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(54) **Composite cup structures**

(57) An improved composite cup structure comprising: an inner plastic cup (1) and an outer paper cup (2). The composite cup is manufactured from paper and plastics by a ratio of 7:3. The rims of both inner plastic cup (1) and outer paper cup (2) are provided with outwards curled edges (11, 21). The curled edge (11) of the inner plastic cup (1) is slightly larger than that of the outer paper cup, and a flat surface (F) is formed on the top. An extension member (12) is formed on the curled edge of the inner cup. The extension member (12) contributes to the separation of inner and outer cups (1, 2) for classification and recycling.

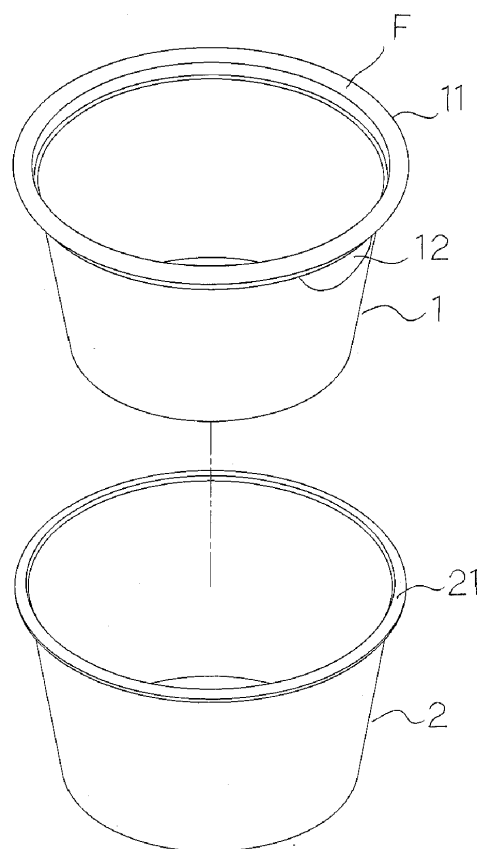


FIG. 1

Description**BACKGROUND OF INVENTION**

1. Field of the Invention

[0001] The present invention relates generally to composite cup structures.

2. Description of Related Art

[0002] Disposable liquid containers may generally be made of plastics and paper materials. Plastics containers of a single-layer structure are not suited for heat insulation despite providing advantages such as: ease of manufacturing, lower cost and better leak-proofing. Paper containers are manufactured using more complex procedures and at higher cost, but their leak-proofing effect and structural strength are inferior to that of plastics containers. Thus, multi-layer or thicker designs are required for desired heat insulation, or foamed heat-insulating layers are added, potentially leading to extremely high cost.

SUMMARY OF THE INVENTION

[0003] The invention provides a composite cup structure as specified in claim 1.

[0004] The composite cup structure may allow the combining of a plastics inner layer, or cup, with an outer paper cup for detachable and recycleable applications by using the extension member provided on the curled edge of the rim of the plastics inner cup.

[0005] The composite cup structure may permit the accommodation of a foamed heat-insulating layer for desired heat insulation in a space defined between the inner and outer cups.

[0006] The composite cup structure may enable the provision of various kinds of opening(s) in the body of outer paper cup, which may be helpful for marketing, without affecting the air-tightness and integrity of the composite cup structure.

[0007] The composite cup structure may be manufactured from recycled paper and plastics in a ratio of 7:3 paper to plastics, thereby contributing to environmental protection and cost effectiveness.

[0008] Embodiments of the composite cup structure comprise: an inner plastic cup and an outer paper cup; the rims of both inner plastic cup and outer paper cup are provided with outwards curled edges, in particular: the curled edge of the inner plastic cup is slightly larger than that of the outer paper cup, and a flat surface is formed on the top; besides, an extension sheet of any shape is formed on the curled edge towards the cup bottom; when the inner and outer cups are overlapped, the curled edge of the inner plastic cup could cover the curled edge of the outer paper cup, thus forming a leakproofing composite cup of excellent strength; the extension sheet contributes to the separation of inner and outer cups for

classification and recycling.

[0009] Embodiments of the invention include a method of forming a composite cup structure comprising:

housing an inner plastics cup in an outer paper cup, disposing an outwardly curling edge of the rim of the inner plastics cup about the outwardly curling edge of the rim of the outer paper cup; providing an upwards facing flat surface of the curling edge of the inner plastics cup; and providing an extension member on the outwardly curling edge of the inner plastics to facilitate separation of the inner and outer cups.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is an exploded view of a composite cup structure.

FIG. 2 is an assembly view of the composite cup structure.

FIG. 3 is a sectional view of the composite cup structure of FIG. 2.

FIG. 4 shows various shapes of extension sheet that may be provided on the curled edge of the inner cup of the composite cup structure.

FIG. 5 shows various shapes of opening(s) that may be provided in the body of the outer cup of the composite cup structure.

FIG. 6 is an assembly view of another composite cup structure.

FIG. 7 is a sectional view of the composite cup structure of FIG. 6.

FIG. 8 is a sectional view of yet another composite cup structure.

FIG. 9 is a sectional view of still another composite cup structure.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0011] Referring to FIGS. 1 to 3, a composite cup structure comprises: an inner plastics cup 1 and an outer paper cup 2, with a ratio of 7:3 of paper to plastics (ie weight percentage 70%: 30%). The outer paper cup 2 provides greater structural strength and is convenient for printing and the incorporation, or application, of marketing features. Recycled paper may be adopted in consideration of environmental protection and cost effectiveness. The plastics inner cup, which will contact with the contents of the composite cup structure, may eliminate concerns on food sanitation or safety.

[0012] The rims of both the inner plastics cup 1 and the outer paper cup 2 are provided with outwards curled edges 11, 21. The curled edge 11 of the inner plastics cup 1 is slightly larger than the curled edge 21 of the outer paper cup 2. A flat surface F is provided on the top

of the curled edge 11 so that packaging required for heat sealing may achieve higher levels of air-tightness to ensure that the contents sealed in the composite cup structure are fully isolated from the outside air to prevent oxidation. An extension sheet, or member, 12 of any geometric shape may be provided on the curled edge 11. The extension sheet 12 extends from the curled edge 11 towards the cup bottom, as shown in FIG. 2.

[0013] The inner plastics cup 1 may be made of PP (Polypropylene), PS (Polystyrene), PLA (Polylactide), PE (Polyethylene) or PET (Polyethylene Terephthalate).

[0014] During assembly of the composite cup structure, the curled edge 11 of the inner plastics cup 1 is spread, then the outer paper cup 2 is sleeved onto the inner plastic cup 1, such that the curled edge 11 of the inner plastic cup 1 can cover the curled edge 21 of the outer paper cup 2. After overlapping, the inner plastics cup 1 may eliminate possible leakage, thereby providing a composite cup structure with excellent heat-insulation, leak-proofing and strength and little or no condensation.

[0015] The outer paper cup 2 of the composite cup structure may be suitable for printing and marketing due to its excellent structural strength or the surface properties it provides.

[0016] When it is intended to separate the inner and outer cups 1, 2 of the composite cup, the extension sheet 12 on the curled edge 11 of the inner plastic cup 1 may be pulled up such that the inner plastics cup 1 and the outer paper cup 2 can be readily separated for independent use.

[0017] The composite cup structure may be manufactured by combining two containers of different materials, without the need of any glue or adhesive. Upon completion of assembly of the composite cup structure, the extension sheet 12 can be used to allow easy separation of the inner plastics cup 1 and outer paper cup 2 for subsequent classification and recycling.

[0018] Referring to FIG. 4, the extension sheet 12 on the curled edge 11 of the inner plastics cup 1, which may take the form of a tab, can be any desired shape, such as: tear drop, convex, round, polygonal and rectangular. Referring to FIG. 5, various forms of opening(s) 22 may be provided in the body of outer paper cup 2. The opening(s) 22 may, for example, be oval, banded, diamond-shaped, rectangular, round or straight. This may allow the contents of the inner plastics cup 1 to be seen, to promote marketing, without affecting the air-tightness and integrity of the composite cup structure.

[0019] Referring to FIGS. 6 and 7, when the contents of the composite cup structure need to be sealed against exposure to the atmosphere, the curled edge 11 on the rim of the inner plastic cup 1 may be sealed with an adhesive film 13. The flat surface F is provided on the top of the curled edge 11 to facilitate sealing, such as heat-sealing, so that the sealed contents are fully isolated from the outside air to avoid oxidation.

[0020] Referring to FIG. 8, a heat-insulating layer 3 may be provided between the inner plastics cup 1 and

outer paper cup 2. The heat-insulating layer 3 may be a plastics-foamed layer formed around the body of inner plastics cup 1 and may be made of the same plastics material. Once the inner and outer cups 1, 2 are overlapped, a heat-insulating, leak-proofed composite cup structure having excellent strength and little or no condensation on its external surface can be provided.

[0021] Referring to FIG. 9, when the contents of the composite cup structure need to be sealed from contact with the atmosphere, the curled edge 11 on the rim of the inner plastics cup 1 is sealed with a sealing layer, such as an adhesive film, so that the contents are fully isolated from contact with the air to prevent oxidation.

[0022] Although not shown in the illustrated embodiments, the inner plastics cup may be provided with more than one extension member, for example, two oppositely disposed extension members.

[0023] The illustrated embodiments described above may provide one or more of the following advantages:

1. The inner and outer cups are assembled without the need of any glue or adhesive.
2. The extension sheet of the composite cup structure can be used to easily separate the inner and outer cups for subsequent classification and recycling.
3. The outer paper cup provides greater structural strength or better surface properties for printing and marketing than a plastics cup.
4. The materials and moulding pattern of the inner plastic cup may eliminate leakage.
5. A flat surface is provided on the top of the curled edge of the inner cup facilitates sealing procedures so that the sealed-in contents of the composite cup structure can be fully isolated from the atmosphere to avoid oxidation.
6. The extension sheet of the inner plastics cup allows easy separation of the inner and outer cups without affecting the air-tightness and strength of the composite cup structure.
7. Various forms of opening(s) may be provided in the body, or side, of the outer paper cup, helping to promote marketing without affecting the air-tightness and integrity of the composite cup structure.
8. The composite cup may be manufactured from paper and plastics with a ratio of 7:3 paper to plastics and recycled paper may be used in consideration of environmental protection and cost effectiveness. Because it is the plastics inner cup that contacts with the contents of the composite cup structure, good food sanitation or safety may be provided.

Claims

1. A composite cup structure comprising: an inner plastics cup (1) and an outer paper cup (2), wherein:

- the respective rims of the inner plastics cup and outer paper cup are provided with outwards curled edges (11, 21);
the curled edge (11) of the inner plastics cup is larger than the curled edge (12) of the outer paper cup;
an upwards facing flat surface (F) is provided on the curled edge (11) of the inner plastics cup;
an extension member (12) is provided on the curled edge (11) of the inner cup (11) to facilitate separation of the inner and outer cups; and
the curled edge (11) of the inner plastics cup covers the curled edge (21) of the outer paper cup.
2. A composite cup structure as claimed in Claim 1, wherein the extension member (12) has one of the following shapes: tear drop, convex, round, polygonal and rectangular.
 3. A composite cup structure as claimed in Claim 1 or 2, wherein at least one opening is provided in the side of the outer paper cup to permit viewing of the side of the inner plastics cup.
 4. A composite cup structure as claimed in Claim 3, wherein the at least one opening comprises an opening having one of the following shapes: oval, banded, diamond-shaped, rectangular, round and straight.
 5. A composite cup structure as claimed in any one of the preceding Claims, wherein the inner plastics cup is made of PP (Polypropylene), PS (Polystyrene), PLA (Polylactide), PE (Polyethylene) or PET (Polyethylene Terephthalate).
 6. A composite cup structure as claimed in any one of the preceding Claims, wherein the interior of the inner plastics cup (1) is sealed by a film secured to the curled edge (11) of the rim thereof.
 7. A composite cup structure as claimed in any one of the preceding Claims, wherein a heat-insulating layer (3) is provided between the inner plastics cup (1) and the outer paper cup (2).
 8. A composite cup as claimed in Claim 7, wherein the heat-insulating layer (3) comprises a plastics-foamed layer formed around the body of inner plastics cup.
 9. A composite cup structure as claimed in Claim 7 or 8, wherein the heat-insulating layer (3) and inner plastics cup (1) are made of the same materials.
 10. A composite cup structure as claimed in any one of the preceding Claims, wherein the ratio of paper to plastics material is 7:3.
 11. A composite cup structure as claimed in any one of the preceding Claims, wherein the outer paper cup (2) is made of recycled paper.
 12. A composite cup structure as claimed in any one of the preceding Claims, wherein said inner plastics cup is semi-transparent or transparent.
 13. A composite cup structure as claimed in any one of the preceding Claims, wherein said inner plastics cup is secured to said outer paper cup by fitting of the curled edge (11) of the inner plastics cup onto the curled edge (21) of the outer paper cup.
 14. A composite cup structure as claimed in Claim 14, wherein said curled edge (11) wraps around said inner plastics cap.
 15. A composite cup structure as claimed in any one of the preceding Claims, wherein said extension member depends from said curled edge (11) of the inner plastics cup.

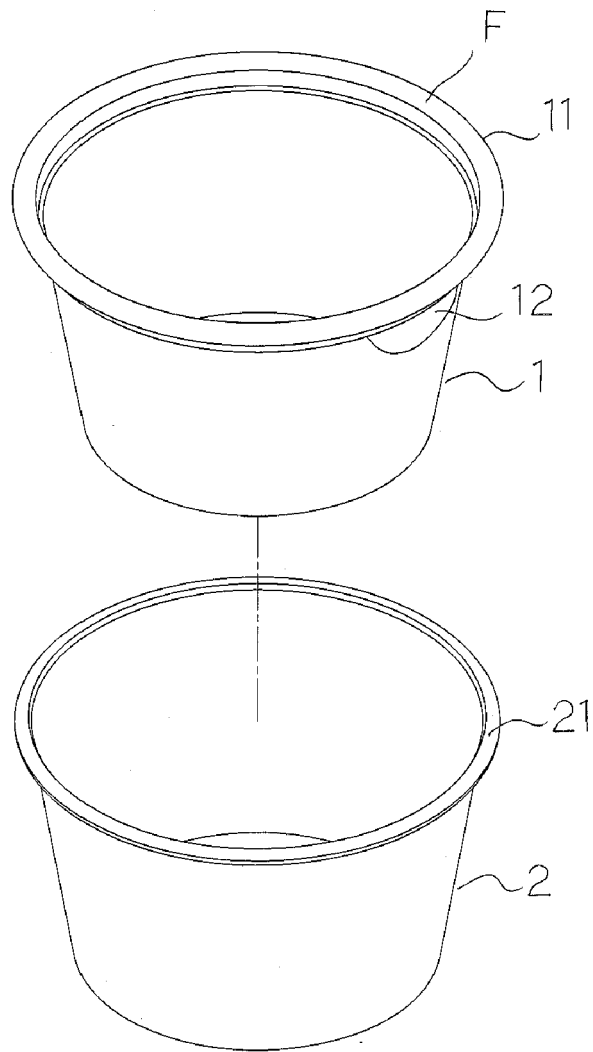


FIG. 1

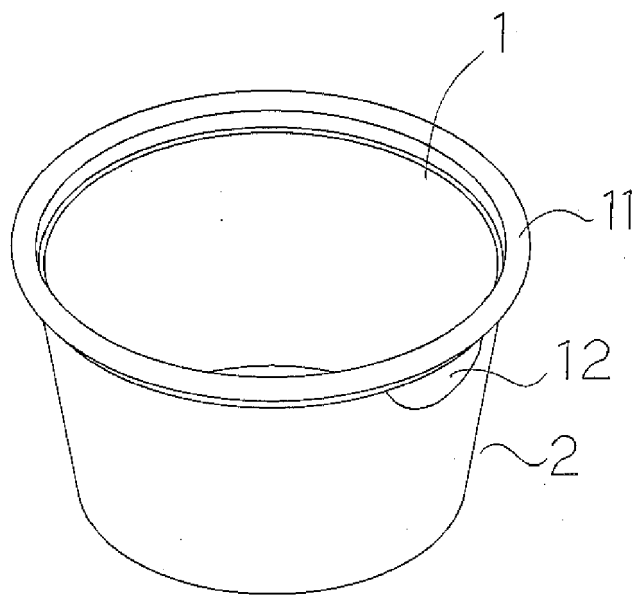


FIG. 2

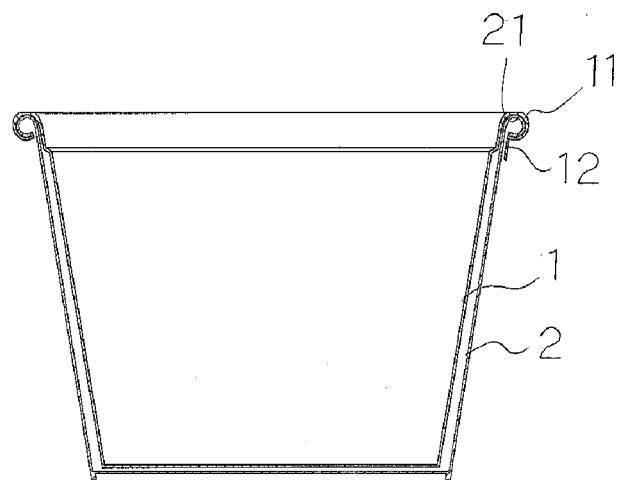


FIG. 3

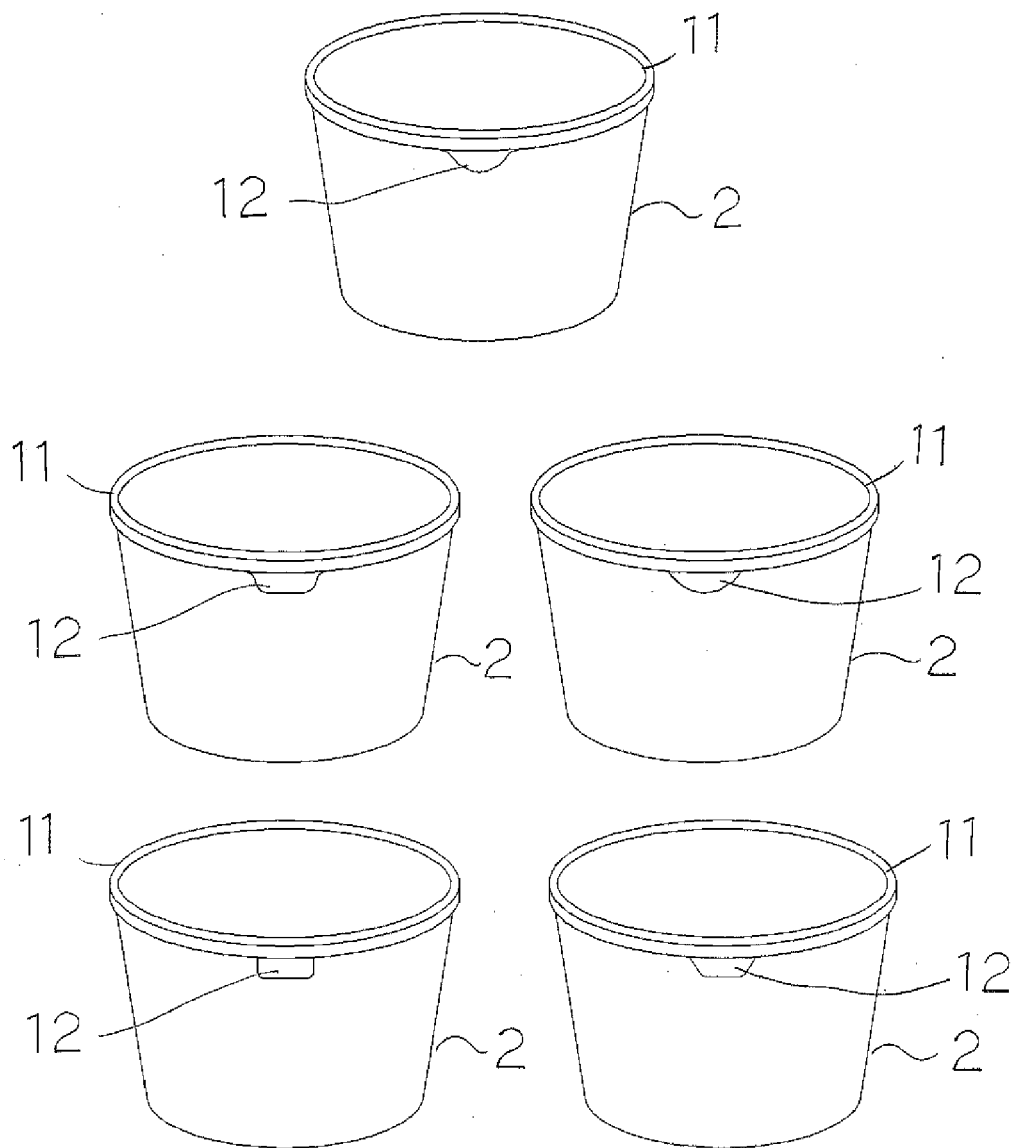


FIG. 4

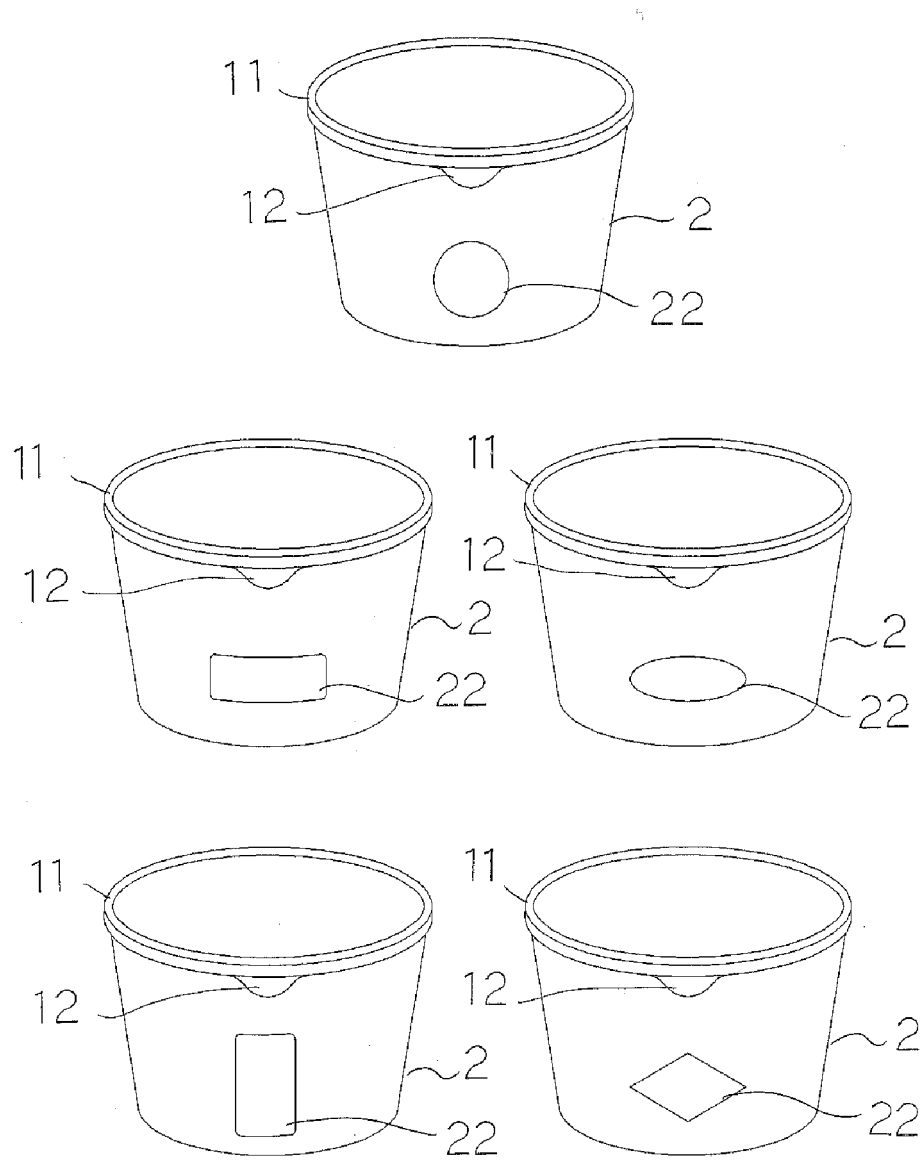


FIG. 5

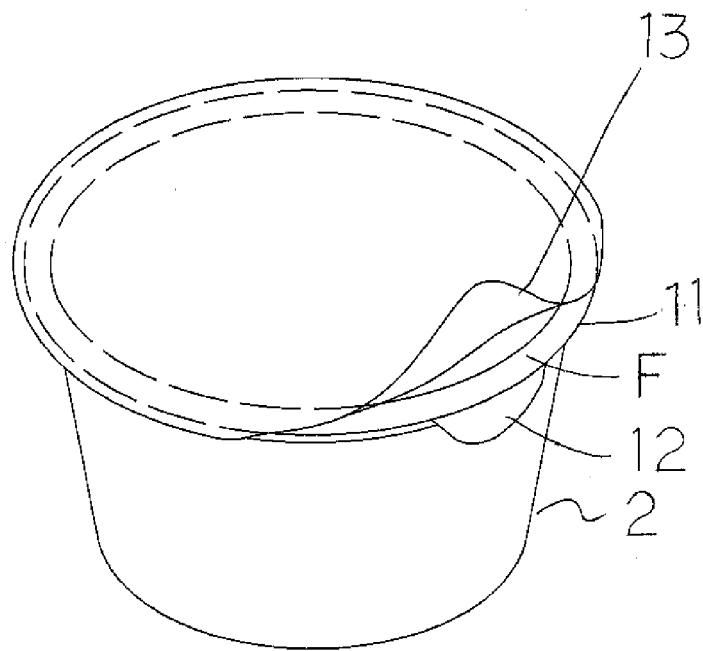


FIG. 6

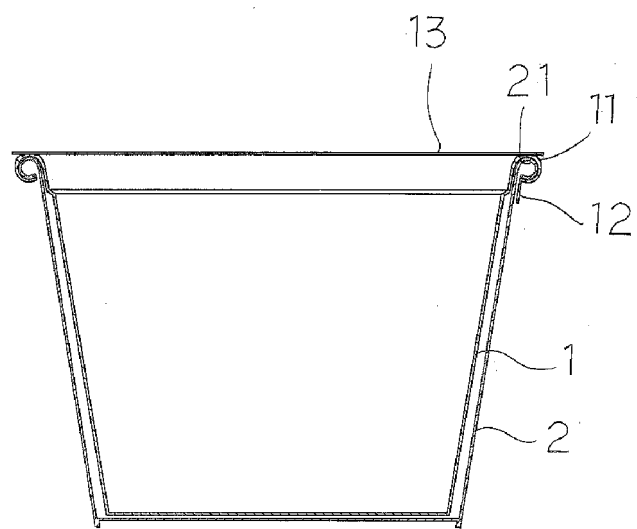


FIG. 7

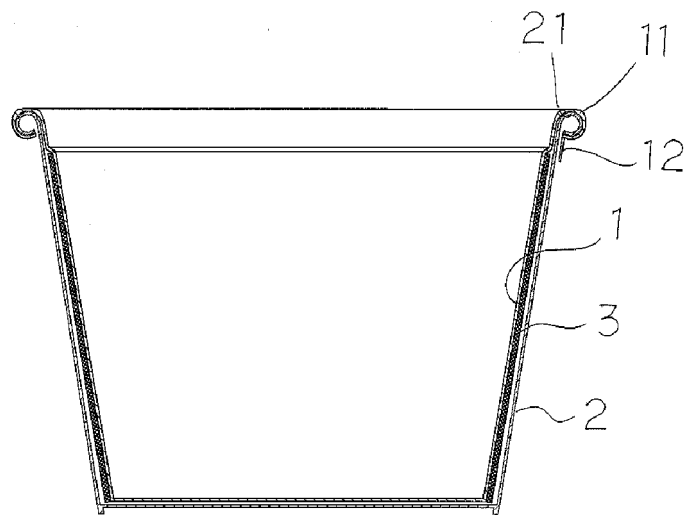


FIG. 8

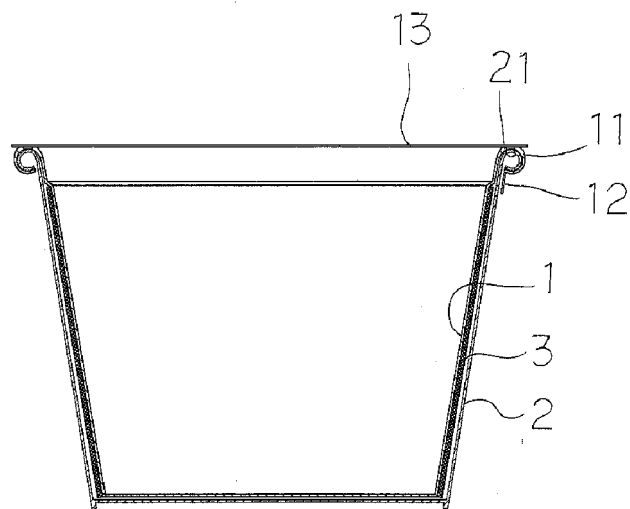


FIG. 9



EUROPEAN SEARCH REPORT

Application Number
EP 13 16 7498

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 October 2013	Examiner Sundell, Olli
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