April 15, 1941. J. E. COOK 2,238,678

PILE FABRIC CUTTER

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Fig. 1

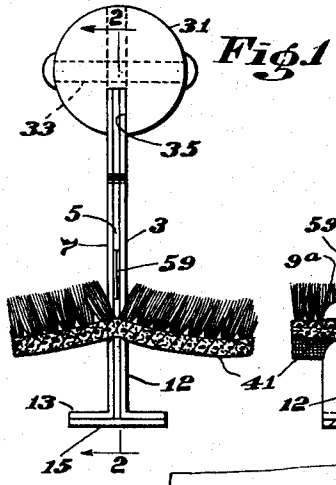


Fig. 2

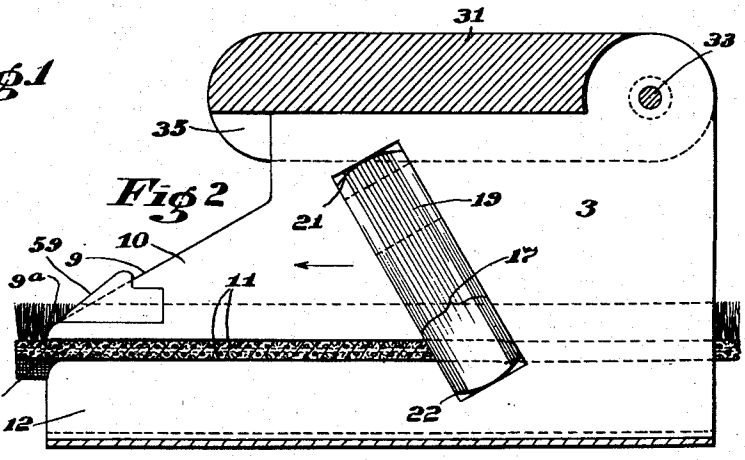


Fig. 3

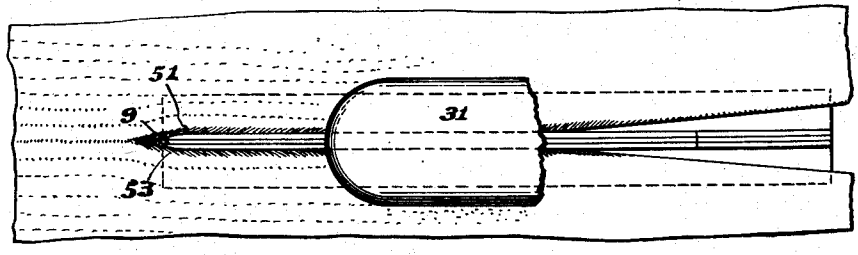


Fig. 4

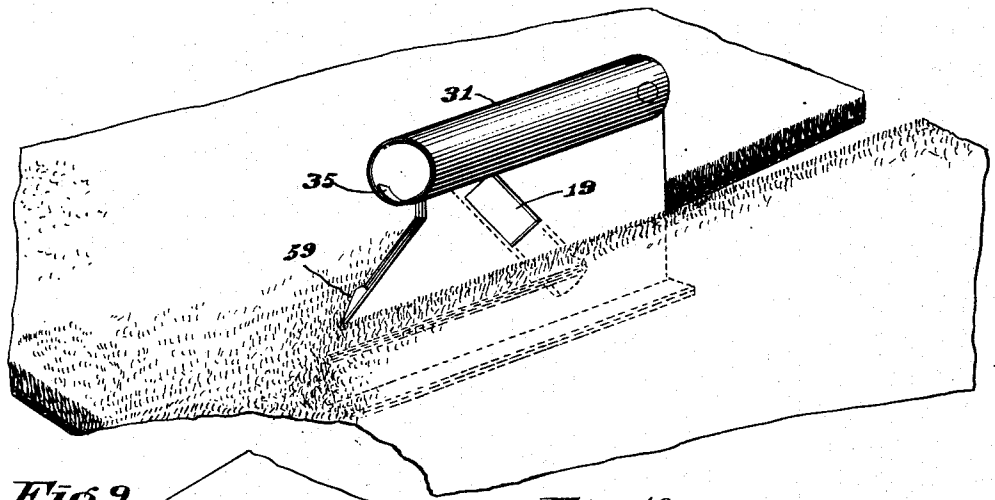


Fig. 9

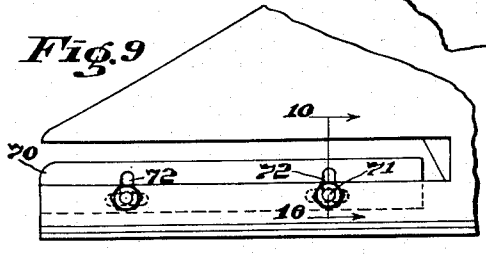
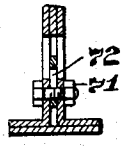


Fig. 10



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Fig. 5

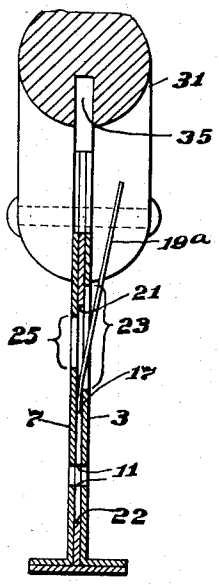


Fig. 6

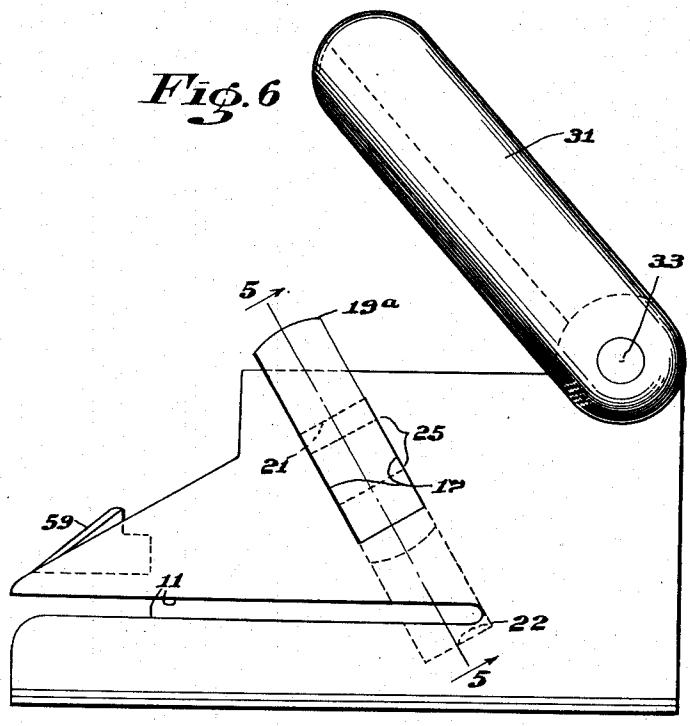


Fig. 8

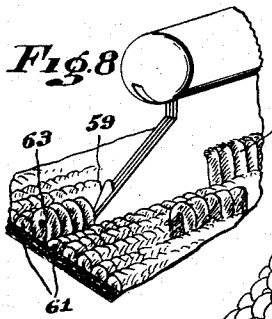


Fig. 7

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UNITED STATES PATENT OFFICE

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PILE FABRIC CUTTER

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Application March 31, 1938, Serial No. 199,191

8 Claims. (Cl. 30—294)

This invention relates to devices for cutting pile fabric and particularly to a novel guide member for such cutters adapted to direct the cut accurately along a line midway between adjacent rows of pile.

In cutting pile fabric, either warpwise or weftwise, it is desirable to cut substantially midway between adjacent pile tuft rows so that a narrow but even margin of backing fabric is left protruding from the marginal tuft rows at both cut edges. In cutting a rug from the back by running a knife against a straight edge, as has been customary, the cut does not follow the proper line between the tuft rows, as the rows are seldom precisely straight, but leaves varying margins of backing fabric and may even cross over a tuft row leaving cut tufts that fall out and produce a gap along the cut edge. Attempts to follow the proper line by eye, using a knife and eliminating the straight edge, have not been satisfactory, and the common practice of cutting the rug face up with hand shears is difficult and time consuming. Furthermore, in cutting rugs of the looped pile variety by any of these methods the cut frequently passes through a loop near the base leaving two strands of unequal length, the longer of which scuffs out during use,—an undesirable characteristic of pieced, looped-pile fabrics known in the trade as "sprouting."

The object of the present invention is to provide a cutter having a guide which will direct the cut along a line substantially midway between adjacent rows of pile despite any deviation of those rows from a straight line. As will appear, the guide preferably consists of a nose member disposed in advance of, and in fixed relation to, the blade, adapted to guide the blade during its advance by ploughing its way between adjacent rows of pile in advance of the cutter.

These and further objects and advantages of my invention will appear from a more detailed description thereof, in connection with the accompanying drawings, in which:

Fig. 1 is an end elevation view of the cutter shown cutting a pile fabric;

Fig. 2 is a side elevation view, partly in section, taken along the line 2—2 of Fig. 1;

Fig. 3 is a plan view of Fig. 2;

Fig. 4 is a perspective view of the device in use;

Fig. 5 is a sectional elevation view on the line 5—5 of Fig. 6;

Fig. 6 is a side elevation view of the cutter with handle raised for insertion of the blade;

Fig. 7 is a perspective view of a modified form of cutter shown cutting looped pile;

Fig. 8 shows the manner of using the auxiliary blade for cutting a special type of looped pile fabric;

Fig. 9 is a side elevation view of a further modification, and

Fig. 10 is a section on the line 10—10 of Fig. 9.

Referring to Figs. 1 to 4 inclusive of the drawings, the frame of the cutter consists of three plates 3, 5 and 7, each shaped as indicated for the plate 3 in Fig. 2 and having a slot or mouth opening 11 formed between a base portion 12 and an upper portion 10 which tapers at 9 to form a guiding nose for directing the cut in a manner to be described. The plates may be secured together in any suitable way, such as by spot welding, and the base 13 of the cutter may be formed by flanging the side plates 3 and 7 and welding, to the flanges, a bottom plate 15 as indicated. A handle 31, pivoted to the frame at 33, is recessed at 35 to fit frictionally over the upper margin of the frame.

The innermost plate 5 is slotted at 17 to receive a razor blade or other suitable knife member 19. The slot 17 is forwardly and upwardly inclined as indicated and extends from below the mouth 11 upwardly for a distance approximating the length of a razor blade, so that a blade, inserted in the slot, will be frictionally held between the upper and lower ends 21 and 22 respectively of the slot. The width of the slot approximates the width of the razor blade.

For insertion and removal of the blade into and from the slot 17 the side plates 3 and 7 are also provided with slots 23 and 25 (Figs. 5 and 6) both of which extend parallel to the slot 17. The slot 23, while shorter than slot 17, extends somewhat above the upper end 21 thereof to permit insertion of the blade through slot 23 into the central slot 17 and, for that purpose, slot 23 is wider than the blade. Slot 25 in plate 7, is used as a finger slot in removing the blade. It is considerably shorter than slot 23 and its upper end terminates below the upper end 21 of slot 17 so that, after the blade has been inserted with its bottom edge resting against bottom 22 of slot 17 and its upper edge snapped into position under edge 21, the blade cannot come out through the slot 25. To remove the blade the finger is pressed through slot 25 to force the blade outwardly through slot 23 so that it may be withdrawn. The handle 31, which, as stated, is pivoted to the frame at 33, locks down frictionally over the side plates to cover the upper end of slot 23 thereby preventing inadvertent removal of the blade during use. When changing

the blade, handle 31 is first swung upwardly to uncover slot 23, as indicated in Fig. 6.

The mouth opening 11 of the frame is preferably of a size approximating, though slightly exceeding, the thickness of the backing fabric 41 of the floor covering to be cut, the arrangement being such that when the backing fabric is received in the mouth 11 the nose portion 9 of the frame will be buried in the pile with the lower portion 9a of the nose in close proximity to the backing fabric and with the under surface of the fabric supported by the upper edge of the base portion 12.

In cutting a rug with a cutter constructed as above described, the pile is parted manually at the edge of the fabric where the cut is to start and the backing fabric is inserted in the mouth 11 of the cutter with the nose 9 ploughing its way between adjacent rows of pile 51 and 53 (Fig. 3). When the blade strikes the edge of the carpet the cut commences and it is apparent from Figs. 3 and 4 that as the cutter advances through the rug the nose 9 of the cutter will guide the blade 19 accurately between adjacent pile tuft rows where the cut is desired. Any tendency of the cutter to pass over a row of pile will be avoided because of the depth to which the nose 9 of the cutter is buried in the pile.

In cutting certain styles of pile fabric, it may be desirable to assist the ploughing action of the nose 9 by flexing the carpet to open up the pile slightly in advance of the nose. In Fig. 7, I have illustrated a looped pile fabric in which the pile loops, twisted in various directions, lie closely compacted against the backing fabric. In such types of weave, as well as in the plain cut pile weave of Figs. 1 to 4 inclusive, I may, if desired, flex the fabric at and in advance of the nose by the provision of a pair of bending shoes 55 and 57 which are suitably curved to cooperate with the base 12 of the frame to flex the rug as indicated and thereby part the pile slightly in advance of the nose as shown at 80.

I have illustrated at 59 a knife projecting from the leading edge of the nose 9. The purpose of this knife is to expedite the cutting of fabrics of the type illustrated in Fig. 8 wherein the pile consists of low loops 61 and high loops 63 formed by suitable dobby or jacquard mechanism cooperating with pile wires of different heights. In fabrics of that character, the space between adjacent rows 61 of low loops, for example, where the cut is to be made will be bridged, at intervals, by a group of high loops and the purpose of the cutter 59 is to sever the high loops. It will be observed from the cut loops 63a that the loops are severed at their top centers, leaving strands of equal length so that objectionable "sprouting" is obviated.

It will be apparent that my invention is subject to various modifications without departing from the principle herein set forth which is to be limited only as indicated in the appended claims. Thus the height of the mouth 11, which, as stated, approximates the thickness of the backing fabric, may be made adjustable for accommodating fabrics of different thicknesses. Thus, as indicated in Figs. 9 and 10, the inner plate of the frame of the base member, for example, may be made in sections with an adjustable piece 70 which may be raised and lowered to vary the size of the mouth opening and adapted to be secured in adjusted position by bolts 71 passing through aligned holes in the outer frame plates 3 and 7 and through elongated slots 72 in the member 70. The width or thickness of the frame could, of course, also be made adjustable by adding or removing extra side plates but such adjustment will not usually be necessary as a thin frame suitable for close weaves is also well adapted for cutting loose weaves, providing the mouth opening is of proper height.

I claim:

1. In a device for cutting pile fabric, the combination of a frame, a mouth opening in the frame adapted to receive the backing of the pile fabric, a blade disposed at the inner end of the mouth for cutting the backing fabric and a guide member at the outer end of the mouth adapted to guide the cut between adjacent rows of pile by ploughing its way through the pile between said rows.

2. In a device for cutting pile fabric, the combination of a frame, a mouth opening in the frame adapted to receive the backing of the pile fabric, the said mouth opening being of a size not substantially exceeding the thickness of the backing fabric, a blade disposed at the inner end of the mouth for cutting the backing fabric and a guide member at the outer end of the mouth adapted to guide the cut between adjacent rows of pile by ploughing its way through the pile between said rows.

3. In a device for cutting pile fabric, the combination of a blade, a blade guiding member disposed in fixed relation to the blade adapted to direct the cut between adjacent rows of pile and an auxiliary cutter projecting forwardly from said guiding member adapted to cut loops of pile bridging the space through which the cut is directed.

4. In a device for cutting pile fabric, the combination of a frame, a mouth opening in the frame adapted to receive the backing of said pile fabric, the said mouth being formed of a base member adapted to engage the undersurface of the backing and an upper guiding member adapted to be received between adjacent rows of pile, means for adjusting the extent of opening of said mouth, and a blade at the inner end of the mouth adapted to cut the backing as the cutter advances, the said blade being guided between adjacent rows of pile by the movement of said guide member between said rows.

5. In a device for cutting pile fabric, the combination of a frame, a mouth opening in the frame adapted to receive the backing of the pile fabric, a blade disposed within the mouth for cutting the backing fabric, and a guide member disposed at the forward end of the mouth, in advance of and above the effective cutting portion of the blade, adapted to guide the cut between adjacent rows of pile by ploughing its way through the pile between said rows.

6. In a device for cutting pile fabric, the combination of a frame, a mouth opening in the frame adapted to receive the backing of the pile fabric, a blade disposed within the mouth for cutting the backing fabric, a guide member disposed at the forward end of the mouth, in advance of and above the effective cutting portion of the blade, adapted to guide the cut between adjacent rows of pile by ploughing its way through the pile between said rows, and shoes extending laterally of the blade having surfaces which bear down on the top of the fabric and thereby flex the fabric in advance of the cut to separate the said rows of pile and form an aisle to receive the guide member.

7. In a device for cutting pile fabric, the com-

bination of a blade, an elongated guide plate extending a substantial distance forwardly of the effective cutting portion of the blade and having a lower edge surface which slides over the upper surface of the backing fabric between adjacent rows of pile to guide the cut therebetween, a holder for the blade positioning the effective cutting portion of the blade so that it extends downwardly from said lower edge surface of the guide plate and intersects the plane of said lower edge surface so that the cut extends through the surface of the backing fabric contacted by the guide plate and shoes extending laterally of the blade having surfaces which bear down on the top of the fabric and thereby flex the fabric in advance of the cut to separate the said rows of pile and form an aisle to receive the said guide member.

8. In a device for cutting pile fabric, the combination of a blade, an elongated guide plate extending a substantial distance forwardly of the effective cutting portion of the blade and having a lower edge surface which slides over the upper surface of the backing fabric between adjacent rows of pile to guide the cut therebetween, a holder for the blade positioning the effective cutting portion of the blade so that it extends downwardly from said lower edge surface of the guide plate and intersects the plane of said lower edge surface so that the cut extends through the surface of the backing fabric contacted by the guide plate and an auxiliary cutter mounted on said guide member adapted to cut loops of pile bridging the space through which the cut is directed.

JEROME E. COOK.