March 2, 1926. 1,575,127

Z. PODHRADSKY

CUTTING MECHANISM FOR PILE FABRICS

Filed August 30, 1922 2 Sheets-Sheet 1

Fig. 1.

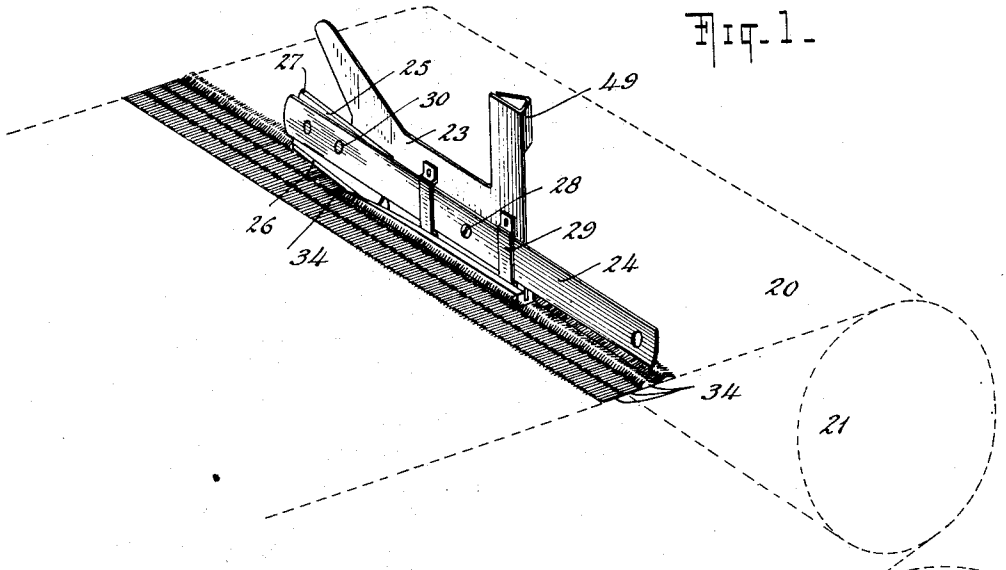


Fig. 2.

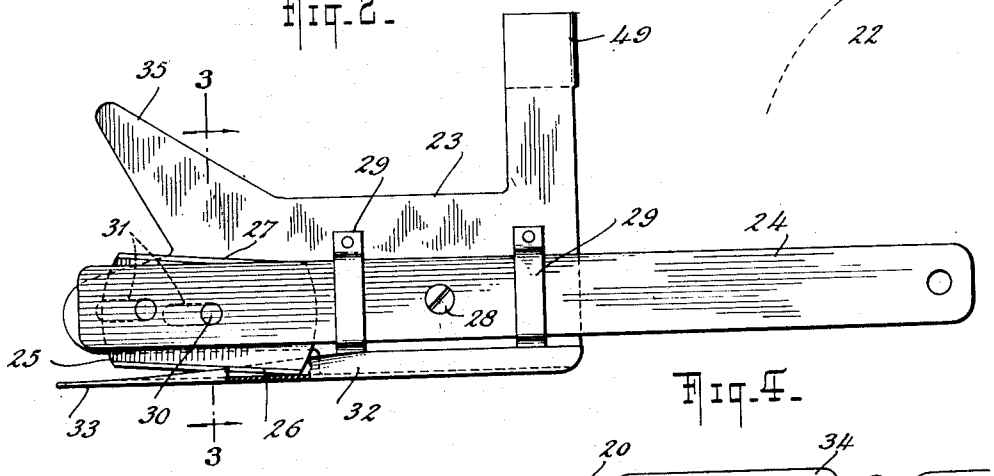
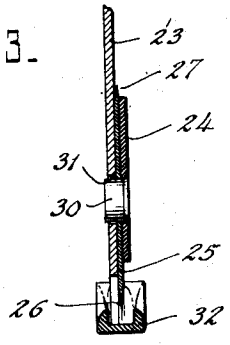


Fig. 4.

Fig. 3.



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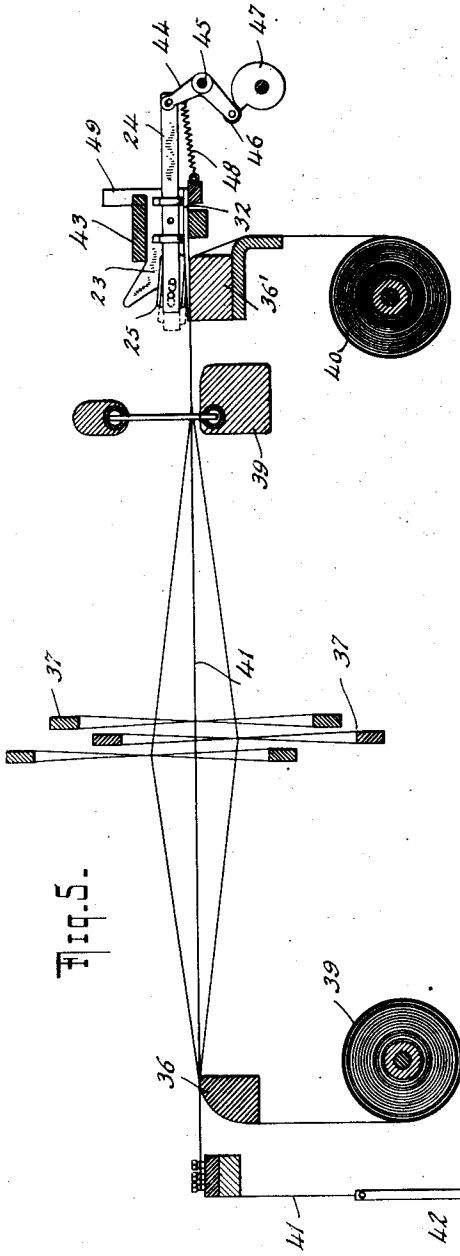


Fig. 5.

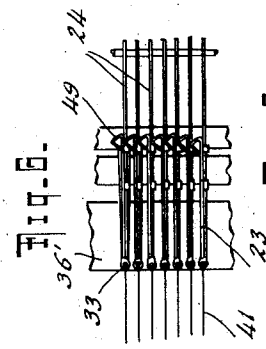


Fig. 6.

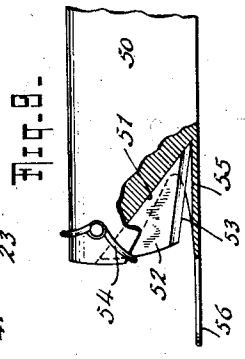


Fig. 8.

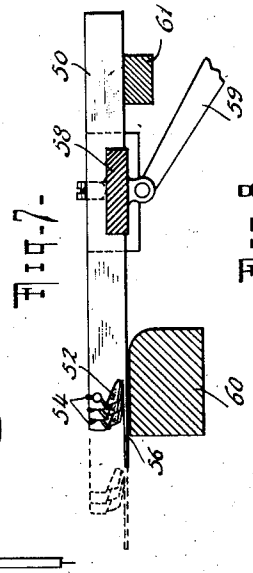


Fig. 7.

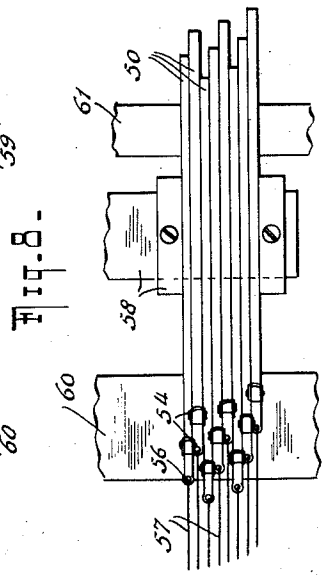


Fig. 9.

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UNITED STATES PATENT OFFICE.

ZDENKO PODHRADSKY, OF ASTORIA, NEW YORK, ASSIGNOR TO H. R. MALLINSON & CO. INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

CUTTING MECHANISM FOR PILE FABRICS.

Application filed August 30, 1922. Serial No. 585,191.

To all whom it may concern:

Be it known that I, ZDENKO PODHRADSKY, a citizen of the Republic of Czechoslovakia, and a resident of Astoria, in the county of Queens, city and State of New York, have invented certain new and useful Improvements in Cutting Mechanism for Pile Fabrics, of which the following is a specification.

This invention relates to looms for weaving pile fabrics, and more particularly to mechanism for cutting the piles or floats of such fabrics. The purpose of the invention is to provide a device of this character which can be operated either by hand or mechanically. Another object is to provide a mechanism which can be used for cutting floats or piles formed either by weft or by warp threads. Still another object of the invention is to simplify and improve the construction and operation of the pile-cutting mechanism and to so construct the device that the cutting knife proper is readily removable for sharpening or replacement without requiring the removal of other parts. These and other objects of the invention will appear from the description following hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawings, I have shown two examples of my invention, together with three different ways of using it. In these drawings, Figure 1 is a perspective view showing the cutting device in a position for cutting a piece of plush fabric, the device being in this case operated by hand; Fig. 2 is an elevation of the device shown in Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 2, shown on an enlarged scale; Fig. 4 is a section through a piece of pile fabric before the cutting operation; Fig. 5 shows certain details of a loom for weaving pile fabrics, together with the cutting device in operative position for mechanical operation; Fig. 6 is a partial plan view showing a plurality of cutting devices arranged side by side; Figs. 7, 8 and 9 show a different kind of cutting device, Fig. 7 being a vertical section, Fig. 8 a top view and Fig. 9 an enlarged detail view of the cutting device proper.

In Fig. 1 I have shown a piece of fabric 20 passing over a roll 21 and being wound, say, on a take-up roll 22. This fabric 20 is shown in the particular instance illustrated as plush fabric, the piles or floats being formed by the warp threads. The cutting device illustrated in Figs. 2 and 3 comprises a blade holding member 24, a carrier 23 for the blade holding member and a blade 25 having cutting edges 26, 27, respectively. In the particular example shown, where the cutting is done by hand, the carrier 23 and the blade holding member 24 may be rigid with each other, a set screw 28 serving to hold these two members together. For mechanical operation of the cutter, however, these two members 24 and 23 are preferably movable relatively to each other, guiding strips 29 secured to the member 23 being provided for this purpose. The blade 25 is held between the members 23 and 24 removably in the following manner: To the forward end of the blade holding member 24 are secured pins or rivets 30 which project through holes in the blade 25 and extend on the other side of this blade into slots 31 provided in the carrier 23. It will be seen that the holding member 24, with the blade 25, can be moved lengthwise of the carrier 23 but that the slots 31 serve to limit this movement.

At its bottom the carrier 23 carries rigidly a channel-shaped guide 32 which, as shown best at 33 in Fig. 2, is reduced and flattened toward its left-hand end, so as to facilitate its introduction into the space 34 formed in the fabric 20 (Fig. 4). It will be seen from Fig. 2 that the pins or rivets 30 are not in horizontal alignment but that one is located higher than the other so as to give the blade 25 a certain amount of inclination. The effect will be that the cutting edge 26 will diverge from the upper surface of the channeled guide 32—33 so that during the cutting operation the guiding surface of the guide 32—33 and the cutting edge 26 of the blade will have a shearing action on the fabric to be cut. The blade 25 is held between the members 23 and 24 removably, the holding member 24 being sufficiently elastic to allow it to be pressed to one side, away from the carrier 23, until the pins or rivets 30 are clear of the holes in the blade, whereupon the blades 25 may be removed for resharpening or replacement; or the blade may simply be

turned to bring the cutting edge 27 into operative relation to the fabric guide 32—33. A blade of the character shown in Figs. 1 and 2 has the further advantage that it presents not only two but four cutting edges, inasmuch as during the cutting operation only approximately one-half of the cutting edge 26 or 27 comes into operative relation to the fabric to be cut. A blade of this character can therefore be used four times without requiring resharpening or replacement.

If it is desired to cut the piles or floats of a plush fabric such as shown in Fig. 1, the flattened end 33 of the fabric guide 32 is inserted into the space 34 (Fig. 4) of the fabric and the cutting device is moved by hand across the piece of goods, as shown in Fig. 1, a lug or handle 35 serving to grasp the device by the hand of the operator. The material is fed slowly over the roll 21 to the take-up roll 22, thus giving the operator an opportunity to cut one row of piles after another.

In Figs. 5 and 6 I have illustrated the cutting device shown in Figs. 2 and 3 arranged for mechanical operation. Fig. 5 indicates certain parts of a loom for weaving a pile fabric which, in this case, may be corduroy fabric, the piles or floats being formed by weft threads. 36 and 36^1 indicate stationary parts of the loom frame, 37 the harness for weaving the pile fabric, 38 the lay, 39 the warp roll, and 40 the take-up roll for the finished fabric. 41 shows the pile wires which are kept taut by weights 42 attached to their left-hand ends while their right-hand ends are connected with the flattened ends 33 of the fabric guides 32. After the fabric has been woven by the harness 37, it passes over the loom frame part 36^1 down to the take-up roll 40. Above said part 36^1 the piles or floats of the fabric may be cut by a device similar to that shown in Figs. 1 and 3, consisting of a carrier member 23, a blade holding member 24, a blade 25 and a fabric guide 32—33. The carrier 23 is held immovable by stationary parts 43 while the blade holding member 24 with the blade 25 may be reciprocated in said carrier in the following manner: With the rear end of the holding member 24 is connected one end of a bell-crank lever 44 fulcrumed at 45, the other arm of the lever carrying a roller 46 traveling on a cam 47 rotating in clockwise direction. A spring 48 serves to hold the roller 46 in contact with the cam 47 and tends to pull the carrier 24 forward, that is, to the left in Fig. 5.

In practice I prefer to arrange a number of cutting devices side by side and these may have individual controlling means for the purpose of effecting the cutting by adjacent cutting devices at different times or the plurality of cutting devices may be operated simultaneously. For the purpose of properly spacing the individual cutting devices from each other, each of them may be provided with a projection 49 (see Figs. 1, 2 and 6). Each of these projections engages the adjacent cutting device, thus properly spacing them, as shown in Fig. 6.

During the weaving operation one of the pile wires 41 is woven into each of the spaces 34 of the fabric 20. The fabric is then fed over the guide wires 41 to the fabric guide 33—32, which guides it up the inclined end of such guide and into contact with the cutting edges 20 of the blade 25. By its periodical in-and-out movement the cutting knife or blade then cuts the pile threads by a shearing action.

Figs. 7, 8 and 9 show a different form of cutting device. In this modification the carrier 23 and the blade holding member 24 are made from a single piece of material 50, the forward portion of which constitutes the blade holding member; in one of its ends a longitudinally extending slot 51 which serves to receive a small blade 52 having an inclined cutting edge 53 and being held in the slot 51 by a spring 54. The holder 50 is also provided with a channeled guide 55 having a reduced and flattened end 56 adapted for connection with pile wires 57. This construction of a blade holder is very simple and lends itself specially for a mechanical performance of the cutting operation. The individual holders 50 are shown as secured to a bar 58 which may be reciprocated in any suitable manner to perform the cutting operation, a lever 59 being shown as connected to said bar 58. Stationary frame members 60—61 serve to guide the members 50 in their reciprocating movement. A further advantage of these blade holders 50 lies in the fact that they may be arranged in staggered relation to each other (see Figs. 7 and 8). With this staggered arrangement of the holders 50 the fabric-engaging portions of the blades will be offset one with respect to the other with the effect that the strain exerted on the fabric during the cutting operation is much less than if the cutting points were all in transverse alignment.

It will be seen that my device is very simple in construction and effective in operation. The knives can be operated either by hand (as, for instance, in cutting warp threads), or mechanically; in the mechanical operation the knives can be moved either as a unit or individually.

It is to be understood that the forms of cutting devices disclosed herein are only examples of my invention and that many modifications may be made within the scope of the appended claims.

I claim:

1. A pile cutting device comprising a carrier, a pile guide integral therewith, a movable blade holding member carried thereon, a blade, having a straight longitudinal cutting edge, on said member, means to hold the blade in fixed and non-movable relation with respect to said blade holding member, the cutting edge of the blade being arranged, with respect to the pile guide, at a gradual inclination in a direction continuously decreasing the space between the cutting edge and the guide as the incision of the cutting edge in the pile increases, so that, during the active cutting operation of the blade the pile is first cut at the top thereof and gradually deeper as the pile is moved against the inclined cutting edge of the blade.

2. A pile cutting device comprising a pile guide, having an inclined surface thereon along which the pile is adapted to move and to be supported with increasing tension during its movement on said inclined surface, a reciprocating blade holding member, a blade having a straight edge on said member, means to hold the blade in fixed and non-movable relation upon said holding member, the cutting edge of the blade being inclined with respect to the inclination of said pile guide in converging relation and in a direction continuously decreasing the space between the cutting edge and the guide as the incision of the cutting edge in the pile increases, so as to gradually cut the pile as the pile is carried along the inclination of the pile guide against the cutting edge of the blade.

3. A pile cutting device comprising a channeled pile guide, having an inclined surface thereon along which the pile is adapted to move and to be supported with increasing tension during its movement on said inclined surface, a blade holding member, a blade having a straight edge on said member, means to hold the blade in fixed and non-movable relation upon said holding member, the cutting edge of the blade from its front edge being inclined toward the pile guide in a direction continuously decreasing the space between the cutting edge and the guide as the incision of the cutting edge in the pile increases, said blade having its rearward and lowermost edge positioned in said channel thereby forming with said blade a cutting point so that the pile is gradually cut at the cutting point as the blade is moved and as the pile is carried along the inclination of the pile guide.

4. A pile cutting device comprising a carrier, a pile guide integral therewith, a channel in the guide, sloping side walls on said guide adapted to exert increasing tension upon the pile as it moves on said sloping side walls and to stretch the material to be cut across said channel, a blade holding member supported by said carrier, a blade having a straight edge carried thereby, said blade having portions thereof positioned in and over said channel and adapted to sever the material as it moves along said inclined walls.

5. In a pile cutting mechanism a carrier, a blade holding member supported thereby, a channel pile guide disposed below said blade holding member, a blade having a straight edge carried by said blade holding member in fixed and non-movable relation thereto, said blade having a cutting edge positioned in a gradually diverging direction from the pile guiding edges of said channel.

6. In a pile cutting mechanism a carrier, a blade holding member thereon, said carrier having a guide for said blade holding member, a blade on said blade holding member in fixed and non-movable relation thereto, means for imparting a reciprocating movement to said blade holding member and said blade, and means on said carrier for limiting the movement of said blade holding member.

7. A pile-cutting device comprising a blade carrier, a cutting blade having a recess, a supporting member for said blade adapted to support said blade on the surface opposite to said blade carrier, a pin and slot connection between said carrier and member, said pin passing through the recess in said blade, and a fabric guide arranged beneath the blade and adapted to guide a portion of the fabric against the cutting edge of said blade.

8. A pile cutting device comprising a blade holding member, a projection on said blade holding member, a cutting blade having a recess arranged to fit upon the projection on said blade holding member whereby said blade is mounted upon said blade holding member, a support for the blade adapted to support said blade on the surface opposite to said blade holding member, the blade being held in stationary relation with respect to the blade holding member and having a longitudinal cutting edge projecting below a lowermost portion of the blade holding member and the support and a fabric guide arranged beneath the blade and adapted to guide a portion of the fabric against the cutting edge of said blade.

9. A pile cutting device comprising a blade carrier provided with a plurality of slots, a cutting blade having a plurality of holes therethrough, a member adapted to lie against the blade and retain the blade between said blade carrier and said member, a plurality of pins carried by said member and extending through the holes in said blade, and through the slots in said carrier, said pins, holes, and slots being so arranged as to support the blade at a slight angle to the horizontal, and a fabric guide arranged

beneath the blade and adapted to guide a portion of the fabric against the cutting edge thereof.

10. A pile cutter, comprising a body formed from a flat piece of metal, a stiffening and bracing member arranged along the bottom of said body portion, said stiffening and bracing member having a forwardly extending section formed into a point, said forwardly extending section having its upper surface at an angle to the lower surface, a cutter carried by said body with the edge facing downwardly and substantially parallel with the lower edge of said extending sections and at an acute angle with the upper edge thereof, a plurality of fixed pins for holding the cutter in position, and means for preventing the cutter from leaving said pins.

11. A pile cutter of the character described, comprising a body formed of flat sheet metal, said body being turned up at the lower edge to provide a stiffening flange, said flange being spaced from the body and merging into a forwardly projecting guide, a knife carried by said body and having one end fitting between said flange and body and overlapping part of said projecting guide, and means for removably clamping said knife on said body.

12. A pile cutter, comprising a body having a V-shaped notch in its front end, the portion of the body below the notch forming a pointed member, a cutter having a straight cutting edge, and means for adjustably securing the cutter to the body with its cutting edge forming an acute angle with the lower wall of the notch, said cutter being stationary in respect to said pointed member.

In testimony whereof I have hereunto set my hand.

ZDENKO PODHRADSKY.