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(54) **IMPROVED PAPER CUP**

VERBESSERTER PAPPBECHER

GOBELET EN PAPIER AMÉLIORÉ

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Description

FIELD OF THE INVENTION

[0001] The present invention relates generally to paper cups coated with thermoplastic, and more particularly, pertains to paper cups intended to drinks vending machine or similar.

BACKGROUND OF THE INVENTION

[0002] It is well known that polystyrene cups are commonly used in hot or cold drinks vending machine because polystyrene cups are inexpensive and present softness essential for vending machines.

[0003] The insulating properties of the outer walls of polystyrene cups and stiffness of its upper rim allow the cup to be comfortably held despite the high temperature of its contents.

[0004] The disadvantages of polystyrene cups are that it is not biodegradable, readily recycled or microwavable.

[0005] In contrast, paper cups are both recyclable and biodegradable, but such cups, using a single sheet of paper for their outer walls, provide little thermal insulation, present a side edge having a stiffness too high for a use in a vending machine, and is too expensive.

[0006] A number of ways to enhance the insulating characteristics of paperboards from which the hot cups are made have been developed.

[0007] One such paperboard is disclosed in U.S. Pat. No. 7,056,563, wherein the insulating paperboard comprises at least one layer having cross-linked fiber therein to enhance the thickness and thus the insulating characteristics of the paperboard.

[0008] Other strategies have been tried to address the problem of heat transfer through a paper cup.

[0009] One way to address this problem is to double cup. However, double cupping not only increases costs, but it also increases the amount of waste that is produced and the stiffness of paper cups.

[0010] There have also been attempts to design insulating holders that are reusable, especially for cold beverages.

[0011] Another paper cup is known from EP 0453 754. Nevertheless, none of these paper cups provide a sufficient softness to be used in a vending machine. Moreover, these paper cups are cost expensive and cannot be comfortably held despite the high temperature of its contents.

[0012] Therefore, a need exists for an improved inexpensive paper cup and providing a sufficient softness to be used in a vending machine.

SUMMARY OF THE INVENTION

[0013] Embodiments of the present invention provide a paper cup comprising a sidewall member having an upper edge, a lower edge, a pair of opposite side edges,

a front surface and a back surface, each of the side edges and the upper edge defining upper corners, the side edges being overlapped and sealed together along an overlapping side seam, and a bottom member having a peripheral lip sealed to the lower edge of the sidewall member; said paper cup further comprises at least one rigid or semi-rigid rim structure attached to the upper edge of the side wall member and in that the paper weight of the bottom member is greater than the paper weight of the sidewall member.

[0014] The paper weight of the bottom member is comprised between 240 and 400 gsm and the paper weight of the sidewall member is comprised between 150 and 240 gsm.

[0015] In a first embodiment, the rim structure consists in a ring enclosed in a rolled upper edge.

[0016] In a second embodiment, the rim structure consists in a ring bounded onto the back surface of the sidewall member near its upper edge.

[0017] Said rim structure can be a plastic and/or metallic ring.

[0018] Preferably, the sidewall member has a generally trapezoidal shape suitable to form a tronconical paper cup and the rim structure is an annular ring.

[0019] Accessorily, the back surface and/or the front surface of the sidewall member and/or the bottom member is coated with a biodegradable film.

[0020] Said biodegradable film is made by Polylactic Acid (PLA), bio-Polymers or bio-degradable plastic suitable to be composted.

[0021] Moreover, the front surface of the sidewall member can be at least partially embossed to form relief.

[0022] Other features and advantages of the invention will become apparent to those skilled in the art during the description which will follow, given by way of a nonlimiting example, with reference to the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023]

Fig. 1 is a perspective exploded view of a paper cup according to the present invention;

Fig. 2 is a cross section view of paper cup according to the invention;

Fig. 3 is a cross section view of a second embodiment of the paper cup according to the invention;

DETAILED DESCRIPTION OF EMBODIMENTS

[0024] In the various figures, the same references are used to designate identical or similar elements.

[0025] Referring to figures 1 and 2, the paper cup comprises a sidewall member 1 having an upper edge 2, a lower edge 3, a pair of opposite side edges 4,5, a front surface and a back surface, each of the side edges 4,5 and the upper edge 2 defining upper corners. The side edges 4,5 are overlapped and sealed together along an

overlapping side seam 6. Moreover, the paper cup comprises a bottom member 7 having a peripheral lip 8 sealed to the lower edge of the sidewall member 1.

[0026] The paper cup according to the invention further comprises a rigid or semi-rigid rim structure 9 attached to the upper edge of the side wall member.

[0027] In this particular embodiment, the sidewall member 1 has a generally trapezoidal shape suitable to form a tronconical paper cup including a curl 10 at the top of the cup, said paper cup being made with a typical cup machine.

[0028] A typical cup machine for making paper cups, for instance, includes a turret having a plurality of mandrels about which the containers are formed. The turret sequentially rotates the mandrels into cooperation with a variety of workstations where numerous cup forming procedures occur.

[0029] In an exemplary procedure, a circular bottom member is cut out at one workstation and attached to the end of a mandrel by a vacuum applied through the mandrel. During this procedure, the outside edge or lip of the bottom member is folded downwardly. At a subsequent workstation, a sidewall member is wrapped around the mandrel. The sidewall member is heated and sealed along an overlapped side seam which runs generally longitudinal along the side of the cup. Typically, a paperboard is coated with a thermoplastic material such as polyethylene or a solid plastic sheet can be used, so the bottom and sidewall members may be heated and sealed together. In some applications, the sidewall member includes a flap 11 extending beyond the lip 8 of the bottom member, and this flap 11 is bent over the lip 8. At a bottom finishing station, the flap 11 is pressed against the lip 8 from an inside recessed area of the bottom of the cup. By heating the polyethylene and firmly pressing the sidewall, sidewall flap, and bottom flap lid together, a bottom seal is formed and the cup is provided with a sturdy bottom region having a recessed area. There may also be other work stations where various other additional cup forming procedures are carried out. For example, one station may be used to provide a curl 10 at the top or rim of the cup to provide a more functional drinking container and a better appearance.

[0030] During this procedure, a rim structure consisting in a rigid or semi-rigid ring 9 is positioned on the top of the cup in such a manner that said ring 9 is finally enclosed in the rolled upper edge forming the curl 10. Said rim structure can be a plastic and/or metallic ring. Nevertheless, said rim structure can be obtained in any suitable rigid or semi-rigid material without departing from the scope of the invention.

[0031] It should be noted that the rim structure 9 rigidifies the top of the paper cup allowing a user to hold it from the top between its thumb and its forefinger without crushing it.

[0032] Moreover, the paper weight of the bottom member is greater than the paper weight of the sidewall member. For instance, for a cold or hot drink paper cup, the

paper weight of the bottom member is comprised between 240 and 400 gsm (grams per square meter) and the paper weight of the sidewall member is comprised between 150 and 240 gsm. In this way, the paper cup according to the invention provides a sufficient softness allowing a use in a vending machine and can be comfortably held despite the high temperature of its contents. Furthermore, by using a lower paper weight for the sidewall member 1, the unit cost production of the paper cup is lower than a traditional paper cup and is close to the unit cost production of a plastic drinks cup.

[0033] Advantageously, the back surface and/or the front surface of the sidewall member and/or the bottom member is coated with a biodegradable film to ensure the impermeability of the cup and/or the sealing of the bottom and sidewall members. Said biodegradable film can be made by Polyactic Acid (PLA), bio-Polymers or bio-degradable plastic suitable to be composted.

[0034] Accessorily, the front surface of the sidewall member 1 is at least partially embossed to form relief, not shown on figures. Said relief decreases the contact area between the user's hand and the cup in such a way that the cup can be comfortably held despite the high temperature of its contents.

[0035] According to a second embodiment of the paper cup according to the invention, referring to figure 3, the paper cup comprises in the same manner as previously a sidewall member 1 having an upper edge 2, a lower edge 3, a pair of opposite side edges 4,5, a front surface and a back surface, each of the side edges 4,5 and the upper edge 2 defining upper corners. The side edges 4,5 are overlapped and sealed together along an overlapping side seam 6. Moreover, the paper cup comprises a bottom member 7 having a peripheral edge 8 sealed to the lower edge of the sidewall member 1.

[0036] The sidewall member 1 has a generally trapezoidal shape suitable to form a tronconical paper cup including a curl 10 at the top of the cup, said paper cup being made with a typical cup machine. Said sidewall member includes a flap 11 extending beyond the lip 8 of the bottom member, and this flap 11 is bent over the lip 8. The flap 11 is pressed against the lip 8 from an inside recessed area of the bottom of the cup.

[0037] The paper cup according to the invention further comprises a rigid or semi-rigid rim structure 9 attached to the upper edge of the side wall member.

[0038] The rim structure consists in a ring bounded by any appropriate means onto the back surface of the sidewall member 1 near its upper edge, i.e. near the upper curl 10. Said ring is made in rigid or semi-rigid plastic and presents an annular shape.

[0039] It is obvious that the paper cup according to the invention can present different shapes, as a tronconical shape, an ovoid shape, a parallelepipedic shape, a trapezoidal shape, etc, the rigid or semi-rigid rim structure 9 having a corresponding shape such as a circular, ovoid, rectangular or squared shape without departing from the scope of the invention.

[0040] Moreover, the paper cup according to the invention can find a large range of applications in the food and drink industry, and can be used as a container for yoghurt or any microwavable food (pastas, rice, etc) for example.

[0041] Any reference sign in the following claims should not be construed as limiting the claim. It will be obvious that the use of the verb "to comprise" and its conjugations does not exclude the presence of any other elements besides those defined in any claim. The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

Claims

1. A paper cup comprising a sidewall member (1) having an upper edge (2), a lower edge (3), a pair of opposite side edges (4,5), a front surface and a back surface, each of the side edges (4,5) and the upper edge (2) defining upper corners, the side edges being overlapped and sealed together along an overlapping side seam (6), and a bottom member (7) having a peripheral lip (8) sealed to the lower edge of the sidewall member, **characterized in that** it further comprises at least one rigid or semi-rigid rim structure (9) attached to the upper edge (2) of the sidewall member (1) and **in that** the paper weight of the bottom member (7) is greater than the paper weight of the sidewall member (1).
2. Paper cup according to claim 1, **characterized in that** the paper weight of the bottom member (7) is comprised between 240 and 400 gsm.
3. Paper cup according to any claim 1 or 2, **characterized in that** the paper weight of the sidewall member (1) is comprised between 150 and 240 gsm.
4. Paper cup according to any claim 1 to 3, **characterized in that** the rim structure (9) consists in a ring enclosed in a rolled upper edge forming a curl.
5. Paper cup according to any claim 1 to 3, **characterized in that** the rim structure (9) consists in a ring bounded onto the back surface of the sidewall member near its upper edge.
6. Paper cup according to any claim 1 to 5, **characterized in that** the rim structure (9) is a plastic and/or metallic ring.
7. Paper cup according to any claim 1 to 6, **characterized in that** the sidewall member (1) has a generally trapezoidal shape suitable to form a tronconical paper cup and **in that** the rim structure (9) is an annular ring.

8. Paper cup according to any claim 1 to 7, **characterized in that** the back surface and/or the front surface of the sidewall member (1) and/or the bottom member (7) is coated with a biodegradable film.
9. Paper cup according to claim 8, **characterized in that** the biodegradable film is made by Polylactic Acid (PLA), bio-Polymers or bio-degradable plastic suitable to be composted.
10. Paper cup according to any claim 1 to 9, **characterized in that** the front surface of the sidewall member (1) is at least partially embossed to form relief.

Patentansprüche

1. Papierbecher, umfassend ein Seitenwandelement (1) mit einer oberen Kante (2), einer unteren Kante (3), einem Paar von gegenüberliegenden seitlichen Kanten (4, 5), einer vorderen Fläche und einer hinteren Fläche, wobei jede der seitlichen Kanten (4, 5) und der oberen Kante (2) obere Ecken definiert, wobei die seitlichen Kanten überlappen und entlang einer überlappenden seitlichen Naht (6) miteinander versiegelt sind, und ein Bodenelement (7) mit einer Umfangsrippe (8), die an die untere Kante des Seitenwandelements versiegelt ist, **dadurch gekennzeichnet, dass** er weiter mindestens eine starre oder halbstarre Randstruktur (9) umfasst, die an die obere Kante (2) des Seitenwandelements (1) befestigt ist, und dadurch, dass das Papiergewicht des Bodenelements (7) größer als das Papiergewicht des Seitenwandelements (1) ist.
2. Papierbecher nach Anspruch 1, **dadurch gekennzeichnet, dass** das Papiergewicht des Bodenelements (7) zwischen 240 und 400 gsm liegt.
3. Papierbecher nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** das Papiergewicht des Seitenwandelements (1) zwischen 150 und 240 gsm liegt.
4. Papierbecher nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Randstruktur (9) aus einem Ring besteht, der in einer gerollten oberen Kante eingeschlossen ist, die eine Wicklung bildet.
5. Papierbecher nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Randstruktur (9) aus einem Ring besteht, der auf die hintere Fläche des Seitenwandelements nahe seiner oberen Kante gebunden ist.
6. Papierbecher nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Randstruktur

(9) ein Kunststoff und/oder Metallring ist.

7. Papierbecher nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** das Seitenwandelement (1) im Allgemeinen eine Trapezform aufweist, die geeignet ist, einen tronkonischen Papierbecher zu bilden, und dadurch, dass die Randstruktur (9) ein runder Ring ist.
8. Papierbecher nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** die hintere Fläche und/oder die vordere Fläche des Seitenwandelements (1) und/oder das Bodenelement (7) mit einer biologisch abbaubaren Folie beschichtet ist.
9. Papierbecher nach Anspruch 8, **dadurch gekennzeichnet, dass** der biologisch abbaubare Film aus Polymilchsäure (PLA), Biopolymeren oder biologisch abbaubarem Kunststoff hergestellt ist, die geeignet sind, kompostiert zu werden.
10. Papierbecher nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** die vordere Fläche des Seitenwandelements (1) mindestens teilweise geprägt ist, um ein Relief zu bilden.

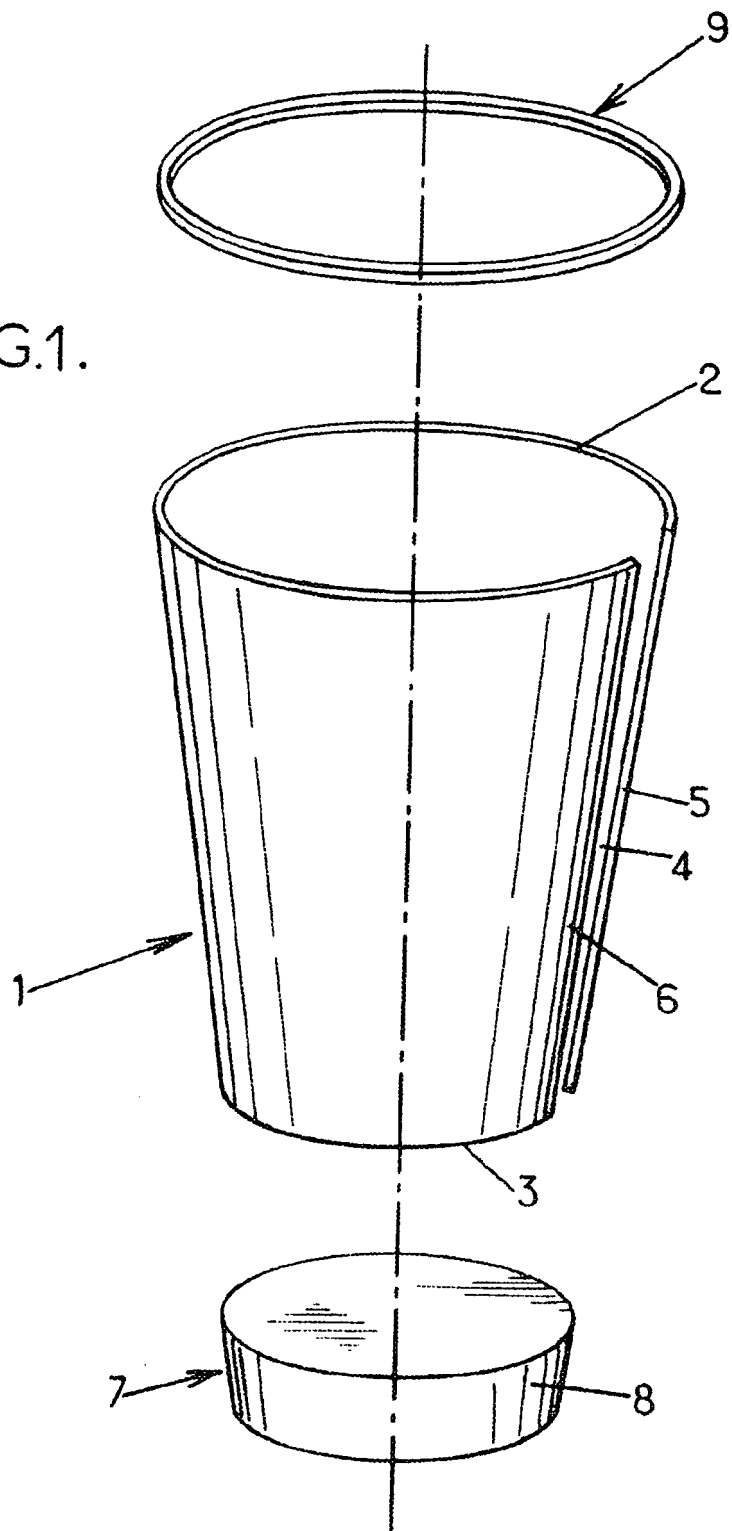
Revendications

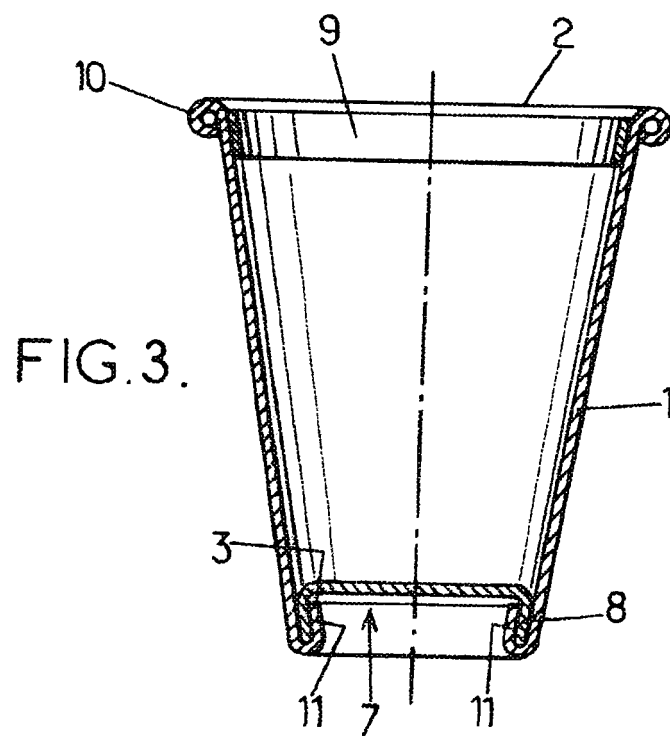
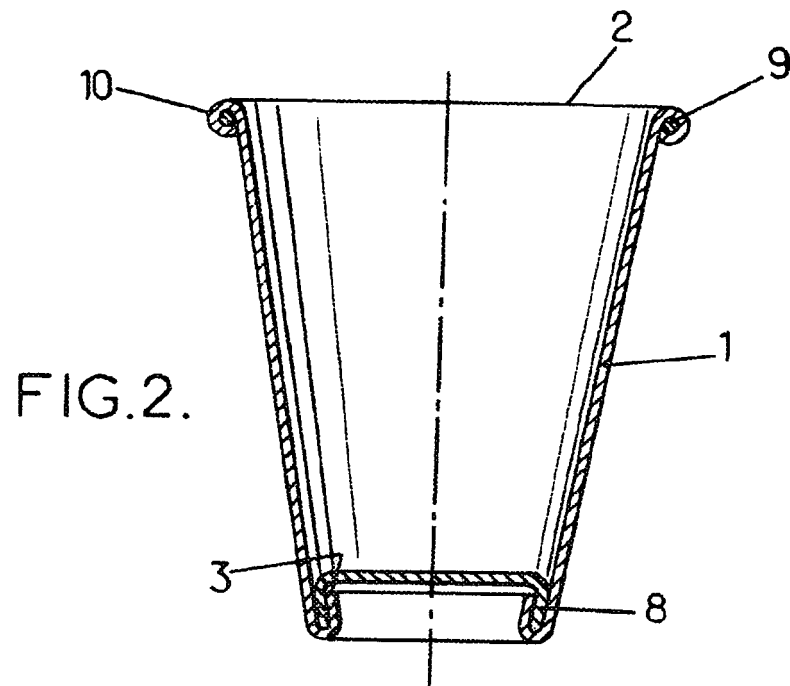
1. Gobelet en papier comprenant un élément de paroi latérale (1) ayant un bord supérieur (2), un bord inférieur (3), une paire de bords latéraux opposés (4, 5), une surface avant et une surface arrière, chacun des bords latéraux (4, 5) et le bord supérieur (2) définissant des coins supérieurs, les bords latéraux étant superposés et joints de manière hermétique le long d'un raccord latéral de superposition (6), et un élément de fond (7) ayant un rebord périphérique (8) joint de manière hermétique au bord inférieur de l'élément de paroi latérale, **caractérisé en ce qu'il** comprend en outre au moins une structure de collerette rigide ou semi-rigide (9) attachée au bord supérieur (2) de l'élément de paroi latérale (1) et **en ce que** le poids de papier de l'élément de fond (7) est supérieur au poids de papier de l'élément de paroi latérale (1).
2. Gobelet en papier selon la revendication 1, **caractérisé en ce que** le poids de papier de l'élément de fond (7) est compris entre 240 et 400 gsm.
3. Gobelet en papier selon l'une quelconque des revendications 1 ou 2, **caractérisé en ce que** le poids de papier de l'élément de paroi latérale (1) est compris entre 150 et 240 gsm.
4. Gobelet en papier selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la struc-

ture de collerette (9) consiste en une bague enfermée dans un bord supérieur roulé formant une boucle.

5. Gobelet en papier selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la structure de collerette (9) consiste en une bague bornée sur la surface arrière de l'élément de paroi latérale près de son bord supérieur.
6. Gobelet en papier selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** la structure de collerette (9) est une bague en plastique et/ou en métal.
7. Gobelet en papier selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** l'élément de paroi latérale (1) a une forme généralement trapézoïdale appropriée pour former un gobelet en papier tronconique et **en ce que** la structure de collerette (9) est une bague annulaire.
8. Gobelet en papier selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** la surface arrière et/ou la surface avant de l'élément de paroi latérale (1) et/ou l'élément de fond (7) sont recouverts d'un film biodégradable.
9. Gobelet en papier selon la revendication 8, **caractérisé en ce que** le film biodégradable se compose d'acide polylactique (PLA), de biopolymères ou de plastique biodégradable appropriés pour être compostés.
10. Gobelet en papier selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** la surface avant de l'élément de paroi latérale (1) est au moins partiellement gaufrée pour former du relief.

FIG.1.





REFERENCES CITED IN THE DESCRIPTION

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