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(54) **Packaging with a vent region**

Verpackung mit Lüftungszone

Emballage muni d'une zone d'aération

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Description

Technical Field

[0001] This invention relates to packaging of the type suitable for use with food stuff to allow the food stuff to be cooked, say in a microwave oven, with the packaging still in place.

[0002] Packaging of this type must form a sealed enclosure to contain the food stuff and prevent it from becoming contaminated during storage. Also, for convenience, it must be adapted to allow venting of steam from the sealed enclosure as the food stuff is cooked, without having to first pierce the packaging. Various venting arrangements have been provided for microwave packaging including wax plugs, weakened seals and leak paths which all vent at increased temperatures and/or pressures. One such packaging is disclosed in the document US-B-6582123.

[0003] An object of the present invention is to provide an improved packaging of the aforesaid type which is especially suitable for fresh foods.

Disclosure of the Invention

[0004] According to the invention, packaging comprises polymer film with portions of the film sealed together to form an enclosure for the food stuff, said sealed portions being sealed by a film-to-film seal except in a vent region where a lacquer layer is bonded to each portion of film before said portions are sealed together with the lacquer layers cohering, the seal strength of the lacquer-to-lacquer interface being similar to that of the film-to-film interface under predetermined storage conditions, and the seal strength of said lacquer-to-lacquer interface being reduced compared with that of the film-to-film interface at temperatures above those expected under said predetermined storage conditions so that the enclosure is vented to atmosphere by a cohesive peel action in the vent region between said lacquer layers.

Description of the Drawings

[0005] The invention will be described by way of example with reference to the accompanying drawings in which:

Figure 1 illustrates packaging according to the invention;
Figure 2 shows a section through a vent seal of the packaging in Figure 1.

Mode of carrying out the Invention

[0006] The illustrated microwave packaging comprises a sheet 1 of Orientated Polypropylene (OPP) film which is folded on itself to bring together opposite edges which are heat sealed together along a back seal 2 to form a tube. The lower open end of the tubular sheet is closed by bringing together opposite portions of the lower edge and heat sealing them together to form a lower seal 3. The packaging is then filled with food stuff and the open upper end closed by bringing together opposite portions of the upper edge and heat sealing them together to form an upper seal 4.

[0007] However, a portion 5 of the upper seal 4 incorporates a lacquer-to-lacquer interface between the two portions of the sheet 1 so as to form a peelable seal which extends across the full width W of the seal 4. The lacquer is a coating 6 adhering to the inner face of each of the opposite portions of the sheet 1, which may be applied by a gravure or flexo printing process in advance of the sheet being formed into the final enclosure illustrated.

[0008] The lacquer coating 6 comprises a colourless, coloured or opaque coating made up of resins or cellulose derivatives and a plasticizer in a solvent. The resin comprises a synthetic polymeric compound physically resembling natural resin, such as polyvinyl, polystyrene or epoxy. A preferred example comprises a composition of EVA based resins and a mixture of solvents comprising ethyl acetate, isopropyl acetate and hydrocarbon such as non-aromatic naptha. Such a lacquer is available as "Sovereign Proxseal J9683A" comprising an EVA copolymer dispersed in a solvent mix of ethyl acetate and aliphatic hydrocarbon.

[0009] The properties of the seals, both those portions comprising OPP sheet sealed face-to-face, and those portions which incorporate the layer-to-lacquer interface, are similar in strength at ambient, chill and freezer temperatures such as apply when the packaging is in use to store food stuff. Also, high humidity conditions caused by the food stuff within the packaging does not adversely affect the strength of the seal under ambient, chill and freezer conditions. High humidity conditions might comprise those up to 100% at 5-8°C, but typical humidity conditions comprise 85% or 95% at 5-8°C.

[0010] However, when the packaging is heated in a microwave oven to cook the food stuff, the strength of that portion of the seal 5 incorporating the lacquer coatings 6 is significantly reduced at the elevated temperatures that are generated up to 100°C or above, the strength being only ~ 30g/25mm. This reduced strength of the lacquer-to-lacquer seal is such as to allow cohesive peeling, and provides an open vent path between the two portions of the OPP sheet to allow pressurised steam and gases to escape from within the packaging. In contrast, the strength of the seal where the OPP sheet is sealed face-to-face without the intermediate lacquer coatings, remains strong enough to hold the seal closed. Thus, venting of the packaging is controlled to occur only in the lacquer coated region 5 of the upper seal 4. Typically, the seal strength of the lacquer-to-lacquer is reduced significantly at temperatures of 60°C and above.

[0011] The size of the lacquered vent region 5 is selected to give an appropriated vent cross-section. If required the vent region 5 could extend the full length of

the seal 4. Alternatively, the position of the lacquered region 5 can be varied to suit the particular application and it may be located in one or more of the other seals 2 and 3. Alternatively, multiple vent regions 5 may be provided in one or more of the seams 2, 3, 4.

[0012] In alternative embodiments of the invention, the film may comprise any one of the following: polypropylene, polyethylene, polyester, polyamide, regenerated cellulose, polylactic acid, or combination of any of the preceding. The film may also comprise films with a heat seal coating.

[0013] The film may be adapted for modified atmosphere packaging by forming microperforations in it which are small enough to control the oxygen/ carbon dioxide gas atmosphere within the bag. The food stuff will have a respiration rate which is matched to the natural permeability of the film and the additional permeability of the microperforations so as to produce the required modified atmosphere within the packaging. However, the total area of the microperforations would be too small to have any significant effect on the water vapour permeability of the film or the need to provide a separate vent.

[0014] Also, in alternative embodiments of the invention, the lacquer may comprise a water-based EVA lacquer or an epoxy/ acrylic solvent based lacquer.

Claims

1. Packaging for food stuff intended to be heated comprising polymer film (1) with portions of the film sealed together to form an enclosure for the food stuff, **characterized in that** said sealed portions are sealed by a film-to-film seal except in a vent region (5) where a lacquer layer (6) is bonded to each portion of film before said portions are sealed together with the lacquer layers cohering, the seal strength of the lacquer-to-lacquer interface being similar to that of the film-to-film interface under predetermined storage conditions, and the seal strength of said lacquer-to-lacquer interface being reduced compared with that of the film-to-film interface at temperatures above those expected under said predetermined storage conditions so that the enclosure is vented to atmosphere by a cohesive peel action in the vent region (5) between said lacquer layers (6).

2. Packaging as claimed in claim 1 in which said enclosure is formed by sealing portions of the film (1) together along multiple seams (2, 3, 4) with a vent region (5) formed in one or more seams (4).

3. Packaging as claimed in claim 2 in which said enclosure is formed by sealing portions of the film together along multiple seams (2, 3, 4) with said vent region (5) formed along the whole of one seam (4), but not along the whole of the length of all seams (2,3).

4. Packaging as claimed in any one of the preceding claims in which the lacquer (6) is applied to the film by a gravure or flexo printing process.

5. Packaging as claimed in any one of the preceding claims in which the film (1) comprises polypropylene, polyethylene, polyester, polyamide, regenerated cellulose, polylactic acid, or combination of any of the preceding.

6. Packaging as claimed in claim 5 in which the lacquer (6) comprises an EVA based resin.

7. Packaging as claimed in claim 6 in which the lacquer (6) comprises a combination of solvents comprising alcohols, esters and hydrocarbons.

8. Packaging as claimed in any one of claims 1 to 5 in which the lacquer (6) comprises a water-based EVA lacquer or an epoxy/acrylic solvent based lacquer.

9. Packaging as claimed in any one of the preceding claims in which the film (1) is formed with microperforations to support a modified atmosphere within the packaging when it contains respiring food stuff.

10. Film for the production of packaging of any one of claims 1 to 9 in which at least one region of the film (1) adapted to be incorporated in a packaging seal between two portions of the film is coated with a lacquer (6) comprising an EVA based resin.

Patentansprüche

1. Verpackung für Nahrungsmittel, die zum Erhitzen gedacht sind, umfassend: einen Polymerfilm (1) mit miteinander verklebten bzw. versiegelten Filmabschnitten, um eine Verkapselung für das Nahrungsmittel zu erzeugen, **dadurch gekennzeichnet, dass** die verklebten Abschnitte mittels eines Film-auf-Film-Klebers mit Ausnahme eines Entlüftungsabschnittes (5), bei dem eine Lackschicht (6) an jeden Abschnitt des Films gebunden worden ist, bevor die Abschnitte mit den zusammenhängenden Lackschichten miteinander verklebt worden sind, verklebt sind, wobei die Klebfestigkeit der Lack-auf-Lack-Berührungsfläche ähnlich zu der der Film-auf-Film-Berührungsfläche unter vorbestimmten Lagerungsbedingungen ist und die Klebfestigkeit der Lack-auf-Lack- Berührungsfläche verglichen mit der der Film-auf-Film-Berührungsfläche bei Temperaturen oberhalb der unter den vorbestimmten Speicherbedingungen erwarteten Bedingungen verringert ist, so dass die Verkapselung durch eine kohäsive Ablösungsaktion in dem Entlüftungsabschnitt (5) zwischen den Lackschichten (6) entlüftet wird.

2. Verpackungsmaterial gemäß Anspruch 1, in welchem die Verkapselung durch Verklebung von Abschnitten des Films (1) entlang mehrerer Nähte (2, 3, 4) zusammen mit einem in einer oder mehreren Nähten erzeugten Entlüftungsabschnitt (5) erzeugt worden ist.

3. Verpackungsmaterial gemäß Anspruch 2, in welchem die Verkapselung durch Verklebung von Abschnitten des Films entlang mehrerer Nähte (2, 3, 4) zusammen mit dem entlang einer gesamten Naht (4) aber nicht entlang der Gesamtlänge aller Nähte (2, 3) erzeugten Entlüftungsabschnitt (5) erzeugt worden ist.

4. Verpackungsmaterial, in welchem der Lack (6) auf dem Film durch ein Tiefdruck- oder Flexodruckprozess aufgetragen worden ist.

5. Verpackungsmaterial gemäß irgendeinem der vorhergehenden Ansprüche, in welchem der Film (1) Polypropylen, Polyethylen, Polyester, Polyamid, wiedergewonnene Zellulose, Polymilchsäure oder Kombinationen aus irgendeinem der Vorhergehenden umfasst.

6. Verpackungsmaterial gemäß Anspruch 5, in welchem der Lack (6) ein EVA-basiertes Harz umfasst.

7. Verpackungsmaterial gemäß Anspruch 6, der eine Kombination aus Lösungsmitteln, welche Alkohol, Ester und Kohlenwasserstoffe umfassen, umfasst.

8. Verpackungsmaterial gemäß irgendeinem Anspruch 1 bis 5, in welchem der Lack (6) einen wasserbasierten EVA-Lack oder einen Epoxid/Acryl-Lösungsmittel-basierten Lack umfasst.

9. Verpackungsmaterial gemäß irgendeinem der vorherigen Ansprüche, in welchem der Film (1) mit Mikroperforationen erzeugt worden ist, um eine modifizierte Atmosphäre innerhalb des Verpackungsmaterials aufrecht zu erhalten, wenn es ein respirierendes bzw. ausatmendes Nahrungsmittel enthält.

10. Film zur Herstellung eines Verpackungsmaterials gemäß irgendeinem der Ansprüche 1 bis 9, in dem wenigstens ein Abschnitt des Films (1), der angepasst ist, um in eine Verpackungsmaterialverklebung zwischen zwei Abschnitten des Films eingebaut zu werden, mit einem ein EVA-basiertes Harz umfassenden Lack (6) beschichtet ist.

Revendications

1. Conditionnement pour produits alimentaires destinés à être chauffés, comprenant un film polymère (1), des parties du film étant soudées les unes sur les autres pour former une enceinte pour les produits alimentaires, **caractérisé en ce que** les parties soudées sont scellées par soudage du film sur lui-même sauf dans une région de ventilation (5) dans laquelle une couche de laque (6) est collée à chaque partie de film avant que ces parties ne soient soudées l'une sur l'autre par mise des couches de laque à l'état cohésif, la résistance mécanique de scellement de l'interface laque-laque étant analogue à celle de l'interface film-film dans des conditions prédéterminées de stockage, et la résistance de soudage de l'interface laque-laque étant réduite par rapport à celle de l'interface film-film à des températures supérieures à celles qui sont prévues dans les conditions prédéterminées de stockage, si bien que l'enceinte est ventilée par mise à l'atmosphère par une action de pelage cohésif dans la région de ventilation (5) entre les couches de laque (6).

2. Conditionnement selon la revendication 1, dans lequel l'enceinte est formée par soudage de parties de film (1) les unes sur les autres le long de soudures multiples (2, 3, 4) avec une région de ventilation (5) formée dans une ou plusieurs soudures (4).

3. Conditionnement selon la revendication 2, dans lequel l'enceinte est formée par soudage de parties de film les unes sur les autres le long de plusieurs soudures (2, 3, 4) avec la région de ventilation (5) formée sur la totalité d'une soudure (4), mais pas suivant la totalité de la longueur de toutes les soudures (2, 3).

4. Conditionnement selon l'une quelconque des revendications précédentes, dans lequel la laque (6) est appliquée au film par un procédé d'impression en creux ou à l'aniline.

5. Conditionnement selon l'une quelconque des revendications précédentes, dans lequel le film (1) est formé de polypropylène, de polyéthylène, de polyester, de polyamide, de cellulose régénérée, d'acide polylactique ou d'une combinaison de substances précédentes quelconques.

6. Conditionnement selon la revendication 5, dans lequel la laque (6) comporte une résine à base de copolymère EVA.

7. Conditionnement selon la revendication 6, dans lequel la laque (6) comprend une combinaison de solvants contenant des alcools, des esters et des hydrocarbures.

8. Conditionnement selon l'une quelconque des revendications 1 à 5, dans lequel la laque (6) est une laque à base aqueuse de copolymère EVA ou une laque

à base de solvants acryliques et époxydes.

9. Conditionnement selon l'une quelconque des revendications précédentes, dans lequel le film (1) est formé avec des microperforations destinées à entretenir une atmosphère modifiée dans le conditionnement lorsqu'il contient des produits alimentaires qui respirent.

10. Film pour la production d'un conditionnement selon l'une quelconque des revendications 1 à 9, dans lequel une région au moins du film (1) destinée à être incorporée dans une soudure du conditionnement entre deux parties du film est revêtue d'une laque (6) contenant une résine à base de copolymère EVA.

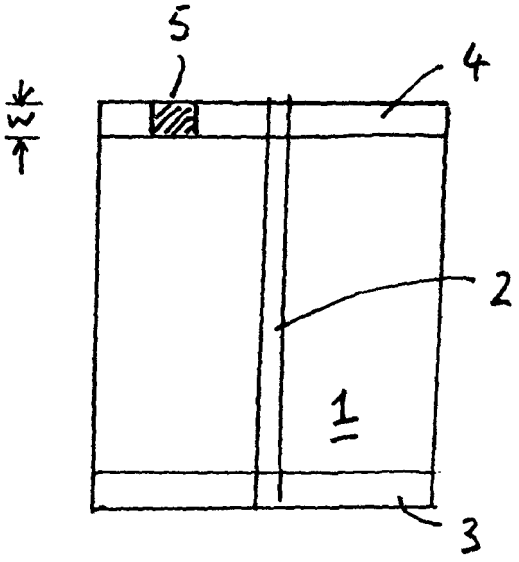

FIG. 1.

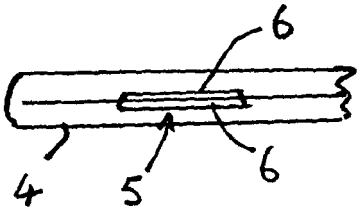

FIG. 2.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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