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(54) PACKAGING FOR PERISHABLE GOODS

(57) Packaging (1) for perishable goods, comprising a container (2) and insulating pads (3), both the container and said insulating pads being substantially composed of cellulose fibers, which insulating pads are placeable adjacent to inner walls of the container, wherein the insulating pads are embodied as one or more paper bags (10) containing said cellulose fibers which are embodied as flakes.

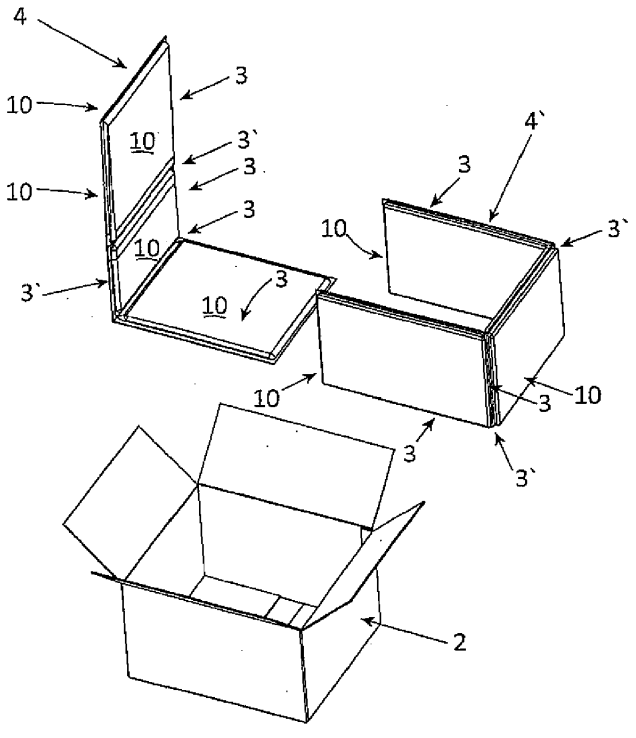

FIG. 1A

EP 3 112 289 A1

Description

[0001] The invention relates to a packaging for perishable goods, comprising a container and insulating pads, both the container and said insulating pads being substantially composed of cellulose fibers, which insulating pads are placeable adjacent to inner walls of the container.

[0002] Such a packaging is known from WO2013/070622, which document discloses an insulated shipping system comprising a container and an insert formed from two blanks that cooperate together to form a cavity within the container that is as much as possible thermally isolated from the outside. Both the container and the two blanks are formed from paper, paperboard or corrugated paperboard. The system is manufactured or assembled without adhering materials. The two blanks of the insert for the container are provided with insulating pads fabricated from cellulose fibers.

[0003] The use of cellulose fibers in isolating packaging has been a subject that has attracted the interest of skilled person's for many years.

[0004] US 2,049,779 which is published August 4, 1936 already disclosed a refrigerating container for ice cream with a container having walls made from corrugated paperboard or fibrous material, and a liner which is preferably made from corrugated paperboard with the corrugations running upwardly and downwardly of the container.

[0005] US 2,071,303 which is published February 16, 1937 discloses a carbon dioxide ice carton for insertion in an outer customer carton comprising an outer multiply paper wrapping, with a recess adapted for the reception of a carbon dioxide ice cake.

[0006] US 2,289,060 which is published July 7, 1942 discloses a corrugated paper carton container provided with pads on the bottom and side walls of the container, each pad consisting of a paper or fabric bag containing dry flour in which is embedded a cake of dry ice spaced from the walls of the pads.

[0007] US 2,467,268 which is published April 12, 1949 discloses a shipping package comprising a carton containing a refrigerant chamber and a pair of refrigerated chambers arranged one above and one below the refrigerant chamber. Cooling is done with dry ice.

[0008] DE 92 07 312 which is published September 24, 1992 and DE 295 02 742 which is published March 28, 1996 each disclose a packaging according to the preamble of the main claim, comprising a container and insulating pads, wherein both the container and said insulating pads are substantially composed of cellulose fibers, which insulating pads are placeable adjacent to inner walls of the container, and wherein the insulating pads are embodied as one or more paper bags containing cellulose fibers that are embodied as flakes.

[0009] Also in the 21st century research has been going on. US 2003/0145561 published August 7, 2003 discloses a packing product including a container, one or more crumpled sheet pads positioned in the container, one or more face sheets positioned adjacent to the crumpled sheet pads, wherein a perishable article can be positioned in the container in at least partial abutting relation to the one or more face sheets. Both the crumpled sheet pads and the face sheets are made of paper.

[0010] One of the problems that the prior art does not solve is to provide an industrially applicable and acceptable way of handling cellulose fibers in the sense that the fibers can be applied in a manner to take full advantage of their heat (or cold) insulating capacity on the one hand, and on the other hand to use the fibers on large scale without being hindered by their volatile nature which makes the handling of cellulose fibers cumbersome.

[0011] It is a first object of the invention to provide a solution for this problem.

[0012] It is another object of the invention to provide a packaging for perishable goods that is capable to meet nowadays requirements for foodstuffs, that is that the goods can be maintained for at least 13 hours at a temperature of less than -15°C, when starting with a temperature of -25°C.

[0013] It is still another object of the invention to provide a packaging which is perfectly suited for recycling, without requiring bothersome additional handling which would otherwise be required by the user of the packaging.

[0014] It is still another object of the invention to provide an alternative packaging for the retail industry, which currently still makes use of reusable packaging placing a high burden on their organizational, financial, administrative and logistic capacity.

[0015] These and other objects of the invention, as well as advantages that may be obtained thereby and that will become apparent from the following disclosure, are provided by the packaging according to any one of the appended claims.

[0016] In a first aspect of the invention the paper of the paper bags of the insulation pads has an air permeability better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, and most preferably in the range of 3 - 5 seconds Gurley. This feature assists that the cellulose fiber flakes in the bags can be effectively equalized for effective insulation and compressed for effective storage and transport of the insulation pads. Air permeability expressed in Gurley is the inverse of air resistance which is the resistance to the passage of air, offered by a paper structure, when a pressure difference exists across the boundaries of the paper specimen. It is quantified by obtaining the time for a given volume of air to flow through a paper specimen of given dimensions under a specified pressure, pressure difference, temperature, and relative humidity.

[0017] As mentioned the insulating pads of the packaging are embodied as one or more bags containing cellulose fibers which are embodied as flakes. The cellulose fibers are preferably sourced from used paper sheets

and carton board (bleached and unbleached) which is intensively shredded and grinded to a low density substance with a low heat conduction coefficient 0,036 [W/m. K] and a specific heat of 2200 [J/Kg.K]. The cellulose fibers are grinded to provide the fibers with a firm structure which will not settle in time.

[0018] Using cellulose fibers serves several purposes. The cellulose fiber structure is capable of absorbing mechanical impact to protect fragile goods during transportation. The cellulose fiber structure is soft and deformable in a way that the original volume will return after release of the pressure at the structure. Further, the cellulose fibers and the air permeable paper bags are fully reusable and recyclable.

[0019] Providing the cellulose fibers in the form of flakes improves the insulating properties of the insulating pads. Providing these flakes in bags makes the fibers very easy to handle, without there being any hindrance caused by the inherent volatile nature of the fibers. Providing the bags as paper bags is preferable because of its ease of recycling. The paper of the paper bags can be selected according to the needs of the case; normal paper or open paper can be used or any suitable combination thereof. Preferable the paper is moist-resistant.

[0020] Otherwise it is preferable that the cellulose fibers of the flakes are treated or coated with a lubricant, preferably linseed oil or silicones. This enables that the fibers can be more or less uniformly distributed within the paper bags without sticking to each other. This secures that the insulating capacity of the pads is present at all parts of the pads.

[0021] It is very beneficial for the insulating properties that the flakes are free from fire retardants. Fire retardants should therefore be avoided.

[0022] In some situations the flakes can be composed of shredded recycled liner material for self-adhesive labels. It is remarked that EP 2 363 544 discloses shredded recycled liner material for self-adhesive labels to be used within insulation material, however according to this document the shredded material should always be combined with a flame retardant which goes against the better insights of the instant invention. The instant invention is therefore outside the scope of EP 2 363 544.

[0023] One of the preferential aspects of the invention is that the paper bags of the insulation pads are composed of paper that is air permeable. Suitably the paper that can be used for the paper bags of the insulation pads is an open paper. It is further possible that the paper of the paper bags is porous and/or perforated in order to optimize the temperature control within the container.

[0024] Still another feature of the packaging of the invention is that it includes an inner lining wherein the one or more paper bags of the insulation pads are received between the inner walls of the container and said inner lining. Such an inner lining protects the integrity of the paper bags, so that it is also possible to transport sharp goods within the container without danger that the paper bags will be damaged and that the cellulose fibers escape therefrom. Another advantage is that the insulation pads are quite well maintained at their desired thickness which promotes that the fibers in the bags are also maintained at a uniform distribution within the paper bags without sticking to each other.

[0025] The inner lining is preferably provided with a height that is lower than the height of the insulation pads within the packaging. This enables a complete covering of the goods by the insulation pads.

[0026] Preferably also the said inner lining substantially comprises cellulose fibers. This secures the ease of recycling of the complete packaging without taking it apart in separate pieces, and contributes in providing a mono material packaging.

[0027] It is particularly useful that the said inner lining comprises perforations. Such perforations promote heat or cold transfer within the packaging by enabling gas passing through.

[0028] In a particular embodiment the said inner lining comprises perforations with larger dimensions and/or in a higher number near to the container's bottom then near to the container's top or lid. This is very effective when the content of the packaging is to be kept refrigerated as long as possible, so that the colder gases which are closer to the bottom can more easily migrate through the perforations that are provided near the bottom of the container.

[0029] One other preferential feature of the packaging of the invention is that the one or more paper bags are flexible. Particularly this feature applies to the paper bag that will be provided on top to cover the perishable goods, since excess air just above the perishable goods can thus as much as possible be removed, which diminishes the energy exchange within the container.

[0030] The inner lining defines an inner space within the container equipped to receive a perishable good and/or preferably one or more cooling packs. The one or more cooling packs comprise for instance a packaged cooling gel and/or packaged dry ice.

[0031] As one of the advantages of the invention the packaged dry ice is preferably dry ice wrapped in a paper bag. Thus the packaging of the invention can truly be said to be a mono material packaging, which makes the packaging fully recyclable for the paper industry.

[0032] Consistent with the earlier mentioned paper bags containing the cellulose fibers, it is preferable that the paper of the paper bag containing the dry ice is also provided with the properties of being air permeable and/or being an open paper and/or is provided with an air permeability of better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, most preferably in the range of 3 - 5 seconds Gurley, and/or is porous and/or perforated.

[0033] The invention will hereinafter be further elucidated with reference to the drawing of an exemplary embodiment of a packaging according to the invention that is not limiting as to the appended claims.

[0034] In the drawing:

- figure 1A, 1B, and 1C show stadia in assembling an packaging according to the invention;
- figure 2A, 2B, and 2C show filling of the packaging according to the invention;
- figure 3 shows a cross-section of the packaging of the invention with an open top;
- figure 4A and 4B show the packaging of the invention with an open top and with a lifted covering insulating pad in a cross-sectional view and in an isometric view respectively;
- figure 5A and 5B show the packaging of the invention with an open top as shown in figure 3 in two different isometric views; and
- figure 6 shows the closed packaging of the invention.

[0035] Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

[0036] Figures 1A, 1B and 1C show the assembly of the packaging of the invention. The packaging which is hereinafter to be referred to with reference 1, comprises a container 2 and insulating pads 3 as shown in two separate sets 4, 4' in figure 1A. Both the container 2 and said insulating pads 3 are substantially composed of cellulose fibers. The insulating pads 3 are placeable adjacent to inner walls of the container 2 as shown in figure 1C. Figure 1A and 1B show that each of the two separate sets 4 and 4' of pads 3 comprises multiple pads 3 which are linked to each other through thinner connecting portions 3'. The said thinner connecting portions can also be dispensed with.

[0037] From figure 1C it will be clear that the two sets 4, 4' of insulating pads 3 that are positioned within the container 2 can completely enclose a space 11 within the container 2 to receive a perishable good. Figure 1C also shows an inner lining 5 immediately prior to it being positioned in the container 2.

[0038] Turning now to figure 2A the packaging 1 of the invention is shown after its completion, wherein the container 2 is provided with the respective sets 4, 4' of insulating pads 3, as well as with the inner lining 5. It can be noted that the insulating pads 3 are received between the inner walls of the container 2 and said inner lining 5.

[0039] According to the invention the insulating pads 3 are embodied as paper bags 10 (that as the skilled person knows are made of cellulose fibers), and are filled with cellulose fibers in the form of flakes. These cellulose fibers of the flakes are preferably treated or coated with a lubricant such as lineseed oil or silicones, and are free from fire retardants. Preferably the flakes are composed of shredded recycled paper material which is free of health risk volatile substances, such as printing ink. It is further possible but not required that the flakes are composed of shredded recycled liner material for self-adhesive labels.

[0040] The paper bags 10 of the insulating pads 3 are preferably composed of paper that is air permeable, such as a so-called open paper. It is found advantageous that the paper of the paper bags 10 has an air permeability better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, and most preferably in the range of 3 - 5 seconds Gurley. It is also possible that the paper of the paper bags 10 forming the insulating pads 3 is porous and/or perforated.

[0041] Also the inner lining 5 preferably comprises cellulose fibers. As can be seen from the respective figures 1C, 2A, 2B and 2C the said inner lining 5 comprises perforations 6. In figure 2A it can be seen that the perforations 6 have larger dimensions and/or are in a higher number near to the container's bottom 2' then near to the container' s lid or top 2".

[0042] Turning again to figure 2A, different objects are shown to be provided in the packaging 1 of the invention. It shows dry ice packs 7, the actual product 8 to be refrigerated and embodying a perishable good, and a couple of cooling packs in the form of packaged cooling gels 9. The dry ice packs 7 are preferably embodied as dry ice wrapped in a paper bag 7'. Preferably also the paper of the dry ice packs 7 is provided with the properties of being air permeable and/or being an open paper and/or is provided with an air permeability of better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, most preferably in the range of 3 - 5 seconds Gurley, and/or is porous and/or perforated.

[0043] In figure 2B the said dry ice packs 7, the actual product 8, and the packaged cooling gels 9 are placed within the inner space 11 delimited by the liner 5, and in figure 2C one of the insulating pads 3 is moved down as a cover on the product 8 and on the packaged cooling gels 9 on top of the product 8. It is particularly useful if the paper bag 10 of this covering insulating pad 3 is flexible to remove excess air just above product 8 and cooling gels 9.

[0044] Figure 3 provides in a cross-sectional view a clear picture of how the product 8 is eventually sandwiched between the dry ice packs 7 supporting the product 8, and above the product 8 the covering insulating pad 3. Between the covering insulating pad 3 and the product 8 preferably the packaged cooling gels 9 can be provided. This is clearly shown in figure 4A and figure 4B, showing the packaging 1 of the invention with an open top and with a lifted covering insulating pad 3 in a cross-sectional view (figure 4A) and in an isometric view (figure 4B) respectively.

[0045] Figure 5A and figure 5B show the assembly of figure 3 in two different isometric views, each time with the top of the container 2 being open.

[0046] Finally figure 6 shows the closed packaging 1 of the invention enclosing and thermally isolating a product to be transported with the packaging of the invention. The packaging can also include auxiliary material such as said dry ice packs and/or cooling gels for keeping the

temperature of the product at a desired low value within prescribed limits. It is to be understood that the packaging 1 of the invention cannot only be used for cooled transport of products but also for transporting of products that need to be kept at an elevated temperature or at room temperature without being disturbed by outside differing temperatures. Evidently in the latter situation auxiliary material such as the dry ice packs and cooling gels are dispensed with.

[0047] Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the apparatus of the invention, the invention is not restricted to this particular embodiment which can be varied in many ways without departing from the gist of the invention. The discussed exemplary embodiment shall therefore not be used to construe the appended claims strictly in accordance therewith. On the contrary the embodiment is merely intended to explain the wording of the appended claims without intent to limit the claims to this exemplary embodiment. The scope of protection of the invention shall therefore be construed in accordance with the appended claims only, wherein a possible ambiguity in the wording of the claims shall be resolved using this exemplary embodiment.

Claims

1. Packaging (1) comprising a container (2) and insulating pads (3), both the container (2) and said insulating pads (3) being substantially composed of cellulose fibers, which insulating pads (3) are placeable adjacent to inner walls of the container (2), wherein the insulating pads (3) are embodied as one or more paper bags (10) containing cellulose fibers that are embodied as flakes, **characterized in that** the paper (10) of the paper bags has an air permeability better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, most preferably in the range of 3 - 5 seconds Gurley.

2. Packaging according to claim 1, **characterized in that** the paper of the paper bags is moist resistant.

3. Packaging according to any one of claims 1 or 2, **characterized in that** the cellulose fibers of the flakes are treated or coated with a lubricant, preferably linseed oil or silicones.

4. Packaging according to any one of claims 1 - 3, **characterized in that** the paper of the paper bags (10) is an open paper.

5. Packaging according to any one of claims 1 - 4, **characterized in that** the paper of the paper bags (10) is porous and/or perforated.

6. Packaging according to any one of the previous claims 1 - 5, **characterized in that** it includes an inner lining (5) wherein the one or more paper bags (10) are received between the inner walls of the container (2) and said inner lining (5).

7. Packaging according to any one of the previous claims 1 - 6, **characterized in that** the inner lining (5) is provided with a height that is lower than the height of the insulation pads (3) within the packaging.

8. Packaging according to claim 6 or 7, **characterized in that** the said inner lining (5) substantially comprises cellulose fibers.

9. Packaging according to claim 6, 7 or 8, **characterized in that** the said inner lining (5) comprises perforations (6).

10. Packaging according to any one of claims 6 - 9, **characterized in that** the said inner lining (5) comprises perforations (6) with larger dimensions and/or in a higher number near to the container's bottom (2') then near to the container' s top (2'').

11. Packaging according to any one of the previous claims 1 - 10, **characterized in that** the one or more paper bags (10) are flexible.

12. Packaging according to any one of the previous claims 6 - 11, **characterized in that** the inner lining (5) defines an inner space (11) within the container (2) equipped to receive a perishable good (8) and/or one or more cooling packs (7, 8).

13. Packaging according to claim 12, **characterized in that** the one or more cooling packs (7, 8) comprise a packaged cooling gel (8) and/or packaged dry ice (7).

14. Packaging according to claim 13, **characterized in that** the packaged dry ice (7) is dry ice wrapped in a paper bag (7').

15. Packaging according to claim 14, **characterized in that** the paper of the paper bag (7') containing the dry ice is provided with the properties of being air permeable and/or being an open paper and/or is provided with an air permeability of better than 10 seconds Gurley, preferably better than 8 seconds Gurley, more preferably better than 6 seconds Gurley, most preferably in the range of 3 - 5 seconds Gurley, and/or is porous and/or perforated.

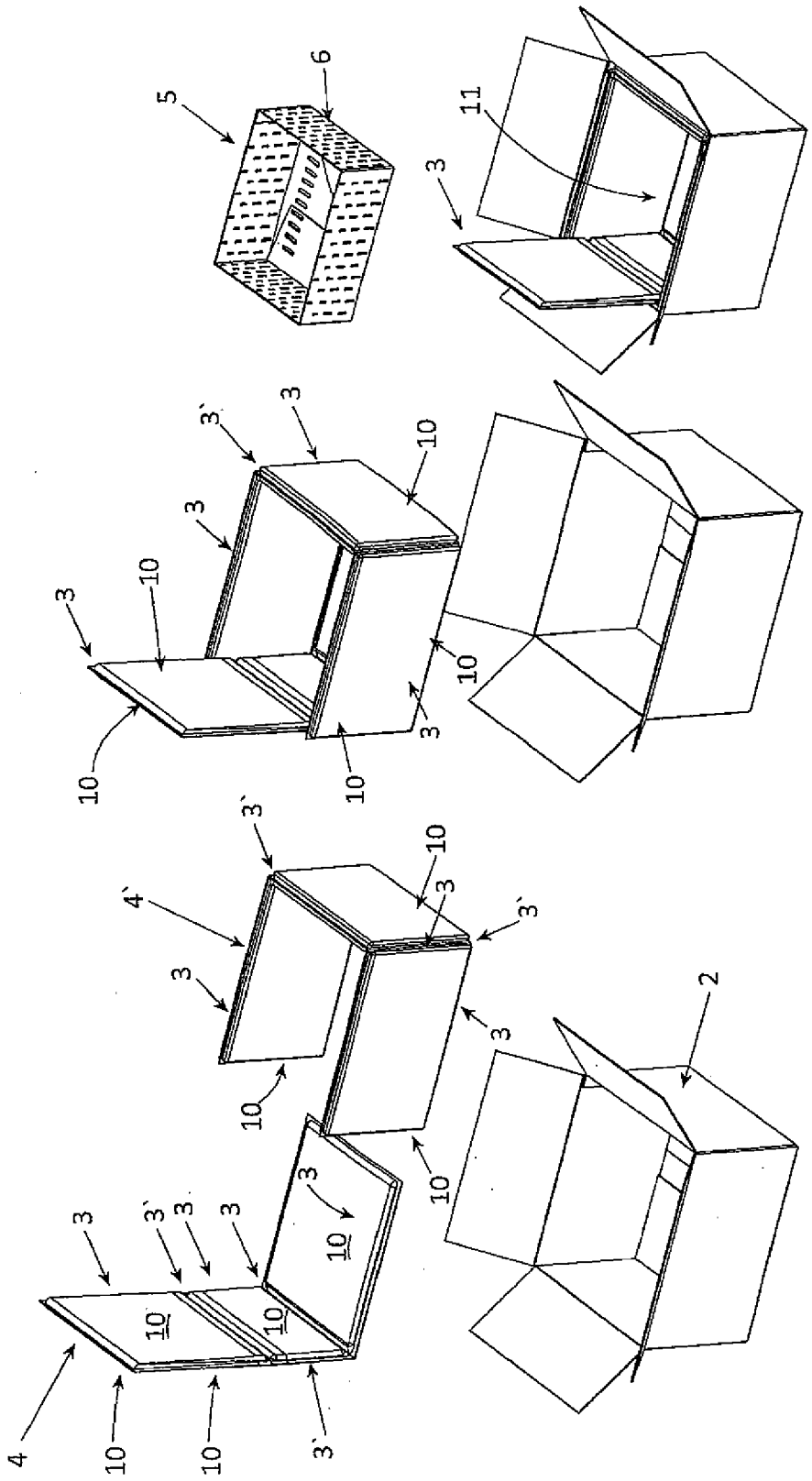

FIG. 1C

FIG. 1B

FIG. 1A

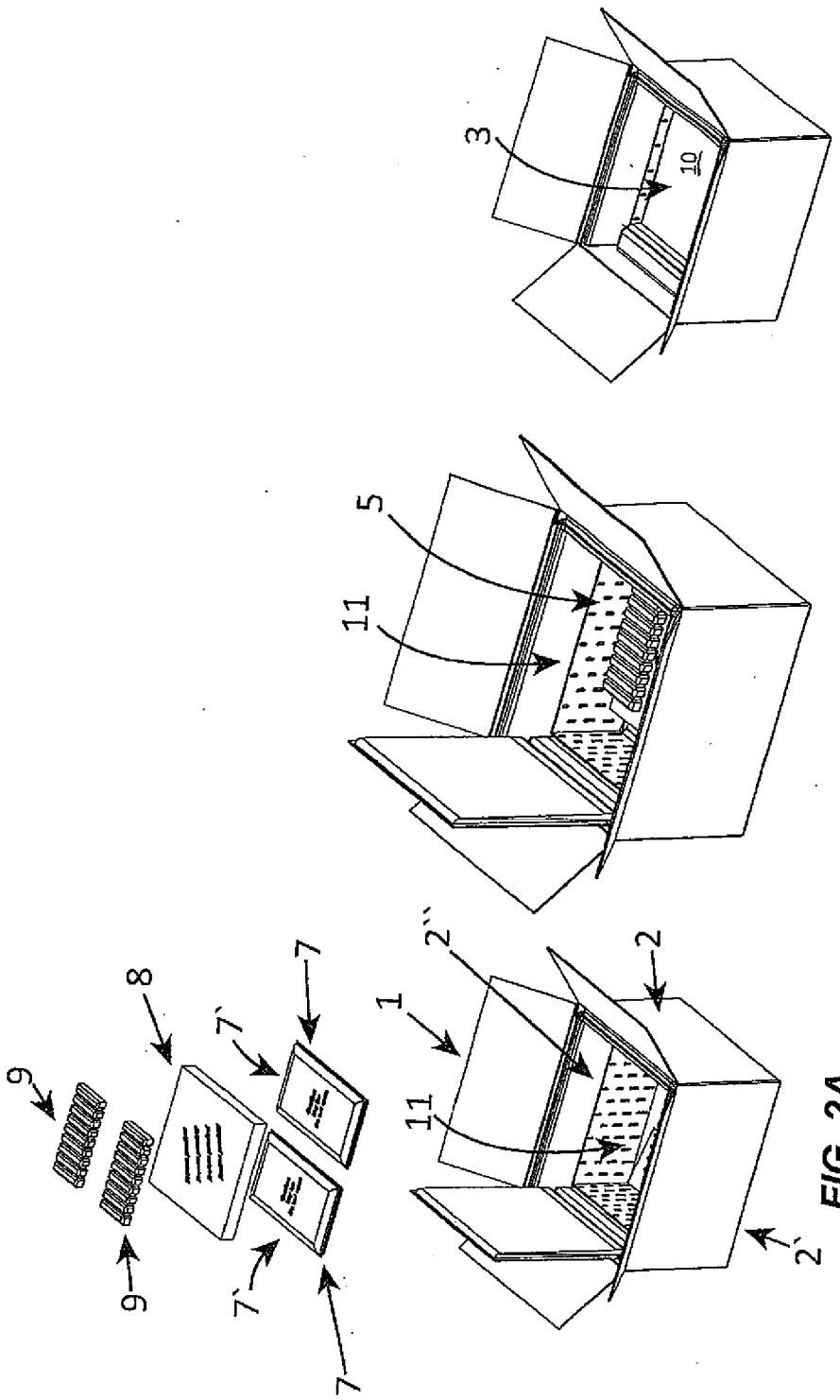

FIG. 2C

FIG. 2B

FIG. 2A

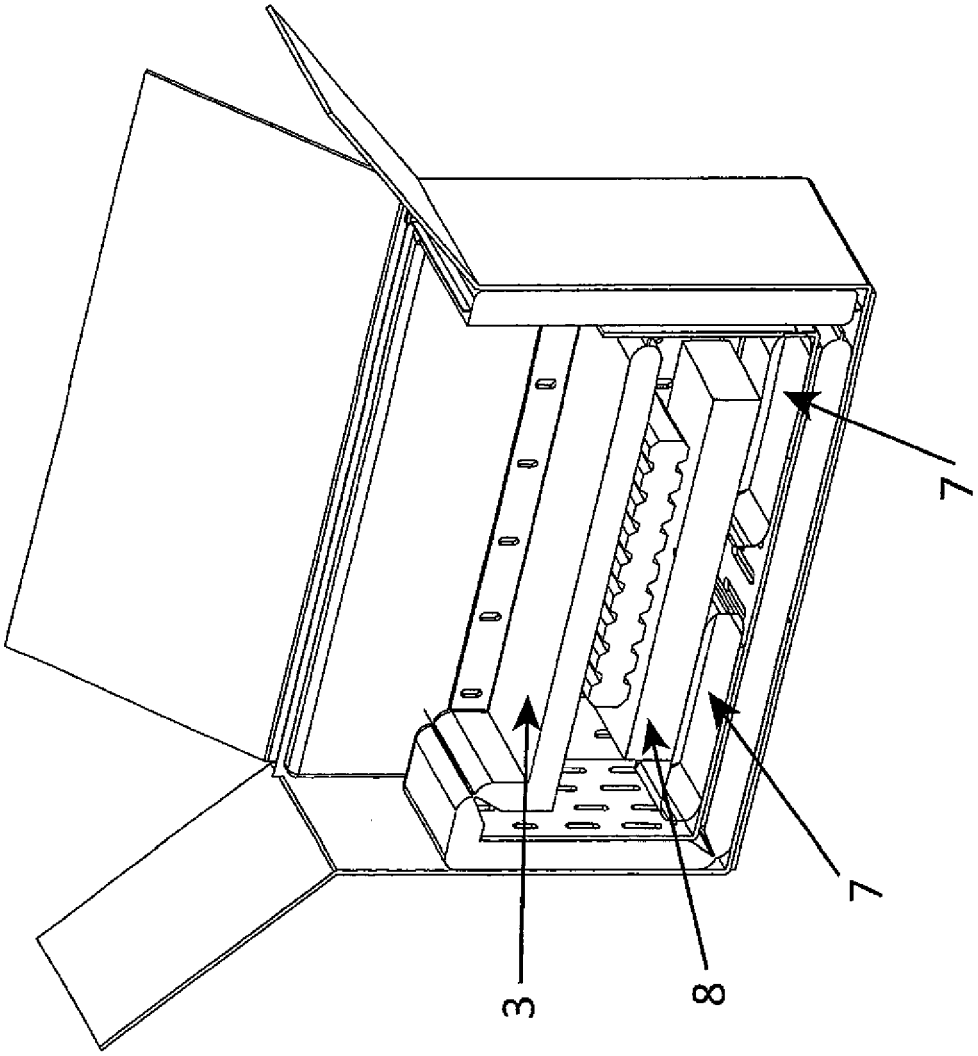

FIG. 3

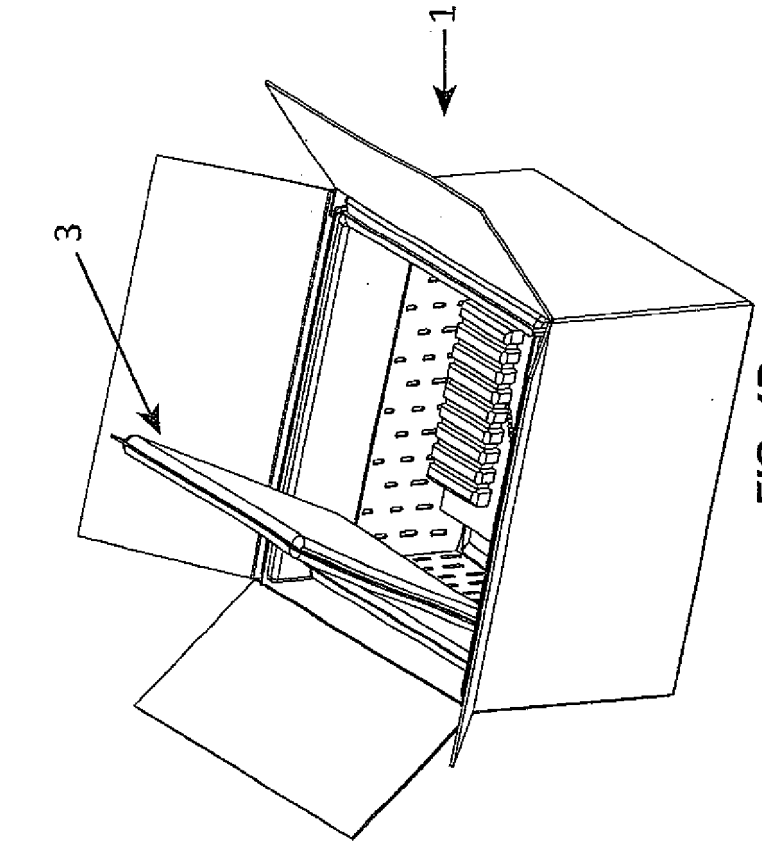

FIG. 4B

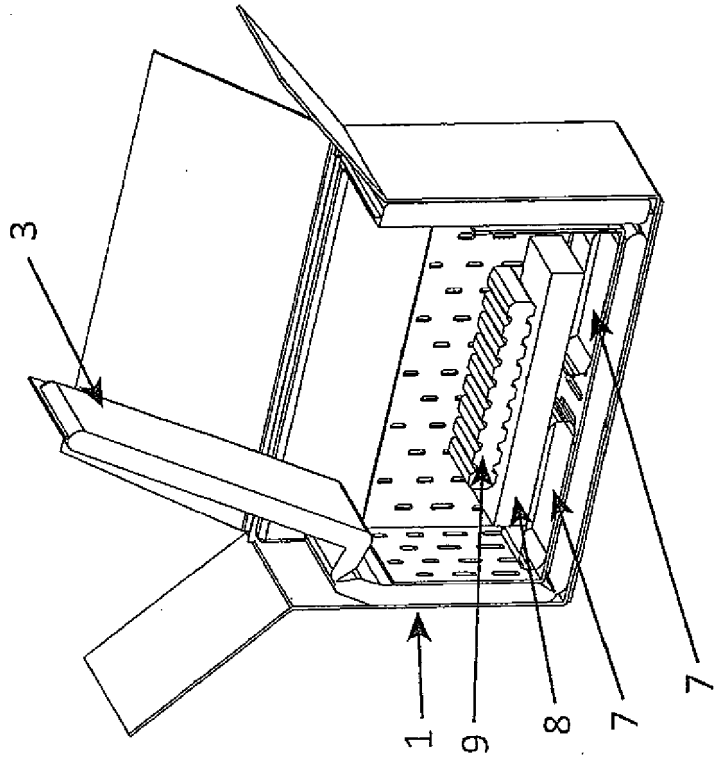

FIG. 4A

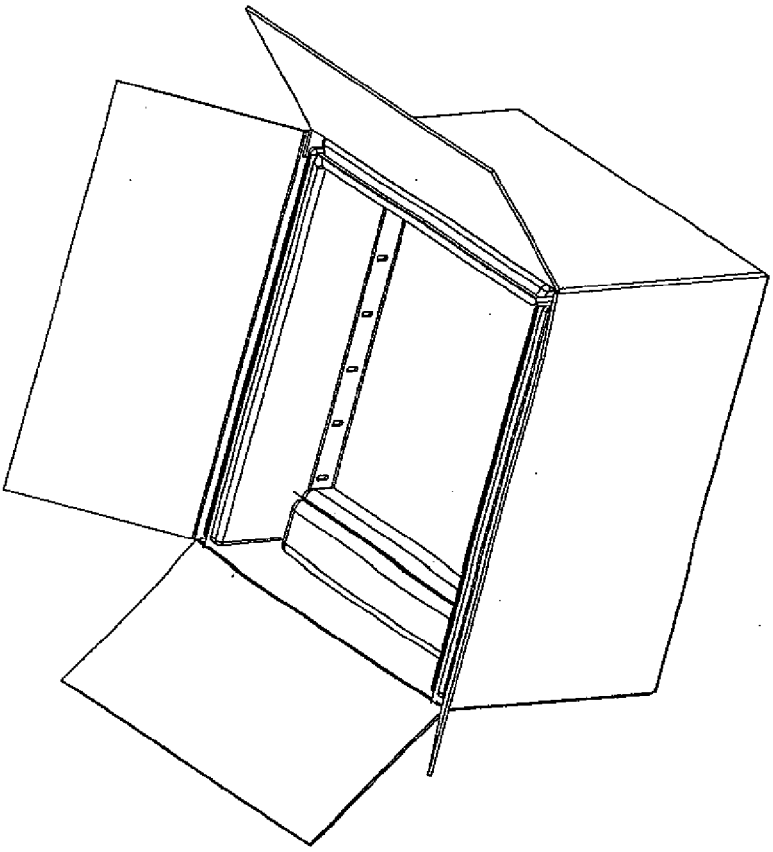

FIG. 5B

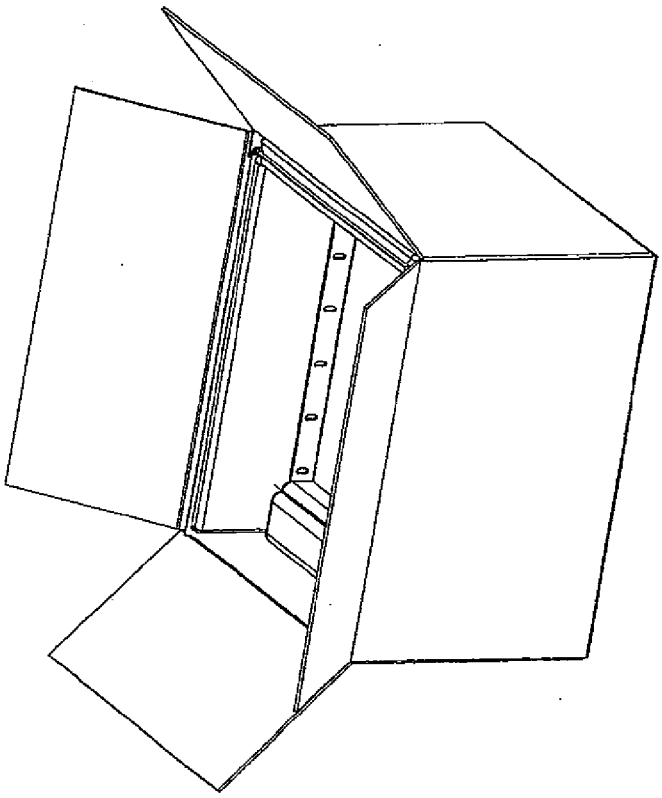

FIG. 5A

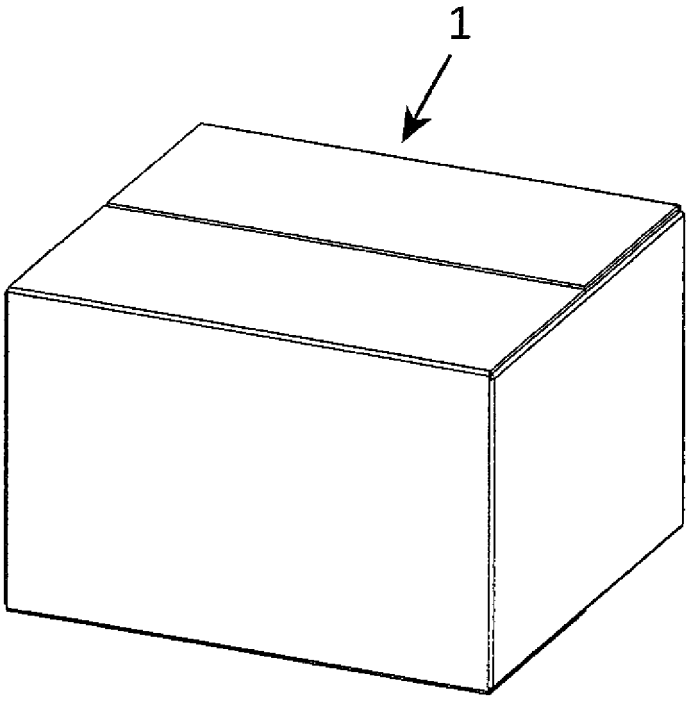

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 6018

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A	GB 2 283 008 A (TANIGUCHI YOSHIKAZU [JP]) 26 April 1995 (1995-04-26) * figure 1 *	6-8	
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TECHNICAL FIELDS SEARCHED (IPC)

B65D
F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 October 2016	Balz, Oliver

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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