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(54) **Title:** CUP LID AND CUP ASSEMBLY COMPRISING A CUP BODY AND THE CUP LID

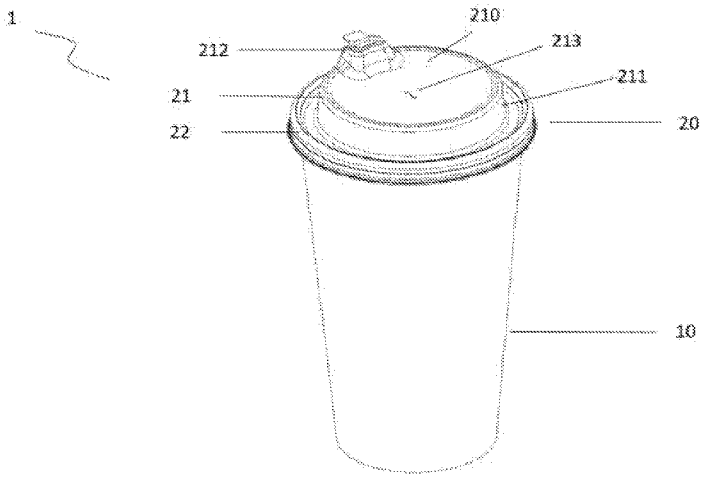

FIG. 1

(57) **Abstract:** The present disclosure discloses a cup lid. The cup lid includes: a lid body provided with a mouth; and a cup body engaged flange extending away from the lid body; it's characterized in that the lid body is provided with a slit throughout its thickness, the slit having an elongate shape and having a maximum width between 0.05 and 0.15 millimeters. The present disclosure also discloses a cup assembly including a cup body and the cup lid described above, and the cup lid covers the cup body in a sealing manner through the cup body engaged flange.

[Continued on next page]

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CUP LID AND CUP ASSEMBLY COMPRISING A CUP BODY AND THE CUP LID

TECHNICAL FIELD

[0001] The present disclosure relates to a cup lid, and also relates to a cup assembly including the cup lid. The cup lid is particularly a cup lid of a beverage cup in molding industry, for example, in paper pulp molding industry.

BACKGROUND

[0002] In modern society, portable and disposable tableware that is more sanitary has been increasingly used in catering industry to hold and transport food and drinks. For example, beverage cups are not only used in take-away service, but also more and more common in eat-in service. However, inevitably, all these cups would go through the process of transportation during which the cups may shake, vibrate, tilt or even topple.

[0003] A beverage cup such as a portable beverage cup usually includes a cup body and a lid, and the lid is provided with an opening through which a drinker can drink the beverage in the cup. In order to drink the beverage in the cup smoothly, the lid is usually provided with air holes which are generally small and round-shaped holes. However, in some cases, the design of the round-shaped air holes in the cup lid may lead to unexpected situations. A typical example is that, when a paper cup is full of beverage and is in transportation, it may shake and even tilt or topple due to bumpiness as mentioned above, and the beverage in the cup may leak or spill out through the round-shaped air holes, which not only pollutes the cup lid, affects the appearance of the cup and hence reduces the dining experiences of users, but also the beverage in the cup may spill onto people's bodies and even cause scald in the case of holding hot beverage.

SUMMARY

[0004] In view of the above problems, the present disclosure provides a cup lid, which can solve the above technical problems with a very simple and easy-to-manufacture structure, and the beverage in the cup will not overflow or leak even if it is tilted or toppled during the transportation process.

[0005] The cup lid according to the present disclosure includes: a lid body provided with a mouth; and a cup body engaged flange extending away from the lid body; it's characterized in that the lid body is provided with a slit throughout its thickness, the slit has an elongate shape and has a maximum width of 0.05 mm to 0.15 mm.

[0006] In the present disclosure, a length direction of the slit refers to its elongate direction, and the width of the slit is measured along a direction approximately perpendicular to its elongate direction. According to the disclosure, the cup lid is provided with an air-permeable slit having the maximum width between 0.05 mm and 0.15 mm, so that a surface tension generated by liquid in the cup at the slit is enough to resist a pressure of the liquid in the cup here when the cup is tilted or toppled, and the liquid will be adsorbed onto the cup lid at this time without leaking or spilling out through the slit, thus effectively preventing from an accidental overflow of the liquid without causing a pollution of the cup lid or even spilling onto people's bodies, realizing safe transportation and safe use, and obviously improving user's experience. Moreover, the process of manufacturing the air-permeable slit in the cup lid is simple and the cost is not increased as compared with the design of round-shaped air holes in the prior art.

[0007] In an embodiment, the slit has two opposite long sides. It should be understood that, in the present disclosure, the long side can be composed of a plurality of sections such as straight or curved sections, and these sections are connected to each other to form the long side. Moreover, the long side can also have the form of a smooth curve. By way of example, the slit may also have the shape of a narrow and elongate rectangle.

[0008] In an embodiment, one of the two long sides has a curved shape and the other is straight.

[0009] In an embodiment, the two long sides both have a curved shape.

[0010] In an embodiment, the slit forms a shape of spindle or crescent.

[0011] In an embodiment, the slit has the maximum width in a middle along its length and has a width of zero at two ends along its length.

[0012] In an embodiment, the slit has a length of 5 mm to 8 mm.

[0013] In an embodiment, a ratio of the length to the maximum width of the slit is approximately 60:1.

[0014] In an embodiment, the slit has an area of 0.5 mm^2 to 0.8 mm^2. In this way, under the condition of guaranteeing an amount of air permeability of the slit, the surface tension of the liquid at the slit is enough to prevent the liquid in the cup from overflowing through the slit.

[0015] In an embodiment, the slit is provided in a central region of an upper surface of the lid body. This arrangement not only improves the aesthetics of the cup lid but also makes it difficult for the liquid to reach the slit when the cup is tilted in the case where the central region of the cup lid is higher than other regions, thus reducing the risk of liquid overflow.

[0016] In an embodiment, the cup lid is a paper-molded product.

[0017] According to another aspect of the present disclosure, it also provides a cup assembly, including a cup body and the cup lid as mentioned above; the cup lid covers the cup body in a sealing manner through the cup body engaged flange. For the cup assembly according to the present disclosure, the liquid in the cup body will not overflow from the air-permeable slit in the case of bumping, vibration, unexpected tilting and toppling during transportation, so that the cup will not be polluted and the liquid will not spill onto people's bodies; in this way, people will fell more relieved in transportation and holding, and the user experience is obviously improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In order to clearly illustrate the technical solutions of the embodiments of the present disclosure, the drawings necessary for the description of the embodiments will be briefly described in the following; it is obvious that the described drawings are only related to some embodiments of the present disclosure, from which other figures may be obtained by those ordinary skilled in the art without paying creative labors. The following drawings are not intentionally drawn according to actual scales, but the emphasis is on showing the spirit of the present disclosure.

[0019] Fig. 1 illustrates a schematic perspective view of a cup assembly including a cup lid according to an embodiment of the present disclosure;

[0020] Fig. 2 illustrates a schematic perspective view of a cup lid according to an embodiment of the present disclosure;

[0021] Fig. 3 is a schematic enlarged view of a portion circled by the box A in Fig. 2;

[0022] Fig. 4 illustrates a schematic perspective view of a cup assembly according to the present disclosure, in which the cup assembly is in an titled state; and

[0023] Fig. 5 illustrates a schematic perspective view of a cup assembly according to the present disclosure, in which the cup assembly is in a toppled state.

DETAILED DESCRIPTION

[0024] The technical solutions of the embodiments in the present disclosure will be described below in a clearly and fully understandable way in connection with the drawings. Apparently, the described embodiments are just a part but not all of the embodiments of the disclosure. Based on the embodiments in the present disclosure, those ordinary skilled in the art can obtain other embodiment(s), without any inventive work, which should be within the scope of the disclosure.

[0025] In the present disclosure, the terms “upper” and “lower” are used to indicate orientations of the cup assembly in a normal placement state; the length direction of the slit refers to the elongate direction thereof, and the width of the slit is measured along a direction substantially perpendicular to the elongate direction thereof.

[0026] Fig. 1 illustrates a cup assembly 1. By way of example, the cup assembly is a paper cup, in particular a portable paper cup which can contain liquid and can be transported in the case of take-away or eat-in service.

[0027] The cup assembly 1 may include a cup body 10 for containing liquid such as water and beverage. In Fig. 1, the cup body 10 as illustrated has a substantially inverted frustum shape and an opening (not shown in the figure) which is opened at an upper part. It should be understood that the cup body may also have other forms. The cup assembly 1 also includes a cup lid 20 which can cover the upper opening of the cup body in a sealing manner and can be opened to expose the upper opening of the cup body when necessary. The cup lid 20 may be, for example, a pulp molded product, thereby contributing to environmental protection.

[0028] As illustrated in Figs. 1 and 2, the cup lid 20 may include a lid body 21 and a cup body engaged flange 22.

[0029] The lid body 21 can cover most area of the upper opening of the cup body 10. In the examples illustrated in Figs. 1 and 2, the lid body 21 has a generally round-shaped,

overall form, and it should be understood that the lid body 21 may have other shapes than the round shape.

[0030] The cup body engaged flange 22 extends away from the lid body 21. For example, as shown in Fig. 1, the lid body 21 may have an upper surface 210 and a skirt 211 which surrounds the upper surface 21 and extends towards the cup body 10. The upper surface 210 is, for example, a substantially round-shaped plane. It should be understood that the upper surface 210 may have other shapes than the round shape, and may not necessarily be a plane. The skirt 211 may extend vertically downward from a peripheral edge of the upper surface 210, or extend slightly obliquely downward with respect to the vertical direction.

[0031] The lid body 21 is further provided with a mouth 212 through which a user can drink the liquid contained in the cup.

[0032] The cup body engaged flange 22 may extend away from the lid body 21 and can be engaged at the upper opening of the cup body 10, so that the cup lid 20 covers the cup body 10 in a sealing manner and is fixed on the cup body 10. The cup body engaged flange 22 may, for example, have a generally annular-shaped overall form. In the example shown in Fig. 1, it surrounds the periphery of the lid body 21 and extends away from the lid body 21 from the edge of the skirt 211 of the lid body 21.

[0033] The cup lid 20 according to the present disclosure and the slit 213 thereof will be described below in connection with Figs. 2 and 3. As shown in Figs. 2 and 3, in the present disclosure, the lid body 21 of the cup lid 20 is provided with a slit 213 throughout its thickness. The slit 213 has an elongate shape, and its maximum width Wmax is 0.05 mm to 0.15 mm. The slit 213 penetrates through the thickness of the lid body 21 (for example, the thickness of the upper surface 210), so that an inner space enclosed by the cup body 10 and the cup lid 20 together can be communicated with the external environment through the slit 213; in this way, when the user drinks the beverage in the cup through the mouth 212, the air can flow through the slit 213.

[0034] According to the present disclosure, the cup lid 20 is provided with an air-permeable slit with a maximum width Wmax of 0.05 mm to 0.15 mm, so that the surface tension generated by the liquid in the cup at the slit is enough to resist the pressure of the liquid in the cup here when the cup tilts (Fig. 4) or topples (Fig. 5), and the liquid will be adsorbed

onto the cup lid at this time without leaking or spilling out from the slit, thus effectively preventing from an accidental overflow of the liquid without causing a pollution of the cup lid or even spilling onto people's bodies, realizing safe transportation and safe use, and obviously improving user's experience. Moreover, the process of manufacturing the air-permeable slit in the cup lid is simple and the cost is not increased as compared with the design of round-shaped air holes in the prior art.

[0035] Preferably, the length L of the slit 213 may be 5 mm to 8 mm, for example. Preferably, the ratio of the length of the slit 213 to the maximum width Wmax of the slit 213 is about 60:1.

[0036] The slit 213 may have two opposite long sides 2131 and 2132, as shown in Fig. 3, which shows a preferred embodiment of the slit 213. In the example shown in Fig. 3, the slit 213 has a generally narrow and elongate spindle shape. In an embodiment not shown, the slit may have a shape such as a narrow and elongate rectangle. In another embodiment not shown, at least one of the long sides may be composed of a plurality of sections, such as straight sections or curved sections which are connected to each other to form one long side. Moreover, the long side may also have the form of a smooth curve. By way of example, one of the two long sides has a curved shape and the other is straight; alternatively, both of the two long sides have a curved shape, for example, forming a slit in the shape of crescent or spindle as shown Fig. 3.

[0037] The slit 213 may have a maximum width Wmax in the middle along its length L, and the two long sides are converged from the middle to both ends, and finally closed at both ends, that is, the width at the end is zero.

[0038] The area of the slit 213 of the cup lid according to the present disclosure is 0.5 mm^2 to 0.8 mm^2. In this way, under the condition of guaranteeing the amount of air permeability of the slit, the surface tension of the liquid at the slit is enough to prevent the liquid in the cup from overflowing through the slit.

[0039] As shown in Figs. 4 and 5, the slit 213 is provided in the central region of the upper surface 210 of the lid body 21. This arrangement not only improves the aesthetics of the cup lid but also makes it difficult for the liquid to reach the slit when the cup is tilted in the case where the central region of the cup lid is higher than other regions, thus reducing the risk

of liquid overflow.

[0040] Unless otherwise defined, all terms (including technical and scientific terms) used here have the same meanings as those commonly understood by those ordinary skilled in the art to which the present disclosure belongs. It should also be understood that terms such as those defined in common dictionaries should be interpreted as having meanings consistent with their meanings in the context of the related art, and should not be interpreted in idealized or extremely formal meanings, unless explicitly defined as such here.

[0041] The above is an explanation of the present disclosure, but it should not be considered as a limitation thereto. Although several exemplary embodiments of the present disclosure have been described, those skilled in the art will easily understand that many modifications can be made to the exemplary embodiments without departing from the novel teaching and advantages of the present disclosure. Therefore, all these modifications are intended to be included in the scope of the present disclosure defined by the claims. It should be understood that the above is an explanation of the disclosure, and should not be considered as limiting the present disclosure to the specific embodiment disclosed here, and the modifications to the disclosed embodiments and other embodiments are intended to be included in the scope of the appended claims. The present disclosure is defined by the claims and their equivalents.

WHAT IS CLAIMED IS:

1. A cup lid comprising:

a lid body provided with a mouth;

cup body engaged flange extending away from the lid body;

characterized in that the lid body is provided with a slit throughout its thickness, the slit having an elongate shape and having a maximum width between 0.05 and 0.15 millimeters.

2. The cup lid as claimed in claim 1, characterized in that the slit has two opposite long sides.

3. The cup lid as claimed in claim 2, characterized in that one of the two long sides has a curved shape and the other is straight.

4. The cup lid as claimed in claim 2, characterized in that the two long sides both have curved shape.

5. The cup lid as claimed in claim 4, characterized in that the slit forms a shape of spindle or crescent.

6. The cup lid as claimed in any one of claims 3 to 5, the slit has the maximum width in the middle along its length and has a width of zero at two ends along its length.

7. The cup lid as claimed in any one of claims 1 to 5, characterized in that the slit has a length of 5 to 8 millimeters.

8. The cup lid as claimed in any one of claims 1 to 5, characterized in that the ratio of the length to the maximum width of the slit is approximately 60 : 1.

9. The cup lid as claimed in any one of claims 1 to 5, characterized in that the slit has an area between 0.5 to 0.8 square millimeters.

10. The cup lid as claimed in any one of claims 1 to 5, characterized in that the slit is provided in a central region of an upper surface of the lid body.

11. The cup lid as claimed in any one of claims 1 to 5, characterized in that the cup lid is paper-molded product.

12. A cup assembly, characterized in that it comprises:

a cup body, and

the cup lid as claimed in any one of the preceding claims, the cup lid covering the cup body in a sealing manner via the cup body engaged flange.

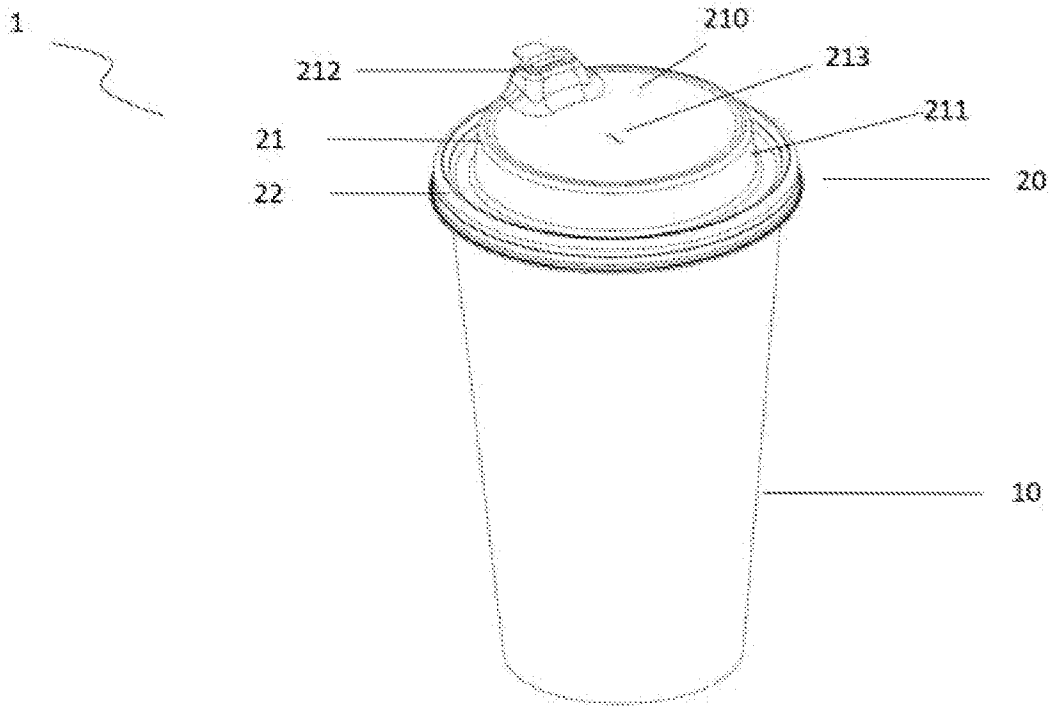

FIG. 1

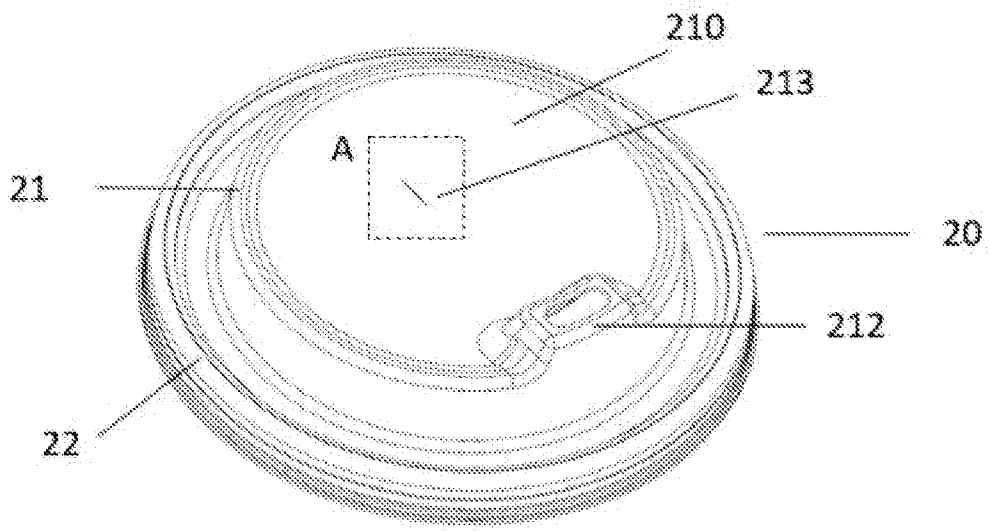

FIG. 2

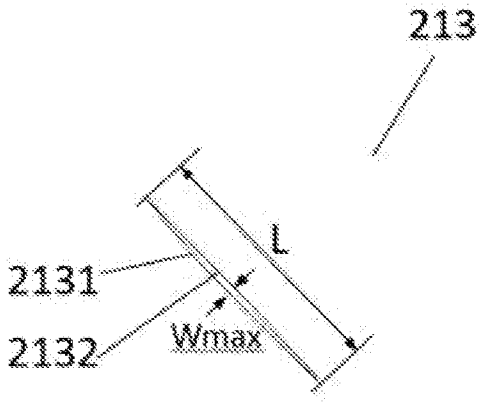

FIG. 3

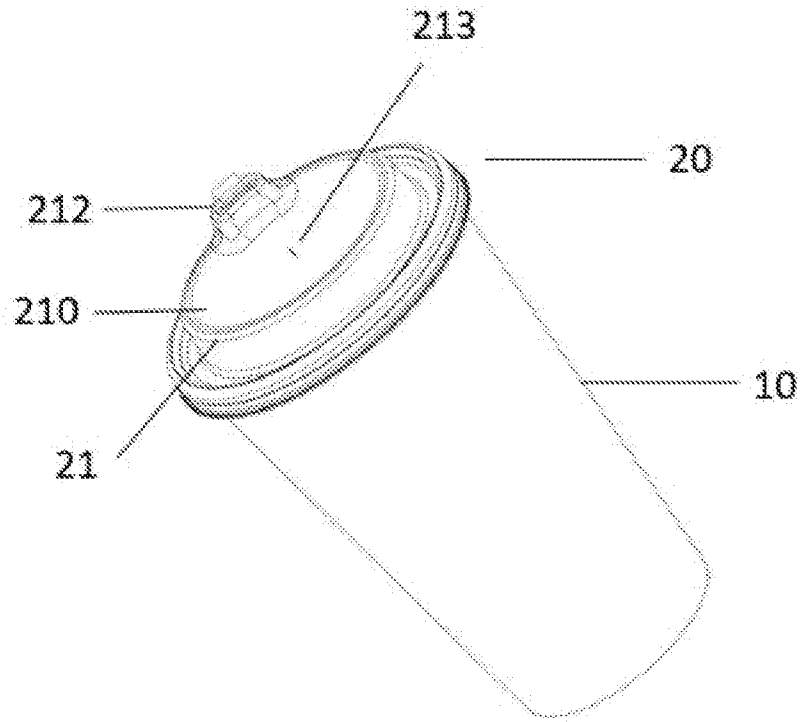

FIG. 4

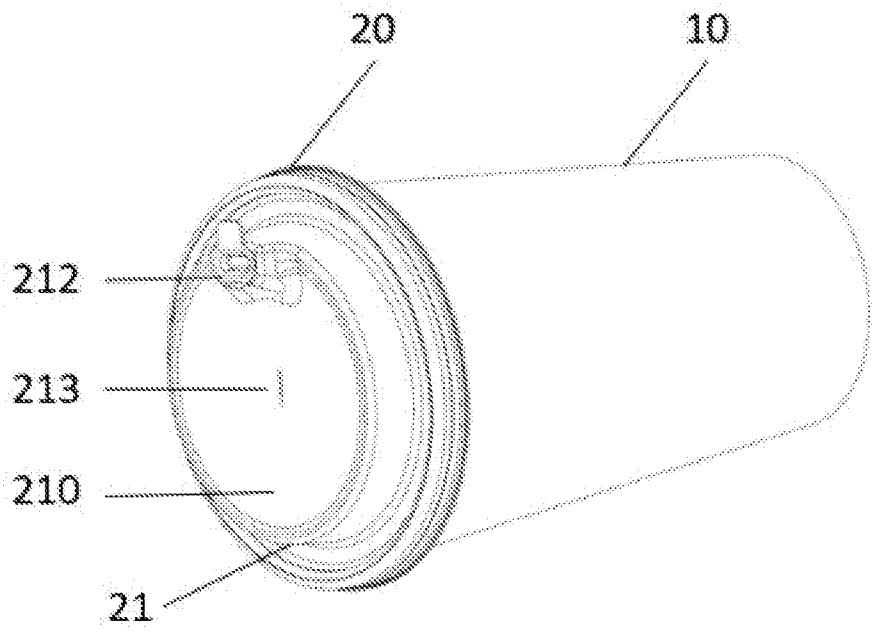

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 20090065518 A1 (CARNEVALI JEFFREY D), 12 March 2009 (2009-03-12); paragraphs [0067]-[0068], [0070], [0108]-[0115]; figures 1-3,5,16-18	1-12
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X	US 4619372 A (MCFARLAND JOSEPH R), 28 October 1986 (1986-10-28); column 2, line 26 - line 37; column 4, line 28 - line 41; column 5, line 5 - line 9; figures 1-5	1-12
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X	CN 201755070 U (HONGBIAO LI), 9 March 2011 (2011-03-09); figure 3; claim 2	1-12
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/SE	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 10239669 B2 (AYRISS LEVI JACOB ET AL), 26 March 2019 (2019-03-26); column 6, line 27 - line 46; figures 1,7	1-12
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A	US 20090266829 A1 (BAILEY CRAIG), 29 October 2009 (2009-10-29); paragraphs [0040], [0044]; figures 1-5	1-12
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International Patent Classification (IPC)

B65D 5/16 (2006.01)
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CN	201755070	U	09/03/2011	NONE			
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EP	3808673	A1	21/04/2021	AU	2018393122	B2	09/04/2020
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				CR	20190499	A	03/03/2020
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				MX	2019009647	A	13/08/2020
				US	20210362912	A1	25/11/2021
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