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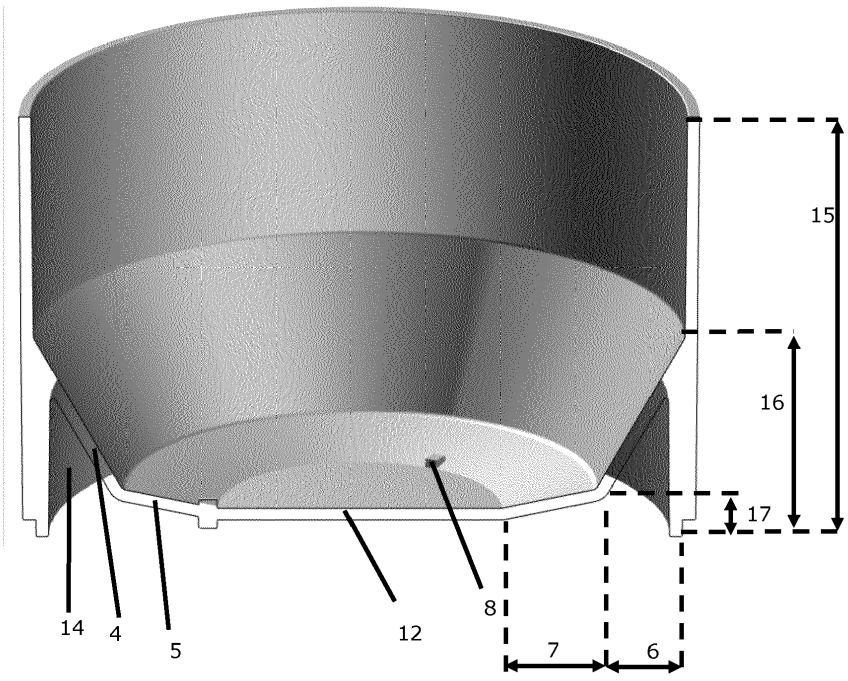
(54) **TEALIGHT CUPS, TEALIGHTS AND METHODS FOR THE PRODUCTION THEREOF**

(57) The invention concerns a plastic tealight cup consisting of a bottom and an outer wall, wherein the bottom contains an inclined part, characterised in that the inclined part runs from the outer wall and that the inclined part has an incline of > 1° The radial length of the inclined part is preferably at least 20% of the radius of the tealight cup. Tealight cups of this kind have a more complete use of fuel, such as paraffin. The invention also concerns tealights with tealight cups of this kind and methods for the production thereof.

Fig. 6



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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The invention concerns a plastic tealight cup consisting of a bottom and an outer wall, wherein the bottom contains an inclined part, characterised in that the inclined part runs from the outer wall and that the inclined part has an incline of > 1°. The radial length of the inclined part is preferably at least 20% of the radius of the tealight cup. Tealight cups of this kind have a more complete use of fuel, such as paraffin. The invention also concerns tealights with tealight cups of this kind and methods for the production thereof.

BACKGROUND OF THE INVENTION

[0002] Tealights consist of a tealight cup fitted with a wick holder with wick, and fuel, such as paraffin or wax. They typically measure approximately 38 mm in diameter, and the height depends on the desired burning time and the corresponding amount of fuel required. The burning time is indicated at the sale of tealights. It is typically between 3 and 8 hours. Most tealight cups are made of aluminium, although plastic tealight cups also exist.

[0003] A disadvantage of tealights according to the state of the art is that an unused residue of fuel always remains in the cup. Although the residual weight of fuel per cup seems relatively low, this causes an annual loss of many tons of fuel given the considerable volume of production of tealights. The underlying goal of the current invention is therefore to give tealights a more complete use of fuel.

[0004] DE19548958 attempts to obtain a more complete combustion by using grooves that are lower than the bottom of the tealight cup. WO2010/064941 also offers adjusted tealight cups with sunken, inclined grooves.

[0005] However, the tealight cups of both references have the disadvantage that a considerable amount of fuel still remains, particularly along the outer edge of the bottom. The inventor has in fact established that the greatest residual amount of fuel is located in the interface area between the bottom and the outer wall. Contrary to existing tealight cups, the cups according to the current invention produce a lower residual amount of fuel, including in the interface area of the bottom and the outer wall, i.e. the area where the greatest loss occurs.

SUMMARY OF THE INVENTION

[0006] The inventor has discovered that a much more complete use of fuel can be obtained by giving the bottom of the cup an incline, with the incline running up to the outer wall. The current invention therefore envisages a tealight cup consisting of a bottom and an outer wall, wherein the bottom contains an inclined part, characterised in that the inclined part runs from the outer wall and that the inclined part has an incline of > 1° In a particular embodiment, the radial length of the inclined part is at least 20% of the radius of the tealight cup.

[0007] In a special embodiment, the inclined part contains at least a first inclined plane that is connected to the outer wall and preferably has an incline of between 15° and 45°. In a further embodiment, the inclined part furthermore contains a second inclined plane. In a particular embodiment, the second inclined plane has an incline that is smaller than the incline of the first inclined plane. In another embodiment, the first inclined plane is connected to the second inclined plane. The second inclined plane as described herein preferably has an incline of between 1° and 35°, in particular between 1° and 25°, more particularly between 1° and 15°. In another embodiment, the second inclined plane has an incline of at least 10°. In a further embodiment, the second inclined plane has an incline of 10° to 20°, in particular of approximately 12° to approximately 15°. The inclined part preferably has an incline of at least 3°, more particularly of at least 5°.

[0008] The first inclined plane preferably meets the outer wall at 40% to 55% of the height of the wall and runs to a height of 1% to 10% of the height of the outer wall. More particularly, the height difference of the first inclined part is 20% to 40% of the height of the outer wall. The radius of the first inclined part is preferably 25% to 45% of the radius of the tealight cup.

[0009] In another embodiment, the tealight cup is made in such a way that when it is placed upon an external surface, a (hollow) space is created between the outer wall, the bottom, and the external surface. To this end, the outer wall preferably at least runs down to, or below, the last point of the bottom. It has been observed that an even better runoff of the paraffin can be achieved in this way. Without wishing to be bound by the theory, the inventor assumes that the space functions as an insulating space. The air in the space will partially warm up, but dissipation of heat to the ambient air is avoided. The hollow space preferably continues between the first inclined plane and the outer wall.

[0010] In a further embodiment, the inclined part furthermore contains ribs that run radially in the direction of the centre of the bottom.

[0011] The bottom of the tealight cup normally contains a central surface that supports the wick holder. In a particular embodiment, the central surface contains radially oriented grooves. In another embodiment, the central surface is situated 0.1 to 1 mm lower than the lowest part of the inclined part.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] With specific reference to the drawings, it must be emphasised that the specifics shown serve only as examples and for the purposes of illustrating the discussion of the various embodiments of the invention under consideration. They are being proposed with the aim of furnishing what is regarded as the most useful and instant description of the principles and conceptual aspects of

the invention. No attempt has been made in this respect to show more structural details of the invention other than those necessary for a fundamental understanding of the invention. The description in combination with the drawings clarify for experts in the field how the various forms of the invention can be executed in practice.

Fig. 1A: Perspective aspect of a tealight cup according to a first embodiment.

Fig. 1B: Cross section of the tealight cup shown in Fig. 1A.

Fig. 1C: Tealight comprising the tealight cup shown in Fig. 1A and a wick holder with wick (paraffin not shown).

Fig. 2: Perspective aspect of a tealight cup with radially oriented ribs.

Fig. 3: Cross section of a tealight cup with radially oriented ribs.

Fig. 4: Cross section of a tealight cup with a first and second inclined plane.

Fig. 5: Cross section of a tealight cup with a first and second inclined plane, wherein the second inclined plane contains radially oriented ribs.

Fig. 6: Cross section of a tealight cup with a first inclined plane and a second inclined plane, where when it is placed upon an external surface, a hollow space is created between the bottom, the outer wall and the external surface.

DETAILED DESCRIPTION OF THE INVENTION

[0013] Tealight cups are known to the skilled person. Tealight cups as meant in the application typically (and preferably) have a diameter of 25 to 75 mm and a height of 8 to 80 mm. The diameter is preferably 33 to 65mm, in particular approximately 38 mm (34-42 mm). The height is preferably 8 to 40 mm, more particularly 10 to 25 mm.

[0014] As described above, the current invention offers a tealight cup consisting of a bottom and an outer wall, wherein the bottom contains an inclined part, characterised in that the inclined part runs from the outer wall and that the inclined part has an incline of > 1°. The radial length of the inclined part is preferably at least 20% of the radius of the tealight cup, in particular at least 25%, more particularly at least 35%. The radial length is preferably at least 45%, more preferably at least 50% of the radius of the tealight cup. In a special embodiment, the inclined plane has an incline of greater than 3°. The inventor has discovered that an incline of this kind results in better runoff than at an incline of 1°. Inclines as mentioned here indicate the incline in relation to the external surface upon which the tealight cup is placed. For example, the outer wall has an incline of 90°. Inclines between 0° and 90° as described here incline towards the centre of the tealight cup.

[0015] The inventor has furthermore discovered that an even more complete use of fuel can be achieved if a steep incline is used that is connected to the outer wall. Consequently the invention also offers a tealight cup as described here, wherein the inclined part contains at least a first inclined plane that is connected to the outer wall and that has an incline of between 15° and 45°. Without wishing to be bound by theory, it appears that this steep incline connected to the outer wall ensures better heat transmission from the flame to the paraffin that is located at the connection between the outer wall and the bottom. At the same time, the steep incline appears to stimulate better runoff of the paraffin. The first inclined plane preferably meets the outer wall at 40% to 55% of the height of the outer wall and runs to a height of 1% to 10% of the height of the outer wall. In particular the height difference of the first inclined part is 20% to 40% of the height of the outer wall. The radius of the first inclined part is preferably 25% to 45% of the radius of the tealight cup, in particular 30% to 35%. In another embodiment, the first inclined part has an incline of 40° to 75°, in particular 60° to 70°, more particularly approximately 65°. These steep inclines in the first inclined part cause optimal runoff.

[0016] The invention also concerns a tealight cup wherein the inclined part further contains a second inclined plane that preferably connects with the first inclined plane. The steep incline connected to the outer wall, herein also called the first inclined plane, preferably has a steeper incline than the incline of the part of the bottom that is located closer to the centre, herein also called the second inclined plane. The current invention therefore envisages a tealight cup wherein the inclined part consists of two inclined planes, one first inclined plane connected to the outer wall, and a second inclined plane. The second inclined plane preferably has an incline of between 5° and 25°, in particular between 10 and 20°, more particularly between 10° and 15°. In a special embodiment, the first inclined plane is connected to the second inclined plane. The radial length of the first inclined plane is preferably at least 15% of the radius of the tealight cup and the radial length of the second inclined plane is preferably at least 20% of the radius of the tealight cup. In a particular embodiment, the radial length of the first inclined plane is 15-35%, in particular 15-30%, more particularly 20-30% of the radius of the tealight cup. The radial length of the second inclined plane can be chosen depending on the radial length of the first inclined plane.

[0017] In another embodiment, the tealight cup has been executed in such a manner that if it is placed upon an external surface, a (hollow) space is created between the outer wall, the bottom and the external surface. To this end, the outer wall preferably at least runs down to, or below, the last point of the bottom. It has been observed that an even better runoff of the paraffin can be achieved in this way. Without wishing to be bound by the theory, the inventor assumes that the space functions as an insulating space. The air in the space will partially warm up, but dissipation of heat to the ambient air is avoided. The hollow space preferably continues between

the first inclined plane and the outer wall. The various preferential embodiments in relation to the first and second inclined plane can of course be combined. Thus a tealight cup according to a particular embodiment (as shown for instance in Fig. 5) has:

i) a first inclined plane connected to the outer wall with an incline of between 60° and 70° and a radial length of 25-35% of the radius of the cup; and
ii) a second inclined plane connected to the first inclined plane with an incline of between 10° and 20° (in particular 12° to 15°) and a radial length of at least 20% of the radius of the cup;

wherein the tealight cup is executed such that, when it is placed on an external surface, a hollow space is created between the bottom, the outer wall and the external surface. More particularly, the hollow space runs at least partially between the first inclined plane and the outer wall.

[0018] In a particular embodiment, the underside of the outer wall of the tealight cup has been fitted with elements that are able to interact with the top of the outer wall of a second (identical) tealight cup. Because of this, the tealight cups according to the invention can be stacked. This preferably concerns a protrusion (or indentation) on the underside of the outer wall that is able to accommodate the top of the outer wall of a second cup.

[0019] The inclined part preferably runs substantially from the outer wall to the central surface that supports the wick holder. For this reason, the invention envisages a tealight cup wherein the sum of the radial length of the central surface that supports the wick holder and the radial length of the inclined part are greater than 90%, for instance greater than 93%, of the radius of the bottom. In another embodiment, the bottom can be fitted with centring elements for a wick holder. In this case, the inclined part preferably substantially runs to these centring elements. In a special embodiment, the inclined part furthermore contains ribs that run radially in the direction of the centre of the bottom. The use of radial ribs offers an additional advantage towards a more complete use of the fuel. The radial ribs are preferably present on the second inclined part as described herein. The radial ribs are not required on the entire surface of the inclined part; for instance by not using them on the first inclined plane. Even in this embodiment, the radial ribs are preferably fitted along the entire circumference of the inclined part.

[0020] As described above, a tealight cup typically contains a central surface to support a wick holder. In a certain embodiment, the central surface is situated 0.1 to 1 mm lower than the lowest part of the inclined part. This permits the fuel to run down along the inclined part to the central surface.

[0021] In another embodiment, the central surface that supports the wick holder contains radially oriented grooves. These grooves are preferably located 0.1 to 1. mm lower than the lowest part of the inclined part. This permits the fuel to run down the inclined part through the grooves to underneath a wick holder. There are preferably 2 to 10 grooves in the central surface.

[0022] The central surface can possibly also be executed with a slight incline, e.g. 0.5-2°, towards the centre.

[0023] The tealight cup is preferably executed in a plastic material as this also affects a more complete use of the fuel. In principle any plastic material can be used that is sufficiently heat-resistant. The tealight cup is preferably made of polycarbonate, in particular fire-resistant polycarbonate.

[0024] In reference to the drawings, Fig. 1A shows a first embodiment of a tealight cup according to the invention. This embodiment contains an inclined part (1) that runs from the outer wall almost completely to a central surface that supports a wick holder (12). Moreover, the central surface contains radially oriented grooves (13). Centring elements (8) for a wick holder have also been fitted. As can be seen in the cross section shown in Fig. 1B, the grooves (13) in the central surface (12) are situated lower than the lowest part of the inclined part (1). In this embodiment, the centring elements (8) for a wick holder are situated on the inclined plane. The radial length (2) of the inclined part (1) and the radius (3) of the tealight cup have also been shown. Fig. 1C shows the same embodiment of the tealight cup, but including a wick holder (9) and wick (10). The wick holder (9) is situated between the centring elements (8).

[0025] Fig. 2 shows another embodiment of the tealight cup, wherein the inclined part contains radially oriented ribs (11). The embodiment shown also contains radially oriented grooves (13) in the central surface that supports a wick holder and centring elements (8) for the wick holder. Figure 3 also shows an embodiment with radially oriented ribs (11) in the inclined part. In this embodiment, the central surface (12) that supports a wick holder does not contain any radially oriented grooves. The central surface (12) is situated lower than the lowest part of the inclined part.

[0026] Fig. 4 shows an embodiment with a first inclined plane (4) with a steep incline and a second inclined plane (5) with a lighter incline. The central surface (12) is situated lower than the lowest part of the inclined part. In this embodiment, the radial length (2) of the inclined part (1) consists of the sum of the radial length (6) of the first inclined plane (4) and the radial length (7) of the second inclined plane (5). Fig. 5 also shows an embodiment with a first (4) and a second (5) inclined plane. In the embodiment shown, the second inclined plane contains radially oriented ribs (11) for efficient runoff of the fuel towards the central surface (12).

[0027] Fig. 6 shows a cross-section of a preferential embodiment according to the current invention, with a first inclined plane (4) with a steep incline and a second inclined plane (5) with a lighter incline. The first inclined plane (4) meets the outer wall at a height (16) between 45 and 55% of the height (15) of the outer wall, and runs up to a height (17). The radial length (6) of the first incline

and the radial length of the second incline (7) are also shown. Centring elements (8) permit the centring of a wick holder upon the central surface (12) to support the wick holder. When the tealight cup is placed upon an external surface (e.g. a table), a hollow space (14) is created between the outer wall, the external surface and the bottom, which consists here of the central surface, the first inclined plane and the second inclined plane.

Claims

1. A plastic tealight cup consisting of a bottom and an outer wall, wherein the bottom contains an inclined part (1), **characterised in that** the inclined part runs from the outer wall and that the inclined part has an incline of > 1°; wherein the inclined part i) contains a first inclined plane (4) that is connected to the outer wall and ii) a second inclined plane (5) that is connected to the first inclined plane, and wherein the first inclined plane has an incline that is greater than the incline of the second inclined plane.

2. The tealight cup according to Claim 1, wherein the radial length of the inclined plane (2) is at least 20% of the radius of the tealight cup (3).

3. The tealight cup according to one of the preceding claims, wherein the radial length of the inclined part (2) is at least 50% of the radius of the tealight cup (3).

4. The tealight cup according to one of the preceding claims, wherein the first inclined plane (4) meets the outer wall at 40 to 55% of the height of the outer wall and runs up to a height of 1-10% of the height of the outer wall and wherein the radial length of the first inclined plane is 25% to 45% of the radius of the tealight cup (3).

5. The tealight cup according to one of the preceding claims wherein the second inclined plane (4) has an incline of 55° to 75°, in particular approximately 65°.

6. The tealight cup according to one of the preceding claims, wherein the second inclined plane (5) has an incline of between 5° and 25°; preferably between 10° and 20°.

7. The tealight cup according to one of the claim 1 to 3, wherein the radial length (6) of the first inclined plane (4) is at least 15% of the radius (3) of the tealight cup and wherein the radial length (7) of the second inclined plane (5) is at least 20% of the radius (3) of the tealight cup.

8. The tealight cup according to one of the preceding claims, wherein the outer wall runs uninterruptedly at least up to or below the last point of the bottom, such that when the tealight is placed upon an external surface, a closed space is created between the outer wall, the bottom and the external surface.

9. The tealight cup according to one of the preceding claims, wherein the bottom furthermore contains centring elements (8) for a wick holder (9) and wherein the inclined part (1) runs substantially from the outer wall to the centring elements.

10. The tealight cup according to one of the preceding claims, wherein the inclined part (1) furthermore contains ribs (11) which run radially in the direction of the centre of the bottom.

11. The tealight cup according to one of the preceding claims, wherein the bottom contains a central surface (12) that supports a wick holder (9), wherein the central surface is situated 0.1 to 1 mm lower than the lowest part of the inclined part (1).

12. The tealight cup according to one of the preceding claims, wherein the bottom contains a central surface (12) that supports a wick holder (9), wherein the central surface (12) contains radially oriented grooves (13).

13. A tealight comprising a tealight cup according to one of the claims 1 to 12, a wick holder (9) with wick (10), and fuel, such as paraffin.

14. A method for the production of a tealight, the method consisting of:

    - obtaining a tealight cup according to one of the claims 1 to 12,
    - introducing a wick holder (9) with wick (10) and fuel, such as paraffin, in the tealight cup.

Fig. 1A

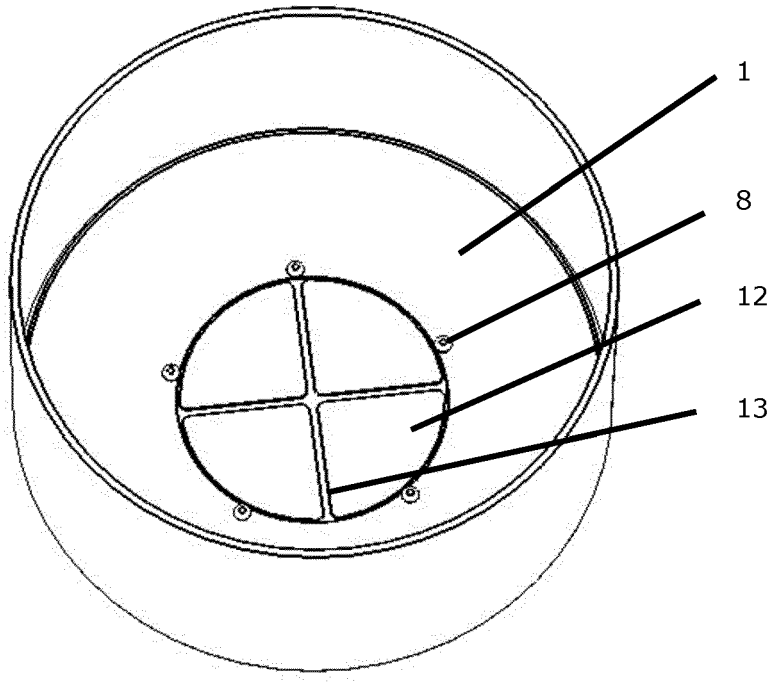


Fig. 1B

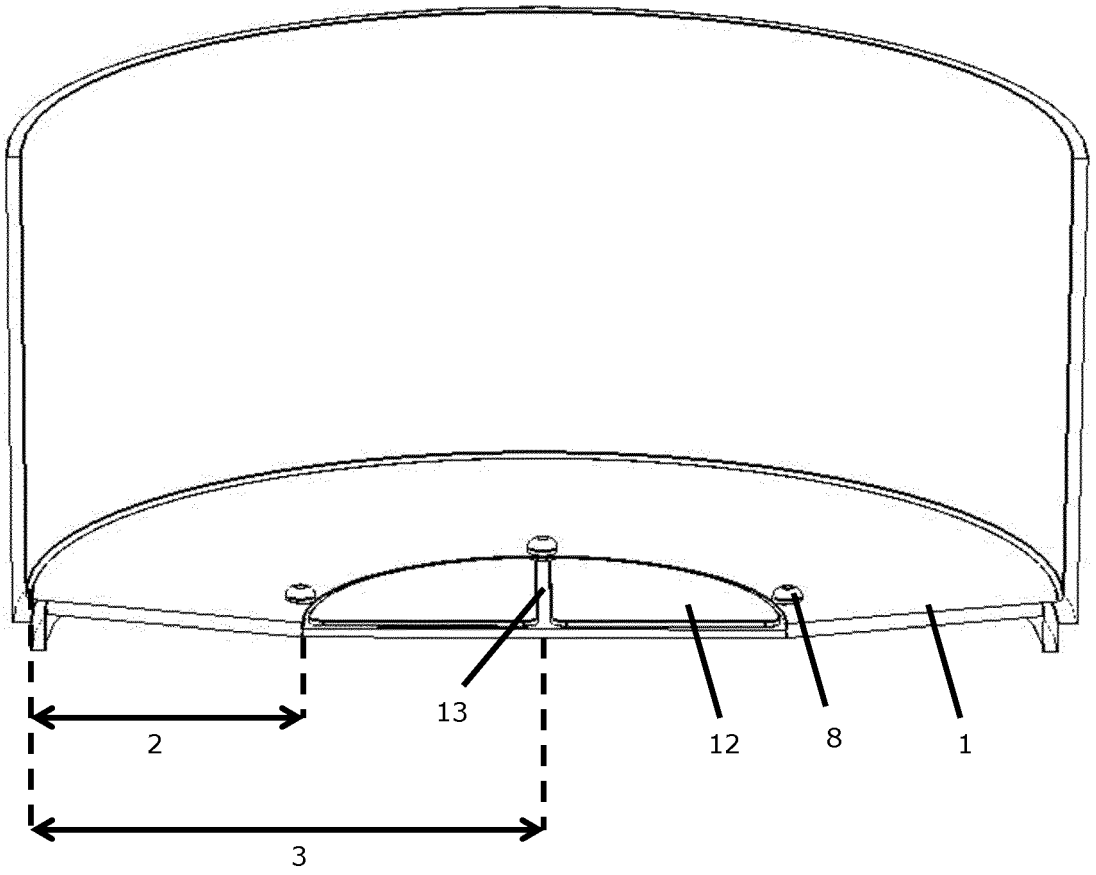


Fig. 1C

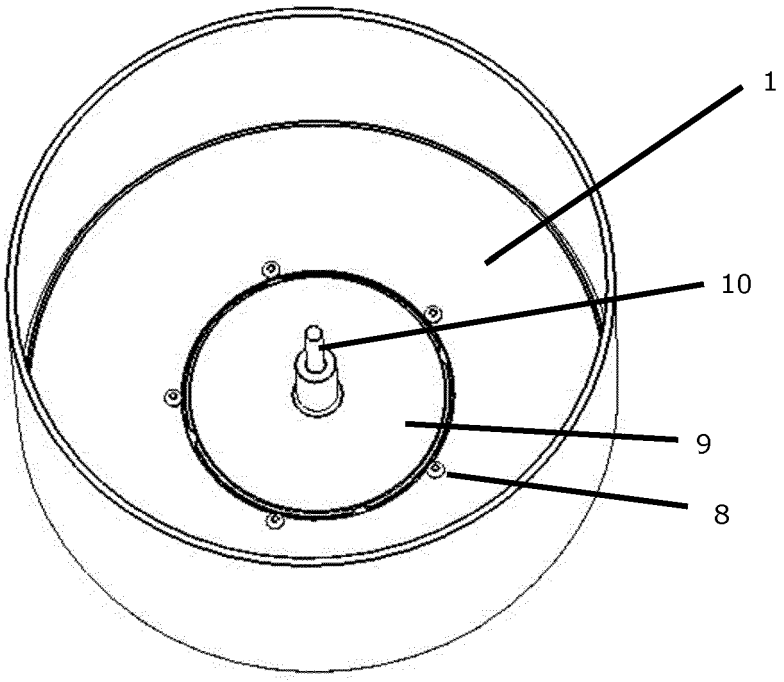


Fig. 2

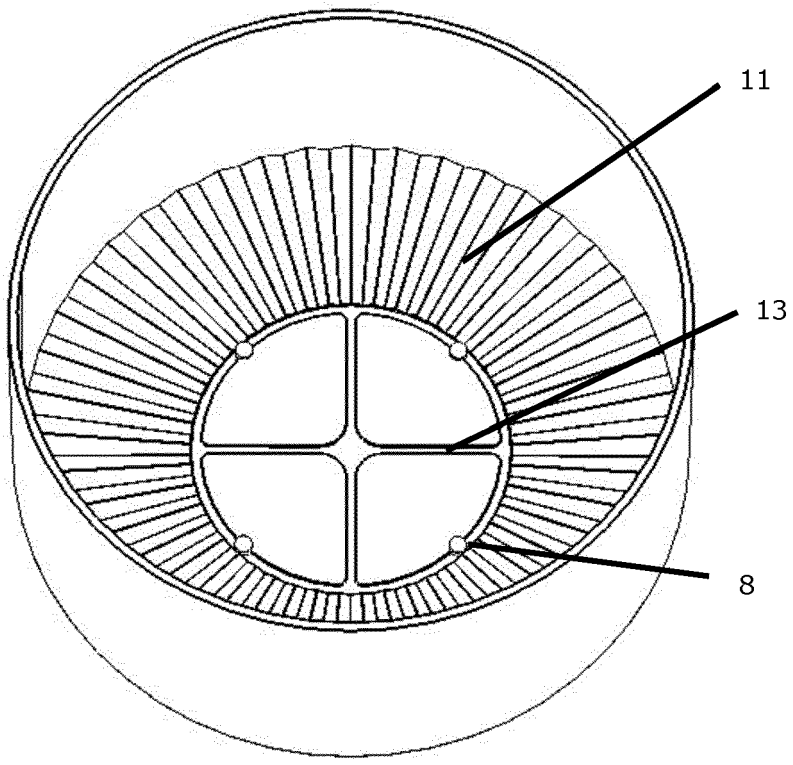


Fig. 3

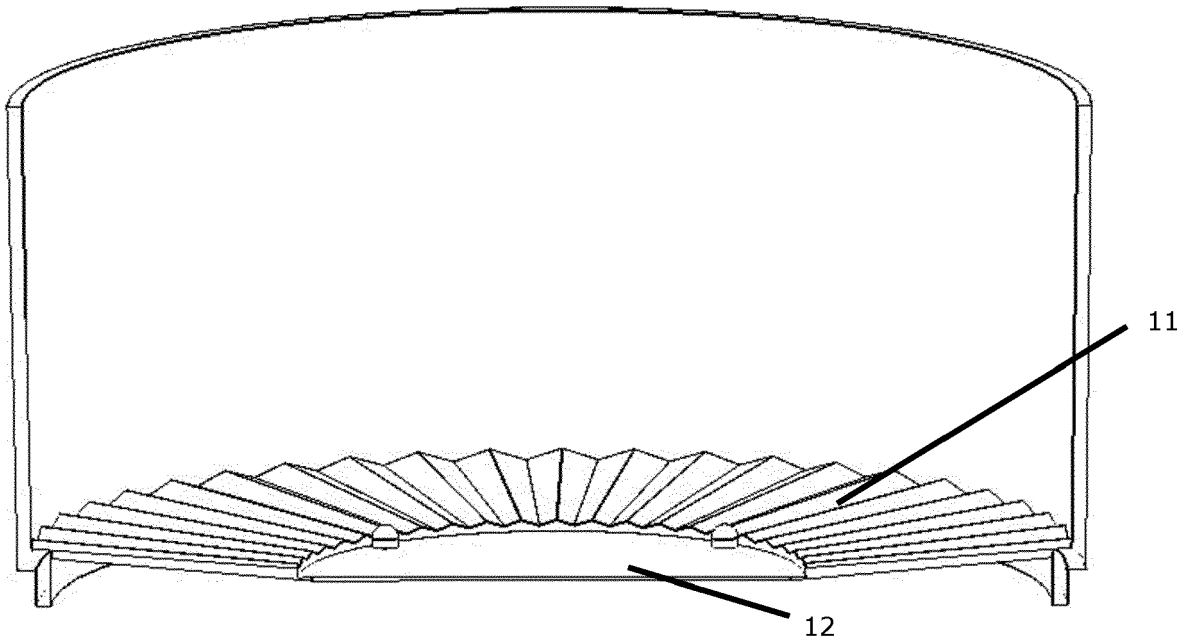


Fig. 4

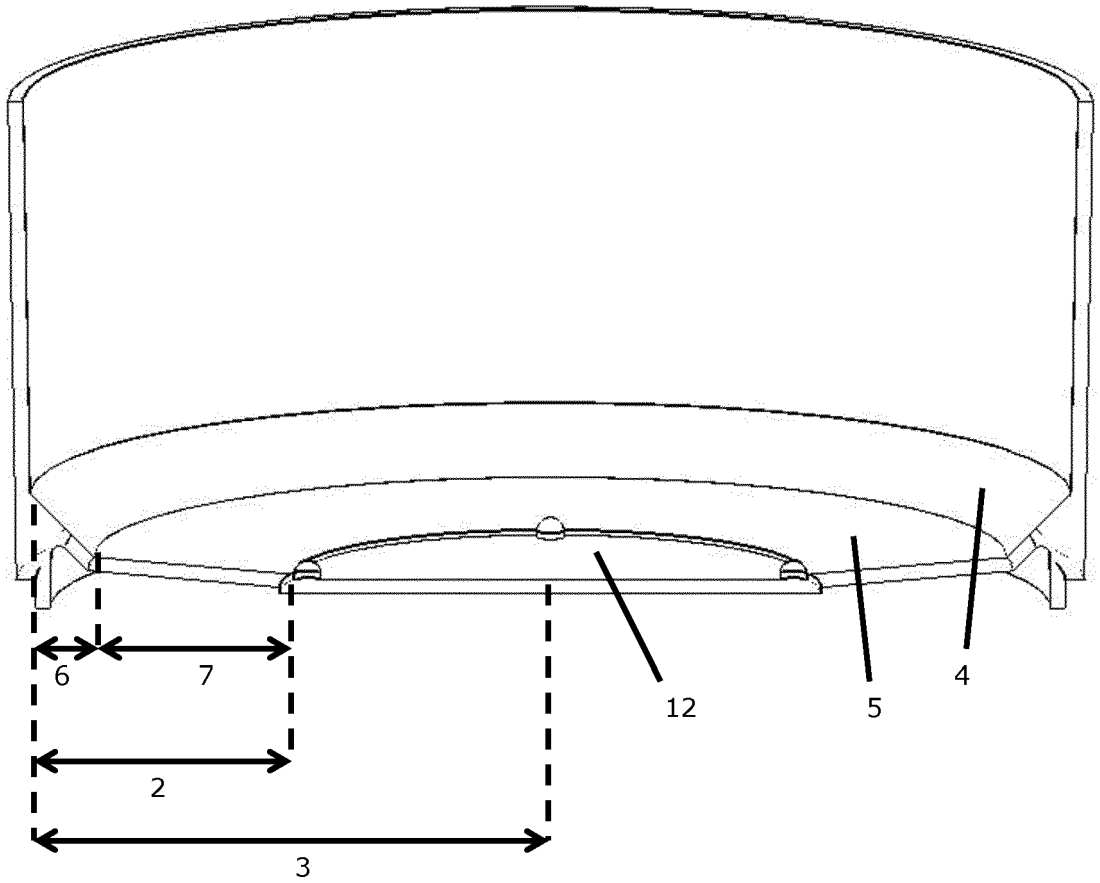


Fig. 5

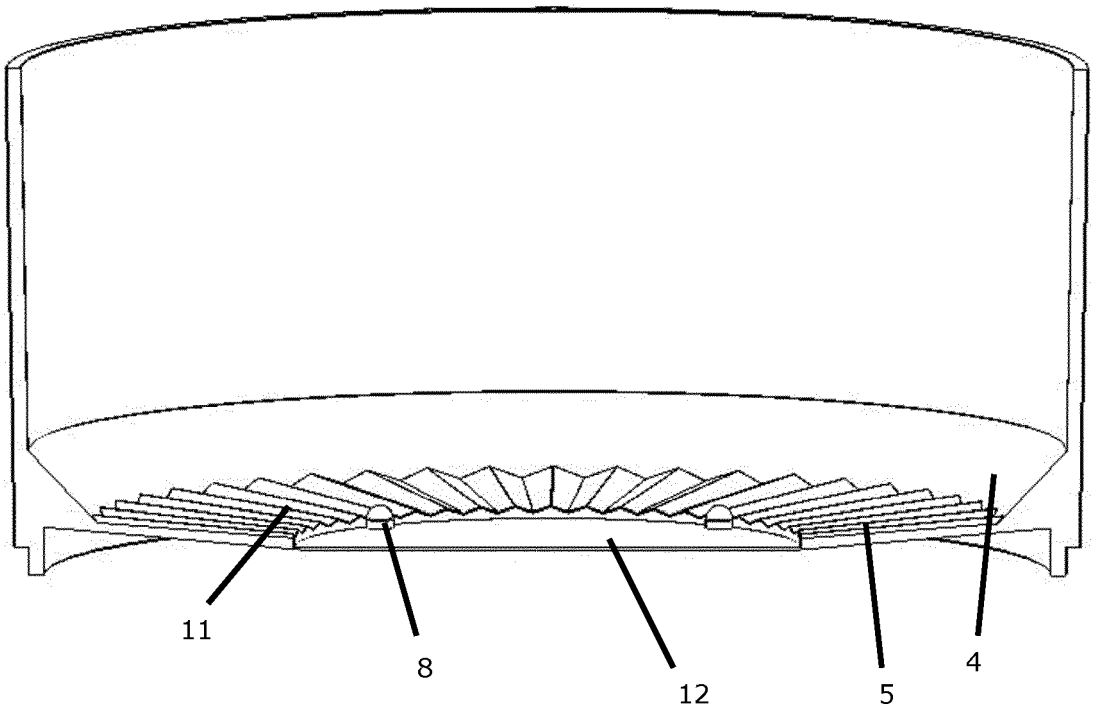
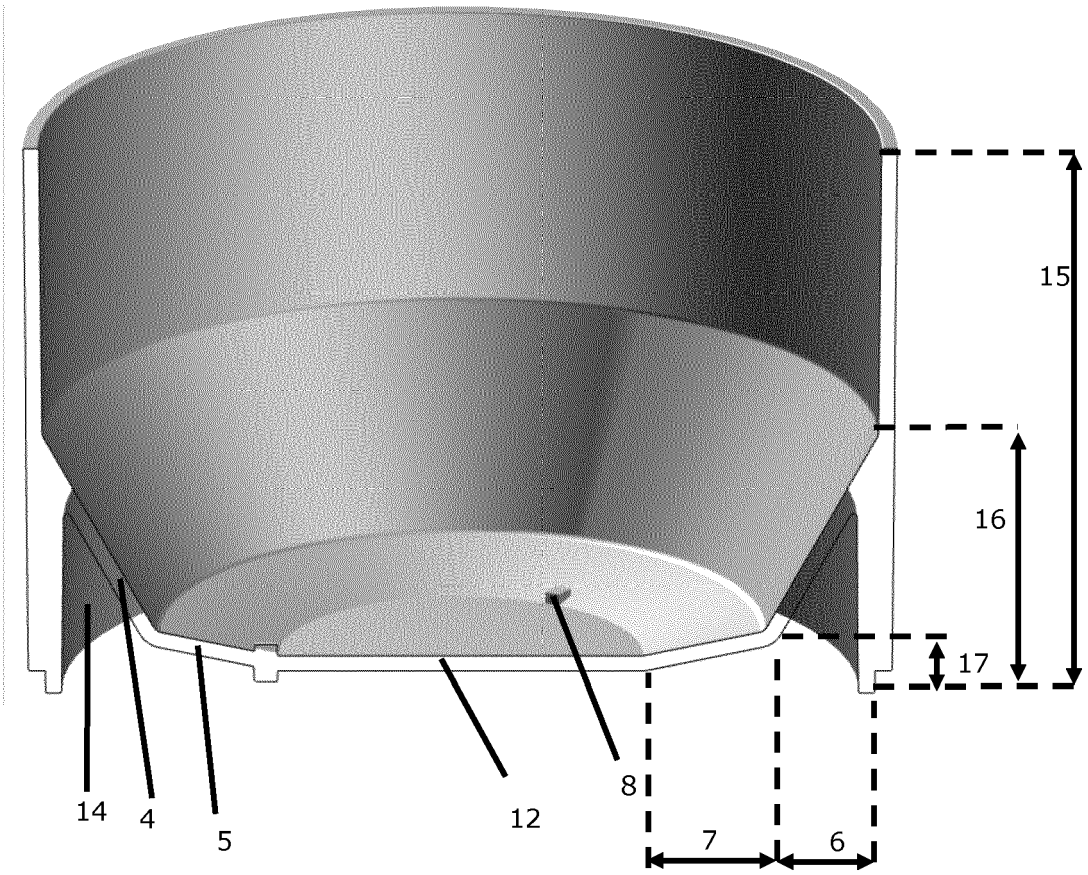


Fig. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 17 15 3394

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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	23 March 2017	Smeets, Dieter

CATEGORY OF CITED DOCUMENTS

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