Feb. 20, 1951 W. A. BLANCHARD 2,542,465

THREAD CUTTER FOR WEFT REPLENISHING LOOMS

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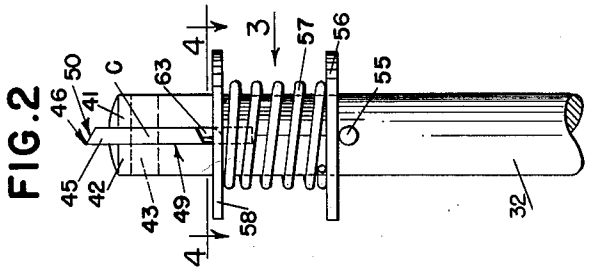


FIG. 2

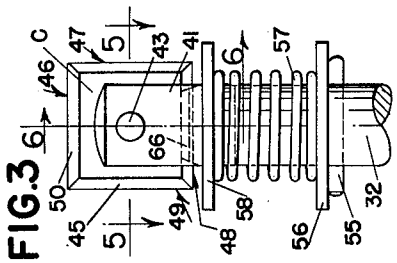


FIG. 3

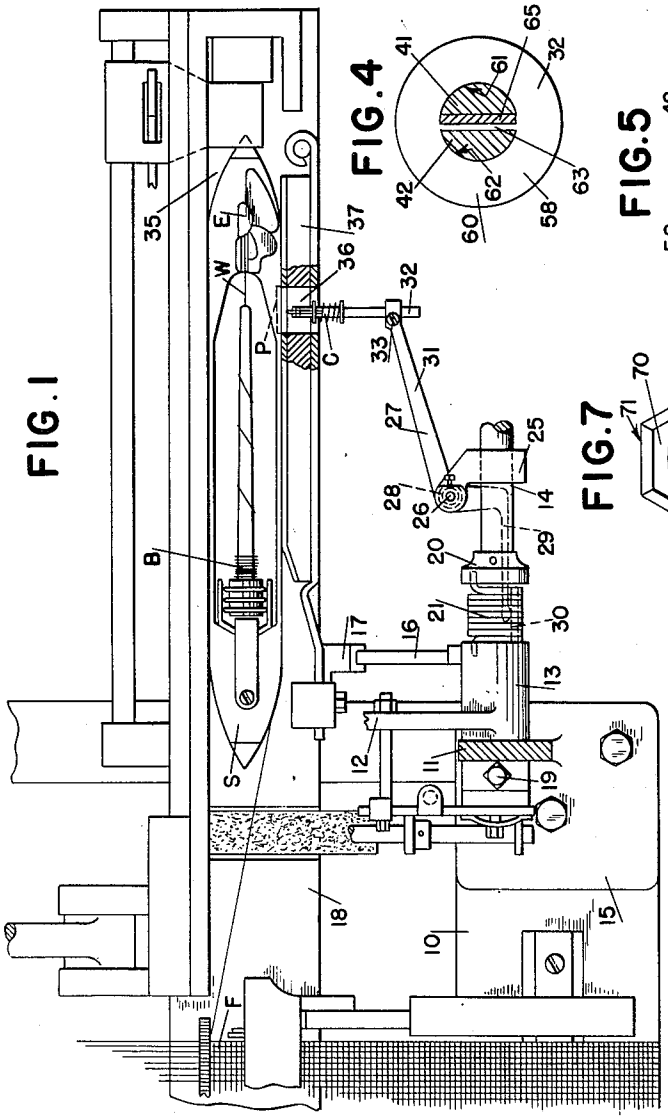


FIG. 1

FIG. 4

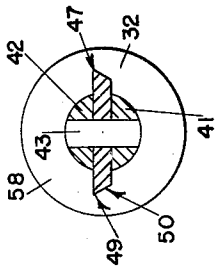


FIG. 5

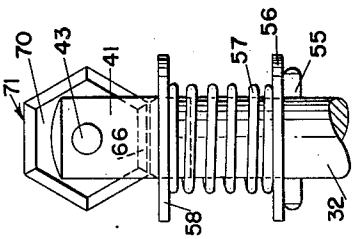


FIG. 7

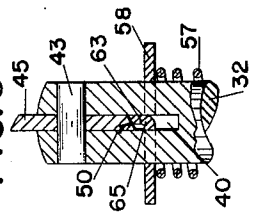


FIG. 6

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THREAD CUTTER FOR WEFT REPLENISHING LOOMS

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1

This invention relates to thread cutting mechanisms for weft replenishing looms and it is the general object of the invention to provide a thread cutting mechanism having multiple cutting edges which can be moved one at a time into operative position.

A type of weft replenishing loom which has gone into general use employs a shuttle having a metallic plate in its front wall to cooperate with a thread cutter at the time of weft replenishment. The thread from the delivery eye of the shuttle extends across the plate to the cloth selvage, and as the lay advances on a replenishing beat the chisel edge of the thread cutter is projected rearwardly against a metal plate to cut the thread. As the result of repeated operations the plate dulling edge and the cutter must be removed from the loom and sharpened.

It is an important object of the present invention to provide a thread cutter of the type hereinbefore mentioned wherein the cutter blade has a plurality of cutting edges distributed around its periphery and wherein the blade is held yieldingly in operative position in such manner that it can be turned manually to move each edge into operating position.

Because of slight inaccuracies in alignment of the plate on the shuttle with the carrier for the cutter it is necessary to make provision for slight angular motion of the cutter blade so that its edge can align with the shuttle carried plate. It is a further object of the present invention to provide a thread cutter wherein the cutting blade will have one of its edges held in operating position by means which will not only permit the aforesaid turning of the blade but will also permit slight angular adjustment of the blade to permit its operative edges to align correctly with the plate on the loom.

It is a more specific object of the invention to provide a thread cutting unit having a stem with a multi-edge cutting blade rotatable thereon associated with a yielding positioner which holds the cutting blade in its approximate operative position by engagement with a non-cutting part of the blade. The cutting edges are provided by beveling the blade and the yielding positioner preferably engages a beveled surface at a point spaced from the corresponding cutting edge. The positioner may conveniently be made part of a washer or the like surrounding the stem and spring urged in a direction to hold the thread cutting blade in normal position.

With these and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts hereinafter described and set forth.

2

In the accompanying drawings, wherein two forms of the invention are set forth,

Fig. 1 is a plan view, parts in section, of one end of a weft replenishing loom showing the shuttle, the lay, and the preferred form of thread cutter,

Fig. 2 is an enlarged plan view of the rear part of the thread cutter shown in Fig. 1,

Fig. 3 is a side elevation looking in the direction of arrow 3, Fig. 2,

Fig. 4 is a transverse vertical section on line 4—4, Fig. 2,

Fig. 5 is a transverse vertical section on line 5—5, Fig. 3,

Fig. 6 is a detailed vertical section on line 6—6, Fig. 3, taken longitudinally of the supporting stem, and

Fig. 7 is a view similar to Fig. 3 but showing a modified form of cutter blade.

Referring particularly to Fig. 1, the loom frame 10 supports a magazine part of which is designated generally at 11. A transferrer arm 12 has a hub 13 rockable on a stud 14 held in fixed position with respect to the foot 15 of the magazine. The latter is bolted to the breast beam of the loom and the transferrer arm is normally raised and has operatively connected thereto a latch 16 which is normally below the path of a bunter 17 on lay 18. The stud 14 is held in fixed position as by a set screw 19 and has fastened thereto a collar 20. A relatively strong torsion spring 21 is interposed between the collar and the hub 13 and tends normally to hold the transferrer arm raised.

Stud 14 extends to the right of the collar 20, as shown in Fig. 1, and has a stand 25 secured thereto which supports a vertical stud 26 on which is rockably mounted a cutter lever 27. A torsion spring 28 shown in dotted lines in Fig. 1 tends normally to hold the lever in such position that the left arm 29 thereof is against a depending lug 30 on the transferrer arm. Arm 31 of lever 27 supports a stem 32 held thereto by set screw 33. The cutter mechanism designated generally at C and forming an important part of the invention is mounted on the rear end of stem 32.

The lay is provided with a shuttle box 35 which receives a shuttle S containing a bobbin B which in the present instance is shown as substantially depleted of weft. The weft thread W extends from the bobbin through the eye E of the shuttle and then along a plate P secured in the front

wall of the shuttle and thence to the selvage of the fabric F.

Under normal conditions when the transferrer arm 12 is raised the lug 30 will be in rear position and will act on arm 29 to hold the cutter mechanism C forwardly in non-cutting position. At the time of transfer, however, the bunter 17 pushes latch 16 forwardly to cause lowering of the transferrer arm and forward motion of lug 30, whereupon the spring 28 turns the lever 27 in a counter-clockwise direction as viewed in Fig. 1, and the cutter mechanism is projected rearwardly through a slot 36 in the shuttle box front wall 37 against the plate P to cut the thread W.

Except for the details of the mechanism C the matter thus far described is of common construction. As heretofore made the mechanism C has employed a small cutting blade having a single cutting edge mounted on the stem 32 so that it is capable of slight angular motion to adjust itself to the plane of the plate P. Because of repeated engagement between the cutter and the plate the cutting edge is likely to become dull and require frequent re-sharpening.

In carrying the present invention into effect the cutter mechanism C is provided with a multi-edge cutting blade which is held yieldingly in position so that any one of the edges may be moved manually to cutting position and any edge when in normal cutting position can adjust itself slightly to the plate P.

In the preferred form of the invention shown in Figs. 2 to 6 the stem 32 has the rear part thereof provided with a vertical slot 40 defining right and left forks or arms 41 and 42, see Fig. 2. A pin 43 secured to the arms extends across the slot 40 and has rotatably mounted thereon a cutter blade 45 which in the preferred form of the invention is provided with four cutting edges 46, 47, 48 and 49. These edges are formed by beveling the blade, each edge having a bevel surface 50.

At a point forward of the cutter blade 45 the stem 32 has extending therethrough a pin 55 behind which is a washer 56 which receives the forward thrust of a relatively weak compression spring 57 surrounding the stem 32. The rear end of spring 57 bears against a positioner or holder in the form of a washer 58 which is formed as shown in Figs. 4 and 5. Washer 58 has a circular disk-like body 60 having two parti-circular openings 61 and 62 therein to receive forks or arms 41 and 42, respectively. The openings 61 and 62 are separated by a bridge 63 which may be integral with the main body 60 of the washer 58. This bridge is so proportioned that it fits the slot 40 and the fit of the washer 58 with respect to the stem is sufficiently loose to permit back and forth motion of the positioning washer relatively to the stem.

The bridge 63 is preferably formed with a positioning lug or lip 65 located at one side of the slot 40 as shown in Fig. 6 and engaging a bevel surface 50 of the cutter at a point removed from the cutting edge edjacent thereto. This lip or lug may be of sufficient length, as indicated at 66, Fig. 3 to extend on both sides of the axis of the stem 32 so that the rear cutting edge, such as 46, will be held in approximate cutting position under normal conditions.

When a cutting operation occurs as previously described the mechanism C will be projected rearwardly and should the cutter edge 46 be not quite aligned with the plane of the plate P the cutter can rock about its pin 43 upon engagement with the plate against the action of spring 57. During this slight rocking of the blade 45 the front cutting edge 48 will be free and will not engage any part of the positioning washer 58 due to the fact that the lug or lip 65 is pressed against the front bevel surface 50 corresponding to the front edge 48.

If, after repeated operations, it is noted that the rear edge 46 is dull the positioning member or washer 58 can be moved forwardly on stem 32 by a manual operation, after which the blade 45 can be turned either to the right or to the left to bring either the cutting edge 49 or 47 into rearward cutting position. As soon as the cutter blade has been set in its new position, the positioning washer 58 will be released, whereupon the spring 57 will reestablish the holding and positioning relationship shown for instance in Fig. 3.

In the modified form shown in Fig. 7 all parts of the structure thus far described may be the same except the cutter blade, which as indicated at 70, will have six sides and have six cutting edges designated at 71. In both forms of the invention the stem 32 is capable of angular adjustment around its axis by reason of a set screw 33, so that the operative cutting edge can be at the left of the cutting blade as shown in Fig. 1, or to the right, depending upon which condition of cutting is desired. In either position of the stem 32 and in both forms of the invention the placing lug or lip 65 will engage a bevel surface of the cutter blade and not a cutting edge.

From the foregoing it will be seen that the invention sets forth a simple thread cutter provided with a cutter blade having multiple cutting edges which are movable manually one at a time into operative position. The cutter mechanism is so made that either form of blade shown will have its rear cutting edge held in approximately the correct position for cutting, but can rock slightly upon engagement with the cutting plate P against the action of spring 57 acting through the washer 58 and positioning lug 65. When it is desired to move a new cutting edge into position the washer 58 will be moved forwardly against the action of spring 57 a sufficient distance to permit turning of the cutting blade in a direction to move a new cutting edge into cutting position. During the slight rocking of the cutter blade incident to its alignment with the plate P the cutter blade will move angularly around the pivot pin 43, the front edge will be spaced from the lug 65 and will not be worn by it during angular movement of the blade incident to its operation. The lug 65 may in fact be formed as an integral part of the washer 58 and be struck from body 60 when the opening 61 is punched. When all of the edges are dull the stem can be removed from the lever arm 31 for re-sharpening, but such removal will not be as frequent as is necessary in the type of filling cutter mechanism heretofore employed.

Having thus described the invention it will be seen that changes and modifications of the foregoing specific disclosure may be made without departing from the spirit and scope of the invention.

What is claimed as new is:

1. In thread cutting mechanism for a weft replenishing loom having a lay, a shuttle provided with a plate in the front wall thereof, a

supporting lever normally in inoperative position but moving to operative position on a weft replenishing beat of the loom as the lay and shuttle move forwardly, a supporting member mounted on and moving with the lever, a cutter blade rotatably mounted on the member and having a plurality of thread cutting edges distributed around the periphery thereof, and resilient means operatively interposed between the member and the blade normally in position to hold one of said cutting edges in operating position for engagement with said plate on the shuttle and enabling the blade to move angularly with respect to the member to align said one cutting edge with said plate, said resilient means being capable of moving in a direction away from said blade to enable the latter to turn with respect to the member to present another cutting edge in operating position and thereafter returning to normal position to engage said blade and hold the same with said other cutting edge in normal cutting position.

2. In thread cutting mechanism for a weft replenishing loom having a lay and a shuttle thereon provided with a plate in the front wall thereof and the loom having a supporting lever normally in inoperative position but moving to operative position on a weft replenishing beat of the loom as they lay and shuttle move forwardly, said cutting mechanism comprising a supporting member secured to the lever, a cutter blade rotatably mounted on the member and having a plurality of straight thread cutting edges distributed around the periphery thereof, a compression spring surrounding part of said member and having the forward end thereof restrained against forward motion relatively to the member, a washer interposed between said spring and the blade cooperating with the spring to hold the blade with one of the cutting edges thereof normally in cutting position, said washer being yieldable against the action of said spring to permit slight angular motion of the cutter blade with respect to the member for alignment of said one cutting edge with the plate in the shuttle, and said washer being movable forwardly away from the blade to enable the latter to turn to move another cutting edge thereof to cutting position.

3. In thread cutting mechanism for a weft replenishing loom having a lay and a shuttle thereon provided with a plate in the front wall thereof and the loom having a supporting lever normally in inoperative position but moving to operative position on a weft replenishing beat of the loom as the lay and shuttle move forwardly, said cutting mechanism comprising a stem secured to the lever and having a vertical slot in the rear end thereof, a cutter blade extending through the slot rotatable on the stem and having a plurality of straight cutting edges disposed around the periphery thereof, a compression spring on said stem having the forward end thereof restrained with respect to forward motion with respect to the stem, and a washer having a portion thereof extending through said slot and held normally by said spring against a forward part of the blade to position a rear cutting edge of the blade in cutting position for cooperation with said plate in the shuttle, said washer being movable forwardly on the stem against the action of said spring to permit turning of the blade to move another cutting edge thereof to cutting position.

4. In thread cutting mechanism for a weft replenishing loom having a lay and a shuttle

thereon provided with a plate in the front wall thereof and the loom having a supporting lever normally in inoperative position but moving to operative position on a weft replenishing beat of the loom as the lay and shuttle move forwardly, said cutting mechanism comprising a stem secured to said lever and having a slot in the rear end thereof, a thread cutting blade extending through the slot rotatably mounted on the stem and having a plurality of straight edges arranged around the periphery thereof, a washer having a bridge extending through said slot, and a spring on said stem urging the washer against a forward part of said blade and holding the latter with one edge thereof in cutting position, said washer being movable forwardly against the action of said spring away from said blade to enable the latter to be rotated with respect to the stem to move another edge thereof to cutting position.

5. In thread cutting mechanism for a weft replenishing loom having a lay and a shuttle thereon provided with a plate in the front wall thereof and the loom having a supporting lever normally in inoperative position but moving to operative position on a weft replenishing beat of the loom as the lay and shuttle move forwardly, said thread cutting mechanism comprising a stem secured to the lever and having a vertical slot in the rear end thereof, a cutter blade pivotally mounted on the stem extending through said slot and having a plurality of straight thread cutting edges arranged around the periphery thereof, said blade having a beveled surface for each cutting edge, a positioning washer on the stem having a lug in said slot extending above and below the axis of the stem and engaging a forward beveled surface of the blade along a line spaced from the cutting edge corresponding to said forward beveled surface, and a spring on said stem normally holding said lug against said forward beveled surface to hold one of said edges yieldingly in cutting position, said blade being angularly movable on said stem to align the edge in cutting position with the plate on the shuttle against the action of said spring, and said washer being movable forwardly from normal position to enable the blade to turn relatively to the stem to move a different cutting edge to cutting position and move a different beveled surface into position for engagement with said lug.

6. A thread cutting unit for a weft replenishing loom operating with a shuttle having a plate in the front wall thereof, said unit comprising a supporting member, a cutter blade rotatable on the member and having a plurality of straight cutting edges arranged around the periphery thereof, and resilient means mounted on the member effective to hold the blade yieldingly in normal position with one of the cutting edges thereof in operative position, said resilient means being movable away from the blade to permit the latter to be turned on the member to move another cutting edge into operative position.

7. A thread cutting unit for a weft replenishing loom operating with a shuttle having a plate in the front wall, said unit comprising a stem, a cutter blade rotatable on the stem, a positioning washer on the stem, and resilient means supported by the stem holding said washer yieldingly against the blade to hold the latter with one of the edges thereof in operative position, said washer being movable forwardly on the stem against the action of the resilient means away

from the blade to permit angular movement of the latter with respect to the stem to move another cutting edge into operative position.

8. A thread cutting unit for a weft replenishing loom operating with a shuttle having a plate thereon for cooperation with the cutter unit, said unit comprising a supporting member having a slot therein, a thread cutting blade rotatably mounted on said member and extending through said slot and having a plurality of straight cutting edges arranged around the periphery thereof, a compression spring on said member the forward end of which is restrained against movement in a direction away from said blade, and a positioning washer between the rear end of said spring and the blade held in normal position by the spring and caused by the latter to engage the blade and hold the same yieldingly normally in position with one of the cutting edges in cutting position, said blade being movable angularly to a slight extent with respect to the member when the washer is held near the normal position thereof by said spring, and said positioning washer being movable away from the blade to enable the latter to be turned manually relatively to the supporting member to move another cutting edge thereof to cutting position.

9. A thread cutter unit for a weft replenishing loom, said unit comprising a stem having a slot in the rear end thereof, a cutter blade pivotally mounted on the stem and rotatable in said slot and having a plurality of straight cutting edges arranged around the periphery thereof, the blade having a beveled surface for each cutting edge, a positioning washer on the stem having a bridge extending through the slot, a lug on the bridge for engagement with a beveled surface of the cutter blade at one side of said slot spaced from the corresponding cutting edge, and resilient means on the stem holding said lug against said beveled surface, said positioning washer being movable forwardly away from said blade to enable the latter to be turned on the stem to move another cutting edge to operative position and move another beveled surface into position for engagement with said lug.

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