March 29, 1932. F. S. GLINES 1,851,005

TAPE APPLYING MACHINE

Filed Oct. 25, 1926 3 Sheets-Sheet 1

Fig. 1

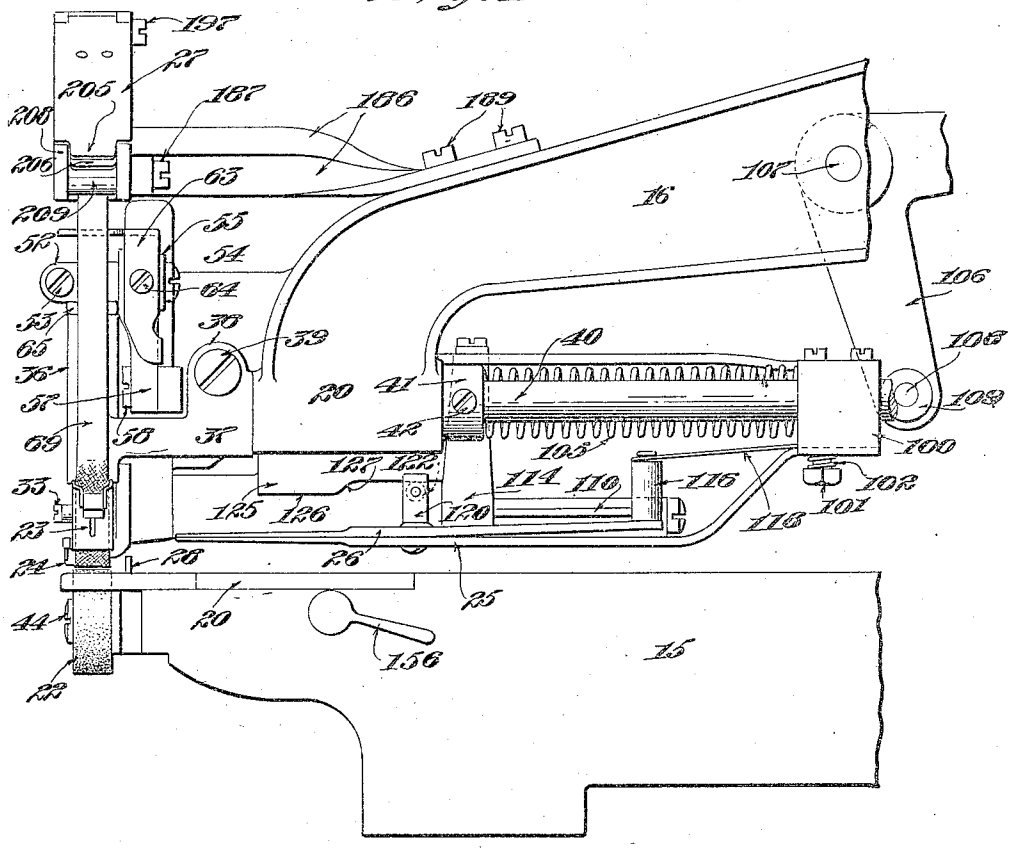
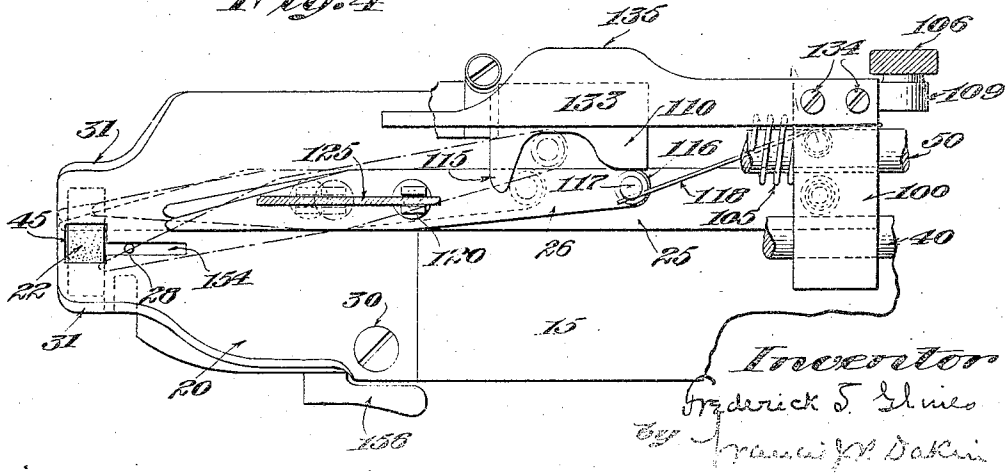


Fig. 4



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TAPE APPLYING MACHINE

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Fig. 2

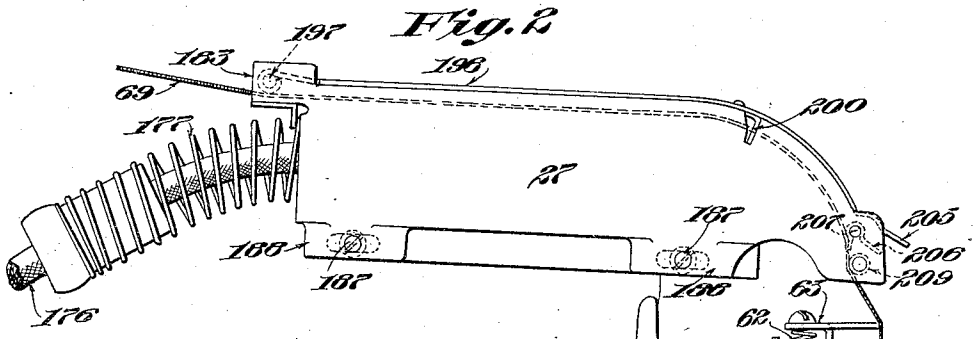


Fig. 6

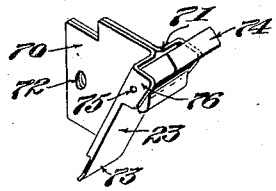


Fig. 9

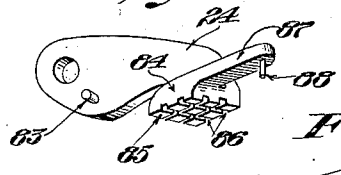
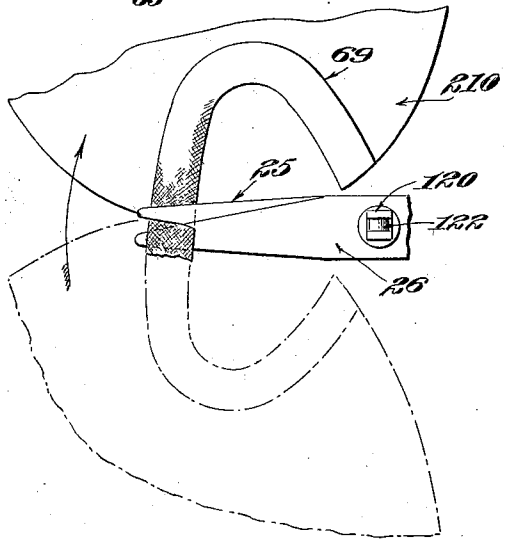


Fig. 10



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TAPE APPLYING MACHINE

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Fig. 3

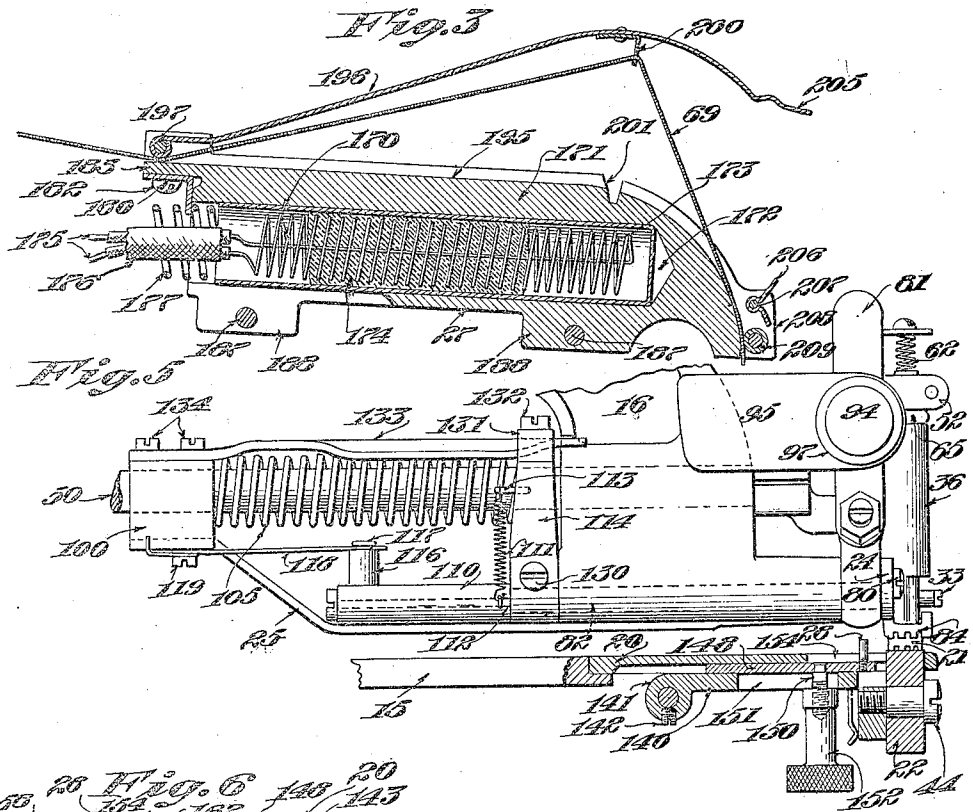


Fig. 5

Fig. 6

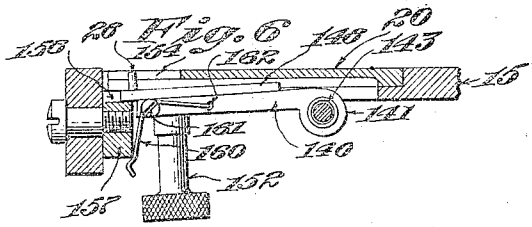


Fig. 11

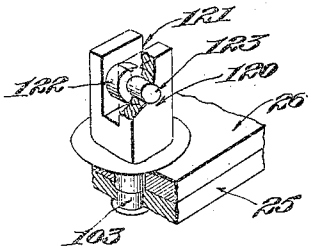
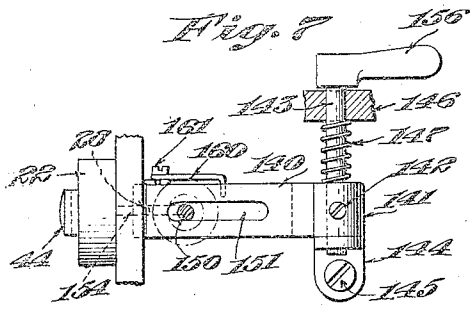


Fig. 7



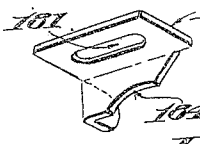


Fig. 12

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UNITED STATES PATENT OFFICE

FREDERICK S. GLINES, OF LYNN, MASSACHUSETTS

TAPE-APPLYING MACHINE

Application filed October 25, 1926. Serial No. 143,986.

This invention relates to a machine for applying tape for reenforcing shoe parts and similar work in which a tape coated with adhesive is delivered to and pressed upon the work as it is fed through the machine.

The principal object of the invention is the provision of a simple, compact and efficient machine for applying reenforcing tape to shoe parts and various other kinds of work.

To this end, the operative instrumentalities for feeding and laying the tape have been simplified in construction and arranged for efficient cooperative action at a high rate of speed without interruption thereby greatly reducing the cost of production of this class of work.

Another object of the invention is the provision of feeding means adapted for feeding the tape directly from a source of tape supply without the intervention of pulling off means.

In attaining this object the cooperating feeding members are provided with feeding faces adapted to engage and to grip the tape its entire width with uniform pressure, and on the forward feeding movement to draw the tape from any suitable source of supply such as a roll located on or adjacent to the machine. The feeding faces of the feeding members are preferably of dimensions suitable for tapes of the greatest width employed in this character of work. Unless the tape is gripped its entire width with a uniform pressure during the feeding movement there is a tendency for the tape to stretch in the parts not gripped and to wrinkle when pressed upon the work and in some cases to pull off after the pressing operation. When covering the entire width of the tape the feeding means will lay it on the work smoothly and will, to some extent at least, serve to press it into adhesive contact with the work.

By constructing the feeding means to draw the tape directly from the source of supply all the difficulties of adjusting a pull-off device to the length of the feeding stroke are obviated. It is always difficult in a machine of this character to so adjust a pull-off attachment that the exact length of tape required shall be furnished to the feeding means free of tension. Generally the pull-off accumulates an excess supply of tape which is embarrassing to take off and requires stoppage of the machine for frequent adjustment.

A further object of the invention is the provision of means for severing the tape at the will of the operator, without interfering with the operation of the machine and at a point in the normal line of feed at or beyond the feeding means.

Heretofore, in machines for applying reenforcing tape no satisfactory means has been devised for cutting the tape when desired and it has been customary to use scissors for this purpose. This practice, however, has many disadvantages, the principal of which are that the work is slowed down and the tape is not cut close to the work requiring pressing of the loose end by hand. The operating instrumentalities of the machines interfere more or less with the insertion of the points of the scissors and obscure the view so that accurate cutting of the tape at the desired point and close to the work is exceedingly difficult. Furthermore, the expenditure of time required for the use of scissors necessitates stopping the machine and slows down most materially the speed of the work and thereby increases the cost. In some classes of work, such as square throated vamps, accurate cutting of the tape at the square corners is absolutely necessary to avoid overlapping of the tape and bulges in the work and such cutting can be accomplished with scissors only by extreme care and the expenditure of time on the part of the operator. In cases where successive short lengths of tape are laid the time consumed and the delay entailed by this manner of cutting are serious disadvantages.

To obviate the foregoing objections, I provide a pair of co-operating members for cutting the tape at the will of the operator and without interfering with the operation of the machine. These members are preferably in the form of shearing members pivotally connected together and operating in the same manner as scissors or shears and are normally held in a retracted inoperative position out of the way but adapted to be thrown forward into a cutting position to cut by treadle-

operated means. In the preferred form of this feature of the invention, the two shearing members are mounted on a suitable carrier above the work-support of the machine to avoid interference with the free handling of the work and are moved longitudinally into operative position; means being provided for opening and closing said members to cut on the forward movement, for guiding the cutting ends of the members to cut on one side or the other of the work and for raising the upper feeding and pressing members to permit the entrance of the shearing members at the desired point of cutting. The provision of a cutting device of this character has a marked advantage in that it is possible to guide the shearing members in their forward movement to the exact point at which the cutting of the tape should be effected to secure the best results. When the upper feeding and pressing members are raised in the forward movement of the cutting members the work is lifted up from the work-support and the points of the cutting members are directed to cut the tape close to the face of the work thereby obviating any loose end. Furthermore, the cutting may be effected at a point close to the pressing means and beyond the feeding means thereby leaving the supply end of the tape in a position to be gripped by the feeding means when those parts are returned to normal feeding position on the return stroke of the cutting members. The cutting operation may thus be accomplished without stopping the machine since the movement of the upper feeding member when raised is ineffective to feed the tape.

The results attained by this feature of my invention contribute very largely to the efficiency of the machine since it may be operated continuously and without interruption and the work may be turned out more rapidly than heretofore and in perfect condition. The cutting of the tape effected by a momentary pressure on a treadle is performed with such rapidity that the interruption of the feeding of the work is hardly noticeable.

Another object of the invention is the provision of simple and efficient means for applying heat to tapes which are coated with adhesives susceptible to being softened or rendered tacky by heat.

To accomplish this object, I provide a simple electric heating device mounted on the top of the machine over which the tape may be drawn before passing to the feeding means. Heretofore, there has been more or less difficulty experienced with such devices owing to the fact that the operator frequently left the machine unattended without turning off the current in the heater with the result that the tape was overheated and burned. This difficulty is obviated in the present invention by the provision of a heater having a cover which, when the machine is stopped, may be raised or opened up to remove the tape from contact with the heating surface without necessitating the turning off of the electric current. The cover may also be adjusted in any desired position in relation to the heating surface and thereby the heating effect on the tape may be regulated while the machine is in operation. It is possible, therefore, to control to a fine degree the tackiness of the tape and to deliver it to the feeding means in just the right condition for securing the best results and all danger of burning or injuring the tape is eliminated.

Another object is the provision of a tape guide which may be easily removed to permit the substitution of guides of other dimensions for tapes of different widths.

It is important that the tape should be delivered to the feeding means at the same point at all times without lateral variation and for this reason the tape guide located adjacent the feeding means should be provided with a guiding passage corresponding in width to the width of the tape being used. If the guiding passage is wider than the tape, it permits of lateral play of the tape in its forward movement which will prevent the tape being laid in a straight line. Since tapes of different widths are used for different classes of work, I provide a tape guide which is easily removable to permit the installation of a guide having a guiding passage corresponding to the width of the particular tape being used.

An additional object is the provision of means for guiding the work comprising an edge-gage adjustable transversely the work and mounted beneath the work-support and adapted to be depressed to an inoperative position at the will of the operator.

In attaining this object, I provide a gage mounted below the work-support and adapted to be moved vertically into an operative position projecting through and above the work-support or into an inoperative position below it. In the preferred form, the gage comprises an upright member carried by an arm pivotally mounted underneath the work-support and adapted to be thrown from an inoperative to an operative position or vice versa by a finger piece on the front of the machine and within easy reach of the operator's hand while holding the work. Suitable means yieldable to a slight pressure is provided for holding the gage in one position or the other. This form of gage is of special advantage for that class of work having holes or openings because the work may be first placed in the machine for laying tape around the edge of the opening and the gage then thrown up into the hole and depressed when the hole is finished. Also in general use on work having edge projections such as straps, the gage may be thrown down temporarily to permit the projection to pass by. In the

machines heretofore in use, the gages interfere more or less with the positioning and the handling of the work in the machine but with my gage the operator may throw the gage out instantly without moving the hand away from the work or interfering with its manipulation.

Other objects of the invention will be more specifically set forth and described hereinafter.

In the accompanying drawings illustrating one form of my invention, Figure 1 is a side elevation as viewed from the operator's seat of the operative end of a machine constructed and operated in accordance with my invention; Fig. 2 is an end elevation of the same looking from left to right in Fig. 1; Fig. 3 is a longitudinal sectional view of a heating element mounted on the machine for rendering the tape tacky; Fig. 4 is a plan view of the lower arm and cutting mechanism with the upper arm removed; Fig. 5 is a rear elevation of the cutting mechanism and end of the upper arm with the work-support and gage shown in longitudinal section; Fig. 6 is a longitudinal vertical sectional view of the operative end of the lower arm showing the gage in elevation in an inoperative position; Fig. 7 is a bottom plan view of the gage mechanism; Fig. 8 is a view in perspective of the removable guide for delivering the tape to the feeding instrumentalities; Fig. 9 is a perspective view from below of the pressing member; Fig. 10 is a diagrammatic view illustrating the position of a sample of work in broken lines at the beginning of the taping operation and the position of the same work in full lines at the conclusion of the taping operation with the cutting mechanism in shearing position; Fig. 11 is a view in perspective, partly in section of the guide member carried by the cutting members for directing said members in their longitudinal movement and Fig. 12 is a view in perspective of the lock for holding the heating coil in the heater.

In the illustrated embodiment of the invention is shown a machine in which the frame and instrumentalities for operating the feeding and pressing mechanisms are the same as those shown in United States Letters Patent No. 1,294,919, issued to William F. Lautenschlager, February 18, 1919, for folding machines, to which reference may be made for a more complete and detailed description thereof. In consequence the operative end only of the machine is shown in the drawings and described herein.

Referring to the drawings, the frame of the machine comprises a standard (not shown) having two laterally extending arms 15 and 16, the former, a lower arm, carrying the main shaft 17 (Fig. 2) and the latter, an upper arm, having its end turned downwardly toward the lower arm; the operating instrumentalities being mounted on the adjacent ends of the two arms.

These operating means comprise a work-support 20 on the end of the lower arm 15 over which the work is fed by the cooperative action of a feeding member 21 and an idler roll 22, a guide 23 for directing the tape to the feeding means, a pressing member 24 for pressing the tape down upon the work and a pair of shearing members 25 and 26 for severing the tape when desired. A heating member 27 may be provided for heating the tape before it is laid to render it tacky and a gage 28 may be employed for guiding the work through the machine.

The work-support 20 is in the form of a flat plate approximately square in plan having its free end narrowed to permit closed vamps and similar work to encircle it and is secured to the top face of the lower arm by screws 30 (Fig. 4). The side edges 31 of the work-support may be bevelled or rounded to permit work to be fed over it without friction.

The feeding member 21, having its feeding face 32 serrated for gripping the work, is secured by a screw 33 to the lower end of a feed-bar 35 which is loosely mounted for reciprocation in a cylindrical housing 36 supported by a bracket 37 integral therewith. The end of the bracket is split and provided with ears 38 bored to receive a screw 39 for fastening the bracket to the end of a rock-shaft 40 rotatably mounted in the upper arm 16. A collar 41 fastened to the rock-shaft 40 by a screw 42 takes up any end thrust off said shaft. For cooperation with the feeding member, the idler roll 22 is loosely mounted on a screw pin 44 threaded into the end of the lower arm, the work-support being provided with an opening 45 to permit the periphery of the idler roll to project slightly above its top face to engage the work. Preferably, the feeding faces of both the feeding member and the idler are of a width corresponding approximately to the widest width of tape used in order to feed it evenly and without distortion.

A forward and backward movement is imparted to the feed foot by rocking the rock-shaft upon the main shaft through instrumentalities which are not shown in the drawings but which are the same as those shown in the Lautenschlager patent hereinbefore referred to. For lowering the feed foot to grip the work at the beginning of the feeding movement and for raising the feed foot from the work at the end of the feeding movement, a lift shaft 50 (Fig. 5) is rotatably mounted in suitable bearings in the upper arm of the machine, said lift shaft being given a rocking movement as shown in the Lautenschlager patent, and is connected to the feed bar by the following means (Figs. 1 and 2). A split collar 52 is fastened to the

top end of the feed bar 35 by a screw 53 and carries a screw pin 54 upon which is loosely mounted a squared block 55 loosely riding in the yoked upper end 56 of a link 57 which at its lower end is pivotally connected by a screw pin 58 to an arm 59 carried by a collar 60 secured to the end of the lift shaft. The rocking of the lift shaft raises and lowers the link and the link in its reciprocating movements carries the feed bar with it through the instrumentality of the block and collar. To permit the feed bar to yield slightly when it engages the work and yet to maintain it in a lowermost position so far as the yoked link permits, a spring 62 is interposed between the upper end of the feed bar and a hood 63 fixed to the link by a screw 64. The top end of the feed bar is recessed for receiving the lower end of the spring to prevent lateral displacement thereof. A fibre washer 65 mounted on the feed bar between the collar 52 and the upper end of the housing 36 prevents wear on the parts.

By the foregoing instrumentalities, the feed foot is given a four-motion movement. Normally the feed foot is in a raised position at the starting point but the parts are so timed that upon the starting of the machine the feed foot is lowered to grip the work by the oscillation of the lift shaft and then the oscillation of the rock-shaft turns the housing and the feed bar to move the feed foot in a forward direction carrying the work with it. At the end of the feeding movement, the oscillation of the lift shaft causes the feed foot to be raised and to continue in a raised position during the return movement of the feed foot when the lift shaft then oscillates in the other direction permitting the feed foot to descend and grip the work for another feeding movement.

For guiding the tape 69 to the feeding members from a roll or other source of supply mounted on or adjacent to the machine the guide 23 is secured to the feed-bar by the screw 33. The guide may be made of two thin plates partially secured together to form a fin 70 and then bent outwardly on an oblique line and turned around to form a guideway or passage 71 for the tape. The fin portion 70 is adapted to fit a vertical recess in the feed-bar and is bored at 72 to receive the screw 33 for securing the guide to the feed-bar. When adjusted in position, the lower end of the passage 71 is adjacent to the curved rear end of the feeding member 21 and the rear wall of the guide extends downwardly beyond the front and side walls of the passage to form a guiding extension 73 for directing the tape in between the feeding member and the idler (Fig. 2). The passage 71 should correspond in width to the width of the tape being used in order to avoid any lateral play of the tape when drawn through the passage and thereby to insure its accurate positioning between the feeding members.

Any suitable means may be provided for preventing retrograde movement of the tape through the guide and one form of such means is shown comprising a weighted dog 74 loosely mounted on a pin 75 carried by ears 76 formed on the top rear portion of the guide 23. The tape engaging edge of the dog is inclined downwardly and is serrated or toothed and the dog is so disposed in the guide that gravity acting on the weight tends to hold its serrated edge in engagement with the tape. In its movement downwardly the tape slides freely by the dog but as soon as it is drawn upwardly the serrated edge penetrates the tape and holds its firmly against upward movement. In Fig. 2 the dog is shown in normal position but in Fig. 8 the weighted portion of the dog is shown raised to permit the tape to be drawn upwardly.

Since the guide 23 is designed for one particular width of tape, it is necessary, when a different width of tape is about to be used in the machine, to change the guide. This is a very simple operation necessitating the manipulation of the screw 33 only. By loosening this screw the guide may be withdrawn from the recess in the feed-bar and another guide, having a passage of a width corresponding to the width of the tape about to be used, may be inserted and the screw tightened.

For pressing the tape down upon and for holding the work between feeding movements, the pressing member or hammer 24 is fastened at one end by a screw 80 to the lower end of an upright arm 81 fixed on the end of a shaft 82 mounted for rocking movement in the end of the upper arm 16. A pin 83 locks the hammer and arm together against relative movement. The free end 84 of the hammer is turned laterally outward and its lower face 85 serves as a pressing surface for engaging the work, the hammer being so mounted that its pressing surface is just in advance of the feeding members. To accentuate the pressing effect and to take care of pleats to better advantage in folding on a curved line, the pressing surface may be provided with a plurality of shallow grooves 86, preferably arranged in two parallel series at right angles to each other. To hold the work in position when first presented to the machine and before it has been gripped by the feeding and pressing means, the laterally turned end 84 of the hammer has an arm or extension 87 provided with a depending pin 88. The arm is of such length that the pin is positioned behind the feeding members and presses downwardly upon the work when it is first placed in the machine and holds it against twisting until it is gripped by the feeding and the pressing members. Until

the work reaches the pressing member in its initial forward movement, it is necessary to provide means for holding it between the feeding movements and the pin 88 (Figs. 2 and 9) serves this purpose. After the work has reached the hammer, that acts to hold it between feeding movements and the pin is of such length that it does not engage the work so long as there is any material under the hammer.

The hammer is operated from the lift shaft by the following means. A short arm or lug 90 is fixed on the collar 60 in position to engage the end of a screw 91 threaded through the lower portion of the upright arm 81 and held therein in adjusted position by a set nut 92 (Fig. 2). To hold the screw 91 in engagement with the lug 90 a spring 93 under compression bears at one end against the arm 81 and at the other end against an adjusting screw 94 threaded through the bent over end of a bracket 95 formed on the upper arm of the machine. The arm may be recessed at 96 and the end of the screw 94 hollowed out to receive the end respectively of the spring 93 to hold it in place. A set nut 97 retains the screw 94 in adjusted position.

In the operation of the machine the hammer is raised by the oscillation of the lift shaft and is lowered by the pressure exerted by the spring 93 so that the pressure exerted upon the work is a resilient spring pressure. By manipulation of the upright arm 81 the operator may raise the hammer from the work at any stage of operation. The adjustment of the screw 91 permits accurate timing of the operation of the hammer in relation to the feeding means.

For severing the tape, the two shearing members 25 and 26 are arranged for longitudinal movement into and out of operative cutting position with means for effecting the cutting at or near the end of their forward movement. Any suitable means may be provided for mounting and operating said members and one form of such means is shown comprising the following. A carrier block 100 is mounted for sliding movement on the rock-shaft 40 and lift-shaft 50, these two shafts being parallel and lying in the same horizontal plane, and the bottom face of the block is recessed to receive the end of the shearing member 25 which is loosely secured thereto by a screw 101 with a spring 102 interposed on the shank of the screw between the end of the shearing member and the head of the screw. The spring 102 should be sufficiently stiff to hold the end of the shearing member in flat engagement with the bottom face of the block and yet permit of a slight yielding when the forward end of the shearing member is depressed. The end of the member 25 fits snugly into the recess in the bottom face of the block to prevent lateral movement thereof, since this member has a longitudinal movement with the block and no lateral movement. The cutting action of the two shearing members is effected by the movement of the shearing member 26 alone, the two members being connected together by a pivot pin 103.

Normally the shearing members are held in a retracted inoperative position by a helical spring 105 under compression and mounted on the lift shaft between the block 100 and the shaft bearing in the end of the upper arm. For throwing the block and shearing members forward a bell-crank lever 106 is pivotally mounted on a pin 107 set in the upper arm and one arm of said lever is provided with a laterally extending pin 108 carrying a roll 109 in position to engage the rear face of the block 100 and the other arm of the said lever is attached by a cord or chain to a treadle (not shown). When the treadle is pressed down the block and shearing members are thrown forward through the instrumentality of the bell-crank lever and when the pressure is released, the spring 105 forces the block back to normal position.

For operating the movable shearing member 26 to cut on the forward stroke, a cam plate 110 is loosely mounted on the extended rear end of the hammer shaft 82, that portion of the cam plate being in the form of a sleeve to receive the shaft. A light spring 111 under tension and attached at one end to a pin 112 set in the sleeve portion of the cam-plate and at the other end to a pin 113 set in an arm 114 tends to hold the cam plate in operative position with the front portion 115 engaging the top face of the shearing member 26. The rear end of the said member carries an upright roll 116 loosely mounted on a screw 117, said roll being held in engagement with the cam-plate by a pressure spring 118 mounted on a screw 119 set in the lower face of the block 100 and having its free end bearing against the screw 117.

In order to prevent interference with the free movement and handling of the work on the work-support, the shearing members are mounted a sufficient distance above the work-support and lower arm to afford full clearance space therefor. This necessitates a depression of the forward ends of the shearing members on the forward stroke in order to pass under the feeding and pressing members when raised and to accomplish this end a block 120 (Fig. 11) is mounted upon the upper end of the pivot pin 103 and provided with a vertical, open at the top, recess 121 within which is rotatably mounted a roll 122 on a pin 123 set in the block transversely the recess. A depending vertical cam-plate 125 is fastened to the under face of the upper arm in position for its lower edge 126 to engage the roll 122 in the block 120. When the shearing members are thrown forward the roll rides along said edge and on reaching the inclined portion 127, the said members are

depressed. In this manner, the point at which the cutting takes place is accurately determined. In Fig. 4 is illustrated in plan three positions of the shearing members. The full lines show the normal inoperative position, the broken lines, the open position of the members preparatory for cutting just before the end of the forward stroke and the dotted lines the closed position at the end of the forward stroke, the cutting having been accomplished.

For raising the upper feeding member and the hammer or pressing member on the forward stroke of the shearing members, the arm 114 is fastened to the shaft 82 for rocking it. The lower end of the shaft and the arm is centrally split for a short distance from said bore so that when the screw 130, threaded through the inner half of said arm, is tightened, it compresses said bore around said shaft to hold the arm firmly locked thereto. The upper end of the arm carries a roll 131 on a screw 132 set endwise in said arm, which roll is adapted to be engaged by a forwardly extending cam-plate 133 secured to the top face of the block 100 by screws 134. The edge 135 of said cam-plate (Fig. 4) is so formed that as the shearing members are moved forwardly the arm 114 is thrown outwardly rocking the shaft 82 to raise the pressing member 24, and at the same time the extension 87 on the latter member engages the screw 33 and raises the feed-bar and tape guide. This naturally raises the tape and the work to a slight extent so that the tape is then inclined upwardly in relation to the work from the point at which it has been pressed onto the work back to the guide and in the final movement of the shearing members, the fixed member passes above the tape and the movable member underneath it so that when they close the tape is sheared off close to the upper surface of the work.

It will be observed from Fig. 4 that the severing of the tape takes place beyond the feeding means, that is, between those means and the pressing means, thereby leaving the supply end of the tape extending under the feeding member and in position to be gripped between it and the idler when the feeding member is lowered by the retractive movement of the cutting mechanism. This is an important feature because it insures a continuous operation of the machine. When the tape is severed in front of the feeding means, the operator is obliged to push or feed the tape forward by hand to a point where it may be gripped by the feeding means, all of which takes time and effort and delays the work. This is one objection to the hand cutting of the tape by means of scissors, because the operator generally has difficulty in inserting the points of the scissors beyond the feeding means and it frequently results in necessitating the rethreading of the tape or the feeding forward of it by hand.

For guiding the work through the machine the edge-gage 28 is mounted below the work-support in a manner which permits it to be depressed below the top surface thereof whenever required and without any appreciable effort on the part of the operator. Any suitable means for attaining this end may be employed and one such is shown comprising an arm 140 having one end in the form of a transverse collar 141 to permit it to be mounted on and secured by a screw 142 to a pin 143 rotatably mounted at one end in a bracket 144 fastened by a screw 145 to the under face of the work-support and at the other end in the side wall 146 of the end of the lower arm 15, (Fig. 7). A spring 147 on the pin 143 holds the arm in engagement with the bracket 144 and against lateral movement on said pin. Slidably mounted on the top face of said arm 140 is a slide 148 which carries at one end the gage 28. In the slide is riveted a depending screw 150 which extends downwardly through a longitudinal slot 151 in the arm and is adapted to receive a knurled headed binding nut 152 which when tightened overlaps the slot 151 and holds the slide in adjusted position on the arm. The work-support is provided with a slot 154 through which the gage projects when in operative position, said slot being sufficiently long to permit a wide adjustment of the gage at different distances from the feeding means in a line perpendicular to the normal line of feed. The gage may be moved from an operative to an inoperative position or vice versa by turning the pin 143 and for this purpose a finger-piece 156 is fastened on the end of the pin which projects beyond the side wall 146 of the lower arm of the machine. The finger-piece is so located as to be within easy reach of the right hand of the operator when handling and guiding the work through the machine and its manipulation requires no appreciable effort nor does it interfere with the work. In Fig. 3 the gage is shown in an operative position extending above the work-support and in Fig. 6 it is shown in an inoperative position, the top of the gage being just below the top face of the work-support. The end wall 157 of the lower arm is cut away at 158 to receive the gage end of the slide which limits the downward movement of the arm 140. A spring 160 is mounted on a screw 161 set in the edge of the arm, one end of the spring being locked in a hole 162 in the arm and the other end bearing against the end wall 157. The lower end of the spring is bent to form an angle for receiving the lower inner corner edge of said end wall when the arm is down so as to lock it in that position. Only a slight pressure is required, however, to move the gage from one position to the other.

To adjust the gage transversely to the nor-

mal line of feed, which is preferably done when it is in operative position, the binding nut is loosened, then used for moving the slide 148 to the desired position and finally tightened, an operation which requires but a moment of time. A gage of this character is most advantageous in view of the varied character of work being done in shoe factories at the present time, much of which requires a gage intermittently rather than constantly. This is especially true of work having edge projections such as straps and bands and having cut out portions and the speed at which the work may be turned out is materially increased if the gage may be dropped down out of the way when necessary, if only momentarily.

The machine is adapted for using and applying all kinds of adhesively coated tapes but when used for applying a tape coated with an adhesive which is rendered sticky or tacky by heat, the machine may be provided with means for heating the coating just before the tape is delivered to the feeding means. One form of such means is shown comprising an electric heating coil 170 of well-known construction mounted in a casing 171 over which the tape may be passed before delivery to the feeding means. The casing is elongated and provided with a longitudinal bore 172 to receive the heating coil which consists of the ordinary cylindrical casing designated as 170 with an interior wire coil 173 and a filler material 174. The electric conductors 175 are covered with insulating material 176 and a spiral spring 177 protects the conductors from strain adjacent the coil 170. For locking the coil within the casing a right-angled slide lock 180 (Fig. 12) is slotted at 181 and mounted on a screw 182 set in the under face of an overhanging end portion 183 of the casing 171. The lock 180 being loosely mounted on the screw 182 is capable of a limited sliding movement in a direction transverse to the bore 172 and when the heating coil is placed in said bore the lock may be pushed inwardly to cause its portion 184 to enter between two adjacent spirals of the protective spring 177 to hold the same. This relieves the heating coil from all strain or pull which may happen to be exerted on the conductor cable. The coil may be released by pulling the slide lock out of engagement with the spring 177.

The casing 171 may be attached to any suitable part of the machine but is preferably secured above the end of the upper arm to the two arms of a split bracket 186 by screws 187 threaded in bottom lugs 188 on the casing; the bracket being fastened to the top of the upper arm by screws 189.

The casing 171 is preferably located directly above the feeding means with its delivery end in position to deliver the tape in an approximately vertical line to the tape guide. The tape passes along the top of the casing, which is approximately horizontal, and down over the curved delivery end and the top and end are provided with a grooved run-way 195 in which the tape travels. A cover 196 hinged on a pin 197 set in the overhanging end portion 183 encloses the run-way 195 its entire length. The cover is frictionally hinged so that it will remain in any position to which it is moved and is provided near its free end with a depending loop 200 through which the tape passes, the casing being recessed at 201 to receive the lower end of the loop when the cover is closed. The position of the tape in relation to the heater is controlled by the cover so that when the cover is raised the tape is carried up with it and away from the heated surface. This is an important consideration in the use of heating devices of this character because it enables the operator to control absolutely the degree to which the tape is heated. In the ordinary constructions heretofore in use, it has been necessary to turn off the electric current when the machine was stopped even though it was for but a short time, otherwise burning of the tape ensued. Even with the greatest care this contingency has frequently happened. With my construction, however, the operator on the stoppage of the machine, grips the cover by the end finger-piece 205 and raises it to the position shown in Fig. 3 thereby raising the tape from contact with the heater. This obviates the necessity of turning off the current. Furthermore, if the operator finds that the tape with the cover closed down is receiving more heat than is required, he may raise the cover slightly and thereby regulate the tackiness of the tape when delivered to the feeding means.

A weighted dog 206 of a construction similar to the dog 74 carried by the tape guide is mounted on a pin 207 set transversely in the ears 208 of the delivery end of the casing 171 to prevent retractive movement of the tape and below the dog is a roll 209 for holding the tape in the groove at that point. The hood 63 carried by the feed-bar housing 36 may be extended outwardly to engage the tape (Fig. 2) between the casing 171 and tape guide and to flatten it out for smooth delivery to the tape guide.

In preparing the machine for operation, the tape is threaded from the source of supply through the tape guide and the end is pushed under the upper feeding member which is normally in a raised position when the machine is at rest. In case the tape used is of the kind requiring heat, it is laid in the groove on the heater, through the loop on the cover and under the dog and roll at the delivery end of the heater and finally through the tape guide. The work is then presented to the machine under the feeding member and with

its edge against the gage if the latter is used. The inserting of the work in the machine may be facilitated by pressure upon the cutting mechanism treadle to throw the shearing members forward to raise the feeding and pressing members. The elevation of these members may be accomplished by depressing the treadle part way but even if the shearing members are thrown fully forward they cut above the work on the work-support and do no damage. Upon the starting of the machine, the feeding members grip the work and tape and feed both forward one step, this movement drawing the tap forward from the source of supply. Just before the feeding member rises, the hammer is lowered and the pin 88 holds the work in case it has not on the first feeding movement reached the hammer. After the work has been fed forward to a point under the hammer the pin 88 no longer operates and the work is held between the feeding movements by the hammer. If, during the progress of the work through the machine, any projection on the edge of the work reaches the gage, the operator by pressure on the finger piece depresses the gage and after the projection has passed by again raises it into operative position. The pressure required is very slight and the finger piece may be operated by the operator's right hand without interfering to any material degree with the handling of the work.

Whenever the cutting of the tape is required, the operator, without stopping the machine, exerts a pressure on the treadle either with the foot or arm, dependent on the character of treadle used, and throws the cutting mechanism forward thereby raising the feeding and pressing elements and severing the tape close to the work. This operation is very rapidly performed and is practically instantaneous and the feeding and pressing elements go through their respective motions as before but without any effect upon the work. The retraction of the cutting mechanism permits the feeding and pressing elements to resume their normal positions and the work then goes forward after a short pause.

For reenforcing some kinds of work, it is customary to lay a plurality of short strips of tape and this kind of work can be most advantageously performed by my machine with practically little or no interruption in the progress of the work. The accuracy with which the cutting is located has been found to be of special advantage in reenforcing the edges of square throated vamps and similar work because in such work the tape must be cut at the square corners and this can be accomplished by the use of my cutting mechanism in such a manner as to cut at the corner and to leave little or no space between the adjacent ends of the tape at the corners so that the edge is reenforced entirely around the throat. In Fig. 10 of the drawings, I have shown a diagrammatic view of a portion of a curved throated vamp 210 in which the position of the vamp at the beginning of the tape applying operation is shown in broken lines and the position at the conclusion of the operation is shown in full lines with the cutting mechanism severing the end of the tape at the edge of the vamp.

In its constructional features, the machine of my invention has certain advantages, for instance, the cutting mechanism is very easily removed from the machine by the manipulation of the single screw 101 and after removal the shearing blades may be sharpened in the same manner as a pair of shears. The shears may be tightened for cooperative action by turning the pivot screw 103 in order to get efficient cutting action. In the operation of the shearing members the movable member has a tendency when cutting to pull the tape slightly forward and thereby further insures the supply end of the tape being in position to be gripped by the upper feeding member on the next feeding movement.

In case the machine is changed from one width of tape to another width, the manipulation of the screw holding the tape guide permits another tape guide, adapted for the particular width of tape about to be used, to be substituted for the first guide. No other change is required because the heater, feeding and pressing means are all adapted for tape of the greatest width used.

It is to be observed that with a machine of this character the speed of the work is greatly increased over that heretofore secured and much improved results are secured. The feeding member which engages the tape its entire width effects a preliminary adhesion between the tape and the work which is finished by the hammer. The use of a cutting mechanism of the character shown permits a longer feed to be used and thereby increases the speed of the work through the machine.

Although I have shown my invention as being embodied in a machine for applying tape, there are many features of the invention which are capable of a wider application than that herein set forth. Furthermore, it is to be understood that the machine shown in the drawings and hereinbefore described is merely one illustrative embodiment of the invention and that it may be embodied in various other forms within the purview of the following claims.

What I claim is:

1. In a machine of the class described, the combination of means for feeding work, means for applying tape thereto and means for severing the tape beyond the feeding means without interfering with the operation of the machine.

2. In a machine of the class described, the combination with feeding means and tape ap-

plying means, of tape shearing means parallel with the longitudinal axis of the machine, said shearing means being normally inoperative, means for moving said shearing means longitudinally into operative position and means for operating said shearing means to cut the tape at or beyond said feeding means.

3. In a machine of the class described, the combination of means for feeding work through the machine, means for applying a continuous strip of reeinforcing material to said work, a pair of cooperating shearing members and means for operating said shearing members to sever said material beyond said feeding means.

4. In a machine of the class described, the combination of means for feeding work through the machine, means for applying a continuous strip of reenforcing adhesive coated material to said work and means within the control of the operator for severing said material beyond said feeding means without interfering with the operation of the machine.

5. In a machine of the class described, the combination of means for feeding work through the machine, means for applying a strip of reenforcing material to said work, means for severing said material, said means being normally in an inoperative position, means for moving said severing means longitudinally into operative position and means for operating said severing means to cut said material at or beyond said feeding means.

6. In a machine of the class described, the combination of means for feeding work through the machine, means for applying a continuous strip of tape to said work and means for severing the tape close to the work and beyond the feeding means without interfering with the operation of the machine; said last mentioned means being within the control of the operator at all times.

7. In a machine of the class described, the combination with feeding and pressing means of tape guiding means and tape cutting means, said cutting means being so arranged that the tape is severed at a point sufficiently beyond said feeding means to insure continuous feeding of said tape by said feeding means.

8. In a machine of the class described, the combination of work feeding means, means for guiding a continuous strip of tape to said feeding means, means for heating said tape to render it tacky, means for pressing said tape upon the work and means for severing said tape when desired and at a point beyond the said feeding means.

9. In a machine of the class described, the combination of work-feeding means, means for delivering a reenforcing tape upon the work to be reenforced and means for severing the tape at a point sufficiently beyond said feeding means to prevent interruption in the feeding of said tape by said feeding means.

10. In a machine of the class described, the combination of means for feeding the work to be reenforced, means for delivering a reenforcing tape to said feeding means, said delivery means being provided with automatic means preventing retractive movement of said tape, means for pressing said tape down upon the work and means for severing the tape when desired and at a point sufficiently beyond the said feeding means to leave the severed end of the supply tape in position to be gripped by said feeding means for forward feeding.

11. In a machine of the class described, the combination of means for feeding the work to be reenforced, removable means for guiding a continuous strip of tape to said feeding means, said guiding means being provided with means for preventing retractive movement of said tape, means for rendering said tape tacky, means for pressing said tape upon the work as it is fed through the machine and means for severing the pressed tape at a point between said feeding means and said pressing means whenever desired without interfering with the continuous feeding of the remaining tape.

12. In a machine of the class described, the combination of means for feeding the work to be reenforced and a reenforcing tape, means for guiding a continuous strip of tape to said feeding means, and means for severing the pressed tape from the continuous strip at a point beyond said feeding means to prevent interruption of the feeding of the remainder by said feeding means.

13. The combination with feeding and pressing means for applying tape, of means for cutting the tape at the will of the operator and without interfering with the operation of the machine, said cutting means being provided with means for raising said feeding and pressing means just prior to the cutting operation to facilitate cutting the tape close to the work.

14. The combination with feeding and pressing means for applying tape, of means for cutting the tape at the will of the operator and without interfering with the operation of the machine, said cutting means being provided with a cam for raising said feeding and pressing means just prior to the cutting operation.

15. The combination with feeding and pressing means for applying tape, of cutting means normally located above the level of the work in an inoperative position, means for throwing said cutting means forward to cut, means for raising said feeding and pressing means upon the forward movement of said cutting means and means for depressing said cutting means during said forward

movement to effect said cutting below said feeding and pressing means when raised.

16. The combination with feeding and pressing means for applying tape, of cutting means normally located above the level of the work in an inoperative position, treadle-operated means for throwing said cutting means forward to cut, means operated by the forward movement of said cutting means for raising said feeding and pressing means and means for depressing said cutting means during its forward movement to effect said cutting below said feeding and pressing means when raised.

17. The combination with feeding and pressing means for applying tape, of a pair of cooperating shearing members normally located above the level of the work in an inoperative position, means for throwing said shearing members longitudinally forward to cut, means for raising said feeding and pressing means upon the forward movement of said shearing members and means for depressing the forward cutting points of said shearing members on the forward movement thereof to pass below said feeding and pressing means when raised to effect the cutting.

18. The combination with feeding and pressing means for applying tape, of a pair of cooperating shearing members normally located above the level of the work in an inoperative position, a block for carrying said shearing members, said block being mounted for reciprocating movement in a path parallel to the longitudinal axes of said shearing members, a spring for holding said block in a normally retracted position, means carried by said block for raising said feeding and pressing means upon its forward movement and means for depressing the cutting points of said shearing members during the forward movement thereof to effect the cutting below said feeding and pressing means when raised.

19. The combination with feeding and pressing means for applying tape, of a pair of cooperating shearing members normally located above the level of the work in an inoperative position, a block for carrying said shearing members, said block being mounted for reciprocating movement in a path parallel to the longitudinal axes of said shearing members, a spring for holding said block in a normally retracted position, means carried by said block for raising said feeding and pressing means upon its forward movement, a fixed cam plate and a guide mounted on said shearing members for engaging said cam plate to depress said shearing members during their forward movement to effect the cutting below said feeding and pressing means when raised.

20. In a machine of the class described, means for feeding the work to be reenforced and a reenforcing tape, means for guiding a continuous strip of tape to said feeding means and a pressing member for pressing said tape down upon the work; said member having an extension directed toward the front of the machine and provided in its end with a downwardly projecting pin for holding the work between the feeding movements and until it has reached the pressing means.

21. In a machine of the class described, the combination of means for feeding the work and a reenforcing tape simultaneously, means for guiding a continuous strip of tape to said feeding means, means for heating said tape to render it adhesive and an adjustable edge-gage for guiding the work in its passage through the machine; said gage projecting upwardly through the work-support of the machine and being adapted at the will of the operator to be depressed into an inoperative position.

22. In a machine of the class described, the combination of a work-support, means for feeding the work and a gage for guiding the work; said gage being pivotally mounted below the work-support and projecting above the work-support when in operative position and means for depressing said gage below the work-support and for holding it in said depressed inoperative position.

23. In a machine of the class described, the combination of a work-support, means for feeding the work and a gage comprising an arm pivotally mounted underneath the said work-support and having on its free end an upright guiding member; said arm being movable through a short arc to throw said guiding member into and out of operative position above said work-support and means for holding said arm in both positions yet permitting it to be thrown from one position to the other by the exertion of a slight pressure.

24. In a machine of the class described, the combination of a work-support, means for feeding the work and a gage for guiding the work; said gage comprising a member pivotally mounted underneath said work-support and movable through a short arc and provided with an upright guiding member on its free end which projects above the work-support when the pivotally mounted member is in an uppermost position and which is withdrawn below the top surface of said work-support when said pivotally mounted member is in a lowermost position, a spring for holding said pivotally mounted member in its adjusted position and a finger piece for moving said gage from one position to the other by the exertion of slight pressure.

25. The combination with means for applying an adhesive coated tape to reenforce work of means for heating the coating on said tape to render it tacky, comprising a heating element over which the tape is fed and means for

regulating the heating of said coating thereby.

26. The combination with means for applying an adhesive coated tape to reenforce work of means for heating said coating to render it tacky, comprising a heating element provided with a groove for the passage of said tape and a cover for said groove, said cover being adjustable to control the heating of said coating on said tape.

27. The combination with means for applying an adhesive coated tape to reenforce work of means for heating the coating of said tape to render it tacky, comprising an electrically heated casing having a groove for the passage of said tape and a cover for said groove; said cover being capable of registration in relation to said casing for regulating the heating of said adhesive coating.

28. The combination with means for applying an adhesive coated tape to reenforce work of means for heating the coating of said tape to render it tacky, comprising an electrically heated casing having a groove for the passage of said tape and a cover for said groove; said cover being provided with an inner depending loop through which said tape passes and being frictionally hinged at its rear end to said casing to permit said cover to be set in an open raised position to control the heating of said coating.

29. The combination with means for applying an adhesive coated tape to reenforce work of means for heating the coating of said tape to render it tacky, comprising an electrically heated casing having a groove for the passage of said tape and a cover for said groove; said cover being provided with inner means for holding the tape adjacent to said cover without interfering with its forward movement and being frictionally hinged at its rear end to said casing to permit said cover to be set in an open position at any angle to said casing to control the heating of the coating on said tape.

30. In a machine of the class described, the combination with work feeding means and means for applying tape thereto of a cutting mechanism having, in combination, a shearing member mounted for longitudinal movement into and out of operative position, a second shearing member pivotally mounted on said first mentioned shearing member for cooperative shearing action therewith, treadle-operated means for moving said shearing members longitudinally into operative position, means for operating said second shearing member to cut on the forward movement of said members and a spring for returning said members to a normal inoperative position after a cutting operation.

31. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a shearing member mounted for movement into and out of operative position, a second shearing member pivotally mounted on said first mentioned shearing member for cooperative shearing action therewith, means for moving said first mentioned shearing member into and out of operative position and means for controlling the movement of said second shearing member to accomplish a cutting action.

32. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a pair of normally inoperative cooperating shearing members, one of said members being pivotally mounted on the other of them, means for moving said members into operative position, a guide for guiding said members while being moved, a cam for operating said pivotally mounted member to shear and a spring for returning said members to normal position.

33. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a pair of shearing members, one of said members being pivotally mounted on the other of said members and both members being normally inoperative, a lever for moving said members into operative position, a cam adapted to be engaged by said pivotally mounted member for causing a cutting action thereof on the forward movement of said members and a spring for returning said members to normal position after a cutting action.

34. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a pair of cooperating shearing members, one of said members being pivotally mounted on the other of them and said members being normally in a retracted inoperative position, means for moving said members into operative position and means for operating said pivotally mounted member to effect a shearing action.

35. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a pair of cooperating, normally inoperative, shearing members, treadle-operated means for moving said members into operative position at the will of the operator and cam-operated means for moving one of said members in relation to the other of them to effect a shearing action.

36. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a carrier

mounted for reciprocation, a spring for holding said carrier in a normally retracted position, treadle-operated means for throwing said carrier forwardly, a shearing member mounted on said carrier, a second shearing member pivotally mounted on said first mentioned shearing member for cooperative action therewith, a spring for holding said two shearing members normally closed and a cam for opening said shearing members on the forward stroke of said carrier to effect a cutting action at the end thereof.

37. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a carrier member mounted for reciprocation, a spring for holding said carrier in a normally retracted position, means within the control of the operator for throwing said carrier forwardly, shearing means mounted on said carrier, a spring for holding said shearing means normally closed and a cam for opening said means to cut on the forward movement of said carrier.

38. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a carrier member mounted for reciprocation in a path parallel with the longitudinal axis of the machine, a spring for holding said carrier in a normally retracted position, a lever for throwing said carrier forwardly, shearing means mounted on said carrier and adapted for shearing action on the forward stroke of said carrier.

39. In a machine of the class described, the combination with work feeding means and means for applying tape thereto, of a cutting mechanism having, in combination, a carrier member mounted for reciprocation in a horizontal plane, a spring for holding said carrier in a retracted position, treadle-operated means for moving said carrier forwardly, a pair of cooperating shearing members mounted on said carrier, and means for operating said members to cut on the forward stroke of said carrier.

In witness whereof, I hereunto set my hand this twenty-third day of October, 1926.

FREDERICK S. GLINES.