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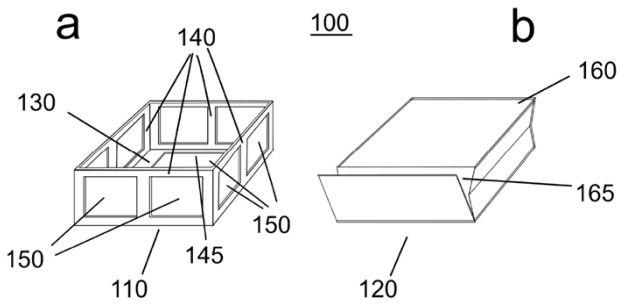
(54) Title **A packaging device, system and method**

(57) Abstract

The disclosure describes a packaging device for transport of seafood, where the packaging device comprises a box and a flexible open pouch removably placed inside the box. The box comprises a bottom wall and four side walls defining an interior volume therebetween. The at least one wall of the box is provided with at least one opening and said at least one opening constitutes at least 15 % of the area of said at least one wall. The flexible open pouch is configured to be sealed shut such as to form an inflatable closed pouch that may conform to the interior volume of the box when inflated. The inflatable closed pouch has a volume when inflated being larger than the interior volume of the box such that the inflatable closed pouch, when inflated, protrudes a non-zero distance out of at least one opening of the at least one wall of the box.



Technical field

The disclosure relates to the field of packaging devices, systems, and methods.

Background

[0001] Transport of seafood is commonly performed though employment of polystyrene containers. The polystyrene containers are typically filled with seafood and ice before being stacked together e.g. on a truck or plane. The ice of each individual polystyrene container keeps the seafood therein cold, and the amount of ice added before transport is thus determined based on the exact transport conditions as well as the length of the journey to be undertaken.

[0002] A problem with polystyrene containers, however, is that they act as individual thermal cells due to their high thermal insulation properties. The latter results in the seafood of each individual polystyrene container experiencing individual conditions during transport, and thus further potentially results in varying quality of the seafood arriving at the destination. Individual conditions between different polystyrene containers may for example arise due to some polystyrene containers not being properly sealed, some being damaged, exposed to a higher ambient temperature etc.

[0003] Another problem with polystyrene containers is that they are a source of environmental pollution. The polystyrene containers cause inter alia residual polystyrene particles to be distributed as a result of wear, and the polystyrene containers may for example go astray and end up in the ocean.

[0004] WO9831608A1 describes an insulating package for transporting chilled foodstuffs consisting of a product bag having a reflective outer surface disposed within a lidded transport container that has inward projection protrusions or baffles of at least 1 cm in depth spaced apart to provide an insulating airspace between the product bag and the base and walls of the lidded container.

[0005] It is an aim of the present invention to provide a thermally conductive packaging device for transport of seafood. It is also an aim of the present invention to provide a packaging device for transport of seafood that does not rely on the use of polystyrene.

Summary of the invention

[0006] A first aspect of the present invention provides packaging device for transport of seafood, the packaging device comprising a box and a flexible open pouch removably placed inside the box, where the box comprises a bottom wall and

four side walls defining an interior volume therebetween, wherein at least one wall of the box is provided with at least one opening, and wherein said at least one opening constitutes at least 15 % of the area of said at least one wall, and where the flexible open pouch comprises a polymer-metal laminate; the flexible open pouch being configured to be sealed shut such as to form an inflatable closed pouch, wherein the inflatable closed pouch conforms to the interior volume of the box when inflated, and wherein the inflatable closed pouch has a volume when inflated being larger than the interior volume of the box such that the inflatable closed pouch, when inflated, protrudes a non-zero distance out of at least one opening of the at least one wall of the box.

[0007] In an embodiment of the invention each wall of the box is provided with at least one opening, wherein said at least one opening constitutes at least 15 % of the area of each said wall, and wherein the inflatable closed pouch has a volume when inflated being larger than the interior volume of the box such that the inflatable closed pouch, when inflated, protrudes a non-zero distance out of at least one of the openings of the walls of the box.

[0008] In another embodiment of the invention the flexible open pouch further comprises a gas port, and the flexible open pouch being configured to be sealed shut such as to form an inflatable closed pouch that is inflatable via the gas port.

[0009] In yet another embodiment of the invention the box further comprises a top wall, where the top wall is provided with at least one top wall opening, and wherein said at least one top wall opening constitutes at least 15 % of the area of the top wall.

[0010] In yet another embodiment of the invention, at least part of the top wall constitutes a lid.

[0011] In yet another embodiment of the invention the packaging device further comprises liquid absorbing means positioned in the inner volume of the box.

[0012] In yet another embodiment of the invention the inflatable closed pouch has an essentially rectangular shape when inflated.

[0013] In yet another embodiment of the invention the box is water repellent.

[0014] In yet another embodiment of the invention the walls of the box are rigid.

[0015] In yet another embodiment of the invention each of the side walls of the box are attached to the bottom wall of the box via a flexible joint.

[0016] In yet another embodiment of the invention the flexible open pouch comprises a polymer-aluminium laminate.

[0017] In yet another embodiment of the invention any opening/openings of any one wall of the box constitutes/constitute at most 55 % of the area of said wall, alternatively at most 75 % of the area of said wall, or alternatively at most 98 % of the area of said wall.

[0018] In yet another embodiment of the invention the flexible open pouch is provided with an overpressure valve.

[0019] In yet another embodiment of the invention the inflatable closed pouch has a volume when inflated being < 10 % larger than the interior volume of the box, the volume preferably being 1% - 3 % larger than the interior volume of the box.

[0020] A second aspect of the present invention provides a packaging system comprising a first and a second packaging device according to any embodiment of the first aspect of the invention, where the first packaging device is placed on top of or next to the second packaging device such that the inflatable closed pouch of the first packaging device contacts the inflatable closed pouch of the second packaging device when the two inflatable closed pouches are inflated.

[0021] A third aspect of the present invention provides a packaging method, comprising the steps of; providing a packaging device according to any embodiment of the first aspect of the invention, filling the pouch of the packaging device with seafood, sealing the pouch of the packaging device, thereby forming an inflatable closed pouch, optionally, purging the inflatable closed pouch with an inert gas, and inflating the inflatable closed pouch such that the inflatable closed pouch conforms to the interior volume of the box, and such that the inflatable closed pouch protrudes a non-zero distance out of at least one opening of at least one wall of the box.

[0022] In an embodiment of the invention the inflatable closed pouch is being inflated with an inert gas.

[0023] Other advantageous features will be apparent from the accompanying claims.

Brief description of the drawings

[0024] In order to make the invention more readily understandable, the description that follows will refer to accompanying drawings, in which:

[0025] Figure 1 is a schematic representation of a packaging device comprising a box and a flexible open pouch, as shown in figure 1a and 1a respectively,

[0026] Figure 2 is a schematic representation of an inflatable closed pouch,

[0027] Figure 3 is a schematic representation of a box having a top wall/lid,

[0028] Figure 4 is a schematic representation of an inflatable closed pouch provided with a gas port/overpressure valve,

[0029] Figure 5 is a schematic representation of a box according to the invention where the box comprises liquid absorbing means positioned in the inner volume of the box,

[0030] Figure 6 is a schematic representation of a box according to the invention where each of the side walls of the box are attached to the bottom wall of the box via a flexible joint,

[0031] Figure 7 is a schematic representation of a packaging device comprising a box and an inflated closed pouch placed in the box, and

[0032] Figure 8 is a schematic representation of a plurality of packaging devices according to the invention stacked on top of each other and next to one another.

Detailed description of the invention

[0033] In the following, general embodiments as well as particular exemplary embodiments of the invention will be described. References will be made to the accompanying drawings. It shall be noted, however, that the drawings are exemplary embodiments only, and that other features and embodiments may well be within the scope of the invention as claimed.

[0034] Unless otherwise defined, all terms of art, notations and other scientific terms or terminology used herein are intended to have the meanings commonly understood by those of skill in the art to which this invention pertains. Certain terms of art, notations, and other scientific terms or terminology may, however, be defined specifically as indicated below.

[0035] A first aspect of the present invention provides a packaging device for transport of seafood. The packaging device comprising a box and a flexible open pouch removably placed inside the box.

[0036] The box 110 comprises, as illustrated in figure 1a, a bottom wall 130 and four side walls 140, where the walls 130,140 define an interior volume 145 therebetween. It will be appreciated that said interior volume 145 may be considered as the same volume as the interior volume of the same box 110 if the latter is provided with a top wall, e.g. a lid. The box 110 may according to the invention for example be a rectangular box 110, but it will be appreciated that other three-dimensional box 110 shapes may be employed. The size of the box 110 may according to the invention vary based on the payload. In some

embodiments the inner volume of the box 110 is 10 litres to 50 litres. In other embodiments the inner volume of the box 110 is 20 litres to 40 litres. In yet other embodiments the inner volume of the box 110 is 35 litres or 40 litres. An example of the inner dimension of a box 110 is 20 cm x 40 cm x 60 cm.

[0037] At least one wall 130,140 of the box 110 is according to the invention provided with at least one opening 150. The latter is schematically illustrated in figure 1a. Said at least one opening 150 constitutes according to the invention at least 15 % of the area of the at least one wall 130,140. The latter means in other words that the area of all the openings in the at least one wall 130,140 constitutes at least 15 % of the total area of that wall 130,140. In some embodiments, said at least one opening 150 constitutes at least 25 % of the total area of the at least one wall 130,140. In other embodiments, said at least one opening 150 constitutes at least 35 % of the total area of the at least one wall 130,140. The at least one wall 130,140 of the box 110 may generally be provided with one or more openings 150.

[0038] It will be appreciated by a person skilled in the art with knowledge of the present invention that any wall 130,140 of the box 110 may be provided with at least one opening 150. Figure 1a schematically illustrates an embodiment of the invention where each wall 130,140 of the box 110 is provided with at least one opening 150. Said at least one opening 150 constitutes according to this embodiment of the invention at least 15 % of the area of each said wall 130,140. The latter means in other words that the area of all the openings in each wall 130,140 constitutes at least 15 % of the total area of that wall 130,140. In some embodiments, said at least one opening 150 constitutes at least 25 % the area of each said wall 130,140. In other embodiments, said at least one opening 150 constitutes at least between 35 % the area of each said wall 130,140. Any wall 130,140 of the box 110 may generally be provided with one or more openings 150, and the number of openings 150 in each wall may vary for each wall 130,140. In an exemplary embodiment of the invention two side walls 140 of the box 110 are each provided with three openings 150 and two sidewalls 140 of the box 110 are each provided with one opening 150.

[0039] Figure 1b schematically illustrates a flexible open pouch 120 of the packaging device 100 according to an embodiment of the invention. An open pouch 120 may in the context of the present invention generally be understood as having at least a pouch opening 165, while a closed pouch 170 may be understood as having no pouch opening 165. An open pouch 120 may thus be considered as a

closed pouch 170 with a pouch opening 165, where the pouch opening 165 for example may be used for the introduction of seafood and ice into the pouch. The pouch opening 165 of the open pouch may be sealed shut such as to form a flexible inflatable closed pouch 170. The sealing operation may be performed though the use of a sealing method such as heat sealing or glue sealing. The resulting inflatable closed pouch 170 will thus comprise an internal volume. An inflatable closed pouch 170 is schematically illustrated in figure 2.

[0040] The inflatable closed pouch formed by sealing shut the flexible open pouch may for example be inflated though a gas port or inflated using an internal source of pressurized gas such as a gas ampule placed inside the open pouch prior to sealing. The inflatable closed pouch may alternatively be inflated by sealing the flexible open poach at a high ambient pressure followed by a transfer of the inflatable closed pouch from the surrounding with high pressure to a surrounding with low pressure.

[0041] The inflatable closed pouch 170 may, as illustrated in figure 4, be provided with a gas port 180. The gas port 180 may be employed in order to inflate the inflatable closed pouch 170, e.g. by employing suitable inflation means such as a pump or a source of pressurized gas. The gas used to inflate the inflatable closed pouch 170 may according to the invention be an inert gas. An inert gas may be preferred when the goods to be transported is a biomass, such as seafood, as the inert gas will not contribute to the degradation of the biomass. Additionally, or optionally the inflatable closed pouch 170 may further be purged with an inert gas prior to inflation, e.g. in order to remove residual oxygen, or other unwanted gasses left inside the inflatable closed pouch 170 after sealing.

[0042] The inflatable closed pouch 170 is according to the invention sized such that it has a volume when fully or partly inflated that is larger than the interior volume of the box. Upon inflation of the inflatable closed pouch 170 in the inner volume of the box the inflatable closed pouch 170 will expand in volume and will consequently start filling the inner volume of the box. Upon continued inflation, the inflatable closed pouch 170 will conform to the inner volume of the box and consequently provide a pressure towards the walls of the box. The pressure generated by the inflatable closed pouch 170 towards the walls of the box will in combination with the flexible nature of the inflatable closed pouch 170 result in the inflatable closed pouch 170 protruding a non-zero distance out of at least one opening 150 of at least one wall of the box. The inflatable closed pouch 170 may, when inflated, protrude out of one or more of the openings 150 of any one or

more walls of the box. The inflatable closed pouch 170 may, when inflated, for example protrude out of each opening 150 of each wall of the box. Any said protrusion may be defined as a protrusion stretching a non-zero distance past an outer surface of a wall of the box. Figure 7 schematically illustrates a packaging device 100 with a lid where an inflated closed poach 170 is located inside a box.

[0043] The flexible open pouch comprises according to the invention a metal-polymer laminate. A metal-based laminate is preferred due to its thermal conductivity. A metal-polymer laminate may generally be considered as a laminate structure comprising one or more layers of a polymer or different polymers and one or more layer of a metal or different metals. A person skilled in the art will appreciate that the flexible nature of the flexible open pouch, and in consequence the inflatable closed pouch, will be determined by parameters such as the thicknesses of each metal layer, the thickness of each polymer layer, the number of metal layers, the number of laminate layers, the exact choice of metal and the exact choice of polymer. A person skilled in the art will further appreciate that different metals and/or polymers may be applied in the same metal-polymer-laminate, and that the metal-polymer may be chosen based on for example the size of the flexible open pouch and/or what the flexible open pouch is intended to store. Examples of polymers that may be employed are polyethylene and/or polypropylene. The metal-polymer laminate comprises according to an embodiment of the invention an aluminium-polymer laminate. Particular examples are aluminium-polypropylene laminate and aluminium-polyethylene laminate. The use of aluminium in the metal-polymer laminate has been found to be beneficial in that aluminium may be rolled with ease to any desired thickness required for obtaining a desired flexibility and strength. Copper and/or tin may alternatively or additionally be employed.

[0044] Figure 3 schematically illustrates a box 110 further comprising a top wall 190 provided with at least one top wall opening 150. Here the top wall 190 may optionally constitute a lid. Said at least one top wall opening 150 constitutes according to the invention at least 15 % of the area of the top wall 190. The latter means in other words that the area of all the top wall openings 150 in the top wall constitutes at least 15 % of the area of the top wall 190. In some embodiments, said at least one top wall opening 150 constitutes at least 25 % the area of the top wall. In other embodiments, said at least one top wall opening 150 constitutes at least between 35 % the area of the top wall. The

internal volume of the box 110 is in this embodiment of the invention the volume enclosed by the top wall 190, bottom wall and the side walls of the box 110.

[0045] The packaging device 100 according to the invention may be used for example for transport of temperature sensitive goods, such as seafood or other biomasses, optionally together with ice. A plurality of packaging devices 100 may according to the invention be employed in order to create a packaging system, where multiple packaging devices 100 are stacked on top of each other and/or next to each other such that thermal contact is obtained between adjacent packaging devices 100. Figure 8 schematically illustrates multiple packaging devices 100 according to the invention where the packaging devices 100 are stacked on top of each other and next to each other. The thermal contact is obtained by arranging two packaging devices such that the inflatable closed pouches protruding from the box of each packaging device 100 are brought into contact with each other. The latter may be obtained by aligning an opening of the box of one packaging device 100 with an opening of the box of another packaging device 100. The closed pouches protruding out of each respective opening may thus be brought into contact with each other such as to enable thermal connection between the two. The contact between the inflatable closed pouches of two packaging devices will due to the thermal conductivity of the metal-laminate structure of each inflatable closed pouch cause a thermal connection between the two. The inflatable closed pouches of two adjacent packaging devices may thus be considered to constitute one thermal unity. It will be appreciated that openings may be provided in the box of any packaging device such that the openings align with openings of the box of another packaging device placed next to or on top of it.

[0046] As a way of example, the goods to be transported may initially be placed inside the flexible open pouch before the flexible open pouch is sealed shut into an inflatable closed pouch. The inflatable closed pouch may following the sealing action be placed inside a box and subsequently be inflated. The inflation makes the inflatable closed pouch increase in volume, and consequently causes the inflatable closed pouch to conform to the interior volume of the box and to press against the walls and the openings of the walls of the box. The pressure against an opening of a wall of the box causes the inflatable closed pouch to protrude a non-zero distance out of this opening. Said protrusion means that two packaging devices consequently may be placed side by side or on top of each other such that the inflatable closed pouches of the two packaging devices can be brought

into contact with each other. The latter may, as stated above, be achieved by aligning one or more openings of the box of one packaging device with one or more openings of the box of the other packaging device.

[0047] The degree of the thermal connection between the inflatable closed pouches of two adjacent packaging devices will depend inter alia on how large a portion of the inflatable closed pouches that are adjoining each other. The latter will at least in part be dependent on the size of the opening/openings of the adjoining walls of the box of the two adjoining packaging devices. The size of an opening in a wall of a box of a packaging device will typically determine how much of the inflatable closed pouch of that packing device that will protrude out of said opening upon inflation of the inflatable closed pouch. It has been discovered that in order for adequate thermal contact to occur between the inflatable closed pouches of two adjoining packaging devices that the area of all the openings in any one wall of the box of a packaging device has to constitute at least 15 % of the total area of that wall. What is considered "adequate" will be appreciated by the person skilled in the art to vary dependent on how much of a thermal unity it is desirable to obtain between a group of adjacent packaging devices, the alignment of the packaging devices, the temperature surrounding the group of adjacent packaging devices, as well as the number of packaging devices in the group of adjacent packaging devices. 15 % has nonetheless been found to be a desirable lower limit for most cases for how much of the area of at least one wall or each wall of the box of a packaging device that has to constitute one or more openings.

[0048] The thermal contact achieved between the inflatable closed pouches of two adjacent packaging devices will typically increase with the size of the openings in the adjoining walls of each box of the adjacent packaging devices. The upper limit for how large a portion of any wall of the box of a packaging device that may constitute openings is set at least in part by the desire to maintain a rigidity of the box. It has been discovered that in order to maintain sufficient rigidity in a packaging device that the area of all the openings in any one wall of the box of a packaging device has to constitute at most 98 % of the area of that wall. At the latter limit any wall of a box of a packaging device may for example comprise a metal grating. In some embodiments, at least one wall or each wall of the box is provided with at least one opening and said at least one opening constitutes at most 55 % of the area of said least one wall or each said wall. In other embodiments, at least one wall or each wall of the box is provided with at least

one opening and said at least one opening constitutes at most 75% of the area of said least one wall or each said wall. In yet other embodiments, at least one wall or each wall of the box is provided with at least one opening and said at least one opening constitutes at most 98% of the area of said least one wall or each said wall.

[0049] At least one wall or each wall of the box may consequently according to the invention be provided with at least one opening where said at least one opening constitutes 15% - 55 % of the area of each said wall. In other embodiments, at least one wall or each wall of the box is provided with at least one opening and said at least one opening constitutes 25% - 75% of the area of each said wall. In yet other embodiments, at least one wall or each wall of the box is provided with at least one opening and said at least one opening constitutes 35 % - 98% of the area of each said wall.

[0050] The box of a packing device may according to the invention be configured such that two packaging devices of the same type may be stacked on top of one another and/or next to one another. The box of the packaging device according to the invention may thus be shaped such that it may be stacked on top of another box of the same type. The shape of a box may in any embodiment of the invention be a rectangular box. Other three-dimensional box shapes may alternatively be employed. The walls of the box may according to the invention be sufficiently solid/strong such that a box of a packing device having multiple packing devices stacked on top of it won't deform in such a manner that the stack tip over or the payload become damaged.

[0051] The walls of a box of a packing device may according to an embodiment of the invention be rigid, or the box as a whole may be rigid. It will be appreciated by a person skilled in the art that that the exact rigidity of the box or the rigidity of the walls of the box may be determined such that the box maintains it shape when the box contains an inflatable closed pouch that is inflated or is being inflated. The latter enables multiple boxes of the same type to be stacked and transported together in a closely packed order without being compressed out of shape due to the weight of the payload. Multiple packaging devices of the same type may thus be stacked such that the inflatable closed pouches of adjacent packaging devices are adjoining, hence enabling a thermal contact between the two adjacent packaging devices. In some embodiments a box or any wall of a box may be made at least in part from plastic or metal. In other embodiments a box or any wall of a box be made at least in part from a composite material or a

glass fibre laminate. In yet another embodiment a box or any wall of a box be made at least in part from cardboard. Cardboard may in some cases be preferred due to its properties of being light, bio-degradable and cheap.

[0052] Figure 2 illustrates an embodiment of the invention where the inflatable closed pouch 170 takes on a rectangular shape, or in practice an essentially rectangular shape, when inflated. The flexible open pouch of the packaging device will in this embodiment thus have a shape that when sealed shut and inflated takes on a rectangular shape, or in practice an essentially rectangular shape. The term "essentially rectangular" is here employed, as it will be understood by a person skilled in the art that a sealed inflated closed pouch made from a metal-polymer laminate will in practice not be perfectly rectangular. The latter results inter alia from the joints created when joining the edges of the metal-polymer laminate when the laminate is formed into a pouch, but also from the edge created when sealing the pouch shut. The term "essentially rectangular" may be considered as a shape having at least six well defined sides, where two or more of the six sides are separated by a well-defined joint.

[0053] In a particular embodiment of the invention, the inflatable closed pouch has a volume when inflated being < 10 % larger than the interior volume of the box. Such a small volume difference between the inflatable closed pouch when inflated and the internal volume of the box may be preferable inter alia for minimizing material use and for maximizing payload capacity within the interior volume of the box. The latter may be understood in that a larger inflatable closed pouch relative to the internal volume of the box will result in a larger volume of the internal volume of the box being occupied by the inflatable closed pouch, and thus a smaller volume for a payload. The inflatable closed pouch may in some embodiments have a volume when inflated being 1 – 20 % larger than the interior volume of the box. The inflatable closed pouch may in other embodiments have a volume when inflated being 5 – 10 % larger than the interior volume of the box. The inflatable closed pouch may in yet other embodiments have a volume when inflated being 1 – 3 % larger than the interior volume of the box.

[0054] The packaging device is generally intended for transport of seafood, but it will be appreciated that the packaging device is also suitable for transport of other goods. As seafood is often packaged and transported in humid environments, the box of the packaging device is in an embodiment of the invention made at least in part from a water repellent material. The box of the packaging device may

alternatively be coated with a water repellent material. The use of a water repellent material for the box is beneficial inter alia in that the boxes are easier to clean. As a way of example, a box of a packaging device may be made largely from cardboard, which is beneficial inter alia due to low cost and low weight. However, as cardboard is non-resistant to water, it may easily loose its rigidity and general strength if exposed to water. Materials such as cardboard may thus for example be coated with a water-resistant material, e.g. a polyurethane coating, or clear acrylic spray paint. A lacquer spray or sealer spray may alternatively be used.

[0055] Figure 5 schematically illustrates an embodiment of the invention where the packaging device further comprises liquid absorbing means 200 positioned in the inner volume of the box 110. Such liquid absorbing means 200 may generally contribute to absorbing liquid that may originate from e.g. condensation, a leaking inflatable closed pouch, moisture, or similar. Examples of liquid absorbing means are a pad of cotton, hemp, bamboo, microfiber, and plastic fibres such as PLA or PU.

[0056] Figure 6 is a schematic illustration of a box 110 of a packing device according to the invention where each of the side walls 140 of the box 110 is attached to the bottom wall 130 of the box 110 via a flexible joint 210. The employment of flexible joints 210 between the side walls 140 and the bottom wall 130 of the box 110 may enable for example folding of the box 110. It will be appreciated by a person skilled in the art that a flexible joint 210 in this context may depend on the material used for the box 110 of the packaging device. A box 110 made from plastic may for example be provided with a flexible joint 210 in the form of a hinge, while a cardboard box may for example be provided with a flexible joint 210 such as a fold.

[0057] Figure 4 is a schematic illustration of an embodiment of the invention where the flexible open pouch 120 is provided with an overpressure valve 185. Sealing of said flexible open pouch 120 into an inflatable closed pouch will result in the latter being provided with an overpressure valve 185. An overpressure valve 185 may be utilized e.g. if the packaging device is intended for air travel. The pressure difference experiences by an inflatable closed pouch during air travel may result in an overpressure inside the inflatable closed pouch, an overpressure valve 185 may thus be utilized in order to compensated for the overpressure.

Claims:

1. A packaging device (100) for transport of seafood, the packaging device (100) comprising a box (110) and a flexible open pouch (120) removably placed inside the box (110), where
   the box (110) comprises a bottom wall (130) and four side walls (140) defining an interior volume therebetween,
      wherein at least one wall (130,140) of the box (110) is provided with at least one opening (150), and wherein said at least one opening (150) constitutes at least 15 % of the area of said at least one wall (130,140),
   and where
   the flexible open pouch (120) comprises a polymer-metal laminate (160); the flexible open pouch (120) being configured to be sealed shut such as to form an inflatable closed pouch (170), wherein
      the inflatable closed pouch (170) conforms to the interior volume of the box (110) when inflated, and wherein
      the inflatable closed pouch (170) has a volume when inflated being larger than the interior volume of the box (110) such that the inflatable closed pouch (170), when inflated, protrudes a non-zero distance out of at least one opening (150) of the at least one wall (130,140) of the box (110).

2. The packaging device (100) according to claim 1, wherein each wall (130,140) of the box (110) is provided with at least one opening (150), wherein said at least one opening (150) constitutes at least 15 % of the area of each said wall (130,140), and wherein the inflatable closed pouch (170) has a volume when inflated being larger than the interior volume of the box (110) such that the inflatable closed pouch (170), when inflated, protrudes a non-zero distance out of at least one of the openings (150) of the walls (130,140) of the box (110).

3. The packaging device (100) according to claim 1 or 2, where the flexible open pouch (120) further comprises a gas port (180), and where the flexible open pouch (120) is configured to be sealed shut such as to form an inflatable closed pouch (170) that is inflatable via the gas port (180).

4. The packaging device (100) according to any one of the preceding claims, where the box (110) further comprises a top wall (190), where the top wall (190) is

provided with at least one top wall opening (150), and wherein said at least one top wall opening (150) constitutes at least 15 % of the area of the top wall (190).

5. The packaging device (100) according to claim 4, where at least part of the top wall (190) constitutes a lid (190).

6. The packaging device (100) according to any one of the preceding claims, where the packaging device (100) further comprises liquid absorbing means (200) positioned in the inner volume of the box (110).

7. The packaging device (100) according to any one of the preceding claims, where the inflatable closed pouch (170) has an essentially rectangular shape when inflated.

8. The packaging device (100) according to any one of the preceding claims, where the box (110) is water repellent.

9. The packaging device (100) according to any one of the preceding claims, where the walls (130,140,190) of the box (110) are rigid.

10. The packaging device (100) according to any one of the preceding claims, where each of the side walls (140) of the box (110) are attached to the bottom wall (130) of the box (110) via a flexible joint (210).

11. The packaging device (100) according to any one of the preceding claims, where the flexible open pouch (120) comprises a polymer-aluminium laminate.

12. The packaging device (100) according to any one of the preceding claims, where any opening/openings (150) of any one wall (130,140,190) of the box (110) constitutes/constitute at most 55 % of the area of said wall (130,140,190), alternatively at most 75 % of the area of said wall (130,140,190), or alternatively at most 98 % of the area of said wall (130,140,190).

13. The packaging device (100) according to any one of the preceding claims, where the flexible open pouch (120) is provided with an overpressure valve (185).

14. The packaging device (100) according to any one of the preceding claims, where the inflatable closed pouch (170) has a volume when inflated being < 10 % larger than the interior volume of the box (110), the volume preferably being 1% - 3 % larger than the interior volume of the box (110).

15. A packaging system comprising a first and a second packaging device (100) according to any one of the claims 1 - 14, where the first packaging device (100) is placed on top of or next to the second packaging device (100) such that the inflatable closed pouch (170) of the first packaging device (100) contacts the inflatable closed pouch (170) of the second packaging device (100) when the two inflatable closed pouches (170) are inflated.

16. A packaging method, comprising the steps of
    a. providing a packaging device (100) according to any one of the claims 1 – 14,
    b. filling the pouch of the packaging device (100) with seafood or other biomasses,
    c. sealing the pouch of the packaging device (100), thereby forming an inflatable closed pouch (170),
    d. optionally, purging the inflatable closed pouch (170) with an inert gas, and
    e. inflating the inflatable closed pouch (170) such that the inflatable closed pouch (170) conforms to the interior volume of the box (110), and such that the inflatable closed pouch (170) protrudes a non-zero distance out of at least one opening (150) of at least one wall (130,140,190) of the box (110).

17. A packaging method according to claim 16, wherein in step e) the inflatable closed pouch (170) is being inflated with an inert gas.

Drawings

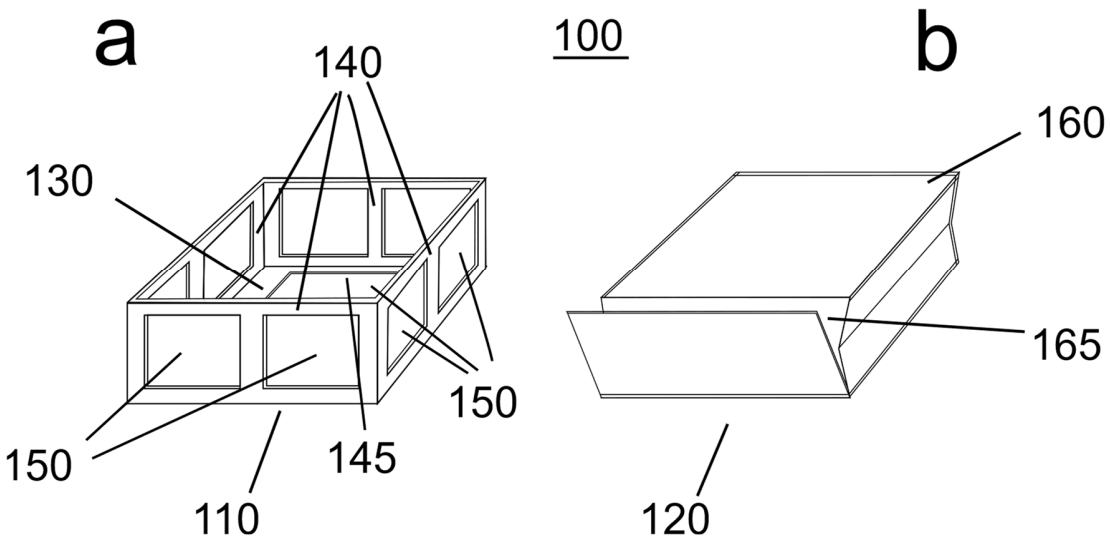


Figure 1

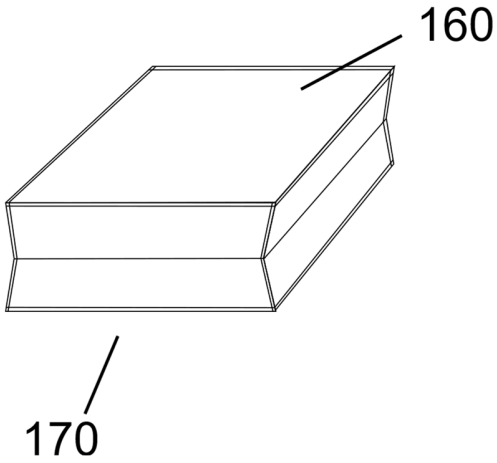


Figure 2

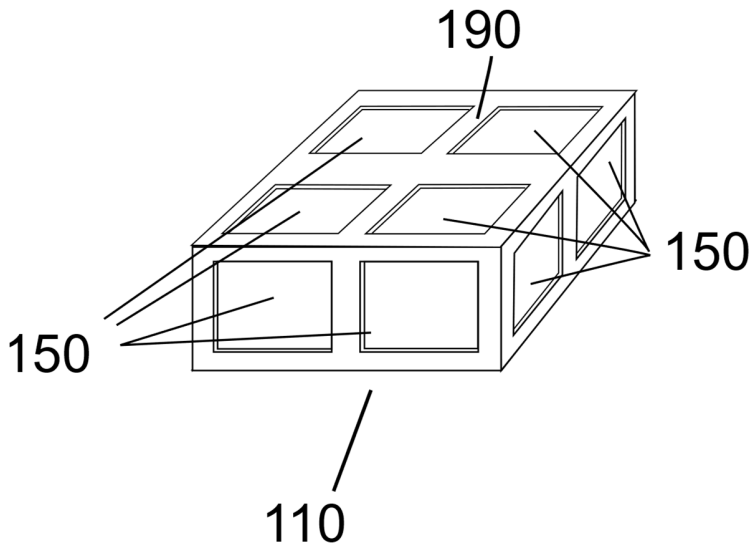


Figure 3

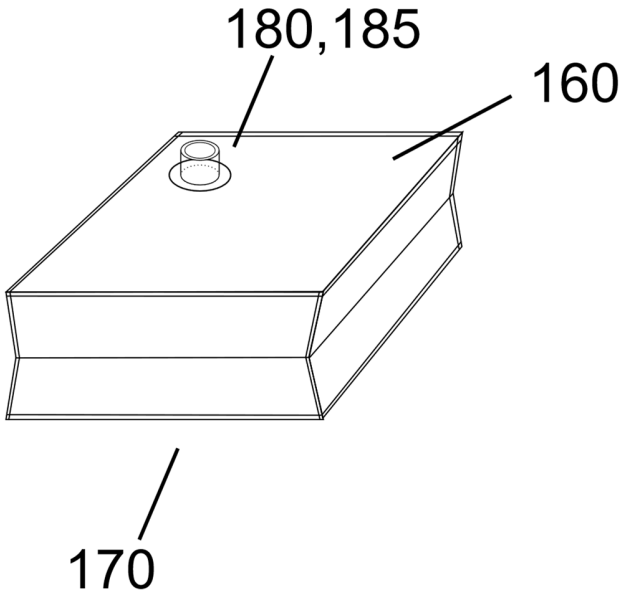


Figure 4

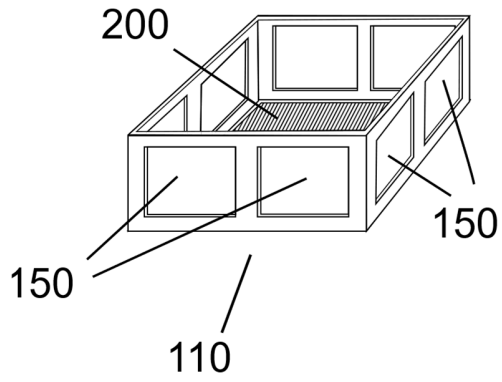


Figure 5

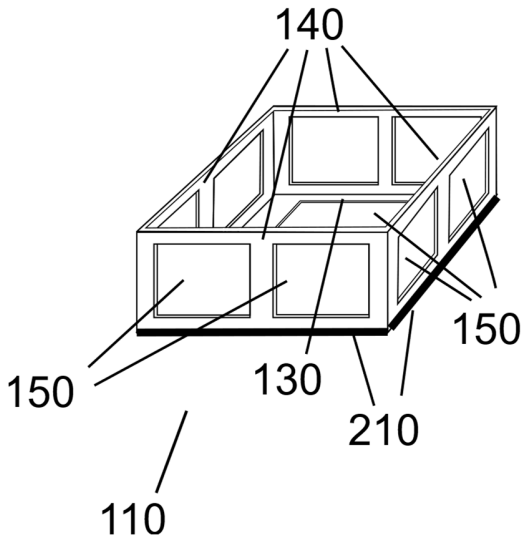


Figure 6

100

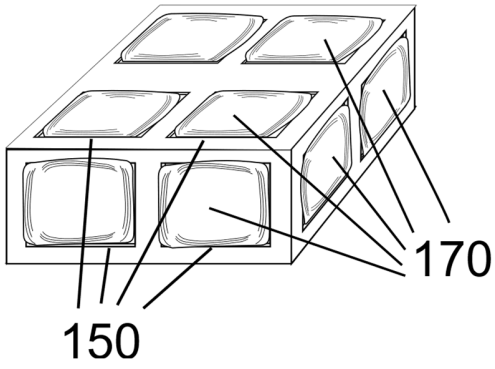


Figure 7

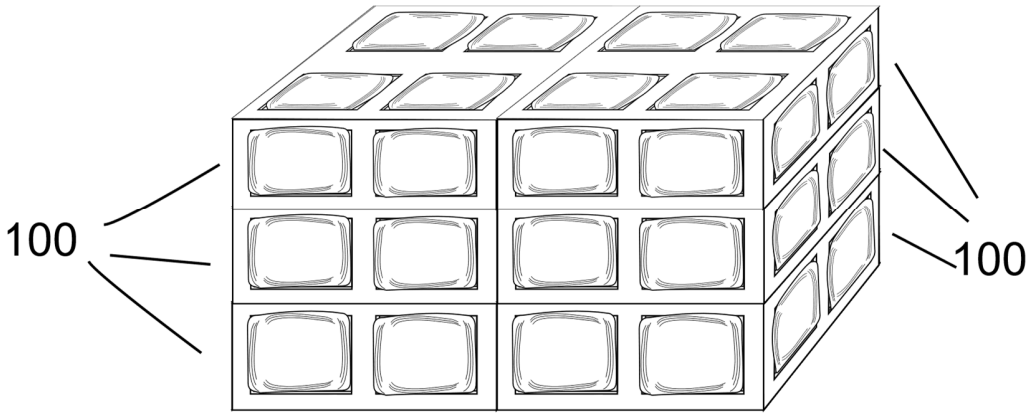


Figure 8