

Aug. 15, 1939.

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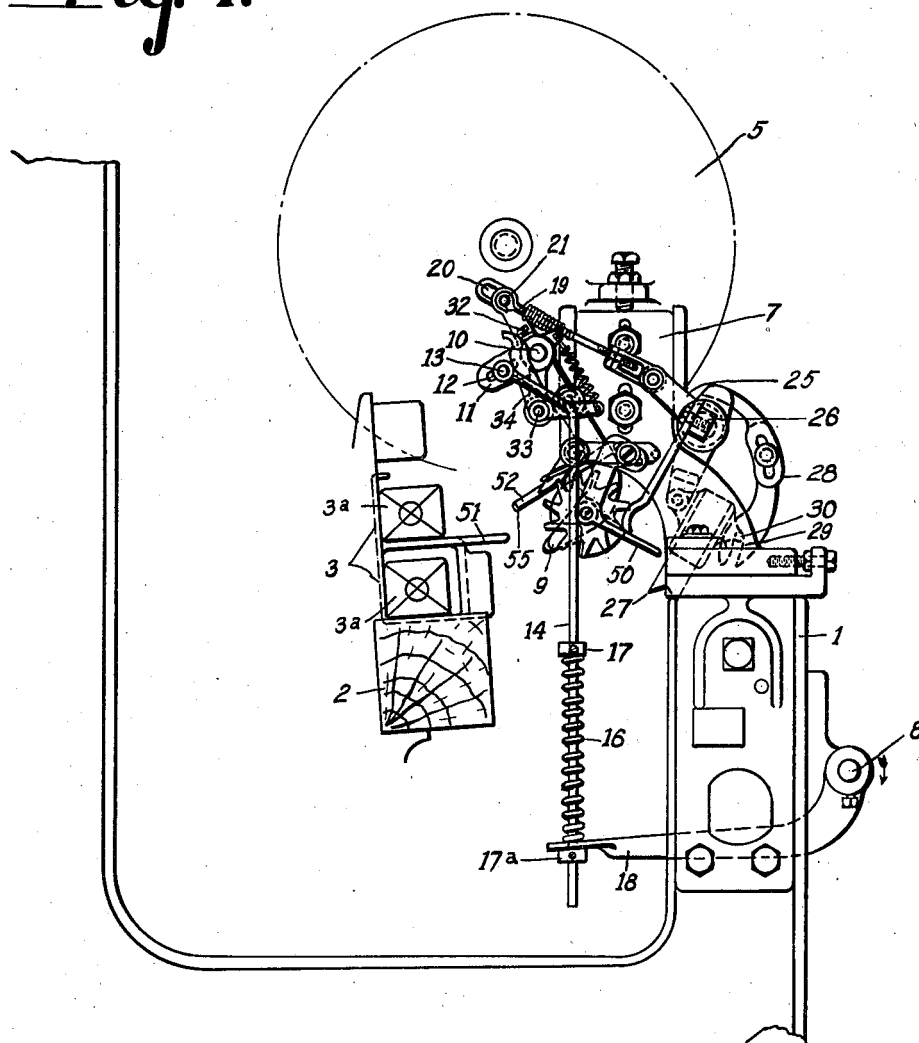
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WEFT CUTTING AND HOLDING DEVICE FOR LOOMS

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4 Sheets-Sheet 1

Fig. 1.



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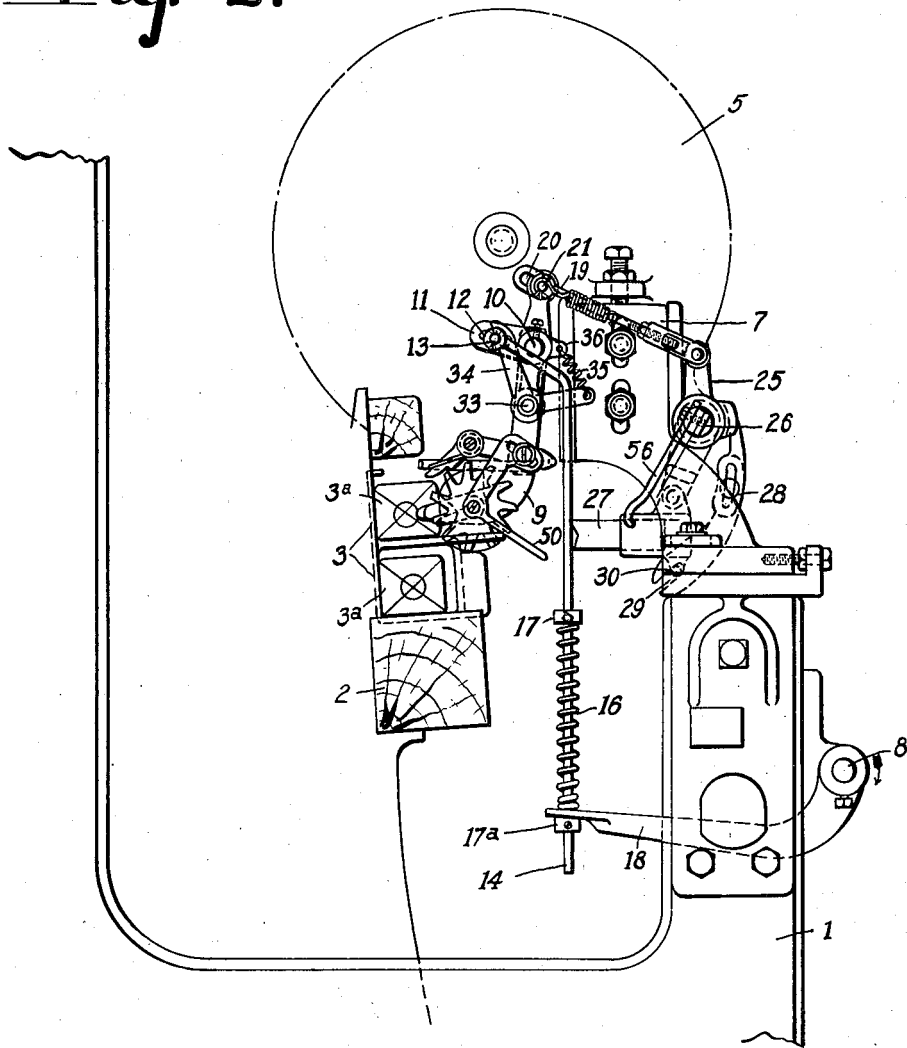
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Fig. 2.



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Fig. 3.

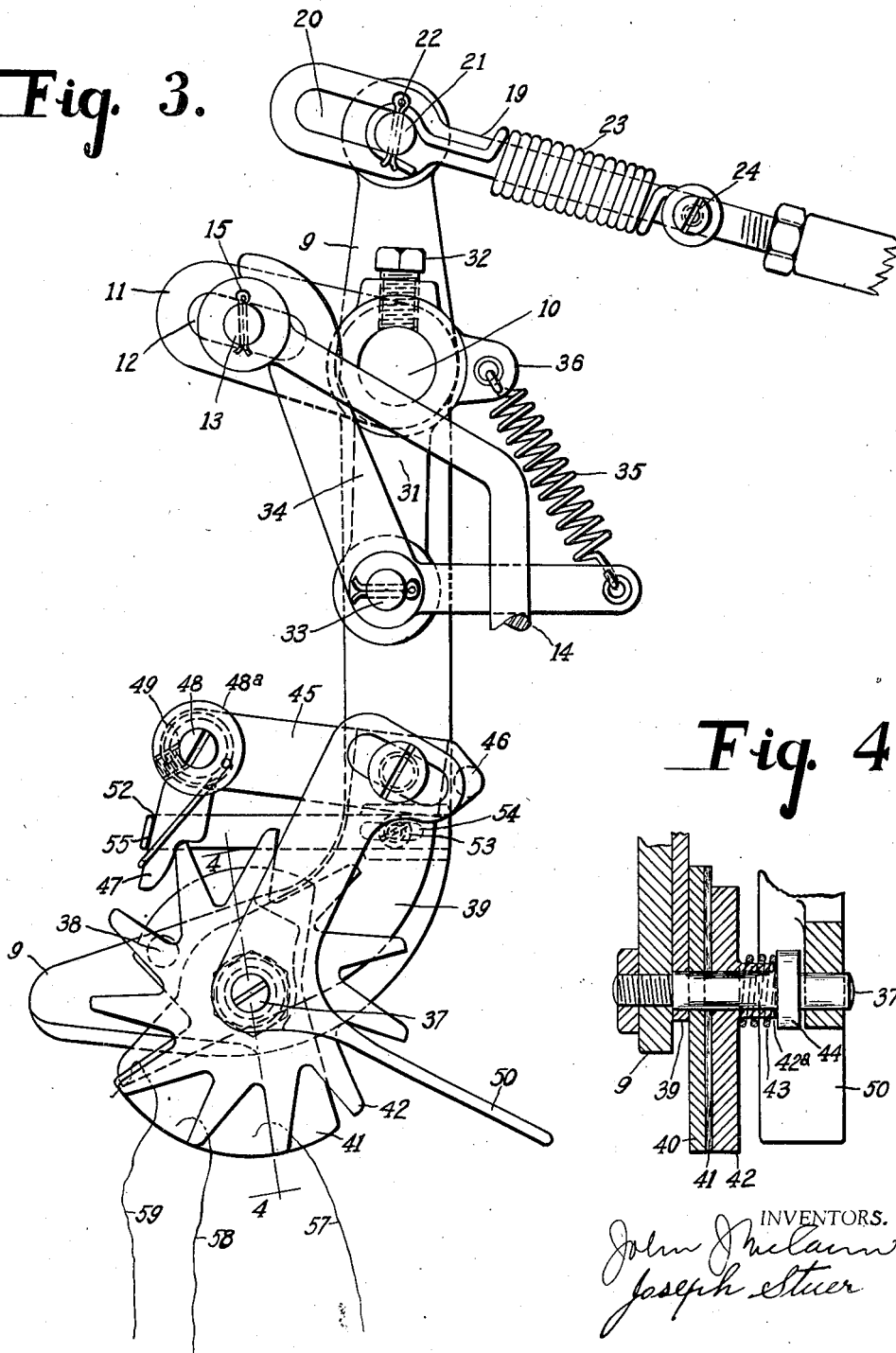
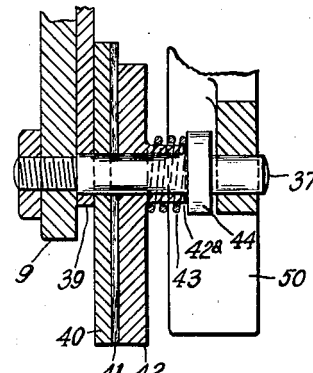


Fig. 4.



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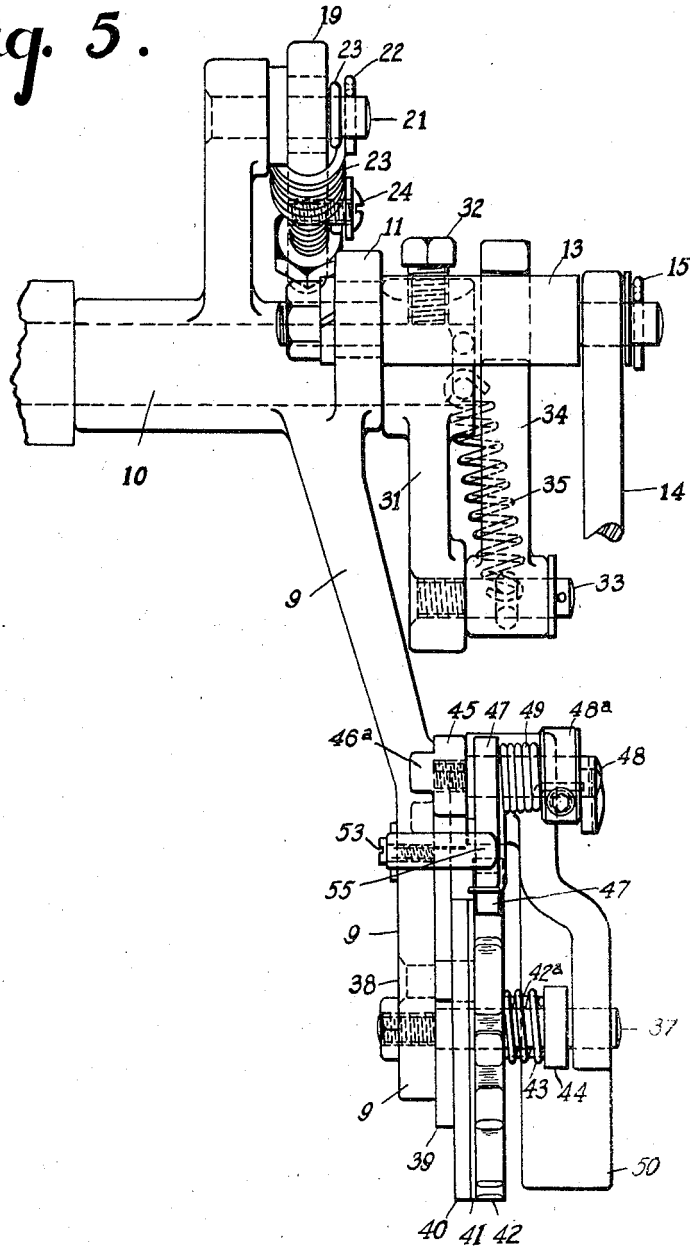
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4 Sheets-Sheet 4

Fig. 5.



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WEFT CUTTING AND HOLDING DEVICE FOR LOOMS

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Application January 27, 1937, Serial No. 122,668

6 Claims. (Cl. 139—264)

This invention relates to a weft cutter and holding means for weft replenishing looms, and is more particularly directed to a weft cutting and holding means that becomes operative when the replenishing mechanism functions to eject a spent weft carrier from the loom.

It is common practice to provide weft replenishing looms with a shuttle feeler having associated therewith a weft cutter and clamp for cutting and holding the weft of the spent bobbin between the shuttle and the cloth selvage when replenishment is effected, and positioning the end of the weft leading to the cloth for cutting by the selvage cutter as the cloth weaves down. Various means have been devised in these cutters and clamps, to prevent this cut weft end from being drawn back into the shed where it may be subsequently beaten into the cloth causing an imperfection. In these devices which are in current use there is insufficient provision to hold the weft end for the selvage cutter when two or more weft replenishing operations take place in close succession with the result, that one or more of these weft ends are liberated to be drawn into the cloth as the weaving operation progresses.

It is the object of this invention to arrange on a weft replenishing loom a cutter and weft holding device to overcome this undesirable condition by providing a weft holding means that definitely holds the cut weft ends over a period covering a plurality of subsequent replenishing operations, and releasing said weft ends only after ample time has elapsed for the selvage cutter to complete its function.

A feature of the invention is the operation of the holding means in which the cut weft ends of the outgoing shuttles are secured and held at weft replenishment, then advanced progressively by the holding means during a number of subsequent replenishing operations allowing ample time for the ends to be severed by the selvage cutter after which said weft ends are automatically released one at a time at succeeding replenishing operations.

Other novel features of the invention and the combination of parts will be made clear from the following description and the accompanying drawings showing a preferred form thereof, although we do not wish to be limited to the specific form as shown and described as other modifications are possible by those skilled in the art without departing from the spirit of the invention.

In the accompanying drawings sufficient portions of a weft replenishing loom of the type

referred to are shown to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings—

Fig. 1 is a side view of the invention in the normal or inoperative position.

Fig. 2 is a view similar to Fig. 1 showing the device in the operative position as assumed during the weft replenishing operation.

Fig. 3 is an enlarged side view showing the arrangement of parts.

Fig. 4 is a cross section taken on line 4—4 of Fig. 3 showing the construction and assembly of the cutter blades and the holding means.

Fig. 5 is a front view.

Referring more particularly to the drawings—

In Fig. 1, 1 represents the loom frame, 2 the lay, 3 the shuttle boxes, 3a the shuttles, 5 represents the magazine mounted on the magazine stand 7 which is secured to the loom frame 1, and 8 is the rock or cross shaft all as may be usual in a weft replenishing loom. 9 is the shuttle feeler pivotally mounted on the magazine stud 10. There is a rearward extension 11 formed on the shuttle feeler body 9 having a horizontal slot 12 in which is adjustable mounted the stud 13 to receive the operating rod 14 which is pivoted at its upper end to the stud 13 and held by the cotter pin 15 as clearly shown in Fig. 3. Mounted on the rod 14, Fig. 1 at the lower end to bear against the operating arm 18 is the thrust spring 16 secured against upward movement by the retaining collar 17. The lower collar 17a maintains the rod 14 in the hole of the operating arm 18 which is connected to the cross shaft 8 so that when the shaft 8 moves in the direction of the arrow at weft replenishment the shuttle feeler is also moved rearwardly to feel for the shuttle. This spring arrangement on the rod 14 acts as a relief if for any reason the shuttle feeler should become jammed when the shaft 8 operates.

The shuttle feeler 9, see Fig. 3, has mounted at its upper end a toggle connection 19 having a slot 20 to fit over the stud 21 and is retained for yielding movement by the spring cotter 22. Also mounted on the stud 21 is a spring 23 which is fastened at its other end to the toggle 19 by a bolt 24 forming a tension relief when the shuttle feeler 9 revokes upon contact with an improperly boxed shuttle. Fig. 1 shows the toggle 19 connected to the swivel member 25 which is mounted on the transfer shaft 26. One arm of this swivel member carries the transfer dog 27 at one end and the adjustable operating member 28 at the other end said member being curved and hav-

ing an elongated slot 29 at its lower end to receive the pin 30 of the transfer dog 27. It will be seen that when the shuttle feeler 9 revokes transfer the movement transmitted through this train of parts will remove the transfer dog from the contacting position thereby preventing damage to the mechanism.

Fastened to the magazine stud 10 is the yielding shuttle feeler clamp comprising a downward extending arm 31 having a hole in its upper end to receive the magazine stud 10 as shown in Fig. 3 a set screw 32 threaded into the arm and extending into the hole secures the arm to the magazine stud. At the lower end of the arm 31 another hole is provided to receive the stud 33 on which is fulcrumed the L shaped lever 34 having a connection at the forward end for the spring 35, the other end of the spring being fastened in a hole in the boss 36 formed in the arm 31. The upward and rearward extending portion of the lever 34 is provided with a notch whereby it is held in contact with the stud 13 through the urge of this spring 35. By this arrangement of the parts the shuttle feeler is yieldingly clamped in the rearward position during the replenishing operation.

The thread cutting and holding means mounted on the shuttle feeler will now be described. Assembled on the lower or shuttle engaging portion of the shuttle feeler 9 is the stud 37 having mounted thereon first the movable blade 39 see Fig. 4 against which bears the fixed blade 40 then a plate of indurated material 41. A pin 38 Fig. 3 fastened in the shuttle feeler and extending laterally through holes in the fixed blade 40 and the plate 41 is provided to prevent these members from turning. Also mounted on the stud 37 for frictional contact with the plate 41 is the thread wheel 42 which is serrated along its periphery and has a hub 42a through which the stud 37 extends. The hub 42a supports the tension spring 43 which is depressed by the collar 44 to create the necessary tension upon the assembly. Referring again to the aforementioned assembly as shown in Figs. 3 and 4 the fixed blade 40 and the plate 41 are constructed to correspond in shape, the blade 40 forming a rigid support for the plate 41. Both of these members are indented on the rearward extending edges and when mounted on the stud 37 form the lower portion of the thread slot, the curved part of the shuttle feeler 9 forming the upper part of the slot. The construction of the serrations on the thread wheel 42 and the arrangement of the blade 40 and the plate 41 on the shuttle feeler is such that a thread slot is defined corresponding to the open blades when the shuttle feeler moves into operating position. It will be noted that the lower section of the blade 40 and the plate 41 is curved and extends some distance below the shuttle feeler to form the friction surface against which the thread wheel 42 operates. The movable blade 39 is constructed in an upright curve to receive at its upper end the pawl holding bar 45 which is secured rigidly thereto. This bar 45 has a boss 46 at its forward end to act as a stop when the bar moves rearward and a pawl 47 at the other end to engage the toothed ends of the thread wheel 42 at its opposite end. The pawl 47 is pivotally mounted on the stud 48 and forced against the serrations of the thread wheel 42 through the urge of the spring 49 which is retained by the collar 48a. A depending stop 46a, Fig. 5, extends laterally at the end of the bar 45 to limit the move-

ment of the bar during forward movement. Pivotaly mounted at its middle on the stud 37 is the L shaped operating lever 50 having an adjustable connection at its upper end with the pawl holding bar 45 and its lower arm positioned for contact with the cutter closer 51, Fig. 1, on the lay. With this arrangement of parts in view it is obvious that when the cutter closer 51 contacts the arm of the operating lever 50 the upper end of the lever moves rearwardly thereby closing the cutter blade 39 and severing the thread, a relative movement of the thread wheel 42 also taking place through the pawl 47 and the bar 45 carrying the cut thread end downward against the friction plate 41. To insure that the wheel 42 moves only the distance of one notch of the serration a stop 52 is provided which is fastened to the shuttle feeler at 53. This stop is provided with a slot 54 in order that the contacting end 55 of the stop 52 can be adjusted to contact the pawl 47 and accurately limit its movement.

There is a depending arm 56 shown in Figs. 1 and 2 suitably mounted on the transfer shaft 26 to contact the downward extending arm of the L shaped lever 50 when the shuttle feeler 9 returns to normal position to reset the parts after each operation.

Referring to Fig. 3, 57, 58 and 59 represent cut thread ends which clearly indicate the action of the holding means at each replenishment. 57 shows the thread of the first replenishment, 58 the second and 59 the third. On the fourth action thread 57 will drop free of the holder as the new thread is received making the entire action of the device automatic. It will be obvious that regardless of how rapidly a replenishing action succeeds its preceding one the holder is bound to secure each thread and retain the same until sufficient time has elapsed for the usual temple cutter to complete its function.

The operation of the device is as follows:

The rock or change shaft is turned by the usual actuator mechanism after the usual welt feeler detects substantial exhaustion of the bobbin. This movement of the change shaft sets the battery and the associated transfer mechanism for the bobbin changing operation, and the shuttle feeler is also moved rearwardly into engaging position through the medium of the arm 18 and the rod 14 and is yieldingly held in this position by the clamp lever 34 being forced against the stud 13 under the urge of the spring 35. As the lay beats forward the thread of the outgoing carrier is drawn into the opening of the shuttle feeler cutter blades and also the corresponding notch of the thread wheel. The closer 51 on the lay then engages the depending arm of the L shaped lever 50 which is connected to the cutter blade. Also connected to the movable lever 50 is the operating mechanism for the thread wheel so that when the cutter closer contacts the depending arm the blades close severing the thread and the toothed wheel is advanced against the plate of indurated material one notch by the pawl carrying with it the cut thread. The rotation of the toothed wheel is limited by a stop which is mounted in a position to engage the pawl at the end of its rearward stroke thereby confining the movement of the wheel to just one notch at each operation. After the thread from the outgoing carrier has been severed and secured in the thread holder where it resides at a point below the plane of the cutter blade opening the lay engages the transfer dog overcom-

ing the spring of the yielding clamp lever permitting the shuttle feeler to move forward towards its normal or inoperative position as the bobbin is transferred. As the shuttle feeler returns the depending arm of the lever 50 contacts the cutter opener 56 fastened to the transfer shaft 26 opening the blades and retracting the contacting pawl the distance of one notch of the toothed wheel resetting the mechanism for the next replenishment. It will be noted as shown in Fig. 3 that upon the subsequent transfers of the weft the preceding thread still remains fastened in the holder, and as shown the first cut end remains in the holder during three subsequent weft transfer operations before it is automatically released.

Should the shuttle feeler attempt to revoke during operation when the lay strikes the transfer dog the spring relief mounted on the upper end of the shuttle feeler and connected to the transfer mechanism will release the shuttle feeler and protect the parts from damage.

From the foregoing description it will be observed that we have provided a thread device that will hold and manipulate the thread of each carrier to be discarded over a plurality of operations of the replenishing mechanism, and we have also provided means to definitely control the individual thread until it is automatically liberated at a point remote from the shuttle activity in the loom, thereby overcoming the faults in the cloth caused by drawn in thread ends.

Having thus described the invention what is claimed is—

1. In a shuttle feeler thread cutter and holder in combination, a shuttle feeler, a cutter mounted thereon, a plate associated therewith provided with an angular thread supporting slot, said plate having a portion extending substantially away from the plane of action of said cutter, a thread wheel the periphery of which constitutes a plurality of thread engaging members mounted in frictional contact with said plate and having at least one of said members normally located above the plane of action of said cutter irrespective of the position assumed by said wheel, means to hold said wheel against the plate, and means to actuate said wheel whereby a thread member is drawn through the plane of action of said cutter to a position against said plate substantially away from the plane of action of said cutter.

2. In a shuttle feeler mechanism supporting a thread cutter, a thread holder mounted thereon and operative therewith comprising a thread engaging member and its support, a rotatable thread manipulating element on the support in frictional engagement with said member, and means whereby said element is moved to secure and manipulate threads against said member until a plurality of threads are held, the successive actuations of said means thereafter liberating a thread from the holder at each actuation of said means.

3. In a shuttle feeler mechanism, a shuttle feeler including a stud, a thread cutter and a thread engaging plate supported on the stud, a rotatable thread wheel provided with a ratchet, means to maintain the wheel on the stud in frictional contact with said plate, an operating member on the stud including a pawl to engage the ratchet and rotate said wheel with respect to the plate when the member operates, means to give said member an intermittent operative movement on the stud, and adjustable means on the shuttle feeler defining a stop whereby the movement of said wheel is limited when the movement of said member is interrupted by the stop.

4. In a shuttle feeler mechanism, means to cut a thread, a thread manipulating device adjacent said means comprising a thread engaging element and its support, a thread wheel the periphery of which constitutes a plurality of thread catching teeth in frictional engagement with said element and rotatably mounted on the support, and means to intermittently rotate said wheel whereby threads caught by said teeth are given a plurality of movements with respect to said element prior to their liberation from said device.

5. In a weft replenishing loom wherein the weft to be abandoned is cut and manipulated during the replenishing cycle, a shuttle feeler having a predetermined movement into the shuttle path during said cycle, a cutter supported on said feeler to act upon the weft to be abandoned, a weft holder associated with said cutter and operative therewith comprising a thread wheel having a periphery that is serrated and adapted to catch a thread, a supporting member for said wheel, a plate on said member, means on said member to maintain said wheel in frictional contact with the plate whereby the weft is clamped when the wheel operates, and means to move the wheel with respect to the plate whereby the weft caught by the serrated periphery of the wheel is moved and clamped against the plate.

6. In a shuttle feeler mechanism, a shuttle feeler supporting a thread manipulating device including a thread member having a surface of predetermined length along which a thread may be moved to assume a plurality of positions, a rotatable thread wheel having a toothed thread catching periphery each tooth of which is adapted to catch and move a thread along the surface of said member when the wheel operates, means to support the wheel in frictional contact with the member of the device, and means to intermittently rotate said wheel whereby a thread caught by a tooth in the periphery of said wheel is moved to assume a plurality of positions with respect to said member prior to its liberation from said device.

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