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(54) **CONTAINER MADE OF PLASTIC MATERIAL FOR PACKAGING FOOD PRODUCTS AND/OR FOODSTUFFS AND RELATED CLOSING COVER**

(57) A container (1) made of plastic material for packaging food products or foodstuffs is described, comprising a base (2) having a bottom (4) and side walls (5, 6) ending at the top with a peripheral edge (7) and at least one groove (8) formed on said bottom (4) and/or on at

least one of said side walls (5, 6), the container being characterized in that said at least one groove (8) is substantially V-shaped (or triangle-shaped) in cross section and it is tapered from an end thereof until it substantially converges in a vertex (V) at the opposite end.

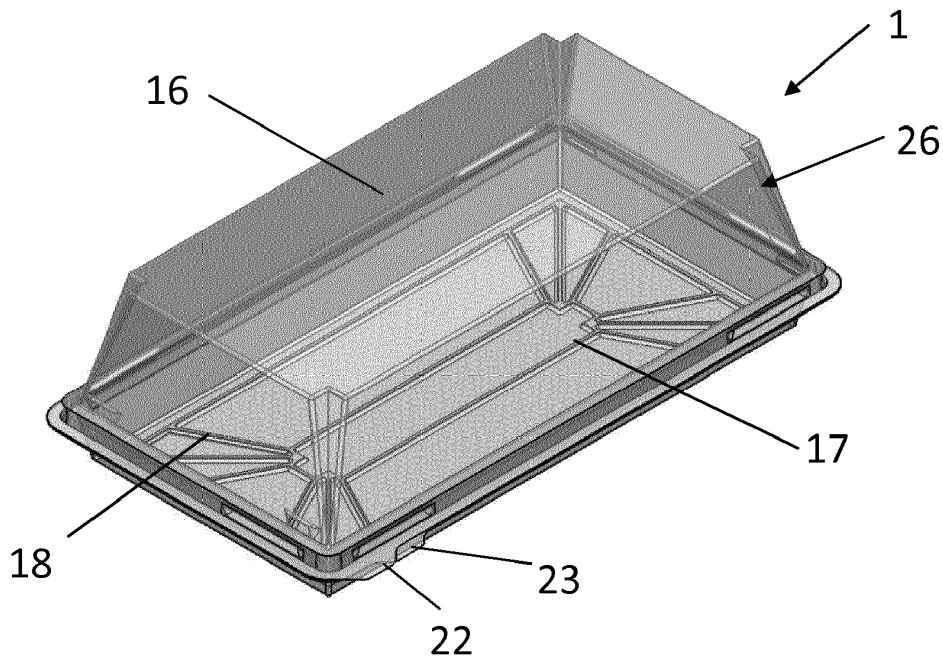


Fig. 1

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Description

Field of application

[0001] In its more general aspect, the present invention relates to the packaging of food products or foodstuffs, particularly but not exclusively bakery products.

[0002] In particular, the present invention relates to a container made of a thermoformed and preferably transparent plastic material equipped with structural reinforcing grooves that are substantially V-shaped in cross section.

[0003] The present invention also relates to a closing cover for a container as above that can be as well equipped with structural reinforcing grooves that are substantially V-shaped in cross section.

Prior art

[0004] As it is well known, containers made of plastic material are widely used in industry and large-scale retail distribution to package food products and foodstuffs, allowing at the same time these food products and foodstuffs to be protected, stored, transported and displayed at sales premises.

[0005] Commonly, the containers for packaging foodstuffs consist in a rigid base (also called bottom) made of plastic material for food products, that is generally square-shaped (tray-like) or round-shaped (bowl-like), in which the desired food product or foodstuff is put and contained, and a closing film that is extensible and heat sealable on the base or a cover that is separated from or integral (hinged) with the base that is simply used to reclose it.

[0006] The containers with a cover, in particular with a cover hinged to the base, are particularly preferred by modern retail distribution, both for displaying pre-packaged products in self-service counters, and by the staff working in deli counters, since these containers are functional (available in various sizes), easy to use (they do not require any specific closing equipment) and they are aesthetically pleasant.

[0007] Containers made of plastic material of the above type are normally produced from a sheet of synthetic resin, for example of polyethylene terephthalate (PET), polystyrene etc., that is formed by pressure and heat (thermoforming) or vacuum application to form the containing base and the closing cover as a single piece or as distinct pieces that can be coupled to each other. A synthetic resin is normally used, that is able to provide the sheet and the container obtained therefrom with appropriate characteristics of transparency to allow the user or consumer to see from the outside the food product or foodstuff arranged in the container.

[0008] Furthermore, it is known that containers as above tend to be manufactured with thinner and thinner thicknesses of the source sheet and this to meet different requirements among which the requirements to reduce

the consumption of plastic material and subsequently the costs of production and possible recycling of the produced containers after use and to obtain lighter and lighter containers.

[0009] Nevertheless, the use of thinner thicknesses for the source sheet reduces the structural strength of the containers obtained therefrom making them more easily deformable, in particular under stacking conditions, for example during the transport or the arrangement onto each other on a display unit of a commercial space, with possible damage or alteration of the food product or foodstuff contained therein.

[0010] Therefore, it is known to provide the above containers also with reinforcing grooves integrally formed with the material of the container in specific positions of the base and/or of the cover so as to confer the containers some structural rigidity that allows them to withstand more external bending and compression stresses.

[0011] Typically, these grooves are substantially round-shaped or square-shaped (for example rectangle-shaped) in cross section, they can face the inside of the container or the outside of the container so as to form in the latter case some sort of projections (ribs) as well as to have an arrangement and extension that can vary as a function for example of the required technical performances and external aspect.

[0012] Nevertheless, the above thermoformed containers have the drawback that they require a considerable number of these grooves along a predominant part or the whole structure thereof (base and cover) so that a satisfactory structural reinforcement can be obtained.

[0013] This disadvantageously involves construction complications in the manufacture of containers, which also affects the production costs thereof and which can require the use of more complex equipment.

[0014] Moreover, the use of a considerable number of these grooves dictated by structural reinforcement requirements greatly worsens the characteristics of "transparency" of the container incorporating them in the sense of a worsening of the visibility of the content of the container that appears with a substantially altered or distorted shape in the eyes of the user/consumer.

[0015] The main aim of the present invention is thus to provide a container made of plastic material for packaging foodstuffs that has a reduced thickness and, in the meantime, appropriate characteristics of structural reinforcement achieved by using a lower number of grooves.

[0016] Another aim of the present invention is to provide a container as above that has improved characteristics of transparency i.e. of visibility of the content thereof from the outside with respect to the existing containers provided with structural reinforcing grooves.

[0017] A further aim of the present invention is to provide a container as above that can be produced in a simple way and at low costs whilst reducing the environmental impact of each package.

Summary

[0018] These aims are achieved by a container made of plastic material for packaging food products or food-stuffs comprising a base having a bottom and side walls ending at the top with a peripheral edge and at least one groove formed on said bottom and/or on at least one of said side walls, the container being characterized in that said at least one groove is substantially V-shaped (or triangle-shaped) in cross section and it is tapered from an end thereof until it substantially converges in a vertex at the opposite end.

[0019] Preferably, the at least one groove is recessed, i.e. it is substantially V-shaped (or triangle-shaped) in cross section facing the inside of the container.

[0020] According to an embodiment, the bottom of the container is substantially square-shaped (for example square-shaped or rectangle-shaped) and has at least one recessed groove, preferably a plurality of recessed grooves, that is/are substantially V-shaped (or triangle-shaped) in cross section. Each groove diagonally extending from an angular area or corner of the bottom or top, and tapering from said angular area or corner until it converges in a vertex at the opposite end thereof, said vertex being located at a central area of said bottom.

[0021] According to another embodiment, the container also comprises a closing cover associated with the base of the container. This closing cover can be both in the form of a distinct component that can be coupled to the base to close the container and a cover constrained by or integral with (for example formed as a single piece) the base of the container. Preferably, the closing cover is formed as a single piece with the base of the container and it is constrained to the latter by a hinge element.

[0022] According to an embodiment, the closing cover as well can be equipped with at least one groove that is substantially V-shaped (or triangle-shaped) in cross section and tapered from an end thereof until it substantially converges in a vertex at the opposite end.

[0023] Preferably, the at least one groove of the cover is recessed, i.e. it is substantially V-shaped (or triangle-shaped) in cross section facing the inside of the container.

[0024] According to an embodiment, the cover of the container has a top portion and side walls ending at the bottom in a peripherally extending flange, and at least one recessed groove, preferably a plurality of recessed grooves, that is/are substantially V-shaped (or triangle-shaped) in cross section, each groove vertically extending at a respective angular area or connecting corner between contiguous side walls of the cover and tapering from the top of the cover downwards or from the bottom upwards.

[0025] Further features and advantages of the present invention will be apparent from the following description of a preferred embodiment thereof, said description being provided by way of non-limiting example with reference to the attached figures.

Brief description of the figures

[0026] In the figures:

- 5 - Figure 1 shows a perspective view of a container according to an embodiment of the invention in the closed configuration thereof,
- Figure 2 shows a perspective view of the container of Figure 1 in the open configuration thereof;
- 10 - Figure 3 shows a top view of the container of Figure 1 in the open configuration thereof;
- 15 - Figures 4 and 5 show respective side views of the container of Figure 1 in the open configuration thereof;
- 20 - Figure 6 shows a perspective view of a container according to another embodiment of the invention in the closed configuration thereof,
- Figure 7 shows a perspective view of the container of Figure 6 in an opened configuration thereof;
- 25 - Figures 8 and 9 show a top view and a bottom view of the container of Figure 6, respectively;
- 30 - Figures 10 and 11 show respective side views of the container of Figure 6;
- Fig. 12 shows a particular of the container of Figure 6.

Detailed description

[0027] With reference to the above figures, a container according to an embodiment of the invention is indicated with 1 as a whole and it comprises a base 2 and a cover 3.

[0028] The base 2 is tray-shaped with a substantially rectangular cross section and it comprises a bottom 4 and long side walls 5 and short side walls 6 ending in a peripherally extending peripheral flange (or peripheral edge) 7, the peripheral flange 7 projecting from the side walls 5 and 6, long and short respectively, outwards of the bottom 4. The bottom 4 together with the long side walls 5 and with the short side walls 6 define a housing storing and containing a food product or foodstuff.

[0029] A rib (or bead) 15 projecting upwards and extended along the whole periphery of said peripheral flange 12 is provided on the peripheral flange 7 of the bottom 4. Moreover, the rib 15 has a plurality of cavities 13 on the side facing the outside of the base 2.

[0030] In accordance with an aspect of the present invention, the bottom 4 of the container 2 is provided with grooves 8 that are substantially V-shaped (or triangle-shaped) in cross section that are tapered each from an end until they substantially converge in a vertex or point V at the opposite end.

[0031] In particular, the bottom 4 has an insert 9 that is substantially rectangle-shaped with rounded angles in a central area thereof and four grooves 8 that branch off each diagonally from an angular area or corner of the bottom 4 tapering from said angular area or corner until they converge and end in a vertex V in contact with the central insert 9.

[0032] Each groove 8 here is recessed, i.e. it faces the inside of the container 1 and it comprises two faces 10 that are substantially triangle-shaped joined by a corner 11, the faces 10 converging from a respective angular area or corner of the bottom 4 until they join in a respective vertex V at the point of contact with the insert 9. Each groove 8 as a whole is thereby pyramid-shaped with a triangular (or cusp-like) base, the base being located at a respective angular area or corner of the bottom 4 and the vertex V facing a central area of the bottom 4 where the insert 9 lies.

[0033] It was surprisingly found that grooves 8 having the above-indicated shape made on the base 2 of the container 1 and in particular on the bottom 4 of the base 2 provide a considerable structural reinforcement to the base 2 increasing in particular the rigidity thereof and subsequently the bending and compression strength of the base 2.

[0034] The cover 3 is substantially rectangle-shaped in cross section and it has a substantially flattened top portion 16 from which long side walls 17 and short side walls 18 branch off downwards, ending at the bottom in a substantially peripherally extending internal flange 21 facing downwards from which a peripheral flange 19 projecting outwards branches off, substantially peripherally extending as well. The cover 3 is joined (hinged) to the base 2 along a hinge line 25 extended along a respective long side 5 of the base 2 and a respective long side 17 of the cover 3. Bumps 14 facing the inside of the cover 3 are formed on the internal flange 21 in the same number as the cavities 13 formed on the rib 15. In particular, the peripheral internal flange 21 of the cover 3 is formed vertically at the rib 15 on the peripheral flange 7 of the bottom 4 and slightly more external than the latter and it has a substantially complementary shape to this rib 15. Likewise, the internal bumps 14 existing on the peripheral internal flange 21 of the cover 3 are located vertically at corresponding cavities 13 on the peripheral flange 7 of the bottom 4 and they have a substantially complementary shape to that of said corresponding cavities 13. When the container 1 is closed, the peripheral flange 19 of the cover 3 and the peripheral flange 7 of the bottom 4 prove thereby to be overlapped to each other and coupled by shape coupling between the complementary profiles of the above rib 15 and of the above more external internal flange 21 and between the complementary profiles of the above bumps 14 and of the corresponding cavities 13. This shape coupling can involve in turn a fixed-joint, slot coupling or the like.

[0035] Moreover, the peripheral flange 7 of the bottom 4 and the peripheral flange 19 of the cover 3 have, at the

opposite ends of respective long sides facing each other, a pair of respective tabs 22, 23 projecting outwards and in an offset position to each other so as to facilitate the opening of the container 1 by a user or consumer.

[0036] In accordance with another aspect of the present invention, the closing cover 3 is provided with grooves 26 that are substantially V-shaped (or triangle-shaped) in cross section and that are tapered each from an end thereof until they substantially converge in a vertex or point V at the opposite end.

[0037] In particular, the cover 3 has four grooves 26 that vertically extend downwards from the top portion 16 each at a respective angular area or connecting corner between contiguous side walls 17, 18, long and short respectively, of the cover 3 and that taper downwards until they converge and end in a vertex V in contact with the lower internal flange 21 of the cover 3.

[0038] Each groove 26 is recessed, i.e. it faces the inside of the container 1 and it comprises two faces 27 that are substantially triangle-shaped joined by a corner 28, the faces 27 converging from the top 16 of the cover 3 downwards in a respective angular area or connecting corner between contiguous side walls 17, 18, long and short respectively, of the cover 3 until they join in a respective vertex V in contact with the lower internal flange 21 of the cover 3. Each groove 26 as a whole is thereby pyramid-shaped with a triangular (or cusp-like) base, the base being located at the top portion 16 of the cover in a respective angular area or connecting corner between contiguous side walls 17, 18, long and short respectively, of the cover 3 and the vertex V facing downwards at the lower internal flange 21 of the cover 3.

[0039] Figures 8-12 show a container according to another embodiment of the present invention, which is indicated with 60 as a whole.

[0040] To the features of the container 60 which are structurally and/or functionally equivalent to corresponding features of the container 1 described above will be assigned the same reference number of the latter.

[0041] The container 60 comprises a base 2 and a cover 3 formed as separate components which are coupled together in the closed configuration of the container 60.

[0042] The base 2 of the container 60 is provided with grooves 8 on the side walls 5 which are substantially V-shaped (or triangle-shaped) in cross section and that are tapered each from an end thereof until they substantially converge in a vertex or point V at the opposite end.

[0043] In particular, the base 2 has four grooves 8 that vertically extend upwards from the bottom 4 each at a respective angular area or connecting corner between contiguous side walls 5, 6 of the base 2 and that taper upwards until they converge and end in a vertex V in contact with the upper peripheral flange 7 of the base 2.

[0044] Each groove 26 is recessed, i.e. it faces the inside of the container 60 and is pyramid-shaped with a triangular (or cusp-like) base, the base being located at the bottom 4 of the base 2 in a respective angular area or connecting corner between contiguous side walls 5, 6

of the base 2 and the vertex V facing upwards at the upper peripheral flange 7 of the base 2.

[0045] Similarly, the cover 3 of the container 60 is provided with grooves 26 which are substantially V-shaped (or triangle-shaped) in cross section and that are tapered each from an end thereof until they substantially converge in a vertex or point V at the opposite end.

[0046] In particular, the cover 3 has four grooves 26 that vertically extend downwards from the top portion 16 each at a respective angular area or connecting corner between contiguous side walls 17, 18 of the cover 3 and that taper downwards until they converge and end in a vertex V in contact with the lower internal flange 21 of the cover 3.

[0047] Each groove 26 is recessed, i.e. it faces the inside of the container 60 and is pyramid-shaped with a triangular (or cusp-like) base, the base being located at the top portion 16 of the cover 3 in a respective angular area or connecting corner between contiguous side walls 17, 18 of the cover 3 and the vertex V facing downwards at the lower internal flange 21 of the cover 3.

[0048] In accordance with an aspect of the present invention, the cover 3 also include notches 64 on the side walls 17, 18 in the proximity of the grooves 26, the notches having basically the same shape as that of the grooves 26 and smaller dimensions.

[0049] In particular, the notches 64 face the inside of the container 60 and is pyramid-shaped with a triangular (or cusp-like) base, the base being located at the lower internal flange 21 of the cover 3 in the proximity of the grooves 26 and the vertex V facing upwards.

[0050] Advantageously, when covers 3 are stacked, the internal side of the notches 64 of each cover 3 of the stack can mate/fit into the external side of corresponding notches of a cover 3 preceding it in the stack.

[0051] However, it should be understood that the above notches 64 are not essential for the implementation of the present invention and thus they may be not present in other embodiments of the present invention.

[0052] In accordance with another aspect of the present invention, the cover 3 also includes a further recess 62 on opposite long side walls 17 having substantially a square shape which is preferably provided in a middle area between of the side walls 17. The recess 62 is delimited by a base portion 63 which protrudes inwardly from the inner peripheral flange 21 of the cover 3, side walls 65 having substantially triangular section which extends upwardly from the base portion 63 and a rear wall 66 extending upwardly from the base portion 63 and connecting the side walls 65. Advantageously, the recess 62 provided on opposite long side walls 17 can improve the closure of the cover 3 onto the base 2 and can improve the stiffness of the cover 3, thereby avoiding that the cover 3 is deformed during handling, transport and/or use.

[0053] The provision of a recess 62 as above is not essential for the implementation of the present invention but may be useful in particular for covers having side walls with long dimensions. Thus, the recess 62 may be

not present in other embodiments of the present invention.

[0054] It was surprisingly found that grooves 26 having the above-indicated shape made on the cover 3 of the container 1 or 60 and in particular in the angular areas or connecting corners between contiguous side walls 17, 18 of the cover 3 provide a considerable structural reinforcement to the cover 3 considerably increasing in particular the compression strength thereof with respect to the conventional containers that are not provided with these grooves. This finding is further improved by providing grooves 8 having the above indicated shape on the bottom or at the connecting area of the side walls of the container.

[0055] Therefore, the container 1 or 60 according to the invention is much less subject to risks of structural failure (crack) and damage of the content thereof with respect to existing containers provided with structural reinforcing grooves having a conventional shape and it is thereby particularly suited to be stacked with similar containers for example during the transport or the display in a display unit of a commercial space.

[0056] Moreover it should be noted that the container according to the invention achieves appropriate characteristics of mechanical strength, in particular of compression and bending (flexure) strength, with the use of a reduced number of reinforcing grooves having the above-described specific shape whereas on the contrary the conventional containers that adopt square-shaped or round-shaped reinforcing grooves require the use of a much higher number of grooves distributed on a predominant part or the whole structure of the container in order to obtain, where possible, similar characteristics of mechanical strength.

[0057] Since a reduced number of reinforcing grooves is used, the container according to the invention has also improved characteristics of "transparency" offering in fact an increased part of the structure thereof without grooves through which the user or consumer can look at and correctly appreciate (i.e. in the actual form thereof) the content of the container.

[0058] It should also be noted that in the container according to the invention satisfactory characteristics of mechanical strength can be achieved by providing reinforcing grooves having the above-described shape even just on the bottom of the container and/or in angular areas of the respective closing cover. The characteristics of visibility from the outside of the container prove thereby to be considerably improved since the consumer/user can observe and perceive the content of the container in the actual form thereof from any observation side.

[0059] However, the container according to the invention can provide reinforcing grooves having the above-described shape also or only on the side walls of the base and/or of the cover, although in a reduced number, for example to meet specific requirements.

[0060] A person skilled in the art will be allowed to bring several modifications and alternatives to the container

according to the invention, all however comprised within the scope of protection of the attached claims.

Claims

1. Container (1;60) made of plastic material for packaging food products or foodstuffs comprising a base (2) having a bottom (4) and side walls (5, 6) ending at the top with a peripheral edge (7) and at least one groove (8) formed on said bottom (4) and/or on at least one of said side walls (5, 6), the container being **characterized in that** said at least one groove (8) is substantially V-shaped (or triangle-shaped) in cross section and it is tapered from an end thereof until it substantially converges in a vertex (V) at the opposite end.
2. Container according to claim 1, wherein the at least one groove (8) is recessed, i.e. it faces the inside of the container (1).
3. Container according to claim 1 or 2, wherein said bottom (4) of the container is substantially square/rectangular-shaped and it has at least one recessed groove (8), preferably a plurality of recessed grooves (8), that is/are substantially V-shaped (or triangle-shaped) in cross section, each groove (8) diagonally extending from an angular area or corner of the bottom (4) and tapering from said angular area or corner until it converges in a vertex (V) at the opposite end thereof, said vertex (V) being located at a central area (9) of said bottom.
4. Container according to claim 1 or 2, wherein said base (2) has at least one recessed groove (8), preferably a plurality of recessed grooves (8), that is/are substantially V-shaped (or triangle-shaped) in cross section, each groove (8) extending upwards from the bottom (4) at a respective angular area or connecting corner between contiguous side walls (5;6) of the base (2) and tapering upwards until they converge and end in a vertex V in contact with said peripheral flange (7) of the base (2).
5. Container according to any one of the previous claims, further comprising a closing cover (3), preferably constrained to said base (2) by a hinge element (25).
6. Container according to claim 5, wherein said closing cover (3) is equipped with at least one groove (26) that is substantially V-shaped (or triangle-shaped) in cross section and tapered from an end thereof until it substantially converges in a vertex (V) at the opposite end.
7. Container according to claim 5 or 6, wherein said at least one groove of the closing cover (3) is recessed, i.e. it faces the inside of the container.
8. Container according to any one of the previous claims 5 to 7, wherein said cover (3) has a top portion (16) and side walls (17, 18) ending at the bottom in a lower flange (21) and at least one groove (26), preferably a plurality of grooves (26) that vertically extends/extend downwards from said top portion (16) each at a respective angular area or connecting corner between contiguous side walls (17, 18), long and short respectively, of the cover (3) and that tapers/taper downwards until it/they converges/converge and ends/end in a vertex (V), possibly in contact with said lower flange (21).
9. Container according to anyone of claims 6 to 8, further including notches (64) on the side walls (17,18) of the cover (3) in the proximity of said grooves (26), the notches (64) having substantially the same shape as that of said grooves (26) and smaller dimensions.
10. Container according to claim 8 or 9, further including a recess (62) provided on opposite side walls (17), preferably in a middle area thereof, the recess (62) being delimited by a base portion (63) which protrudes inwardly from the inner peripheral flange (21), side walls (65) having preferably triangular section which extends upwardly from the base portion (63) and a rear wall (66) extending upwardly from the base portion (63) and connecting the side walls (65).
11. Closing cover (3) for a container (1) made of plastic material for packaging food products or foodstuffs, the cover (3) having at least one groove (26), preferably recessed, that is substantially V-shaped (or triangle-shaped) in cross section and tapered from an end thereof until it substantially converges in a vertex at the opposite end.
12. Closing cover (3) according to claim 11, wherein said cover (3) has a top portion (16) and side walls (17, 18) ending at the bottom in a lower flange (21) and at least one groove (26), preferably a plurality of grooves (26) that vertically extends/extend downwards from said top portion (16) each at a respective angular area or connecting corner between contiguous side walls (17, 18), long and short respectively, of the cover (3) and that tapers/taper downwards until it/they converges/converge and ends/end in a vertex (V), possibly in contact with said lower flange (21).
13. Closing cover (3) according to claim 12, further including notches (64) on the side walls (17,18) of the cover (3) in the proximity of said grooves (26), the notches (64) having substantially the same shape

as that of said grooves (26) and smaller dimensions.

14. Closing cover according to claim 12 or 13, further including a recess (62) provided on opposite side walls (17), preferably in a middle area thereof, the recess (62) being delimited by a base portion (63) which protrudes inwardly from the inner peripheral flange (21), side walls (65) having preferably triangular section which extends upwardly from the base portion (63) and a rear wall (66) extending upwardly from the base portion (63) and connecting the side walls (65).

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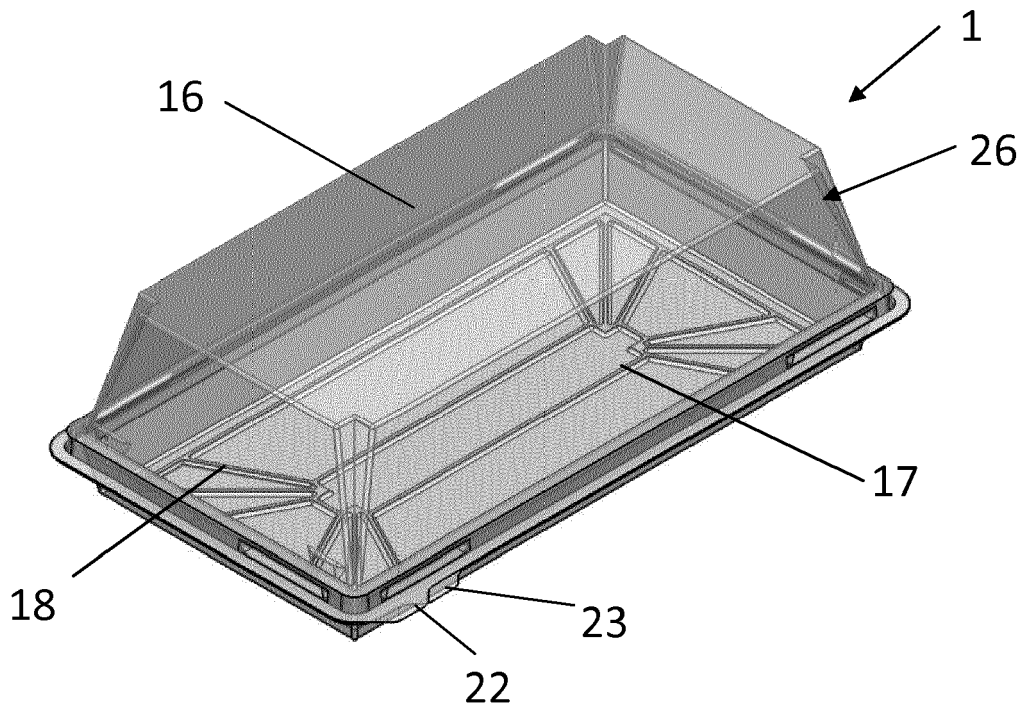


Fig. 1

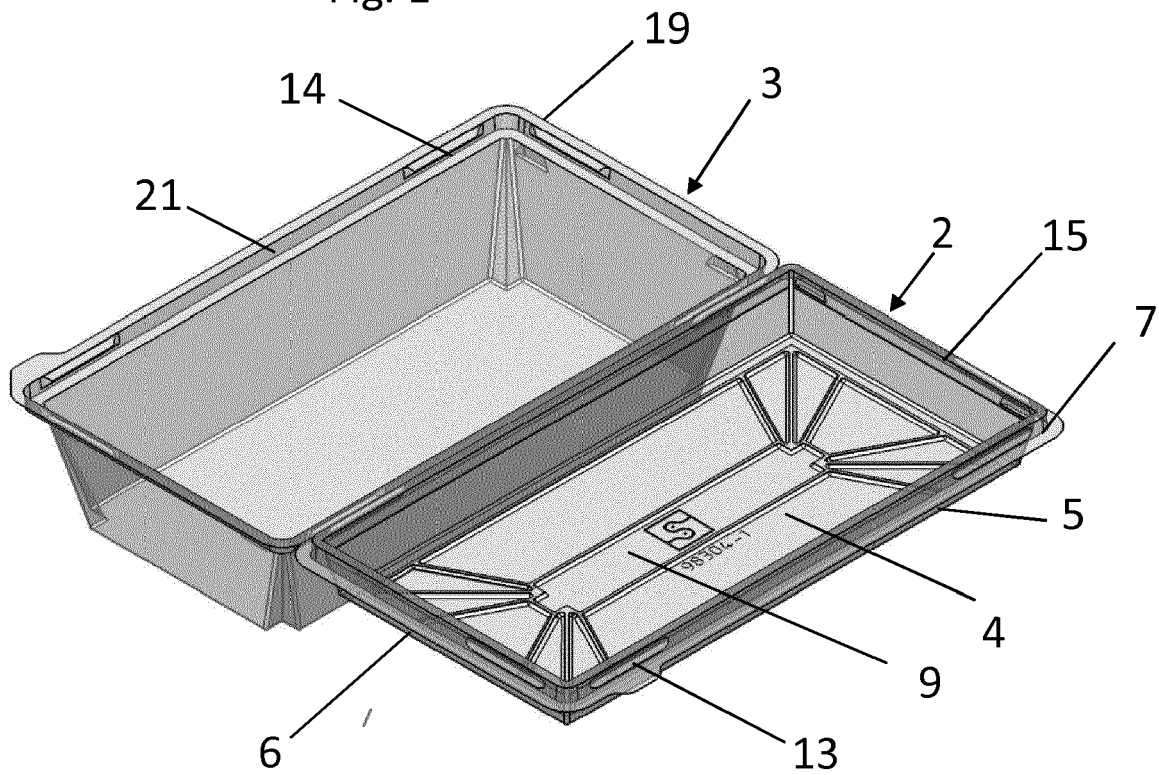


Fig. 2

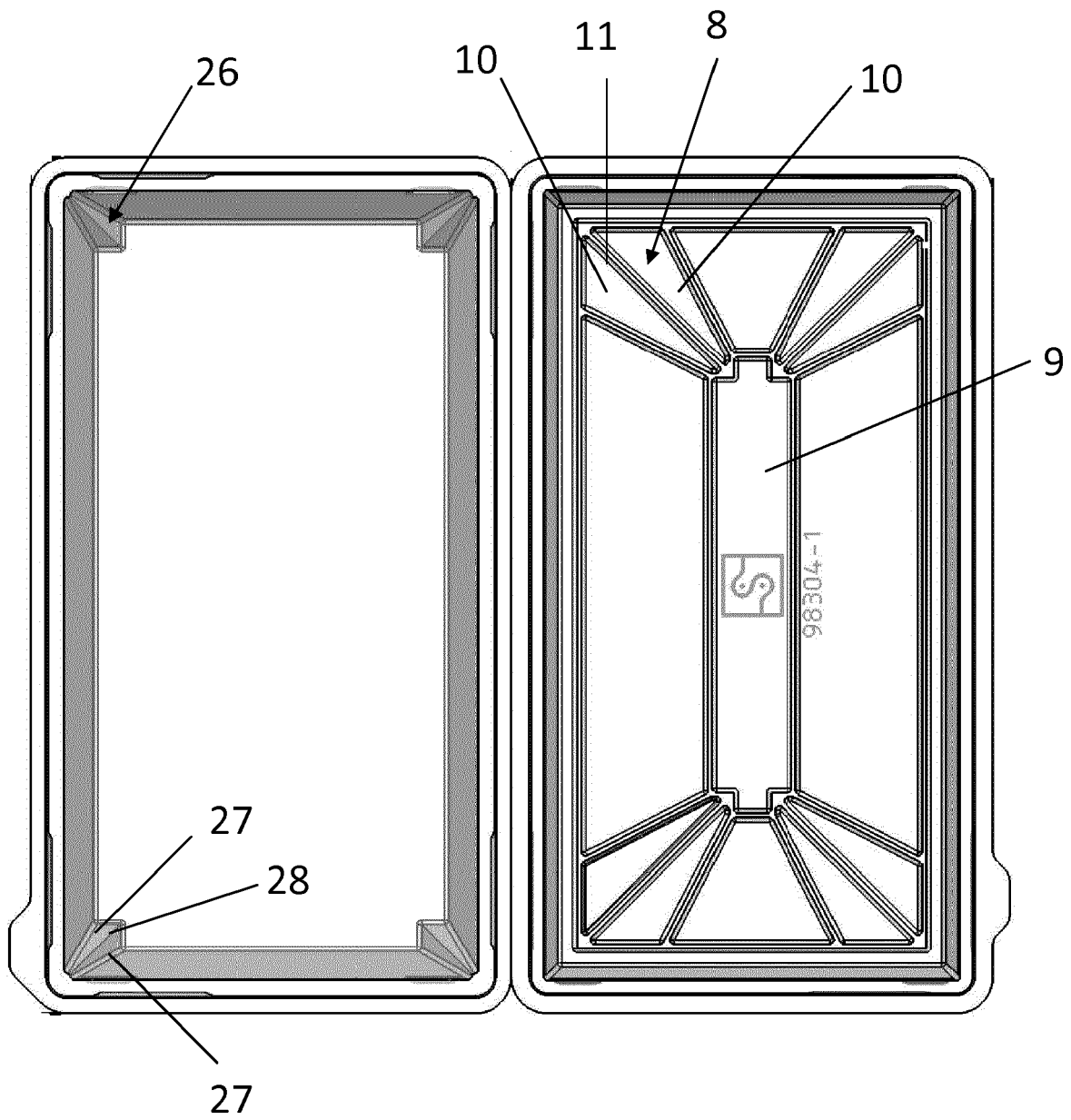


Fig. 3

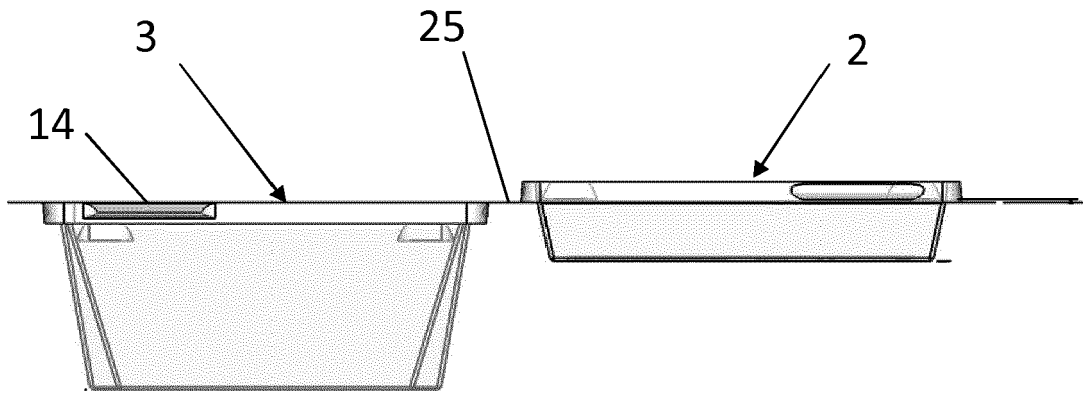


Fig. 4

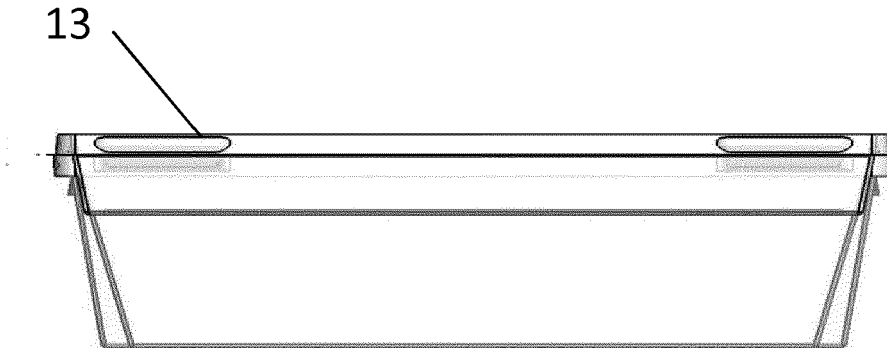


Fig. 5

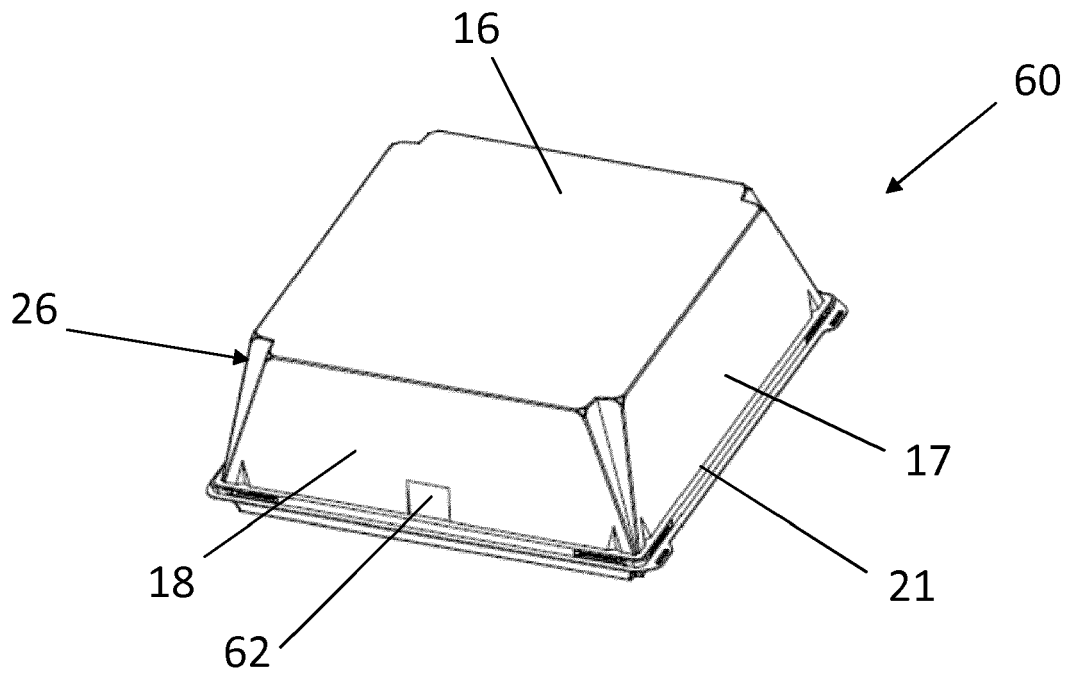


Fig. 6

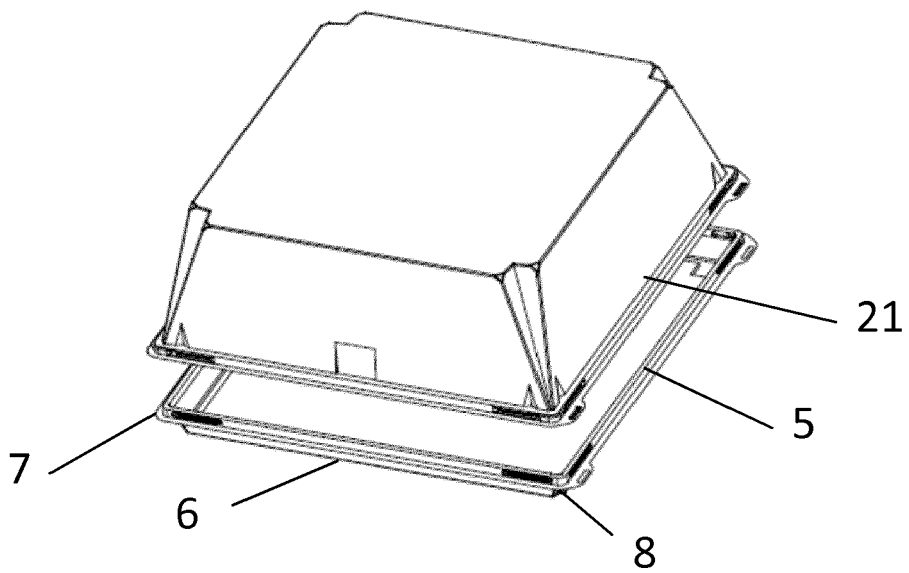


Fig. 7

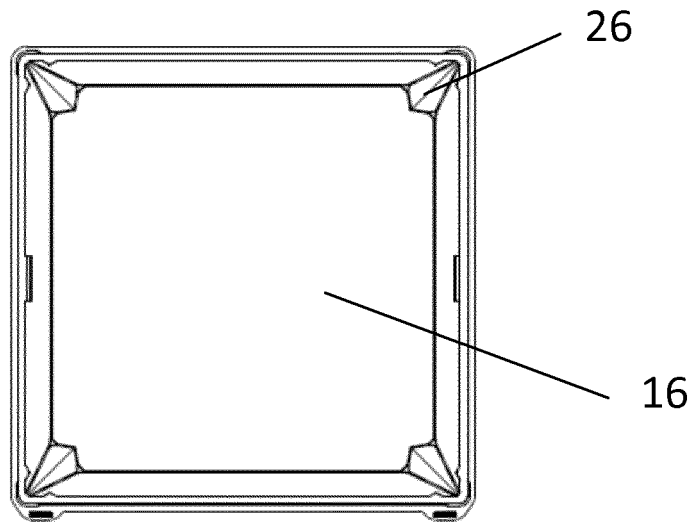


Fig. 8

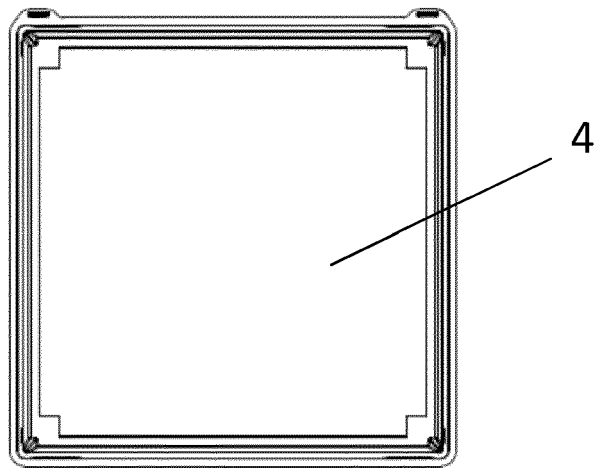


Fig. 9

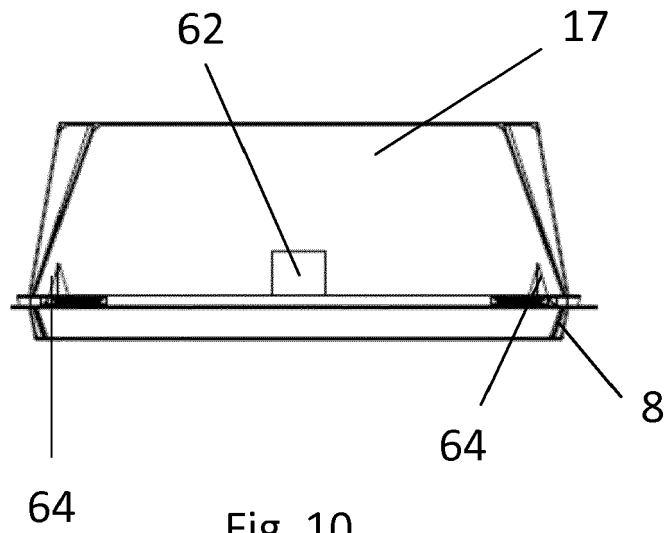


Fig. 10

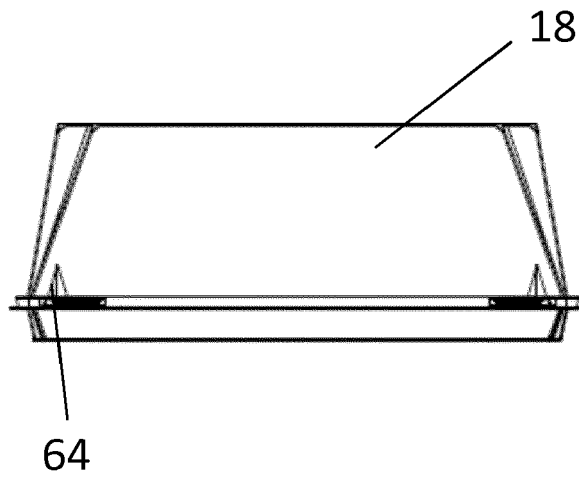


Fig. 11

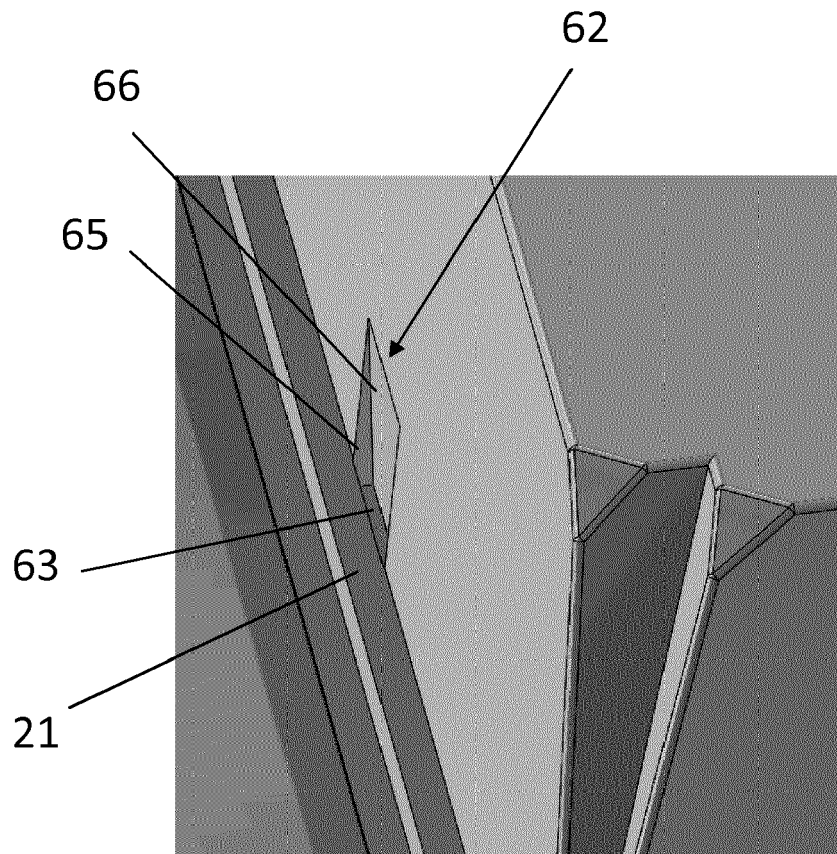


Fig. 12



EUROPEAN SEARCH REPORT

Application Number
EP 19 18 1572

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2013 039949 A (SEKISUI GIKEN KK; SEKISUI PLASTICS) 28 February 2013 (2013-02-28) * paragraphs [0001] - [0031] * * figures 1-7 *	1-14	INV. B65D1/34 B65D43/16
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