

Sept. 1, 1970

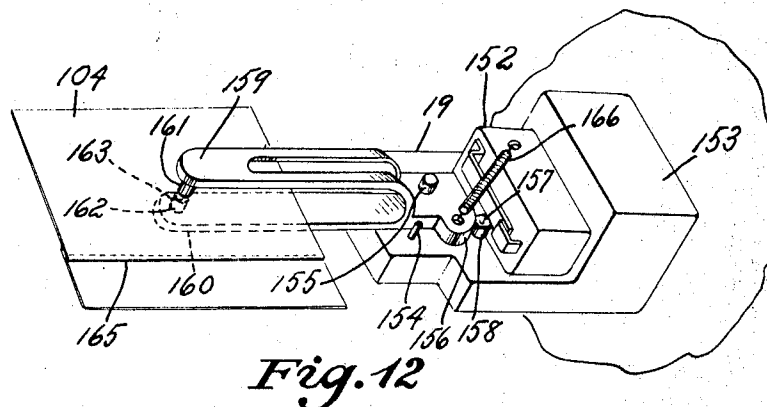
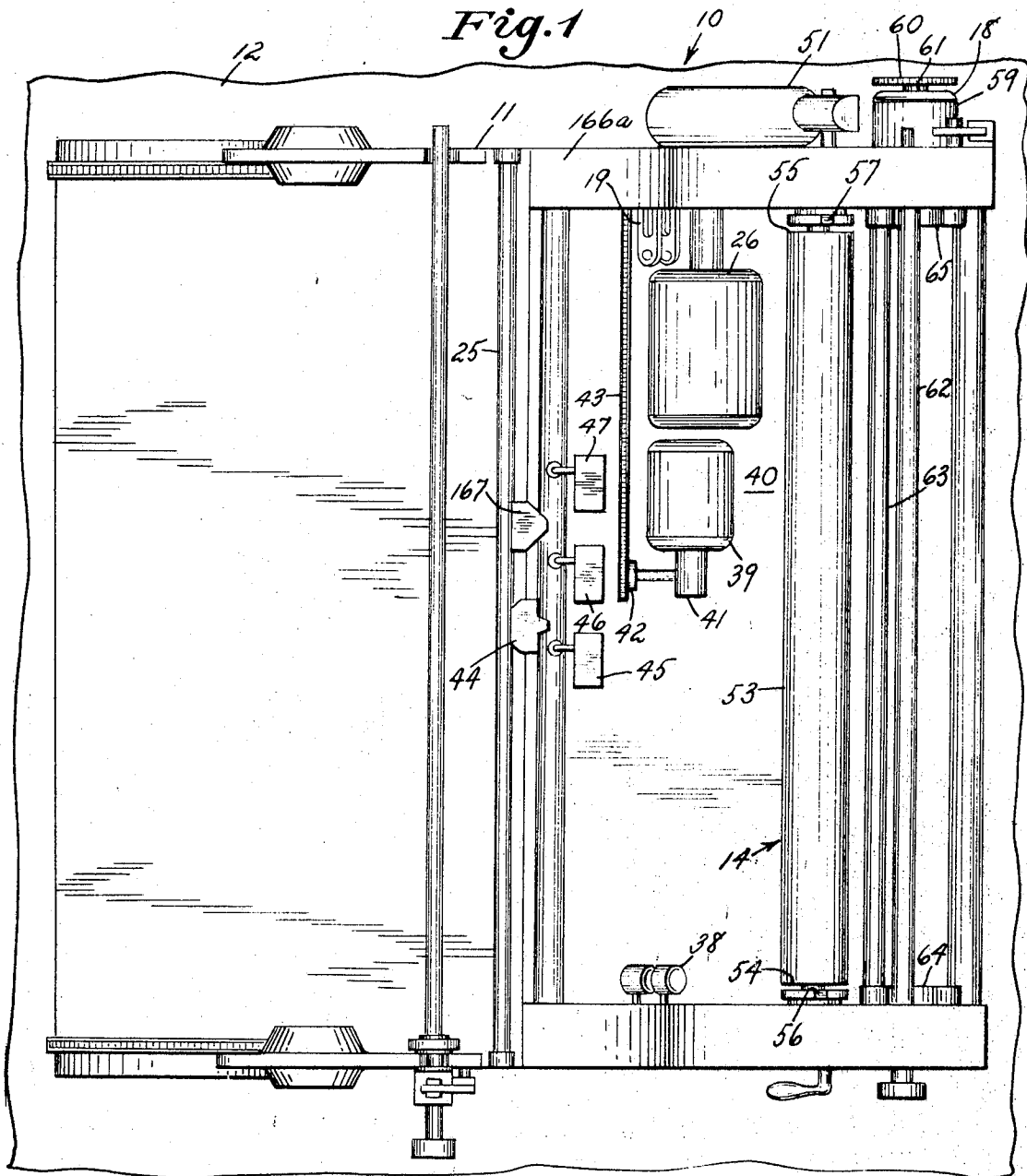
E. M. MERRILL

3,526,398

CLOTH LAYING MACHINE WITH SEAM DETECTION MEANS

Original Filed Aug. 18, 1967

5 Sheets-Sheet 1



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Fig. 2

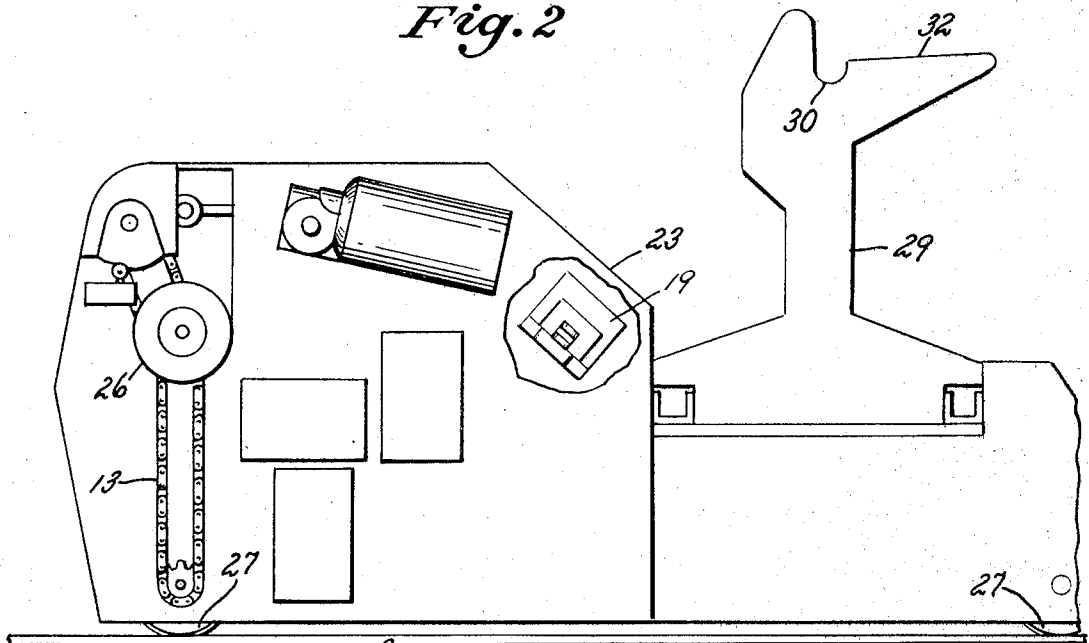


Fig. 13

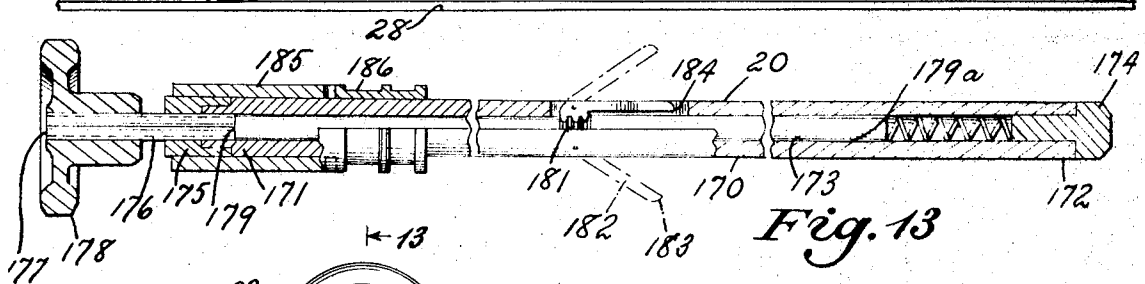
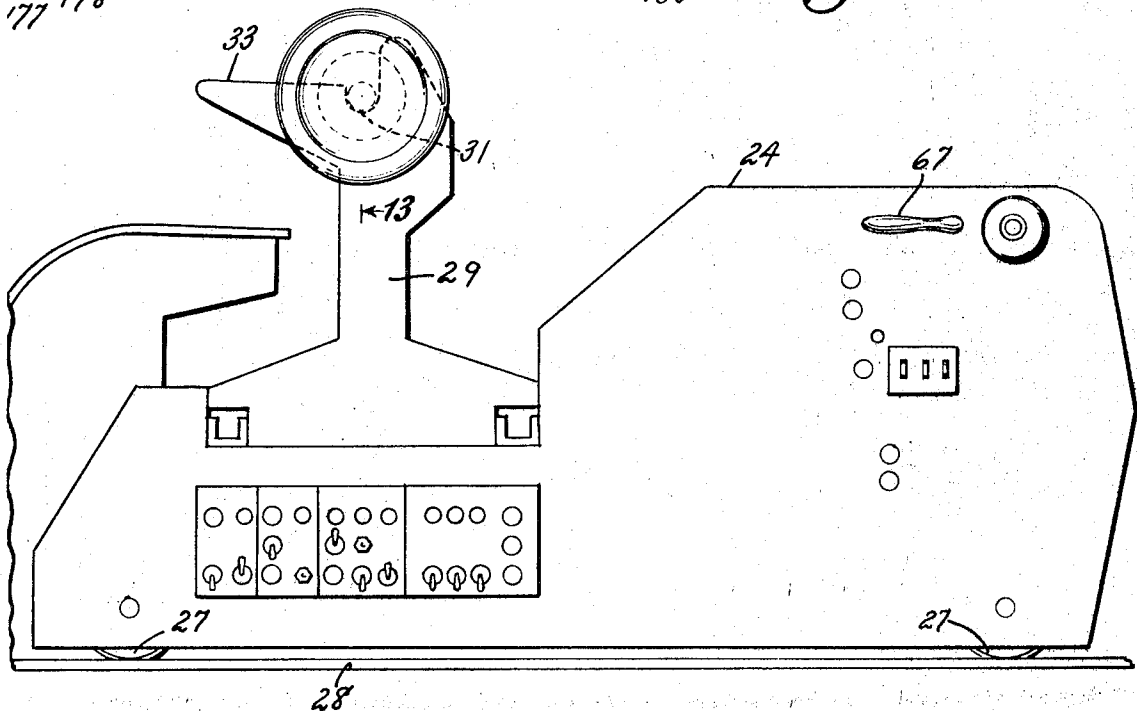


Fig. 3



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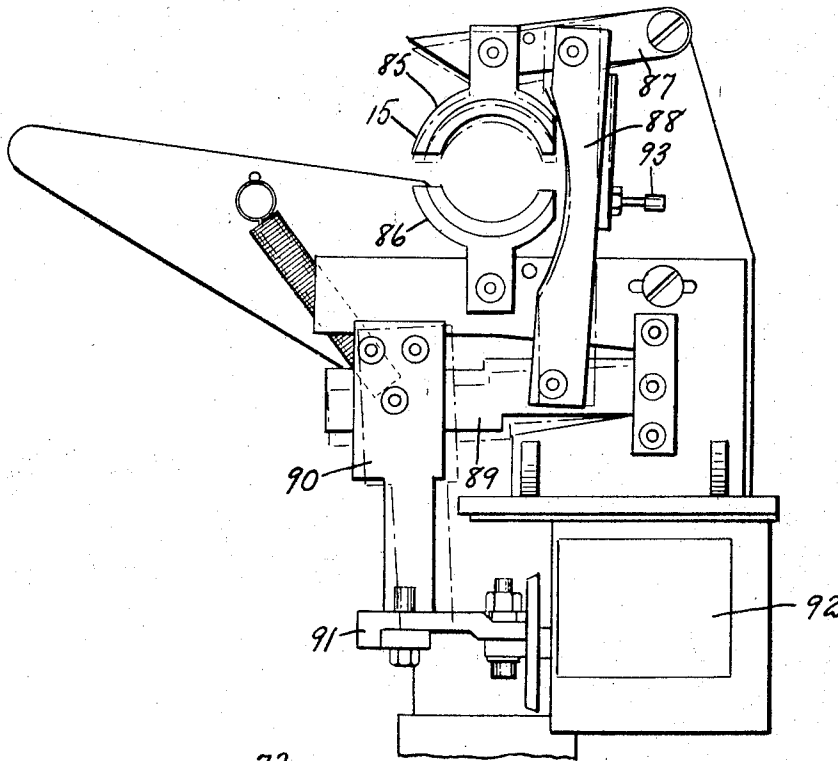


Fig. 4

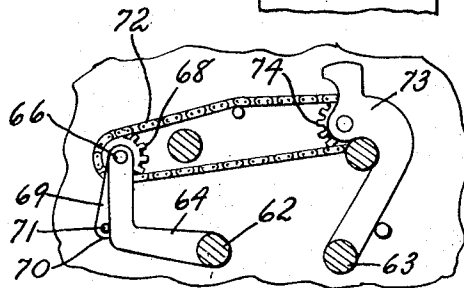


Fig. 7

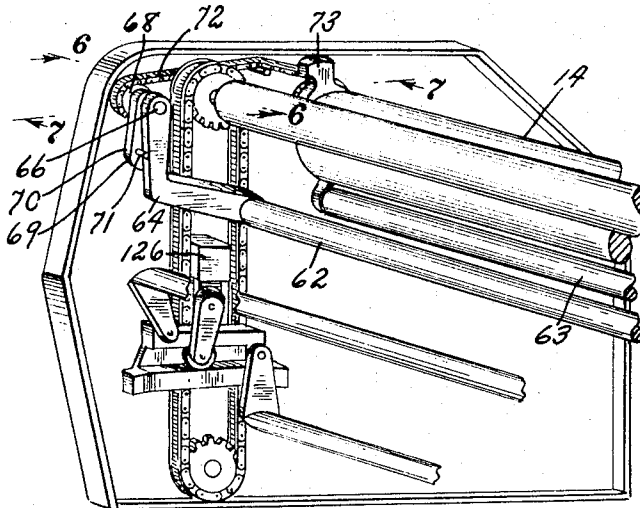


Fig. 5

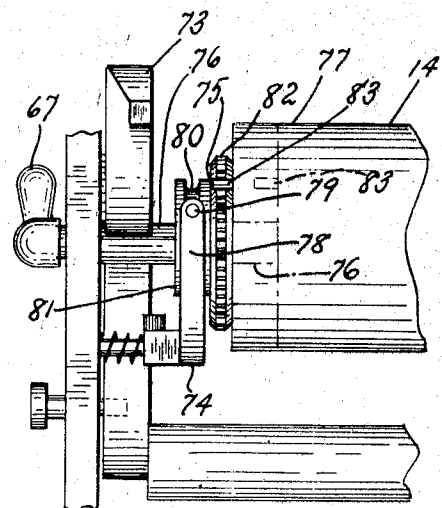


Fig. 6

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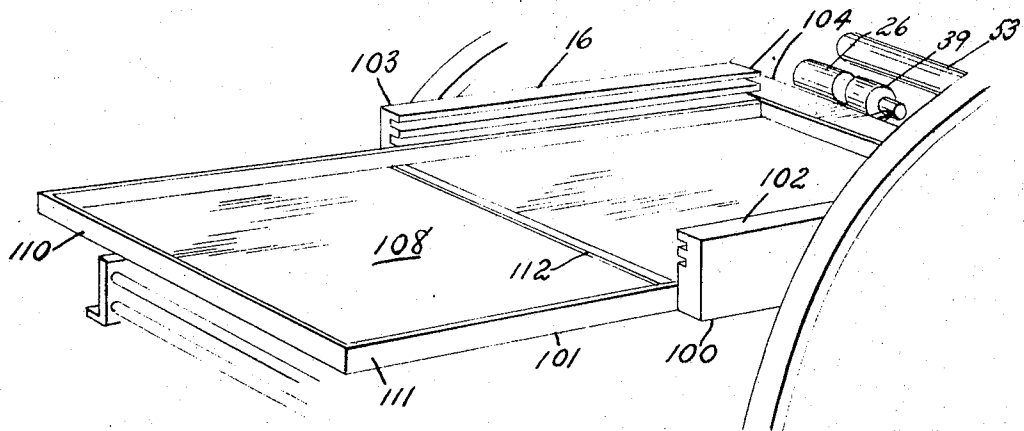


Fig. 8

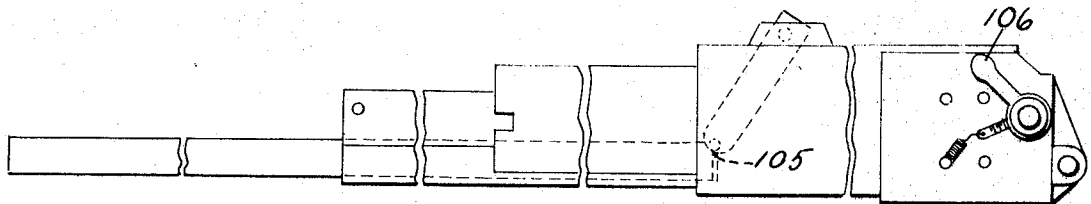


Fig. 9

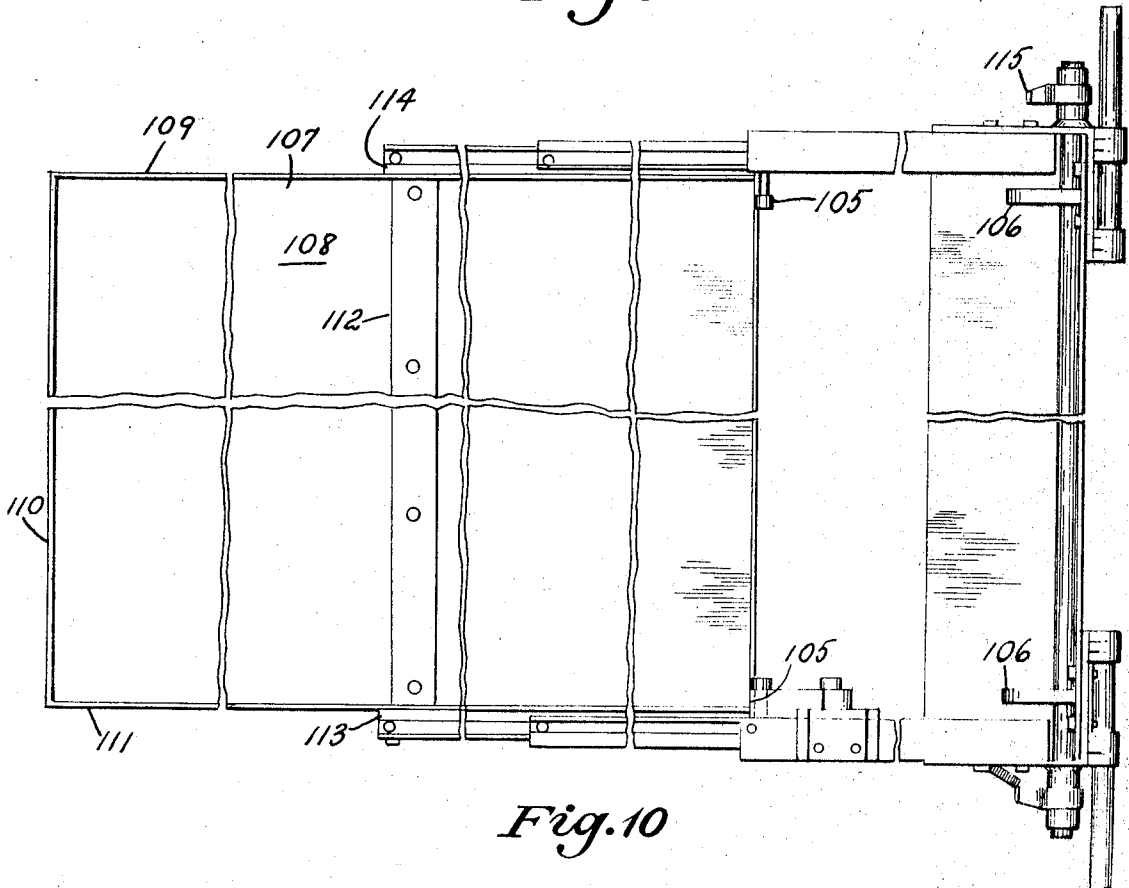


Fig. 10

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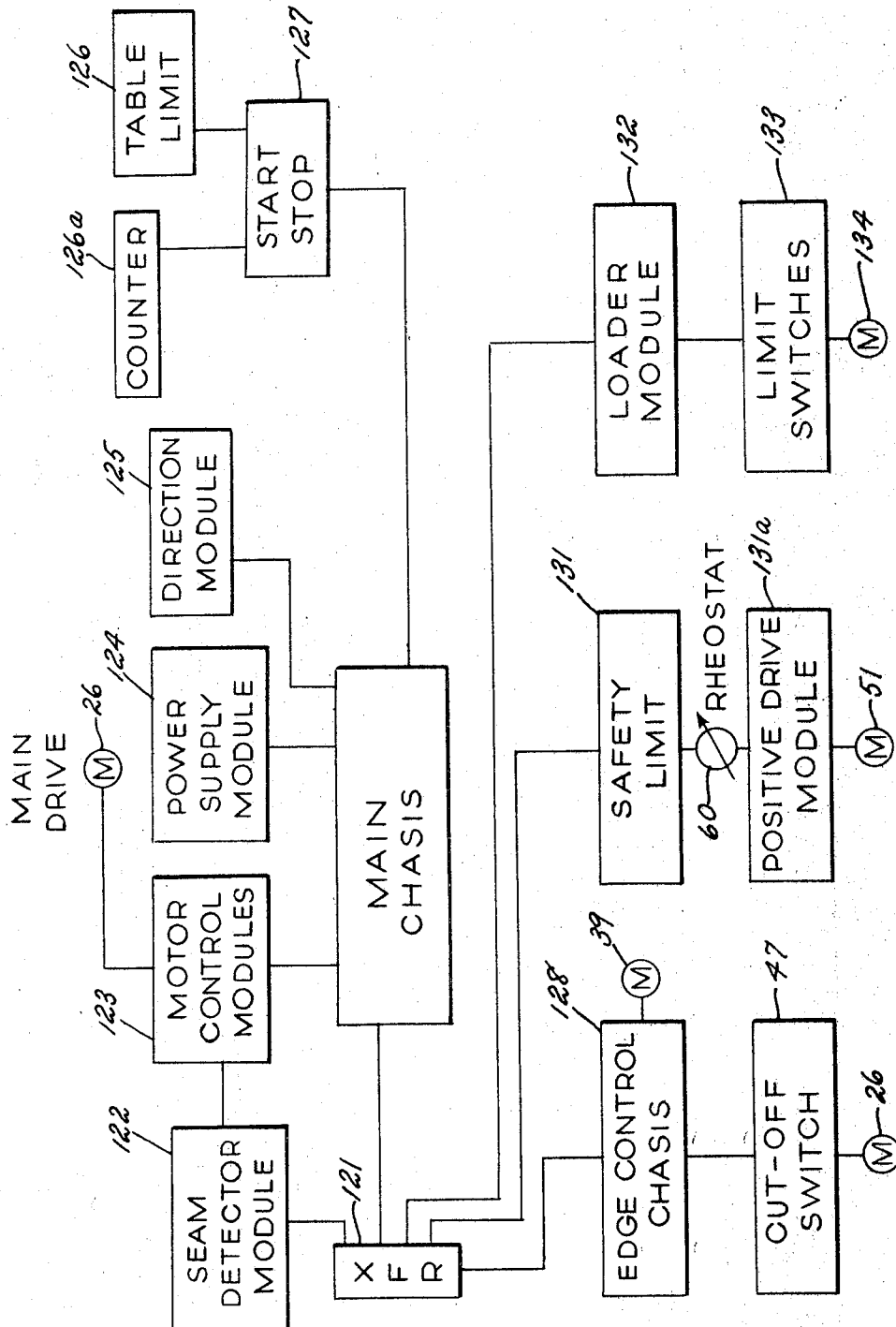


Fig. 11

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CLOTH LAYING MACHINE WITH SEAM DETECTION MEANS

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Original application Aug. 18, 1967, Ser. No. 665,666.
Divided and this application July 18, 1969, Ser. No.
842,970

Int. Cl. B65h 29/46, 25/14

U.S. Cl. 270—31

2 Claims 10

ABSTRACT OF THE DISCLOSURE

A high speed motorized cloth laying machine having a positively driven main feed roller, and including the following features:

(a) Orbitally mounted wrap roller which in one position disengages the driven roller.

(b) The wrap roller is coupled with a dancer bar for simultaneous movement to an inactive position to facilitate threading.

(c) A powered loader for semiautomatically moving fresh cloth supply rolls into position for feeding upon the carriage.

(d) Upon positioning of a fresh supply roll, braking means automatically engages the spindle of said roll.

(e) Automatic means for slowing the carriage at each end of the cloth laying table prior to engagement of cloth clamping means thereat.

(f) Automatically actuated braking of cloth supply roll by nip roller to detect material feed.

(g) Acceleration of the carriage from rest at incrementally increased acceleration rates.

(h) Means for detecting a seam extending across the web of the cloth, and for stopping the machine a short time interval after detection, by which time the seam has reached the cloth laying table, to permit the same to be cut out, and the web overlapped.

(i) Automatic transfer of machine carriage speed from low level to high level after leaving catcher to increase average rate of lay.

(j) Cloth roll supporting bar having adjustable outer diameter to permit simplified engagement with a cloth roll.

(k) Selectively extendable loading tray for dispensing cloth web supply in flattened folded condition.

This application is a division of my copending application Ser. No. 665,666 filed Aug. 18, 1967.

This invention relates generally to the field of high speed motorized cloth laying machines, and more particularly to a device of this type requiring a minimum of attention during operation, whereby the number of personnel necessary for such operation may be materially reduced.

It is among the objects of the present invention to provide in a machine of the class described an improved wrap roller cooperating with a positively driven feed roller on the carriage in such manner that moving the wrap roller to an inactive position for threading of a cloth web therearound automatically disengages the drive to the driven roller, so that the same may be freely rotated upon coming into contact with the cloth web.

Another object of the invention lies in the provision of structure of the above described type featuring a dancing roller lying in the path of travel of the web for the purpose of sensing the presence of slack and operating braking means, movement of the wrap roller to an inactive position serving to simultaneously move the dancer arm to a

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similar position, for further facilitating the threading of a web of cloth.

Another object of the invention lies in the provision of power operated loading means capable of lifting a cloth roll from the surface of a cloth loading table to a position for threading, and for automatically aligning said roll upon reaching a position for threading.

Another object of the invention lies in the provision of means for detecting the end of a web emanating from a source of supply, and automatically stopping the machine by the time said end has been laid upon the cloth laying table, so that a reserve roll may be immediately positioned, threaded, and the resumption of cloth laying may be commenced, without the necessity of repositioning the carriage upon the table.

Yet another object of the invention lies in the provision of a power driven feed roller, the movement of which is independent of movement of the carriage over the table, the speed of which is governed solely by cloth demand.

Still another object of the invention lies in the provision of a cloth laying machine having means for detecting the presence of a laterally extending seam in the cloth web, and for arresting movement of the carriage at the position in which the seam has just been deposited upon the table, so that it may be manually cut, the web subsequently overlapped, and the cloth laying operation continued.

A further object of the invention lies in the provision of a cloth laying machine having a power operated carriage which smoothly accelerates and decelerates between the limits of reciprocating motion determined by the length of the table, whereby abrupt starts and stops are eliminated.

Still another object of the invention lies in the provision of improved electronic circuitry which may be substantially trouble free for a relatively long useful life, and in which the individual components thereof may be replaced as modules.

A feature of the invention lies in the provision of cloth roll braking and power driven feed roller speed control as a function of a single dancer arm responsive to the occurrence of cloth web slack.

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 claims.

FIG. 1 is a plan view of a cloth laying machine carriage embodying the invention.

FIG. 2 is a fragmentary side elevational view thereof.

FIG. 3 is a fragmentary side elevational view thereof showing the side opposite that seen in FIG. 2.

FIG. 4 is a fragmentary side elevational view showing cloth roll loading means comprising a part of the embodiment.

FIG. 5 is a fragmentary view in perspective showing operation of wrap roller and dancer roller positioning means.

FIG. 6 is an enlarged fragmentary sectional view as seen from the plane 6—6 in FIG. 5.

FIG. 7 is a fragmentary sectional view as seen from the plane 7—7 in FIG. 5.

FIG. 8 is a fragmentary view in perspective showing feed tray means for holding bulk piece goods in engaged and extended position.

FIG. 9 is a fragmentary side elevational view of said feed tray means.

FIG. 10 is a fragmentary plan view thereof.

FIG. 11 is a flow diagram showing interconnection of electrical control means.

FIG. 12 is a fragmentary view in perspective of cloth seam detection means.

FIG. 13 is a sectional view of a cloth roll supporting means.

In accordance with the invention, the device, generally indicated by reference character 10, comprises broadly: a carriage element 11, adapted to traverse a cloth laying table 12, carriage element propulsion means 13, selectively positively driven cloth feeding means 14, cloth roll loading means 15, cloth bolt tray supporting means 16, carriage control means 17, cloth roll feeding and braking means 18, cloth web seam detecting means 19, and cloth roll supporting spindle means 20.

The carriage element 11 may be of a type well known in the art, including first and second longitudinal frame members 23 and 24, respectively, interconnected by transverse members 25, and including an electric motor 26 for driving a suitable number of wheels 27 which are in contact with the cloth laying table 28. Each frame member 23-24 includes vertical stanchions 29, each forming at an upper end thereof a notched cloth roll engaging member at 30 and 31. Guiding ramps 32 and 33 communicate with the members 30 and 31 respectively, and extend to the area of the upper terminal of track means 34 and 35, and track engaging members 36 and 37 which form part of the powered cloth roll loading means 15. As the details of the loading means 15 is fully disclosed in the copending application of Edward M. Merrill, Ser. No. 602,094; filed Dec. 15, 1966, and assigned to the same assignee as the present application, it need not be further described herein.

The carriage element 11 is also provided with photocell edge alignment means 38, of suitable type, as for example that disclosed in U.S. Pat. No. 3,222,005, granted Dec. 7, 1965, to Gerard J. Wendelken, and assigned to the same assignee as the present application. The means 38 controls a motor 39 on a transverse support 40. The motor 39 includes gear reduction means 41, and drives a sprocket 42 transmitting motion to a chain 43 to accomplish transverse shifting of the cloth roll in well known manner. Switch tripping means 44 operates limit switches 45, 46 and 47, the third switch 47 serving to interrupt the flow of current to the motor 26, thereby halting the means 13, as will more fully appear hereinafter.

The positively driven cloth feeding means 14 includes a driven roll 53 having first and second ends 54 and 55, respectively, journaled in bearings 56 and 57. Power is transmitted directly from a motor 51 controlled by a rheostat 59. The rheostat 59 includes a wiper 60 mounted on a shaft 61 which supports a dancer roller 62, operating in conjunction with a nip or wrap roller 63.

The roller 62 is mounted by end supporting members 64 on a discontinuous shaft 66. The outer end of the shaft 66 (see FIG. 6) mounts an operating handle 67 which serves to move the roller 62 upwardly when the device is threaded with an end of the cloth web. This movement also transmits motion to a concentrically mounted sleeve 68 having a lever 69 the outer end 70 of which mounts a pin 71 which rests upon the member 64, and motion is transmitted through a sprocket chain 72, and members 73 and 74 to operate a clutch means 75 (see FIG. 6), the purpose of which is to disengage the roll member 53 so that a cloth web may be freely moved thereover.

The roll member 53 includes a driven shaft 76 and concentrically disposed roll sleeve 77 carried thereby. Linkage 78 is operated by a cam on the member 74 to move a yoke 79 axially along the axis of the driven roll member, and transmits motion through a groove 80 in a motion transmitting member 81 formed integrally with a sprocket 82. The sprocket engages a pin 83, when the clutch is in engaged condition, so that motion imparted to the shaft 76 is transmitted directly to the sleeve 77. When the clutch is disengaged, the sleeve may be freely rotated without disturbing the shaft which is connected to the motor 51.

Referring to FIG. 4 in the drawings, the loading means

15 is similar to that disclosed in the above mentioned copending application Ser. No. 602,094, and includes an upper jaw 85 cooperating with a lower jaw 86 in a manner similar to that disclosed therein. The upper jaw 85 is mounted in pivotal manner upon a lever 87, interconnected through links 88, 89, 90 and 91 to a solenoid 92 actuated by a switch 93 contacted by the entry of a cloth roll into position.

Referring to FIGS. 8, 9 and 10 in the drawings, the cloth bolt tray supporting means 16 includes a first or main frame member 100 and a second or auxiliary frame member 101 slidably associated therewith.

The main frame member 100 includes side portions 102 and 103 interconnected by end portion 104. Projecting lugs 105 are selectively engageable with corresponding latching means 106 which holds the frame member 100 in position upon the carriage element.

The auxiliary frame member 101 includes a platform 107, the upper surface 108 of which supports folded cloth for dispensing upon the cloth laying table. The platform 107 is reinforced by frame members 109, 110, 111 and 112, and includes elongated engaging member 113 and 114 which permit slidable movement of the frame member 101 with respect to the frame member 100. Latch means 115 fixes the relationship in retracted position, whereby the auxiliary frame 101 may be withdrawn outwardly for loading, and later slid into position for cloth dispensing.

Referring to FIG. 11 in the drawings, there is illustrated the interconnection between various control modules whereby the automatic functions of which the device is capable are controlled. A power transformer 121 powers a seam detector module 122, operated by seam detector means to be described hereinafter, the seam detector module being connected to motor control modules 123 in turn connected to the main drive motor 26. Upon detection of a seam, the module 122 commences a timing cycle which interrupts the flow of current to the motor control modules approximately one to two seconds later, whereby the motor 26 will stop at a point in which the detected seam will have reached the surface of the table at which time an operator may manually cut the seam, overlap the cloth web, and recommence operation of the cloth laying cycle.

A power supply module 124 is interconnected with a source of alternating current (not shown). A direction module 125 is controlled by switches to be subsequently described, this module preventing reversal of the direction of current to the motor 26 until the carriage has reached the end of a path of travel, as indicated by actuation of table limit switches 126. A start and stop switch 127 is manually controlled, and if desired, a conventional Veeder-Root counter 126a may be actuated by the tripping of the table limit switches 126.

The edge control chassis module 128 corresponds to that described in the above mentioned Wendelken Pat. No. 3,222,005, and connects with a cut off switch 47 interrupting the flow of current to the motor 26. As is known in the art, the photocell unit 38 includes two cells, one of which is normally blocked by the presence of the edge of the web of cloth, and the other of which is normally uncovered, whereby the camming means 44 will remain disposed between the switches 45 and 46 (see FIG. 1). When the end of the web is reached, the normally covered photocell is uncovered, and the motor 39 continues to run, resulting in continued movement of the laterally adjustable part 166 to a point where the cam 167 actuates the switch 47, thereby interrupting the flow of current to the motor 26 and arresting the carriage. Upon rethreading with a fresh cloth roll, the sensing means 38 returns to its normal position, and the part 166 repositions itself, whereby the switch 47 is again closed, and current flow to the motor 26 is resumed.

Control of the motor 51 is accomplished through a safety limit switch 131 which overrides the rheostat 60

connected to the positive drive module 131a controlling the motor 51. The loader module 132 cooperates with limit switches 133 controlling the motor 134 which serves to elevate cloth rolls (not shown) as disclosed in Merrill application, Ser. No. 602,094, above mentioned.

The cloth web seam detecting means 19 is actuated by a microswitch 152 (FIG. 12) mounted upon a bracket 153 on an inner surface of the frame member 23. The switch is operated by a pivotally mounted cam member 154 rotating about a shaft 155 and having an operative profile 156 bearing upon a roller follower 157 supported on arms 158. The cam member 154 includes free ends 159 and 160, the former of which mounts an adjustable feeler member 161 which cooperates with a fixed feeler member 162 on the latter to define a gap 163 through which a web of material 164 may pass. The gap 163 is adjusted to engage a seam 165 in the web 164 which will normally be thicker than the remaining portions of the web, whereby subsequent movement of the web will pivot the member 154 whereby the seam detector module 122 is actuated.

The cloth roll supporting means 20 is adapted to be adjusted for cloth rolls having varying internal diameters, and may be conveniently engaged with a cloth roll prior to engagement with the cloth laying machine carriage. As seen in FIG. 13, the means 20 includes a main shaft 170 having first and second ends 171 and 172, respectively, and a longitudinally arranged bore 173. An end plug 174 closes one end of the bore 173, and the opposite end is surrounded by a threaded terminal 175. A threaded member 176 engages the terminal 175, the outer end 177 being provided with a hand wheel 178 for convenient rotation. The inner end 179 thereof contacts a sliding shaft 178, the opposite end 179a of which bears against a spring 180. At convenient intervals, the shaft 178 is provided with annular cam members 181 engaging pivotally mounted followers 182, the outer ends 183 of which project through openings 184 in the main shaft 170 to engage the inner surfaces of cloth rolls. An outer sleeve 185 is provided with recesses 186 to facilitate engagement within the notched members 30 and 31 (FIGS. 2 and 3).

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:

1. In a cloth laying machine carriage including electrically powered means for driving the same in a reciprocating path of travel over the surface of a cloth laying table, and means for feeding a web of material to be dispensed upon the surface of said table during such reciprocation, the improvement comprising: means contacting opposed surfaces of said web for detecting the presence of a transversely extending seam thereon, said means including a bracket mounted upon said carriage, a switch mounted upon said bracket, a cam member pivotally mounted upon said bracket to actuate said switch upon rotation to predetermined position, first and second feeler members mounted upon said cam member for movement therewith, said feeler members defining a gap corresponding to the thickness of a web of material positioned therebetween, and less than the thickness of a seam in said web, resilient means urging said cam to predetermined position in which it is free of engagement with said switch, at least one of said feeler members including a resilient component allowing it to flex to enlarge said gap to permit passage of a seam after further rotation of said cam against said resilient means is prevented by the engagement of said cam with said switch.

2. Structure in accordance with claim 1, said switch means including time delay means, permitting said driven means to operate for a limited period of time after actuation of said switch means, whereby said seam may be transported from said detecting means to said table.

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P. V. WILLIAMS, Assistant Examiner

U.S. Cl. X.R.

26—17; 200—61.13; 226—10