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DESCRIPTION

[0001] The invention relates to a container assembly for liquids, such as beverages and oils, comprising a container, chimes and a valve assembly for feeding a propellant to and dispensing the liquid from the container. The invention further relates to a group of container assemblies, e.g. stacked on a pallet.

[0002] WO 2011/134949 relates to a container for liquids, such as beverages and oils, comprising a blow moulded polyester casing, a valve for dispensing the liquid from the container, and an inlet for introducing a propellant. The casing is enveloped by a stretch blow moulded polyester shell. Further, in an embodiment, the top and the base of the shell are shaped to render the container stackable, as shown in Figure 4 of WO 2011/134949.

[0003] It is explained in WO 2011/134949 that containers having a relatively high length to width ratio (L/D) and/or a relatively long cylindrical portion facilitate logistics, e.g. more containers can be placed on a pallet, and facilitate cooling, e.g. four containers fit in a standard size refrigerator.

[0004] DE 10 2009 044 314 addresses the problem of providing a stacking aid for kegs, in particular kegs made from a synthetic material, such as PET, PP or PEN, to enable secure and economical stacking of kegs on a pallet.

[0005] To this end, DE 10 2009 044 314 provides a stacking aid for containers having a first dome-shaped region (top 7 in Figure 1 of DE 10 2009 044 314) and a second dome-shaped region (bottom 9). The stacking aid comprises a first element releasably positioned on the first dome-shaped region and a second element releasably positioned on the second dome-shaped region.

[0006] On pallets, container assemblies such as kegs are subjected to considerable forces, in particular during transport.

[0007] It is an object of the present invention to provide a container assembly that allows relatively straightforward and stable palletization.

[0008] To this end, the container assembly according to the invention is defined by the subject matter of claim 1.

[0009] In an embodiment, the polygonal cross-section comprises at least two pairs of parallel sides, the pairs preferably extending at a right angle (square, octagon) or $\sim 120^\circ$ (hexagon) with respect to each other.

[0010] The polygonal cross-section, such as square, hexagonal or octagonal cross-sections having e.g. straight or curved sides, provide abutment, in particular between surfaces or lines

(not merely points) of adjacent container assemblies, and a degree of coherence within the layers of a stack on a pallet. Preferably, abutting polygons limit, at least through increased friction, rotation and translation (shifting) of the container assemblies relative to each other, in particular during transport.

[0011] Further, the polygonal cross-section hinders rolling of the container assembly over a floor and help prevent any damage that may result from such rolling.

[0012] In a further embodiment, at least two, preferably four of the sides of the polygonal cross-section comprise self-complementary interlocking features, i.e. features isomorphic to their complement, thus further increasing stability in layers of such container assemblies e.g. when stacked on a pallet.

[0013] Preferably the top chime, has a polygonal cross-section, i.e. forms a or the portion of the container assembly.

[0014] In a further embodiment, at least one of the chimes is a separate element attached, e.g. screwed and/or snap fitted, to the container, preferably about the valve, providing protection, and preferably releasably, to allow removal when the container is scrapped after use.

[0015] In an embodiment, the container or at least one of the chimes comprises one or more notches or at least one of the chimes diverges, thus defining a recess for accommodating a tensioning element. Thus, container assemblies in a layer of a stack on a pallet can be pulled together to further increase coherence within the layers.

[0016] In another embodiment, one of the chimes of the container assembly comprises an annular rim and the other chime comprises an annular step or groove suitable for accommodating an identical annular rim, thus increasing stackability and coherence between layers in a stack on a pallet.

[0017] In an embodiment, rigidity of the rim is increased by imposing undulation on the rim, preferably partially beyond the circumference of main part of the container, and/or by embossing the bottom chime of the container, near or at the rim.

[0018] In addition to contributing to stackability and palletization, in an embodiment, the chime provides at least one grip for lifting and manipulating the container assembly.

[0019] The invention further relates to a group of container assemblies. In an embodiment, the container assemblies are stacked in layers on a pallet, such as a Europallet or block pallet, and juxtaposed assemblies in a, preferably all, layers abut, and optionally interlock, at their polygonal cross-sections.

[0020] In a further embodiment, the container assemblies in at least one, preferably all layers

in the stack are urged together by means of an elongate tensioning element, such as a strap or cord tensioned about the chimes of the outer container assemblies in the layer.

[0021] In an embodiment, a sheet of a flexible and/or plastically deformable material, in particular a polymer film or a hollow-core plate, is present between the layers. By placing a next layer of container assemblies on a flexible sheet, the sheet will be deformed, i.e. caught between the top and bottom chimes of stacked layers of container assemblies, and draw the assemblies within the layers together.

[0022] In another embodiment, the container assemblies are empty, i.e. do not contain a liquid, and positioned upside down. This orientation provides improved hygiene and facilitates filling of the container assemblies, in that the container assemblies need not be turned upside down at the bottling facility.

[0023] In a further embodiment, the container comprises an inner casing for holding the liquid and an outer shell enveloping the casing. In a further embodiment, the shell comprises two separate parts, e.g. divided along a circumference of the shell, and at least one of the parts, preferably the top part, is clamp fitted on the casing when the latter is pressurized. The remaining part of the shell can be secured, e.g. by clamping, cementing and/or welding, in the bottom end of the top part, e.g. upside down, as will be explained in the examples.

[0024] US 2010/0077790 relates to a plastic beer keg which includes an outer container and an inner liner. A removable lid is secured over an opening to the container to enclose the liner. In use, the lid can be removed and ice placed in the container directly on the liner, ice flows into gaps between the liner and the container to provide rapid cooling of the content of the liner. WO 2010/123864 relates to a similar beer keg wherein the base of the liner interlocks with the base of the container to prevent relative rotation between the two.

[0025] US 3,683,549 relates to a flowerpot having protrusion means and recess means in each of the sides of an angular, upper marginal portion. The protrusion means and recess means on each side are mirror-inverted symmetrical to the vertical center line of the respective side for engaging like protrusion means and recess means in an adjacent flowerpot. Downwardly tapering wall means extend from the upper marginal portion to the base of the pot. US2005/0189243 A1, US6302291B1 and WO2011/101814A1 disclose systems for improving or allowing bottle stack-ability.

[0026] The invention will now be explained in more detail with reference to the drawings, which show a preferred embodiment of the present invention.

Figure 1 is a perspective view of a container assembly according to the present invention provided with a multifunctional chime.

Figures 2 and 2A are cross-sections of the container of the container assembly shown in Figure 1.

Figures 3 to 5 are a top view and perspective side views of the multifunctional chime of the assembly shown in Figure 1.

Figures 6 and 6A are perspective views of the container of the assembly shown in Figure 1, in upside down position.

Figures 7 and 7A are bottom views of the container of the assembly shown in Figure 1.

Figures 8 and 8A are perspective views of a stack of two container assemblies according to the present invention.

Figure 9 is a perspective view of a pallet carrying two layers of (4 x 5) container assemblies according to the present invention, filled with a liquid.

Figure 10 is a perspective view of a pallet carrying four layers of (4 x 5) empty container assemblies according to the present invention.

Figures 11 and 11A are top views of container assemblies according to the present invention.

[0027] The drawings are not necessarily to scale and details, which are not necessary for understanding the present invention, may have been omitted. Further, elements that are at least substantially identical or that preform an at least substantially identical function are denoted by the same numeral.

[0028] Figure 1 shows a container assembly 1 for a beverage containing a gas, in particular beer, comprising a container 2 made by stretch blow moulding polyester preforms, in particular PET (polyethylene terephthalate), a valve assembly 3, and a top chime 4 fitted about the valve assembly.

[0029] As shown in Figures 2 and 3, in this example, the container 2 comprises an inner casing 5 for holding the liquid and an outer shell 6 enveloping the inner casing. The casing has smooth shape, defined by a cylinder 5A and upper and lower domes 5B, 5C to withstand internal pressure, and a central opening 7 in the top dome 5B formed by the non-deformed part of the preform. The valve assembly 3 is attached to this part.

[0030] The shell comprises two parts 6A, 6B, separated along a circumference, i.e. in hoop direction, of the shell 6, relatively close to the bottom of the shell, such that the top part of the shell is longer than the casing 5. The top part 6A of the shell comprises a central opening 7 surrounding the valve assembly 3 and provided with an external thread 8. The bottom part 6B of the shell provides a petaloid foot fitted, upside down, in the top part of the shell, forming a annular rim, as will be explained more detail below.

[0031] For more detailed information on the valve assembly and other suitable valve assemblies reference is made to International patent application WO 00/07902 (see especially

page 8, line 12 ff. in conjunction with Figures 4A and 4B). In this example, a riser pipe (not shown) or a gastight bag (not shown) for receiving the beverage is connected to the valve assembly and located inside the casing. Further details on the bag can be found in *inter alia* WO 2011/134949.

[0032] The top chime 4 is shown in more detail in Figures 3 to 5. The chime 4 comprises an octagonal rim, defining an octagonal circumference circumscribing the circular circumference of the container 2 and providing four sides 10 for abutting identical chimes of one or more neighboring container assemblies. The chime further comprises a central cylinder 11 providing a circular opening and an internal thread 12 to screw the chime onto the central opening 7 of the shell 6 and thus about the valve assembly 3 of the casing 5. The inner wall of the central opening 7 is preferably also provided with one or more slots 13 which snap onto corresponding protrusions 14 (Figure 2A) on the outer wall of the central opening of the shell, thus establishing a final position of the chime on the container.

[0033] In this example, the rim is interconnected with the central cylinder 11 via a plurality of, e.g. four spokes 15, defining an equal number of grips 16 between the spokes. The rim and spokes are essentially hollow and stiffened by means of baffles 17 extending substantially radially.

[0034] The upper surface of the chime is provided with an annular groove, in this example obtained by providing the upper edges of the baffles in the rim with notches 18, for accommodating the bottom rim of an identical container assembly, as shown in Figures 8 and 8A. The bottom walls of the spokes are provided with openings 19 to allow any liquids falling into the chime to drain. The side walls provide flat portions 20 or notches for accommodating a tensioning element, such as a flexible strip.

[0035] As, in top view, the four sides of the polygonal chime for abutting identical chimes of neighboring container assemblies are tangential to the circumference of the container, these sides are necessarily provided with cut-aways 21 to accommodate coinciding portions of the lower rim 2A of the container 2.

[0036] The shape of the bottom of the spokes corresponds to the shape of the upper part of the shell, which shell thus support the chime, e.g. when another container assembly is stacked on top of it.

[0037] The bottom chime of the container assembly is shown in Figures 6 to 7A. The bottom part 6B of the shell is petaloid and is pressed, upside down, in the lower end of the upper part of the shell and fixed in place e.g. by cementing or ultrasonic welding. To further increase stability, it is preferred that, at the rim 2A, the wall undulates, as indicated by line 22 (in Figure 7A) to increase its effective thickness and stiffness and/or the wall is actually thicker, preferably at least two times thicker, than the wall of the cylindrical section of the shell. In the embodiment shown, rigidity of the rim 2A is further increased by circumferential embossing 23.

[0038] In this example, the container has a net volume of 20 liters, an overall length of approximately 57 cm and a width of approximately 24 cm, yielding an L/D of 2,4. Thus, layers of 4x5 containers assemblies fit on a standardized Europallet (800 x 1200 mm).

[0039] Figure 9 shows such a pallet 25 carrying two layers of juxtaposed container assemblies holding a beverage, such as beer. The container assemblies in each of the layers are urged together by means of strap 26 tensioned about the chimes 4 of the outer container assemblies in the layer.

[0040] Figure 10 shows a pallet 25 carrying four layers of juxtaposed container assemblies. In this embodiment, the container assemblies are empty and positioned upside down. A sheet of a flexible material (not shown), in particular a polymer film, is present between the layers. By placing a next layer of container assemblies on a flexible sheet, the sheet will be deformed and draw the assemblies within the layers together.

[0041] Figures 11 and 11A show a further embodiment of the container assembly according to the present invention, wherein the abutting sides of the chimes comprise self-complementary interlocking features, in this example a protrusion 30 and a corresponding recess 31 on each side.

[0042] The top chimes provide abutment and thus mutual support between the containers in a layer, suppressing rotation and translation (shifting) of the container assemblies relative to each other, in particular during transport.

[0043] The invention is not restricted to the above-described embodiments which can be varied in a number of ways within the scope of the claims.

REFERENCES CITED IN THE DESCRIPTION

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- [WO2010123864A](#) [\[0024\]](#)

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Patentkrav

1. Beholderanordning (1) til væsker, såsom drikkevarer og olier, omfattende en beholder (2), kimme (4, 6B) og en ventilanordning (3) til at tilføre et drivmiddel til, og dosere væsken fra, beholderen (2), **kendetegnet ved, at** et segment (4) af mindst en af beholderanordningens (1) kimmer (4, 6B) har et polygonalt tværsnit, hvilket tværsnit i det mindste delvist afgrænser tværsnittet af resten af beholderanordningen (1) og tilvejebringer understøtning, når tilstødende beholderanordninger (1) stables i lag på en palle.
2. Beholderanordning (1) ifølge krav 1, hvor det polygonale tværsnit omfatter mindst to par af parallelle sider, hvor parrene fortrinsvist strækker sig i en ret vinkel i forhold til hinanden.
3. Beholderanordning (1) ifølge krav 1 eller 2, hvor mindst to, fortrinsvist fire, af siderne af det polygonale tværsnit omfatter selvkomplementære sammenlåsningsegenskaber (30, 31).
4. Beholderanordning (1) ifølge et hvilket som helst af de foregående krav, hvor mindst en af kimmerne (4, 6B) er et separat segment (4) fastgjort til beholderen (2), fortrinsvist omkring ventilen (3).
5. Beholderanordning (1) ifølge et hvilket som helst af de foregående krav, hvor beholderen (2) eller i det mindste en af kimmerne (4, 6B) omfatter en eller flere udskæringer, eller mindst den ene kimme divergerer og derved definerer en fordybning for at imødekomme et spændingselement (26).
6. Beholderanordning (1) ifølge et hvilket som helst af de foregående krav, hvor en af beholderanordningens kimmerne (4, 6B) omfatter en ringformet kant (2A), og den anden kimme (4) omfatter en ringformet udskæring eller rille (18) egnet til at rumme en identisk ringformet kant (2A).
7. Beholderanordning (1) ifølge krav 6, hvor kanten (2A) bølger.
8. Beholderanordning (1) ifølge krav 6 eller 7, hvor beholderens (2) bundkimme (6B), nær eller ved kanten (2A), er præget (23).

9. Beholderanordning (1) ifølge et hvilket som helst af de foregående krav, hvor mindst en af kimmerne (4) tilvejebringer mindst et greb (16) til at løfte og manipulere anordningen (1).
- 5 10. Beholderanordningskonstruktion (1) ifølge et hvilket som helst af de foregående krav.
- 10 11. Beholderanordningskonstruktion (1) ifølge krav 10, hvor beholderanordningerne (1) er stablet i lag på en palle (25) og sidestillet beholderanordninger (1) i et lag anbragt ved deres polygonale tværsnit.
- 15 12. Beholderanordningskonstruktion (1) ifølge krav 11, hvor beholderanordningerne (1) i mindst en, fortrinsvist alle lag i stablen, presses sammen ved hjælp af et aflangt spændingselement (26).
13. Beholderanordningskonstruktion (1) ifølge et hvilket som helst af kravene 10-12, hvor et ark af et fleksibelt og/eller plastisk deformerbart materiale er til stede mellem lagene.
- 20 14. Beholderanordningskonstruktion (1) ifølge et hvilket som helst af kravene 11-13, hvor beholderanordningerne (1) er tomme og anbragt på hovedet.

DRAWINGS

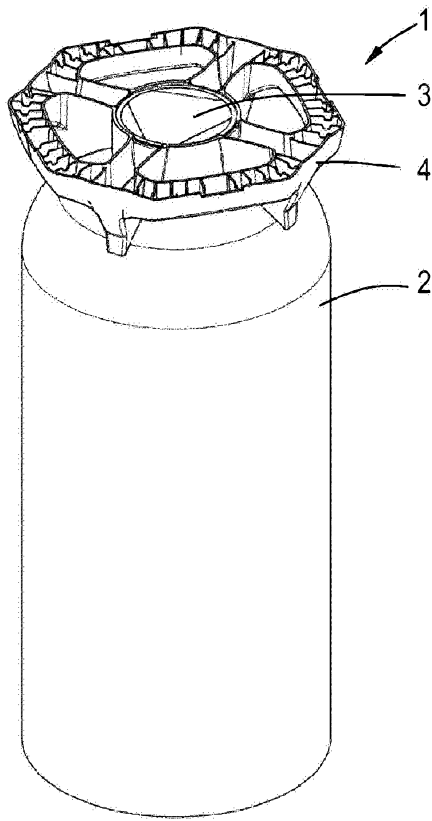


Fig. 1

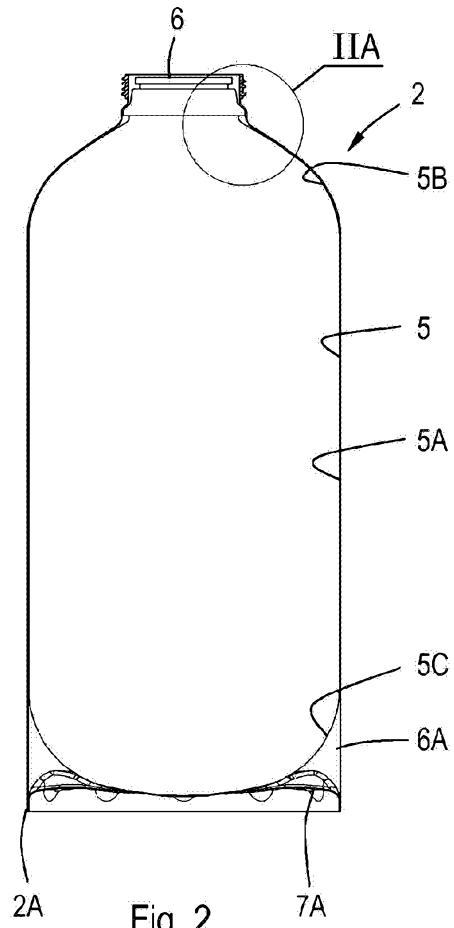


Fig. 2

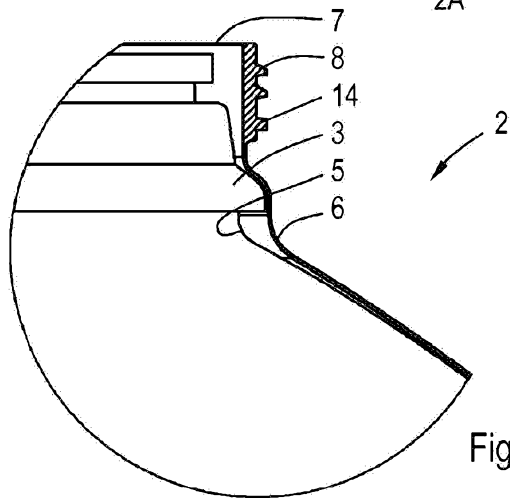


Fig. 2A

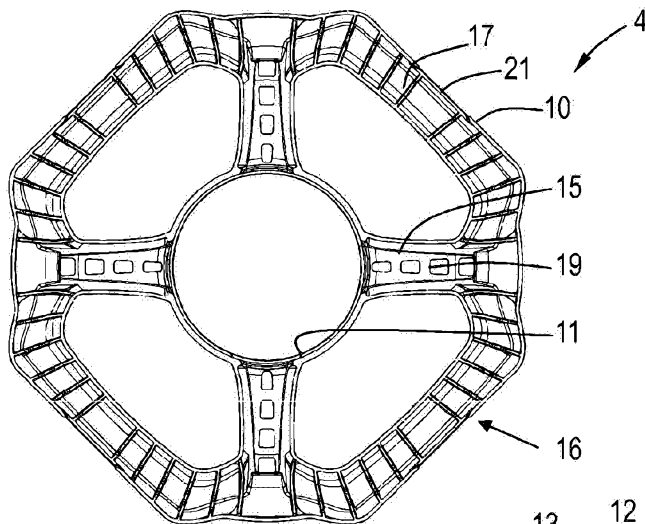


Fig.3

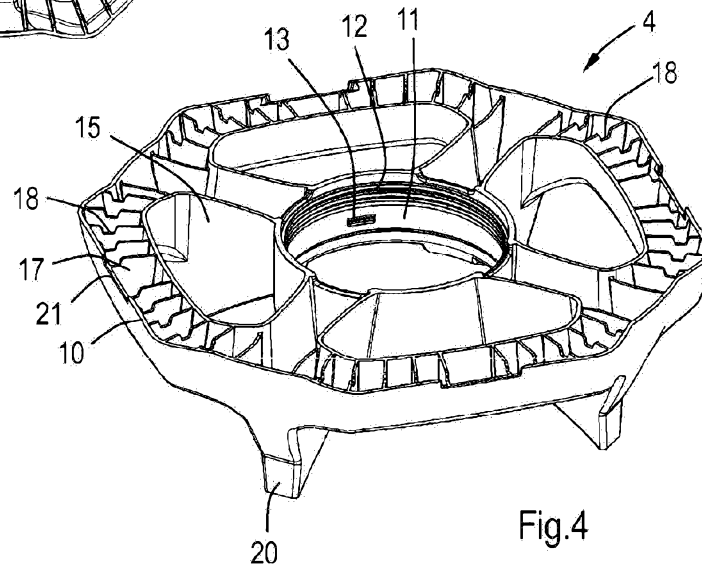


Fig.4

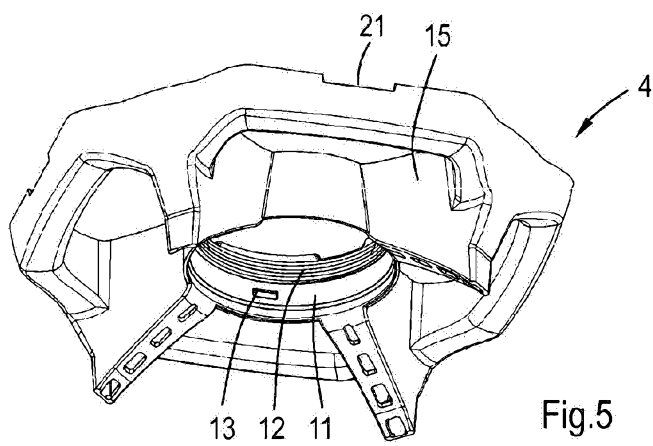


Fig.5

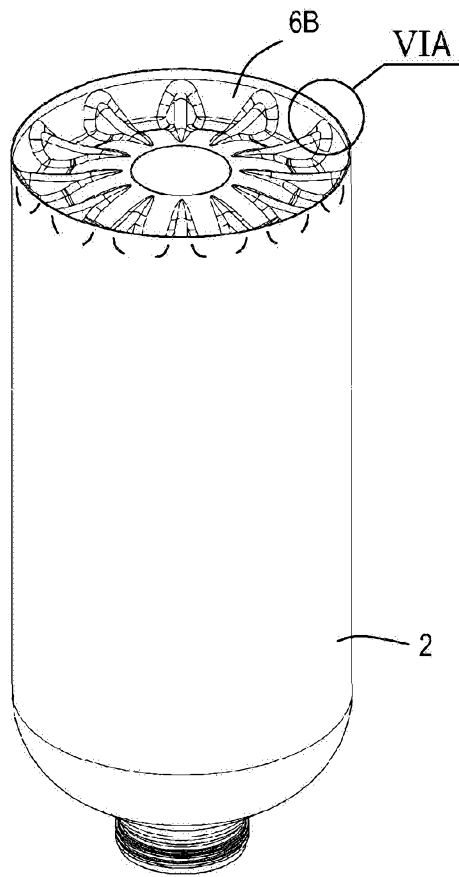


Fig. 6

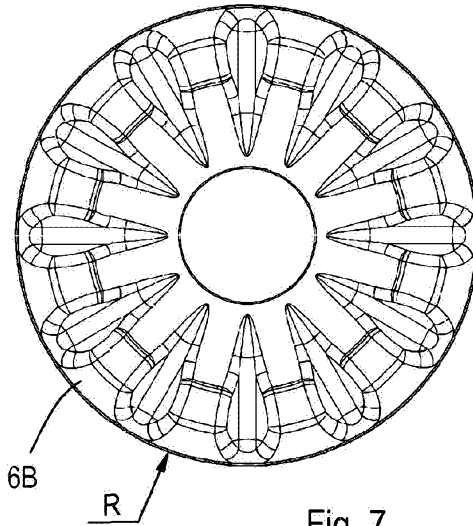


Fig. 7

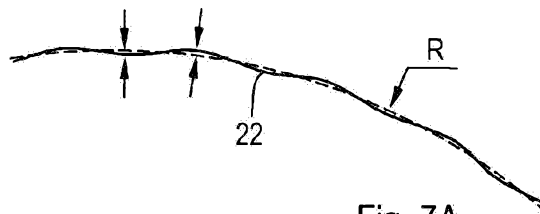


Fig. 7A

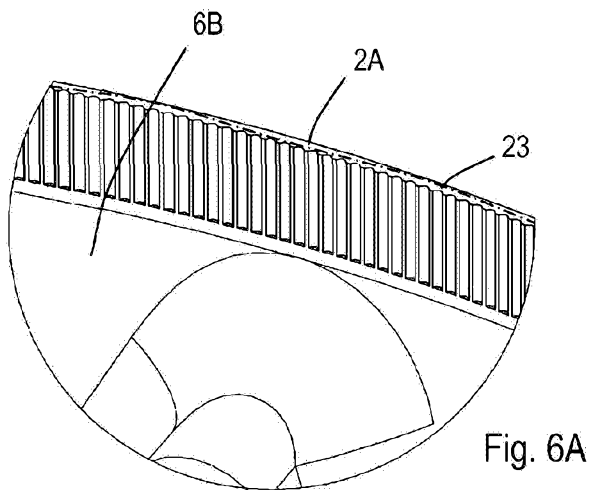


Fig. 6A

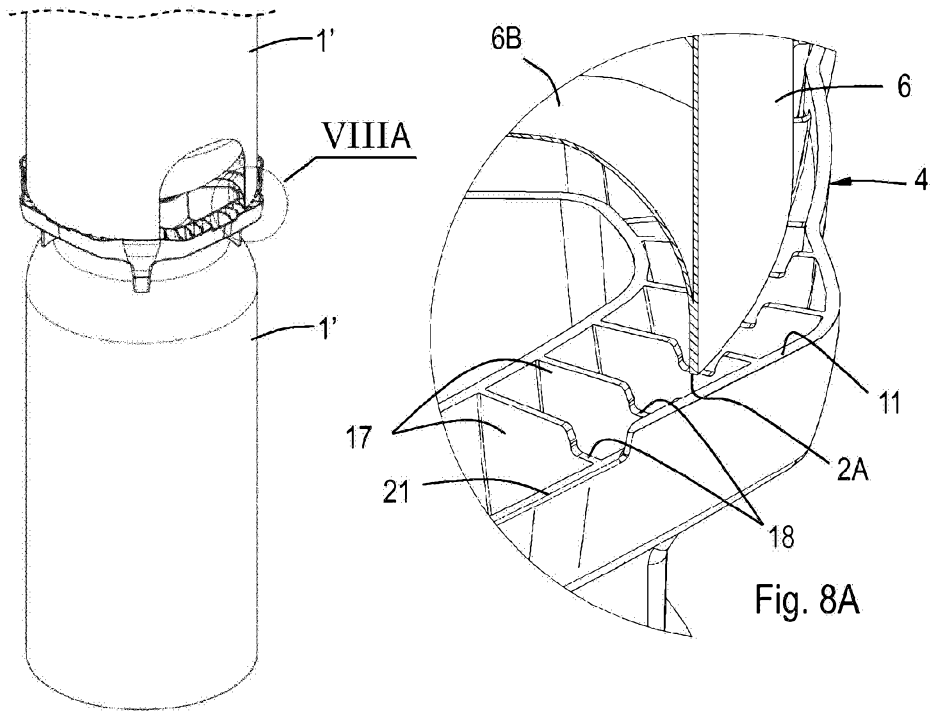


Fig. 8

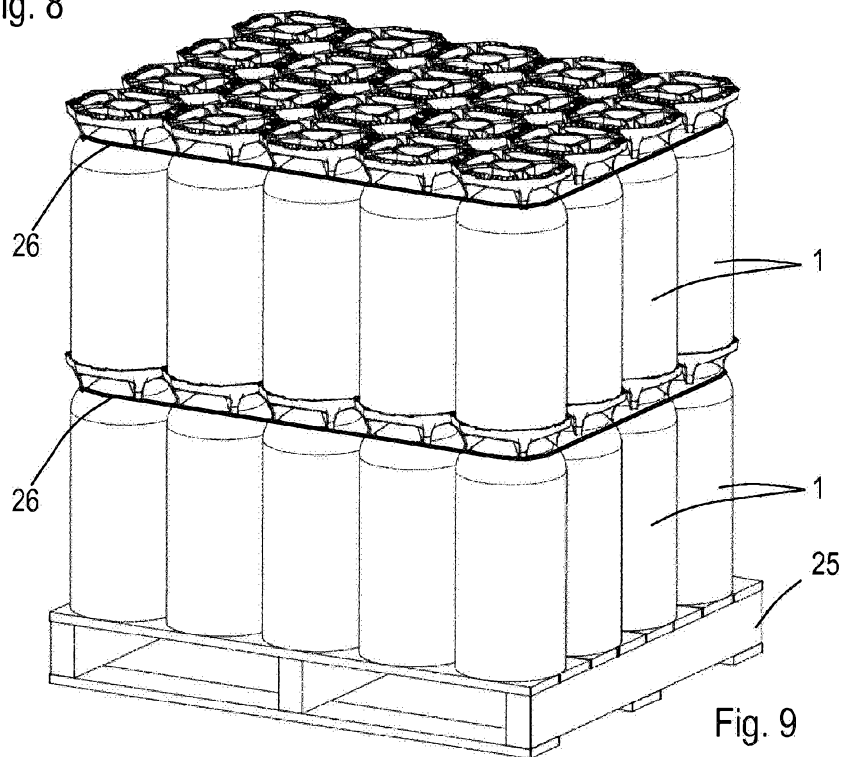


Fig. 9

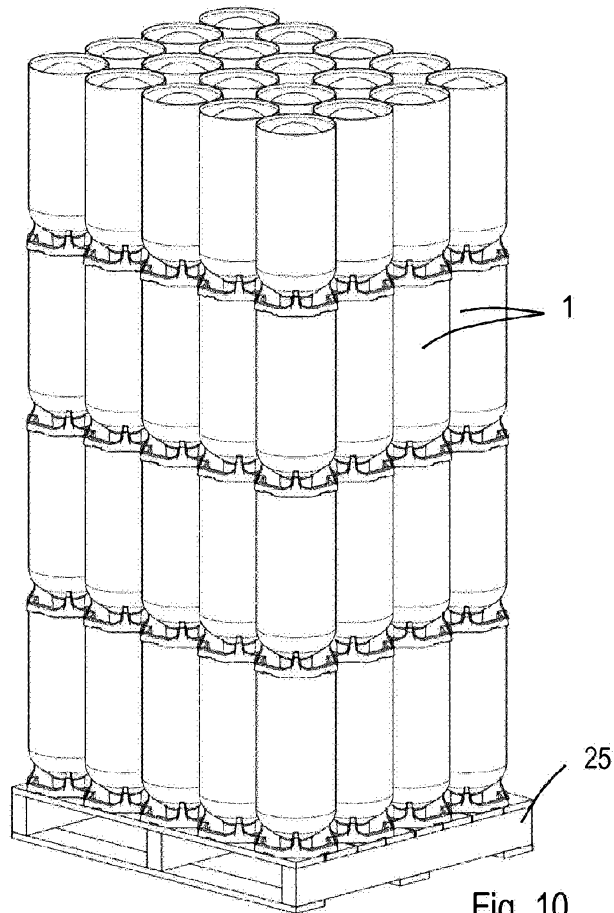


Fig. 10

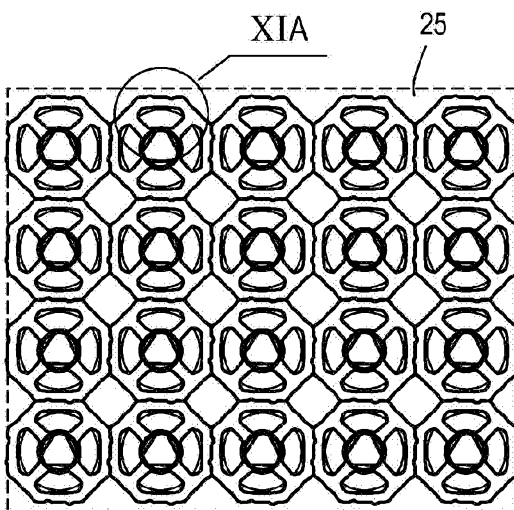


Fig. 11

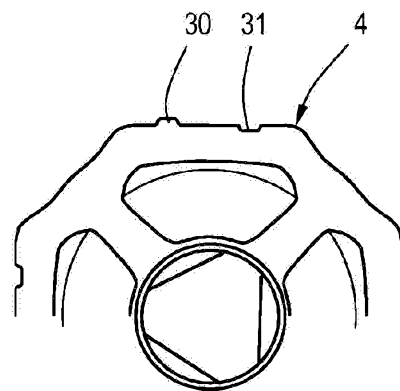


Fig. 11A