged construction. The controlling movements of the controller are transmitted through suitable transmitting mechanism, preferably of a flexible nature, from the fixed location of the controller, wherever situated, to the filling cutting mechanism carried by the movable temple and movable itself with respect to the temple.

The invention thus provides a principle of construction involving the controller mounted in fixed position, the filling cutting mechanism mounted on the movable temple and itself movable with respect to the temple, and the transmitting mechanism which enables the desired intermittent operation of the cutting mechanism to be secured efficiently and which enables the mechanism to be made of durable and rugged construction.

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.

As the general operation and construction of the automatic filling replenishing loom and of the thread cutting temple are well known and familiar to those skilled in the art, it is only necessary to illustrate and describe in detail those parts directly concerned with the present invention.

The drawings, therefore, illustrate so much of a filling replenishing loom of the well-known Northrop type as is sufficient to disclose a preferred form of the present invention.

In the drawings:

Fig. 1 is a view partially in vertical cross section looking toward the inside of the loom toward the replenishing side with parts broken away or removed.

Fig. 2 is a view similar to Fig. 1 on a larger scale, showing the controller and its connections, with the casing of the controller removed.

Fig. 3 is a front elevation of the construction shown in Fig. 2 with the casing in place.

Fig. 4 is a view in horizontal cross section taken on line 4—4 of Fig. 2.

Fig. 5 is a view in cross section taken on the line 5—5 of Fig. 2.

Fig. 6 is a view in side elevation of the temple looking at the side opposite to that shown in Fig. 1 and with the thread cutting mechanism shown in inoperative position.

Fig. 7 is a view similar to Fig. 6 with the thread cutting mechanism shown in operative position.

The loom comprises the usual frame having the side frames, 1, only one of which is illustrated, connected at the front by the breast beam, 2. The lay, 3, is carried by the lay swords, 4, pivoted on the shaft, 5, extending between the side frames, 1, and is swung toward and from the breast beam by the usual connection, 6. The supply of fresh filling carriers, 7, is maintained in a hopper, 8, mounted at the replenishing side of the frame. When the filling in the running shuttle, 9, is substantially exhausted, suitable detecting mechanism actuates the intermittent filling replenishment by rocking in a clock-wise direction the rock shaft, 10.

In the form of the loom illustrated, when the shaft, 10, is rocked, it raises the arm, 11, connected thereto and this arm in turn swings the shuttle-feeler, 12, rearwardly about its pivot, 13. When the shuttle-feeler, 12, is thus swung rearwardly, it raises a dog, 14, pivoted at 15 to the transferrer, 16, so as to bring this dog into the path of a bunter, 17, carried by the lay. Consequently, as the lay beats up after the call for replenishment, the bunter, 17, strikes the dog, 14, and causes the transferrer, 16, to swing downwardly and force the fresh filling carrier, 7, into the shuttle, 9, and discharge from the shuttle the exhausted filling carrier.

While the foregoing mechanism, specifically considered, forms no part of the present invention, it is described somewhat in detail because, in the particular embodiment of the illustration, the movement of the shuttle-feeler is conveniently utilized to effect the shifting of the controller into the operative effecting position and the movement of the lay is conveniently utilized to effect the movement of the controller into the inoperative effecting position.

The temple comprises the usual stand, 18, which is rigidly secured by a bracket, 19, to the breast beam, 2. In this stand is mounted the temple arm, 20, carrying at its forward end the temple head, 21, and the depending heel, 22, in the path of the lay. A spring, not shown, in the temple stand acts normally to project the temple rearwardly and on each beat up of the lay the heel, 22, is struck and the temple moved forwardly, all in the familiar manner.

The thread cutting mechanism is carried by the temple so as to have its field of operation close to the selvage and adjacent to the fell. This mechanism may be of any type. The important thing to note in connection with this invention is that this cutting mechanism is carried by the temple and is consequently bodily reciprocated with the temple with each beat up of the lay. It is also important to note that in order that this mechanism may have the required intermittent action, that is, be operative during certain predetermined periods and inoperative during the remaining time, it must have an operative position and an inoperative position. For convenience in illustrating the present invention, a familiar type of thread cutting mechanism is shown. It comprises a fixed vertical cutting blade, 23, in a slot in the temple head and a cooperative movable cutting blade, 24. The movable blade, 24, extends through the temple head, guided by a slot therein and is provided with a depending heel, 25. A spring, 26, connected to a stud, 27, on the temple arm, 20, and to a stud, 28, on the heel, 25, acts normally to project the movable blade, 24, rearwardly or into the position shown in Fig. 7. When thereafter the lay beats up, it strikes the heel, 25, and swings the movable blade, 24, downwardly and forwardly and the filling end caught between it and the fixed blade, 23, is sheared off close to the selvage.

It will thus be seen that, with this type of mechanism, each time the lay swings back the movable blade, 24, is projected by the spring rearwardly into operative position so that each time the lay beats up, the heel, 25, of the movable blade is struck and the cutting mechanism operated. But, as pointed out, this movement of the cutting mechanism is only necessary immediately after filling replenishment takes place, an operation which occurs at widely separated intervals in the operation of the loom.

In effecting a simple and preferred embodiment of the present invention in connection with the particular type of thread cutting temple illustrated, a simple form of detent latch is provided to retain the cutting mechanism in inoperative position. This detent latch, 29, is shown in the form of a lever fulcrumed at 30 on the temple stand,

18, and hook shaped at its rearward end to cooperate with a stud, 31, projecting from the forward end of the movable cutting member, 24. A second lever, 32, is fulcrumed at 33 on the temple stand and carries on its rearward end a stud, 34, engaging a slot in the forward end of the lever, 29. A helical spring, 35, seated at one end in a socket in a lug, 36, on the temple stand and seated at the other end in a socket in the forward end of the lever, 32, acts normally to press the forward end of the lever, 32, against a lug, 37, on the temple stand and thus to depress the hooked end of the detent latch, 29, into detaining engagement with the stud, 31. The transmitting means already referred to, and hereinafter described, acts to raise the forward end of the lever, 32, against the spring, 35, and thus to release the detent latch from the stud, 31.

The controller, or controlling mechanism, is essentially mounted on a fixed part of the loom and in a position where it can be made of large and rugged construction and be operated from this moving part of the loom. In the preferred construction illustrated, it is conveniently located at the bottom of the loom on the side frame, 1, where there is plenty of room and where it may be operated from a pawl carried by the lay.

This location is shown in Fig. 1, and the details of the specific form of the features illustrated are shown in Figs. 2–5, inclusive. A base plate or bracket, 38, is rigidly and adjustably secured as by means of the set screws, 39, passing through the slots, 40, therein, to the side of the frame, 1. The base plate, 38, has rigidly secured therein the reduced portion 41 of the stub shaft, 42, having a reduced threaded outer end, 43, upon which is mounted the nut, 44. Upon this shaft, 42, is mounted the main controlling element which is in the form of a combined cam and mutilated ratchet wheel. The cam is shown as having the concentric portions, 45, and re-entrant portions, 46. A follower, 47, is pivoted at 48 on the base plate, 38, and it will thus be seen that as the cam rotates with the portion, 45, in contact with the follower, this follower remains unmoved in its elevated position and that as a re-entrant portion, 46, comes opposite the follower, this follower will move into the depressed position. The number of times that the concentric and re-entrant portions of the cam are repeated is, of course, immaterial, and herein they are shown repeated twice, so that two similar cycles of operation successively take place during one rotation of the cam. The ratchet wheel is provided with ratchet teeth, 49, which, when acted upon, move the cam step by step with the concentric portion, 45, in contact with the follower and until the follower drops into the re-entrant portion, 46. It is also provided with a mutilated portion, 50, which prevents operation of the ratchet wheel when the follower has dropped into the re-entrant portion, 46.

When the follower, 47, is in a re-entrant portion, 46, of the cam it is in its inoperative effecting position. When the follower is in contact with the concentric portion of the cam, 45, it is in its operative effecting position and it will be noted that when it is in its latter position the controller may be gradually moved without affecting the position of the follower until the inoperative effecting position is reached.

In order to effect the shifting of the controller from inoperative effecting position to operative effecting position a pawl mechanism is provided actuated by or through the filling replenishing mechanism. For this purpose a hook-shaped pawl, 51, is mounted in vertical position and loosely guided on a stud, 52, projecting from the base plate, 38. This pawl is conveniently suspended by a rod, 53, from the stud, 54, on the shuttle-feeler, 12, engaged by the arm, 11. Consequently, when filling replenishment is called for and the shuttle-feeler swings rearwardly, this stud, 54, is raised and the rod, 53, raises the pawl, 51, which thereupon shifts the controlling ratchet wheel sufficiently to cause the concentric portion, 45, of the cam to ride beneath and elevate the follower, 47.

The actuating pawl, 55, for the ratchet wheel is pivoted to the lay sword, 4, and loosely guided on a stud, 56, projecting from the base plate, 38. As soon as the ratchet wheel is shifted by the pawl, 51, the ratchet teeth are brought to engagement with pawl, 55, and each time the lay beats up the controller is rotated one step and thus moved through its operative effecting position until the mutilated portion of the ratchet teeth is reached when the follower, 47, drops into the re-entrant portion, 46, and the controller is in the inoperative effecting position.

The pawl, 51, is shown at one side of the pawl, 55, and in order to get a direct pull on the pawl, 51, a few of the ratchet teeth as 57, are widened to come in line with the path of the pawl, 51. The pivotal connection of the pawl, 55, with the lay sword, 4, illustrated, is shown separately in Fig. 4. A two-part clamping bracket, 58 and 59, is clamped over the flange, 60, of the lay sword and held in place by a shaft or rod, 61, passing there through and provided near one end with a fixed collar, 63, and at the other end with a nut, 64, threaded thereon. The end of the rod, 61, is prolonged beyond the collar at the end 63, and on this prolonged portion 65 is loosely fastened the hub, 66, of the pawl, 55.

A casing cover, 67, fits over the controlling mechanism and is held in place by the nut, 44. This cover is also utilized to main-

tain the different movable parts of the mechanism in position at the base plate. A helical spring, 68, situated between the cover, 67, and the hub, 69, of the combined cam and ratchet wheel, holds that member loosely in place. The cover also holds the pawls, 51 and 55, and the follower, 47, on their respective studs. This enables the various parts to fit loosely and move freely and also enables the mechanism readily to be taken apart for cleaning or repair.

The transmitting means by which movement is transmitted from the controller mounted in a fixed position on a convenient part of the loom to the cutting mechanism carried by the movable temple includes the detent latch or device already described and a flexible transmitting connection, which, in the preferred form illustrated, is shown as what is known as a Bowden wire. This device comprises a flexible outer shaft formed of a wire, both ends of which are fixedly supported, and an interior wire plunger. This construction enables a thrust or a pull to be transmitted through the interior wire while the entire device may be bent or twisted as required.

In the construction illustrated the upper end of the shaft, 70, of the Bowden wire is clamped in a split sleeve, 71, by a set screw, 72, in the lug, 37, on the temple stand while the lower end is similarly clamped by the set screw, 73, in a lug, 74, projecting from a bracket plate, 38, above the rearward end of the follower, 47. The interior or thrust wire 75, sits at its upper end in a depression, 76, in the bottom of the forward end of the lever, 32, and sits at its lower end in a depression, 77, in the top of the rear end of the follower, 47. The operation of the mechanism will now be apparent. In all the figures of drawing except Fig. 7, the parts are in the position they normally occupy when the loom is running or, in other words, the cutting mechanism is in inoperative position, the movable blade, 24, being held forwardly by the detent latch, 29, and the follower, 47, resting in the re-entrant portion, 46, of the cam and the actuating pawl, 55, moving idly in the mutilated portion of the ratchet wheel. When replenishment is called for the shaft 10 is rocked, the shuttle-feeler, 12, is swung rearwardly, the rod, 53, is raised, the pawl 51 catching on one of the teeth 57, shifts the controller sufficiently to bring the concentric portion of the cam, 45, beneath the follower, 47, and to bring the teeth, 51, into position to be caught by the pawl, 55. The movement thus given the follower, 47, is transmitted through the Bowden wire rocking the lever, 32, and releasing the detent latch, 29, thus allowing the movable cutter blade, 24, under the action of its spring, 26, to be projected into operative position. The parts are then as shown in Fig. 7. At each beat up of the lay that now takes place the cutting mechanism is operated in the usual manner and the controller is moved step by step through the pawl, 55, and until the next re-entrant portion 46 of the cam, 45, and the mutilated portion 50 of the ratchet is reached, when the parts are again restored to inoperative position. The number of operations thus given will depend on the number of teeth on the ratchet wheel between successive mutilated portions and the extent of movement of the actuating pawl, both of which may be varied as desired. The clamping device, 58, 59, varies the throw of the pawl according to its vertical position on the lay and the size and number of teeth may be designed as required.

There is thus produced a mechanism in which the controlling elements may be located at any desired position on the loom and may be made of large rugged and durable construction. Thus these parts may be made subject to a minimum amount of wear and may have an easy fit and a wide range of movement, since the only movement transmitted to the cutting mechanism is the movement given to the cam follower.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A loom comprising automatic filling replenishing mechanism; a temple mounted for reciprocating movement on a fixed part of the loom; filling cutting mechanism carried by the temple and movable with respect thereto into operative and inoperative positions; a controller mounted on a fixed part of the loom, having operative effecting and inoperative effecting positions and movable when in, and without affecting, the operative effecting position; means actuated by or through the movement of the replenishing mechanism to shift the controller from inoperative effecting position to operative effecting position; means actuated by a moving part of the loom to move the controller gradually through operative effecting position into inoperative effecting position; and transmitting means between the controller and the cutting mechanism acting upon the said shifting of the controller to effect the movement of the filling cutting mechanism into operative position.

2. A loom comprising automatic filling replenishing mechanism; a temple mounted for reciprocating movement on a fixed part of the loom; filling cutting mechanism carried by the temple and movable with respect thereto into operative and inoperative positions; a controller mounted on a fixed part of the loom, having operative effecting and inoperative effecting positions and movable when in, and without affecting, the operative effecting position; means actuated by or

through the movement of the replenishing mechanism to shift the controller from inoperative effecting position to operative effecting position; means actuated by a moving part of the loom to move the controller gradually through operative effecting position into inoperative effecting position; and transmitting means between the controller and the cutting mechanism acting upon the said shifting of the controller to effect the movement of the filling cutting mechanism into operative position and acting upon the movement of the controller into inoperative effecting position to effect the inoperative position of the filling cutting mechanism.

3. A loom comprising automatic filling replenishing mechanism; a temple mounted for reciprocating movement on a fixed part of the loom; filling cutting mechanism carried by the temple and movable with respect thereto into operative and inoperative positions; detent means for retaining the cutting mechanism in inoperation position; a controller mounted on a fixed part of the loom having operative effecting and inoperative effecting positions and movable when in, and without affecting, the operative effecting position; means actuated by or through the movement of the replenishing mechanism to shift the controller from inoperative effecting position to operative effecting position; means actuated by a moving part of the loom to move the controller gradually through operative effecting position into inoperative effecting position and a flexible transmitting connection between the controller and the detent means acting upon the said shifting of the controller to effect the movement of the filling cutting mechanism into operative position.

4. A loom comprising a frame; a lay; automatic filling replenishing mechanism; a temple mounted for reciprocating movement on the frame; filling cutting mechanism carried by the temple and moved with respect to the temple into inoperative position by the lay; a spring acting to move the filling cutting mechanism with respect to the temple into operative position; detent means for retaining the cutting mechanism in inoperative position; a controller mounted on the frame, having operative effecting and inoperative effecting positions and movable when in, and without affecting, the operative effecting position; means actuated by or through the movement of the replenishing mechanism to shift the controller from inoperative effecting position to operative effecting position; means actuated by a moving part of the loom to move the controller step by step through operative effecting position into inoperative effecting position; and a flexible transmitting connection between the controller and the detent means acting upon the said shifting of the controller to release the detent means and permit the movement of the filling cutting mechanism into operative position.

5. A loom comprising the construction defined in claim 4, together with means acting normally to move the detent means into detaining position; and in which the flexible transmitting connection also acts upon the movement of the controller into inoperative effecting position to permit the said detent means to move into and remain in detaining position and thus to permit the filling cutting mechanism to move into and remain in inoperative position.

6. A loom comprising automatic filling replenishing mechanism; a temple mounted for reciprocating movement on a fixed part of the loom; filling cutting mechanism carried by the temple and movable with respect thereto into operative and inoperative positions; a controller comprising a combined cam and mutilated ratchet wheel journaled on a fixed part of the loom; a follower for the cam; a pawl actuated by a moving part of the loom and acting when in engagement with the ratchet teeth to rotate the controller step by step; a second pawl actuated by or through the movement of the replenishing mechanism to engage the ratchet teeth and rotate the controller to bring the ratchet teeth into engagement with the first pawl; the said cam acting to effect the movement of the follower in one direction when the controller is rotated by the second pawl and in the opposite direction at the end of the rotation of the controller by the first pawl; and transmitting means between the follower and the cutting mechanism acting upon the movement of the follower in the first direction to effect the movement of the cutting mechanism into operative position and acting upon the movement of the follower in the opposite direction to effect the movement of the cutting mechanism into inoperative position.

7. A loom comprising a frame; a lay; automatic filling replenishing mechanism; a temple mounted for reciprocating movement on the frame; filling cutting mechanism carried by the temple and movable by the lay into inoperative position; a spring controlled detent latch acting to retain the cutting mechanism in inoperative position; a controller comprising a combined cam and mutilated ratchet wheel journaled on the frame; a follower for the cam; a pawl carried by the lay and acting when in engagement with the ratchet teeth to rotate the controller step by step; a second pawl actuated by or through the movement of the replenishing mechanism to engage the ratchet teeth and rotate the controller to bring the teeth into engagement with the first pawl; the said cam acting to effect the movement of the follower in one direction when the con-

troller is rotated by the second pawl and in the opposite direction at the end of the rotation of the controller by the first pawl; and a flexible transmitting connection between the follower and the detent latch acting upon the movement of the follower in the first direction to release the latch and allow the cutting mechanism to move to operative position and acting upon the movement of the follower in the opposite direction to permit the detent latch to engage and retain the cutting mechanism in inoperative position.

8. A loom comprising automatic filling replenishing mechanism, a temple filling cutter, a detent for normally holding said cutter in inoperative position, a controller mounted on a fixed part of the loom for controlling the position of said detent, connecting mechanism between said detent and said controller, means for actuating said controller by or through the filling replenishing mechanism to release said detent and permit the cutter to operate, and means whereby said controller retains said detent from holding engagement with the cutter for a predetermined period following replenishment.

9. A loom comprising automatic filling replenishing mechanism, a temple filling cutter, movable means for holding the cutter in inoperative position, a controller on a fixed part of the loom having operative effecting and inoperative effecting positions, means actuated by or through movement of the replenishing mechanism to position the controller in operative effecting position, means to place said controller in inoperative effecting position after a predetermined number of beats of the lay, and transmitting or connecting means between the controller and the said cutter holding means whereby the cutter may be normally held inoperative and be rendered operative for a predetermined period following replenishment.

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

WALLACE I. STIMPSON.

Executor of Last Will and Testament of Edward S. Stimpson, Deceased.