March 1, 1966 C. O. KILHAM 3,237,595

ADHESIVE TAPE DISPENSING APPARATUS

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Fig. 1

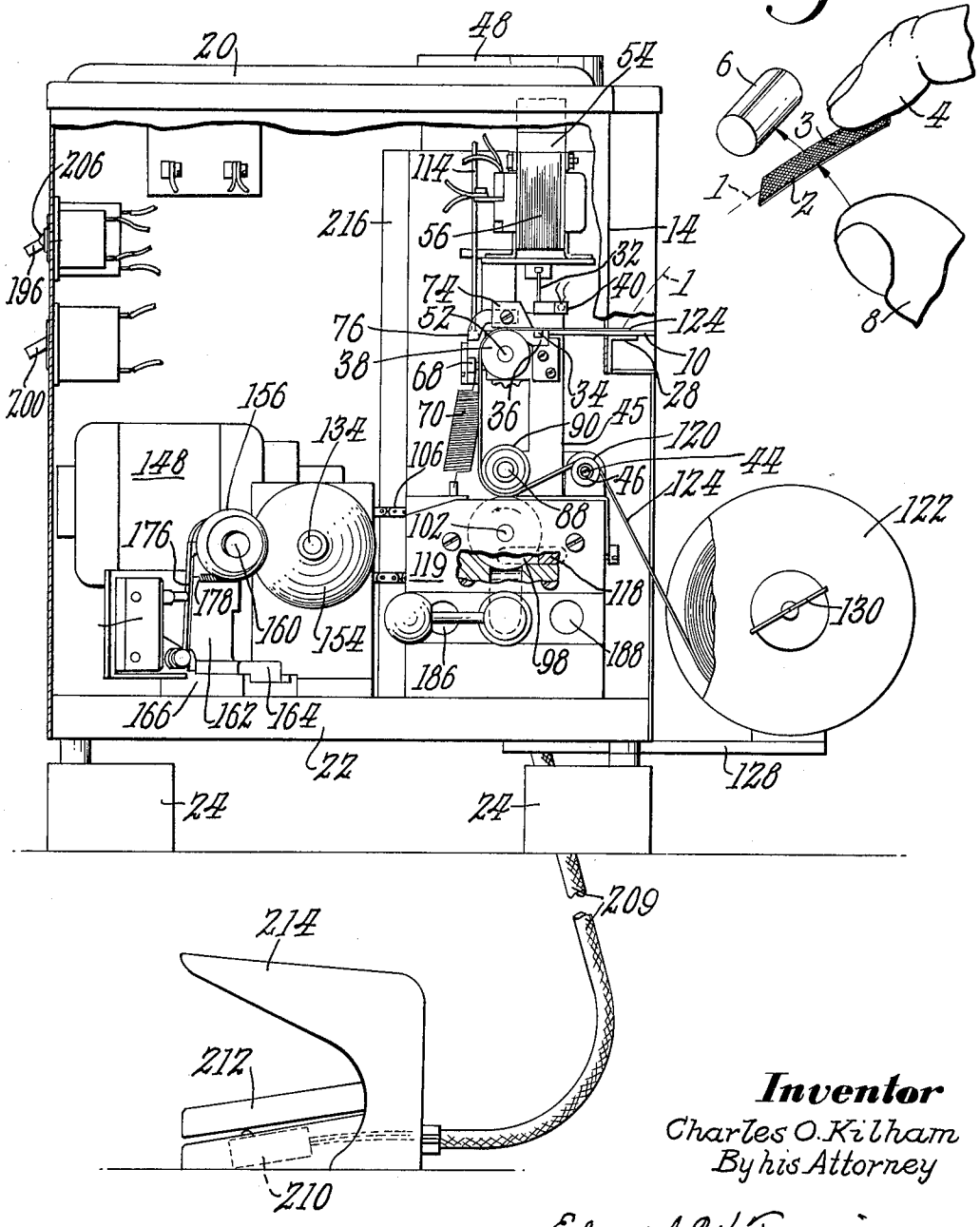

Fig. 2

Inventor

Charles O. Kilham

By his Attorney

Edward W Fearing

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ADHESIVE TAPE DISPENSING APPARATUS

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Fig. 3

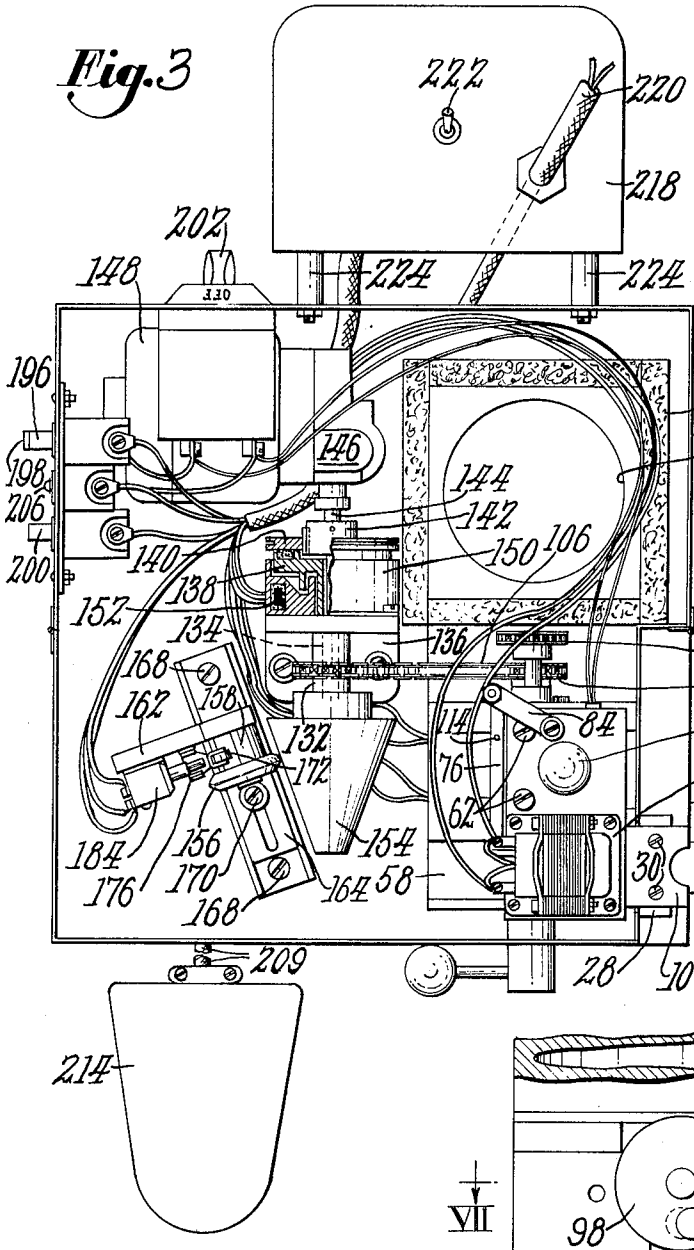


Fig. 4

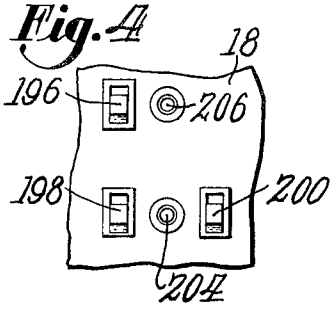
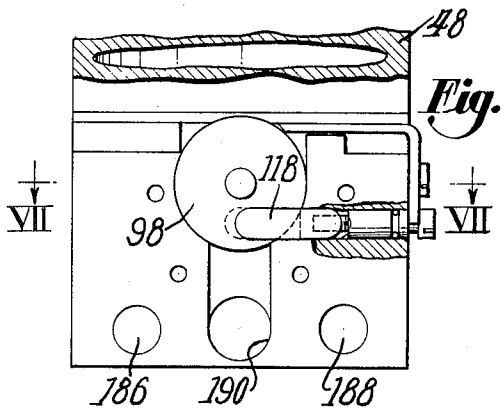


Fig. 5



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ADHESIVE TAPE DISPENSING APPARATUS

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Fig. 6

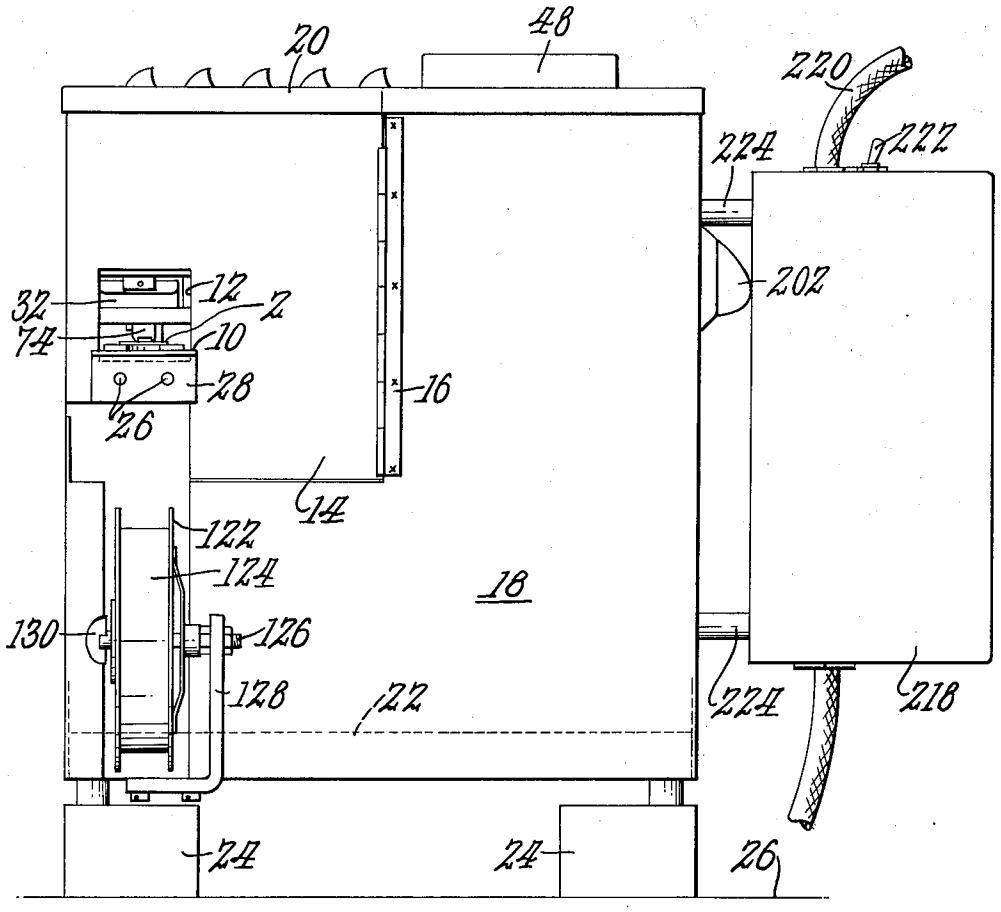


Fig. 9

Fig. 8

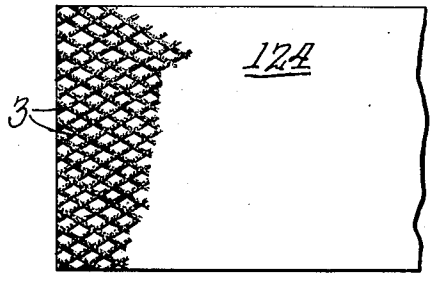
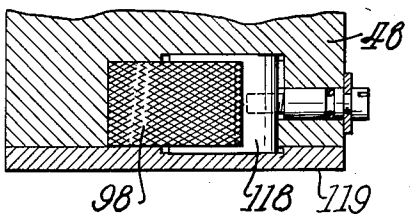


Fig. 7



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ADHESIVE TAPE DISPENSING APPARATUS

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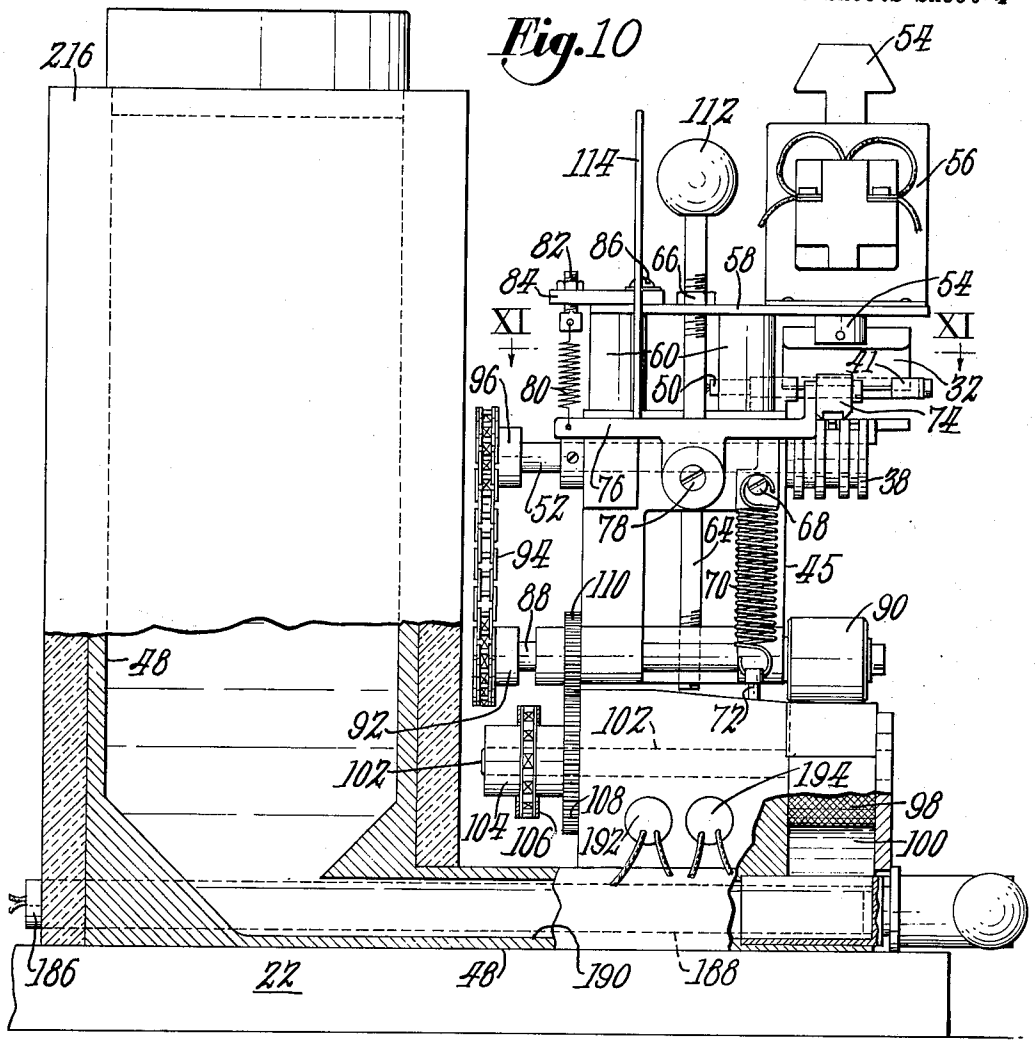
Fig. 10



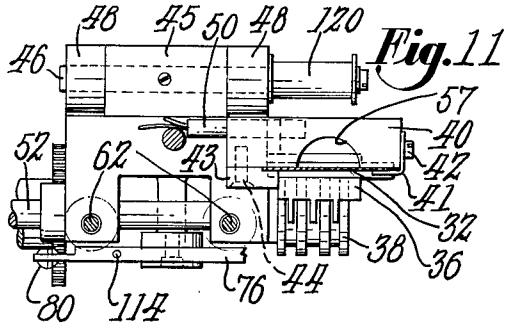


Fig. 11

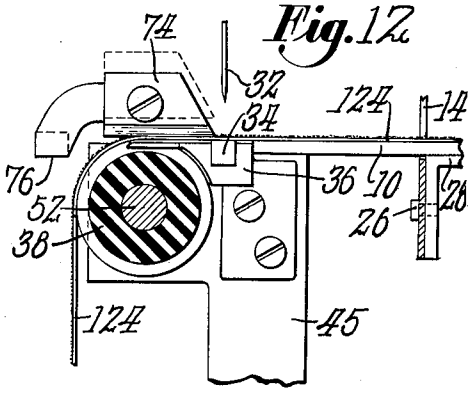


Fig. 12

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Fig. 14

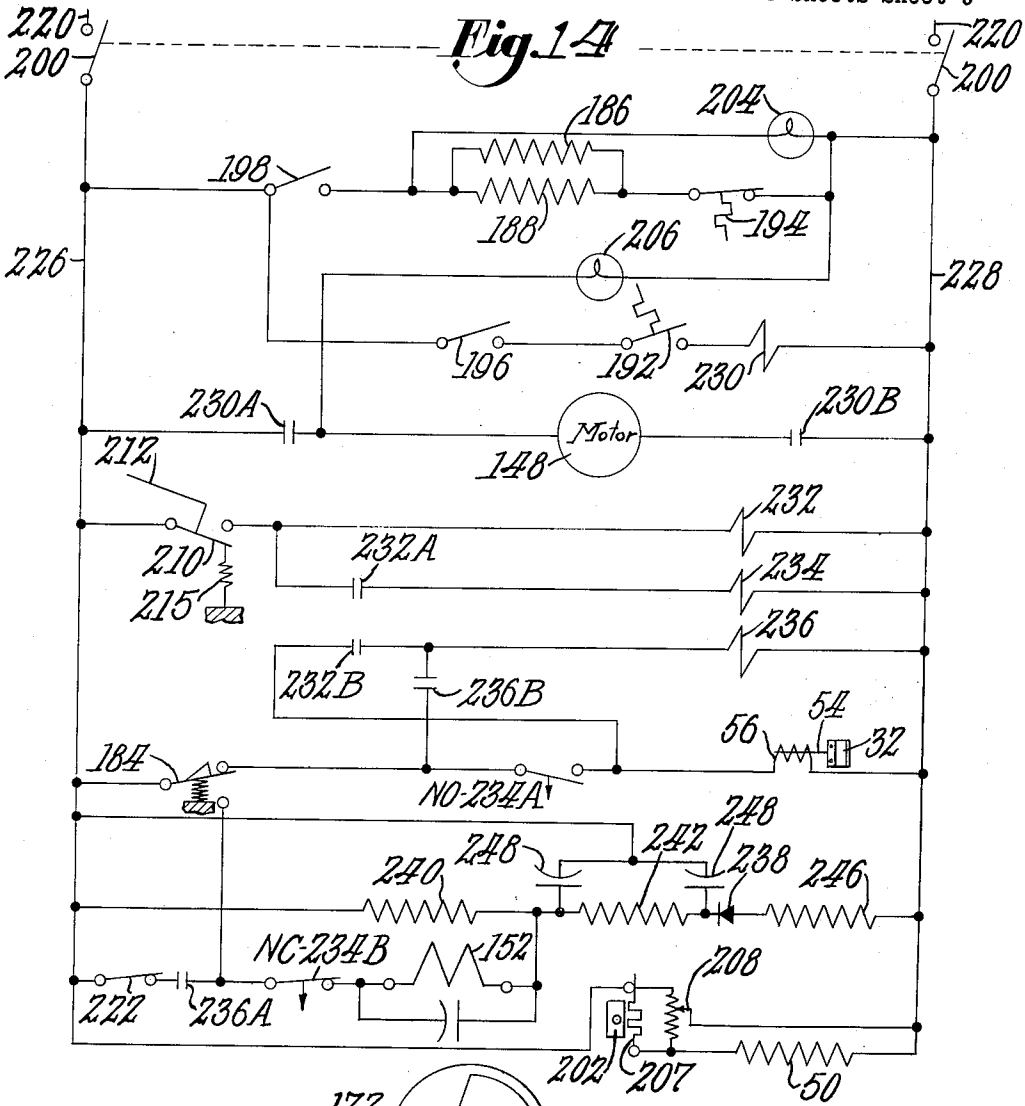
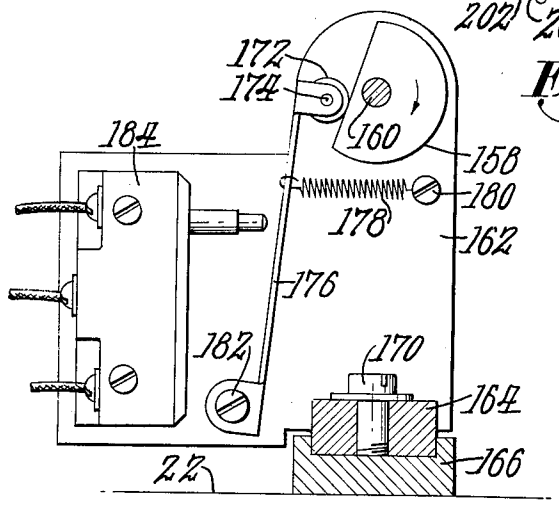


Fig. 13



United States Patent Office 3,237,595 Patented Mar. 1, 1966

3,237,595

ADHESIVE TAPE DISPENSING APPARATUS

Charles O. Kilham, Beverly, Mass., assignor to United Shoe Machinery Corporation, Boston, Mass., a corporation of New Jersey

Filed Oct. 27, 1960, Ser. No. 65,525
2 Claims. (Cl. 118—42)

This invention relates to improvements in apparatus for dispensing predetermined lengths of tape coated continuously on one side throughout the lengths with pressure-sensitive adhesive and is illustrated as embodied in a machine for applying the adhesive to the tape as well as for dispensing the adhesive coated tape. The illustrated adhesive applying apparatus is of the type disclosed in United States Letters Patent No. 2,965,066, granted December 20, 1960, on an application filed in the name of Hans C. Paulsen, in which apparatus the adhesive must be heated substantially before being applied, so that a need arises for avoiding the possibility of an operator's burning his fingers from contact with heated parts of the machine, or for avoiding other difficulties in handling the tape with its adhesive coating as he attempts to grasp a dispensed length.

Besides the possibility of becoming burned as a length of adhesive tape dispensed by the machine of the type referred to is grasped by the operator, a further difficulty arises in handling tape coated with pressure sensitive adhesive, particularly when the tape is cut into lengths as it is dispensed. In attempting to grasp a length of adhesive coated tape having a strong tack, the tape may adhere to the operator's fingers before he has obtained a firm grasp on it or the position of the tape is disturbed, so that the operator will be unable to utilize it and affix it accurately in the manner intended without loss of time in restoring his grasp on it.

To assist the operator in grasping a dispensed length of tape without danger of burning or other difficulty, according to an object of the present invention, the tape is severed from the supply along its coated surface at a position where there are no exposed heated parts of the machine, so that in case of undesired adhesion of the coating on the tape to the operator's fingers in grasping the tape, it is only necessary for the operator to withdraw his hand from the machine, disengaging the tape from his fingers and thereafter making a new attempt, the adhesive grip of the tape being broken by its connection with the supply until severed by a positive act on the part of the operator. Thus, the difficulty of restoring the tape within the grasp of his fingers is minimized. To these ends a feature of the invention resides in apparatus for dispensing a predetermined length of tape by advancing it across a delivery plate with its pressure sensitive coating facing away from the delivery plate and a tape severing knife acting directly against the adhesive coated surface of the tape, in which apparatus a control member is provided for convenient access by the operator to actuate the knife and the advancing means in sequence, so that the severed length of tape may be freed readily without danger of adhesion from the delivery plate before a new length may be advanced along the delivery plate for a subsequent operation. Such an arrangement is distinguished from that in prior machines of this type, in which each length of tape is both advanced and severed before it is removed. In the use of a machine in which the adhesive coated tape is advanced across the delivery plate with its pressure sensitive coating facing away from the plate, the operator has no difficulty in grasping the tape for application to an article and utilizing the adhesive coating on the tape to assist him in applying it to the article intended. Thus, the tape may be removed from

the delivery plate, first, by pressing a finger lightly against the coating, then, by actuating the control member to sever the tape on the delivery plate from the supply and, finally, by transferring the severed length to the article to be taped, a new length of tape then being advanced automatically after a predetermined time period without further attention by the operator.

In the preferred form of the machine in the present invention, the means for advancing the tape across the delivery plate is actuated by power including driving mechanism, having a clutch and means driven from the driving mechanism for holding the clutch in driving engagement while the new length of tape is being projected across the plate and a conveniently located control member causes the knife to be actuated and the clutch to be engaged in proper time sequence, the knife being actuated by the operator upon movement of the control member in one direction and the clutch being engaged upon movement of the control member in the opposite direction. In its preferred form, the control member consists of a yieldingly raised treadle connected for actuating the knife by depressing the treadle and for engaging the clutch during release of the treadle.

These and other features of the invention, as hereinafter described and claimed, will be readily apparent to those skilled in the art from a consideration of the following detailed specification, taken in connection with the accompanying drawings in which:

FIG. 1 is a view in front elevation with front portions of an enclosing casing broken away and shown in section to illustrate the underlying mechanisms of a machine embodying the features of the present invention;

FIG. 2 is a detail view on a slightly enlarged scale illustrating the manner of handling an adhesively coated tape dispensed by the machine shown in FIG. 1;

FIG. 3 is a plan view of the machine of FIG. 1 with a cover removed from the casing;

FIG. 4 is a detail view in left side elevation of a portion of the casing carrying a set of switches and pilot lights;

FIG. 5 is a detail view on an enlarged scale of a base for an adhesive reservoir with a front plate removed, as employed in the machine;

FIG. 6 is a view in right side elevation of the machine shown in FIG. 1;

FIG. 7 is a detail plan view in horizontal section, taken along the line VII—VII of FIG. 5, showing an adhesive spreading roll in the reservoir base of the machine;

FIG. 8 is a plan view on an enlarged scale of a portion of the tape after having adhesive spread thereon;

FIG. 9 is a fragmentary sectional view of a portion of the adhesive spreading roll;

FIG. 10 is a partially sectional side view looking from the left of the machine shown in FIG. 1 with certain parts broken away and removed for clarity;

FIG. 11 is a plan view, looking along the line XI—XI, of a dispensing roll and a delivery plate shown in FIG. 10;

FIG. 12 is an enlarged detail view in front elevation of the dispensing roll and delivery plate;

FIG. 13 is a further detail and partially sectional view in end elevation and on enlarged scale of a timing switch employed in the machine; and

FIG. 14 is a wiring diagram of the machine, indicating the manner in which the different parts are connected electrically.

The apparatus illustrated in the drawings is intended for use in dispensing a predetermined length of tape coated throughout its length on only one side with a pressure sensitive adhesive and is provided with a delivery plate, across which the coated tape is advanced, with its pressure sensitive side facing away from the plate, so

that it does not adhere to the plate and it is unnecessary in removing the tape from the plate to free the adhesive coating therefrom, thus simplifying the operation of transferring the tape from the plate to an article to be taped. Accordingly, an operator may grasp the tape with a very light force insufficient to cause adhesion to his fingers or in some instances he may press one of his fingers lightly against the tape so that only a partial adhesion occurs. In this way the tape may be transferred along the broken line **1** of FIGS. 1 and 2 without adhesive resistance from the plate to the article to be taped with one finger, or the article itself may be pressed against the coated side and after severing the tape it may be withdrawn with the length of tape to a positon where complete and smooth adhesion to the article may be accomplished without interference or further difficulty. In case of improper initial adhesion of the tape with the operator's fingers or with the article, the tape may readily be disengaged from the fingers or article, since the dispensed length is not severed from the supply until the operator so chooses. After the severed length of tape is withdrawn from the delivery plate, a new length is automatically advanced, so as to be ready for transfer and application to a new article.

Rather than utilize a reel of tape precoated with a continuous coating of adhesive, the machine of the present invention is provided with a heated adhesive supply reservoir from which the adhesive is coated directly on the tape as it is being unwound from the reel and advanced to the delivery plate. In this way a fresh coated supply of tape is always on hand and the tape is stripped more readily from the reel without the inconvenience of providing a separating layer between turns on the reel or of avoiding deterioration in the coating from lengthy storage.

Referring more particularly to FIG. 2 of the drawings, it is apparent that if a length of adhesive tape **2** is lightly attached by its continuous coating **3** to an operator's index finger **4** it may be applied to an article **6** in the direction of the arrows merely by brushing it across the surface of the article and squeezing it against the article by an operator's thumb **8** or the article may be pressed directly against the tape. The tape may then be applied smoothly by wrapping it about the article with a rolling action between the thumb and index finger, the adhesion of the tape with the article having sufficient tenacity when first applied to enable the index finger or the article to be stripped from the tape during the complete application of the tape. Handling the tape by reason of light adhesion to the operator's index finger is most conveniently accomplished after the tape is dispensed from the machine and before severance takes place. Whether the advancing and severing are initiated automatically upon removal of the length of tape or manually whenever a new length of tape is required, it is dispensed with its adhesive coating exposed and preferably while the tape is still connected to the supply, so that improper contact of the index finger or the article with the tape may be broken by reason of the connection of the length with the supply, thus assisting a new corrected contact with the tape.

The adhesive coated tape is advanced freely without adhesive restriction across a stationary delivery plate, indicated at **10**, mounted in a horizontal position at one side of the machine and extending through an opening **12** (see FIG. 6) in a hinged setback door **14** at the right side of the machine. The door **14** is mounted for swinging movement about a vertical piano hinge **16** secured to a casing **18** at the same side of the machine. The casing **18** surrounds the entire machine and is provided with a top cover plate **20** and a base plate **22**. Connected to the base plate **22** beneath the machine are four blocks **24** forming supporting legs for the machine, by means of which the machine may be mounted on a table top **26** while providing ventilation for the heated adhesive reservoir and other operating parts of the machine. To secure the delivery plate **10** to the door **14**, the door has made fast to it, by means of screws **26** (FIGS. 6 and 12), an angle piece **28** having a horizontal arm to which the delivery plate is similarly attached by screws **30** (FIG. 3). Thus, the base **22** supports the delivery plate at an accessible position for an operator.

Although the tape **2** is advanced across the delivery plate with its adhesive coating **3** uppermost, it is possible with a metal delivery plate that particles of adhesive or the edges of the tape might adhere to the delivery plate in such manner as to interfere with the uiform advancement of the tape. For this reason the delivery plate **10** is composed of a sheet of adhesion resisting material, such as polytetrafluorethylene (TSF-Fluorocarbon) resins, particularly of the high melting point thermocuring type sold under the trade name of Teflon. It is easy then to grasp the adhesive coated tape by downward pressure against the coating **3** on the tape and to transfer the severed length of tape from the delivery plate to an article to which it is to be applied.

To sever the length of tape advanced across the delivery plate from the supply, according to the present invention the tape is acted upon by a knife **32** in the form of a blade sharpened along a lower straight edge and arranged to engage at right angles with a cutting block in the form of a rectangular bar **34** formed of relatively soft material such as aluminum or brass. The bar **34** is arranged transversely of the length of the tape and is set into a separating block **36** having its upper surface and that of the bar **34** mounted substantially at the level of the delivery plate **10** and the periphery of a dispensing roll **38** (see FIG. 12), the cutting block being disposed between the dispensing roll and the delivery plate. The dispensing roll acts to advance the coated tape across the delivery plate and the knife is reciprocated vertically to engage the adhesively coated surface of the tape and sever it with a single impact against the flat surface of the bar **34**, as distinguished from a shearing action. In this way there is little opportunity for the adhesive to stick to the knife.

As a further means to prevent the tape severing knife from adhering to the adhesive coat on the tape, the knife is heated to a temperature above that which will liquefy the adhesive, the knife being in contact with the tape for such a brief time and a limited area that no difficulty from deterioration of the adhesive occurs. To heat the knife it is slidingly mounted in a heated guide **40** (FIG. 11) embracing the width of the knife.

The knife guide **40** is composed of heat conducting block formed with a rectangular cross section of a length appreciably greater than the width of the cutting edge on the knife, which is normally maintained in loose engagement with the guide. Along the forward edge of the knife it is held against the guide by an angular clip **41** secured to the guide by means of a screw **42**. Along the rear edge of the knife it is retained against the guide by a block **43** secured to the guide by a screw **44**. The guide is mounted on a swinging frame **45** mounted at its lower end on a stud **46** passing through a projecting portion of the frame and through lugs on an upstanding portion of a base projecting horizontally from the adhesive reservoir indicated at **48**, in FIGS. 3, 5 and 10 which has a horizontal adhesive storage portion.

To heat the tape severing knife guide **40** at its rearward end is bored to receive an electrical heating cartridge **50** (see FIG. 11) of sufficient capacity to maintain it above a temperature at which the adhesive may adhere thereto. To mount the knife guide its rearward end is made fast to the upper surface of the swinging frame **45** in alinement with the path of movement of the knife. The swinging frame **45** not only supports the heating guide for the knife, but it has mounted at its upper portion a shaft **52** to the forward end of which the delivery roll **38** is fixed.

To actuate the tape severing knife **32** with an impact against the tape its upper edge is pinned within a slot

formed in a downwardly projecting extension of an armature **54** (FIG. 10) slidingly mounted within the core of an electromagnet **56**. To clear the extension of armature **54** the guide **40** has a semicircular cut away area **57** (FIG. 11) alined with the armature. The electromagnet **56** is secured to a plate **58** spaced from the upper surface of the swinging frame **45** by a pair of cylindrical metal blocks **60**, best shown in FIG. 10. Passing through the plate **58** and the blocks **60** is a pair of screws **62** (FIG. 3) threaded at their lower ends into the upper surface of the swinging frame **45**. Also passing through a threaded opening in the plate **58** and the upper portion of the swinging frame **45** is a threaded rod **64** (FIG. 10), the lower end of which engages a threaded opening in the lower portion of the frame **45**. The upper portion of the rod **64** carries a nut **66** which assists in preventing rotation of the rod in the plate. By means of the mounting for the electromagnet **56** and the heating guide **40** for the knife **32** the parts are kept in alinement with each other and the knife **32** moves freely through the guide toward and from the cutting bar **34** to sever the adhesive coated tape.

The swinging frame **45** is maintained in a fixed position relatively to the upwardly projecting portion of the base for the reservoir **48** by the engagement of the lower end of the rod **64** with the base. To retain the swinging frame at the position in which the rod **64** engages the base of the reservoir, the swinging frame has protruding from its left side a horizontal screw **68** (FIGS. 1 and 10) engaged by the upper end of a tension spring **70**, the lower end of which is engaged with a pin **72** secured in the reservoir base.

To enable the dispensing roll **38** to engage the uncoated side of the adhesive tape frictionally with sufficient pressure to cause the tape to be advanced across the delivery plate **10** with certainty, the coated side of the tape is acted upon by a nonadhesive member **74** (FIG. 12). The member **74** also is composed of Teflon (polytetrafluoroethylene) and is pressed yieldingly against the upper surface of the tape carried by the delivery roll. For this purpose the member **74** is formed as a wedge shaped block slotted to receive a laterally bent forward end of a lever **76** so that the member may be raised to the broken line position of FIG. 12 for convenience in rethreading the machine with tape. The lever **76** has a central lug through which passes loosely a fulcrum screw **78** (FIG. 10) having its right end engaged in a boss formed on the swinging frame **45**. The rearward end of the lever **76** has an opening to receive the lower end of a tension spring **80**, the upper end of which enters a similar opening in the head of a screw **82** passing through a rearwardly projecting block **84** secured by a screw **86** to the upper surface of the plate **58**. By rotating the screw **82** the force of the spring **80** may be adjusted to press the Teflon member **74** into varying degrees of sliding engagement with the adhesive coated surface of the tape and with sufficient pressure to cause the tape to engage the dispensing roll frictionally, thus to insure advance of the tape as the roll **38** is rotated.

To insure that the adhesive coated tape will separate from the dispensing roll **38**, so that the tape may be advanced properly across the delivery plate, the dispensing roll is grooved about its periphery (FIG. 11) and the block **36** is formed with a plurality of fingers projecting to the left with their upper surfaces at the level of the delivery plate to enter the grooves in the dispensing roll. In this way the arc of engagement of the tape is confined to 90° about the dispensing roll.

The apparatus for applying adhesive to the tape is substantially the same as that disclosed in Patent No. 2,965,066 in which the reservoir **48** is heated to a critical temperature of 350° F. The adhesive employed is a combined polyvinyl ethyl ether mixed with a styrene polymer resin without the use of a solvent. On account of the high viscosity of this adhesive and the relatively high temperature to which it must be heated to use it most efficiently, special precautions are required for preventing the operator of the machine from burning his fingers while handling the dispensed tape. To reduce the likelihood of such difficulties the dispensing roll **38** is mounted in the swinging frame **45** at a substantial distance above the point where the adhesive is applied to the tape, thus enabling the adhesive coated tape to cool appreciably between the point of coating and the location of the delivery plate where the operator's fingers may be subjected to the temperature of the tape. Accordingly, the swinging frame **45** has at its lower end a pair of spaced bearings through which passes a horizontal shaft **88** (FIGS. 1 and 10) having fixed to its forward end a tape pressing roll **90**, acting to maintain the tape in contact with a spreading roll and at the rearward end of the shaft **88** is a sprocket wheel **92** surrounded by a chain **94** engaging a similar sprocket wheel **96**, secured to the rearward end of the shaft **52**. The arrangement is such that the dispensing roll **38** turns at the same rate of peripheral speed as the pressing roll **90** and its associated adhesive spreading roll.

As in the apparatus of the prior patent referred to, adhesive is supplied to the tape by the adhesive spreading roll, indicated herein at **98**, which is disposed in an outlet opening **100** (see FIG. 5) at the forward side of the reservoir base, the tape passing across the outlet opening between the pressing and spreading rolls **90** and **98** to apply the adhesive to the under side of the tape at the same rate or peripheral speed as that of the dispensing roll. The adhesive spreading roll **98** is secured to the forward end of a horizontal shaft **102** running through the reservoir base, and the shaft **102** has at its rearward end a sprocket wheel **104** surrounding which is a chain **106** for driving the shaft. To insure that the peripheral speeds of both the spreading roll **98** and the pressing roll **90** will be the same the two rolls are connected together by meshing gears **108** and **110** having the proper number of teeth thereon to produce a ratio equal to the diameters of the respective rolls. As the swinging frame **45** moves about the stud **46** the meshing relation of the gears **108** and **110** changes slightly without causing their teeth to be disengaged. Thus, a reliable grip is maintained on the tape by the rolls at all times under the influence of the spring **70**. Preferably, the adjustment of the threaded rod **64** prevents actual engagement of the pressing roll with the adhesive spreading roll when no tape is present between them, so that no contamination of the pressing roll with cement takes place.

To assist in adjustment of the threaded rod **64** and to provide a convenient handle in moving the swinging frame about its mounting stud **46** while replacing the tape in the machine, the upper end of the threaded rod has secured to it a knob **112**. Also, the block member **74** may be lifted separately from engagement with the dispensing roll **38** by rearward movement of the upper end of a pin **114** projecting from the lever **76**. By lifting the block member **74** from the roll **38** a new supply of tape may readily be applied to that roll while threading the machine with tape.

The surface of the adhesive spreading roll **98** is knurled with a crosshatch pattern, as best shown in FIGS. 7 and 9, formed by two series of intersecting parallel grooves **116**. The grooves **116** are of sufficient depth to receive appreciable amounts of adhesive from the outlet opening **100** in the base of the adhesive reservoir **48**. When the adhesive filled grooves move toward the tape a similar over-all pattern of adhesive will be applied to the tape as in FIG. 8. To regulate the amount of adhesive on the tape, the roll has embracing one side thereof a doctor plate **118** (FIG. 7) slidingly mounted in grooves running transversely of the outlet, the doctor plate **118** being arranged for adjustment toward and from the knurled periphery of the roll. To prevent escape of the adhesive

the front end of the reservoir has secured to it a cover plate **119**.

To provide a supply of uncoated tape the stud **46** has rotatably mounted at its forward end a flanged spool **120** (FIG. 11) over which the tape passes from a supply reel **122**, shown in FIGS. 1 and 3. Since the supply of tape, indicated at **124**, supported by the reel **122** is uncoated successive turns on the reel do not adhere one to another and the tape may be withdrawn readily from the reel without requiring any additional nonadhesive strip between successive turns to separate them as is required in the winding when the tape is adhesive coated.

The supply reel **122** is rotatably mounted on a spindle **126** (FIG. 3) having one end secured in an upstanding arm on a bracket **128** and the other end formed with a threaded opening to receive a retaining nut **130**. The bracket **128** is fixed to the base **22** of the machine in a position where the reel will be aligned with the guide spool **120**.

To enable a predetermined length of adhesive coated tape to be advanced across the delivery plate with uniform results the chain **106** (FIG. 10) for the applying roll **98**, is actuated by driving mechanisms including an electric motor, an electro-magnetic clutch, a switch for controlling the clutch, a cam for actuating the switch, a friction wheel for driving the cam and a conical drum driven from the roll driving mechanism and engaged along its conical surface by the friction wheel. The chain **106** passes over a sprocket wheel **132** (FIG. 3) secured to a shaft **134** passing through a bearing in a bracket **136** and having its rearward end keyed to a driven member **138** of the electro-magnetic clutch. The driving member of the clutch is indicated at **140** and is keyed to a collar **142** loosely surrounding the shaft **134**. The collar **142** is secured to a driving shaft **144** alined with the shaft **134** and mounted in bearings formed within a reduction gear **146** mounted on the frame of the electric driving motor, shown at **148**. For energizing the electrical clutch an electro-magnetic core **150** having a coil **152** surrounds the shaft **134** and is disposed in magnetic relation to the driving and driven members of the clutch.

To enable the length of tape advanced across the delivery plate **10** to be adjusted according to the requirements of the article being taped, the forward end of the shaft **134** has secured to it the conical drum shown at **154**, and is connected to the chain **106** of the roll driving mechanism. The drum **154** is engaged along its conical surface by the friction wheel at **156**, secured to the cam, indicated at **158** (FIG. 13), both wheel and cam being rotatable loosely on a pin **160**. The pin **160** is secured to a vertical plate **162** carried by a horizontal slide **164** fitting within a guideway **166** made fast to the base **22** by screws **168**. The slide **164** is secured in adjusted position along the guideway **166** by a clamp screw **170** passing through a slot in the slide **164** and into threaded engagement with the guideway. The guideway is arranged in parallel relation to the left side surface of the conical drum so that during adjustment the friction wheel is maintained in engagement with the conical surface of the drum. Thus, when the slide **164** is shifted rearwardly the wheel **156** engages surface portions of the drum increasing in diameter and when moved in a forward direction the wheel engages the surface portions of the drum decreasing in diameter.

To actuate the clutch controlling switch the cam **158** is formed with a flat side and is engaged by a follower roll **172** rotatable on a pin **174** passing through angularly bent tabs of an arm **176**. The arm **176** is engaged by a tension spring **178** (FIG. 13) stretched between the arm and a screw **180** on the plate **162**. The lower end of the arm **176** is rotatable on a screw **182** also secured in the plate **162**. When the clutch is energized the cam **158** forces the follower roll **172** outwardly and presses the arm **176** against a plunger of the clutch controlling switch, indicated at **184**, mounted on the plate **162**. When the switch **184** is actuated by the arm **176** the circuit to the electromagnetic clutch remains closed until the cam has completed its rotation, thus retaining the clutch circuit in closed condition each time the clutch is energized until a length of tape is advanced fully across the delivery plate. The arrangement of the cam **158** and the follower roll **172** is such that when the slide **164** is adjusted along the drum the cam completes its rotation in a shorter or longer time as compared to the rotation of the drum. Consequently, more or less tape will be advanced across the delivery plate according to adjustment of the slide.

As in the machine of the Paulsen patent above referred to, the adhesive reservoir is heated by a pair of resistance cartridges illustrated in FIGS. 1, 5, and 10 at **186** and **188**. The resistance cartridges **186** and **188** are disposed at either side of an adhesive conducting passageway **190** running horizontally between the reservoir **48** and the outlet **100**. To heat the reservoir and its base to a working temperature it is desirable to employ resistance cartridges of greater capacity than required to raise the parts to the desired temperature and to utilize thermostats to prevent difficulty from both overheating and underheating. For these purposes the upwardly projecting portion of the reservoir base has passing through it a pair of thermostat cartridges **192** and **194** (FIG. 10). The cartridge **192** is arranged to disconnect the motor **148** from its source of power when the temperature of the reservoir falls below a predetermined minimum and the cartridge **194** is arranged to disconnect the resistance cartridges **186** and **188** when the temperature of the reservoir rises above a predetermined maximum, as in the apparatus of the Paulsen patent.

To enable proper manual control of the apparatus of the invention there are mounted on the left wall of the casing a motor control switch **196** (see FIGS. 3 and 4), a heat control switch **198**, and a double pole line switch **200**. On the rear wall of the casing is a knife guide heat and control switch **202**. Also, on the left wall of the casing are a reservoir heat pilot light **204** and a minimum temperature pilot light **206**.

The knife guide heat and control switch **202** is intended for opening and closing the circuit to the knife guide heater. The control switch **202** includes in its construction a thermostat **207** (FIG. 14) and a separate adjustable thermostat heating resistance **208** connected to the knife guide heating cartridge **50**. The switch **202** is provided with a manual operator having a block acting to open the thermostatic switch regardless of the heat produced by the resistance **208**. Connected through a flexible electrical cable **209** to the circuits in the casing is also an independently movable unit in the form of a foot switch **210** arranged for actuation by a treadle member **212** (see FIGS. 1 and 3) hinged within a protecting housing **214** biased yieldingly in a raised position by a tension spring **215** (FIG. 14).

Surrounding the vertical portion of the adhesive reservoir **48** is an insulating box **216** to protect the other apparatus within the casing from exposure to excessive temperatures in the reservoir. Also mounted at the rear of the casing is a separate outlet box **218** having a line connection **220** and a clutch disconnecting switch **222**, the operating handle of which projects from the upper surface of the outlet box. The outlet box is mounted on spacers **224** secured to the rearward wall of the casing to protect the outlet box from heat developed in the casing.

The circuit connections for controlling the apparatus are illustrated more particularly in FIG. 14, in which the line connection **220** consists of a source of A.C. power and is connected to the circuit through the line switch **200**, a left hand conductor **226**, the heat control switch **198**, the resistance cartridges **186** and **188**, the maximum heat thermostat cartridge **194** and a right hand conductor **228** to the line **220**. The pilot light **204** is arranged to be lighted whenever the switch **198** is closed.

To start the motor the switch **196** is closed, the circuit being completed from the conductor **226**, through the switch **196**, the minimum heat thermostat **192**, a relay coil **230** and the right hand conductor **228**. If the temperature of the adhesive reservoir has reached the minimum required the thermostat **192** completes the circuit to the relay coil **230** to close relay contacts **230A** and **230B** energizing the motor **148**. When the temperature of the reservoir reaches a maximum the thermostat cartridge **194** opens the circuit to the resistance cartridges and prevents overheating. If the temperature in the reservoir for any other reason drops below the minimum permissible value the thermostat cartridge **192** opens the circuit to the relay coil **230** and causes the motor to be disconnected.

After threading the machine with the leading end of a tape from the supply reel **122** the treadle **212** is depressed closing the circuit through the switch **210** to energize a relay coil **232**. As soon as the coil **232** is energized contacts **232A** and **232B** are closed. The contacts **232A** establish a branch circuit from the switch **210** through a coil **234** of a time delay release relay having normally open contacts NO**234A** and normally closed contacts NC**234B**. The arrangement is such that when the coil **234** is energized the contacts NO**234A** are immediately closed and the contacts NC**234B** are immediately opened. Upon closing the contacts NO**234A** a circuit is completed from the left hand conductor **226** to the clutch controlling switch **184**, contacts NO**234A**, the coil of the electromagnet **56** and the right hand conductor **228**. When the coil of the electromagnet **56** is energized the knife **32** is projected against the cutting block **34** to sever the measured length of tape from the supply.

The contacts **232B** are closed simultaneously with the contacts **232A** and in circuit with the contacts **232B** is a third relay coil **236** energized from the left hand conductor **226**, through the cam operated contacts **184**, contacts NO**234A** and contacts **232B**, to the coil **236** and the conductor **228**. Energizing the coil **236** causes contacts **236A** to be closed to prepare a circuit through the coil **152** of the magnetic clutch. The circuit for this clutch coil, however, is held open by the contacts NC**234B** which are opened as a result of energizing the time delay relay coil **234**.

The clutch coil **152** is energized by direct current from a filter network and a rectifier **238**. The filter network includes resistors **240**, **242**, and **246** connected in series between the left and right conductors **226** and **228**. Also connected between the resistors are a pair of filter condensers **248**, the common connection for which is to the left hand conductor **226**. Because the contacts NC**234B** are opened at the time that contacts **236A** are closed the clutch coil **152** is not energized until after the time delay relay contacts NC**234B** are closed. This closure of the contacts NC**234B** takes place at an appreciable time after the tape is severed by the knife **32** in order to permit the operator to remove the tape out of the range of movement of a new length of tape about to be projected across the dispensing plate **10**.

To insure that the coil **236** remains energized until the time delay contacts NC**234B** are restored to their closed position the relay of coil **236** has a second set of contacts **236B** connecting the cam operated contacts **184** directly with the coil **236**. After the contacts **236B** are closed the only way to open the circuit to coil **236** is by disengaging the cam operated contacts **184**. This occurs as soon as the clutch coil **152** is energized and the driving connections to the dispensing rolls are started in operation. As soon as this occurs the cam operated switch **184** moves away from its uppermost contact, which connects the coil **236**, and into engagement with a lowermost contact, bridging the contacts **236A**, thus continuing the energization of the clutch coil **152**. The cam switch **184** maintains the bridging lower contact closed until the necessary length of tape has been dispensed. After the tape has been dispensed the switch **184** is returned to its uppermost contact, as in FIG. 14, in preparation for a new operation and the circuit to the clutch coil **152** is broken so that the driving rolls are brought to rest.

The nature and scope of the invention having been indicated and a particular embodiment described, what is claimed is:

1. Apparatus for dispensing a predetermined length of tape coated on only one side with a pressure-sensitive adhesive, said apparatus being provided with a stationary delivery plate across which the tape moves and on which the tape is supported after being dispensed, means for advancing the tape across the delivery plate with its coated side facing away from the plate, a nonadhesive member for engaging the coated side of the tape to press the uncoated side against the advancing means, driving mechanism for the tape advancing means, including a clutch and means driven from the driving mechanism for holding the clutch engaged while the length of tape is being projected across said delivery plate, and a cutting block mounted between the delivery plate and the advancing means at a position substantially level with the delivery plate to engage the uncoated side of the tape, in combination with a straight edged tape severing knife acting with a single impact against a flat surface of the cutting block by first engaging the adhesive coated side of the tape, electromagnetic means for actuating the knife and a control member arranged for convenient access by the operator to cause the electromagnetic knife actuating means to be energized and thereafter to engage the clutch in sequence to project a new length of tape across the delivery plate, the knife being actuated upon movement of the control member by the operator in one direction and the clutch being engaged upon movement of the control member in the opposite direction.

2. Apparatus for dispensing a predetermined length of tape coated on only one side with a continuous coating of pressure-sensitive adhesive, said apparatus being provided with a flat stationary delivery plate across which the tape moves and on which the tape is supported after being dispensed, means comprising a dispensing roll engaging the tape at the uncoated side opposite the adhesive for advancing the tape across the delivery plate with its continuously coated side facing away from the plate, a nonadhesive member comprising a block of Teflon engaging the coated side of the tape to press the uncoated side against the advancing means, a resiliently actuated lever on which the block of Teflon is secured for sliding engagement with the coated side of the tape, a cutting block mounted between the delivery plate and the advancing means at a position substantially level with the delivery plate to engage the uncoated side of the tape, a vertical adhesive supply reservoir formed with a heated base extending laterally beyond the vertical portion of the reservoir, and an adhesive conducting passageway running from the reservoir horizontally through the extension of the base and having an outlet opening at one side of the vertical portion of the reservoir, across which opening in the extension of the base the tape is drawn by the dispensing means to coat the adhesive on the tape, the tape being advanced across the delivery plate with the adhesive side up for enabling the adhesive to cool between the coating outlet and the location of the delivery plate, in combination with a straight-edged tape severing knife acting with a single impact against a flat surface of the cutting block by first engaging the adhesive coated side of the tape.

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