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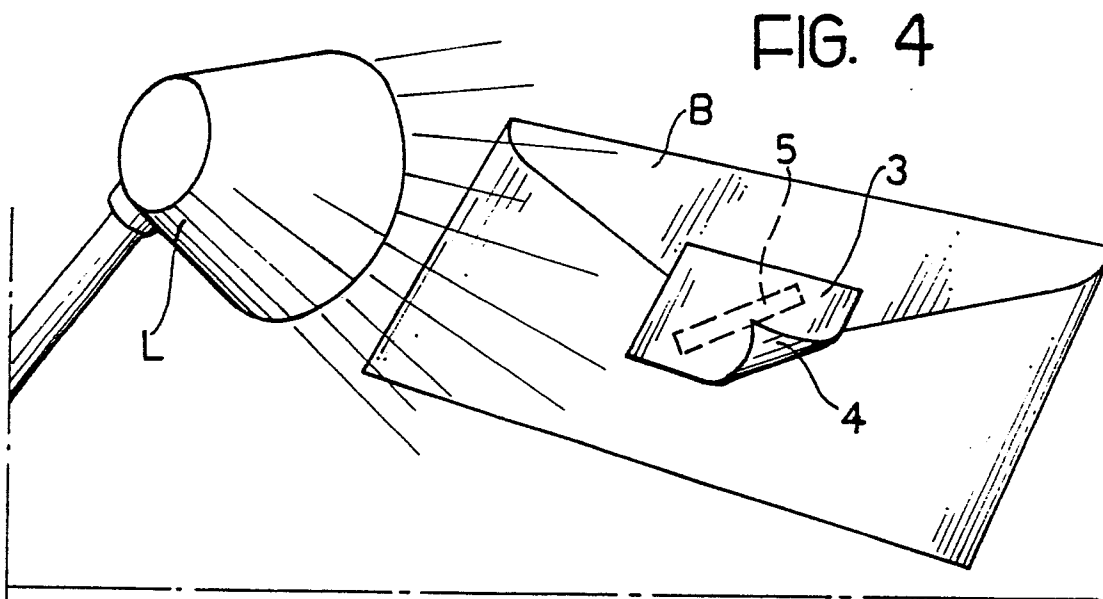
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54 Inviolability seal for mail-containers and the like.

57 An inviolability seal for postal containers and the like, comprising a laminar sealing member of photopermeable material (5), of which the surface intended to be applied to the container (B) to be sealed bears a photopolymerisable adhesive layer (6).

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Inviolability seal for postal containers and the like

The present invention relates to inviolability seals for postal containers and the like.

In general, such seals must be able to seal the openable part of a container in a permanent manner, in order to hinder its fraudulent opening and tampering with its contents and to leave a permanent and unalterable trace of any unauthorised opening of the container.

Conventionally, such seals consist of deposits of sealing wax which, as well as being difficult and impractical to apply, also have the inconvenience that they can be removed without excessive difficulty to allow the container to be opened and then be reapplied in the original position without leaving any obvious traces of tampering.

Another sealing system currently in use consists of the use of self-adhesive elements provided with pressure adhesive. Although more practical than sealing wax seals, even this solution is not able to guarantee sufficient security, in that the pressure adhesives can be rendered ineffective by subjection of the seal to a heat source or to chemical solvents. Since such seals also generally consist of flexible labels or tapes, their removal can be achieved even more easily by a gentle pull for a more or less long period of time on one end of the seal, so as to achieve complete removal without obvious alterations in the region of the container to which it was applied.

More recent sealing techniques envisage a plasticization of the zone of closure of the container by means of the use of plasticizing substances. These substances are normally of the two-component type and, as well as being relatively expensive, require a certain skill to obtain effective results.

The object of the present invention is to avoid the above inconveniences and provide a seal which is simple and economical to produce and convenient and practical to use, and which can, at the same time, ensure characteristics of absolute inviolability.

According to the invention, this object is achieved by means of a seal, characterised in that it comprises a laminar sealing member of photopermeable material, of which the surface intended to be applied to the container to be sealed bears a layer of photopolymerisable adhesive.

The advantages of the seal according to the invention lie on the one hand in extreme practicality and convenience of application, and on the other hand in a much improved functional effectiveness compared to conventional seals. In fact, by virtue of the characteristics of extreme tenacity and strength obtained as a result of polymerisation of

the polymerisable adhesive, there is no possibility of violating the sealing member without breaking it or pulling it from the container complete with the surface to which the seal is applied. In both cases, an indelible and unalterable trace remains of the violation of the seal which has occurred.

With a view to making its application even easier and more convenient, the seal according to the invention includes, to advantage, a substrate with a non-stick surface and a backing sheet of photopermeable material with an adhesive surface of reduced adhesiveness, to which the laminar sealing member adheres separably and which is applied to the non-stick surface of the substrate so that it can be peeled off, the adhesion of the sealing member to the backing sheet being substantially less than the adhesion of the sealing member to the container to be sealed as a result of the photopolymerisation of the photopolymerisable adhesive.

By virtue of this characteristic, the application of the seal according to the invention can be effected particularly easily by first removing the backing sheet with the sealing member from the substrate, then placing the backing sheet with the sealing member carefully onto the region of the container to be sealed, and finally subjecting the backing sheet with the sealing member to a source of ultraviolet radiation. After a brief period of exposure to the source, the adhesion of the sealing member photopolymerises to ensure permanent adhesion to the container and allow the final removal of the backing sheet.

Even though it is not in fact necessary, given the tenacious characteristics of the photopolymerised adhesive, it is possible to provide the sealing member with auxiliary means of indicating breakage, consisting, for example, of continuous elements whose discontinuity caused by any rupture of the seal would be detectable optically, electrically or magnetically.

To advantage, the seal according to the invention can be used by workshops, on a personal level, for private and public offices, and in the industrial sphere. In the case of workshop use, the seal can be supplied in various versions, possibly of different shapes and dimensions, in a kit including an ultraviolet photopolymerisation lamp.

Further characteristics and advantages of the invention will become clear in the course of the detailed description which follows with reference to the appended drawings, provided purely by way of non-limiting example, in which:

Figure 1 is a perspective view of an inviolability seal according to the invention,

Figure 2 is an exploded perspective view of Figure 1,

Figure 3 is a cross-section of the seal on an enlarged scale, and

Figure 4 illustrates schematically the method of application of the seal.

With reference to the drawings, the inviolability seal according to the invention comprises essentially a substrate 1 of paper, card, plastics or similar material, which conveniently has characteristics of photoimpermeability. The substrate 1 has a non-stick surface 2, for example plastic-coated or treated with silicone substances, to which a flexible photopermeable backing sheet 3, normally consisting of a transparent plastics material, adheres. The sheet 3 is applied to the substrate 1 by means of a layer of pressure adhesive 4 with reduced adhesiveness, so that it can be peeled off.

A laminar sealing member 5, which is also photopermeable, adheres separably to the central zone of the adhesive surface 4 of the backing sheet 3. In the example illustrated, the sealing member 5 consists of a strip of plastics or similar transparent material, to whose surface opposite that adhering to the sheet 3, that is, the one facing the substrate 1, is applied a layer of photopolymerisable adhesive 6. This adhesive may be, for example, of the type marketed by the Belgian company UCB under the designations ST71 or ST93. This adhesive includes among its components a prepolymer, a monomer and a photoactivator, and is characterised by a high initial viscosity.

In use, the unit consisting of the substrate 1, the sealing strip 2 and the backing sheet 4 should conveniently be kept protected from natural light, even though this is not strictly necessary given that the above-mentioned adhesives which form the layer 6 only polymerise as a result of concentrated exposure to an artificially-produced beam of ultraviolet rays, for example, from a UV lamp, schematically indicated L in Figure 4. This lamp can conveniently be provided complete with a plurality of seals according to the invention, in a commercial package constituting a "kit" for supply to private and public offices.

In any case, to ensure effective protection of the adhesive layer 6 from natural light, it is sufficient to keep the seal upside down on a supporting surface, that is, with the photoimpermeable substrate 1 turned upwards.

To apply the seal to a container, for example, to a postal envelope, indicated B in Figure 4, one proceeds in the following manner.

Firstly, the backing sheet 3 bearing the sealing strip 5 is peeled and separated from the substrate 1. At this stage, the photopolymerisable adhesive layer 6 is inactive and does not offer any resistance to the detachment of the sealing strip 5 from

the substrate 1 by virtue also of the non-stick characteristics of the surface 2 of the latter.

Subsequently, the backing sheet 2 is applied to the container B with the sealing strip 5 arranged astride the parts of the container B which are to be sealed.

At this point, the backing sheet 3 with the sealing strip 5 is subjected to ultraviolet rays from the lamp L for a time which is variable in dependence on the characteristics of the adhesive 6 and anyway is not more than a few seconds. This exposure causes the photopolymerisation of the adhesive 6 and hence a tenacious and permanent adhesion of the sealing strip 5 to the surface of the container B.

The final step consists of the removal of the backing sheet 3 from the container B: this step does not present any difficulty since the adhesiveness of the adhesive layer 4 of the backing sheet 3 is low and, in any event, very much less than that of the photopolymerised adhesive 6.

The strip 5 applied to the container B in the manner explained above is absolutely inviolable, since the tenacity of the photopolymerised adhesive 6 does not permit its removal except by its breakage or at any rate its leaving a permanent and unalterable trace on the surrounding region of the container B.

In order further to improve the security of the seal, it is possible to provide the strip 5 with auxiliary means for indicating breakage, consisting, for example, of continuous elements in the form of wires, fibres or simply printed traces whose discontinuity, due to any cutting of the strip 5, can be detected by means of optical, electrical or magnetic systems.

Clearly, the strip 5 could be replaced by elements of different shape, structure and dimensions from that illustrated in the example.

Finally, it should be noted that the inviolability seal according to the invention can also be used to advantage on an industrial scale, with the use of automatic application machines supplied from reels carrying the seals and combined with lamps or similar sources of ultraviolet radiation.

Claims

1. An inviolability seal for postal containers and the like, characterised in that it comprises a laminar sealing member of photopermeable material (5), of which the surface intended to be applied to the container (B) to be sealed bears a layer of photopolymerisable adhesive (6).

2. A seal according to Claim 1, characterised in that it includes a substrate (1) with a non-stick surface (2) and a backing sheet (3) of photoper-

meable material with an adhesive surface (4) of reduced adhesiveness, to which the laminar sealing member (5) adheres separably and which is applied to the non-stick surface (2) of the substrate (1) so that it can be peeled off, the adhesion of the sealing member (5) to the backing sheet (3) being substantially less than the adhesion of the sealing member (5) to the container (B) to be sealed as a result of the photopolymerisation of the photopolymerisable adhesive (6).

3. A seal according to Claim 1, characterised in that the substrate (1) is of photoimpermeable material.

4. A seal according to any one of the preceding claims, characterised in that the sealing member (5) is provided with means for indicating discontinuities which can be detected optically, electrically or magnetically.

5. A seal according to any one of the preceding claims, characterised in that the sealing member is in the form of a strip (5).

6. A sealing kit for postal containers and the like, characterised in that it comprises a plurality of seals according to one or more of the preceding claims and a photopolymerisation device consisting of a source (L) of ultraviolet radiation.

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FIG. 1

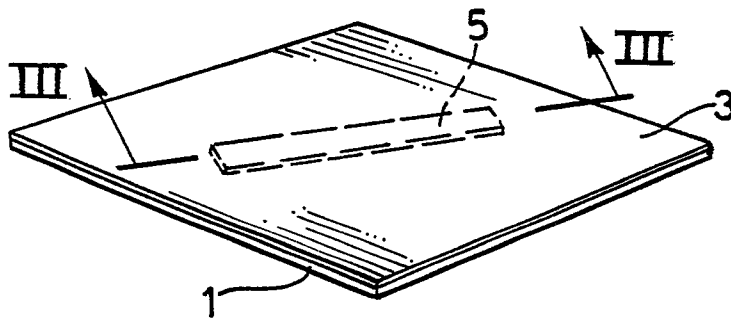


FIG. 2

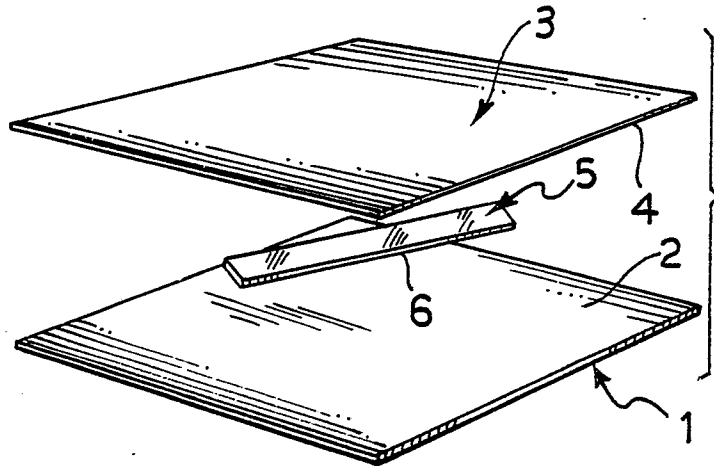


FIG. 3

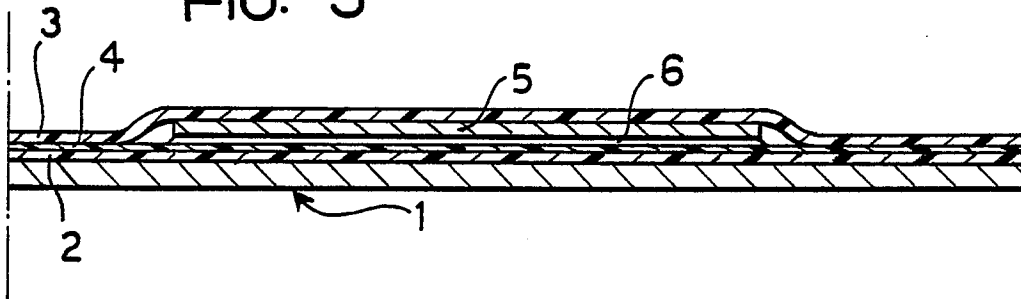
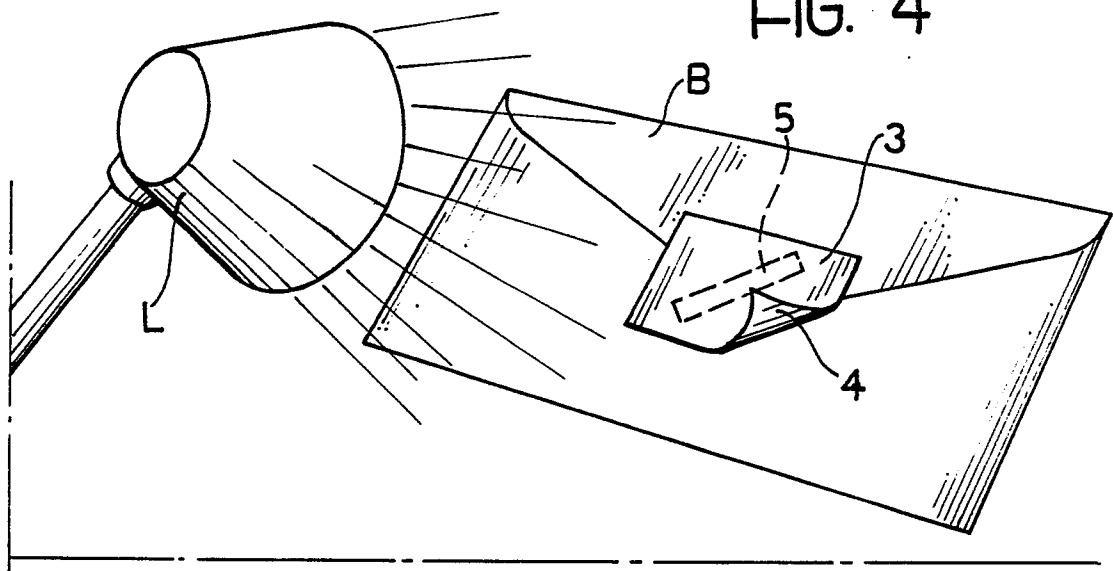


FIG. 4





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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	DE-C- 191 635 (PLANCHE) * claim 1; figures 1, 2 *	1	B 65 D 27/30
A	US-A-4 509 196 (SAK et al.) * claim 1; figure 1 *	1	
A	FR-A-2 345 355 (JANOWSKI) * claims 1, 2; figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 65 D 27/00 B 65 D 33/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 12-02-1988	Examiner GRUNFELD D.P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			