

# United States Patent

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[54] **ENVELOPE WITH SEALING MEANS**

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161/406, 206/56 AA

[51] Int. Cl. .... **B65d 27/16**, B65d 27/30

[58] Field of Search ..... 229/77, 79, 80, 48 T, 48 SB,  
229/51 WB; 161/167, 406; 206/DIG. 18, 56 AA

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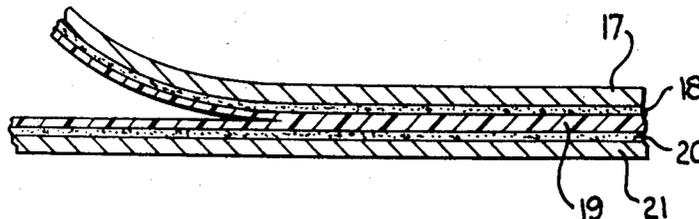
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[57]

**ABSTRACT**

A sealing strip which is particularly useful for securing two layers of paper together, for example sealing the flap of an envelope, which consists of a paper carrier of low internal strength coated on both sides with a pressure-sensitive adhesive. One or both adhesive surfaces may be protected with a removable strip of paper or plastics material.

**4 Claims, 4 Drawing Figures**



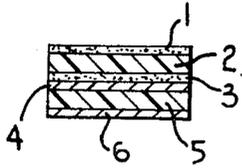


FIG. 1

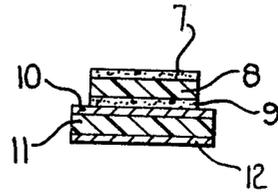


FIG. 2

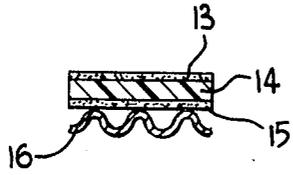


FIG. 3

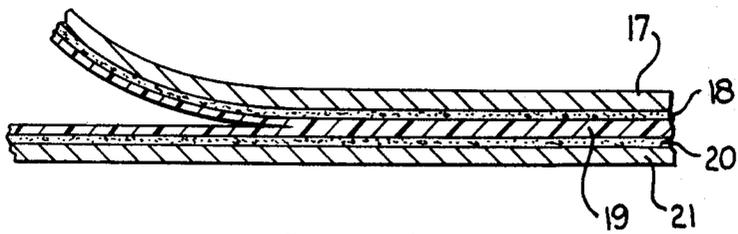


FIG. 4

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## ENVELOPE WITH SEALING MEANS

This invention concerns sealing means of the kind (hereinafter termed of the kind referred to) adapted to form a seal between two layers of paper, particularly though by no means exclusively suitable for sealing certain articles of stationary such as wage envelopes.

In the manufacture of wage envelopes, it is necessary to provide a means for the sealing of same. This can either be a strip of water remoisenable adhesive, heat activated adhesive, or pressure-sensitive adhesive, protected before use by means of a strip of release paper, or film, or other removable material. The first two adhesive types suffer from the disadvantages that they are difficult to apply and that they need activation before a seal can be made. The third adhesive, in its conventional form, suffers from the disadvantage that the bond can be broken by carefully peeling the flap away, particularly as one layer of paper to which it is stuck is often transparent and, in consequence, has a hard non-fibrous surface.

It is an object of the present invention to provide sealing means of the kind referred to which utilize a pressure-sensitive adhesive and which overcome at least to some extent the disadvantage aforesaid.

According to the present invention sealing means of the kind referred to comprises a thin paper carrier of low internal strength which is coated on both sides with a layer of pressure-sensitive adhesive material.

Preferably the paper carrier is supplied in the form of a tape and the adhesive surfaces are protected prior to use by a removable tape or release paper, or film or other removable material.

Specific embodiments of the invention will now be described, by way of example with reference to the accompanying drawings, in which:

FIGS. 1 to 3 show three different sealing means embodying the invention and suitable for the sealing of wage envelopes; and

FIG. 4 illustrates the splitting of the carrier paper when the sealing means is broken.

Referring to the drawings the sealing means is comprised by a tape of thin paper having a low internal strength and preferably manufactured from mechanical wood or sulphite pulp, but nevertheless having characteristics which prevent penetration of the adhesive through the body of the paper.

FIG. 1 illustrates a tape in which a carrier 2 coated with pressure-sensitive adhesive on both sides 1 and 3 is laminated to a paper 5 coated on either side with release coatings 4 and 6. The carrier 2 and paper 5 are of the same width. FIG. 2 illustrates a similar construction but in which the paper carrier 8 with its adhesive layers 7 and 9 is narrower than the release paper 11 coated with the release coatings 10 and 12.

FIG. 3 illustrates an example in which the release material 16 is an embossed plastic film, or paper. The paper carrier 14 is coated on both sides with adhesive 13 and 15.

Referring to FIG. 4 the paper carrier 19 with its adhesive layer 18 is first fastened to the flap of, say, a wage envelope 17. When the seal is made the release paper, which is temporarily attached to the other side of the carrier by adhesive layer 20 is removed and the adhesive layer is used to bond the tape to the opposite flap of the envelope 21 thus making a seal. When an attempt is made to peel the two flaps apart, the carrier paper, because of its peculiar characteristics, splits longitudinally, as illustrated.

A tape of protective material, capable of releasing from the adhesive, is provided and laminated with the adhesive on one face of the carrier to permit the latter to be wound up into a coil, both adhesive layers then being juxtaposed with a releasing surface. The release material may be either paper or plastic film coated on both sides with a coating having non-adhering properties, such as Shellac, suitable combination of nitro-cellulose and wax, polyethylene or silicone. Another alternative is an embossed plastic film, wherein the area of contact is reduced to facilitate removal. The protective, or release material, may be the same width as the adhesive coated carri-

er, but preferably slightly wider to provide free edges facilitating removal.

In use, for example, a length of the carrier may be secured to the body of a wage envelope by means of the adhesive layer on one face thereof at a position adapted to be overlaid by the flap of such envelope, the release paper being left in position on the outwardly directed adhesive layer to ensure against premature sealing of the envelope.

When it is desired to seal the envelope, the release paper is peeled from the carrier and the flap of the envelope is pressed firmly against the then exposed adhesive layer to effect the seal.

The seal is tamperproof, since any attempt to peel the flap open will result in a splitting of the paper carrier preventing normal re-sealing of the envelope. It will be understood that the internal strength of the paper carrier must be less than the adhesive forces between pressure-sensitive adhesive layers and the paper carrier on the one hand, and between the pressure-sensitive adhesive layer and the body of the envelope and envelope flap on the other hand.

The following example illustrates the invention:

A sulphite paper is constructed having the following properties:

substance:	80 gsm	
tensile strength:	27.5 lb/in	machine direction
	14.5 lb/in	cross direction
Elemdorf tear strength:	30 gsm	machine direction
	35 gsm	cross direction
Bendtsen air porosity:	60 mls/min	

was coated on either side 25 gms/sq.m with adhesive prepared in accordance with the following formulation:

35 ribbed smoked sheet No. 1 rubber	100 parts by weight
Hydrocarbon Resin 1071	50 parts by weight
Hydrocarbon Resin 1102	50 parts by weight
modified Terpene Resin 2010	30 parts by weight
anti-oxidant	2 parts by weight
petroleum spirit	543 parts by weight

The hydrocarbon resins were of the type supplied by R. H. Cole & Company Limited under the trade name "Escores"; the terpene resin was supplied by BX Plastics Limited; the anti-oxidant used was Nonox CNS supplied by ICI Limited.

This was interleaved with a release paper prepared from a 68 gsm Vegetable Parchment coated on both sides with a silicone release coating. In order to demonstrate the manner in which the construction works, tests were carried out using a Keil type tester.

First, the adhesive coated carrier was laminated between two pieces of MG envelope paper of 73 gsm. The sandwich was then peeled apart at a rate of 3 inch/minute. The carrier paper delaminated at a force of 650 gms/inch. A similar construction was made using a bleached glassine paper of 50 gsm substance; in this case the carrier paper delaminated at a force of 350 gms/inch. In both cases, because of the delamination of the sandwich, it was impossible to reseal the construction. The same adhesive was then coated directly on to the MG envelope paper and glassine at a weight of 25 gms. These were laminated to glass and Keil adhesion tests were carried out in the normal manner at a peel rate of 3 inch/ minute. The envelope paper delaminated at a force of 1,700 gms/inch and the glassine at 1,800 gms/inch. It, therefore, can be seen that the bond between the envelope paper and the glassine is much higher than the delamination strength of the carrier paper; also, that the delamination strength of the envelope paper and the glassine is greater than that of the carrier paper, so that always the carrier paper will delaminate. As hereinbefore mentioned, thin paper having low internal strength is preferably manufactured from mechanical wood, that is from wood which has been made mechanically or from sulphite pulp, that is from wood which has been reduced to a pump chemically rather than mechanically.

What is claimed is:

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1. In combination a sealing means comprising a thin paper carrier which is coated on both sides with a layer of pressure-sensitive material and an envelope having a flap, said sealing means being secured to the body of the envelope in the region adapted to be overlaid by the flap, said paper carrier having an internal strength which is less than the adhesive force between a layer of said pressure-sensitive material and said paper carrier, between a layer of said pressure-sensitive material and said body of the envelope, and between a layer of said pressure-sensitive material and said flap.

2. The combination of claim 1, in which the outer face of the sealing means is covered by a release means to prevent premature sealing of the envelope.

5 3. The combination of claim 2, in which the release means is of slightly greater width than the width of the paper carrier.

4. The combination of claim 3, in which the paper carrier is of low internal strength and is manufactured from a substance selected from the group consisting of mechanical wood and sulphite pulp.

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