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ADHESIVE LABEL DISPENSER

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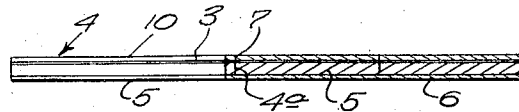
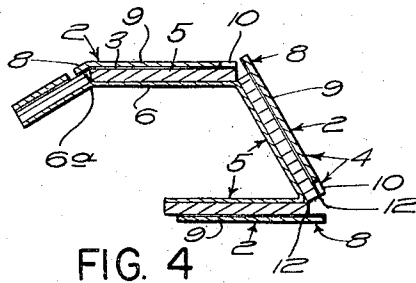
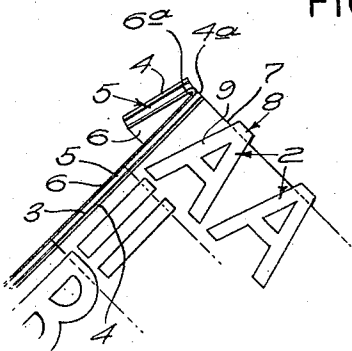
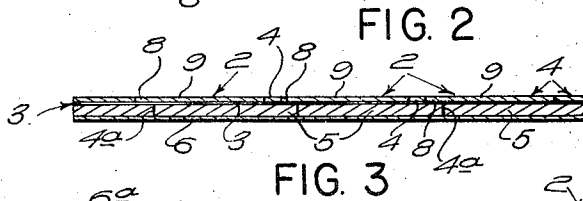
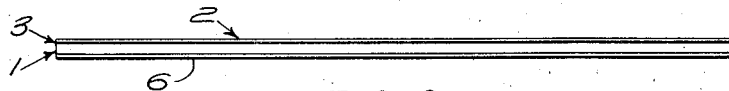
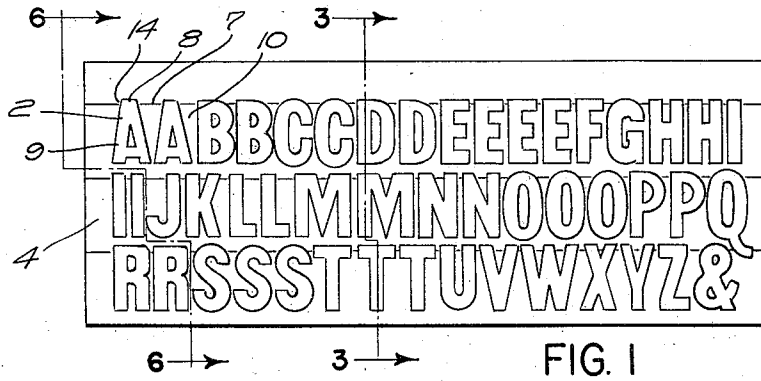


FIG. 5

FIG. 6

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ADHESIVE LABEL DISPENSER

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12 Claims. (Cl. 206—56)

This invention relates to a combination of pressure sensitive labels with a dispenser mounting therefor. It resides more specifically in a series of pliant yet somewhat stiff adhesive backed labels in separable pressure sensitive adhesive contact with a releasably surfaced and slit carrier having a flexible hinge forming material attached to the back side bridging the slits. The slits divide the carrier into strips and each label overlays a slit with a small tab end on one side of the slit and the major portion on the other side. Cuts are provided through the label stock between each label, said cuts substantially overlaying the carrier slits. The cohesion in shear of the label material is greater than the adhesion in shear provided by the adhesive between the small tab end of each label and the strip of the carrier to which it is secured. The stiffness of the label material resists bending of the label over the slit and thereby exerts a releasing force on the tab end when adjacent carrier strips are rotated rearwardly with respect to each other. Consequently, by rotating said carrier strips rearwardly with respect to each other to thereby exert a shearing force on the adhesive between the tab end and its strip and a bending force on the label through the adhesive, the adhesive between the tab end and its carrier strip yields in shear and the strip moves in shear with relation to the tab end to thereby weaken the adhesive bond between the tab end and carrier strip sufficiently so that the resistance to bending of the label over the slit overcomes the weakened adhesive bond to release the tab end from its strip, whereupon the tab end snaps back to substantially the plane of the major portion of the label secured to the other strip and can be readily grasped for the purpose of removing the label from the carrier for placement elsewhere.

In certain cases, the gap between the top edges of each slit when the strips formed by such slit are rotated rearwardly a substantial distance is greater than the dimension of the tab end of the label in a direction transverse to the slit. With such an arrangement, if the resistance to bending of the label material is not sufficient to overcome the weakened bond and release the tab end, continued rotation of the carrier strips causes the gap between the top edges of the slit to become greater than the dimension of the tab end in the direction transverse to the slit, whereupon such tab end is released from the strip to which it is secured.

By rotating the carrier strips back to original position, rebonding of the tab ends of the unused labels to the carrier strip occurs to protect their adhesive from deleterious effects of air and to protect them from distortion in handling.

Heretofore pressure sensitive adhesive labels have been furnished to the user mounted either on a backing of paper, from which they are peeled with some difficulty as considerable manipulation is necessary to get the edge of each label free from the paper in order to grasp it for further peeling, or on cards overlaying a partly scored line, the card with its attached labels being flexed both

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forwardly and backwardly to break the card along the partly scored line, one portion of the card subsequently being peeled off rearwardly to expose the minor portion of the first few of the labels or peeled entirely off to expose the minor portions of an entire row of labels. In the latter case the subsequent protection of the minor portions of the unwanted labels is left to the return of some loose type of backing.

By the use of the present invention all of a row of pressure sensitive adhesive labels are made immediately available for selective removal without any difficult manipulations and without the necessity of tearing the backing and the unused labels are readily protected for later use. These factors are particularly important when the labels are in the form of letters or numbers to be used for making signs or the like where selection of the proper shape is essential and there will likely be a surplus of unused labels left on any of the rows or series of characters.

The invention is hereinafter described by reference to the accompanying drawing which forms apart hereof, in which there is set forth by way of illustration and not of limitation certain forms in which the dispenser of this invention may be embodied and in which:

Fig. 1 is a top plan view of one form of label dispenser of the present invention.

Fig. 2 is a side view in elevation of the dispenser shown in Fig. 1.

Fig. 3 is an enlarged view taken along the line 3—3 of Fig. 1.

Fig. 4 is like Fig. 3 showing progressive steps in the release of the tab ends of the labels.

Fig. 5 is a perspective view of a fragment of the dispenser shown in Fig. 1 showing the final position of the rotated carrier strip exposing the tab ends of a series of labels for complete removal from all of the carrier.

Fig. 6 is a view taken along the line 6—6 of Fig. 1.

Referring now to the drawing, a dispenser is there shown made up of a carrier 1 to which a series of separate pressure sensitive adhesive labels 2 is secured. The carrier 1 is formed for purposes to be more fully described hereinafter of a resilient but dense material such as, for example, sheet vulcanized fibre, phenolaldehyde-resin bonded fibre pulp, homogeneous pyroxylin or other plastic of similar physical properties or any similar material including dense paper of sufficient thickness with a surface from which the adhesive label will not remove surface fibers or delaminate the paper, in some cases densified by materials which will not migrate into the adhesive layer to its detriment such as zinc chloride or some of the silicones. The carrier 1 is relatively stiff compared to the label material and is substantially thicker than the label material.

As appears more clearly in Fig. 3 the labels 2 are provided with a pressure sensitive adhesive coating 3 of rubber and resin combination or the like which is in adhesive contact with the carrier 1 thus serving to maintain the labels 2 in their intended display position on the top surface of carrier 1. Before applying the label stock 4 to the carrier 1 the carrier 1 is slit at 4a completely into two or more strips 5 and is brought together again by a sheet of flexible hinge forming material 6 such as cellophane pressure sensitive adhesive tape, or a pressure sensitive adhesive tape of cellulose acetate or mylar, which is adhesively secured to the lower sides of the several carrier strips 5 and which acts as a hinge 6a (see Fig. 4) about which adjacent strips 5 can rotate rearwardly with respect to each other.

Following this a sheet of conventional label stock 4 of various grades, including, but not limited to, crepe paper, polyvinyl resin and other so-called label stock, all having an application of conventional pressure sensitive adhesive

on one side, is applied to the top side of the reassembled carrier 1 and characters 2 such as letters and/or numbers are die cut by forcing a sharp edged die conforming to the shape required through the label stock 4 and its adhesive coating 3 and into but not through carrier 1. Additional cuts 7 are also made in the portions 10 of the label material 4 between each label. Cuts 7 substantially overlay the slits 4a of carrier 1, as shown in Fig. 6, to facilitate the rotation of the carrier strips 5 and to assure that only the label tabs or tips 8 stand out when adjacent carrier strips 5 are rotated rearwardly with respect to each other to release the tab ends as described hereinafter. These cuts 7 do not quite extend to the cuts of the labels and consequently there is a small uncut gap 14 between the ends of each cut 7 and the adjacent cuts of the two labels between which the cut extends. These gaps aid in holding the parts together but they are easily torn when adjacent strips 5 are rotated rearwardly with respect to each other as described hereinafter.

The pressure sensitive adhesive 3 on the labels is of a conventional type permitting the labels 2 to be peeled off from the carrier 1. Such adhesive may range from solvent rubber and rubber-resin combination to synthetic chemicals of a tacky character.

The labels are in parallel rows and each label of each row bridges a slit 4a in the carrier with a tab end or tip of small area 8 extending from one side of the slit 4a and secured to one of the strips 5 of the carrier formed by such slit and with the major portion 9 of the label extending from the opposite side of the slit and secured to the other strip 5 of the carrier formed by such slit 4a.

The label material 4 and the backing sheet 6 hold the strips 5 of the carrier together as shown in Fig. 3.

The area of the tab or tip end 8 of each label 2 is selected so that the adhesive force in shear supplied by adhesive 3 between tip 8 and the strip 5 to which it is secured is less than the cohesion (resistance to tearing and stretching) in shear of the label material so that when adjacent strips 5 of the carrier are rotated rearwardly with respect to each other, as shown in Fig. 4, the shearing force exerted on adhesive 3 by the strip 5 to which the tab 8 is secured will cause the adhesive between 8 and its strip 5 to yield and the strip moves in shear with respect to tab 8, as shown in Fig. 4, whereby such tab 8 commences to be pulled off its strip. The yielding of the adhesive and the consequent movement of the strip with respect to the tab end 8 weakens the adhesive bond between tab 8 and its carrier strip. The forces applied by the rotation of adjacent strips as aforesaid do not cause the portion 9 of the label to move with respect to its strip 5 because the area of 9 is relatively large compared with the area of 8 so that the adhesive force holding 9 to its strip is much greater than that holding 8 to its strip. Consequently, it is the adhesion between 8 and its strip which yields and not the adhesion between 9 and its strip.

The cohesion which is referred to above refers to the forces holding the label material together against tearing and stretching. Since the cohesion or resistance to tearing and stretching is greater than the adhesion of tab 8 to its strip, it is this adhesion which will yield rather than the strip itself.

The above mentioned cohesion and stiffness of the label material resists bending of the label over slit 4a (Fig. 4) caused by the rotation of strips 5. This resistance to bending exerts a release force on the tab end 8 when the strips are thus rotated. This release force finally overcomes the weakened adhesive bond between the tab end 8 and its strip 5 as the strips continue to be rotated and the tab end is released from its strip and snaps back to the plane of the major portion 9 secured to the other strip. In the event this resistance to bending is insufficient to overcome the weakened adhesive bond between 8 and its strip 5 continued rearward rotation of the strips 5 with respect to each other continues to pull the tab 8 from its strip as above described, until the gap between the top

edges 12 (see Fig. 4) of the strips becomes greater than the dimension of the tab end 8 in a direction transverse to the strip (the distance tab 8 extends beyond slit 4a when the parts are in the positions shown in Fig. 3) whereupon the tab 8 is pulled completely off its strip and is thereby released and the stiffness of the label causes tab end 8 now released from its strip to snap back to substantially the plane of portion 9 so that it can be readily grasped by the fingers to pull the label off from the strip 5 to which 9 is secured.

The above mentioned gap between the top edge of adjacent strips 5 is achieved by selecting the proper total thickness of the carrier 1 and backing strip 6 as compared to the dimension of 8 in the direction transverse to the slit 4a. Such a gap is assured if the combined thickness of the carrier 1 and backing sheet 6 is more than one half the dimension but such thickness can be less if the label material is of stiff enough material so that the resistance to bending of the label over the slit 4a is sufficient to overcome the weakened adhesive bond between tab end 8 and its strip 5 to release the tab end 8 when the adjacent strips are rotated rearwardly about their hinge connection only slightly to relative positions in which the gap is less than the above mentioned dimension.

The smaller the area of tab end 8 the less is the total adhesive force between it and its strip and hence the easier it is to release the tab end. Preferably such area should be the smallest area which is consistent with the desired label dimensions and which permits it to be grasped by the fingers. Preferably the dimension of the tab area 8 in a direction transverse to the slit (this dimension determines the area for a label of any particular size) should be the smallest dimension which will permit the tab end to be grasped by the fingers. In this way the label material does not have to be very stiff to overcome the adhesion between the tab end and its strip because the total adhesion between the tab end and its strip is small and because bending of the label is more difficult close to its edge than at a more intermediate portion.

While in the drawing the thickness of materials has been exaggerated by reason of the limitations of pen and ink drafting methods, it will be understood that the materials shown in actual use are no thicker than they need be to perform their intended function thus the label stock 4 may vary from .001 to .012 inch or more in thickness, the carrier 1 may vary from .003 to .040 inch or more in thickness and the flexible hinge forming material 6 may be on the order of .003 inch in thickness. The exposed tab end 8 of the labels released as described above may be approximately $\frac{1}{32}$ to $\frac{3}{64}$ inch in extension or substantially one third of the width of such tab end such as the upper line of the letter E or the upper portion of the numeral 7. It may be convenient to apply a release surfaced paper or film adhered to the top surface of carrier 1 and under the label stock 4 before slitting both carrier 1 and said release surface paper or film to provide a better release of the pressure sensitive adhesive 3.

Practically any conventional label stock can be used in the present invention. Such stock varies from paper and vinyl sheets to metal, rigid plastic and impregnated cloth. If the stock has a low cohesion and a low stiffness and is easily torn or stretched, then the area of tab 8 and the dimension of tab 8 extending in a direction transverse to the slit should be kept at a minimum and a pressure sensitive adhesive of low strength should be used so that the total adhesion between the tab 8 and its carrier is very small. Furthermore, the stiffness and resistance to tearing and stretching of the label stock can be increased by increasing the thickness of the stock. Where the stock is stiffer and stronger and is not easily stretched, which is true of most conventional label stock, as for example, most paper and resin stocks and conventional adhesive tapes, a stronger adhesive can be used and the area of tab 8 can be greater. The maximum area of tab 8 and the maximum dimension of tab 8 in a direction trans-

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verse to the slit and the proper pressure sensitive adhesive required for any particular label stock to assure release of the tab ends 8 by rotation of the carrier strips 5 can be readily ascertained by persons skilled in the art after having been taught the principle of the present invention.

Suitable carrier materials are described in U. S. Patents Nos. 2,434,545, 2,681,732 and 2,831,277.

Suitable release films which may be adhered to the top surface of the carrier to provide a better release of the pressure sensitive adhesive 3 are described in U. S. Patents Nos. 2,831,277 and 2,679,928.

The word "label" as used in the claims includes a label of any shape, such as a letter or figure.

The label material or stock may be applied to the carrier in a number of ways as for example coating pressure sensitive adhesive onto the slit or unslit carrier and then coating or otherwise applying over this after or before slitting, a material to form the label stock, or printing the adhesive and then over this printing the label forming material with vinyl or other ink in the shape of the desired label on the carrier.

Instead of leaving uncut gaps 14 to hold the assembly together this can be done by slightly offsetting each cut 7 between the labels from its carrier slit in the direction of the carrier having large areas 9 of the labels adhered thereto, so that the label forming material between the labels and adjacent one side of the cut 7 is adhered across the slit and in hinging stands out a bit on the carrier strip to which the small areas 8 were adhered, out of the way of the labels, which stand out on the other carrier strip.

Although in the embodiment shown in the drawing the carrier is stiff compared to the label stock which is an adhesive tape, and is thicker than the label stock, the label stock might very well be metal or other material as stiff or stiffer than the carrier, and be thicker than the carrier, as heavy cardboard.

I claim:

1. In combination a label and label dispenser comprising a carrier, a slit in the upper face of said carrier separating said carrier into strips, means on the lower face of said carrier and bridging said slit to hingedly secure said strips for relative rearward rotation with respect to each other, a label releasably secured by pressure sensitive adhesive to the upper surface of said carrier and bridging said slit, said label having a small end area extending from one side of said slit and adhesively secured to one of said strips adjacent said slit and a large end area extending from the opposite side of said slit and secured to the other strip adjacent to said slit, the adhesion in shear provided by said adhesive between said small end area and its strip being less than the cohesion of said label material in shear, whereby when said strips are rotated rearwardly to apply a shearing force on said adhesive and said small end area of said label, the adhesive between said small end area and the strip to which it is secured yields in shear and said last mentioned strip on which the small end of the label is secured moves in shear relative to said small end area against the adhesive force in shear exerted by said adhesive, the resistance to bending of the label over said slit being greater than the adhesion of said adhesive after said adhesive yields and said movement occurs to thereby overcome said adhesion and release said small area from the strip to which it is adhered in response to further relative rearward rotation of said strips, said small area being large enough to be grasped by the fingers to peel the label off the strip to which the large end is secured after said small area is released from its strip.

2. A label dispenser according to claim 1, said label forming a part of a sheet cut to form a row of said labels, said slit in said carrier extending through the thickness of said carrier to form said strips, said hinge means comprising a sheet of flexible hinge forming material adhesively secured to the lower surface of said carrier and bridging said slit.

3. A label dispenser according to claim 2, said sheet of labels having cuts extending between the labels, said cuts being substantially parallel with and substantially overlying said slit in said carrier.

4. A label dispenser according to claim 3, the ends of said last mentioned cuts falling short of the label cuts between which said last mentioned cuts extend.

5. A label dispenser according to claim 1, the dimension of said small area in a direction transverse to the slit being less than the maximum gap formed between the top edges of said slit upon continued relative and rearward rotation of said strips.

6. In combination a label and label dispenser comprising a carrier, a slit in the upper face of said carrier separating said carrier into strips, means on the lower face of said carrier and bridging said slit to hingedly secure said strips for relative rearward rotation with respect to each other, a label releasably secured by pressure sensitive adhesive to the upper surface of said carrier and bridging said slit, said label having a small end area extending from one side of said slit and adhesively secured to one of said strips adjacent to said slit and a large end area extending from the opposite side of said slit and adhesively secured to the other strip adjacent to said slit, the total adhesion in shear provided by said adhesive between said small end area and its strip being less than the cohesion of said label material in shear, whereby when said strips are rotated rearwardly to apply a shearing force to said adhesive and said small end area of said label, the adhesive between said small end area and the strip to which it is secured yields in shear and said last mentioned strip to which the small end of the label is secured moves in shear relative to said small end area against the adhesive force in shear exerted by said adhesive and said small end area is thereby released from its carrier strip.

7. A label dispenser according to claim 6, said label forming a part of a sheet cut to form a row of said labels, said slit in said carrier extending through the thickness of said carrier to form said strips, said hinge means comprising a sheet of flexible hinge forming material adhesively secured to the lower surface of said carrier and bridging said slit.

8. A label dispenser according to claim 7, said sheet of labels having cuts extending between the labels, said cuts being substantially parallel with and substantially overlying said slit in said carrier.

9. A label dispenser according to claim 8, the ends of said last mentioned cuts falling short of the label cuts between which said last mentioned cuts extend.

10. In combination a label and label dispenser comprising a carrier, a slit in the upper face of said carrier separating said carrier into strips, means on the lower face of said carrier and bridging said slit to hingedly secure said strips for relative rearward rotation with respect to each other, a label releasably secured by pressure sensitive adhesive to the upper surface of said carrier and bridging said slit, said label having a small end area extending from one side of said slit and adhesively secured to one of said strips adjacent to said slit and a large end area extending from the opposite side of said slit and adhesively secured to the other strip adjacent to said slit, the total adhesion in shear provided by said adhesive between said small end area and its strip being less than the cohesion of said label material in shear and the dimension of said small area in a direction transverse to the slit being less than the maximum gap between the top edges of said slit produced when said strips are rotated rearwardly with respect to each other about said hinge means, whereby when said strips are thus rotated rearwardly to apply a shearing force to said adhesive and said small end area of said label, the adhesive between said small end area and the strip to which it is secured yields in shear and said last mentioned strip to which the small end of the label is secured

moves in shear relative to said small end area against the adhesive force in shear exerted by said adhesive and said small end area is released from its carrier strip.

11. A label and label dispenser comprising a series of dispensably mounted pressure sensitive adhesive labels, a carrier having an upper surface capable of releasing pressure sensitive adhesive, one or more slits extending completely through said carrier and separating it into two or more strips, a sheet of flexible hinge forming material adhesively secured to the lower surface of said carrier strips and bridging said slit to hingedly secure said strips for relative rearward rotation with respect to each other, and a sheet of label forming material releasably secured by pressure sensitive adhesive to the upper release surfaces of said carrier strips, said label material being cut to form said series of substantially parallel labels, each of said labels having a very small end area extending from one side of said slit and a very large end area extending from the opposite side of said slit, said small end area being small enough whereby it may be separated from the release surface of the underlying carrier initially by weakening the grasp of the pressure sensitive adhesive by shear and eventually by the

slight stiffness of the label when the carrier strips are rotated rearwardly relative to each other about the hinge formed by said hinge material and large enough whereby it may be gripped by the fingers of the user to remove the larger end area of the label from the release surface of the other carrier strip by tension.

12. The combination of claim 11, wherein said labels are cut in the form of characters and said label forming material is formed with a series of aligned spaced cuts, each of said cuts being located substantially above the carrier slit and substantially extending between the label cuts which form adjacent characters, whereby the label forming material between the characters is separated at said carrier slits when the carrier strips are rotated relative to each other about the hinge formed by said hinge forming material.

References Cited in the file of this patent

UNITED STATES PATENTS

2,434,545	Brady	Jan. 13, 1948
2,681,732	Brady	June 22, 1954