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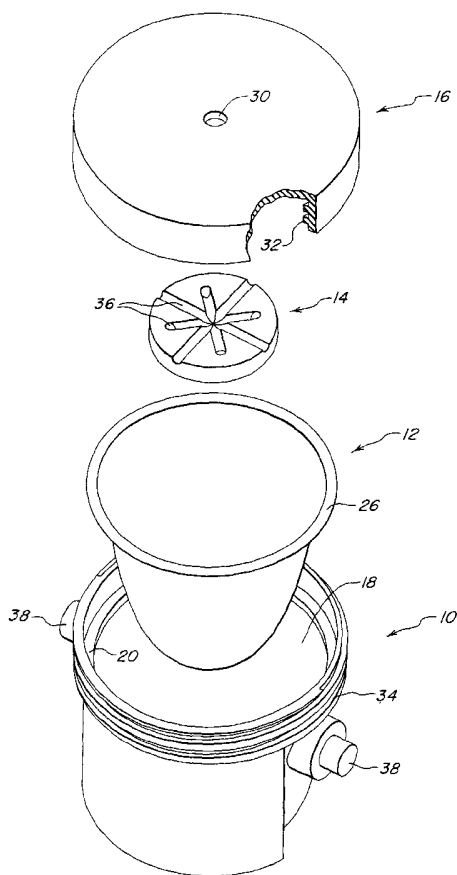
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(54) Title: RE-USABLE BEVERAGE FILTER CARTRIDGE



(57) Abstract: For use in a single serve beverage brewer in which a measured charge of a dry beverage medium is infused with a metered amount of heated liquid to produce a beverage medium, a reusable beverage filter cartridge is provided for containing the beverage medium and for accommodating an inflow of the heated liquid and an outflow of the beverage medium. The cartridge comprises a cup-shaped housing (10) having a top opening (18) and a closed bottom (22) with an outlet port (24). A filter (12) internally subdivides the housing into a first chamber (A) accessible via the top opening (18) and configured and dimensioned to contain the beverage medium, and a second chamber (B) communicating with the outlet port (24). A lid (16) is removably secured to the housing in a position closing the top opening (18), and an inlet port (30) in the lid serves to admit heated liquid into the first chamber (A) for infusion with the beverage medium contained therein. The filter (12) is permeable to accommodate a flow therethrough of the resulting beverage into the second chamber (B) from which it exits via the outlet port (24).

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RE-USABLE BEVERAGE FILTER CARTRIDGE

CROSS REFERENCE TO RELATED APPLICATION

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This application claims priority from provisional patent application Serial No. 60/283,290 filed 04/11/2001 and U.S. Utility patent application filed on April 3, 2002, Serial No. Unknown.

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BACKGROUND DISCUSSION1. Field of the Invention

This invention relates generally to single serve beverage brewers, and is concerned
15 in particular with the provision of a reusable beverage filter cartridge for use in such brewers.

2. The Prior Art

As disclosed for example in U.S. Patent Nos. 5,325,765 (Sylvan et al.); 5,840,189
20 (Sylvan et al.); and 6,082,247 (Beaulieu), it is known to employ disposable beverage filter cartridges that are pierced during the brewing cycle of single serve beverage brewers. Although such cartridges function in an entirely satisfactory and user friendly manner, the need to dispose of them after only a single use has raised concerns on the part of environmentalists.

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SUMMARY OF THE INVENTION

An objective of the present invention is to deal with these concerns by providing a
30 filter cartridge designed for reuse in successive brewing cycles.

A companion objective of the present invention is the realization cost savings resulting from the repeated rather than single use and disposal of cartridge units.

These and other objectives and advantages of the present invention will now be described in greater detail with reference to the accompanying drawing, wherein:

35

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a reusable beverage filter cartridge in accordance with the present invention;

- 5 Figure 2 is a front view on an enlarged scale of the beverage filter cartridge;
 Figure 3 is a vertical sectional view taken through the beverage filter cartridge; and
 Figure 4 is an exploded view of the components of the beverage filter cartridge.

10 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

With reference initially to Figure 4, it will be seen that the reusable beverage filter cartridge of the present invention includes a cup-shaped housing 10, a permeable filter 12, a flow diffusing baffle 14, and a lid 16.

- 15 The cup-shaped housing 10 has a top opening 18 surrounded by an internal circular ledge 20, and a closed bottom 22 converging to an outlet port 24. The filter 12 is also generally cup-shaped, but smaller than the housing 10, with a circular peripheral lip 26. When the filter is received in the housing, as shown in Figure 3, the lip 26 rests on the ledge 20, and the interior of the housing is subdivided by the filter into a first chamber "A"
20 accessible via the top opening 18, and a second chamber B communicating with the outlet port 24. The first chamber is configured and dimensioned to receive a measured charge of a dry beverage medium 28, typically ground roasted coffee.

The lid 16 has an inlet port 30 and is internally threaded as at 32 for removable attachment to an externally threaded collar 34 on the housing 10.

- 25 The baffle 14 underlies the lid 16 and comprises a circular disc having its center aligned with the inlet port 30. The upper surface of the disc is interrupted by grooves 36, preferably of differing lengths, emanating from the disc center.

The reusable cartridge may serve as a substitute for a disposable cartridge and cartridge holder of the type disclosed, for example, in U.S. Patent No. 6,079,315 (Beaulieu
30 et al.), the description of which is herein incorporated by reference. To this end, the housing may be provided with oppositely disposed externally projecting trunnions 38.

- The filter 12 may be removably received in the housing 10, or alternatively, it may be fixed in place. Other mechanically equivalent means may be employed to removably attach the lid to the housing, and the lid and housing may be provided, respectively with
35 multiple inlet and outlet ports.

In use, the lid 16 is removed and a measured charge of a beverage medium is deposited in the filter 12 in chamber A. The lid is then closed, and a metered amount of heated liquid is injected as at 40 into the cartridge inlet opening 30. The liquid is diffused by the radial grooves 36 in baffle 14 before infusing with the beverage medium 28 to
5 produce a brewed beverage. The beverage flows through the filter into chamber B from which it exits via outlet port 24. At the conclusion of the brewing cycle, the lid 16 may be opened to allow removal of the spent grounds of the beverage medium, and the filter and cartridge interior may be flushed in readiness for the next brewing cycle.

We claim:

1 1. For use in a single serve beverage brewer in which a measured charge of a
2 dry beverage medium is infused with a metered amount of heated liquid to produce a
3 beverage medium, a reusable beverage filter cartridge for containing the beverage medium
4 and for accommodating an inflow of said heated liquid and an outflow of said beverage
5 medium, said cartridge comprising:

6 a cup-shaped housing having a top opening and a closed bottom;

7 an outlet port in said closed bottom;

8 a filter internally subdividing said housing into a first chamber accessible via said
9 top opening and a second chamber communicating with said outlet port, said first chamber
10 being configured and dimensioned to contain said beverage medium;

11 a lid;

12 means for removably securing said lid to said housing in a position closing said top
13 opening; and

14 an inlet port in said lid for admitting heated liquid into said first chamber for
15 infusion with a beverage medium contained therein, said filter being permeable to
16 accommodate a flow therethrough of the resulting beverage into said second chamber and
17 out through said outlet port.

1 2. The cartridge of claim 1 further comprising baffle means underlying said lid
2 for diffusing the heated liquid received in said first chamber via said inlet port.

1 3. The cartridge of claim 2 wherein said baffle means comprises a circular
2 disc having its center aligned with said inlet port, and having an upper surface interrupted
3 by grooves emanating from said center.

1 4. The cartridge of claim 1 wherein said filter is removably received in said
2 housing.

1 5. The cartridge of claim 1 wherein said filter includes a circular peripheral lip
2 configured and dimensioned to be supported on a circular ledge surrounding said top
3 opening.

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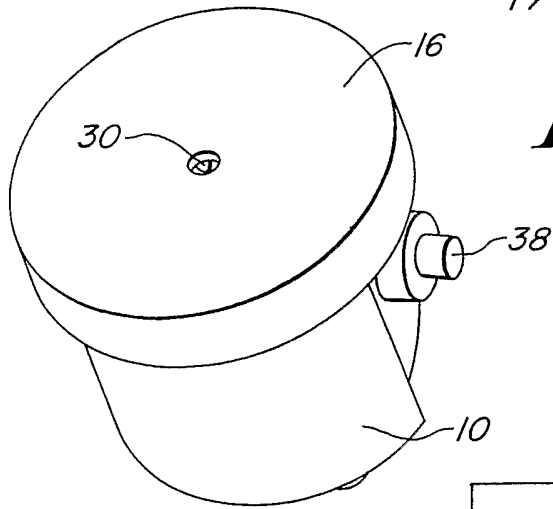


FIG. 1

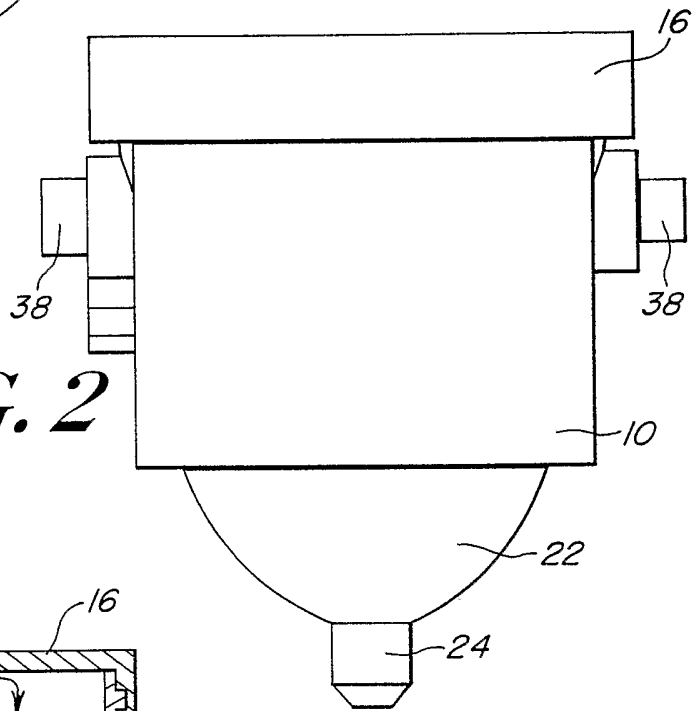


FIG. 2

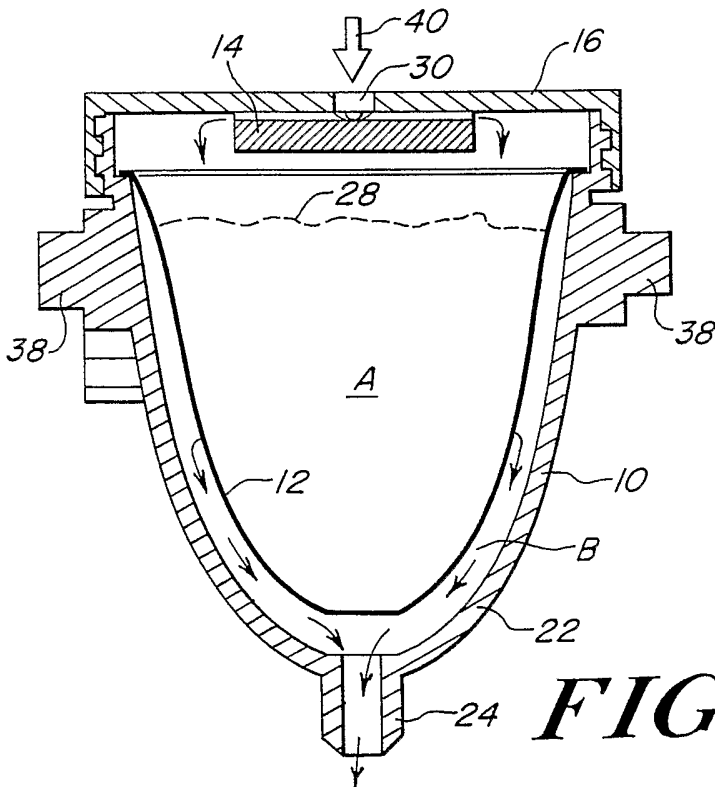


FIG. 3

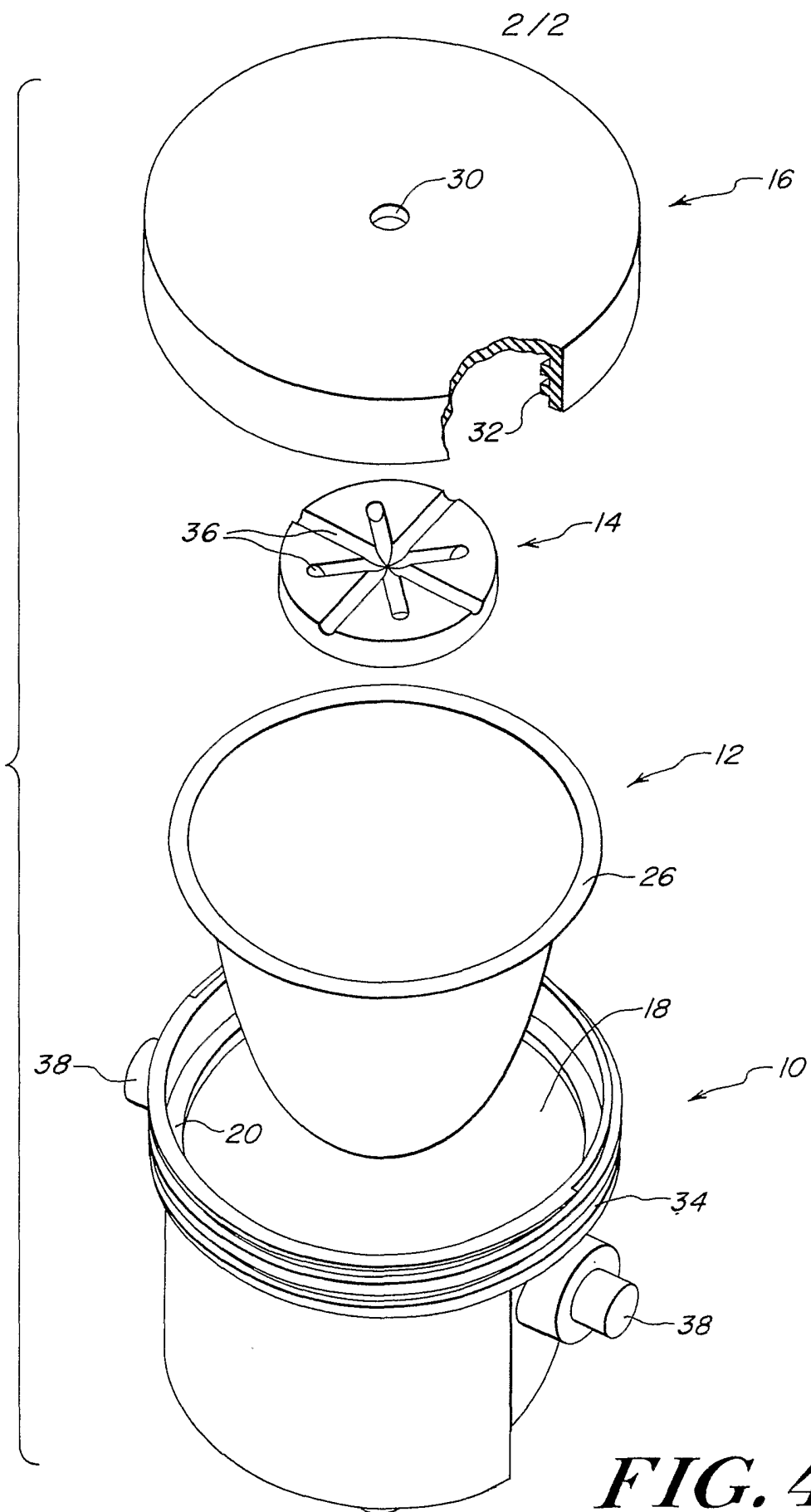


FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A47J31/44 A47J31/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 016 365 A (WMF WUERTEMBERG METALLWAREN) 5 July 2000 (2000-07-05) column 4, line 35 -column 5, line 48; figure 2	1,2,4
Y	-----	3
Y	DE 93 17 251 U (HUESELMANN WILHELM) 3 March 1994 (1994-03-03) page 3, line 7 -page 4, line 13; figures 1,2	3
X	----- WO 98 56285 A (PRILEY ANTHONY P) 17 December 1998 (1998-12-17) page 6, line 3 - line 19 page 7, line 22 - line 29; figures 1-4 -----	1,2,4,5

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Patent family members are listed in annex.

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Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1016365	A	05-07-2000	EP 1016365 A1	05-07-2000
			JP 2000271009 A	03-10-2000
			US 2001042444 A1	22-11-2001

DE 9317251	U	03-03-1994	DE 9317251 U1	03-03-1994

WO 9856285	A	17-12-1998	WO 9856285 A1	17-12-1998
			AU 3311197 A	30-12-1998
			US 6220147 B1	24-04-2001
