Sept. 27, 1927. 1,643,457

V. H. JENNINGS ET AL

THREAD CUTTER FOR LOOMS

Filed Dec. 26, 1924 2 Sheets-Sheet 1

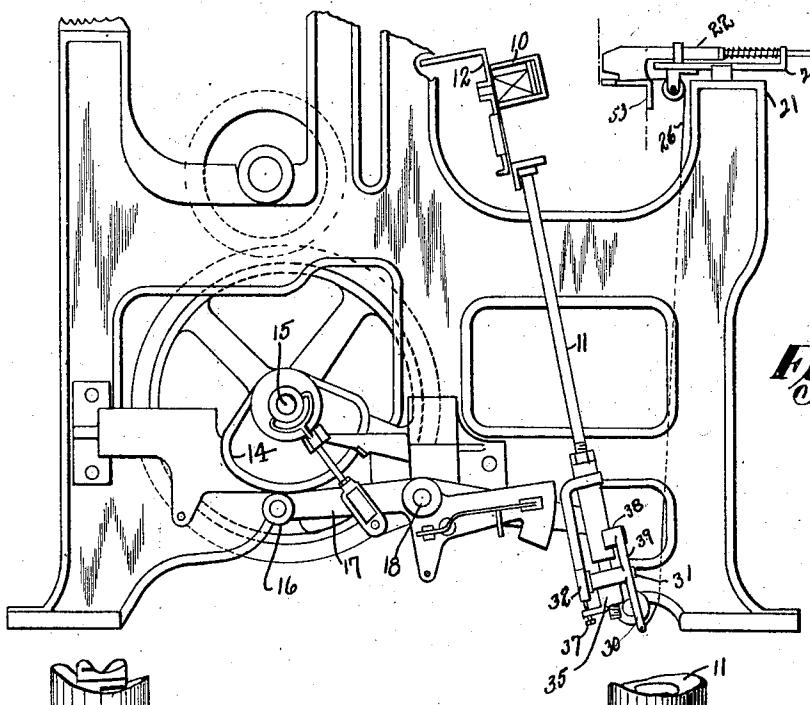


Fig. 1.

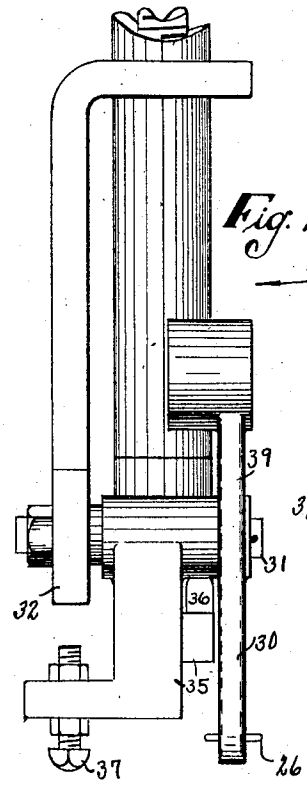


Fig. 2.

—3.

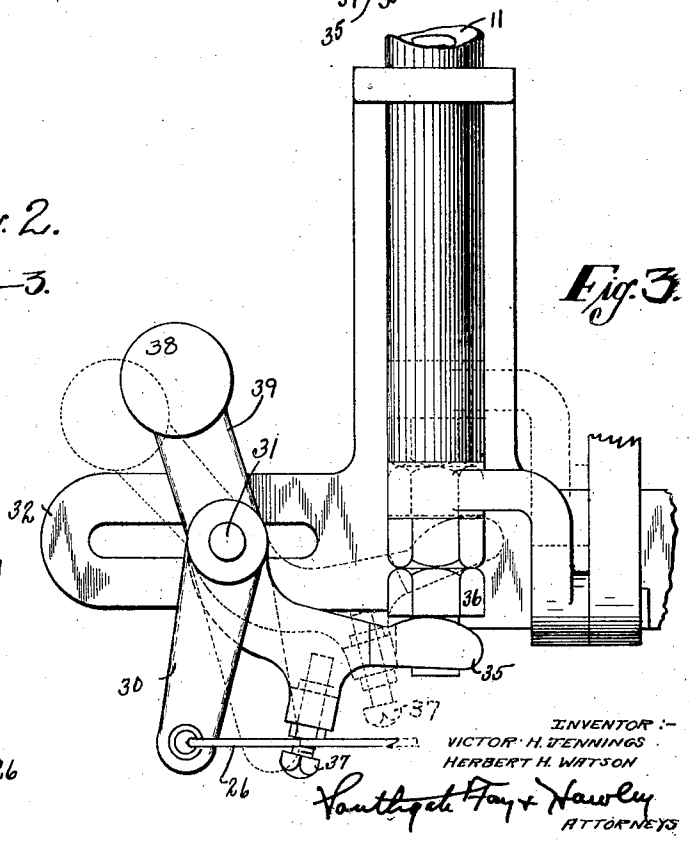


Fig. 3.

INVENTOR:-
VICTOR H. JENNINGS
HERBERT H. WATSON
Coulthgate Flay & Hawley
ATTORNEYS

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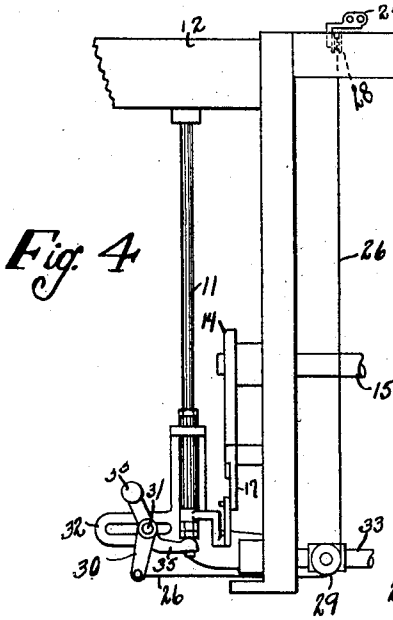


Fig. 4.



Fig. 9.

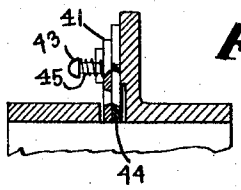
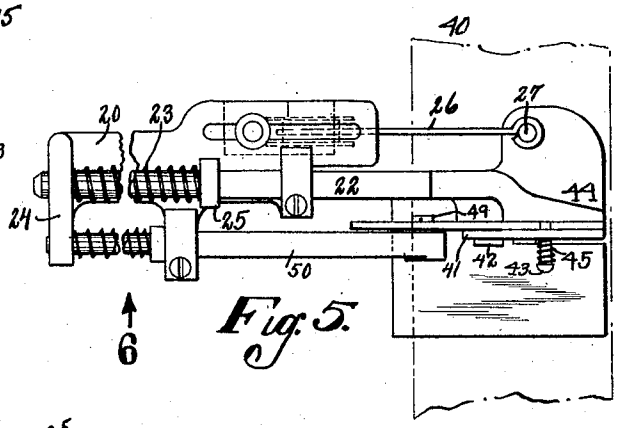


Fig. 8.



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Fig. 5.

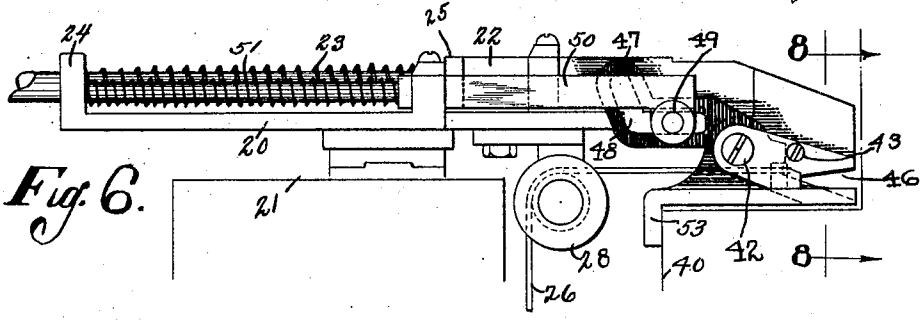


Fig. 6.

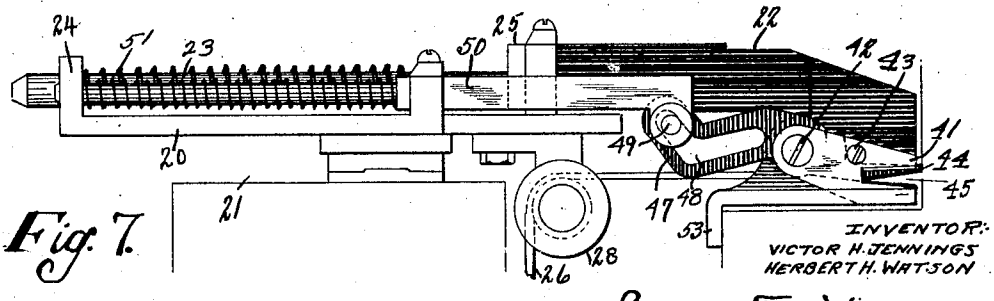


Fig. 7.

INVENTOR:
VICTOR H. JENNINGS
HERBERT H. WATSON

Southgate Fay & Hawley
ATTORNEYS.

Patented Sept. 27, 1927. 1,643,457

UNITED STATES PATENT OFFICE.

VICTOR H. JENNINGS AND HERBERT H. WATSON, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

THREAD CUTTER FOR LOOMS.

Application filed December 26, 1924. Serial No. 758,010.

This invention relates to a thread cutter capable of general application but particularly designed for use in an automatic shuttle changing loom. In such loom it is essential that the weft be severed at the selvage as a substantially exhausted shuttle is ejected and also that the weft attached to the incoming shuttle be severed at the selvage after the new shuttle has been sent to the other end of the lay.

It is the general object of our invention to provide a thread cutter for such purposes which will be normally inoperative, but which will be reliable and efficient when operation thereof is desired at the time of shuttle replenishment.

A further object is to provide a thread cutter which will cut a thread when the cutter blade is moving in either of two directions.

An important feature of the invention relates to provision for co-operation between the shuttle changing mechanism and the thread cutter, so that the latter is rendered operative in timed relation to the operation of the former.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a partial side elevation of a shuttle changing loom embodying our improvements;

Fig. 2 is an enlarged side elevation of certain parts shown in Fig. 1;

Fig. 3 is an enlarged front elevation of the parts shown in Fig. 2;

Fig. 4 is a front elevation of additional parts of the loom;

Fig. 5 is a plan view of the thread cutter;

Fig. 6 is a side elevation thereof, looking in the direction of the arrow 6 in Fig. 5 and showing the cutter in inoperative position;

Fig. 7 is a view similar to Fig. 6, but showing the cutter in rearward position;

Fig. 8 is a detail sectional view, taken along the line 8—8 in Fig. 6; and

Fig. 9 is an enlarged cross-section of one of the cutting blades.

We have shown our invention as applied to a shuttle changing loom of the type found in the prior patent to Ryon, No. 1,476,847, issued December 11, 1923. In this loom the running shuttle box 10 (Fig. 1) is mounted upon a lifter rod 11 so that it can be raised above the back box plate 12 to rearwardly eject a substantially exhausted shuttle, while a new shuttle is at the same time lifted to running position.

The lifter rod 11 is actuated from a cam 14 on the usual cam shaft 15 of the loom, said cam being engaged by a roll 16 on a lever 17 mounted on a fixed pivot 18. The lever 17 is regularly oscillated by the continuous rotation of the cam shaft 15 and cam 14, and is adapted to be connected by certain parts, not shown in detail herein, so that the lever 17 will raise the lifter rod 11 upon indication of weft exhaustion. For a more complete description of the mechanism for actuating the lifter rod 11 upon indication of shuttle change, reference is made to the prior patent to Ryon, above cited.

The shuttle changing mechanism may operate upon complete exhaustion of the shuttle, under the control of a filling fork, or it may operate upon substantial exhaustion of the shuttle, under the control of some usual type of weft detecting mechanism. In the latter event, it is particularly necessary that the old weft extending from the adjacent selvage to the substantially exhausted shuttle should be severed as the shuttle is ejected and that the new weft extending from the end holder to the adjacent selvage should be severed, after the new shuttle has been sent across the lay to the opposite side of the loom.

Our improved thread cutter comprises a stand 20 (Fig. 5) which is secured in adjusted position upon the loom frame 21. A slide 22 is mounted for forward and rearward movement in the stand 20 and is pressed yieldingly rearward by a spring 23, positioned between a fixed bearing 24 and a collar 25 on the slide 22. A chain, cord, or other flexible connection 26 is secured at 27 to the stand 22 and passes over guide pulleys 28 (Fig. 6) and 29 (Fig. 4) to a three-armed lever 30.

The lever 30 is pivoted at 31 to a bracket 32 which is secured to the rock shaft 33 which forms a pivot for the oscillating movement of the lay 40. A laterally pro-

jecting arm 35 of the lever 30 engages a nut 36 which forms a shoulder at the lower end of the lifter rod 11. An adjustable screw 37 is threaded in a lug in the side of the arm 35 and engages the under side of the bracket 32, thus limiting upward movement of the arm 35. A weight 38 on the end of the third arm 39 of the lever 30 counter-acts the weight of the arm 35 and holds the screw 37 yieldingly against the bracket 36 when the lifter rod is in raised position.

The parts are so connected that when the lifter rod is in its normal or lower position, the arm 35 is depressed and the lever 30 is swung to the left to place tension upon the flexible connection 26 and withdraw the cutter slide 22 toward the front of the loom, to normal or inoperative position. When the lifter rod 11 rises at a change of shuttles, the tension on the connection 26 is released and the spring 23 forces the slide 22 yieldingly toward the lay 40.

Our improved thread cutter comprises a cutting plate 41 secured to the rearward end of the slide 22 but in spaced relation therefrom, as indicated in Fig. 8. The plate 41 may be secured in any convenient manner as by screws 42 and 43, the screw 42 acting also as a pivot for the movable cutter. A spring 45 (Fig. 5) on the screw 43 presses the cutter plate 41 firmly against the movable cutter 44. The plate 41 has a deep notch or recess 46 formed at its rear end, both the upper and lower edges of said recess co-operating with the moving cutter 44 to cut the weft. The cutter 44 is likewise provided with upper and lower cutting edges and is thus adapted to cut the weft during either the upward or the downward movement of the cutter.

The movable cutter 44 has a plate 47 forming a forward extension thereof and having a cam slot 48 formed therein. The slot 48 is substantially L-shaped and receives a roll or stud 49 mounted on a depending projection at the rear end of a bar or support 50, which is also slidable in the stand 20 and which is normally pressed rearward by a spring 51.

When the parts are in their normal inoperative position, as shown in Fig. 6, the cam stud or roll 49 is in the horizontal rearward portion of the slot 48. While in this position, the weft extending to the substantially exhausted shuttle can enter the recess 46.

The stand 22 has a depending projection 53 which is positioned to engage the front edge of the lay 40, whenever the slide 22 is released. As the lifter rod 11 rises for the shuttle change, the slide 22 is thus released and moves rearward with the lay 40. During such movement the bar 50 and cam stud 49 remain in fixed position and the stud is thus caused to have relative forward travel along the cam slot 48.

As the stud 49 reaches the upwardly inclined front portion of the slot 48, the cam plate 47 is swung about the pivot 42 to the position indicated in Fig. 7, thus giving the cutter 44 an upward cutting movement.

As the lay 40 thereafter continues its rearward movement, the exhausted shuttle is ejected and a new shuttle is placed in running position and is picked across to the opposite end of the lay.

As the lay next moves forward, the weft from the new shuttle enters the recess 46. The lug 53 on the slide 22 is then engaged by the lay in its continued forward movement, thus causing the stud 49 to travel in the reverse direction along the slot 48, returning the parts to the position shown in Fig. 6, and thus giving the cutter 44 a downward cutting movement.

By this time, the lifter rod 11 has returned to normal lowered position and the thread cutter will be thereafter retained in the position shown in Fig. 6 until another shuttle change is indicated. It will be noted that the cam 14 is provided with a concentric outer surface of somwhat greater extent than is shown in the patent to Ryon, so that the time for operation of the thread cutter may be correspondingly extended.

Having thus described our invention and the operation thereof the advantages will be readily apparent. All of the parts are exceedingly simple in construction and the cutter is held inoperative during a very large portion of the period of operation of the loom. When released at shuttle change, the cutter has two successive operating movements in opposite directions, timed so that these movements will successively sever the outgoing and the incoming weft.

While we have described our invention as applied to a shuttle changing automatic loom, it will be evident that many features of our improved thread cutter are available for general use and that they possess manifest advantages when thus used.

Having thus described our invention, we do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what we claim is:—

1. In a loom, a thread cutter having a cutting blade with two cutting edges, and means to give said blade successive cutting movements in opposite directions.

2. In a loom, a thread cutter, means to hold said thread cutter normally inoperative and to release said cutter upon substantial weft exhaustion, and means to cut a thread on each of two successive movements of said cutter in opposite directions.

3. In a loom, a thread cutter comprising a stand, a slide, a spring to press said slide yieldingly rearward, cutting blades mounted for relative movement on said slide, a cam and cam plate co-acting to move one of

said blades, and a separate yielding support for one of said cam elements said support being additional to said slide.

4. In a loom, a lay, shuttle changing mechanism, a thread cutter, means to hold said cutter normally in forward position, means to release said thread cutter for rearward movement upon shuttle change, said cutter having a portion engaged by said lay to move said cutter forward and said thread cutter having a cutting movement on both rearward and forward movements thereof.

5. In a loom, a thread cutter comprising a cutting blade having a recess with both its upper and lower edges formed as cutting surfaces, and a second blade movable past said recess and having upper and lower cutting edges co-operating with said first blade to sever a weft inserted in said recess.

6. In a loom, a shuttle changing mechanism having a running shuttle box movable into and out of operative position, a thread cutter, and a connection between said shuttle changing mechanism and said thread cutter effective to hold said thread cutter withdrawn from cutting position so long as said shuttle box is in operative position.

7. In a loom, a shuttle changing mechanism having a running shuttle box movable into and out of operative position, a thread cutter, a connection between said shuttle changing mechanism and said thread cutter effective to hold said thread cutter withdrawn from cutting position so long as said shuttle box is in operative position, and means to move said thread cutter to operative position when said running shuttle box is moved from operative position.

In testimony whereof we have hereunto affixed our signatures.

VICTOR H. JENNINGS.
HERBERT H. WATSON.