

Oct. 27, 1959

S. F. ANDERSON ET AL
AUTOMATIC ALIGNING TRIMMING DEVICE FOR
PILE FABRICS OF VARIOUS WIDTHS

2,910,122

Filed May 14, 1957

3 Sheets-Sheet 1

FIG. 1 -

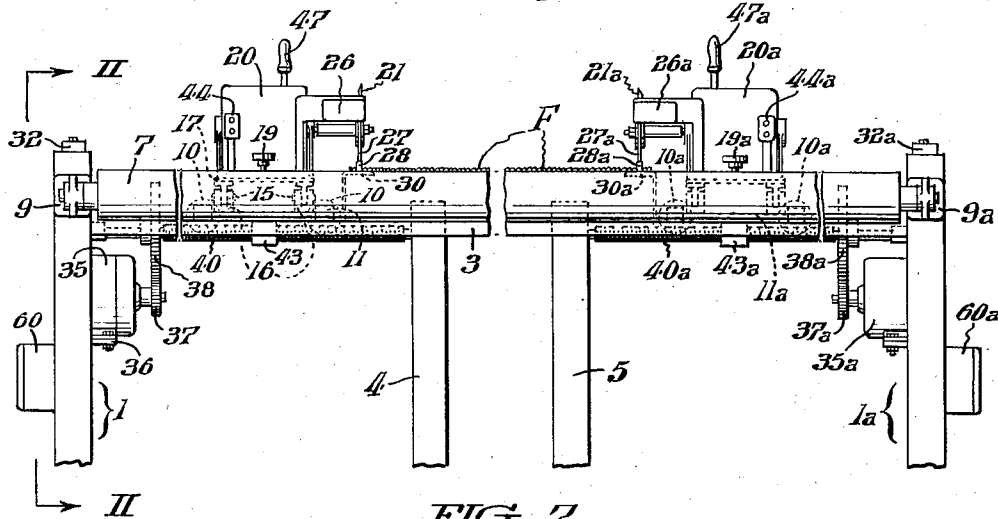
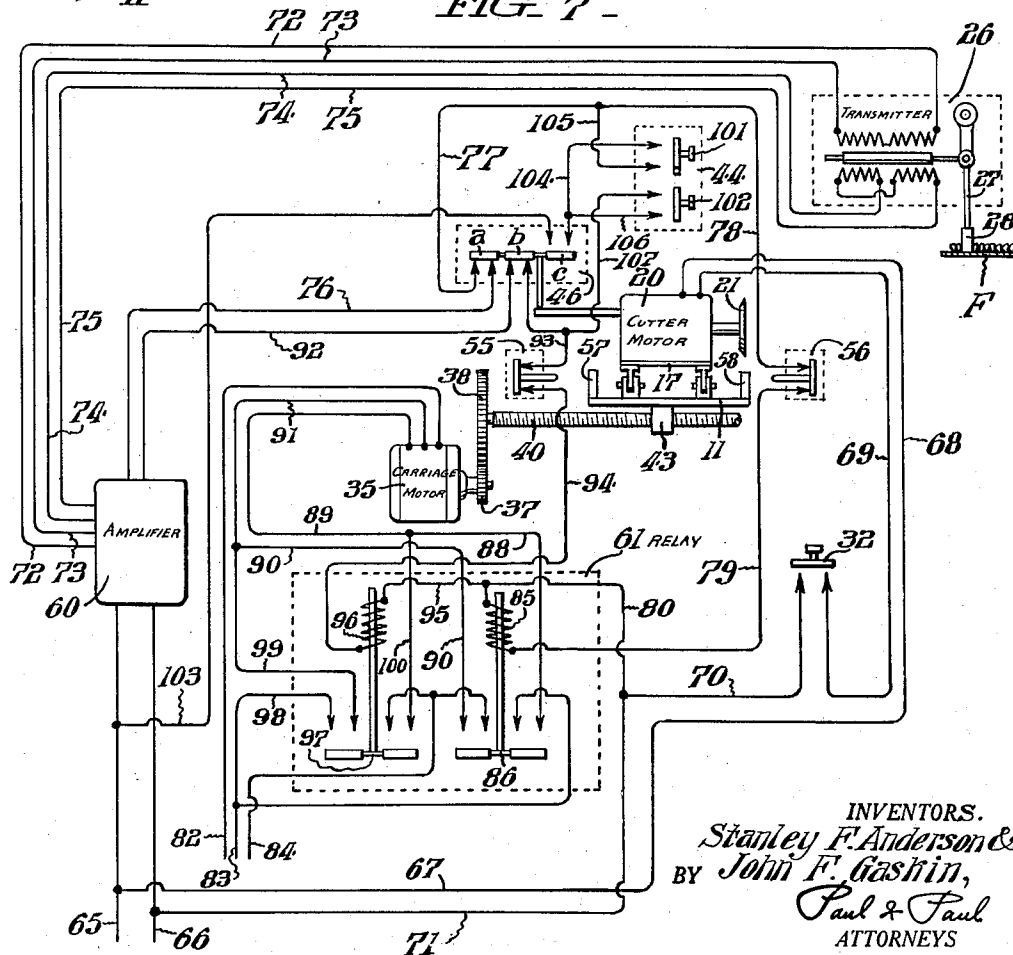


FIG. 7 -



INVENTORS.
Stanley F. Anderson &
John F. Gashin,
Paul & Paul
ATTORNEYS

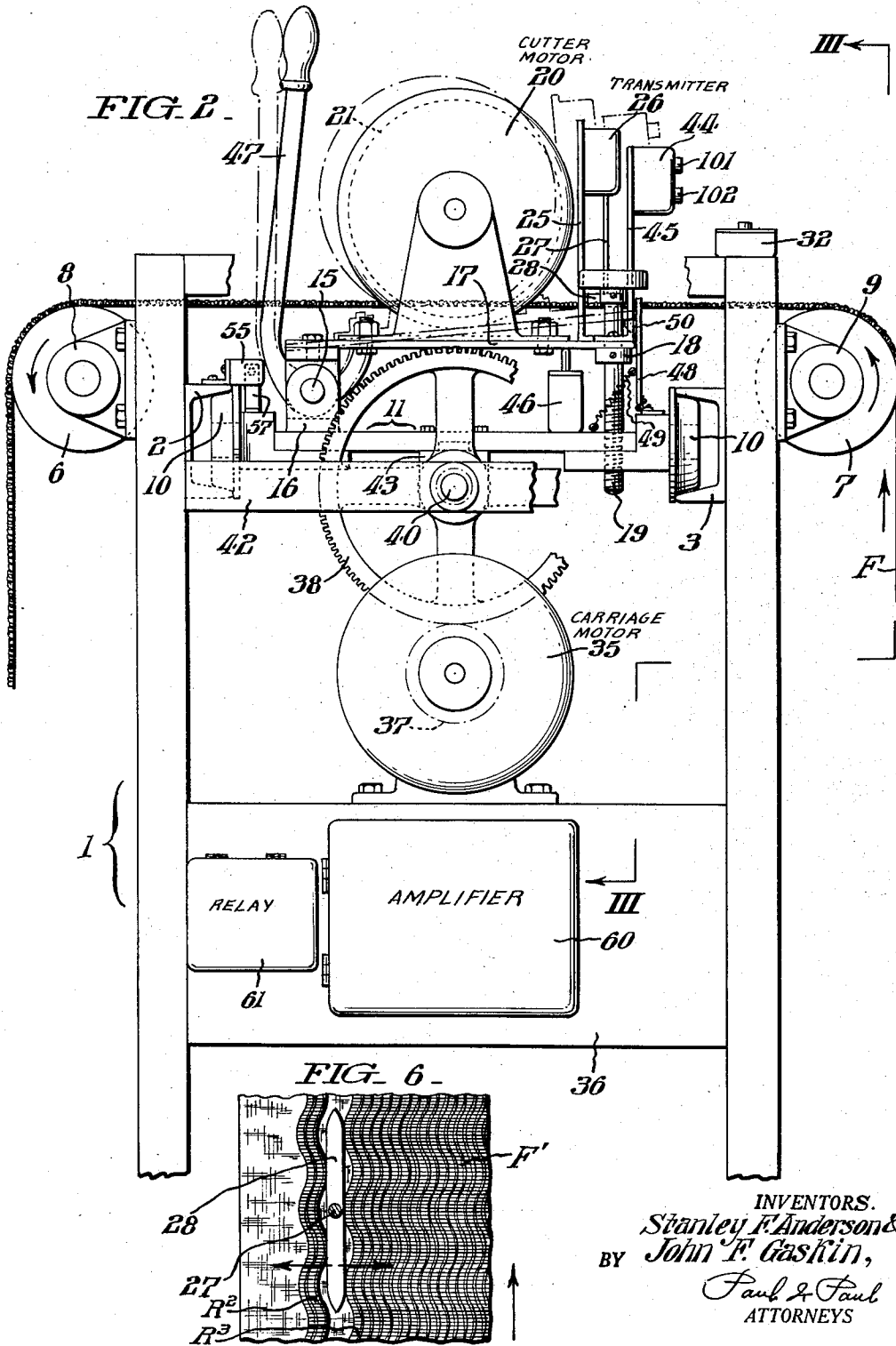
Oct. 27, 1959

S. F. ANDERSON ET AL
AUTOMATIC ALIGNING TRIMMING DEVICE FOR
PILE FABRICS OF VARIOUS WIDTHS

2,910,122

Filed May 14, 1957

3 Sheets-Sheet 2



INVENTORS.
*Stanley F. Anderson &
John F. Gaslin,*
BY *Paul & Paul*
ATTORNEYS

Oct. 27, 1959

S. F. ANDERSON ET AL
AUTOMATIC ALIGNING TRIMMING DEVICE FOR
PILE FABRICS OF VARIOUS WIDTHS

2,910,122

Filed May 14, 1957

3 Sheets-Sheet 3

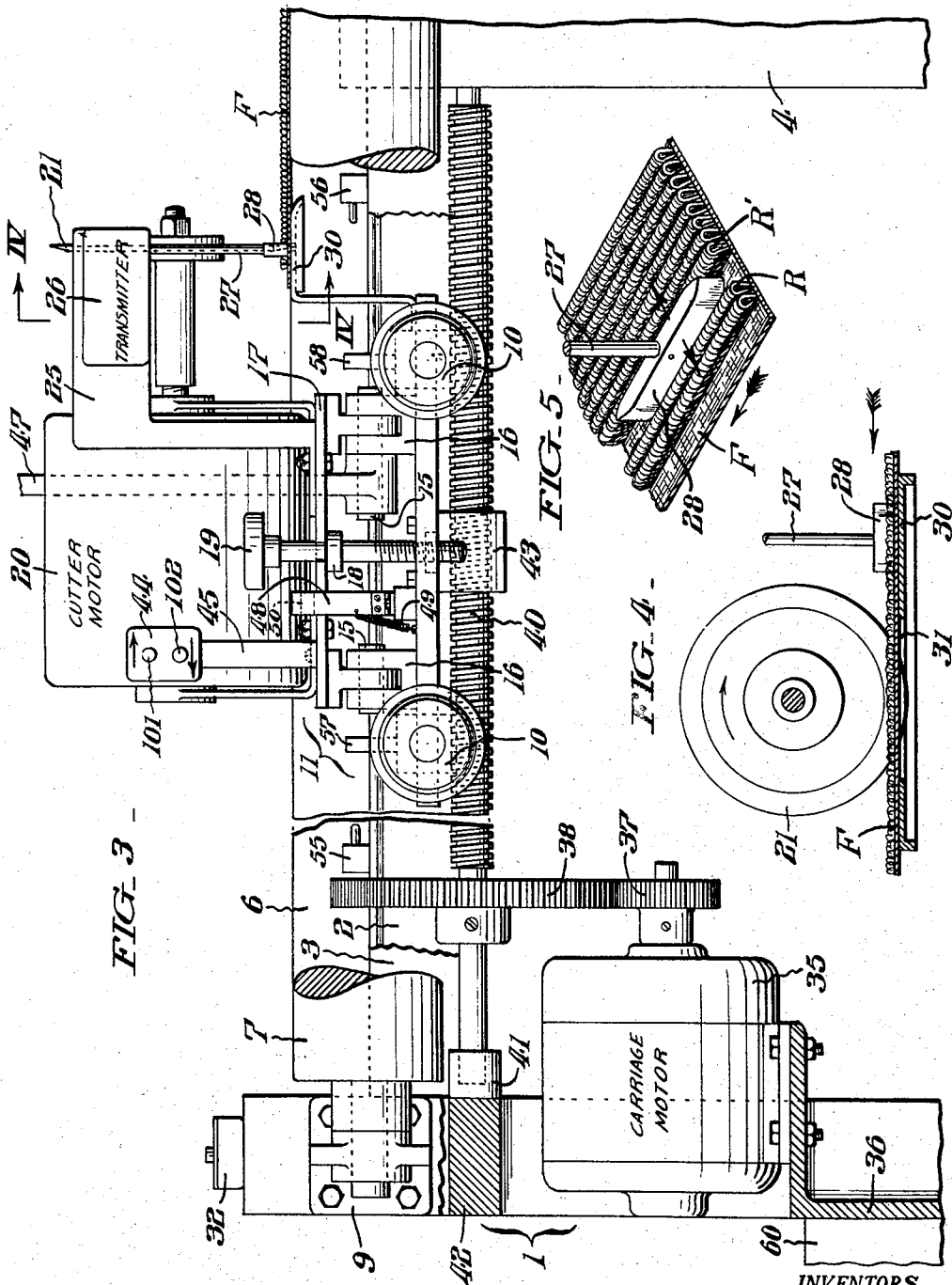


FIG. 3 -

FIG. 4 -

FIG. 5 -

INVENTORS.
*Stanley F. Anderson &
John F. Gaslin,*
BY *Paul & Paul*
ATTORNEYS

1

2,910,122

AUTOMATIC ALIGNING TRIMMING DEVICE FOR PILE FABRICS OF VARIOUS WIDTHS

Stanley F. Anderson, Jenkintown, and John F. Gaskin, Philadelphia, Pa., assignors to Artloom Carpet Company, Inc., Philadelphia, Pa., a corporation of Pennsylvania

Application May 14, 1957, Serial No. 659,153

1 Claim. (Cl. 164—61)

This invention relates to apparatus for trimming the side edges of pile fabrics.

In the production of different types of pile fabrics, the side edges do not always run true to the direction of the longitudinally-extending rows of the pile tufts or loops, as the case may be, or the edges may be rough and uneven. This is particularly true of needle-tufted pile fabrics to the back of which a layer of rubber or the like has been applied.

The chief aim of our invention is to provide a trimming apparatus which is simple in construction; which is economical from the standpoint of power consumption; which is entirely automatic in operation; and which can be relied upon to trim one or both side edges of pile fabrics, run through the machine at high speed, straight and clean along lines in true parallelism with the longitudinally-extending rows of the pile tufts or loops of the fabrics.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein:

Fig. 1 is a broken out view, in end elevation, of a fabric edge trimming apparatus constructed in accordance with our invention.

Fig. 2 is a fragmentary view in side elevation looking as indicated by the angled arrows II—II in Fig. 1 with the portions of the apparatus broken out and removed to expose important details which otherwise would be hidden.

Fig. 3 is a fragmentary view in section taken as approximately indicated by the angled arrows III—III in Fig. 2.

Fig. 4 is a detail view in section taken as indicated by the angled arrows IV—IV in Fig. 3.

Figs. 5 and 6 are fragmentary views which will be referred to more particularly hereinafter; and

Fig. 7 is a wiring diagram of various electrical instrumentalities by which the apparatus is automatically controlled in accordance with our invention.

As herein exemplified, our improved trimming apparatus has two laterally-spaced side frames 1 and 1a which, adjacent their tops, are connected by channel section transverse beams 2 and 3 arranged with their hollows facing toward each other as best seen in Fig. 2, said beams being sustained in the interval between the side frames by a pair of auxiliary frames 4 and 5 as best seen in Figs. 1 and 3. The fabric F, of which the edges are to be trimmed, is continually advanced longitudinally in the machine over the top of supports in the form of rolls 6 and 7 journaled in bearings 8 and 8a, 9 and 9a at opposite ends of the respective side frames somewhat above the level of the channel beams 2 and 3. From Figs. 2 and 3, it will be observed that the channel beams serve as guide tracks for the flanged wheels 10 and 10a of two carriages 11 and 11a beyond opposite edges of the running fabric.

Fulcrumed about pins 15 in upstanding lugs 16 at one end of the carriage 11 is a small platform 17 whereof the free end normally rests upon a collar 18 on a stop screw 19 adjustable vertically in the carriage. Mounted on the platform 17 is an electric motor 20 to the shaft of which is affixed a cutting disk 21 having a sharp peripheral edge for trimming the corresponding side edge of the fabric.

2

Also mounted on the carriage 11 is a bracket arm 25 which overhangs the fabric edge and supports an electric signal transmitting device 26. In accordance with our invention, this device 26 is arranged to be influenced by a pivotally-suspended feeler finger 27 whereof is affixed, at the bottom, a small shoe 28 which is adapted to follow the channel or furrow between two adjacent longitudinally-extending pile tuft or loop rows R, R' of the fabric F as shown in Fig. 5. Preferably in producing the fabric, a few longitudinal rows of pile tufts or loops are omitted adjacent each side edge as instanced in Fig. 5 to provide a guide channel or furrow of adequate width for the shoe 28 of the feeler 27. The functioning of the device 26 will be more fully explained later.

In the region of the shoe 28, the fabric is marginally sustained from beneath by elongate plate 30 which is supported at the top level of the rolls 6 and 7 from one end of the carriage 11 as best shown in Fig. 3, said plate having a clearance slot 31 therein (Fig. 4) for the cutter disk 21. A two button manual start and stop switch 32 for the cutter motor 20 is affixed for convenience of ready access to the top of the side frame 1 of the machine.

For shifting the carriage back and forth during the trimming along the channel beams 2 and 3 to keep the cutting disk 21 parallel with the loop rows R, R', we have provided means including a reversible electric motor 35 which is bolted to the bottom cross member 36 of the side frame 1. A spur pinion 37 on the shaft of the motor 35 meshes with a spur wheel 38 on a transverse shaft 40 which is rotatively supported at one end in a bearing 41 centrally of an upper cross member 42 of the side frame 1 and at the other end in the intermediate frame 4 of the machine, the threaded portion of said shaft being engaged in a nut block 43 centrally affixed to the bottom of the carriage 11. A manual switch 44, by which forward and reverse rotation of the motor 35 may be controlled to position the carriage 11 upon starting the machine, is supported at the top of another bracket 45 on the carriage 11. Also mounted on the carriage 11 is a cut-out switch 46, the plunger of said switch being normally held depressed by the platform 17. By means of a hand lever 47, the platform 17 can be tilted about the pivots 15 to a position at a slight angle to the horizontal for relief of the plunger of the switch 46. As the platform 17 is so moved, a pivoted stop element 48 (Fig. 2) is drawn forwardly by a spring 49 to bring a beveled stop projection 50 thereon beneath the free end of the platform 17 to hold the latter temporarily in tilted inclined position for a purpose also explained later. By manual retraction of the element 48 subsequently against the pull of the spring 49, the platform 17 is allowed to drop back to its normal horizontal position.

In order to limit the travel of the carriage in opposite directions we have provided limit switches 55 and 56 which, as will be seen presently, serve to break circuits in which the motor 35 is interposed, these switches being fixedly mounted on the channel beam 2 and arranged to be actuated by upstanding lugs 57 and 58 at opposite ends of the carriage 11.

In addition to the electrical instrumentalities already mentioned, we have provided an amplifier 60 (Fig. 2) for amplifying the signals induced from the transmitter 26, and a double switch relay 61 for closing circuits to cause the carriage shifting motor 35 to be rotated in one direction or the other in accordance with the amplified signals transmitted from the amplifier, said amplifier and said relay being supported on the cross member 36 of the side frame with said carriage motor. It is to be understood that these electrical instrumentalities are all of known commercially available types and need not therefore be described in detail herein.

The operation of the apparatus is as follows: By refer-

ence to the diagram of Fig. 7, it will be seen that, by closing the manual switch 32, current will flow from the power lines 65, 66 to the cutter motor 20 by way of conductors 67, 68, 69, 70 and 71 to keep said motor running while fabric is being trimmed in the machine. As long as the fabric follows a straight course, the electric system of Fig. 7 will remain dormant. However, in the event that the fabric F swerves to the right slightly for example, the feeler finger 27 will be correspondingly moved and cause a signal to be transmitted from the transmitter 26 by way of conductors 72, 73, 74 and 75 to the amplifier 60 for excitation of a circuit through the conductor 76, plate *a* of control switch 46, conductors 77, 78, closed limit switch 56, and conductors 79, 80, 71, 66, in which circuit the actuating coil 85 for the contacts 86 of the relay 61 is interposed. As a result the contacts 86 of the relay 61 will be closed and permit current flow through conductors 82, 83, 87, 88, 89 and 84, 90 and 91, to the screw-driving motor 35 which will then be turned in the proper direction to move the carriage 11 rightward until the detector finger 27 re-assumes its neutral position for restoration of the system to its normal dormant condition. On the other hand, in the event that the fabric F in its travel swerves to the left and the feeler finger 27 is correspondingly shifted, a different signal will be transmitted from the transmitter 26 to the amplifier 60 by way of the conductors 72, 73, 74 and 75 to establish a circuit through the conductor 92, plate *b* of control switch 46, conductor 93, closed limit switch 55 and conductors 94, 95, 80, 71 and 66, in which circuit the actuating coil 96 for the contacts 97 of the relay 61 is interposed. The contacts 97 of relay 61 will thereupon close to permit current flow through conductors 82, 83, 98, 99 and 84, 100 and 89 to the screw driving motor 35 which will then be rotated in the proper direction to move the carriage 11 leftward until the detector finger 27 resumes its neutral position for restoration of the system to its normal dormant condition. By shifting of the carriage 11 back and forth in this way, the cutter disk 21 will be maintained always at the same distance from the furrow between the adjacent rows of pile loops R, R' of the fabric in which the shoe 28 of the feeler finger 27 is engaged. Accordingly, it will be seen that the corresponding edge of the fabric will be trimmed along a line always parallel with the longitudinal pile loop rows of the fabric.

Upon completion of a run of fabric through the machine, the platform 17 is tilted about the pivot axis 15, by means of the hand lever 47, incident to which the latch element 48 will be displaced rearwardly by camming action of the distal edge of the platform until eventually the lug 50 on said element engages beneath said edge to support the platform in tilted position as indicated in dash and dot lines in Fig. 2. As the platform 17 is so tilted, the plunger of the switch 46 (Fig. 6) will rise to break the circuits in which the conductors 76 and 92 are involved. With the switch 46 so re-positioned, the carriage can be moved in one direction or the other by selective use of the buttons 101 and 102 of the manual switch 44. Thus, when the button 101 of switch 44 is pressed, current will flow through the conductors 65, 103, closed contact *c* of the switch 46, and conductors 104, 105, 78, closed limit switch 56, conductors 78, 79, coil 85 and conductors 89, 71 and 66 to close contacts 86 to energize the motor 35 to rotate the latter in one direction for shift of the carriage 11 to the right. By pressing the button 102 of the switch 44, current will flow through the conductors 65, 103, closed contact *c* of the switch 46 and conductors 106, 107, 93, closed limit switch 55, conductors 94, coil 96, conductors 95, 80, 71 and 66 to close contact 97 to energize the motor 35 to drive the latter this time in the opposite direction and cause the carriage to be shifted to the left. Over-

travel of the carriage 11 leftward is prevented by automatic opening of the limit switch 55 and consequent interruption of current to the motor 35. Similarly, over-travel of the carriage 11 rightward is prevented by automatic opening of the limit switch 56 and interruption of current to the motor 35. From the immediately foregoing, it will be seen that the shifting of the carriage 11 can be manually controlled to properly position the cutting wheel 21 and the feeler finger 27 in adapting the machine for the trimming of fabric of different widths.

The carriage 11a is identical with the carriage 11 and therefore, in order to obviate the necessity for repetitive description, all of its component and associated facilities having their counterparts in said carriage 11, have been identified by the same reference characters previously employed, with addition however in each instance, of the letter "a" for convenience of more ready distinction. Furthermore, it is to be understood that the shifting of the carriage 11a is controlled automatically in practice by an electric system identical with that shown in Fig. 6, both edges of the fabric being thus trimmed simultaneously.

The machine is not necessarily restricted to the trimming of fabrics in which the pile loops or tufts extend along perfectly straight lines, since as shown in Fig. 6, fabric F' in which the pile is formed in sinuous lines, can be edge trimmed with equal facility. In latter instance, the elongate shoe 28 of the detector finger 27 is engaged from opposite sides by the crests of two contiguous pile rows R², R³ so that the cutting disk (not here shown) is always positioned at a uniform distance from said rows and the fabric edge is thus severed in true parallelism with the pile.

While the preferred embodiment of this invention has been described in some detail, it will be obvious to one skilled in the art that various modifications may be made without departing from the invention as herein-after claimed.

Having thus described our invention, we claim:

In fabric edge trimming apparatus, a pair of spaced supports over which textile fabric, having longitudinally-extending rows of pile loops or tufts, is continually advanced; a carriage constrained for movement toward and away from a side edge of the advancing fabric; a feeler on the carriage adapted to follow a furrow between a pair of loop or tuft rows adjacent the edge of the fabric; a platform pivotally connected at one end to the carriage with capacity to be tilted from a normal horizontal position; releasable means for temporarily holding the platform in tilted position; means for trimming an edge of the fabric including a motor on the platform having a rotary cutting disk on its shaft; means for moving the carriage including a feed screw and a reversible electric motor for driving the feed screw; a relay having reversing switches in circuit with the screw driving motor and selectively operated through interposed instrumentalities controlled from the feeler; a switch in the circuit of the screw driving motor normally held closed by the weight of the cutter motor platform on the carriage and arranged to open automatically when the platform is tilted as aforesaid; auxiliary circuits established upon closing said switch; and manual switches in said auxiliary circuits by which operation of the relay switches can be manually controlled for drive of the screw motor in opposite directions.

UNITED STATES PATENTS

References Cited in the file of this patent

70	1,133,297	Lewis	Mar. 30, 1915
	1,611,960	Thomas	Dec. 28, 1926
	2,049,023	Richardson	July 28, 1936
	2,538,972	Magnani	Jan. 23, 1951
	2,606,614	Piper et al.	Aug. 12, 1952
75	2,696,884	Mishler et al.	Dec. 14, 1954