



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 422 163 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
26.05.2004 Bulletin 2004/22

(51) Int Cl.7: **B65D 81/34, B65D 77/22**

(21) Application number: **02388075.0**

(22) Date of filing: **22.11.2002**

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

(72) Inventors:
• **Olsen, Erik**
8700 Horsens (DK)
• **Meldgaard-Andersen, Willy**
8700 Horsens (DK)

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

(74) Representative: **Jensen, Peter Kim et al**
Chas. Hude A/S
33, H.C. Andersens Boulevard
1780 Copenhagen V (DK)

(54) Food package for heating in an oven

(57) A packaging for packing of articles of food and heating thereof in an oven, especially a microwave oven and comprising at least one sealable packaging material (2) at least partially defining a closed chamber (16) containing the article of food. The packaging further includes a venting means for allowing gas and vapour or steam released during the heating of the article of food to escape from the chamber. The venting means is a pressure relief valve (18) opening at a predetermined excess pressure generated in the inner chamber (16) of

the packaging. The valve (18) includes a first inner film (10) provided with a first opening (13, 14) communicating with the inner chamber (16) of the packaging and a second outer flexible film (11) covering the opening (13, 14) in the first inner film (10) and connected thereto to form a channel portion (12) between the inner and the outer films. The channel portion (12) communicates with the surroundings of the packaging through a second opening (15) being offset in relation to the first opening (13, 14).

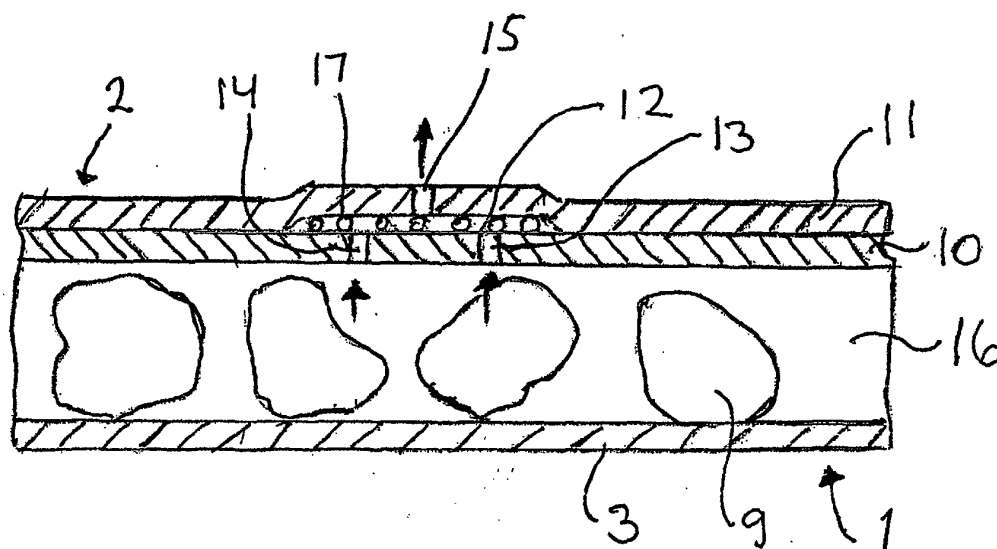


Fig 2

EP 1 422 163 A1

Description

[0001] The invention relates to a packaging for packing articles of food and heating thereof in an oven, especially in a microwave oven, said packaging including at least one sealable packaging film at least partially defining a closed chamber containing said article of food, said packaging further including a venting means for allowing gas and vapour emitted during the heating of the article of food to escape from the chamber.

[0002] Food products are increasingly sold in a partly or fully cooked state, ie either precooked for reheating, eg complete meals, or prepared for cooking, eg fresh vegetables. For consumer convenience these products are packed in packagings allowing for heating or cooking of the food product contained therein without removal of the packaging.

[0003] EP 1 067 058 A1 discloses a packaging of the above type, in which the venting means is provided by means of a specifically designed heat-sealed area causing the packaging material to rupture at at least one point when an excess pressure occurs in the interior of the packaging during heating of the article of food contained therein in a microwave oven. Furthermore FR 27 96 047 A1 and JP 2001-240150 disclose a packaging of the above type, wherein the venting means is formed of a weak seal, which is broken when an excess pressure occurs in the interior of the packaging during heating of the article of food contained therein.

[0004] The venting means is thus provided in the above known packagings by an excess pressure in the interior of the packaging causing a seal or the packaging material *per se* to rupture. However, in relation to the process of manufacture it may prove difficult to ensure that the venting means in fact opens at a predetermined excess pressure.

[0005] The object of the present invention is to provide a packaging of the above type which ensures a controlled opening of the venting means at a predetermined excess pressure in the interior of the packaging during heating of the article of food contained therein. Another object of the invention is to provide a packaging having a venting means which is prevented from opening before the packed product is heated in an oven, such as a conventional oven, an IR oven or a microwave oven, said venting means further maintaining an excess pressure in the interior of the packaging during the heating process.

[0006] The packaging according to the invention is characterised in that the venting means is a pressure relief valve opening at a predetermined excess pressure generated in the inner chamber of the packaging, said valve including a first inner film provided with a first opening communicating with the inner chamber of the packaging, and a second outer flexible film covering the opening in the first inner film and connected thereto to form a channel portion between the inner and the outer films, said channel portion communicating with the sur-

roundings of the packaging through a second opening being offset in relation to the first opening.

[0007] As a result, the first film and the second film sealingly abut each other either directly or indirectly in the closed position of the valve so as to prevent an open connection between the first and second opening. In the closed position of the valve ambient air is thus prevented from penetrating into the interior of the packaging to the packed article of food. When the packaging and the article of food contained therein is heated, the article of food releases gases and the water present in the article of food evaporates, thus generating an excess pressure in the interior of the packaging. The excess pressure causes the pressure relief valve to open at a predetermined excess pressure, gases and aqueous vapour penetrating into the channel portion through the first opening and further from the channel portion to the surroundings through the second opening. While the valve opens, the inner and outer films move away from each other due to the excess pressure in the channel, a certain excess pressure being maintained in the inner chamber of the packaging at the same time. The internal excess pressure effects a rapid heating of the packed product. In practice it has been found that the use of the present packaging may reduce the heating or cooking time of an article of food by 30 to 40% compared to the use of known packagings.

[0008] The term "film" should be understood in its widest sense, as it also covers mono films, multilayered co-extrudates and laminates.

[0009] As regards the design or structure of the pressure relief valve it should be noted that it is known to use such a valve for packaging materials containing a gas-releasing product. A multi-layered packaging material having a pressure relief valve or one-way valve is thus known from EP 0 144 011 B2, EP 0 559 598 B1 and WO 88/07479. Furthermore DE 25 37 317 A1, EP 0 023 703 B1, EP 0 738 227, DE 44 35 492 A1 and EP 0 760 790 B1 disclose a pressure relief valve or a packaging having a pressure relief valve corresponding to the pressure relief valve of the packaging according to the present invention. The above packaging materials and pressure relief valves are, however, solely intended to be used in connection with the packing of products releasing gases during storage, eg freshly ground coffee. None of the said publications indicate that the valve structures also may be used for packaging of articles of food which are to be heated in a microwave oven. In this connection it should be noted that the amount of gases being emitted per time unit by for instance coffee is about 100 times less than the amount of gases and vapour typically being emitted by articles of food during heating thereof. A person skilled in the art would thus not consider using the said known valve structures in packagings for articles of food, which are to be heated in a microwave oven.

[0010] Preferably, the pressure relief valve of the packaging according to the invention has an initial pres-

sure of between 5 and 100 mbars, most preferably of between 5 and 30 mbars.

[0011] According to the invention a fluid is provided in the channel portion, preferably at least in the area adjacent the opening of the inner film.

[0012] According to the invention the fluid may be an oil, preferably a vegetable oil or a silicon oil.

[0013] Furthermore according to the invention the fluid may include an antibacterial agent.

[0014] The provision of a fluid film in the channel portion aims to provide a secure closure of the channel, until the predetermined excess pressure is reached in the inner chamber of the packaging. Moreover the fluid film may provide an interspacing between the inner and outer films allowing gases and aqueous vapour to penetrate into the channel portion when the predetermined excess pressure has been reached in the interior of the packaging.

[0015] Furthermore according to the invention the fluid may contain colloids, preferably of a size between 20 and 80 μm , and most preferably of a size between 40 and 60 μm . The colloids provide an interspacing between the inner and the outer films in the channel portion, the fluid preventing an open connection between the inner outer openings in the closed position of the valve. The interspacing between the inner and outer films ensures that the interior excess pressure in the packaging also acts on the fluid in the channel portion. During the heating process, the internal pressure causes the heated film to be blown out of the channel through the outer opening, whereby a connection between the inner and outer openings is established.

[0016] Moreover according to the invention the fluid may have a boiling point exceeding that of water such that during heating in an oven the fluid is heated to a higher temperature than the water contained in the packed article of food.

[0017] At least a partial fluid evaporation may take place in the channel during the initial heating process causing an earlier opening of the valve and at a lower excess pressure in the inner chamber of the packaging. The above applies in particular when the fluid in the channel contains colloids providing an interspacing between the inner and the outer films. As a result, the large amount of aqueous vapour released by the packed article of food during the continued heating process may more readily escape from the packaging through the valve. Between 30 and 90% of the fluid in the channel portion is discharged during the initial evaporation of the fluid and the subsequent vapour outflow through the valve.

[0018] Furthermore according to the invention the pressure relief valve may be formed of the packaging material, which is a laminate formed of the first inner film and the second outer film being laminated together except in an unlaminated area forming the channel portion. Preferably the size of the first inner film and the second outer film is substantially the same. However, it should

be understood that one of these two films may be smaller than the other film transversely of the machine direction.

[0019] Moreover according to the invention, the first inner film of the pressure relief valve may be formed of the packaging material and the second outer film of the valve may be a label fixed to the outer surface of the packaging material, preferably by means of a pressure-sensitive adhesive. Optionally the outer film of the pressure relief valve may be formed of the packaging material and the inner film of the valve may be a label fixed to the inner surface of the packaging material.

[0020] Furthermore according to the invention, the pressure relief valve may be a label including the inner and outer films, said inner film fixed to the outer surface of the packaging material, preferably by means of a pressure-sensitive adhesive. The opening of inner film, moreover, being aligned with a third opening in the packaging material. In this embodiment of the invention the pressure relief valve is entirely formed as a label fixed to the packaging material around an opening therein. Preferably, the label is attached during the manufacture of the packaging. Optionally the pressure relief valve may be a label including the inner and outer films, said outer film fixed to the inner surface of the packaging material and being provided with an opening aligned with an opening in the packaging material.

[0021] Moreover according to the invention the second opening through which the channel portion communicates with the surroundings of the packaging may be formed of at least one edge area of at least the outer film. This embodiment of the invention is particularly advantageous when the outer film of the valve or the inner as well as the outer film of the valve is/are formed as a label. However, the said embodiment may also be combined with the embodiment, in which the pressure relief valve is formed by means of an unlaminated area of the packaging material.

[0022] According to yet another embodiment of the invention the interspacing between the first and the second openings may be between 2 and 40 mm, preferably between 2 and 25 mm, and most preferably between 2 and 10 mm.

[0023] The openings in the inner and outer films may be provided and shaped in many ways. The openings may thus for instance be slits formed by means of a knife, perforations made by means of a needle and punched-out or laser-cut perforations of various shapes.

[0024] Finally according to the invention, the inner film may be provided with two openings in the form of two parallel slits and the outer film may be provided with a slit-shaped opening arranged in parallel to and between the openings in the inner film.

[0025] The invention is explained in details below with reference to the drawings, in which

Figure 1 is an isometric view of a first embodiment of the packaging according to the invention,

Figure 2 is sectional view along the line II-II in Figure 1,

Fig. 3 is an isometric view of a second embodiment of the packaging according to the invention,

Fig. 4 is a sectional view along the line IV-IV in Figure 3, and

Fig. 5 shows a section of the packaging in Figure 3 in the direction of the arrow V.

[0026] The first embodiment shown in Figures 1 and 2 of a packaging according to the invention includes a bowl-shaped lower part 1 and a planar cover part 2.

[0027] The lower part 1 is rectangular and includes a bottom 3. Two pairs of opposing lateral walls 4, 5 and 6, 7 extend upwardly from the bottom 3. At their upper ends the lateral walls continue into a common flange 8. The lower part 1 is typically made from polypropylene (PP) and made by thermoforming or injection moulding.

[0028] The planar cover part 2 is sealed to the flange 8 of the lower part 1 to form a closed inner chamber 16, in which the packed article of food 9 is housed. For reason of clarity the article of food is not shown in Figure 1, but only in Figure 2. The cover part 2 is made from a flexible packaging material, which is a laminate including a first inner film 10 and a second outer film 11. The two films are laminated together in their entirety except in an unlaminated area extending in the machine direction and forming a narrow channel 12 between the inner and outer films 10, 11.

[0029] Two parallel and mutually interspaced first openings in the form of slits 13, 14 are provided in the channel 12 in the inner film 10. Another opening in the form of a slit 15 is provided in the outer film 11 between the inner slits 13, 14. The slit 15 is parallel to the slits 13, 14 in the inner film 10.

[0030] The inner slits 13, 14 thus form a connection between the channel 12 and the inner chamber of the packaging. Correspondingly, the other slit 15 in the outer film 11 forms a connection between the channel 12 and the surroundings.

[0031] A fluid in form of silicon oil containing colloids 17 is provided in the channel adjacent the area of the slits 13, 14, 15. The channel portion, in which the silicon oil containing colloids 17 is provided, is indicated by means of dots in Figure 1. The colloids 17 keeps the inner and outer films 10, 11 slightly spaced apart in the said portions of the channel, while the silicon oil prevents an open connection between the inner openings 13, 14 and outer opening 15. A one-way valve or a pressure relief valve 18 is thus provided by means of the channel, the slits 13, 14, 15 and the silicon oil with colloids. The valve prevents ambient air from entering the inner chamber 16 of the packaging in the closed position of the valve as shown in Figure 2. However, the valve 18 is caused to open when a specific excess pressure

is generated in the inner chamber 16 of the packaging. Such an excess pressure is generated when the packaging and the article of food 9 packed therein are heated in a microwave oven. When being heated the packed article of food 9 releases large amounts of aqueous vapour or steam which generate the excess pressure. Through the inner slits 13, 14 the aqueous vapour penetrates into the channel 12 and moves the inner and outer films 10, 11 further away from each other such that an open connection between the inner slits 13, 14 and the outer slit 15 is formed. As a result the aqueous vapour may escape from the inner chamber 16 of the packaging through the inner slits 13, 14, the channel area with the silicon oil and the outer slit 15. Furthermore a partial evaporation of the silicon oil takes place during the initial heating process in the microwave oven. The reason why is that the silicon oil is more polar than water and is thus heated more rapidly than the water contained in the packed article of food, which contributes to a faster opening of the valve.

[0032] It should be noted that the cover part 2 is provided with an additional pressure relief valve 18' corresponding to the pressure relief valve 18. By providing several valves the venting capacity may be adjusted according to the amount of vapour or steam generated at the heating of the article of food.

[0033] It should also be noted that the valve may be provided in non-laminated pockets between the outer and inner films 11, 10, even though the channel 12 is shown as a through-going channel. This feature may be obtained by laminating the two films in register. The inner film 10 of the laminated packaging material 2 is typically a PE film (polyethylene film) or another sealing medium film sealable to the lower part 1. A sealing medium may further be chosen, which seals peelably to the lower part 1, offering the consumer easy access to the heated product by peeling off the cover part 2. The outer film 11 of the laminate 2 may for instance be OPP (oriented polypropylene), OPA (oriented polyamide) and PET (polyethylene terephthalate). Finally it should be noted that the inner film as well as the outer film of the cover 2 may be a multilayered film or a laminate and include a barrier layer or a metallisation layer. This also applies to the film used for the lower part 1.

[0034] The second embodiment shown in Figures 3 - 5 of a packaging according to the invention is formed as a bag. The bag is made from a packaging material 20 having an inner sealing medium layer. In a known manner the bag has a back seal 21, a bottom seal 21 and a top seal 23. The said three seals 21, 22, 23 are shaped as fin seals, ie the packaging material is sealed inner face to inner face. The seals provide a sealed inner chamber 25 housing the article of food. The article of food is not shown in Figures 3 - 5.

[0035] The bag packaging further includes a pressure relief or one-way valve 24 formed as a label. The pressure relief valve or label 24 includes an inner annular film part 26 having a rectangular aperture 27. On one

side the inner film part 26 is provided with a pressure-sensitive adhesive 28 by means of which it is fixed to the outer face 29 of the packaging material 20. The inner film part of the label 24 is fixed to the packaging material 29 such that its rectangular aperture 27 is aligned with an aperture 30 formed in the packaging material. On the side opposite the one containing the pressure-sensitive adhesive 28 the inner film part 26 is connected to an outer flexible film part 31. The outer film part 31 has substantially the same contour as the inner film part 26. The inner and the outer film parts 26, 31 are mutually connected in strip-shaped areas 32, 33 on either side of the rectangular aperture 27, whereby two channel portions 34, 35 are formed between the inner film part 26 and the outer film part 31. The channel portions 34, 35 are open at the inner edges at the periphery of the aperture 27. The channel portions are also open (at reference numerals 36, 37) at their outer edges at the outer periphery of the inner film part 26 and the outer film part 31, respectively. As described above with reference to the embodiment shown in Figures 1 and 2 silicon oil containing colloids is provided in these channel portions.

[0036] When being heated in a microwave oven the article of food packed in the bag packaging releases gases and aqueous vapour or steam. As a result an excess pressure is generated in the inner chamber 25 of the packaging. However, the valve 24 allows the aqueous vapour to escape when a specific excess pressure occurs in the packaging. The vapour escapes through the aperture 30 in the packaging material 20 and through the rectangular aperture 27, where the pressure of the vapour acts on the silicon oil in the channel portions 34, 35 and on the outer flexible film part 31. This causes the outer film part 31 to move away from the inner film part 26 in the channel portions 34, 35. The channel portions 34, 35 are thus opened between their inner edges and their outer edges. Consequently vapour may flow from the inner chamber of the packaging to the surroundings.

[0037] In a modification of the embodiment described above, the inner film part 26 is omitted and the outer film part 31 is adhered directed onto the outer face of packaging material 20 in strip-shaped areas corresponding to the strip-shaped areas 32, 33. As a result the packaging material 20 and the outer film part 31 form the channel portions.

Claims

1. A packaging for packing of articles of food and heating thereof in an oven, especially a microwave oven, said packaging including at least one sealable packaging material (2; 20) at least partially defining a closed chamber (16; 25) containing the article of food, said packaging further including a venting means for allowing gas and vapour released during the heating of the article of food to escape from the

chamber, **characterised in that** the venting means is a pressure relief valve (18; 24) opening at a predetermined excess pressure generated in the inner chamber (16; 25) of the packaging, said valve (18; 24) including a first inner film (10; 26) provided with a first opening (13, 14; 27) communicating with the inner chamber (16; 25) of the packaging and a second outer flexible film (11; 31) covering the opening (13, 14; 27) in the first inner film (10; 26) and connected thereto to form a channel portion (12; 34, 35) between the inner and the outer films, said channel portion (12; 34, 35) communicating with the surroundings of the packaging through a second opening (15; 36, 37) being offset in relation to the first opening (13, 14; 27).

2. A packaging according to claim 1, **characterised in that** a fluid is provided in the channel portion (12; 34, 35), preferably at least in the area adjacent the opening of the inner film.
3. A packaging according to claim 2, **characterised in that** the fluid contains colloids (17), preferably of a size between 20 and 80 μm , and most preferably between 40 and 60 μm .
4. A packaging according to claim 2 or 3, **characterised in that** the fluid has a boiling point exceeding that of water.
5. A packaging according to one or more of the preceding claims, **characterised in that** the pressure relief valve (18) is formed of the packaging material (2), which is a laminate formed of the first inner film (10) and the second outer film (11), which are laminated together except in an unlaminated area forming the channel portion (15).
6. A packaging according to one or more of the preceding claims 1-4, **characterised in that** the first inner film of the pressure relief valve is formed of the packaging material and the second outer film of the pressure relief valve is a label fixed to the outer surface of the packaging material, preferably by means of a pressure-sensitive adhesive.
7. A packaging according to one or more of the preceding claims 1-4, **characterised in that** the pressure relief valve is formed as a label (24) including the inner and outer films (26, 31), said inner film (26) fixed to the outer surface (29) of the packaging material, preferably by means of a pressure-sensitive adhesive and that the opening in the inner film is aligned with a third opening in the packaging material.
8. A packaging according to one or more of the preceding claims, **characterised in that** the second

opening (36, 37) through which the channel portion communicates with the surroundings of the packaging is formed of at least one edge area of at least the outer film (31).

5

9. A packaging according to one or more of the preceding claims, **characterised in that** the interspacing between the first and the second opening is between 2 and 40 mm, preferably between 2 and 25, and most preferably between 2 and 10 mm.

10

10. A packaging according to one or more of the preceding claims 1-7 and 9, **characterised in that** the inner film (10) is provided with two openings in the form of two parallel slits (13, 14) and the outer film is provided with a slit-shaped opening (15) arranged in parallel to and between the openings in the inner film.

15

20

25

30

35

40

45

50

55

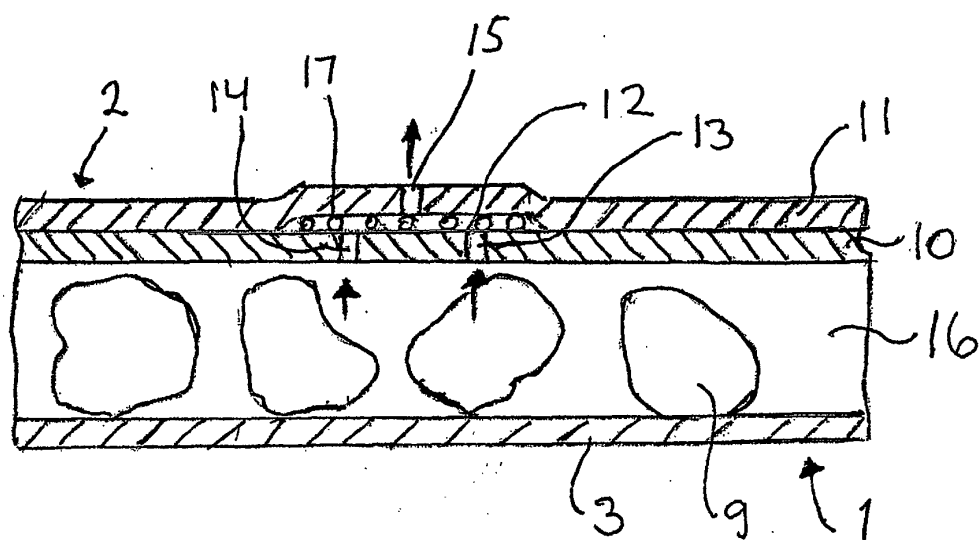
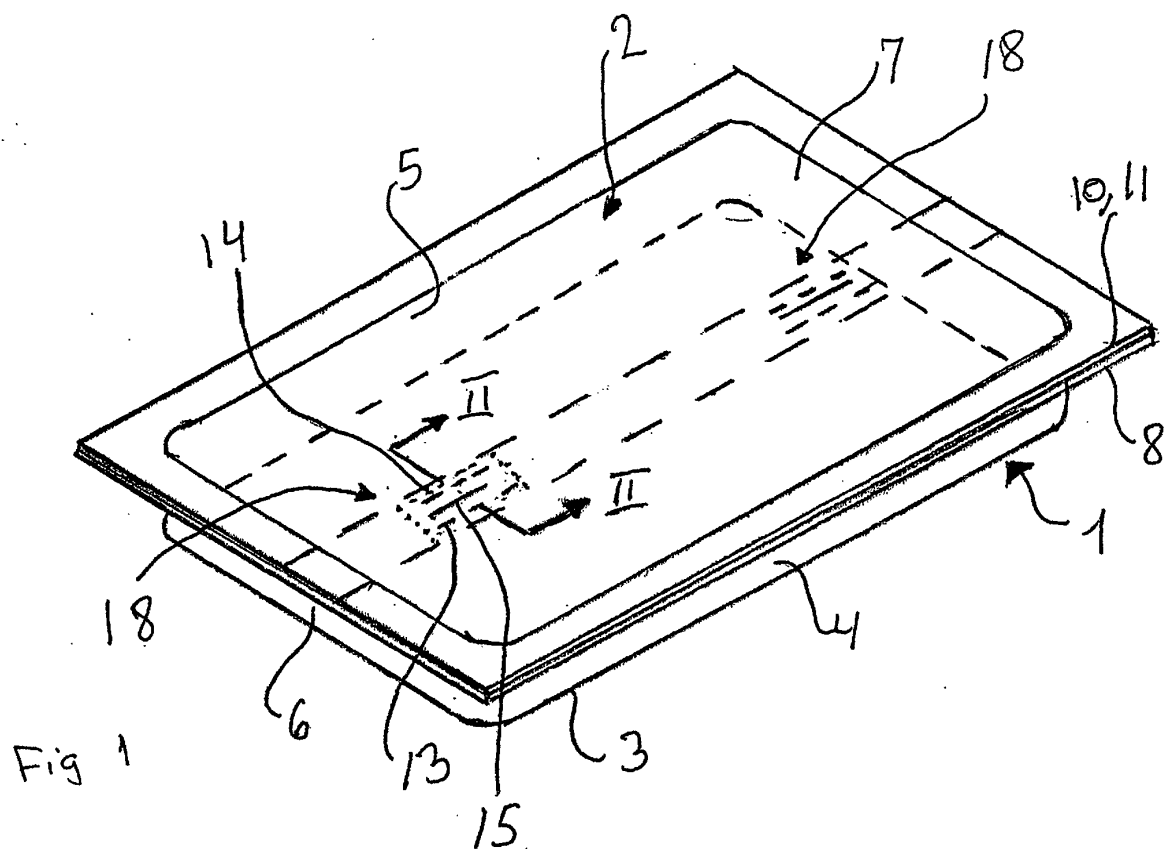
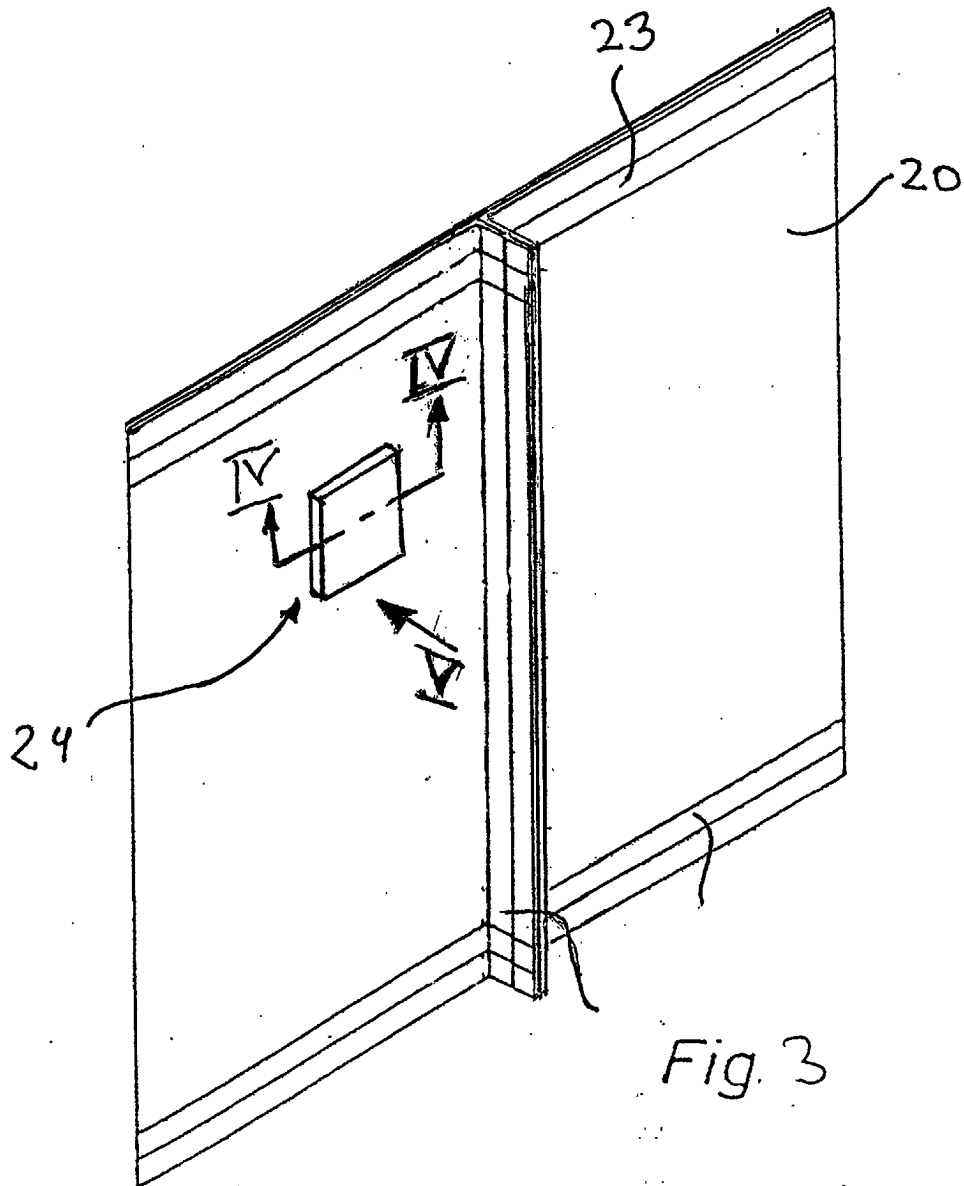


Fig 2



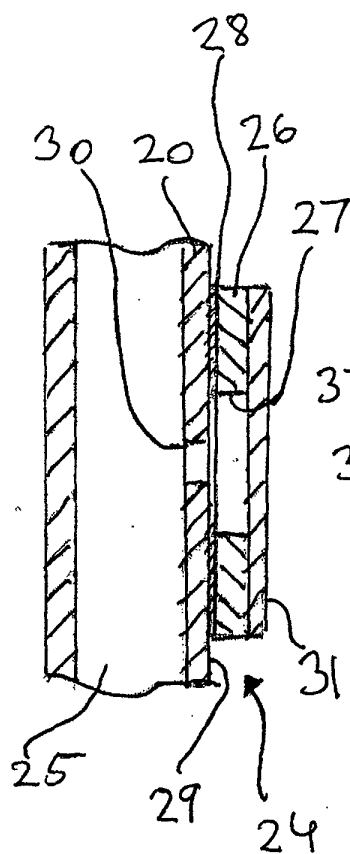


Fig. 4

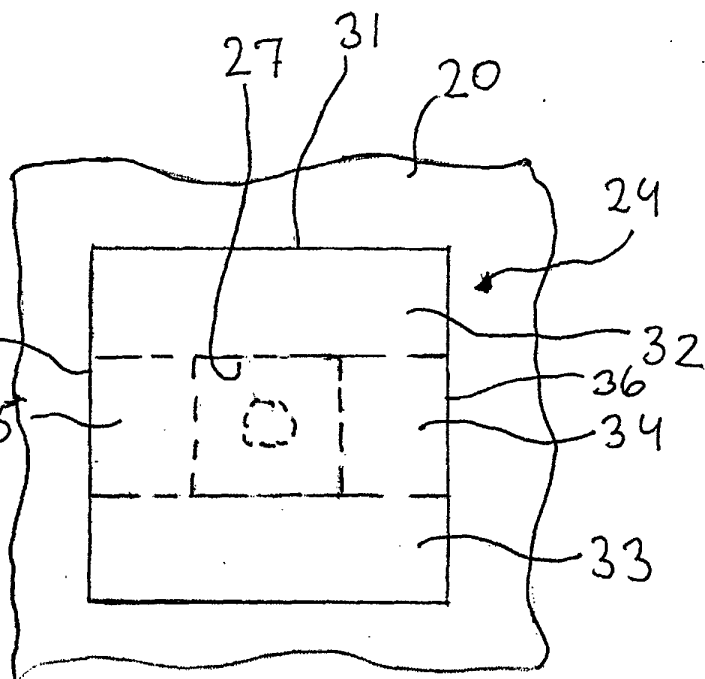


Fig. 5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 38 8075

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 1 157 942 A (KIM BANG HYUN ; KIM MI SOON (KR)) 28 November 2001 (2001-11-28) * column 1, line 7 - line 16 * * column 8, line 35 - line 55; figures 14A-14C *	1,6-9	B65D81/34 B65D77/22
X	FR 2 796 924 A (PROPLAST) 2 February 2001 (2001-02-02) * page 9, line 16 - page 14, line 29; figures 1-3 *	1,6-9	
X	EP 0 661 219 A (PACKS CO LTD) 5 July 1995 (1995-07-05) * column 1, line 16 - line 55 * * column 6, line 33 - column 7, line 20 * * column 13, line 43 - column 16, line 3; figures 1-4, 11-24, 32-35 *	1,5,8	
Y		2-4	
A		10	
X	EP 0 915 013 A (BRODART SA) 12 May 1999 (1999-05-12) * paragraph [0060] - paragraph [0063]; figures 1-3 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
X	JP 2001 301802 A (MITSUBISHI ALUM CO LTD) 31 October 2001 (2001-10-31) * figures 3-8 *	1,10	B65D
X	EP 1 122 189 A (MORINAGA MILK INDUSTRY CO LTD) 8 August 2001 (2001-08-08) * column 8, line 48 - column 9, line 3 * * column 18, line 6 - column 20, line 50; figures 8-27 *	5	
Y,D	WO 88 07479 A (BOSCH GMBH ROBERT) 6 October 1988 (1988-10-06) * page 3, line 31 - page 4, line 2 * * page 5, line 12 - line 14; figures 1-3 *	2-4	
	-/--		
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 4 April 2003	Examiner Berrington, N
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

EUROPEAN SEARCH REPORT

Application Number
EP 02 38 8075

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)
Y	US 4 640 838 A (ISAKSON GARY A ET AL) 3 February 1987 (1987-02-03) * column 5, line 3 - line 9; figures 3,4 * -----	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 4 April 2003	Examiner Berrington, N
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03.82 (P04C01)

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

EP 02 38 8075

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.

04-04-2003

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 1157942	A	28-11-2001	EP	1157942 A1	28-11-2001

FR 2796924	A	02-02-2001	FR	2796923 A1	02-02-2001
			FR	2796924 A1	02-02-2001
			AU	7009300 A	19-02-2001
			EP	1198393 A1	24-04-2002
			WO	0109003 A1	08-02-2001
			JP	2003506269 T	18-02-2003

EP 0661219	A	05-07-1995	JP	7187199 A	25-07-1995
			JP	8011585 B	07-02-1996
			JP	2574651 B2	22-01-1997
			JP	8085580 A	02-04-1996
			JP	2866587 B2	08-03-1999
			JP	8119343 A	14-05-1996
			DE	69423199 D1	06-04-2000
			DE	69423199 T2	09-11-2000
			EP	0661219 A2	05-07-1995
			HK	1013054 A1	16-06-2000
			US	5655842 A	12-08-1997
			US	5839832 A	24-11-1998

EP 0915013	A	12-05-1999	EP	0915013 A1	12-05-1999

JP 2001301802	A	31-10-2001	NONE		

EP 1122189	A	08-08-2001	EP	1122189 A1	08-08-2001
			WO	9961346 A1	02-12-1999

WO 8807479	A	06-10-1988	DE	8704279 U1	21-07-1988
			WO	8807479 A1	06-10-1988
			DK	645288 A	18-11-1988
			ES	2006117 A6	01-04-1989

US 4640838	A	03-02-1987	AU	2962489 A	08-06-1989
			AU	585244 B2	15-06-1989
			AU	4613385 A	13-03-1986
			BR	8504131 A	17-06-1986
			CA	1241701 A1	06-09-1988
			DE	3571593 D1	24-08-1989
			DK	370985 A ,B,	07-03-1986
			EP	0174188 A2	12-03-1986
			JP	1623090 C	25-10-1991
			JP	2049986 B	31-10-1990
			JP	61069576 A	10-04-1986
			KR	9302049 B1	22-03-1993

EPO FORM P0459

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

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

EP 02 38 8075

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.

04-04-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4640838 A		MX 163238 B	20-03-1992
		NO 853470 A ,B,	07-03-1986
		PH 22232 A	01-07-1988
		ZA 8506823 A	29-04-1987
