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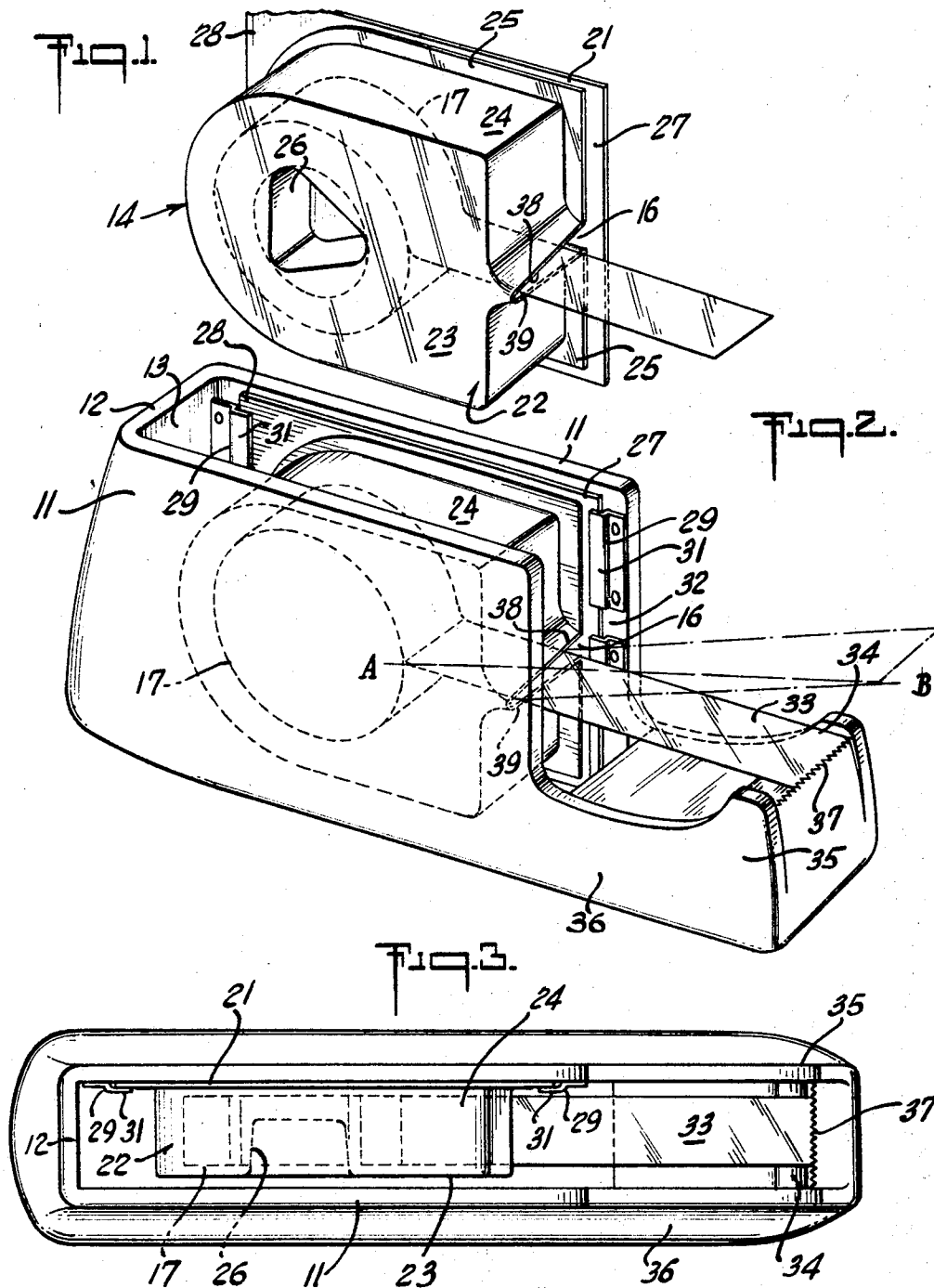
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3,403,869

TAPE CARTRIDGE AND DISPENSER

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3 Sheets-Sheet 1



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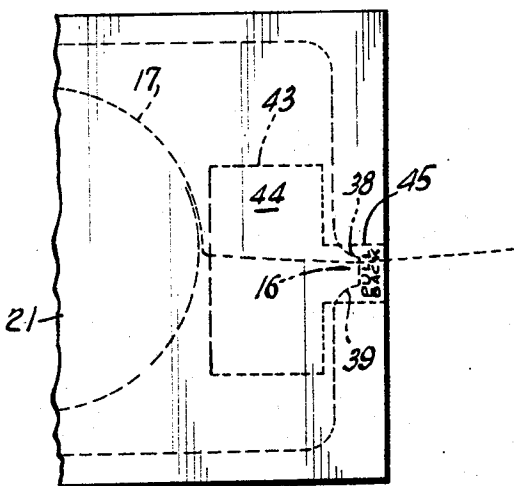
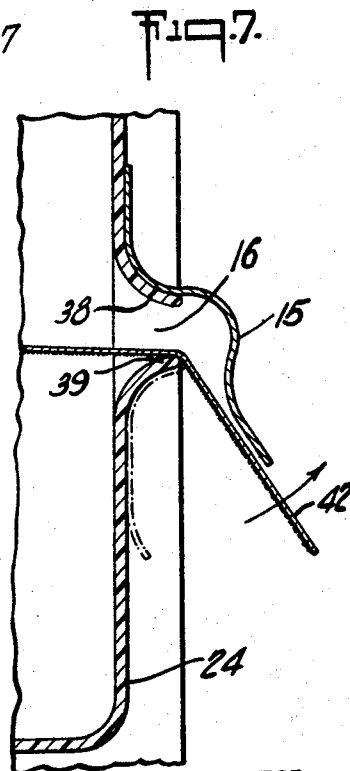
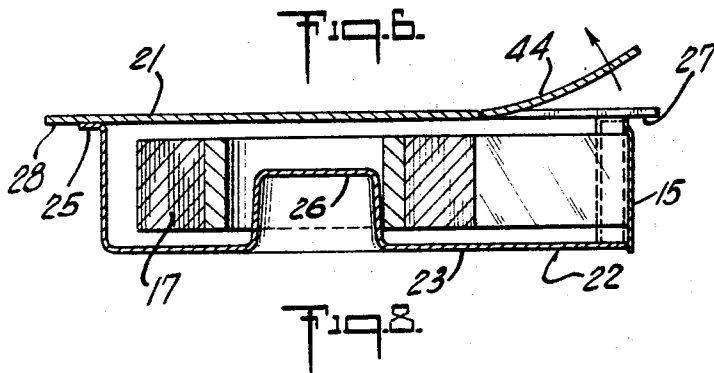
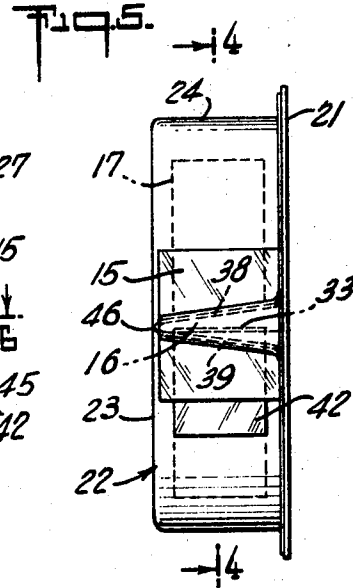
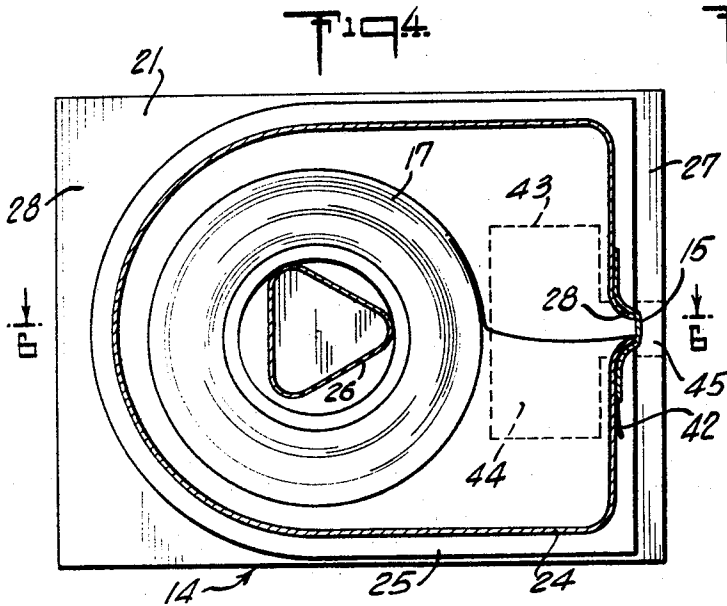
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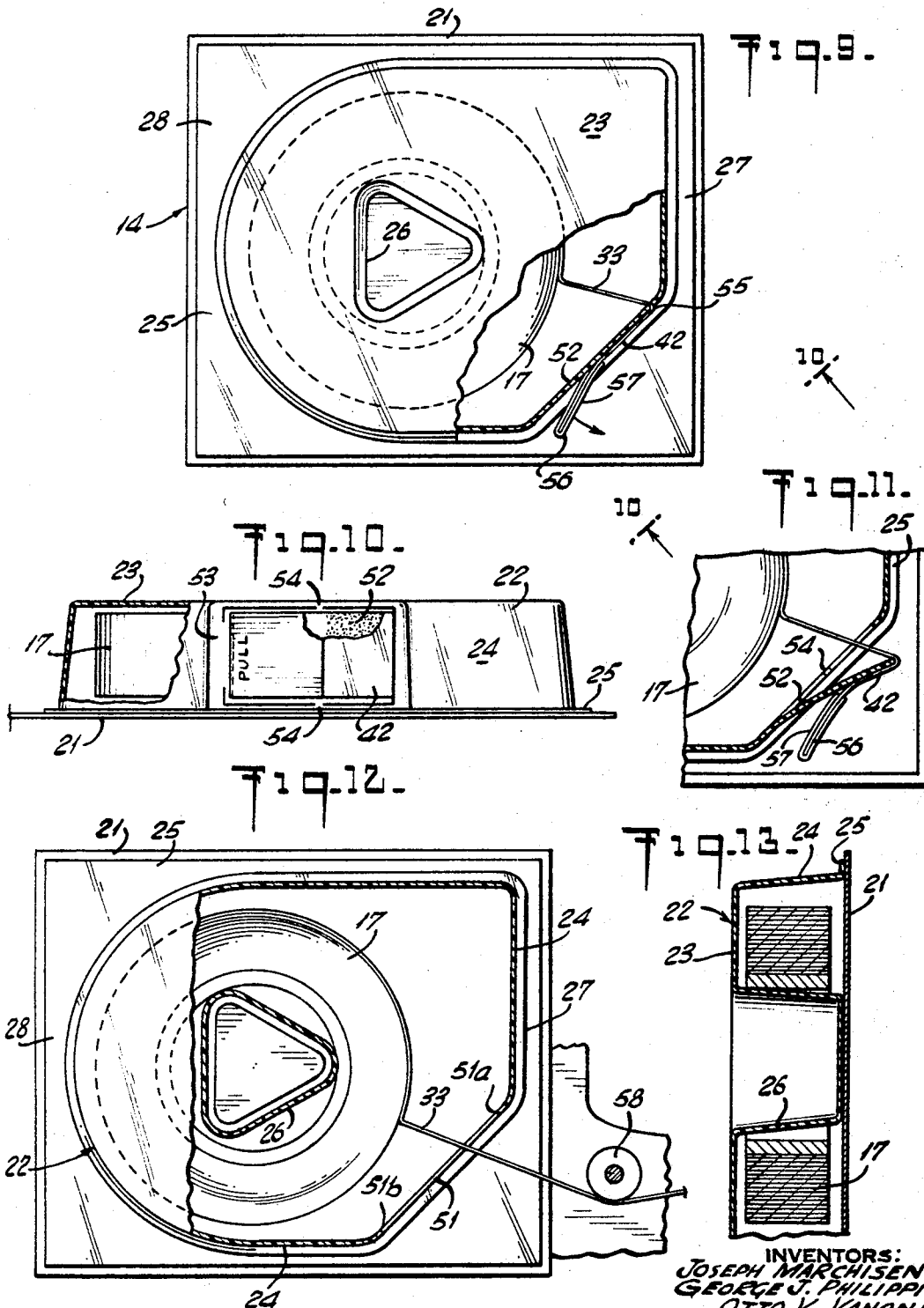
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TAPE CARTRIDGE AND DISPENSER

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3 Sheets-Sheet 3



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3,403,869

TAPE CARTRIDGE AND DISPENSER

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ABSTRACT OF THE DISCLOSURE

A dispenser, splicer, or the like, for pressure-sensitive adhesive tape and a cartridge therefor. The cartridge is adapted to act both as a package for the tape and as mounting means for positioning the tape roll in the dispenser and protecting the tape during dispensing.

The present invention relates to the packaging and dispensing of pressure-sensitive adhesive tape, more particularly to the packaging and dispensing of pressure-sensitive adhesive tape which is intended to be dispensed or applied from a dispenser, splicer, or the like, in which the tape is loaded after it is acquired by the user.

Heretofore such rolls of pressure-sensitive adhesive tape have been removed by the purchaser from the package in which they are received and then placed on a spool for mounting in the dispenser. Unpackaged rolls of tape also have been mounted in a dispenser on rollers forming a cradle for the roll. Other techniques also have been used for supporting the tape roll through the core on which the tape is wound.

All of these techniques have two major disadvantages, i.e., the adhesive sides of the tape roll are exposed and therefore tend to pick up dust and other foreign particles, and the roll must be specially mounted in the dispenser such as by pressing the roll onto a spool and then positioning the spool in the dispenser or by threading the tape around rollers making up the cradle, or the like.

According to this invention, the tape roll is packaged in a cartridge comprising an enclosure which protects the roll from contamination, and which is, itself, adapted to be non-rotatably mounted in the dispenser via means provided for this purpose. A slot or opening is provided or adapted to be presented in one of the end walls of the cartridge for withdrawing tape from the roll and the interior of the cartridge is adapted for rotatably positioning the roll as tape is withdrawn therefrom, so that tape may be dispensed without ever removing the roll from the cartridge. Not only is this convenient for positioning the roll in the dispenser in the first place, but it also assures that the roll will not become contaminated with dust and the like. This latter feature is particularly important when the dispenser is a film splicer wherein pressure-sensitive adhesive tape is being utilized to splice photographic film for processing. In this application, it is extremely undesirable for the edges of the tape to be dirty, since this may result in poor edge adhesion which will allow processing fluids to seep between the tape and the film and weaken the splice. Dirty tape also may result in visible lines or marks on the film which are highly undesirable.

In this connection, whenever the word dispenser is used in this application it shall mean a dispenser, splicer, applicator, or any device capable of dispensing or applying tape, in which the tape is loaded after it is acquired by the user.

In a preferred embodiment of this invention, the cartridge comprises a first side wall and a second side wall spaced from one another by a distance greater than the axial dimension of a tape roll located between them, and a peripheral wall surrounding the roll and connecting the

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first and second side walls. The peripheral wall together with the first and second side walls form a container for the tape roll and the peripheral wall presents an opening for withdrawing tape from the roll therethrough. A mounting flange extending radially outwardly from one edge of the peripheral wall is provided for cooperating with corresponding means on the dispenser housing for mounting the cartridge in a fixed position on the housing and preventing the cartridge from rotating with respect to the housing. Means is presented inside the cartridge for rotatably positioning the tape roll as the tape is withdrawn through the slot in the peripheral wall. Thus, the cartridge is fixed in position in the dispenser and the tape roll is free to rotate inside the cartridge for dispensing tape from the cartridge.

In a preferred form of this embodiment, the first side wall extends radially outwardly beyond the peripheral wall of the cartridge and the second side wall and the peripheral wall are integrally molded to form an enclosure for the tape roll. The enclosure includes molded flange portions at the edge of the peripheral wall where the peripheral wall is connected to the first side wall and the first side wall is attached to the enclosure through the flange portions of the enclosure. Preferably, the first side wall is formed from a relatively stiff rectangular piece of paperboard and the enclosure is formed from a moldable plastic adhered to the paperboard by a suitable adhesive or by a heat seal in the case of a thermo-plastic enclosure. In this form, opposite edges of the paperboard side wall act as the mounting flanges for the cartridge. In this connection, it is preferred that spaced slide means be provided on one of the housing walls of the dispenser for slidably receiving the mounting flanges and preventing rotation thereof when the cartridge is in position in the dispenser. Thus, the cartridge containing the tape roll may be easily mounted in the dispenser merely by locating the mounting flanges in line with the slide means and sliding the cartridge into position.

Other and further advantages of this invention will appear to one skilled in the art from the following description and claims taken together with the drawings wherein:

FIG. 1 is a view in perspective of a cartridge according to a preferred embodiment of this invention showing the tape attached to the tape roll as it might be withdrawn from the roll through the slot in the peripheral wall of the cartridge.

FIG. 2 is a view in perspective of a tape dispenser, according to this invention, with a cartridge of FIG. 1 in position therein and with the tape withdrawn from the cartridge and placed in position over a tape dispensing platform.

FIG. 3 is a top plan view of the dispenser of FIG. 2.

FIG. 4 is a view partly in section and partly in elevation taken along the line 4—4 of FIG. 5.

FIG. 5 is a somewhat enlarged front end view of the cartridge of FIG. 1 before the tape closure has been removed from the dispensing slot.

FIG. 6 is a view partly in plan and partly in section taken along line 6—6 of FIG. 4.

FIG. 7 is an even more greatly enlarged view in section of a portion of the peripheral wall of the cartridge of FIG. 4 showing the lifting of the tape closure which occurs when the tape end attached to the roll supply is elevated.

FIG. 8 is a view in elevation of the back of a cartridge according to a slightly different embodiment of this invention.

FIG. 9 is a view partly in section and partly in elevation of a cartridge according to a somewhat different embodiment of the invention, with a portion broken away to show the tape roll and the relation between the tape

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passing from the roll and the peripheral wall of the cartridge.

FIG. 10 is an end view taken along the line 10—10 of FIG. 9, partially broken away to show a portion of the removable closure under the tape end.

FIG. 11 is a view partly in section and partly in elevation of a portion of the cartridge of FIG. 9, showing the closure being torn away from the peripheral wall as the tape end is drawn away from the cartridge.

FIG. 12 is a schematic view similar to FIG. 9, showing the cartridge in position in a dispenser with the closure removed and with the cartridge mounting means not shown for the sake of clarity.

FIG. 13 is a transverse sectional view taken through the hub of the cartridge of FIG. 9.

Referring in particular to FIGS. 2 and 3 of the drawings, there is shown a dispenser according to a preferred embodiment of this invention which comprises opposed housing side walls 11 and a transversely extended rear-end wall 12 connecting the side walls and forming therewith a chamber 13 for receiving a tape cartridge according to this invention. FIG. 1 illustrates a tape cartridge 14 according to a preferred embodiment of this invention which is adapted to be mounted in the chamber of the dispenser of FIGS. 2 and 3 for dispensing tape therefrom. FIGS. 2 and 3 show a cartridge 14 according to the embodiment of FIG. 1 in position in the dispenser.

The cartridge of FIG. 1 is further illustrated in FIGS. 4-7 which also show a tape closure 15 located over a dispensing slot 16 of the cartridge to provide a completely enclosed package for a tape roll 17 contained therein, prior to use of the cartridge. The cartridge 14 of FIGS. 1 and 4-7 comprises a first side wall 21 in the form of a rectangular sheet of relatively stiff paperboard, and a molded plastic enclosure 22 adhering to one side of the paperboard sheet. The plastic enclosure 22 and the first side wall 21 together form a container for the tape roll 17 rotatably positioned therein. The enclosure 22, in turn, comprises a second side wall 23 spaced from the first side wall by a distance greater than the axial dimension of the tape roll 17 and a peripheral wall 24 surrounding the tape roll and connecting the first and second side walls 21 and 23. The peripheral wall 24 has an outwardly extending flange portion 25 all around the edge of said peripheral wall which contacts the first side wall 21, and the enclosure 22 is attached to the first side wall 21 by adherence with the flange portion 25 of the enclosure. A hub 26 integral with the second side wall 23 of the cartridge extends inwardly from the second side wall centrally of the cartridge and the core of the tape roll is rotatably mounted on the hub, as shown most clearly in FIGS. 1, 4 and 6.

The paperboard first side wall 21 extends radially outwardly beyond the peripheral wall 24 of the cartridge and presents opposed flanges 27 and 28 at the front and rear edges of the cartridge for positioning the cartridge in the dispenser. Corresponding slide means 29 are located on the far housing wall 11 of the dispenser for receiving the opposed flanges 27 and 28 presented by the cartridge. The slide means 29 are in the form of oppositely facing Z-bar portions riveted or screwed to the inside surface of the far housing wall 11. The Z-bars 29 are so arranged that one leg 31 of the bar is spaced from the housing wall 11, to which it is attached, and forms a slot therewith which acts as a slide for receiving one of the mounting flanges 27 or 28. The slide means 29 adjacent the rear-end wall 12 of the dispenser extends continually along a major portion of the length of the rear mounting flange 28 of the cartridge, whereas the slide means at the front of the dispenser is interrupted at 32 to assure that the slide will not interfere with the tape 33 as the tape is withdrawn through the slot 16 in the cartridge.

Once the cartridge 14 is positioned in the dispenser by sliding the mounting flanges 27 and 28 into the corre-

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sponding slides 29 extending inwardly from the housing wall, the tape 33 may be withdrawn from the supply roll 17 by pulling on the tape end to cause the roll to rotate on the hub 26 and the tape to be released from the roll. A conventional tape dispensing platform 34 is presented by raised structure 35 at the front end of an extension 36 integral with the dispenser housing. The platform 34 is elevated above the side walls of the extension 36 and approximately in line horizontally with the dispensing slot 16 of the cartridge 14 when the cartridge is properly positioned in the dispenser, as shown in FIG. 2. A conventional serrated cutter 37 is attached to the top of the platform 34 for facilitating the tearing or cutting of the tape. Thus, when the tape 33 is drawn through the dispensing slot 16 in the cartridge and pulled out over the platform 34 and adhered thereto, as shown in FIG. 2, the adhesive bottom surface of the tape is spaced from the recessed side walls of the extension 36 to allow the tape end to be picked up easily by the fingers for withdrawal of another length of tape. When the tape end is picked up in this manner, it will be elevated, as shown by the dotted lines in FIG. 2, so that pull on the tape end draws the tape 33 around the curved lip 38 at the top of the dispensing slot 16. As long as the back of the tape bears on the lip 38 at the top of the slot, there is no danger of adhesive bottom surface of the tape sticking to the lip 39 at the bottom of the slot. Thus, it is important that the dispensing slot 16 be located sufficiently below the natural line of withdrawal A-B from the tape roll 17 to the point 41 where tension is applied to the tape end to assure that the back of the tape will be urged upward against the lip 38 at the top of the slot 16, as illustrated in FIG. 2.

It is intended that the manufacturer package the tape roll 17 in the cartridge 14 of this embodiment with a tape end portion 42 attached to the roll drawn through the dispensing slot 16 and placed downwardly into adhesive contact with the peripheral wall 24 of the cartridge just below the slot, roughly as shown in FIGS. 4 and 5. The tape end portion 42 is held in position and the slot 16 is sealed off, so as to provide a closed container for the tape roll, by the tape closure 15 adhered to the peripheral wall 14 of the cartridge over the slot, as shown in FIGS. 4-7. The tape closure 15 may be a short length of a sufficiently durable and air-tight pressure-sensitive adhesive tape which may be removed from the dispensing slot 16 by the technique illustrated in FIG. 7. In FIG. 7, the end portion 42 of the tape attached to the peripheral wall of the dispenser is grasped and swung upwardly about the lower lip 39 of the dispenser slot, as shown in FIG. 7, to lift the tape closure 15 off the peripheral wall 14, below the slot. Once this is accomplished, the free portion of the tape closure 15 may be grasped to peel the closure from the peripheral wall.

To provide for the unlikely possibility that the tape end attached to the roll 17 should become "lost" inside the cartridge, i.e., it would somehow pass through the slot 16 into the interior of the cartridge; a portion of the paperboard first side wall 21 behind the slot 16, and behind the cartridge space between the slot 16 and the tape roll 17, is removable for access to the roll 17. This is accomplished by perforating the paperboard wall 21 along the line 43 to define a removable portion 44 which may be removed by grasping a narrow neck 45 thereof, at the edge of the side wall 21 behind the slot 16, and tearing the removable portion 44 from the cartridge. The neck portion 45 is located behind the slot so that, when the neck 45 and the removable portion 44 are removed, the back of the slot is opened. This allows the "lost" tape end to be positioned easily in the slot merely by drawing it away from the roll through the opening formed by the removable portion 44 and then swinging it into position in the slot through the opening formed by the neck 45.

FIG. 8 illustrates a modification of the embodiment of FIGS. 1-7 wherein the lips 38 and 39 forming the dis-

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pensing slot 16, and the slot itself, are positioned somewhat lower with respect to the center of the roll 17 than the corresponding portions of the cartridge of FIGS. 1-7. In the embodiment of FIG. 8, the dispensing slot 16 is located appreciably below a horizontal line through the center of the tape roll 17 when the cartridge is properly positioned in the dispenser. This assures that even horizontal pull upon the tape end for withdrawing tape through the dispensing slot 16 will cause the back of the tape, i.e., the top surface thereof, to bear against the lip 38 at the top of the slot 16, and thereby assure that the bottom adhesive surface of the tape will not stick to the bottom lip 39 of the slot 16. This is particularly advantageous when the dispenser is a film splicer or some other device wherein the tape is drawn from the roll by mechanical means along a fixed path, such as that shown in FIG. 8.

The plastic enclosure 22 may be molded in the form of a "blister" from a plastic such as cellulose acetate, which is commonly used for blister packaging, to form an enclosure having walls ringing in thickness between about 0.005 and 0.020 of an inch. The flange portions 25 of the enclosure typically may be heat sealed to a rectangular piece of paperboard approximately 0.030 of an inch thick to form the cartridge. As shown most clearly in FIG. 5, the top and bottom lips 38 and 39 of the dispensing slot 16 normally are inclined toward one another and towards the plastic side wall 23 of the cartridge. Since the tape 33 will be drawn more or less horizontally from the tape roll 17, the inclination of the bottom lip 39 of the slot away from the horizontal tends to minimize the possibility of adhering contact between the adhesive surface of the tape and the bottom lip. In other words, the tape edge adjacent the apex 46 of the slot 16 will contact the bottom lip 39 first and tend to hold the adhesive surface of the tape off the remainder of the lip 39.

FIGS. 9-13 show a cartridge 14 according to a somewhat different embodiment of the invention. This cartridge is very similar to that of the preceding figures but differs in the following respects.

In the embodiment of FIGS. 9-13, a dispensing opening 51 is formed in the peripheral wall 24 of the cartridge by removing a removable closure portion 52 of the wall. This closure portion is located in an inclined section of the peripheral wall 24 which traverses the front bottom corner of the cartridge. The closure 52 normally is integral with the peripheral wall 24 but only partially attached thereto so that it may be removed easily from the cartridge. As shown most clearly in FIG. 10, the removable closure 52 is not completely cut away from the peripheral wall 24 prior to its removal, but is connected thereto by a relatively wide uncut portion 53 at one end of the closure and opposed tying portions 54 located centrally of the closure. The opposite end of the closure 52 is completely cut away, or free, from the adjacent peripheral wall to form a slot 55 therewith. Prior to removal of the closure the outermost end 42 of the tape 33 on the tape roll 17 is drawn through the slot 55, as shown most clearly in FIG. 9, and adhered to the outer surface of the closure 52. A tab 56 is provided at the very end of the tape by positioning a U-shaped piece of paper 57 over the end 42. Thus, the end of the tape may be pulled by gripping the tab 56 and the free end of the closure 52 will bend down to cause the ties 54 to break and allow partial removal of the closure, roughly as shown in FIG. 11.

It is an important feature of the closure 52 of this embodiment of the invention that it may be removed as described above to provide a tape dispensing opening 51 which subtends a substantial arc, with reference to the tape roll 17, and is relatively long compared to the slot 16 of the embodiment of FIGS. 1-7. In fact, the resulting opening 51 is sufficiently large to allow access to the tape roll, itself, if the tape end is "lost" by entry into

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the cartridge as described hereinbefore. An additional advantage of the embodiment shown, is that the opening 51, is located predominantly below the horizontal center line of the tape roll 17 so that when the tape end is drawn around a guide roller 58, positioned in the dispenser in such a way that the path of the tape 33 will not strike the top edge 51a of the opening 52, the likelihood of contact between the adhesive side of the tape and the peripheral wall 24 at the bottom edge 51b of the opening is minimized due to the distance between the bottom edge of the opening and the normal path of the tape. The fact that the portion of the peripheral wall 24 defining the dispensing opening 51 is inclined inwardly under the edge of the tape roll, as shown in FIGS. 11 and 12, also tends to minimize the likelihood of contact between the peripheral wall and the adhesive side of the tape.

FIG. 13 illustrates another feature of this embodiment of the invention in that the hub 26 extends all the way to the first side wall 21 and is attached thereto by heat-sealing or the like to enhance the rigidity and strength of the cartridge.

Having now described the invention in specific detail and exemplified the manner in which it may be carried into practice, it will be readily apparent to those skilled in the art that innumerable variations, applications, modifications and extensions of the basic principles involved may be made without departing from its spirit or scope.

Wherefore we claim:

1. A cartridge for positioning tape in a dispenser for dispensing tape from a roll supply thereof which comprises a first side wall and a second side wall spaced from one another by a distance greater than the axial dimension of the roll, a peripheral wall surrounding the roll and connecting the first and second side walls and together with said side walls forming a container for the roll, said peripheral wall being adapted to present a slot for withdrawing tape from the roll therethrough, a removable closure normally closing said slot but being at least partially removable from said peripheral wall for dispensing purposes, and a mounting flange extending radially outwardly from one edge of said peripheral wall, the interior of said container being adapted for rotatably positioning the tape roll as the tape is withdrawn through said slot, the outermost end of the tape on said roll being drawn through said slot and adhered to the outer surface of the closure prior to removal of said closure, whereby said cartridge may be positioned in a tape dispenser having means cooperating with said mounting flange and tape may be dispensed through said slot while retaining said roll in said cartridge to protect the tape supply.

2. A cartridge according to claim 1, wherein said closure is adapted to be at least partially removed from said cartridge when the tape end applied thereto is pulled away from the cartridge.

3. A dispenser for pressure-sensitive adhesive tape which comprises a housing wall for holding a tape roll; mounting means for positioning the tape roll on said housing wall, said mounting means comprising a pair of mounting flanges each at the same side of the tape roll and extending oppositely outwardly from the axis of said roll beyond the perimeter of the roll, and means for holding the tape roll between said flanges; and slide means extending from said housing wall for receiving and holding said mounting flanges and preventing rotation thereof when said mounting means is in position on said housing wall.

4. A dispenser according to claim 3, wherein said mounting means comprises an enclosure for the tape roll, said mounting flanges extend from opposite ends of said enclosure, and said enclosure includes an opening in one end for withdrawing tape from the roll therethrough for dispensing purposes.

5. A dispenser according to claim 3, wherein said mounting means comprises a base sheet, and which further comprises a molded enclosure for the tape roll and said

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enclosure comprises a side wall spaced from the base sheet by a distance greater than the axial dimension of said roll, and a peripheral wall connecting the side wall and the base sheet and completing the enclosure, said peripheral wall being adapted to present an opening for withdrawing tape from the roll therethrough. 5

6. A dispenser according to claim 5, wherein said tape roll holding means is in the form of a hub molded integral with said side wall and said hub extends inwardly from the side wall toward said base sheet.

7. A dispenser according to claim 5, wherein said enclosure is attached to said base sheet via flange portions of said enclosure presented adjacent opposite edges of said sheet. 10

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