



(51) International Patent Classification:
B65D 5/74 (2006.01) **B31B 1/84** (2006.01)

(21) International Application Number:
PCT/GB2010/000491

(22) International Filing Date:
17 March 2010 (17.03.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0904495.9 17 March 2009 (17.03.2009) GB

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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,
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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.

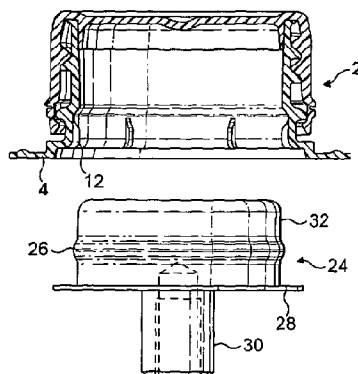
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,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

(54) Title: POUR SPOUT AND METHOD OF MOUNTING A POUR SPOUT ON A SPIGOT

FIG. 3



(57) Abstract: A spigot (24) of a pour spout fitment applicator includes a ridge (26) extending therearound. The pour spout (4) of a fitment (2) includes a series of ribs (12) extending longitudinally of the spout (4) and protruding from an internal peripheral surface of the spout (4) and distributed about that surface, the ridge (26) being of a maximum radius from a longitudinal axis of the spigot greater than the radii from that axis of the radially innermost portions of the respective ribs (12), and the spigot (24) being insertable into the pour spout (4) sufficiently far that radially outermost portions of the ridge (26) become located beyond the radially innermost portions of the ribs (12).



POUR SPOUT AND METHOD OF MOUNTING A POUR SPOUT ON A SPIGOT

This invention relates to a method of mounting a pour spout on a spigot, a combination of such spigot and such pour spout, and such pour spout itself.

5 US-A-6,086,523 discloses a pour spout fitment which has an annular flange and an integral, removable membrane with a pull tab. The membrane has a peripheral line of weakness connected to an inward projection located halfway along the spout inner wall. The lower end of the spout may have a continuous internal bead for releasably frictionally engaging a fitment-applying spigot which is
10 inserted into the spout lower end. The spout has a snap-on screw-threaded cap with a tamper-evident band. Instead of a continuous internal bead there may be employed a ring of segments extending peripherally of the spout, or a ring of vertical ribs formed extending upwards from adjacent the bottom edge of the spout.

15 GB-A-2,396,151 discloses an integrally moulded, tamper-evident, closure system for forming into a pour spout fitment and comprising a cap, a flanged neck and tamper-evident means. The structure allows the application of the cap to the neck by axially pressing the cap and the neck together, whereupon the tamper evident means prevents the cap from being removed from the neck while the
20 tamper evident means remains intact. The closure system includes transition means between the top of the neck and the bottom of a band of the tamper-evident means, a locking wall, and corresponding screwthreads, wherein the transition means is attached to the neck by frangible engagement, and may be provided by a plurality of spaced elements separated by apertures, or may include
25 one or more pleats or folds. With the closure system in the assembled condition, the fitment may be applied to a carton in a conventional manner. The inside of the bottom end of the neck is defined by a downwardly and radially outwardly inclined surface which facilitates the insertion of a spigot of a fitment applicator. A plurality of circumferentially spaced, radially inwardly projecting lugs facilitate the retention
30 of the fitment on the spigot. The fitment may be bonded to either the outside or the inside of a carton panel, as desired.

US2004/0245262A1 discloses a flanged pour spout in which at least one

projection is provided on an inside surface of the pour spout for releasably retaining the pour spout on a spigot which is used to apply the pour spout to a container wall. That disclosure acknowledges as known a version in which the projection takes the form of an annular bead or lip round a lower inner edge of the pour spout, as well as another version in which several separate, bead-like projections are provided distributed over the circumference of the spout on its inside surface and near to the lower inner edge. The disclosure explains that, if the pour spouts are of different sizes, the spigots for holding those spouts have to be changed because a given spout size can be held only on a suitably matched spigot, there being only slight play in order, on the one hand, to ensure the retention and transportation of the pour spout on the spigot whilst, on the other hand, to facilitate easy removal of the spigot from the applied spout. The disclosure further explains that the changing of the spigots to suit differing spout sizes is relatively time-consuming and tiresome and significantly reduces productivity and that even slightly differing dimensions arising during the production of one-and-the-same type of pour spout can lead to malfunctions during assembly, as the spout then either slides too easily from the spigot or is held too tightly on the spigot. That disclosure proposes that the or each projection should have the form of a bendable web which is oblique to the inside surface of the pour spout, namely is at an angle smaller than 90° and greater than 0° thereto.

According to one aspect of the present invention, there is provided a method of mounting a pour spout on a spigot, comprising producing relative axial movement between the spout and the spigot to cause a leading end zone of the spigot to enter the spout and thus to cause a ridge of the spigot extending about the spigot to squeeze past a series of protrusions extending from an internal peripheral surface of the spout and distributed about said surface and to engage releasably behind said protrusions.

According to a second aspect of the present invention, there is provided a combination comprising a spigot including a ridge extending thereabout, and a pour spout including a series of protrusions extending from an internal peripheral surface of the spout and distributed about that surface, the ridge being of a maximum radius from a longitudinal axis of the spigot greater than the radii from

that axis of the radially innermost portions of the respective protrusions, and the spigot being insertable into the pour spout sufficiently far that radially outermost portions of the ridge become located beyond said radially innermost portions.

According to a third aspect of the present invention, there is provided a pour
5 spout comprising first and second cylindrical portions of which the second portion
is of a throughflow cross-sectional area greater than that of the first portion, an
internal shoulder between the first and second portions, and a series of protrusions
extending from an internal surface of said second portion and distributed about
said surface, the radially innermost portions of said protrusions being spaced from
10 said internal shoulder.

Owing to the invention, it is possible to improve the reliability of retention of
the pour spout on the spigot while, nevertheless, enabling the pour spout to be
readily releasable therefrom.

Advantageously, the protrusions are such that they yield resiliently as the
15 ridge squeezes past them.

Preferably, the ridge is annular and substantially co-axial with the spigot.

It is advantageous if the radially innermost portions of the protrusions are
substantially aligned with the internal peripheral surface of the first portion of the
spout, namely that portion which is of the lesser throughflow cross-sectional area,
20 since this facilitates injection molding of the pour spout compared with an
arrangement in which those radially innermost portions project significantly
inwardly beyond that internal peripheral surface of the first portion.

The protrusions may take the form of ribs extending longitudinally of the
pour spout, those ribs may take the form of strips, and the strips may extend
25 substantially in respective axial planes of the pour spout. Those features again
facilitate injection molding.

In order that the invention may be clearly and completely disclosed,
reference will now be made, by way of example, to the accompanying drawings, in
which:-

30 Figure 1 is an axial sectional view through a pour spout fitment;

Figure 1A shows a detail of Figure 1 in the region encircled by chain lines;

Figure 2 is an underneath plan view of the pour spout fitment;

Figure 3 is an axial sectional view through the fitment and a plan view of a spigot approaching the fitment; and

5 Figure 4 corresponds to Figure 3, but shows the spigot inserted into the fitment.

Referring to the drawings, the pour spout fitment 2 includes a flanged pour spout 4 comprising upper and lower, substantially circular-cylindrical portions 6 and 8 of which the lower portion 8 is of a throughflow cross-sectional area greater
10 than that of the upper portion 6. There is thus formed between the portions 6 and 8 an internal shoulder 10. A series of protrusions 12 extend from the internal surface 14 of the portion 8 and are distributed round that surface, the radially innermost portions 16 of those protrusions 12 being spaced from the internal
15 shoulder 10. As can be seen from Figure 1A, those radially innermost portions 16 are substantially aligned with the external peripheral surface 18 of the portion 6. The protrusions 12 take the form of profiled strips which extend in respective axial planes of the pour spout 4. The pour spout fitment 2 is completed by a screw cap 20 with a tamper-evident band 22.

Referring particularly to Figures 3 and 4, the spigot 24 includes an annular
20 ridge 26 therearound and also includes a flange 28 and an internally threaded stub 30 whereby the spigot may be releasably fixed to an arm of a pour spout fitment applicator.

As readily understood by those of ordinary skill in the art, for mounting of the fitment 2 upon the spigot 24, once the fitment has arrived at the lower end of a
25 supply chute and so is ready for mounting, the spigot 24 is advanced to cause the leading end zone of the spigot to enter the spout 4. This causes the ridge 26, which is of a maximum radius greater than the radii of the radially innermost portions 16 of the protrusions 12, to squeeze past the protrusions 12, the protrusions yielding resiliently, and to engage releasably behind the protrusions 12,
30 i.e. between the protrusions 12, on the one hand, and the shoulder 10, on the other hand, as shown in Figure 4. The connection between the spout 4 and the

spigot 24 is in the form of a snap connection, in which the ridge 26 fits in between the shoulder 10 and the protrusions 12 and so retains the fitment 2 firmly, but releasably, in position during its transfer to the container, where the fitment 2 is attached, particularly ultrasonically, to the container. A cylindrical part 32 of the leading end zone of the spigot 24 is received by the internal peripheral surface 18 of the portion 6. Following ultrasonic welding of the flange of the pour spout 4 to the inside surface of the relevant container panel, the spigot 24 is withdrawn from the fitment 2, the protrusions 12 again yielding resiliently, this time to enable the ridge 26 to squeeze past them in the opposite direction.

10 Because of the provision of the resilient protrusions 12, the system described with reference to the drawings is able to cope with varying play required by a range of differing types of pour spout fitments, as well as manufacturing tolerances of such fitments within a particular type, whilst the snapping of the ridge 26 behind the protrusions and fittingly between those protrusions, on the one
15 hand, and the internal shoulder 10, on the other hand, retains the fitment more reliably and more firmly upon the spigot 24 during withdrawal from the chute and transport to the container.

CLAIMS

1. A method of mounting a pour spout on a spigot, comprising producing relative axial movement between the spout and the spigot to cause a leading end zone of the spigot to enter the spout and thus to cause a ridge of the spigot extending about the spigot to squeeze past a series of protrusions extending from an internal peripheral surface of the spout and distributed about said surface and to engage releasably behind said protrusions.

10

2. A method according to claim 1, wherein said protrusions yield resiliently as said ridge squeezes past them.

15

3. A combination comprising a spigot including a ridge extending thereabout, and a pour spout including a series of protrusions extending from an internal peripheral surface of the spout and distributed about that surface, the ridge being of a maximum radius from a longitudinal axis of the spigot greater than the radii from that axis of the radially innermost portions of the respective protrusions, and the spigot being insertable into the pour spout sufficiently far that radially outermost portions of the ridge become located beyond said radially innermost portions.

20

4. A combination according to claim 3, wherein said ridge is annular and substantially co-axial with said spigot.

25

5. A pour spout comprising first and second cylindrical portions of which the second portion is of a throughflow cross-sectional area greater than that of the first portion, an internal shoulder between the first and second portions, and a series of protrusions extending from an internal surface of said second portion and distributed about said surface, the radially innermost

30

portions of said protrusions being spaced from said internal shoulder.

6. A spout according to claim 5, wherein said radially innermost portions are substantially aligned with an internal peripheral surface of said first portion.

5

7. A combination according to claim 3 or 4, or a spout according to claim 6 or 7, wherein said protrusions are capable of yielding outwards resiliently.

10

8. A combination according to claim 3, 4, or 7, or a spout according to claim 5, 6, or 7, wherein said protrusions take the form of ribs extending longitudinally of said pour spout.

9. A combination or a spout according to claim 8, wherein said ribs take the form of strips.

15

10. A combination or a spout according to claim 9, wherein said strips extend substantially in respective axial planes of said pour spout.

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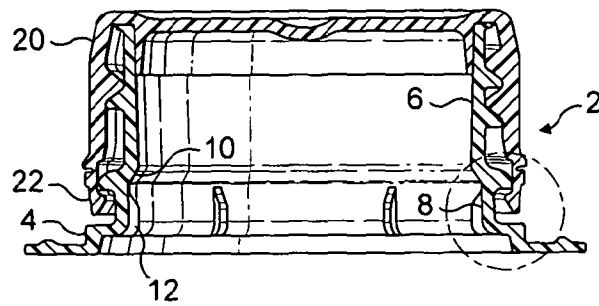


FIG. 1

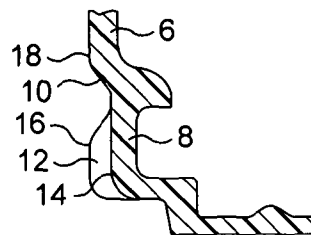


FIG. 1A

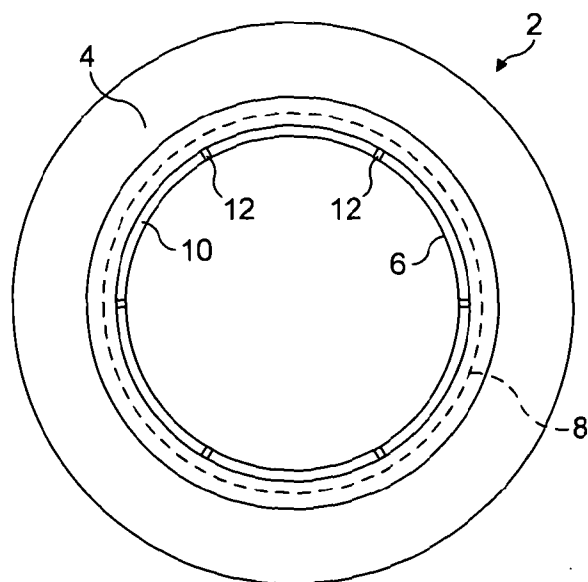


FIG. 2

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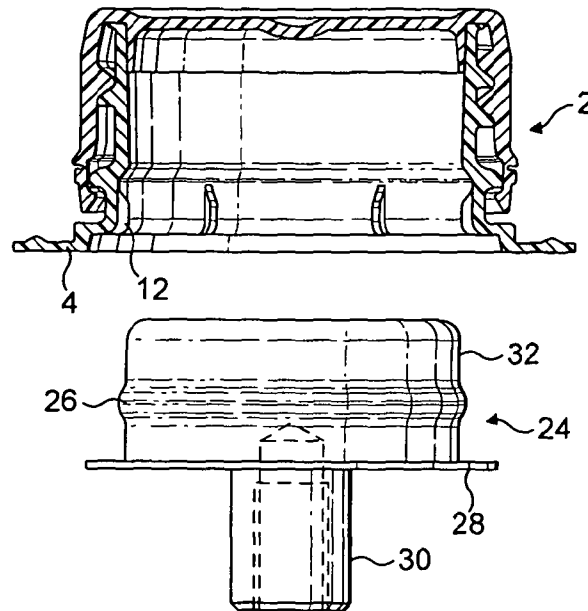


FIG. 3

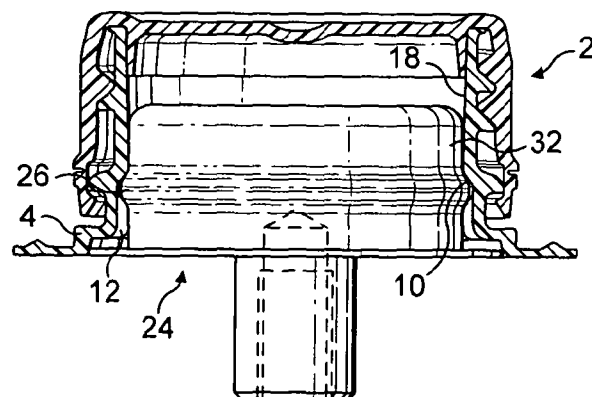


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2010/000491

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B65D5/74 B31B1/84
 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 B31B B65B

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	US 2003/071042 A1 (ADAMS BRIAN M [US]) 17 April 2003 (2003-04-17)	5-10
A	paragraph [0064] - paragraph [0065]; figures 7,8 paragraph [0076]; figure 15	1,3
A	US 6 086 523 A (ADAMS BRIAN M [US] ET AL) 11 July 2000 (2000-07-11) cited in the application column 4, line 52 - column 5, line 18; figures 5,8,9	1,3,5
A	US 2004/245262 A1 (KRAUTKRAEMER GUENTER JAKOB [DE]) 9 December 2004 (2004-12-09) cited in the application figures 1-3	1,3,5

☐ 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

28 May 2010

Date of mailing of the international search report

14/06/2010

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INTERNATIONAL SEARCH REPORT
information on patent family members

International application No
PCT/GB2010/000491

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