

Feb. 23, 1954

R. E. SAYLES
CLOTH CUTTER FOR CLOTH SPREADING MACHINES
AND HAVING RECIPROCABLE CUTTER DISK

2,670,040

Filed July 24, 1950

3 Sheets-Sheet 1

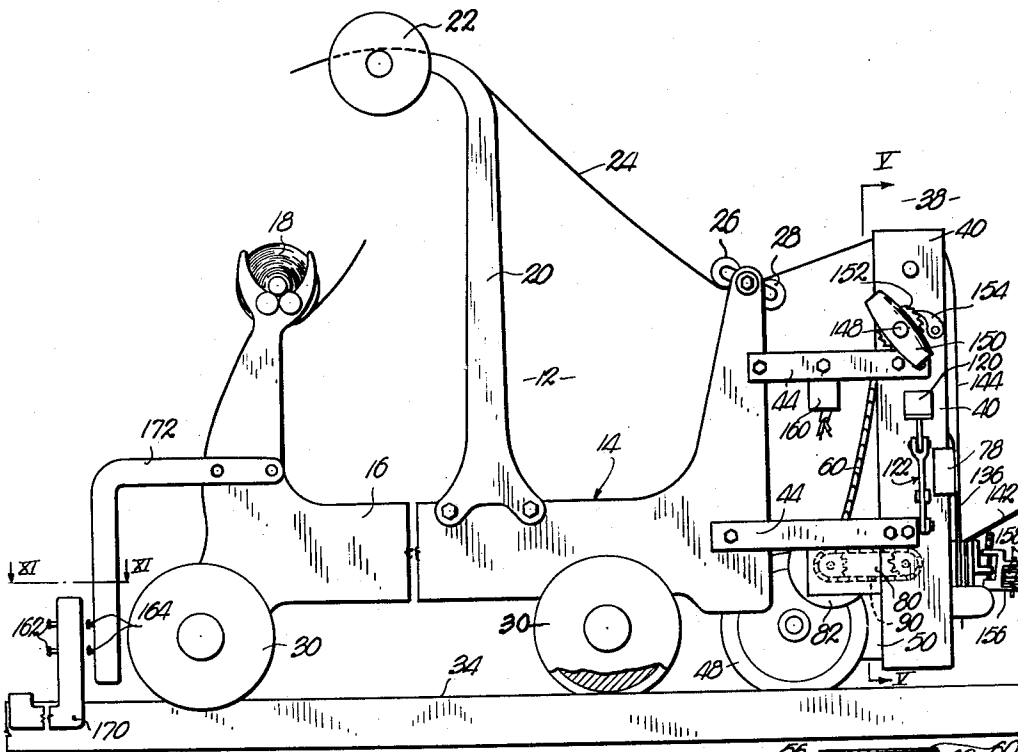


Fig. 1.

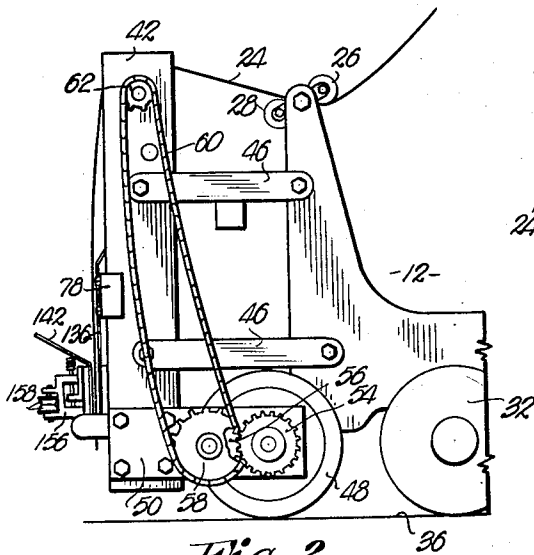


Fig. 2.

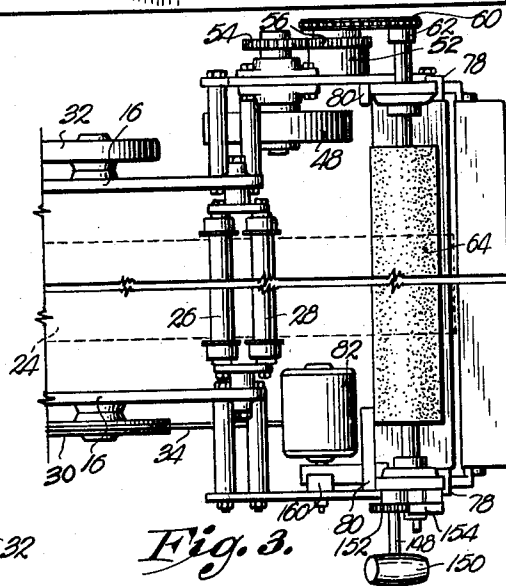


Fig. 3.

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3 Sheets-Sheet 2

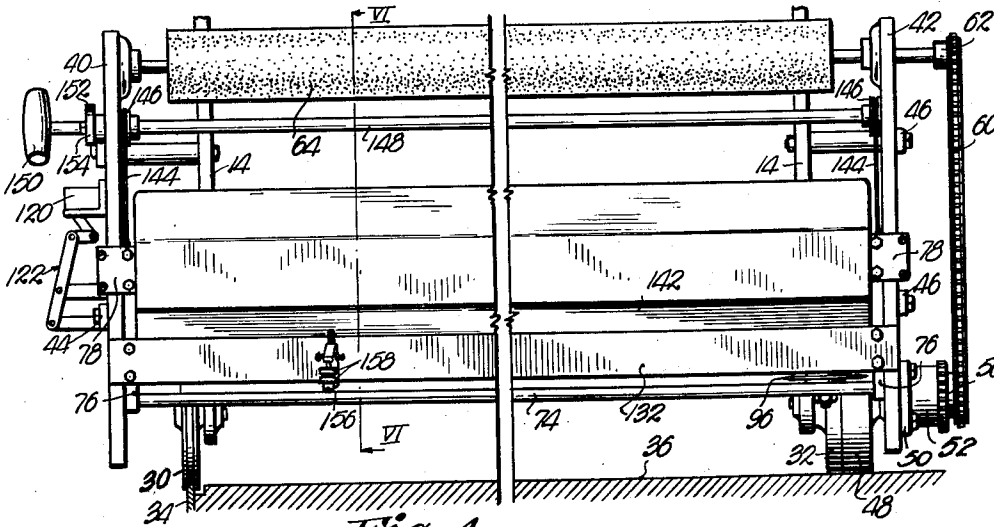


Fig. 4.

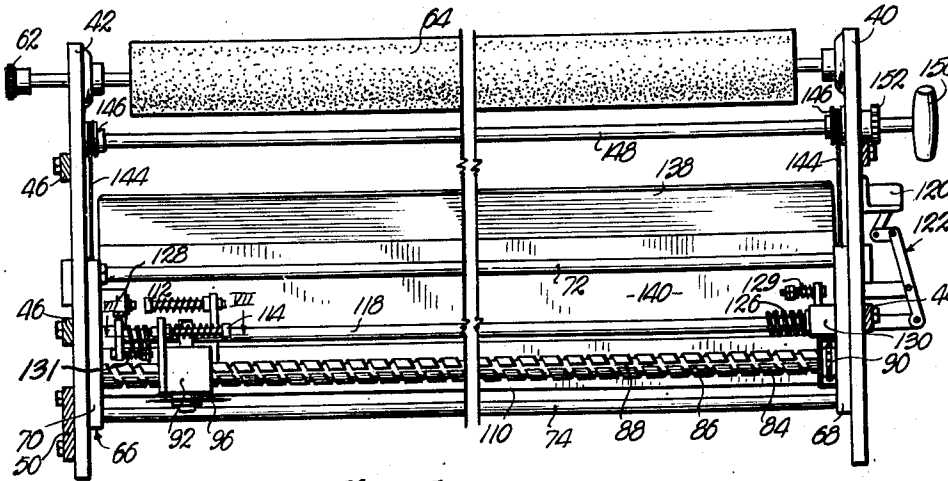


Fig. 5.

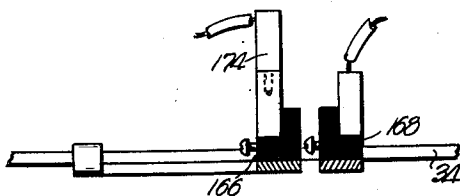


Fig. 11.

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3 Sheets-Sheet 3

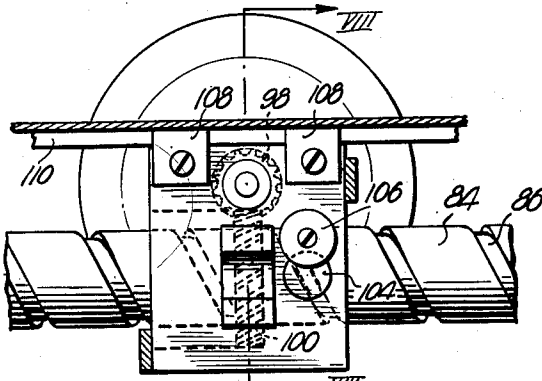


Fig. 7.

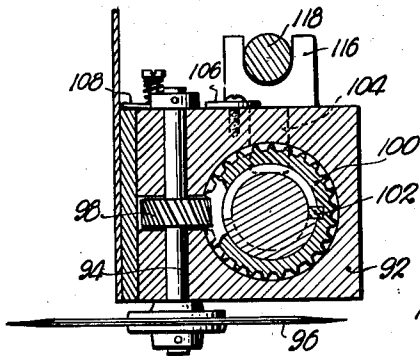


Fig. 8.

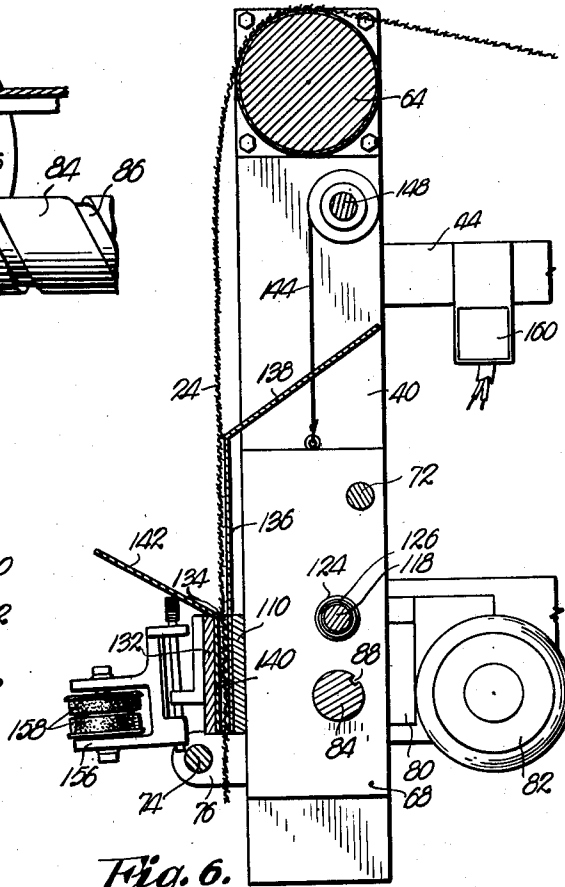


Fig. 6.

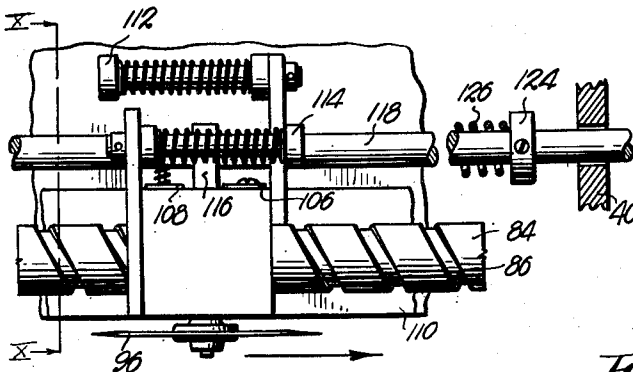


Fig. 9.

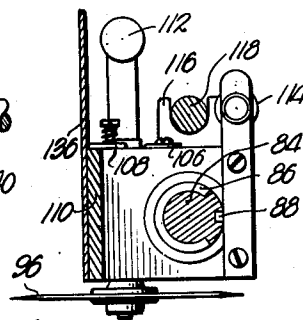


Fig. 10.

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UNITED STATES PATENT OFFICE

2,670,040

CLOTH CUTTER FOR CLOTH SPREADING
MACHINES AND HAVING RECIPROCABLE
CUTTER DISKS

Raymond E. Sayles, Kansas City, Mo.

Application July 24, 1950, Serial No. 175,622

6 Claims. (Cl. 164—76)

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This invention relates to automatic cutters for cloth and textile fabrics generally, the primary object being to provide a rotatable cutter disc that reciprocates simultaneously with its rotative movement, whereby the same may be moved into cutting engagement with a strip of cloth and sever the same as the cloth is traversed.

It is one of the most important objects of this invention to provide a cloth cutter of the kind that is particularly adapted for mounting upon and use in connection with a cloth-spreading machine such as disclosed in my U. S. Letters Patent, No. 2,478,840, dated August 9, 1946.

An important object of this invention has to do with the provision of a disc-like cloth cutter rotatably mounted upon a rotatable shaft and reciprocable on the shaft, there being structure interconnecting the shaft and the cutter for not only reciprocating the same but imparting rotative motion thereto whereby cloth may be severed as the cutter traverses the same.

Another important object of the present invention is to provide a cloth-cutter including the assemblage of parts just above mentioned, all of which is mounted as a unit on a frame that is in turn vertically reciprocable so that the cutter disc may be raised and lowered to suit the desires and needs of the operator.

A further object of the present invention is to provide a cutter assembly mounted upon a vertically reciprocable frame, which frame is in turn mounted upon a mobile framework that includes a part of the cloth spreading mechanism whereby the cloth may be spread from a roll thereof and cut into predetermined lengths with ease and speed.

Other objects of the present invention include many novel details of construction, all of which will be made clear or become apparent as the following specification progresses, wherein:

Figure 1 is a side elevational view of a cloth spreading machine showing the cloth cutter of the present invention operably mounted thereon.

Fig. 2 is a fragmentary, elevational view showing that side opposite to Fig. 1.

Fig. 3 is a fragmentary, top plan view thereof.

Fig. 4 is a front elevational view of the cloth cutting assembly.

Fig. 5 is a transverse, vertical, cross-sectional view taken on line V—V of Fig. 1, looking in the direction of the arrows.

Fig. 6 is a vertical, cross-sectional view on a slightly enlarged scale taken on line VI—VI of Fig. 4, looking in the direction of the arrows.

Fig. 7 is an enlarged, fragmentary, top plan

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view of the reciprocable cutter disc carriage per se and associated parts and taken on line VII—VII of Fig. 5.

Fig. 8 is a cross-sectional view taken on line VIII—VIII of Fig. 7.

Fig. 9 is an enlarged, rear elevational view of the carriage assembly per se similar to the illustration thereof in Fig. 5.

Fig. 10 is a cross-sectional view taken on line X—X of Fig. 9; and

Fig. 11 is a cross-sectional view taken on line XI—XI of Fig. 1.

As fully explained in my patent above identified, users of fabrics such as manufacturers of clothing customarily utilize cloth spreading machines that are capable of automatically removing the cloth from a bolt thereof and spreading the same in a plurality of superimposed layers of predetermined lengths.

In the machine disclosed in said patent, structure is provided to permit continuous spreading of the cloth by reciprocating the spreader without the necessity of severing the fabric at each end of the path of travel of the mobile cloth spreader. However, there are many cloth spreading machines in use today that are incapable of spreading cloth in both directions unless the cloth is cut transversely at each end of the path of travel of the spreader. For this reason, it is highly desirable to provide an attachment for the cloth spreading machine that will eliminate the arduous and time-consuming task of cutting the cloth with the scissors, which task is even more difficult when the bolt of cloth is relatively wide. Additionally, many operators may be desirous of cutting the cloth in predetermined lengths intermediate the ends of travel of the spreading machine or be desirous of cutting the cloth at each end thereof irrespective of whether or not a machine such as disclosed in my prior patent, is placed in use.

The cloth spreading machine that has been chosen for illustration and upon which the cloth cutting assembly is mounted, is broadly designated by the numeral 12, and includes a mobile frame 14 having a pair of opposed U-shaped side members 16. The uppermost end of one leg of the U-shaped members 16, is bifurcated for rotatably receiving a bolt of cloth 18 as illustrated in Fig. 1 of the drawings. Each frame member 16 has an upstanding arm, one only of which is shown in the drawings and designated by the numeral 20. Arms 20 rotatably carry an idler drum 22 at the uppermost ends thereof for receiving the cloth 24 from roll 18 thereof.

From drum 22, the cloth 24 is threaded between a pair of rollers 26 and 28 carried by the uppermost ends of the other leg of members 16.

Frame 14 is rendered mobile through a plurality of wheels 30 and 32, wheels 30 being circumferentially grooved for travel on a guide track 34 and wheels 32 being adapted to ride along a suitable flat surface 36.

The cloth cutting assembly that is adapted for attachment to the machine 12 and which forms the subject matter of this invention, is broadly designated by the numeral 38 and includes a pair of spaced-apart, upright plates 40 and 42 that are in turn connected with that leg of the frame members 16 having rollers 26 and 28 thereon. A pair of interconnecting straps 44 hold the plate 40 in place above the surface 36 and a similar pair of straps 46 pivotally join the plate 42 with the proximal frame member 16. Through such pivotal connection of the straps 46, a drive wheel 48 that frictionally engages surface 36 will always remain in contact with the latter, irrespective of slight unevenness in such surface 36. Drive wheel 48 is rotatably mounted on a bracket 50 extending rearwardly from plate 42 near the lowermost end of the latter. Bracket 50 also carries an over-riding clutch (not shown) within a housing 52. A pair of intermeshing gears 54 and 56 on the axle for wheel 48 and connected with the aforesaid clutch respectively, impart rotative movement from wheel 48 to a sprocket wheel 58, also operably connected with said clutch. An endless chain 60 is trained over sprocket wheel 58 and a second sprocket wheel 62, the latter of which is secured to an elongated friction drum 64 rotatably mounted between and upon the upright plates 40 and 42 adjacent the uppermost ends of the latter. As shown in Figs. 1, 2 and 6 of the drawings, cloth 24 passes over drum 64 as it emanates from rollers 26 and 28.

A secondary frame, broadly designated by the numeral 66, is mounted for vertical reciprocation between the plates 40 and 42 and includes a pair of spaced-apart blocks 68 and 70 slidable upon the innermost faces of plates 40 and 42 respectively. Blocks 68 and 70 are rigidly interconnected by a pair of cross rods 72 and 74, the latter being disposed forwardly of the blocks 68 and 70 and plates 40 and 42 by means of laterally extending brackets 76. Lateral movement of the blocks 68 and 70 with respect to the plates 40 and 42, is prevented by utilization of guides 78 and 80 respectively, one of the latter also serving as a base support for a reversible electric motor 82.

An elongated shaft 84 spanning the distance between the blocks 68 and 70 and rotatably carried thereby, is provided with a helical groove 86 extending throughout the entire length thereof and with a longitudinal slot 88.

Motor 82 is operably coupled with the shaft 84 for rotating the latter by means of an endless chain 90.

A carriage taking the form of a polygonal block 92 circumscribes the shaft 84 and is reciprocally mounted thereon. Block 92 rotatably supports a vertical shaft 94 having a cutter disc 96 secured to the lowermost end thereof immediately below block 92 and a gear 98 within block 92 and intermediate the ends of shaft 94. Gear 98 is in mesh with a second gear 100 within block 92 that circumscribes the shaft 84 and is rotatable therewith. Such unitary rotation of shaft 84 and gear 100 is accomplished through

utilization of a key 102 rigid to gear 100 and extending into slot 88 for sliding movement along the latter. Block 92 additionally carries a freely rotatable plug 104 that extends into groove 86 and is releasably held in place by a small disc 106 on the uppermost face of block 92. Block 92 is held against rotative movement by means of overhanging fingers 108 on the uppermost face thereof that ride along the uppermost edge of an elongated bar 110 joining the two blocks 68 and 70 at the outermost edges of the latter and immediately below guides 78.

Block 92 also carries a pair of oppositely facing spring-loaded plungers 112 and 114 as well as a U-shaped actuating bracket 116 for a reciprocable rod 118, which bracket 116 partially embraces as shown in Fig. 8. Rod 118 overlies block 92 and shaft 84 in parallelism with the latter and is carried by the blocks 68 and 70 for a limited reciprocation along the longitudinal axis of rod 118. Rod 118 is operably connected with a reversing switch 120 for motor 82 through toggle linkage 122 and collars 124 adjacent opposite ends of the rod 118, limit movement of springs 126 coiled about rod 118 when the latter are engaged by the bracket 116. Limit switches 128 and 130, carried by blocks 70 and 68 respectively, are in alignment with plungers 112 and 114 respectively. Blocks 68 and 70 carry bumpers 129 and 131 respectively within the path of travel of block 92 for absorbing the shock as block 92 is stopped at each end of its path of travel.

A secondary bar 132 also secured to blocks 68 and 70, is held away from the proximal face of bar 110 by a pair of spacers 134, and it is between the bars 132 and 110 that the cloth 24 is threaded in its vertical stretch from friction drum 64 as is clear in Fig. 6 of the drawings.

A shield 136 interposed between spacers 134 and bar 110 has an apron 138 at its uppermost end that overlies the blocks 68 and 70 between plates 40 and 42. A second shield 140 between spacers 134 and bar 132, has an outwardly extending apron 142 at its uppermost end that overlies the uppermost edge of bar 132 between blocks 68 and 70, thereby presenting a funnel-like construction for receiving the cloth 24.

It is notable that the cutter disc 96 is disposed between rod 74 and the lowermost edges of the bars 110 and 132 and that the cloth 24 is threaded between rod 74 and the proximal edges of blocks 68 and 70.

The entire secondary frame 66 including blocks 68 and 70, shaft 84, block 92, switches 120, 128 and 130, shields 136 and 140 and associated parts, are suspended from a pair of cables 144 secured at one end thereof to corresponding blocks 68 and 70 and at the opposite ends thereof to corresponding sheaves 146. Sheaves 146 are in turn secured to an elongated shaft 148 rotatably mounted on plates 40 and 42 and having a handle 150 at one end thereof. Rotation of the shaft 148 in one direction is releasably restrained through utilization of a ratchet 152 on shaft 148 and a swingable pawl 154 on plate 40.

Sharpening means for the cutter disc 96 includes a bracket 156 swingably mounted on bar 132 and having a pair of opposed grinding wheels 158 that are disposed upon the opposite marginal edges of disc 96 when the bracket 156 is swung from the position shown in Fig. 6 toward disc 96. As disc 96 is caused to reciprocate and rotate past the grinding wheels 158, the peripheral

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edge of disc 96 can be easily and quickly sharpened.

The reversible electric motor 82, switches 120, 128 and 130, and a starter switch 160, are all operably coupled in the conventional manner (not shown) with a suitable source of electric energy. Make and break mechanism is interposed in the circuit and includes as shown in Figs. 1 and 11, two sets of contacts 162 and 164 that are mounted in insulating blocks 166 and 168. Blocks 166 and 168 are carried by arms 170 and 172 on track 34 and frame 14 respectively. A conventional plug 174 couples the contacts 162 with the said source of electrical energy and the contacts 164 are joined with motor 82 and switches 120, 128 and 130, through suitable wiring (not shown) that moves with the machine 12 as the same travels on surface 36 and track 34.

In operation, the machine 12 and the attachment 38 are moved manually back and forth along surface 36 and track 34 or through use of a suitable prime mover not shown, in the same manner as the cloth spreading machine of my aforesaid patent. As the machine 12 is reciprocated, wheel 48 frictionally riding on surface 36, drives the drum 64 when the machine 12 is moved in one direction, but because of the over-riding clutch within housing 52, drum 64 is not rotated by wheel 48 when the machine 12 is moved in the opposite direction. Such rotation of the drum 64, pulls the cloth 24 from the bolt 18 thereof and feeds the same downwardly between the bars 110 and 132 for spreading upon the surface 36. While the machine 12 moves away from bracket 170 and returns, a motor 82 is fully inoperable even though switch 160 may be accidentally engaged because of the fact that the circuit is broken through separation of contacts 162 and 164. As soon as contacts 164 are brought into engagement with contacts 162, the circuit is closed at that point and the motor 82 may be energized by closing of the switch 160.

Assuming that the block 92 is at that end of its path of travel shown in Fig. 5 of the drawings, as soon as switch 160 is closed, energization of motor 82 will rotate the shaft 84 through chain 90. As shaft 84 rotates, block 92 will be moved toward the opposite end of its path of travel away from block 70 by virtue of the interconnection between rotatable plug 104 and shaft 84, it being understood that plug 104 rides in the groove 86 and is moved along shaft 84 thereby. Simultaneously, cutter disc 96 is caused to rotate by virtue of the fact that gear 100 is caused to rotate with shaft 84, through key 102, riding in the elongated slot 83 in shaft 84. Such rotation of disc 96 is caused by the operable connection between gears 98 and 100. As the block 92 and the cutter disc 96 carried thereby approach the block 68, the plunger 114 moves against limit switch 130 and deenergizes the circuit to render motor 82 inoperable. Rotation of shaft 84 will then discontinue and block 92, as well as cutter disc 96, will remain stationary. Additionally, as the block 92 approaches the block 68, bracket 116 will come into contact with that spring 126 adjacent block 68 and move the rod 118 toward the plate 40 to actuate the reversing switch 120 through toggle linkage 122. This sets the circuit and makes motor 82 ready for reverse rotation of the shaft 84. As the rotating disc 96 moves from adjacent block 70 toward the block 68, the suspended cloth 24 is severed immediately below bars 110 and 132. The spreading operation is then repeated and as

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soon as contacts 164 engage contacts 162, motor 82 may be energized to operate in the opposite direction for returning block 92 to the position illustrated in Fig. 5.

Again the circuit is deenergized as soon as plunger 112 contacts the limit switch 128. Additionally, the bracket 116 on block 92 will contact that spring 126 adjacent block 70 to move the rod 118 toward block 70 and to actuate reversing switch 120 through toggle linkage 122.

As the layers of cloth are superimposed upon the surface 36, it will be necessary to progressively raise the cutter 96. Accordingly, the operator merely turns handle 150 in one direction to rotate shaft 148 and sheaves 146. As the cables 144 wind upon sheaves 146, the entire secondary framework 66 will be elevated by virtue of the connection of cables 144 with blocks 68 and 70. Pawl 154 engaging the teeth of ratchet 152, holds the shaft 148 against counter-rotation and maintains the disc 96 in an elevated condition. Disc 96 may be lowered by merely manually releasing pawl 154 and permitting the shaft 148 to rotate in the opposite direction in response to the inherent weight of the entire assembly 66.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a cloth cutter, a rotatable member; a carriage reciprocally mounted on said member; a cutter disc rotatably attached to said carriage; means operably interconnecting said carriage and the member for reciprocating the carriage as the member rotates; and structure on the carriage and operably joining said member and the cutter disc for simultaneously rotating the latter as the member rotates and as the carriage reciprocates on the member, said structure including a longitudinal slot formed in said member, a gear on the member and having a key slidable within the slot, and a second gear in mesh with the first mentioned gear and connected with the cutter disc, said gears being reciprocable with the cutter disc, said means including a helical groove formed in the member and parts on said carriage extending into the groove said groove intersecting the slot.

2. In a cloth cutter, a rotatable member; a carriage reciprocally mounted on said member; a cutter disc rotatably attached to said carriage; means operably interconnecting said carriage and the member for reciprocating the carriage as the member rotates; and structure on the carriage and operably joining said member and the cutter disc for simultaneously rotating the latter as the member rotates and as the carriage reciprocates on the member, said means including a helical groove formed in the member and parts on said carriage extending into the groove, said structure including a slot formed in the member parallel with the path of travel of carriage, an element rotatably secured to the carriage and mounted on the member, said element having a part slidable in the slot, and apparatus operably connecting said element and the cutter disc for rotating the latter as the element rotates with the member.

3. In a cloth cutter, an elongated, rotatable shaft; a carriage mounted on the shaft for rectilinear reciprocation longitudinally thereof; a cutter mounted on the carriage for rotation on an axis perpendicular to the path of reciprocation of the carriage; structure for rotating the cutter in response to rotation of the shaft, said structure including power transmission means op-

erably connecting the shaft with the cutter; apparatus for reciprocating the carriage as the cutter rotates in response to rotation of the shaft; said apparatus including power transmission mechanism operably connecting the shaft with said carriage; and means for holding the carriage against rotation about the shaft.

4. In a cloth cutter as set forth in claim 3, wherein said power transmission means includes a gear mounted on the shaft and on the cutter, respectively, for rotation therewith, said gears being in intermeshing relationship, and means securing the gear of said shaft for reciprocation relative to the shaft and longitudinally of the latter.

5. In a cloth cutter as set forth in claim 3, wherein said power transmission mechanism includes external screw threads on the shaft, and

means on the carriage in mesh with said threads.
6. In a cloth cutter as set forth in claim 4, wherein said power transmission mechanism includes external screw threads on the shaft, and means on the carriage in mesh with said threads.

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