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(54) PACKAGE FOR FROZEN PRODUCTS AND MANUFACTURING THEREOF

(57) The invention relates to a package for a frozen food product, the package comprising a first mould element provided with at least one mould cavity having a base and a first peripheral wall extending from the base; and a sealing element to seal the mould cavity, wherein the sealing element is connected to at least part of an edge of the first peripheral wall, wherein the mould element further comprises at least one filling opening, such that the mould cavity is fillable with the fluid food product.

The invention also relates to a method for manufacturing such a package for a food product, the method comprising providing a first mould element and a sealing element, the first mould element comprising at least one mould cavity having a base and a first peripheral wall extending therefrom, and at least one filling opening for filling the mould cavity; sealing the mould cavity of the first mould element by connecting the sealing element to at least part of a peripheral edge of the first peripheral wall; and at least partly filling the mould element with a liquid product.

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention relates to a package for a frozen product, such as a frozen liquid. Furthermore, the invention relates to a method for manufacturing such a package.

Description of the Related Art

[0002] Packages for a frozen products are well known, for instance in the shape of plastic bags holding ice cubes or cardboard containers holding blocks of frozen food, such as spinach or soup. Such packages are used to pack the frozen product after manufacturing.

[0003] Manufacturing of the frozen products is usually done in a mould as disclosed in Dutch patent publication 1034074. A liquid, usually water, is frozen in a mould comprising two parts, which mould parts comprise pairs of interconnected hollow spaces for forming ice blocks. Upon moving the mould parts away from each other after forming the ice blocks, the ice blocks can be released from the mould.

[0004] The ice blocks resulting from such a mould have an interconnection that is broken upon release from the mould. The resulting individual blocks are then packed in a container or a bag.

[0005] A disadvantage of packing loose, individual ice blocks or blocks of frozen products in a container or a bag is that the volume of such a package is not used optimally. As it is, the cardboard containers used are usually larger than needed for the amount of frozen product inside, due to the random orientation, i.e. not ordered, of the blocks. This is also the case for the used bags. The volume needed for transport and storage is therefore larger than the actual transported or stored volume of product. To optimize the efficiency of transport and storage, the superfluous volume in these packages may be reduced.

[0006] It would therefore be desirable to provide a package for frozen product that overcomes the disadvantages of the known packages.

BRIEF SUMMARY OF THE INVENTION

[0007] According to the invention, there is provided a package for a frozen product, the package comprising:

> a first mould element provided with at least one mould cavity having a base and a first peripheral wall extending from the base; and
> a sealing element to seal the mould cavity,

wherein the sealing element is connected to at least part of an edge of the first peripheral wall, wherein the mould element further comprises at least one filling opening, such that the mould cavity is fillable with the food product in liquid state.

[0008] The package is formed of a mould element that has at least one mould cavity. The mould cavity comprises a filling space enclosed by a base, a first peripheral wall and the sealing element opposite the base and connected to at least part of the first peripheral wall. The filling opening is used to fill the mould cavity with the food product in liquid state. The food product can be water for the making of ice lumps, but soup or a paste are possible as well. The liquid food product will then be frozen within the mould cavity. The mould element and the sealing element may form a part of a package for the food product when in a solid or frozen state, thereby reducing the volume of the package of such a food product.

[0009] According to an embodiment, the filling opening is provided at a top end of the mould element. The filling opening can be an opening in the first peripheral wall or in the base of the mould cavity. Preferably, the filling opening is provided between the sealing element and the first peripheral wall at the top end of the moulding element. For this embodiment it is preferred that the filling opening comprises a first recessed portion in the first peripheral wall of the moulding element, extending from an exterior of the moulding element to an interior of the mould cavity, which first recessed portion forms an interruption in a connection between the sealing element and the peripheral wall. The filling opening is thereby enclosed by the first recessed portion and the sealing element. The first recessed portion can be shaped in various forms, such as U-shaped, V-shaped, or square-like or semi-circular.

[0010] In a further embodiment, the mould element is provided with at least two mould cavities, wherein the periphery of each mould cavity is provided with a first peripheral wall. It is preferred that the mould element is provided with a series of at least two mould cavities. The series of mould cavities can be arranged as a row, i.e. next to each other, or as a column, i.e. one above the other. Preferably, the mould cavities are adjacent to each other such that the adjacent mould cavities share a part of the first peripheral wall.

[0011] According to a further embodiment, the mould element is provided with at least four mould cavities, wherein the mould cavities are arranged in an n x n matrix or an m x n matrix, wherein n and m represent the number of columns and rows, respectively. When the mould element comprises a series of at least four mould cavities, the mould cavities can also be arranged in a matrix having n columns and m rows, wherein n and m are both higher than 1, such that a mould element with four mould cavities, a 2x2 matrix having 2 columns and 2 rows can be formed. For a mould element having nine mould cavities, a 3x3 matrix can be formed. For a mould element having 12 mould cavities, either a 3x4, a 4x3, a 2x6 or a 6x2 matrix could be formed. Of course, the mould cavities in the mould element could also be formed as a single row

or single column as described above. Preferably, the matrix is an n x n matrix, i.e. has an equal number of rows and columns, i.e. the matrix is a square matrix, i.e. m=n.

[0012] According to another embodiment, a part of the first peripheral wall located between the adjacent mould cavities is provided with a second recessed portion extending from a first mould cavity to a second mould cavity, such that the adjacent mould cavities are interconnected. Preferably, the sealing element extends over the recessed portion, thereby forming a connecting space enclosed between the second recessed portion and the sealing element, which connecting space extends from the first mould cavity to the second mould cavity.

[0013] According to another embodiment, the mould element comprises a second peripheral wall enclosing the at least one mould cavity, wherein the first peripheral wall located between adjacent mould cavities has a lower height relative to the second peripheral wall.

[0014] The mould cavities are delimited by a base, a first peripheral wall extending from the base and the sealing element connected to the first peripheral wall, thereby forming an interior of the mould cavity. The base of the mould cavity and the sealing element form opposite sides of the mould element. When in an upright position, the base of the mould cavity and the opposite sealing element form substantially parallel, vertical planes. The mould element is delimited by a second peripheral wall, enclosing the at least one mould cavity. In case the mould element comprises a series of mould cavities, the second peripheral wall encloses the series of mould cavities. The second peripheral wall is preferably higher than the part of the first peripheral wall located between adjacent mould cavities. The sealing element can then be connected to the relatively higher second peripheral wall at the ends of the mould element. It is preferred that the second peripheral wall and the first peripheral wall enclosing mould cavities adjacent to the second peripheral wall of the mould element coincide. Preferably, the second peripheral wall and the first peripheral wall enclosing mould cavities adjacent to the second peripheral wall of the mould element, coincide, wherein the sealing element is connected to the second peripheral wall of the mould element. The first peripheral wall enclosing mould cavities positioned at an end of the mould element forms a second peripheral wall of the mould element, surrounding the mould cavities provided in the mould element. The first peripheral wall located between adjacent mould cavities has a lower height relative to the second peripheral wall, and wherein the sealing element is connected to the second peripheral wall of the mould element.

[0015] According to another embodiment, the package comprises a second mould element connected to the first mould element. Preferably, the first and second mould element are connected at an end of each mould element through a pivoting connection, such that the sealing elements, such as a foil, of each mould element face each other upon pivoting of the first and second mould elements towards each other. In this way the package can contain double the amount of lumps of frozen products.

[0016] It is preferred that the sealing element is a foil material, such as a polyethylene (PE) or polyethylene terephthalate (PET) foil. Alternatively, the sealing element comprises a third mould element provided with at least one mould cavity having a base and a first peripheral wall extending therefrom, wherein the first and the third mould element are symmetrical with respect to each other and are connected along at least part of the peripheral edges of the respective first peripheral walls.

[0017] The package is preferably used when the mould cavity is filled with a frozen food product. The food product is entered into the mould cavities in a liquid state and frozen in a suitable device according to a suitable method. As the food product is frozen and remains frozen upon use, the filling openings may be left open, i.e. not closed. Alternatively, the filling openings can be sealed by a further sealing element or a sealing material such as a wax or suitably putty. Preferably, the package further comprises a container for containing the mould element comprising the frozen food product.

[0018] The invention also relates to a method for manufacturing a package for a food product according to any of the preceding claims, the method comprising:

providing a first mould element and a sealing element, the first mould element comprising at least one mould cavity having a base and a first peripheral wall extending therefrom, and at least one filling opening for filling the mould cavity; and
sealing the mould cavity of the first mould element by connecting the sealing element to at least part of a peripheral edge of the first peripheral wall.

[0019] The mould cavity is sealed with the sealing element such that a filling space enclosed by the base, the first peripheral wall and the sealing element is provided. The filling opening can be provided in the base of the mould cavity, the first peripheral wall or between the first peripheral wall and the sealing element.

[0020] The method can further comprise after sealing the mould cavity with the sealing opening at least partly filling the mould element with a liquid product through the filling opening. The mould cavity is at least partly filled after sealing the mould cavity and enclosing the filling space.

[0021] According to an embodiment, the method comprises after the step of filling the mould element:

freezing the liquid product in a suitable refrigerating device to form a frozen product in the mould element. It is preferred that the mould element is positioned such that the filling opening is located at a top end of the mould element during filling and/or refrigerating, such that the liquid product remains within the mould element. Alternatively, the filling opening can be closed or sealed with a further sealing element or a suitable material such as a wax or putty after

filling.

[0022] According to a preferred embodiment, the method comprises inserting the mould element into a container. The frozen food product in the mould cavity remains in the package during transport and storage and is only taken out upon use.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The features and advantages of the invention will be further appreciated upon reference to the following drawings of a number of exemplary embodiments, in which:

Figure 1 shows a planar view of a first embodiment of the package according to the invention.
Figure 2 shows a perspective view of the package of Fig. 1.
Figure 3 shows a perspective view of the package of Figs. 1 and 2 from an opposite direction as Fig. 2.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0024] Figure 1 shows a planar view of a first embodiment of the package 1 according to the invention. The package 1 comprises a first and second mould element 2, 5 with a series of interconnected mould cavities 4 and a sealing element 3 to close the mould cavities 4. Each mould cavity 4 comprises a base 6, see Figure 3, and a first peripheral wall 7 extending from the base 6. The mould element 2 is surrounded by a second peripheral wall 8, that coincides with the first peripheral wall 7 of the mould cavities 4' positioned at one of the ends of the mould element 2, i.e. at the ends of the mould element the first peripheral wall 7 forms the second peripheral wall 8 of the mould element 2, 5. Pairs of mould cavities 4, 4' that are adjacent to each other share a first peripheral wall 7. The sealing element 3, here shown as a foil, is connected to the first peripheral wall 7 of the mould cavities 4 and to the second peripheral wall 8 of the mould element. The second peripheral wall 8 is on one side provided with a series of filling openings 9 to fill the sealed mould cavities 4, 4' with a suitable substance. The filling opening 9 is a first recessed portion of the peripheral wall 7, as shown in Figure 2. To allow flowing of the substance into mould cavities 4 that do not have such a filling opening 9, the first peripheral wall 7 is provided with a second recessed portion 10 extending from a first mould cavity 4' to a second mould cavity 4, such that the adjacent mould cavities 4, 4' are interconnected. The sealing element or foil 3 extends over the second recessed portion 10, thereby forming a connecting space 11 enclosed between the second recessed portion 10 of the first peripheral wall 7 and foil 3, which connecting space 11 extends from the first mould cavity 4' to the second mould cavity 4. Similar connecting spaces 11 are provided between pairs of adjacent mould cavities 4, 4'.

[0025] The second mould element 5 is shaped in a similar way as the first mould element 2 and is connected to the first mould element 2 by means of a pivotable connection piece 12. In such a way the first and second mould elements 2, 5 can be pivoted towards each other such that the sides provided with the foil 3 are either facing each other, as shown in Figure 3, or are facing away from each other. The package 1 can also contain only one mould element 2 as described here.

[0026] The package 1 is manufactured by sealing the mould cavities 4, 4' of the mould element 2, 5 with the foil 3 by connecting the foil to the edges of the first peripheral wall 7 surrounding the mould cavities 4, 4' and the second peripheral wall 8 surrounding the mould element 2, 5. Then the mould cavities 4, 4' are filled through the filling openings 9 provided at an end of the mould element as a first recessed portion of the second peripheral wall 8. The mould cavities adjacent to the mould cavities at the end of the mould element provided with the filling openings 9 are filled with a liquid food product via the connecting spaces 11 that interconnect the adjacent mould cavities. After filling the mould cavities 4, 4', the package 1 is put in a refrigerating device to freeze the food product. The food product can be a liquid, such as water, a drink or a soup, but can also be a paste or emulsion, such a spinach paste.

[0027] As the food product is frozen, the mould element 2, 5 is only partially filled to allow expansion of the food product while being frozen and to prevent the package from bursting and subsequent leakage. The filling openings 9 serve as air outlets during the freeze process.

[0028] Thus, the invention has been described by reference to certain embodiments discussed above. It will be recognized that many modifications in addition to those described above may be made to the structures and techniques described herein without departing from the spirit and scope of the invention. Accordingly, although specific embodiments have been described, these are examples only and are not limiting upon the scope of the invention.

LIST OF PARTS

[0029]

1. Package
2. First mould element
3. Sealing element/foil
4. Mould cavity
4'. Mould cavity at an end of the mould element
5. Second mould element
6. Base of mould element
7. First peripheral wall of mould cavity
8. Second peripheral wall of mould element
9. Filling opening
10. Second recessed portion
11. Connecting space
12. Pivotable connection piece

Claims

1. Package for a frozen food product, the package comprising:

   a first mould element provided with at least one mould cavity having a base and a first peripheral wall extending from the base; and
   a sealing element to seal the mould cavity,

   wherein the sealing element is connected to at least part of an edge of the first peripheral wall, wherein the mould element further comprises at least one filling opening, such that the mould cavity is fillable with the fluid food product.

2. Package according to claim 1, wherein the filling opening is provided between the sealing element and the first peripheral wall at the top end of the moulding element.

3. Package according to claim 1 or 2, wherein the filling opening comprises a recessed portion in the first peripheral wall of the moulding element, extending from an exterior of the moulding element to an interior of the mould cavity, which recessed portion forms an interruption in a connection between the sealing element and the peripheral wall.

4. Package according to any of the preceding claims, wherein the mould element is provided with at least two mould cavities, wherein the periphery of each mould cavity is provided with a first peripheral wall and wherein the mould cavities are adjacent to each other such that the adjacent mould cavities share a part of the first peripheral wall.

5. Package according to claim 4, wherein the first peripheral wall between the adjacent mould cavities is provided with a recessed portion extending from a first mould cavity to a second mould cavity, such that the adjacent mould cavities are interconnected.

6. Package according to claim 5, wherein the sealing element extends over the recessed portion, thereby forming a connecting space enclosed between the recessed portion of the first peripheral wall and the sealing element, which connecting space extends from the first mould cavity to the second mould cavity.

7. Package according to any of the claims 4-6, wherein the first peripheral wall enclosing mould cavities positioned at an end of the mould element forms a second peripheral wall of the mould element, surrounding the mould cavities provided in the mould element.

8. Package according to claim 7, wherein the first peripheral wall located between adjacent mould cavities has a lower height relative to the second peripheral wall, and wherein the sealing element is connected to the second peripheral wall of the mould element.

9. Package according to any of the preceding claims, wherein the sealing element is a foil material.

10. Package according to any of the preceding claims, comprising a second mould element connected to the first mould element and wherein the first and second mould element are connected at an end of each mould element through a pivoting connection, such that the sealing elements of each mould element face each other upon pivoting of the first and second mould elements towards each other.

11. Package according to any of the claims 1-9, wherein the sealing element comprises a third mould element provided with at least one mould cavity having a base and a first peripheral wall extending therefrom, wherein the first and the third mould element are symmetrical with respect to each other and are connected along at least part of the peripheral edges of the respective first peripheral walls.

12. Package according to any of the preceding claims, wherein the mould cavity is filled with a frozen food product.

13. Package according to claim 12, further comprising a container for containing the mould element comprising the frozen food product.

14. Method for manufacturing a package for a food product according to any of the preceding claims, the method comprising:

   providing a first mould element and a sealing element, the first mould element comprising at least one mould cavity having a base and a first peripheral wall extending therefrom, and at least one filling opening for filling the mould cavity;
   sealing the mould cavity of the first mould element by connecting the sealing element to at least part of a peripheral edge of the first peripheral wall; and
   at least partly filling the mould element with a liquid product.

15. Method according to claim 14, comprising after the step of filling the mould element:

   freezing the liquid product in a suitable refrigerating device to form a frozen product in the mould element.

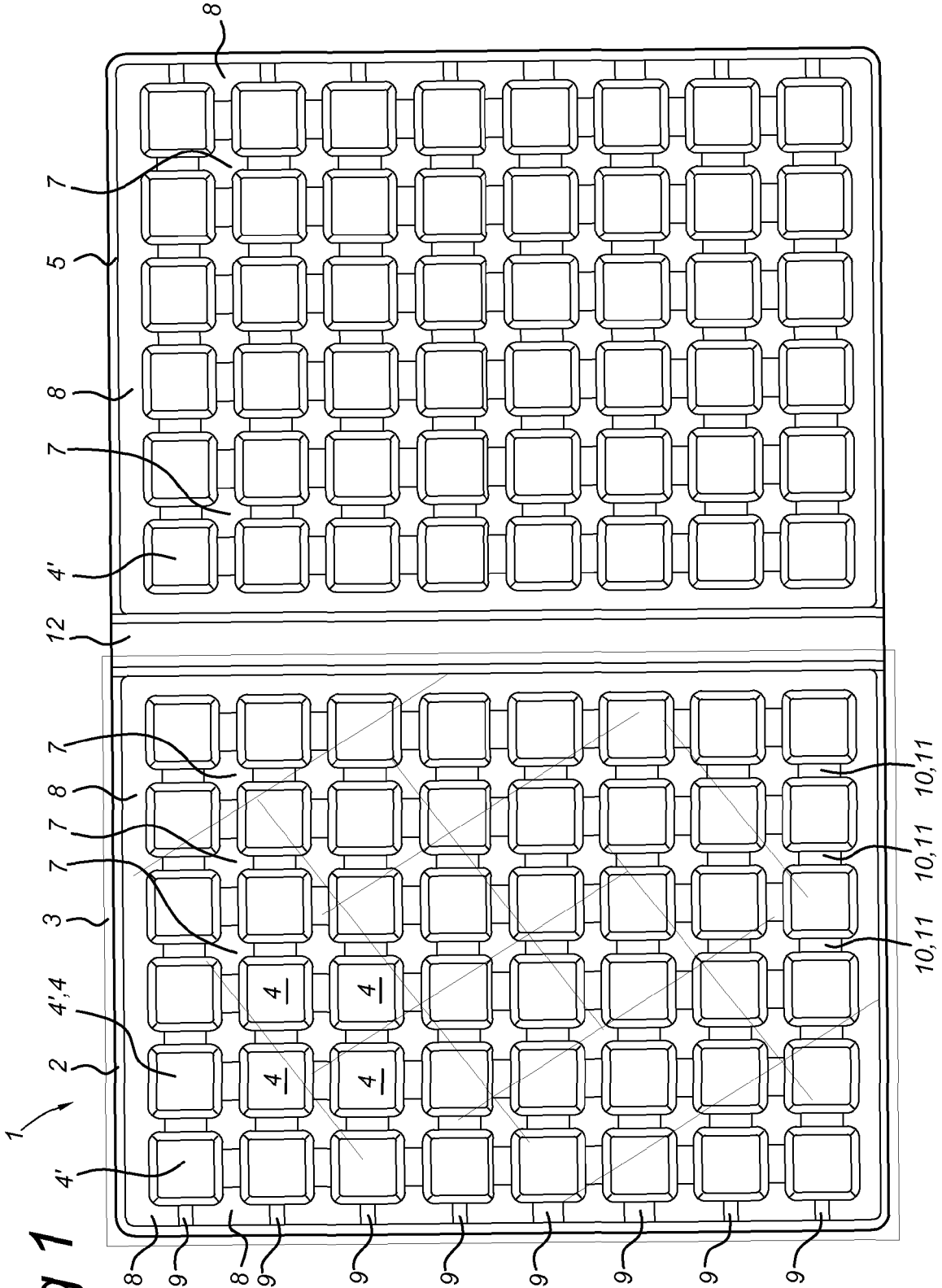

Fig 1

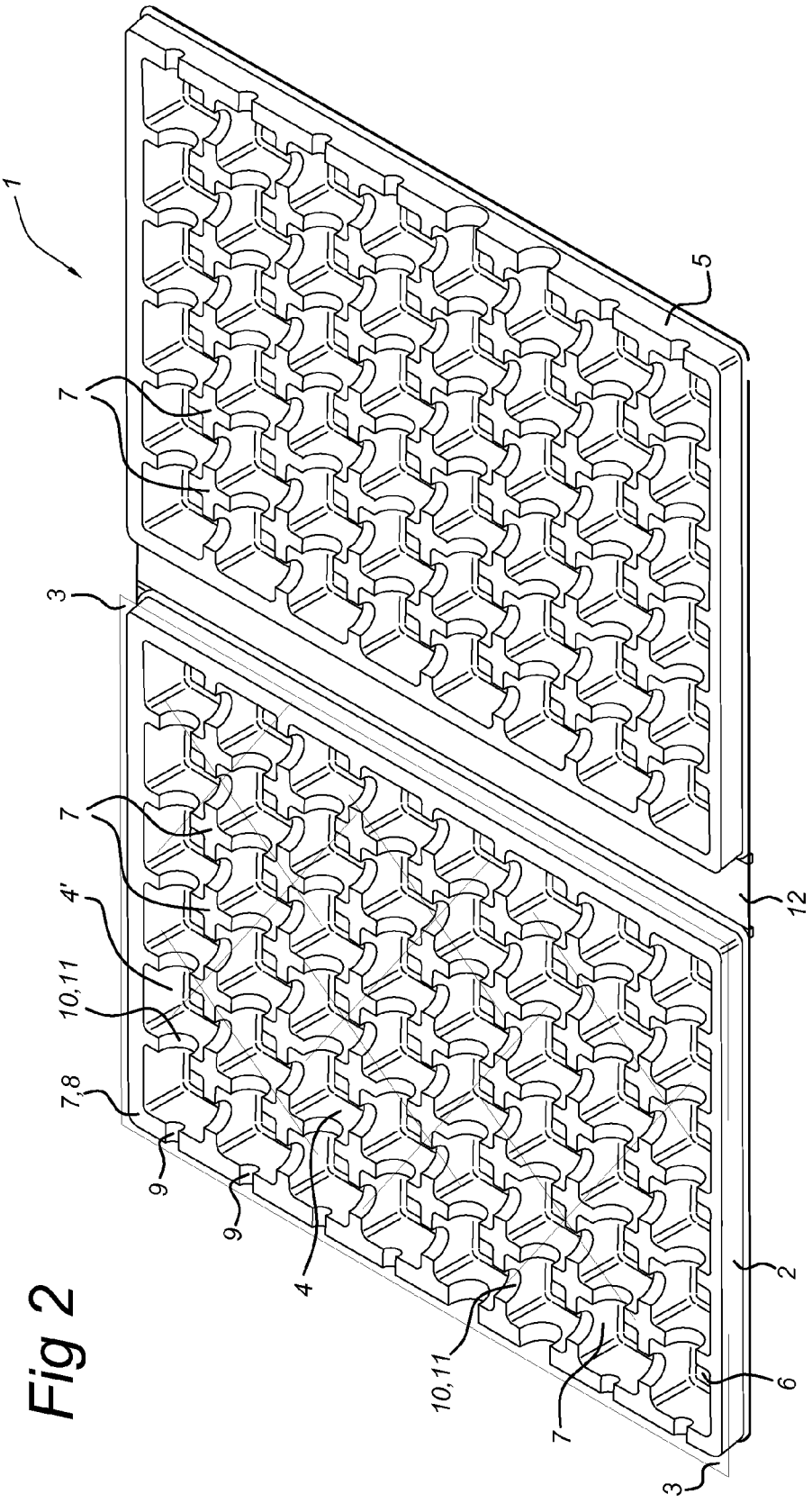

Fig 2

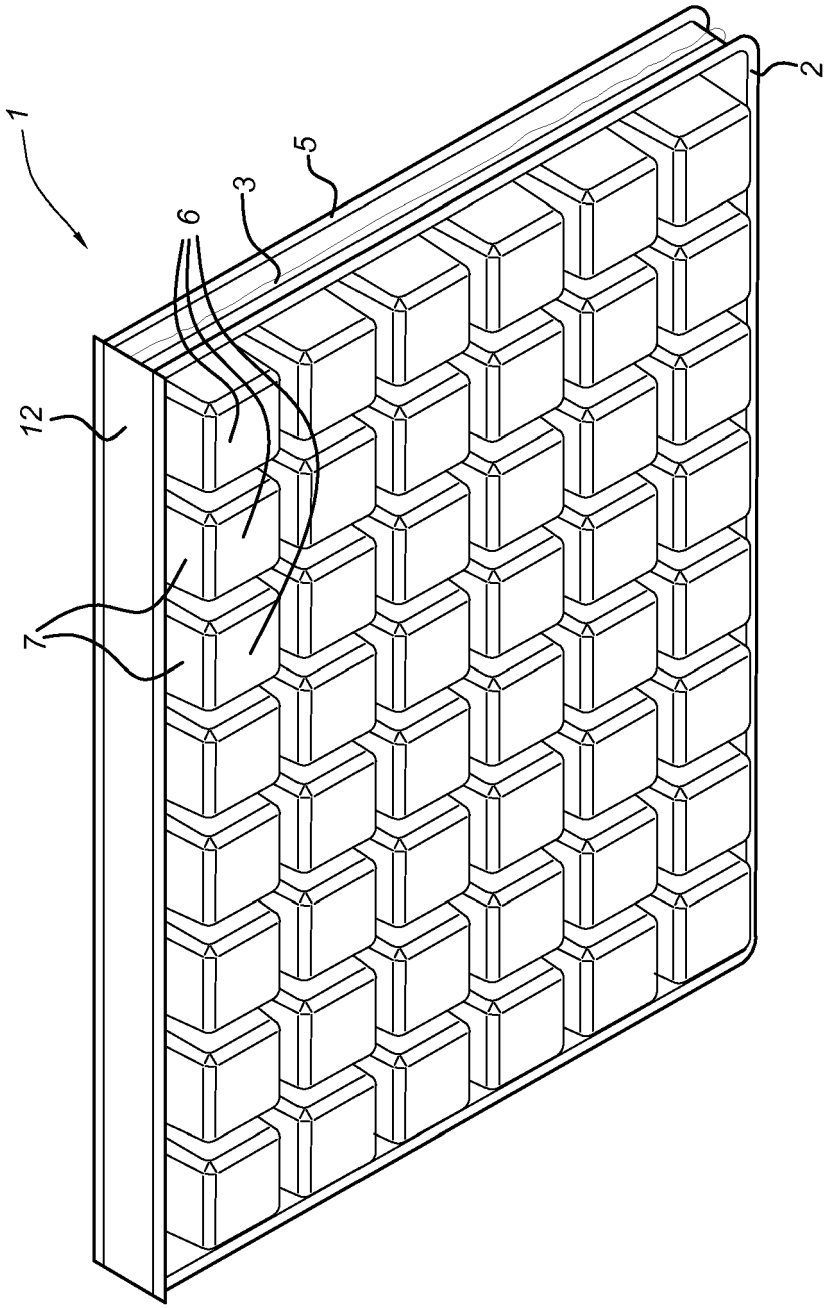

Fig 3

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 2339

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	US 2007/107447 A1 (LANGLOTZ BENNET K [US]) 17 May 2007 (2007-05-17) * paragraphs [0002], [0003], [0007], [0033]; figures 1-3, 7-8 *	1-15	INV. F25C1/24
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TECHNICAL FIELDS SEARCHED (IPC)

F25C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 July 2015	Melo Sousa, Filipe

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 15 2339

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

REFERENCES CITED IN THE DESCRIPTION

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