

(19)



(11)

EP 2 149 509 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

03.02.2010 Bulletin 2010/05

(51) Int Cl.:

B65D 81/38 (2006.01)

(21) Application number: **08013715.1**

(22) Date of filing: **31.07.2008**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

Designated Extension States:

AL BA MK RS

(72) Inventor: **Guo, Tzer-Huang
Keelung City (TW)**

(74) Representative: **Nix, Frank Arnold
Kröckelbergstrasse 15
65193 Wiesbaden (DE)**

(71) Applicant: **Guo, Tzer-Huang
Keelung City (TW)**

(54) **Thermal insulation paper container**

(57) The invention relates to a novel paper thermal-insulation container with characteristics that it mainly comprises an interior paper cup (1) and an exterior paper cup (3). The interior paper cup has a cup bottom (12). On the outer side of the interior paper cup there are two surrounding rails (11). The exterior paper cup sets on the

interior paper cup and combines with the interior paper cup by the surrounding rails. The surrounding rail, the interior paper cup and the exterior paper cup integratively form a space for foaming that will generate a thermal-insulation protective layer inside the space. The invention provides a safe and thermal-insulation paper container.

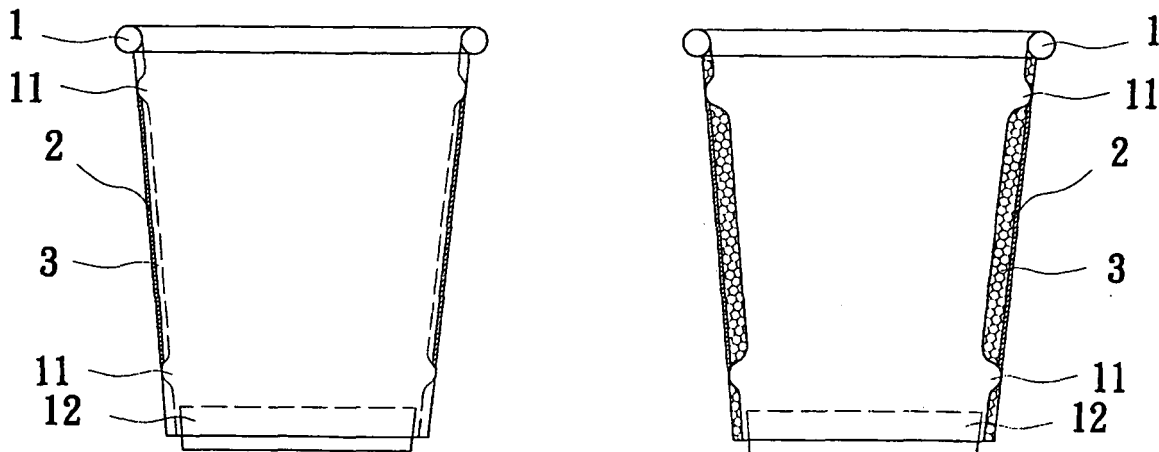


Figure 2

EP 2 149 509 A1

Description

1. Field of the Invention

[0001] The invention relates to a novel thermal-insulation paper container, especially with a double-wall paper cup structure.

2. Description of the Prior Art

[0002] Currently common paper containers usually do not have surface treatment and are simply made by single-layer paper into cup or bowl shape. Although the production cost is low, the thermal insulation is poor due to relatively thin single-layer paper. When it is used for hot drinks, there is no thermal-insulation effect and it is easy to cause burn injuries.

[0003] Therefore, such simple paper containers do not satisfy the safety requirements and are gradually withdrawn from the market. Although some higher grade paper containers use Wax Coating or LDPE Coating treatment, they still have the following disadvantages:

1. Expensive investment for equipment

[0004] The equipments, such as wax or LDPE coaters and IR heaters, are expensive and their cost easily hits tens of million dollars. This is not easily affordable by common companies or individuals. This also weakens the investment intention. With the investment made to purchase the equipments, the unit production cost will become high and the product price will be high too.

2. Poor Effect from Expanding Foam Printing

[0005] This production method is to coat several foaming materials evenly around paper exterior first, and then go to container forming, foaming and printing. But the foamed cup body is full of holes or irregularities which leads to fuzzy pattern or color or difficulty in printing.

[0006] Thus, the inventor, with many years of experience in related product development, actively sought the solutions for low cost, safe and thermal-insulation paper containers.

Summary of the Invention

[0007] To overcome current technological drawbacks, the objective of the invention is to provide a paper thermal-insulation container that uses laminating foaming agent on the inner side of the exterior cup and heats it up to form inwardly a certain thickness of a thermal-insulation protective layer to effectively prevent heat transfer and burn injuries when the container holds hot contents.

[0008] The secondary objective for the invention is to provide a paper thermal-insulation container that satisfies both aesthetic and application requirements. There-

fore, the printed pattern is not affected by holes due to foaming agent or irregularity. The vivid pattern or color is also maintained. Besides, a certain thickness of thermal-insulation protective layer is formed on the inner side of the exterior paper cup.

[0009] Another objective of the invention is to provide a paper thermal-insulation container that has an easy manufacturing process and a simplified method for sealing cup bottom. The invention also adopts a method of partial application of laminating foaming agent, so under a mass production scale (about 130-180 units/min) it can save time and cost significantly for the manufacturer.

[0010] To achieve the above objectives, the technical approach taken by the invention is described in the following.

[0011] A paper thermal-insulation container has the characteristics that it is made of an interior paper cup and an exterior paper cup; the interior paper cup has a cup bottom; on the outer side of the interior paper cup there are two surrounding rails; the exterior paper cup sets onto the interior cup and combines with the interior cup by the surrounding rails; the surrounding rail, the interior paper cup and the exterior paper cup form a space for foaming that will generate a thermal-insulation protective layer.

[0012] The thermal-insulation protective layer is made of foamed PE.

[0013] Compared to existing technology, the new technology in the invention has advantages that it can effectively prevent heat transfer and burn injuries when the container holds hot contents.

Brief Description of the Drawings

[0014]

Figure 1 is an illustration diagram for the invention. Figure 2 is an illustration for the forming process of the invention.

Figure 3 is a cross-sectional view for the invention.

Detailed Description of the Preferred Embodiment

[0015] Please refer to Figure 1 for the illustration diagram of the invention. The cup body 4 for the paper thermal-insulation container comprises a settable interior paper cup 1 and an exterior paper cup 3. On the inner side of the exterior paper cup 3 (the gap between the interior paper cup 1 and the exterior paper cup 3) there applies a suitable amount of laminating foaming agent 2, like PE, which under heating will foam inwardly to finish the making of a novel paper thermal-insulation container (please refer to Figure 2 and Figure 3). The details are described in the following.

[0016] Please refer to Figure 1 and Figure 2 for the novel paper thermal-insulation container. The original paper is made to interior paper cup 1 and exterior paper cup 3 of predetermined size and shape (fan shape).

[0017] First, a fan shape or other shape paper is printed outside with patterns, words and colors. Then a laminating step will apply a suitable amount of foaming agent 2, like PE, and transform the fan shape paper into a hollow exterior paper cup 3 (as shown in Figure 1) with wider top than bottom. 5

[0018] Another fan shape or other shape paper is wrapped and attached with a cup bottom 12. Then, from the inside of the fan shape paper, two protruding surrounding rails 11 are made in a proper place by roll pressing, as shown in Figure 1. As a result, the interior paper cup 1 with two surrounding rails 11 and wider top than bottom is formed. 10

[0019] After the exterior paper cup 3 sets onto the interior paper cup 1, the surrounding rails 11 of the interior paper cup 1 secure the combination of the two paper cups. Besides, the surrounding rails 11, the interior paper cup 1 and the exterior paper cup 3 integratively form a space for foaming. This also concludes the preliminary forming step for the cup body 4. 15 20

[0020] The cup body 4 is subject to oven heating at 80°C ~ 200°C for 0.5 - 30 seconds to evaporate the water contained in the paper and activate the foaming agent 2, like PE, between the inner side of the exterior paper cup 3 and the two surrounding rails 11 of the interior paper cup 1 to foam inwardly and generate a certain thickness of thermal-insulation protective layer. As a result, a finished product of a novel paper thermal-insulation container is made. 25

[0021] The above description is only explanatory but not restrictive. Any equivalent modifications or changes by people in the field without deviating from the principles and concepts of the invention shall fall within the claims of the invention. 30 35

Claims

1. A paper thermal-insulation container has characteristics that the container mainly comprises an interior paper cup and an exterior paper cup wherein the interior paper cup contains a cup bottom and the interior paper cup contain two surrounding rails on the outer surface; the said container further **characterized in that:** the said exterior paper cup sets on the said interior paper cup and combines with the interior paper cup by the surrounding rails. 40 45
2. A paper thermal-insulation container as claimed in claim 1, wherein the said surrounding rail, the interior paper cup and the exterior paper cup integratively form a space for foaming that generates a thermal-insulation protective layer. 50
3. A paper thermal-insulation container as claimed in claim 1, wherein the thermal-insulation protective layer is made of foamed PE. 55

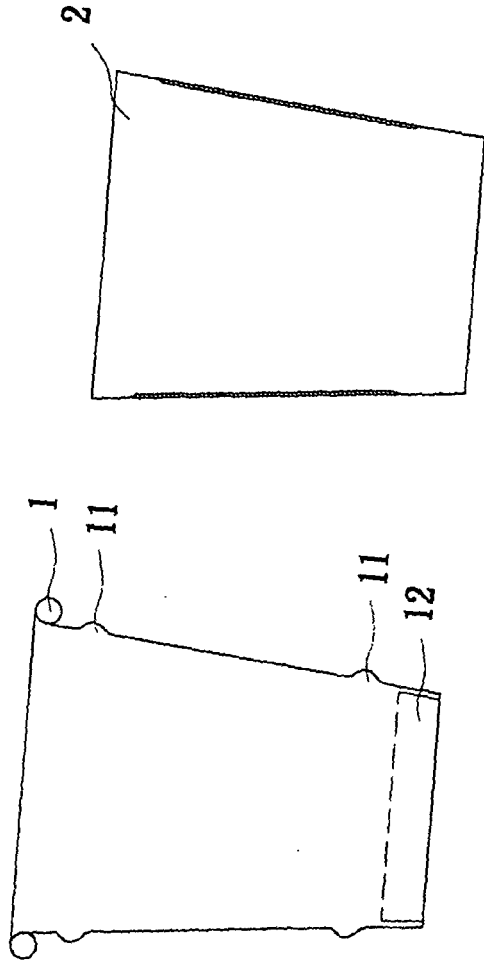


Figure 1

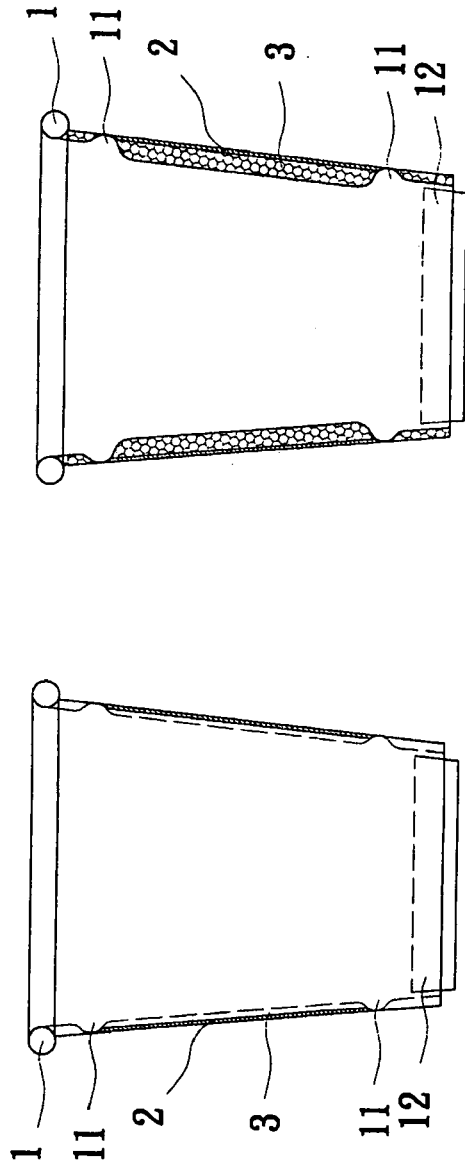


Figure 2

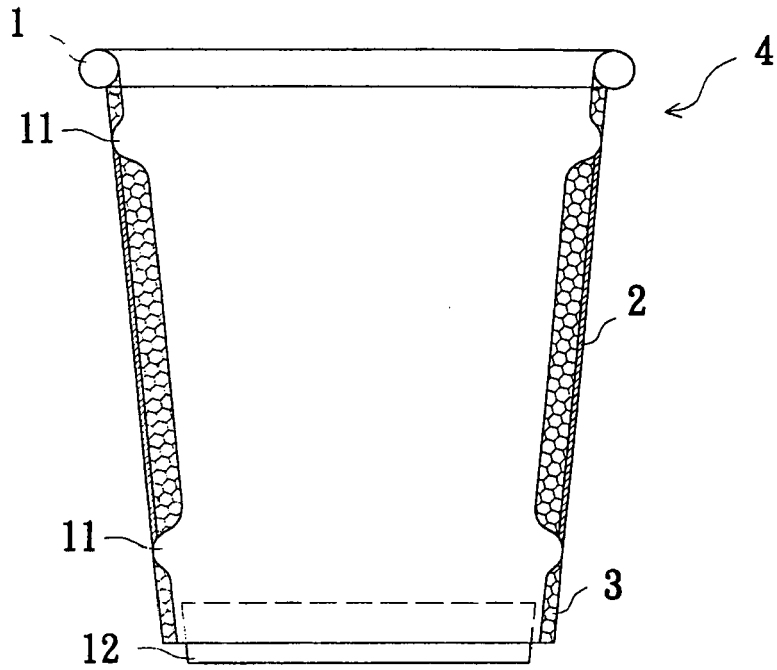


Figure 3



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 3715

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	GB 2 443 790 A (GUO TZER-HUANG [TW]) 21 May 2008 (2008-05-21) * page 4, line 7 - page 5, line 4; claims 1,2; figures 1-3 *	1-3	INV. B65D81/38
X	US 6 598 786 B1 (GUO TZER-HUANG [TW]) 29 July 2003 (2003-07-29) * column 2, lines 32-59; claims 1,2; figures 1-3 *	1-3	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 January 2009	Examiner Dick, Birgit
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03.82 (P/MC01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 01 3715

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-01-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2443790	A	21-05-2008	NONE	

US 6598786	B1	29-07-2003	DE 20300116 U1	17-04-2003
			FR 2849839 A3	16-07-2004
			GB 2396288 A	23-06-2004
			JP 3756146 B2	15-03-2006
			JP 2004196396 A	15-07-2004

EPO FORM P0459

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