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(54) **POURER FOR A CONTAINER, IN PARTICULAR FOR A BOTTLE**

(57) A pourer (1) for a container comprises a tubular body (2) having an inlet opening (4) adapted to be introduced into a neck (3) of a container and an outlet opening (5) opposite the inlet opening (4) and configured to pour a liquid; a cover element (6) disposed within the tubular body (2) transverse to a longitudinal axis (A) between the inlet (4) and outlet (5) openings; the cover element (6) has a convex portion (9) whose convexity is directed toward the outlet opening (5) and a plurality of holes (10) each having a characteristic dimension ranging from 1 to 1.8 mm, each of the holes (10) having a respective center axis (C) parallel to the longitudinal axis (A) of the tubular body (2).

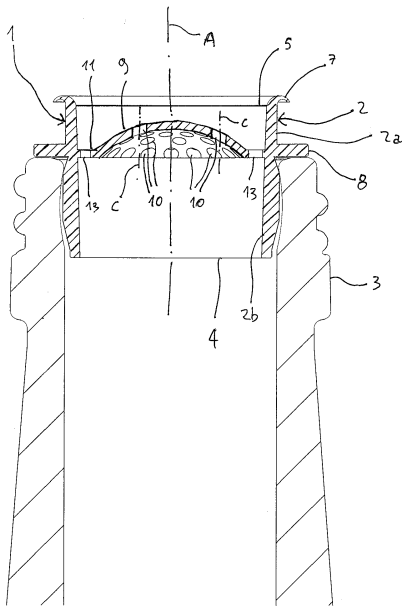

Fig. 3

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Description

[0001] The present invention relates to a pourer for a container, namely a bottle. This pourer is particularly of the non-refillable type, i.e. has the purpose to prevent replenishment of the liquid in the container and, as a result, to prevent the container from receiving a liquid other than the one originally contained therein. This is particularly useful in the field of high-quality food supply (for example oil and alcoholic beverage supply) as it prevents alteration of the original product and introduction of a poorer-quality product into the container, unless the pourer is broken.

[0002] Multiple variants of a non-refillable pourer are known in the art. For example, IT 1 131 961, by the same Applicant hereof, discloses a closure for a bottle comprising a pourer. This pourer comprises a flat grille with narrow slits, which is designed to lie over a non-return valve. As liquid is poured on the grille, it interacts with the slits and creates a meniscus due to surface tension, which can prevent the fluid from flowing past the grille. In other words, the geometry of the grille and the inherent properties of the fluid create a "barrier effect" which prevents any unauthorized replenishment attempt.

[0003] Nevertheless, IT '961 recognizes that the grille alone is not sufficient to prevent refilling of the container, as a fluid poured from a greater height can overcome the barrier created by grille-fluid interaction. Therefore, IT '961 specifies the presence of a non-return valve in the container located inward from the grille.

[0004] The prior art also includes US patent application 2010/0018940 by Alcan Packaging Capsules. This patent application discloses a non-refillable pourer, in which the above discussed barrier effect is provided by a convex member having a plurality of holes. These holes are adapted to allow the passage of the liquid that flows out of the pourer, while creating the above discussed barrier effect in case of attempted unauthorized filling.

[0005] US '940 describes several variants of the convex member, having various degrees of convexity. All these variants show a uniform arrangement of holes on the surface. Also, the holes have converging axes. Finally, the smallest dimension of the holes is less than 0.7 mm.

SUMMARY OF THE INVENTION

[0006] The Applicant noted that one drawback of the above arrangements is that liquid pouring from prior art pourers is hindered in that the holes provide a partial "barrier effect" also during the pouring action.

[0007] Also, particularly referring to types of holes as disclosed in US '940, they have been found to be hardly formed by molding.

[0008] Therefore, the technical purpose of the present invention is to provide a pourer for a container that can obviate the aforementioned prior art drawbacks.

[0009] In particular, the object of the present invention is to provide a pourer for a container that can improve the pouring operation.

[0010] A further object of the present invention is to provide a pourer for a container that has a simpler construction.

[0011] The aforementioned technical purpose and objects are substantially fulfilled by a pourer for a container that comprises the technical features as disclosed in one or more of the accompanying claims.

[0012] In particular, a pourer for a container of the present invention comprises a tubular body. This tubular body has an inlet opening adapted to be introduced into a neck of a container. The tubular body also has an outlet opening opposite the inlet opening and configured to pour a liquid. The tubular body has a longitudinal axis extending through the openings.

[0013] A cover element is disposed in the tubular body, particularly transverse to the longitudinal axis between the inlet and outlet openings.

[0014] The cover element has a convex portion whose convexity is directed toward the outlet opening. The cover element has a plurality of holes each having a diameter ranging from 1 to 1.8 mm. These holes have a respective center axis parallel to the longitudinal axis of the tubular body.

[0015] Due to its greater holes having parallel axes, the pourer of the invention can achieve the same "barrier effect" as the existing pourers, while ensuring a considerably improved liquid pouring function.

LIST OF DRAWINGS

[0016] Further features and advantages of the present invention will result more clearly from the illustrative, non-limiting description of a preferred, non-exclusive embodiment of a pourer for a container as shown in the annexed drawings, in which:

- Figure 1 is a perspective view of a pourer of the present invention;
- Figure 2 is a top view of the pourer of Figure 1;
- Figure 3 is a sectional side view of the pourer of Figures 1 and 2, when applied to the neck of a container; and
- Figures 4a-4e are top views of respective embodiments of a pourer for a container of the present invention.

DETAILED DESCRIPTION

[0017] Referring to the annexed figures, numeral 1 designates a pourer for a container of the present invention.

[0018] The pourer 1 comprises a tubular body 2 having a longitudinal axis "A". This tubular body 2 is configured to be fitted to a neck 3 of a container (not shown), e.g. a bottle. In particular, the tubular body 2 is designed to be fitted into the neck 3. In the embodiment as described

and shown herein, the shape of the tubular body 2 is axially symmetric shape with respect to the longitudinal axis "A", particularly has a circular cross section and more particularly is a substantially cylindrical shape. In certain alternative embodiments, not shown, the tubular body may have any shape whatever.

[0019] More in detail, the tubular body 2 has an inlet opening 4 and an outlet opening 5 opposite the inlet opening 4. The inlet opening is designed to be introduced into the aforementioned container. In operation, the inlet opening is situated in the container, whereas the outlet opening 5 is external thereto. The outlet opening 5 is configured to pour a liquid from the interior of the container to the outside and particularly has a rim 7 that is specially shaped for drip control.

[0020] More in detail, the tubular body 2 comprises a flange 8 which is externally placed between the inlet opening 4 and the outlet opening 5. In particular, the flange 8 is adapted to abut the neck 3 of the container, to stop the introduction of the tubular body 2.

[0021] The flange 8 divides the tubular body 2 into an upper portion 2a and a lower portion 2b. In operation, the upper portion 2a is situated outside the container. Likewise, the lower portion 2b is placed within the container, and in particular is specially shaped to be restrained in the container by interference, in any manner known to the skilled person.

[0022] A cover element 6 is arranged within the tubular body 2. In particular, the cover element 6 is arranged transverse to the flow direction "A" between the inlet 4 and outlet 5 openings. More in detail, the cover element 6 extends along the entire cross section of the tubular body 2. It shall be noted that the cover element 6 is designed to allow liquid to flow threrethrough from the inlet opening 4 to the outlet opening 5 while being able to prevent the liquid from being introduced into the container, i.e. from flowing from the outlet opening 5 to the inlet opening 4.

[0023] In order to allow the liquid to flow, the cover element 6 is formed with a plurality of holes 10. Each hole 10 has a respective center axis "C" parallel to the longitudinal axis "A" of the tubular body 2. Each hole 10 has a characteristic dimension ranging from 1 to 1.8 mm. 10.

[0024] As used herein, the term "characteristic dimension" is intended to designate the dimension that will be relevant to achieve an adequate surface tension, given an arbitrary shape of the hole 10. For example, if the hole 10 has a circular shape, the characteristic dimension is the diameter. If the hole 10 has the shape of a slot, as shown for example in Figures 4c, 4d and 4e, the characteristic dimensions is defined by the lower transverse dimension of that slot. For different shapes of the hole 10, the skilled person will be able to determine the dimension to be taken as a reference by routine testing.

[0025] Concerning the position of the center axis "C", if the hole 10 has a shape other than a circular shape, the center axis "C" shall be located in a middle position between the long sides and the short sides.

[0026] Each hole 10 may have a taper converging from the outlet opening 5 toward the inlet opening 4. Alternatively, each hole 10 has a taper converging from the inlet opening 4 toward the outlet opening 5. The arrangement of the holes 10 will be illustrated in greater detail hereinafter.

[0027] Particularly referring to Figure 3, it shall be noted that the cover element 6 has a convex portion 9 which is defined by a convexity directed toward the outlet opening 5. In the embodiment as described herein, the convex portion 9 is preferably defined by a spherical dome.

[0028] It shall be noted that, according to the embodiment as shown in the Figures 1-3, the convex portion 9 has a central area 9a and a peripheral area 9b, which is external to the central area 9a. The diameter of the central area 9a ranges from 15% to 30% of the diameter of the entire cover element 6.

[0029] The convex portion 9, in particular the peripheral area 9b, is surrounded by a perimeter portion 11. This perimeter portion 11 is particularly substantially flat and arranged perpendicular to the longitudinal axis "A" of the tubular body 2.

[0030] Referring to the arrangement of the holes 10, it shall be noted that at least some of them are formed on the convex portion 9, in particular in the peripheral area 9b. Therefore, the central area 9a of the convex portion 9 has no holes 10.

[0031] It shall be noted that the holes 10 are grouped around the longitudinal axis "A" into a plurality of groups, in particular three groups. The holes of each group are arranged along a respective circumference 12, particularly centered on the longitudinal axis "A". Each circumference 12 groups a variable number of holes and its radius is distinct from that of the other circumferences 12.

[0032] Particularly referring to Figure 2, it shall be noted that each hole 10 is angularly arranged between two holes 10 of an adjacent group. In other words, the holes 10 of adjacent groups are not aligned along the same radial direction, but are in an alternate relationship. Advantageously, any rupture of the pourer 1 will be immediately evident, due to this arrangement of the holes 10

[0033] In addition, the cover element 6 comprises a plurality of slots 13 arranged outside the convex portion 9. In particular, the slots 13 are arranged on the perimeter portion 9 of the cover element 6.

[0034] Each slot 13 mainly extends in a tangential direction, i.e. is orthogonal to a radial direction. The width of the slot 13 in the radial direction is approximately one millimeter, but the width may be greater in the tangential direction. These slots 13 have the purpose of allowing air to flow into the container as liquid is being poured. Nevertheless, the shape of the slots 13 causes them to behave like the holes 10 when attempting to introduce a liquid into the container from the outside.

[0035] It should be finally noted that, in the above discussed embodiment, each slot 13 is placed between two holes 10. Therefore, these holes 10 are formed on the

perimeter portion 11 of the cover element 6 and are at equal distances from the longitudinal axis "A"as the slots 13.

[0036] According to an advantageous embodiment of the present invention, the pourer 1 is specifically adapted for pouring oil. In this case, the tubular body 2 and the cover element 6 are made of plastic, in particular polyolefins or polycarbonate.

Claims

1. A pourer (1) for a container comprising:

   - a tubular body (2) attachable to a neck (3) of a container, said tubular body (2) having an inlet opening (4), an outlet opening (5) opposite the inlet opening (4) and configured to pour a liquid, a longitudinal axis (A) that extends through said openings (4, 5);
   - a cover element (6) disposed in the tubular body (2) transverse to the longitudinal axis (A) between said inlet (4) and outlet (5) openings;

   characterized in that said cover element (6) has a convex portion (9) whose convexity is directed toward the outlet opening (5), said cover element (6) having a plurality of holes (10) each with a characteristic dimension ranging from 1 to 1,8 mm, said holes (10) each having a respective center axis (C) parallel to the longitudinal axis (A) of the tubular body (2).

2. A pourer (1) as claimed in the preceding claim, **characterized in that** at least some of said holes (10) are formed on said convex portions (9).

3. A pourer (1) as claimed in any of the preceding claims, **characterized in that** said convex portion (9) is defined by a spherical dome.

4. A pourer (1) as claimed any of the preceding claims, **characterized in that** said holes (10) are divided around said longitudinal axis (A) into a plurality of groups, the holes of each group being arranged along a respective circumference (12), every hole (10) being angularly placed between two holes (10) of an adjacent circumference 12.

5. A pourer (1) as claimed in any of the preceding claims, **characterized in that** said convex portion (9) has a central area (9a) and a peripheral area (9b) external to the central area (9a), said holes (10) being located on said peripheral area (9b).

6. A pourer (1) as claimed in the preceding claim, **characterized in that** said central area (9a) has no holes (10).

7. A pourer (1) as claimed in claim 5 or 6, **characterized in that** the diameter of the central area (9a) ranges from 15% to 30% of the diameter of the cover element (6).

8. A pourer (1) as claimed in any of the preceding claims, **characterized in that** said cover element (6) comprises a plurality of slots (13) external to said convex portion (9).

9. A pourer (1) as claimed in the preceding claim, **characterized in that** each slot (13) is placed between two holes (10) located at the same distance from said longitudinal axis (A) of said slot (13).

10. A pourer (1) as claimed in any of the preceding claims, **characterized in that** said holes (10) have a cylindrical shape or a tapering shape converging from said outlet opening (5) toward said inlet opening (4) or a tapering shape converging from said inlet opening (4) toward said outlet opening (5).

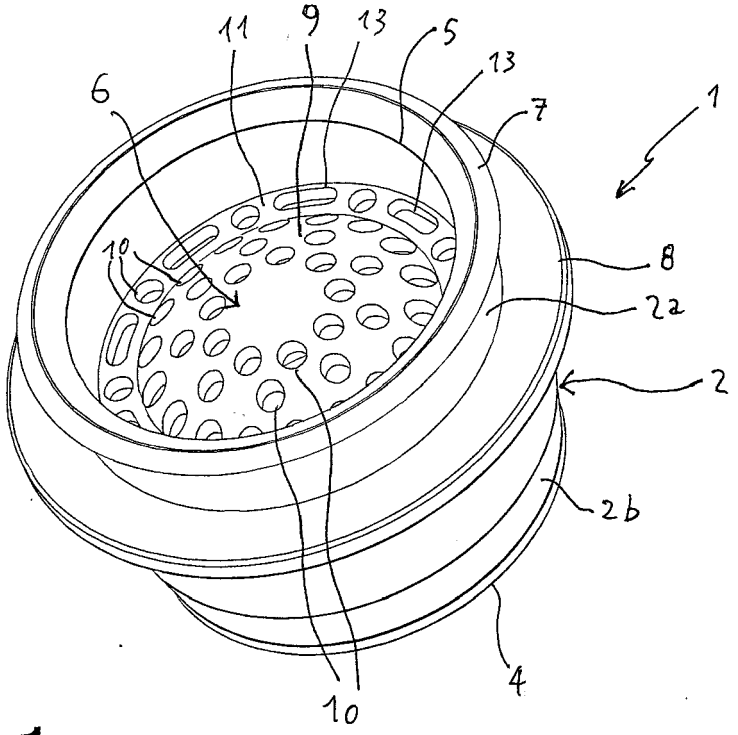

Fig. 1

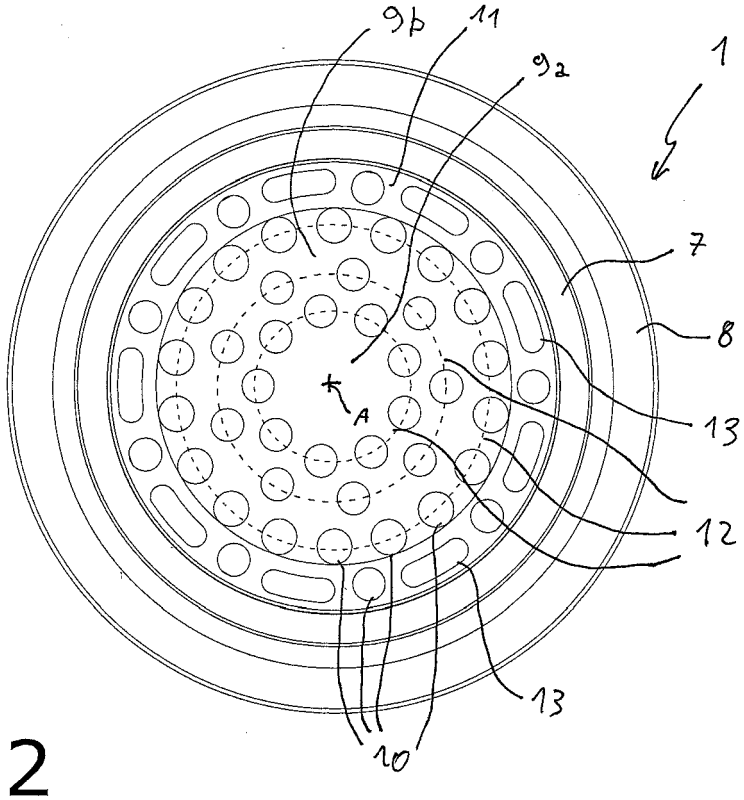

Fig. 2

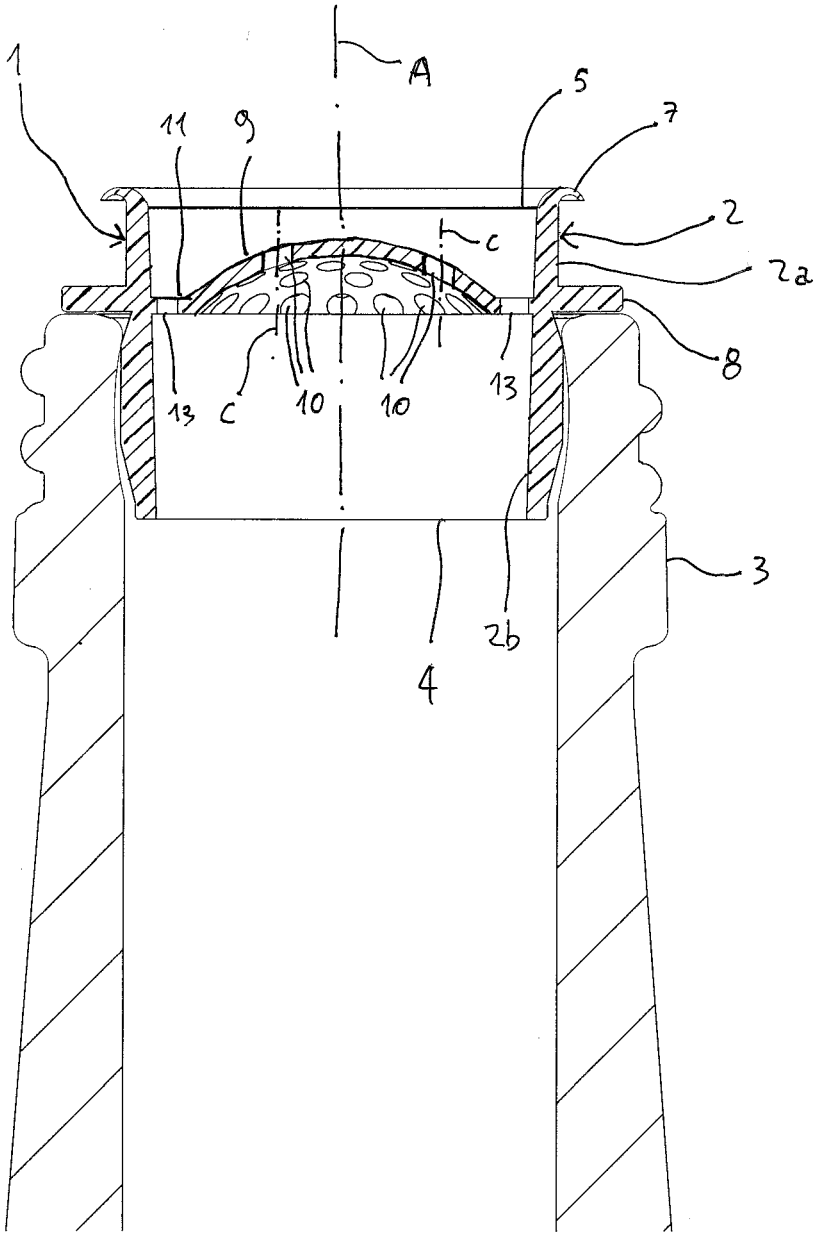

Fig. 3

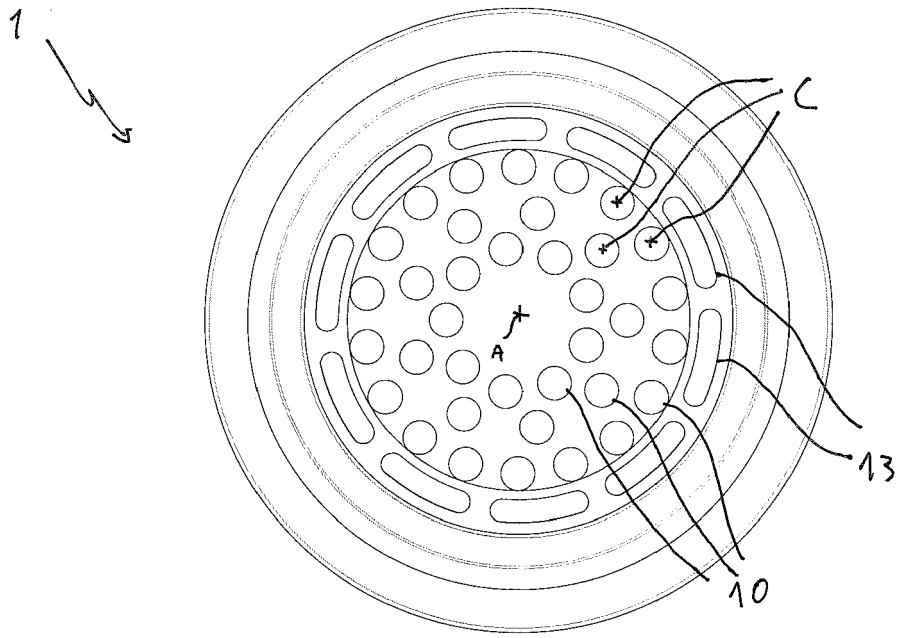

Fig. 4a

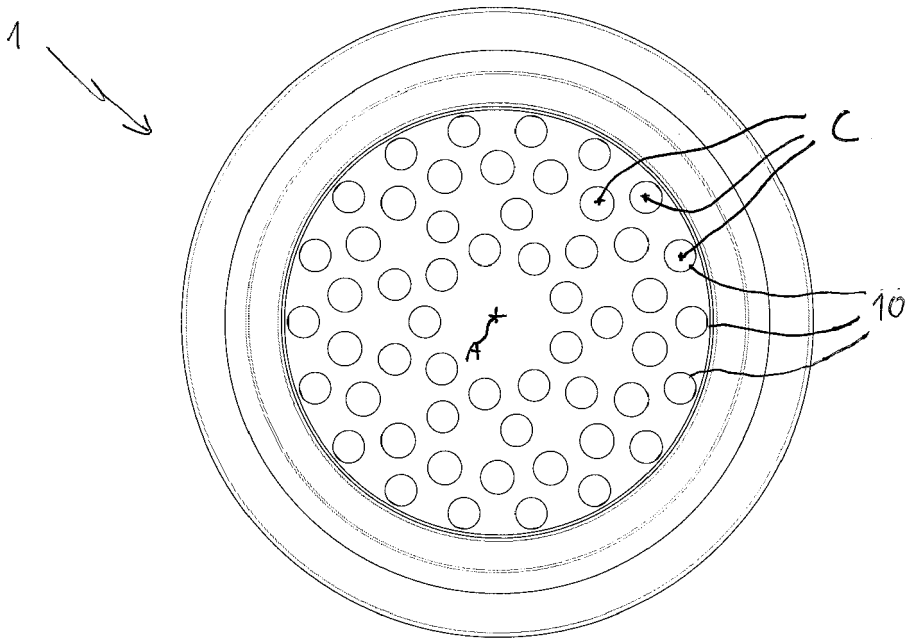

Fig. 4b

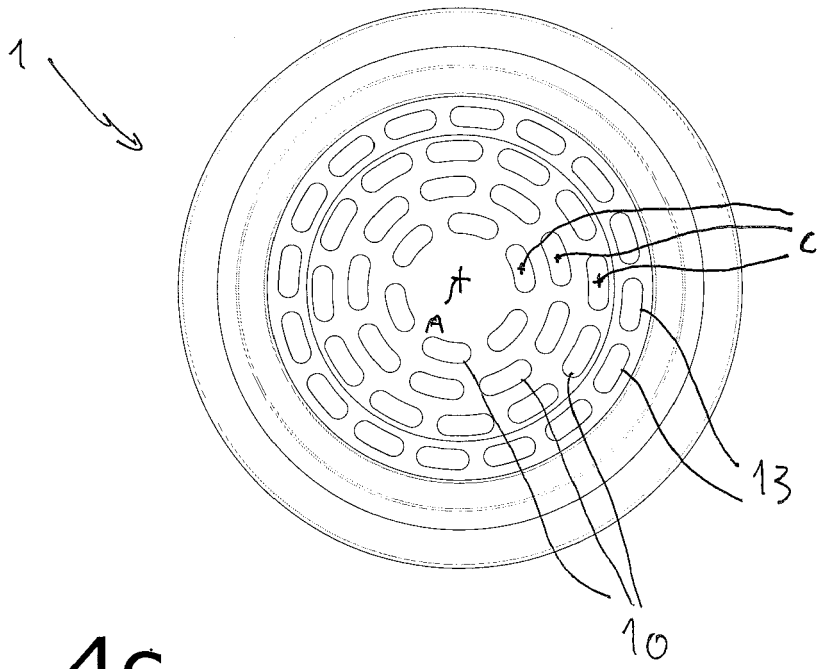

Fig. 4c

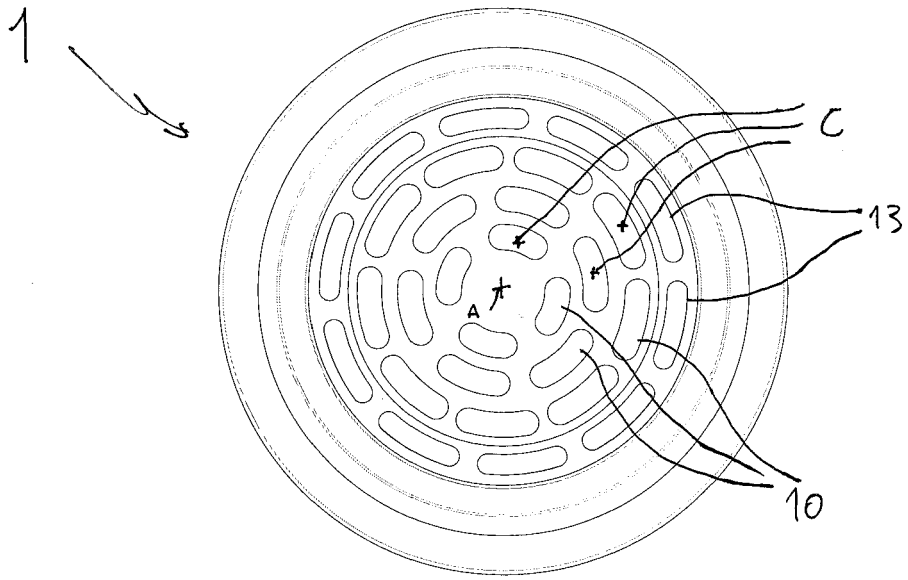

Fig. 4d

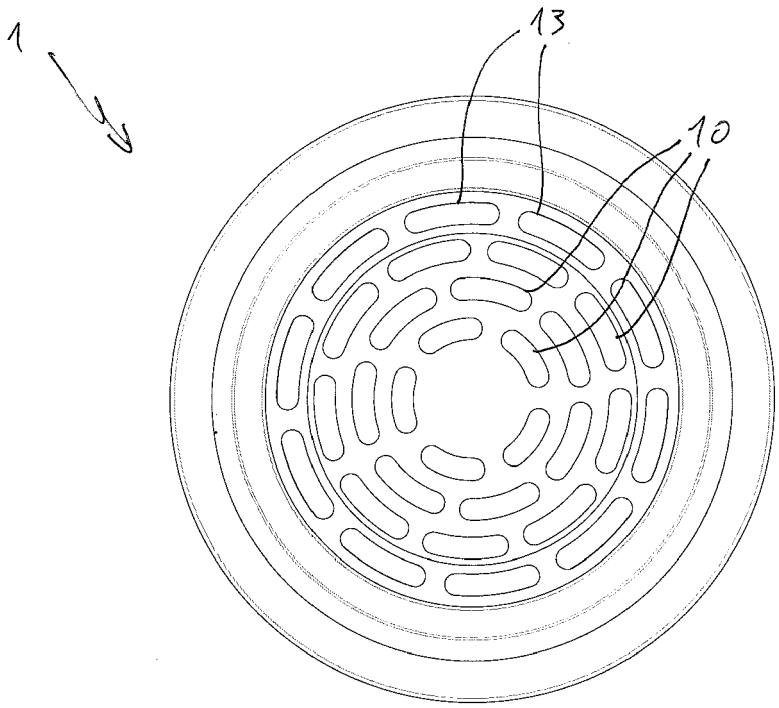

Fig. 4e

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EUROPEAN SEARCH REPORT

Application Number
EP 19 20 5671

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2010/018940 A1 (GRANGER JACQUES [FR] ET AL) 28 January 2010 (2010-01-28) * paragraphs [0007] - [0015], [0019], [0051] - [0055]; claims 1,2,9; figures *	1-10	INV. B65D49/02
A	GB 2 416 765 A (AITKEN LEON [GB]; BROWN MATTHEW [GB]) 8 February 2006 (2006-02-08) * page 15, lines 6-18; figures *	1-10	
A	IT 1 131 961 B (GUALA ANGELO SPA [IT]) 25 June 1986 (1986-06-25) * page 7, paragraph 16 - page 8, line 14; figures *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 March 2020	Serrano Galarraga, J

CATEGORY OF CITED DOCUMENTS

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- US 20100018940 A **[0004]**