

Dec. 7, 1965

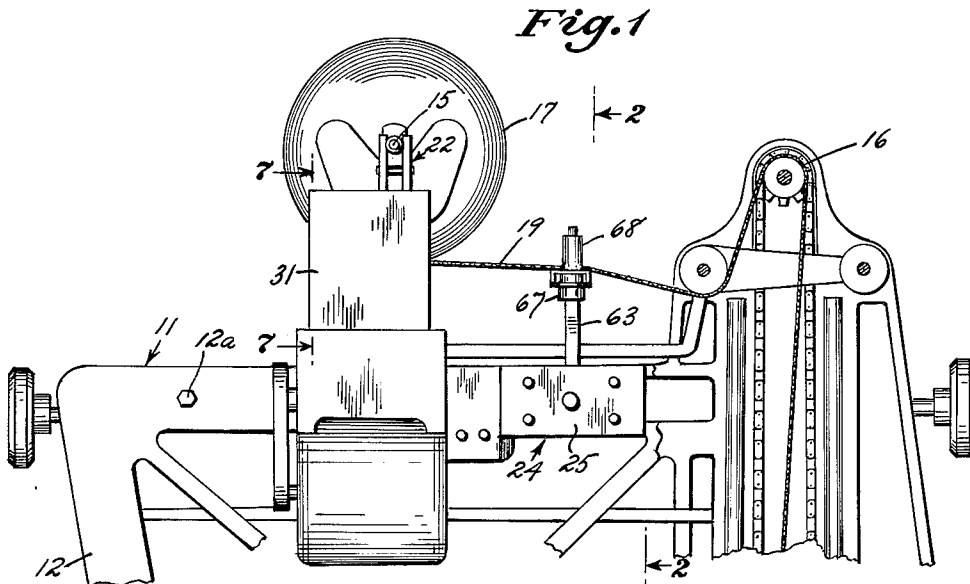
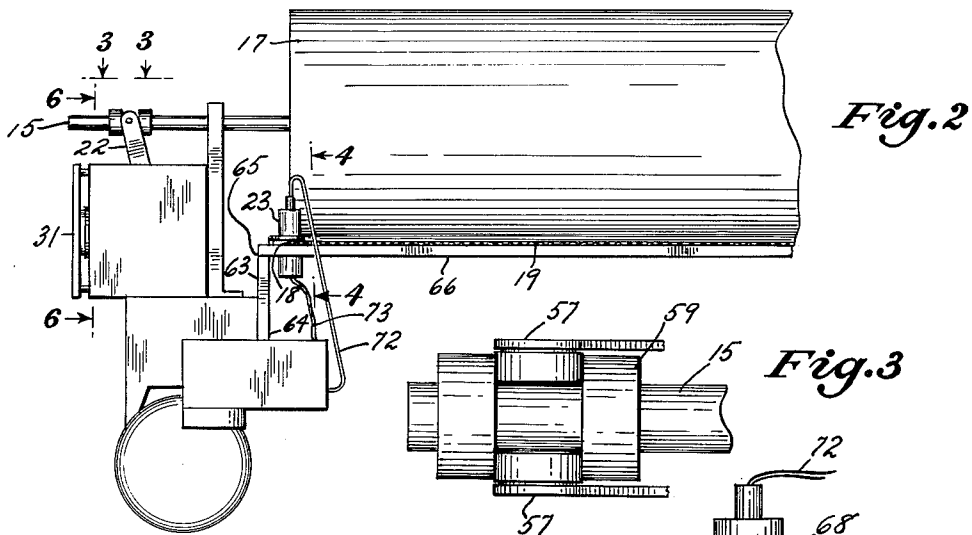
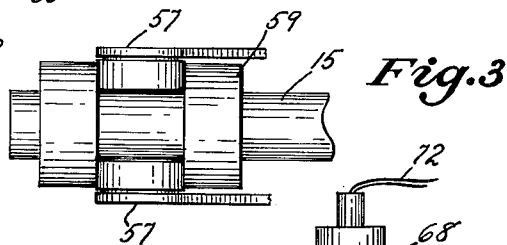
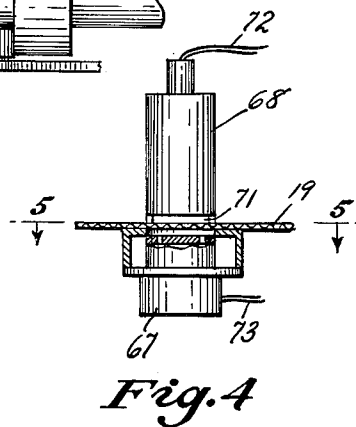
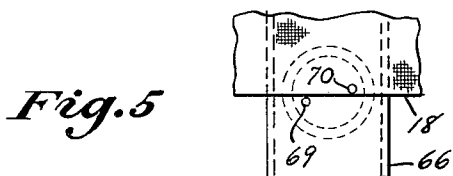
G. J. WENDELKEN

3,222,005

EDGE ALIGNMENT DEVICE FOR CLOTH LAYING MACHINES

Filed Dec. 13, 1963

3 Sheets-Sheet 1



Dec. 7, 1965

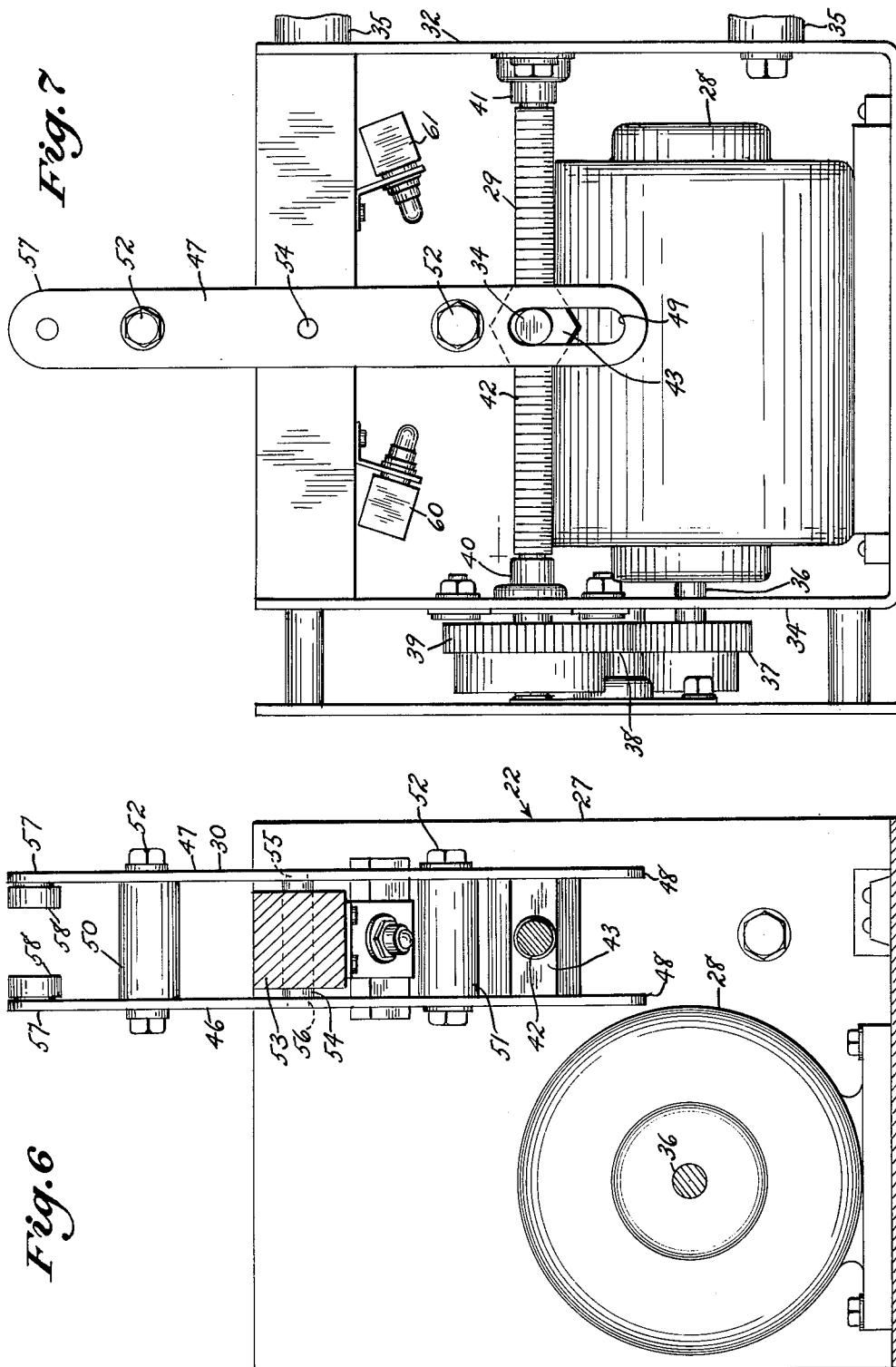
G. J. WENDELKEN

3,222,005

EDGE ALIGNMENT DEVICE FOR CLOTH LAYING MACHINES

Filed Dec. 13, 1963

3 Sheets-Sheet 2



Dec. 7, 1965

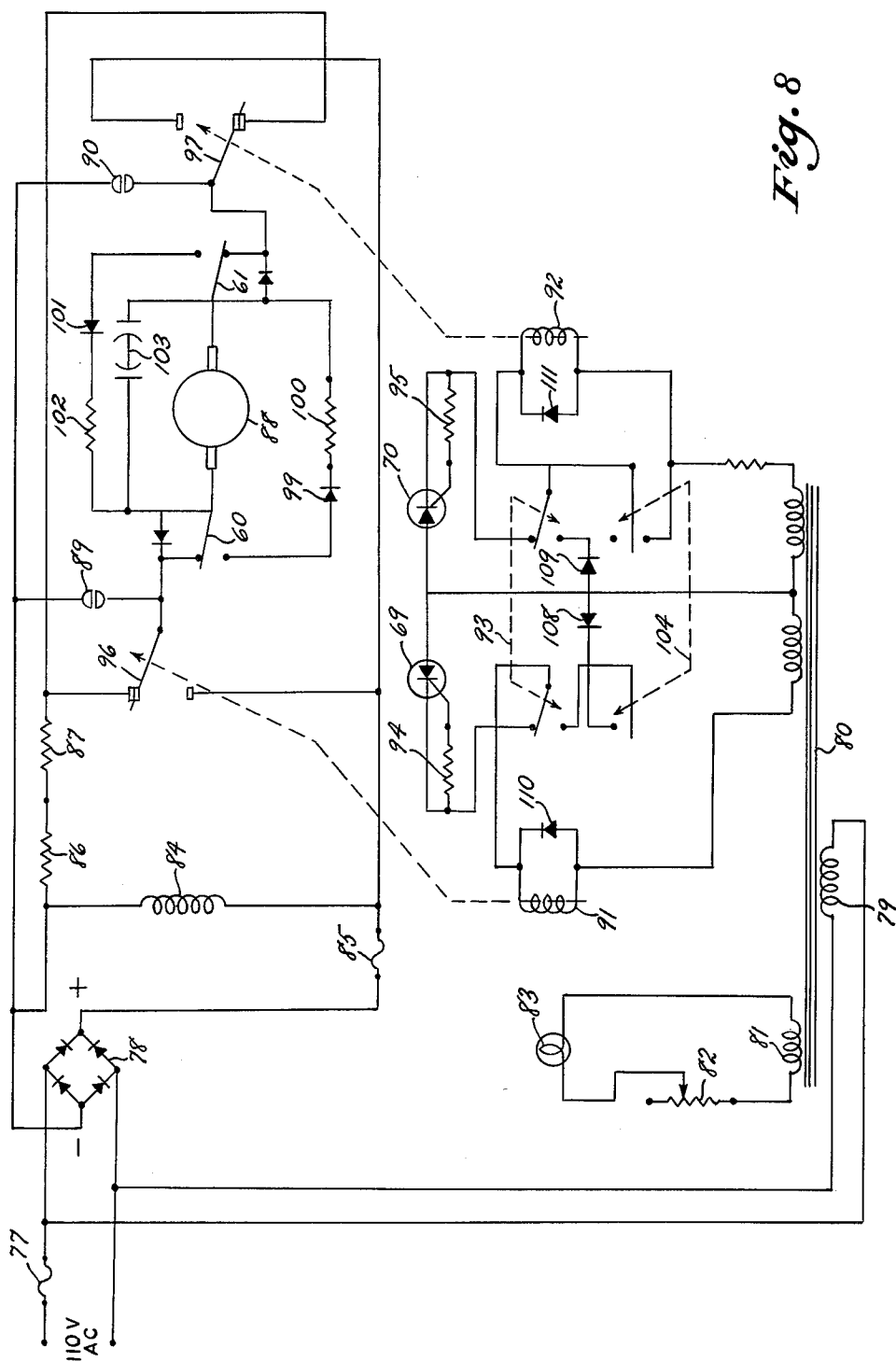
G. J. WENDELKEN

3,222,005

EDGE ALIGNMENT DEVICE FOR CLOTH LAYING MACHINES

Filed Dec. 13, 1963

3 Sheets-Sheet 3



1

3,222,005

EDGE ALIGNMENT DEVICE FOR CLOTH LAYING MACHINES

Gerard J. Wendelken, Harrington Park, N.J., assignor to Cutting Room Appliances Corp., New York, N.Y., a corporation of New York

Filed Dec. 13, 1963, Ser. No. 330,419

1 Claim. (Cl. 242—57.1)

This invention relates generally to the field of cloth laying machines, and more particularly to the improved means for maintaining the edge of a web of cloth being fed from a cloth feed roll to be deposited upon a table in a substantially vertical plane.

It is known in the art to provide for the manual adjustment of the cloth roll by shifting the same along the axis of the spindle supporting the roll whereby tendencies of the web to creep to one side or another are compensated for. In the prior art, this adjustment has been accomplished by having an operator walk along the edge of the table following the carriage, and manually shifting the cloth roll supporting the spindle by turning a knob located on the side of the carriage. The disadvantages of such construction are obvious. Firstly, the carriage cannot be operated at a speed faster than the walking speed of the operator. Secondly, visual detection of shifting of the material is not often fast enough to permit the operator to take corrective steps before a substantial amount of cloth is misaligned. This is particularly true when the worker becomes fatigued from following the carriage back and forth, and as a practical matter, visual detection is only practical with hand operated carriages.

With the recent development of heavier and larger power-operated carriages, which operate at speeds too high to permit visual detection, the problem of maintaining accurate alignment of the cloth web has increased.

It is therefore among the principal objects of the present invention to provide an improved mechanical means for detection of misalignment of the cloth web as the same is fed from a cloth roll to be deposited upon a table.

Another object of the invention lies in the provision of mechanical means for axially shifting the cloth roll feed spindle in response to a signal received from a mechanically operated sensing means, whereby the adjustment may be formed immediately as required, and only to the degree required.

A further object of the invention lies in the provision of improved mechanical edge alignment means of the class described which may have a high degree of mechanical reliability consistent with accuracy, thereby allowing for servicing at relatively infrequent intervals.

Yet another object of the invention lies in the provision of improved edge alignment means in which the cost of fabrication may be of a reasonably low order, with consequent wide sale, distribution, and use.

A feature of the invention lies in the fact that the degree of sensitivity of the control device may be manually adjusted as required.

Another feature of the invention lies in the fact that edge sensing is accomplished by photo-electric means without physical contact of the edge of the web of material being aligned.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claim.

In the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIGURE 1 is a fragmentary view in elevation of an embodiment of the invention.

2

FIGURE 2 is a fragmentary sectional view seen from the plane 2—2 in FIGURE 1.

FIGURE 3 is a fragmentary enlarged plan view as seen from the plane 3—3 in FIGURE 2.

FIGURE 4 is a fragmentary enlarged sectional view as seen from the plane 4—4 in FIGURE 2.

FIGURE 5 is a fragmentary sectional view as seen from the plane 5—5 in FIGURE 4.

FIGURE 6 is a vertical sectional view as seen from the plane 6—6 in FIGURE 2.

FIGURE 7 is a fragmentary view in elevation as seen from the right-hand portion of FIGURE 6.

FIGURE 8 is a schematic wiring diagram.

In accordance with the invention, the device, generally indicated by reference character 10, is illustrated in FIGURES 1, 2, 3, inclusive, in installed condition upon the moveable carriage 11 of a cloth laying machine. The carriage is of conventional type, including a pair of side frames, one of which is indicated by reference character 12, and which are inter-connected by horizontally disposed structure 12A. Wheels 13 are provided to permit the carriage 11 to be moved over the surface of a cloth laying table (not shown). The side frames 12 support a cloth roll spindle 15 which permit the rotation of a roll of cloth thereupon as well as the usual feeding means 16 for laying the cloth upon the table as the carriage is moved through a reciprocating motion. The spindle 15 is removable to allow a roll of cloth 17 to be positioned thereon, the cloth being fed from the roll as a continuous web having a pair of edges, one of which is indicated by reference character 18. Where the cloth has been evenly spooled, little or no adjustment of the cloth spindle 15 is required. However, many types of goods are not readily spooled evenly, and when laying such cloth, the shifting of the edge 18 causes successive layers of cloth being positioned upon the table to be uneven, with consequent waste of cloth as well as misaligning of pattern.

Secured to the outer surface of one of the side frames 12 is a cloth roll spindle shifting means 22, a cloth edge sensing means 23, and control means 24.

The shifting means 22 includes a frame element 27, a prime mover element 28, a lead screw element 29, and a lever element 30.

The frame element 27 includes an inner side wall 32, an outer side wall 34, and is normally enclosed by a casing 31 (see FIGURE 1). The inner side wall 32 is provided with mounting studs 35 permitting the mounting of the frame element 27 directly beneath the cloth roll spindle 15.

The prime mover element 28 is in the form of a fractional horse power electric motor, and includes an armature shaft 36 driving a gear train consisting of gears 37, 38, and 39 which are mounted for rotation on the outer side wall 34.

Lead screw element 29 is anchored in bearings in the walls 32 and 34 at ends 40 and 41 and includes a centrally disposed threaded portion 42 which engages a traveling nut 43 having laterally extending projections 34 thereon.

The lever element 30 includes first and second elongated members 46 and 47, respectively, the lower ends 48 of each being provided with an elongated slot 49 in which the projections 44 are engageable. The members 46 and 47 are maintained in parallel spaced relationship by members 50 and 51, and inter-connected therewith by bolt means 52. A transverse support 53 is penetrated by a pintle 54 about which the lever element pivots, in orifices 55 and 56.

The upper ends 57 of the members 46 and 47 are provided with spindle engaging members 58 which are engageable in a recess in a channeled bushing on the spindle 15. Limit switches 60 and 61 are positioned to be con-

tacted by the lever element at the extreme limits of its path of rotation, and interrupt current to the prime mover element 28 upon such occurrence.

The cloth edge sensing means 23 is supported by vertical stanchions 63, the lower end 64 which are mounted upon the side frames 12, and the upper end 65 of which maintain a horizontal support member 66 over which the web of cloth 19 passes. Disposed in a first casing 67 is a luminescent means, while a second casing 68 supports first and second photo cells 69 and 70, respectively. The upper casing 68 is disposed above the member 66 a distance sufficient to provide a channel 71 through which the edge 18 passes. A cable 72 interconnects the luminescent means in the casing 67 with the control means, and a second cable 73 receives signals from the photo-electric cells 69 and 70.

The control means 24 is preferably disposed within a box 25 mounted on one of the side frames 12, and is best understood by a consideration of the schematic wiring diagram in FIGURE 7.

Current from a conventional 110 volt A.C. line enters through a fuse 77, and passes through a silicon bridge full wave rectifier 78 to provide direct current for the motor 28. Alternating current also flows to the primary winding 79 of a power transformer 80. A first secondary winding 81 supplies current through a variable resistor 82 to the light source 83 disposed in the casing 67. The motor field winding 84 is maintained in constant excited condition, current to the winding 84 being limited by a fuse 85. Current to the motor armature 88 is limited by a pair of resistors 86 and 87.

To enable the operator to ascertain that the device is in operation, there is provided a pair of neon lights 89 and 90 which are so connected as to be conductive (and thus luminous) when no armature current is flowing. Thus, upon movement of the armature in either direction, one of the lights 89 and 90 will extinguish. As correction within relatively narrow limits requires constant rotation of the armature in one direction or another, a continuous flickering of the lights 89 and 90 will assure the operator of proper operation. Since one of the lights will be on at all times, a pilot light is provided as well.

The first and second photosensitive cells 69 and 70 are in the form of light-actuated silicon-controlled rectifiers, which energize, respectively, relays 91 and 92, which are operative to control the motor armature 88 when the double pole double throw switch 93 is in its upper position as shown in FIGURE 7. The silicon-controlled rectifiers 69 and 70 are provided with gating currents through gate resistors 94 and 95 of relatively high value, a technique well-known in the art.

The relays 91 and 92 control corresponding single pole double throw switches 96 and 97, which, acting in concert, determine the direction of flow of direct current through the motor armature 88. Since, during normal operation, one of the silicon-controlled rectifiers will be conductive, and the other will not, the switches 96 and 97 will be in the positions shown in FIGURE 7, the relay 92 being normally energized and the relay 91 being normally de-energized.

The previously mentioned limit switches 60 and 61 are normally in closed condition, and upon being opened, the switch 60 provides a directional short circuit through diode 99 and resistor 100, tending to exert dynamic braking on the armature to slow the same to a stop. It will

be observed that the diode 99 provides a short circuit in one direction only, so that when a current in a direction tending to rotate the armature in an opposite direction, that is to say in a direction which will permit the limit switch 60 to again close, this current will not be impeded by the presence of the short circuit which exists while the switch 60 is open. The switch 61 provides a similar short circuiting action through diode 101 and resistor 102. To avoid arcing during the constant change in the direction of current supplied to the armature 88, arc suppressor means 103 of well-known type is also provided.

When the switch 93 is moved to the downward position, opposite that seen in FIGURE 7, the device is placed under manual control of the operator, and the direction of rotation of the motor armature is determined by a manual switch 104 of a type which is normally open, and which may be momentarily closed in either of two locations. The operation of the device is the same, the movement of the switch 104 serving again to control the relays 91 and 92. The function of the silicon-controlled rectifiers 69 and 70 are replaced by rectifiers 108 and 109, respectively, and the photosensitive function by the manual switch 104. Diodes 110 and 111 prevent chattering of the relays 91 and 92.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

In an edge control device for use in conjunction with a cloth laying machine, said cloth laying machine having means supporting a roll of cloth upon a spindle and dispensing layers of cloth upon a table in superimposed folds, said edge control device including sensing means disposed in the path of travel of a continuous web of cloth fed from said cloth roll, and motor means controlled by said sensing means for shifting said roll of cloth axially in either of two directions to maintain an edge of said web continuously substantially in a fixed vertical plane, as said web is advanced, improved control means comprising: first and second limit switches for limiting the path of axial displacement of said roll of cloth in either of two oppositely disposed directions, diode means and resistance means selectively connectable in series by said limit switches to short the armature of said motor means when said armature is rotating in a direction toward a limit position, and permitting the flow of current in a opposite direction to move said armature in a direction away from said limit position.

References Cited by the Examiner

UNITED STATES PATENTS

1,186,906	6/1916	Hopkins	242—57.1
2,088,473	7/1937	Gulliksen	242—57.1
2,203,181	6/1940	Potdevin et al.	242—57.1
2,356,567	8/1944	Cockrell	242—57.1
2,643,117	6/1953	Frisbie et al.	242—57.1
2,672,198	3/1954	Jones et al.	242—57.1 X
2,840,721	6/1958	Frommer	242—57.1 X
2,860,841	11/1958	Jacobsen	242—57.1
2,902,888	9/1959	Powischill et al.	270—31
3,033,561	5/1962	Hanna	270—31

MERVIN STEIN, *Primary Examiner.*