US 20210002020A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2021/0002020 A1

Pizarro Del Rio et al. (43) Pub. Date: Jan. 7, 2021

(54) **CORRUGATED CARDBOARD BOX FOR THE TRANSPORT OF FRESH PRODUCE, WHICH HAS IMPROVED INSULATION AND LEAK-TIGHTNESS PROPERTIES AND FACILITATES PLACING ADHESIVE STRIPS DURING THE FINAL SEALING OF THE BOX**

(71) Applicant: **Empresas CMPC S.A.**, Santiago (CL)

(72) Inventors: **Nicolas Pizarro Del Rio**, Santiago (CL); **Cristian Saavedra Flores**, Santiago (CL)

(21) Appl. No.: **16/971,525**

(22) PCT Filed: **Feb. 20, 2019**

(86) PCT No.: **PCT/CL2019/050013**

§ 371 (c)(1),
(2) Date: **Aug. 20, 2020**

(30) **Foreign Application Priority Data**

Feb. 21, 2018 (CL) 0466-2018

Publication Classification

(51) **Int. Cl.**

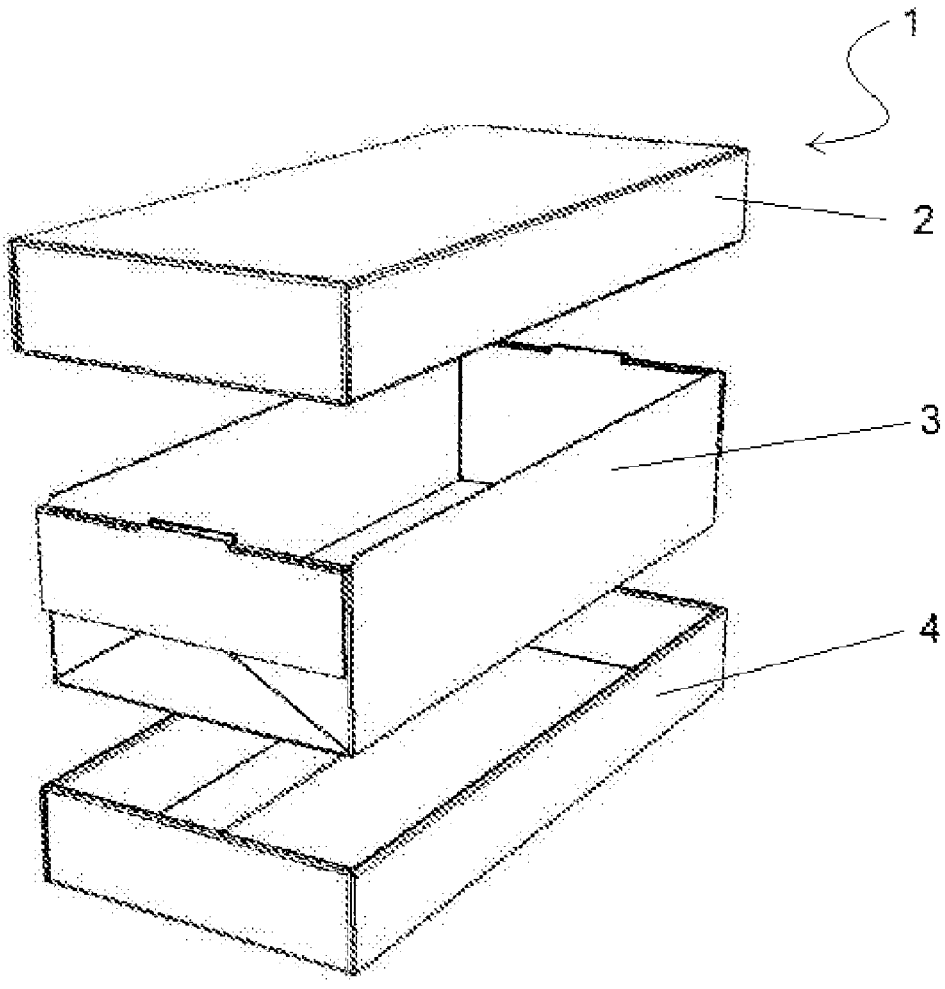
B65D 5/24	(2006.01)
B65D 5/40	(2006.01)
B65D 5/68	(2006.01)
B65D 81/38	(2006.01)
B65D 85/50	(2006.01)
B65D 5/56	(2006.01)
B65D 5/32	(2006.01)

(52) **U.S. Cl.**

CPC ***B65D 5/241*** (2013.01); ***B65D 5/40*** (2013.01); ***B65D 5/68*** (2013.01); ***B65D 5/321*** (2013.01); ***B65D 85/50*** (2013.01); ***B65D 5/563*** (2013.01); ***B65D 81/3848*** (2013.01)

(57) **ABSTRACT**

This invention relates to a corrugated cardboard box (**1**) for the transport of fresh produce, such as frozen fish, which has improved insulation and leak-tightness properties and facilitates placing adhesive strips during the final sealing of the box, said box comprising a top cover (**2**), a bottom cover (**4**) and an intermediate leak-tight container (**3**) that is positioned inside the top cover (**2**) and the bottom cover (**4**) and has vertical folded edges (**6**).



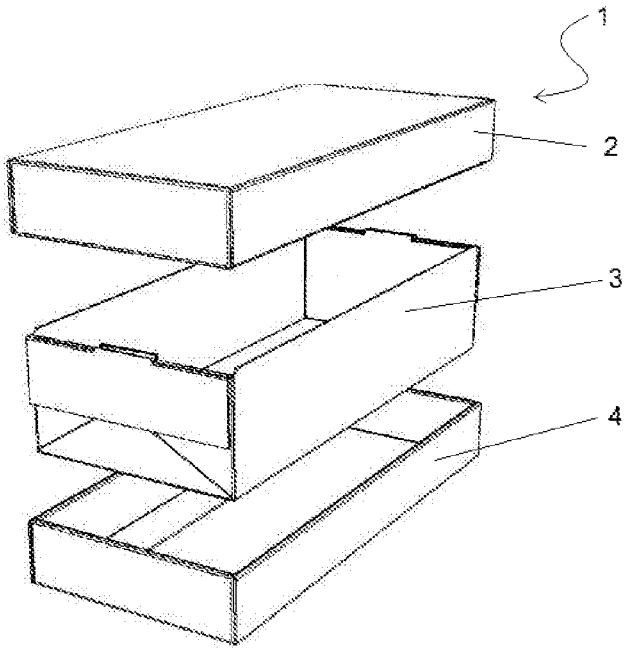


Figure #1

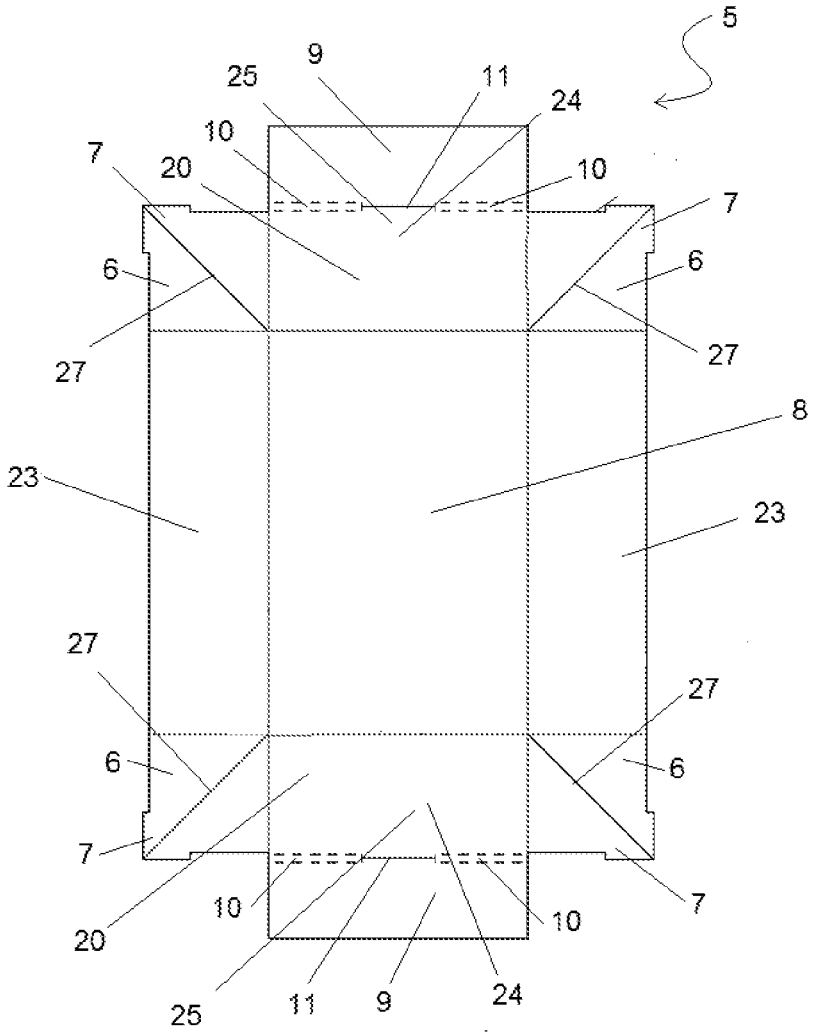


Figure #2

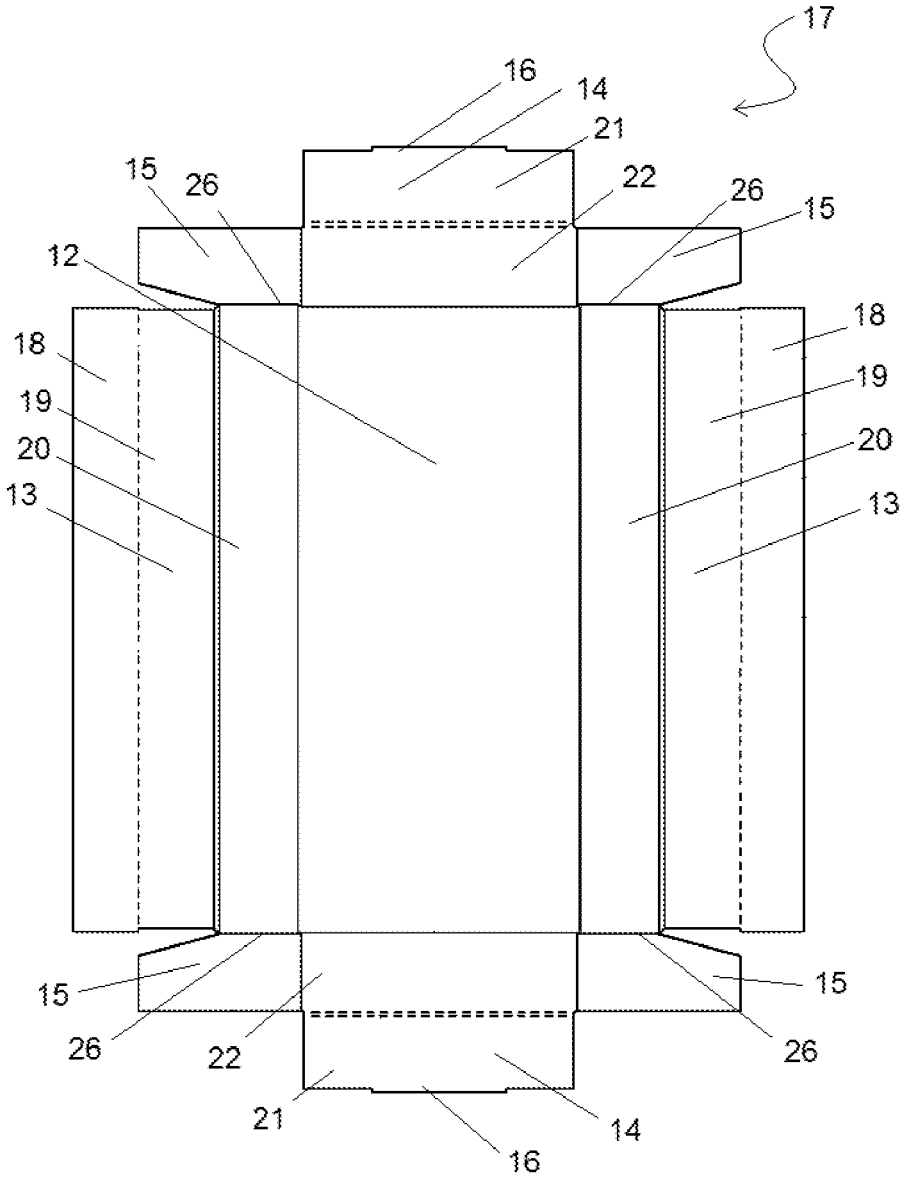

17
16
14
21
15
26
22
26
15
12
18
18
19
19
20
20
13
13
15
15
26
22
26
21
14
16

Figure #3

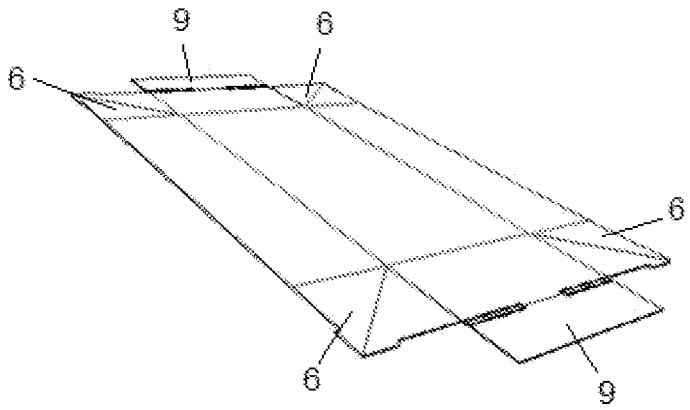


Figure #4A

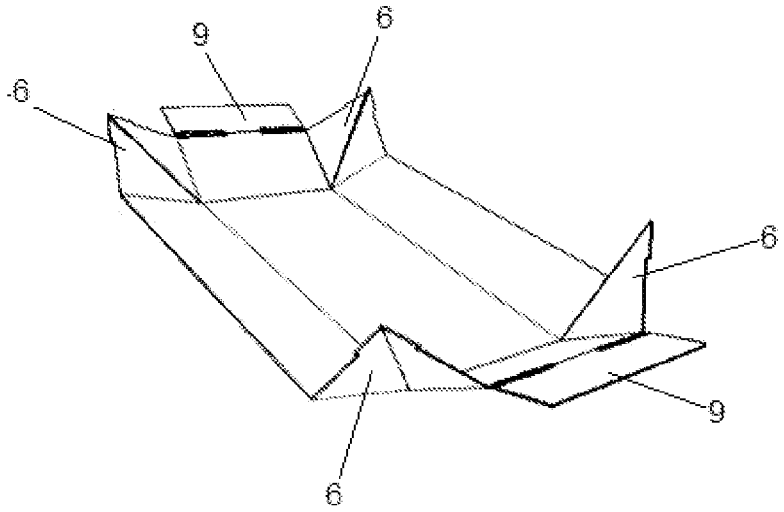


Figure #4B

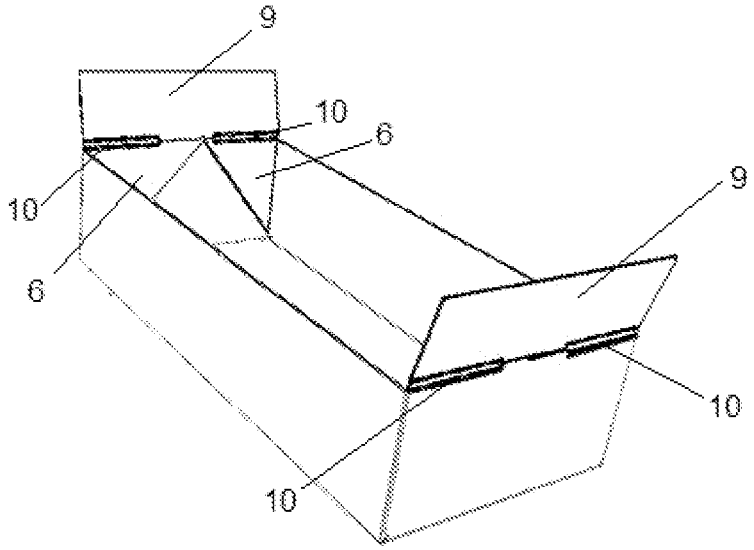


Figure #4C

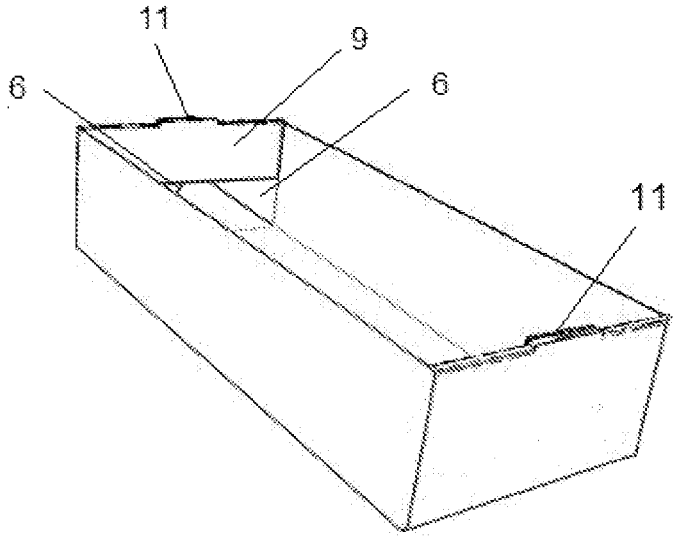


Figure #4D

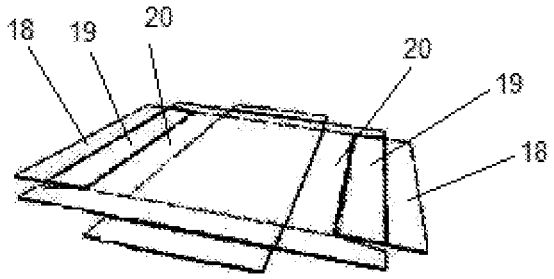


Figure #5A

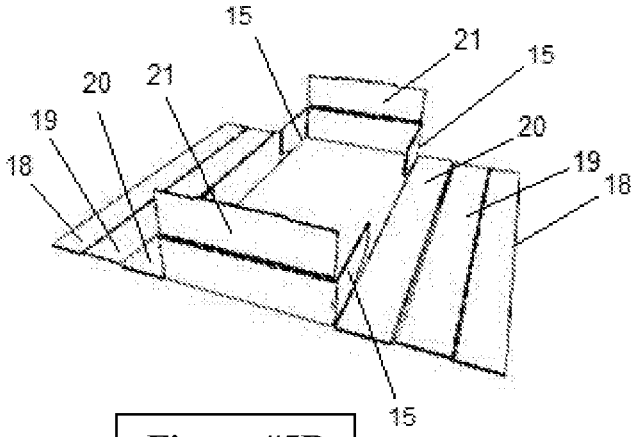


Figure #5B

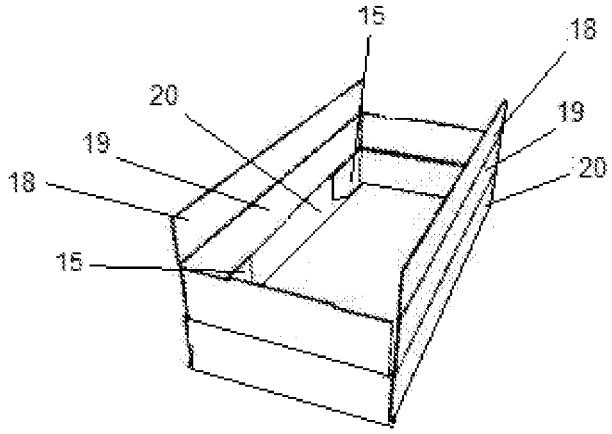


Figure #5C

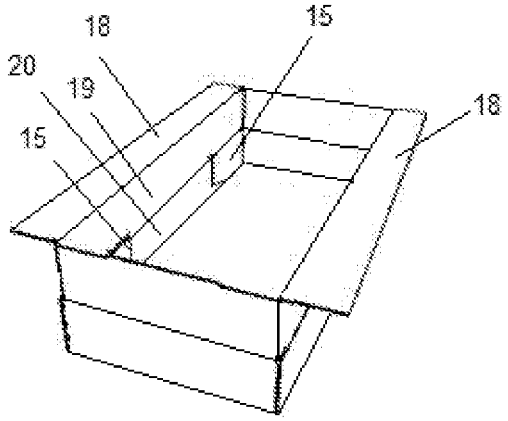


Figure #5D

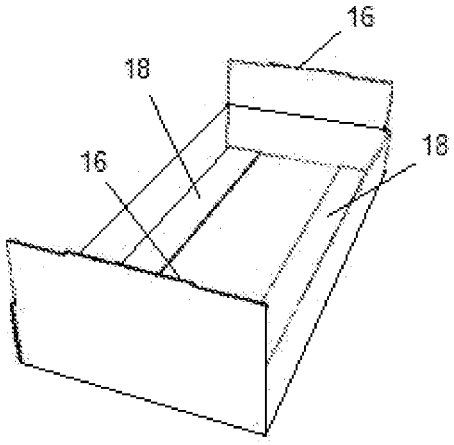


Figura 5E

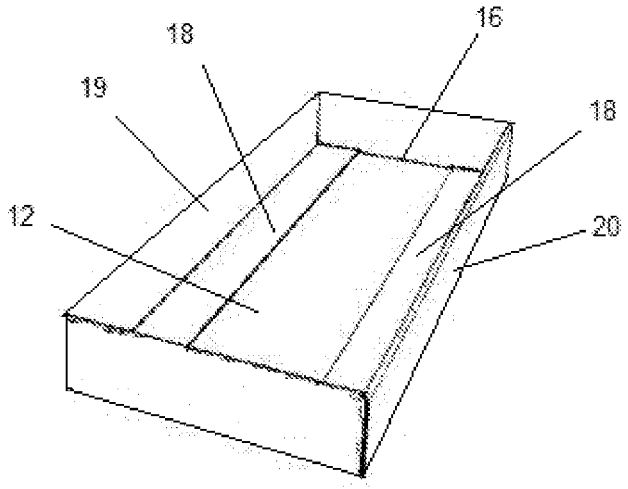


Figure #5E

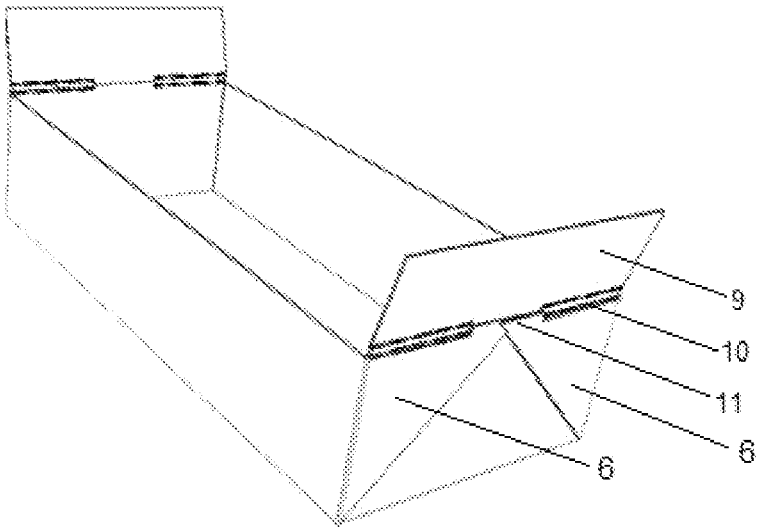


Figure #6

CORRUGATED CARDBOARD BOX FOR THE TRANSPORT OF FRESH PRODUCE, WHICH HAS IMPROVED INSULATION AND LEAK-TIGHTNESS PROPERTIES AND FACILITATES PLACING ADHESIVE STRIPS DURING THE FINAL SEALING OF THE BOX

FIELD OF THE INVENTION

[0001] This disclosure deals with packaging for transporting refrigerated products. It deals specially with corrugated cardboard boxes for transporting fresh fish. It has improved insulation properties & leak tightness aimed to make easier installation of adhesive strips during final sealing of the box.

PRIOR ART DESCRIPTION

[0002] Fresh food products transportation, such as transportation of frozen fresh fish has implemented various solutions aimed to keep inner temperature and to avoid liquids leakages. Maybe the most used is high-density expanded polystyrene containers. These are usually made up of a container with a pressure lid. This is a good solution for insulating from outer temperature, weight and leak tightness, as it does not allow liquids coming out, because it is a one-piece molded packaging with no folds or joints for liquids to come out.

[0003] However, this solution has environmental problems, mainly because manufacturing expanded polystyrene involves a polluting process and also because it is not an easy-degrading material. This disadvantage has tried to be overcome by designing new packaging manufactured with materials having poorer insulating properties and less resistance, such as cardboard, but these proposed structures are aimed to get similar and better benefits.

[0004] It is easy to find cardboard packaging containing food, but leaking. These usually have a structure of bellow folded corners, aimed to prevent liquids from coming out. However these solutions usually are not intended for containing frozen food, such as fish. Even though they can have good leak tightness conditions—at the same time—they do not have good insulating conditions/structural resistance, as they are manufactured with just one layer of material.

[0005] Another issue cardboard boxes have not solved is when containers are filled and closed, as it is always necessary to use adhesive strips for sealing the container joints/lid. These strips must wrap around the whole perimeter of the joint with no cuts or additions. These act as warranty seals, as they should not look cut and resealed, thus guaranteeing packaging conditions till final destination. In order to do so, once the container has been closed, it must be moved, shaken and sometimes lifted, in order to reach the matching edges between the lid and the container where the tape must be set, which is usually located at the lower edge of the container, thus constraining installation of such adhesive strip.

[0006] For instance, the state of the art has documents, such as the U.S. Pat. No. 5,050,794(A). This patent describes a box which just like the disclosure it is a leak-tight container with bellow folded corners and a collapsible panel covering the bellow, plus a telescopic lid. This is different, because it is made up of a container with only one telescopic lid and the collapsible panel has other formal features, with more shoulders and cuts where the liquid may leak through. The disadvantage is to be made up of two telescopic pieces only. Even though these two walls become parallel to each other at the perimeter faces, the lower/upper face of the container remains as one insulating wall in contact with the environment; therefore, there is a high chance that it cannot hold inner temperature low enough to keep food and prevent fluids leakage as well. On the other hand, when joining the two pieces together inserting the container from inside the lid, the joint between both pieces is located at the lower edge of the container, and it reaches the edge of the lid; therefore, in order to wrap around with a perimeter sealing strip, the box has to be lifted in order to reach the lower edge. This is a hard and inconvenient maneuver, as the box has to be turned or leaned.

[0007] Another document to be considered is U.S. Pat. No. 4,391,405 (A). It describes a box that just like the disclosure, has bellow folded corners with a shoulder matching into a groove, and a collapsible panel covering the bellow. It is different, because it does not have telescopic lids, but only one lid that is collapsible/attached to the body. In this case, just like the previous document, the disadvantage is that the walls do not have good insulating capabilities, as they are made up of just one layer, the lid is not a telescopic one and it acts as a second wall, and it only covers the upper edge; therefore, it is not capable to keep proper insulation & leak tightness, but it does facilitate the installation of a perimeter sealing strip, as the joint between the body and the lid is not located at the lower edge. Despite the foregoing, the insulating conditions are very poor, because it does not solve all the issues of the art in a proper manner.

[0008] Document EP0392227 (A1) is also part of the state of the art and it describes a box that just like the disclosure has bellow folded corners with a shoulder matching into a groove, with a collapsible panel retaining the bellow. It is different, because it does not have telescopic lids and the collapsible panel is not wide enough, therefore it does not secure fixed position of the folded walls. Because of the foregoing, this box cannot be used for transporting fresh food, such as frozen fish. This box does not have a lid/double walls, required for keeping temperature insulation.

[0009] Another document to be considered is GB2392150 describing a box that just like the disclosure, has bellow folded corners with a shoulder matching into a groove and has a collapsible panel retaining the bellow. It is different, because it does not have telescopic lids and the collapsible panel has shoulders on its edge matching into grooves at the base. Therefore it does not have leak tightness properties, as it has grooves at the base the liquids leak out. It does not have a lid; therefore it cannot keep a low inner temperature required for transporting frozen fresh food.

[0010] Finally, the document U.S. Pat. No. 4,915,291 is close to the state of the art and describes a box that just like the disclosure has an inner container and two telescopic lids. However, the inner container is tubular. It has no base wall/upper wall; therefore, it cannot be used as a leak-tight container for carrying fresh food, such as frozen fish, as the only base wall is the lower face of the lower lid. If the latter gets soaked, due to the content of the container, such base wall would tear out and the container would break the bottom out, even though if it has double walls at the perimeter.

[0011] As it may be seen, none of the Prior Art solutions can offer high insulation/leak tightness conditions, as none of them includes a leak-tight inner package fully wrapped by a second container made up of lids. Specifically, none of the

solutions includes a double/triple wall of material, at the box base/perimeter walls, considering the base wall of the container supports the food content; therefore, it is the wall enduring most of the work during transportation. That is why none of the solutions of the Prior Art is capable to offer a corrugated cardboard package with high insulating properties, with more than one layer or wall of material, providing—at the same time-a stable structure, despite carrying inner liquids and allowing/facilitating the installation of a perimeter sealing strip as it has a joint at the perimeter faces, and at a height far from the base.

[0012] According to the foregoing, this disclosure is aimed to overcome problems of the Prior Art by proposing a cardboard box, with high insulating properties/leak tightness against the existing ones. It also allows easy installation of perimeter sealing strips, with just one horizontal turn of the box, with no need to lift it or lean it.

SUMMARY

[0013] This disclosure deals with a corrugated cardboard box for transporting fresh food, such as frozen fish, whose main objective is to replace expanded polystyrene boxes (trade name as "Aislapol" or "Plumavit").

[0014] Another objective of the invention is to provide a box for carrying fresh food, such as frozen fish, with improved heat transference resistance conditions, and at the same time keeping the temperature inside the container, thus keeping food frozen.

[0015] Another objective of this model is to provide a box for carrying fresh food, such as frozen fish, with improved leak tightness conditions, avoiding fluids leaking out of the container or making walls to get soaked and deteriorate.

[0016] Another objective of the invention, is to provide a simple model of a box for transporting fresh food, such as frozen fish, with only two different type of pieces, each of them based on a template to be stored piled up, thus using very little room to be assembled when packing the product.

[0017] Even another objective of the invention is to provide a box for transporting fresh food, such as frozen fish, aimed to facilitate wrapping with perimeter sealing adhesive strips to seal the joint between the lid and the body of the container.

[0018] In order to reach the goals, this invention provides a box made up of three pieces, but based on two types of foldable forms only. The box once assembled has double/triple walls plus reinforced edges improving insulating/resistance conditions of the package. It has leak-proof folded edges. The height ratio among the outer pieces facilitates wrapping with perimeter sealing strips.

[0019] The three pieces make up an inner leak-tight container, and one lower/upper lid. The lower lid/upper lid are the same repeated piece, telescopically inserted around the leak-tight container, one at each upper/lower side, in such a way that when closing they get together in a central line, at half the height of the box, thus allowing the box to be horizontally sealed with adhesive strips around the box, and no need to lift or lean the box to reach the joint line. That would happen if the joint line was located at the lower edge of the box. Once the two lids are inserted from the outside of the inner container, the box has to be turned at one axis only and keep the seal strip horizontally so that it sticks to the joint and provide a final seal.

[0020] The inner leak-tight container is manufactured with a special cardboard made of polyethylene coated paper aimed to prevent the liquid content (ice and blood) to get through and soak/weaken the walls of the box and allowing to leak out.

[0021] The leak-tight container can be assembled only by folding it. It has no cuts to let liquids come out, thus getting high leak tightness properties. The vertical edges of the container are made up of bellow folds, where such fold is further attached to the minor face of the container and secured by a collapsible panel set on top of such folds. Such folded bellow edges have upper shoulders matching into a central groove located at the joint folded edge between such collapsible panel and the minor face of the container, thus securing its folded position below such panel.

[0022] The upper/lower lids have the same shape, and are made up of walls that, in turn, are made up of several sections folded among each other, thus getting two-layer perimeter walls, plus a distal section of the major walls. When assembling the lids the distal section is set along the base wall, thus making the longitudinal edges of the lid are covered as well, preventing liquids leakage in case the box is suddenly shaken during transportation and providing a second partial layer of the base face of the lids.

[0023] Once the box is fully assembled, the product is a box whose perimeter walls have reinforced walls with at least three layers, as the leak-tight container has major perimeter walls made up of one section only and in the minor walls it has a section plus the folded portions of the edges set on/folded against such minor wall. Later, when the lids are set around the inner container, such lids have major/minor walls made up of two sections folded against each other, thus generating two additional layers at the perimeter walls; therefore, the whole box has three-layer perimeter walls parallel among each other, thus increasing required insulating conditions.

[0024] The lower face or box base has—at least—two layers. One layer comes from the base wall of the same inner container. The second layer comes from the base wall of the lower lid covering the lower portion of the inner leak-tight container. Besides, the lower lid has the distal portion in its major walls. When folded it is set on the base face of the lid, thus reinforcing the longitudinal edges of the box base. At this point the box has three layers of walls.

[0025] The upper face of the box has a wall provided by the base wall of the upper lid, plus the two distal sections of the major faces of such lid, which are parallel and set along the base face, thus partially covering such upper lid with a second layer.

[0026] The foregoing are enough reasons to believe this box has better features against the state of the art. It offers practical benefits compared with the existing models, as it solves issues more effectively. Even though it is a cardboard box it is capable to carry frozen fresh food and keep good temperature insulating conditions between the inner/outer side of the box, thanks to its several-layer structure.

[0027] This model has another advantage. It prevents inner liquids from coming out, because its structure with bellow folded corners have folds only, no cuts/cut works potentially leaking out. The corners are secured into position with a collapsible panel covering the upper edge of these bellow folds. The inner container is made up of a plastic-coated material aimed to prevent liquids from soaking/weakening the walls, thus creating a leak-tight container.

[0028] Another practical benefit of this model is that it facilitates installation of bands/strips to seal the joints where

the two lids covering the inner container touch each other, as such joint line is located at half the height of the container; therefore, when the seal strip is used to wrap the box it is only necessary to turn it horizontally on one axis. There is no need to lift/lean the box in order to access the bottom face.

[0029] It is also possible to find another advantage of the model. The three-piece configuration—based on two unique forms—can be stored unfolded and can be assembled during packing, thus saving a great deal of space.

DESCRIPTION OF THE FIGURES

[0030] A comprehensive description of the invention and the Figures making up this presentation shall be made next—

[0031] FIG. **1** shows an isometric exploded view of the box, showing the three pieces of the box.

[0032] FIG. **2** shows the template used to assemble the inner leak-tight container.

[0033] FIG. **3** shows the template used to assemble the lids.

[0034] FIG. **4**A shows the template to assemble the unfolded inner leak-tight container.

[0035] FIG. **4**B shows the first step of the folding sequence for the template bellow edges, in order to assemble the inner leak-tight container. The edges are folded inwards.

[0036] FIG. **4**C shows a second step in the folding sequence of the template, in order to assemble the inner leak-tight container.

[0037] FIG. **4**D shows a third final step of the folding sequence for the template, in order to assemble the inner leak-tight container. The edges are folded inwards and covered by the collapsible panel folded inwards, as well.

[0038] FIG. **5**A shows the template to assemble the unfolded lids.

[0039] FIG. **5**B shows a first step in the folding sequence of the template, in order to assemble the leak-tight compartment.

[0040] FIG. **5**C shows a second step in the folding sequence of the template, in order to assemble the leak-tight compartment.

[0041] FIG. **5**D shows a third step in the folding sequence of the template, in order to assemble the leak-tight compartment.

[0042] FIG. **5**E shows a fourth step in the folding sequence of the template, in order to assemble the leak-tight compartment.

[0043] FIG. **5**F shows a final fifth step in the folding sequence of the template, in order to assemble the leak-tight compartment. This is the fully assembled lid.

[0044] FIG. **6** shows an option where the leak-tight container has folded bellow edges outwards, just like the option shown in FIG. **1**.

COMPREHENSIVE DESCRIPTION

[0045] The disclosure describes a corrugated cardboard box (**1**), basically made up of three pieces, just as described in FIG. **1**—one upper lid (**2**), one lower lid (**4**) and an intermediate leak-tight container (**3**). The upper lid (**2**) and the lower lid (**4**) are identical and come from the same template (**17**) design. The intermediate leak-tight container (**3**) come from a template (**5**) design, different from the upper lid (**2**) and from the lower lid (**4**).

[0046] The intermediate leak-tight container (**3**) is coated with a special cardboard, including polyethylene-coated paper preventing liquid content of the product (ice and blood) from leaking out through the walls of the box (**1**). Such inner leak-tight container (**3**) is located inside the upper lid (**2**) and the lower lid (**4**) and has bellow folded edges (**6**) retained by a foldable panel (**9**). Such container (**3**) can be assembled with folds only, and no cuts the liquid could leak out through.

[0047] The telescopic upper (**2**) and lower (**4**) lids make up a second wall around the intermediate leak-tight container (**3**), thus getting excellent thermal insulation.

[0048] The upper (**2**) and lower (**4**) lids, when assembled from outside the container (**3**), get together at half of the height of the container (**3**), thus facilitating the installation of a seal strip.

[0049] Just as described in FIG. **2**, the template (**5**) of the intermediate leak-tight container (**3**) is made up of a base (**8**). From the base two major walls (**23**), two minor walls (**24**) and four foldable edges (**6**) are projected. The major walls (**23**) are made up of one section only. The minor walls (**24**) are made up of a distal section (**9**) making up a collapsible panel and a proximal section (**25**). The template (**5**) has vertical/horizontal/oblique folding lines allowing assembly of such inner leak-tight container (**3**).

[0050] The edges (**6**) have a shoulder (**7**). The proximal section (**25**) of the minor walls (**24**) of the container (**3**) and the section that is the foldable panel (**9**) are attached to each other by folded portions (**10**) and among them there is a central groove (**11**).

[0051] When assembling the inner leak-tight container (**3**) based on the template (**5**), the edges (**6**) are bellow folded using the folding lines (**27**). The edges (**6**) may be located either inside/outside the body of the intermediate leak-tight container (**3**). In both cases the shoulders (**7**) are inserted into central (**11**) grooves, where the folded portions (**10**) located between the distal section (**9**) or collapsible panel and the proximal section (**25**) are set above the upper edge of the bellow folded edges (**6**), thus securing them into position. In case the folded edges (**6**) are located outside, the foldable panel (**9**) is also folded outwards from the container (**3**) covering such folded edges, just as described in FIGS. **1** and **6**. Contrariwise, when folded edges (**6**) are inwards, the foldable panel (**9**) is also folded inwards, just as described in FIGS. **4**C and **4**D.

[0052] Just as described in FIG. **3**, the templates (**17**) of the lids (**2**) and (**4**) are made up of a base (**12**) from where two major walls (**13**), two minor walls (**14**) and four wings (**15**) are projected. The major walls (**13**) are made up of three foldable sections, a distal section (**18**), a central section (**19**) and a proximal section (**20**). The minor walls (**14**) are made up of a distal section (**21**) and a proximal section (**22**), where the distal section (**21**) has a central shoulder (**16**) at its edge.

[0053] When assembling the upper (**2**) and lower (**4**) lids, based on the template (**17**), the distal sections (**18**) of the major walls (**13**) are set along/parallel to the base of the lids (**12**). The shoulders (**16**) are located between such distal sections (**18**) of the major walls (**13**), (See FIG. **5**F). In turn, the width of these distal sections (**18**) matches the width of the folded portions (**10**) of the container (**3**).

[0054] The distance between the two distal sections (**18**), set along/parallel to the base (**12**) of the lids (**2**) and (**4**), matches the width of the central groove (**11**) of the container

(3) and the width of the shoulder (16) of the same minor walls (14) of the lids (2) and (4).

[0055] In order to form the lids (2) and (4) the template (17) must have vertical/horizontal folding lines allowing assembly of such lids.

[0056] The template (17) has cuts (26) between the wings (15) and the proximal section (20). This allows that when the major walls (13) are folded in their sections (18, 19, and 20) the wings (15) are set between the central sections (19) and the proximal sections (20). (See FIGS. 5D and 5E).

1. A corrugated cardboard box (1) for carrying fresh products, such as frozen fish, with improved insulation properties/leak tightness aimed to facilitate wrapping with adhesive strips during final sealing of the box, featured because it is made up of:

a telescopic upper lid (2) and lower lid (4), that make up a second wall around an intermediate leak-tight container (3), each of them covering half the height of the container (3), the upper (2) and lower (4) lids come from one single template (17), the template (17) is made up of a base (12) from where two major walls (13), two minor walls (14) and four wings (15) are projected, the major walls (13) are made up of three foldable sections in a row, a distal section (18), a central section (19) and a proximal section (20), the minor walls (14) are made up of a distal section (21) with a central shoulder (16) located at the edge and a proximal section (22); and

an intermediate leak-tight container (3) located inside the upper lid (2) and the lower lid (4), having bellow vertical folded edges (6) retained by a foldable panel (9) folded on top of them, the intermediate leak-tight container (3) coming from a template (5) other than the lids template (17), the template (5) of the intermediate leak-tight container (3) made up of a base (8) from where two major walls (23), two minor walls (24) and four foldable edges (6) are projected, the major walls (23) are made up of one section only and the minor walls (24) are made up of a proximal section (25) and a distal section which is the foldable panel (9).

2. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because the proximal section (25) of the minor walls (24) of the container (3) and the section acting as foldable panel (9) are attached to each other by folded portions (10) and there is a central groove (11) among them.

3. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because in order to form the upper lid (2) and the lower lid (4), the template (17) must have cuts (26) between the wings (15) and the proximal section (20) of the major walls (13), so that when the major walls (13) are folded in their sections (18, 19, 20), the wings (15) are set among the central sections (19) and the proximal sections (20).

4. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because in the upper lid (2) and the lower lid (4) the distal sections (18) of the major walls (13) are set along and parallel to the base (12). The width of these distal sections (18) matches the width of the folded portions (10) of the inner leak-tight container (3).

5. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because the distance between the two distal sections (18) set along and parallel to the base (12) of the lids (2) and (4), matches the width of the central groove (11) of the container (3) and matches the width of the shoulder (16) of the minor walls (14) of the lids (2) and (4).

6. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because the inner leak-tight container (3) is coated with a special cardboard including a piece of polyethylene coated paper.

7. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because with the template (5), located in the inner leak-tight container (3), the bellow folded edges (6) are set outside or inside the proximal section (20) of the minor walls (24).

8. A corrugated cardboard box (1) for carrying fresh products, according to the claim 1, featured because the edges (6) have a shoulder (7).

9. A corrugated cardboard box (1) for carrying fresh products, according to claim 8, featured because when the bellow folded edges (6) are set whether outside or inside the minor walls (24), their shoulders (7) are inserted into the central groove (11) and the foldable panel (9) is covered by such foldable edges (9) thus securing its position.

* * * * *