Feb. 1, 1927.

1,616,345

M. B. BEHRMAN

PILE WIRE CUTTER

Filed Oct. 3, 1924

Fig. 1.

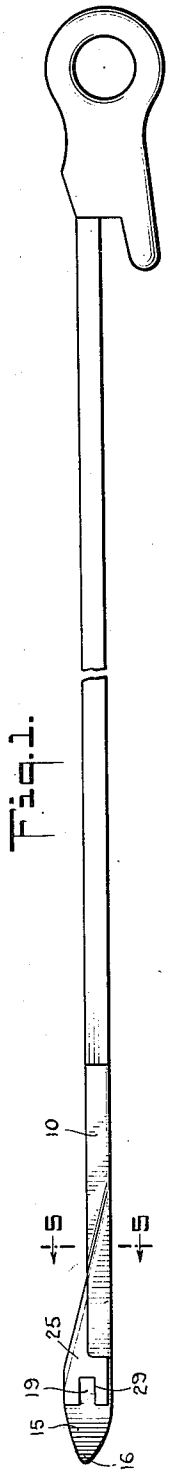


Fig. 2.

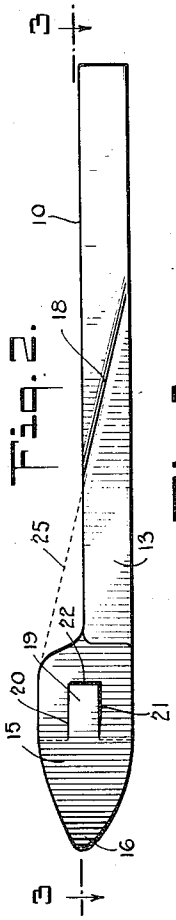


Fig. 3.

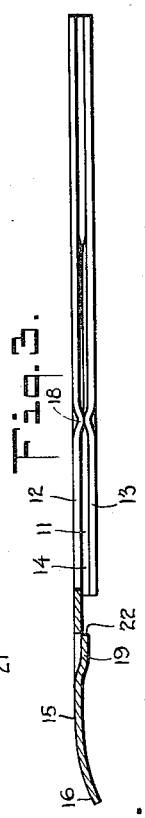


Fig. 4.

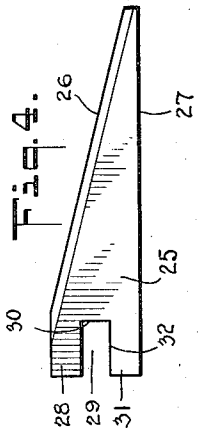


Fig. 6.

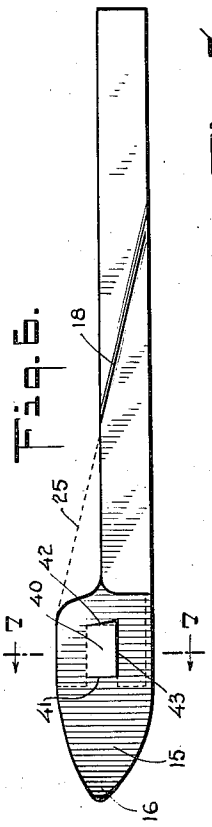


Fig. 7.

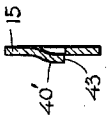


Fig. 8.

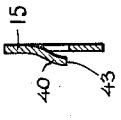
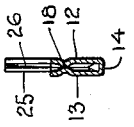


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PILE-WIRE CUTTER.

Application filed October 3, 1924. Serial No. 741,400.

My 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 wires generally employed in such looms, of a cutter for cutting the loops as the pile wires are withdrawn.

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, among which is that any arrangement for securing the blade in position which on the one hand will serve to hold the blade in association with the pile wire so that it will not shift therein nor will it be accidentally separated therefrom, may on the other hand so secure the blade as to render its removal difficult and 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 plie wire that while it is fixedly held in position thereon and against accidental movement, its quick and effective removal is permitted.

Where I have attempted to employ an arrangement for holding the blade in position in which the front and rear ends of the blade are so engaged as to prevent their movement longitudinally along the holder in either direction and also their movement upwardly from their seat on the holder and the insertion of which is dependent upon a flexing of the blade to a substantial degree, that the insertion of the blade on the one hand is rendered extremely difficult and its removal correspondingly difficult and frequently attended with the breaking of the blade.

My invention therefore involves the provision of an arrangement for positively holding the blade against movement relatively to the pile wire in which no substantial flexing of the blade is necessary, particularly for purposes of insertion.

My invention further involves the provision of a simple, inexpensive and efficient cutting blade and of a novel, simple, readily operable, inexpensive manner of associating the blade with the pile wire so as to permit the blade on the one hand to perform its function at a maximum of effectiveness, and at the same time to permit of its quick removal and replacement.

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

Fig. 1 is an elevational view of one embodiment showing the pile wire with the blade in position.

Fig. 2 is an enlarged elevational view of the forward or front end of the pile wire which serves to hold the blade.

Fig. 3 is a view partly in top plan and partly in section taken on line 3—3 of Fig. 2.

Fig. 4 is an elevational view of the blade.

Fig. 5 is an enlarged cross-sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is a view similar to Fig. 2 showing the modified form of the holder.

Fig. 7 is a section taken on line 7—7 of Fig. 6; and

Fig. 8 is a section similar to that of Fig. 7, showing a slightly modified form.

Upon viewing Fig. 1 of the drawings, it will be observed that my arrangement shown in this embodiment for associating the blade with the pile wire, comprises the holder 10 which may be made either integral with the pile wire or as an attachment thereto and which is in the form of a thin strip of sheet material bent so as to provide a channelled construction which is preferably, though not necessarily U-shaped in cross-section, the channel 11 being defined by the walls 12 and 13, upstanding from the bottom 14. Extending forwardly from the wall 12, is the enlarged spoon-like member 15 preferably curved as outer end 16, for purposes well understood to those skilled in the art.

The channel 11 is provided in any preferred or desired manner with the inclined end abutment wall 18, the illustrated embodiment showing this end wall as formed by forcing together the walls 12 and 13 along a line which is inclined as shown in the drawings.

The spoon-like member 15 is provided with the punched up finger 19 cut away along three sides, 20, 21 and 22, the sides 20 and 21 in this embodiment being horizontal and shown preferably, although not necessarily, as parallel. This member 19 is positioned angularly part way across the channel 11 as shown in Fig. 3.

Upon viewing Fig. 4 of the drawing, it will be here observed that the knife or cutter 25 which I employ is preferably of the flexible wafer type, the cutting edge 26 of which inclines upwardly with reference to the bottom 27 at an angle substantially that of the end wall 18 of the channel 11 and the butt end of which is intended to cooperate with the members 19. In the embodiments herein illustrated, the knife 25 is shown as slotted at 29, the slot being defined by the fingers 28 and 31.

In the insertion of this type of blade in the holder, the front or pointed end of the blade is first worked into the channel 11 into position beneath the inclined end wall 18 of the channel and the blade when moved angularly downwardly so as to cause the butt end to move over the inclined surface 35 of the finger 19, which inclined surface inclines from the end 22 to the inner surface of the spoon 15 into which it merges.

It will be understood that the dimensions of the parts are such that when the front or pointed end of the blade is fully nested in the channel 11 beneath the inclined wall 18, that the end wall 30 of the slot 29 of the blade will register with or be slightly to the rear of the end wall 22 of the member 19, the width of this slot being preferably equal to or slightly wider than the distance between the walls 20 and 21 of the finger 19 and the length of the slot being preferably substantially longer than the length of the member 19.

The holder 10 is made of a substantially stiff metal and it will be observed upon viewing Fig. 3 that the finger 19 is punched up just sufficiently to cause the transversely extending end wall 22 thereof to serve as an abutment to prevent the forward movement of the blade along the channel 11. This finger 19 is however not punched up sufficiently to permit the blade to pass thereunder. The same is true of the coaction of the longitudinally extending upper wall 32 of the finger 31 with reference to the lower wall 21 of the finger 19. In other words, when the blade is positioned in the channel as recited, with the forward end beneath the inclined end 18, the wall 22 of the finger 19 due to its engagement with the front wall 30 of the slot of the blade will prevent any movement of the blade in the opposite direction or towards the front end of the holder and similarly the wall 21 of the member 19 due to its engagement with the upper wall 32 of the finger 31 will prevent any upward movement of the blade at this point and these engaging points along with the engagement of the front end of the blade beneath the overhanging wall 18 will prevent any movement of the blade in the channel.

It will be understood that where it is desired to prevent movement of the blade lengthwise of and toward the front end of the holder, this can be accomplished by having a transversely extending end or wall on the blade coact with an abutment on the holder to engage therewith and prevent such movement. Where on the other hand, it is desired to prevent upward movement of the blade, this can be attained by having a longitudinally extending wall or portion of the perimeter of the blade engage an abutment on the holder presented so as to engage said wall or portion and prevent such movement. By providing a finger presenting the abutment portions formed by the walls 21 and 22 to coact both with the transversely extending end or wall 30 of the blade, and with the longitudinal end or wall 32 thereof, I not only attain both functions, but also attain these by the employment of only one punched up finger or projection as shown in the drawings. It will furthermore be understood that it is not necessary for the provision of the walls or ends 30 and 32, positioned at an angle to each other as shown, to having the cutaway 29 presented intermediate the upper and lower edge of the blade, as the presence of the finger 28 is merely incidental to the illustrated embodiment.

To remove the blade, all that is necessary is that the finger 31 be flexed slightly so as to permit it to pass over the abutting portions of the finger 19 upon which an upward angular movement of this part of the blade will permit of its full withdrawal.

It will be understood from the description thus far given that the blade when so positioned in the holder is prevented from moving toward the rear end of the pile wire by the overhanging inclined wall 18 and is prevented from moving forward by the member 19 and is prevented from moving upward by the associated action of the parts 18 and 19.

Where the finger 31 is longer than the member 19, as suggested, the butt end of this finger 31 will extend beyond and to the front of the member 19, thus additionally preventing the upward movement of the blade due to the engagement of the upper

wall of the finger 31, which is the lower wall of the slot 29, with the wall 21 of the finger 19 at the point where such finger joins or hinges onto the metal of the spoon 15.

In the embodiment of Fig. 6 of the drawing, instead of the member 19 punched up as shown, I employ the member 40 which also is in the form of a bent up finger cut out along three sides to provide the inclined surface 40′, two of the cuts however, being vertical and the connecting cut horizontal so as to provide this member 40 with the two ends 41 and 42 and the bottom 43. The cut which forms the end 42 is preferably slightly inclined as shown in this figure, and for purposes that will be understood as the assembly of the knife with the holder is explained.

The knife of Fig. 4 may be employed also with this holder and is inserted generally as described in connection with the embodiment of Figs. 1 and 2. Here also it will be understood that the provision of the cutaway 29 intermediate the top and bottom edges of the blade and resulting in the presence of the finger 28 is merely as illustrative of one embodiment of my invention.

The dimensions of the parts in this figure are somewhat the same as those described, in connection with Fig. 2, so that when the blade is inserted as described, the wall 32 of the blade will be below and in abutting relation to the wall 43 of the member 40 just as is the wall 32 with reference to the wall 21 in Fig. 2 and the wall 30 will be in abutting relation to the wall 42.

The purpose of the inclined wall 42 will be understood in connection with Figure 8, where the finger 40 is shown as forced upwardly or outwardly either accidentally or purposefully to a sufficient extent to permit the wall 30 of the blade to work beneath the wall 42, thus giving a slight play to the blade and preventing any flexing of the blade outwardly.

It will be observed that with this arrangement, the slot 29 is formed on a part of the blade that extends to the rear of the cutting edge 26, and that therefore I not only secure the blade to the holder, wholly through the engagement of that part of the blade which carries no cutting edge, but that the engaging means of which the tang 40 is a part, is positioned at a point in the holder which is open laterally through one side thereof, so that the release of the blade can be quickly effected and where it is desired for any reason whatsoever to effect the release of the blade by breaking off the part 33 thereof, this can be done very readily.

It will be further observed that the height or width of the intermediate part of the spoon is much greater than that of the tang 40 and that the tang is positioned a substantial distance below the top of the spoon, so that the inner surface of the spoon 15 will serve to support and guide the blade end over the inclined surface thereof.

It will be understood that the embodiment shown in the drawings and described herein are merely illustrative of one or more applications of my invention, and my invention is to be limited to such disclosure only to the extent called for by the language of the claims hereto appended.

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 pile wire blade holder having a channel to receive a cutting implement or blade therein, means for engaging one end of the blade, and means for engaging the opposite end of the blade, said last mentioned means comprising a plurality of abutment portions, one of said abutment portions engaging with a portion of the blade to prevent movement of the blade upwardly and transversely out of the channel, and another abutment portion cooperating with another portion of the blade to prevent movement of the blade longitudinally of the channel.

2. For use in looms for weaving pile fabrics, a pile wire blade holder having a channel to receive a cutting implement or blade with one edge of the implement seated in the channel, one of the walls of the channel being extended longitudinally beyond the other and means on said holder for holding the blade against movement in said channel said means including an abutment wall on said extended portion of the aforementioned wall presented in the path of movement of a blade in the channel toward the front end of the holder and an inclined surface leading from said abutment wall to the inner surface of said extended portion whereby the blade can be moved over said inclined surface to bring a portion thereof in abutting relation to said abutment wall.

3. A holder for a pile wire, said holder having two walls presenting between them a groove which receives one edge of a blade, an abutment adapted to overlie the rear end of said blade and retain the same in said groove, said abutment serving to guide the blade in its attaching association with and detaching association from the holder, one of said walls extending longitudinally in a forward direction beyond the other and presenting a head and means on said head wall engaging said blade adjacent its forward end and cooperating with said abutment to hold said blade in said groove.

4. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated on the bottom of the

channel, and means on said holder for holding the blade against movement in said channel, including a member punched up from the holder and projecting inwardly into the path of a cutting implement in the channel and spaced a substantial distance below the top of the holder, said member presenting an inclined surface which merges into the inner surface of one of the walls forming the channel in the holder in the direction of the front end of the holder whereby a blade can be moved over said inclined surface to bring a portion of the blade in back of it.

5. For use in looms for weaving pile fabrics, a pile wire blade holder having a channel to receive a cutting implement or blade therein, means for engaging one end of the blade and means for engaging the opposite end of the blade, said last mentioned means comprising a plurality of abutment portions, one of said abutment portions being constructed and arranged to have a blade portion pass thereover to a position between it and the blade seat as the blade is moved into its seat so as to prevent an upward movement of the blade from its seat, and another of said abutment portions being arranged and constructed to engage a blade when fully seated in the channel to prevent any longitudinal movement toward the front end of the holder.

6. A blade holder for a pile wire, said holder having two walls presenting between them a groove adapted to receive one edge of the blade, one of said walls presenting a portion which is exposed laterally with reference to the other wall, an abutment adapted to overlie one end of the blade and retain it in the channel, and means on said exposed portion of one of said walls arranged to engage the blade adjacent the other of its ends and cooperating with said abutment to hold said blade in said groove.

7. For use in looms for weaving pile fabrics, a pile wire blade holder having a channel to receive a cutting implement with one edge of the implement seated in the channel, and means for holding the blade against movement in said channel, said means including a member extending in the path of movement of a cutting implement in the channel, the parts being so arranged and constructed that as the cutting implement is moved along the channel in contact with the member, a relative lateral movement between the member and the implement will result, and the member will position itself in engagement with the cutting implement upon the completion of the movement to prevent a reverse movement of the cutting implement.

8. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated on the bottom of the channel, and means for holding a blade against movement on said channel, said means including a member punched up from one of the walls of the channel along three sides and having a portion thereof presented in the path of movement of an implement in the channel and capable of being moved out of such path, said member being directed generally toward the rear end of the holder.

9. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated on the bottom of the channel, and means on said holder for holding the blade against movement in said channel, including a member punched up from the holder and having a portion projecting inwardly into the path of a cutting implement in the channel and spaced a substantial distance below the top of the holder, said member extending generally toward the rear of the holder.

10. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated in the channel and having a spoon at one end and means on said holder for holding the blade against movement in said channel including a member punched up from the spoon and having a portion thereof projecting inwardly into the path of the cutting implement in the channel and spaced a substantial distance below the top of the spoon.

11. A blade holder for a pile wire, said holder having two walls presenting between them a groove adapted to receive one edge of the blade, one of said walls presenting a portion which is exposed laterally with reference to the other wall, an abutment adapted to overlie one end of the blade and retain it in the channel, and means on said exposed portion of one of said walls arranged to engage the blade adjacent its opposite end and cooperating with said abutment to hold said blade in said groove.

12. A pile wire comprising in combination, a blade holder having two walls which embrace said blade, and blade retaining means including a member which presents an obstruction to the movement of said blade in one direction, and a tongue which extends generally in the direction of the walls and prevents movement of the blade in the opposite direction.

13. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated on the bottom of the channel, and means for holding the blade against movement in said channel, said means

including a member punched up from one of the walls of the channel along three sides and forced angularly inwardly into the path of the channel, whereby a blade can be moved in the channel over said member.

14. For use in looms for weaving pile fabrics, a holder adapted to form part of a pile wire and having a channel to receive a cutting implement or blade with one edge of the implement seated in the channel, and means on said holder for holding the blade against movement in said channel, including a member formed on the holder and projecting inwardly into the channel and spaced a substantial distance below the top of the holder, said member being constructed and arranged to permit a cutting implement to pass thereover in one direction as the blade is moved to its seated position, and to serve as a positive stop to its movement in the opposite direction.

15. For use with a holder adapted to form part of a pile wire and having a channel to receive a knife blade with one edge of the blade seated on the bottom of the channel and having a member formed on the holder and projecting inwardly into the channel and spaced a substantial distance above the bottom of the channel, with said member presenting an inclined surface which merges into the surface of the walls forming the channel in the holder, a blade having a portion thereof cut away in such a way that as the blade is moved over the inclined surface to bring said cut away portion into registry with said member, said member will be positioned in said cut away portion and lock the blade against movement.

In witness whereof, I have signed this specification, this 26th day of September, 1924.

MARCUS B. BEHRMAN