

Oct. 8, 1963

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3,106,324

DOUBLE-COATED TAPE DISPENSER

Filed Jan. 27, 1961

3 Sheets-Sheet 1

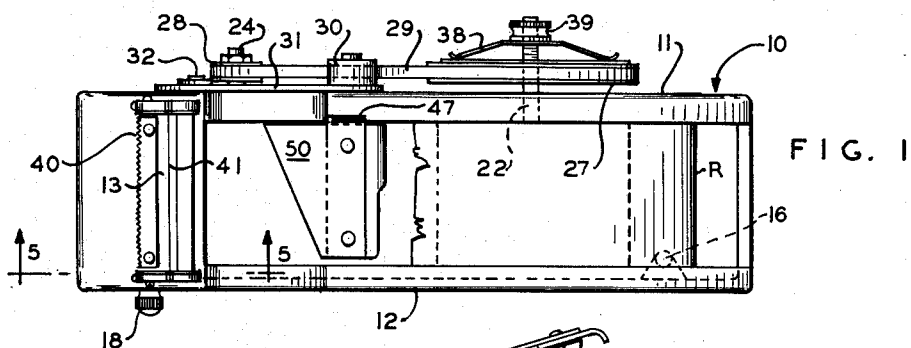


FIG. 2

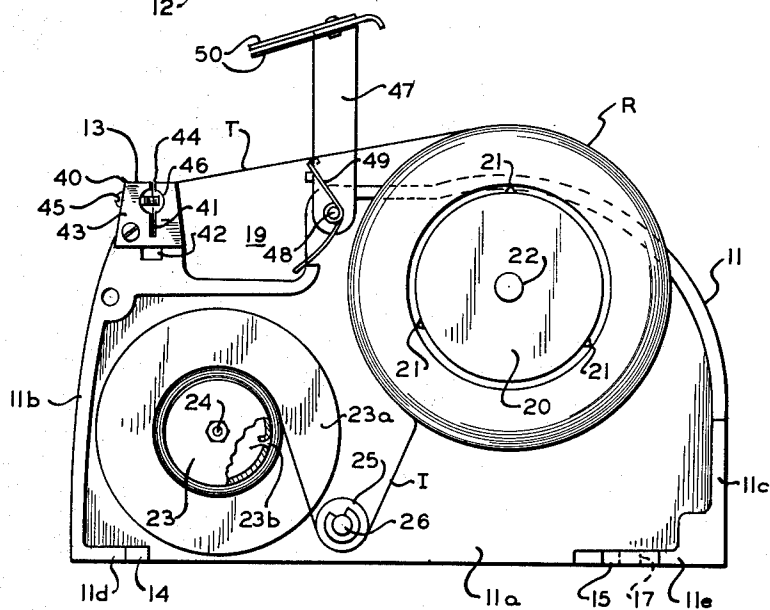
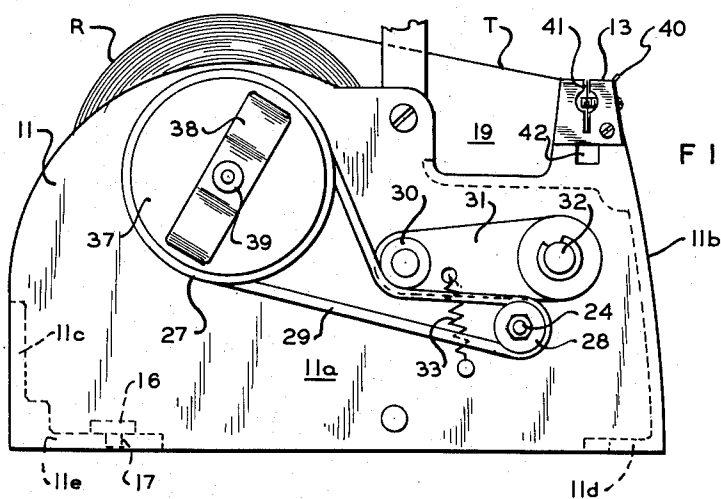


FIG. 3



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3,106,324

DOUBLE-COATED TAPE DISPENSER

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3 Sheets-Sheet 2

FIG. 4

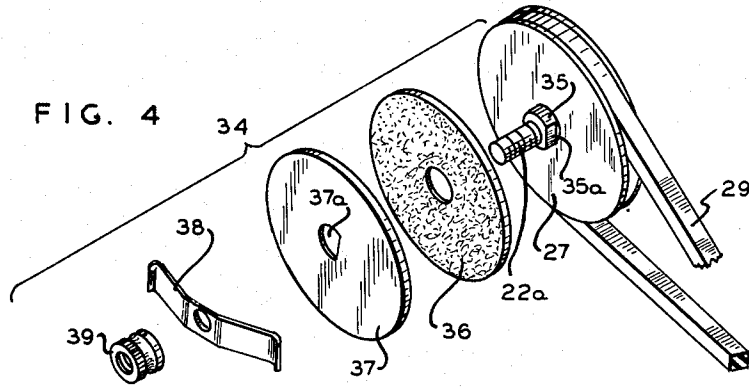


FIG. 5

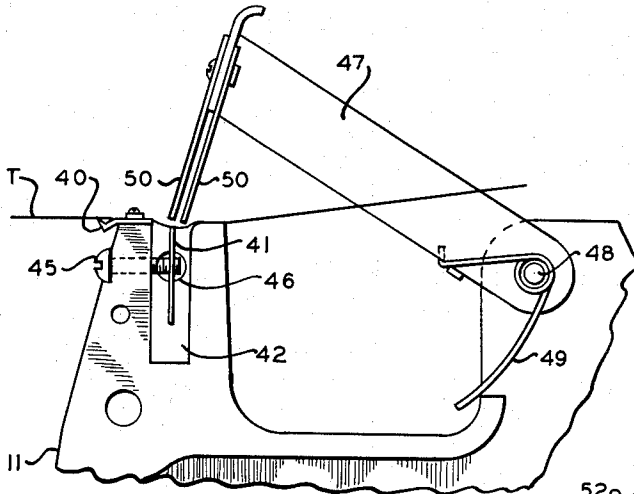
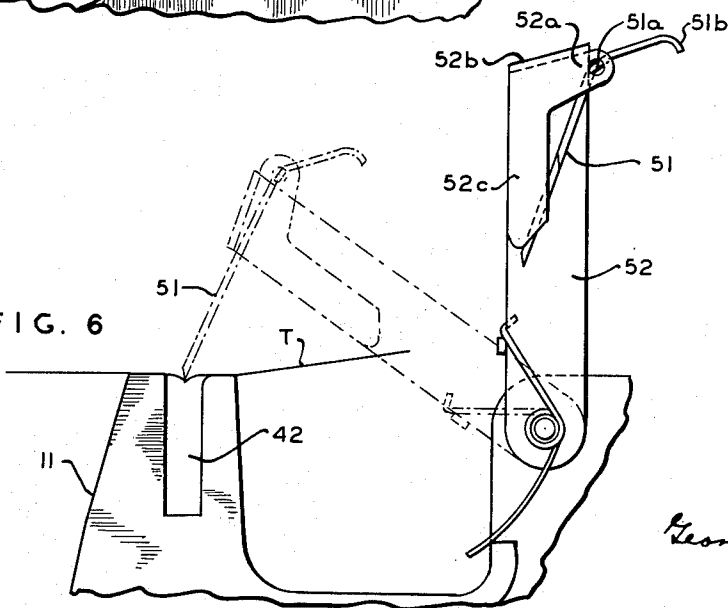


FIG. 6



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3,106,324

DOUBLE-COATED TAPE DISPENSER

Filed Jan. 27, 1961

3 Sheets-Sheet 3

FIG. 7

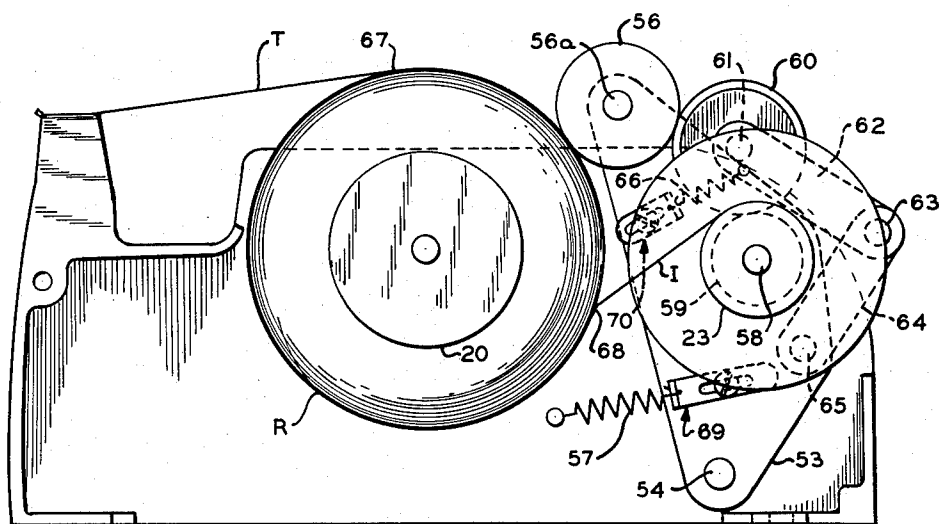
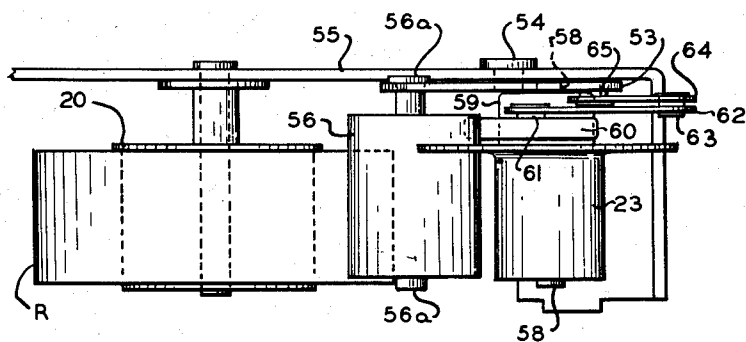


FIG. 8



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1

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DOUBLE-COATED TAPE DISPENSER
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This invention relates to manual pull-off dispensers for double-coated tapes.

The double-coated tapes comprise an intermediate layer or film of a paper, plastic or cloth coated on both sides with pressure-sensitive adhesive. The tape is wound in roll form with a paper or cloth interliner treated so as to have poor adherence with the double-coated tape to permit it to be readily stripped therefrom. Since the double-coated tape has the intermediate layer the tape has a high tensile strength permitting it to be drawn from the supply roll without the interliner attached thereto.

An object of the invention is to provide a simple and compact form of pull-off dispenser for double-coated tapes which incorporates a take-up reeling means overdriven through friction slip means by the unwinding of the supply roll to windup positively the interliner.

Another object is to provide such dispensers wherein the friction slip means is readily adjustable to control the winding tension on the interliner.

Another object is to provide such improved dispenser which operates dependably throughout the entire unwinding of tape which have interliners requiring high tensile force to strip it from the rolls.

Another object is to provide such dispenser in a complete housing affording easy access to both the supply-roll core and the take-up reel to permit easy loading of the dispenser.

A further object is to provide such dispenser wherein the double-coated tape and the interliner are stripped from nearly diametrically opposite sides of the supply roll.

A still further object of the invention is to provide such pull-off dispensers with novel and dependable means for cutting those tapes which cannot be tear cut against a serrated edge. Also, objects of the invention are to provide such improved cutting means which do not leave exposed any sharp cutting edges and which do not obstruct the manual pull-off of the tape from either side of the dispenser.

In manual pull-off dispensers the cutting means must be spaced ahead of the supply roll to provide room for gripping each new length of tape to be drawn from the supply roll and must be spaced vertically from the base of the dispenser especially when a tear cutter is used to permit the user to draw the tape downwardly against the cutter. The dispenser has therefore unavoidably a free space in the lower portion of the housing ahead of the supply roll. A feature of the present invention is in providing a form of drive coupling between the supply roll and the take-up reel which permits the latter to be mounted in this normally unused space. Thus, a dispenser is obtained in its most compact form.

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 top plan view of one embodiment of the invention incorporating a special blade mechanism for cutting the tape;

FIGURE 2 is a right hand elevational view of the dispenser shown in FIGURE 1 but with the side cover removed to show the internal parts;

FIGURE 3 is a left-hand elevational view of the dis-

2

penser showing the drive coupling between the supply-roll core and the take-up reel;

FIGURE 4 is an exploded view of the parts forming the friction slip clutch of the drive coupling;

FIGURE 5 is a fractional view on the line 5-5 of FIGURE 1 showing the cutting mechanism in a partially actuated position to demonstrate the start of the cutting action;

FIGURE 6 is a side elevational view of another cutting mechanism showing by full lines the cutting blade in unoperated position and by dash-dot lines in a partially actuated position to demonstrate the start of the cutting action;

FIGURE 7 is a fragmentary side elevational view of another embodiment of tape dispenser according to the invention; and

FIGURE 8 is a top plan view of the dispenser shown in FIGURE 7.

The embodiment of double-coated tape dispenser shown in FIGURES 1-5 has a housing 10 of generally rectangular shape comprising a main frame section 11 and a removable side cover plate 12. The main frame section 11 is of a shell form comprising the left wall 11a of the housing, a slightly curved front wall 11b, a short back wall 11c and bottom flanges forming front and back feet 11d and 11e for the housing. The upper portion of the front wall 11b forms a head structure 13 whereat the tape is cut as later described. The side cover 12 the same contour as the left wall 11a and is notched at the bottom to receive lugs 14 and 15 extending laterally from the feet 11d and 11e. The cover is secured removably to the main section by a detachable hinge at its lower rearward portion comprising an inset downwardly extending lug 16 on the cover engaging a hole 17 in the foot 11e and by a thumbscrew 18 at its forward upper portion which threads into the front wall 11b. The housing is open to the top between the side wall 11a and side cover 12 from the head structure 13 to the back wall 11c. Along the upper edges of the side wall 11a and cover 12 there are inwardly curved rim flanges as shown. On viewing the housing from the side there appears a trough-like space 19 open to the sides just back of the head structure 13. This space provides access for the fingers to grip a length of double-coated tape T leading from a supply roll R in the rearward portion of the housing to the head structure whereat the leading end is held releasably by adhesive contact.

The supply roll R is mounted on a core 20 provided with peripheral cleats 21 for engaging the inside hole of the roll with a driving fit. The core has a shaft 22 journaled in a bearing on the side wall 11a. In the forward lower portion of the housing is a take-up reel 23 for the interliner I having a shaft 24 journaled also in a bearing on the side wall 11a. The reel has a large flange 23a at its inner side to space the interliner wound on the reel from the adjacent side wall 11a. The core of the reel has a slit 23b for receiving the end of the interliner and attaching the same thereto. The interliner is lead from the bottom of the supply roll around an idler roller 25 to the take-up reel, the roller 25 being journaled on a stud 26 staked to the side wall 11a. By so stripping the interliner at a point spaced nearly oppositely from that where the tape T is stripped from the supply roll these two stripping points are prevented from merging as the tape is drawn from the roll. The interliner is therefore always stripped directly from the supply roll to require only a limited amount of overdrive of the take-up reel, as will appear.

The drive coupling between the supply roll core 20 and the take-up reel 23 comprises a large drive pulley 27 on an extension of the shaft 22 and a small driven

pulley 28 on an extension of the shaft 24. The two pulleys are interconnected by a flexible V belt 29 trained past an idler roller 30 journaled on an arm 31 pivoted at 32 to the side wall 11a. The arm 31 is biased by a tension spring 33 to hold the belt taut.

The ratio of the diameter of the drive pulley 27 to that of the driven pulley 28 is made greater than the ratio of the diameter of a full-sized supply roll R to the diameter of the core of the take-up reel 23. This is done so that the reel will tend always to be overdriven to wind up the interliner under sufficient tension to strip it from the supply roll throughout the entire unwinding of the latter. However, because of this overdriving of the reel a slippage in the drive coupling is necessary. This slippage is provided by a friction slip clutch 34 shown in exploded view in FIGURE 4. The clutch comprises the drive pulley 27 journaled freely on a flanged bushing 35 secured to the shaft 22. Applied flat against the outer face of the pulley 27 is a friction disk 36 as of a cork compound, and applied next against the cork disk is a metal clutch disk 37. However, the portion of the hub 35 extending past the outer face of the pulley 27 has a flat 35a and the clutch disk 37 has a corresponding non-circular center hole 37a so these two parts have a driving engagement. Beyond the hub 35 the shaft 22 has a threaded extension 22a. A clutch spring 38 is placed on this extension and compressed by a thumb screw 39 to the desired extent to obtain the necessary windup tension on the interliner at which slippage occurs.

The belt coupling shown in FIGURE 3 is operative only when the supply roll is turned clockwise as it appears in this figure. The user is therefore required to load the dispenser so that the tape T will be drawn from the top of the supply roll. Also, for this same purpose the slit 23b in the take-up reel is adapted to grip the end of the interliner only when the take-up reel is turned in the same direction. The advantages in so loading the dispenser is that more finger space is provided in the trough 19 to grip the tape when the tape is lead from the top of the supply roll, and the points where the tape T and interliner I are stripped from the supply roll are so widely spaced as to prevent them from merging as successive lengths of tape are drawn from the supply roll.

On the top surface of the head structure 13 along the front edge thereof is mounted a serrated cutting member 40 for tear cutting lengths of tape drawn ahead of the head structure as the lengths are pulled sidewise against the serrated edge. After a length of tape has been so cut off the leading edge of the remaining length of tape T leading from the supply roll is held by adhesive contact with the top smooth surface of the cutting member 40 just back of its serrated edge.

For the double-coated tapes which can not be tear cut such as those with a cloth intermediate layer there is provided a special cutting mechanism comprising a razor blade 41 located in a wide transverse slot 42 in the head structure 13 so that the sharp upper edge of the blade is not exposed to present a hazard to the user. The blade is mounted at its ends in respective blocks 43 having narrow slits 44 open to the top to receive the blade. The blade has notches in its ends engaged by screws 45 threaded through the blocks from the front. To remove the blade the screws 45 are unthreaded until they are disengaged from the blade and then the user extends his fingernails into central openings 46 in the blocks and lifts the blade out of the slot 42.

The cutting mechanism comprises further a blade lever 47 pivoted at 48 in the side wall 11a back of the trough 19. The lever has an inverted L shape and is biased into an upright position by a torsion spring 49 against an edge of the rim flange on the side wall. Riveted to opposite sides of the upper cross member of the blade lever are two blade members 50 each in the form of a

thin plate having its leading edge inclined in the direction of swinging movement which the blade members receive when the lever 47 is turned forwardly. These blade members are positioned to move into the cross slot 42 at opposite sides of the razor blade 41. The inclined leading edges of the blade members are not sharpened, and are preferably even rounded, so that they present no cutting hazard to the user. As the blade members are moved into the cross slot they press the tape across the head structure progressively along its width onto the sharp razor edge of the blade 41 to cut the same. When the user removes his hand from the lever 47 the latter is snapped back by the torsion spring 49 into its upper position leaving the leading portion of the tape T held by adhesive contact with the top surface of the head structure back of the slot 42 as shown in FIGURE 5.

In FIGURE 6 there is shown another form of cutting mechanism comprising simply a sharp cutting blade 51 mounted on a lever 52 corresponding to the lever 47 of the previous embodiment. As lever 52 is swung forwardly the blade 52 cuts a tape held taut across the slot 42. In order to protect the user from the sharp cutting edge of the blade the same is pivoted to the lever by providing it with oppositely extending lugs 51a which pivotally engage apertured ears 52a at opposite ends of the upper cross bar 52b of the lever, and further the lever is provided with an arm 52c at the far end of the cross bar which is parallel with the main arm of the lever. The blade normally hangs down by its own weight between the main arm of the lever and the side arm 52c to prevent accidental contact with the cutting edge. Extending rearwardly from the pivot axis of the blade 51 is a fingerpiece 51b. When the user presses against this fingerpiece the blade is first turned upwardly until it is stopped by the cross member 52b and is then swung forwardly into the cross slot 42 leading edge first. When the blade reaches its dotted position shown in FIGURE 6 it begins to cut the tape as indicated because of the leading edge being inclined in the direction of swinging movement of the blade. Upon release of the fingerpiece the blade is returned to its unoperated position.

In the embodiment of double-coated dispenser shown in FIGURES 7 and 8 the take-up reel is overdriven through a friction slip means directly by the supply roll R instead of from the supporting core 20. The drive coupling comprises a rocker arm 53 positioned for example at the back of the supply roll R and offset from the inner side thereof. The rocker is pivoted on a transverse stud 54 at its lower end to a housing frame 55 fractionally shown. Journaled at 56a to the upper end of the rocker arm is a drive roller 56 which extends crosswise of the supply roll and past the inner side thereof. Under influence of a tension spring 57 connected between the rocker and the frame the drive roller is pressed into driving engagement with the peripheral surface of the supply roll.

Journaled on a transverse stud 58 rearwardly and downwardly from the drive roller 56 is the take-up reel 23. The reel is in line with the supply roll but has a driven wheel 59 secured to the inner end thereof which forms a drive train with the drive roller 56 and with an intermediate friction wheel 60. The wheel 60 is journaled at 61 to a link 62 which is pivoted at 63 to an arm 64 itself pivoted at its lower end to a stud 65 on the rocker 53. The link is biased by a tension spring 66 to pull the intermediate wheel into driving engagement with the drive roller 56 and the driven wheel 59. The drive roller and driven wheel may for example have metal peripheral surfaces and the intermediate wheel may be rubber tired.

In the drive coupling of FIGURES 7 and 8 the journal axis of the take-up reel must be spaced from the drive roller 56 and from the supply roll R at least by the radius of the largest size of interliner roll to be wound on the take-up reel. Another limitation on the drive train is that the driven wheel 59 be smaller in diameter than that of

5

the take-up reel so that the reel will tend always to be overdriven at a faster peripheral speed than that of the supply roll.

Because of the overdriving tendency just mentioned a friction slip means must be provided in the drive coupling. This slippage may occur between the drive roller 56 and the supply roll R or in the drive train itself. In the particular illustrative embodiment of the invention herein shown the tape T is stripped at 67 from the top of the roll R and the interliner I is stripped at 68 from a lower rearward part of the roll. The drive roller 56 engages the exposed adhesive side of the tape on the roll between these two stripping points and has a strong drive coupling with the roll even under a low biasing pressure of the rocker 53. However, this biasing pressure may be varied to set the winding tension on the interliner at which slippage will occur between the drive roller 56 and the supply roll R by providing an adjustable connection 69 between the biasing spring 57 and the rocker 53. Alternatively, the drive roller 56 may have a non-slip engagement with the supply roll and the bias pressure of the intermediate wheel 60 may be adjusted to set the winding tension on the interliner at which slippage will occur by providing an adjustable connection of the biasing spring 66 with the rocker 53.

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 endeavour to set forth according to the following claims.

I claim:

1. A dispenser for double-coated pressure sensitive tape wound in roll form with a non-adhesive interliner from which the pressure sensitive tape is readily releasable, comprising a housing, a core journaled to said housing for carrying a supply roll of said tape, said core having peripheral means for engaging said supply roll without slippage to provide a drive connection between the supply roll and core, a dispensing station on said housing unobstructed across the top thereof and including means for cutting off lengths of double-coated tape drawn past the station from the supply roll, said station being separated from the supply roll by a free space open at the sides of the housing to provide access for the fingers of the hand to grip the double-coated tape prior to drawing lengths of the tape from the supply roll, a take-up reel for said interliner journaled on said housing on an axis parallel to that of said core, said take-up reel being mounted in said housing below said free space between the core and said station, means on said take-up reel for attaching thereto an end of the interliner drawn from the supply roll, and a drive coupling including an adjustable friction slip clutch between said core and said take-up reel, said drive coupling having a transmission ratio tending to over-drive said take-up reel with a peripheral speed greater than the peripheral speed of said core whereby as the double-coated tape is drawn past said station from the supply roll the take-up reel is driven with slippage of said clutch to strip the interliner from the supply roll and wind the same on the reel.

2. A dispenser for double-coated pressure sensitive tape wound in roll form with a non-adhesive interliner from which the pressure-sensitive tape is readily releasable, comprising a generally rectangular housing as viewed from the side, a core spaced from the base of the housing and journaled on a rearward portion of the housing for carrying a supply roll of said tape, means on said core for holding a supply roll in fixed driving engagement therewith, a dispensing station including a cutter on a forward portion of the housing substantially at the level of said core, said housing having a free space between said station and core open at the sides to provide access for gripping the double-coated tape prior to drawing the tape from the supply roll, a take-up reel for said inter-

6

liner journaled on a lower portion of said housing below said free space, means on said take-up reel for attaching thereto an end of said interliner leading from said supply roll, a drive coupling including a friction clutch between the core and take-up reel having a transmission ratio tending to overdrive the reel at a greater peripheral speed than that of said core as the tape is drawn from the supply roll, said drive coupling being operative in the direction of the supply roll causing the double-coated tape to lead from the top thereof as the tape is drawn past the dispensing station, and an idler roller below the supply-roll core and around which said interliner is led from the bottom of the supply roll to said reel whereby the interliner is stripped from the supply roll on a line substantially diametrically opposite from the line where the double-coated tape is stripped from the supply roll.

3. The dispenser set forth in claim 1 wherein said attaching means includes a narrow transverse slit in said take-up reel operative to receive an end of said interliner and attach the interliner thereto only in the direction of driven movement which said take-up reel receives when the double-coated tape is unwound from the top of the supply roll and drawn past said dispensing station.

4. The dispenser set forth in claim 1 wherein said cutting means comprises a transverse slot in the forward portion of said housing, a cutting blade mounted in said slot midway between the walls thereof and having a sharp cutting edge at the top, and a pair of spaced plate members mounted for swinging movement into said slot at opposite sides of said cutting blade, said plate members having leading edges inclined in their direction of movement whereby upon a tape being held across said slot the leading edges of said blade members press the tape progressively past the top cutting edge of said blade to cut the tape as said plate members are moved into the slot.

5. The dispenser set forth in claim 1 wherein said cutting means comprises a transverse slot in the housing at said dispensing station open to the top and across which the adhesive double-coated tape is drawn from said supply roll with placement of the tape in adhesive contact with the top edges of the side walls of said slot to hold the tape taut across the slot by said adhesive contact when the tape is to be cut, a lever pivoted on said housing on an axis parallel to said slot between the dispensing station and said core, a blade mounted on said lever parallel to the pivot axis thereof for swinging movement into said slot from an upper rearward position, said blade having a sharp leading edge inclined in the direction of movement of the blade whereby upon the tape being held taut across said slot by said adhesive contact with said side walls the same is cut progressively crosswise thereof as the blade is moved into the slot.

6. A cutter for a pull-off dispenser of pressure sensitive tape comprising a frame having a head structure with a transverse slot open at the top and having a surface for releasably holding by adhesive contact the end portion of a tape leading from a supply roll mounted rearwardly of the head structure, said head structure having free space at the back and across the top thereof to enable the tape to be gripped by the hand and drawn onwardly past the head structure, a lever pivoted to said frame back of said head structure on an axis parallel to said slot and biased into an upright position, a cross member on the upper portion of said lever parallel to the pivot axis of the lever, a downwardly extending arm on the far end of said cross member, a cutting blade, means pivotally connecting a back portion of said cutting blade between said lever and said arm on an axis at said cross member, said blade having a sharp leading edge oblique to its pivot axis and said blade being biased about its pivot axis on said lever normally to assume a position in line with said lever and arm to prevent exposure of the cutting edge of the blade, and a rearward finger-piece on said blade extending rearwardly of said cross member to cause the blade

to be first turned forwardly in line with its path of swinging movement and thereupon the lever to be turned forwardly to swing the blade leading edge first into said slot to cut a tape held across the slot as the lever is moved forwardly by pressure exerted on said finger-piece.

7. A cutter for a pull-off dispenser of pressure sensitive tape comprising a frame having a head structure with a transverse slot open at the top and having a surface for releasably holding by adhesive contact the end portion of a tape leading from a supply roll mounted rearwardly of the head structure, said head structure having free space at the back and across the top thereof to enable the tape to be gripped by the hand and drawn onwardly past the head structure, a stationary blade mounted in said slot midway between and at a spacing from the side walls of the slot, said blade having a razor sharp cutting edge at the top approximately flush with the top edges of the slot, an L-shaped blade lever pivoted back of said free space behind said structure on an axis parallel with said slot, means biasing said blade lever into an upright position, and a pair of plate members mounted in spaced parallel relation on the upper cross member of said blade lever for swinging movement forwardly and downwardly into said slot at a clearance respectively from the opposite sides of said cutting blade, said plate members having leading edges inclined in the direction of their movement for pressing a tape held across said slot into progressive contact with the cutting edge of said cutting blade to cut the tape crosswise thereof as the blade members are moved into said slot.

8. The cutter set forth in claim 7 including block members at the ends of said transverse slot having slits therein open at the top and in the medial plane of said slot for receiving end portions of said cutting blade, said cutting blade having notches in the ends thereof, means in said blocks for engaging said notches to lock the cutting blade in mounted position, and central openings in said blocks providing access to engage said notches and lift the cutting blade out of said blocks while said locking means are disengaged.

9. In a manual pull-off dispenser for double-coated tape wound with a non-adhesive interliner in roll form: the combination of a frame, a core journaled on said frame for supporting a supply roll of said tape, a take-up reel for said interliner and supporting means therefor mounted on said frame, a cutter on said frame spaced forwardly from said supply roll to provide access for gripping a length of double-coated tape leading from the

supply roll to said cutter and drawing the tape forwardly ahead of the cutter, and means power driven by rotation of the supply roll as the tape is drawn manually therefrom for rotating said take-up reel to wind up said interliner, said means comprising a drive transmission between the supply roll and said take-up reel having a transmission ratio tending to overdrive the reel with a peripheral speed greater than that of said core, and said drive transmission including friction slip means to allow slippage in the drive transmission to the extent of said overdrive as tape is drawn from the supply roll, said power driven means comprising a rocker pivoted to said frame, a drive wheel journaled on said rocker in axially parallel relationship with said core and extending past one side of said roll, means biasing said rocker to hold said drive wheel in frictional engagement with the peripheral surface of said supply roll, means rotatably mounting said take-up reel on said rocker with its axis parallel to that of said core and spaced from the supply roll and from said drive wheel at least by the radius of the largest sized roll of said interliner to be wound on said reel comprising a driven wheel on one end of said reel extending beyond said one side of said supply roll and provided with a diameter less than that of said reel, and an intermediate friction wheel between said drive and said driven wheels whereby said reel tends to be driven responsive to rotation of said supply roll at a greater peripheral speed than that of the supply roll.

10. The combination set forth in claim 9 wherein said drive wheel is positioned to engage the adhesive side of the double-coated tape on said supply roll at a place beyond that where the interliner is stripped from the supply roll and before that where the double-coated tape is stripped from the supply roll, including means for adjustably biasing said intermediate wheel against said drive and driven wheels to preset the windup tension on the interliner at which slippage occurs in said drive train.

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