(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 October 2011 (13.10.2011)

PCT

(10) International Publication Number
WO 2011/124290 A1

(51) International Patent Classification:
*B65D 85/816* (2006.01)

(21) International Application Number:
PCT/EP2011/000092

(22) International Filing Date:
12 January 2011 (12.01.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10 2010 016 390.2 9 April 2010 (09.04.2010) DE
10006946.7 6 July 2010 (06.07.2010) EP

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

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(54) Title: CONTAINER WITH A MEMBRANE WHICH CONFINES A COMPARTMENT WITHIN THE CONTAINER

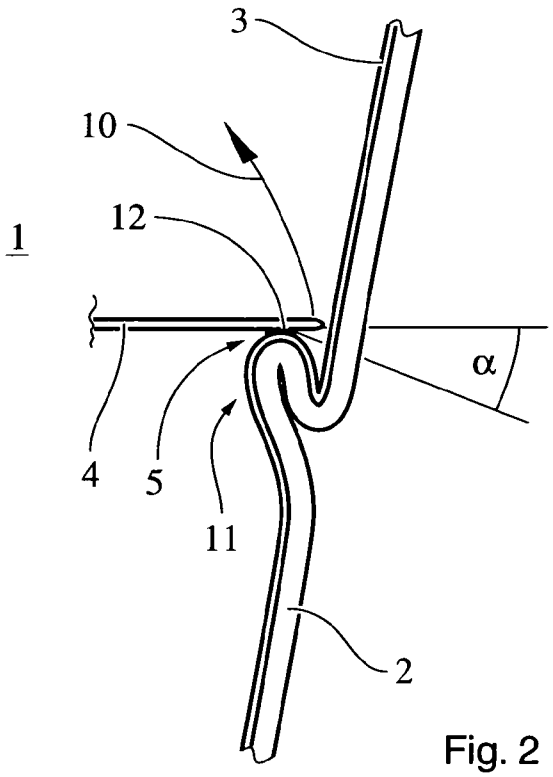


Fig. 2

(57) Abstract: The present invention relates to a container (1) with a sidewall (2) and a base which is connected to the lower end of the sidewall and a membrane (4) which confines a compartment (7) within the container and which is sealed to the sidewall in an area distant from the rim (8) of the container at a sealing area and which can be pulled off.

WO 2011/124290 A1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published**:

— *with international search report (Art. 21(3))*

# Container with a membrane which confines a compartment within the container

The present invention relates to a container with a sidewall and a base which is connected to the lower end of the sidewall and a membrane which confines a compartment within the container, which is sealed to the sidewall in an area distant from the rim of the container at a sealing area and which can be pulled off.

In many cases, containers, for example cardboard containers, comprise a confined compartment, in which for example pellets, powder or the like are/is arranged, from which, by addition of a fluid, for example a beverage or a food can be made. This compartment needs to be sealed by a membrane to avoid, for example, that the pellets get lost and/or that the pellets lose their aroma.

Often, the containers are cardboard containers which comprise on the surface, that is subjected to a fluid and/or humidity, a coating which makes it, at least temporarily, resistant against for example humidity, water, aqueous solutions, oil and/or fat or a combination thereof. This coating can be provided as a film, which is adhered to the cardboard container.

This is objective of the present invention, to provide a container whose coating is not damaged in case the membrane is removed from the container.

The problem is solved with a container with a sidewall and a base which is connected to the lower end of the sidewall and a membrane which confines a compartment within the container, which is sealed to the sidewall in an area distant from the rim of the container at a sealing area and which can be pulled off, whereas the sealing area is plastically formed into the sidewall of the container and whereas the shear angle between the membrane and the sealing area is larger than 0°.

The present invention relates to a container. Particularly, the container is a cup, in which beverages, especially hot beverages such as coffee or tea or food, especially soup can be served. This container is preferably made from paper, thick paper, cardboard, fiber-material, plastic-material, materials made from renewable and/or biodegradable raw materials or a combination thereof. However, paper and cardboard are preferred. Preferably, the material is plastically deformable, preferably embossable and more preferably also elastically

deformable. All parts of the inventive container are made from this material, whereas the individual parts of the container can be made from different materials.

Especially the surfaces of parts of the container which are subjected to a liquid and/or vapour are provided with means, especially a coating, an impregnation, a film or the like, which makes the parts at least temporarily resistant against for example humidity, water, aqueous solutions, oil and/or fat or a combination thereof. Preferably the above mentioned means are also heat sealable. The means are preferably provided as a film.

The container according to the present invention comprises a first sidewall, which is, preferably, conically shaped and which, more preferably, has, at its upper end, a rolled rim. The first sidewall is preferably made from a flat segment, preferably a cardboard-segment, which is subsequently formed, preferably rolled into its final, preferably conical shape. Preferably at its lower end, the sidewall is connected to a base, in order to close the container at the bottom. The base is preferably a separate part, which is attached, more preferably glued or heat sealed, to the lower end of the sidewall of the container.

According to the present invention, the first sidewall comprises at least a first shaping, which extends, preferably entirely, around the circumference of the first sidewall. This shaping is directed inwardly, i.e. towards the content of the container. This shaping can be produced by any technique known by a person skilled in the art, e.g. by folding or any other method of plastic deformation. Preferably, the shaping is inserted into the segment before it is formed, e.g. rolled, into the final shape of the sidewall. More preferably the shaping is an embossment, which is produced for example by applying locally pressure to the sidewall and deforming the material of the sidewall plastically. The shaping can have any form known by a person skilled in the art. However, it should be compressible, at least partially, especially in case an axial-force, preferably axial pressure, is applied to the sidewall. Preferably, the shaping is U-shaped or has, at least partially, the shape of a segment of a circle.

This shaping is preferably compressed in its height extension, i.e. after the compression of the shaping, the sidewall is reduced in its height. Due to the compression of the shaping, the shaping receives its final shape.

This shaping is utilized as the sealing area for the membrane, whereas the shaping is shaped such, that the shear angle between the membrane and the sealing area is larger than 0°. Preferably, the shaping comprises an undercut adjacent to the sidewall, whereas the membrane preferably extents, at least partially, into or above the undercut

The invention is now further explained according to figures 1 and 2. This explanation does not limit the scope of protection of the present invention.

**Figure 1** shows the inventive container.

**Figure 2** shows details of the sealing area.

**Figure 1** shows the inventive container 1, which is in the present case a cup, preferably a cardboard cup. This container comprises a sidewall 2, which has at its upper end a rim 8 and at its lower end a base 6, which is preferably sealed to the sidewall. In order to have a confined department 7, a membrane 4 is sealed to the sidewall 2, specifically to a shaping 11 that has been plastically formed, here embossed, into the sidewall 2 of the container 1, in a height defined by the desired volume. The shaping 11 extends around the entire inner circumference of the sidewall 2. The compartment 7 can, for example, comprise pellets or a powder, from which, under the addition of water a beverage or a food can be produced.

Therefore, the membrane 4 has to be pulled off, which is carried out, as depicted in figure 2 by pulling the membrane 4 off the sealing area 5 in a pull-off direction 10. According to the present invention, this shaping is now shaped such, that the shear angle α between the membrane 4 and the shaping, at least at the edge 12 is larger than 0°. Due to this shear angle α, a coating 3 which is attached to the inside of the sidewall 2 is not damaged especially not delaminated from the sidewall 2 during the rip off of the membrane 4. Thus, the container especially a cardboard container maintains its stability.

**List of reference signs:**

| | |
|---|---|
| 1 | cardboard container, cup |
| 2 | sidewall |
| 3 | inner layer |
| 4 | membrane |
| 5 | sealing area |
| 6 | base |
| 7 | compartment |
| 8 | rim |
| 9 | undercut |
| 10 | pull-off direction |
| 11 | shaping, embossment |
| 12 | edge of the sealing area |
| α | shear angle |

**Claims:**

1. Container (1) with a sidewall (2) and a base which is connected to the lower end of the sidewall (2) and a membrane (4) which confines a compartment (7) within the container and which is sealed to the sidewall in an area distant from the rim (8) of the container at a sealing area (5) and which can be pulled off, characterized in, that the sealing area (5) is plastically formed into the sidewall and that the shear-angle ($\alpha$) between the membrane (4) and the sealing area (5) is larger than 0°.

2. Container (1) according to claim 1 or the preamble of claim 1, characterized in, that the sealing area (5) comprises an undercut (9) adjacent to the sidewall (2).

3. Container according to one of the preceding claims, characterized in that the sidewall (2) comprises an inner layer (3).

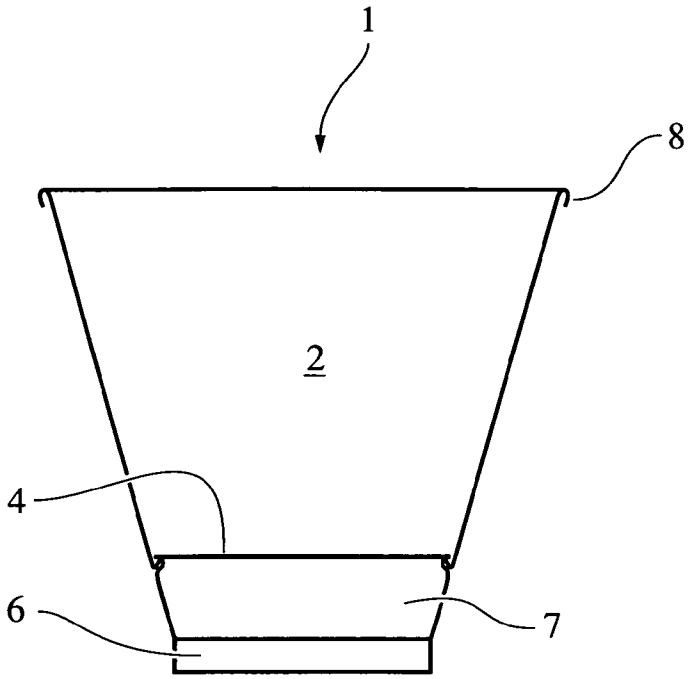


Fig. 1

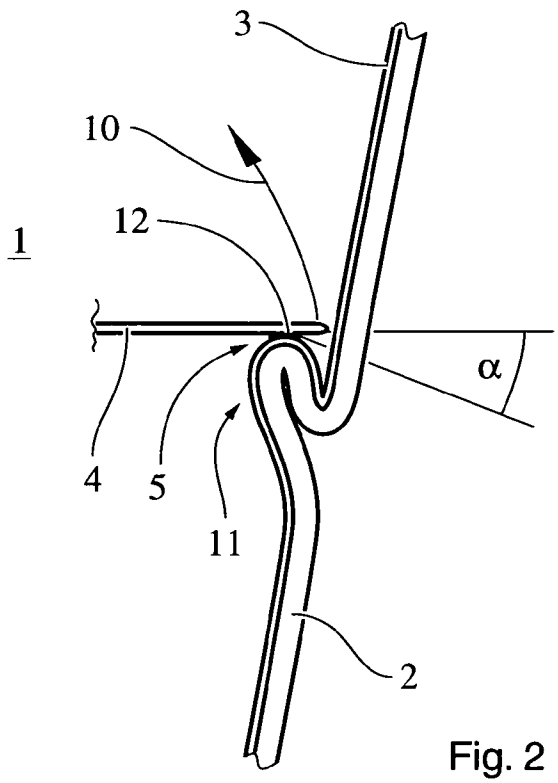


Fig. 2

# INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/000092

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/816
ADD.

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)
B65D

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | GB 2 152 469 A (DRG UK LTD)<br>7 August 1985 (1985-08-07)<br>page 1, line 85 - page 2, line 4<br>page 2, lines 67-123; figures 1-8 | 1-3 |
| A | US 2009/092711 A1 (NINH ANDY [US] ET AL)<br>9 April 2009 (2009-04-09)<br>paragraph [0035] - paragraph [0036];<br>figures 1-6 | 1 |
| A | EP 0 254 446 A1 (GEN FOODS LTD [GB])<br>27 January 1988 (1988-01-27)<br>column 3, line 49 - column 4, line 27;<br>figures 1-2 | 1 |
| A | FR 2 844 777 A1 (ROUVIERE JEAN YVES NICOLAS [FR]) 26 March 2004 (2004-03-26)<br>page 4, lines 16-31; figures 1-8 | 1 |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 7 March 2011 | 17/03/2011 |

| Name and mailing address of the ISA/ | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016 | Grondin, David |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2011/000092

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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| GB 2152469 A | 07-08-1985 | NONE | |
| US 2009092711 A1 | 09-04-2009 | NONE | |
| EP 0254446 A1 | 27-01-1988 | NONE | |
| FR 2844777 A1 | 26-03-2004 | NONE | |