May 11, 1948. W. Y. ROBB 2,441,374

PILE TUFT CUTTER FOR AXMINSTER LOOMS

Filed Feb. 1, 1946

FIG. 1

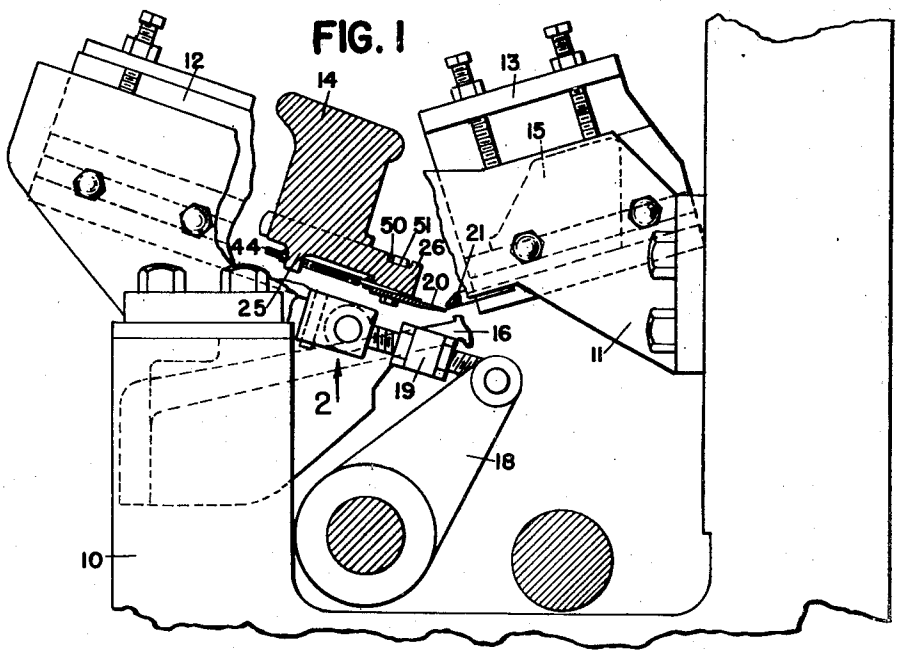


FIG. 2

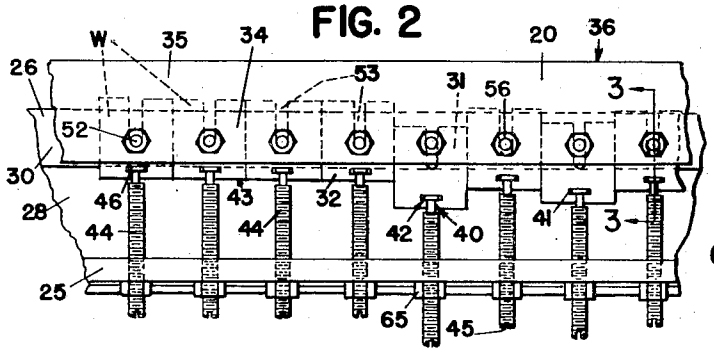


FIG. 4

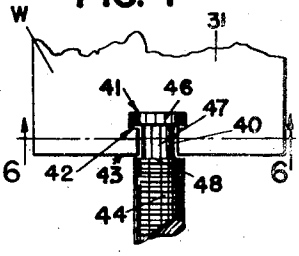


FIG. 3

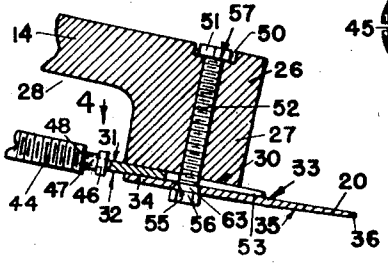


FIG. 5

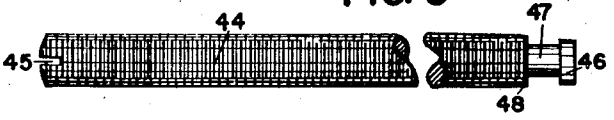
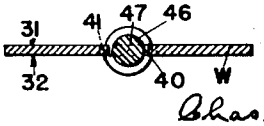


FIG. 6



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PILE TUFT CUTTER FOR AXMINSTER LOOMS

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3 Claims. (Cl. 139—2)

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This invention relates to improvements in tuft cutting mechanism for Axminster looms and it is the general object of the invention to provide such a mechanism with adjusting means which will be accurate, durable, and capable of holding its adjustment.

Axminster looms ordinarily operate with front and back cutter knives which cut the tufts woven into the fabric from the tube frames which supply the tuft forming yarn. These knives are mounted on heavy bars which extend across the loom and should have cutting engagement with each other throughout their length. It is an important object of my present invention to provide a series of wedges or tapered shims between a knife and its supporting bar and construct the shims so that they can be moved by adjusting screws relatively to the bar to affect changes in the contour of the knife. The shims and adjusting screws are preferably made to have direct operative engagement with each other, thereby providing a simple two-part adjustment for the knife.

It is another object of the invention to provide the adjusting screws with a mounting on the bar so located that the screws are in longitudinal alignment with the shims and to construct the supporting bar in such manner as to permit adjustment by the screws, preferably by means of a recess between a knife supporting rear shelf on the bar and a front screw supporting rib.

In order to provide an inexpensive cutting blade or knife I form the latter of a piece of flat metal and taper the rear edge thereof, leaving the forward part of the blade with parallel sides. Holding bolts pass through the bar, wedges and blade to hold these parts together in fixed position. It is a further object of my present invention to provide the aforesaid shelf with an under surface inclined with respect to the forward part of the knife by an amount substantially equal to the taper of the shims, thereby enabling the holding bolts to be substantially perpendicular to the part of the blade through which they pass to permit tight holding of the blade and the shims despite the vibration of the blade due to loom operation.

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

In the accompanying drawings, wherein a convenient embodiment of my invention is set forth,

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Fig. 1 is a side elevation partly in section of the forward upper part of an Axminster loom setting forth a front cutter bar provided with my invention,

Fig. 2 is a bottom plan looking in the direction of arrow 2, Fig. 1,

Fig. 3 is an enlarged detailed vertical section on line 3—3 of Fig. 2,

Fig. 4 is an enlarged fragmentary plan view of one of the adjusting shims and the adjusting screw corresponding thereto,

Fig. 5 shows one of the adjusting screws, and Fig. 6 is a vertical section on line 6—6 of Fig. 4.

Referring particularly to Fig. 1, the loom frame 10 supports a bridge member 11 provided with front and back guides 12 and 13 for front and back knife or cutter bars 14 and 15, respectively. The fabric being woven is supported by a stationary nose board 16 and tufts not shown extending upwardly from the nose board in position to be cut from the tube frame not shown at the end of a tuft forming operation. Prior to the cutting operation the front bar 14 will be to the left of the position shown in Fig. 1, while the rear bar 15 will be moved backwardly to the right, thereby providing space for the operation of the tube frame. The front bar will then be moved downwardly and rearwardly, as by a lever 18 and connector 19, while the rear bar will be moved forwardly by any approved mechanism not shown. The front bar is provided with a cutter blade 20 which engages a second blade 21 on the rear bar.

As a result of continued use the front knife may change the contour of its cutting edge sufficiently so that it does not engage the back knife at all points across the loom, and in order to correct this condition it is necessary to raise the low parts of the front knife. In a similar manner, if part of the front knife is too high it should be lowered to establish the correct cutting relation with the back knife.

Fig. 1 shows a specific relationship between the front and back cutting knives such as is found on a well-known type of Axminster loom, but I do not wish to be limited in the practice of my invention to the particular knife shown.

Referring more particularly to Figs. 2 and 3 and the under side of the knife bar 14, it will be seen that the latter is formed with a downwardly extending rib 25 extending along the forward part of the bar and is also formed with a backward extension 26 the lower part of which

is formed with a depending shelf 27 which may be parallel to rib 25. A recess or depression 28 is formed in the under side of the bar 14 between the rib 25 and the shelf 27.

The shelf 27 has an under surface 30 which engages the upper surfaces 31 of a series of tapered shims or wedges W the under surfaces 32 of which engage the flat top surface 33 of the knife 20. The forward part 34 of the bottom surface 35 of the knife is preferably parallel to the top surface 33, thereby facilitating manufacture of the knife out of a flat strip of steel which can be provided with a reduced cutting rear part 36.

The thick forward part of each wedge W is provided with a vertically extending slot 40 disposed transversely of the body of the wedge and open at its front end. The rear part of slot 40 opens into a wider slot 41 cut through the wedge and forming rear vertical walls 42 behind forward walls 43 on the front of the wedge and at the sides of slot 40. The rib 25 has threaded therein a plurality of backwardly and forwardly extending adjusting screws 44 each having a screw driver slot 45 in the forward part thereof. The rear end of each screw has a head 46 connected to the body of the screw by a reduced neck 47. As shown more particularly in Figs. 3 and 4, each head 46 fits into the wide slot 41 behind walls 42, while the neck 47 extends forwardly through slot 40. The slot 41 may be slightly larger than the head 46 to provide a small amount of clearance. It will be apparent more particularly from Figs. 3 and 4 that the axis of the adjusting screws extends directly forwardly from the shims or wedges W, and that the rear threaded part 48 of screw 44 is in front of walls 43.

The upper part of the rear projection 26 of knife bar 14 is provided with a longitudinal slot 50 extending over shelf 27 and arranged to receive the heads 51 of clamp bolts 52 which extend downwardly through the projection 26 and the shelf 27 and through slots 53 formed in the shims W and opening rearwardly as indicated in Fig. 2. Bolts 52 also extend through holes 55 in the forward part of the cutter blade 20, and nuts 56 on the lower ends of the bolts 52 afford means for clamping the parts together in the position shown in Fig. 3. The bolt heads 51 rest on a flat surface 57 at the bottom of slot 50.

In assembly, bar 14 will be inverted and rest on a support not shown to maintain the bolt heads 51 in slot 50. The screws 44 will then be threaded through rib 25 until heads 46 are adjacent to shelf 27. The shims W will then be placed on surface 30 with slots 53 aligned with bolts 52 and thereafter pushed rearwardly until slots 40 and 41 can fall in position around necks 47 and heads 46. Blade 20 is then placed over the shims with bolts 52 extending through holes 55 and the nuts 56 tightened to hold the blade and wedges in place. Bar 14 is then inverted and put in the loom. If any part of knife 20 is too low the corresponding shim will be moved forwardly by turning the associated screw with a screw driver not shown in slot 45. If, on the other hand, any part of the knife is too high the corresponding shim can be moved rearwardly by an appropriate turning of the associated screw 44.

It will be apparent from Figs. 2, 3, and 4 that the screws 44 can be detached from their shims by a simple relative vertical motion in which

the necks 47 will pass out of the open top or bottom end of slot 40, provided the screw is moved far enough forwardly to enable tilting of the shim until detachment is effected. This quick and easy detachment of the shims and screws not only facilitates original assembly but simplifies repairs.

Referring again to Fig. 3, it will be seen that back and forth movement of each adjusting screw is communicated directly to its shim, and since the axis of the screw is in substantial alignment longitudinally with the body of the shim there is no vertical force which might otherwise tend to move the shim vertically to an improper position. The recess 28 on the under side of the bar 14 not only provides room for the screws 44 but also simplifies machining the under side of shelf 27.

Surface 30 is preferably inclined with respect to surface 57 of slot 50 by an amount substantially the same as the taper of the shims, hence bottom surface 35, at least that part of it engaging screws 56, is parallel to surface 57, and all forces brought to bear upon the knife by the bolts 52 and nuts 56 will be in sufficient balance to enable adjustments of the shims to be retained and not be disturbed by the vibration of the knife 20 incident to the repeated back and forth movements of the front knife bar 14.

The heads 46 preferably have a diameter somewhat larger than the thickness of the forward parts of the shims, and the axial center of the heads is between the top and bottom surfaces of the shims, hence turning of the screws 44 will have little or no effect in exerting unbalanced vertical forces on the shims. If desired, the holes 55 may be conical as indicated in Fig. 3 and the nuts 56 can have correspondingly conically shaped upper surfaces 63. The slot 50 is narrow enough to prevent turning of the heads 51 of the bolts 52 when the nuts 56 are tightened. Adjustments of the screws 44 can be held by lock nuts 65 which when tightened will press against the front of the rib 25 to prevent turning of the screws 44.

From the foregoing it will be seen that I have provided simple and effective means for adjusting the tuft cutting knife of an Axminster loom with respect to its supporting bar. The tapered shims or wedges extend rearwardly directly from their adjusting screws and the forces incident to moving the shims backwardly and forwardly are transmitted directly from the screws to the shims. It will also be seen that the inclinations of the bottom surfaces of the shelf and the top and bottom surfaces of the shims is such that the forward part of the knife is substantially parallel to the surface 57, and the bolts 52 are substantially perpendicular to surfaces 35 and 57, hence the heads 51 will be drawn tightly against the surface 57 when the nuts 56 are tightened and the parts will retain their setting. Also, the recess 28 formed on the under side of the bar 14 not only provides room for the screws 44, but also facilitates machining of surface 30 on the bottom of the inverted shelf 27. Furthermore, the screws 44 can be readily detached from their shims by a simple vertical motion of the shims after the screws have been turned forwardly far enough to permit such motion of the shim. This separation of the two parts of the adjusting unit is further facilitated by the fact that the length of the shim is less than the distance between the rib 25 and shelf 27.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In tuft cutting mechanism for the pile yarns of an Axminster loom having a cutter bar extending thereacross, an inverted shelf depending from and extending along the rear part of the bar, a rib depending from and extending along the front of the bar, a cutter blade secured to the bar under the shelf, a plurality of wedges between the shelf and blade extending transversely of the shelf and movable backwardly and forwardly, each wedge having the front end thereof thicker than the rear end thereof and located forwardly of the shelf and having a slot extending vertically therethrough forward of the shelf, the slot having a relatively narrow part opening forwardly through the front end of the wedge and having a wider part rearward of said front end, and an adjusting screw threaded in the rib and having a head on the rear end thereof located in the wider part of said slot, each head and wedge being separable by vertical relative movement, any wedge when moved forwardly relatively to the other wedges by turning of the corresponding screw in said rib being movable vertically to effect disengagement from said corresponding screw due to the fact that the narrow part of the wedge is loose with respect to and movable vertically relatively to said shelf and blade.

2. In tuft cutting mechanism for the pile yarns of an Axminster loom having a cutter bar extending thereacross, an inverted shelf depending from and extending along the rear part of the bar, a rib depending from and extending along the front of the bar and spaced forwardly from the shelf, a cutter blade secured to the bar under the shelf, a plurality of wedges between the ledge and blade extending transversely of the shelf and movable backwardly and forwardly, each wedge having the front end thereof thicker than the rear end thereof and located intermediate the shelf and rib and having a slot extending vertically therethrough, the slot having a front relatively narrow part opening forwardly through the front end of the wedge and having a wider part rearward of said front part, and an adjusting screw for each wedge threaded into the rib and extending rearwardly therefrom and having a head on the rear end thereof forward of the shelf located in the wider part of the corresponding slot and extending above and below the associated wedge, each head and wedge being separable by vertical relative movement, any wedge when moved forwardly relatively to the other wedges by turning of the corresponding screw in said rib being movable vertically with respect to its screw to effect disengagement from the screw due to the fact that the narrow part of the wedge is loose with respect to and movable vertically relatively to said shelf and blade.

3. In tuft cutting mechanism for an Axminster loom having a cutter bar extending transversely thereof, said bar formed with a depending rib extending along the front part thereof and a depending shelf spaced rearwardly from the rib extending along the rear part of the bar, a tuft cutting blade extending along and under said shelf, an adjusting wedge located between the shelf and the blade and of less length measured transversely of the bar than the distance between the rib and shelf, an adjusting screw threaded into and extending rearwardly from the rib, and cooperating connections between the screw and the wedge so constructed that turning of the screw in one direction effects forward movement of the wedge transversely of the shelf and turning of the screw in the opposite direction effects rearward movement of the wedge transversely of the shelf, the screw when turned sufficiently in said one direction moving the wedge to a position between the shelf and rib to permit removal of the wedge.

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