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DISPENSER FOR ADHESIVE COATED SHEET MATERIAL HAVING A LINER ADHERED TO AN ADHESIVE SURFACE

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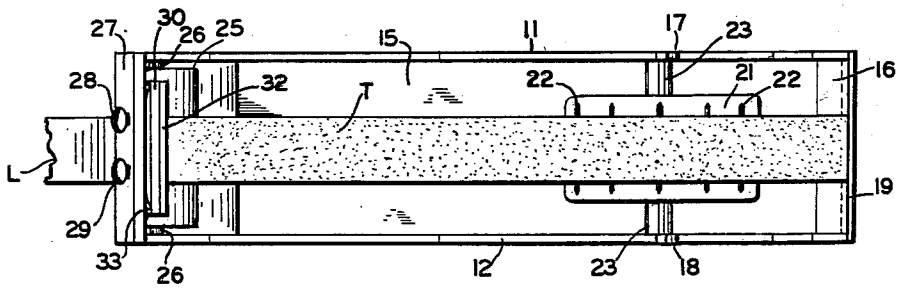


FIG. 1

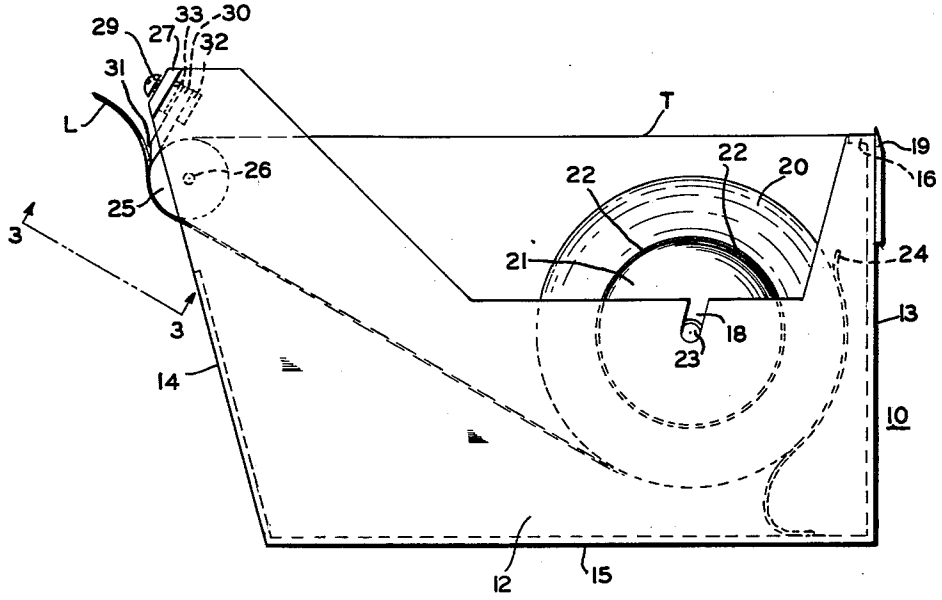


FIG. 2

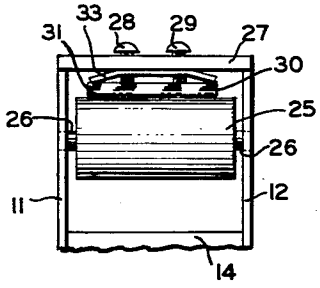


FIG. 3

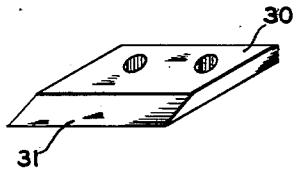


FIG. 4

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DISPENSER FOR ADHESIVE COATED SHEET MATERIAL HAVING A LINER ADHERED TO AN ADHESIVE SURFACE

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The present invention relates to machines for dispensing adhesive tape. More particularly, it relates to machines for dispensing adhesive tapes or sheet material which have a separable liner adhered to an adhesive coated surface. The machines of this invention include means for separating the liner from said adhesive surface as the sheet material and the adhered liner are moved in the machine.

There are many different adhesive coated sheet materials being manufactured at the present time which have a coating of a pressure-sensitive adhesive, a heat-sensitive adhesive, or a solvent-activated adhesive on at least one surface, and such sheet materials frequently have a liner adhered to an adhesive surface to serve as a temporary protective covering therefor. The liner also serves to facilitate the handling of the sheet materials, as well as to protect the adhesive coating from dirt and contamination. Many of these adhesive coated sheet materials are sold in strip or tape form, wound into rolls. Liners are used with many of the pressure-sensitive coated sheet materials to prevent the adhesive from adhering to the non-adhesive side of the material. Liners are also used with some sheet materials which have a pressure-sensitive adhesive coating on both sides of the sheet, and the liner is adhered to one of the adhesive coated surfaces to prevent that surface from contact with the adhesive coated surface on the other side of the tape when the tape is wound into roll form. Such a double-coated tape is the illustrative embodiment shown in the attached drawings.

The liners which are used with various types of adhesive tapes are generally made of paper which has been coated with a chemical composition to cause the surface of the liner to be somewhat resistant to the adhesive action of the adhesive coating, but the liners are nevertheless adhered to the adhesive surface and must be removed before the tape can be used. Since the adhesive bond between the liner and the adhesive surface is reduced, the liner and said surface are relatively easy to separate from each other, either by hand or by other various means which have been used in connection with machines for dispensing such sheet material. However, the present invention provides a more simple and inexpensively constructed means for separating liners from such products than has been heretofore available.

A machine of the present invention includes a separating means comprising a surface for supporting the tape (with its liner) and a plow member positioned adjacent to said supporting surface for engagement between said liner and the adhesive surface of the tape, as the tape and the attached liner are together moved along said supporting surface. The plow member is preferably movable and is urged toward the supporting surface to bear against

the side of the tape to which the liner was attached, with the other side of the tape in contact with the supporting surface, so that the plow will contact the adhesive bond at the interface between the liner and the tape, to separate the liner from the tape as the tape and the liner are together moved against the plow. The liner is thus skived from the tape by the plow, and the separated liner passes on the side of the plow opposite from the tape.

We have found that an ordinary piece of wire will serve as a satisfactory plow member for use with certain products, and that plows suitable for use with other products can be constructed from various materials, such as steel or plastic. The preferable material from which a plow member is constructed for use with a product coated with a pressure-sensitive adhesive is the plastic material (polytetrafluoroethylene) sold under the trademark "Teflon," since this material is somewhat resistant to the adhesive forces of pressure-sensitive adhesives. The plow member can be constructed in various shapes, and the edge of the plow which contacts the adhesive bond can be sharpened or formed to a relatively keen edge to facilitate the separation of the liner from the adhesive surface. Care must be exercised, however, so that the edge does not cut into the adhesive surface or the liner.

The present invention, and the various objectives and advantages obtained thereby, will be apparent from the following detailed description of the illustrative embodiment shown in the accompanying drawings, wherein like reference characters refer to corresponding parts in the several views, and in which drawings:

FIGURE 1 is a plan view of a machine of the present invention, with a roll of double-coated pressure-sensitive adhesive tape mounted therein, which tape has a liner adhered to only one of the adhesive coated surfaces thereof;

FIGURE 2 is an elevational view of the machine shown in FIGURE 1, showing the interior of the machine in broken lines;

FIGURE 3 is a view taken along lines 3—3 in FIGURE 2 with the liner and tape removed, for purposes of clarity; and

FIGURE 4 is a perspective view of the plow member removed from the machine shown in FIGURES 1 and 2.

Referring first to FIGURES 1 and 2, frame **10** is integrally formed of side members **11** and **12**, end members **13** and **14**, and base member **15**. As is shown in dotted lines in FIGURE 2, end member **14** does not enclose the entire end of the machine, as does end member **13**, and one end of end member **13** is flanged at approximately right angles to form tape receiving platform **16**. Knife **19** is affixed to end member **13**, and said knife is positioned so that the cutting edge of said knife extends beyond tape receiving platform **16**.

Slots **17** and **18** are formed inwardly from the edges of side members **11** and **12**, respectively, and said slots are positioned opposite from, or across from, each other. Supply roll **20** of double-coated pressure-sensitive adhesive tape, having a liner adhered to the outside adhesive surface as said tape is wound on said roll, is mounted on hub **21**, and said hub contains ridges **22** to engage the inner circumference of said supply roll more firmly. Stub shafts **23** extend from each side of hub **21**, and said hub is positioned between side members **11** and **12**, with said stub shafts engaged into slots **17** and **18**, so that

hub 21 and supply roll 20 are rotatably suspended between said side members. One end of spring strip 24 is affixed to base member 15, and said spring extends upwardly therefrom to bear against the periphery of tape supply roll 20, to retard the rotational movement of said roll.

Guide roller 25 is rotatably journaled on pin 26. One end of pin 26 is attached to side member 11 and the other end of said pin is attached to side member 12, so that guide roller 25 is rotatably suspended between side members 11 and 12. The peripheral surface of guide roller 25 is preferably knurled, since the adhesive surface of the tape which is not covered by the liner is brought into contact with the surface of this roller. One end of support bar 27 is affixed to side member 11 and the other end of said bar is affixed to side member 12. Support bar 27 is formed to contain threaded apertures through said bar, and bolts 28 and 29 are attached through said apertures.

Plow 30 is preferably formed to contain sharpened edge 31, as is shown in FIGURE 4, and said plow also contains apertures which extend through said plow. The positioning of the apertures in plow 30 corresponds with the position of the apertures in support bar 27. The apertures in said plow are not threaded, and are slightly larger than the apertures in said support bar, so that bolts 28 and 29 extend through the apertures in said plow. Tie bar 32 is formed to contain threaded apertures which correspond with the apertures in support bar 27. Tie bar 32 is positioned beyond plow 30 from support bar 27, with bolts 28 and 29 threaded into the apertures in said tie bar, to attach said tie bar and plow 30 to support bar 27.

Strip spring 33 is formed to contain unthreaded apertures which are positioned to correspond with the threaded apertures in support bar 27, but the apertures in said strip spring are also slightly larger in size than said threaded apertures in support bar 27 and tie bar 32. Strip spring 33 is positioned between support bar 27 and plow 30, with bolts 28 and 29 journaled through the apertures in said strip spring, and bolts 28 and 29 are adjusted so that plow 30 is firmly held against strip spring 33, so that the entire width of sharpened edge 31 bears against the periphery of guide roller 25, as is shown in FIGURES 2 and 3. Plow 30 is preferably poistioned so that it extends tangentially to the peripheral surface of guide roller 25, with sharpened edge 31 preferably positioned about 90° beyond the point at which the tape will first contact guide roller 25, as is shown in FIGURE 2. Strip spring 33 serves to bias plow 30 toward guide roller 25, so that sharpened edge 31 is urged into contact with the peripheral surface of said guide roller, but said plow can be moved away from the resilient contact with guide roller 25, against the force of said strip spring, when the machine is being threaded for use.

In the operation of this machine, supply roll 20 containing the tape T and the adhered liner L is positioned in the machine so that the adhesive surface of the tape to which the liner is not adhered will be in position to contact the peripheral surface of guide roller 25. The operator then manually separates liner L and tape T, along the free end of supply roll, and plow 30 is moved away from guide roller 25 so that tape T can be threaded between said roller and said plow. The separated end of tape T is then threaded around roller 25, with the side of the tape to which liner L is adhered facing away from the surface of said roller, and plow 30 is permitted to move back toward roller 25 so that sharpened edge 31 is in contact with the adhesive surface of tape T to which the liner is adhered. Liner L is not threaded between plow 30 and guide roller 25, but said liner is threaded on the opposite side of said plow from said tape, as is shown in FIGURE 2.

Plow 30 thus extends between tape T and liner L, and sharpened edge 31 is in position to bear directly against the interface of the adhesive bond between said tape and said liner, to separate said liner and said tape as the interface of the bond is moved against said edge.

The operator then grasps the end of tape T and pulls said tape toward knife 19, and beyond said knife for a distance equal to the length of tape desired. This movement of tape T causes tape and the attached liner to be unwound from supply roll 20 and moved toward guide roller 25, and the movement of the adhesive bond against sharpened edge 31 of plow 30 causes said liner to become skived from said tape. Liner L is thus separated from tape T, and said liner is moved out of the machine (as is shown in FIGURE 2) as tape T is moved toward knife 19. When the desired length of tape T has been moved beyond knife 19, the operator moves the side of tape T against knife 19, severing the desired length of separated tape from supply roll 20, and the newly severed end of tape becomes adhered to tape receiving platform 16, in position to be grasped and pulled again, whenever another piece of separated tape T is desired.

As is evident from the above description of an embodiment of our invention, variations in the operation and various modifications of our machine can be envisioned. For example, plow member 30 can be fixed in relationship to the supporting surface provided by guide roller 25, rather than resiliently biased toward the supporting surface, and plows can be made from heavy materials so that they will be urged toward the supporting surface by the weight of the plow itself, or an object can be attached to the plow to urge it in that direction by the weight of said object. Also, the plow can be positioned adjacent to the tape supply roll so that the underlying layers of tape provides the supporting surface, or the plow can be positioned adjacent to a flat or curved surface positioned remote from the supply of tape, rather than adjacent to a rotatable roller as shown and described. Such variations, embodying some or all of the novel features herein disclosed are comprehended, and we do not intend to be limited only to the specific embodiment herein described, but, rather, we intend to be limited only by our disclosure taken as a whole, including the appended claims.

We claim:

1. A machine for dispensing adhesive tape having a separable liner adhered to an adhesive surface of said tape, said machine comprising a frame, means attached to said frame for rotatably supporting a supply roll of said tape, means for separating said liner from said tape as said tape and said liner are together moved in said machine, and means for severing said tape after said liner has been separated from said tape; said separating means comprising a curved surface for supporting said tape and liner, a plow member positioned tangentially to and adjacent said supporting surface for engagement with the adhesive bond at the interface between said liner and said adhesive surface of said tape to skive said liner from said tape as said tape and said liner are together moved along said supporting surface, and means for urging said plow member toward said supporting surface.

2. A machine for dispensing adhesive tape having a separable liner adhered to an adhesive surface of said tape, said machine comprising a frame, means attached to said frame for rotatably supporting a supply roll of said tape, means for separating said liner from said tape as said tape and said liner are together moved in said machine, and means for severing said tape after said liner has been separated from said tape; said separating means comprising a rotatable roller for supporting said tape and liner, a plow member positioned tangentially to and adjacent said roller for engagement with the adhesive bond at the interface between said liner and said adhesive surface of said tape to skive said liner from said tape as said tape and said liner are together moved around said roller, and means for urging said plow member toward said roller.

3. A machine for dispensing adhesive tape having a separable liner adhered to an adhesive surface of said tape, said machine comprising a frame, means attached to said frame for rotatably supporting a supply roll of said tape,

means for separating said liner from said tape as said tape and said liner are together moved in said machine, and means for severing said tape after said liner has been separated from said tape; said separating means comprising a rotatable roller for supporting said tape and liner, a plow member positioned tangentially to said roller, said plow member including a sharpened edge for engagement with the adhesive bond at the interface between said liner and said adhesive surface of said tape to skive said liner from said tape as said tape and said liner are together moved around said roller, and means for urging said sharpened edge of said plow member toward said roller.

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