July 2, 1957 H. W. HEMPEL 2,797,919

TWIN LENGTH SELECTOR CONTROL FOR TAPE DISPENSER

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Fig. 1.

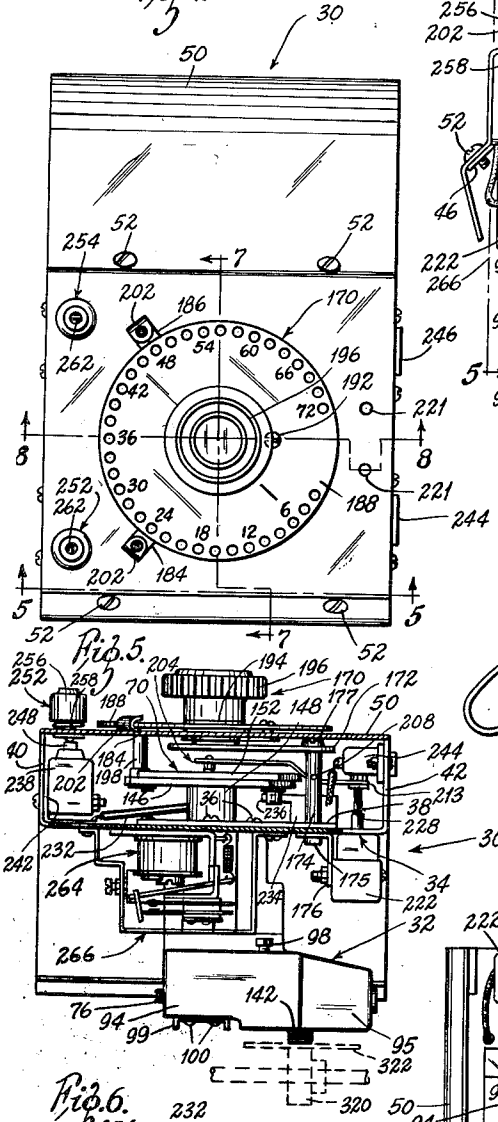


Fig. 2.

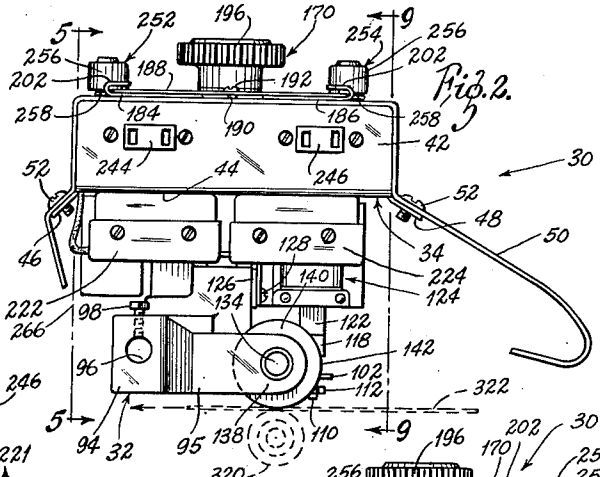


Fig. 3.

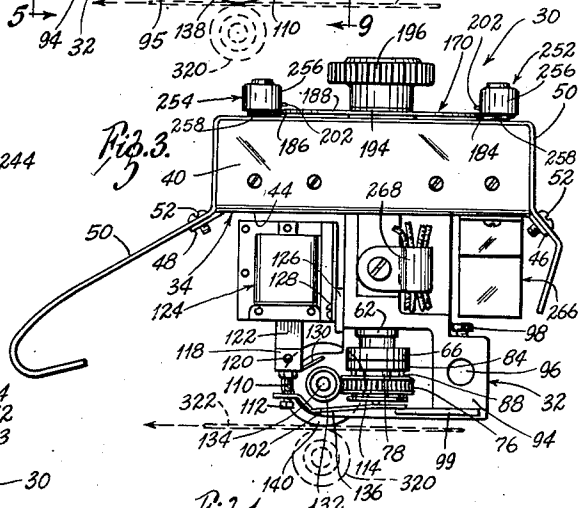


Fig. 5.

Fig. 4.

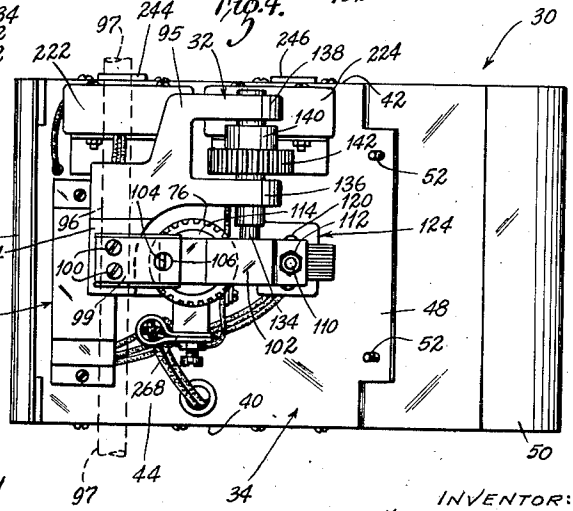
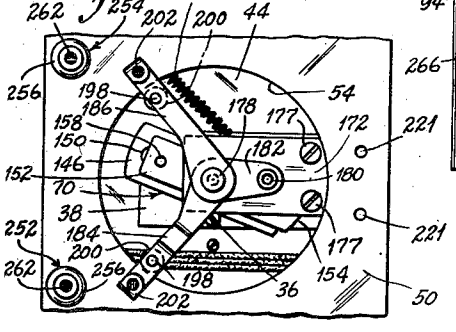


Fig. 6.

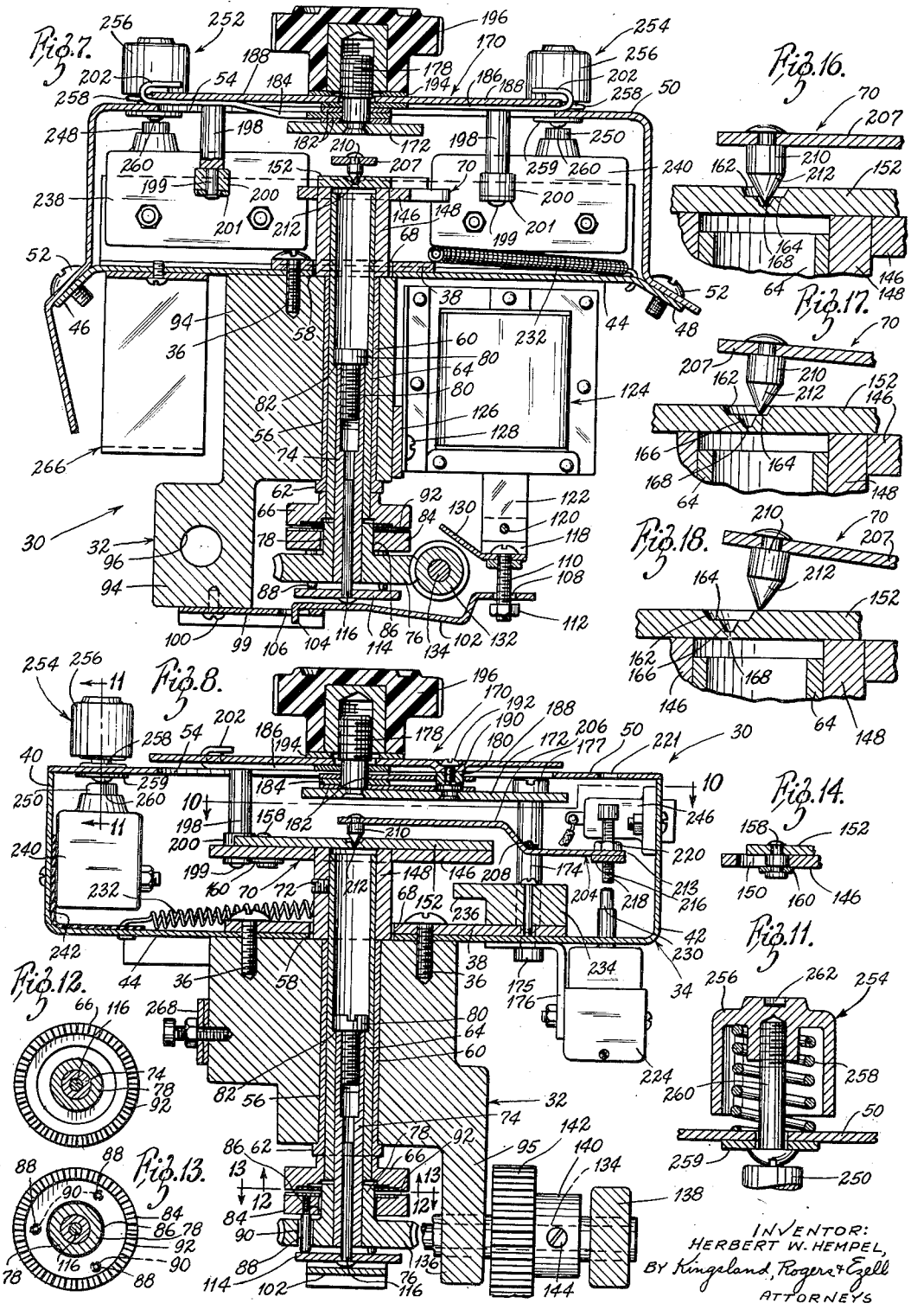


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Fig. 9.

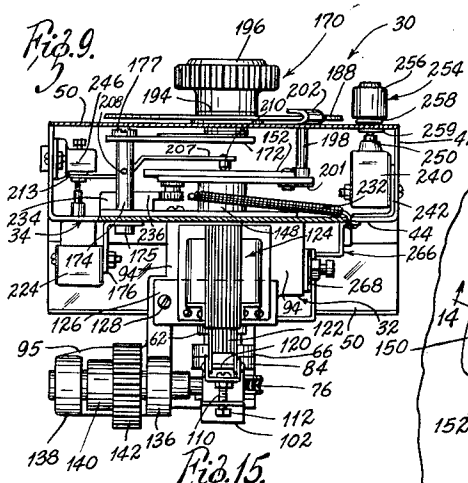


Fig. 10.

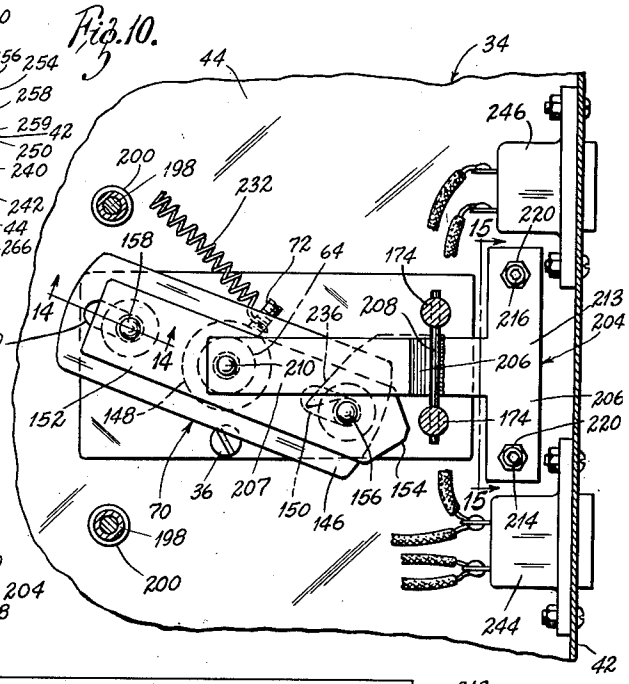


Fig. 15.

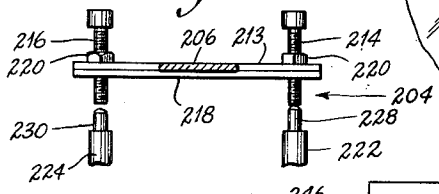
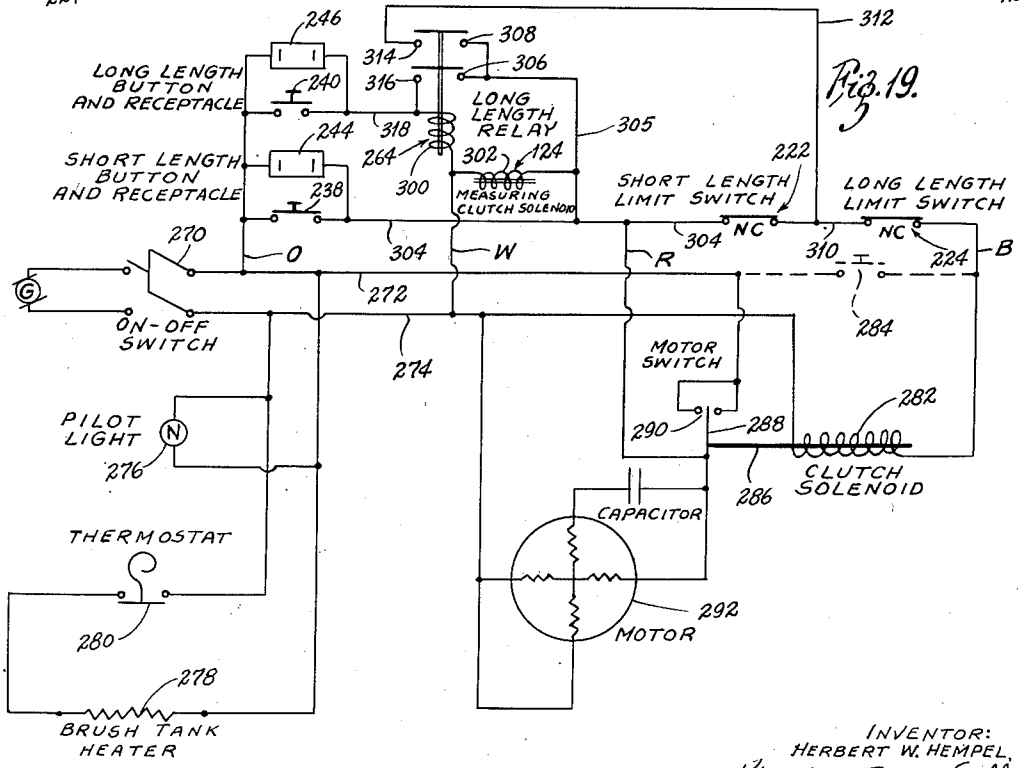


Fig. 19.



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TWIN LENGTH SELECTOR CONTROL FOR TAPE DISPENSER

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Application March 25, 1955, Serial No. 496,689

14 Claims. (Cl. 271—2.4)

The present invention relates generally to machines for dispensing gummed tape used for packaging purposes, and more particularly to a novel control system providing twin selection of tape lengths in an electrically actuated and controlled tape measuring and dispensing machine.

The widespread use of gummed tape in packing and shipping rooms has already led to the development of tape dispensing machines adapted to deliver various selected lengths of moistened tape upon the execution of an appropriate manual maneuver on the part of the operator. However, notwithstanding the obvious increase in efficiency afforded by this general ability to procure different lengths of tape at will, the care which the operator must exercise in operating conventional machines so as to obtain the particular lengths of tape desired has prevented realization of even greater efficiency in the packaging art. In other words, peak efficiency is now limited by the fact that the operator must repeatedly divert his attention from closing the package and actually applying tape in order to assure delivery of the proper length of tape next to be applied.

In many instances, of course, tape segments of equal length may be used without the necessity for procuring other lengths. In such instances, attempts have been made to solve the condition noted above, at least in part, by providing a repeating action of the dispenser under control of a special actuating button or the like. By and large, however, the great majority of packing and sealing operations involve the application of two different lengths of tape, which clearly eliminates simple repetition as a solution of the problem at hand. The present invention, therefore, contemplates a control which enables preselection of two different lengths and subsequent repeated selection between the two preselected lengths.

Thus, it is an object of the present invention to provide a novel selector mechanism for a tape dispenser whereby the latter may be operated to deliver, at will, either of two preselected lengths of tape.

It is another object of the invention to provide a novel selector mechanism for tape dispensers which incorporates means for preselecting two different lengths of tape along with individual, easily differentiated actuating means for effecting delivery of either preselected length of tape at will.

It is another object of the invention to provide a novel control system for tape dispensers which is effective to measure the tape during the feeding thereof and to terminate the feeding of tape upon the delivery of a selected one of two preselected lengths thereof.

It is another object of the invention to provide a novel twin selector for tape dispensers which enables two different lengths of tape to be preselected and either of the preselected lengths to be subsequently selected at will through separate, easily differentiated manual maneuvers.

The foregoing, along with additional objects and advantages, are apparent from the following description, taken with the accompanying drawings, in which:

Figure 1 is a top plan view of a twin selector mechanism constructed in accordance with the teachings of the present invention;

Figure 2 is a right side elevational view thereof;

Figure 3 is a left side elevational view thereof;

Figure 4 is a bottom plan view thereof;

Figure 5 is a front elevational view thereof, partly in section, taken substantially on the lines 5—5 of Figures 1 and 2;

Figure 6 is a fragmentary top plan view generally similar to Figure 1, but with certain parts removed for the purpose of revealing additional structural features of the invention;

Figure 7 is an enlarged sectional elevation taken generally along the line 7—7 of Figure 1;

Figure 8 is an enlarged sectional elevation taken generally along the line 8—8 of Figure 1;

Figure 9 is a rear elevational view of the mechanism, partly in section, taken along the line 9—9 of Figure 2;

Figure 10 is a fragmentary sectional plan taken generally along the line 10—10 of Figure 8;

Figure 11 is a further enlarged sectional elevation taken generally along the line 11—11 of Figure 8;

Figure 12 is a sectional bottom plan view taken generally along the line 12—12 of Figure 8;

Figure 13 is a sectional top plan view taken generally along the line 13—13 of Figure 8;

Figure 14 is a fragmentary vertical section taken generally along the line 14—14 of Figure 10;

Figure 15 is a fragmentary vertical section taken generally along the line 15—15 of Figure 10;

Figures 16, 17 and 18 are further enlarged fragmentary vertical sections illustrating different operative relationships between an actuator arm assembly and a selector cam assembly; and

Figure 19 is a schematic diagram of an electrical control circuit.

Referring now to the drawings more particularly by means of reference characters, the numeral 30 indicates generally a twin selector mechanism incorporating the concepts of the present invention. As clearly shown in the drawings, and particularly in Figures 7 and 8, the mechanism 30 includes a main bracket member 32 and a main frame member 34. These parts are firmly secured together by means of screws 36, the latter serving also to secure a base plate 38 flush against an upper surface of the frame member 34. The member 34 is generally square in plan form and is provided with upstanding sides 40 and 42 along opposite edges of a main horizontal panel 44. The remaining two edges of the panel 44 have downwardly slanted tabs or flanges 46 and 48. A cover plate 50 formed to the shape clearly illustrated in Figures 1 and 2 is adapted for attachment to the flanges 46 and 48 by means of screws 52. Except for a relatively large circular opening 54 formed in the cover plate 50 as illustrated in Figure 6, the cover plate 50 and the main frame member 34 cooperate to form a box-like enclosure mounted on top of the main bracket member 32.

The member 32 is preferably of cast or forged construction and may be made from aluminum, or similar light metal. A preferred shape of the bracket member 32 is apparent from the several figures of the drawings, and the utility of this shape will become clear from the description which follows.

The member 32 is provided with a vertical bore 56 which communicates at its upper end with an opening 58 in the panel 44 of the frame member 34. Preferably, the bore 56 is provided with a sleeve bearing 60 having a flange 62 at its lower end. A hollow shaft 64 having a driven clutch member 66 secured at its lower end, as by

press fitting, is rotatably disposed in the sleeve **60** and extends upwardly through the opening **58** in the panel **44** and through a similar opening **68** in the base plate **38** to receive a selector cam assembly **70**. Setscrews **72** secure the assembly **70** to the hollow shaft **64** for rotation therewith.

The hollow shaft **64** has its lower half formed to an inside diameter which is less than that of its upper half. This lower half of the shaft **64** rotatably receives the upper end of a smaller hollow shaft **74** which has a worm wheel **76** secured, as by pressing, to its lower end. The upper side of the worm wheel **76** is provided with an axially extending boss **78** adapted for abutment with the lower end of the shaft **64**. The shaft **74** is threaded at its upper end so as to receive a screw **80**, the head of which abuts an annular shoulder **82** formed at the junction of the previously mentioned different inside diameters of the shaft **64**. Preferably, the length of the shaft **74** is such that with the screw **80** pulled against its upper end it is freely rotatable in the shaft **64**.

A driving clutch member **84** has a center opening **86** which allows it to be loosely fitted over the boss **78** of the worm wheel **76**. This member **84** is also provided with three pins **88** secured therein, as by threaded engagement or pressing, and depending therefrom to pass loosely through appropriately spaced openings **90** in the web of the worm wheel **76**. As best shown in Figures 7 and 8, then, the driving clutch member **84** must, perforce, rotate with the worm wheel **76** and, at the same time, is vertically movable for selective engagement with the driven clutch member **66**. Each of the members **66** and **84** is provided with an outer rim face **92** which is serrated for clutching engagement. Figures 12 and 13 illustrate the respective mating faces of these clutch members **66** and **84**.

As best shown in Figures 3 and 4, the worm wheel **76**, along with the clutch members **66** and **84**, is accommodated in a corner cavity defined by a lower mounting portion **94** and a clevis portion **95**, each of these portions being integral parts of the bracket member **32**. The mounting portion **94** is provided with a horizontal bore **96** for receiving a pivot shaft **97** indicated by broken lines in Figure 4. A setscrew **98** is provided for securing the mechanism **30** in proper position on the shaft **97**. A channel-like bracket **99** is secured by screws **100** to the lower surface of the mounting portion **94** so as to extend generally toward the axis of the shaft **64**. A leaf member **102**, shaped as clearly shown in Figures 4 and 7, includes a tab **104** inserted through an aperture **106** in the web of the bracket **99**. The other end of the member **102** has an aperture **108** which loosely receives a screw **110** provided with a nut **112** for retaining the member **102** thereon.

As is clear from the drawings, the leaf member **102** extends beneath the worm wheel **76** and the downwardly extending pins **88** which extend below the worm wheel **76**. A disc-like pressure plate **114** mounted loosely on a headed pin **116** is interposed between the leaf member **102** and the aforementioned pins **88**, the pin **116** being slidably inserted into the lower end of the hollow shaft **74**. Clearly, with this arrangement an upward movement of the screw **110** will be communicated through the leaf member **102**, the pin **116**, the pressure plate **114** and the several pins **88** so as to move the clutch member **84** into driving engagement with the clutch member **66**.

The above mentioned screw **110** is secured in a clip **118** fastened by means of a rivet **120** to the end of an armature **122** of a solenoid **124**. The solenoid **124** is mounted on a mounting plate **126** secured to a side surface of the bracket member **32** by means of screws **128**. Preferably, the clip **118** is provided with a tab **130** which extends above a worm **132** as illustrated in Figure 7. By means of this arrangement, the leaf member **102** is prevented, in the absence of energization of the solenoid **124**, from dropping down appreciably farther than necessary to disengage the clutch members **66** and **84**.

The worm **132**, above mentioned, is disposed in driving engagement with the worm wheel **76** and is mounted for rotation with a shaft **134** supported in the clevis portion **95** of the bracket member **32**. The portion **95** includes parallel arms **136** and **138** each of which is provided with a sleeve bearing for the shaft **134**. A measuring wheel **140** having a serrated peripheral face **142** is secured to the shaft **134** between the clevis arms **136** and **138**. A setscrew **144** secures the measuring wheel **140** to the shaft **134**. It will be seen that rotation of the measuring wheel **140**, accompanied by energization of the solenoid **124**, will be effective to rotate the shaft **64** and, hence, the selector cam assembly **70** secured to its upper end.

The selector cam assembly **70**, best shown in Figures 8 and 10, comprises an elongated base plate **146** firmly secured, as by welding, pressing, or the like, to a mounting sleeve **148**. Preferably, the ends of the base plate **146** are rounded off to a constant radius as is evident in Figure 10. The plate **146** is provided with a slot **150** near each of its ends, the slots **150** being in alignment with each other. A cam plate **152** having one end provided with a rounded point **154** is disposed flush against a top surface of the base plate **146** and has pins **156** and **158** secured therein so as to depend downwardly through the slots **150**. Each of the pins **156** and **158** is provided with a washer **160**, and each also has a headed portion which retains the washers **160** as shown particularly in Figure 14. It will be noted, however, that the headed portion of the pin **156** located adjacent the pointed end of the cam plate **152** is deeper than the head of the pin **158**. This is particularly evident in the illustration of Figure 5. Preferably, the arrangement is such that the cam plate **152** is freely slidable within the obvious limits provided by its attachment to the base plate **146**.

The upper face of the cam plate **152** has a double depression formed therein as best shown in Figure 18. This double depression comprises a shallow depression **162** having an annular floor **164** and a deep depression **166** having a flat circular floor **168**. The depressions **162** and **166** are concentric as illustrated in the drawings. The double depression formed as above described is located so as to be on the extended axis of the hollow shaft **64** when the cam plate **152** is moved as far as it will go in the direction of the pointed end **154** thereof.

A selector assembly designated generally by the numeral **170** is also disposed on the extended axis of the hollow shaft **64**. The assembly **170** is mounted on a clamp plate **172** supported upon twin posts **174** secured by screws **175** which pass upwardly through a switch bracket **176**, the panel **44**, and the base plate **38** to engage the lower ends of the posts **174**. The clamp plate **172** is secured at one end by screws **177** engaging the posts **174** and extends in cantilever fashion so as to dispose an upstanding stud **178** concentric with the extended axis of the shaft **64**. The stud **178** is securely mounted to the clamp plate **172** and has its upper end threaded as clearly shown in Figures 7 and 8. The plate **172** is also provided with an upstanding stud **180** extending to a lesser height than the stud **178** and being internally threaded at its upper end. A flat plate-like spacer **182** shaped as best shown in Figure 6, and having two holes for enabling it to be disposed over the studs **178** and **180** is laid flush upon the top surface of the clamp plate **172** so as to support a short length selector arm **184** pivotably mounted upon the stud **178**. A second plate-like spacer **182** is then disposed over the studs **178** and **180** and this is followed by a long length selector arm **186** which is also pivotably mounted upon the stud **178**. An index plate **188**, circular in form as illustrated in Figure 1, is then placed over the stud **178** and rotated until a per-

forated downwardly embossed porton **190** is aligned with the stud **180**, whereupon the index plate **188** is secured firmly in place by a screw **192**. Finally, a resilient clamp knob washer **194** and a clamp knob **196** are disposed over the stud **178**, the latter being screwed thereon so as to provide a desired degree of clamping against inadvertent pivoting of the selector arms **184** and **186**.

The selector arms **184** and **186** are preferably formed from sheet metal to the general shape illustrated in Figure 6. Each has a depending pintle **198** affixed thereto as best illustrated in Figure 7, and each pintle **198** has a lower portion **199** of reduced diameter for rotatably receiving an annular roller **200** retained by a washer **201** secured by peening the portion **199** at its lower end. It will be noted that the rollers **200** are disposed at an elevation which enables them to be engaged by the pointed end **154** of the cam plate **152**. It should also be noted that the pintle **198** and roller **200** of the long length selector arm **186** are disposed closer to the axis of the stud **178** than are the corresponding parts of the short length selector arm **184**.

Preferably, the free ends of the arms **184** and **186** are given a return bend as indicated at **202** in Figure 7, and these returned portions are color coded as illustrated in Figures 1 and 6. It is obvious that this arrangement of the selector assembly **170** enables the arms **184** and **186** to be individually positioned relative to the index plate **188** and retained in adjusted position by tightening the knob **196**.

Directing particular attention now to Figures 8 and 10, an actuating arm assembly **204** comprises a T-shaped arm **206** having a stem portion **207** offset as illustrated in Figure 8, and having a pivot pin **208** secured transversely thereto. The pivot pin **208** extends through appropriate pivot holes in the posts **174** so that the arm **206** may rock freely while thus supported. The stem portion **207** of the arm **206** extends into the space between the selector cam assembly **70** and the clamp plate **172** of the selector assembly **170**. A pin **210** having a conical point **212** is affixed adjacent the free end of the stem portion **207** so as to be substantially on the axis of the hollow shaft **64** aforementioned. As best illustrated in Figures 16 and 17, the conical point **212** of the pin **210** is of such size that it may rest upon either the floor **168** of the deep depression **166** or upon the floor **164** of the shallow depression **162**.

A crossbar portion **213** of the T-shaped arm **206** is provided with holes at each end to receive adjustable limit screws **214** and **216**. As clearly shown in Figure 15, these screws pass through holes provided in the portion **213** and threadedly engage a strip **218** which underlays the latter. Lock nuts **220** are provided for maintaining the screws **214** and **216** in adjusted position. Holes **221** are provided in the cover plate **50** for making minor adjustments to the screws **214** and **216**.

A pair of single pole, single throw, normally closed limit switches, designated **222** and **224**, respectively, are supported by means of the aforementioned angular bracket **176** secured to the underneath panel **44** of the frame member **34** by means of the screws **175**. Thus mounted, the switches **222** and **224** present their respective actuating plungers **228** and **230** for abutment with the screws **214** and **216**, respectively. The arrangement is clearly such that rocking movement of the actuator arm assembly **204**, along with appropriate adjustment of the screws **214** and **216**, is effective to actuate the switches **222** and **224**. The invention contemplates that the individual screws **214** and **216** be adjusted so that with the assembly **204** in the position illustrated by the condition of Figure 16, wherein the point **212** rests upon the floor **168**, neither of the switches **222** or **224** will be actuated. When, however, the condition illustrated in Figure 17 exists, wherein the point **212** rests upon the floor **164**, the assembly **204** will be pivoted to a position wherein the switch **222** is actuated. Finally, with the condition of Figure 18 established, wherein the point **212** rests upon the uppermost surface of the cam plate **152**, the assembly **204** is pivoted to a position wherein both the switches **222** and **224** are actuated. From the foregoing description, it is clear that the different conditions of Figures 16, 17 and 18 are brought about by movement of the cam plate **152** relative to the base plate **146**, and, further, that such movement is induced through engagement of the point **154** of the cam plate **152** with the respective rollers **200** of the selector arms **184** and **186**.

As previously noted, the drive for the selector cam assembly **70** is through the clutch members **66** and **84**. After each excursion, however, the assembly **70** is returned to a home position through the action of a tension spring **232** having one end hooked to one of the setscrews **72** and the other end hooked to the frame member **34**. The home position of the selector cam assembly is established by a stop lug **234** having an extended cam portion **236** formed to the shape clearly illustrated in Figure 10. The cam portion **236** is disposed at an elevation such that the head of the cam plate pin **158** will pass freely thereover, but such that the elongated head of the pin **156** will engage the portion **236** and thereby urge the cam plate **152** to that position which establishes the condition illustrated in Figure 16.

A pair of single pole, single throw, normally open start switches **238** and **240** are mounted on the inside of the upturned side **40** of the frame **34** as clearly illustrated in Figures 7 and 8. A sheet of insulating material **242** may be provided between the member **34** and these switches. A pair of conventional electrical receptacles **244** and **246** are similarly mounted on the side **42** of the frame member **34**.

The start switches **238** and **240** have actuating plungers **248** and **250**, respectively, positioned as best illustrated in Figure 7 so as to engage touch button assemblies **252** and **254**, respectively, the latter being mounted on top of the cover plate **50**. Figure 11 illustrates the arrangement of these touch button assemblies, and it will be observed that an inverted cup member **256** accommodates a compression spring **258** which biases it away from the cover plate **50**. The member **256** is retained by a washer **259** and a screw **260**, the latter having its head disposed at least substantially in engagement with the plunger **250**. Obviously, any movement of the member **256** either downwardly or to one side will cause the head of the screw **260** to depress the plunger **250** and, hence, to actuate the switch **240**. Preferably, the members **256** are provided with indentations **262** which are color coded to correspond respectively with the selector arms **184** and **186**.

In addition to the several mechanically actuated switches already mentioned, the mechanism **30** includes a conventional double pole, single throw electrical relay **264** mounted to the underside of the panel **44** of the frame member **34** as best illustrated in Figure 5. Preferably, a shield **266** is provided for the relay **264**.

The interconnection of the electrical elements included in the mechanism **30** may, of course, be variously effected. It is preferred, however, that they emerge as four distinct electrical conductors. The four conductors may be gathered at a convenient point and retained together, as by a clip **268** secured to the bracket member **32** as illustrated in Figures 3, 4 and 8.

Figure 19 illustrates schematically the electrical circuits incorporated in the mechanism **30**, as well as the circuits of a tape dispenser with which the mechanism **30** is adapted to cooperate. A particularly suitable tape dispenser is disclosed in my copending application, Serial No. 210,155, filed February 9, 1951, now Patent No. 2,757,730.

As previously mentioned, the electrical interconnection between the mechanism **30** and its cooperating tape dispenser is desirably through four separate wires. These wires are indicated in Figure 19 by the letters O, W, R and B. It will be understood that whereas these four wires are deemed physical, the remaining leads indicated in Figure 19 are schematic and may take various physical paths.

To describe first the tape dispenser circuits shown in Figure 19, a double pole, single throw toggle switch **270** connected to a suitable source of electrical power, indicated by the generator G, is effective to energize the main bus bars **272** and **274**. It is clear from the illustration of Figure 19 that the closing of the switch **270** will energize a pilot light **276** and also a heater circuit containing a heating coil **278** and a thermostat **280**. In addition to energizing these accessories, closing of the switch **270** prepares an operating circuit through a clutch solenoid **282** having one end connected to the bus bar 274 and having its other end connected through an appropriate circuit making and breaking device to the lead **272**. The dotted interconnection of the switch designated **284** in Figure 19 is illustrative of this latter connection. Clearly, actuation of the switch **284** effects energization of the clutch solenoid **282** which is in turn effective to withdraw an armature **286** connected to a pole **288** of a single pole, double throw switch **290**. This switch **290** has both its contacts connected to the bus bar **272**, while its pole **288** is connected to a motor **292**. The other side of the motor **292** is connected to the bus bar **274**.

In adding the circuits of the mechanism **30** to the tape dispenser circuits just described, the switch **284**, shown connected in dotted lines in Figure 19, may be removed, it being understood that this switch is representative of a selector of different type than here disclosed. Considering now the circuits of the selector mechanism **30**, the lead O is connected into the bus bar **272** and has branch leads to each of the start switches **238** and **240**, and to each of the receptacles **244** and **246**. The wire W is connected into the bus bar **274** at one end and extends to a coil **300** of the relay **264**, and to a coil **302** of the solenoid **124** which operates the clutch mechanism of the device **30**. The wire R is connected at one end into the interconnected pole **288** and motor **292**, and at its other end to a lead **304** shown schematically to interconnect various electrical elements in the mechanism **30**, as will appear. The wire B is connected between the clutch solenoid **282** and the long length limit switch **224**.

Within the selector mechanism **30**, the electrical connections include the lead **304** above-mentioned, which extends from the start switch **238** to the short length limit switch **222**. Between these two elements, a branch lead **305** connects the lead **304** with one side of the solenoid coil **124** and also with contacts **306** and **308** of the relay **264**. The other side of the limit switch **222** is connected by a lead **310** to the limit switch **224**, and this lead **310** is also connected by a lead **312** to a contact **314** of the relay **264**. The remaining contact **316** of the relay **264** is connected into a lead **318** which extends from the start switch **240** to the coil of the relay **264**. Finally, it will be noted that the receptacles **244** and **246** are also connected into the leads **304** and **318**, respectively.

Operation

As has already been mentioned, the control mechanism **30** is particularly well adapted to replace the measuring and control unit disclosed in my copending application, Serial No. 210,155, filed February 9, 1951. When thus used, the measuring wheel **140** of the mechanism **30** is disposed in position to cooperate with a feed wheel 320 forming part of a dispensing mechanism which is effective to feed a strip of tape 322 as indicated in dotted outline in each of the Figures 2, 3 and 5. Clearly, the arrangement is such that advancement of the tape strip 322 is always reflected in corresponding rotation of the measuring wheel **140**, since both the tape 322 and the measuring wheel **140** are driven by the feed wheel 320. It may be mentioned also at this point that the feed wheel 320 is connectible into driven relationship with the motor 292 upon energization of the clutch solenoid 282. Hence, since energization of the clutch solenoid 282 also serves to close the motor switch **290**, it is evident that the tape strip **322** will be advanced and the measuring wheel **140** will be caused to rotate as long as the clutch solenoid **282** remains energized.

As noted previously, however, rotation of the measuring wheel **140** effects a corresponding angular displacement of the selector cam assembly **70**, provided, of course, that the measuring clutch solenoid **124** is energized so as to engage the clutch members **66** and **84**. Thus, the angular displacement of the assembly **70** from its position of normal rest is proportional to the length of tape strip which is dispensed.

The mechanics of operating the mechanism **30** and an associated tape dispenser therefore involves preselection of any two tape lengths within the capacity of the mechanism **30** and setting the selector arms **184** and **186** to positions which correspond to the preselected tape lengths. This is illustrated in Figure 1 wherein the short length selector arm **184** is positioned for a tape length of 24 inches and the long length selector arm **186** is positioned for a tape length of 48 inches. The arms **184** and **186** are readily movable when the knob **196** is loose, and are retained firmly in position when the latter is tightened. Then, referring to Figure 19, the closing of the master switch **270** prepares the whole apparatus for the dispensing of either of the preselected tape lengths.

If it be assumed that, with the selector arms **184** and **186** positioned as above described, a 24-inch length of tape is desired, the touch button assembly **252** is operated so as to actuate the switch **238** and thereby connect the lead **304** with the bus bar **272**. Incidentally, it will be noted that this interconnection of the lead **304** with the bus bar **272** can also be effected through the receptacle **244**, provided only that a conventional single pole, single throw switch be connected therewith. Such a switch could obviously take the form of a foot operated switch which would leave the operator's hands free for handling the package to be taped. However effected, the interconnection of the lead **304** with the bus bar **272** completes a circuit through the normally closed switch **222**, the lead **310**, the normally closed switch **224**, the lead B, and the clutch solenoid **282** back to the bus bar **274**. Hence, one result of closing the switch **238**, for example, is to energize the solenoid **282** which, as above mentioned, connects the feed wheel **320** to the motor **292** and moves the pole **288** so as to close the motor switch **290**.

While the closing of the switch **290** serves to complete a circuit through the motor **292**, it will be observed that a motor circuit which bypasses the switch **290** has already been established from the bus bar **272**, through the lead O, the closed switch **238**, the lead **304**, the lead R, and the motor **292** back to the bus bar **274**. Inasmuch as the switch **238** is of the momentary contact type, however, this latter circuit will almost immediately be reopened. In the meantime, though, the switch **290** will have closed so as not only to maintain a complete motor circuit, but also to establish and maintain a different circuit through the clutch solenoid **282**. This latter circuit extends from the bus bar **272**, through the closed switch **290**, the lead R, the lead **304**, the normally closed switch **222**, the lead **310**, the normally closed switch **224**, the lead B, and the solenoid **282** back to the bus bar **274**. The resultant energization of the solenoid **282** of course maintains the closed condition of the switch **290** and the driving connection of the motor **292** with the feed wheel **320**. Clearly, the tape strip **322** will be continuously fed until the clutch solenoid **282** is deenergized.

The original closing of the switch **238**, or the equivalent closing of the circuit through the receptacle **244**, serves also to energize the measuring clutch solenoid **124**. The circuit through this latter element extends from the bus bar **272** through the lead O, the now closed switch **238**, the lead **304**, the lead **305**, the solenoid **124**, and the lead W back to the bus bar **274**. Again, although the switch **238** will be immediately reopened, the measuring clutch solenoid **124** will be maintained in energized condition by virtue of the aforementioned energization of the lead **304**

through the motor switch **290**, and the lead R. Inasmuch as this energization of the measuring clutch solenoid **124** effects clutching engagement between the clutch members **66** and **84**, the aforementioned cooperative rotation of the feed wheel **320** and the measuring wheel **140** is effective also to displace the measuring cam assembly **70** from its home position.

Eventually, of course, the assembly **70** is displaced until the cam portion **154** of the cam plate **152** engages the roller **200** of the short length selector arm **184**, whereupon the cam plate **152** is displaced so as to raise the pin **210** secured to the stem portion **207** of the arm **206** from the position of Figure 16 to that of Figure 17. This, as previously mentioned, causes the short length limit switch **222** to open, which, from Figure 19, causes the clutch solenoid **282** to be deenergized. Thus, the feed wheel stops rotating and with it the measuring wheel **140** and the measuring cam assembly **70**. At the same time, the motor switch **290** opens and causes the measuring clutch solenoid **124** to be deenergized so as to release the clutching engagement between the clutch members **66** and **84**. This enables the spring **232** to rotate the measuring cam assembly **70** to its home position where the cam plate **152** is returned by the cam **236** to its position as illustrated in Figure 16.

When it is desired to effect dispensing of the preselected long length of tape, the operator manipulates the touch button assembly **254** so as to actuate the switch **240**, or he closes the circuit by means of a foot switch plugged into the receptacle **246**. This completes a circuit from the bus bar **272** through the lead O, and hence through the lead **318**, the coil **300** of the long length relay **264**, and the lead W back to the bus bar **274**. The consequent closing of the relay **264** then completes a circuit extending from the lead **318** through the contacts **316** and **306** of the relay **264**. From the contact **306**, one circuit extends through the lead **305** and the measuring clutch solenoid **124** back to the bus bar **274**. Also, the connection of the lead **305** to the lead **304** extends energization through the lead R and the motor **292** back to the bus bar **274**. Still further, the energization of the lead **304** is extended through the closed switch **222**, the lead **310**, the closed switch **224**, the lead B, and the clutch solenoid **282** back to the bus bar **274**. Finally, in addition to these circuits which include the lead **305**, it will be noted that the interconnected contacts **308** and **314** are connected through the lead **312** to the lead **310** and are therefore equally effective to energize the solenoids **124** and **282**, along with the motor **292**.

As before, the switch **240** will normally be immediately released. However, the same holding circuit which was described above maintains the operating elements in energized condition. Furthermore, with the arrangement here illustrated, the opening of the short length limit switch **222** will not affect the continuous feeding and measurement of the tape. When the switch **222** opens, for example, the circuits are maintained from the bus bar **272** through the closed motor switch **290**, the lead R, the lead **304** and the lead **305**. From the energized lead **305**, one circuit extends through the solenoid **124** and the lead W to the bus bar **274**, another circuit extends through the closed contacts **306** and **316**, through the coil **300** of the relay **264**, and through the lead W to the bus bar **274**, and another circuit extends through the closed contacts **308** and **314**, the leads **312** and **310**, the long length limit switch **224**, the lead B, and the solenoid **282** to the bus bar **274**. When, ultimately, the cam plate **152** engages the roller **200** of the long length selector arm **186**, the resulting additional displacement of the plate **152** causes the pin **210** in the end of the actuator arm **206** to be displaced to the position of Figure 18 and the long length limit switch **224** to be opened, thereby breaking the circuit through the clutch solenoid **282** and causing the motor switch **290** to open. As a result of this, the aforementioned circuits through the solenoid **124** and the long length relay **264** are likewise opened and the mechanism **30** is once more returned to its normal rest condition.

Clearly, there has been described a twin selector for tape dispensers which fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given only by way of illustration and example. It is further to be understood that changes in the form of the elements, rearrangement of parts, or the substitution of equivalent elements, all of which will be apparent to those skilled in the art, is contemplated as being within the scope of the invention, which is limited only by the claims which follow.

What is claimed is:

1. In a tape dispenser comprising electrically driven tape feeding means: means including individual positionable members for preselecting a plurality of tape lengths for subsequent selective dispensation, means including individual actuating members corresponding to said individual positionable members for selecting particular preselected tape lengths for immediate dispensation and for actuating the electrically driven feeding means, means for measuring a strip of tape while it is being fed, and means cooperable with both the preselecting means and the measuring means for deactuating the electrically driven feeding means, said deactuating means including different circuit breaking means corresponding to each positionable member.

2. In a tape dispenser comprising a tape feed wheel, an electric motor for driving the feed wheel, and solenoid operated clutch means for establishing a driving connection between said motor and said feed wheel: a measuring wheel for driven engagement with a tape strip in driven engagement with said feed wheel, displaceable means connected with said measuring wheel and adapted to be displaced upon rotation of the measuring wheel, means for preselecting a length of tape to be dispensed, said preselecting means comprising a plurality of positionable elements for engagement by said displaceable means, and electrical circuit means for energizing the clutch solenoid, said circuit means including deactuating switch means operable upon predetermined engagement between said positionable elements and said displaceable means for deenergizing said clutch solenoid.

3. The combination of claim 2 wherein the switch means comprises at least two switches, and relay means operable to maintain the clutch solenoid energized when a selected one of said switches is operated.

4. The combination of claim 3, wherein the circuit means includes a first and a second actuating switch, each of said actuating switches being operable to energize the clutch solenoid, said second actuating switch being operable also to energize said relay means for maintaining the clutch solenoid energized.

5. In a control system for a tape dispenser having a motor in circuit with a motor switch, and a solenoid for operating the motor switch: an actuating circuit for energizing the motor switch solenoid, said actuating circuit including a normally open actuating switch and a normally closed limit switch, a holding circuit for maintaining energization of the motor switch solenoid, said holding circuit extending in series through said motor switch and said limit switch, and automatic means for opening said limit switch upon dispensation of a preselected length of tape.

6. The combination of claim 5 with the addition of a second actuating circuit for energizing the motor switch solenoid, said second actuating circuit including a second normally open actuating switch, a second normally closed limit switch, and a second holding circuit for maintaining energization of the motor switch solenoid, said second holding circuit extending through said motor switch and said second limit switch and including a self-holding re-

lay for by-passing the first-mentioned limit switch, and automatic means for opening said second limit switch upon dispensation of a preselected different length of tape.

7. The combination of claim 6, wherein the automatic means for opening said limit switches includes a clutch-engaged mechanism and a measuring clutch solenoid for actuating said clutch-engaged mechanism, said measuring clutch solenoid being connected in parallel with the motor switch solenoid.

8. A control mechanism for use with a tape dispenser having power driven means for dispensing tape, said mechanism comprising a main support adapted for attachment to said dispenser, measuring means including a rotatable measuring wheel mounted on said support for rolling engagement with an advancing strip of tape as it is dispensed from said dispenser, a limit switch, means including a movable cam element for actuating said limit switch, electrically controlled clutch means for selectively connecting the movable cam element for driven movement by the measuring means, said limit switch being effective to disconnect the cam element from the measuring means used to stop the means for dispensing tape, and mechanical means for returning the movable cam element to a normal rest position upon its disconnection from the measuring means.

9. The mechanism of claim 8, wherein the means for actuating the limit switch further includes a positionable element for preselecting the movement of the cam element required to actuate the switch, said positionable element including a portion engageable by said cam element in actuating the switch.

10. The mechanism of claim 9, wherein the cam element is shiftable in addition to being displaceable, wherein the engagement of the cam element with the positionable element is effective to shift the former, and wherein the means for actuating the limit switch further includes a pivoted actuator arm in slidable engagement with the cam element, said cam element having an irregular surface for pivoting said actuator arm upon shift of the cam element.

11. The mechanism of claim 10, with the addition of a second limit switch actuatable by the displaceable cam element upon a different preselected displacement of the cam element, said second limit switch being also in circuit with the solenoid, and a second positionable element for preselecting the displacement of the cam element required to actuate said second limit switch, said second positionable element including a second portion engageable by said cam element in actuating said second switch,

said second portion being disposed so as to shift the cam element beyond the place to which it is shifted by the first-mentioned portion, the irregular surface of the cam element being such as further to pivot the actuator arm upon the additional shift of the cam element.

12. A selector mechanism for a tape dispenser, said mechanism comprising a frame, tape length preselecting means including a plurality of positionable elements mounted on the frame for preselecting a like plurality of tape lengths to be dispensed, tape length measuring means mounted on the frame for cooperation with said preselecting means in dispensing preselected tape lengths, and control means including electrical conducting means mounted on the frame and connectible to a tape dispenser for energizing and deenergizing the latter, said control means including a different selectively operable energizing switch for selecting each preselected tape length to be dispensed by the tape dispenser and a different deenergizing switch for each energizing switch, said energizing switches being effective to energize the tape dispenser, and said deenergizing switches being effective in cooperation with said preselecting means and said measuring means to deenergize the tape dispenser.

13. The mechanism of claim 12, wherein the control means includes a relay having a coil connected for energization through a first, but not through a second, energizing switch, said relay having contacts for maintaining a circuit through a first deenergizing switch, said circuit being effective to by-pass a second deenergizing switch.

14. The mechanism of claim 13, wherein the measuring means includes clutch means and a solenoid for operating the clutch means, said solenoid being connected for energization through either said first or said second energizing switch and being in parallel with said first deenergizing switch.

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