

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 0 628 007 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:

**28.06.2000 Bulletin 2000/26**

(51) Int. Cl.<sup>7</sup>: **B65D 35/34, G09F 3/02**

(86) International application number:  
**PCT/GB93/00385**

(21) Application number: **93905474.8**

(87) International publication number:  
**WO 93/16933 (02.09.1993 Gazette 1993/21)**

(22) Date of filing: **25.02.1993**

**(54) TAMPER INDICATING PACKAGES**

VERPACKUNG MIT ANZEIGE IHRER UNERLAUBTEN ÖFFNUNG

EMBALLAGES INDICATEURS D'OUVERTURE

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL  
PT SE**

(30) Priority: **25.02.1992 GB 9203931**

(43) Date of publication of application:  
**14.12.1994 Bulletin 1994/50**

(73) Proprietor:  
**BRITTON SECURITY PACKAGING LIMITED  
London W1Y 5DH (GB)**

(72) Inventors:  
• **WATTS, Alan Lincoln  
Grimoldby, Louth LN11 8SY (GB)**

• **WEST, Peter, John  
Louth LN11 9QE (GB)**

(74) Representative:  
**Shindler, Nigel et al  
BATCHELLOR, KIRK & CO.  
102-108 Clerkenwell Road  
London EC1M 5SA (GB)**

(56) References cited:  
**WO-A-91/00227                      WO-A-91/04199  
GB-A- 2 013 571                    GB-A- 2 138 396  
GB-A- 2 200 337                    US-A- 4 711 368  
US-A- 4 972 953                    US-A- 5 042 842**

**EP 0 628 007 B1**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

**[0001]** This invention relates to tamper indicating packages and labels, and in particular, to packages made of plastics materials, of a type which are commonly used for transporting cash or other valuables, and which are arranged so as to ensure that no tampering with the contents is possible, without such tampering being made immediately obvious on inspection.

**[0002]** One known system of this kind is shown in our WO91/04199 entitled "Tamper Indicating Package", which discloses, inter-alia, a tamper indicating sealing tape, label or package including a transparent or translucent flexible plastics base material, a pattern printed on the base material in a silicone acrylate which forms a discontinuous release layer, a layer of opaque ink applied over the release pattern, and a layer of adhesive applied over the opaque ink.

**[0003]** The effect of this arrangement is that if the seal is peeled apart, the ink will be left on the base material, in the intervening spaces formed by the silicone acrylate release pattern, whereas they will come away from the base film, in the filled areas of the silicone acrylate pattern, because the adhesive will cause them to adhere more strongly to the overlying material in those areas.

**[0004]** The pattern of the release layer preferably spells out some wording such as "void", and thus, if the ink layer is opaque, and the base film is transparent or translucent, these words will be revealed, as soon as the seal is pulled apart, and it will then be very difficult for the interrupted areas of ink to be reconstituted in such a way that the wording is no longer visible.

**[0005]** Basically, systems of this kind depend on the fact that the ink has low cohesive strength, and will adhere to whichever surface has the greatest surface energy. In particular, seals of this kind are useful to prevent opening of the bag by freezing it, which reduces the adhesivity of the adhesive. In most such existing systems, the adhesive layer, and the ink layer are made continuous, and the discontinuities are provided by the silicone release layer. However, such an arrangement does have the disadvantage that it is necessary to apply three successive coatings to the material, i.e. the release layer, the ink, and the adhesive.

**[0006]** The present invention therefore seeks to provide a tamper evident sealing system which has improved performance and at the same time is simpler to manufacture.

**[0007]** Accordingly, the present invention provides a closure for a security bag or a security label, comprising a seal for two surfaces which can be contacted together to close the seal, and including an ink pattern and an adhesive pattern, characterised in that both patterns are comprised of sets of strips or lines which are so arranged that they overlap, but do not match, at least after the seal has been closed.

**[0008]** In one embodiment of the invention the ink

pattern is applied first to one of the surfaces to be sealed, and overlaid by the adhesive pattern.

**[0009]** When this surface is brought into contact with an opposing surface, so as to form a seal, because the ink adheres more strongly to the adhesive on one side, than to the surface on the other, any attempt to open the seal results in the ink pattern being "broken up", because those areas which coincide with the adhesive will become transferred with the adhesive to the opposing surface, whilst those areas which do not coincide with the adhesive will, of course, remain on the original surface on which they were printed. In this way, a very distinct disruption of the seal area is produced, making it extremely difficult or impossible to reseal the bag without this being apparent.

**[0010]** In another embodiment of the invention the ink pattern is applied to one surface and the adhesive is applied to the opposing surface. Because the ink receiving surface must be of low surface energy great care must be used to ensure that the pattern is not damaged by normal handling before the seal is achieved. These embodiments ensure tamper evidence both at normal operating temperatures and when the adhesive strength of the adhesive has been diminished by low temperatures.

**[0011]** Normally, in order to achieve a required level of adhesivity, on a polythene surface, for example, the supporting surface is first treated by corona discharge so as to increase surface energy and the surface is subsequently treated with a coating which reduces the surface energy to a predetermined degree for example, a coating of silicone acrylate or a blend of a silicone copolymer with other polymers or copolymers. However, a similar effect may be achieved more simply by leaving the surface untreated and instead, using an ink which has adequate bonding to the surface. These inks include those which are based on nitro-cellulose and polyamides, possibly modified by the addition of wax to obtain the right balance of adhesive and cohesive strengths. Additionally or alternatively, titanium esters may be added to increase the temperature resistance, and nitro-cellulose urethane inks with titanates may also be utilised. On other surfaces more appropriate ink vehicles may be used including inks which are cured by UV light and use water rather than solvents as their diluent.

**[0012]** The adhesive strips or lines may be applied in straight lines or in undulating lines produced by moving the extruder head across the substrate or conversely moving the substrate across the glue head.

**[0013]** In a further alternative embodiment of the invention the adhesive pattern is applied first to one of the surfaces and the ink pattern is superimposed on it.

**[0014]** In this embodiment tamper evidence can be achieved even when the cohesive strength of the adhesive has been diminished e.g. by high temperatures, in addition to the situation at normal and low temperatures. This is because the failure of the seal by cohesive

failure still results in ink being transferred from one surface to the other and matching of the pattern becomes extremely difficult.

**[0015]** The application of the ink over the adhesive surface is best carried out by a non-contacting process such as an ink jet printer.

**[0016]** Some embodiments of the invention will now be described by way of example, with reference to the accompanying drawings in which:

Figure 1 is a plan view of part of a bag closure flap of a first type in accordance with the invention;

Figure 2 is a plan view of a closure of a second type;

Figure 3 is a schematic view of a security bag incorporating a closure of the type shown in Figure 1;

Figure 4 illustrates a second type of bag incorporating a seal according to the invention;

Figure 5 illustrates a third example of a security bag;

Figure 6 illustrates a fourth example of a security bag; and

Figure 7 is a partial view of an alternative form of seal in accordance with the invention.

**[0017]** Referring first to Figure 1, a small section of a sealing flap for a security bag is illustrated, comprising a region 2 extending along one edge of the flap, which is adapted to be heat sealed onto a corresponding edge of the bag to be sealed, for example along the top edge of the bag as illustrated in Figure 3. The main body of the flap 4 carries a series of transversely extending glue lines, and preferably, as shown, these comprise a number of narrow lines 6, 8, 10 etc, and a broader line 12 which is positioned so that in use, it overlies a slit 14 in the face of the bag, which forms the normal opening.

**[0018]** Before the lines of glue are applied to the flap, as illustrated, it is printed with a distinctive non matching opaque ink pattern comprised of sets of strips or lines. After application of the glue, the exposed glued surface is covered with a silicone release tape to protect it, before the bag is closed. As can be seen from Figure 3, when the release tape is removed and the flap is pressed down over the mouth of the bag to close it, the lines of glue will adhere to the face of the bag, and in particular, the glued area 12 will effectively seal the slit opening 14.

**[0019]** If an attempt is then made to peel away the flap from the face of the bag, the ink pattern will become detached from the flap, in those areas that coincide with adhesive lines, whereas the ink will remain on the flap, in the intervening areas, and thus, the printed ink pattern will be clearly disrupted. For this purpose, the ink must have a relatively low cohesive strength, so that the pattern will be clearly broken at the interface between the glued and non glued regions.

**[0020]** Alternatively, instead of being attached with a heat seal, as suggested in Figure 1, the flap illustrated

in Figure 2 carries a further area of adhesive on its edge 2a, and otherwise functions in the same way as the flap of Figure 1.

**[0021]** Figures 4, 5 and 6 illustrate various different ways of arranging the adhesive stripes on the flap, such as lengthwise of the flap as illustrated in Figures 4 and 5, and of arranging the flap itself Figure 6. In the latter case, where it will be seen that the flap is connected to the bag below the mouth, the arrangement may be of the "double seal" type as exemplified by our British Patent No. 2,145,997.

**[0022]** The above examples are of the general type in which the flap is first printed with a distinctive ink pattern, and the glue lines are subsequently laid down on top of the ink. However, in an alternative arrangement illustrated diagrammatically in Figure 7, the arrangement may be "inverted" with lines of adhesive 20 applied first to a corona treated plastics (e.g. polythene) flap surface, and very narrow lines 22 of ink, subsequently laid down on top of the adhesive. Obviously, it is undesirable to use a "contact method" of applying the ink onto a surface already carrying adhesive, and it has been found that a good non contact method of applying the ink, is to use an "ink jet" printer. This also has the advantage that a complex and "programmable" pattern can then be laid down under automatic control (for example by computer) and in this way the seal can embody a code which can be automatically read at the receiving end of the package, and which will be unreadable if the seal has been tampered with. For example, the pattern could be made to form a "bar code".

**[0023]** In use, the surface that the flap is brought into contact with, to form the seal, is preferably treated, for example by the known process of corona discharge, so that the adhesive lines will adhere strongly to it, and thus, if a subsequent attempt is made to peel the seal apart, the considerably greater cohesive strength of the lines of adhesive will cause the narrow "bridging" regions of ink to break, thus ensuring, as before, that the overall pattern is visibly disrupted.

**[0024]** As a further precaution against unauthorised opening of the seals by freezing or heating, it is also envisaged that any of the arrangements discussed above could be modified by incorporating parallel sets of glue lines, comprising adhesive with different operating temperature ranges. For example, there could be three sets of glue lines, a first one of which has a normal operating temperature range such as -5°C to +30°C, whilst the next adjacent one has a very low operating range as much as -30°C to +10°C, and the final set has a high operating range such as 25°C to 60°C. It will be appreciated that the glue lines having the "colder" operating range must be confined between other sets, since, at normal ambient temperatures, they will be liquid and likely to "run out". Such an arrangement will, therefore, protect the bag against tampering, even if it is frozen to a very low temperature or heated to a very high temperature, because there will always be one or other set of

patterns which is disrupted by the subsequent tampering.

**[0025]** Although the examples have been described specifically as having both the ink and adhesive pre-coated onto the same surface, it will also be appreciated that, particularly in the case of a bag closure, it would be possible to apply the pattern of adhesive to one surface and the pattern of ink to the other surface, since the effect of the finished closure will still be the same.

**[0026]** While the invention is particularly suitable for sealing devices it may also be used for labels where it is desirable that the removal of a label should be evident both on the label itself and the surface from which it has been removed. This is particularly valuable if the bar code design is incorporated thereby preventing the switching of bar coded labels which may give incorrect specification or price.

### Claims

1. A closure for a security bag or a security label, comprising a seal for two surfaces which can be contacted together to close the seal, and including an ink pattern and an adhesive pattern, characterised in that both patterns are comprised of sets of strips or lines which are so arranged that they overlap, but do not match, at least after the seal has been closed. 25
2. A closure according to claim 1, in which the ink pattern is applied to one of the surfaces, and the adhesive pattern is then applied over the ink pattern. 30
3. A closure according to claim 1 in which the adhesive pattern is applied to one of the surfaces, and the ink pattern is then applied over the adhesive pattern. 35
4. A closure according to any preceding claim in which the ink is applied by means of an ink jet printer. 40
5. A closure according to claim 1 in which the ink pattern is applied to one of the surfaces, and the adhesive pattern is applied to the other surface. 45
6. A closure according to any preceding claim in which the adhesive strips are laid down in an undulating pattern by moving the extruder head and the receiving substrate relatively to one another. 50
7. A closure according to any of claims 1 to 6 for a bag made from polythene, in which the ink is based on nitro-cellulose and polyamides. 55
8. A security bag having a closure according to claim 7, the bag being made from polythene, in which the ink also includes wax and/or titanium esters.
9. A closure according to any of claims 1 to 6 in which the ink is based on nitro-cellulose urethanes and includes titanates.

### 5 Patentansprüche

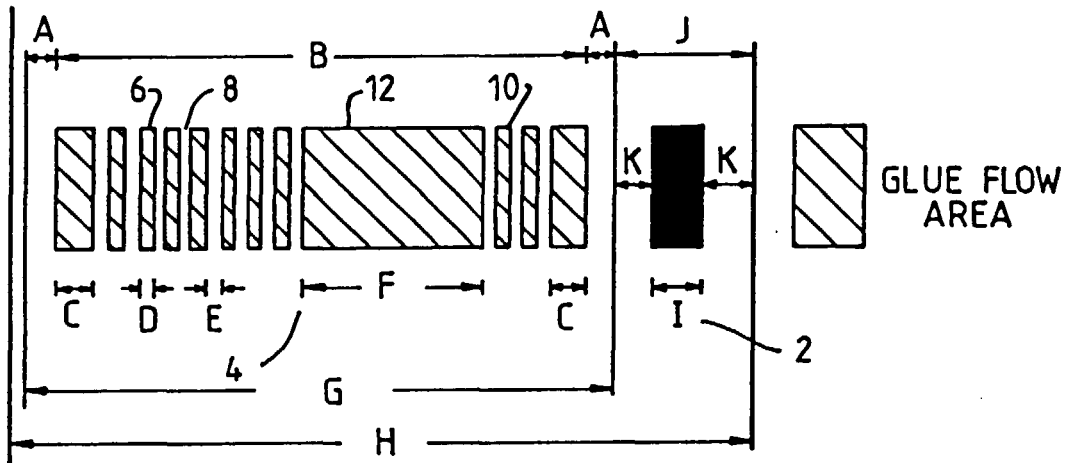
1. Verschluß für eine Sicherheitstasche oder eine Sicherheitsmarke mit einem Siegel für zwei Oberflächen, die zum Schließen des Siegels in gegenseitige Berührung gebracht werden können, und mit einem Tintemuster und einem Klebstoffmuster, dadurch gekennzeichnet, daß beide Muster aus Gruppen von Streifen oder Linien bestehen, die so angeordnet sind, daß sie sich wenigstens nach dem Schließen des Siegels überlappen, aber nicht zusammenpassen.
2. Verschluß nach Anspruch 1, bei dem das Tintemuster auf eine der Oberflächen aufgebracht ist und das Klebstoffmuster dann über dem Tintemuster aufgebracht ist.
3. Verschluß nach Anspruch 1, bei dem das Klebstoffmuster auf eine der Oberflächen aufgebracht ist und das Tintemuster dann über dem Klebstoffmuster aufgebracht ist.
4. Verschluß nach einem vorhergehenden Anspruch, bei dem die Tinte mittels eines Tintenstrahl Druckers aufgebracht ist.
5. Verschluß nach Anspruch 1, bei dem das Tintemuster auf eine der Oberflächen aufgebracht ist und das Klebstoffmuster auf die andere Oberfläche aufgebracht ist.
6. Verschluß nach einem vorhergehenden Anspruch, bei dem die Klebstoffstreifen durch Bewegung des Extruderkopfes und des aufnehmenden Substrats relativ zueinander in einem wellförmigen Muster abgelegt sind.
7. Verschluß nach einem der Ansprüche 1 bis 6, für eine Tasche aus Polyethylen, bei dem die Tinte auf Basis von Nitrocellulose und Polyamiden gebildet ist.
8. Sicherheitstasche mit einem Verschluß nach Anspruch 7, wobei die Tasche aus Polyethylen besteht und die Tinte auch Wachs und/oder Titanester enthält.
9. Verschluß nach einem der Ansprüche 1 bis 6, bei dem die Tinte auf Basis von Nitrocelluloseurethanen gebildet ist und Titanate enthält.

## Revendications

1. Fermeture pour sachet de sécurité ou étiquette de sécurité, comprenant une garniture pour deux surfaces qui peuvent être mises en contact ensemble afin de fermer la garniture, et comprenant un motif à l'encre et un motif adhésif, caractérisée en ce que les deux motifs sont constitués d'ensembles de bandes ou de lignes qui sont agencés de telle sorte qu'ils se chevauchent, mais ne se correspondent pas, au moins après que la garniture a été fermée. 5  
10
2. Fermeture selon la revendication 1, dans laquelle le motif à l'encre est appliqué sur une des surfaces, et le motif adhésif est ensuite appliqué sur le motif à l'encre. 15
3. Fermeture selon la revendication 1, dans laquelle le motif adhésif est appliqué sur une des surfaces, et le motif à l'encre est ensuite appliqué sur le motif adhésif. 20
4. Fermeture selon l'une quelconque des revendications précédentes, dans laquelle l'encre est appliquée à l'aide d'une imprimante à jet d'encre. 25
5. Fermeture selon la revendication 1, dans laquelle le motif à l'encre est appliqué sur une des surfaces et le motif adhésif est appliqué sur l'autre surface. 30
6. Fermeture selon l'une quelconque des revendications précédentes, dans laquelle les bandes adhésives sont disposées selon un motif ondulant en déplaçant la tête de filière et le substrat récepteur l'une par rapport à l'autre. 35
7. Fermeture selon l'une quelconque des revendications 1 à 6 pour un sachet en polythène, dans laquelle l'encre est à base de nitrocellulose et de polyamides. 40
8. Sachet de sécurité ayant une fermeture selon la revendication 7, le sachet étant tait en polythène, dans lequel l'encre comprend également de la cire et/ou des esters de titane. 45
9. Fermeture selon l'une quelconque des revendications 1 à 6, dans laquelle l'encre est à base d'uréthanes de nitrocellulose et comprend des titanates. 50

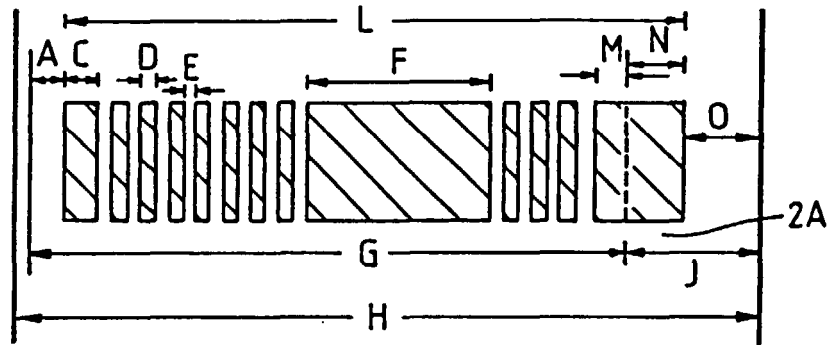
55

FIG. 1



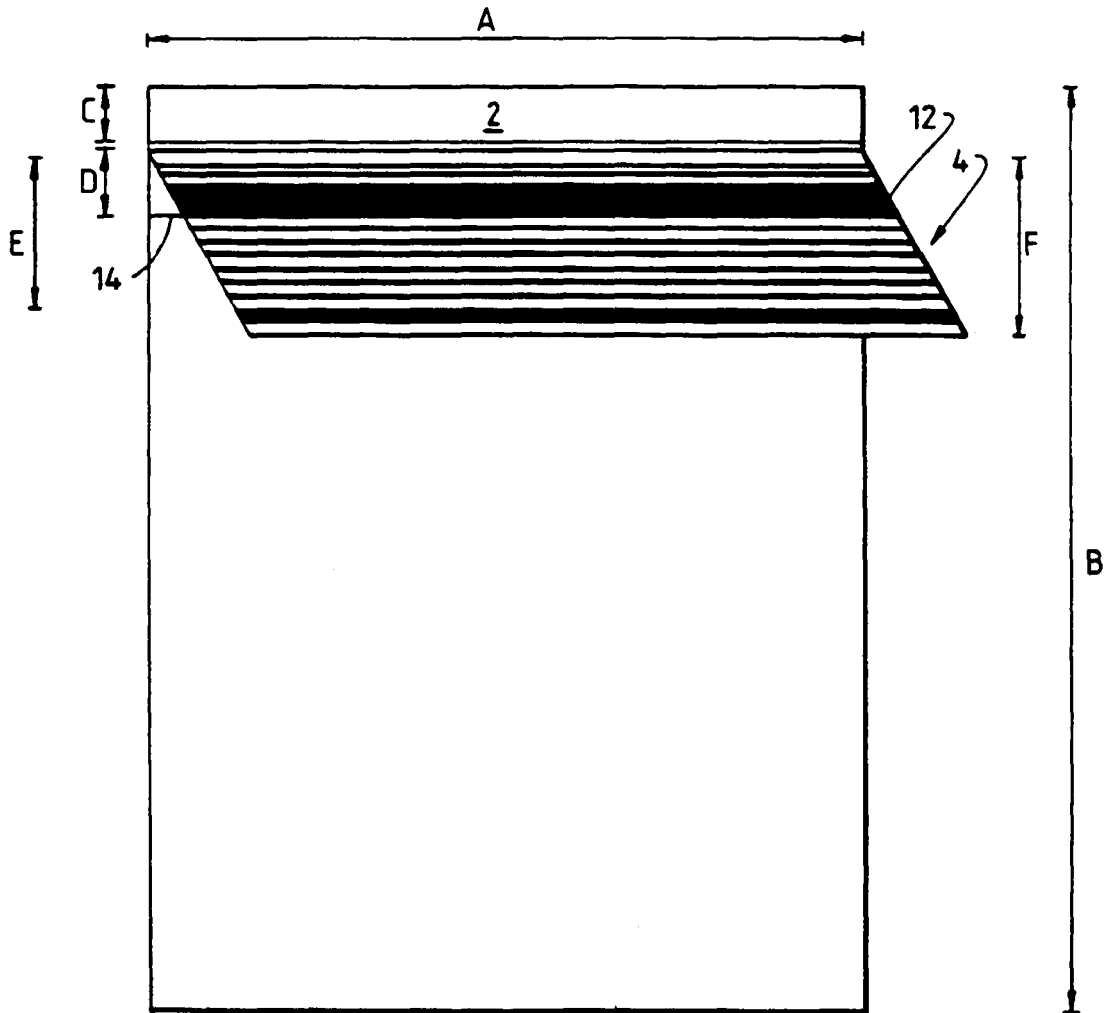
A)	2MM	FINGER LIFT ON SILICON TAPE
B)	36MM	TOTAL WIDTH OF GLUE FLOW PATTERN
C)	2MM	GLUE FLOW ON OUTER EDGES
D)	1MM	GLUE FLOW
E)	1MM	GAPS CLEAR OF GLUE
F)	12MM	GLUE FLOW THAT COVERS MOUTH OF BAG
G)	40MM	SILICON TAPE WIDTH
H)	50MM	FRAUDETER TAPE
I)	3MM	■ BAND SEALER
J)	9MM	LIP
K)	3MM	CLEARENCE

FIG. 2



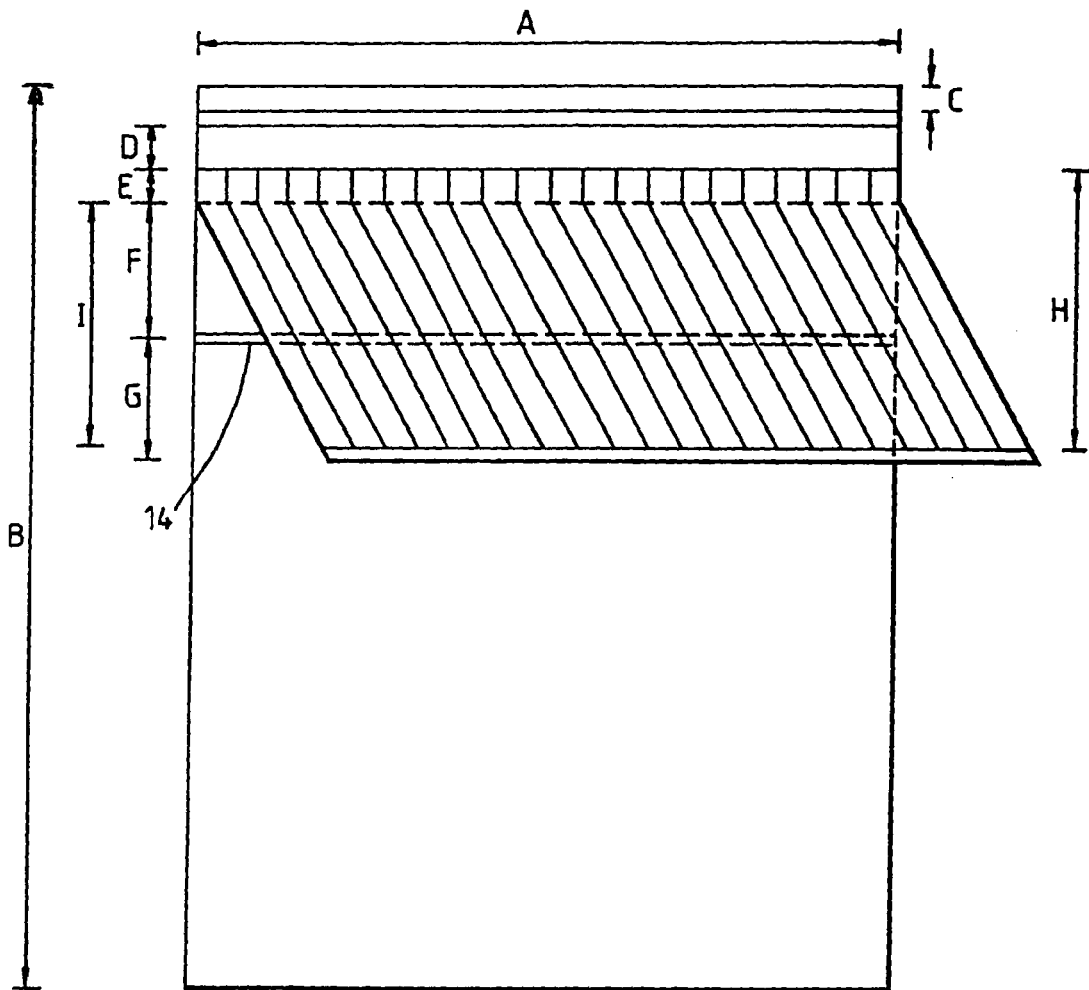
A)	2MM	FINGER LIFT ON SILICON TAPE
<del>B)</del>	<del>36MM</del>	<del>TOTAL WIDTH OF GLUE FLOW PATTERN</del>
C)	2MM	GLUE FLOW ON OUTER EDGES
D)	1MM	GLUE FLOW
E)	1MM	GAPS CLEAR OF GLUE
F)	12MM	GLUE FLOW THAT COVERS MOUTH OF BAG
G)	40MM	SILICON TAPE WIDTH
H)	50MM	FRAUDETER TAPE
J)	9MM	LIP
L)	42MM	TOTAL WIDTH OF GLUE FLOW PATTERN
M)	2MM	GLUE FLOW TO EDGE OF SILICON TAPE
N)	4MM	GLUE FLOW, REPLACEMENT OF BAND SEALER

FIG. 3



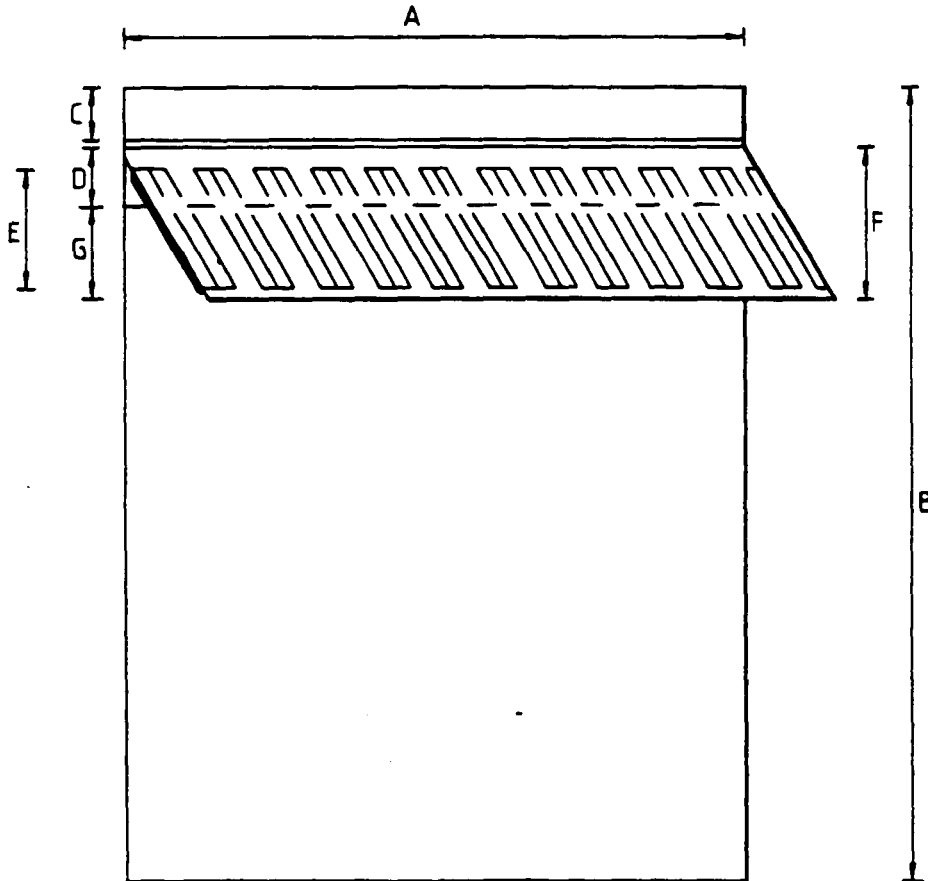
A	WIDTH OF BAG
B	LENGTH OF BAG
C	2MM BETWEEN BAND SEALER AND TOP OF BAG
D	10MM GAP BETWEEN BAND SEALER AND MOUTH OF BAG
E	36MM TOTAL GLUE WIDTH USING FRAUDETER GLUE PATTERN
F	38MM EXPOSED FRAUDETER TAPE

FIG. 4



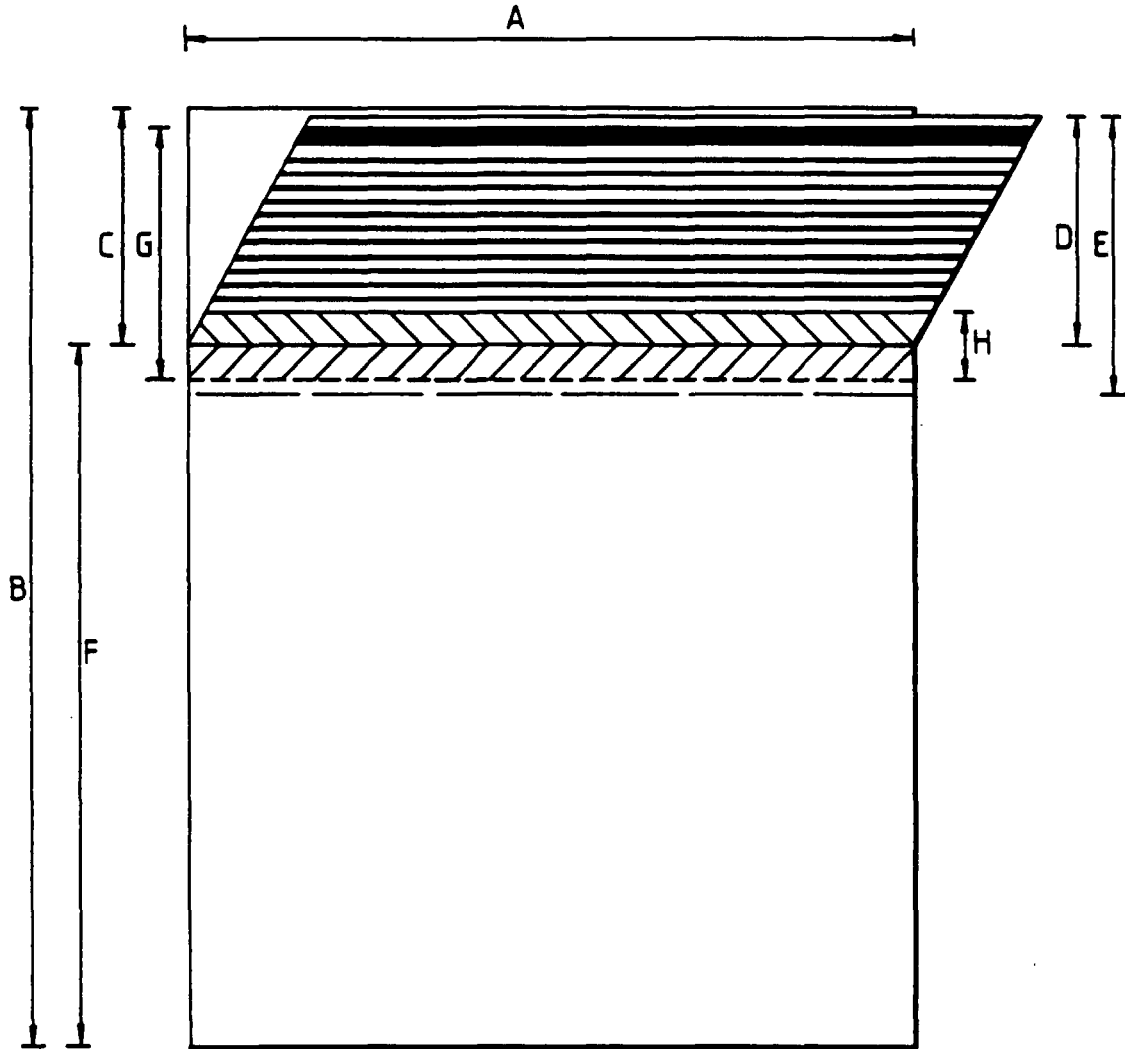
A	WIDTH OF BAG
B	LENGTH OF BAG
C	2MM BETWEEN BAND SEALER AND TOP OF BAG
D	10MM GAP BETWEEN VOID TAPE AND BAND SEAL
E	5MM GLUE LINE THAT PROTRUDES' SILICON TAPE
F	20MM VOID TAPE ABOVE MOUTH OF BAG
G	20MM VOID TAPE BELOW MOUTH OF BAG
H	45MM WIDTH OF INTERVOID TAPE
I	38MM GLUE LINE COVERED BY SILICON TAPE (40MM)
J	
K	

FIG. 5



A	WIDTH OF BAG
B	LENGTH OF BAG
C	2MM GAP BETWEEN BAND SEAL AND TOP OF BAG
D	10MM GAP BETWEEN BAND SEAL AND MOUTH OF BAG
E	36MM GLUE LINE (6MM ABOVE MOUTH 30MM BELOW MOUTH)
F	45MM INTERVOID TAPE (PRINTED) CLOSE TO BAND SEAL AS POSSIBLE
G	32MM INTERVOID TAPE (30MM GLUE LINE ON TAPE)

FIG. 6



A	WIDTH OF BAG
B	LENGTH OF BAG INCLUDING LIP
C	LIP OF BAG/RECEIPT etc.
D	34MM EXPOSED FRAUDETER TAPE
E	43MM TOTAL WIDTH OF FRAUDETER TAPE
F	LENGTH OF ACTUAL BAG
G	36MM TOTAL GLUE WIDTH USING FRAUDETER GLUE SYSTEM
H	9MM SOLID GLUE LINE (4MM UNDER MOUTH 5MM ABOVE)

*FIG. 7*

