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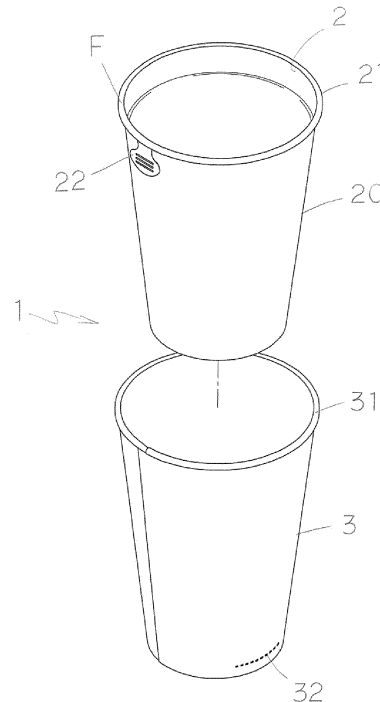
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(54) **IMPROVED STRUCTURE OF PAPER CUPS**

(57) The present invention provides an improved structure of paper cups, including a plastic fastener and a paper cup, the plastic fastener and the mouth of the paper cup are formed with an outwards curled edge respectively, the curled edge of the plastic fastener is a little larger than the curled edge of the paper cup, and covers the curled edge of the outer paper cup, so that the plastic fastener is integrated with the paper cup through the curled edges, and the plastic fastener is a plane on the top surface of the cup mouth, and the lower edge of the plastic fastener extends downwards to the bottom surface of the paper cup to form an airtight space; the curled edge of the plastic fastener is provided with an extension piece, so that the plastic fastener and the paper cup can be separated quickly and recycled; the lower edge of the paper cup is provided with some small holes for dissipating the heat of hot drinks.



[Fig. 3]

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Description

BACKGROUND OF INVENTION

1. Field of the Invention

[0001] The present invention relates generally to the structure of paper cups, and more particularly to an improved structure of a paper cup which forms a perfect plane at the mouth of the cup and is convenient for quick separation and disposal after use.

2. Description of Related Art

[0002] Disposable containers are commonly made of plastic or paper materials. Although plastic containers with a single-layer structure have the advantages of easy manufacture, lower cost and better leak resistance, they are not suitable for heat preservation. The manufacturing of paper containers requires more complex process and higher cost, but their leakproof effect and structural strength are not as good as that of plastic containers. Therefore, in order to obtain the desired insulation effect, it is necessary to adopt a multi-layer or thicker design, or add a foam insulation layer, that may lead to an extremely high cost.

[0003] As shown in Fig. 1, it is known that the conventional paper cup (4) made of paper will naturally form a non-plane with a difference in height due to the overlapping of the curled edge at the cup mouth, that is an insurmountable difficulty in paper cups; this kind of paper cup is often prone to liquid leakage or residual stains due to the height difference of the cup mouth, which is likely to cause inconvenience to the users.

SUMMARY OF THE INVENTION

[0004] The main object of the present invention is to provide an improved structure of paper cups, a plastic fastener is combined with a paper cup, and the plastic fastener forms an extension piece at the curled edge of the cup mouth, or the body of the paper cup is provided with an easy-to-tear strip, so as to achieve the effect of easy separation and recycling. There are some small holes in the outer layer, which are convenient for releasing the heat of hot drinks.

[0005] In order to attain the above goal, the inventor has designed an improved structure of paper cups, including: A plastic fastener and a paper cup; the plastic fastener and the mouth of the paper cup are formed with an outwards curled edge respectively, particularly, the curled edge of the plastic fastener is a little larger than the paper cup and covers the curled edge of the paper cup, and the top surface of the curled edge forms a flat surface, so that the plastic fastener is integrated with the paper cup through the curled edge, and the plastic fastener is a plane on the top surface of the cup mouth, and the lower edge of the plastic fastener extends downwards to the

bottom surface of the paper cup to form an airtight space, the curled edge of the plastic fastener is provided with an extension piece, and the lower edge of the paper cup is provided with some small holes.

5 **[0006]** In a preferred embodiment, the extension piece on the curled edge at the mouth of the film plastic inner cup can be formed in any geometric shape, including but not limited to: Any of teardrop, convex, circular, polygonal and rectangular.

10 **[0007]** In a preferred embodiment, an easy-to-tear strip is provided on the surface of the body of the paper cup.

[0008] In a preferred embodiment, the plastic fastener can be made of any one or a composite of Polypropylene (PP), Polystyrene (PS), Poly Lactic Acid (PLA), Polyethylene (PE), Polyethylene Terephthalate (PET).

15 **[0009]** In a preferred embodiment, the paper cup is made of recycled paper.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

20 Fig. 1 is the cross-section and partial enlarged view of a conventional paper cup.

25 Fig. 2 is the outside view of the improved structure of paper cups of the present invention.

Fig. 3 is the exploded view of the improved structure of paper cups of the present invention.

30 Fig. 4 is the partial cross-section and enlarged view of the improved structure of paper cups of the present invention.

Fig. 5 is the schematic diagram of service state of the improved structure of paper cups of the present invention.

35 Figs. 6 (A)(B)(C) are the exploded views of the improved structure of paper cups of the present invention.

40 Fig. 7 is the outside view of another structure of the improved structure of paper cups of the present invention.

Fig. 8 is the exploded view of another structure of the improved structure of paper cups of the present invention.

45 Figs. 9 (A)(B)(C) are the schematic diagrams of disassembly of another structure of the improved structure of paper cups of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

50 **[0011]** Please refer to Figs. 2~4, which disclose the exploded, combined and partial cross-sectional structures of the improved structure of paper cups in a preferred embodiment of the present invention. The improved structure of paper cups (1) comprises: a plastic fastener (2) and a paper cup (3); wherein the plastic fastener (2) and the mouth of the paper cup (3) are formed with an outwards curled edge (21, 31) respectively, the curled edge of the plastic fastener (2) is a little larger than

the curled edge (31) of paper cup (3) and covers the curled edge (31) of the paper cup (3), so that the plastic fastener (2) is integrated with the paper cup (3) through the curled edges (21, 31), and the top surface of the curled edge (21) of the plastic fastener (2) forms a flat surface (F), the lower edge of the plastic fastener (2) extends downwards as a plane (20) to the bottom surface of the paper cup (3) to form an airtight space, the curled edge (21) of the plastic fastener (2) is formed with an extension piece (22) in any geometric shape towards the bottom. In addition, the circumferential surface near the bottom edge of the paper cup (3) is provided with some small holes (32).

[0012] Based on environmental considerations, the ratio of the paper to plastic as raw materials of the improved structure of paper cups (1) is 7: 3 (i.e. the weight percentage is 70%: 30%), so that the paper cup (3) has better structural strength; and the proportion of paper is relatively high, so the recycled paper is selected as the best raw material, both environmental protection and cost are considered. In addition, the part in contact with the liquid is a plastic fastener (2), so it is unnecessary to worry about food hygiene or safety.

[0013] In terms of the materials of the said plastic fastener (2), including but not limited to: Any one or a composite of Polypropylene (PP), Polystyrene (PS), Poly Lactic Acid (PLA), Polyethylene (PE), Polyethylene Terephthalate (PET).

[0014] The extension piece (22) on the curled edge (21) of the plastic fastener (2) can be formed in any geometric shape, including but not limited to: teardrop-shaped, convex, circular, polygonal and rectangular.

[0015] In terms of assembly, the curled edge (21) of the plastic fastener (2) is unrolled by automatic processing before the paper cup (3) is inserted in, so that the curled edge (21) of the plastic fastener (2) covers the curled edge (31) of the paper cup (3), which are superimposed on each other, and the plane (F) formed by the plastic fastener (2) can completely avoid the liquid leak and residual stains resulted from the height difference of the mouth of a paper cup (3).

[0016] Please refer to Fig. 5, when a hot drink is loaded, such as coffee, the small holes (32) in the circumferential surface near the lower edge of the paper cup (3) can discharge hot air timely and conveniently.

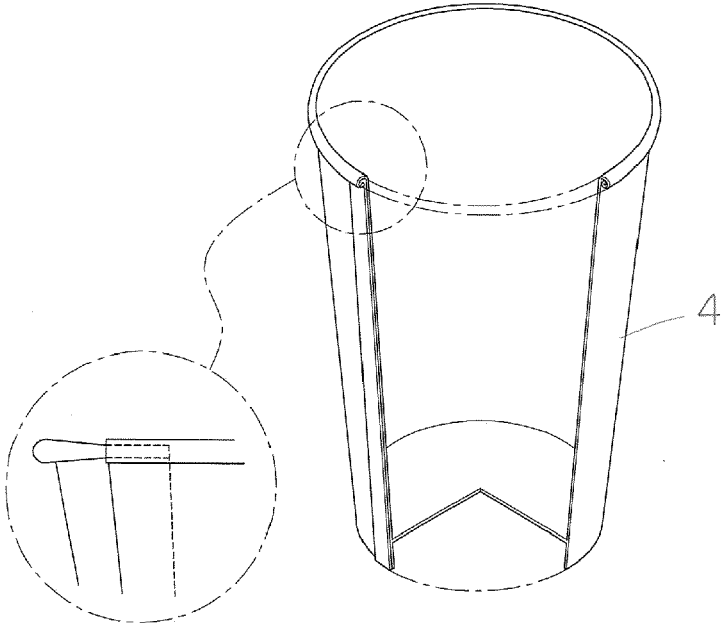
[0017] Please refer to Figs. 6 (A)(B)(C), the improved structure of paper cups (1) of the present invention directly combines the plastic and paper materials without gluing, the assembly is performed quickly. To discard the improved structure of paper cups (1) after use, the plastic fastener (2) can be easily and quickly separated from the paper cup (3) by using the extension piece (22), contributing to garbage sorting and recycling.

[0018] Please refer to Figs. 7~9(A)(B)(C), which disclose the improved structure of paper cups in a preferred embodiment of the present invention, including: A plastic fastener (2) and a paper cup (3); wherein the plastic fastener (2) and the mouth of the paper cup (3) are formed

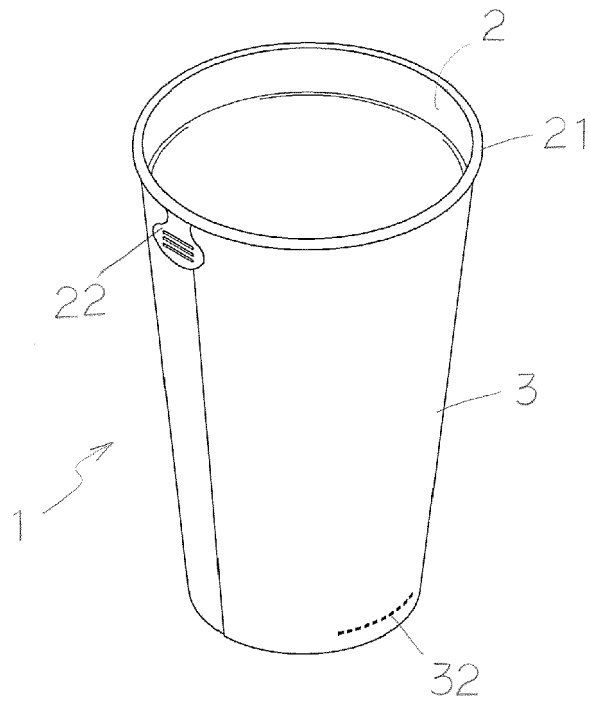
with an outwards curled edge (21, 31) respectively, the curled edge (21) of the plastic fastener (2) is a little larger than the curled edge (31) of paper cup (3) and covers the curled edge (31) of the paper cup (3), so that the plastic fastener (2) is integrated with the paper cup (3) through the curled edges (21, 31), and the top surface of the curled edge (21) of the plastic fastener (2) forms a flat surface (F), the lower edge of the plastic fastener (2) extends downwards as a plane to the bottom surface of the paper cup (3) to form an airtight space, the curled edge (21) of the plastic fastener (2) is formed with an extension piece (22) in any geometric shape towards the bottom, the circumferential surface of the lower edge of the paper cup (3) is provided with some small holes (32), and the circumferential surface of the paper cup (3) is provided with an easy-to-tear strip (33). When the improved structure of paper cups (1) is to be discarded after use, the paper cup (3) can be split easily by using the easy-to-tear strip (32) to take out the plastic fastener (2), contributing to waste sorting and recycling.

Claims

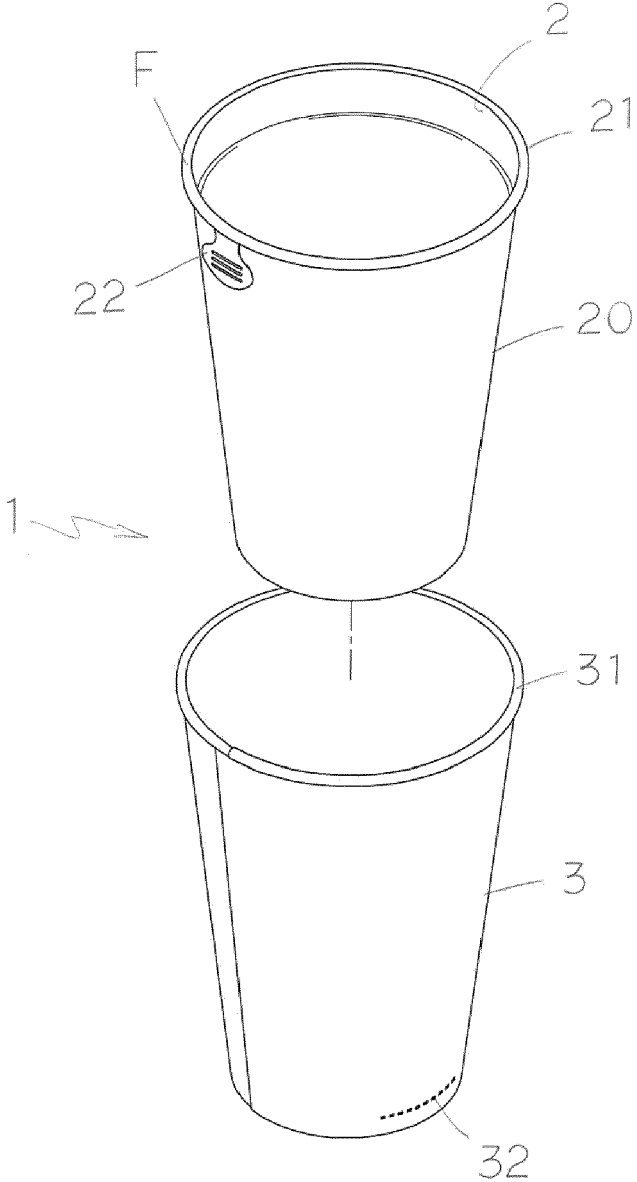
1. An improved structure of paper cups, including: a plastic fastener and a paper cup, wherein: the plastic fastener and the edge of the cup mouth are provided with an outwards curled edge respectively, the curled edge of the plastic fastener is larger than the curled edge of the paper cup and covers the curled edge of the paper cup; the curled edge of the plastic fastener provides an upward plane, features: there is an extension piece on the curled edge of the plastic fastener, which is used for separating the plastic fastener from the paper cup, and the lower edge of the paper cup is provided with some small holes for discharging hot air.
2. The improved structure of paper cups defined in Claim 1, wherein the extension piece includes but not limited to the following shapes: teardrop-shaped, convex, circular, polygonal and rectangular.
3. The improved structure of paper cups defined in Claim 1, wherein the surface of the paper cup is provided with an easy-to-tear strip.
4. The improved structure of paper cups defined in any of Claims 1 to 3, wherein the plastic fastener can be made of any one or a composite of Polypropylene (PP), Polystyrene (PS), Poly Lactic Acid (PLA), Polyethylene (PE), Polyethylene Terephthalate (PET).
5. The improved structure of paper cups defined in any of Claims 1 to 3, wherein the paper cup is made of recycled paper.



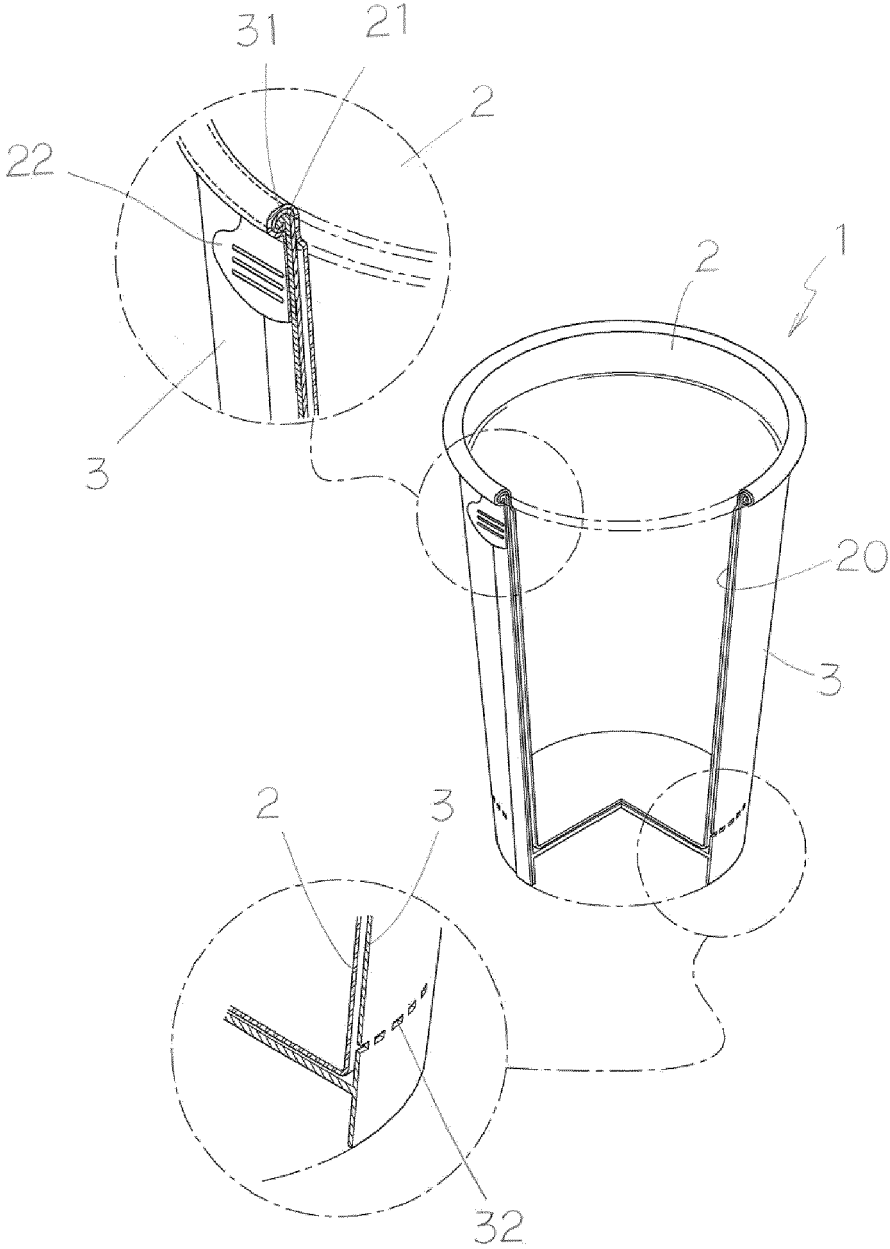
[Fig. 1]



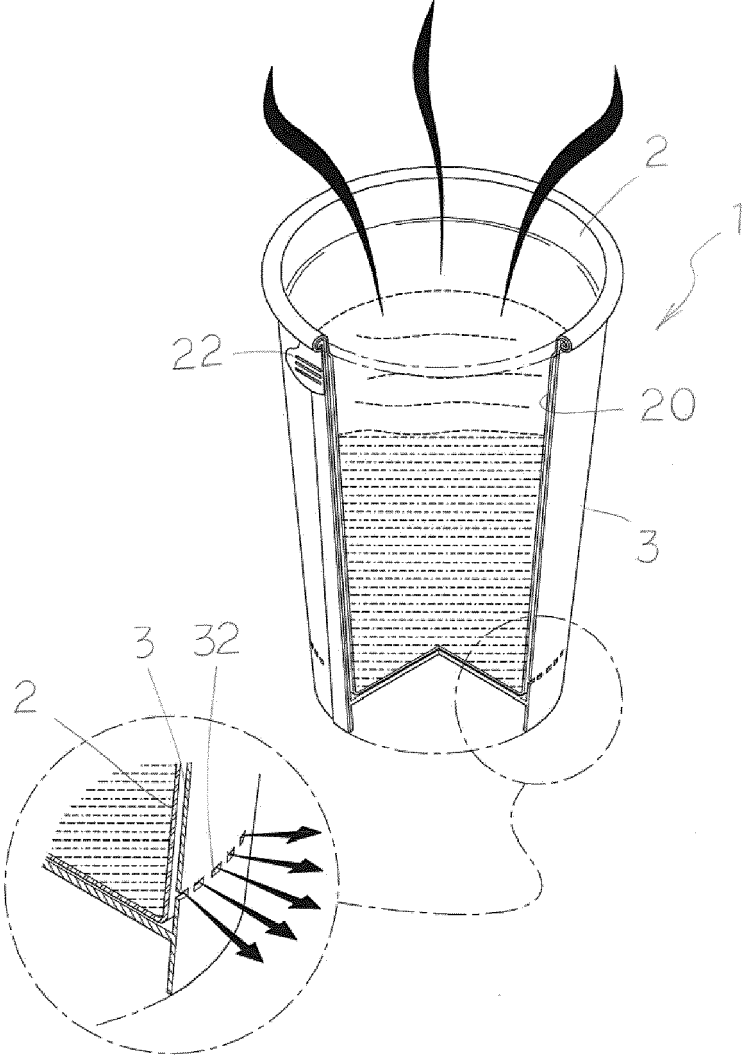
[Fig. 2]



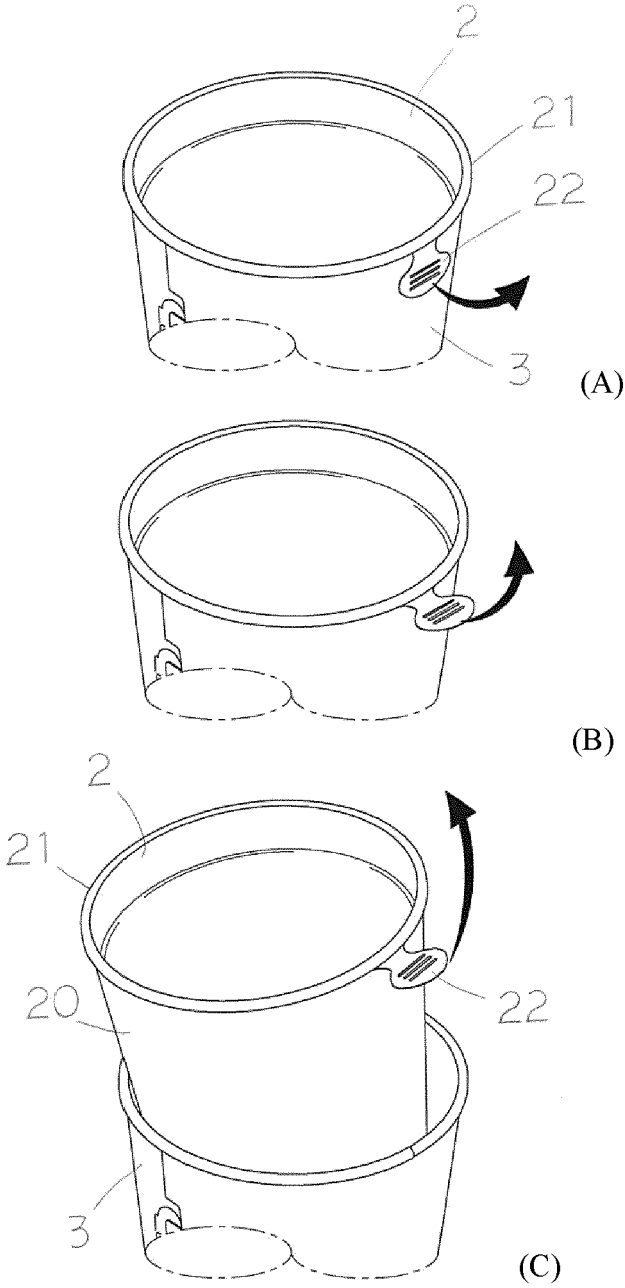
[Fig. 3]



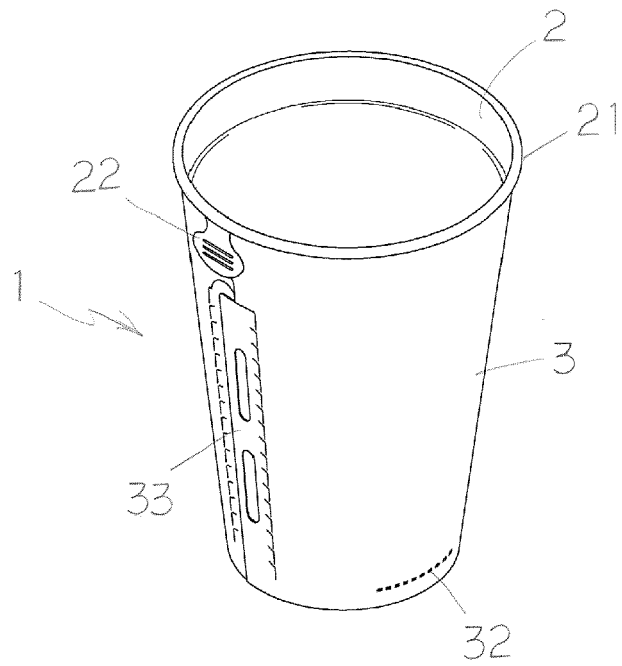
[Fig. 4]



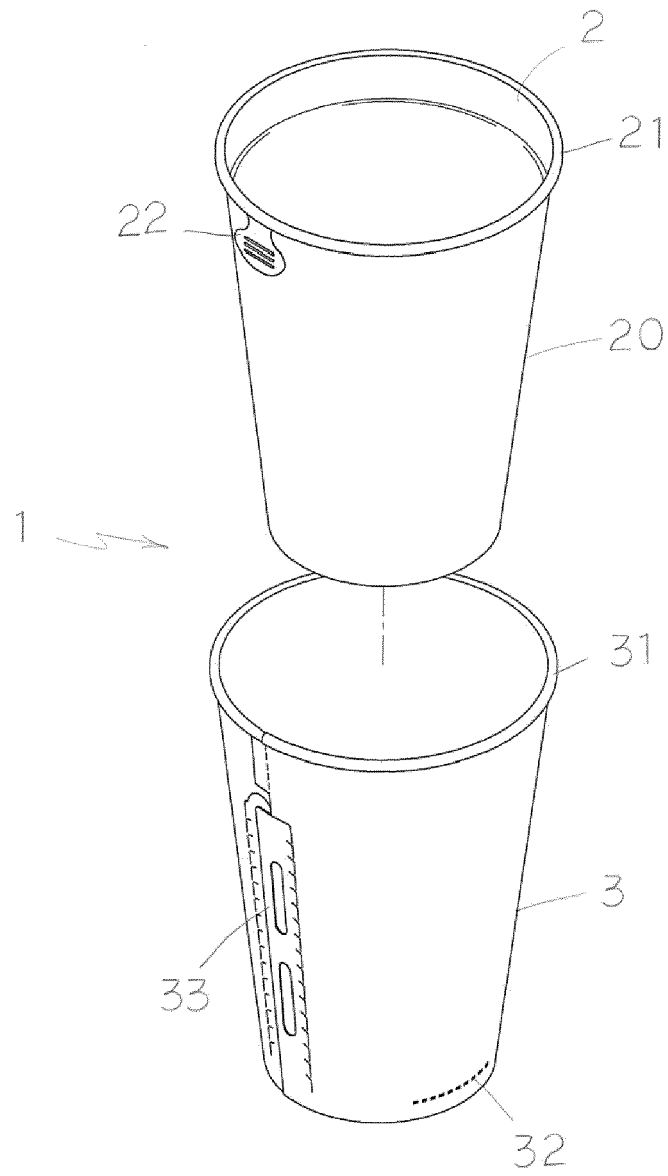
[Fig. 5]



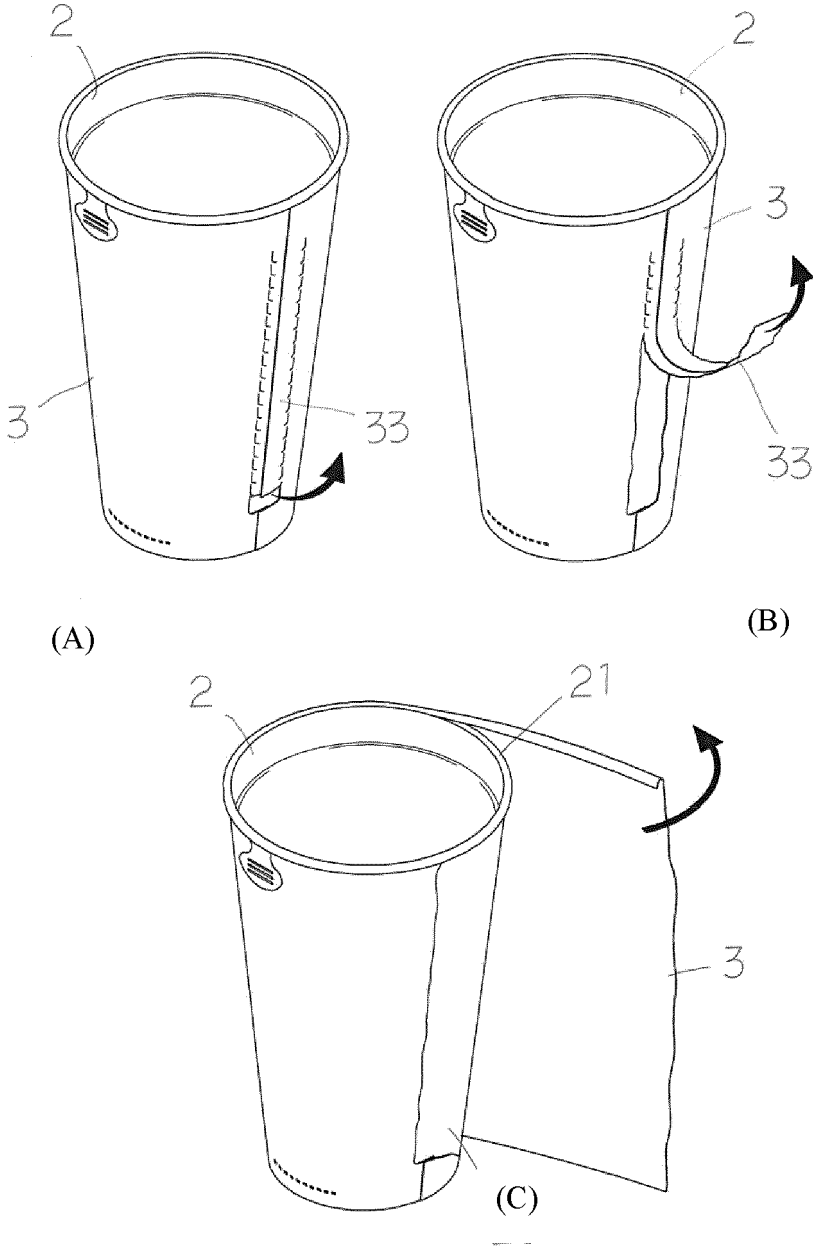
[Fig. 6]



[Fig. 7]



[Fig. 8]



[Fig. 9]



EUROPEAN SEARCH REPORT

Application Number

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DOCUMENTS CONSIDERED TO BE RELEVANT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 2 803 598 A1 (GUO TZER-HUANG [TW]) 19 November 2014 (2014-11-19) * paragraph [0017]; figures 1-6 *	1-5	INV. B65D81/38
A	US 2010/264201 A1 (SMITH STEPHEN ALAN [US] ET AL) 21 October 2010 (2010-10-21) * figure 11 *	1-5	
A	US 7 056 563 B2 (WEYERHAEUSER CO [US]) 6 June 2006 (2006-06-06) * column 2, line 58; figure 2 *	1-5	
Y	KR 200 344 484 Y1 (UNKNOWN) 11 March 2004 (2004-03-11) * element 12a; figures 3, 4 *	1-5	
Y	US 2017/196383 A1 (SHOAGA TAJU [US]) 13 July 2017 (2017-07-13) * see element 20 *	1-5	
Y	US 5 025 981 A (SCHELLENBERG WALTER [CH]) 25 June 1991 (1991-06-25) * figures 4, 5 *	3	
A	US 2018/044084 A1 (ORLER ANTHONY J [US]) 15 February 2018 (2018-02-15) * element 406; figures 1, 2 *	1-5	
A	US 2010/237069 A1 (HELOU JR ELIE [US] ET AL) 23 September 2010 (2010-09-23) * paragraphs [0012] - [0013]; figure 1 *	1-5	
A	US 2023/150713 A1 (ROSELL JOHAN [SE]) 18 May 2023 (2023-05-18) * figures 1-5 *	1-5	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 December 2023	Examiner Dominois, Hugo
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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ANNEX TO THE EUROPEAN SEARCH REPORT
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2803598 A1	19-11-2014	DK 2803598 T3	03-04-2017
		EP 2803598 A1	19-11-2014
		ES 2618890 T3	22-06-2017
		HU E032500 T2	28-09-2017
		PL 2803598 T3	31-07-2017
		PT 2803598 T	30-03-2017
US 2010264201 A1	21-10-2010	AR 047625 A1	01-02-2006
		CA 2542905 A1	16-01-2005
		GB 2426045 A	15-11-2006
		PA 8618201 A1	25-11-2005
		TW I308549 B	11-04-2009
		US 2005115975 A1	02-06-2005
		US 2010264201 A1	21-10-2010
WO 2005054082 A1	16-06-2005		
US 7056563 B2	06-06-2006	NONE	
KR 200344484 Y1	11-03-2004	NONE	
US 2017196383 A1	13-07-2017	NONE	
US 5025981 A	25-06-1991	AT E94828 T1	15-10-1993
		CA 2021035 A1	15-01-1991
		CH 678938 A5	29-11-1991
		DK 0408515 T3	07-02-1994
		EP 0408515 A1	16-01-1991
		ES 2045882 T3	16-01-1994
		JP 2509655 Y2	04-09-1996
		JP H0323014 U	11-03-1991
		US 5025981 A	25-06-1991
US 2018044084 A1	15-02-2018	CA 3008928 A1	21-08-2018
		CA 3034946 A1	21-08-2018
		CA 3060750 A1	21-08-2018
		EP 3573902 A1	04-12-2019
		IS 050228 A	15-01-2020
		US 2018044084 A1	15-02-2018
		US 2018297759 A1	18-10-2018
		US 2018297760 A1	18-10-2018
		US 2019177064 A1	13-06-2019
		WO 2019036096 A1	21-02-2019
US 2010237069 A1	23-09-2010	EP 2389327 A1	30-11-2011
		TW 201043546 A	16-12-2010
		US 2010237069 A1	23-09-2010

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15-12-2023

	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
10			US 2013228575 A1	05-09-2013
			WO 2010085504 A1	29-07-2010
15	US 2023150713 A1	18-05-2023	CA 3175972 A1	28-10-2021
			EP 4139216 A1	01-03-2023
			US 2023150713 A1	18-05-2023
			WO 2021214002 A1	28-10-2021
20				
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40				
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