



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.04.2016 Bulletin 2016/14

(51) Int Cl.:
B65D 81/20 (2006.01) B65D 81/26 (2006.01)

(21) Application number: **14186950.3**

(22) Date of filing: **30.09.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

• **Klabbers, Theo**
1693 CC Wervershoof (NL)

(74) Representative: **Kirkpatrick**
Avenue Wolfers, 32
1310 La Hulpe (BE)

(71) Applicant: **Dampack International BV**
4251 NZ Werkendam (NL)

Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(72) Inventors:
• **Rutten, Ludo**
3910 Neerpelt (BE)

(54) **A closed food packaging tray**

(57) The tray is for fluid-exuding and oxygen sensitive food (14). It comprises a food chamber (8), a liquid chamber (9), a perforated partition (7) between the two chambers (8, 9) for supporting the food (14). The tray is filled up with modified atmosphere enveloping the food (14) thanks to the perforations (15) of the perforated par-

tion (7). The partition (7) obturates both chambers (8, 9) and the liquid chamber (9) is empty of gas releasing material. Thanks to the invention, the modified atmosphere is not polluted. The flow of exuding fluid from one chamber to the other is very slow.

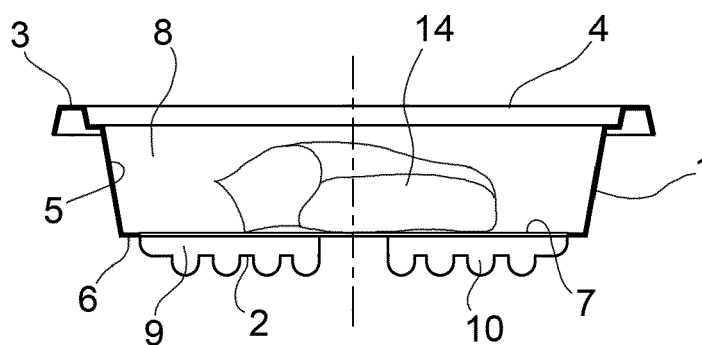


FIG.2

Description

[0001] The invention relates to a food packaging tray. The food of concern may be, fresh or frozen, meat, poultry, fish, fruit and vegetables.

[0002] It is already known, for extending the shelf life, to package perishable food in a modified gaseous environment, in taking the air out of the tray, prior to injecting the modified atmosphere and closing the tray hermetically.

[0003] This is of a particular interest for fluid-exuding and oxygen sensitive food.

[0004] Accordingly, trays are known, which are divided into

- a food chamber, where the food is received on a support, and
- a liquid chamber, where the exuding fluid is received.

[0005] Preferably, the food support is a partition wall dividing the tray into the two chambers and it is perforated so that the modified atmosphere may diffuse in both chambers and, hence, circulate around the food, envelop the food. The gas mixture can come into direct contact with the underside of the food product. EP 2 540 634 teaches such a tray.

[0006] In the tray of this prior art reference, the perforated partition support is surrounded by a circular opening through which the fluid exuding from the food may flow into the fluid chamber. For that reason, it has been often proposed to cover the bottom of the fluid chamber with an absorbing layer (absorbent), as taught for instance in US 6152295. However, the absorbent material is full of air (or gas) and, little by little, this air is coming out of the absorbing layer and modifies the modified atmosphere which is thus polluted, with the drawback of reducing the shelf life of the product.

[0007] The invention of the instant case aims at obviating such a drawback.

[0008] To this end, the invention relates to a closed food packaging tray, for fluid-exuding and oxygen sensitive food, comprising

- a food chamber,
- a liquid chamber,
- a perforated partition between the two chambers, arranged for supporting the food,
- the tray, for extending the shelf life of the food, being filled up with modified atmosphere enveloping the food thanks to the perforations of the perforated partition,

characterized in that

- the perforated food supporting partition obturates both chambers, and
- the liquid chamber is empty of gas releasing material.

[0009] The liquid chamber of the tray of the instant case may even be empty of solid material.

[0010] The tray of the instant case has two major advantages.

5 **[0011]** The first one is the fact that there is no absorbent in the liquid chamber and, therefore, the modified atmosphere will not be modified or polluted by air. Furthermore, since there is no absorbent, there is no risk that the absorbing layer and the perforated food supporting partition come in direct contact with each other, thus no risk that
10 i) the absorbing layer, through the perforations of the partition, sucks out liquid from the food product and ii) the modified atmosphere does not circulate around the food product anymore.

15 **[0012]** The second advantage is the fact that the exuding fluid cannot flow around the perforated partition but only through its perforations. The flow is very slow and in both ways either from the food chamber to the fluid chamber or, after having inadvertently turned the tray upside down, from the liquid chamber back to the food chamber.
20

[0013] In the preferred embodiment of the invention, the perforated partition is a permeable film, advantageously a moisture permeable film. The permeable film has a liquid communication between the two food and liquid chambers and may also have micro-perforations used for gas circulation only and too small for liquid circulation.
25

30 **[0014]** The bottom of the liquid chamber may have a capillary honeycomb structure.

[0015] Advantageously, in the tray of the instant application, the food supporting partition is supported by a shelf provided on the inner wall of the tray and, more advantageously, also on pillars having an height, from the bottom of the liquid chamber, such that their free ends and the top surface of the shelf lay in a common plane parallel to the bottom of the liquid chamber. By top surface of the shelf is meant the surface supporting the supporting partition.
35

40 **[0016]** The invention shall be better understood upon reading the following description while reverting to the attached drawing in which

- figure 1 is a perspective top view of the tray of the invention;
45
- figure 2 is a simplified cross-sectional view of the tray of figure 1;
- figure 3 is a top view, at a larger scale, of a portion of the bottom of the liquid chamber of the tray of figure 1 and
50
- figure 4 is a simplified view of the perforated food supporting partition of the tray of figure 1.

[0017] Referring to figures 1, 2, the packaging tray of the instant case has a generally parallelepipedic shape with an outer side wall 1, and a bottom 2. In a plane generally parallel to the bottom 2, the side wall 1 is extended by a rather thin top border 3, except that the four

corners where it is slightly larger. A transparent plastic sheet 4 is secured onto the border 3 for covering and closing the tray.

[0018] The inner surface 5 of the sidewall 1 is provided with a shelf 6 for supporting a perforated food supporting partition 7, dividing the tray into a food chamber 8 and a liquid chamber 9 (figure 2).

[0019] The height of the partition 7 above the bottom 2 is small, compared to the height of the closing sheet 4 above the partition 7.

[0020] The perforated food supporting partition 7 obturates both chambers 8, 9.

[0021] The liquid chamber 9 is empty of absorbant material. Actually, the chamber is empty of gas releasing material; it could be just empty of air or oxygen releasing material.

[0022] The bottom 2 of the tray has here a capillary structure 10, here a honeycomb structure, as shown on figure 3, with, here, hexagonal recesses 16.

[0023] Pillars 11 are provided on the bottom 2, of an height such that their free ends 12 lie here in the same plane as the top annular surface 13 of the shelf 6 forming a shoulder supporting the partition 7.

[0024] In the instant case, the perforated partition is a permeable film 7, which could be preferably a moisture permeable film.

[0025] The tray as described above will be used as follows.

[0026] The permeable film 7 having been secured onto the annular shoulder 13 of the shelf 6 and a food product 14 - here a piece of meat - having been put on the film 7, the air is taken out of the tray and a modified atmosphere is injected therein prior to closing the tray on top of the food chamber 8 by the plastic sheet 4 secured onto the top boarder 3.

[0027] Thanks to the invention and particularly to the perforations of the film 7, the modified atmosphere may diffuse in both chambers 8, 9 and circulate around the piece of meat 14. The fluid chamber 9 being empty of solid material, the modified atmosphere is not polluted.

[0028] The film 7 obturating both chambers 8, 9, in case of the piece of meat exuding fluid (blood) which can thus flow through the perforations of the film 7, exclusively, the flow is very slow and there is very little liquid which can flow to the liquid chamber. And if the tray has been turned upside down, the fluid in the liquid chamber 9 can hardly return to the food chamber 8.

[0029] In the instant case, the perforations 15 of the film 7 are designed for liquid circulation. Some of the perforations could be micro-perforations used for gas circulation only and too small for liquid circulation. In any case, the film 7 should be designed for the modified atmosphere to be able to envelop the piece of food 14 and be in contact with the underside of the food product.

Claims

1. A closed food packaging tray, for fluid-exuding and oxygen sensitive food (14), comprising

- a food chamber (8),
- a liquid chamber (9),
- a perforated partition (7) between the two chambers (8, 9) arranged for supporting the food (14),
- the tray, for extending the shelf life of the food, being filled up with modified atmosphere enveloping the food (14) thanks to the perforations (15) of the perforated partition (7),

characterized in that

- the perforated food supporting partition (7) obturates both chambers (8, 9), and
- the liquid chamber (9) is empty of gas releasing material.

2. A tray according to claim 1, wherein the liquid chamber (9) is empty of solid material.

3. A tray according to one of claims 1 and 2, wherein the perforated partition is a permeable film (7).

4. A tray according to claim 3, wherein the permeable film is a moisture permeable film (7).

5. A tray according to one of claims 3 and 4, wherein the permeable film (7) has a liquid communication (15) between the two food and liquid chambers (8, 9).

6. A tray according to claim 5, wherein the permeable film (7) has micro-perforations used for gas circulation only and too small for liquid circulation.

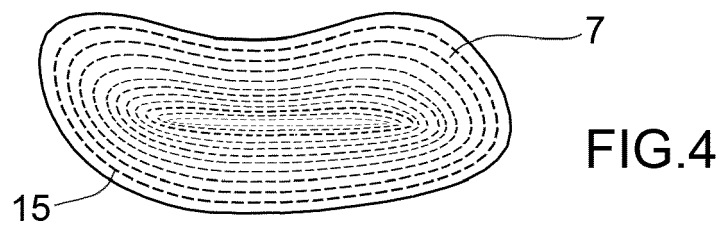
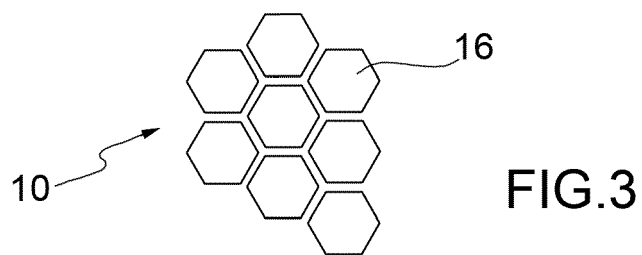
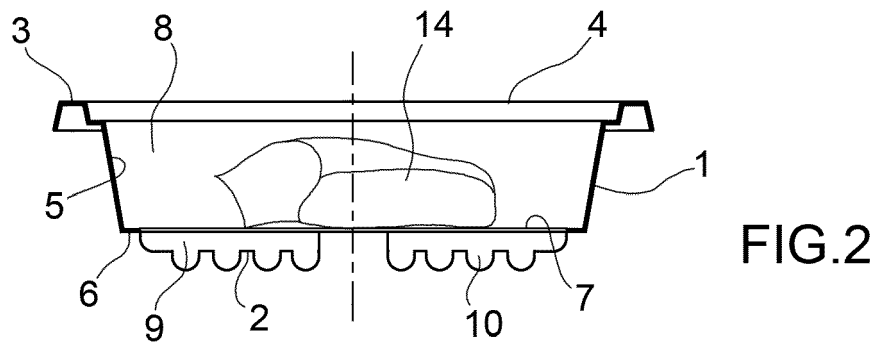
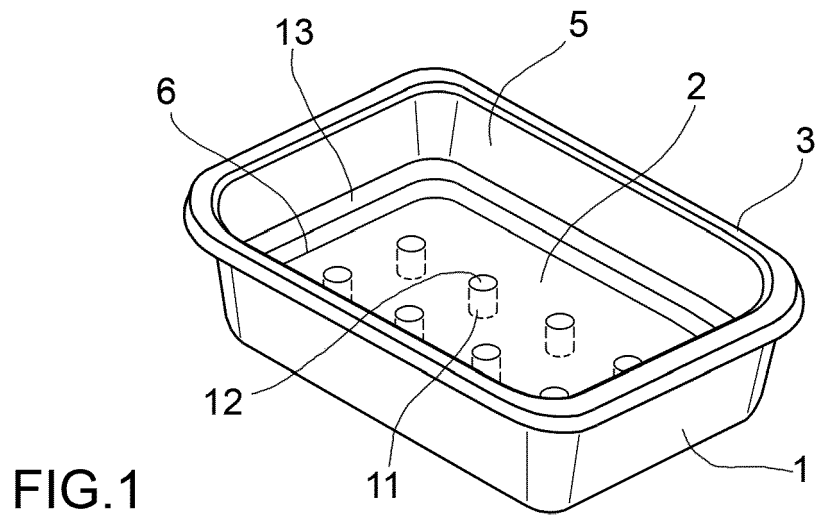
7. A tray according to one of claims 1 to 6, wherein the bottom (2) of the liquid chamber (9) has a capillary honeycomb structure (10).

8. A tray according to one of claims 1 to 7, wherein the food supporting partition (7) is supported by a shelf (6) provided on the inner wall (5) of the tray.

9. A tray according to claim 8, wherein the food supporting partition (7) is supported on pillars (11) having an height, from the bottom (2) of the liquid chamber (9), such that their free ends (12) and the top surface of the shelf (13) lie in a common plane parallel to the bottom (2) of the liquid chamber (9).

**Amended claims in accordance with Rule 137(2)
EPC.**

1. A closed food packaging tray, for fluid-exuding and oxygen sensitive food (14), comprising 5
 - a food chamber (8),
 - a liquid chamber (9),
 - a perforated partition (7) between the two chambers (8, 9) arranged for supporting the food (14), 10
 - the tray, for extending the shelf life of the food, being filled up with modified atmosphere enveloping the food (14) thanks to the perforations (15) of the perforated partition (7), 15
- characterized in that**
- the perforated food supporting partition (7) ob- 20
turbates both chambers (8, 9), and
 - the liquid chamber (9) is empty of gas releasing material.
2. A tray according to claim 1, wherein the liquid chamber (9) is empty of modified atmosphere polluting solid material. 25
3. A tray according to one of claims 1 and 2, wherein the perforated partition is a permeable film (7). 30
4. A tray according to claim 3, wherein the permeable film is a moisture permeable film (7).
5. A tray according to one of claims 3 and 4, wherein the permeable film (7) has a liquid communication (15) between the two food and liquid chambers (8, 9). 35
6. A tray according to claim 5, wherein the permeable film (7) has micro-perforations used for gas circulation only and too small for liquid circulation. 40
7. A tray according to one of claims 1 to 6, wherein the bottom (2) of the liquid chamber (9) has a capillary honeycomb structure (10). 45
8. A tray according to one of claims 1 to 7, wherein the food supporting partition (7) is supported by a shelf (6) provided on the inner wall (5) of the tray.
9. A tray according to claim 8, wherein the food supporting partition (7) is supported on pillars (11) having an height, from the bottom (2) of the liquid chamber (9), such that their free ends (12) and the top surface of the shelf (13) lie in a common plane parallel to the bottom (2) of the liquid chamber (9). 50
55





EUROPEAN SEARCH REPORT

Application Number
EP 14 18 6950

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	EP 2 540 634 A1 (DAMPACK INTERNAT BV [NL]) 2 January 2013 (2013-01-02)	1-6,8,9	INV. B65D81/20 B65D81/26
Y	* the whole document *	1-5,7	
X	WO 2009/141213 A1 (CRYOVAC INC [US]; VITEMBAL SOC IND [FR]; LONGO EUGENIO [IT]; BALDET PH) 26 November 2009 (2009-11-26) * abstract * * paragraphs [0015] - [0047]; figures 1-7 *	1-5	
Y	EP 0 743 262 A1 (SIRAP GEMA SPA [IT]) 20 November 1996 (1996-11-20) * the whole document *	1-5	
Y	DE 195 08 484 A1 (HORDIJK VERPAKKINGSIND BV [NL]) 19 October 1995 (1995-10-19) * the whole document *	1-5	
Y	BE 1 004 887 A6 (HEIRMAN GUSTAAF; CATTOIR JEAN PIERRE) 16 February 1993 (1993-02-16) * the whole document *	7	
A	EP 1 832 525 A1 (C G L PACK SERVICE [FR]) 12 September 2007 (2007-09-12) * paragraphs [0052] - [0053]; figure 7 *	7	
A	US 2004/200845 A1 (WATZKE DAVID [US] ET AL) 14 October 2004 (2004-10-14) * paragraphs [0018] - [0022]; figures 8-9 *	8,9	
A	FR 2 564 807 A1 (FRAIGNEAU MICHEL [FR]) 29 November 1985 (1985-11-29) * the whole document *	8,9	
The present search report has been drawn up for all claims			
			B65D
Place of search		Date of completion of the search	Examiner
Munich		16 March 2015	Leijten, René
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)

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

EP 14 18 6950

5

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.

16-03-2015

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2540634 A1	02-01-2013	BE 1020634 A3	04-02-2014
		DE 202012102319 U1	21-09-2012
		DK 2540634 T3	18-08-2014
		EP 2540634 A1	02-01-2013
		ES 2490966 T3	04-09-2014
		FR 2977244 A1	04-01-2013
		NL 2009039 C	07-01-2013
		PT 2540634 E	26-08-2014
WO 2009141213 A1	26-11-2009	EP 2276680 A1	26-01-2011
		RU 2010152350 A	27-06-2012
		US 2011266168 A1	03-11-2011
		WO 2009141213 A1	26-11-2009
EP 0743262 A1	20-11-1996	AT 172430 T	15-11-1998
		DE 69600820 D1	26-11-1998
		DE 69600820 T2	22-04-1999
		EP 0743262 A1	20-11-1996
		ES 2124618 T3	01-02-1999
		IT MI951024 A1	19-11-1996
		PL 312976 A1	09-10-2000
		US 5720999 A	24-02-1998
DE 19508484 A1	19-10-1995	DE 19508484 A1	19-10-1995
		NL 9400389 A	02-10-1995
BE 1004887 A6	16-02-1993	NONE	
EP 1832525 A1	12-09-2007	AT 444919 T	15-10-2009
		EP 1832525 A1	12-09-2007
		FR 2898107 A1	07-09-2007
US 2004200845 A1	14-10-2004	AU 2004294924 A1	16-06-2005
		CA 2548558 A1	16-06-2005
		EP 1689651 A2	16-08-2006
		US 2004200845 A1	14-10-2004
		US 2009108005 A1	30-04-2009
		WO 2005053470 A2	16-06-2005
FR 2564807 A1	29-11-1985	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2540634 A [0005]
- US 6152295 A [0006]