



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.11.2004 Bulletin 2004/47

(51) Int Cl.7: **B65D 75/58**

(21) Application number: **03447110.2**

(22) Date of filing: **15.05.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR
 Designated Extension States:
AL LT LV MK

• **Verbeeck, Bart**
3540 Herk-De-Stad (BE)
 • **Somers, Kurt**
3110 Rotselaar (BE)

(71) Applicant: **Amtor Flexibles Europe A/S**
8700 Horsens (DK)

(74) Representative: **Van Malderen, Michel et al**
Office van Malderen
85/043 Boulevard de la Sauvenière
4000 Liège (BE)

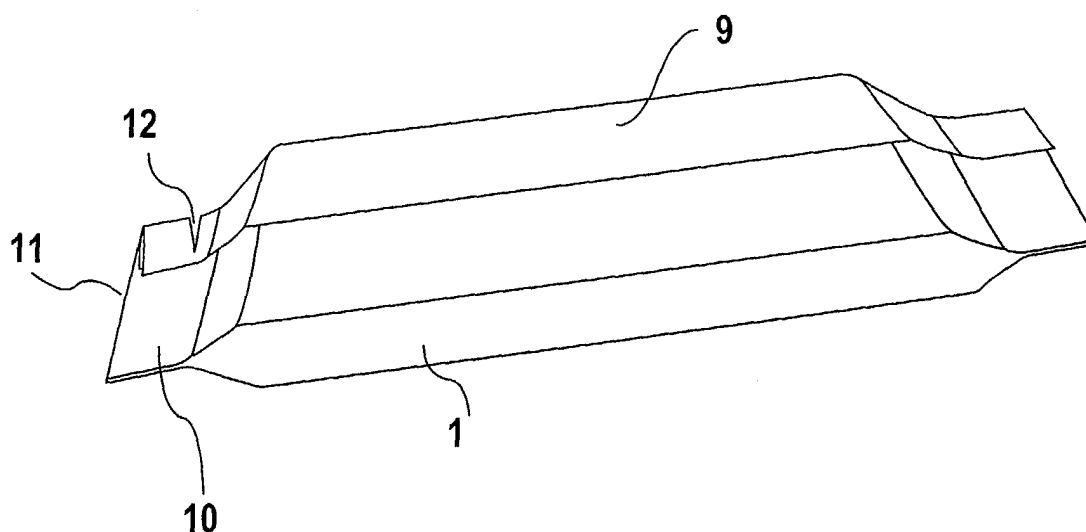
(72) Inventors:
 • **Daelmans, Eddy**
3650 Dilsen-Stokkem (BE)

(54) **Easy opening, reclosable flow-pack wrapper**

(57) The present invention is related to an easy opening flow-pack wrapper for rigid or semi-rigid products intended to be used in a vertical or horizontal form, fill and seal process comprising a longitudinal fin seal

(9), a closing cold-seal area (2), and an opening initiation (12), wherein said longitudinal fin seal (9) is situated on the longitudinal edge of the product, and said opening initiation (12) is situated in said closing cross cold-seal area (2), cross-cutting said longitudinal fin seal (9).

figure 7



Description

Field of the invention

[0001] The present invention relates to packaging and in particular to easy opening flow-pack wrapper intended to be used in a horizontal or vertical form, fill and seal process for rigid or semi-rigid products.

State of the art

[0002] Nowadays, most rigid or semi-rigid articles are packed in a flow-pack wrapper in horizontal or vertical form fill and seal lines reaching extremely high packing speeds.

[0003] The principle of a horizontal flow-pack machine is that a flat film is formed into a tube through a folding box and after the forming of this tube, a set of rotating sealing wheels makes a longitudinal seal also called fin seal. A fin seal is a seal where the packing wrapper is sealed face to face in machine direction (or longitudinal way). This seal is an "inside-inside" seal, in opposition to an overlap seal, which is an "inside-outside" seal.

[0004] The sealing wheels sealing the fin seal are responsible for the transport through the machine together with some guiding wheels. The packed products moves over a horizontal conveyer belt and runs via the folding box into the formed tube.

[0005] Once the product is placed into the tube, the cross-seals are formed through the cross-sealing jaws. In most applications, the end seal of a pack is formed together with the beginning seal of the following pack. During sealing, the film is cut to split the adjacent pack and the cutting knife is generally built into the sealing jaws.

[0006] Such a process is extensively described in the document GB-A-2349862. This document describes in particular the cold-seal wrapping of food articles under controlled atmosphere.

[0007] A normal flow-pack is opened by tearing, starting at the profiled cross-seal. This tear is generally not guided, which means that the opening is unpredictable and has as a consequence the impossibility of a correct reclosability. Furthermore, all pre-cuts of the prior art wrappers, do not cross-over the longitudinal fin seal of the wrapper and the tearing is generally stopped by this longitudinal fin seal and from that point makes it unpredictable. If the tear power is increased, a piece of the pack brakes off, or the tear continues in a random way.

[0008] In order to obtain an easy and predictable opening of a flow-pack, various solutions have been proposed. One of these solutions is the inclusion of a tear strip in the packaging. This tear strip is sealed at the inside of the pack and allows to guide the tear. If a tear tape is fixed to the wrapper in the cross-direction, the tear also stops at the longitudinal fin seal, while tearing the pack beginning from the tear tape tear initiation.

Most of the tear tapes in the market are not heat-sealable but cold-sealable with a pressure sensitive glue already on the tape, taking care of the seal. The disadvantages of this method are the high costs and negative effects on the packing speed. Besides that, a tear tape has a negative influence on machine speed if it is put on the wrapper on cross direction. In machine direction however, in most cases the speed can be maintained.

[0009] Another solution, well known by those skilled in the art, is the perforation of the flow-pack to achieve easy opening. Such perforation supplies an opening initiation, which generally allows a predictable opening. Nevertheless, this perforation has to be performed within a sealed area in order to keep hermetic packs.

[0010] The documents EP 0 406 613 A1 presents an alternative in form of a package for rigid or semi-rigid food bars with a notch on the flow wrapper substantially parallel to an edge of the bar. This flow wrapper presents no longitudinal fin seal and therefore seems not to be realistic in practice.

[0011] Document DE 10026551 A1 presents a pre-cut in the longitudinal fin seal of a flow-pack wrapper used as a multi-pack wrapper for tablets. The pre-cut does not cross-cut the longitudinal fin seal to preserve the air tightness of the pack.

[0012] Document US 5,934,048 presents a pouch produced in a vertical form, fill and seal process (VFFS) wherein a pre-cut is realised, as opening initiation, in a hot-seal but again does not cross-cut the longitudinal seal.

[0013] Document US 6,352,364 B1 presents a tubular stick-pack in an overlap seal process wherein a pre-cut is realised in the transverse sealing joints as well as in the longitudinal overlap sealing joint. Heat seals have numerous disadvantages such as low packing speed due to heat transfer limitations or danger of product damage such as melted chocolate due to heat transfer from the heated seal jaws.

Aims of the invention

[0014] The present invention aims to provide an easy opening flow-pack wrapper with predictable opening, intended to be used in a horizontal or vertical form fill and seal process not entailing reduction of packing speed on a usual packing equipment.

[0015] Another aim of the present invention is to present an easy opening flow-pack wrapper which is reclosable via a cold-seal area exhibiting a particular pattern design.

Summary of the invention

[0016] The present invention discloses an easy opening flow-pack wrapper for rigid or semi-rigid products comprising a longitudinal fin seal, a closing cold-seal area and an opening initiation characterised in that said longitudinal fin seal is situated on the longitudinal edge

of the product, and in that said opening initiation is situated in said closing cold-seal area, and cross-cuts said longitudinal fin seal.

[0017] In a particular aspect of the present invention, said package further comprises at least one reclosable cold-seal area and at least one tear guide cold-seal free area, said tear guide area being situated in between said closing cold-seal area and the adjacent reclosable cold-seal area in the prolongation of the opening initiation.

[0018] According to the present invention, said reclosable cold-seal area has a lower seal strength than said closing cold-seal area .

[0019] In a particular embodiment of the present invention, said reclosable cold-seal area has a specific pattern design allowing a progressive opening and a "push-through" of the semi-rigid or rigid product.

[0020] An additional feature of the present invention is that the specific pattern design of said reclosable cold-seal is a banana, a triangle, a multi-triangle or a dot pattern.

[0021] Another feature of the present invention is that said opening initiation is a mechanical weakening such as pre-cut and/or a perforation and/or an embossing.

[0022] Additionally, the present invention discloses an easy opening flow-pack wrapper intended to be used in a horizontal and/or a vertical form, fill and seal process.

[0023] Finally, a packed product comprising the wrapper of the present invention is disclosed.

Short description of the drawings

[0024] Fig. 1 shows a mask of the closing cold-seal area on the unfolded wrapper (first embodiment)

[0025] Fig. 2 shows a mask of the closing cold-seal area and the reclosable cold seal area on the unfolded wrapper (second embodiment)

[0026] Fig. 3 shows the cold-seal area on the unfolded wrapper with an embossed mechanical weakening as opening initiation.

[0027] Fig. 4 shows the pattern of the closing cold-seal area and the reclosable cold seal area on the unfolded wrapper with a perforated mechanical weakening as opening initiation.

[0028] Fig. 5 shows the profile of a folded flow-pack wrapper with longitudinal fin seal situated on the longitudinal edge of the product.

[0029] Fig. 6 shows the profile of a folded longitudinal fin seal on the folded flow-pack wrapper.

[0030] Fig. 7 represents a perspective view of a packed product showing the pre-cut crossing the longitudinal fin seal.

[0031] Fig. 8 represents a mask of the opening possibility at two sides of the pack with closing cold seal areas and reclosable cold seal areas.

Detailed description of the invention and preferred embodiments

[0032] The present invention is based on the technology of a flow-pack used in a horizontal or vertical form fill and seal process. This flow-pack wrapper is easy to open (first embodiment) and preferably, but not necessarily, reclosable (second embodiment). The modifications on the wrapper of the present invention do not entail a significant reduction of the packaging speed and can be achieved on standard packing machinery without significant extra costs.

Definitions

[0033] The expression "cold seal" refers to an area of the flexible packaging film covered by a sealing coating able to seal to itself without melting of the polymer film and essentially by the application of pressure. This concept is well known by those skilled in the art.

[0034] The expression "opening initiation" refers to all kind of mechanical weakening intended to initiate the tear of the package independently of the generation process of this mechanical weakening.(perforations, full pre-cuts, notches, embossing...etc). As far as it would be endless to describe all the existing mechanical weaknesses, they should be understood in a wide range, independently of their pattern. A pre-cut can for instance start inside a cold-seal area instead of starting at the edge of the pack.

[0035] The expression "cross seal" or "transverse seal" should be understood as the sealing in a transverse direction to the flow direction of the wrapper during the pack process. The cross seal is perpendicular to the longitudinal fin seal, said longitudinal fin seal being parallel to the longest edge of the packed product.

[0036] The expression "wrapper" should be understood in a large sense as a mono or multilayer packaging film which is optionally printed and generally coiled, and cutted into strips to be used in form, fill and seal processes. After the production process of such coils, well known by those skilled in the art, the semi-finish wrapper is used to wrap a serie of products, transforming them into wrapped products using the wrapper of the present invention.

Problem intended to be resolved by the invention

[0037] A particular problem occurring in the opening of cross seals with pre-cuts or other opening initiations is the fact that these various opening initiations are stopped by the longitudinal fin seal which is generally situated in the middle of the confectionery bar. Once the tear reaches this longitudinal fin seal, said tear stops or becomes unpredictable.

Solution proposed by the present invention

[0038] In a first embodiment of the present invention, the longitudinal fin seal 9 is situated on the longitudinal edge of the product and cross-cut by the opening initiation. This allows the continuation of a predictable tear.

[0039] In a second embodiment of the present invention, the longitudinal fin seal 9 is also situated on the longitudinal edge of the product and cross-cut by the opening initiation, but additionally, a reclosable cold seal area 6 adjacent to the closing cold seal area 2 in the cross direction is added to the packaging. In this configuration, a cold seal free area 5 subsist in between said closing cold seal area 2 and said adjacent reclosable cold seal area 6 which guides the tear automatically in between both zones. The reason for this guidance is that the tear chooses the way of the lowest resistance. In other words, the non adhesived multilayer film/film is less tear resistant than the multilayer complex film/cold seal/cold seal/film. The adhesion of the cold seal layer to itself increasing even this tear resistance.

[0040] The converting process is based on the production of a normal cold-seal wrapper, preferably, but not necessarily, with a special cold seal pattern design. The closing cold-seal area 2 contains a cold-sealing coating in a quantity of about 3 to 5 grams per square meter. The reclosable cold-seal area 6 has a lower seal strength than the closing cold seal area. This lower seal strength can be reached by different means. No limitative examples of such means are, a lower quantity of cold-sealing coating (only 2 to 3 grams per square meter), the use of a very dry cold-seal and/or the use of specific pattern design.

[0041] In the particular case of food packaging, food-approved cold-seals for confectionery products are well known by those skilled in the art. No limitative examples are based on natural rubber latex and styrene acrylics. The rubber latex performs the cohesion of the coating to itself, while the acrylic polymers perform the adhesion onto the substrate.

[0042] All kind of substrates used in the standard flow-wrap technology can be used in the present invention. No limitative examples are mono and/or multilayer polymer films in general, and in particular aluminum coated and bioriented polypropylene mono and/or multilayer films.

[0043] The packing of the product is performed on a standard horizontal or vertical form, fill and seal machine with slightly adapted sealing jaws. The knife in the sealing jaws should preferably be straight. The sealing jaw area at one side has a specific design adapted to the desired pattern. In order to obtain an opening initiation one, non limitative, option is the inclusion of a cutting knife in the sealing jaw to make a pre-cut in the cross-seal. This pre-cut has to be made in the closing cold-seal area 2 to guarantee hermetic or semi-hermetic packs.

[0044] Other opening initiations such as perforations,

tear initiations by mechanical or laser weakening or embossing are also possible and should also be situated in the closing cold-seal area 2 to ensure said hermetic or semi-hermetic packaging.

[0045] The easy opening of the wrapper of the present invention, is possible by the fact that there are no profiled ends to have a "fool-prove" packaging. If the consumer cannot tear from the end, he is obliged to use the "side possibility". The easy opening is possible through opening initiation in the closing cold seal area 2 in the prolongation of the tear guide cold-seal free area 5. The tear is guided through the cold-seal free area 5 to the other end of the wrap and the consumer takes away the major part of the closing cold-seal 2 and the remaining reclosable cold-seal 6 can be "pushed through" by the packed product. This particular reclosable cold-seal area 6 with lower seal strength can be improved in terms of easy opening by the use of particular banana-shaped cold-seal patterns, triangle or dots, so that the product only touches this particular reclosable sealing area at one point and makes the "push-through" easier (see Fig 3). The reclosability is possible by pushing the reclosable cold seal area 6 at the open end of the flow-wrap against each other. Due to pressure and human temperature, this is easily resealed.

[0046] The present invention can be used in different configurations. No limitative examples are easy openings on each side of the pack such as represented in figure 8. Multi-packs (not represented) are also part of the present invention. Such multi-packs can be separated by a closing cold seal area 2 and equipped with opening initiations according to the present invention on each side top and/or bottom.

[0047] In a vertical form, fill and seal process, a heat seal coating of 3 to 5 grams per square meter can be used according to the same concept. In this case, the opening initiation is again placed within the sealed area and cross-cuts the longitudinal fin seal placed on the longitudinal edge of the packed product.

[0048] Typical heat seal coatings for this application are:

- Primaseal H 59-123-Sovereign-EVA based low temperature heat seal coating.
- Diofan A 716 or Diofan 193 D- Solvay- PVDC based heat seal coating.

[0049] In terms of problem-solution approach, the problem in the present invention to be solved, was to create the possibility of a reclosable package by a cold seal. To develop such a seal, it was first necessary to develop a flow wrapper with a predictable tear, to make it correctly reclosable. The predictable tear has been obtained by placing the longitudinal fin seal 9 on the longitudinal edge of the packed product (see Fig.5 and 6) making it possible to place a cross-cutting opening initiation over said longitudinal fin seal 9. The discovering of this possibility by the inventors not only improves the

opening of non-reclosable packs (first embodiment) but also offers the possibility of the use of a reclosability concept by the presence of a reclosable cold seal 6 (second embodiment).

[0050] Legend

1. Flow wrapper
2. Closing cold seal area
3. Interrupted notches as opening initiation
4. Cut zone
5. Cold seal free zone
6. Reclosable cold seal area (in different pattern designs)
7. Embossing as opening initiation
8. Perforation as opening initiation
9. Longitudinal fin seal on the longitudinal edge of the packed product
10. Closed cross seal of the finished pack
11. Cutted end of the packed product
12. Full pre-cut as opening initiation crosscutting the longitudinal fin seal

Claims

1. Easy opening flow-pack wrapper preferably for rigid or semi-rigid products comprising
 - a longitudinal fin seal (9),
 - a closing cold-seal area (2),
 - an opening initiation,

characterised in that said longitudinal fin seal (9) is situated on the longitudinal edge of the product, and **in that** said opening initiation is situated in said closing cold-seal area (2), and cross-cuts said longitudinal fin seal (9).
2. Easy opening flow-pack wrapper according to Claim 1, **characterised in that** said package further comprises at least one reclosable cold-seal area (6) and at least one tear guide cold-seal free area (5), said tear guide area being situated in between said closing cold-seal area (2) and the adjacent reclosable cold-seal area (6) in the prolongation of the opening initiation.
3. Easy opening flow-pack wrapper according to Claim 2, **characterised in that** said reclosable cold-seal area (6) has a lower seal strength than said closing cold-seal area (2).
4. Easy opening flow-pack wrapper according to Claim 2, **characterised in that** said reclosable cold-seal area (6) has a specific pattern design allowing a progressive opening and a "push-through" of preferably semi-rigid or rigid product.

5. Easy opening flow-pack wrapper according to Claim 4, **characterised in that** the specific pattern design of said reclosable cold-seal (6) is a banana, a triangle, a multi-triangle or a dot pattern.
6. Easy opening flow-pack wrapper according to Claim 1, **characterised in that** said opening initiation is a mechanical weakening such as pre-cut and/or a perforation and/or an embossing.
7. Easy opening flow-pack wrapper according to any of the previous claims, **characterised in that** said package is intended to be used in a horizontal and/or a vertical form, fill and seal process.
8. A wrapped product comprising the wrapper of claim 1.

figure 1

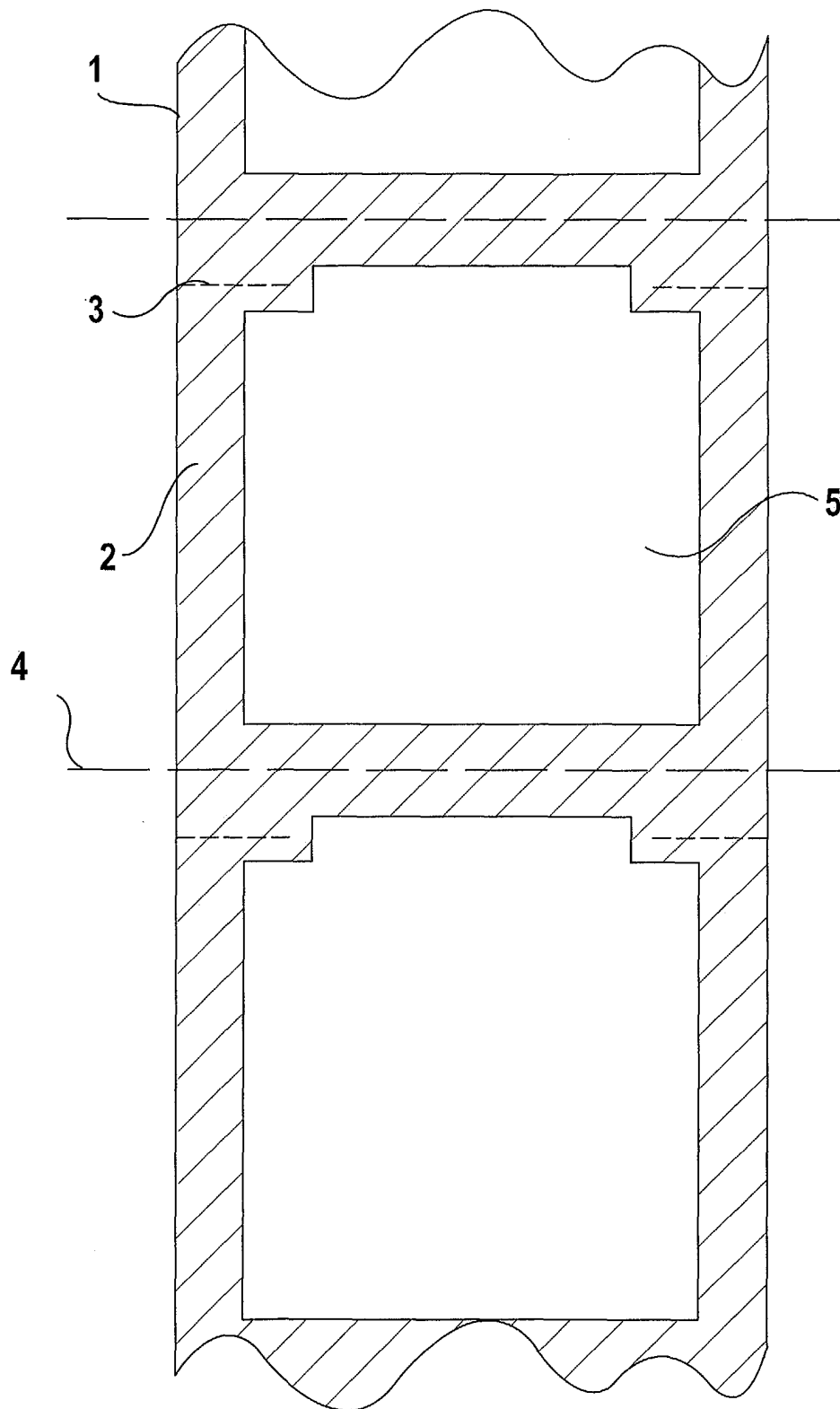


figure 2

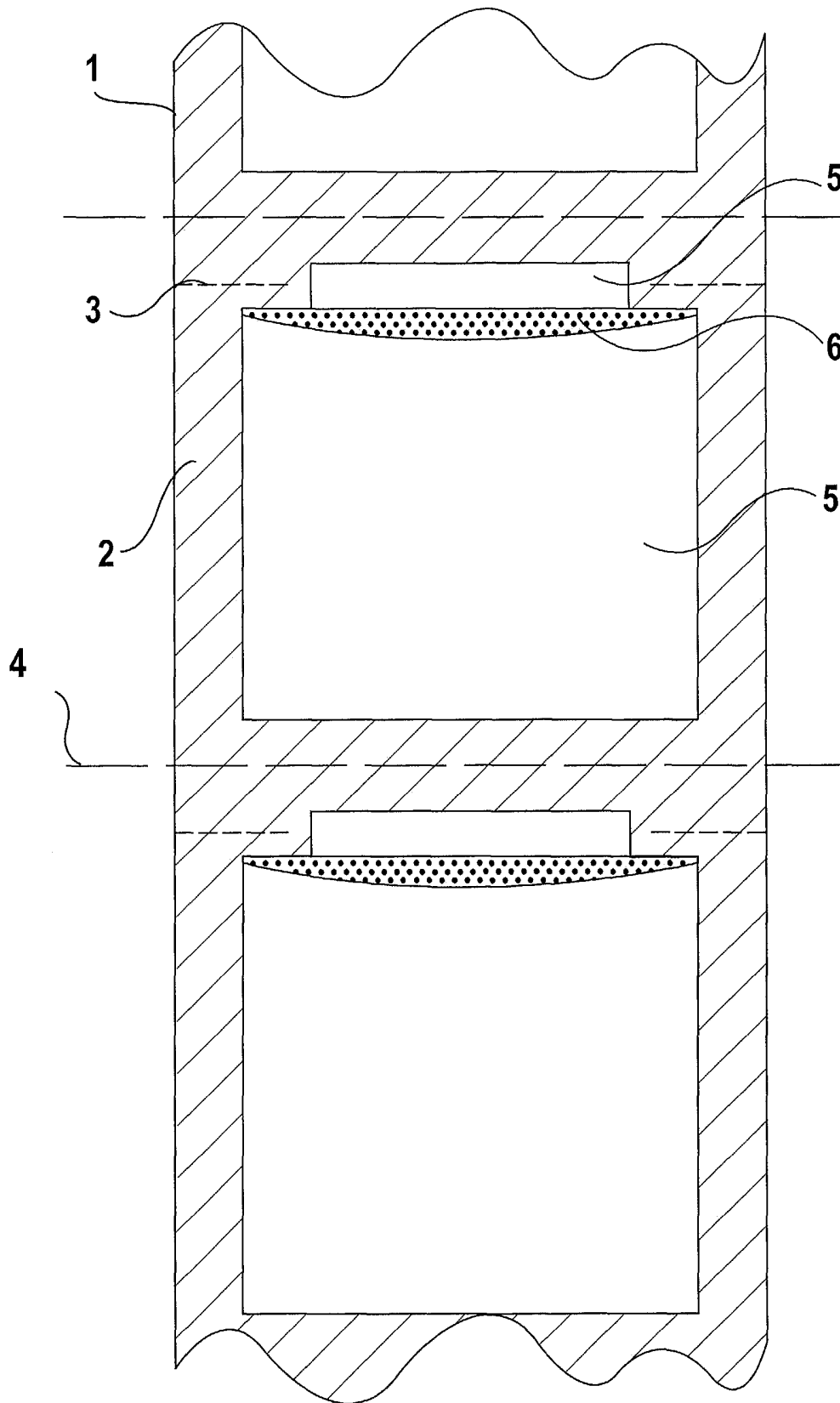


figure 3

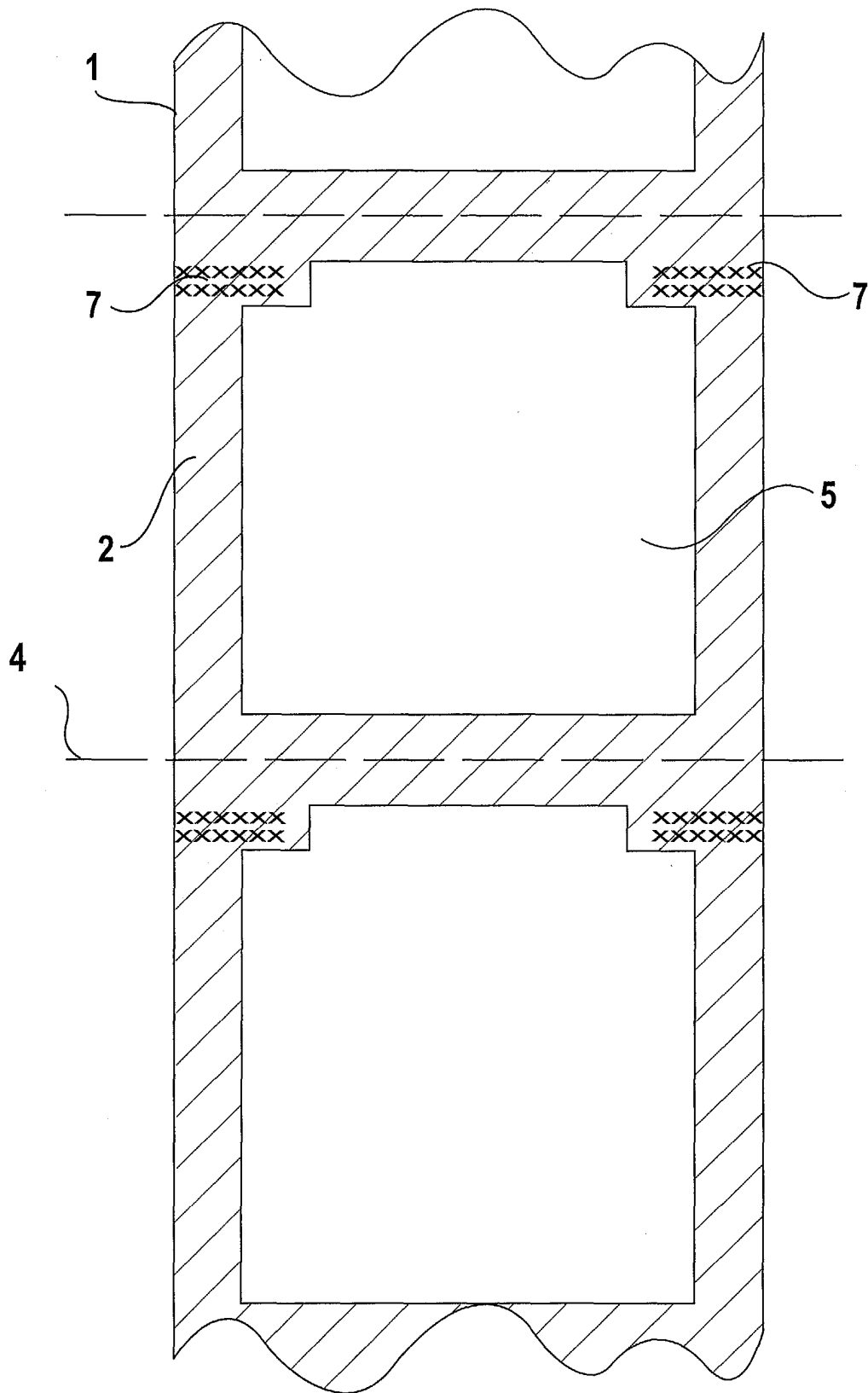


figure 4

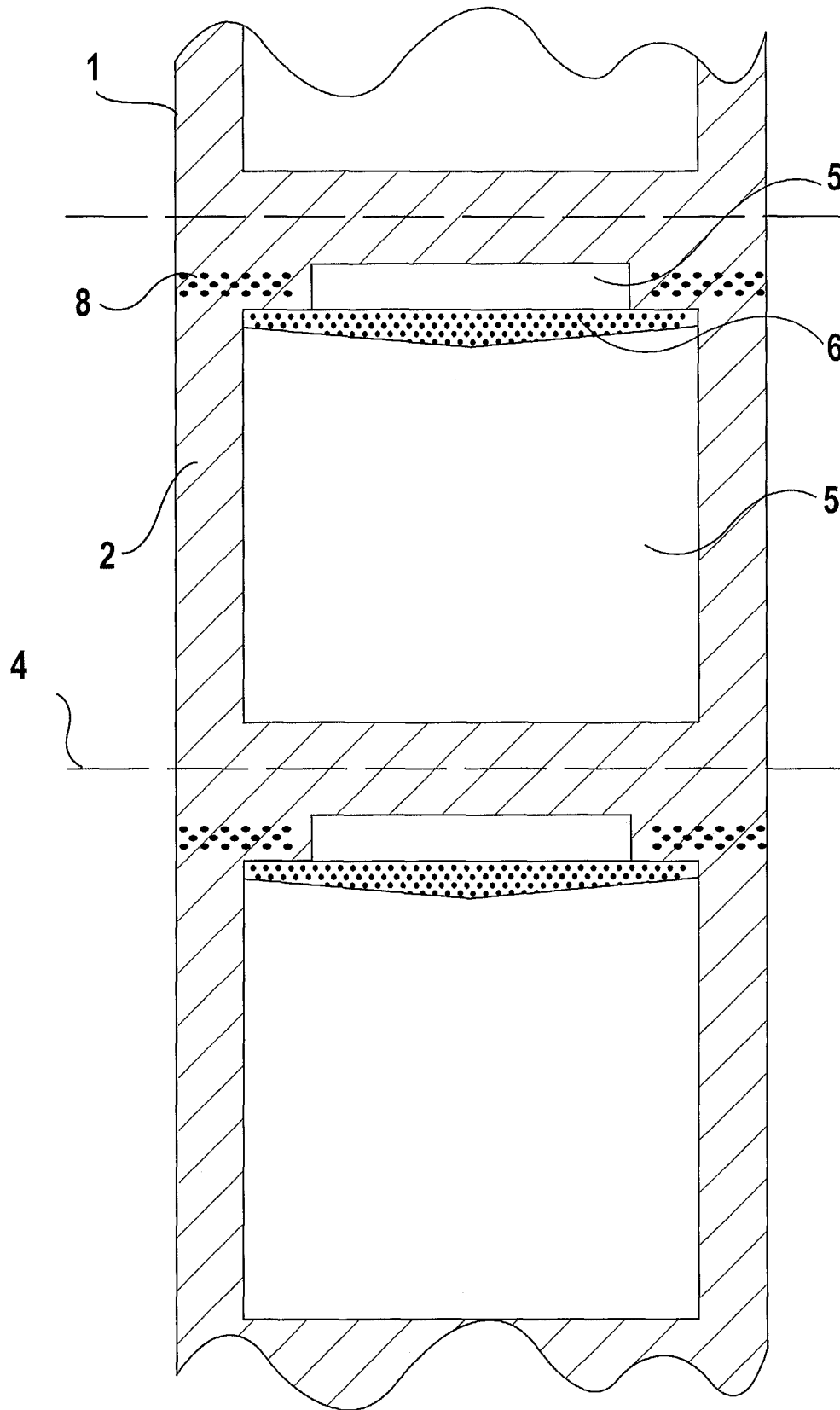


figure 5

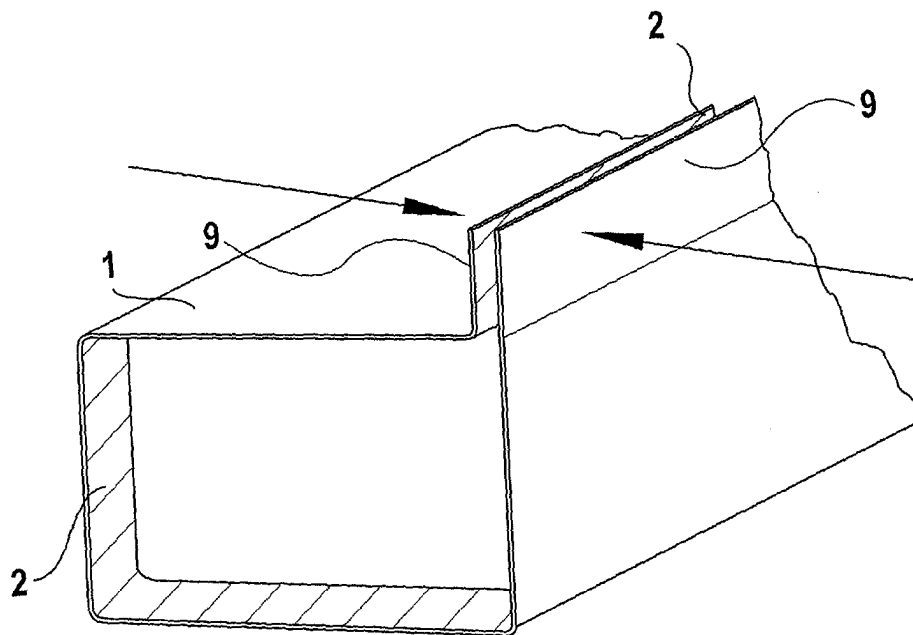


figure 6

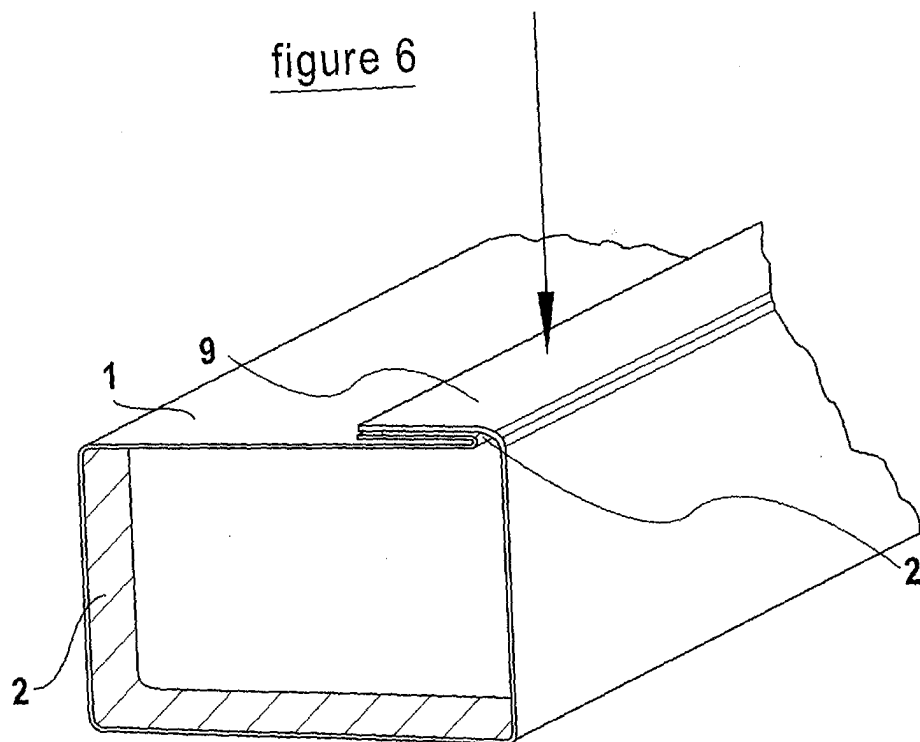


figure 7

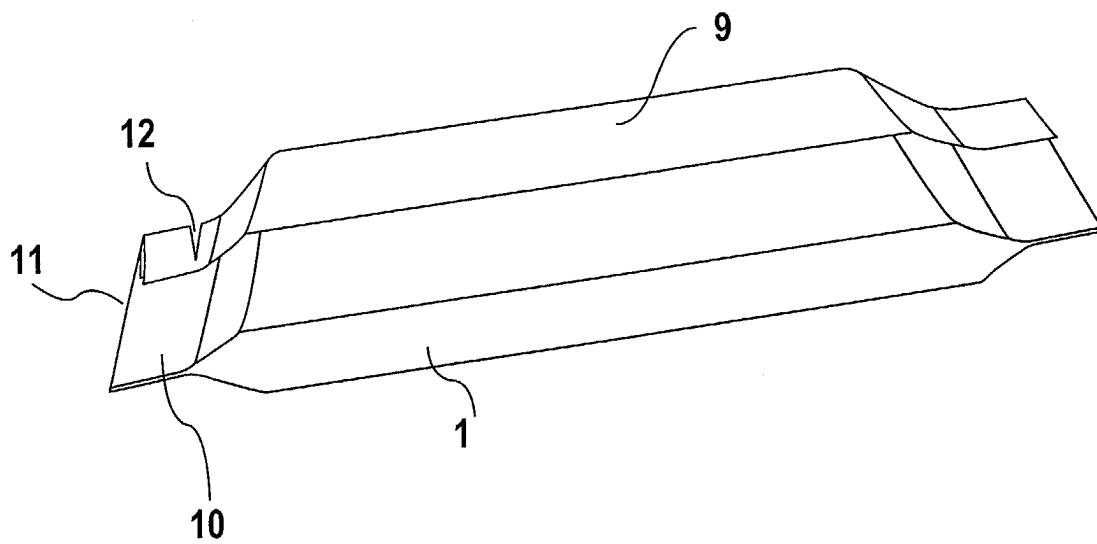
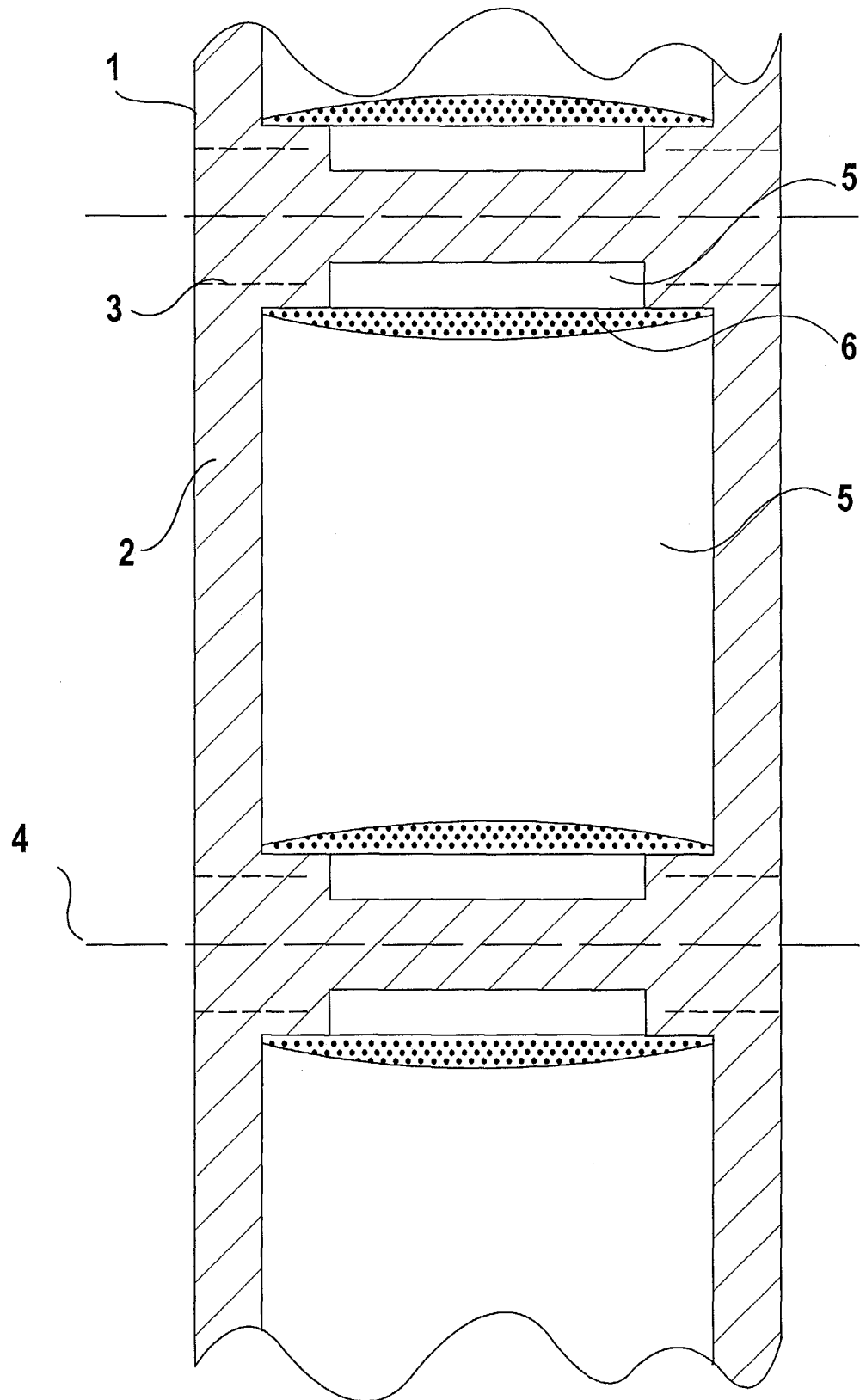


figure 8





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 44 7110

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.7)
X	EP 1 136 379 A (ALUSUISSE TECH & MAN AG) 26 September 2001 (2001-09-26) * paragraphs [0003], [0054]; figures 1A, 1B *	1, 6, 8	B65D75/58
X	US 5 371 997 A (KOPP GEORG ET AL) 13 December 1994 (1994-12-13) * column 3, line 18 - line 20; claim 1; figures 1-3, 8, 9 *	1, 6-8	
A	NL 8 301 946 A (DOUWE EGBERTS TABAKSFAB) 2 January 1985 (1985-01-02) * figure *	1, 6-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 October 2003	Examiner Fitterer, J
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			

EPO FORM 1503 03.82 (P04C01)



European Patent
Office

Application Number

EP 03 44 7110

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1, 6-8



European Patent
Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 03 44 7110

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1,6-8

Flow-pack wrapper having particular opening initiation means.

2. claims: 1,2-5

Flow pack wrapper having means for reclosing the package.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 44 7110

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1136379	A	26-09-2001	EP 1136379 A1	26-09-2001
			BR 0101102 A	06-11-2001
			CA 2340183 A1	21-09-2001

US 5371997	A	13-12-1994	AU 649754 B2	02-06-1994
			AU 8971391 A	16-07-1992
			DE 59104618 D1	23-03-1995
			EP 0494582 A1	15-07-1992
			ES 2067909 T3	01-04-1995
			JP 4339766 A	26-11-1992
			US 5222813 A	29-06-1993

NL 8301946	A	02-01-1985	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82