Dec. 19, 1939. A. BENNETT 2,184,091

TAPE DISPENSER

Filed July 25, 1938

Fig. 1.

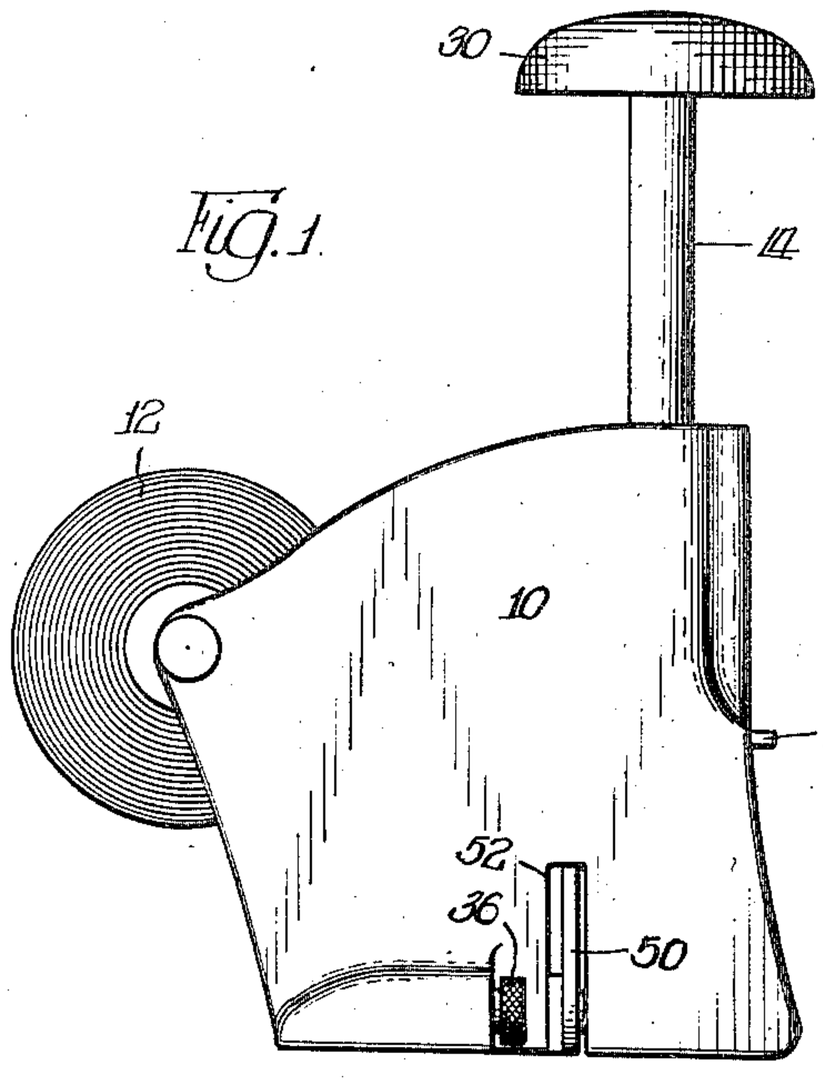


Fig. 2.

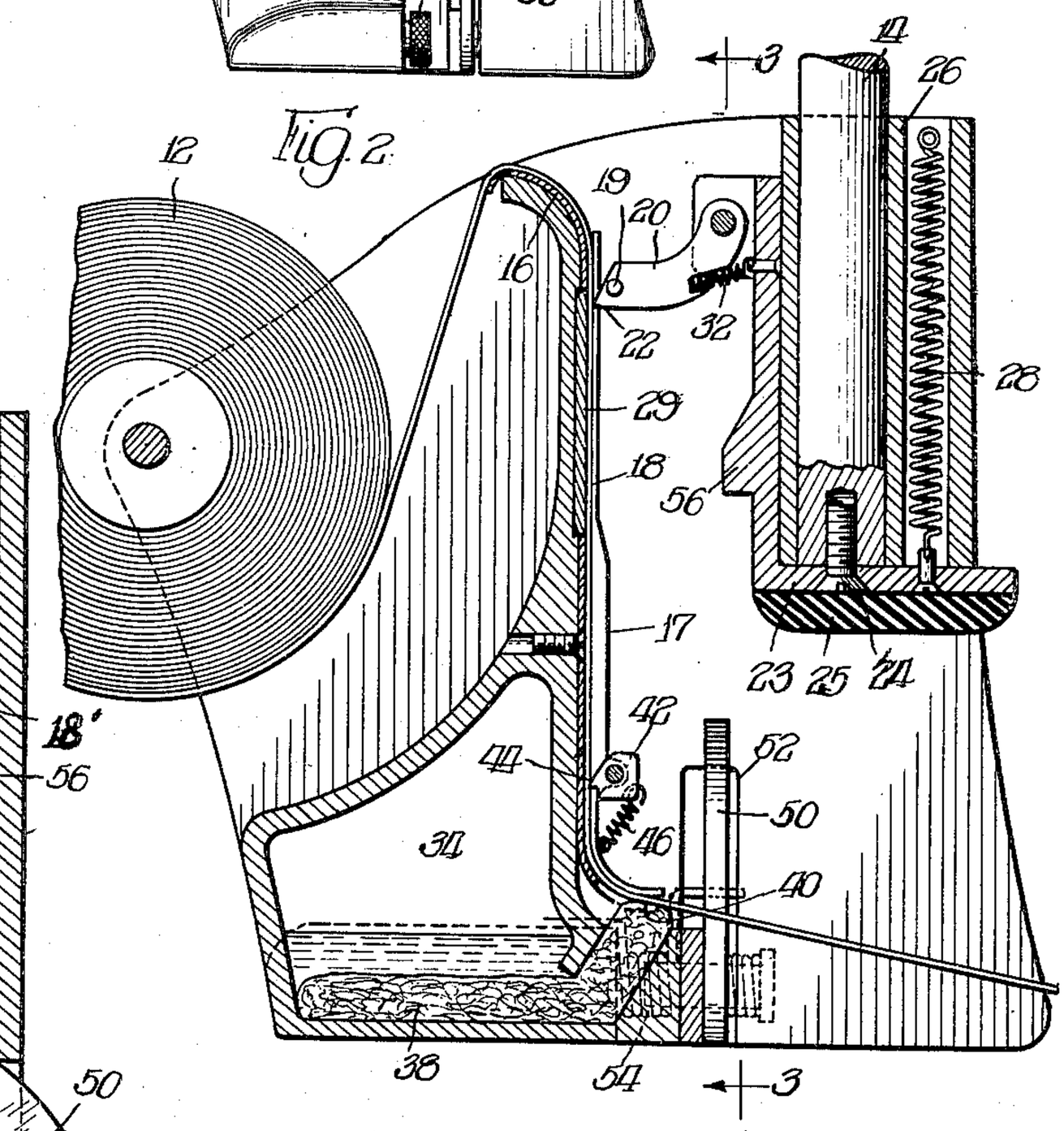
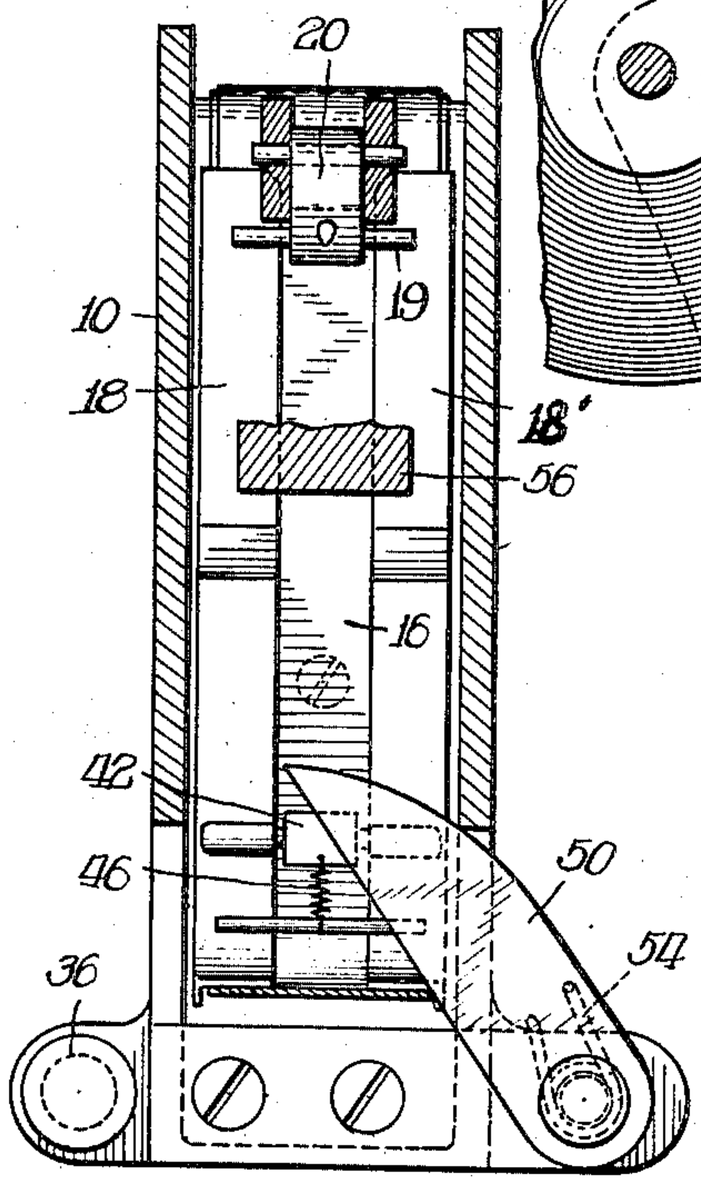


Fig. 3.



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TAPE DISPENSER

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10 Claims. (Cl. 216—23)

This invention relates to devices or appliances for use in dispensing gummed tape, such, for example, as tape having moisture-activatable adhesive applied to one face thereof. The invention pertains to that class of devices in which a continuous roll of the tape is placed within the device to be dispensed therefrom in short lengths or strips. In accordance with the various features of the present invention several distinct functions are performed by the device. In the first place, the gummed tape is dispensed in predetermined lengths and the device is so constructed and arranged that the predetermined length may be varied and controlled as desired. Furthermore, the device includes means for moistening the gummed side of the tape during the dispensing operation, together with means for engaging a severed moistened length of the tape to press it firmly into engagement with a surface to which it is desired to affix the tape being dispensed. Thus, the device is capable not only of dispensing tape in desired lengths, but additionally includes the feature of attaching the severed sections to applying surfaces.

Various objects and features of the invention will become apparent from a reading of the following specification in the light of the accompanying drawing, in which

Figure 1 is a view in side elevation of a machine constructed in accordance with the principles of the present invention;

Figure 2 is a view in front elevation taken along a vertical section through the machine as illustrated in Figure 1; and

Figure 3 is a view in section taken along the line 3—3 of Figure 2.

Turning now to the drawing, the improved device comprises, generally speaking, a main casting or body member 10 arranged to support a roll or coil of adhesive tape 12, and a hand operating or actuating member 14.

It is to be appreciated that the device is capable of distributing or dispensing any type of material wound in the form of a strip upon a spool or roll, although primarily the machine was developed for the purpose of dispensing gummed tape of the type described in my Patent No. 2,109,583, granted March 1, 1938. Accordingly, although the machine is in no wise limited to the dispensing of gummed tape of the type shown in my patent, the attention of the reader may be invited to such patent for a disclosure of a kind of tape which may be employed in the machine. As therein shown, one side of the tape is coated with a pressure-sensitive adhesive which in turn is covered by Holland cloth, and the other or opposite side is coated by the ordinary water-soluble adhesive, such as animal or casein glue, or the like.

The purpose of the present invention is to provide means for dispensing the gummed strip, for moistening the water-soluble adhesive during the dispensing operation, for severing the strip into predetermined lengths, and for applying pressure to the unmoistened face to cause the moistened gum side of the severed length to be firmly affixed to an applying surface.

As shown in Figure 2, the tape 12 passes from the spool, downwardly over a descending guideway 16. The guide, as shown in Figures 2 and 3, is provided with overlying flanges 18, 20 slightly spaced from the surface of the guide, and the descending tape is arranged to move downwardly between the guide and the flanges. These members thus constitute a track or guideway which assures smooth and uninterrupted feeding of the tape.

The feeding or forward motion of the tape is effected by means of a spring pressed pawl or detent 20, having a pointed extremity 22 which engages frictionally the exposed surface of the tape at a point midway between the guides 18 and 18', and the amount of pressure exerted by the detent 20 is sufficient to cause the pointed extremity 22 frictionally to engage the tape and move the latter downwardly when the detent is in turn moving downwardly. This latter motion is imparted to the detent by means of a pressure-applying member 23 which is attached to the operating member 14 by means of a suitable screw 24. The hand operated member 14 is mounted for vertical movement within a guideway 26, which latter is formed within the casting 10 as an integral part thereof and a spring 28 tends normally to maintain the operating member 14 and the presser foot 23 at the limit of their upward travel.

In order to control accurately the amount of downward motion of the tape during each feeding stroke, there is positioned adjacent the guide 16, as shown in Figure 2, a cam or ramp 17, the lower portion of which is raised as shown. A pin 19 is carried by the pawl 20 and is adapted to engage the ramp in order to move the pointed extremity of the pawl out of engagement with the tape, thereby bringing to a conclusion the feeding operation. Accordingly, it will be understood that the feeding stroke is measured and determined by the distance between the pointed extremity of the pawl 20 in its uppermost position and the raised position of the cam or ramp 17 which operates to release the pawl from engagement with the tape.

The operating member 14 is surmounted by a hand knob 30 and in the operation of the device the latter is adapted to be struck by the hand of the operator, causing the presser foot 23 to descend, carrying with it the feeding member or pawl 20. During the descending motion the pointed extremity of the pawl engages the tape

and causes the latter to be fed downwardly and outwardly by a distance equivalent to the distance between the pointed extremity of the pawl 20 at its uppermost position and the raised position of the ramp 17. Upon removal of the hand of the operator from the knob 30 the spring 28 causes the rod 14 and the presser foot 23 to ascend, and during this motion the feeding member 20 slides uninterruptedly over the surface of the strip without imparting any rearward or upward motion thereto. However, to insure against any inadvertent upward movement of the tape during the return stroke of the feeding element 20, the device is provided with a back stop 42 having an extremity 44 which is maintained in firm engagement with the tape by means of a tension spring 46.

So much for the feeding action. It has already been pointed out that one side of the strip may be coated with a water-soluble adhesive and that in such event the invention contemplates moistening the adhesive during the dispensing operation. To this end the casting is formed with an integral tank or reservoir 34 therein, access to which may be gained through a closure member 36 shown in Figure 1. In operation the device may be tilted rearwardly as shown in Figure 1, the closure 36 removed and the reservoir filled with water, following which the closure may be replaced and the device restored to its normal upright position, in which condition the liquid therein contained assumes the level shown in Figure 2. A wick or other suitable device 38 is positioned within the reservoir and supplies the liquid to the tape by capillary attraction. It will be observed that the outer extremity of the wick 40 is in firm engagement with the tape at a point disposed below the lower extremity of the guide 16 and in the rear of the lower extremity of the flanges 18 and 18', thereby assuring positive application of the moistening fluid to the tape.

From so much of the description as has been given the reader will understand the manner in which the device feeds and moistens a predetermined amount or length of the tape. Now will be described the manner in which the short lengths of tape are severed from the continuous strip and applied to a selected surface. As shown in Figures 2, and particularly 3, a knife 50 is mounted at the base of the device within an opening 52, shown in Figure 1, and is normally maintained in a raised, inoperative position by means of a coil compression spring 54. However, the knife is adapted to be engaged and depressed by a shoulder 56 carried by the presser member 23.

Thus, in the operation of the device with the parts normally occupying the position shown in Figures 1 and 2, movement imparted to the knob 30 causes the rod 14 and the presser member 23 to descend and the feeding pawl 20 to move the tape downwardly between the guide and flanges a predetermined distance, whereupon the shoulder 56 engages the knife 50, causing the latter to descend and sever from the continuous strip the length thereof which has been fed forward the predetermined distance. Continued downward motion of the presser member 23 causes complete severance to take place, whereupon the severed portion having its lower surface thoroughly moistened by means of the wick 38 falls into a space provided between the sides of the casting of the body 10, and the upper surface of the tape is thereupon engaged by the descending presser 23.

The presser member forces the severed section with its moistened adhesive-carrying face into firm engagement with the surface upon which the device is disposed, thereby completing the operation. The invention contemplates mounting a soft rubber pad 25 on the base of the presser foot 23, the purpose of which pad is to accommodate the presser foot to variations in the smoothness of the applying surface. Although it takes some time to describe the operation of the device, in use it is practically instantaneous in much the same manner as the ordinary stapling device or the like. By imparting a series of short downward motions to the handle 30 the tape is fed forward without being severed and in this manner various predetermined lengths of tape may be obtained without the severing operation taking place until such time as the plunger is depressed through its maximum stroke. Furthermore, by constructing and mounting the feeding pawl 20 in the manner illustrated there is obtained a positive and highly efficient feeding operation. To prevent any possible jamming or clogging of the machine a hardened steel insert 29 is positioned within the guide 16 and covers the entire path of travel of the pointed extremity 22 of the pawl 20. By imparting the angular shape to the pawl 20, as illustrated, a firm and positive feeding action is effected. Thus, when the plunger is depressed the pointed extremity 22 engages the tape and during further depression of the plunger there is a tendency for the pointed extremity to dig into the tape and resist downward movement. This action establishes a wedging action between the pawl 20, its pivot and the presser foot 23, which in turn insures firm contact or engagement between the pawl and the tape.

It is to be appreciated that various modifications in design and construction may be made in the machine as illustrated without departing either from the scope or spirit of the invention as set forth in the following claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a ramp adjacent said guide, a plurality of overlying flanges cooperating with said guide, and a feeding mechanism, said mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, said pawl being adapted to engage the ramp to disengage the pawl from the tape to stop the forward feeding movement of the tape.

2. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a ramp adjacent said guide, a plurality of overlying flanges cooperating with said guide, and a feeding mechanism, said mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, said pawl being shaped in the form of a bell crank lever and normally urged toward the tape by means of a resilient element, said pawl being adapted to engage the ramp to disengage the

pawl from the tape to stop the forward feeding movement of the tape.

3. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a ramp adjacent said guide, a plurality of overlying flanges cooperating with said guide, and a feeding mechanism, said mechanism comprising a vertically movable presser foot, a tape-engaging pawl carried by said presser foot, and auxiliary means in combination therewith adapted to prevent inadvertent upward movement of the tape across the face of the guide, said pawl being adapted to engage the ramp to disengage the pawl from the tape to stop the forward feeding movement of the tape.

4. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a plurality of overlying flanges cooperating with said guide, a feeding mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, and a tape-severing device adapted to be actuated by downward motion of the presser foot, the said tape-severing device having a flat bottom surface which at the completion of a downward stroke of the presser foot applies fastening pressure to a severed end of the tape.

5. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a plurality of overlying flanges cooperating with said guide, a feeding mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, and a tape-severing knife adapted to be actuated by means of a projection carried by the presser foot, the said tape-severing knife having a flat bottom surface which at the completion of a downward stroke of the presser foot applies fastening pressure to a severed end of the tape.

6. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a plurality of overlying flanges cooperating with said guide, a feeding mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, and a tape-severing device adapted to be actuated by downward motion of the presser foot, together with means for moistening one side of the tape during the dispensing operation, the said tape-severing device having a flat bottom surface which at the completion of a downward stroke of the presser foot applies fastening pressure to a severed end of the tape.

7. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a plurality of overlying flanges cooperating with said guide, a ramp adjacent said guide, a feeding mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, said pawl being adapted to engage the ramp to disengage the pawl from the tape to stop the forward feeding movement of the tape, and a tape-severing device adapted to be actuated by downward motion of the presser foot, together with means for moistening one side of the tape during the dispensing operation, said means comprising a reservoir positioned within the base of the device and a wick extending outwardly from the reservoir into the path of feed of the tape.

3. A tape dispensing and applying device of the character described, having, in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a plurality of overlying flanges cooperating with said guide, a ramp adjacent said guide, a feeding mechanism comprising a vertically movable presser foot and a tape-engaging pawl carried by said presser foot, and a tape-severing device adapted to be actuated by downward motion of the presser foot, the said tape-severing device having a flat bottom surface which at the completion of a downward stroke of the presser foot applies fastening pressure to a severed end of the tape, together with means for moistening one side of the tape during the dispensing operation, said means comprising a reservoir positioned within the base of the device and a wick extending outwardly from the reservoir into the path of feed of the tape, said presser foot being adapted and arranged to engage and apply vertically downward pressure to a severed and moistened segment of tape.

9. A tape dispensing and applying device of the character described, having in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a feeding mechanism comprising a vertically movable presser foot and a tape engaging pawl carried by said presser foot, a ramp on said guide adapted to be engaged by the said pawl, a tape shearing means adapted to be actuated by downward motion of the presser foot, the said ramp being adapted to cause disengagement of the pawl from the tape to stop the forward movement of the tape during the shearing operation.

10. A tape dispensing and applying device of the character described, having in combination, means for receiving and supporting a roll of tape, a vertical guide across the surface of which the tape is moved during a dispensing operation, a feeding mechanism comprising a vertically movable presser foot and a tape engaging pawl carried by said presser foot, a ramp on said guide adapted to be engaged by the said pawl, a tape shearing means adapted to be actuated by downward motion of the presser foot, the said ramp being adapted to cause disengagement of the pawl from the tape to stop the forward movement of the tape during the shearing operation, the said tape shearing means having a flat bottom surface which at the completion of a downward stroke of the presser foot applies fastening pressure to a severed end of the tape.

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