July 22, 1969 R. F. McCARTHY 3,457,137

METHOD FOR LABEL INSPECTION AND IMPROVEMENT
AND THE PRODUCT PRODUCED THEREBY
Filed May 25, 1966

Fig. 1

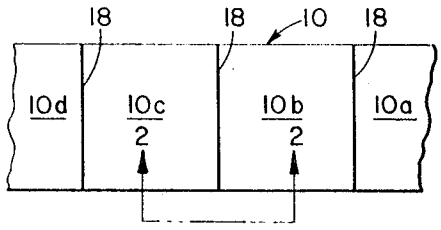


Fig. 3

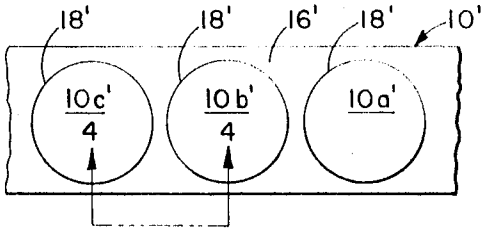


Fig. 2
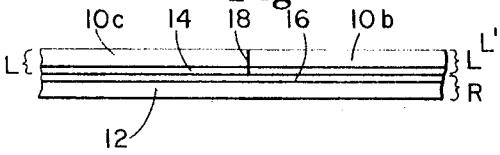


Fig. 4

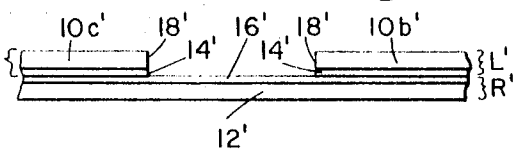


Fig. 5

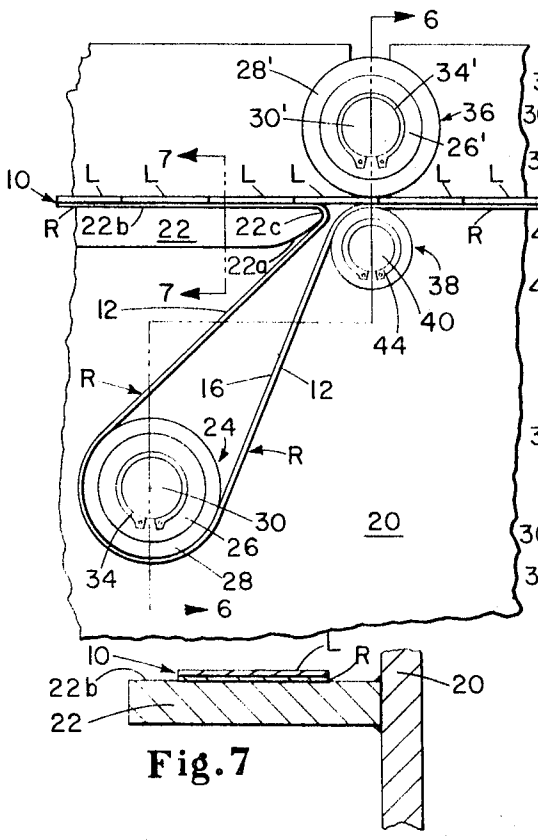


Fig. 6

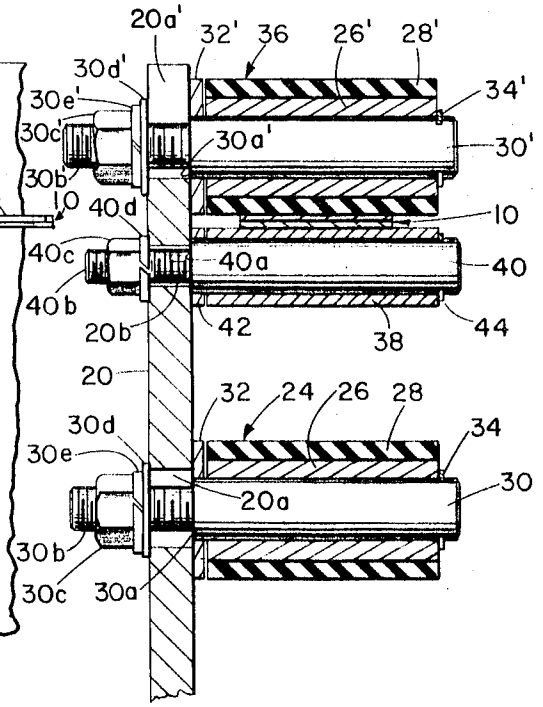


Fig. 7

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METHOD FOR LABEL INSPECTION AND IMPROVEMENT AND THE PRODUCT PRODUCED THEREBY

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U.S. Cl. 161—116 6 Claims

ABSTRACT OF THE DISCLOSURE

The inspection and improvement of the application peeling characteristics of label supplies, which supplies comprise die cut pressure sensitive labels mounted on a ribbon of release liner, by sequentially stripping the labels from the release liner on which they are cut and relaminating the labels to a different release liner or to the same release liner at positions in advance of those from which the labels were stripped.

This invention relates to a method and apparatus for inspection and improvement of continuous lengths of pressure sensitive (self-adhesive) label supplies and more particularly to a method and apparatus for the stripping and relamination of pressure sensitive labels mounted in seriatim on a ribbon of release liner.

Pressure sensitive labels are presently commercially available in a form wherein they are mounted in seriatim on a long ribbon or strip of release liner, the combination herein being termed a "continuous supply of pressure sensitive labels." Generally speaking, such continuous supply is in roll form whereby to have utility in connection with label applying means such as that disclosed in U.S. Letters Patent 3,093,528, issued to Robert L. Reich on June 11, 1963. In preparing pressure sensitive labels in this form, a converting operation is performed on pressure sensitive label stock, a laminate of continuons lengths of face material and release liner which are adhered one to the other in superposed relation by means of the pressure sensitive adhesive. This converting operation comprises the separation of successive or adjacent pressure sensitive labels by means of a die, the cutting edges of which are intended to penetrate the face material completely without entering or otherwise damaging the release liner.

Due to the fact that the release liner can vary in thickness and hardness and to problems inherent in such cutting operation (e.g., wear in machine parts, minor deviations from proper adjustment of the dies and dull dies which require excessive pressure) quality defects are frequently encountered in continuous supplies of pressure sensitive labels. Such a defect can be actual cuts in, or partial penetration of, the release liner by the die, in which case the release liner may be weakened to such an extent that it ruptures or tears as it is drawn around the forward edge of a stripping bar of label applying apparatus such as that disclosed in the aforesaid Reich patent. Severing of the web in this manner necessitates shutdown of the label applying apparatus to reunite or rethread the release liner onto the take-up reel. An associated problem with this quality defect is the application of pressure sensitive labels which have not been fully separated from a fragment of the release liner, requiring removal of the label from a package to which it may have been applied.

Another quality defect is a tenacious adherence of the pressure sensitive label to the release liner along the lines of the die cuts, an adherence which is very much stronger than the adherence of the balance of the label. It is thought that the reason for this defect is that excessive

pressure along the die cut lines forces the pressure sensitive adhesive into more intimate contact with the release liner, possibly penetrating the release coat, whereby to achieve a firmer bond to the release liner. Whatever the cause, the defect results in the erratic placement or registration of the pressure sensitive labels on the packages acted upon by the label applying apparatus because the labels do not peel smoothly from the release liner, but, rather, undergo jerky movements during the peeling operation. This label misregistration frequently requires a reworking of the packages affected, i.e., removal of the label and reapplication of the same or another label.

Each of the defects noted causes monetary loss to the label user and/or the label supplier. To date these problems have not been successfully solved by the industry although much work has been done in an effort to correct the deficiencies.

It is an object of the present invention to obviate the above problems.

It is another object of the present invention to provide a method to improve the peeling characteristics of pressure sensitive labels of the type described above, when fed to the label stripping position of a label applying means.

A further object of this invention is to provide an inexpensive method to improve the application peeling characteristics of pressure sensitive labels (i.e., the characteristics of peeling exhibited on label applicating machines such as that of the aforesaid Reich patent) and to test or prove the quality of a continuous supply of pressure sensitive labels with respect to die cutting, during converting operations subsequent thereto, whereby any needed die adjustment can be made promptly and without the great expense which would be otherwise encountered if off-quality die cutting was continued on a commercial scale.

Still another object of the present invention is the provision of an inexpensive method to test or prove the quality of a continuous supply of pressure sensitive labels prior to placement thereof on a label applying apparatus, to improve the peeling characteristics of the pressure sensitive labels as they are stripped from the release liner, to eliminate machine downtime due to rupture of the release liner on a label applying apparatus and to materially reduce scrap and reworking of labeled objects due to faulty labeling by reason of die cutting quality defects in pressure sensitive label rolls.

In accordance with one aspect of the present invention there is provided a method of label stripping and relamination which comprises feeding the release liner with the labels thereon in their die cut positions to a stripping station, sequentially stripping each label from the liner by a peeling action starting at the leading edge of the label and proceeding progressively to the trailing edge, feeding a release liner to a relamination station adjacent the stripping station and sequentially and progressively placing thereon the labels being peeled at the stripping station, with the leading edge of each label being so placed prior to the peeling of the trailing edge at the stripping station.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as forming the present invention, it is believed that the invention will be better understood from the following description taken in connection with the accompanying drawing, in which:

FIGURE 1 is a fragmentary plan view of a continuous supply of pressure sensitive labels of split top or butt form;

FIGURE 2 is an enlarged side elevation of the continuous supply of pressure sensitive labels of FIGURE 1, looking along the line 2—2 thereof;

FIGURE 3 is a fragmentary plan view of a continuous supply of pressure sensitive labels of laid-on form;

FIGURE 4 is an enlarged side elevation of the continuous supply of pressure sensitive labels of FIGURE 3, looking along the line **4—4** thereof;

FIGURE 5 is a fragmentary side elevational view of one embodiment of apparatus in accordance with the present invention;

FIGURE 6 is a fragmentary sectional view of the apparatus of FIGURE 5 taken along the line **6—6**; and

FIGURE 7 is a fragmentary sectional view of the apparatus of FIGURE 5 taken along the line **7—7**.

Referring to the drawings, and particularly to FIGURES 1 and 2, there is illustrated a continuous supply **10** of pressure sensitive labels of butt form, i.e., labels which are die-cut in such a manner that one edge of a label abuts upon that of the adjacent label. The butt labels ilustrated as **10***a*, **10***b*, **10***c* and **10***d* comprise but a portion of a multiplicity of butt labels adhered to a release liner R by means of a film **14** of pressure sensitive adhesive. The release liner R comprises a continuous length of backing web **12** to which is affixed a layer **16** of release coat material. The layer **16** of release coat material allows pressure sensitive labels to be removed from the release liner without damage to either. The individual labels are severed one from the other by die cuts **18** extending completely through the face material (the material of which the labels **10***a*–**10***d* are made) and the film **14** of pressure sensitive adhesive whereby the individual labels may be stripped, peeled, from the release liner for application to a substrate such as a package, carton or the like. As used hereinafter the term, "pressure sensitive label" denotes the individual labels, such as label **10***a*, in combination with the portion of the film **14** of pressure sensitive adhesive underlying it and has been assigned reference character L.

A laid-on label form of a continuous supply **10'** of pressure sensitive labels L' is illustrated in FIGURES 3 and 4. Laid-on labels are die-cut, pressure sensitive labels mounted on a release liner from which the pressure sensitive matrix or waste has been removed. As shown, the labels **10***a'*, **10***b'*, and **10***c'* which have been die-cut from the face material of the pressure sensitive label stock, remain adhered to the underlying release liner R' (backing web **12'** and layer **16'** of release coat material) by means of coextensive portions of film **14'** of pressure sensitive adhesive. The waste, i.e., the portions of the face material outside the die-cut labels **10***a'*, **10***b'* and **10***c'* and coterminous portions of the pressure sensitive adhesive layer of the pressure sensitive label stock, has been stripped from the release liner R' during the converting operations.

Each of the above-described forms of continuous supplies of pressure sensitive labels is well known in the art. In addition, the materials from which the various elements comprising the continuous supplies are made and the processes and procedures for converting the same into the finished forms described are also known to those of ordinary skill in the pressure sensitive label art. In view of this knowledge, and since the specific materials, processes and procedures used to prepare the continuous supplies of pressure sensitive labels are not aspects of the present invention (except insofar as the same create the previously described need for this invention), further description thereof is unnecessary.

Referring now to FIGURES 5, 6 and 7, there is disclosed one preferred embodiment of apparatus of the instant invention. The function of the form of apparatus shown is to take a continuous supply **10** of pressure sensitive labels being fed thereto, strip the pressure sensitive labels from the release liner and relaminate each of the pressure sensitive labels to the release liner in a position in advance of that to which it previously was adhered. The continuous supply **10** of pressure sensitive labels is shown in FIGURES 5, 6 and 7 as merely comprising pressure sensitive labels L mounted in seriatim on release liner R (i.e., without specifically illustrating the pressure sensitive adhesive film **14** or the layer **16** of release coat) to simplify the drawing. In this embodiment a mounting plate **20** made of a suitably rigid material such as ½" hot rolled steel plate is provided to support the elements comprising the inspection and improvement device. The mounting plate **20** may be fastened securely to a machine frame, standard, or the like in the position desired by fastening means, not shown, e.g., by bolts, clamps, welding or any other known means.

A peeler plate **22** of substantially rectangular face configuration projects outwardly at right angles with the vertical face of mounting plate **20**, being fastened thereto by welding, machine screws or the like whereby structural stability is achieved. The plate **22** is also preferably constructed of a substantially rigid material and here, too ½" hot rolled steel plate is satisfactory. The length of the plate **22** is not critical nor is the width (the outward projection of plate **22** from mounting plate **20**) except insofar as it preferably has a width at least as great as the width of the continuous supply **10** of pressure sensitive labels to be fed thereover. On the downstream side, the forward end **22***a* of plate **22** (the right end as shown in FIGURE 5) is formed at an acute angle with the top or support surface **22***b* of the plate **22** and the forward edge **22***c* rounded so that a web such as the release liner may be drawn along said top face or surface **22***b* and around forward edge **22***c* without tearing. A radius of 1/32" for the forward edge **22***c* and an included angle between the forward end **22***a* and top surface **22***b* of the plate **22** of 30° are satisfactory; however, such dimensions can vary widely without significant problems arising, depending upon the parameters of particular applications, e.g., speed and type of materials being processed. The other end (not shown) of the plate **22** may be of any configuration desired, but the upper edge thereof is preferably rounded to provide a lead-in surface which will not damage a web passing thereover. Top surface **22***b* and forward edge **22***c* are desirably very smooth, preferably polished, to reduce the coefficient of friction thereof in conjunction with a web passing thereover.

An idler **24** is mounted in a position below the plate **22**, preferably arranged so that a line tangent to both the forward edge **22***c* of plate **22** and the idler **24** does not fall within the included angle of the forward edge **22***c* and top surface **22***b* of plate **22**. As shown, the idler **24** comprises a bushing **26** (which has a length approximately the same as the width of plate **22** and which is made of any suitable bearing material, e.g., bronze) pressed into the interior of a cylindrical, elastomeric cover **28** of a length matching bushing **26** and constructed of neoprene, polyurethane or other similar resilient materials. Idler **24**, which can for example have a 2" O.D., is rotatably affixed to a steel shaft **30** having a shoulder **30***a* adjacent a threaded end **30***b* of reduced diameter. The threaded end **30***b* projects through a vertically oriented elongated slot **20***a*, the width of which is smaller than the shoulder **30***a* diameter, and a washer **30***d* and lock washer **30***e* are applied to the protruding portion of end **30***b*. A nut **30***c* engaged with the threads of end **30***b* rigidly secures the shaft to the mounting plate **20** by a clamping force exerted on the thickness thereof between the shoulder **30***a* and nut **30***c*. The shaft **30** can be secured at any point along the slot **20***a*, thereby permitting a limited amount of adjustment of the distance between the idler **24** and the forward edge **22***c* of peeler plate **22**. A steel thrust washer **32** is placed on shaft **30** intermediate the idler **24** and the mounting plate **20** for the usual purposes and the distal end of the shaft **30** is grooved to accept a spring-type retaining ring **34** therein to restrict outward movement of idler **24** on shaft **30**. The above construction details of idler **24** and shaft **30** are merely exemplary of many ways in which an idler can be fabricated and mounted and are therefore not critical.

Another adjustably mounted idler, pressure roll **36**, is affixed to mounting plate **20** above and in advance of the leading edge **22***c* of plate **22**. The roll **36** is identical to idler **24** in construction as is the manner of rotatably supporting the same on mounting plate **20**, like reference numerals with primes affixed thereto denoting corresponding parts associated with roll **36**. As is the case of idler **24**, roll **36** is vertically adjustable within the elongated slot **20***a*'.

A freely rotatable back-up roll **38** is mounted on the mounting plate **20** directly below pressure roll **36**, with the top portion of the periphery thereof approximately aligned with the top surface **22***b* of plate **22**. Roll **38** has preferably the same length as roll **36** and may be of any convenient diameter which permits the nip between rolls **38** and **36** to be closely adjacent the forward edge **22***c*, spaced from said edge by a distance which is smaller than the dimension of each pressure sensitive label L parallel to the length of the release liner R on which it is mounted. Preferably such spacing should be as small as possible without causing interference between the release liner as it leaves the stripping station and as it approaches the relamination station, and a maximum of about 1¼" to permit good control of the pressure sensitive label L as it transfers to the relamination station, as will be more fully understood from subsequent description. In the illustrated embodiment the roll **38** has an outside diameter of 1¼". The material comprising the roll **38** is metal, preferably a bearing material such as bronze or the like, with smooth interior and exterior surfaces. The roll **38** is telescoped over steel shaft **40** similar in construction to shaft **30** and in like manner secured to mounting plate **20**, with threaded end **40***b* extending through clearance hole **20***b*, by means of a nut **40***c* bearing against washer **40***d* and bringing shoulder **40***a* into contact with the face of mounting plate **20**. A thrust washer **42** and a spring-type retaining ring **44** serve to retain the roll **38** in axial position without directly contacting the mounting plate **20**.

It will be understood that the plate **22**, idler **24** and rolls **36** and **38** are each normal to the mounting plate. Therefore when a web is fed over the plate **22**, around idler **24** and between rolls **36** and **38** and pulled in a direction parallel to the plane of the face of mounting plate **20**, the web remains in alignment, as viewed in plan.

In operation, a continuous supply **10** of pressure sensitive labels coming from a source thereof (e.g., from a preceding converting operation (such as a die-cutter) or from a supply reel, neither of which are shown) is threaded on the apparatus. The continuous supply **10** extends along the top surface **22***b* of plate **22** to a stripping station, the forward edge **22***c* of plate **22**. Then the continuous supply **10** is looped downwardly around the idler **24** and upwardly through the nip between rolls **36** and **38** and onward to apparatus for performing a subsequent operation or to a winding reel. At the start of the operation the pressure sensitive labels along the loop described can be removed and discarded, if desired. Then the web is fed through the apparatus by means not shown, whereby to commence the inspection and peel improvement operation. At this time each of the pressure sensitive labels L being fed to the stripping station is in the exact position on the release liner R which it occupied at the time that die-cuts **18** were made during the converting operation. At the stripping station the pressure sensitive labels L (in this case, butt labels) are sequentially peeled from the release liner R by an abrupt change in the direction of movement of the release liner R as it is fed around the forward edge **22***c* and along a path lying at an angle with support surface **22***b* to the idler **24**, a technique which is known in the art. The peeling commences at the leading edge of each pressure sensitive label L and proceeds progressively along the balance thereof to its trailing edge, occurring at the speed of movement of the release liner R as it is pulled around the forward edge **22***c*. The release liner R makes a loop around a guide means, idler **24** and is then fed into the relamination station comprising the nip of rolls **36** and **38**. The spacing between the periphery of rolls **36** and **38**, the nip thickness, is adjustable by movement of roll **36**, the spacing required being dependent upon the thickness of the pressure sensitive labels L and release liner R, the materials from which the same and the rolls are constructed and the degree of adhesion required.

As the peeling of a pressure sensitive label L commences at the stripping station, the leading edge of the pressure sensitive label L moves unsupported in a direction generally in line with the direction of movement thereof along top surface **22***b* of plate **22**, towards the relamination station and the release liner R being fed thereto. Due to the close adjacency of the relamination station to the stripping station, the adhesive side of the leading edge of a pressure sensitive label L (when it has been sufficiently stripped and thus advanced) will recontact the release liner R as it enters the relaminating station, such recontact occurring prior to the peeling of the trailing edge of such pressure sensitive label L at the stripping station. The rolls **36** and **38** press the pressure sensitive label L against the release liner R as both proceed, necessarily at the same speed, through the nip intervening the rolls thereby relaminating each pressure sensitive label L to a portion of the release liner in advance of that to which it was adhered previously during the die-cutting operation. The exact position at which the pressure sensitive label L will be placed on such advance portion is dependent upon the length of the loop, which can be adjusted by moving the idler **24**. Preferably, the pressure sensitive label L is placed in a position out of registry with that occupied by a pressure sensitive label L before the foregoing stripping operation was performed.

Following the peeling of the trailing edge of a pressure sensitive label L from the release liner R at the stripping station, the pressure sensitive label L continues to be moved into the relamination station, being drawn in with the release liner R being fed thereto and to which the leading edge of such label is attached. As the relamination of one pressure sensitive label L is being completed, the stripping of the next consecutive pressure sensitive label L commences. In this way, all the pressure sensitive labels L mounted on the continuous supply **10** of pressure sensitive labels are sequentially and progressively placed and relaminated to the release liner R, preferably at a position in advance of that previously occupied. Since the release liner R is in alignment and traveling at identical speeds at the stripping and relamination stations the relative positions of the pressure sensitive labels L to one another will remain unchanged following the stripping and relamination operation described.

If the release liner was damaged during the die-cutting operation and therefore ruptures as it is fed around the stripping station, then this indicates a quality defect and steps can be taken to correct the problem. For example, if the label converter performs the subject method, he can readjust the cutting dies or, alternatively, reject off-quality pressure sensitive label stock prior to performing further converting operations thereon and in this way be sure that his customers receive only high quality continuous supplies of pressure sensitive labels. If the customer uses the present invention to inspect the said continuous supplies prior to feeding the same into a label applying machine, then he can be fairly well assured that liner rupture will not occur in the applying machine if it does not occur in the subject device. If rupture does occur in the inspection and relamination device of this invention, then the customer is in a position to reject such continuous supplies for quality defects without interrupting the operation of the applying machine. Regardless of who employs the present invention, however, and at which point it is employed, the result will be an improvement in the application peeling characteristics of the pressure sensitive labels since the tenacious bond along the die-cut lines will

have been eliminated prior to approaching the application station of the label applying machine. As a consequence, accurate application of labels can be achieved, thereby improving the appearance of the goods being labeled and reducing manufacturing costs.

The apparatus and method of this invention can, for example, be employed in the label converting plant at which the pressure sensitive labels are produced, in a position intermediate the die-cutting station and the means for winding the continuous supply **10** of pressure sensitive labels in roll form. In this case, the means for feeding the continuous supply **10** through the described apparatus would be that normally used to feed such supplies as they proceed through the converting operations.

Alternatively, the apparatus and method of this invention can be utilized in connection with label applying devices such as that disclosed in the aforesaid Reich patent where, for example, the present device can be placed intermediate the supply reel and the tension clamp associated with the stripping bar of the patented device. The means for feeding the continuous supply **10** of pressure sensitive labels would, in this case, be the take-up reel or, if this would tend to put too much tension on the release liner R, a set of driven power rolls located between the present device and the applicating machine stripping bar could be used. To assure proper tension on the continuous supply as it is fed to the stripping station of the present device, a braking device can be mounted on the supply reel.

Another alternative is to employ the apparatus and method of this invention at any stage intermediate the converting and applicating stages, for example as a separate piece of equipment. A roll of the continuous supply **10** of pressure sensitive labels can be mounted for rotation on an upstream extension of the mounting plate **20** and using either a tension clamp arrangement such as illustrated in the aforesaid Reich patent or a braking device on the roll, the continuous supply can be fed to the stripping station at the proper tension. A take-up reel can then be mounted for rotation on a downstream extension of mounting plate **20** and this reel driven at a desired speed whereby to provide the means to feed the continuous supply of pressure sensitive labels through the present apparatus by the application of tension thereto as the relaminated continuous supply **10** is rewound.

None of the above alternative ways of employing the present device is illustrated since one skilled in the art would recognize, from the brief description given, the variety of ways in which it can be used and since the art is replete with respect to devices for feeding webs along a predetermined path.

It will be realized that while the apparatus is shown in connection with the inspection and improvement of butt type pressure sensitive labels, it is equally well adapted to similarly inspect and improve the application peeling characteristics of laid-on forms of pressure sensitive labels. In addition, it is recognized that many changes can be made in the specific structure illustrated without necessarily deleteriously affecting its operation and in the process described whereby to achieve the basic purpose of this invention, i.e., stripping and relaminating die-cut pressure sensitive labels prior to feeding the same to the application station of a label applying machine. For example, the idler **24** and roll **36** can be constructed entirely of metal, the relamination station location can be altered by raising or lowering the same to some extent, the release liner R coming from the stripping station can be directly rewound (for later use, if desired) and another release liner R fed to the relamination station, the relamination station can merely comprise a roll and a stationary back-up plate, the idler **24** and/or rolls can be changed so as to be power driven and many other changes can be made which are within the purview of this invention.

Many modifications of the above invention may be used and it is not intended to hereby limit it to the particular embodiments shown or described. The terms used in describing the invention are used in their descriptive sense and not as terms of limitation.

What is claimed is:

1. The method of inspecting and improving the application peeling characteristics of pressure sensitive labels formed by die-cutting the face material thereof in situ on a ribbon of release liner, said method comprising:

(A) feeding the release liner with the said pressure sensitive labels mounted thereon in their die-cut positions to a stripping station;

(B) sequentially stripping each of said pressure sensitive labels from its die-cut position on the release liner to which it is adhered by a peeling action, said peeling commencing at the leading edge of said pressure sensitive label and proceeding progressively across the balance thereof to its trailing edge;

(C) feeding a ribbon of release liner to a relamination station at the same speed as the release liner feeding to said stripping station, said relamination station being closely adjacent to said stripping station; and

(D) sequentially and progressively placing the pressure sensitive labels being peeled at said stripping station on the release liner feeding into said relamination station, with the pressure sensitive adhesive side of said pressure sensitive labels in contact therewith, the leading edge of each of said pressure sensitive labels being so placed prior to the peeling of the trailing edge of said pressure sensitive label at said stripping station.

2. The method of claim **1** in which the release liner feeding into said stripping station and the release liner feeding into said relamination station are portions of the same web.

3. The method of claim **1** in which the release liner being fed into said relamination station previously supported die-cut pressure sensitive labels which had been stripped therefrom and in which the pressure sensitive labels placed on the said release liner feeding into said relamination station are in a position out of registry with that formerly occupied by the labels stripped from the said release liner.

4. The method of inspecting and improving the application peeling characteristics of pressure sensitive labels formed by die-cutting the face material thereof in situ on a ribbon of release liner, said method comprising:

(A) feeding the release liner with the said pressure sensitive labels mounted thereon in their die-cut positions to a stripping station;

(B) sequentially stripping each of said pressure sensitive labels from its die-cut position on the release liner to which it is adhered;

(C) feeding a ribbon of release liner to a relamination station;

(D) sequentially moving the stripped labels to said relamination station; and

(E) sequentially placing the stripped pressure sensitive labels on the release liner feeding into said relamination station, with the pressure sensitive adhesive side of the pressure sensitive labels contacting the release liner.

5. The method of preparing a continuous supply of pressure sensitive adhesive-backed labels secured in serial arrangement by said adhesive to a ribbon of release liner, the dimension of said labels in the direction of the length of said release liner being short relative to such length, said method comprising:

(A) feeding a laminate of continuous lengths of a face material and a release liner to a die cutting means, said laminate being formed by adhering the continuous lengths in superposed relation by means of a pressure sensitive adhesive;

(B) die cutting said face material to form and separate the labels from one another while the release liner remains a continuous length;

(C) feeding the release liner with the adhesive-backed labels thereon to a stripping station;

(D) progressively stripping each of said labels from its die-cut position on the release liner to which it is secured by abruptly changing the direction of movement of the release liner while it is maintained under tension;

(E) moving the stripped portion of each of said labels to a relamination station at a speed matching the speed of stripping thereof;

(F) feeding a ribbon of release liner to said relamination station at a speed matching the speed of movement of said labels to said relaminaiton station; and

(G) progressively placing the stripped portion of each of said labels on the ribbon of release liner feeding to said relamination station with the pressure sensitive adhesive backing on the labels contacting the release liner.

6. The product produced by the method of claim 4.

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U.S. Cl. X.R.

156—152, 248, 344, 542, 584; 161—406