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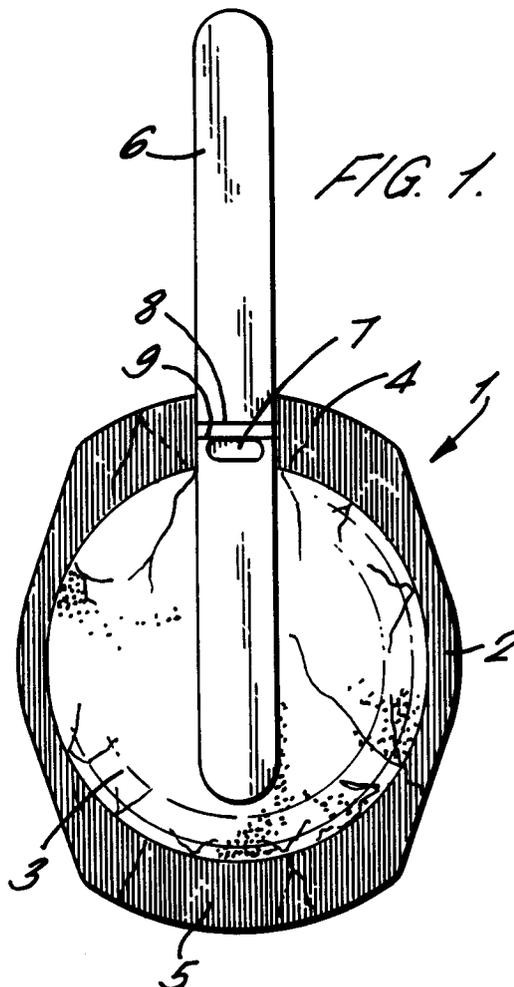
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⑸④ **Beverage infusion device.**

⑸⑦ A disposable beverage infusion device (1) which comprises a body portion having a first part and a second part which are joined together around the edges (2) thereof, at least one of the parts being permeable to liquids and the body portion providing a receptacle (3) for the beverage ingredient or ingredients, the body portion having a handle (6) sealed thereto characterised in that the body portion is provided with two diametrically opposed ears (4,5) which, in use, assist in positively locating the infusion device in a recess beneath the base of a cup, the ears overlapping the edges of the recess, and the handle having a density of less than 0.9 g/cm<sup>3</sup>.



The present invention relates to a beverage infusion device and, in particular, to a bag containing leaf tea or ground coffee which is intended to provide an infusion of tea or coffee, respectively, by placing the bag in a cup or pot and adding hot water thereto.

Vending machines which dispense beverage ingredients for reconstitution into hot or cold drinks are well known in the art. The coffee which is dispensed by such vending machines is usually so-called "instant" coffee and the tea which is dispensed by such machines is usually instant tea. The drinks formed by reconstituting the instant coffee and instant tea with hot water are not acceptable to all consumers and there has therefore been a need for a system whereby infusion of leaf tea and ground coffee can be provided in vending machines.

In EP-A-0158511 we describe a beverage infusion device having a round body portion providing a receptacle for the beverage ingredient or ingredients, and a handle passing transversely through the body portion. This was formed of a stiff material such as metal. The beverage infusion device of this type suffered, in use, a disadvantage in that the handle could not always be guaranteed to present itself to the user after the addition of water.

We have now developed a beverage infusion device which mitigates or overcomes the problems associated with the prior art devices.

Accordingly, the present invention provides a disposable beverage infusion device which comprises a body portion having a first part and a second part which are joined together around the edges thereof, at least one of the parts being permeable to liquids and the body portion providing a receptacle for the beverage ingredient or ingredients, the body portion having a handle sealed thereto characterised in that the body portion is provided with two diametrically opposed ears which, in use, assist in passively locating the infusion device in a recess beneath the base of a cup, the ears overlapping the edges of the recess, and the handle having a density of less than 0.9 g/cm<sup>3</sup>.

Preferably, the body portion of the beverage infusion device is generally elliptical. The body portion is made from a water-permeable material, preferably a water-permeable cellulosic material, preferably cellulosic fibres, cellulosic fibres comprising paper fibres being particularly preferred. The cellulosic fibres may be admixed with fibres of polypropylene, polyvinylchloride and/or polyethylene. The incorporation of these plastic materials into the cellulosic material renders the cellulosic material heat-sealable. The body portion may also be made from a water-permeable synthetic material, for example a spun-bonded polyester web sold under the Trade Name REMAY, a spun-bonded nylon web sold under the Trade Name CEREX or a spun-bonded non-woven polypropylene sold under the Trade Mark COROVIN.

The ears of the body portion extend beyond the receptacle for the beverage ingredient or ingredients to an extent such that, in use, the ears will overlap the edges of a recess formed beneath the base of a cup. This, together with careful selection of the radius used for the central portion of the body greatly assists in the correct location of the beverage infusion device across the recess. In this manner, the beverage infusion device for a particular cup in a stack is provided by being located in the recess of the base of the cup above it in the stack as formed and used in a beverage dispensing machine.

In a preferred aspect of the invention, the first part and second part of the body portion are joined together around the edges thereof by heat-sealing and it is further preferred to join the handle to the body portion by heat sealing, for example by means of at least one spot weld.

The cellulosic material may also be coated with a material which is activated by heat and/or pressure. In such a case the parts of the body portion may be joined together by the application of heat and/or pressure. When the cellulosic material is coated with a material which is activated by both heat and pressure, then if a low temperature is used a higher pressure is required to effect the sealing than if a high temperature is used when a lower pressure is required.

The handle which is used in the beverage infusion device of the present invention has a density of less than 0.9 g/cm<sup>3</sup>, so that when a beverage is prepared by the addition of water to a cup containing the beverage infusion device, the handle floats and presents itself to the user. The handle preferably has a density of 0.3 to 0.5 g/cm<sup>3</sup>. The handle is preferably made from polystyrene. The polystyrene may be mixed or co-extruded with another thermoplastic material such as polyethylene, polypropylene or polyester based polymer. Other thermoplastic or blown thermoplastic materials may also be used provided that they have a density of less than 0.9 g/cc.

The handle is preferably in the form of a strip of about 1 centimetre in width. The length of the handle will be adjusted to the particular intended use of the beverage infusion device, for example if the device is to be used in a cup then the handle will be of the order of from 5 to 8 centimetres in length. The handle is preferably formed with one or more crease lines formed therein adjacent the heat seal to the body portion or is provided with a formed area, so that the handle will readily bend around the crease line or formed area. In this manner, with the beverage infusion device in the recess at the bottom of a cup, the handle can be readily placed against the wall of the cup as a stack of cups is formed.

The handle on the beverage infuser of the present invention also has an added advantage in that the parts of the handle either side of the hinge may be squeezed together, so that at least some of the bev-

erage remaining in the beverage infusion device may be squeezed out. Furthermore, the parts of the handle on either side of the hinge are advantageous in that one of the handle parts will be presented to the user even if the device flips over.

When the beverage infusion device of the present invention is placed in a cup and water added thereto, infusion is possible without the need for a spoon or other means of agitation. The handle is sufficiently stiff to allow the infuser to be swirled or dunked through the liquid. The beverage infusion device may also be used for white beverage preparation which permits both the infusion of the beverage and the dispersion of the whitener. The beverage infusion device may also be used for the preparation of sweetened drinks by including sugar in the beverage ingredients.

The present invention also includes within its scope a cup which contains therein a disposable beverage infusion device of the invention. In another aspect the invention provides a stack of cups wherein each cup contains therein a disposable beverage infusion device as above defined. In this latter embodiment the handle of the beverage infusion must be sufficiently flexible to allow the nesting of non-interlocking cups.

The present invention also includes within its scope a method of forming a stack of cups as defined above, which method comprises placing a disposable beverage infusion device as defined herein in a recess formed beneath the base of a cup, the cup being in an inverted position, and stacking a plurality of cups with associated infusion devices one on top of the other to form the said stack. The stack of cups may, if desired, be wrapped with a sheet material.

The beverage infusion device of the invention preferably contains leaf tea or ground coffee as the, or one of the, beverage ingredient(s), although it can be used for the packaging of other beverage ingredients such as chocolate and fruit drinks.

The present invention will be further described by way of example and with reference to Figures 1 to 4 of the accompanying drawings in which:

Figure 1 is a plan view of a beverage infusion device according to the invention;

Figure 2 is a side view of a beverage infusion device of the invention;

Figure 3 is a side elevation of a cup with a recess beneath the base, the recess having a beverage infusion device of the invention located therein; and

Figure 4 is a part sectional view of a cup according to Figure 3 stacked above another similar cup and with the beverage infusion device of the invention located in the recess between the base of each cup.

The beverage infusion device comprises a body portion generally shown at 1 having first and second

parts which are joined together around the edges thereof at 2, thus providing a receptacle 3 for the beverage ingredient or ingredients. The body portion is provided with two diametrically opposed ears 4 and 5 which give the beverage infusion device a generally elliptical shape. The ears 4 and 5 are formed in the parts of the body portion which are joined together around the edges. A handle 6 is heat sealed to one ear 4 of the body portion by means of a heat seal 7. Adjacent to the heat seal are crease lines 8 and 9. The handle is preferably made from polystyrene which may be mixed or co-extruded with other thermoplastic materials. The handle may be folded about the crease lines 8 and 9 and this enables the beverage infusion device as shown in Figures 1 and 2 to be incorporated into stacking cups as is best shown in Figures 3 and 4.

Referring to Figures 3 and 4, a cardboard, paper or plastic cup is generally shown at 10. The cup 10 is shown in inverted position for the sake of clarity. The cup 10 has a recess formed in the base thereof in which a beverage infusion device 1 according to the invention is located.

As best shown in Figure 4, two cups 12 and 13 are formed into a stack. Cup 12 has a recess 14 formed in the base thereof whilst cup 13 has a recess 15 formed in the base thereof. In recess 14 a beverage infusion device 16 is positioned and in recess 15 a beverage infusion device 17 is positioned. The ears 18 and 19 on the beverage infusion device 16 assist in locating this device correctly on the recess 14 of the cup 12 and overlap the bottom edges of the side walls of the recesses 14 and 15. The handle 20 of the infusion device 16 is shown bent around the corner of the recessed base. The flexibility of the handle on the beverage infusion device of the invention and the folding around the crease lines formed in the handle thus enables one cup to be stacked inside another, with the handle of the infusion device extending up the side of the next cup in the stack. This is best shown in Figure 4 with reference to the infusion device 17. It will be noted that the handle 21 of this device extends along the inside of the wall 22 of cup 12.

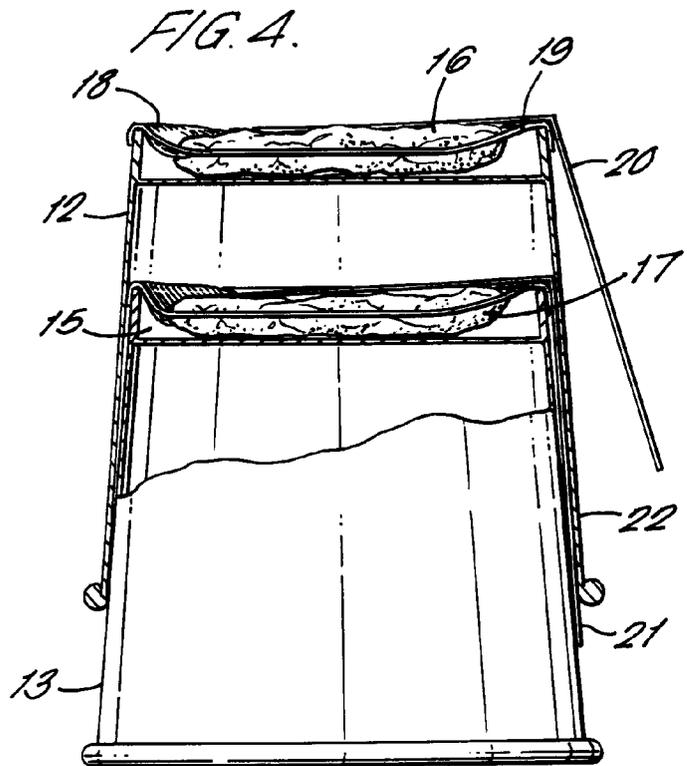
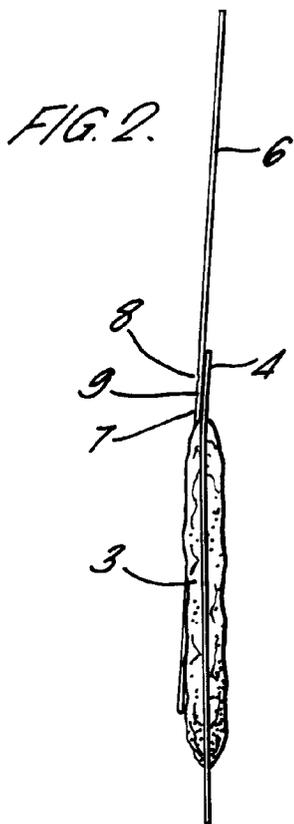
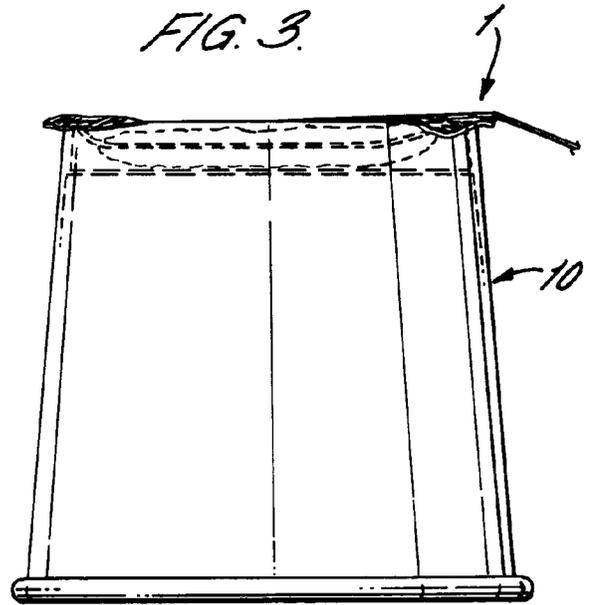
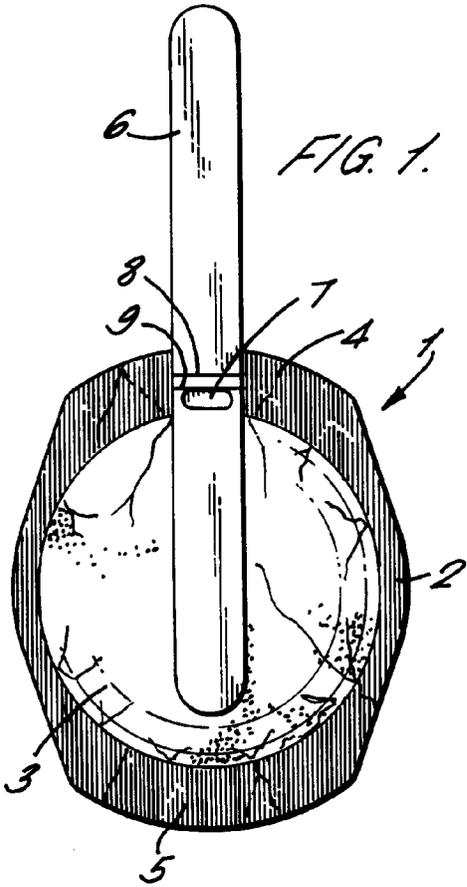
In use, the stack of cups will be inverted and the beverage infusion device located in the recess of cup 13 will in fact be used in combination with cup 12.

The infusion device contains a beverage ingredient or ingredients, for example leaf tea or ground coffee, together with a whitener and/or sugar, if desired.

## Claims

1. A disposable beverage infusion device which comprises a body portion having a first part and a second part which are joined together around the edges thereof, at least one of the parts being

- permeable to liquids and the body portion providing a receptacle for the beverage ingredient or ingredients, the body portion having a handle sealed thereto characterised in that the body portion is provided with two diametrically opposed ears which, in use, assist in positively locating the infusion device in a recess beneath the base of a cup, the ears overlapping the edges of the recess, and the handle having a density of less than 0.9 g/cm<sup>3</sup>. 5
2. A disposable beverage infusion device as claimed in claim 1 wherein the handle has a density of 0.3 to 0.5 g/cm<sup>3</sup>. 10
3. A disposable beverage infusion device as claimed in claim 1 or claim 2 wherein the handle is formed from polystyrene or polystyrene co-extruded or admixed with another thermoplastic material. 15
4. A disposable beverage infusion device as claimed in any one of the preceding claims wherein the body portion has a generally elliptical shape. 20
5. A disposable beverage infusion device as claimed in any one of the preceding claims wherein the body portion is made from a water-permeable cellulosic material. 25
6. A disposable beverage infusion device as claimed in claim 5 wherein the water-permeable material comprises a mixture of cellulosic fibres and thermoplastic fibres. 30
7. A disposable beverage infusion device as claimed in claim 6 wherein the cellulosic fibres are mixed with fibres of polypropylene, polyvinylchloride and/or polyethylene. 35
8. A disposable beverage infusion device as claimed in any one of the preceding claims wherein the first part and second part of the body portion are joined together by heat sealing. 40
9. A disposable beverage infusion device as claimed in any one of the preceding claims wherein the handle is joined to the first part and second part of the body portion by heat sealing. 45
10. A disposable beverage infusion device as claimed in any one of the preceding claims which contains leaf tea or ground coffee therein. 50
11. A cup containing therein a disposable beverage infusion device as claimed in any one of the preceding claims. 55
12. A stack of cups wherein each cup contains therein a disposable beverage infusion device as claimed in any one of claims 1 to 11.
13. A method of forming a stack of cups as claimed in claim 12, which method comprises placing a disposable beverage infusion device as claimed in claim 1 in a recess formed beneath the base of a cup, the cup being in an inverted position, and stacking a plurality of cups with associated infusion devices one on top of the other to form the said stack.
14. A method as claimed in claim 13 wherein the stack of cups is wrapped with a sheet material.





European Patent  
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 30 3959

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	EP-A-0 158 511 (GENERAL FOOD LIMITED) * the whole document * ---	1-14	B65D81/00 B65D21/02 B65D77/24
A	US-A-3 920 120 (A.P.SHVEDA) * abstract; figures * ---	1	
A	GB-A-2 028 635 (COMPACT INDUSTRIES) * abstract; figures 1,3 * ---	1,13,14	
A	DE-A-1 532 414 (K.GRIMM) * page 6, paragraph 1; figures * ---	1	
A	FR-A-2 323 589 (MIRANDA LARUCCEA) * figures * ---	1,4	
A,P	FR-A-2 673 606 (J.LANGEVIN) * abstract; figures * -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
Place of search	Date of completion of the search	Examiner	
THE HAGUE	23 SEPTEMBER 1993	Amedeo ZANGHI	
CATEGORY OF CITED DOCUMENTS		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	
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			

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