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(54) Beverage packages.

(57) A sealed beverage package containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package (1) having an outlet nozzle (2) formed therein which is surrounded by a wall (3) onto which is sealed an air- and water-impermeable material (5) covering the outlet nozzle (2), the beverage package (1) having a trough (6) formed between the outlet nozzle (2) and at least a part of the said surrounding wall, the said trough (6) being adapted to receive therein the air- and water-impermeable material (5) covering the outlet nozzle (2) when, in use of the package to prepare a beverage, the said material (5) covering the outlet nozzle (2) is partially cut around the nozzle (2) to form a flap and the flap folded away from the outlet nozzle during the formation of an outlet (4) in the said package.

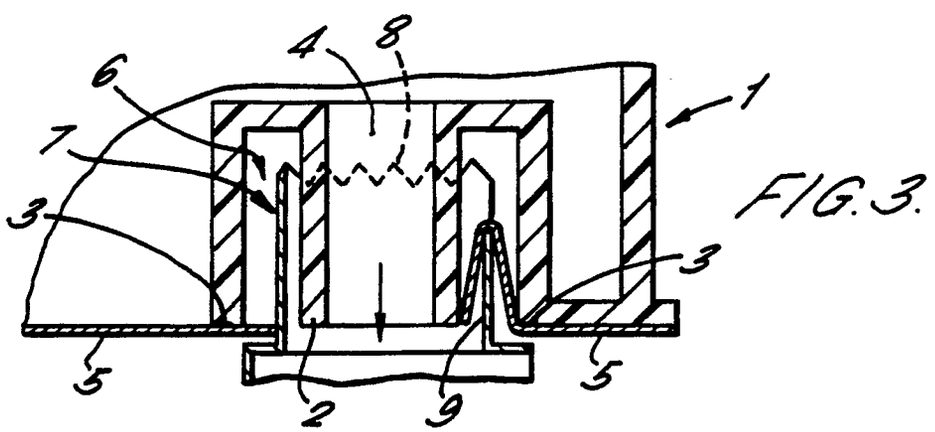

FIG. 3.

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BEVERAGE PACKAGES

The present invention relates to beverage packages and, in particular, to sealed beverage packages which are formed from a substantially air-and water-impermeable material and which contain one or more ingredients for the preparation of beverages.

The production of freshly brewed tea or coffee involves contacting tea leaves or roast and ground coffee with hot water and separating the beverage from the tea leaves or coffee grounds. Various methods for the production of freshly brewed coffee or tea are well known. For example, tea is prepared traditionally in a teapot, the tea leaves being immersed in boiling water and allowed to stand before being poured from the pot. Freshly brewed coffee may be prepared by the continuous passage of hot water through roast and ground coffee contained in a filter and the coffee collected in a jug or other receptacle, or by percolation which involves the continuous recycling of water through the roast and ground coffee.

It has previously been proposed to seal fresh roast and ground coffee or tea leaves in individual air-impermeable packages. For example, cartridges or capsules containing compacted ground coffee are known for use in certain coffee making machines which are generally termed "espresso" machines. In the production of coffee using these coffee machines the coffee cartridge is placed in a brewing chamber and hot water is generally caused to pass under pressure through the cartridge, thereby extracting the aromatic coffee constituents from the ground coffee and producing a coffee beverage.

Cartridges containing roast and ground coffee in which hot water flows under gravimetric force through the cartridge are also known. A cartridge of this general type is described in British Patent No. 1397116.

In our European Patent Application No. 87311325.2 there is described a package which contains at least one beverage preparation ingredient e.g. roast and ground coffee. In a preferred embodiment the package is formed from a substantially air-and water-impermeable material and comprises a sealed body portion having a compartment containing the beverage ingredient and outlet means designed so that the beverage produced, in use, is filtered thereby avoiding the necessity for an external filter.

There is also described in Application No. 87311325.2, a method for preparing a beverage which comprises positioning a beverage containing package at a brewing station, introducing water through water introduction means into the package, allowing the water to commingle with the beverage ingredient, and collecting the beverage so-formed through an outlet formed in the package.

The beverage packages and cartridges as described above generally have an area which is adapted, when in use, to form an outlet for the beverage from the package. The outlet of the package or cartridge may be designed to be opened, in use, by the user for example, by means of tear strings, tear strips or peelable tabs. Alternatively, the package of cartridge may be designed for use with a machine in which the outlet of the package is opened automatically by cutting or piercing a material covering the outlet opening.

The outlet formed automatically in packages and cartridges as described above by means of a machine cutting or piercing the material having the outlet opening suffers from the disadvantage that the beverage tends to sputter and splash from the outlet.

In our co-pending British Patent Application No. 8806667 we described a beverage package with a sealed outlet having a counterbore in which the piercing action of the cutting or piercing tool folds inwardly the material surrounding the opening formed by the tool whereby the material lies within the counterbore of the outlet.

We have now developed a beverage package with a different outlet arrangement in which the outlet has a trough adjacent the outlet, and the piercing action of the tool folds the material covering the outlet into the trough thereby moving the material out of the path of the beverage which emerges through the outlet.

Accordingly, the present invention provides a sealed beverage package containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package having an outlet nozzle formed therein which is surrounded by a wall onto which is sealed an air- and water-impermeable material covering the outlet nozzle, the beverage package having a trough formed between the outlet nozzle and at least a part of the said surrounding wall, the said trough being adapted to receive therein the air- and water-impermeable material covering the outlet nozzle when, in use of the package to prepare a beverage, the said material covering the outlet nozzle is partially cut around the nozzle to form a flap and the flap folded away from the outlet nozzle during the formation of an outlet in the said package.

The outlet nozzle of the beverage package is preferably covered by a rupturable air- and water-impermeable material which has appropriate dead-

fold characteristics so that on cutting the material around and folding the material away from the outlet nozzle the material will remain folded in the trough adjacent the outlet nozzle. Appropriate materials are aluminium foil or a laminated material. Specific examples of materials which can be used are aluminium foil having a thickness in the range from 30 to 60 micrometres coated with a layer of polypropylene or a polypropylene/vinyl lacquer.

The beverage packages of the present invention may contain, for example, leaf tea or roast and ground coffee as the beverage preparation ingredient. A beverage is prepared from the beverage package by means of a brewing machine and the outlet to the package is formed in the beverage package during the brewing cycle.

The wall which surrounds the outlet nozzle and onto which the air- and water-impermeable material is sealed may be of any desired configuration, although it is preferred that the wall should be square, rectangular or circular. The air- and water-impermeable material should be sealed tautly to the said surrounding wall so that the material can be cut cleanly and efficiently by a cutting tool during the formation of the outlet in the beverage package. Preferably a single cutting tool both cuts the air-and water-impermeable material around the outlet nozzle and folds the cut flap portion into the trough adjacent the outlet nozzle. The piercing or cutting tool should be designed so that it does not completely cut the air- and water impermeable material around the outlet nozzle since in such circumstances the cut material would fall into the consumers cup.

It will be understood that the trough adjacent to the outlet nozzle should be of a depth sufficient to receive therein the air- and water-impermeable material covering the outlet nozzle when it is folded away from the outlet nozzle. Accordingly, the depth B of the trough is related to the width of the flap of material partially cut around the outlet nozzle by the cutting tool such that 2B is greater than these or equal to the width of the said flap A. The trough preferably surrounds the outlet nozzle.

The wall which surrounds the outlet nozzle and onto which the air- and water-impermeable material is sealed is preferably either at the same level as the outlet nozzle, or stands slightly proud of the outlet nozzle so that the outlet nozzle does not inadverently damage the air- and water-impermeable material which covers the nozzle and which is sealed to the said wall.

The present invention will be further described with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of the underneath of a capsule according to the invention;

Figure 2 is a section along line X-X of Figure 1; and

Figure 3 is a section along line X-X of Figure 1 during the opening of the outlet in the capsule.

Referring to the drawings, a beverage package according to the invention is generally shown at 1. The package has an outlet nozzle 2 which is shown in chain dotted lines in Figure 1. Surrounding the outlet nozzle 2 is a wall 3, also shown in chain dotted lines in Figure 1. The outlet nozzle 2 has an outlet aperture 4 through which the beverage prepared in the package flows. The outlet aperture 4 is covered by an aluminium foil 5 which is sealed to the wall 3 but not to the outlet nozzle 2.

Only the outlet of the beverage package is depicted in detail in the drawings. The beverage package may be, for example, a package of the type as described in detail in our European Patent Application No. 87311325.2.

Surrounding the outlet nozzle 2 is a trough 6, which is also covered by the aluminium foil 5 before the opening of the outlet in the capsule.

As shown in Figure 3, the outlet in the capsule is opened by a cutting tool 7 which is of generally tubular construction. The cutting tool 7 is mounted on a platen or the like which is not shown in the drawings. The cutting tool 7 comprises an open ended cylinder of D cross-section having dimensions larger than the external dimensions of outlet nozzle 2. The arcuate portion 8 of the upper end of the tool 7 is serrated to pierce and eventually to cut foil 5, without removing any foil. The straight bar portion 9 of the tool is cut back longitudinally of the cylinder at least to the base of the teeth of the serrated portion to fold or pull the cut foil away from outlet aperture 4 before the coffee is dispensed therethrough. The cutting tool 7 pierces the beverage package 1 externally of the outlet nozzle 2 as it is raised by means not shown. The cutting tool rests in trough 6. The cutting tool 7 opens the outlet aperture in the beverage package by piercing and eventually cutting the foil 5 and folding it back into the trough 6. Thereby both the cut material and the cutting tool 7 are held out of the path of the beverage to be dispensed through the outlet nozzle 2.

The cutting tool and the method of forming the outlet opening in the beverage package and more fully described in our co-pending Patent Application (BWT Reference 31231/001).

Claims

1. A sealed beverage package containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package (1) having an outlet nozzle (2) formed therein which is sur-

rounded by a wall (3) onto which is sealed an air- and water-impermeable material (5) covering the outlet nozzle (2), the beverage package (1) having a trough (6) formed between the outlet nozzle (2) and at least a part of the said surrounding wall, the said trough (6) being adapted to receive therein the air- and water-impermeable material (5) covering the outlet nozzle (2) when, in use of the package to prepare a beverage, the said material (5) covering the outlet nozzle (2) is partially cut around the nozzle (2) to form a flap and the flap folded away from the outlet nozzle during the formation of an outlet (4) in the said package.

2. A package as claimed in claim 1 wherein the air- and water-impermeable material (5) covering the outlet nozzle (2) has appropriate deadfold characteristics so that on formation of the outlet (4) in the package it will remain folded in the trough (6) adjacent the outlet nozzle (2).

3. A package as claimed in claim 2 wherein the air- and water-impermeable material is aluminium foil or a laminated material.

4. A package as claimed in any one of the preceding claims wherein the wall (3) surrounding the outlet nozzle is square, rectangular or circular.

5. A package as claimed in any one of the preceding claims wherein the depth B of the trough (6) is related to the width A of the flap such that $2B \geq A$.

6. A package as claimed in any one of the preceding claims wherein the trough (6) totally surrounds the outlet nozzle (2).

FIG. 1.

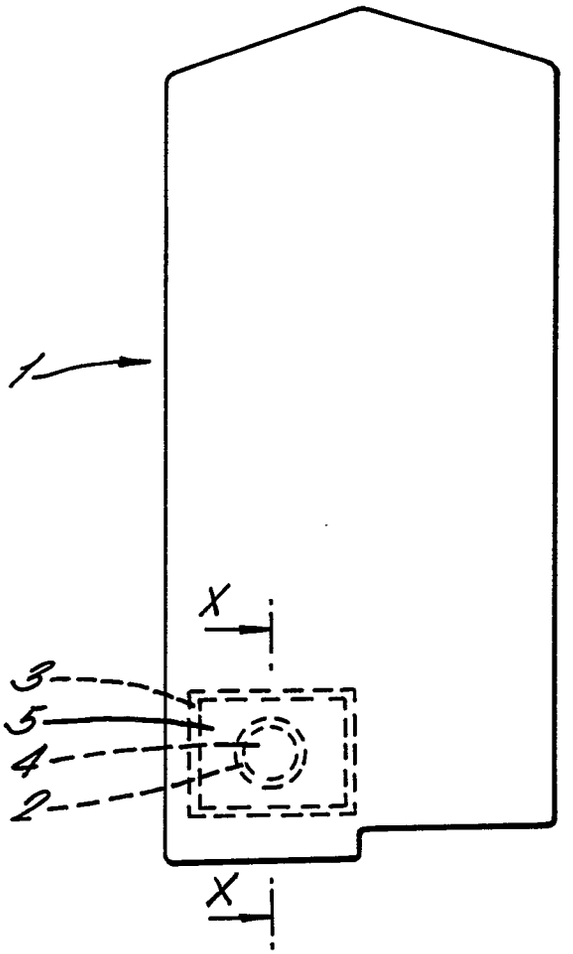
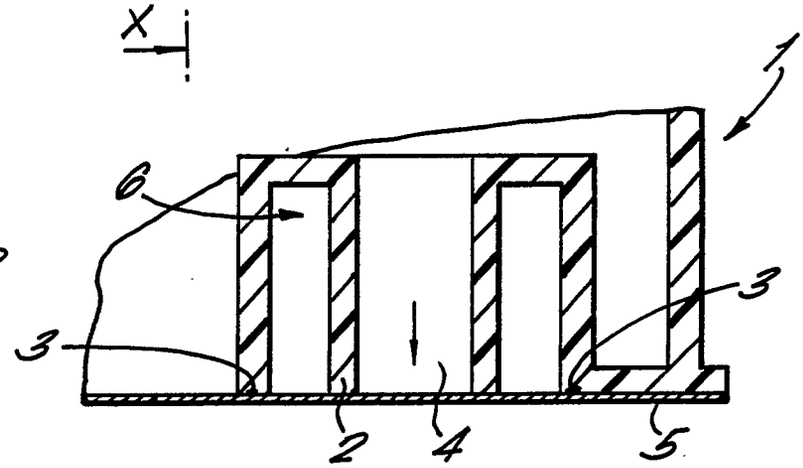


FIG. 2.



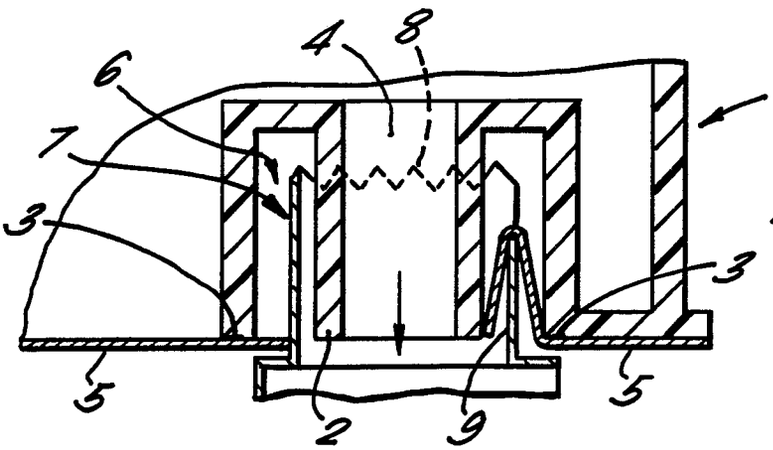


FIG. 3.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 2339

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)
P,X	EP-A-334572 (GENERAL FOODS LIMITED) * column 13, line 41 - column 17, line 12; claims 5, 20, 21 *	1-6	B65D81/34 A47J31/40
P,X	EP-A-334571 (GENERAL FOODS LIMITED) * column 12, line 49 - column 16, line 19 *	1-6	
A	US-A-2778739 (RODTH JOSEPH J.) * column 2, line 9 - column 4, line 18 *	1, 3, 4	
D,A	GB-A-1397116 (JOH. JACOBS & CO.) * page 3, lines 13 - 92 *	1, 3	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B65D
A47J
B67D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 JUNE 1990	FUOCHI R.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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