Feb. 1, 1927. 1,616,347

M. B. BEHRMAN

PILE WIRE CUTTER

Filed July 6, 1925

Fig. 1.

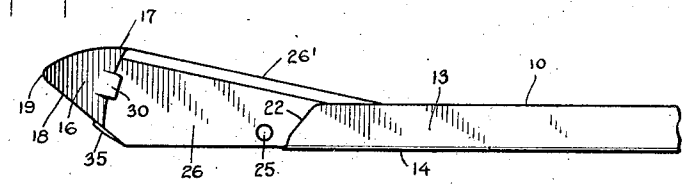


Fig. 2.

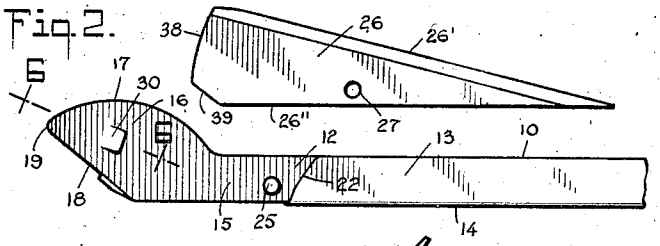


Fig. 3.

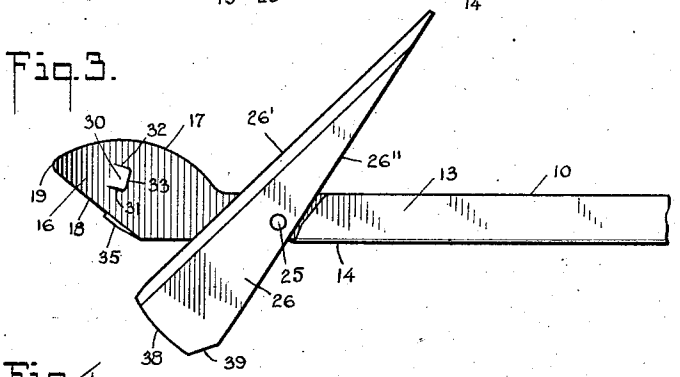


Fig. 4.

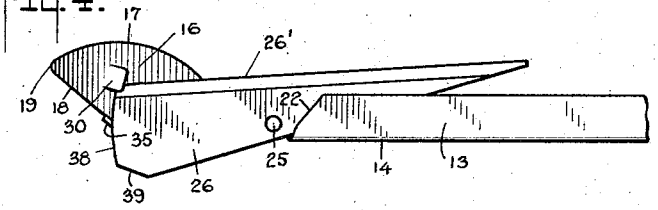


Fig. 5.

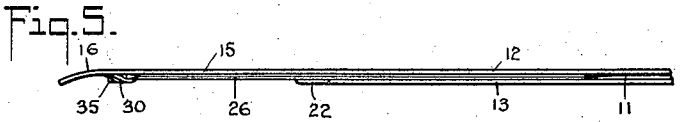
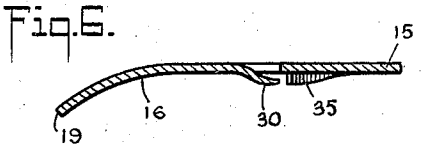


Fig. 6.



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UNITED STATES PATENT OFFICE.

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PILE-WIRE CUTTER.

Application filed July 6, 1925. Serial No. 41.515.

My present invention relates generally to a pile cutting means for the type of looms which weave pile fabrics and more particularly to an association with the pile wire employed for such purposes of a blade holder which can be attached thereto, and also to the manner of attachment.

In looms which I employ pile wires, the warp threads are generally looped over these wires and when it is desired to produce a cut pile fabric, cutters are so associated with the pile wires that upon withdrawal of the wires from the fabric, the cutters will cut through the loops. Due to the rapidity with which these pile wires are thrown in and withdrawn and the number of threads to be cut upon each withdrawal, each cutting edge is subject to a great number of cutting operations in a short time and therefore dulls quickly and such edges must obviously therefore be either frequently resharpened or frequently replaced.

The use of a cutter which is separable from the pile wire for permitting replacement of the blade is attended with a number of problems, amongst which is that arising from the fact that the arrangement for securing the blade in position on the one hand must serve to hold the blade in such fixed association with the pile wire that it will not shift therein nor will it be accidentally separated therefrom and, on the other hand, will so secure the blade as not to render its removal difficult or time consuming.

One of the important objects of my invention, therefore, is the provision of an arrangement whereby a cutting blade is so associated with the pile wire that while it is fixedly held in position thereon and against accidental removal, its quick and effective removal is permitted.

Looms of the type referred to, are already provided with pile wires and it is one of the important objects of my invention to so devise the cutter holder and its manner of association with a pile wire that the holder can be formed as a separable unit for attachment to a pile wire and can be associated with the conventional form of pile wire without requiring a replacement of the pile wires or any substantial change of reconstruction thereto.

My invention generally involves an arrangement whereby a separable blade is first preliminarily associated with the holder and then moved to its final position of association in which position, it is held against movement and one of the objects of my invention is the provision of an arrangement whereby the preliminary association of the blade with the holder can be readily attained and for this purpose, I have provided means whereby the manner of the preliminary association of the two is definitely predetermined and this predetermination I attain by providing on the holder an element to be so associated with the blade that the blade cannot be given only a pivotal movement with reference to the holder.

My invention further provides an arrangement whereby as the blade is given such pivotal movement toward its predetermined final position, not only will such predetermined final position also be definitely predetermined, but the blade will be locked in such predetermined final position against movement therefrom in any direction.

My invention generally involves the production of a simple inexpensive and efficient blade holding attachment for a pile wire, which on the one hand holds the blade fixedly in its predetermined association and yet permits of its ready removal and replacement.

For the attainment of these objects and such other objects as may hereinafter appear or be pointed out, I have illustrated an embodiment of my invention in the drawings wherein:

Fig. 1 is a side elevational view showing a blade in its final predetermined association with the holder;

Fig. 2 is a similar view showing the blade removed from the holder;

Fig. 3 is a view similar to Fig. 1 showing the blade in its preliminary position of association with the holder;

Fig. 4 is a side elevational view showing the flap in an intermediate stage and as it is being moved from the preliminary stage of Fig. 3 to its final stage of Fig. 1;

Fig. 5 is a top plan view, looking down upon Fig. 1; and

Fig. 6 is a cross-section taken on line 6—6 of Fig. 2.

Upon viewing Figs. 2 and 3 of the drawing, it will be observed that I here employ a blade holder 10 which is preferably in the form of a thin strip of sheet material bent

so as to provide a channelled construction, which is preferably although not necessarily U-shaped in cross-section, the channel 11 being defined by the walls 12 and 13 upstanding from the bottom 14. One of the walls 13 is shorter than the other wall 12, thus providing said other wall 12 with the extension 15 and extending forwardly from this extending portion 15 is the enlarged spoon-like member 16 having its upper edge curved as shown at 17 and its lower edge inclined as shown at 18, the two meeting to form the point of the spoon 19. The shorter wall 13 of the channel 11 has its end edge preferably inclined as shown at 22.

For the purposes of predetermining the preliminary association of the blade in the holder, I provide an arrangement whereby the two can be associated pivotally and in the embodiment of the invention this comprises a projection 25 extending from the inner surface of the extending portion 15 of the wall 12, the projection 25 extending into the path of the blade when in the channel 11 and into the space that forms a continuation of the channel between the walls 12 and 13, and the blade 26 which I prefer to use is provided with a slot or opening 27 which is arranged to be received on said pivot projection 25 so as to permit the blade 26 to have a pivotal movement with reference to the holder, but to prevent any other movement of the blade with reference thereto except that movement by which the blade is associated with or removed from said projection 25, and while in the embodiment herein disclosed, the blade 26 is shown as provided with a hole 27 to form a bearing for pivot pin 25, it will be understood that the blade might also be provided with a slot open to the bottom thereof.

The blade initially positioned as shown in Fig. 3 of the drawing, can now be moved to its final or operative position of association with the holder by swinging it clockwise about the pivot 25 until the forward part of the body of the blade seats on the bottom of the channel which is its final position of operation as shown in Fig. 1 of the drawing and for holding the blade in this position, I provide the arrangement which I will now describe.

The spoon 16 is preferably provided with the tongue 30 formed by the cuts 31, 32 and 33 to permit the tongue to be punched up so as to cause the free end of the finger or tongue 30 formed by such cuts to project upwardly above the surface of the spoon 16 for a substantial distance. The spoon is further provided at the lower end of the inclined lower edge 18 with the upwardly extending abutment portion 35 preferably wedge shaped and increasing in height in the direction of the spoon tip 19.

The dimensions of the blade is such that as the blade 26 is moved from its position of Fig. 3 to its position of final association as shown in Fig. 1, the rear end of the blade will pass over the wedge abutment 35, which movement is permitted by the fact that the blade is flexible, and upon a continuation of such movement, the end of the blade will be moved under and be received beneath the finger 30, Fig. 4 of the drawing showing the blade at the beginning of its movement into position beneath the finger 30 and in the continued movement of the blade, a point will be reached in which the blade will be fully received beneath the finger 30 and intermediate the rear edge thereof as shown in Fig. 1.

The rear edge of the blade 26 is preferably curved as shown at 38 along an arc of a circle of which the pivot 25 is the center of rotation and the lower part of the rear edge of the blade is inclined as shown at 39 so that when the blade is in its final position of association as shown in Fig. 1 of the drawing, the portion 39 of the rear edge of the blade will register with and be received in back of the wedge abutment 35.

As has already been stated, the rear end of the blade as it passes over the wedge abutment 35 is slightly flexed and as the blade is moved to its position of Fig. 1, the rear edge thereof will have passed by this abutment 35 and will resume its normal flat position in back of such abutment with the edge 39 in contact with and in back of the abutment 35 so that no reverse or counterclockwise movement of the blade is permitted.

A forward or clockwise pivotal movement of the blade beyond its position of Fig. 1 of the drawing is prevented by the engagement of the lower edge of the blade with the bottom of the channel 11. A movement upwardly out of the channel is prevented by the pivot pin 25 and a movement sidewise out of the channel is prevented by the engagement with the blade with the side walls 11 and 12 and with the tongue 30.

To remove the blade for replacement, all that is necessary to do is to flex the lower inclined portion 39 of the rear edge upwardly sufficiently so as to permit the blade to be moved from its position of Fig. 1 in a counterclockwise direction and over the abutment 35 until it reaches a position free of said abutment such as that shown in Fig. 3 upon which it can be freely removed from its pivot 25.

The cutting edge 26′ is inclined with reference to the lower edge 26″ of the blade and the angle of incline and the length of the cutting edge with reference to its point of pivot 25 is such that this cutting edge is tangential to the upper curved edge 17 of the spoon 16 and terminates at the point where it is tangent to such cutting edge.

Upon viewing Fig. 1 of the drawing, it will be observed that the lower edge of the blade not only seats on the bottom of the channel 11, but also seats on the wedge abutment 35 so that, in fact, the seat for the blade has been cut away between these two points so as to permit of the manipulation of the blade for insertion and removal.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and to receive a cutting implement or the blade and means for holding the blade in operative association with said holder, said means including a pivot passing through the blade and about which the blade is adapted to swing as it moves into such operative association.

2. For use in looms for weaving pile fabrics, a blade holder having a channel therein adapted to receive a blade, one wall of the channel having a portion extending beyond the other and means for holding the blade in the channel, said means including a pivot about which the blade is adapted to swing, said pivot being carried by said extending portion of one of the walls.

3. For use in looms for weaving pile fabrics, a blade holder having a channel therein adapted to receive a blade, one of the walls of the channel presenting a portion which is exposed laterally with reference to the other wall and means for holding a blade in the channel, said means including a pivot about which the blade is adapted to swing, said pivot being carried by said exposed portion of one of the walls.

4. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and to receive a cutting implement or the blade and means for holding the blade in operative association with said holder, said means including a pivot about which the blade is adapted to swing as it moves into such operative association, and means spaced from and cooperating with said pivot to lock the blade in position.

5. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and to receive a cutting implement or the blade and means for holding the blade in operative association with said holder, said means including a pivot passing through the blade and about which the blade is adapted to swing as it moves into such operative association, and means spaced from the pivot and adapted to engage with the blade as it moves about the pivot to its operative position to lock the blade in operative position, and means for preventing a reverse movement of the blades from its operative position.

6. For use in looms for weaving pile fabrics, a pile wire blade holder having a channel adapted to receive the blade with its lower edge seated therein and means for holding the blade in the channel comprising a supplemental seat for the lower edge of the blade spaced from said channel, and over which the blade flexes as it moves into the channel.

7. A pile wire blade holder comprising a member having a channel defined by upstanding walls, and means for holding the blade from movement in said channel, comprising spaced apart members carried by one of said upstanding walls and cooperating with one end of the blade, one of said members being in the form of a finger positioned in spaced relation to said wall and adapted to overlap an end of the blade which is received between it and the said wall.

8. A pile wire blade holder comprising a member having a channel defined by upstanding walls, and means for holding the blade from movement in said channel, comprising spaced apart members carried by one of said upstanding walls and cooperating with one end of the blade, one of said members being in the form of a finger positioned in spaced relation to said wall and adapted to overlap an end of the blade which is received between it and the said wall, and the other of said members comprising an abutment over which the blade flexes as it moves to its aforementioned overlapped position.

9. A pile wire blade holder comprising a member having upstanding walls defining a channel therebetween, one of said walls being extended beyond the other to form a spoon end for the holder, and means for holding said blade in position in said channel, said means comprising a plurality of spaced apart members, two of which engage the blade adjacent one end and the other of which engages the blade at a point remote from such end, one of the two aforementioned members comprising an abutment carried by the spoon and presented in the path of movement of the blade to its position of operative association with the holder so as to cause said end of the blade to flex thereover as the blade is moved to such position.

10. A pile wire blade holder comprising a member having upstanding walls defining a channel therebetween, one of said walls being extended beyond the other to form a spoon end for the holder, and means for holding said plate in position in said channel, said means comprising a plurality of spaced apart members, one of which is in the form of an abutment carried by the spoon at its perimeter and so arranged and constructed as to be presented in the path of movement of one end of the blade as the

blade is moved to its position of operative association with the holder and to cause said end of the blade to flex thereover and pass thereby as the blade is moved to such position.

11. A pile wire blade holder comprising a member having a bottom and upstanding walls to define a channel in which the blade is received, one of said walls extending longitudinally beyond the other, and means for holding a blade in said channel with the lower edge thereof seated on the channel bottom, said means comprising spaced apart abutments carried by said longitudinally extending portion of the blade, one of said abutments being spaced a substantial distance from said bottom, and being arranged and constructed that as the blade is moved to its operative position with the lower edge of the blade seated in the channel, one end of the blade will flex over and past said abutment and a portion of the perimeter of the blade will position itself in back of and in contacting association with said abutment so as to prevent a reverse movement of the blade.

In witness whereof, I have signed this specification this 1st day of July, 1925.

MARCUS B. BEHRMAN.