Feb. 20, 1968 G. H. FRITZINGER 3,369,951

DOUBLE-FACED ADHESIVE APPLICATORS

Filed July 6, 1964 2 Sheets-Sheet 1

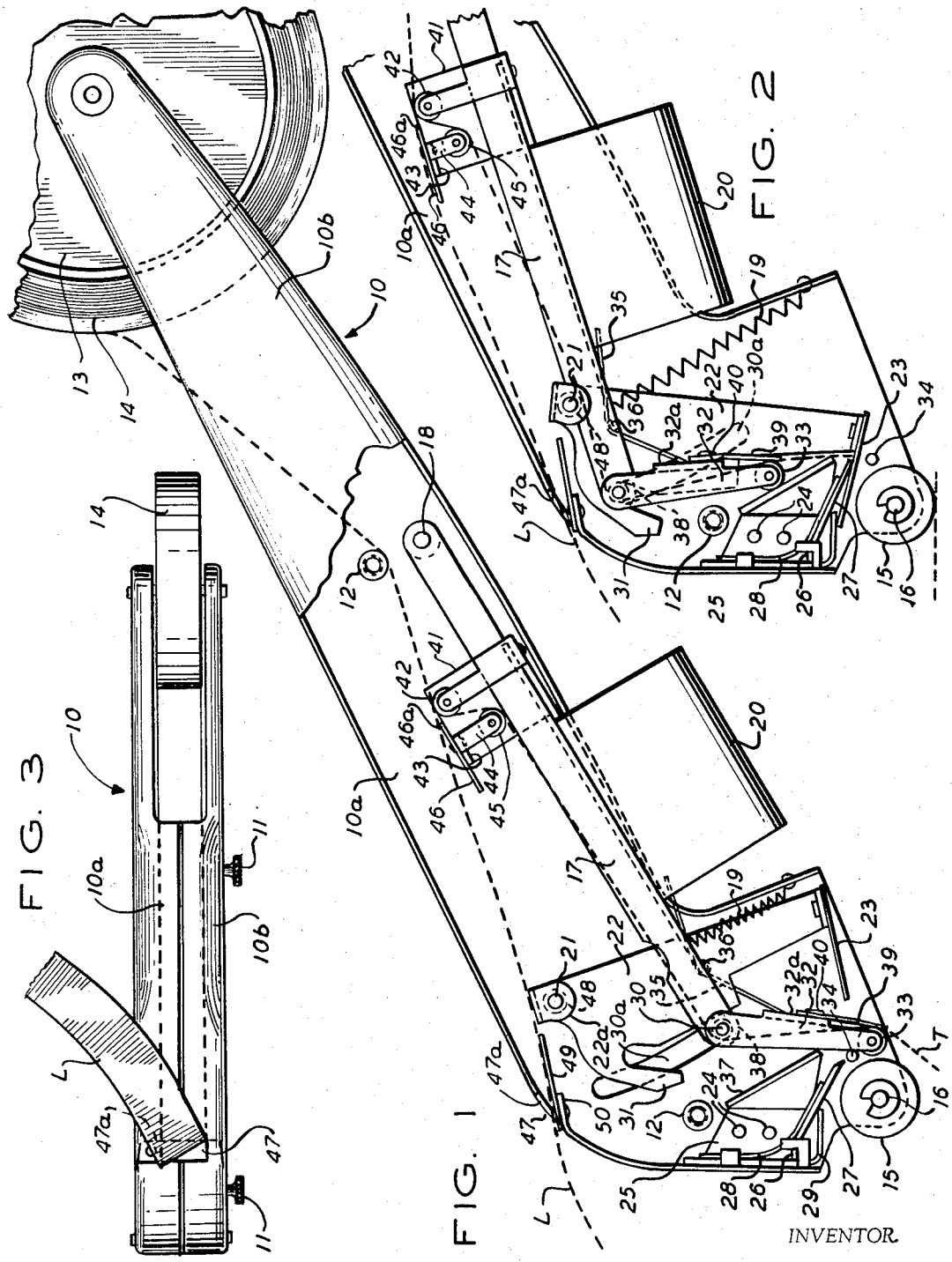


FIG. 1

FIG. 3

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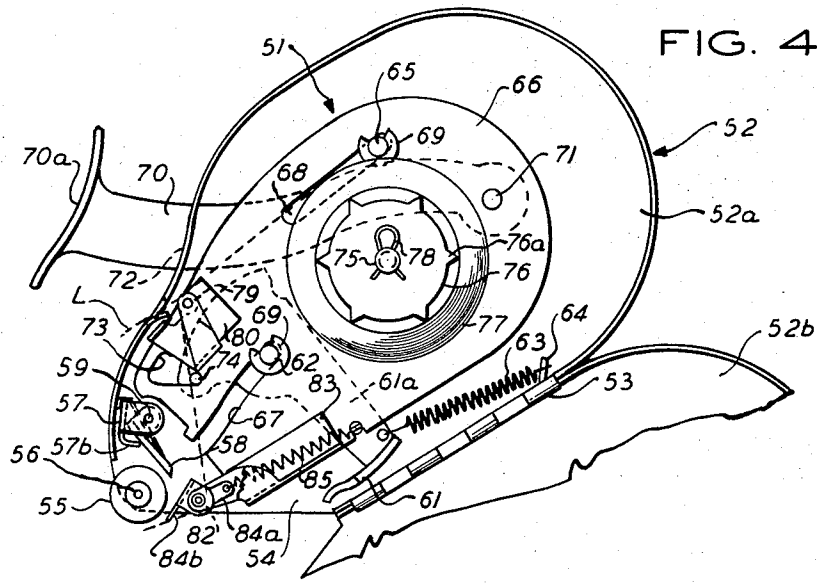
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Filed July 6, 1964 2 Sheets-Sheet 2

FIG. 4



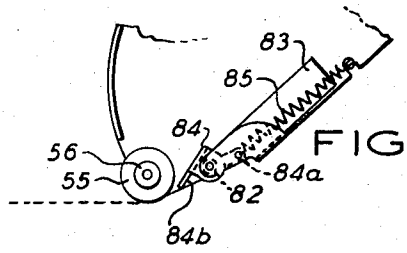
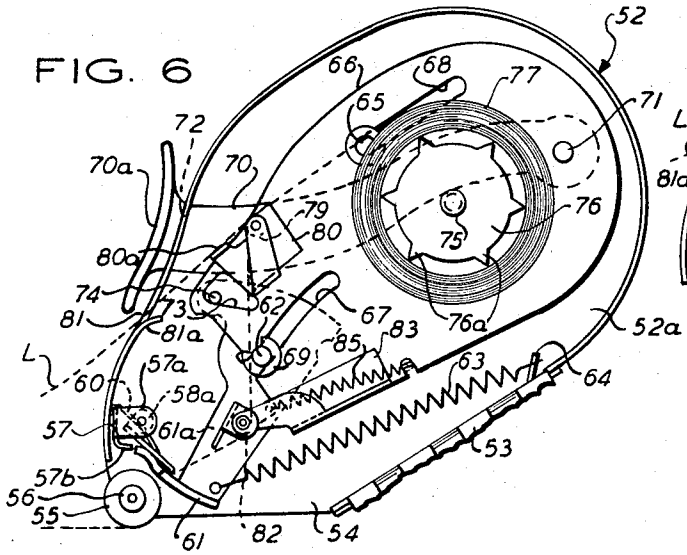


FIG. 5

FIG. 6



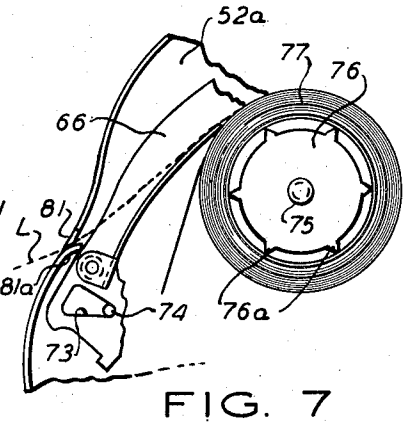


FIG. 7

INVENTOR.

George H Fritzinger

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3,369,951

DOUBLE-FACED ADHESIVE TAPE APPLICATORS

George H. Fritzinger, 18 Oakridge Road,
West Orange, N.J. 07052

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5 Claims. (Cl. 156—523)

ABSTRACT OF THE DISCLOSURE

This application relates to devices for dispensing and applying pressure-sensitive double-faced tape without the interliner, and particularly it relates to hand operable devices which are adapted for direct application of any selected length of such tape.

The term "pressure-sensitive double-faced tape" is used herein to include both the transfer film tapes which comprise a fibrous adhesive film material having two pressure-sensitive adhesive surfaces, and the so-called double-coated tapes which comprise an intermediate layer of paper, plastic or cloth coated on both sides with a pressure-sensitive adhesive. These tapes are wound with a paper or cloth liner covering one of the adhesive surfaces and treated to have a poor adherence with the adhesive surface of the tape so as to enable the liner to be stripped readily from the tape after the tape has been drawn from the roll. The transfer film tapes are mainly an adhesive film which is limp and weak in tension, making it difficult to dispense. The double-coated tapes on the other hand are relatively strong but difficult to cut because of the intermediate layer of paper, plastic or cloth.

An object of my invention is to provide dispensers which handle both the transfer film and the double-coated tapes.

Another object is to provide a light and readily manipulatable dispenser for such tapes which strips the liner from the tape and feeds it out of the housing as the tape is dispensed and applied.

Another object is to provide a simple and economical form of such dispenser which permits the extending lengths of the liner to be readily tear-cut and removed as desired.

Another object is to provide a new and improved dispenser mechanism which cuts the double-faced tape by a scissors action and then projects out a starting length of the double-faced tape for another tape application without any fouling of the tape.

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

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

FIGURE 1 is a side elevational view of a hand dispenser for double-faced tape according to one embodiment of the invention, showing the dispenser with the side cover partly broken away;

FIGURE 2 is a side elevational view of the dispenser mechanism of FIGURE 1 showing scissors cutter in operated position;

FIGURE 3 is a top plan view of this dispenser illustrating the tear cutting of the liner extending from the dispenser housing;

FIGURE 4 is a side elevational view of another dispenser according to the invention, showing fractionally the side hinged cover in open position;

FIGURE 5 is a fractional view of the front portion of the dispenser of FIGURE 4, showing the guide for the starting length of tape in the position which it assumes as tape is being drawn from the dispenser;

FIGURE 6 is another side view of dispenser mechanism of FIGURE 4 showing the parts and the positions which they assume when the cutter is operated; and

FIGURE 7 is a fractional side elevational view of the dispenser of FIGURE 4 showing an alternative means for stripping the liner from the tape.

The embodiment of my invention shown in FIGURES 1 to 3 is a modification of the dispenser for strapping tape shown in my Patent No. 2,906,426, dated Sept. 29, 1959, wherein the dispenser has been adapted for dispensing and applying double-faced tape without the interliner. This dispenser comprises a housing including a frame section **10***a* carrying the operating mechanism and a side cover section **10***b* held removably to the frame section by two thumb screws **11** which thread into respective studs **12** staked to the inner wall of the frame section. The two sections have rearwardly extending arms spaced apart to carry a reel **13** therebetween for supporting a roll of double-faced tape **14**. The central portion of the housing is rounded so that it can be gripped by the hand, and the forward or head portion of the housing is enlarged and open at the bottom to allow the tape to be drawn from the housing via the handle portion. At the forward end of this head portion there is an applicator roller **15** journaled on a stud **16** staked to the frame section. This roller has a silicone rubber sleeve so that it will not adhere to the double-faced tape. A starting length T of the tape is projected alongside this applicator roller to enable an application of tape to be started simply by setting the roller onto a surface to be taped and rolling it along the surface to the desired length.

The dispenser mechanism includes a channel-shaped rocker **17** pivoted at the rear end of the handle portion of the housing on a stud **18** staked to the frame section **10***a*. The rocker is biased into its downward position by a return spring **19** connected between the rocker and a wall of the head portion of the housing. A trigger **20** on the central portion of the rocker extends below the handle portion of the housing to enable the rocker to be pressed upwardly against the force of the return spring by the grip of the hand holding the dispenser. Pivoted at the forward and upper part of the handle portion of the housing on a stud **21** staked to the frame section **10***a* is a blade lever **22** which has a cross arm at its upper end with a turned down apertured lug **22***a* also embracing the stud **21** to provide a stable pivoted mounting and which has a cross arm at its lower end carrying a swing blade **23**. Secured by rivets **24** to the very forward end of the frame section is a bracket **25** to which a blade **27** is pivoted at **26**. This blade is biased about its pivot axis by a cantilever spring **28** against a locating tongue **29** on the bracket **25**. On the forward end of the rocker **17** is a cross pin **30** with an end portion which extends through a slot **30***a* in the frame section **10***a*. This end portion of the cross pin engages a hook-shaped finger **31** of the blade lever to swing the blade lever forwardly and engage the scissors blades **23** and **27** as shown in FIGURE 2 when the trigger **20** is pressed inwardly.

Pivoted to the cross pin **30** on the rocker **17** is a tape guide lever **32** of a U-shape having a cross member **32***a* joining the two side legs of the lever. Journaled to the lower end of the guide lever is a guide roller **33** comprising a metal core covered with a tube of silicone rubber. This guide lever is biased forwardly against a stop pin **34** on the frame section **10***a* by a torsion spring **35** anchored to the rocker at **36** and having one leg bearing forwardly against the cross member **32***a* of the guide lever and the other leg extending rearwardly and bearing upwardly against the cross member of the rocker. Secured also by the rivets **24** to the frame section **10***a* is an L-shaped guide bracket **37** against which the guide roller **33** runs under pressure of torsion spding **35** when the trigger **20** is pressed

inwardly and released. As will appear, the double-faced tape is drawn from the supply roll across a tape feed roller **38** journaled on the central portion of the pin **30** carried by the rocker and is then led downwardly across the back side of the guide roller **33**. In order that the tape will be retained in contact with the guide roller there is a cantilever spring **39** secured at **40** to the cross member **32***a* of the guide lever and leading downwardly past the back side of the guide roller to hold the tape clamped thereagainst. The inner side of this clamp spring is faced with a material such as Teflon (polytetrafluoroethylene) to reduce the adherence of the tape to the spring.

Secured to a rearward portion of the rocker **17** is an upright U bracket **41** carrying a first roller **42** at a level spaced above the rocker. This bracket has a cross arm **43** ahead of the roller **42** and of a length equal to that of the roller. At the outer end of the cross arm is an apertured lug **44**. Journaled between the back wall of the bracket and this apertured lug **44** is a second roller **5** which is positioned ahead and below the roller **42**. Secured to the top face of the cross arm **43** is a stripper plate **46** which is approximately tangent to the roller **42** but its adjacent edge **46***a* is spaced about 1/32" from the roller. The tape is lead across the top of the roller **42** and around to the lower side of the roller **45** with the liner being separated from the tape where it curves around the top roller and being guided forwardly across the top side of the stripper plate. From the stripper plate the liner is fed through a slot **47** in the top side of the housing sections at the front of the handle portion thereof. The double-faced tape without the liner is led forwardly from the bottom side of the roller **45** across the feed roller **38** and downwardly between the guide roller **33** and clamp spring **39**. To reduce adherence of the tape the rollers **42** and **45** are covered with silicone rubber sleeves and the feed roller **38** is provided with a heavy knurl. Also, the post **21** on which the blade lever is pivoted has thereon a silicone rubber sleeve **48** to reduce adherence of the double-faced tape thereto when the mechanism is in its operated position shown in FIGURE 2.

In operation, since the liner L is relatively stiff it will feed forwardly from the stripper plate **46** through the slot **47** as the tape is drawn from the supply roll. As lengths of the liner accumulate it can be tear cut by drawing it sidewise on a bias against the edge **47***a* of the housing slot. In order to prevent the leading edge of the liner from falling down into the housing after the liner is so cut, an inwardly extending plate **49** is riveted to the lug **50** which is lanced inwardly in forming the slot **47**. The top side of the cross member of the blade lever **22** also aids in guiding the liner from the stripper plate through the slot **47**.

When the trigger is in its returned position shown in FIGURE 1 the starting tape will extend downwardly past the guide roller **33** as shown by the dotted line T. Upon setting the applicator roller **15** onto a surface to be taped and rolling it forwardly a length of the tape will be applied with the tape being drawn from the supply roll around the rollers **42** and **45** and across the feed roller **38**. At the same time the liner is separated progressively from the tape both by the curvature of the stripper roller **42** around which the tape is drawn and by the action of the stripper plate **46**. When the desired length of double-coated tape is applied the trigger **20** is pressed inwardly causing the guide roller to be moved upwardly to the position it has in FIGURE 2 and causing the tape to be cut at a distance ahead of the guide roller by the cutter blades. Upon releasing the trigger the dispenser mechanism is returned by the spring **19** to the position it has in FIGURE 1. In so returning to this position a projecting end portion of the tape ahead of the guide roller and the clamp spring **39** is carried downwardly to a starting position as above-described.

In FIGURES 4 to 7 there is shown another form of dispenser which is adapted for dispensing and applying double-faced tape without the liner in accordance with the invention. The basic form of this dispenser is in accordance with the design shown by Patent No. 2,582,980, dated Jan. 22, 1952.

This embodiment of the invention incorporates the same basic features as in the first embodiment in that a stripper for the liner is mounted on a movable portion of the dispenser mechanism and in that the housing is provided with a slot through which the liner is fed and against which the liner can be tear cut.

This embodiment shown in FIGURES 4 to 7 comprises a small pear-shaped housing **52** including a frame section **52***a* and a cover section **52***b* (partially shown) connected to the frame section by a piano hinge **53**. The housing sections may be drawn from metal stampings each to the same contour of which there are left and right sections meeting on a central medial plane. The housing is closed around its entire periphery except for an opening **54** running from the forward end of the hinge to an applicator roller **55** at the nose of the housing. This applicator roller is covered with silicone rubber and is mounted on a stud **56** staked to the frame section **52***a*. Back of the applicator roller within the housing is a bracket **57** having an apertured overhanging lug **57***a*. Between this lug and the wall of the housing section is a pivot blade **58** having turned-over apertured ears **58***a* traversed by a pin **59** which engages the bracket lug **57***a* at one end and a corresponding aperture in the side wall of the housing section at the other end. The blade **58** is biased forwardly by a torsion spring **60** on the pin **59** into a position determined by abutment of the blade against a lug **57***b* on the bracket.

Cooperating with the pivot blade **58** is a swing blade **61** formed integrally with a lever **61***a* at right angles to the blade proper. The lever portion **61***a* lies flat on the side wall of the housing frame **52***a* and is pivoted thereto on a stud **62** staked to this housing frame. The swing lever is biased to an unoperated position shown in FIGURE 4 by a tension spring **63** connected between the lever and a lug **64** struck inwardly from the hinge **53**.

Mounted slidably on the stud **62** and on a second stud **65** also staked to the side wall of the housing frame **52***a* is a slide plate **66**. This plate has a curved slot **67** receiving the stud **62** and a straight slot **68** receiving the stud **65** which serve to guide the plate between its unoperated position shown in FIGURE 4 and its operated position shown in FIGURE 6. The plate is retained on the studs by retainer rings **69**. Between the forward portion of the slide plate and the side wall of the frame section of the housing is the lever portion **61***a* of the swing blade, and between the rearward portion of the slide plate and this side wall of the housing is a trigger **70** pivotally connected to the plate at **71**. This trigger extends forwardly through a slot **72** in the peripheral wall of the housing and has its forward end turned over to form a finger piece **70***a*. The slide plate has also a triangular opening **73** receiving a pin **74** staked to the blade lever **61***a* at a point beyond the pivot stud **62** from the blade **61** itself. By the action of the bias spring **63** on the blade lever, the slide plate is biased into its forward position shown in FIGURE 4. Upon pressing the finger piece of the trigger **70** the slide plate is moved to its operated position shown in FIGURE 6.

Staked to a central portion of the slide plate **66** is a stud **75** on which is mounted a core roller **76** of rubber having peripheral cleats **76***a* which frictionally grip the inside hub of a tape roll **77** when the roll is pressed onto the core. The core is held on the stud by a clip spring **78**.

The tape is drawn from the supply roll **77** around a stripper roller **79** which is of small diameter to place the tape under a sharp curvature causing the liner L to separate from the tape. The roller **79** has trunnion ends pivoted in a bearing hole in the slide plate at one end and in an apertured lug of an L-bracket **80** at the other end. The bracket **80** is secured to the slide plate as by spotwelding. The bracket **80** has also an arm **80***a* in front of the stripper

roller 79 to aid in stripping the liner L from the tape. The stripper roller 79 and stripper arm 80*a* are positioned adjacent the upper peripheral wall of the housing. It is in this wall portion of the housing that a slot 81 is formed by lancing inwardly a lug 81*a*. The liner L is directed through this slot as tape is drawn from the supply roll. Outwardly extending lengths of the liner are tear cut by drawing the liner on a bias against the back edge of the slot. After each tear cut operation the inwardly extending lug 81*a* aids in directing the liner through the slot in the next tape applying operation.

The tape without the liner is drawn from the stripper roller 79 across the under side of a guide roller 82 on the forward end of the slide plate 66. This guide roller has trunnion ends journaled in apertured side arms of a U bracket 83 secured as by spotwelding to the slide plate. During a tape applying operation the tape is led from the under side of the guide roller to the under side of the applicator roller as indicated in FIGURE 4. The tape is held by adhesive contact to the guide roller but this adherence is purposely limited by grooving or knurling the guide roller.

When the finger piece 70*a* is depressed the slide plate is moved rearwardly to carry the guide roller 82 away from the applicator roller, and then the swing blade 61 engages the pivot blade 58 to cut the tape adjacent the applicator roller and at a distance ahead of the guide roller as indicated in FIGURE 6. When the trigger is released the dispenser mechanism is returned by the spring 63 to carry the starting length of tape ahead of the guide roller into a position below the applicator roller for another applying operation.

It is important that the starting length of tape ahead of the guide roller be deflected away from the pivot blade 58 and applicator roller 55 when the dispenser mechanism is returned so that this projecting length of tape will not become snarled. For this reason a guide bail 84 is pivoted on the trunnion ends of the guide roller 82 and is biased into the position shown in FIGURE 4 by a tension spring 85 connected between an ear 84*a* on the guide bail and a hook at the rear end of the bracket 83. The guide bail has a forwardly extending lip 84*b* which contacts the upper face of the projecting length of starting tape to deflect this projecting tape downwardly away from the pivot blade and the applicator roller the instant the tape is cut. Thus the starting length of tape is guided free of these parts as the dispenser mechanism is returned. When the tape is being applied it is drawn straight from the bottom side of the guide roller to the bottom side of the applicator roller since there is only a light tensioning on the guide bail which yields to the pull on the tape required to draw it from the supply roll. The tensioning on the guide bail is however sufficient to deflect the tape away from the pivot blade and to guide the tape free of the applicator roller as the dispenser mechanism is returned.

The embodiments of my invention herein particularly shown and described are intended to be illustrative and not necessarily limitative of my invention since the same are 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. A dispenser for a double-faced pressure sensitive tape wound in roll form with a liner from which the double-faced tape is readily releasable, comprising a housing including means for carrying a supply roll of said tape, said housing having a slot for feed out of said liner, an applicator roller on said housing for applying double-faced tape from said roll after the liner is released therefrom, a reciprocable member in said housing spring biased in one direction, a trigger connected to said reciprocable member and extending outwardly of said housing for moving the reciprocable member in the other direction, means operable by said reciprocable member for cutting the double-faced tape at a point back of said applicator roller as said trigger is depressed and for feeding out a starting length of double-faced tape below said applicator roller as said trigger is released, and means mounted on said reciprocable member for stripping said liner progressively from said double-faced tape and feeding the liner outwardly of the housing through said slot as the double-faced tape is drawn from said housing past said applicator roller.

2. The dispenser set forth in claim 1 wherein said stripping means comprises a stripper roller partially around which said double-faced tape is drawn on a curvature tending to separate the liner from the tape responsive to the stiffness of the liner, and a stripper plate in an adjacent and substantially tangential relation to said stripper roller for aiding in peeling the liner from said tape and directing the liner through said slot as the tape is drawn from said supply roll around said stripper roller.

3. In a dispenser for double-faced pressure sensitive tape wound in roll form with a readily releasable liner: the combination of a housing for carrying a supply roll of said tape and an applicator roller for pressing the tape to a surface after the liner is removed therefrom, said housing having a slot for outward feed of said liner, a reciprocable mechanism mounted in said housing for cutting the tape when the mechanism is shifted in one direction and for presenting a starting length of tape adjacent said applicator roller when the mechanism is returned, stripper means mounted in said housing to engage the tape before it reaches said reciprocable mechanism for stripping the liner from the tape as the tape is drawn from said supply roll, and means in said housing for directing the tape from said stripping means through said slot.

4. The dispenser set forth in claim 3 including a guide roller adjacent said applicator roller and a cooperating clamping member at the back side of said guide roller with respect to said applicator roller for releasably holding tape drawn across the back side of the guide roller to the under side of said applicator roller, said reciprocable mechanism including means for retracting said guide roller from said applicator roller past the line at which the tape is cut as said mechanism is shifted to cut the tape and for returning said guide roller to its position adjacent the applicator roller as said mechanism is returned.

5. The dispenser set forth in claim 3 including a guide roller adjacent said applicator roller and across the back side of which the tape is drawn to the under side of said applicator roller as the tape is dispensed and applied, and a guide bail pivoted coaxially with said guide roller for slidably contacting the side of the tape which confronts the guide roller and the applicator roller, and means biasing said bail member to break adhesive contact of the tape from the cutting elements of said reciprocable mechanism prior to the return of the mechanism and for directing the projecting tape ahead of the guide roller away from said applicator roller as the mechanism is returned, said biasing means being adapted to yield to the tensioning of the tape to allow the tape to be drawn straight from the under side of the guide roller to the under side of the applicator roller as the tape is drawn from said supply roll and applied.

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DOUGLAS J. DRUMMOND, *Primary Examiner.*