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(54) Thermally insulated cup and insulating cover

(57) A thermally insulated cup in the form of container for foodstuffs, made of a paper-type material. An inner cup (1) has the form of a conical surface section and contains a turned back peripheral upper edge. The outer surface (41) of the side wall (4) of the inner cup (1) is covered with an insulating cover (5). The insulating cover (5) contains creases in the form of bends (51), where the

outer surface (52) of bottoms of the bends (51) contact the outer surface (41) of the side wall of the inner cup (1).

The insulating cover (5) is an outer sleeve for the inner cup (1). The cover (5) has a side wall corresponding to the shape of the outer surface (41) of the side wall (4) of the inner cup (1). The cover (5) contains creases in the form of bends (51).

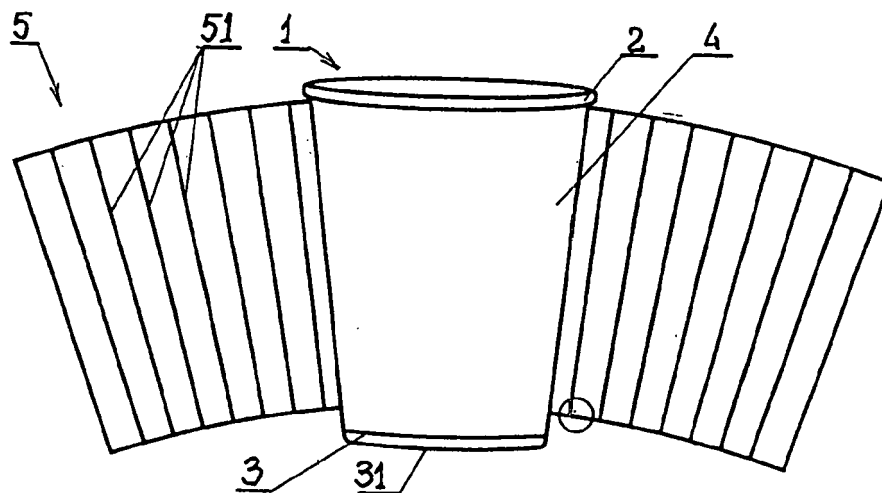


Fig. 2

EP 2 583 913 A1

Description

[0001] The subject of the invention is a thermally insulated cup for serving especially hot beverages, such as coffee, tea, chocolate or cocoa. The cup can also be used for serving cold beverages. The subject of the invention is also a thermal insulating cover for the cup. The invention relates to the food industry.

[0002] There are a number of solutions of disposable cups made of paper or cardboard, wherein said materials prior to manufacturing a final product from them undergo impregnation processes with the use of materials admitted for contact with hot food products.

[0003] The basic problem to be solved in the described products is the insulating power of the cup walls, wherein the aim is to allow the consumer of a hot content, such as a hot drink, to grab and hold the cup through said side walls. In known solutions thermal insulating power of the cup side walls is obtained in the first group of solutions by the application on the side wall of an insulating layer inseparably connected with the wall. In the second group of solutions, a two-layer paper or cardboard wall is used, wherein between said two layers of paper or cardboard the means that allow to keep a greater or smaller distance are used. Keeping a distance between two layers of paper or cardboard enables the maintaining to a greater or lesser degree an air space being excellent insulation means. This is the way to provide good insulation properties in the interests of the user comfort as regards the possibility of grabbing the cup, but at the same time to increase the capability of the cup to maintain the appropriate temperature of a hot drink inside the cup.

[0004] The solution according to the invention belongs to the second of the above types, where the insulating power of the cup walls is obtained by a two-layer structure of side walls, with inner air spaces between the two layers of paper or cardboard. The outer cover can be made of cardboard of various density with polymeric materials applied on its surface, or without such a layer, with the possible application of a layer of varnish. A layer of polymer or a layer of varnish can be used to thermally glue the cover. A layer of glue can also be used for this purpose. The use of varnish can protect the inner surface of other cups from the migration of dyes from the outer surface of other cups inserted one into another in multipacks.

[0005] Known solutions of thermally insulated cups and thermal insulating covers for this kind of cups are presented below.

[0006] Known solution of an insulated cup, belonging to said second group of solutions are presented in the patent specification of international application WO 2007/054318. According to this known solution, a cup comprises an internal wall and an external sleeve. The external sleeve is formed from a corrugated hollow material containing a corrugated layer and a substrate layer. The sleeve is arranged in such a way that the substrate layer is outside the proper cup and covers it. The first end of the sleeve is overlapped at least partially by the

second end of the sleeve in an overlapping area provided for this. Further, the sleeve is adhesively attached to the internal wall of the cup at least by one first area of adhesive being provided in another place with the second area of adhesive being provided on an inner side of the sleeve on the first end of the sleeve. The second area of adhesive is provided with a distance member. The second area of adhesive contains a distance area from overlapping sleeve areas separating it from the internal wall of the cup. The surface of the cup is thus provided with a sleeve made of corrugated cardboard, which by its very nature keeps a distance between peaks of waves and their bottoms, which in itself maintains troughs between the external area of cardboard and the working wall of the cup according to this solution. The figure attached to this patent specification shows a corrugated layer over the entire surface of the working wall of the cup, wherein wave peaks are peripherally arranged around the cup. However, another embodiment of this known solution also shows a sleeve with vertical rectilinear waves extending essentially vertically.

[0007] Another solution, known from the patent specification of international application WO 2008/045944 shows a different solution of a cup with a multilayer wall.

This known solution presents a container in the form of a cup and the method of manufacture the same. The container comprises an inner wall with an outer sleeve kept at a certain distance from it. The sleeve contains a plurality of inwardly directed protuberances providing an air gap between a substantial portion of the sleeve surface and the inner wall of the cup. The sleeve is formed by wrapping the proper cup with a layer of paper or cardboard comprising a mosaic of said protuberant points.

[0008] Another solution known from the patent specification of international application WO 2009/054110 presents a different solution of an insulated cup. According to this known solution, a cup for hot beverages contains an insulating section. To make a holding section, or a lower or upper section of an outer sleeve, slits are formed in a fixed manner over the cup body on the outer sleeve. The deformed surface of the sleeve has a bottom area, an intermediate area and an upper area. In the upper area above the slit section and in the bottom part below the slit section, on the inner sleeve surface there is a layer of heat-shrinkable film. To obtain slits the upper and bottom edges of the outer sleeve are brought nearer, and then after pouring hot liquid to the cup, the upper and bottom area of the outer sleeve shrunk on the outer surface of the cup. According to this known solution, a cup cover contains a bottom edge and an upper edge, and between the edges there is a peripheral area of vertical cuts.

[0009] Another known solution of an insulated cup with an outer cover is presented in the US patent specification US 2006/0144915. In this solution an insulated cup with an outer cover is presented. The cup is formed as a single layer paper or plastic cup. The outer cover comprises a paper base sheet and outer sidewalls, printed only on

one side and an insulating insert in the form of corrugated paper or a layer of foamed plastic. The insulating insert is similar in shape to the outer cover but smaller in size. The insert is glued in a centred position to the non-printed side of the sidewall to form a two-layer insulating cover. Less than 20% of the area of the insulating insert is glued to the outer sheet. Specifically, no glue is applied to the area adjacent to the cut side edges of the insert, and to similar areas which are not attached to the base sheet. The cover is wrapped around the inner wall of the cup. The side edges of the cup sheet overlap and are sealed directly together to form a side seam. The outer cover is adhesively secured to the same side seam of the inner cup. The side edges of the insert are not tightly connected between the seam of the base sheet and the inner layer of the cup. The cover can also be adhered to the inner cup with the use of cold glue in the form of paste adhesive or a thin layer of polyethylene or similar heat sealing material that can be pre-applied to the cut edges of the sheets. This connection is heat-activated prior to wrapping the cover around the inner cup, and by pressing the overlapping side seam of the sidewall of the inner cup and the side seam of the insulating cover of the cup.

[0010] The purpose of the invention is to develop a new design of a cup for hot beverages with the use of the creased material technology. This task has been solved by claim 1 and claim 8.

[0011] According to the invention, a disposable cup for hot beverages comprises a working container made of impregnated paper. The working container has the form of a conical surface section and contains a turned back peripheral upper edge. The bottom of the working container is above the bottom peripheral edge of the conical side wall. At least one part of the outer surface of the working container is covered with an insulating sleeve in the form of a conical surface section made of paper.

[0012] According to the invention, the disposable cup is characterised in that the insulating sleeve contains creases in the form of bends where the outer surface of bottoms of the bends contacts the outer surface of the working container.

[0013] According to the invention, the creases preferably are continuous rectilinear bends.

[0014] In another embodiment according to the invention, the creases can be rectilinear dashed bends.

[0015] In another preferred embodiment, creases can be curvilinear bends.

[0016] Bends are preferably arranged in planes in line with the symmetry axis of the working container of the cup.

[0017] Another embodiment of the invention provides that bends are arranged in planes perpendicular to the symmetry axis of the working container of the cup, which means that they wrap up the cup in planes perpendicular to the longitudinal symmetry axis of the cup.

[0018] Another solution according to the invention provides that bends can be arranged in planes oblique in relation to the symmetry axis of the cup.

[0019] In a further development of the solution according to the invention, bends are arranged in mutually intersecting planes. Material in the form of paper or cardboard according to the invention can be covered with a layer of polyethylene on the outer surface of the working container.

[0020] In a further development of the solution according to the invention, the outer surface of the insulating sleeve put on the working cup can be covered with a layer of varnish.

[0021] According to the invention, a thermal insulating cover is an outer sleeve put on a cup comprising a container for foodstuffs. The cover is made of paper or cardboard type materials and the inner surface of the side wall of the cover corresponds to the shape of the outer surface of an inner cup comprising a container for foodstuffs. The cover has the form of a truncated cone. The side wall of the cover contains spatial strains.

[0022] According to the invention, the thermal insulating cover is characterised in that it contains creases in the form of bends, where the outer surface of bottoms of the bends is directed to the outer surface of the side wall of the working container of the cup.

[0023] In the first embodiment according to the invention, creases on the cover wall can comprise continuous rectilinear bends.

[0024] In another embodiment of the cover according to the invention, creases can be rectilinear dashed bends.

[0025] In another solution of the cover according to the invention, creases can be curvilinear bends.

[0026] In a further embodiment according to the invention, bends can be arranged in planes in line with the symmetry axis of the cover extending vertically on the side wall of the cover. According to the invention, bends can be arranged in planes perpendicular to the symmetry axis of the cover extending perpendicularly on the side wall of the cover.

[0027] In another embodiment of the cover according to the invention, bends can be arranged in planes oblique in relation to the vertical symmetry axis of the cover.

[0028] In a further preferred embodiment of the cover according to the invention, bends can be arranged in mutually intersecting planes. An embodiment according to the invention also provides that the outer surface of the cover can be covered with a layer of varnish.

[0029] According to the invention, a disposable cup for hot beverages contains an outer insulating cover. On the cover, made of cardboard, just as the proper cup, prior to gluing to form a truncated cone, in the operation of cutting out at the same time the operation of cardboard bending is performed, that is making linear embossments which outside have the form of grooves and inside the cover adjacent to the outside of the proper cup have the form of linear convex projections. As it has turned out as a result of tests carried out, this kind of bends keep the cover walls at a distance from the side wall of the proper cup, carrying an air bag being the main component of

the thermal insulation of a ready-made cup with a cover. It has turned out that the operation of cardboard bending can be combined with the operation of cutting out of a pattern from cardboard for an insulating cover, which significantly simplifies the technology and reduces manufacturing costs of a thermal cover.

[0030] The subject of the invention is shown in the accompanying figures in examples of realization, where individual figures present:

- Fig. 1 - a side view of an inner cup.
- Fig. 2 - the inner cup against an insulating cover with vertical bends unwrapped.
- Fig. 3 - a thermally insulated cup according to the invention.
- Fig. 4 - a cross-sectional view of the cup according to Fig. 3 with the plane parallel to the bottom.
- Fig. 5 - the insulating cover unwrapped.
- Fig. 6 - the insulating cover prepared to be put on a working cup.
- Fig. 7 - a detail of the insulating cover according to Fig. 2.
- Fig. 8 - the inner cup against the insulating cover unwrapped shorter than the height of the working cup.
- Fig. 9 - the cup according to Fig. 1 with bends comprising dashed lines.
- Fig. 10 - the inner cup against the insulating cover with horizontal bends unwrapped.
- Fig. 11 - the inner cup in the cover according to Fig. 10.
- Fig. 12 - the inner cup against the insulating cover with oblique bends unwrapped.
- Fig. 13 - the inner cup against the insulating cover with intersecting bends unwrapped.

[0031] A disposable cup for hot beverages comprising an inner cup 1 made of high density paper- or cardboard-type materials, impregnated with the use of known impregnations and an insulating cover 5 is shown in the accompanying drawings from fig. 1 to fig. 13. The inner cup 1 is the proper container to which hot drink is poured. As shown in the accompanying figures, the inner cup 1 has the form of a conical surface section and contains a turned back peripheral upper edge 2, with a larger diameter than the bottom 3 of the container 1. The bottom 3 of the inner cup 1 is above the bottom peripheral edge 31 of a conical side wall 4. Embodiments presented in Fig. 2, Fig. 8, Fig. 9, Fig. 10, Fig. 12 and Fig. 13 show the inner cup 1 against an insulating cover 5 unwrapped. The outer surface 41 of the side wall 4 of the inner cup 1 is covered with the insulating cover 5 in the form of a conical surface section made of cardboard. In other embodiments, the insulating sleeve 5 can be made of different materials.

As shown in the accompanying figures, the insulating cover 5 contains creases in the form of bends 51, where the outer surface of bottoms 53 of the bends 5 contacts

the outer surface 41 of the inner cup 1. This is shown in Fig. 4. The contact of the surfaces 41,52 prior to connecting the working cup 1 with the insulating cover 5 is covered with a layer of adhesive. In other embodiments, the connection is obtained by heat-sealing of a layer of polyethylene. As shown in other embodiments, creases comprise continuous rectilinear bends 51.

[0032] This is shown in drawings from fig. 1 to fig. 8. Fig. 9 illustrates another embodiment, where creases in the form of bends 5 comprise dashed lines containing one gap. In other embodiments, bends 52 can comprise lines with more gaps. As shown in Fig. 8, the insulating cover 5 can cover only part of the inner cup 1 height, where it is usually the upper part of the cup 1.

[0033] Bends 51 are arranged in planes in line with the symmetry axis of the working container 1 of the cup, as shown in fig. 2, fig. 3, fig. 5, fig. 6, fig. 8 and fig. 9.

[0034] Other embodiments are shown in fig. 10 and fig. 11, where bends 51 are arranged peripherally in planes perpendicular to the symmetry axis of the inner cup 1.

[0035] Other embodiments shown in fig. 12 and fig. 13 illustrate an oblique arrangement of embossments comprising bends 51 and an intersectional arrangement of embossments comprising bends 51, respectively.

[0036] A material in the form of paper or cardboard according to the invention can be on the outer surface 41 of the inner cup 1 covered with the known layer of polyethylene.

[0037] In another embodiment of the cup according to the invention, the outer surface of the insulating cover 5 put on the inner cup 1 can be covered with the known layer of varnish.

[0038] Fig. 5, fig. 6 and fig. 7 present in an embodiment the insulating cover 5 according to the invention. Fig. 5 shows the cover unwrapped after the operation of cutting out from a sheet of cardboard with simultaneous cardboard bending, in the form of a pattern. The same pattern after gluing to form the cover 5 intended to be put on the wall of the inner cup 1 is shown in Fig. 6. The cover 5 here has a form ready to be put and stuck on the side wall of the inner cup 1. In this form it can be traded independently, where it can be used for putting on traded cups without thermal insulation. Fig. 7 shows a detail of the insulating cover 5 from fig. 2. This figure presents part of the edge of the cover 5 together with the edge of the bend 51. It is clearly visible that the bend 51 comprises an embossment whose outer surface of the bottom 52 is covered with adhesive and attached to the outer surface 41 of the side wall of the inner cup 1. In other embodiments, the surface 52 of the bottom of the bend can be hot-sealed with the surface 41 of the inner cup 1 wall, when the surface 41 is covered for example with a layer of polyethylene. In yet another embodiment, the cover 5 can only be fitted on the side surface of the inner cup 1. A conical shape of the cover 5 protects from slipping out of the inner cup 1 from the inside of the insulating cover 5.

[0039] The inner cup, especially for hot beverages is

made from sheets of cardboard in one processing line, and the insulating cover 5 is cut out from sheets of cardboard which have been previously one-side printed and varnished in the second processing line. After printing and varnishing, a pattern of the insulating cover 5 is cut out and at the same time cardboard bending is performed in one operation, namely embossments in the form of bends 51 are made, that are convex inside the pattern of the insulating cover. The cover after this operation is shown in fig. 5. Flat cardboard elements obtained in this way in another technological operation are rolled into to form the conical insulating cover 5 and glued or hot-sealed. Then, a layer of adhesive is applied on the inner surface of the insulating cover 5 and inner cups 1 made on another processing line from cardboard being proper disposable containers for hot beverages are inserted into the covers prepared in this way. Inner cups 1 are then inserted into insulating covers 5 to form a connection. Ready-made cups with covers put on are packed into multipacks.

[0040] In other embodiments, only insulating covers 5 intended for distribution as separate products capable of being used in the sale of food products in cups not containing thermal insulation are packed into multipacks.

The list of designations in the drawings

[0041]

1. Inner cup.
2. Upper edge.
3. Bottom of the container.
31. Peripheral edge of the bottom of the inner cup.
4. Side wall of the inner cup.
41. Outer surface of the side wall.
5. Insulating cover.
51. Bend.
52. Outer surface of the bottom of the bend.
53. Outer surface of the insulating cover.

Claims

1. A thermally insulated cup, in the form of container for foodstuffs, made of impregnated paper, wherein an inner cup has the form of a conical surface section and contains a turned back peripheral upper edge, and the bottom of the inner cup is above the bottom peripheral edge of the conical side wall, wherein at

least one part of the outer surface of the inner cup is covered with an insulating cover in the form of a conical surface section made of a paper-type material, **characterised in that**, the insulating cover (5) attached to the inner cup (1) contains creases in the form of bends (51), where the outer surface (52) of bottoms of the bends (51) contacts the outer surface (41) of the side wall of the inner cup (1).

2. The insulated cup, according to claim 1, **characterised in that**, the creases are continuous rectilinear bends (51).
3. The insulated cup, according to claim 1, **characterised in that**, the creases are rectilinear dashed bends (51).
4. The insulated cup, according to claim 1, **characterised in that**, the creases are curvilinear bends (51).
5. The insulated cup, according to one of claims from 1 to 4, **characterised in that**, the bends (51) are arranged in planes in line with the symmetry axis of the inner cup (1).
6. The insulated cup, according to one of claims from 1 to 4, **characterised in that**, the bends (51) are arranged in planes perpendicular to the symmetry axis of the inner cup (1).
7. The insulated cup, according to one of claims from 1 to 4, **characterised in that**, the bends (51) are arranged in planes oblique in relation to the symmetry axis of the inner cup (1).
8. A thermal insulation cover comprising an outer sleeve put on the inner cup comprising a container for foodstuffs, wherein the cover is made of paper- or cardboard-type materials and has the shape of the inner surface of the side wall corresponding to the shape of the outer surface of the inner cup, where the side wall of the cover contains spatial strains, **characterised in that**, it contains creases in the form of bends (51), where the outer surface (52) of bottoms of the bends (51) is directed to the outer surface (41) of the side wall of the inner cup (1).
9. The thermal insulation cover, according to claim 8, **characterised in that**, the creases comprise continuous rectilinear bends (51).
10. The thermal insulation cover, according to claim 8, **characterised in that**, the creases comprise rectilinear dashed bends (51).
11. The thermal insulation cover, according to claim 8, **characterised in that**, the creases comprise curvilinear bends (51).

12. The thermal insulation cover, according to claim 8 or 9, or 10, **characterised in that**, the bends (51) are arranged in planes in line with the symmetry axis of the cover (5).

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13. The thermal insulation cover, according to claim 8, **characterised in that**, the bends (51) are arranged in planes perpendicular to the longitudinal symmetry axis of the cover (5).

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14. The thermal insulation cover, according to claim 8, or 9, or 10, **characterised in that**, the bends (51) are arranged in planes oblique in relation to the symmetry axis of the cover (5).

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15. The thermal insulation cover, according to one of claims from 8 to 14, **characterised in that**, the bends (51) are arranged in mutually intersecting planes.

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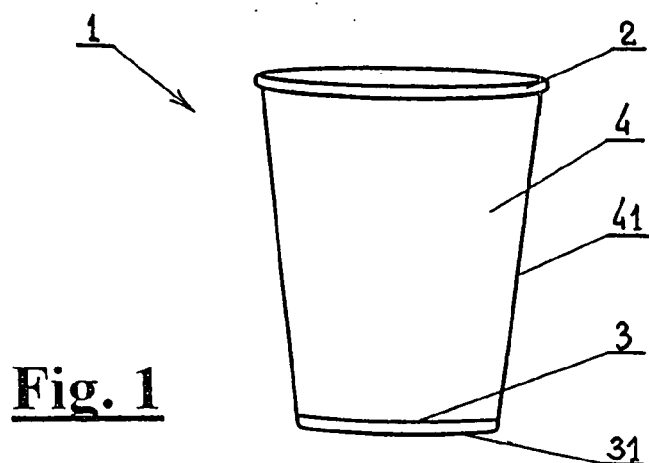


Fig. 1

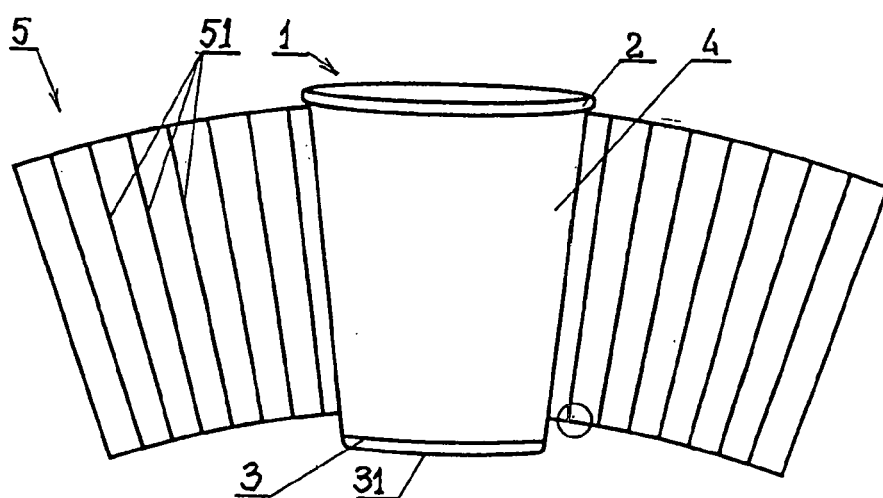


Fig. 2

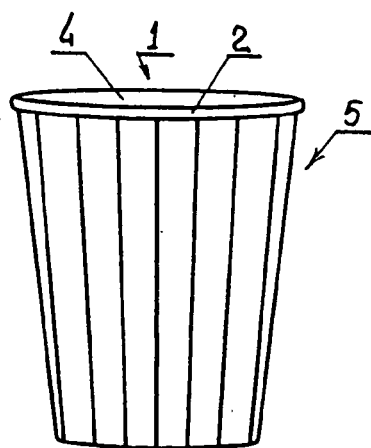


Fig. 3

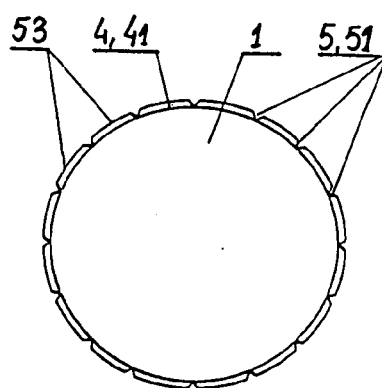


Fig. 4

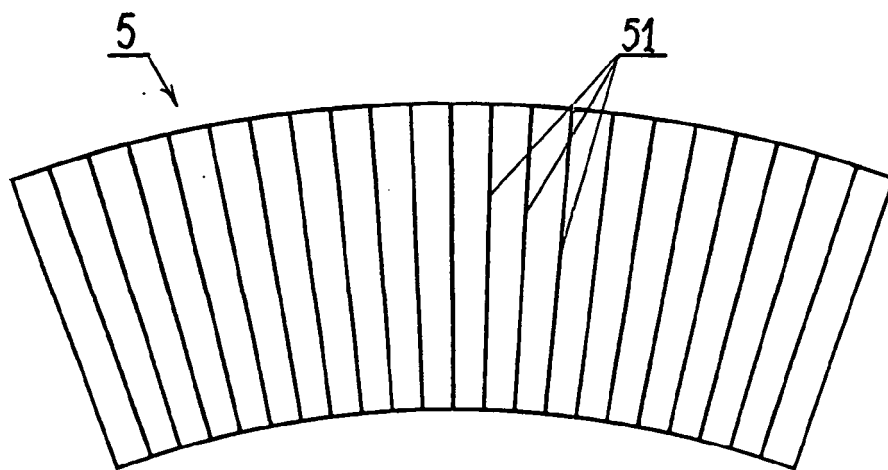


Fig. 5

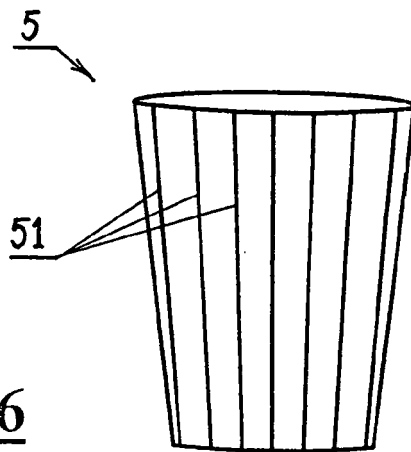


Fig. 6

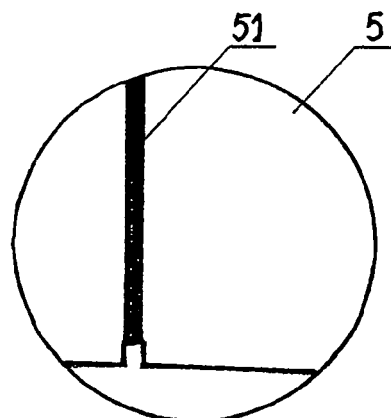


Fig. 7

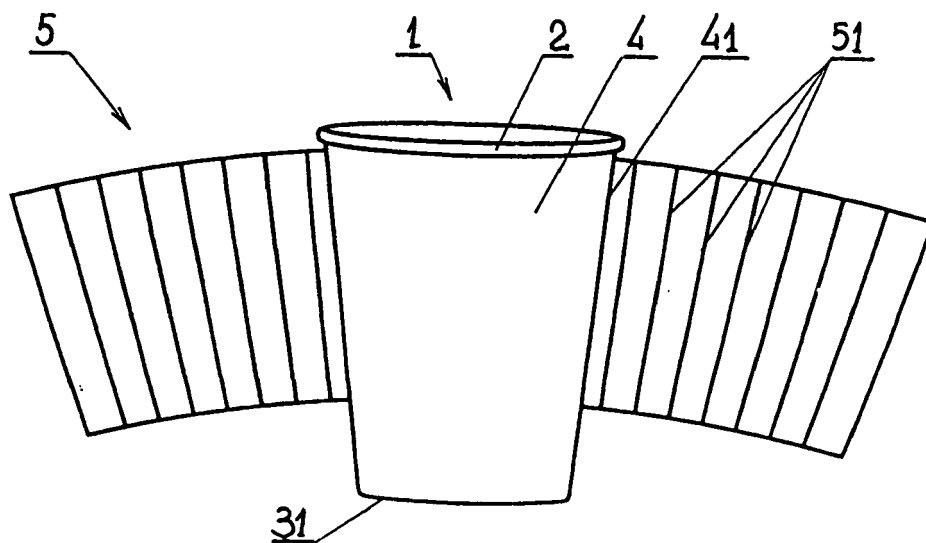


Fig. 8

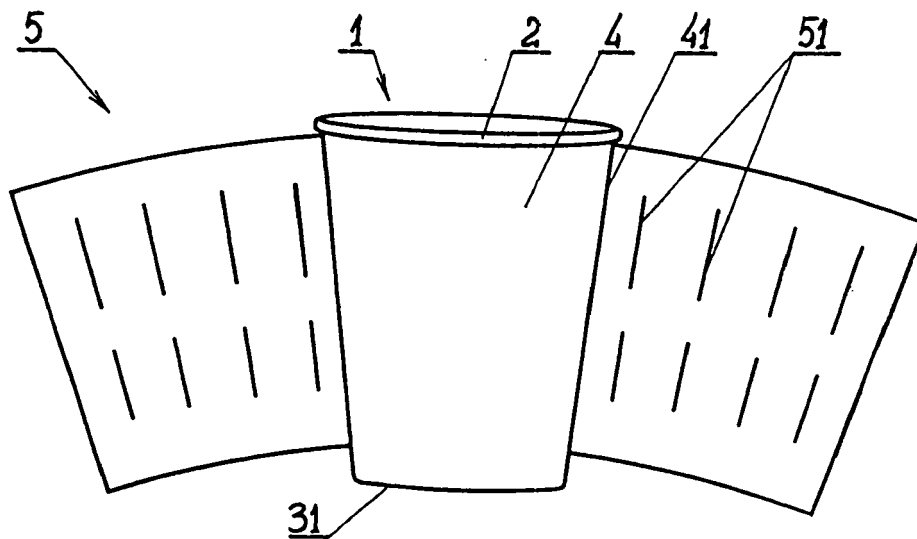


Fig. 9

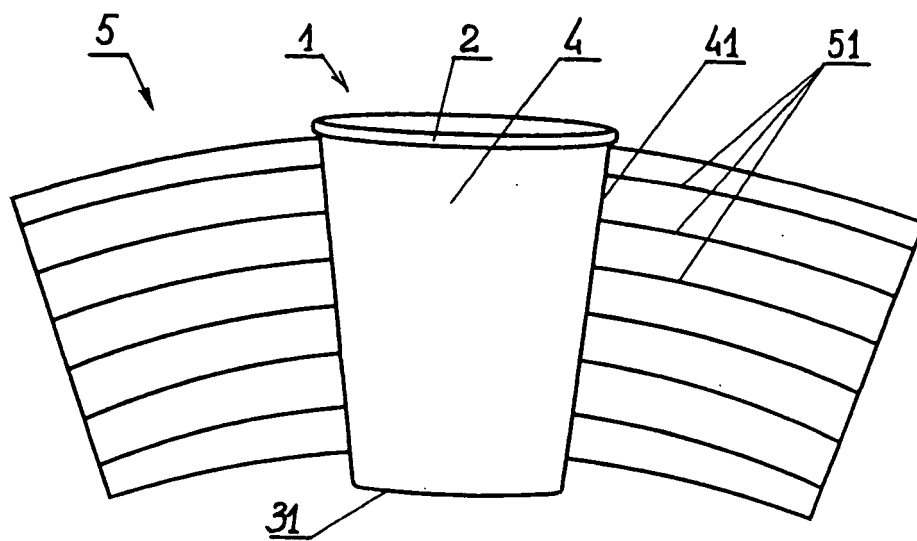


Fig. 10

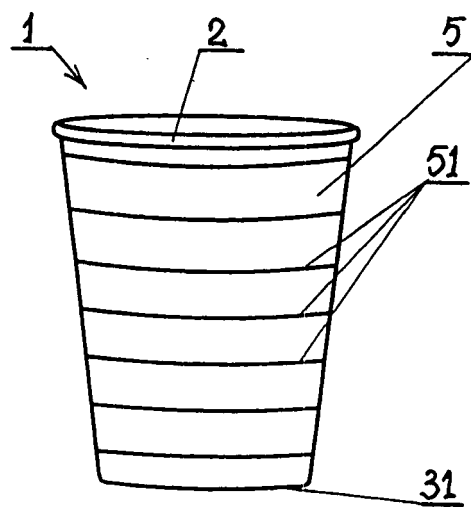


Fig. 11

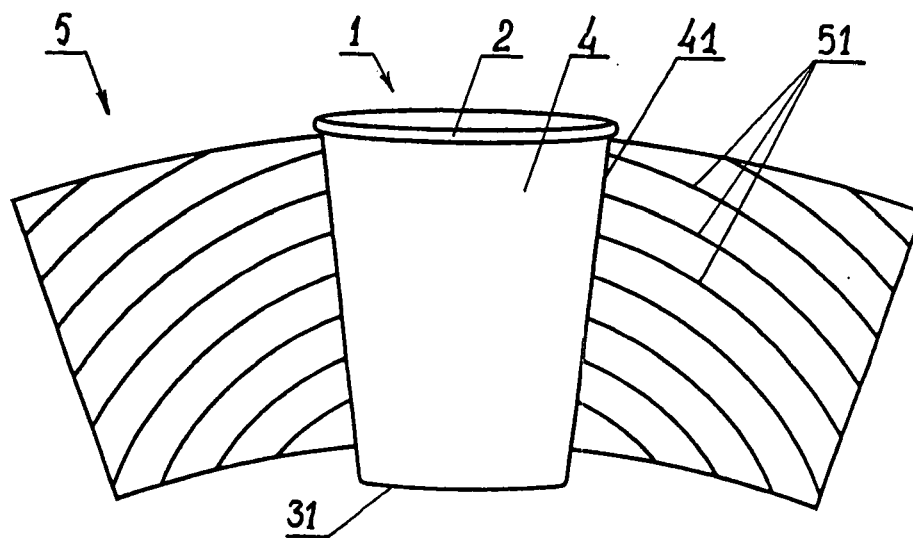


Fig. 12

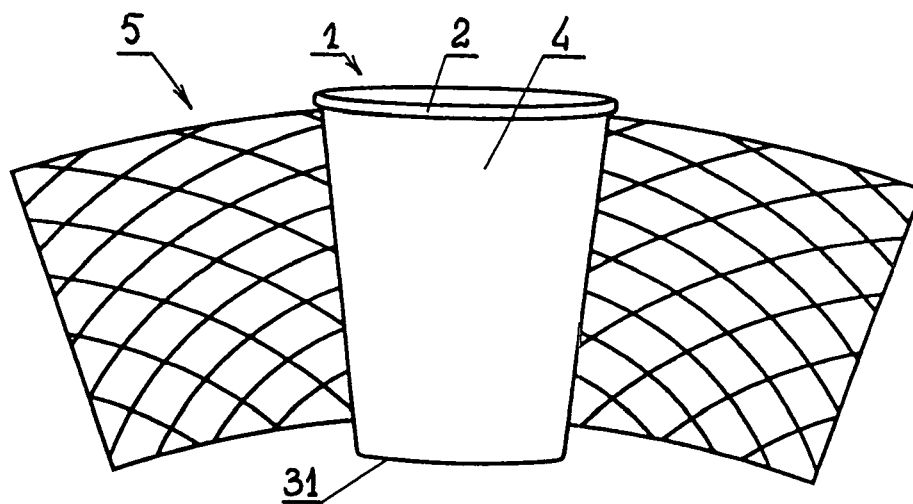


Fig. 13



EUROPEAN SEARCH REPORT

Application Number
EP 12 46 0072

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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 15 January 2013	Examiner Bridault, Alain
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	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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