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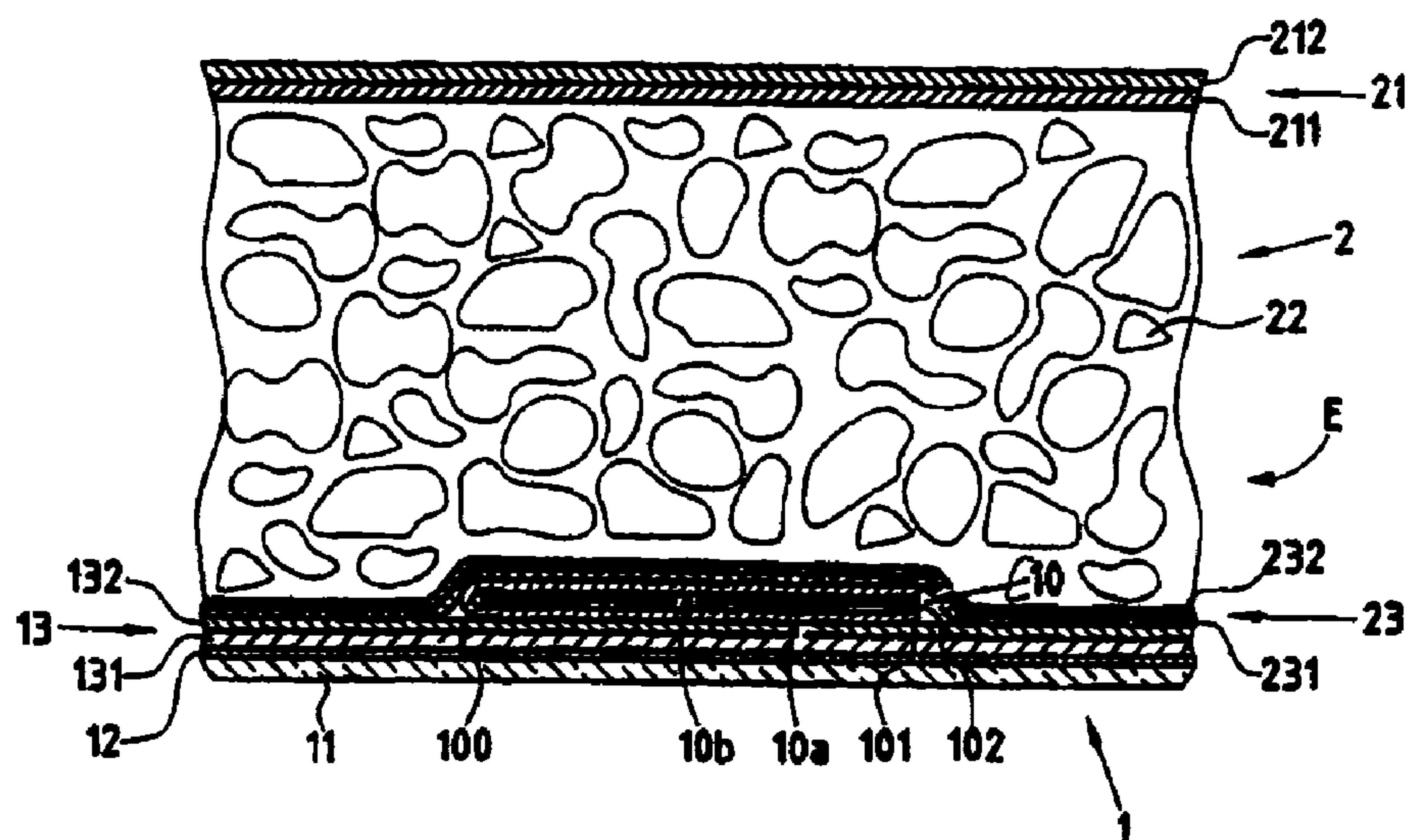
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(54) **ELEMENT D'ETANCHEITE ET D'INVIOLABILITE POUR
RECIPIENT**

(54) **SEALING AND TAMPER-PROOF ELEMENT FOR CONTAINER**



(57) L'invention concerne un élément combiné d'étanchéité et d'inviolabilité pour récipient (R) dont l'ouverture (A) est obturable par un couvercle (C), caractérisé en ce qu'il comprend, en une seule pièce: un opercule (1) amovible dont la face inférieure est destinée à être scellée de manière étanche sur le rebord de l'ouverture (A) et dont la face supérieure porte un ruban (10) formant languette de préhension, et un joint (2) destiné à être retenu dans ledit couvercle (C) et dont la face inférieure adhère à la face supérieure de l'opercule (1) au moins dans les zones laissées libres par ledit ruban (10) avec une force de liaison inférieure aux forces retenant respectivement le joint (2) dans le couvercle (C) et l'opercule (1) sur le rebord de l'ouverture (A).

(57) The invention concerns a combined sealing and tamper-proof element for container (R) whereof the opening (A) is capable of being closed by a lid (C), characterised in that it comprises, in a single piece: a removable inner seal (1) whereof the inner surface is designed to be tightly sealed on the opening (A) rim and the top surface bears a strip (10) forming a prehensile tab; and a joint (2) designed to be maintained in said lid (C) and whereof the bottom surface adheres to the inner seal (1) top surface at least in the zones unoccupied by said strip (10) with a linking force less than the forces maintaining the joint (2) in the lid (C) and the inner seal (1) on the opening (A) rim respectively.

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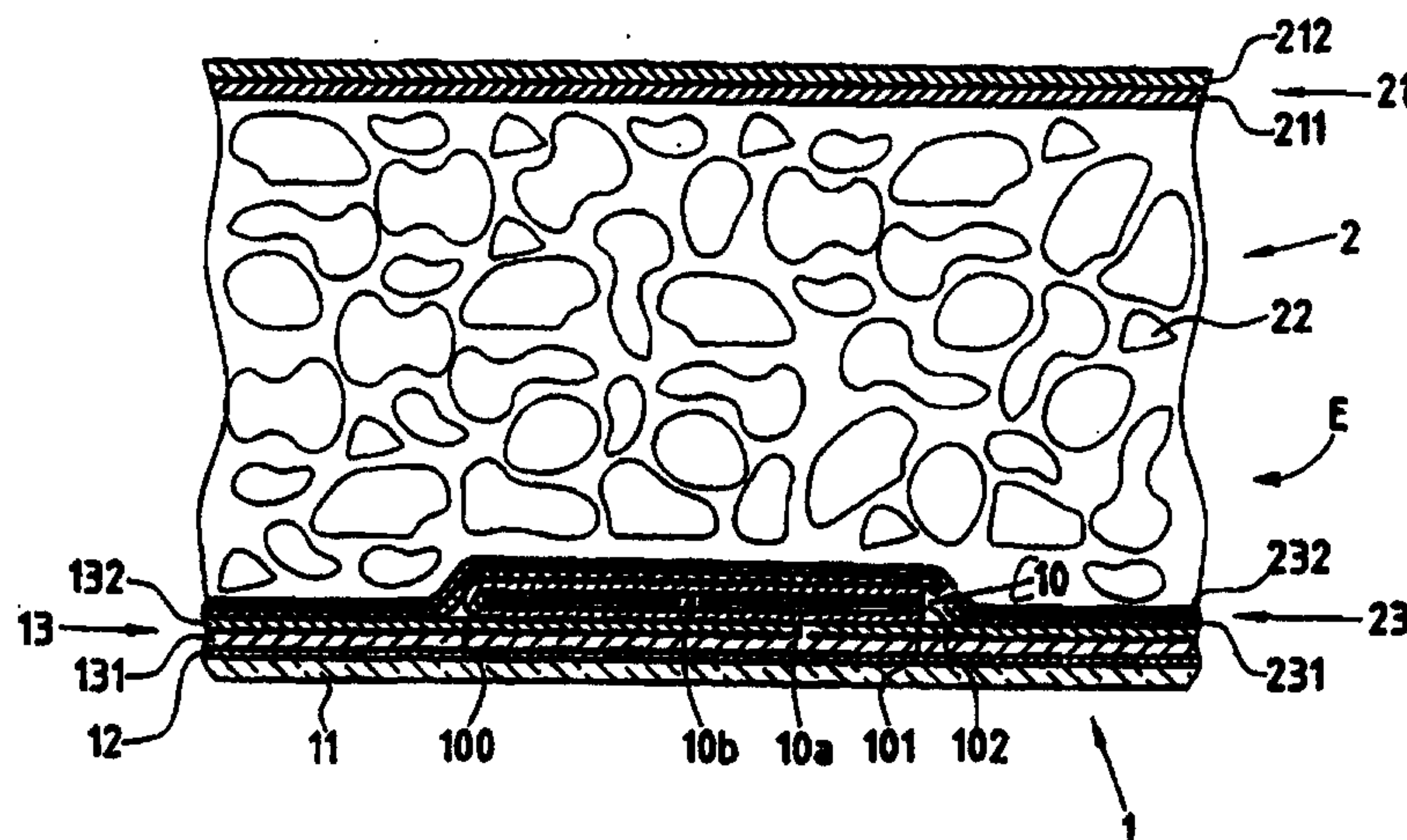
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(57) Abstract

The invention concerns a combined sealing and tamper-proof element for container (R) whereof the opening (A) is capable of being closed by a lid (C), characterised in that it comprises, in a single piece: a removable inner seal (1) whereof the inner surface is designed to be tightly sealed on the opening (A) rim and the top surface bears a strip (10) forming a prehensile tab; and a joint (2) designed to be maintained in said lid (C) and whereof the bottom surface adheres to the inner seal (1) top surface at least in the zones unoccupied by said strip (10) with a linking force less than the forces maintaining the joint (2) in the lid (C) and the inner seal (1) on the opening (A) rim respectively.

SEALING AND TAMPER-PROOF ELEMENT FOR CONTAINER.

The present invention relates to a combined sealing and tamper-proofing element for a container, and in particular for a container whose opening is designed to be closed by a lid, and to a method of manufacturing such an element.

Numerous technical solutions exist for jointly sealing and tamper-proofing a container.

Among such solutions, heat-sealed covers or "tops" are in wide use, in particular for food products.

Such covers are sometimes associated with additional sealing means such as gaskets disposed inside the lid or cap that is designed to fit over the top portion of the container.

Such covers can also be provided with graspable means such as tabs which are generally formed by portions of the cover itself, as described in EP 395 660, EP 460 096, EP 534 949, and US 4 754 890.

Unfortunately, the presence of such tabs prevents any possibility of the top face of the cover being bonded, even temporarily, to the gasket of the cover.

Such bonding is necessary to reinforce the tamper-proofing, and to simplify the manufacturing method insofar as it enables the sealing and tamper-proofing element to be made in one piece.

An object of the present invention is to solve the preceding technical problems, firstly by making the graspable tab in the form of a separate tape mounted on the cover, and secondly by setting up temporary bonding around said tab between said cover and the gasket of the lid.

The invention achieves this object by means of a combined sealing and tamper-proofing element for a container whose opening can be closed by a lid, said element being of the type comprising:

a removable cover whose bottom face is designed to be sealed in leak-tight manner to the rim of the opening

and whose top face carries a tape forming a graspable tab; and

5 a gasket designed to be retained in said lid, said element being characterized in that the cover and the gasket are made in one piece; the bottom face of said gasket adhering to the top face of the cover, at least in the zones not covered by said tape, with bonding force that is weaker than the forces retaining respectively the gasket in the lid and the cover on the rim of the
10 opening.

According to an advantageous characteristic, said tape is provided with a longitudinal fold forming a resilient hinge and defining firstly a fixed portion secured to the top face of the cover, and secondly a
15 moving portion folded-over parallel to said fixed portion by means of the gasket bearing against said moving portion.

Preferably, said moving top portion of the tape is bonded to the gasket in separable manner.

20 In a variant, the fixed portion and the moving portion are of equal width.

In a particular embodiment, said tape extends diametrically over the top face of the cover.

25 In a variant, said tape is made up of at least two layers.

In which case, the bottom layer of the tape is secured to the top face of the cover, and is bonded separably to the bottom face of the gasket.

30 For example, the bottom layer is made of polyethylene and the top layer is made of polyethylene terephthalate (PET) or polyester.

In another embodiment, said cover is made up of at least two layers.

35 In a variant, said cover comprises a sealing bottom layer, a metal interposed layer and a top layer.

Preferably, said top layer is made up of at least two sub-layers, namely a bottom sub-layer compatible with

the metal layer and a top sub-layer compatible with the tape.

In yet another embodiment, said gasket comprises at least two layers.

5 In a variant, said gasket comprises a bottom layer bonded separably to the tape and to the cover, an expanded intermediate layer, and a top layer disposed facing the bottom of the lid.

10 In another variant, the bottom layer and the top layer of the gasket are each made up of two sub-layers.

For example, the bottom layer of the gasket is made of polyethylene terephthalate or of polyamide, and the intermediate layer is made of a polyolefin foam.

Preferably, said gasket has a symmetrical structure.

15 In a specific embodiment, the weak bonding between the bottom face of the gasket and the top face of the cover is mainly of mechanical origin.

The invention also provides a method of manufacturing said element, said method being
20 characterized in that the top layer of the cover is formed by hot extrusion and then the gasket is applied to the hot top layer, thereby holding the previously fixed tape captive, so that, after cooling, weak bonding is obtained between the gasket and the cover.

25 The invention makes it possible to reinforce sealing and tamper-proofing for the container because the gasket and the cover are assembled together so as to form a single hermetic-sealing piece.

The layers making up the cover are fixed together
30 firmly as are the layers making up the gasket.

Thus, on taking off the lid, the gasket and the cover come apart easily without causing either of them to undergo delamination, and without causing any damage to their interface or to the tab.

35 Once the lid has been taken off, the cover can also be unstuck without undergoing delamination or tearing, by means of the graspable tab.

In addition, by making a single element for tamper-proofing and for sealing, it is possible to simplify closing and packaging operations.

5 The invention will be better understood on reading the following description with reference to the drawing, in which:

Figure 1 is a section view of the element of the invention; and

10 Figure 2 is a perspective view of the element of the invention after the lid has been taken off.

The element E shown in Figure 1 is designed to provide both sealing and tamper-proofing of a container R (visible in Figure 2) whose opening A can be closed with a lid or a cap C.

15 The element E comprises a combination of a cover 1 and of a gasket 2 in one piece.

The bottom face of the cover 1 is designed to be stuck or sealed in leak-tight manner to the rim of the opening A in the container R, and its top face carries a
20 tape 10 forming a graspable tab. For example, the cover 1 may be heat sealed in known manner by high-frequency induction.

The gasket 2 is designed to be received in the lid C which is organized for this purpose. For example, the
25 gasket may be retained by means of a peripheral ring provided on the inside wall of the cover and behind which the gasket is locked at least in part. In the invention, the bottom face of the gasket 23 adheres in easily-separable manner to the top face of the cover 1 at least
30 in the zones not covered by the tape 10.

The bonding force between the bottom face of the gasket 2 and the top face of the cover 1 is determined such that it is less than the forces retaining the gasket 2 in its seat, and less than the resistance of the cover
35 1 to being torn off from the rim of the opening 1 of the container R. Preferably, this bonding force is such that any displacement of the lid C, and in particular of the

gasket 2 relative to the container R causes the gasket and the cover 1 to separate immediately. Such weak bonding is preferably obtained by extruding or by co-extruding the top layer of the cover 1 at a high
5 temperature (at which the materials melt), then by fixing the tape 10, and then by applying the gasket 2 rapidly to the top layer of the resulting cover, thereby holding the tape 10 captive.

While the gasket 2 is being applied, the extruded
10 top layer of the cover is still hot enough to conserve a state facilitating adhesion, at least to some extent.

Then, after cooling, the lack of chemical compatibility (that may be more or less marked) between the materials constituting respectively the bottom layer
15 of the gasket 2 and the top layer of the cover 1 provides weak bonding, mainly of mechanical origin (by a vacuum or suction effect). Thus, the higher the degree of compatibility between the materials in contact, the larger the bonding force between the gasket and the
20 cover, because the chemical bonds that are strongest are more numerous.

The tape 10 is provided with a longitudinal fold 100 forming a resilient hinge and defining firstly a fixed portion 10a secured to the top face of the cover 1, and
25 secondly a moving portion 10b, folded over parallel to the bottom portion 10a by means of the gasket 2 bearing against said moving portion. The fixed portion 10a and the moving portion 10b are preferably of equal width, as shown in Figure 1, and they extend diametrically over the
30 top face of the cover 1 which, in this example, is circular.

The moving portion 10b of the tape 10 which is folded over so that it lies flat on the fixed portion 10a is optionally bonded to the bottom face of the gasket 2
35 by an adhesion phenomenon analogous to that concerning those zones of the top face of the cover 1 which are adjacent to the fixed portion 10a of the tape.

In which case, when the lid is taken off on the container being opened for the first time, removal of the lid participates in raising the moving portion, which makes it easier for it to be grasped subsequently.

5 However, the inside facing faces of the fixed and the moving portions 10a, 10b of the tape 10 that are in contact in the folded-over state, are never bonded together, thereby allowing the moving portion 10b to move resiliently upwards under the action of the hinge 100
10 after the gasket 2 has been separated from said portion.

 When the tape 10 is made up of at least two layers 101, 102, the bottom layer 101 is fixed firmly to the top face of the cover 1, and the layer 101 is free or is bonded separably to the bottom face of the gasket 2. By
15 means of the above-described adhesion phenomenon, when the tape 10 is in the folded-over state, the top layer 102 is disposed inside the fold, between the fixed portion 10a and the moving portion 10b.

 For example, the bottom layer 101 may be made of
20 polyethylene while the top layer 102 is made of polyethylene terephthalate (PET) so as to avoid any adhesion phenomenon between the fixed portion 10a and the moving portion 10b.

 The cover 1 is made up of at least two layers and,
25 preferably, three layers in the embodiment shown in Figure 1.

 Going upwards from the bottom, the three layers are constituted by a bottom layer 11 that is sealed to rim of the opening A, a metal interposed layer 12, e.g. of
30 aluminum, and a top layer 13.

 The top layer 12 is made up of at least two sub-layers 131, 132.

 The bottom sub-layer 131 is compatible with the metal of the layer 12, and the top sub-layer 132 is
35 compatible with the bottom layer 101 of the tape 10.

 The layers 11, 12, 131, 132, and 101 are assembled together firmly and permanently, e.g. by extruding or co-

extruding surface coatings that are heat-sealed together so as to obtain bonding that is strong enough to avoid any delamination on tearing off the cover 1 by pulling on the moving portion 10b of the tape 10 that forms the
5 graspable tab.

Where applicable, the bonding forces between firstly the bottom layer 11 and the rim of the opening A and secondly the bottom layer 11 and the interposed layer 12 are determined relative to one another so as to produce
10 partial delamination of the bottom layer 11 on tearing off the cover 1. The purpose of this partial delamination is to leave a peripheral portion of the bottom layer 11 on the rim of the opening, after tearing off the cover, as a sealing and tamper-proofing
15 indicator, when the container is opened for the first time.

The gasket 2 is made up of one or more layers, and preferably of at least two layers as in the embodiment shown in Figure 1, with three layers 21, 22, 23 defining
20 a symmetrical structure.

The top layer 21 is disposed facing the end wall of the lid C while optionally being fixed thereto by gluing or any other means.

The intermediate layer 22 is expanded and has a
25 thickness that is much larger than the thickness of the other two layers 21, 23. For example, this layer may be formed of a cellular material such as a polyolefin foam.

The bottom layer 23 is bonded in separable manner firstly to the moving portion 10b of the tape 10, and
30 secondly to the top face of the sub-layer 132 of the cover 1. The top layer 21 and the bottom layer 23 of the gasket 2 are each made up of two sub-layers 211 & 212 and 231 & 232.

The bottom layer 23 and optionally the top layer 21
35 are made of polyethylene terephthalate or of polyamide.

In a variant, the outermost layers are of very small thicknesses and are, for example, constituted by films.

Thus, in the folded-over state, the tape 1 is temporarily enclosed between the cover 1 and the gasket 2.

When the container is used for the first time, the
5 consumer takes off the lid C as shown in Figure 2.

This effect of this action is to separate the gasket 2 from the cover 1 while releasing the moving portion 10b of the tape 10, which portion can then pivot upwards to come into a position in which it is substantially
10 perpendicular to the plane common to the fixed portion 10a and to the cover 1.

Then, by pulling on the portion 10b, the consumer separates the cover 1 from the rim of the container 1 so as to open the opening A.

15 Various embodiments are given below by way of non-limiting example, with the following abbreviations being used as listed:

PET = polyethylene terephthalate or polyester

PA = polyamide

20 PVC = polyvinyl chloride

PVDC = polyvinylidene chloride

PE = polyethylene

PP = polypropylene

PO = polyolefin

25 * The top layer (13 or 132) is made by extruding a material or co-extruding a plurality of materials taken, for example, from the above list, on their own or in association as alloys.

Example 1

		Layer	Materials
5	gasket 2	21	PET
		22	PE foam
		23	PET
	tape 10	102	PET
		101	PE
10	cover 1	13	extrusion or co-extrusion/spreading of one or more layers*
		12	PET film, aluminum or PA
15		11	Glassine (32 g) stuck to the rim (A)

Example 2

20		Layer	Materials
	gasket 2	21	card
		23	aluminum
	tape 10	102	PET
		101	PE
25	cover 1	13	extrusion or co-extrusion/spreading of one or more layers*
		12	PET film
30		11	mono- or multi-layer PE film heat-sealed to the rim (A)

10

Example 3

		Layer	Materials
5	gasket 2	21	card
		23	PET
	tape 10	102	PET
		101	PE
10	cover 1	13 { 132	extrusion or co-extrusion/spreading of one or more layers*
		131	aluminum
15		12	PET film
		11	mono- or multi-layer PE film heat-sealed to the rim (A)

20

Example 4

		Layer	Materials
	gasket 2	21	card
		23	PET
25	tape 10	102	PET
		101	PE
30	cover 1	13 { 132	extrusion or co-extrusion/spreading of one or more layers*
		131	PET film
		12	aluminum
35		11	mono- or multi-layer PE film heat-sealed to the rim (A)

Example 5

		Layer	Materials
5		gasket 2	mono-layer
		tape 10	mono-layer
			PET
10		cover 1	extrusion or co-extrusion/spreading of one or more layers*
	13	{ 132	PET film
		{ 131	aluminum
		12	
15		11	mono- or multi-layer PE film heat-sealed to the rim (A)

CLAIMS

1/ A combined sealing and tamper-proofing element for a container (R) whose opening (A) can be closed by a lid (C), said element being of the type comprising:

5 a removable cover (1) whose bottom face is designed to be sealed in leak-tight manner to the rim of the opening (A) and whose top face carries a tape (10) forming a graspable tab; and

10 a gasket (2) designed to be retained in said lid (C),

said element being characterized in that the cover (1) and the gasket (2) are made in one piece; the bottom face of said gasket adhering to the top face of the cover (1), at least in the zones not covered by said tape (10), with
15 bonding force that is weaker than the forces retaining respectively the gasket (2) in the lid (C) and the cover (1) on the rim of the opening (A).

2/ An element according to claim 1, characterized in that
20 said tape (10) is provided with a longitudinal fold (100) forming a resilient hinge and defining firstly a fixed portion (10a) secured to the top face of the cover (1), and secondly a moving portion (10b) folded-over parallel to said fixed portion (10a) by means of the gasket (2)
25 bearing against said moving portion.

3/ An element according to claim 2, characterized in that said moving top portion (10b) of the tape (10) is bonded to the gasket (2) in separable manner.

30

4/ An element according to claim 2 or 3, characterized in that the fixed portion (10a) and the moving portion (10b) are of equal width.

35 5/ An element according to any preceding claim, characterized in that said tape (10) extends diametrically over the top face of the cover (1).

6/ An element according to any preceding claim,
characterized in that said tape (10) is made up of at
least two layers (101, 102).

5

7/ An element according to claim 6, characterized in that
the bottom layer (101) of the tape (10) is secured to the
top face of the cover (1), and is bonded separably to the
bottom face of the gasket (2).

10

8/ An element according to claim 6 or 7, characterized in
that the bottom layer (101) is made of polyethylene and
the top layer is made of polyethylene terephthalate
(PET).

15

9/ An element according to any preceding claim,
characterized in that said cover (1) is made up of at
least two layers (11, 12, 13).

20

10/ An element according to claim 9, characterized in
that said cover comprises a sealing bottom layer (11), a
metal interposed layer (12) and a top layer (13).

25

11/ An element according to claim 10, characterized in
that said top layer (13) is made up of at least two sub-
layers (131, 132), namely a bottom sub-layer (131)
compatible with the metal layer (12) and a top sub-layer
(132) compatible with the tape (10).

30

12/ An element according to any preceding claim,
characterized in that said gasket (2) comprises at least
two layers (21, 22, 23).

35

13/ An element according to claim 13, characterized in
that said gasket (2) comprises a bottom layer (23) bonded
separably to the tape (10) and to the cover (1), an

expanded intermediate layer (22), and a top layer (21) disposed facing the bottom of the lid (C).

14/ An element according to claim 13, characterized in
5 that the bottom layer (23) and the top layer (24) of the gasket (2) are each made up of two sub-layers (231, 232) and (211, 212).

15/ An element according to claim 13 or 14, characterized
10 in that the bottom layer (23) of the gasket is made of polyethylene terephthalate or of polyamide.

16/ An element according to claim 13 or 15, characterized
15 in that the intermediate layer (22) is made of a polyolefin foam.

17/ An element according to any preceding claim,
characterized in that said gasket (2) has a symmetrical
20 structure.

18/ An element according to any preceding claim,
characterized in that the weak bonding between the bottom
face of the gasket (2) and the top face of the cover (1)
is mainly of mechanical origin.

25 19/ A method of manufacturing an element according to any one of claims 1 to 18, said method being characterized in that the top layer of the cover (1) is formed by hot extrusion and then the gasket (2) is applied to the hot
30 top layer, thereby holding the previously fixed tape captive, so that, after cooling, weak bonding is obtained between the gasket (2) and the cover (1).

1/1

