

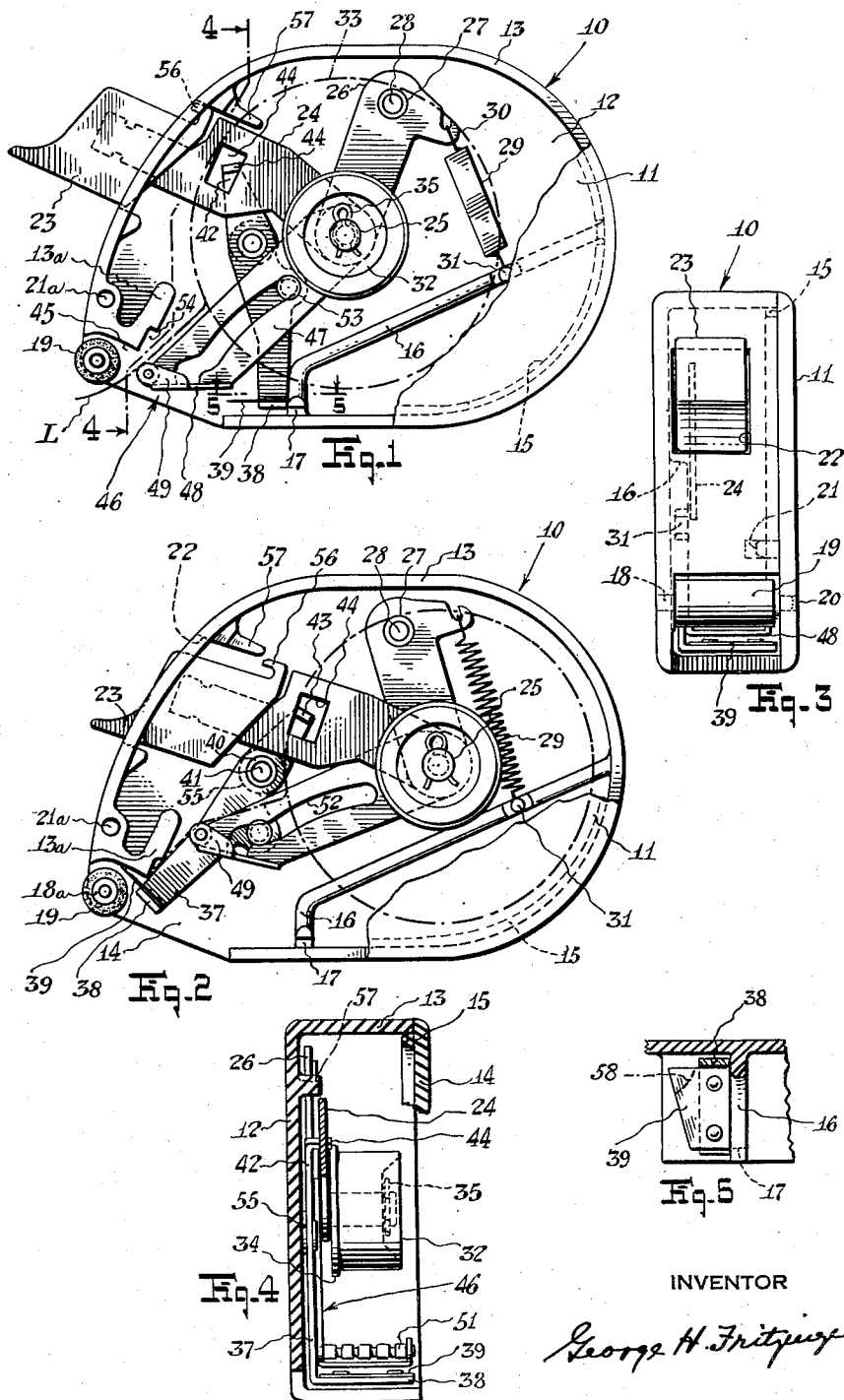
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G. H. FRITZINGER

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TAPE DISPENSER AND APPLICATOR

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INVENTOR

George H. Fritzinger

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TAPE DISPENSER AND APPLICATOR

George H. Fritzinger, West Orange, N. J., assignor
of one-half to Harold G. Kendall, Brooklyn,
N. Y.

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10 Claims. (Cl. 216—29)

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The present invention relates to devices for dispensing and/or applying selected lengths of pressure-sensitive tape.

In the patent to Harold G. Kendall, Number 2,511,856, issued June 20, 1950, and having common ownership with the present application, there is disclosed and broadly claimed a tape dispenser-applicator which embodies the novel principle in the art of dispensing pressure-sensitive tape, of drawing tape from the supply roll as an incident precedent of cutting the tape, so as to make available a starting length for a succeeding dispensing operation at the completion of each cutting operation. The dispenser-applicator herein shown to illustrate the invention employs this principle and embodies features claimed in my Patent 2,511,857 issued June 20, 1950, and in my pending application Serial No. 40,548, filed July 24, 1948. In particular, the present invention relates to detailed improvements in the dispenser-applicators shown in my pending application last mentioned above.

It will be understood that these dispenser-applicators, while adapted especially for applying selected lengths of tape to objects, are usable alternatively as devices for spotting short lengths of tape at selected points or as hand dispensers for drawing off selected lengths of tape to be applied by hand.

The principle above stated is carried out in my application Serial No. 40,548 as follows: A tape guide member is normally positioned so that it holds a projecting length (hereinafter referred to as the starting length) of the tape at a dispensing position. When it is desired to sever a drawn-off length of the tape from the supply roll, the tape is held from backfeeding at the dispensing station and the guide member is retracted from the dispensing station in backfeeding relation to the tape; concurrently the supply roll is maintained at a fixed distance from the end of the guide member so that the length of the path of the tape between the roll and the dispensing station is increased to cause tape to be drawn from the roll. As the guide member reaches the final portion of its retracting movement, the tape is severed at the dispensing station to leave a starting length projecting ahead of the guide member. The guide member is then returned, while being maintained at its fixed distance from the roll, to present the starting length at the dispensing station for a succeeding dispensing operation.

Objects of this invention are to provide improvements in the embodiments shown in my

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pending application Serial No. 40,548 which enable the principle above stated to be carried out by an operating mechanism which is operable by a small actuating force and which is adapted neither to offset the gum of the tape nor to reduce its adhesiveness.

Another object is to provide such improved operating mechanism which is adapted to enable the tape to be threaded easily into place after installation of a new roll.

Another object is to provide such operating mechanism which reduces the tension on the tape during cutting to give a cleaner and straighter cut.

Another object is to provide improvements for guiding the starting length of the tape in an unobstructed path out of the machine after a cutting operation.

A still further object is to provide improvements in the operating mechanism to prevent the starting length from being reapplied to an object just taped should the operator release the mechanism from a cutting position before lifting the device from the object.

These and other objects and features of the invention will be apparent from the following description and the appended claims.

In the description of the invention, reference is had to the accompanying drawings, of which:

Figure 1 is a side elevational view of a dispenser-applicator embodying the invention, and hereinafter referred to as a "taping device," wherein the main portion of the side cover is broken away and the operating mechanism is shown in unoperated position;

Figure 2 is a view similar to Figure 1 but showing the mechanism in actuated position;

Figure 3 is a front elevational view of this taping device;

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 1; and

Figure 5 is a detailed sectional view taken substantially on the line 5—5 of Figure 1.

The taping device shown in the accompanying figures comprises a housing made, for example, of plastic and including a main section 10 and a side cover 11 each of which has a contour as shown in Figure 1. The main section comprises a side wall 12 provided with a transverse wall 13 along its entire edge except at the lower forward part of the housing whereat the wall is omitted to provide an opening 14 through which the tape is dispensed. The side cover 11 has a flange 15 inset from the edge thereof which slidably engages the rim of the wall 13, interiorly of the

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latter, to hold the cover detachably to the main housing section. Extending across the side wall 12 and across the lower portion of the wall 13, at the rear of the opening 14, is a reinforcing rib 16. This rib has a slot 17 in the end thereof, which is engaged by the flange 15 of the cover to interlock the lower portion of the wall 13 to the cover, when the cover is mounted on the main housing section.

The forward end of the side wall 12 is apertured to receive a stud pin 18 secured thereto as by riveting. A pressure roller 19, which has a resilient peripheral layer as of rubber, is journaled on this stud pin and is retained thereon by a collar 18a near the outer end portion of the pin. The side cover 11 is apertured at 20 to receive the end of this pin so that the cover will support the outer end of the pin when the pressure roller is pressed against an object. In order that the side cover may so support the stud pin without itself being displaced relative to the main housing section, the cover has an anchor pin 21 which engages a hole 21a in the main housing section.

In the forward upper portion of the wall 13 there is a rectangular opening 22 for an outwardly-extending push button 23. This push button is movable inwardly to actuate the operating mechanism to cut the tape and is movable outwardly to present a starting length of tape in a dispensing position, as will appear. The push button is mounted on the end of a push bar 24 which is pivoted at its inner end to a stud 25 carried by a lever 26. This lever is pivoted at its upper end on a shouldered metal bushing 27 carried by a boss 28 on the side wall 12. The push button itself slides on the bottom edge of the opening 22. The lever 26 is urged clockwise, to hold the push button normally in its outer position, by means of a tension spring 29 connected between an arm 30 on the lever and a boss 31 on the side wall 12.

Journalled on the outer portion of the stud 25 is a cylindrical core 32 for carrying a supply roll 33 of pressure-sensitive tape shown by dash-dot lines. This core has a peripheral flange 34 at its inner end to space the roll from the push bar 24. The core is retained on the stud by a spring clip 35 which engages a groove in the outer portion of the stud.

In the forward portion of the housing there is a lever 37 which has a transverse arm 38 near the opening 14 on which there is mounted a blade 39. This lever is pivoted on a shouldered bushing 40 carried on an integral boss 41 of the side wall 12 at a position just below the push bar 24. This lever has an upright arm 42, positioned between the push bar 24 and the wall 12, on the upper end of which there is a turned-over lug 43. This lug engages an aperture 44 in the push bar to couple the lever to this bar. The spring 29 normally holds the blade 39 in a concealed position at the rear of the opening 14 (Figure 1) whereat the lever 37 abuts against the reinforcing rib 16 acting as a stop. As the push button is pressed inwardly, the blade is swung forwardly into a slot 45 between the pressure roller and adjacent wall 13a of the housing. The wall 13a extends upwardly in an oblique direction to form a stationary guide for slidably contacting the non-adhesive side of the tape to direct it outwardly at a clearance distance from the pressure roller when the push button is released, as will appear.

Pivotaly connected to the stud 25 and dis-

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posed between the push bar 24 and the lever 26 is a feed and guide member 46. This guide member comprises a bar 47 extending forwardly and downwardly from the stud 25 to the opening 14. At its forward end the bar has a transverse lug 48 provided with a turned-up ear 49. The ear and bar are apertured on an axis at right angles to the bar, and journaled in these apertures are end trunnions of a guide roller 51 that bridges nearly the full space between the side walls of the housing (Figure 4). In the bar 47 lengthwise thereof there is a slot 52 which is engaged slidably by a stud 53 mounted on the blade lever 37. The slot is curved on an arc throughout the greater portion of its length so as to move the guide roller 51 substantially on a radius line of the pivot axis of the blade lever, at a clearance distance from the guide wall 13a, as the push button is pressed inwardly. However, according to the invention, the end portion of the slot, which is engaged by the stud 53 while the blade is entering the slot 45 to cut the tape, is curved upwardly so that the guide roller is retained at a substantially fixed distance from the blade during the cutting operation. This reduces the tension on the tape during the cutting operation and tends to give a cleaner and straighter cut. By moving the guide roller on the radius line of the pivot axis of the blade lever, the tape is held at right angles to the plane of the blade during cutting. This reduces the adhesive contact of the tape with the blade to a line, and facilitates the cutting action.

To condition the taping device for operation, a supply roll of tape is so mounted on the core 32 that the tape from the outer end thereof is coiled clockwise about the roll on viewing the roll from the open side of the housing. The free end of the tape is then drawn through the opening 14 by way of the space between the guide roller 51 and the wall 13a of the housing, the adhesive side of the tape facing away from the pressure roller and towards the guide roller in view of the positioning of the supply roll on the core as just described. To establish a proper starting length L of tape ahead of the guide roller, the outwardly-projecting tape is held stationary with respect to the housing and the push button is pressed inwardly once, to cut the extending length from the supply roll, and is then released.

Upon pressing the push button inwardly, the supply roll is swung rearwardly and the guide roller which contacts the adhesive side of the tape is retracted from the opening 14 while being maintained at a fixed distance from the supply roll. The length of the path of the tape from the pressure roller to the supply roll is therefore increased. This causes the tape to be backed with respect to the pressure roller, or if the tape is held from backfeeding as by its adherence to an object being taped, which is the case in the normal operation of the taping device, it causes the guide roller to be backed along the tape and the tape to be drawn from the roll. In either case, a starting length L of tape is left projecting ahead of the guide roller after the tape is cut, and is fed out below the pressure roller as the push button is released (Figure 1), the tape being carried by adhesive contact with the guide roller and being guided by sliding contact of its non-adhesive side with the guide wall 13a. In order that the adhesive side of the end of the tape may not contact the guide wall and cause the tape to be buckled back on itself as the push button is released, the end portion of the guide wall nearest the slot 45

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is recessed at 54, according to the present invention, to clear the guide wall from the end of the tape.

To use the present device for taping purposes, the operator holds the housing in his hand with his forefinger overlying the end of the push button, and then tilts the device forwardly to bring the pressure roller against the object to be taped, thus adhesively engaging the starting length of the tape with the object. Next, he moves the device across the object while maintaining the pressure roller in engagement therewith to draw tape from the supply roll and to press it against the object. When the desired length has been applied, the operator presses the push button, while continuing either to move the device forwardly or while holding it stationary, to cut the tape. The reason for not permitting the device to be backfed while the push button is being pressed is to prevent the tape already applied from being pulled loose from the object and to hold the tape taut to facilitate the cutting action.

A number of advantages accrue by using the roller 51 at the end of the guide member 46. For instance, the roller permits the guide member to be backfed along the adhesive side of the tape preliminary to a cutting operation without offsetting the gum or in any way destroying its adhesive qualities. Also, the roller eases materially the force required to actuate the push button. In this respect, to reduce still further the actuating force, the peripheral surface of the guide roller is broken or recessed, as by knurling, grooving or etching, grooving being shown by way of example (Figure 4), to reduce its contact area with the tape to a value just amply sufficient to maintain adherence of the tape to the roller when the push button is released. A still further advantage of the guide roller is that the free end portion of the tape will remain in adhesive contact therewith, during idle operation of the push button, without the use of a hold-down spring acting against the roller. The elimination of such hold-down spring makes it very easy to thread the tape through the opening 15 when a new roll is installed.

Preferably, the initial positioning of the guide roller is one wherein the roller will clear the tape as the tape is drawn from the supply roll against the pressure roller. However, in view of the breaking of the surface of the guide roller, as above described, the roller will not increase substantially the feed resistance of the tape should the roller be in engagement with the tape during a dispensing operation.

In accordance with the present invention, the aperture 44 in the push bar 24 is made oversize with respect to the engaging lug 43 of the blade lever so that the coupling between these two members will be of a lost-motion type. The result of such coupling is that upon release of the push button from an actuated position the guide roller is returned a short distance before the start of the return of the blade 39. This causes the blade to pick up the end of the starting length of the tape, to deflect it rearwardly away from the pressure roller, as the starting length is fed out of the housing. One advantage of this action is that the tape is prevented from engaging the slot 45, as well as from adhesively contacting the pressure roller, and being buckled back on itself during the feed-out of the starting length. A further advantage is that if, at the end of a taping operation, the operator should release the push button before lifting the device from the object just

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taped, the adhesive side of the tape is prevented from accidentally reengaging the object.

In order to assure positively a delayed return of the blade 39 just described, a friction washer 55 (Figure 4) is interposed between the blade lever 37 and the side wall 12.

In order to effect a clean, straight cut of the tape, particularly of cellophane tape during seasons of the year when it is in a dry and brittle condition, the blade 39 may be cut off along the dash-dot line 58 shown in Figure 5 to give it a pointed end. The edge of the blade along the dash-dot line need not be sharp but the remaining edge should preferably have a sharpness approximating that of a razor edge. With such a blade the pointed end will contact the tape intermediate its width and will first puncture the tape and then effect cutting simultaneously in the opposite directions running from the puncture point.

The opening 22 in the housing is made higher than the height of the push button so that the button may be rocked upwardly when in an actuated position. This upward rocking is for the purpose of engaging an upstanding catch 56, at the rear end of the button, with a rib 57 on the housing to latch the mechanism in an actuated position. The advantage in so locking the mechanism is to retain the starting length of tape in a protected position within the housing as when the device is set aside or is being carried in a pocket, handbag, or the like.

The embodiment of my invention herein particularly shown and described is intended to be illustrative and not limitative of my invention since the same is subject to changes and modifications without departure from the scope of my invention, which I endeavor to express according to the following claims.

I claim:

1. In a dispenser for pressure-sensitive tape: the combination of a support for a supply roll of said tape, a movably-mounted guide roller engaging the adhesive side of the tape at a distance from the free end thereof for holding a projecting starting length of the tape at a dispensing station solely by adhesive contact, and means effective upon the tape being held stationary at said station for backfeeding said roller against and along the adhesive side of the tape in a direction to increase the length of the tape between said supply roll and said dispensing station.

2. In a taping device including a support for a supply roll of pressure-sensitive tape and a pressure roller for pressing the tape progressively into contact with an object as the tape is drawn from said roll: the combination of a guide roller positioned adjacent to said pressure roller and engaging the adhesive side of the tape at a distance from the free end thereof to hold a projecting starting length of the tape solely by adhesive contact in a dispensing position, means effective upon the tape being held stationary at said pressure roller for retracting said guide roller from the pressure roller in backfeeding relation to the tape and in a direction to increase the length of the tape between said pressure roller and said supply roll, means operable by said last-stated means to cut the tape at a place near said pressure roller while said guide roller is in a retracted position, and a stationary guide wall extending along the path of said guide roller for slidably contacting the non-adhesive side of the tape projecting ahead of the guide roller to guide the projecting tape

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past said pressure roller as said guide roller is returned.

3. In a taping device including a support for a supply roll of pressure-sensitive tape and a pressure roller for pressing the tape progressively into contact with an object as the tape is drawn from said roll: the combination of a movable guide member contacting the tape at a distance from the free end thereof for holding a projecting starting length of the tape in a dispensing position at said pressure roller; actuatable means connected to said guide member for retracting the same from said pressure roller in a direction to increase the length of the path of the tape between said pressure roller and said supply roll whereby to cause tape to be drawn from said roll upon the tape being held stationary at said pressure roller as said actuatable means is actuated, means operable by said actuatable means to cut the tape at a distance ahead of the guide member while the guide member is in a retracted position, and a stationary guide wall extending along the path of said guide member for slidably contacting the non-adhesive side of the tape length projecting ahead of the guide member to guide said length past said pressure roller as the guide member is returned, the end portion of said guide wall nearest said pressure roller being recessed to clear it from the end of said projecting length during said return of the guide member.

4. In a taping device including a support for a supply roll of pressure-sensitive tape and a pressure roller for pressing the tape progressively into contact with an object as the tape is drawn from said roll: the combination of a guide means for holding a projecting starting length of the tape in a dispensing position at said pressure roller, actuatable means connected to said guide means and effective upon the tape being held stationary at said pressure roller to backfeed the guide means along the tape and concurrently to draw tape from said roll, tape-severing means including a blade movable through the tape from the adhesive side thereof at a place adjacent to said pressure roller, means urging said actuatable means into an unactuated position, and a lost-motion coupling between said blade and said actuatable means for moving the blade into cutting position as said guide means is retracted and for returning said blade and guide means when said actuatable means is released, said lost-motion coupling being adapted to delay the start of the return of said blade to cause the blade to pick up momentarily the end of the tape and to deflect it away from said pressure roller as the guide means is returned.

5. The combination set forth in claim 4 including a friction slip means associated with said blade to assure a delaying of said blade within the lost-motion of said coupling during the initial return of said guide means.

6. In a dispenser for pressure-sensitive tape including a support for a supply roll of said tape: the combination of guide means engaging the tape at a distance from the free end thereof to hold a projecting starting length of the tape at a dispensing station; actuatable means mounted for movement through a predetermined range of travel; means operable by said actuatable means, substantially only as the actuatable means is moved through a first portion of said range while the tape is held stationary at said station, for backfeeding said guide means along the tape and for concurrently drawing tape from said roll; a tape-severing blade; and means coupling said

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blade to said actuatable means to cause the blade to engage the tape as said actuatable means is moved through the remaining portion of said range.

7. In a dispenser for pressure-sensitive tape including a support for a supply roll of said tape: the combination of guide means engaging the tape at a distance from the free end thereof to hold a projecting starting length of the tape at a dispensing station; actuatable means mounted for movement through a predetermined range; coupling means between said guide means and said actuatable means effective to cause said guide means to be retracted from said station as the actuatable means is moved through a first portion of said range and ineffective to cause any substantial retraction of said guide means as the actuatable means is moved through the remaining portion of said range; a blade movable into cutting position to cut the tape at said station; and means coupling said blade to said actuatable means to move said blade into said cutting position as said actuatable means is moved through said remaining portion of said range.

8. In a dispenser for pressure-sensitive tape: the combination of a housing for a supply roll of said tape, said housing having an opening through which lengths of tape from said roll are dispensed; a pivotally-mounted support in said housing; a core rotatably mounted on said support for carrying a supply roll of said tape; a guide roller for adhesively contacting the tape drawn from said roll and holding a projecting length at said opening; a bar rotatably supporting said guide roller at its outer end and pivotally connected to said support at the axis of said core, said bar having a slot lengthwise thereof; severing means including a lever pivoted to said housing and a blade mounted on said lever; means for moving said support and for concurrently actuating said lever to cut the tape at said opening, said lever being controlled to cause the blade to engage the tape during the final portion of the actuating stroke of said moving means; and means carried by said lever in slidable engagement with said slot for so guiding the outer end of said bar that said guide roller is moved substantially along a radius line of the pivot axis of said lever as said moving means is actuated through a first portion of its stroke, an end portion of said slot being at an angle to the remaining portion thereof to cause said guide roller to be moved transversely to said radius line as said moving means is actuated through the remaining portion of its stroke to bring said blade into engagement with the tape.

9. In a dispenser for pressure-sensitive tape: the combination of a housing for a supply roll of said tape, said housing having an opening through which lengths of tape from said roll are dispensed; a pivotally-mounted support in said housing; a core rotatably mounted on said support for carrying a supply roll of said tape; a guide roller for adhesively contacting the tape drawn from said roll and holding a projecting length at said opening; a bar rotatably supporting said guide roller at its outer end and pivotally connected to said support at the axis of said core, said bar having a slot lengthwise thereof; severing means including a lever pivoted to said housing and a blade mounted on said lever; means for moving said support and for concurrently actuating said lever to cut the tape at said opening, said lever being controlled to cause the

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blade to engage the tape during the final portion of the actuating stroke of said moving means; and means carried by said lever in slidable engagement with said slot for so guiding the outer end of said bar that said guide roller is moved substantially along a radius line of the pivot axis of said lever as said moving means is actuated.

10. In a dispenser for pressure-sensitive tape: the combination of a support for a supply roll of said tape; a guide roller engaging the adhesive side of the tape at a distance from the free end thereof for holding a projecting length of the tape at a dispensing station solely by adhesive contact; means mounting said guide roller for backfeeding movement in a direction against the adhesive side of the tape between said dispensing station and said supply roll; actuatable means

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coupled to said guide roller for backfeeding the same and for concurrently increasing the length of the tape between said station and said supply roll; and tape severing means operable to sever the tape at said station while said guide roller is retracted from said station.

GEORGE H. FRITZINGER.

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