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(54) Container for fluids, in particular liquids, and a method of making a container

(57) The invention pertains to a container (1) for fluids, in particular liquids, such as beer or water, comprising a spherical or spheroid casing (2), a valve part (4) for filling the container (1) with a fluid and an outer package surrounding the casing (2). The outer package comprises a shell (6), which follows the circumference of the casing (2).

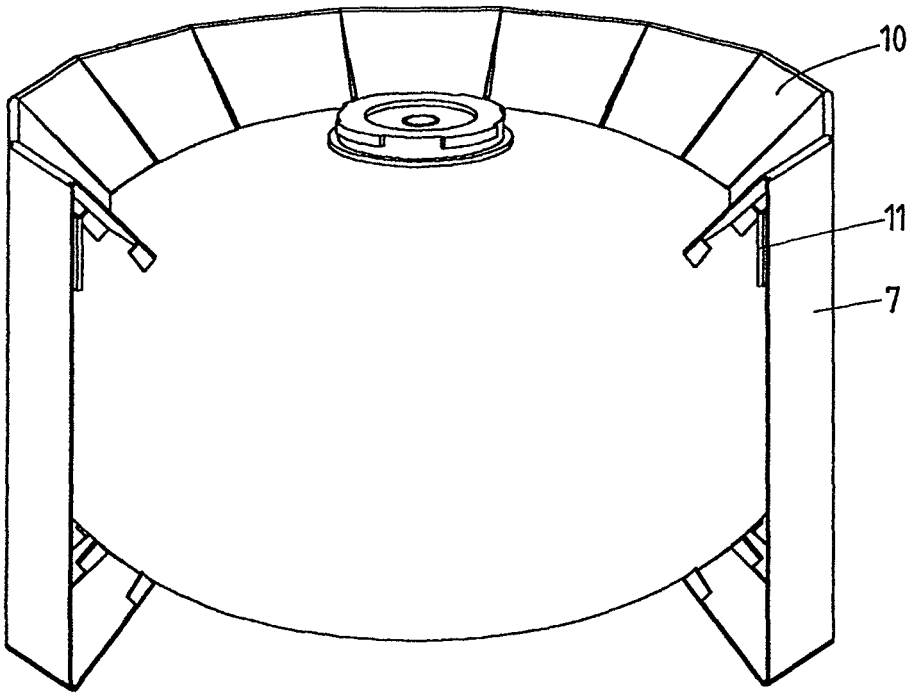

Fig.2B

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Description

[0001] The invention relates to a container for fluids, in particular liquids, such as beer or water, comprising a casing, preferably a pressure resistant casing, and a valve part for filling the container with a fluid. The invention further relates to a blank for folding an outer package around a spherical or spheroid casing and a method of making a container.

[0002] EP 862 535 discloses a container for fluids comprising an outer and preferably ellipsoid casing of a flexible, pressure resistant material, a gastight inner casing of flexible material located inside the outer casing, and a filling connection for filling the inner casing. As a result, the container is collapsible so that filling the container may take place from the collapsed condition and filling is therefore possible without pressure difference while the fluid does not enter an empty space. The egress of gas from the fluid is substantially reduced.

[0003] In practice, some embodiments according to EP 862 535, such as the BB/30, have been provided with an outer package, i.e. a cardboard box.

[0004] It is an object of the present invention to provide an improved container.

[0005] To this end, the container according to the opening paragraph comprises a spherical or spheroid casing and an outer package surrounding the casing and is characterized in that the outer package comprises a shell, which follows the circumference of the casing.

[0006] It is preferred that the shell is cylindrical and has a circular cross-section or a polygonal cross-section with at least five angles. It is further preferred that at least one of the ends of the cylindrical shell is open and that the valve part is accessible through this open end.

[0007] Also, it is preferred that the shell comprises a plurality of grips, e.g. openings for accommodating a hand, such that, when the container is lifted by means of these grips, the valve part will normally face upwards.

[0008] The outer package according to the present invention significantly improves handling and provides effective protection of the spherical or spheroid casing with a relatively small amount of material, especially when compared to a box. Further, the package allows the container to be stored and stacked in an upright position and provides an appearance that resembles an ordinary keg.

[0009] To secure the container inside the outer package, the shell preferably comprises, on its inner wall and at or near its (upper) rim nearest the valve part and/or at or near its (bottom) rim remote from the valve part, means for retaining the casing inside the shell, preferably a plurality of inwardly extending lamella providing a one way retaining means, as will be explained in more detail below.

[0010] The invention also relates to a blank for folding an outer package around a spherical or spheroid casing, which blank is substantially oblong in shape and which comprises a plurality of fold lines, extending substantially parallel to the short sides of the blank, and, at or near at least one, preferably both, of the long sides and on the fold lines, a plurality of cuts or slots.

[0011] The invention further relates to a container for fluids comprising an outer casing, a gas and/or fluid tight inner casing of a flexible material located inside the outer casing, and a valve part for filling the container with a fluid, wherein the inner casing comprises at least one polygonal sheet of a flexible material, preferably two polygonal sheets of a flexible material sealed together along their edges.

[0012] The invention further relates to a method of making a container for fluids, comprising a casing having an opening and a valve part attached to the opening, which method comprises the steps of

melting a polymeric material,

forming the casing from the material, preferably by means of blow-moulding, and

attaching the valve part to the casing while the casing is still sufficiently hot for it to be plastically deformed, i.e. preferably before it has cooled down to a temperature below 40ºC, more preferably before it has cooled down to a temperature below 50ºC.

[0013] It is preferred that the valve part comprises a threaded portion, that the casing is formed in a mould comprising a feature corresponding to that threaded portion, such that the moulded casing comprises a threaded opening for receiving the threaded portion of the valve part, and that the valve part is screwed to the inner casing.

[0014] The method according to the present invention was found to be surprisingly effective in providing a tide fit between the valve part and the casing. Additional tooling, i.e. milling of the upper rim of the opening in the casing to improve the fluid-tightness of the connection, is no longer required. Moreover, depending on the exact configuration of the container, the present method may also obviate the need for a seal or gasket between the valve part and the casing.

[0015] Within the framework of the present invention the term "spheroid" is defined as any shape generated by a half-revolution of an square or rectangle with rounded corners or preferably an ellipse or oval about its major axis or minor axis.

[0016] The invention will now be explained in more detail with reference to the drawings, which show a preferred embodiment of the present invention.

[0017] Figure 1 is a perspective view of a prior art container, with part of the outer and inner casings cutaway.

[0018] Figures 2A to 2C are perspective views of a container according to the present invention enveloped by a cardboard shell.

[0019] Figure 3 is a top plan view of a blank suitable for forming a shell as shown in Figure 2.

[0020] Figure 4 is a top view of an empty inner casing for use in the present container.

[0021] 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 per-

form an at least substantially identical function are denoted by the same numeral.

[0022] Figure 1 shows a container 1 for fluids, in particular liquids, such as beer under pressure or water, comprising a spheroid and pressure resistant outer casing 2, a gastight inner casing 3 of a flexible material, i.e. a bag, located inside the outer casing 2, and a valve part 4 for filling the container with a fluid respectively tapping fluid from the container.

[0023] In this example, the outer casing 2 is collapsible and made from a blow-molded thermoplastic e.g. PE or elastomeric liner provided with a filament wound outer reinforcement and an outer layer of latex obtained by immersing the liner (with filaments) in a latex bath. In an alternative example, the liner is rigid and made of e.g. a relatively thick-walled thermoplastic material or even a metal, such as aluminum. Yet other suitable casings are described in, for example, EP 0 626 338, which is incorporated herein by reference.

[0024] The valve part 4 is connected to the inner casing 3 and in fluid communication with the interior 5 of the inner casing 3. Further, the valve part 4 is screwed into an opening in the top of the outer casing, as will be explained in more detail below. As preferred valve part is disclosed in International patent application WO00/07902 (see especially page 8, line 12 ff. in conjunction with Figures 4A and 4B), which is incorporated herein by reference.

[0025] In accordance with a first aspect of the present invention, the container 1, shown in Figure 2, is provided with an outer package, which follows and abuts the circumference of the outer casing 2 at its maximum diameter. The outer package comprises a substantially cylindrical shell 6, made of cardboard, which partially envelops the outer casing 2 and which is open at its top and bottom ends, i.e. the cylindrical shell 6 is co-axial with the central axis of the outer casing.

[0026] The shell 6 has a polygonal cross-section with N, e.g. twelve, sixteen or twenty, angles and N substantially flat panels 7 connected via fold lines 8. A plurality of rectangular openings 9, e.g. four equidistant openings, are provided in the shell 6 to serve as grips. Further, resilient lamella 10 are present on the inner wall of the shell 6 and at or near its top and bottom rims. In this preferred example, the lamella 10 are extensions of the panels 7 folded inwards and provide a very effective one-way retaining means to lock the outer casing 2 inside the shell 6. When a casing 2 enters the top end of the outer package, the upper lamella 10 are urged, by the lower half of the casing 2, towards the inner wall of the shell 6. When the middle of the casing 2, i.e. its maximum diameter portion, passes the lamella 10, the lamella 10 flex inwards thus preventing the casing 2 from being easily removed from the shell 6. The lower lamella serve as a stop. As soon as the casing 2 reaches these lower lamella the casing 2 is locked in place.

[0027] Optionally, a strip 11 (Figure 2B) of a reinforcing material, for instance cardboard, is attached to the inner wall of the shell 6 in between the upper rim and the grips.

[0028] The outer package according to the present invention significantly improves handling and provides effective protection of the spherical or spheroid casing with a relatively small amount of material, especially when compared to a box. Further, the package allows the container to be stored and stacked in an upright position and one on top of the other, thus utilizing the load-bearing capabilities of the present container in its upright position. The equidistant grips also facilitate handing the container from one person to the next, for instance while loading a vehicle or vessel.

[0029] Figure 3 shows a preferred cardboard blank 12 for folding the shell 6. The blank 12 is substantially oblong in shape and comprises two (relatively long) fold lines 13, extending parallel to the long sides of the blank, and a plurality of fold lines 8, extending parallel to the short sides of the blank 12. It further comprises, at a distance in a range from 1 to 4 cm from both of its long sides and on the fold lines 8, a plurality of outwardly divergent, e.g. triangular, slots 14, preferably extending up to the (relatively long) fold lines 13.

[0030] The blank 12 is formed into a shell 6 by gluing the short ends of the blank 12 together and pressing the lamella 9 trough the open top and bottom ends. Subsequently, an outer casing can be pushed through the top end of the shell 5, as set out above.

[0031] To prevent water from reaching the shell, the outer package in turn is wrapped in a water-impermeable shrink film 15 (Figure 2C). It is preferred that printing, such as a trademark of the fluid in the container or decorations e.g. the outlines and colors of a metal keg, is applied to the film.

[0032] Figure 4 a top plan view of an empty, that is to say flat, inner casing 3. In accordance with a further aspect of the present invention, this casing 3 comprises two polygonal, in this example octagonal, flexible sheets 15 of a gas and liquid tight laminate, preferably a laminate comprising a sealing layer (e.g. PP), a barrier layer (e.g. aluminum) and one or more further layers (e.g. PA and/or PET), sealed together along their edges, e.g. by means of welding. As a matter of course, one of the sheets is provided with a valve part 4. This preferred inner casing is robust, corresponds, in its fully expanded condition, in shape to the inner wall of the outer casing and can be obtained in a relatively straightforward manner. Furthermore, due to the fact that, in its fully deflated condition, the inner casing is flat, it allows relatively easy folding to a size and shape that facilitate entering the inner casing into the outer casing.

[0033] In accordance with a further aspect of the present invention, the outer casing was obtained by melting a polymeric material, forming the casing, and a threaded opening in it wall, from the melted material by means of blow-moulding, and screwing the valve part into the opening the casing before it has cooled down to a temperature below 50ºC. Thus, a tide fit between the valve part and the casing is obtained and milling of the

upper rim of the opening, to improve the fluid-tightness of the connection, is no longer required.

[0034] 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. For instance, the shell can be made of more durable material, such as a plastic or metal, preferably aluminium, sheet material.

[0035] Also, although the container described above typically has a capacity of 30 litres, smaller versions, preferably weighing less that 25 kilograms, are useful in reducing the strain on those who have to handle the containers. As the (empty) containers according the present invention typically weigh less than 1,5 kilograms, a container having a maximum total weight of 25 kilogram would still have a capacity of 23,5 kilograms (-litres) of liquid. In comparison, an empty metal keg having a capacity of 23,5 kilograms of liquid would weigh at least 8 kilograms, yielding a total of at least 31,5 kilograms.

[0036] The container according to the present invention is also suitable for holding pressurised gasses, for instance medical gasses or industrial gasses, such as LPG, natural gas, or hydrogen.

Claims

1. Container (1) for fluids, in particular liquids, such as beer or water, comprising a spherical or spheroid casing (2), a valve part (4) for filling the container (1) with a fluid and an outer package surrounding the casing (2), **characterized in that** the outer package comprises a shell (6), which follows the circumference of the casing (2).

2. Container (1) according to claim 1, wherein the shell (6) is cylindrical and has a circular cross-section or a polygonal cross-section with at least five angles.

3. Container (1) according to claim 2, wherein at least one of the ends of the cylindrical shell (6) is open and the valve part (6) is accessible through this open end.

4. Container (1) according to any one of the preceding claims, wherein the shell (6) comprises a plurality of grips (9), such that, when the container (1) is lifted by means of these grips (9), the valve part (4) will face upwards.

5. Container (1) according to any one of the preceding claims, wherein the shell (6) comprises, on its inner wall and at or near its rim nearest the valve part (4) and/or at or near its rim remote from the valve part, means (10) for retaining the casing (2) inside the shell (6).

6. Container (1) according to claim 5, comprising a plurality of inwardly extending lamella (10) providing a one way retaining means.

7. Container (1) according to any one of the preceding claims, comprising a water-impermeable film (15) covering the shell (6).

8. Container (1) according to any one of the preceding claims, wherein the inner casing (3) comprises two polygonal sheets of a flexible material sealed together along their edges.

9. Blank (12) for folding an outer package (15) around a spherical or spheroid casing (2), which blank (12) is substantially oblong in shape and which comprises a plurality of fold lines (8), extending substantially parallel to the short sides of the blank (12), and, at or near at least one, preferably both of the long sides and on the fold lines, a plurality of cuts or slots (14).

10. Container (1) for fluids, in particular liquids, such as beer or water, comprising an outer casing (2), a gas and/or fluid tight inner casing (3) of a flexible material located inside the outer casing (2), and a valve part (4) for filling the container (1) with a fluid, **characterized in that** the inner casing (3) comprises at least one polygonal sheet of a flexible material.

11. Container (1) according to claim 10, wherein the inner casing (3) comprises two polygonal sheets of a flexible material sealed together along their edges.

12. Container (1) according to claim 10 or 11, wherein the volume taken up by the inner casing (3), in fully expanded condition, exceeds the volume enclosed by the inner wall of the outer casing (2).

13. Container (1) according to any one of the preceding claims, wherein the (outer) casing comprises a blow-molded polymeric liner provided with a filament wound reinforcement and preferably an outer layer of latex.

14. Method of making a container (1) for fluids, comprising a casing (2) having an opening and a valve part (4) attached to the opening, which method comprises the steps of
melting a polymeric material,
forming the casing (2) from the material, preferably by means of blow-moulding, and
attaching the valve part (4) to the casing (2) while the casing (2) is still sufficiently hot for it to be plastically deformed.

15. Method according to claim 14, wherein the valve part (4) comprises a threaded portion and the casing (2) is formed in a mould comprising a feature corresponding to that threaded portion, such that the moulded casing (2) comprises a threaded opening

for receiving the threaded portion of the valve part (4), and the valve part (4) is screwed to the inner casing (2).

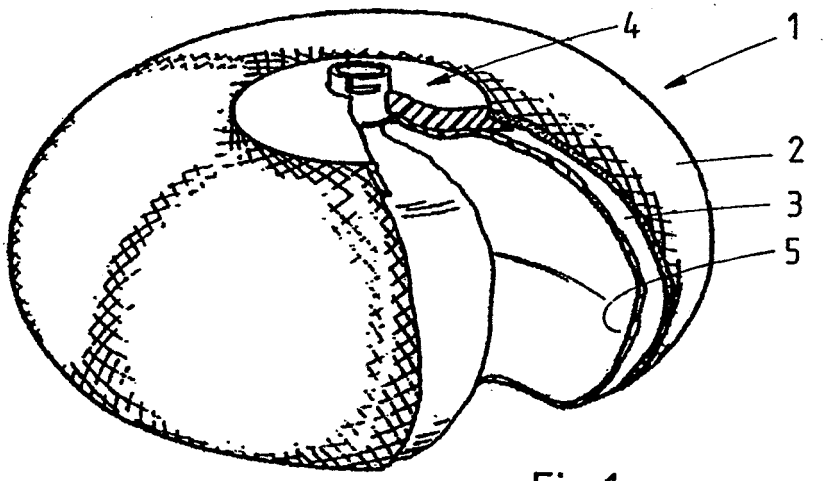

Fig.1

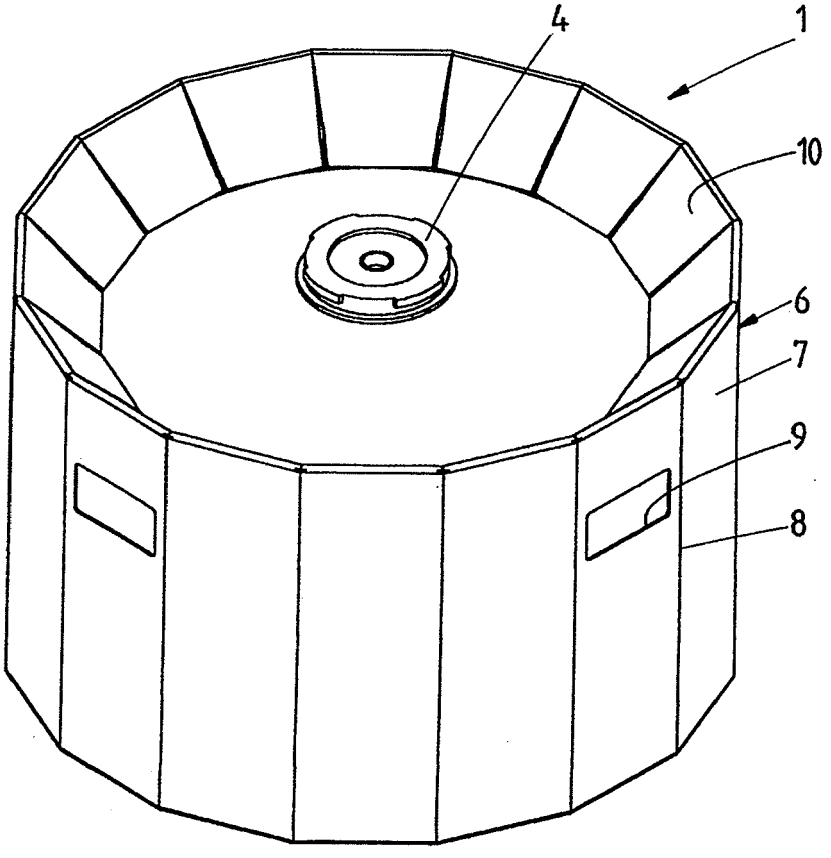

Fig.2A

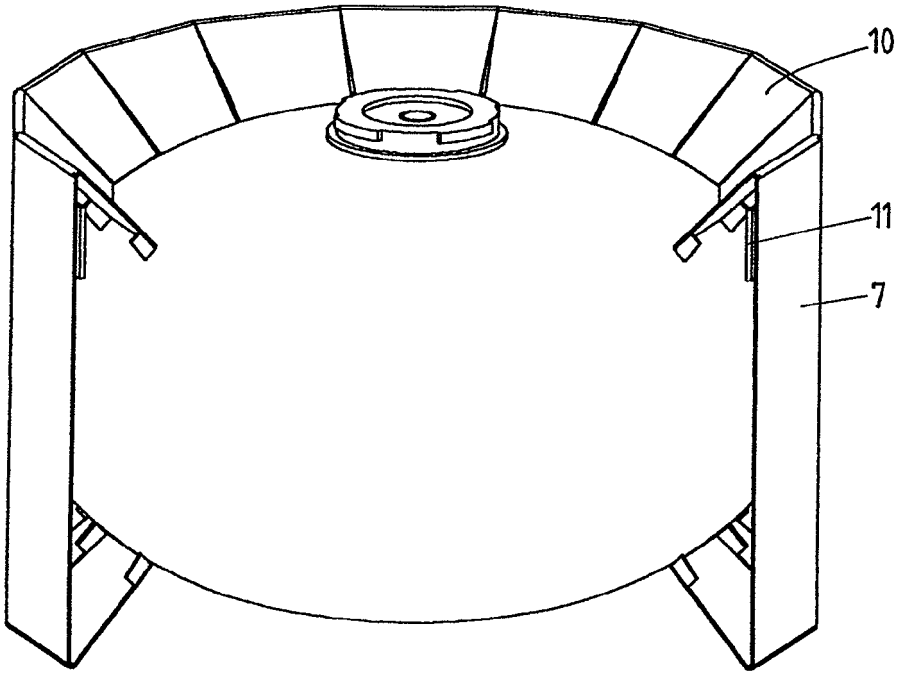

Fig.2B

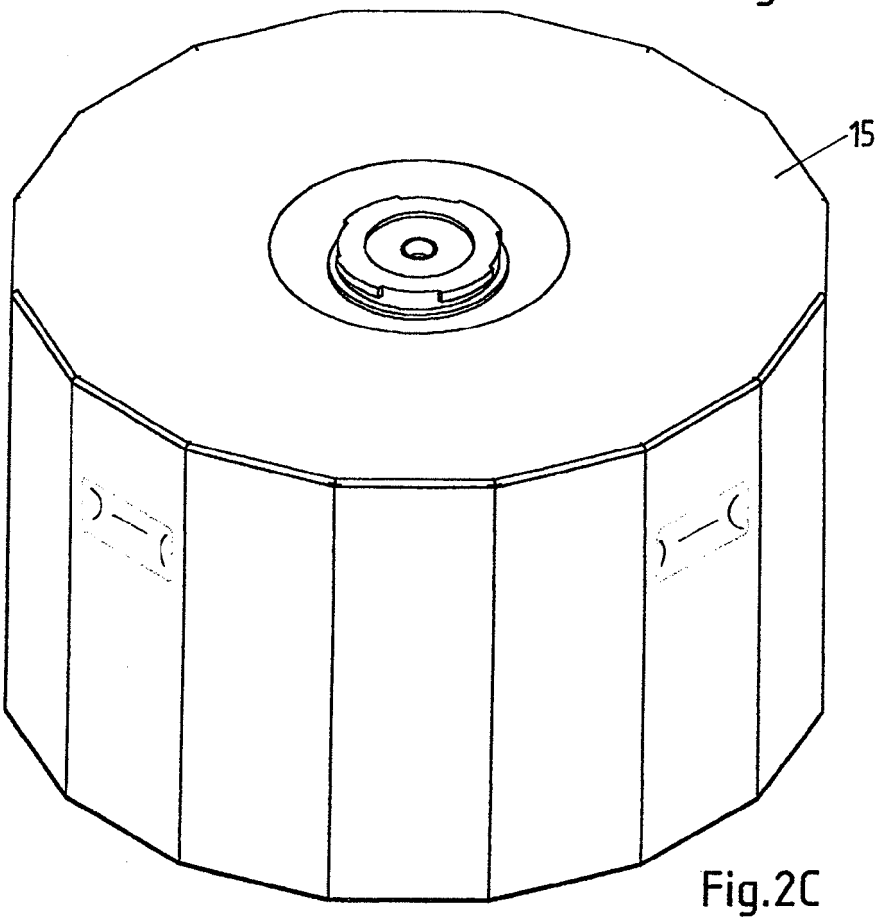

Fig.2C

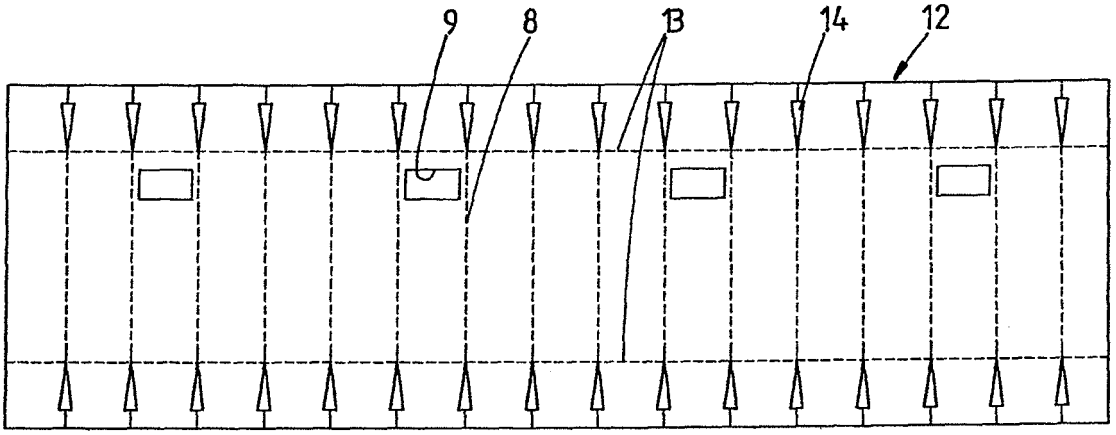

Fig.3

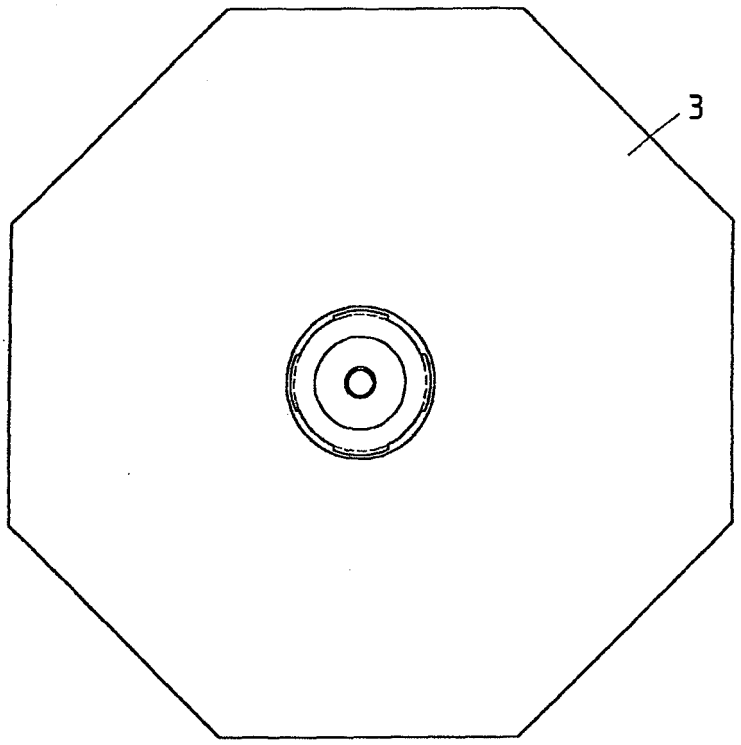

Fig.4

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Application Number
EP 05 10 5671

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 November 2005	Janosch, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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