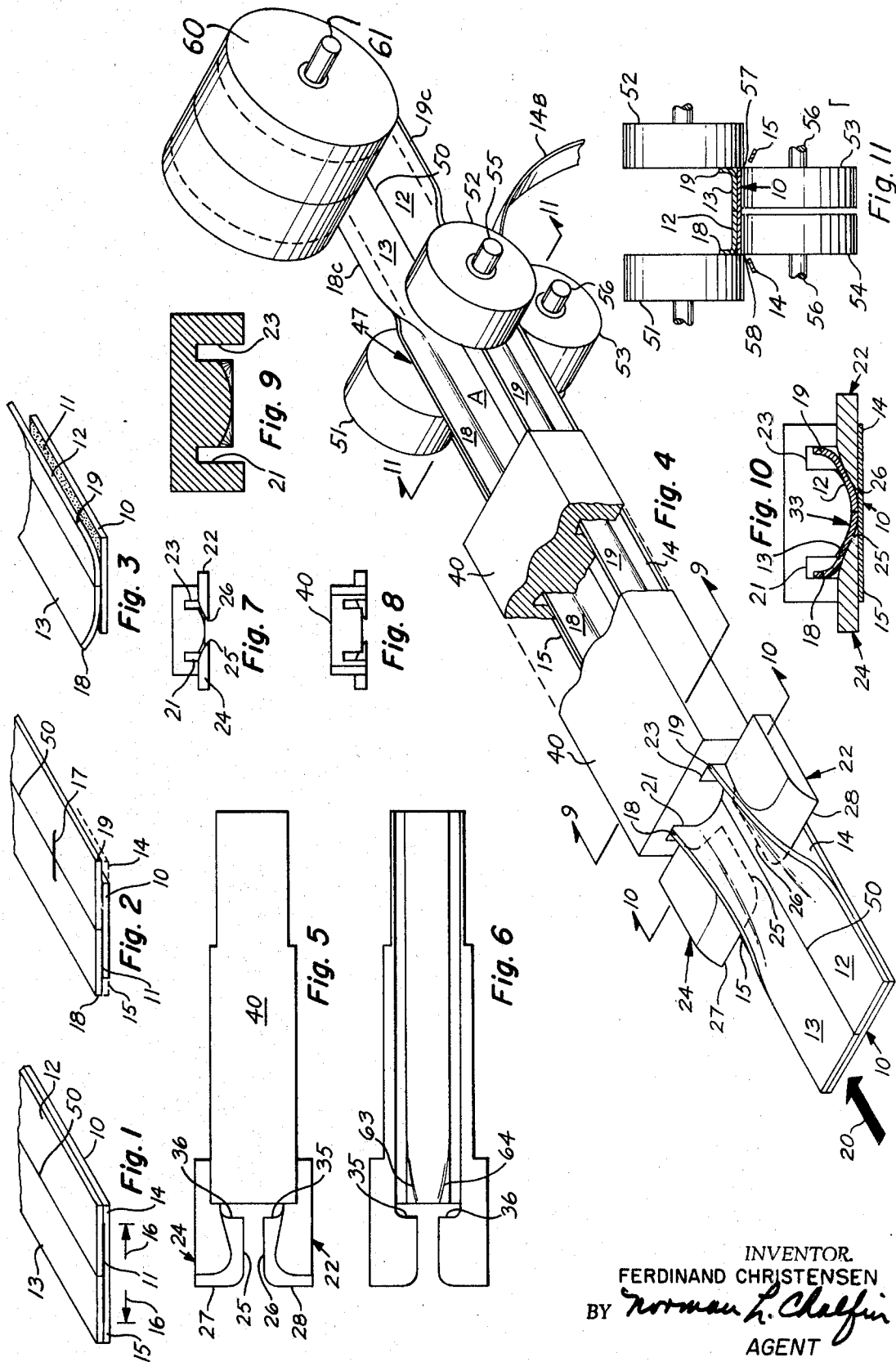


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PRESSURE SENSITIVE RIBBON COVER STRIPPING
MEANS AND METHOD THEREFOR
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PRESSURE SENSITIVE RIBBON COVER STRIPPING MEANS AND METHOD THEREFOR

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6 Claims

ABSTRACT OF THE DISCLOSURE

This invention defines means for stripping the edge portions of a pressure sensitive adhesive ribbon so as to permit ready removal of release paper covering thereon and assembly thereof with other components to be attached by the adhesive ribbon and provide grab surfaces by which the remainder of the cover can be removed to expose the adhesive surface of the ribbon.

BACKGROUND OF THE INVENTION

Pressure sensitive adhesive tapes and labels are widely used in present day packaging and assembly of various articles to surfaces and the like. These pressure sensitive tapes and adhesives are normally protected prior to use by a cover backing or release paper which must be peeled off in order to expose the adhesive surface for use.

As a convenience in the manufacture of the adhesive backing surfaces the entire assembly of labelling material with its adhesive coating and the protective release paper cover thereon are assembled in a continuous strip. Normally, such paper is split along a central line to permit grabbing the release paper for removal from the adhesive. For situations where it is not convenient to use the center slit release paper, an edge must be made free for the release paper to be handled for removal of the paper. To remove an edge portion of the adhesive-backed base of such elongated continuous strips would be a difficult problem and exceptionally time consuming if done by hand. Some machine techniques are available but do not leave free edges. Yet the edges must be removed so that the backing can be handled with the user's fingers to strip it off of the adhesive surface for use.

This invention describes machinery for lifting, separating the edge portion of the backing, and stripping of the strip of pressure sensitive adhesive coated ribbon as described above.

No comparable device is known to the inventor in the prior art which performs in the identical fashion to this invention.

SUMMARY OF THE INVENTION

To strip back the release paper backing and sever the edges of the pressure sensitive adhesive coated ribbon the invention described herein provides a pair of lifting shoes positioned so as to lift a predetermined portion of the edge of the backing or release material from the elongated strip as the strip passes through the machine. The lifted portions of the release material are guided through rectangular guide grooves to pairs of cutting wheels which sever the exposed edges of the adhesive coated portion of the strip permitting the raised backing or release paper portion thereafter to return to a level position and the now edge-stripped adhesive ribbon wound on a take-up reel. Whereas in the prior art, in order to use such paper in continuous production applications, it was necessary to index the strip for unit use along the strip. By the technique of this innovation of the continuous strip is used without indexing.

DESCRIPTION OF THE INVENTION

FIG. 1 is a section of a strip of the pressure sensitive tape with its release paper backing according to its use in this invention as supplied prior to being treated as described in the invention;

FIG. 2 is a section of the strip shown in FIG. 1 after being acted upon by the machinery of this invention to remove an edge portion of the adhesive-backed material so as to expose a predetermined edge portion of the release paper backing to be handled by the fingers of the user;

FIG. 3 shows how the coating may now be stripped back to expose the adhesive surface for use of the label material thereunder;

FIG. 4 shows in perspective the machine of this invention arranged schematically to show how the ribbon being treated passes through the various parts thereof;

FIG. 5 is a top plan view of the guide portion of the device shown in FIG. 4;

FIG. 6 is a bottom plan view of the portion of the invention shown in FIG. 5;

FIG. 7 is a front end view of the device of FIG. 4;

FIG. 8 is a rear end view of the device of FIG. 4;

FIG. 9 is a section through 9—9 of FIG. 4;

FIG. 10 shows in cross-section how the portions of the tape are separated from one another; and

FIG. 11 is a cross-section through 11—11 of FIG. 4 showing the cutting action of the cutting wheels.

For a fuller understanding of the operation and composition of the elements of this invention in FIGS. 1—3 inclusive are shown portions of a pressure-sensitive adhesive-backed ribbon covered with its release paper backing cover material in the before treatment condition (FIG. 1) as supplied by the tape or ribbon manufacturer; after the edges of the adhesive have been stripped and cut by the equipment of this invention (FIG. 2); and as used by the ultimate consumer (FIG. 3).

In FIG. 1 the adhesive-backed pressure-sensitive tape 10 is covered centrally with its adhesive material 11 to an extent between arrows 16 and the entire surface covered with adjacent backing strips 12 and 13 for protection of the adhesive surface 11 until used. It should be obvious that the need for the backing strips 12 and 13 arises because the adhesion of the pressure sensitive adhesive 11 is very great so that the tape 10 would stick on any surface with which it comes in contact. The strips 12, 13 provide protection against this contingency.

In one use of the tapes 10, 11, 12, 13 according to this invention staples are used, as at 17 in FIG. 2, to attach the release paper backed adhesive tape to a device with which it is used to provide means by which the device can be adhered to other surfaces. Such a use is found in the attachment of gift and similar package decorations, such as flowers or bows made of ribbons to gift packages and the like.

When such stapling together of a bow or flower decoration (not shown) is made, lifting strips 12, 13 from the adhesive 11 will be extremely difficult if an attempt is made to do this from center line separation 50 usually provided. Thus the need can be seen for the stripping of the edges beyond the dimension arrows 16 (FIG. 1) so that, as shown at 14, 15 (FIG. 2), the edges 18, 19 of the backing 12, 13 can be lifted, as indicated in FIG. 3.

From the above discussion it can be seen that the tape 10 can be described as a tape laminate with pressure sensitive adhesive coated base and on which the adhesive coated base is protected prior to use by a backing covering of release paper which can be removed from the base readily but which does not affect the adhesive quality of the pressure sensitive material while covering it or

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when removed from it. Normally this backing coat is removed by bending the tape along a center line 50 so as to separate the backing portions 12, 13 along center line 50. But since a staple 17 is used in the application of the tape 10 according to this invention, the means described herein must be provided to prepare the tape for a different technique of lifting the backing when the staple prevents bending along the center line 50.

With reference to FIGS. 4, 5, and 6 the novel means of this invention is described by which the edges 14, 15 of the adhesive backed portion of the tape 10 is stripped away to leave a portion of the edges 18, 19 of the backing or release paper material 12, 13 free so that they can be handled for easy removal of the backing 12, 13 from the adhesive coated tape 10, 11 despite the presence of staple 17 across the center line 50.

It can be seen in the arrangement of the strip cutting means of this invention shown in FIG. 4, that the tape 10 is presented from a supply reel (not shown but from the direction of arrow 20) to a pair of lifting shoes 22, 24 which are tapered to a feathered edge at 25, 26 the surfaces facing center and opposite one another and also to the front surfaces 27, 28 which meet the oncoming tape 10. Surfaces 35, 36 of the stripping shoes 22, 24 which are the trailing edges thereof are also tapered to a point in front of the entrance to guide block 40. As the tape 10 approaches the stripper from the direction of arrow 20 spaded edges 27, 28 enter the tape 10 between the edges 18, 19 of the backing 12, 13 and the edges 14, 15 of the adhesive-backed tape 10 to lift edges 18, 19 of backing 12, 13 upward so that edges 18, 19 now lifted approximately perpendicular to the base enter into rectangular guide grooves 21, 23 provided in the guide block 40. This section can be seen more fully with reference to FIG. 10 which details the passage of the backing (12, 13) covered tape 10 into separating shoes 22, 24 along the feathered edges 25, 26 thereof so that edges 18, 19 of the backing 12, 13 pass into vertically disposed guide grooves 21, 23 and the outer edges 14, 15 of the adhesive coated base of tape 10 pass beneath shoes 22, 24. The cross sections through 9—9 show the change in shape of the path through guide grooves 21, 23 from shoes 22, 24, which, incidentally, taper back down as shown in the area 35, 36 in FIG. 5 so that the adhesive backed portions of tape 10 return to a flat configuration during the passage under the area beneath block 40 along the outer edges of guide grooves 21, 23 in guide block 40, from the bowed condition, which can be observed in FIG. 10 at 33. The bottom of block 40 in the area between guide grooves 21, 23 tapers back from the curve seen at 33 to the parallel condition as seen at 63, 64.

As the tape passes through area A in the guide path beyond block 40 the vertically standing edges of backing 12, 13 as identified by 18 and 19 pass inside a pair of roller cutter wheels 51, 52 as indicated at 47 and edges 14, 15 of the adhesive coated portion of tape 10 arrive flat under cutter wheels 51, 52. As may be seen in FIG. 11 a lower set of cutter wheels 53, 54 rotate inside the edges of wheels 51, 52 so that a pair of scissors edges are formed at each of the junctions 57, 58. The scissors action of edges 57, 58 causes the edges 14 and 15 of tape base 10 to be sheared off into a strip as shown at 14B in FIG. 4.

The edges 18, 19 of backing 12, 13 as seen at 18C and 19C beyond cutting wheels 51—54 flatten out again as the ribbon of tape 10 is wound up on a take-up wheel or reel 60 sans edges 14, 15 of the tape 10, so that edges 18, 19 may be easily lifted to tear away backing 12, 13 from the tape as seen in FIG. 3.

Wheels 51, 52, and 53, 54 and the take-up reel 60 can be driven by motorized means of known types coupled to the axles thereof 55, 56, and 61.

What is claimed as new is:

1. A method of stripping the edges of a pressure-sen-

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sitive adhesive coated ribbon laminate with a release paper backing so that the release paper backing may be removed by handling the edges thereof, the method comprising the steps of:

- inserting the pressure-sensitive adhesive coated ribbon laminate with its released paper backing thereon into a separator which lifts the extreme edges of the release paper from the adhesive coated ribbon only along the edges thereof;
- raising the lifted edges of the release paper to a perpendicular position with respect to the adhesive coated ribbon laminate;
- drawing the adhesive coated ribbon laminate with lifted release paper through a pair of rotary shears so that the release paper is not touched by the shears and the edges of the ribbon are sheared off;
- returning the release paper to the horizontal configuration so that it extends over the cut away edges of the adhesive coated ribbon; and
- reeling the ribbon and backing upon reels for storage.

2. An apparatus for stripping the extreme edges from one of the layers of a ribbon laminate, said apparatus comprising:

- a guide block having elongated rectangular grooves vertically cut into the areas near the edges of said block;
 - a pair of separators in the form of contoured blades positioned in front of said guide block so as to be insertable between the outer edges of the layers of the ribbon laminate thereby to separate the layers along the extreme edges thereof;
 - the bottom of said block having contoured means therein for guiding the separated edges of said ribbon laminate so that the separated portion of the upper layer of the ribbon laminate are directed vertically into said guide grooves and the lower layer of said ribbon laminate is guided beneath said guide blade; and
 - a pair of rotating shears respectively positioned behind and on opposite sides of said guide block, inline with said separators and said block so as to receive the ribbon laminate with the raised edges of the upper layer passing between the opposite wheels of the rotating shears without being cut and the edges of the lower layer passing between the cutting edges of the shears;
- whereby the edges of the lower layer of the laminate are sheared away and the edges of the upper layer remain to overhang the remainder of the lower layer of the ribbon laminate.

3. A stripper for removing the edges of a lower one of the lamina of a laminate of adhesive-backed ribbon covered with a release paper covering, said stripper comprising:

- spaded guide means for separating opposite edges of the laminar layers of the laminate ribbon;
- grooved guide means disposed in line with said spaded guide means, said grooved guide means having grooves along the length thereof positioned to receive the edges of the upper of said laminar layers in a vertical position and to guide said edges of said upper laminar layer along a predetermined path; and
- rotary cutting means disposed in line with said spaded guide means and said grooved guide means and on opposite edges of said predetermined path; and
- said rotary cutting means being positioned so that said vertically positioned edges of said upper laminar layers are disposed between said cutting means and the edges of said lower laminar layer are guided into the cutting edges of said rotary cutting means; whereby the edges of said lower laminar layer are sheared off.

4. In the method defined in claim 1, an initial step comprising the presentation of the laminate on reels to

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the separator prior to insertion of the pressure sensitive adhesive coated ribbon therein.

5. In the apparatus defined in claim 2, the guide block, the separators, and rotating shears being assembled on a common base in line so that the ribbon laminate passes there through on one plane.

6. In the stripper defined in claim 3, the rotary cutting means including a first set of wheels separated between the cutting lines for cutting said edges of said lower laminar layer on one shaft and a second set of wheels positioned in a similar manner on a second shaft so that the outer edges of said lower wheels are in contact with the inner edges of said upper wheels.

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