



(11) **EP 4 206 091 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.07.2023 Bulletin 2023/27

(51) International Patent Classification (IPC):
B65D 85/36 ^(2006.01) **B65D 75/32** ^(2006.01)
B65D 77/20 ^(2006.01)

(21) Application number: **22216890.8**

(52) Cooperative Patent Classification (CPC):
B65D 85/36; B65D 75/327; B65D 77/2024;
B65D 2575/3227; B65D 2577/2091

(22) Date of filing: **28.12.2022**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(71) Applicant: **D’Haubry Bakery BV**
8980 Zonnebeke (BE)

(72) Inventors:
• **DESMET, Philippe**
8980 Zonnebeke (BE)
• **VANDOORNE, Geert**
8980 Zonnebeke (BE)

(30) Priority: **29.12.2021 BE 202106097**

(74) Representative: **Brantsandpatents bv**
Pauline Van Pottelsberghelaan 24
9051 Ghent (BE)

(54) **PACKAGING DEVICE AND PACKAGING METHOD FOR MACARONS**

(57) The present invention relates to a packaging device and a packaging method for macarons, comprising a container or tray made of thermoplastic and transparent material and provided with a number of rows of single compartments, each compartment housing one macaron in an upright or lying position, and wherein several rows next to each other in one plane describe a layer, which

layer is sealed by means of a sealed joint with a transparent cover film wherein the cover film is provided with one or more weakening edges on the sealed joint wherein the rows can be opened separately at different times, so that these rows remain closed until they are actually consumed.

EP 4 206 091 A1

Description

TECHNICAL FIELD

[0001] The invention relates to a packaging device and a packaging method for macarons.

PRIOR ART

[0002] In the packaging of food products, especially for large-scale distributors, various shapes and sizes of thermoplastic containers, dishes, trays or holders are already widely used. They are produced by means of single- or multi-layer thermofilm-forming materials or injection molding. In general, these trays or containers have only one compartment for one product and are sealed by means of a cover film that is placed on the corresponding edge and secured by means of a sealed joint.

[0003] However, these known containers present some problems due to the complexity of simultaneously placing food in the different food compartments, requiring specific packaging machines.

[0004] In addition, when the sealing cover film is removed, all compartments are opened and all food products are exposed, even if they are not used or consumed at the same time.

[0005] Macarons are small round airy and crispy dough cookies that adhere to each other by means of a soft filling. Macarons come in different colors and flavors. They are originally from France. The dough cookies have a rather closed visible surface, while the internal part that contacts the filling is airier. So there is a significant difference between the filling, the part of the dough cookie that contacts the filling and the outer visible shell of the dough cookie. These significant physical and chemical differences between the filling and the dough cookies, and more particularly the difference in free and bound water, pose a challenge for any packaging of macarons. The migration of moisture from the filling to the dough cookies must be extremely limited in order to maintain the crispness of the dough cookies.

[0006] In addition, macarons are light and easily breakable, which poses an additional challenge for suitable packaging.

[0007] US2018/229907A1 describes a packaging provided with a cover film, wherein the cover film has individually removable film portions which can be opened separately at different times.

[0008] US3394869A describes a packaging comprising a container and a cover film. The container is provided with a number of rows of single compartments, making it easy to pack items (such as macarons) individually. The cover film is provided with one or more weakening edges so that the rows can be opened separately at different times.

[0009] Such known packaging devices, however, often use a cardboard cover film, which results in numerous disadvantages, on the one hand when the cover film has

to be attached to the container and on the other hand when the individually removable film portions are opened separately.

[0010] The present invention aims to find a solution for at least some of the above problems.

SUMMARY OF THE INVENTION

[0011] This object is achieved by means of a thermoplastic container or tray according to claim 1, configured with several rows of compartments each compartment housing one macaron.

[0012] The invention thus relates to a packaging device for macarons, comprising a container or tray made of thermoplastic and transparent material and provided with a number of rows of single compartments, each compartment housing one macaron in an upright or lying position, and wherein several rows next to each other in one plane describe a layer, which layer is sealed by means of a sealed joint with a transparent cover film, wherein the cover film is provided with one or more weakening edges on the sealed joint wherein the rows can be opened separately at different times, so that these rows remain closed until they are actually consumed.

[0013] It is thus a peel-off tray comprising a container or tray with a sealing, peel-off cover film. Since this cover film is provided with a material weakening in the sealed seams on the edges between the rows, it is possible to open row by row, optimizing shelf life. This packaging is moreover advantageous in that the moisture migration from the filling to the dough cookies is limited. Preferably, the macarons lie in a lying position individually in separate compartments. These compartments considerably limit the movability, so that the macarons are not damaged during transport and logistical handling.

[0014] In a second aspect, the invention relates to a method for packaging macarons in a packaging device according to the invention, wherein the different or identical macarons are housed per layer in the container or tray, upright or preferably in a lying position and side by side in separate compartments, in a number of rows per layer and each layer being sealed by means of a sealed joint with a transparent cover film, wherein one or more weakening edges are provided in the cover film just before the welding operation, so that the rows can be opened separately at different times and so these rows remain closed until they are actually consumed.

DETAILED DESCRIPTION

[0015] The invention relates to an improved packaging device and a packaging method for macarons.

[0016] Unless otherwise defined, all terms used in the description of the invention, including technical and scientific terms, have the meaning as commonly understood by a person skilled in the art to which the invention pertains. For a better understanding of the description of the invention, the following terms are explained explicitly.

[0017] In this document, "a" and "the" refer to both the singular and the plural, unless the context presupposes otherwise. For example, "a segment" means one or more segments.

[0018] The terms 'comprise', 'comprising', 'consist of', 'consisting of', 'provided with', 'have', 'having', 'include', 'including', 'contain', 'containing' are synonyms and are inclusive or open terms that indicate the presence of what follows, and which do not exclude or prevent the presence of other components, characteristics, elements, members, steps, as known from or disclosed in the prior art.

[0019] Quoting numerical intervals by endpoints comprises all integers, fractions and/or real numbers between the endpoints, these endpoints included.

[0020] In a first aspect, the invention relates to a packaging device for macarons, comprising a peel-off tray with a cover film. The container or tray is made of a thermoplastic and transparent material and provided with a number of rows. Each row has a number of single compartments, each compartment housing one macaron in an upright or lying position.

[0021] The lying position of the macarons in their separate compartments is preferred. Research has shown that a macaron packaged in a lying position suffers less damage during the logistics process. The individual compartments, which limit the freedom of movement of the macarons, are also advantageous. Another advantage of these macarons packaged separately in a lying position is that the taste is not negatively affected because any possible crumbs of the dough cookies also remain in each compartment.

[0022] A material weakening by means of small micro-perforations according to a line pattern is provided on the cover film. These micro-perforations are applied only at the weld position between the rows. Somewhat later in the packaging process, this cover film is welded to the tray by means of UV or heat and/or pressure welding. This weld on, over and around the weakening is sufficiently wide to ensure a good seal. A weakening has therefore been made at the position between the rows along which the weld is applied, so that the rows can be opened separately at different times, so that these rows remain closed until the macarons are actually consumed.

[0023] In a preferred embodiment, it concerns a packaging device wherein the container or tray consists of one layer of macarons. These packages are then further packed in cardboard boxes and are then ready for sale. Single-layer peel-off packaging is sufficiently rigid and rigid, making it advantageous for repacking to further cardboard packaging.

[0024] In a further preferred embodiment, it concerns a packaging device where per layer 1 (one), 2 (two), 3 (three) or 4 (four) rows are provided and where each row comprises at least 3 (three) different macarons. More preferably, it concerns one layer with 2 (two) or 3 (three) rows with 3 macarons per row. In other words, a 2x3 or a 3x3 pack. This configuration also ensures an efficient

packaging process with minimal damage to the macarons.

[0025] In a further preferred embodiment, it concerns a packaging device for macarons wherein the container or tray is manufactured from a PP/EVOH/PP multi-layer system wherein at least one layer of PP comprises recycled PP. Virgin PP is preferably used for the layer that makes contact with the macarons. In a further preferred embodiment, the thickness of the container is between 0.430-0.470 mm. Such a thickness provides sufficient rigidity necessary for the protection of the sensitive macarons.

[0026] In a further preferred embodiment, it concerns a packaging device wherein the sealing of the cover film on the container with the heat seal is performed at a temperature between 140 and 220°C. The duration of the weld is also very limited, so that on the one hand sufficient melting occurs but no quality reduction for the macarons. In a further preferred embodiment, it concerns a packaging device with a sealing cover film manufactured from a PA/PP/PA/PP or PA/EVOH/PP multi-layer material. This material is extremely suitable as a heat seal, peel-off cover film. This material is also suitable for making micro-perforations according to a line pattern. In a further preferred embodiment, the thickness of the cover film is between 60-62 μm and a weight between 54 and 56 g/m². This makes a heat seal over and around the micro-perforations possible.

[0027] In a further preferred embodiment, it concerns a packaging device, with an oxygen permeability of less than 1 cc/m²/24h, 23°C/0%RH as measured in accordance with ASTM D 3985 and with a water vapor permeability of less than 1 cc/m²/24h, 23°C/0%RH as measured in accordance with ASTM F 1249. The permeability to moisture and air are extremely important. The invention strives for macarons that are as fresh and crispy as possible. This can advantageously be obtained by keeping both these values as low as possible, i.e. less than 1 and more preferably less than 0.5. In a further preferred embodiment, it concerns a packaging device where the oxygen present in the air in the packaging has been displaced for at least 80% by an inert gas such as CO₂ or Nz.

[0028] Finally, the invention relates to a method for packaging macarons in a packaging device according to the invention, wherein the different or identical macarons are positioned per layer in the container or tray, in an upright or lying position and side by side in separate compartments, and in several rows per layer and each layer being sealed by means of a heat-sealed joint with a transparent cover film, wherein one or more weakening edges are provided in the cover film just before the welding operation, so that rows can be opened separately at different times so these rows remain closed until they are actually consumed.

Claims

1. Packaging device for macarons, comprising a container or tray made of thermoplastic and transparent material and provided with a number of rows of single compartments, each compartment housing one macaron in an upright or lying position, and wherein several rows next to each other in one plane describe a layer, which layer is sealed by means of a sealed joint with a transparent cover film and wherein the cover film is provided with one or more weakening edges on the sealed joint wherein the rows can be opened separately at different times, so that these rows remain closed until they are actually consumed, **characterized in, that** the cover film is manufactured from a PA/PP/PA/PP or PA/EVOH/PP laminate. 5
2. Packaging device for macarons according to claim 1, wherein the container or tray consists of one layer of macarons. 10
3. Packaging device for macarons according to claim 1 or 2, wherein the layer or layers of the container comprises 1 (one), 2 (two), 3 (three) or 4 (four) rows and wherein each row comprises at least 3 different macarons. 15
4. Packaging device for macarons according to any of the preceding claims 1-3, wherein the container is manufactured from a PP/EVOH/PP laminate wherein at least one layer of PP comprises recycled PP. 20
5. Packaging device for macarons according to any of the preceding claims 1-4, wherein the thickness of the container is between 0.430-0.470 mm. 25
6. Packaging device for macarons according to any of the preceding claims 1-5, **characterized in, that** the cover film is welded to the tray by means of a heat seal, wherein the heat seal is performed at a temperature comprised between 140 and 220°C. 30
7. Packaging device for macarons according to any of the preceding claims 1-6, **characterized in, that** the cover film has a thickness of between 60-62 μm and a weight of between 54 and 56 g/m². 35
8. Packaging device for macarons according to any of the preceding claims 1-7, **characterized in, that** the packaging has an oxygen permeability of less than 1 cc/m²/24h, 23°C/0%RH as measured in accordance with ASTM D 3985. 40
9. Packaging device for macarons according to any of the preceding claims 1-8, **characterized in, that** the packaging has a water vapor permeability of less than 1 cc/m²/24h, 23°C/0%RH as measured in accordance with ASTM F 1249. 45
10. Packaging device for macarons according to any of the preceding claims 1-9, **characterized in, that** the weakening edges comprise linear material weakenings in the form of micro-openings or micro-perforations which are so small that they do not disturb the heat seal and are not a disadvantage with regard to the permeability of oxygen and water vapor. 50
11. Packaging device for macarons according to any of the preceding claims 1-10, **characterized in, that** the oxygen in the packaging has been displaced for at least 80% by an inert gas such as CO₂ or N₂. 55
12. Method for packaging macarons in a packaging device according to any of the preceding claims 1-11, wherein the different or identical macarons are positioned per layer in the container or tray, in an upright or lying position side by side in separate compartments, in several rows per layer and each layer being sealed by means of a sealed joint with a transparent cover film and wherein one or more weakening edges are provided in the cover film just before the welding operation, so that rows can be opened separately at different times so these rows remain closed until they are actually consumed, **characterized in, that** the oxygen in the packaging is displaced for at least 80% by an inert gas such as CO₂ or N₂. 60



EUROPEAN SEARCH REPORT

Application Number

EP 22 21 6890

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 2018/229907 A1 (GAYER MARK [US]) 16 August 2018 (2018-08-16) * paragraphs [0026], [0057]; figures 7, 9, 11 *	1-3, 7-10, 12	INV. B65D85/36 B65D75/32 B65D77/20
Y	US 2005/150891 A1 (SCHALK GERWIN [NL] ET AL) 14 July 2005 (2005-07-14) * paragraph [0053] *	1, 3	
Y	EP 2 202 174 A1 (KWH PLAST AB OY [FI]) 30 June 2010 (2010-06-30) * paragraph [0039] *	1-3, 7-9, 12	
Y	EP 2 546 165 A1 (OMNICARE INC [US]) 16 January 2013 (2013-01-16) * paragraph [0050]; figure 1 *	10	
A	US 3 394 869 A (FONTANA ROBERT M ET AL) 30 July 1968 (1968-07-30) * column 2, lines 1-10; figures 1, 4-7 *	1-12	
A	WO 2014/186572 A2 (INTERCONTINENTAL GREAT BRANDS LLC [US]) 20 November 2014 (2014-11-20) * figure 15 *	1-3, 12	TECHNICAL FIELDS SEARCHED (IPC) B65D
A	FR 2 833 585 A1 (JPJ EMBALLAGES [FR]) 20 June 2003 (2003-06-20) * claims 3, 4 *	8, 9	
A	FR 2 691 130 A1 (VIENNOISERIE FINE [FR]) 19 November 1993 (1993-11-19) * claim 1 *	11	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 May 2023	Examiner Balz, Oliver
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	

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

EP 22 21 6890

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.

25-05-2023

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2018229907 A1	16-08-2018	NONE	
US 2005150891 A1	14-07-2005	AT 406325 T	15-09-2008
		DK 1544127 T3	12-01-2009
		EP 1544127 A1	22-06-2005
		ES 2312739 T3	01-03-2009
		IL 165795 A	17-05-2010
		US 2005150891 A1	14-07-2005
EP 2202174 A1	30-06-2010	DK 2202174 T3	29-04-2013
		EP 2202174 A1	30-06-2010
		FI 20086238 A	24-06-2010
		PL 2202174 T3	31-07-2013
EP 2546165 A1	16-01-2013	CA 2776015 A1	14-01-2013
		CN 102871839 A	16-01-2013
		EP 2546165 A1	16-01-2013
		JP 2013022457 A	04-02-2013
		KR 20130009661 A	23-01-2013
		US 2013015095 A1	17-01-2013
US 3394869 A	30-07-1968	NONE	
WO 2014186572 A2	20-11-2014	CN 105189306 A	23-12-2015
		EP 2996959 A2	23-03-2016
		ES 2632453 T3	13-09-2017
		US 2016122109 A1	05-05-2016
		WO 2014186572 A2	20-11-2014
FR 2833585 A1	20-06-2003	NONE	
FR 2691130 A1	19-11-1993	NONE	

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

- US 2018229907 A1 [0007]
- US 3394869 A [0008]