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(54) **Drink-through lid**

(57) A drink through lid (1) attachable to a beverage cup (30) comprising a drinking lip (10), such that an outer surface of the drinking lip (10) extends about and abuts an outer surface of the cup (30) and an inner surface of the drinking lip (10) extends about and abuts an inner surface of the cup (30).

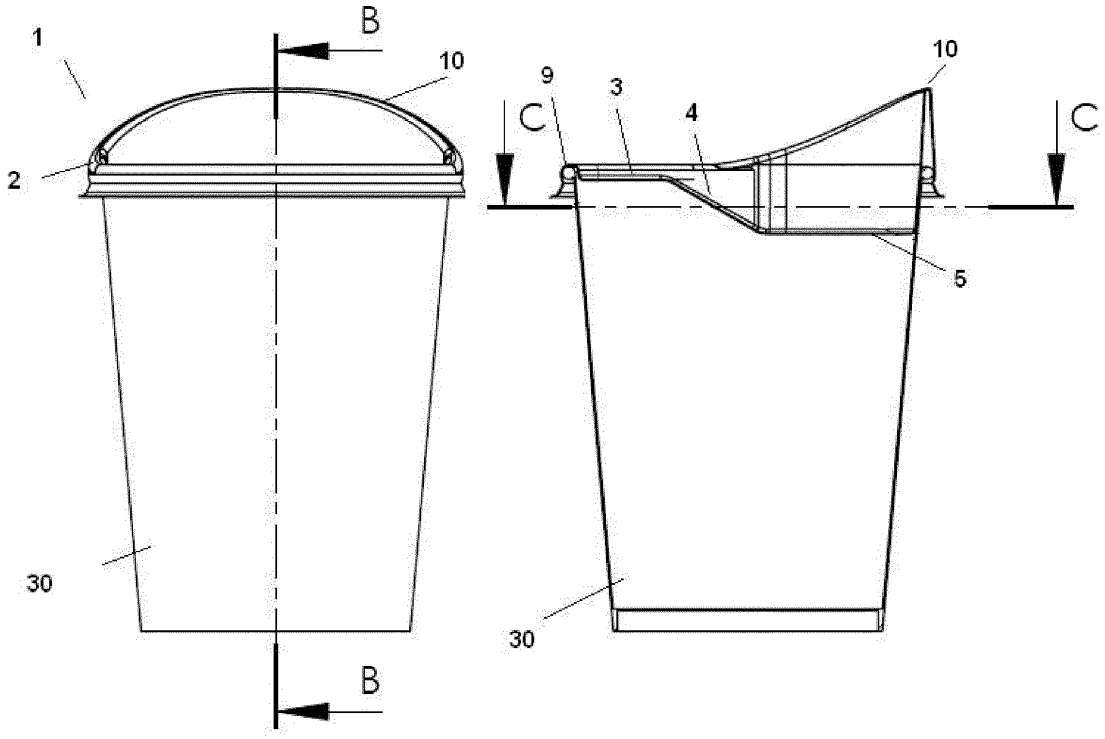

Figure 2

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Description

Field of the Invention

[0001] The present invention relates to lids for drinking vessels and in particular drinking vessels which have a cup and a drink-through lid on the cup. Of particular interest are lids for disposable cups. Disposable cups are often given out with beverage sales for example from shops, on airlines, in public arenas such as theatres, cinemas, stadiums etc. The beverage is often tea or coffee. Typically the cup is designed as a take-away disposable cup, the lid for preventing spillage of the liquid whilst being carried.

Background to the Invention

[0002] Many types of drinking vessel have existed. These include vessels designed for various purposes including those having spouts or nozzles on a lid and through which the liquid to be drank must be sucked. Such arrangements are typically used on baby cups in particular to avoid spillage.

[0003] Such arrangements often further require a user to squeeze the vessel in order for a consistent flow of liquid to be obtained from the vessel. It is further the case that small volumes of liquid, for example the last millilitres of a drink, become trapped in the vessel as the shape of the spout or nozzle is more suited to the passage of larger volumes of liquid.

[0004] Typically with such lids, it is common for a user to spill a beverage while drinking. It is thus desirable to provide a lid which reduces the tendency of a user to spill a beverage while drinking. Furthermore, it is desirable to provide a consistent flow of a beverage through the lid while drinking, for large and small volumes of liquid.

[0005] Such lids are typically circular in shape and comprise a recess about their outer circumference in order that the lid can be fitted to the drinking vessel. Typically, the upper rim of the drinking vessel is fit within the outer recess of the lid. Typically, the lid, the vessel or in some cases both, are resiliently deformable such that the lid is secured to the top of the vessel by being gripped between the surfaces of the outer recess. The outer recess serves only to secure the lid to the vessel.

Summary of the Invention

[0006] The present invention provides a drink though lid attachable to beverage cup by a drinking lip, such that a topside of the drinking lip extends about and abuts an outer surface of the cup and an underside of the drinking lip extends about and abuts an inner surface of the cup.

[0007] This is advantageous as the need for an additional outer recess for securing the lid to a beverage cup is obviated. Instead, the lid is attachable to a beverage cup by the drinking lip of the lid. This provides for a greatly simplified lid profile as a separate outer recess for securing the lid to a cup is no longer required. This leads to significant benefits in terms of ease of manufacture as well as cost of manufacture.

[0008] The lid may comprise an annular recess defined therein between outer and inner annular walls for engaging a rim of the cup, **characterised in that** the drinking lip is an upstanding arcuate lip formed by a raised portion of the outer wall and a raised portion of the inner wall which converge at a position above the rim, the outer wall arranged to engage the outside of the rim about an outer surface of the cup and the inner wall sealingly engages an inner surface of the cup.

[0009] In such a construction, the internal annular recess between the raised portion of the outer wall and the raised portion of the inner wall which converge to form the drinking lip does not fill with beverage as the annular recess of the drinking lip is sealed off about an inner surface of the cup. This in turn means that no residual fluid becomes trapped as for example occurs in GB 2473042 or the inventors' earlier WO 2012/104385. In such prior art arrangements, a separate rim is required to form the seal to prevent liquid from leaking about a peripheral edge of the cup. Such arrangements create a seal against the outside of a rim of the cup. In contrast, the present invention creates a seal against an inner wall of the cup typically at a position below the rim of the cup.

[0010] This means that the inner annular wall forming the drinking lip is flush with the inner wall of the cup. This means that no liquid finds its way into the annular recess within the drinking lip. This in turn means that the inner wall prevents any fluid finding its way into the space between the inner wall and the cup, and in particular the annular recess defined by the inner and outer walls. There is then no trapped residual fluid such as occurs with alternative arrangements.

[0011] Moreover it is a simple construction where the rim for attachment to the cup also forms the drinking lip. This means that there is no multiple rim arrangement so that on the underside of the lid there is no area where liquid becomes trapped as a user drinks through the lid. In prior art arrangements liquid was trapped by various parts on the underside of the lid including the annular recess formed for attachment to the cup rim, a bridging portion attaching a drinking lip to a wall defining the annular recess and the recess formed by the drinking lip itself. All such liquid traps have been eliminated by the construction of the present invention.

[0012] The underside of the lip may be flush with an inner surface of the beverage cup such that when a liquid is poured from the beverage cup over a topside of the drinking lip, the liquid is prevented from entering a region between the underside of the drinking lip and an inner surface of the beverage cup.

[0013] This provides the advantage of preventing pooling of liquid between a bottom surface of the drinking lip and an inner side wall of the cup. As the underside of the drinking lip is flush with the inner surface of the cup, there is no gap or reservoir area between the underside of the

lip and the inner surface of the cup into which liquid from the cup may enter. Such a gap or reservoir leads to pooling of liquid in the cup whilst being tilted in a typical manner by a user drinking a beverage from the cup. Such pooling leads to inconsistency of flow of a liquid from the cup when a cup is tilted by a user in order to drink through the lid. Furthermore, when a low volume of liquid is in the cup, it prevents such low volumes from becoming trapped between the bottom surface of the drinking lip and the side walls of the cup. Thus, it allows for both consistent flow of large volumes of liquid (i.e. from a substantially full cup) and small volumes of liquid (i.e. from a substantially empty cup). Thus, remnants of a beverage are further prevented from remaining in the cup which would ordinarily remain trapped between the bottom surface of the drinking lip and the side walls of the cup.

[0014] The annular recess of the lid may have a portion of increased depth for sealably mating the topside of the drinking lip with the outer surface of the cup and the underside of the drinking lip with the inner surface of the cup.

[0015] This is advantageous as it allows the drinking lip of the lid to provide the dual purpose of allowing a beverage to be sipped by a user via the lip whilst also allowing the lip structure to seal the lid to a cup. Thus the need for an additional outer rim or recess to seal the lid to a cup is overcome. Mating the topside of the drinking lip with the outer surface of the cup and the underside of the drinking lip with the inner surface of the cup allows the edge of the cup to be "gripped" or "pinched" by the surfaces of the drinking lip, thus providing a reliable water tight seal. The portion of increased depth allows for the underside of the drinking lip to extend down the side wall of the inner surface of the cup. Extending the lip along the inner surface of the side wall further provides a better seal and further provides stability to the lid atop a beverage cup.

[0016] The lid may comprise a drink through aperture through which a beverage can exit the lid along the drinking lip.

[0017] Positioning the aperture such that a beverage can exit the lid along the drinking lip is advantageous as it allows the user to see the liquid in the period from which it exits the aperture and flows along the drinking lip towards the users lips. This allows the user to see the volume of liquid which has exited the cup, thus preventing the user from imbibing too much liquid in a single drinking action. This further overcomes the need for a user to suck on an aperture in order for a beverage to exit a cup. It also provides a cooling effect for hot beverages as the beverage is exposed to the air before being imbibed by the user. It further provides a opportunity for the user to blow onto the beverage before being imbibed without the need to remove the lid from the cup.

[0018] The lid may further comprise a recessed area in the topside of the lid. The recessed area may further comprise the drink through aperture.

[0019] Providing the drink through aperture in a recessed area is advantageous as it allows a user drinking from the cup to see the flow of liquid as it exits the aperature and flows along the drinking lip. This allows a user to visually judge the rate of flow and helps to prevent spillage. Furthermore, providing the aperture in a recessed area overcomes the needs to compress the cup or rely on suction in order to cause liquid to exit through the aperture.

[0020] An outer edge of the recessed area is pliably connected to the lid such that the recessed area is moveable between a holding position and a drinking position.

[0021] In the holding position, the recessed area may be angled downward into a cup whereas in the drinking position, the recessed area is substantially parallel to a base of a cup to which it is fitted. Thus, in the holding position, the recessed area provides the advantage of acting as a baffle to prevent the inadvertent spilling of liquids, for example if a cup is shaken.

[0022] The topside of the lid may be nestable within the underside of a further lid. The top surface of the drinking lip may be nestable within the bottom surface of a drinking lip of a further lid. This provides the advantage of greater storage efficiency as multiple lids may be stacked atop each other in a minimum amount of space. This is particular advantageous where storage space is at a premium, for example in commercial vehicles.

[0023] The lid may be fitted to a beverage cup to form a beverage cup assembly of the present invention.

Brief Description of the Drawings

[0024] **Figure 1A** shows a drink through lid of the prior art

[0025] **Figure 1B** shows a detail of the lid of the present invention about the sealing region with the beverage cup wall

[0026] **Figure 2A** shows a drink through lid of the present invention on a beverage cup

[0027] **Figure 2B** shows a cross section of the drink through lid of the present invention on a beverage cup along the section B-B

[0028] **Figure 3** shows a cross section of the drink through lid of the present invention on a beverage cup along the section C-C

[0029] **Figure 4** shows a detail of the lid about the sealing region with the beverage cup rim

[0030] **Figure 5** shows a detail of the lid about the sealing region with the beverage cup wall

[0031] **Figure 6** shows a detail of a cross section of the lid about the sealing region with the beverage cup wall

[0032] **Figure 7A** shows a drink through lid of the present invention stacked atop a further drink through lid of the present invention

[0033] **Figure 7B** shows a cross section of drink through lid of the present invention stacked atop a further drink through lid of the present invention along the section A-A

Detailed Description

[0034] The present invention will now be described with reference to the accompanying drawings.

[0035] Figure 1A shows a drink through lid of the prior art. An additional rim B, separate from the drinking lip A is required to form a seal to prevent liquid from leaking about a peripheral edge of the cup. In use, residual fluid becomes trapped in the area labelled C as no seal is formed between the drinking lip and the wall of a beverage cup. Figure 1B shows a drink-through lid 1 for a beverage cup of the present invention about an area equivalent to the area circled in Figure 1A. Figure 1B shows the lid 1 about the sealing region with the beverage cup wall. It can be seen from lid 1 that there is no outer rim equivalent to rim B in Figure 1A. Furthermore, the cup rim 19 is situated between the walls of the drinking lip 10 in a manner providing a seal that will be further described below.

[0036] **Figure 2** shows a drink-through lid 1 for a beverage cup of the present invention. The lid 1 has a lid body 2. The lid body 2 is a single piece of plastic or other suitable material which has been formed into the lid shape by a suitable forming process such as a thermoforming process. A drink-through aperture 5 **(Figure 3)** is defined in the lid body 2 through which a beverage can exit the lid 1 for drinking when the lid is on a beverage cup 30.

[0037] The lid comprises a level surface 3 on the non-drinking side of the lid, i.e. the side of the lid opposite to the side with the drink through aperture. A breather hole is provided in the level surface. A sloped surface 4 connects the level surface on the non-drinking side to the drink through aperture.

[0038] The drink-through aperture 5 comprises an area 6 on the lid in which there may be defined many apertures 7. Each of the apertures 7 is large enough to allow a beverage to be drank through the lid whilst obstructing passage of a filtrate material (which is in the beverage and thus is removed from the beverage before the beverage is drank). The filtrate material is typically solid insoluble matter and often times is material which has been subjected to infusion with hot water such as ground coffee or tea leaves. Any suitable array of apertures may be employed and there is no requirement for the array or apertures to have any particular geometry. The apertures need not all be of the same size or shape.

[0039] The lid 1 also has formed therein a drinking lip 10 (Figure 5). The drinking lip 10 is raised relative to the lid body and comprises opposing upstanding walls, namely a topside outer wall 11, an underside outer wall 12, a topside inner wall 13 and an underside inner wall 14. The drinking lip 10 is formed where the topside inner wall 13 meets the topside outer wall 11. As with all other features of the lid, the drinking lip 10 is integrally formed with the lid 1. The drinking lip has a width of about 0.6 mm, for example it may have a width of 0.67mm. In a further embodiment, the drinking lip 10 has a width of about 1 mm, for example it may have a width of 1.04 mm. The underside outer wall 12 and the underside inner wall 14 of the lid are not visible when the lid is placed on a beverage cup 30.

[0040] To drink a beverage through the lid 1 a user places their lips on the lid so that their mouth is about the lip 10 and imbibes liquid through the aperture 5. When the cup is held in a drinking position, tilting the cup about a horizontal axis through the cup will allow a beverage to pass through the drink-through aperture, and along the topside inner wall 13 towards the lip 10 so that the user can see the beverage after it has exited the aperture 5 and before it reaches the lip 10. Such an arrangement is very desirable because it dramatically reduces the tendency of a user to spill the beverage. In particular, because the user can see the beverage and in particular the beverage level, as it flows out of the lid 1, they are less likely to spill it.

[0041] Desirably, and as shown in the embodiment, the beverage aperture is formed in an area of the lid 1 that is at a lower position relative to an outer rim 9 and the drinking lip 10 of the lid. This increases the area available for forming the fluid bed for the liquid and thus makes liquid flow visually more prominent to a user. In an embodiment, the beverage aperture is about 35 mm below the drinking lip 10, for example, it may be 35.03 mm below the drinking lip.

[0042] The underside 15 of the lid, i.e. the side of the lid which is not visible when placed atop a beverage cup comprises a recess 16 about the circumference of the lid. The recess 16 is shallow in the portion furthest from the drinking lip and is of increased depth in the portion bounded by the underside inner wall 14 of the drinking lip 10 and the underside outer wall 12 of the drinking lip. When placed on a beverage cup 30, the circumferential recess 16 acts to push fit to the top of the cup. The recess 16 is formed in the shallow portion by two inner surfaces 17, 18 of the lid and fits around a raised rim 19 on the top of the beverage cup 30 to form a fit providing side support. An upper surface 20 provides vertical support. This is the fit formed on the non-drinking side of the lid i.e. the side of the lid opposite the drinking lip **(Figure 4).** On the drinking side of the lid, i.e. the side with the drinking lip 10 **(Figure 5),** the recess 16 is of increased depth and is formed between the underside inner wall 14 of the drinking lip 10 and the underside outer wall 12 of the drinking lip. The underside inner wall 14 is dimensioned such that, when in place on a cup, the underside wall extends along the inner surface 21 of the beverage cup such that it mates with the surface 21 of the inner side wall of the beverage cup. When placed on a beverage cup, a push fit is formed when the rim 19 of the beverage cup is fitted into the recess 16 between the underside inner wall 14 of the drinking lip and the underside outer wall 12 of the drinking lip. Unlike on the non-drinking side, there is no vertical support around the cup rim afforded by the lid surfaces. Instead there is a hollow region 29 above the cup rim 19 formed between the underside inner

wall 14 of the rim 10 and the underside outer wall 12 of the rim 10. The separation of the underside wall 14 and the underside wal 12 which from the recess is thus important as the separation must be wide enough to allow the rim 19 of a beverage cup to fit into the recess 16 but not be so wide as to prevent a push fit with the beverage cup rim 19 from forming. Preferably, the wall 12 is separated from the wall 14 by an angle of 6 degrees.

[0043] A notch 22 in the underside outer wall 12 fits to the corresponding rim 19 on the top of the beverage cup. This provides horizontal support to the lid 1 to retain it in place on a beverage cup 30. The underside inner wall 14 extends along the inner surface 21 of the beverage cup and mates with the surface. In this manner, a seal is formed such that there is no gap between the bottom surface of the aperture 23 and the inner surface 21 of the beverage cup. Furthermore, a seal is formed between the underside wall 14 of the lip 10 and the inner side wall surface 21 of the beverage cup. This seal extends for about half of the circumference of the lid. The seal is broken by a dip 24 in underside wall **(Figure 6),** which causes a separation between the underside inner wall 14 of the rim and the inner wall surface 21 of the cup. Breaking the seal at this point, provides sufficient clearance between the underside inner wall 14 of the lid and the inner wall surface 21 of the cup for the push fit seal between the lid and cup to function.

[0044] **Figure 7** A and B show a drink through lid 1 of the present invention stacked atop a further drink through lid 1 of the present invention. It can be seen that the lids are capable of nesting within each other. In the nesting arrangement with one drinking lid atop another, the topside surface 25 of the lower drinking lid occupies the recess on the underside surface 26 of the upper drinking lid. In this arrangement, the lids can be packed very closely together. In a preferred embodiment of the device, the distance between the top surface 27 of the upper lid and the bottom surface 28 of a lower lid in a nesting arrangement is 15.44 mm. Such a nesting feature significantly reduces the storage space required for multiple lids. It further provides for substantially efficiency in the packing of multiple lids. Such efficiency of storage and packing is of particular importance for commercial vehicles, including aircraft, where storage space is extremely limited.

[0045] In a further embodiment of the present invention, the aperture area 5 of the lid may be pivotable, for example, along an axis 29 (See Figure 3) where the edge of the aperture area 5 meets the sloped surface 4 of the drinking lid. The edge of the aperture area is thus sufficiently pliable such that the aperture can be made to bend from one position to another. For example, when fitted to a cup, the aperture area 5 is thus capable of being in one position, being substantially horizontal and parallel with the base of the beverage cup to which it is fitted, and in another position being angled downwards into the cup itself. This arrangement has the effect of preventing liquid splashing out of the beverage cup if the cup is shaken. When in the downward position or "holding position", the aperture area 5 acts as a baffle to prevent liquid escaping from the cup. The aperture area 5 is pivotable such that when the cup is tilted by a user in order to drink from the lip 10 of the lid, the aperture 5 moves towards a level position or "drinking position" and allows liquid to flow through the aperture region in the manner described above.

[0046] The words "comprises/comprising" and the words "having/including" when used herein with reference to the present invention are used to specify the presence of stated features, integers, steps or components but do not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

[0047] It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable subcombination.

Claims

1. A drink though lid attachable to a beverage cup by a drinking lip, such that a topside of the drinking lip extends about and abuts an outer surface of the cup and an underside of the drinking lip extends about and abuts an inner surface of the cup.

2. A drink through lid according to claim 1, wherein the lid comprises an annular recess defined therein between outer and inner annular walls for engaging a rim of the cup, **characterised in that** the drinking lip is an upstanding arcuate lip formed by a raised portion of the outer wall and a raised portion of the inner wall which converge at a position above the rim, the outer wall arranged to engage the outside of the rim about an outer surface of the cup and the inner wall sealingly engages an inner surface of the cup.

3. A drink through lid according to claim 1 or 2; wherein, in use, the underside of the lip is flush with an inner surface of the cup such that when a liquid is poured from the beverage cup over a topside of the drinking lip, the liquid is prevented from entering a region between the underside of the drinking lip and an inner surface of the beverage cup.

4. A drink through lid according to claim 2 or 3 wherein the annular recess comprises a portion of increased depth for sealably mating the outer wall of the drinking lip with the outer surface of the cup and the inner wall of the drinking lip with the inner surface of the cup.

5. A drink through lid according to any preceding claim

comprising:

a drink through aperture through which a beverage can exit the lid along the drinking lip.

6. A lid according to claim 5 further comprising a recessed area in the topside of the lid.

7. A lid according to claim 6 wherein the recessed area comprises the drink through aperture.

8. A lid according to claim 7 wherein an outer edge of the recessed area is pliably connected to the lid such that the recessed area is moveable between a holding position and a drinking position.

9. A lid according to any preceding claim such that the topside of the drinking lip is nestable within the underside of a drinking lip of a further lid.

10. A beverage cup assembly comprising a beverage cup fitted with the lid of any of claims 1 to 9.

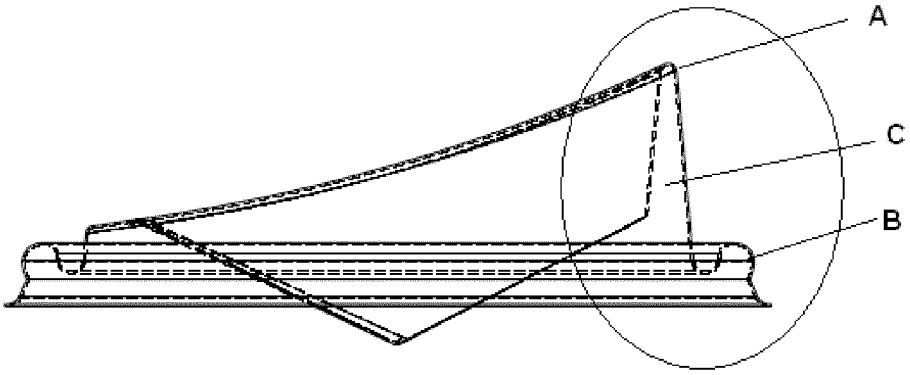

Figure 1A (Prior Art)

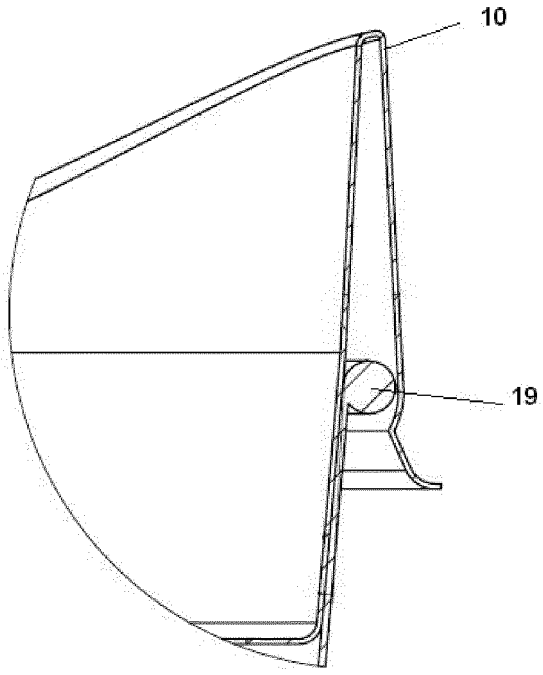

Figure 1B

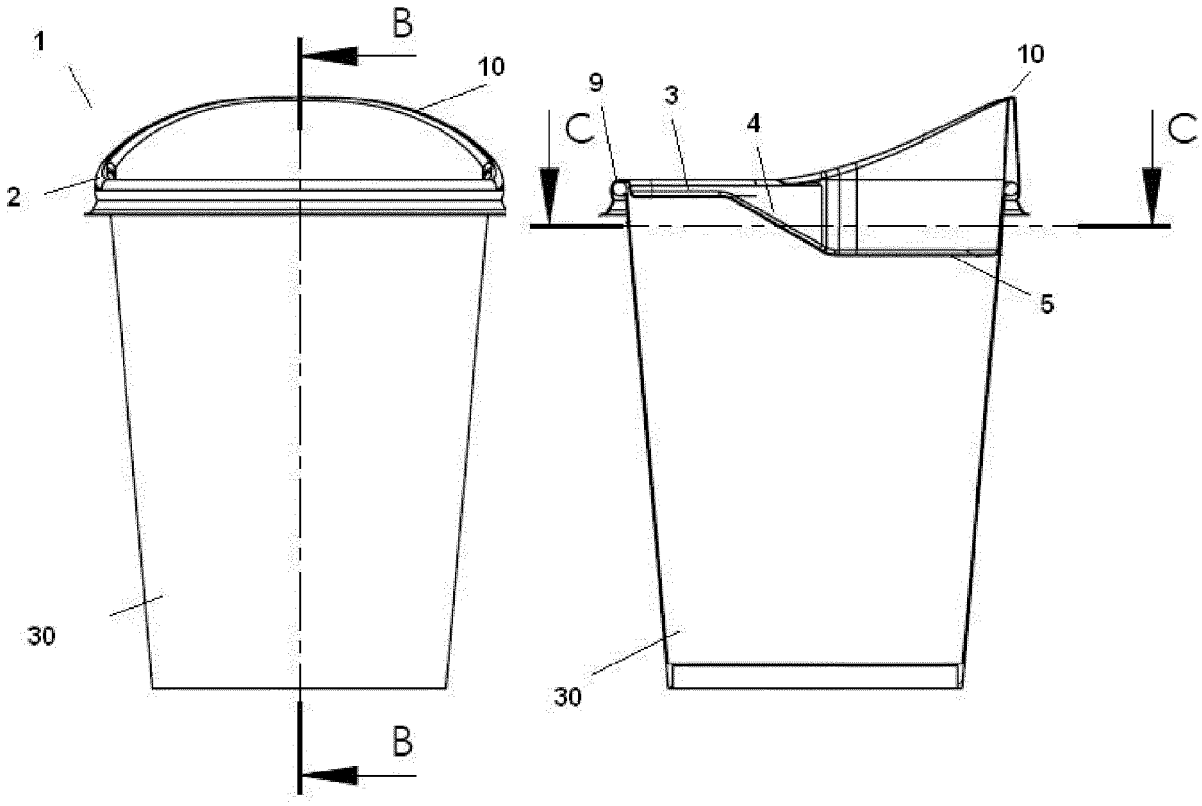

Figure 2

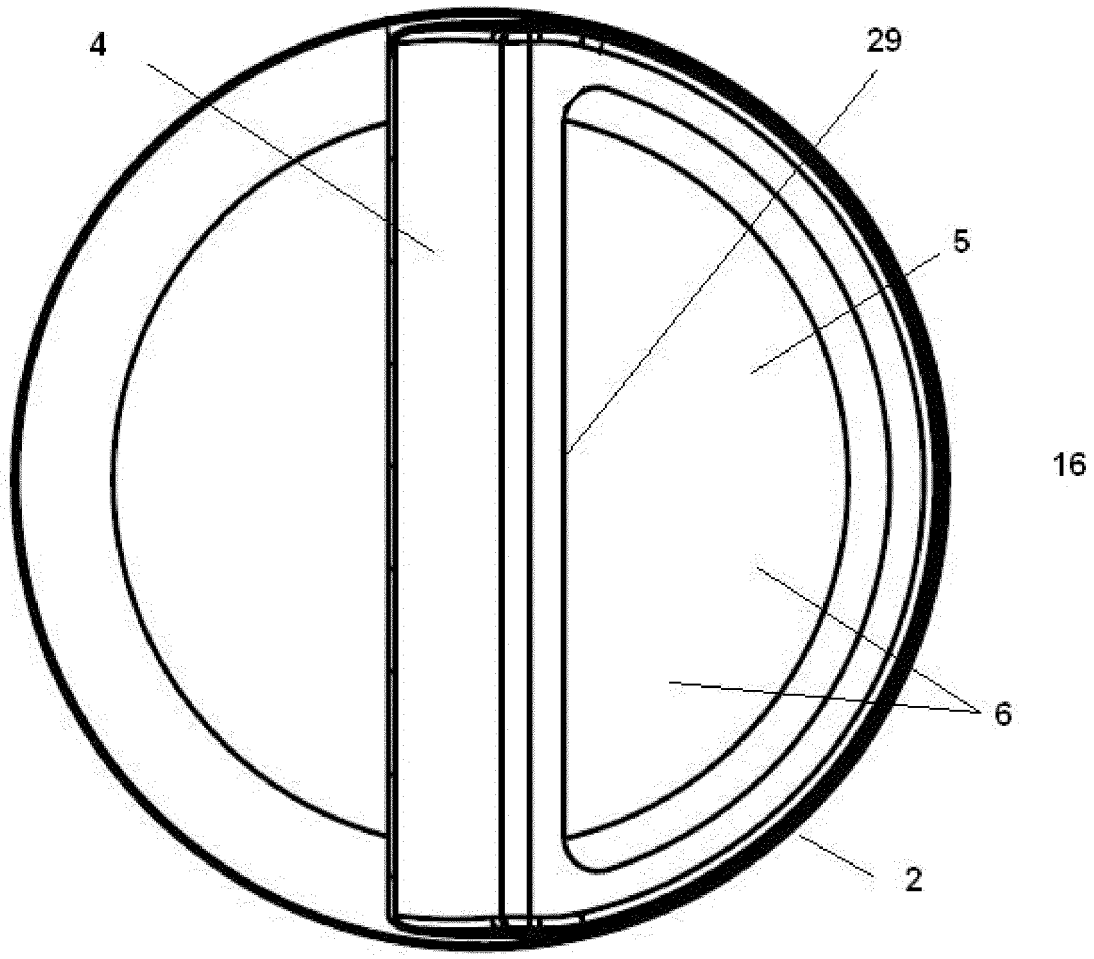

Figure 3

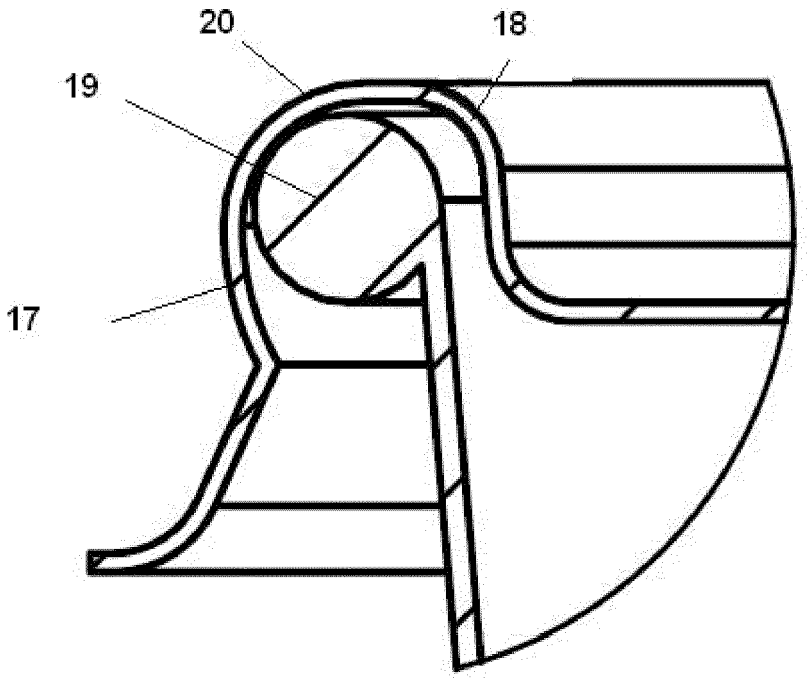

Figure 4

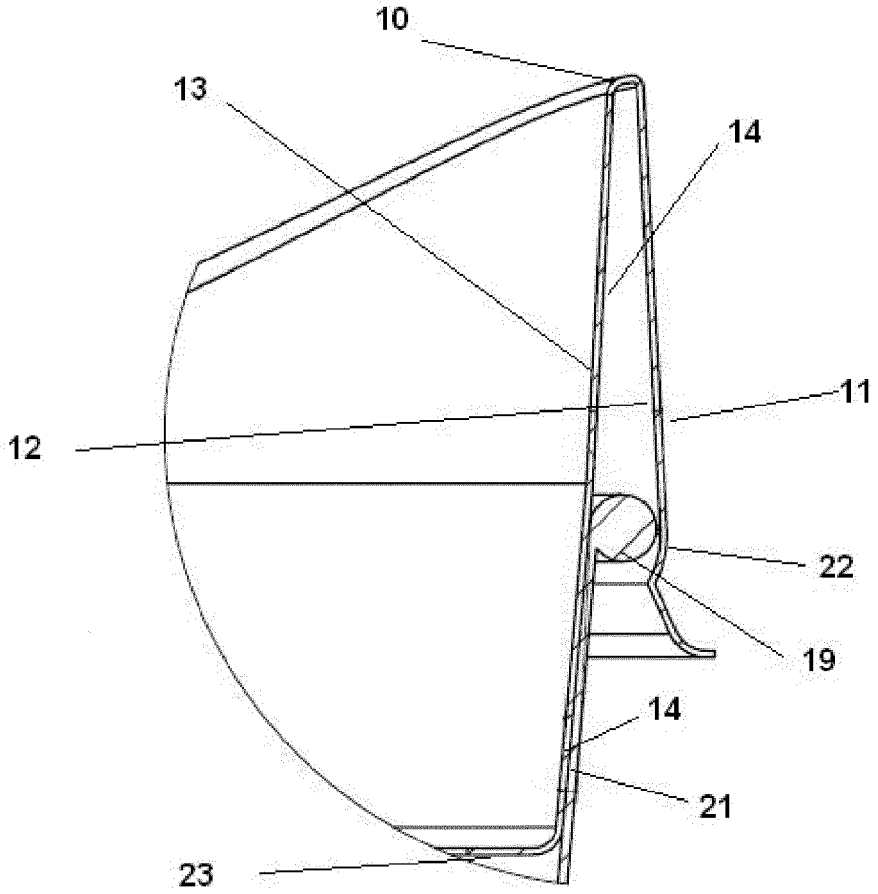

Figure 5

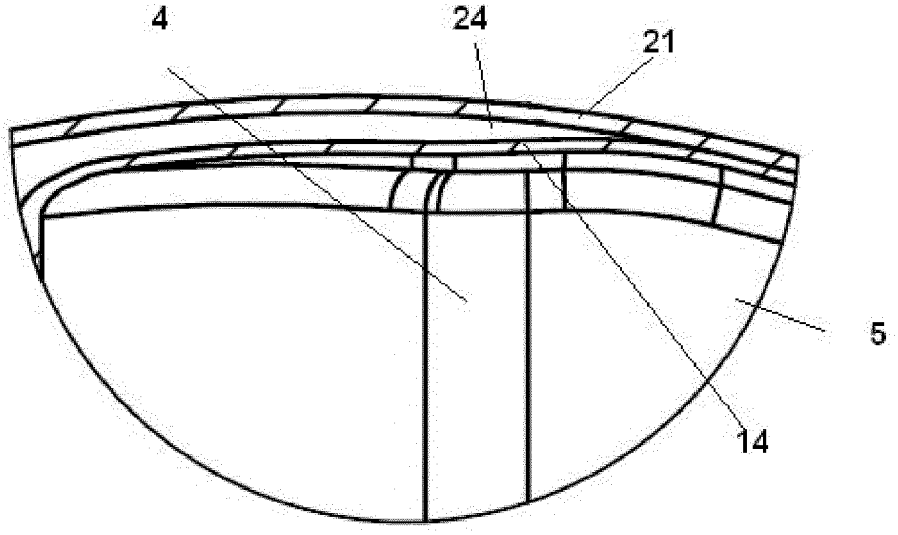

Figure 6

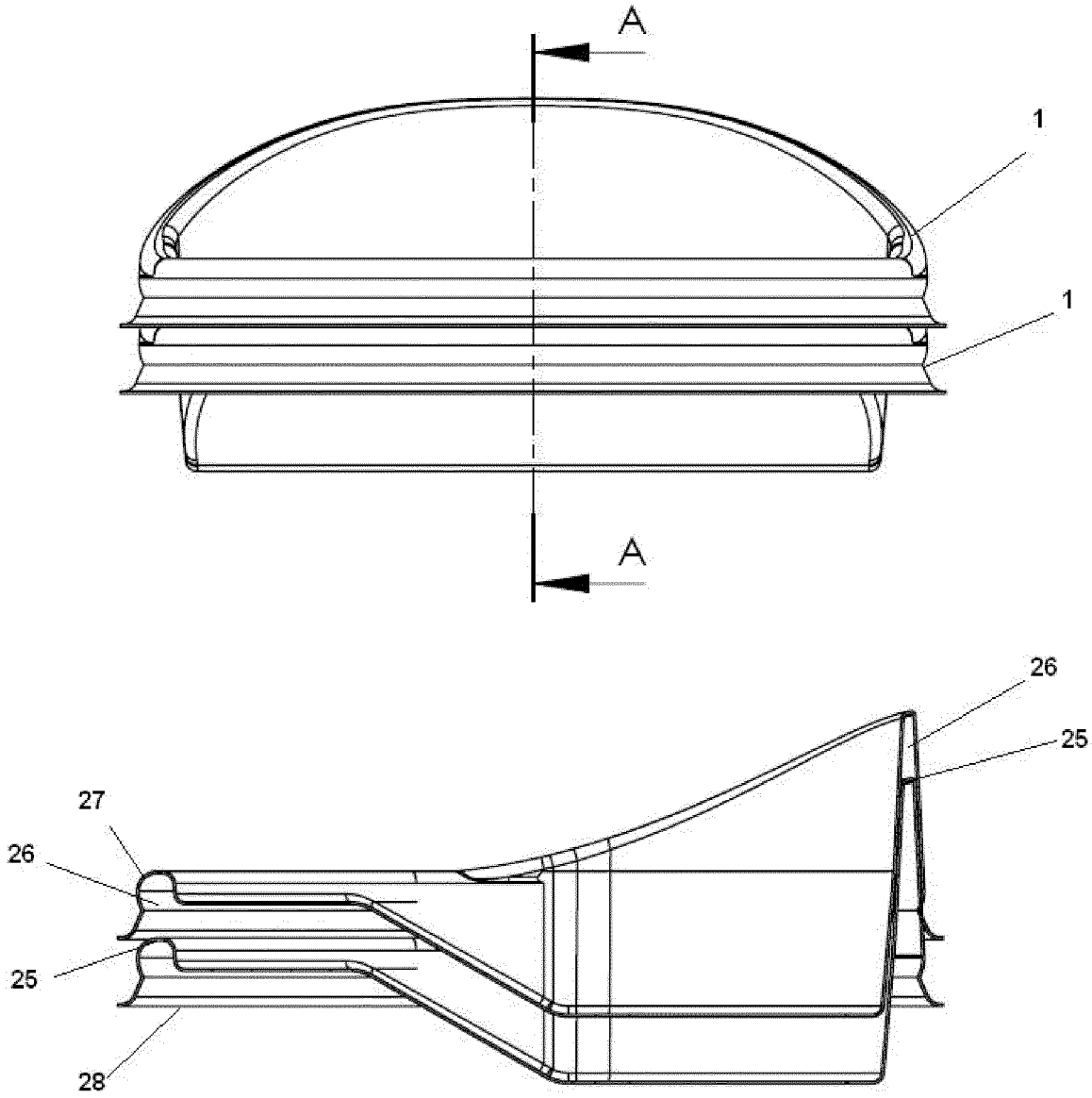

Figure 7

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EUROPEAN SEARCH REPORT

Application Number
EP 13 18 8752

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	US 4 441 623 A (ANTONIAK NICKOLAS J [CA]) 10 April 1984 (1984-04-10) * figures 1-3 * -----	1-10	INV. B65D43/02

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 December 2013	Sundell, Olli

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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20-12-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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