VIII-4-1	**Declaration: Inventorship (only for the purposes of the designation of the United States of America)** Declaration of Inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America:	I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought. This declaration is directed to the international application of which it forms a part (if filing declaration with application). This declaration is directed to international application No. PCT/ . . . . . (if furnishing declaration pursuant to Rule 26ter). I hereby declare that my residence, mailing address, and citizenship are as stated next to my name. I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications", by application number, country or Member of the World Trade Organization, day, month, and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.
VIII-4-1-1	Prior applications:	10162741.2, EP, 12 May 2010 (12.05.2010);10169374.5, EP, 13 July 2010 (13.07.2010)

		I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.
VIII-4-1-1-1	Name (LAST, First)	JARISCH, Christian
VIII-4-1-1-2	Residence: (city and either US State, if applicable, or country)	Lutry, Switzerland
VIII-4-1-1-3	Mailing address:	Chemin de Fenix 122 1095 Lutry Switzerland
VIII-4-1-1-4	Citizenship:	CH
VIII-4-1-1-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/JARISCH Christian/
VIII-4-1-1-6	Date:	10 May 2011 (10.05.2011)

PCT REQUEST

Print Out (Original in Electronic Form)

VIII-4-1-2-1	Name (LAST, First)	**PERENTES, Alexandre**
VIII-4-1-2-2	Residence: (city and either US State, if applicable, or country)	**Lausanne, Switzerland**
VIII-4-1-2-3	Mailing address:	**Avenue Virgile Rossel 10 1012 Lausanne Switzerland**
VIII-4-1-2-4	Citizenship:	**CH**
VIII-4-1-2-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/PERENTES Alexandre/**
VIII-4-1-2-6	Date	**10 May 2011 (10.05.2011)**
VIII-4-1-3-1	Name (LAST, First)	**KAESER, Stefan**
VIII-4-1-3-2	Residence: (city and either US State, if applicable, or country)	**Aarau, Switzerland**
VIII-4-1-3-3	Mailing address:	**Goldernstrasse 6 5000 Aarau Switzerland**
VIII-4-1-3-4	Citizenship:	**CH**
VIII-4-1-3-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/KAESER Stefan/**
VIII-4-1-3-6	Date	**10 May 2011 (10.05.2011)**
VIII-4-1-4-1	Name (LAST, First)	**MAGRI, Carlo**
VIII-4-1-4-2	Residence: (city and either US State, if applicable, or country)	**Monthey, Switzerland**
VIII-4-1-4-3	Mailing address:	**Route d'Outre-Vièze 10 1870 Monthey Switzerland**
VIII-4-1-4-4	Citizenship:	**IT**
VIII-4-1-4-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/MAGRI Carlo/**
VIII-4-1-4-6	Date	**10 May 2011 (10.05.2011)**
VIII-4-1-5-1	Name (LAST, First)	**GERBAULET, Arnaud**
VIII-4-1-5-2	Residence: (city and either US State, if applicable, or country)	**Oye et Pallet, France**
VIII-4-1-5-3	Mailing address:	**24 rue du chalet 25160 Oye et Pallet France**
VIII-4-1-5-4	Citizenship:	**FR**
VIII-4-1-5-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/GERBAULET Arnaud/**
VIII-4-1-5-6	Date	**10 May 2011 (10.05.2011)**

PCT REQUEST

Print Out (Original in Electronic Form)

VIII-4-1-6-1	Name (LAST, First)	**KAESER, Thomas**
VIII-4-1-6-2	Residence: (city and either US State, if applicable, or country)	**Brent, Switzerland**
VIII-4-1-6-3	Mailing address:	**rte de Brent 30 Fontanivent 1817 Brent Switzerland**
VIII-4-1-6-4	Citizenship:	**DE**
VIII-4-1-6-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/KAESER Thomas/**
VIII-4-1-6-6	Date	**10 May 2011 (10.05.2011)**
VIII-4-1-7-1	Name (LAST, First)	**ABEGGLEN, Daniel**
VIII-4-1-7-2	Residence: (city and either US State, if applicable, or country)	**Rances, Switzerland**
VIII-4-1-7-3	Mailing address:	**Le Bugnon 1439 Rances Switzerland**
VIII-4-1-7-4	Citizenship:	**CH**
VIII-4-1-7-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	**/ABEGGLEN Daniel/**
VIII-4-1-7-6	Date	**10 May 2011 (10.05.2011)**

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
Borne, Patrice
NESTEC S.A.
Avenue Nestlé 55
CH-1800 Vevey
SUISSE

24 Aug 2011

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 10893-WO-PCT	Date of mailing *(day/month/year)* 24 August 2011 (24-08-2011) **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/EP2011/057657	International filing date *(day/month/year)* 12 May 2011 (12-05-2011)
Applicant NESTEC S.A.	

1. [X] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fascimile No.: (41-22) 338.82.70

   For more detailed instructions, see *PCT Applicant's Guide,* International Phase, paragraphs 9.004 - 9.011.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer GäRTNER, Sabine Tel: +31 (0)70 340-2353

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2011/057657	12.05.2011	12.05.2010

International Patent Classification (IPC) or both national classification and IPC
INV. B65D85/804 A47J31/22

Applicant
NESTEC S.A.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Bridault, Alain Telephone No. +31 70 340-3224

Form PCT/ISA/237 (Cover Sheet) (July 2009)

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	4-10, 14-18
	No:	Claims	1-3, 11-13
Inventive step (IS)	Yes:	Claims	14-18
	No:	Claims	1-13
Industrial applicability (IA)	Yes:	Claims	1-18
	No:	Claims	

2. Citations and explanations

see separate sheet

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 EP 1 764 015 A1 (GRIMAC S R L [IT]) 21 March 2007 (2007-03-21)

D2 WO 02/28241 A1 (BOYD COFFEE CO [US]) 11 April 2002 (2002-04-11)cited in the application

D3 WO 2010/026053 A1 (NESTEC SA [CH]; DENISART JEAN- PAUL [CH]; RYSER ANTOINE [CH]) 11 March 2010 (2010-03-11)cited in the application

2 The present application does not meet the criteria of Article 33 (2) PCT, because the subject-matter of claim 1 is not new.

D1 discloses (the reference numbers referring to this document) a capsule (17) for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (72) adapted for being identified or read by external reading means; considering the arrangement of the code shown on figure 4, it is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule. Therefore, the capsule of D1 has all the technical features of the subject-matter of claim 1.

Furthermore, D2 also discloses a capsule having all said features.

3 Since the capsule of D1 has also the additional features of dependent claims 2 and 3, their subject-matter is not new either.

4 The code on the capsule of D2 (Fig. 2f) is present on the lid, on the rim, and on the bottom of the rim. Therefore, claims 11 to 13 do not meet the requirements of the PCT with respect to novelty.

5 Dependent claims 4-10 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

6 The additional features of claims 4 and 5 appear to be a mere matter of choice, which would not bring any unexpected effect.

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IPR2023-00502, U.S. PATENT 10,994,923

7 The coding means of dependent claims 6 to 10 appear to be usual, and therefore do not bring any unexpected effect.

8 D3 discloses a system from which the subject-matter of claim 14 differs in that there are provided reading means arranged for reading the code when the capsule is rotated along the axis. Said subject-matter is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as improving the recognition of the code.

The solution to this problem proposed in claim 14 of the present application is considered as involving an inventive step (Article 33(3) PCT) because no prior art document suggests reading the code while the capsule is rotated, which enables a multiple reading of said code (note: D1 discloses a capsule suitable for being read when rotated, but fails to effectively suggest such reading).

9 Claims 15 and 16 are dependent on claim 14 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

10 Since the method of claim 17 uses the novel and inventive system of claim 14, said method is novel and inventive, too.

11 Claim 18 is dependent on claim 17 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

1 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

2 Independent claim 14 is not in the two-part form in accordance with Rule 6.3 (b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D3 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, the following features are not known in combination from D3 and belong in the characterising portion of such a claim: reading means arranged for reading the code when the capsule is rotated along the axis.

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3 Contrary to the requirements of Rule 5.1 (a)(ii) PCT, the relevant background art disclosed in D1 is not mentioned in the description, nor is this document identified therein.

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Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

BNSDOCID: <XS_____200704010CK_I_>

This listing of claims will replace all prior versions, and listing of claims in the application:

Listing of claims:

Claim 1 (currently amended) Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, ~~wherein~~ the container comprises a code adapted for being identified or read by an external ~~reading means~~reader, ~~wherein~~ the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

Claim 2 (currently amended) Capsule according to claim 1, ~~having a circumference~~ wherein the code is arranged on the container along an arc-shaped or circular path of ~~the~~ a circumference of the container.

Claim 3 (currently amended) Capsule according to claim 1, ~~having a circumference~~ wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of ~~the~~ a circumference of the container.

Claim 4 (currently amended) Capsule according to ~~claims 2 or 3~~claim 1, wherein the code is arranged along at least ~~a~~ an eighth of the circumference of the container.

Claim 5 (currently amended) Capsule according to ~~any of claims 2 to 4~~claim 1, wherein the code is repeated along ~~said~~ the circumference of the container.

Claim 6 (currently amended) Capsule according to ~~any of the preceding claims~~claim 1, wherein the code is a bit code formed by a series of discrete polygonal ~~(e.g., rectangles or squares)~~ or dot surfaces printed on and/or embossed in the container.

Claim 7 (currently amended) Capsule according to ~~any of claims~~ claim 1 ~~to 5~~, wherein the code is printed by an ink which is not visible by the human ~~eyes~~ eye under natural light ~~(e.g., ink visible under UV)~~.

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Claim 8 (currently amended) Capsule according to ~~any of claims~~ claim 1 ~~to 5~~, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.

Claim 9 (currently amended) Capsule according to claim 8, wherein the pattern possesses a first ~~surfaces~~ surface having inclined mirroring or absorbing properties to light and a second ~~surfaces~~ surface having flat mirroring or flat reflective properties to light.

Claim 10 (currently amended) Capsule according to ~~any of claims~~ claim 1 ~~to 6 and 8 to 9~~, wherein the code is mechanically embossed or engraved on the container by a laser.

Claim 11 (currently amended) Capsule according to ~~any of claims~~ claim 1 ~~to 10~~, wherein the container comprises a body and a lid connected to the body and ~~wherein~~ the code is present on the lid of the container.

Claim 12 (currently amended) Capsule according to ~~any of claims~~ claim 1 ~~to 10~~, wherein the code is present on ~~the~~ a rim of the capsule.

Claim 13 (currently amended) Capsule according to claim 12, wherein the code is present on ~~the~~ a bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

Claim 14 (currently amended) System for preparing a beverage from a capsule ~~according to any of the preceding claims~~ comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule and ~~further comprising a~~ the beverage preparation device~~; wherein the device~~ comprises a capsule ~~holding means~~ holder for holding the capsule and rotational ~~drive means~~ driver for driving the ~~holding means~~ holder and capsule in rotation along ~~said~~ the axis of rotation and ~~reading means~~ reader arranged for reading the code when the capsule is rotated along ~~said~~ the axis.

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Claim 15 (currently amended) System according to claim 14, wherein the ~~reading means~~ reader comprises a light emitter and a light sensor or an inductive sensor.

Claim 16 (currently amended) System according to ~~claims~~ claim 14 ~~or 15~~, wherein the optical ~~reading means~~ reader or inductive sensor is arranged to detect a code on the rim of the capsule.

Claim 17 (currently amended) Method for preparing a beverage from a system ~~according to any one of claims 14 to 16~~from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, comprising rotating the container and reading the code while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device, the device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis, ~~wherein~~ and extracting the beverage ~~is extracted~~ from the capsule by rotating the capsule along ~~said~~ the axis.

Claim 18 (original) Method according to claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
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International Bureau

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17 November 2011 (17.11.2011)

PCT

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10169374.5 13 July 2010 (13.07.2010) EP

(71) Applicant *(for all designated States except US)*: **NESTEC S.A.** [CH/CH]; Av. Nestlé 55, CH-1800 Vevey (CH).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **JARISCH, Christian** [CH/CH]; Chemin de Fenix 122, CH-1095 Lutry (CH). **PERENTES, Alexandre** [CH/CH]; Avenue Virgile Rossel 10, CH-1012 Lausanne (CH). **KAESER, Stefan** [CH/CH]; Goldernstrasse 6, CH-5000 Aarau (CH). **MAGRI, Carlo** [IT/CH]; Route d'Outre-Vièze 10, CH-1870 Monthey (CH). **GERBAULET, Arnaud** [FR/FR]; 24 rue du chalet, F-25160 Oye et Pallet (FR). **KAESER, Thomas** [DE/CH]; rte de Brent 30 Fontanivent, CH-1817 Brent (CH). **ABEGGLEN, Daniel** [CH/CH]; Le Bugnon, CH-1439 Rances (CH).

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

(57) Abstract: Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (65) adapted for being identified or read by external reading means (62), wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

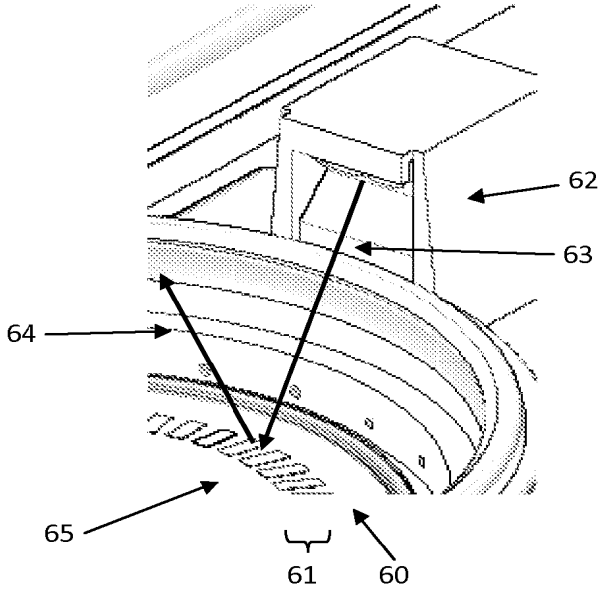


Fig. 2

WO 2011/141532 A1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

Introduction

The invention relates to the preparation of a beverage by use of a capsule containing beverage ingredient in a beverage production device. The present invention in particular focuses on the detection of the capsule.

Background art

The preparation of a beverage by a capsule containing beverage ingredient is known. In general, the capsule is inserted in a beverage production device, such as a coffee machine, liquid is fed in the capsule and a beverage is extracted from the capsule under pressure or by gravity.

The preparation of a beverage by using the centrifugation is known. The principle mainly consists in providing beverage ingredient in a container of the capsule, feeding liquid in the receptacle and rotating the receptacle at elevated speed to ensure interaction of liquid with powder while creating a gradient of pressure of liquid in the receptacle; such pressure increasing gradually from the centre towards the periphery of the receptacle. As liquid traverses the coffee bed, extraction of the coffee compounds takes place and a liquid extract is obtained that flows out at the periphery of the receptacle.

The term "capsule" refers to any flexible, rigid or semi-rigid container containing beverage ingredient. Other synonymous to a capsule are: "pod", "pad", "cartridge" or "sachet". The capsule can be single use. The container can also be filled with ingredient by the user to form the capsule just before use.

The term ingredient means any suitable beverage substance such as ground coffee, soluble coffee, leaf tea, soluble tea, herbal tea, dairy powder, baby food, culinary powder and combination thereof.

The invention relates more particularly to the identification of the capsule by means of a code. The code may be necessary to control parameters in the beverage preparation device such as liquid or beverage flow rate, pressure, rotational speed, temperature and combinations thereof.

EP0451980 relates to packages containing comestibles for the preparation of beverages. Recognition means can comprise one or more strips of a magnetic material applied to the body of the package which can be read by an appropriate magnetic sensor, one or more

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shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.

WO02/28241 relates to an encoded coffee packet for use in the preparation of hot or cold beverages comprising a filter defining a cavity and a brewing ingredient within the cavity. The packet further comprises a machine-interpretable feature located on the filter such as a color, a shape, a glyph, a text string, a barcode or a digital watermark.

WO02/078498 relates to a machine-readable identifier on a portion package which contains ground coffee for espresso machine. The identifier can be a concentric barcode which is read when the capsule turns around an axis which is placed outside of its perimeter such as when the capsule is stored in a carousel.

WO2005044067 relates to a system for identifying a capsule having a code visible under UV light printed thereon or a magnetic code such as a ribbon or label. The code may be read by a turning magnetic reading head. However, such system is not adapted for detecting a capsule in a device using centrifugal forces for extracting the beverage.

WO2009007292 relates to a method for reading barcodes in a drinks machine when the brewing chamber is being closed from an open position to a closed position.

WO2010/026053 relates to a controlled beverage production device using centrifugal forces. The capsule may comprise a barcode provided on an outside face of the capsule and which enables a detection of the type of capsule and/or the nature of ingredients provided within the capsule in order to apply a predefined extraction profile for the beverage to be prepared.

A problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always reliable or convenient. The present invention brings a solution to this problem.

Brief description of the invention

The aim of the present invention is to propose an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine.

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This aim is achieved by a capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In a particular mode, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. More particularly, the code is arranged along at least a eighth of the circumference. This configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one code is readable but also may potentially reduce the reading time.

Preferably, the code is an optical code. The code may be a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on the container and/or embossed in the container.

The code may printed by a visible ink by human eyes under natural light or, alternatively, an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).

Preferably, the code is printed or embossed to form a pattern which possesses surfaces having different reflective and/or absorbing properties to light. In particular, the pattern possesses first surfaces and second surfaces having different reflective and/or absorbing properties to light. More particularly, the pattern possesses first surfaces inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.

In a possible mode, the code is mechanically embossed or engraved on the container by laser or by other means such as a press.

In an embodiment, the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container. The lid may be a closed foil and/or a filter, for example.

In another embodiment, the code is present on the rim of the capsule. In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is opposed to

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the lid of the capsule. The bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles). As a result, the reading is made more reliable. The reading may also be carried out while the capsule is in place in the beverage production device. Therefore, the preparation of the beverage is simplified and the preparation time can be reduced.

The invention further relates to a system for preparing a beverage from a capsule as aforementioned and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.

The invention further relates to a method for preparing a beverage from a system comprising a capsule as aforementioned and a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule therein and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

The invention is further described in the appended claims and the following detailed description.

Brief description of the figures

The present invention will be better understood thanks to the detailed description which follows and the accompanying drawings, which are given as non-limiting examples of embodiments of the invention, namely:

- figure 1 illustrates the basic principle of the centrifugal extraction,

- figure 2 illustrates the reading method of a mark on the lid surface of the capsule,

- figure 3 illustrates the reading method of an absence of the mark,

- figure 4 illustrates an alternate position of the code on the capsule, in particular, when placed on the underside of the rim of the capsule, and the capsule fitted into a capsule holder of the extraction device,

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- figures 5 and 6 illustrate the combination of a laser source and a detector in positive and negative detection, for example, for the alternate position of the code of figure 4,

- figure 7 illustrates the detection of a color code on the capsule, for example, for the alternate position of the code of figure 4.

Detailed description

Figure 1 illustrates an example of a beverage preparation system 1 as described in WO2010/026053 for which the capsule of the invention can be used.

The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as a rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system may further comprise a flow meter such as a flow-metering turbine 8 for providing a control of the flow rate of water supplied in the cell 3. The counter 11 can be connected to the flow-metering turbine 8 to enable an analysis of the generated impulse data 10. The analysed data is then transferred to the processor 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time. A user interface 13 may be provided to allow the user to input information that is transmitted to the control unit 9. Further characteristics of the system can be found in WO2010/026053.

In the following examples (see figure 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.

The capsule is designed for rotating around an axis A. This axis A crosses perpendicularly the center of the membrane which has the form of a disk. This axis A exits at the center of the bottom of the body. This axis A will help to define the notion of "circumference" which is a circular path located on the capsule and having the axis A as reference axis. This circumference can be on the lid, e.g., membrane or on the body part such as on the flange-like rim. The lid may be impervious to liquid before insertion in the device or it may be pervious

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to liquid by means of small openings or pores provided in the center and/or periphery of the lid. The code is spread along the circumference or a part of the circumference. The code may comprise successive arch-shaped segments. The code may also comprise successive segments which are individually rectilinear but extend along at least a part of the circumference.

According to one embodiment, the sensor cannot read the code without the rotation of the capsule. This is the case where the code is spread along at least a eighth, preferably at least a quarter of the circumference or even more. The fact that the code is placed along an arc-shaped line render the reading by a sweep beam very difficult. This is why the rotation of the capsule plays an important role. In case that the code is located on the body, it is then necessary to rotate the capsule to have access, for the sensor, to the entire set of marks composing the code. The code is further located close to the peripheral edge of the capsule. The peripheral edge is defined as the outermost circular line of the capsule. Preferably, the distance of the code from the peripheral edge is not more than 10 mm, more preferably not more than 8 mm.

According to an embodiment, the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV). In this case, the sensor further comprises a UV-light beam source and a UV detector.

The code is preferably repeated along the circumference in order to ensure a reliable reading. The code is repeated at least twice on the circumference. Preferably, the code is repeated three to six times on the circumference. Repetition of the code means that the same code is duplicated and the successive codes are positioned in series along the circumference so that upon a 360-degree rotation of the capsule, the same code can be detected or read more than one time.

EXAMPLES:

1) Optical reading on foil, respectively on top side rim of capsule (figures 2 and 3):

A light beam is projected onto the capsule's lid, e.g., membrane or foil 60, as illustrated on figure 2.

Onto the capsule foil 60, a plurality of bits forming the code 61 is applied along a circular or arc-shaped path.

Preferably, the code is placed on a flat portion of the lid and close to the peripheral edge of the capsule. The code is preferably placed the lid that is supported by the flange-like

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rim of the capsule or overlaps with the rim. Hence, the code is not distorted due to mechanical constraints and can be read more reliably.

The marks may consist of:

- Mirroring or absorbing surfaces for providing bit "0" and,
- Diffusing and reflective surfaces for providing bit "1"

The binary values “0” and “1” are arbitrary chosen and can be inversed.

The code is read by rotating the capsule along a central axis A (figure 1).

The reader or sensor 62 is part of the centrifugal unit 2 and consists of

- A light source with or without focusing optic and
- A light sensor with or without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or
- Embossing (mirroring + rough reflecting + diffusing) or
- Laser engraving.

Optionally, the bit code may also consist of different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined “mixed color”. As an example, a capsule with half the circumference in blue and the other half in yellow would result in reading a green color during rotation. In the same manner, one third in blue and the remaining part in yellow will give another color. In this case, the light could be a simple light source without specific convergence means.

As illustrated in figure 2, when the light beam 63, sent by the light source of the sensor 62, touches the mirror code pattern (small rectangles 65) it reflects in a reflective beam 64 which is not received by the sensor.

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As the capsule is rotated (figure 3), the light beam 63 touches a diffuse reflecting surface (surface between the small rectangles) and is partially reflected to the sensor. A reflective beam 66 is received by the sensor whereas other beams 67, 68 are diffused or reflected outside the sensor.

2) Optical reading on rim bottom side of capsule (figures 4 to7):

The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring and/or diffusing properties. The surfaces are arranged in a circular pattern or an arc-shaped pattern at least along an angular portion of the rim.

A light beam 74 is projected to the capsule's rim 73.

Onto the capsule rim, a bit code is applied along a circular or arc-shaped path of the rim.

The bit code may consist of:

- Inclined mirroring or (flat) absorbing surfaces for bit "0" and
- Flat mirroring or flat reflective (diffusing) surfaces for bit "1"

The bit code is read by rotating the capsule along its central axis A.

The reader may consist of

- A light source with/without focusing optic and,
- A light sensor with/without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or,
- Laser engraving (e.g. for absorbing / reflecting-diffusing) surfaces or,
- Embossing: Flat and inclined mirroring surfaces.

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In the embodiment of the figure 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the figure 4 to deflect the forward and backward beams.

On figure 5, the light beam 74 from the light source "L" touches the mirror surface of the code (small rectangle 81) and is reflected into a reflective beam 76 to the sensor "S" with high intensity. A bit such as "0" or "1" is thereby provided to the control unit.

On figure 6, the light beam 74 from the light source "L" touches diffusing or absorbing surfaces (surface 82 between two small rectangles). The light beam 77 that reaches the sensor S is of small intensity. Other beams such as beam 78 are diffused outside the sensor S due to the diffusing properties of the surface.

In each configuration (e.g., Figs. 5-6), a bit such as "1" or "0" is provided to the control unit.

Therefore, the number of bits and their bit code depend on the number and specific arrangement of mirror surfaces (e.g. rectangles) and diffusing or absorbing surfaces (e.g., zones between the rectangles). The same sequence of bits forming a "code" can be repeated several times on the circumference of the rim. This repetition provides redundancy and more reliability to the reading.

Optionally (figure 7), the code comprises different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined "mixed color". As an example, a capsule with half the "dots" in blue and the other half in yellow would result in reading a green color during rotation.

3) Application modes of codes onto a capsule

The codes described in the previous examples can be applied by different methods onto a capsule such as by:

- Printing or mechanical deforming on a formed capsule or,

- Printing or mechanical deforming on the capsule raw material (foil) before container forming or,

- Printing on outer surface of a capsule container or,

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- Printing on the inner surface of a capsule container, using the curl as information support (Aluminum capsule technology).

4) Inductive code reading:

Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface. For instance, the capsule comprises a circumferential metal rim which comprises a succession of discrete slots and/or bumps. When the capsule is rotated about its central axis, the rim is moved relative to the sensor such that the slots and/or bumps are detected. The code can be read on a time base of a CPU of the beverage preparation device. The maximum rotational speed to read the code depends on the used sensor and the internal CPU of the device.

5) Other general characteristics to all embodiments:

The speed for reading can, for instance, be comprised between 0.1 and 1000 rpm.

When reading the code, liquid can already be fed in the capsule for providing a pre-wetting of the beverage ingredients.

The code preferably comprises three sections, the synchronization section, the payload section and the verification section. The synchronization section serves for the synchronization purpose i.e. to inform the sensor when the code begins. Since the speed of the rotation of the capsule can vary, the synchronization is achieved through a known sequence of bits such as 0,1,0,1. Then the payload of the code identifying the capsule can be read. In order to avoid misinterpretation of the code, the payload can be followed by verification bits. These bits can be a checksum on the payload or a similar verification function.

The code can be replicated along the code path so that if one code gives a wrong verification value, the other code(s) can be taken into account.

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CLAIMS :

1. Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.
2. Capsule according to claim 1, having a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference.
3. Capsule according to claim 1, having a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference.
4. Capsule according to claims 2 or 3, wherein the code is arranged along at least a eighth of the circumference.
5. Capsule according to any of claims 2 to 4, wherein the code is repeated along said circumference.
6. Capsule according to any of the preceding claims, wherein the code is a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on and/or embossed in the container.
7. Capsule according to any of claims 1 to 5, wherein the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).
8. Capsule according to any of claims 1 to 5, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.
9. Capsule according to claim 8, wherein the pattern possesses first surfaces having inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.
10. Capsule according to any of claims 1 to 6 and 8 to 9, wherein the code is mechanically embossed or engraved on the container by laser.

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11. Capsule according to any of claims 1 to 10, wherein the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container.

12. Capsule according to any of claims 1 to 10, wherein the code is present on the rim of the capsule.

13. Capsule according to claim 12, wherein the code is present on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

14. System for preparing a beverage from a capsule according to any of the preceding claims and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

15. System according to claim 14, wherein the reading means comprises a light emitter and a light sensor or an inductive sensor.

16. System according to claims 14 or 15, wherein the optical reading means or inductive sensor is arranged to detect a code on the rim of the capsule.

17. Method for preparing a beverage from a system according to any one of claims 14 to 16, wherein the beverage is extracted from the capsule by rotating the capsule along said axis.

18. Method according to claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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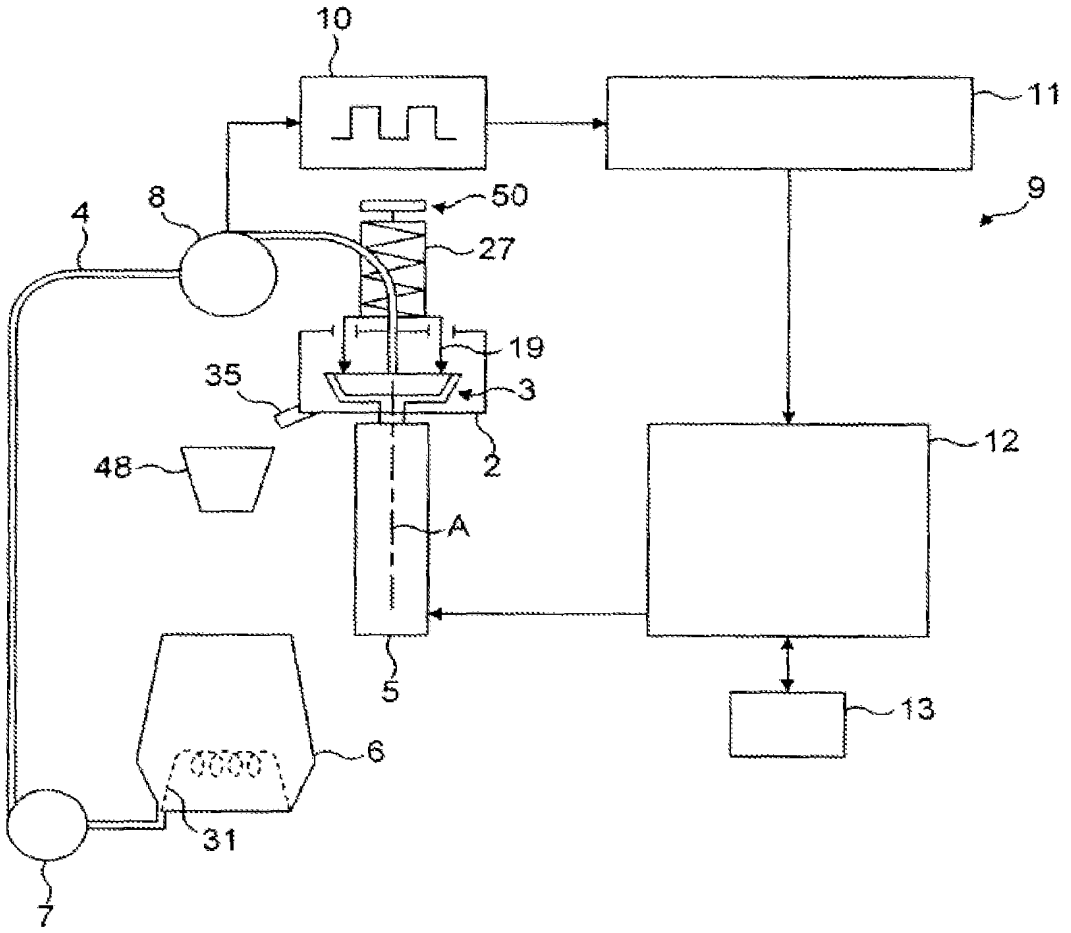


Fig. 1

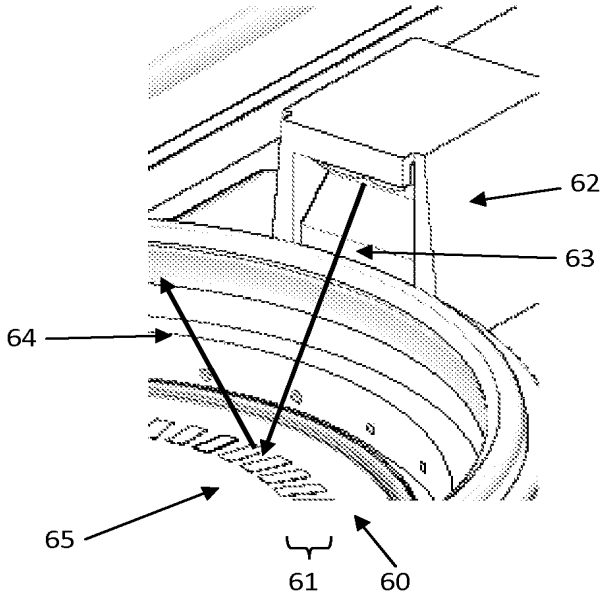


Fig. 2

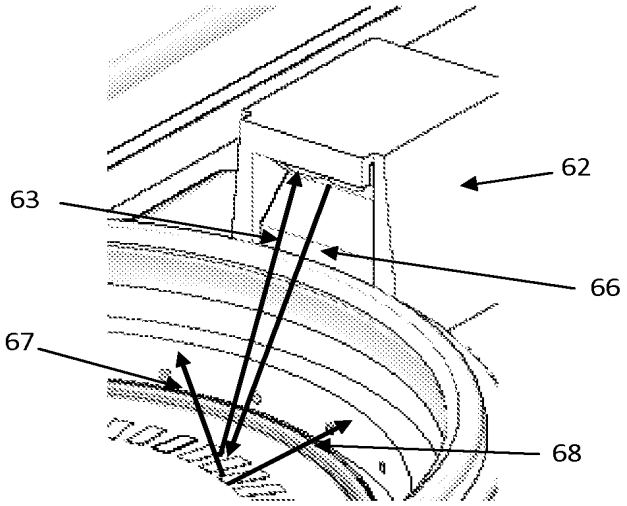


Fig. 3

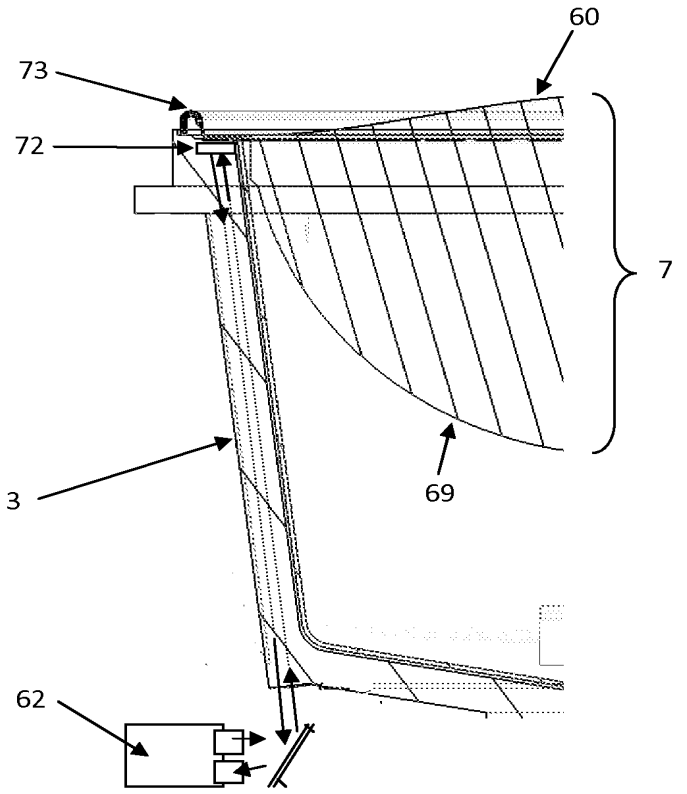


Fig. 4

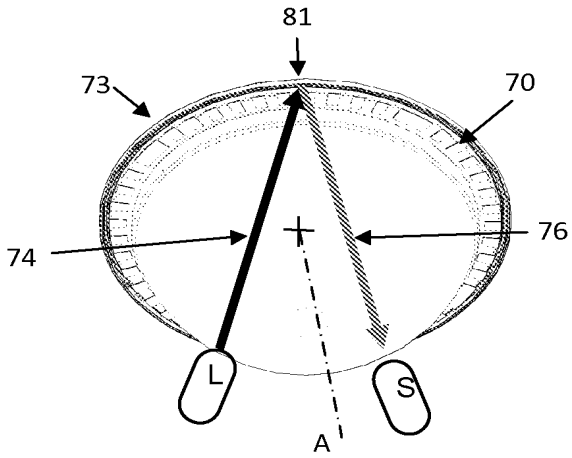


Fig. 5

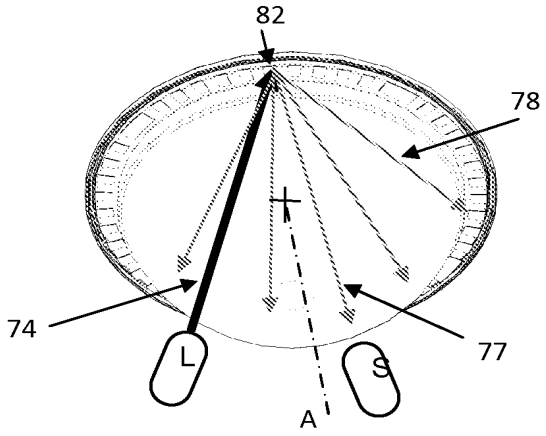

82
78
74
77
L
S
A

Fig. 6

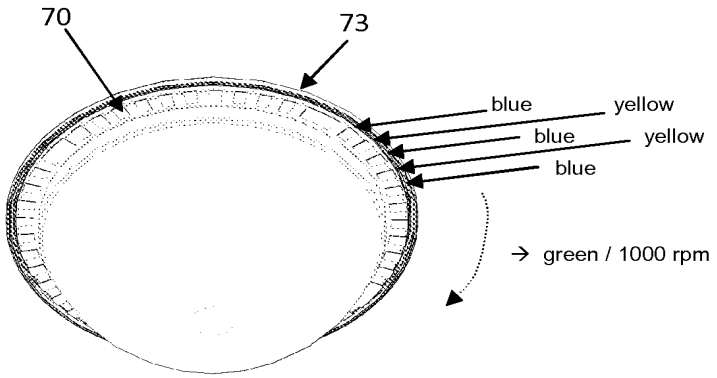

70
73
blue
yellow
blue
yellow
blue
→ green / 1000 rpm

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/057657

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/804 A47J31/22
ADD.

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)
B65D 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 764 015 A1 (GRIMAC S R L [IT]) 21 March 2007 (2007-03-21)	1-10,12
A	paragraph [0019]; figure 4	14,17
X	WO 02/28241 A1 (BOYD COFFEE CO [US]) 11 April 2002 (2002-04-11) cited in the application claim 1; figure 2f	1,2,6-13
A	WO 2010/026053 A1 (NESTEC SA [CH]; DENISART JEAN-PAUL [CH]; RYSER ANTOINE [CH]) 11 March 2010 (2010-03-11) cited in the application page 9, line 28 - line 33; claim 5	1,14,17

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 August 2011	24/08/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bridault, Alain

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2011/057657

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1764015 A1	21-03-2007	NONE	
WO 0228241 A1	11-04-2002	AU 1148902 A	15-04-2002
WO 2010026053 A1	11-03-2010	AU 2009289682 A1	11-03-2010
		CA 2734935 A1	11-03-2010
		EP 2317897 A1	11-05-2011

Form PCT/ISA/210 (patent family annex) (April 2005)

REMARKS

Pursuant to this Preliminary Amendment, Claims 1-17 have been amended. This Preliminary Amendment does not add new subject matter. Moreover, Applicants note for the record that the Preliminary Amendment is submitted to place the above-identified application in proper U.S. format and not to avoid prior art. Therefore, Applicants do not intend to disclaim any subject matter in view of the Preliminary Amendment.

Respectfully submitted,

K&L GATES LLP

BY _____

Robert M. Barrett
Reg. No. 30,142
Customer No.: 29157

Dated: November 9, 2012

K-FEE SYSTEM GMBH, EX2009, page 36
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

IN THE UNITED STATES ELECTED/DESIGNATED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY

Applicants:	Jarisch et al.
Intnl. Appl. No.:	PCT/EP11/057657
Intnl. Filing Date:	12 May 2011
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Docket No.:	3712036-01693

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

Please amend the above-identified International Application before entry into the National stage before the U.S. Patent and Trademark Office under 35 U.S.C. §371 as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks begin on page 6 of this paper.

K-FEE SYSTEM GMBH, EX2009, page 37
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Amendments to the Specification:

Please add a new paragraph after the Title on page 1, as follows:

CROSS REFERENCE TO RELATED APPLICATIONS

The present application is a National Stage of International Application No. PCT/EP2011/057657, filed on May 12, 2011, which claims priority to European Patent Application No. 10162741.2, filed on May 12, 2010, and European Patent Application No. 10169374.5, filed on July 13, 2010, the entire contents of which are being incorporated herein by reference.

K-FEE SYSTEM GMBH, EX2009, page 38
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

PTO-1390 (10-12)
Approved for use through 4/30/2013. OMB 0651-0021
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

Attorney Docket No.	
3712036-01693	
U.S. Application No. (if known, see 37 CFR 1.5)	

International Application No.	International Filing Date	Priority Date Claimed
PCT/EP11/057657	12 May 2011	12 May 2010

Title of Invention
CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

First Named Inventor
Jarisch et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☒ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☐ is attached.
   b. ☒ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☒ A preliminary amendment.
11. ☒ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☐ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821-1.825.
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: _____
16. ☐ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No.	ATTORNEY DOCKET No.
	PCT/EP11/057657	3712036-01693

17. ☐ Other items or information:

The following fees have been submitted.	CALCULATIONS	PTO USE ONLY
18. ■ Basic national fee (37 CFR 1.492(a)) **$390**	$ 390.00	
19. ■ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** All other situations **$250**	$ 250.00	
20. ■ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$120** International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB ..... **$500** All other situations **$630**	$ 500.00	
TOTAL OF 18, 19, and 20 =	$ 1,140.00	

☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)).
Fee for each additional 50 sheets of paper or fraction thereof **$320**

Total Sheets	Extra Sheets	Number of each addition 50 or fraction thereof (round **up** to a whole number)	RATE	
18 - 100 =	/ 50 =		x **$320**	$

Surcharge of **$130.00** for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	18 - 20 =	0	x **$62**	$	
Independent claims	3 - 3 =	0	x **$250**	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$460**	$	
			TOTAL OF ABOVE CALCULATIONS =	$	
☐ Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by ½.					
			SUBTOTAL =	$	
Processing fee of **$130.00** for furnishing the English translation later than 30 months form the earliest claimed priority date (37 CFR 1.492(i)). +				$	
			TOTAL NATIONAL FEE =	$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property. +				$	
			TOTAL FEES ENCLOSED =	$ 1,140.00	
				Amount to be refunded:	$
				Amount to be charged:	$

K-FEE SYSTEM GMBH, EX2009, page 40
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ■ Please charge my Deposit Account No. 02-1818 in the amount of $1,140.00 to cover the above fees.

c. ■ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 02-1818 as follows:

i. ☐ any required fee.

ii. ■ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is **not** recommended and by doing so your **credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Correspondence Address

■ The address associated with Customer Number: 29157 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone			
Email					

Signature		Date	2012-11-09
Name (Print/Type)	Robert M. Barrett	Registration No. (Attorney/Agent)	30142

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
10893-WO-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/EP2011/057657	12/05/2011	12/05/2010
Applicant		
NESTEC S.A.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [ ] the text is approved as submitted by the applicant
   [X] the text has been established by this Authority to read as follows:

   CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION.

5. With regard to the **abstract,**
   [ ] the text is approved as submitted by the applicant
   [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 2
      [ ] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [X] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (July 2009)

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (65) adapted for being identified or read by external reading means (62), wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

K-FEE SYSTEM GMBH, EX2009, page 43
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/057657

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/804 A47J31/22
ADD.

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)
B65D 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 764 015 A1 (GRIMAC S R L [IT]) 21 March 2007 (2007-03-21)	1-10,12
A	paragraph [0019]; figure 4	14,17
X	WO 02/28241 A1 (BOYD COFFEE CO [US]) 11 April 2002 (2002-04-11) cited in the application claim 1; figure 2f	1,2,6-13
A	WO 2010/026053 A1 (NESTEC SA [CH]; DENISART JEAN-PAUL [CH]; RYSER ANTOINE [CH]) 11 March 2010 (2010-03-11) cited in the application page 9, line 28 - line 33; claim 5	1,14,17

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 August 2011	24/08/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bridault, Alain

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2011/057657

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1764015 A1	21-03-2007	NONE	
WO 0228241 A1	11-04-2002	AU 1148902 A	15-04-2002
WO 2010026053 A1	11-03-2010	AU 2009289682 A1	11-03-2010
		CA 2734935 A1	11-03-2010
		EP 2317897 A1	11-05-2011

Form PCT/ISA/210 (patent family annex) (April 2005)

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Christian		Jarisch	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Lutry	Country of Residence	CH

Mailing Address of Inventor:

Address 1	Chemin de Fenix 122
Address 2	

City	Lutry	State/Province	
Postal Code	CH-1095	Country	CH

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Alexandre		Perentes	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Lausanne	Country of Residence	CH

Mailing Address of Inventor:

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Address 2	

City	Lausanne	State/Province	
Postal Code	CH-1012	Country	CH

Inventor 3 Remove

Legal Name

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Stefan		Kaeser	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Aarau	Country of Residence	CH

Mailing Address of Inventor:

Address 1	Goldernstrasse 6		
Address 2			
City	Aarau	State/Province	
Postal Code	CH-5000	Country	CH

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Carlo		Magri	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Monthey	Country of Residence	CH

Mailing Address of Inventor:

Address 1	Route d'Outre-Vieze 10		
Address 2			
City	Monthey	State/Province	
Postal Code	CH-1870	Country	CH

Inventor 5 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Arnaud		Gerbaulet	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Oye et Pallet	Country of Residence	FR

Mailing Address of Inventor:

Address 1	24 rue du chalet		
Address 2			
City	Oye et Pallet	State/Province	
Postal Code	F-25160	Country	FR

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

Inventor 6 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas		Kaeser	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Brent	Country of Residence i	CH

Mailing Address of Inventor:

Address 1	rte de Brent 30 Fontanivent		
Address 2			
City	Brent	**State/Province**	
Postal Code	CH-1817	**Country** i	CH

Inventor 7 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Daniel		Abegglen	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Rances	Country of Residence i	CH

Mailing Address of Inventor:

Address 1	Le Bugnon		
Address 2			
City	Rances	**State/Province**	
Postal Code	CH-1439	**Country** i	CH

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	29157		
Email Address	chicago.patents@klgates.com	Add Email	Remove Email

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

Application Information:

Title of the Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION		
Attorney Docket Number	3712036-01693	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	29157		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/EP11/057657	2011-05-12

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Priority Claimed
10162741.2	EP	2010-05-12	(•) Yes ( ) No

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Priority Claimed
10169374.5	EP	2010-07-13	(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Remove

(●) Assignee	( ) Legal Representative under 35 U.S.C. 117
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Assignee is an Organization check here. [X]

Organization Name	NESTEC S.A.

Mailing Address Information:

Address 1	Avenue Nestle 55		
Address 2			
City	Vevey	**State/Province**	
Country [i]	CH	Postal Code	1800
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Robert M. Barrett/			Date (YYYY-MM-DD)	2012-11-09
First Name	Robert	Last Name	Barrett	Registration Number	30142

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3712036-01693
	Application Number	
Title of Invention	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	14195209
Application Number:	13697297
International Application Number:	PCT/EP11/57657
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Breanne Osborne
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	09-NOV-2012
Filing Date:	
Time Stamp:	17:44:58
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1140
RAM confirmation Number	5143
Deposit Account	021818
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Application Data Sheet	1693ads.pdf	871274 4685ec2dd6d48367da68fad829093d4ed6d1780d	no	8
Warnings:					
Information:					
2	Documents submitted with 371 Applications	1693app.pdf	789125 ce749bb9fb3de574718d10f489152f35f4997c67	no	20
Warnings:					
Information:					
3	Documents submitted with 371 Applications	1693dec.pdf	118432 9ad981d444dcf3d85188c4a69990472acb52286a	no	4
Warnings:					
Information:					
4	Documents submitted with 371 Applications	1693sr.pdf	205316 d9702acb62a770fe74707c24eda0654f5a1760e7	no	5
Warnings:					
Information:					
5	Documents submitted with 371 Applications	1693wo.pdf	283880 5ee9025ceb276206c1a5e724070a50ae8638454e	no	7
Warnings:					
Information:					
6	Transmittal of New Application	1693trans.pdf	89488 0a5c7010b5d1461e2874a723fcd11e7466b5b93a	no	3
Warnings:					
Information:					
7		1693pa.pdf	76708 edb20a7014d7b5b593766eef01c6d26b8dfb24ab	yes	6

Multipart Description/PDF files in .zip description

Document Description	Start	End
Preliminary Amendment	1	1
Specification	2	2
Claims	3	5
Applicant Arguments/Remarks Made in an Amendment	6	6

Warnings:

Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	33351 da4ac382650b1e28bebfb2448c7cbf8820518097	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	2467574	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Filer:	Robert M. Barrett/Karin Barrett
Attorney Docket Number:	3712036-01693

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
National Stage Fee	1631	1	390	390
Natl Stage Search Fee - Report provided	1642	1	500	500
National Stage Exam - all other cases	1633	1	250	250
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1140**

CLAIMS :

1. Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.
2. Capsule according to claim 1, having a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference.
3. Capsule according to claim 1, having a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference.
4. Capsule according to claims 2 or 3, wherein the code is arranged along at least a eighth of the circumference.
5. Capsule according to any of claims 2 to 4, wherein the code is repeated along said circumference.
6. Capsule according to any of the preceding claims, wherein the code is a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on and/or embossed in the container.
7. Capsule according to any of claims 1 to 5, wherein the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).
8. Capsule according to any of claims 1 to 5, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.
9. Capsule according to claim 8, wherein the pattern possesses first surfaces having inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.
10. Capsule according to any of claims 1 to 6 and 8 to 9, wherein the code is mechanically embossed or engraved on the container by laser.

K-FEE SYSTEM GMBH, EX2009, page 59
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

11. Capsule according to any of claims 1 to 10, wherein the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container.

12. Capsule according to any of claims 1 to 10, wherein the code is present on the rim of the capsule.

13. Capsule according to claim 12, wherein the code is present on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

14. System for preparing a beverage from a capsule according to any of the preceding claims and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

15. System according to claim 14, wherein the reading means comprises a light emitter and a light sensor or an inductive sensor.

16. System according to claims 14 or 15, wherein the optical reading means or inductive sensor is arranged to detect a code on the rim of the capsule.

17. Method for preparing a beverage from a system according to any one of claims 14 to 16, wherein the beverage is extracted from the capsule by rotating the capsule along said axis.

18. Method according to claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/697,297	11/09/2012	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	11/09/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $ =		OR	X $62=	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/VERONICA DAY EVERETT/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

VIII-2-1	**Declaration: Entitlement to apply for and be granted a patent** Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate: Name (LAST, First)	In relation to this international application NESTEC S.A. is entitled to apply for and be granted a patent by virtue of the following:
VIII-2-1(iv)		an assignment from JARISCH, Christian to NESTEC S.A., dated 01 November 1999 (01.11.1999)
VIII-2-1(iv)		an assignment from PERENTES, Alexandre to NESTEC S.A., dated 01 November 2007 (01.11.2007)
VIII-2-1(iv)		an assignment from KAESER, Stefan to NESTEC S.A., dated 20 July 2007 (20.07.2007)
VIII-2-1(iv)		an assignment from MAGRI, Carlo to NESTEC S.A., dated 02 February 2009 (02.02.2009)
VIII-2-1(iv)		an assignment from GERBAULET, Arnaud to NESTEC S.A., dated 01 June 2008 (01.06.2008)
VIII-2-1(iv)		an assignment from KAESER, Thomas to NESTEC S.A., dated 01 April 1997 (01.04.1997)
VIII-2-1(iv)		an assignment from ABEGGLEN, Daniel to NESTEC S.A., dated 01 June 1997 (01.06.1997)

VIII-3-1	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	In relation to this international application NESTEC S.A. is entitled to claim priority of earlier application No. 10169374.5 by virtue of the following:
VIII-3-1(iv)		an assignment from JARISCH, Christian to NESTEC S.A., dated 01 November 1999 (01.11.1999)
VIII-3-1(iv)		an assignment from PERENTES, Alexandre to NESTEC S.A., dated 01 November 2007 (01.11.2007)
VIII-3-1(iv)		an assignment from KAESER, Stefan to NESTEC S.A., dated 20 July 2007 (20.07.2007)
VIII-3-1(iv)		an assignment from MAGRI, Carlo to NESTEC S.A., dated 02 February 2009 (02.02.2009)
VIII-3-1(iv)		an assignment from GERBAULET, Arnaud to NESTEC S.A., dated 01 June 2008 (01.06.2008)
VIII-3-1(iv)		an assignment from KAESER, Thomas to NESTEC S.A., dated 01 April 1997 (01.04.1997)
VIII-3-1(iv)		an assignment from ABEGGLEN, Daniel to NESTEC S.A., dated 01 June 1997 (01.06.1997)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 November 2011 (17.11.2011)

PCT

(10) International Publication Number
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B65D 85/804 (2006.01) *A47J 31/22* (2006.01)

(21) International Application Number:
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(22) International Filing Date:
12 May 2011 (12.05.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10162741.2 12 May 2010 (12.05.2010) EP
10169374.5 13 July 2010 (13.07.2010) EP

(71) Applicant *(for all designated States except US)*: **NESTEC S.A.** [CH/CH]; Av. Nestlé 55, CH-1800 Vevey (CH).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **JARISCH, Christian** [CH/CH]; Chemin de Fenix 122, CH-1095 Lutry (CH). **PERENTES, Alexandre** [CH/CH]; Avenue Virgile Rossel 10, CH-1012 Lausanne (CH). **KAESER, Stefan** [CH/CH]; Goldernstrasse 6, CH-5000 Aarau (CH). **MAGRI, Carlo** [IT/CH]; Route d'Outre-Vièze 10, CH-1870 Monthey (CH). **GERBAULET, Arnaud** [FR/FR]; 24 rue du chalet, F-25160 Oye et Pallet (FR). **KAESER, Thomas** [DE/CH]; rte de Brent 30 Fontanivent, CH-1817 Brent (CH). **ABEGGLEN, Daniel** [CH/CH]; Le Bugnon, CH-1439 Rances (CH).

(74) Agent: **BORNE, Patrice**; Avenue Nestlé 55, -, CH-1800 Vevey (CH).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

[Continued on next page]

(54) Title: CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

(57) Abstract: Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (65) adapted for being identified or read by external reading means (62), wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

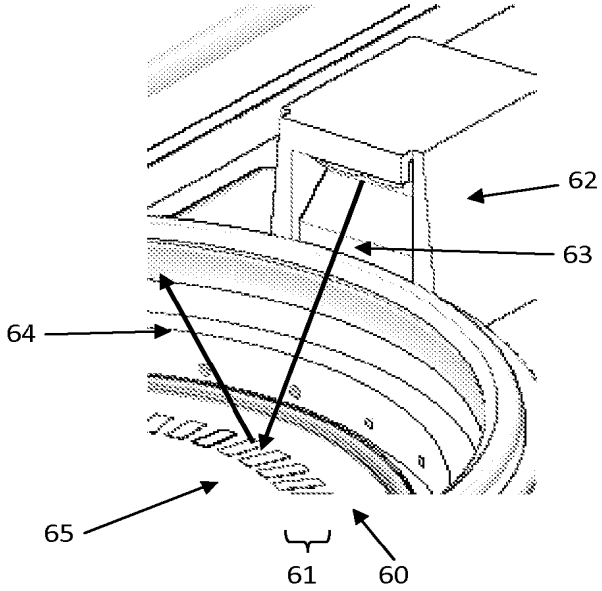


Fig. 2

WO 2011/141532 A1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

VIII-4-1	**Declaration: Inventorship (only for the purposes of the designation of the United States of America)** Declaration of Inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America:	I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought. This declaration is directed to the international application of which it forms a part (if filing declaration with application). This declaration is directed to international application No. PCT/ . . . . . (if furnishing declaration pursuant to Rule 26ter). I hereby declare that my residence, mailing address, and citizenship are as stated next to my name. I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications", by application number, country or Member of the World Trade Organization, day, month, and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.
VIII-4-1-1	Prior applications:	10162741.2, EP, 12 May 2010 (12.05.2010);10169374.5, EP, 13 July 2010 (13.07.2010)

		I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.
VIII-4-1-1-1	Name (LAST, First)	JARISCH, Christian
VIII-4-1-1-2	Residence: (city and either US State, if applicable, or country)	Lutry, Switzerland
VIII-4-1-1-3	Mailing address:	Chemin de Fenix 122 1095 Lutry Switzerland
VIII-4-1-1-4	Citizenship:	CH
VIII-4-1-1-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/JARISCH Christian/
VIII-4-1-1-6	Date:	10 May 2011 (10.05.2011)

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VIII-4-1-2-1	Name (LAST, First)	PERENTES, Alexandre
VIII-4-1-2-2	Residence: (city and either US State, if applicable, or country)	Lausanne, Switzerland
VIII-4-1-2-3	Mailing address:	Avenue Virgile Rossel 10 1012 Lausanne Switzerland
VIII-4-1-2-4	Citizenship:	CH
VIII-4-1-2-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/PERENTES Alexandre/
VIII-4-1-2-6	Date	10 May 2011 (10.05.2011)
VIII-4-1-3-1	Name (LAST, First)	KAESER, Stefan
VIII-4-1-3-2	Residence: (city and either US State, if applicable, or country)	Aarau, Switzerland
VIII-4-1-3-3	Mailing address:	Goldernstrasse 6 5000 Aarau Switzerland
VIII-4-1-3-4	Citizenship:	CH
VIII-4-1-3-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/KAESER Stefan/
VIII-4-1-3-6	Date	10 May 2011 (10.05.2011)
VIII-4-1-4-1	Name (LAST, First)	MAGRI, Carlo
VIII-4-1-4-2	Residence: (city and either US State, if applicable, or country)	Monthey, Switzerland
VIII-4-1-4-3	Mailing address:	Route d'Outre-Vièze 10 1870 Monthey Switzerland
VIII-4-1-4-4	Citizenship:	IT
VIII-4-1-4-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/MAGRI Carlo/
VIII-4-1-4-6	Date	10 May 2011 (10.05.2011)
VIII-4-1-5-1	Name (LAST, First)	GERBAULET, Arnaud
VIII-4-1-5-2	Residence: (city and either US State, if applicable, or country)	Oye et Pallet, France
VIII-4-1-5-3	Mailing address:	24 rue du chalet 25160 Oye et Pallet France
VIII-4-1-5-4	Citizenship:	FR
VIII-4-1-5-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/GERBAULET Arnaud/
VIII-4-1-5-6	Date	10 May 2011 (10.05.2011)

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VIII-4-1-6-1	Name (LAST, First)	KAESER, Thomas
VIII-4-1-6-2	Residence: (city and either US State, if applicable, or country)	Brent, Switzerland
VIII-4-1-6-3	Mailing address:	rte de Brent 30 Fontanivent 1817 Brent Switzerland
VIII-4-1-6-4	Citizenship:	DE
VIII-4-1-6-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/KAESER Thomas/
VIII-4-1-6-6	Date	10 May 2011 (10.05.2011)
VIII-4-1-7-1	Name (LAST, First)	ABEGGLEN, Daniel
VIII-4-1-7-2	Residence: (city and either US State, if applicable, or country)	Rances, Switzerland
VIII-4-1-7-3	Mailing address:	Le Bugnon 1439 Rances Switzerland
VIII-4-1-7-4	Citizenship:	CH
VIII-4-1-7-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/ABEGGLEN Daniel/
VIII-4-1-7-6	Date	10 May 2011 (10.05.2011)

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0	**For receiving Office use only**	
0-1	International Application No.	**PCT/EP2011/057657**
0-2	International Filing Date	**12 MAY 2011 (12.05.2011)**
0-3	Name of receiving Office and "PCT International Application"	**RO/EP**

0-4	**Form PCT/RO/101 PCT Request**	
0-4-1	Prepared Using	PCT Online Filing Version 3.5.000.221 MT/FOP 20020701/0.20.5.9
0-5	**Petition** The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	European Patent Office (EPO) (RO/EP)
0-7	**Applicant's or agent's file reference**	10893-WO-PCT
I	**Title of Invention**	
II	**Applicant**	
II-1	This person is	Applicant only
II-2	Applicant for	All designated States except US
II-4	Name	NESTEC S.A.
II-5	Address	Av. Nestlé 55 1800 VEVEY Switzerland
II-6	State of nationality	CH
II-7	State of residence	CH
II-8	Telephone No.	+ 41219242740
II-9	Facsimile No.	+ 41219242880
II-10	e-mail	patrice.borne@nestle.com
II-11	Applicant's registration No. with the Office	0595800.4
III-1	**Applicant and/or inventor**	
III-1-1	This person is	Applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	JARISCH, Christian
III-1-5	Address	Chemin de Fenix 122 1095 Lutry Switzerland
III-1-6	State of nationality	CH
III-1-7	State of residence	CH

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III-2	**Applicant and/or inventor**	
III-2-1	This person is	Applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	PERENTES, Alexandre
III-2-5	Address	Avenue Virgile Rossel 10 1012 Lausanne Switzerland
III-2-6	State of nationality	CH
III-2-7	State of residence	CH
III-3	**Applicant and/or inventor**	
III-3-1	This person is	Applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	KAESER, Stefan
III-3-5	Address	Goldernstrasse 6 5000 Aarau Switzerland
III-3-6	State of nationality	CH
III-3-7	State of residence	CH
III-4	**Applicant and/or inventor**	
III-4-1	This person is	Applicant and inventor
III-4-2	Applicant for	US only
III-4-4	Name (LAST, First)	MAGRI, Carlo
III-4-5	Address	Route d'Outre-Vièze 10 1870 Monthey Switzerland
III-4-6	State of nationality	IT
III-4-7	State of residence	CH
III-5	**Applicant and/or inventor**	
III-5-1	This person is	Applicant and inventor
III-5-2	Applicant for	US only
III-5-4	Name (LAST, First)	GERBAULET, Arnaud
III-5-5	Address	24 rue du chalet 25160 Oye et Pallet France
III-5-6	State of nationality	FR
III-5-7	State of residence	FR

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III-6	**Applicant and/or inventor**	
III-6-1	This person is	Applicant and inventor
III-6-2	Applicant for	US only
III-6-4	Name (LAST, First)	KAESER, Thomas
III-6-5	Address	rte de Brent 30 Fontanivent 1817 Brent Switzerland
III-6-6	State of nationality	DE
III-6-7	State of residence	CH
III-7	**Applicant and/or inventor**	
III-7-1	This person is	Applicant and inventor
III-7-2	Applicant for	US only
III-7-4	Name (LAST, First)	ABEGGLEN, Daniel
III-7-5	Address	Le Bugnon 1439 Rances Switzerland
III-7-6	State of nationality	CH
III-7-7	State of residence	CH
IV-1	**Agent or common representative; or address for correspondence**	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	Agent
IV-1-1	Name (LAST, First)	BORNE, Patrice
IV-1-2	Address	Avenue Nestlé 55 – 1800 Vevey Switzerland
IV-1-3	Telephone No.	+41 21 924 27 40
IV-1-4	Facsimile No.	+41 21 924 28 80
IV-1-5	e-mail	patrice.borne@nestle.com
IV-1-6	Agent's registration No.	101016266
V	**DESIGNATIONS**	
V-1	**The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.**	
VI-1	**Priority claim of earlier regional application**	
VI-1-1	Filing date	12 May 2010 (12.05.2010)
VI-1-2	Number	10162741.2
VI-1-3	Regional Office	EP

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VI-2	**Priority claim of earlier regional application**		
VI-2-1	Filing date	13 July 2010 (13.07.2010)	
VI-2-2	Number	10169374.5	
VI-2-3	Regional Office	EP	
VI-3	**Priority document request** The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1, VI-2	
VI-4	**Incorporation by reference :** where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.		
VII-1	**International Searching Authority Chosen**	European Patent Office (EPO) (ISA/EP)	
VIII	**Declarations**	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	–	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	1	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	2	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	1	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	–	

PCT REQUEST

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IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	12	✓
IX-2	Description	10	✓
IX-3	Claims	2	✓
IX-4	Abstract	1	✓
IX-5	Drawings	4	✓
IX-7	TOTAL	29	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	–	✓
IX-10	Original general power of attorney	–	✓
IX-18	PCT-SAFE physical media	–	–
IX-20	**Figure of the drawings which should accompany the abstract**	2, 3	
IX-21	**Language of filing of the international application**	English	
X-1	**Signature of applicant, agent or common representative**	/BORNE Patrice/	
X-1-1	Name (LAST, First)	BORNE, Patrice	
X-1-2	Name of signatory	BORNE, Patrice	
X-1-3	Capacity	(Representative)	

FOR RECEIVING OFFICE USE ONLY

10-1	**Date of actual receipt of the purported international application**	**12 MAY 2011 (12.05.2011)**
10-2	**Drawings:**	
10-2-1	Received	received
10-2-2	Not received	
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**	
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**	
10-5	**International Searching Authority**	ISA/EP
10-6	**Transmittal of search copy delayed until search fee is paid**	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	**Date of receipt of the record copy by the International Bureau**	

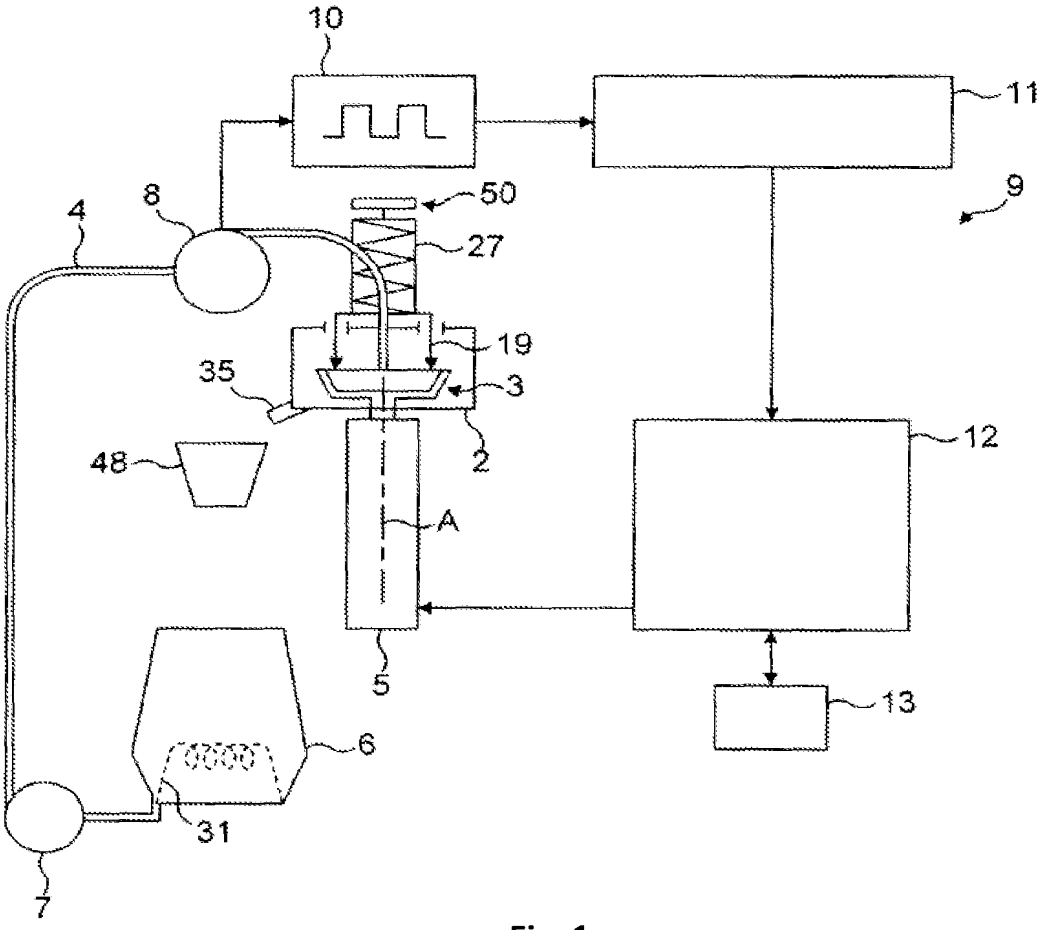


Fig. 1

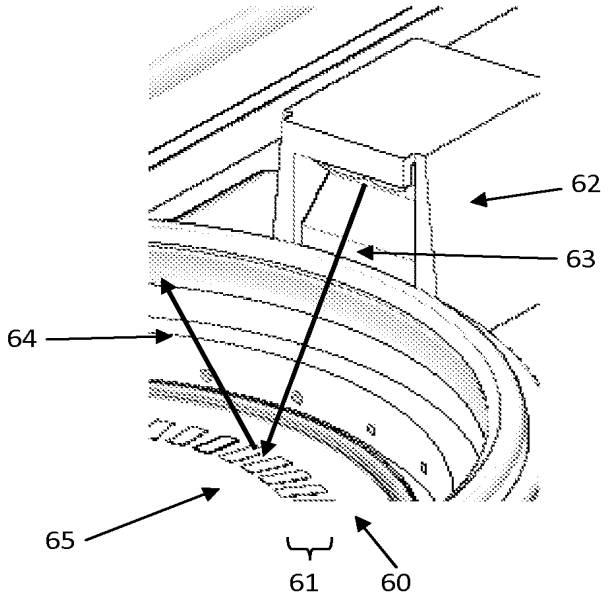


Fig. 2

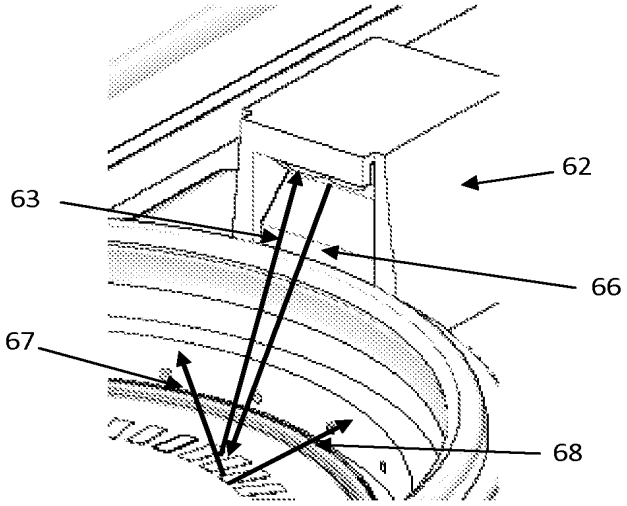


Fig. 3

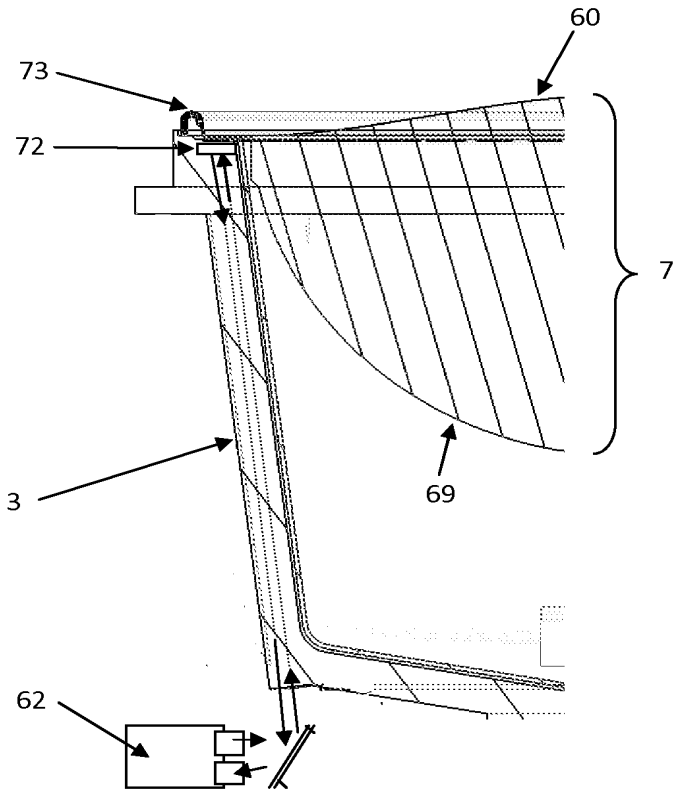


Fig. 4

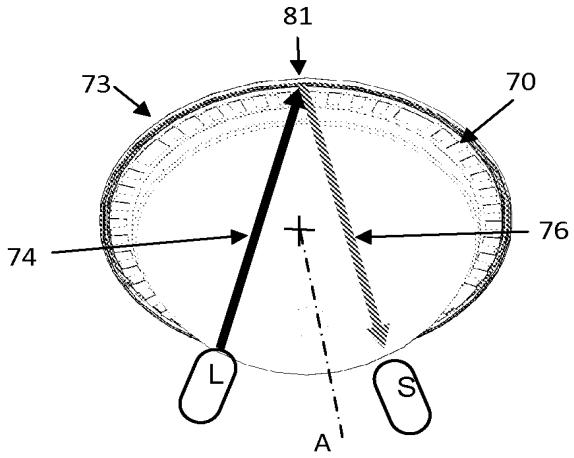


Fig. 5

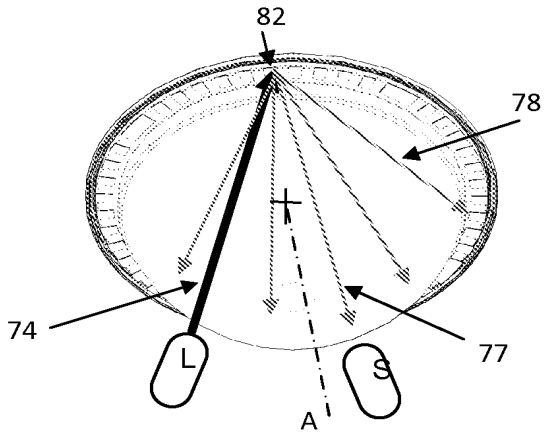

82
78
74
77
L
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A

Fig. 6

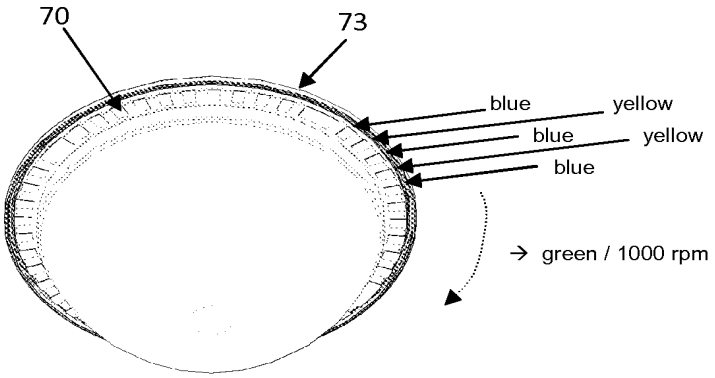

70
73
blue
yellow
blue
yellow
blue
→ green / 1000 rpm

Fig. 7

VIII-3-2	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	In relation to this international application NESTEC S.A. is entitled to claim priority of earlier application No. 10162741.2 by virtue of the following:
VIII-3-2(iv)		an assignment from JARISCH, Christian to NESTEC S.A., dated 01 November 1999 (01.11.1999)
VIII-3-2(iv)		an assignment from PERENTES, Alexandre to NESTEC S.A., dated 01 November 2007 (01.11.2007)
VIII-3-2(iv)		an assignment from KAESER, Stefan to NESTEC S.A., dated 20 July 2007 (20.07.2007)
VIII-3-2(iv)		an assignment from MAGRI, Carlo to NESTEC S.A., dated 02 February 2009 (02.02.2009)
VIII-3-2(iv)		an assignment from GERBAULET, Arnaud to NESTEC S.A., dated 01 June 2008 (01.06.2008)
VIII-3-2(iv)		an assignment from KAESER, Thomas to NESTEC S.A., dated 01 April 1997 (01.04.1997)
VIII-3-2(iv)		an assignment from ABEGGLEN, Daniel to NESTEC S.A., dated 01 June 1997 (01.06.1997)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 10893-WO-PCT	**FOR FURTHER ACTION** See item 4 below	
International application No. PCT/EP2011/057657	International filing date *(day/month/year)* 12 May 2011 (12.05.2011)	Priority date *(day/month/year)* 12 May 2010 (12.05.2010)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NESTEC S.A.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 13 November 2012 (13.11.2012)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Agnès Wittmann-Regis e-mail: pt06.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2011/057657	12.05.2011	12.05.2010

International Patent Classification (IPC) or both national classification and IPC
INV. B65D85/804 A47J31/22

Applicant
NESTEC S.A.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Bridault, Alain Telephone No. +31 70 340-3224

Form PCT/ISA/237 (Cover Sheet) (July 2009)

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	4-10, 14-18
	No:	Claims	1-3, 11-13
Inventive step (IS)	Yes:	Claims	14-18
	No:	Claims	1-13
Industrial applicability (IA)	Yes:	Claims	1-18
	No:	Claims	

2. Citations and explanations

see separate sheet

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 EP 1 764 015 A1 (GRIMAC S R L [IT]) 21 March 2007 (2007-03-21)

D2 WO 02/28241 A1 (BOYD COFFEE CO [US]) 11 April 2002 (2002-04-11)cited in the application

D3 WO 2010/026053 A1 (NESTEC SA [CH]; DENISART JEAN- PAUL [CH]; RYSER ANTOINE [CH]) 11 March 2010 (2010-03-11)cited in the application

2 The present application does not meet the criteria of Article 33 (2) PCT, because the subject-matter of claim 1 is not new.

D1 discloses (the reference numbers referring to this document) a capsule (17) for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code (72) adapted for being identified or read by external reading means; considering the arrangement of the code shown on figure 4, it is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule. Therefore, the capsule of D1 has all the technical features of the subject-matter of claim 1.

Furthermore, D2 also discloses a capsule having all said features.

3 Since the capsule of D1 has also the additional features of dependent claims 2 and 3, their subject-matter is not new either.

4 The code on the capsule of D2 (Fig. 2f) is present on the lid, on the rim, and on the bottom of the rim. Therefore, claims 11 to 13 do not meet the requirements of the PCT with respect to novelty.

5 Dependent claims 4-10 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

6 The additional features of claims 4 and 5 appear to be a mere matter of choice, which would not bring any unexpected effect.

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7 The coding means of dependent claims 6 to 10 appear to be usual, and therefore do not bring any unexpected effect.

8 D3 discloses a system from which the subject-matter of claim 14 differs in that there are provided reading means arranged for reading the code when the capsule is rotated along the axis. Said subject-matter is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as improving the recognition of the code.

The solution to this problem proposed in claim 14 of the present application is considered as involving an inventive step (Article 33(3) PCT) because no prior art document suggests reading the code while the capsule is rotated, which enables a multiple reading of said code (note: D1 discloses a capsule suitable for being read when rotated, but fails to effectively suggest such reading).

9 Claims 15 and 16 are dependent on claim 14 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

10 Since the method of claim 17 uses the novel and inventive system of claim 14, said method is novel and inventive, too.

11 Claim 18 is dependent on claim 17 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

1 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

2 Independent claim 14 is not in the two-part form in accordance with Rule 6.3 (b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D3 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, the following features are not known in combination from D3 and belong in the characterising portion of such a claim: reading means arranged for reading the code when the capsule is rotated along the axis.

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3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 is not mentioned in the description, nor is this document identified therein.

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Bescheinigung	Certificate	Attestation
Die angehefteten Unterlagen stimmen mit der als ursprünglich eingereicht geltenden Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.	The attached documents are exact copies of the text in which the European patent application described on the following page is deemed to have been filed.	Les documents joints à la présente attestation sont conformes au texte, considéré comme initialement déposé, de la demande de brevet européen qui est spécifiée à la page suivante.

Patentanmeldung Nr.	**Patent application No.**	**Demande de brevet n°**

10162741.2 / EP10162741

The organization code and number of your priority application, to be used for filing abroad under the Paris Convention, is EP10162741.

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le President de l'Office européen des brevets
p.o.

R.C. van Dijk

EPA/EPO/OEB Form 1014 12.08

Anmeldung Nr:
Application no.: 10162741.2
Demande no :

Anmeldetag:
Date of filing: 12.05.10
Date de dépôt :

Anmelder / Applicant(s) / Demandeur(s):

Nestec S.A.
IP Department
Avenue Nestlé 55
1800 Vevey/CH

Bezeichnung der Erfindung / Title of the invention / Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se référer à la description.)

Capsule for preparing a beverage by centrifugation, system and method for preparing a beverage by centrifugation.

In Anspruch genommene Priorität(en) / Priority(Priorities) claimed / Priorité(s) revendiquée(s)
Staat/Tag/Aktenzeichen / State/Date/File no. / Pays/Date/Numéro de dépôt:

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A47J31/22

Am Anmeldetag benannte Vertragstaaten / Contracting States designated at date of filing / Etats contractants désignées lors du dépôt:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

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Capsule for preparing a beverage by centrifugation, system and method for preparing a beverage by centrifugation.

The invention relates to the preparation of a beverage by use of a capsule containing beverage ingredient in a beverage production device.

The preparation of a beverage by a capsule containing beverage ingredient is known. In general, the capsule is inserted in a beverage production device, such as a coffee machine, liquid is fed in the capsule and a beverage is extracted from the capsule under pressure or by gravity.

The preparation of a beverage by using the centrifugation is known. The principle mainly consists in providing beverage ingredient in a container of the capsule, feeding liquid in the receptacle and rotating the receptacle at elevated speed to ensure interaction of liquid with powder while creating a gradient of pressure of liquid in the receptacle; such pressure increasing gradually from the centre towards the periphery of the receptacle. As liquid traverses the coffee bed, extraction of the coffee compounds takes place and a liquid extract is obtained that flows out at the periphery of the receptacle.

The term "capsule" refers to any flexible, rigid or semi-rigid container containing beverage ingredient. Other synonymous to a capsule are: "pod", "pad", "cartridge" or "sachet". The capsule can be single use. The container can also be filled with ingredient by the user to form the capsule just before use.

The term ingredient means any suitable beverage substance such as ground coffee, soluble coffee, leaf tea, soluble tea, herbal tea, dairy powder, culinary powder and combination thereof.

The invention relates more particularly to the identification of the capsule by means of a code. The code may be necessary to control parameters in the beverage preparation device such as liquid or beverage flow rate, pressure, rotational speed, temperature and combinations thereof.

WO2010/026053 relates to a controlled beverage production device using centrifugal forces. The capsule may comprise a barcode provided on an outside face of the capsule and which enables a detection of the type of capsule and/or the nature of ingredients provided within the capsule in order to apply a predefined extraction profile for the beverage to be prepared.

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The present invention is defined by the appended claims.

Figure 1 illustrates an example of a beverage preparation system 1 as described in WO2010/026053 for which the capsule of the invention can be used.

The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system further comprises control means 9 and a user interface 13. Further characteristics can be found in WO2010/026053.

In the following examples (see figure 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A foil or membrane (liquid-tight or permeable) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.

EXAMPLES:

1) Optical reading on foil, respectively on top side rim of capsule (figures 2 and 3):

A light beam is projected onto the capsule foil 60 as illustrated on figure 2.

Onto the capsule foil 60, a bit code 61 is applied along a circular or arc-shaped path.

The barcode may consists of:

- Mirroring or absorbing surfaces for providing bit "0" and,
- Diffusing and reflective surfaces for providing bit "1"

The code is read by rotating the capsule along a central axis A (figure 1).

The reader or sensor 62 is part of the centrifugal unit 2 and consists of

- A light source with/without focusing optic and
- A light sensor with/without focusing optic.

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The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or
- Embossing (mirror + rough reflecting + diffusing) or
- Laser engraving.

Optionally, the bit code could also be consisting of different colour patterns combined with a colour reading device. The combination of different colours and reading at a specific rotational speed results in a well defined "mixed colour". As an example, a capsule with half the circumference in blue and the other half in yellow would result in reading a green colour during rotation.

As illustrated in figure 2, when the light beam 63, sent by the light source of the sensor 62, touches the mirror code pattern (small rectangles 65) it reflects in a reflective beam 64 which is not received by the sensor.

As the capsule is rotated (figure 3), the light beam 63 touches a diffuse reflecting surface (surface between the small rectangles) and is partially reflected to the sensor. A reflective beam 66 is received by the sensor whereas other beams 67, 68 are diffused or reflected outside the sensor.

2) Optical reading on rim bottom side of capsule (figures 4 to7):

The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring or diffusing properties. The surfaces are arranged in a circular pattern or at least along an angular portion of the rim.

A light beam 74 is projected to the capsule's rim 73.

Onto the capsule rim, a bit code is applied along a circular or arc-shaped path of the rim.

The bit code may consist of:

- Inclined mirroring or (flat) absorbing surfaces for bit "0" and
- Flat mirroring or flat reflective (diffusing) surfaces for bit "1"

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The bit code is read by rotating the capsule along its central axis A.

The reader may consist of

- A light source with/without focusing optic and,
- A light sensor with/without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or,
- Laser engraving (e.g. for absorbing / reflecting-diffusing) surfaces or,
- Embossing: Flat and inclined mirroring surfaces.

On figure 5, the light beam 74 from the light source "L" touches the mirror surface of the code (small rectangle 81) and is reflected into a reflective beam 76 to the sensor "S" with high intensity. A bit such as "0" or "1" is thereby provided to the control unit.

On figure 6, the light beam 74 from the light source "L" touches diffusing or absorbing surfaces (surface 82 between two small rectangles). The light beam 77 that reaches the sensor is of small intensity. Other beams such as beam 78 are diffused outside the sensor S due to the diffusing properties of the surface.

A bit such as "1" or "0" is provided to the control unit.

Therefore, the number of bits and their bit code depends on the number and specific arrangement of mirror surfaces (e.g. rectangles) and diffusing or absorbing surfaces (e.g., zones between the rectangles). The same sequence of bits forming a "code" can be repeated several times on the circumference of the rim. This repetition provide redundancy and more reliability to the reading.

Optionally (figure 7), the code comprises different colour patterns combined with a colour reading device. The combination of different colours and reading at a specific rotational speed results in a well defined "mixed colour". As an example, a capsule with half the "dots" in blue and the other half in yellow would result in reading a green colour during rotation.

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3) Application modes of codes onto a capsule

The codes described in the previous examples can be applied by different methods onto a capsule such as by:

4.1 Printing or mechanical deforming on a formed capsule or,

4.2 Printing or mechanical deforming on the capsule raw material (foil) before container forming or,

4.3 Printing on outer surface of a capsule container or,

4.4 Printing on the inner surface of a capsule container, using the curl as information support (Aluminium capsule technology).

4) Inductive code reading:

Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface. For instance, the capsule comprises a circumferential metal rim which comprises a succession of discrete slots and/or bumps. When the capsule is rotated about its central axis, the rim is moved relative to the sensor such that the slots and/or bumps are detected. The code can be read on a time base of a CPU of the beverage preparation device. The maximum rotational speed to read the code depends on the used sensor and the internal CPU of the device.

The speed for reading can, for instance, be comprised between 0.1 and 1000 rpm.

When reading the code, liquid can already fed in the capsule for providing a pre-wetting of the beverage ingredients.

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CLAIMS :

1. Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

2. Capsule according to claim 1, wherein the code is arranged on the container along an arc-shaped or circular path.

3. Capsule according to claim 2, wherein the code is repeated along said path.

4. Capsule according to any of the preceding claims, wherein the code is a bit code formed by a series of discrete polygonal (e.g., rectangles) or dot surfaces printed on and/or embossed in the container.

5. Capsule according to claims 3 or 4, wherein the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).

6. Capsule according to claims 4 or 5, wherein the code is printed by a pattern which possesses surfaces having different reflective and/or absorbing properties.

7. Capsule according to claims 3 or 4, wherein the code is mechanically embossed or engraved on the container by laser.

8. Capsule according to any of claims 1 to 7, wherein the code is present on the rim of the capsule.

9. Capsule according to any of claim 8, wherein the code is present on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

10. System for preparing a beverage from a capsule according to any of the preceding claims and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means for reading the code when the capsule is rotated along said axis.

11. System according to any of claims 10, wherein the reading means comprises a light emitter and a light sensor.

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12. System according to claim 10, wherein the reading means comprises an inductive sensor.

13. System according to claim 12, wherein the inductive sensor is arranged to detect a code on the rim of the capsule.

14. Method for preparing a beverage from a system according to any one of claims 10 to 13, wherein the beverage is extracted from the capsule by rotating the capsule along said axis.

15. Method according to claims 14, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

16. Method according to claim 15, wherein the first speed is lower than the second speed.

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ABSTRACT:

Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

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Bescheinigung	Certificate	Attestation
Die angehefteten Unterlagen stimmen mit der als ursprünglich eingereicht geltenden Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.	The attached documents are exact copies of the text in which the European patent application described on the following page is deemed to have been filed.	Les documents joints à la présente attestation sont conformes au texte, considéré comme initialement déposé, de la demande de brevet européen qui est spécifiée à la page suivante.

Patentanmeldung Nr.	**Patent application No.**	**Demande de brevet n°**

10169374.5 / EP10169374

The organization code and number of your priority application, to be used for filing abroad under the Paris Convention, is EP10169374.

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le President de l'Office européen des brevets
p.o.

R.C. van Dijk

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Anmeldung Nr:
Application no.: 10169374.5
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Date of filing: 13.07.10
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Anmelder / Applicant(s) / Demandeur(s):

Nestec S.A.
Avenue Nestlé 55
1800 Vevey/CH

Bezeichnung der Erfindung / Title of the invention / Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se référer à la description.)

Capsule for preparing a beverage by centrifugation, system and method for preparing a beverage by centrifugation.

In Anspruch genommene Priorität(en) / Priority(Priorities) claimed / Priorité(s) revendiquée(s)
Staat/Tag/Aktenzeichen / State/Date/File no. / Pays/Date/Numéro de dépôt:

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A47J31/00

Am Anmeldetag benannte Vertragstaaten / Contracting States designated at date of filing / Etats contractants désignées lors du dépôt:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

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Capsule for preparing a beverage by centrifugation, system and method for preparing a beverage by centrifugation.

Introduction

The invention relates to the preparation of a beverage by use of a capsule containing beverage ingredient in a beverage production device. The present invention in particular focuses on the detection of the capsule.

Background art

The preparation of a beverage by a capsule containing beverage ingredient is known. In general, the capsule is inserted in a beverage production device, such as a coffee machine, liquid is fed in the capsule and a beverage is extracted from the capsule under pressure or by gravity.

The preparation of a beverage by using the centrifugation is known. The principle mainly consists in providing beverage ingredient in a container of the capsule, feeding liquid in the receptacle and rotating the receptacle at elevated speed to ensure interaction of liquid with powder while creating a gradient of pressure of liquid in the receptacle; such pressure increasing gradually from the centre towards the periphery of the receptacle. As liquid traverses the coffee bed, extraction of the coffee compounds takes place and a liquid extract is obtained that flows out at the periphery of the receptacle.

The term "capsule" refers to any flexible, rigid or semi-rigid container containing beverage ingredient. Other synonymous to a capsule are: "pod", "pad", "cartridge" or "sachet". The capsule can be single use. The container can also be filled with ingredient by the user to form the capsule just before use.

The term ingredient means any suitable beverage substance such as ground coffee, soluble coffee, leaf tea, soluble tea, herbal tea, dairy powder, baby food, culinary powder and combination thereof.

The invention relates more particularly to the identification of the capsule by means of a code. The code may be necessary to control parameters in the beverage preparation device such as liquid or beverage flow rate, pressure, rotational speed, temperature and combinations thereof.

EP0451980 relates to packages containing comestibles for the preparation of beverages. Recognition means can comprise one or more strips of a magnetic material applied to the body of the package which can be read by an appropriate magnetic sensor, one or more

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shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.

WO02/28241 relates to an encoded coffee packet for use in the preparation of hot or cold beverages comprising a filter defining a cavity and a brewing ingredient within the cavity. The packet further comprises a machine-interpretable feature located on the filter such as a color, a shape, a glyph, a text string, a barcode or a digital watermark.

WO02/078498 relates to a machine-readable identifier on a portion package which contains ground coffee for espresso machine. The identifier can be a concentric barcode which is read when the capsule turns around an axis which is placed outside of its perimeter such as when the capsule is stored in a carousel.

WO2005044067 relates to a system for identifying a capsule having a code visible under UV light printed thereon or a magnetic code such as a ribbon or label. The code may be read by a turning magnetic reading head. However, such system is not adapted for detecting a capsule in a device using centrifugal forces for extracting the beverage.

WO2009007292 relates to a method for reading barcodes in a drinks machine when the brewing chamber is being closed from an open position to a closed position.

WO2010/026053 relates to a controlled beverage production device using centrifugal forces. The capsule may comprise a barcode provided on an outside face of the capsule and which enables a detection of the type of capsule and/or the nature of ingredients provided within the capsule in order to apply a predefined extraction profile for the beverage to be prepared.

Brief description of the invention

The aim of the present invention is to propose a way to identify the capsule within a production machine so as to adjust working parameters of the machine.

This aim is achieved by a capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

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The invention further relates to a method for preparing a beverage from a system comprising a capsule as aforementioned and a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule therein and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

The invention is further described in the appended claims.

Brief description of the figures

The present invention will be better understood thanks to the detailed description which follows and the accompanying drawings, which are given as non-limiting examples of embodiments of the invention, namely:

- figure 1 illustrates the basic principle of the centrifugal extraction,

- figure 2 illustrates the reading method of a mark on the lid surface of the capsule,

- figure 3 illustrates the reading method of an absence of the mark,

- figure 4 illustrates an alternate position of the code on the capsule, in particular, when placed on the underside of the rim of the capsule, and the capsule fitted into a capsule holder of the extraction device,

- figures 5 and 6 illustrate the combination of a laser source and a detector in positive and negative detection, for example, for the alternate position of the code of figure 4,

- figure 7 illustrates the detection of a color code on the capsule, for example, for the alternate position of the code of figure 4,.

Detailed description

Figure 1 illustrates an example of a beverage preparation system 1 as described in WO2010/026053 for which the capsule of the invention can be used.

The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as a rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction

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means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system may further comprise a flow meter such as a flow-metering turbine 8 for providing a control of the flow rate of water supplied in the cell 3. The counter 11 can be connected to the flow-metering turbine 8 to enable an analysis of the generated impulse data 10. The analysed data is then transferred to the processor 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time. A user interface 13 may be provided to allow the user to input information that is transmitted to the control unit 9. Further characteristics of the system can be found in WO2010/026053.

In the following examples (see figure 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.

The capsule is designed for rotating around an axis A. This axis A crosses perpendicularly the center of the membrane which has the form of a disk. This axis A exits at the center of the bottom of the body. This axis A will help to define the notion of "circumference" which is a circular path located on the capsule and having the axis A as reference axis. This circumference can be on the lid, e.g., membrane or on the body part such as on the flange-like rim. The lid may be impervious to liquid before insertion in the device or it may be pervious to liquid by means of small openings or pores provided in the center and/or periphery of the lid. The code is spread along the circumference or a part of the circumference. The code may comprise successive arch-shaped segments. The code may also comprise successive segments which are individually rectilinear but extend along at least a part of the circumference. According to one embodiment, the sensor cannot read the code without the rotation of the capsule. This is the case where the code is spread along at least a eighth, preferably at least a quarter of the circumference or even more. The fact that the code is placed along an arc-shaped line render the reading by a sweep beam very difficult. This is why the rotation of the capsule plays an important role. In case that the code is located on the body, it is then necessary to rotate the capsule to have access, for the sensor, to the entire set of marks composing the code. The code is further located close to the peripheral edge of the capsule. The peripheral edge is defined as the outermost circular line of the capsule. Preferably, the distance of the code from the peripheral edge is not more than 10 mm, more preferably not more than 8 mm.

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According to an embodiment, the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV). In this case, the sensor further comprises a UV-light beam source and a UV detector.

The code is preferably repeated along the circumference in order to ensure a reliable reading. The code is repeated at least twice on the circumference. Preferably, the code is repeated three to six times on the circumference. Repetition of the code means that the same code is duplicated and the successive codes are positioned in series along the circumference so that upon a 360-degree rotation of the capsule, the same code can be detected or read more than one time.

EXAMPLES:

1) Optical reading on foil, respectively on top side rim of capsule (figures 2 and 3):

A light beam is projected onto the capsule's lid, e.g., membrane or foil 60, as illustrated on figure 2.

Onto the capsule foil 60, a plurality of bits forming the code 61 is applied along a circular or arc-shaped path.

Preferably, the code is placed on a flat portion of the lid and close to the peripheral edge of the capsule. The code is preferably placed the lid that is supported by the flange-like rim of the capsule or overlaps with the rim. Hence, the code is not distorted due to mechanical constraints and can be read more reliably.

The marks may consist of:

- Mirroring or absorbing surfaces for providing bit "0" and,
- Diffusing and reflective surfaces for providing bit "1"

The values "0" and "1" are arbitrary chosen and can be inversed.

The code is read by rotating the capsule along a central axis A (figure 1).

The reader or sensor 62 is part of the centrifugal unit 2 and consists of

- A light source with or without focusing optic and
- A light sensor with or without focusing optic.

The light can be:

- Non polarized or

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- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or
- Embossing (mirroring + rough reflecting + diffusing) or
- Laser engraving.

Optionally, the bit code may also consist of different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined "mixed color". As an example, a capsule with half the circumference in blue and the other half in yellow would result in reading a green color during rotation. In the same manner, one third in blue and the remaining part in yellow will give another color. In this case, the light could by a simple light source without specific convergence means.

As illustrated in figure 2, when the light beam 63, sent by the light source of the sensor 62, touches the mirror code pattern (small rectangles 65) it reflects in a reflective beam 64 which is not received by the sensor.

As the capsule is rotated (figure 3), the light beam 63 touches a diffuse reflecting surface (surface between the small rectangles) and is partially reflected to the sensor. A reflective beam 66 is received by the sensor whereas other beams 67, 68 are diffused or reflected outside the sensor.

2) Optical reading on rim bottom side of capsule (figures 4 to7):

The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring and/or diffusing properties. The surfaces are arranged in a circular pattern or at least along an angular portion of the rim.

A light beam 74 is projected to the capsule's rim 73.

Onto the capsule rim, a bit code is applied along a circular or arc-shaped path of the rim.

The bit code may consist of:

- Inclined mirroring or (flat) absorbing surfaces for bit "0" and
- Flat mirroring or flat reflective (diffusing) surfaces for bit "1"

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The bit code is read by rotating the capsule along its central axis A.

The reader may consist of

- A light source with/without focusing optic and,
- A light sensor with/without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or,
- Laser engraving (e.g. for absorbing / reflecting-diffusing) surfaces or,
- Embossing: Flat and inclined mirroring surfaces.

In the embodiment of the figure 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the figure 4 to deflect the forward and backward beams.

On figure 5, the light beam 74 from the light source "L" touches the mirror surface of the code (small rectangle 81) and is reflected into a reflective beam 76 to the sensor "S" with high intensity. A bit such as "0" or "1" is thereby provided to the control unit.

On figure 6, the light beam 74 from the light source "L" touches diffusing or absorbing surfaces (surface 82 between two small rectangles). The light beam 77 that reaches the sensor is of small intensity. Other beams such as beam 78 are diffused outside the sensor S due to the diffusing properties of the surface.

A bit such as "1" or "0" is provided to the control unit.

Therefore, the number of bits and their bit code depends on the number and specific arrangement of mirror surfaces (e.g. rectangles) and diffusing or absorbing surfaces (e.g., zones between the rectangles). The same sequence of bits forming a "code" can be repeated

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several times on the circumference of the rim. This repetition provides redundancy and more reliability to the reading.

Optionally (figure 7), the code comprises different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined "mixed color". As an example, a capsule with half the "dots" in blue and the other half in yellow would result in reading a green color during rotation.

3) Application modes of codes onto a capsule

The codes described in the previous examples can be applied by different methods onto a capsule such as by:

- Printing or mechanical deforming on a formed capsule or,

- Printing or mechanical deforming on the capsule raw material (foil) before container forming or,

- Printing on outer surface of a capsule container or,- Printing on the inner surface of a capsule container, using the curl as information support (Aluminum capsule technology).

4) Inductive code reading:

Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface. For instance, the capsule comprises a circumferential metal rim which comprises a succession of discrete slots and/or bumps. When the capsule is rotated about its central axis, the rim is moved relative to the sensor such that the slots and/or bumps are detected. The code can be read on a time base of a CPU of the beverage preparation device. The maximum rotational speed to read the code depends on the used sensor and the internal CPU of the device.

5) Other general characteristics to all embodiments:

The speed for reading can, for instance, be comprised between 0.1 and 1000 rpm.

When reading the code, liquid can already fed in the capsule for providing a pre-wetting of the beverage ingredients.

The code preferably comprises three sections, the synchronization section, the payload section and the verification section. The synchronization section serves for the synchronization purpose i.e. to inform the sensor when the code begins. Since the speed of the rotation of the capsule can vary, the synchronization is achieved through a known sequence of bits such as

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0,1,0,1. Then the payload of the code identifying the capsule can be read. In order to avoid misinterpretation of the code, the payload can be followed by verification bits. These bits can be a checksum on the payload or a similar verification function.

The code can be replicated along the code path so that if one code gives a wrong verification value, the other code(s) can be taken into account.

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CLAIMS :

1. Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.
2. Capsule according to claim 1, having a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference.
3. Capsule according to claim 1, having a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference.
4. Capsule according to claims 2 or 3, wherein the code is arranged along at least a eighth of the circumference.
5. Capsule according to any of claims 2 to 4, wherein the code is repeated along said circumference.
6. Capsule according to any of the preceding claims, wherein the code is a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on and/or embossed in the container.
7. Capsule according to any of claims 1 to 5, wherein the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).
8. Capsule according to any of claims 1 to 5, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.
9. Capsule according to claim 8, wherein the pattern possesses first surfaces having inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.
10. Capsule according to any of claims 1 to 6 and 8 to 9, wherein the code is mechanically embossed or engraved on the container by laser.

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11. Capsule according to any of claims 1 to 10, wherein the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container.

12. Capsule according to any of claims 1 to 10, wherein the code is present on the rim of the capsule.

13. Capsule according to claim 12, wherein the code is present on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

14. System for preparing a beverage from a capsule according to any of the preceding claims and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

15. System according to claim 14, wherein the reading means comprises a light emitter and a light sensor or an inductive sensor.

16. System according to claims 14 or 15, wherein the optical reading means or inductive sensor is arranged to detect a code on the rim of the capsule.

17. Method for preparing a beverage from a system according to any one of claims 14 to 16, wherein the beverage is extracted from the capsule by rotating the capsule along said axis.

18. Method according to claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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ABSTRACT:

Capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

Figures 2 and 3

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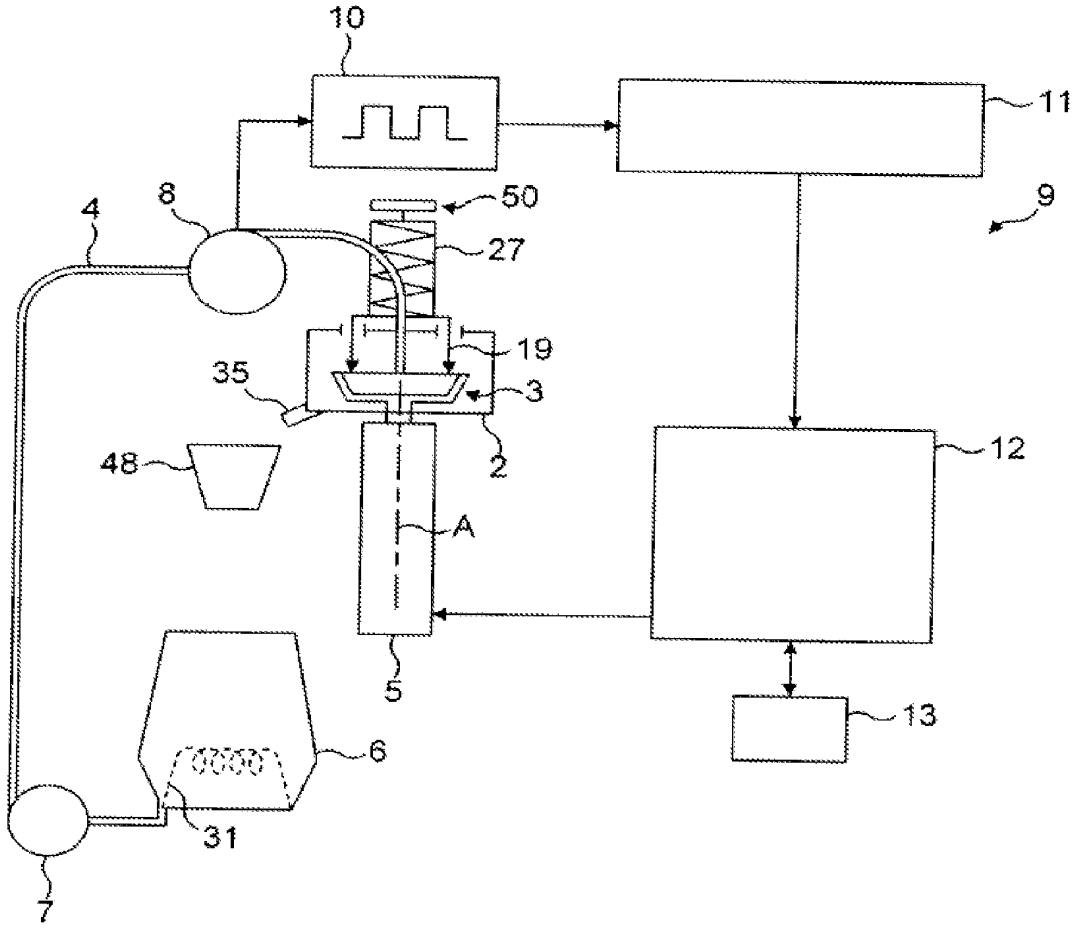


Fig. 1

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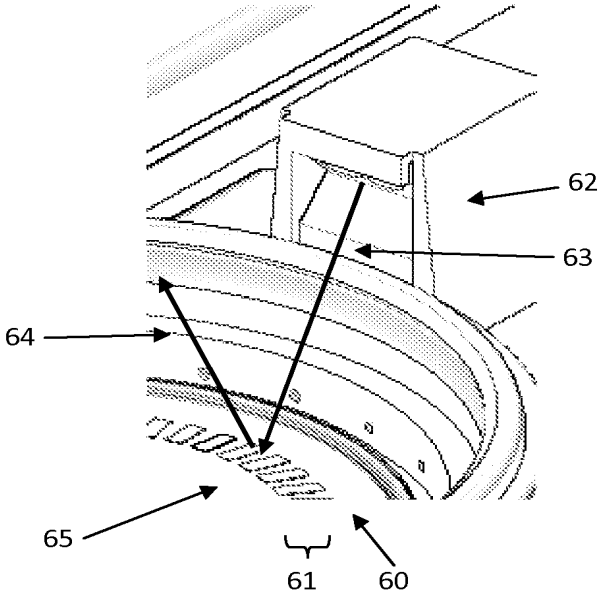


Fig. 2

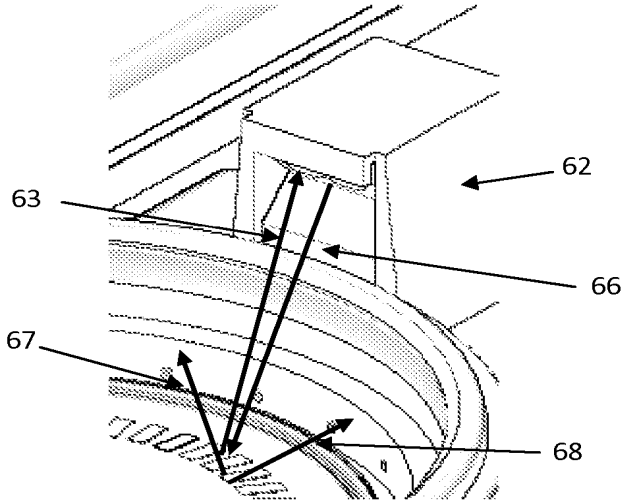


Fig. 3

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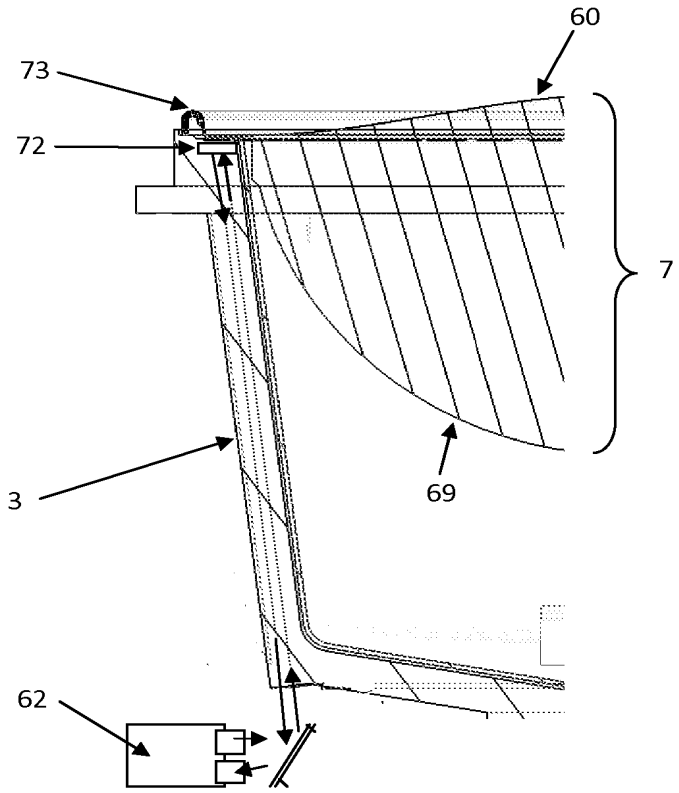


Fig. 4

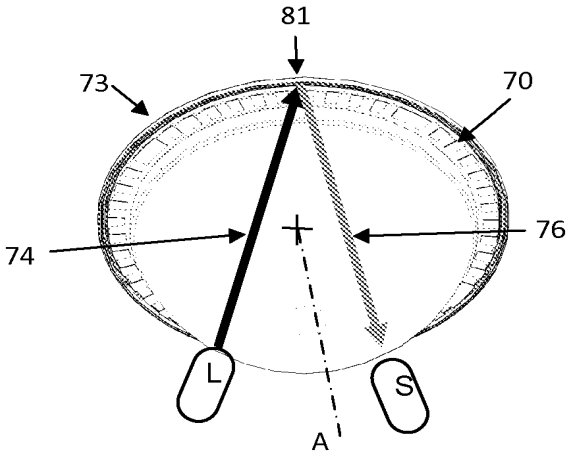


Fig. 5

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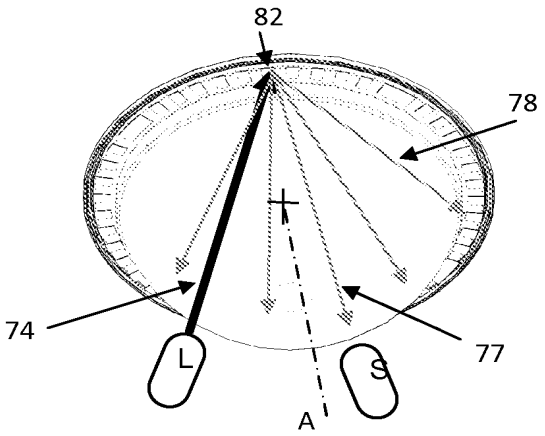


Fig. 6

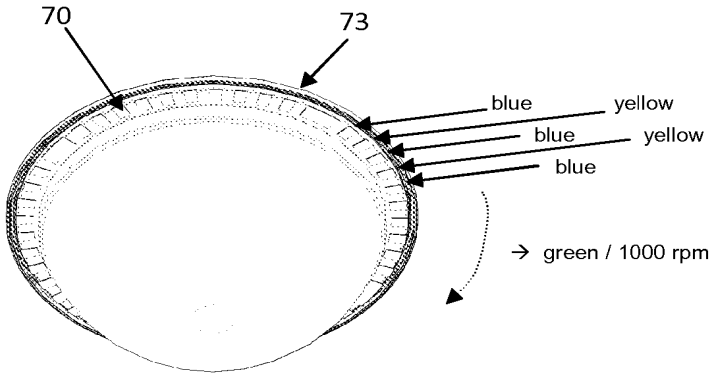


Fig. 7

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CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

Introduction

The invention relates to the preparation of a beverage by use of a capsule containing beverage ingredient in a beverage production device. The present invention in particular focuses on the detection of the capsule.

Background art

The preparation of a beverage by a capsule containing beverage ingredient is known. In general, the capsule is inserted in a beverage production device, such as a coffee machine, liquid is fed in the capsule and a beverage is extracted from the capsule under pressure or by gravity.

The preparation of a beverage by using the centrifugation is known. The principle mainly consists in providing beverage ingredient in a container of the capsule, feeding liquid in the receptacle and rotating the receptacle at elevated speed to ensure interaction of liquid with powder while creating a gradient of pressure of liquid in the receptacle; such pressure increasing gradually from the centre towards the periphery of the receptacle. As liquid traverses the coffee bed, extraction of the coffee compounds takes place and a liquid extract is obtained that flows out at the periphery of the receptacle.

The term "capsule" refers to any flexible, rigid or semi-rigid container containing beverage ingredient. Other synonymous to a capsule are: "pod", "pad", "cartridge" or "sachet". The capsule can be single use. The container can also be filled with ingredient by the user to form the capsule just before use.

The term ingredient means any suitable beverage substance such as ground coffee, soluble coffee, leaf tea, soluble tea, herbal tea, dairy powder, baby food, culinary powder and combination thereof.

The invention relates more particularly to the identification of the capsule by means of a code. The code may be necessary to control parameters in the beverage preparation device such as liquid or beverage flow rate, pressure, rotational speed, temperature and combinations thereof.

EP0451980 relates to packages containing comestibles for the preparation of beverages. Recognition means can comprise one or more strips of a magnetic material applied to the body of the package which can be read by an appropriate magnetic sensor, one or more

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shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.

WO02/28241 relates to an encoded coffee packet for use in the preparation of hot or cold beverages comprising a filter defining a cavity and a brewing ingredient within the cavity. The packet further comprises a machine-interpretable feature located on the filter such as a color, a shape, a glyph, a text string, a barcode or a digital watermark.

WO02/078498 relates to a machine-readable identifier on a portion package which contains ground coffee for espresso machine. The identifier can be a concentric barcode which is read when the capsule turns around an axis which is placed outside of its perimeter such as when the capsule is stored in a carousel.

WO2005044067 relates to a system for identifying a capsule having a code visible under UV light printed thereon or a magnetic code such as a ribbon or label. The code may be read by a turning magnetic reading head. However, such system is not adapted for detecting a capsule in a device using centrifugal forces for extracting the beverage.

WO2009007292 relates to a method for reading barcodes in a drinks machine when the brewing chamber is being closed from an open position to a closed position.

WO2010/026053 relates to a controlled beverage production device using centrifugal forces. The capsule may comprise a barcode provided on an outside face of the capsule and which enables a detection of the type of capsule and/or the nature of ingredients provided within the capsule in order to apply a predefined extraction profile for the beverage to be prepared.

A problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always reliable or convenient. The present invention brings a solution to this problem.

Brief description of the invention

The aim of the present invention is to propose an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine.

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This aim is achieved by a capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In a particular mode, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. More particularly, the code is arranged along at least a eighth of the circumference. This configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one code is readable but also may potentially reduce the reading time.

Preferably, the code is an optical code. The code may be a bit code formed by a series of discrete polygonal (e.g., rectangles or squares) or dot surfaces printed on the container and/or embossed in the container.

The code may printed by a visible ink by human eyes under natural light or, alternatively, an ink which is not visible by human eyes under natural light (e.g., ink visible under UV).

Preferably, the code is printed or embossed to form a pattern which possesses surfaces having different reflective and/or absorbing properties to light. In particular, the pattern possesses first surfaces and second surfaces having different reflective and/or absorbing properties to light. More particularly, the pattern possesses first surfaces inclined mirroring or absorbing properties to light and second surfaces having flat mirroring or flat reflective properties to light.

In a possible mode, the code is mechanically embossed or engraved on the container by laser or by other means such as a press.

In an embodiment, the container comprises a body and a lid connected to the body and wherein the code is present on the lid of the container. The lid may be a closed foil and/or a filter, for example.

In another embodiment, the code is present on the rim of the capsule. In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is opposed to

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the lid of the capsule. The bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles). As a result, the reading is made more reliable. The reading may also be carried out while the capsule is in place in the beverage production device. Therefore, the preparation of the beverage is simplified and the preparation time can be reduced.

The invention further relates to a system for preparing a beverage from a capsule as aforementioned and further comprising a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.

The invention further relates to a method for preparing a beverage from a system comprising a capsule as aforementioned and a beverage preparation device; wherein the device comprises capsule holding means for holding the capsule therein and rotational drive means for driving the holding means and capsule in rotation along said axis of rotation and reading means arranged for reading the code when the capsule is rotated along said axis.

The invention is further described in the appended claims and the following detailed description.

Brief description of the figures

The present invention will be better understood thanks to the detailed description which follows and the accompanying drawings, which are given as non-limiting examples of embodiments of the invention, namely:

- figure 1 illustrates the basic principle of the centrifugal extraction,

- figure 2 illustrates the reading method of a mark on the lid surface of the capsule,

- figure 3 illustrates the reading method of an absence of the mark,

- figure 4 illustrates an alternate position of the code on the capsule, in particular, when placed on the underside of the rim of the capsule, and the capsule fitted into a capsule holder of the extraction device,

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- figures 5 and 6 illustrate the combination of a laser source and a detector in positive and negative detection, for example, for the alternate position of the code of figure 4,

- figure 7 illustrates the detection of a color code on the capsule, for example, for the alternate position of the code of figure 4.

Detailed description

Figure 1 illustrates an example of a beverage preparation system 1 as described in WO2010/026053 for which the capsule of the invention can be used.

The centrifugal unit 2 comprises a centrifugal cell 3. The cell 3 may comprise a capsule holder and a capsule received therein. The centrifugal unit is connected to driving means 5 such as a rotary motor. The centrifugal unit comprises a collecting part and an outlet 35. A receptacle 48 can be disposed below the outlet to collect the extracted beverage. The system further comprises liquid supply means such as a water reservoir 6 and a fluid circuit 4. Heating means 31 may also be provided in the reservoir or along the fluid circuit. The liquid supply means may further comprise a pump 7 connected to the reservoir. A flow restriction means 19 is provided to create a restriction to the flow of the centrifuged liquid which leaves the capsule. The system may further comprise a flow meter such as a flow-metering turbine 8 for providing a control of the flow rate of water supplied in the cell 3. The counter 11 can be connected to the flow-metering turbine 8 to enable an analysis of the generated impulse data 10. The analysed data is then transferred to the processor 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time. A user interface 13 may be provided to allow the user to input information that is transmitted to the control unit 9. Further characteristics of the system can be found in WO2010/026053.

In the following examples (see figure 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The capsule is filled with beverage ingredient such as ground coffee.

The capsule is designed for rotating around an axis A. This axis A crosses perpendicularly the center of the membrane which has the form of a disk. This axis A exits at the center of the bottom of the body. This axis A will help to define the notion of "circumference" which is a circular path located on the capsule and having the axis A as reference axis. This circumference can be on the lid, e.g., membrane or on the body part such as on the flange-like rim. The lid may be impervious to liquid before insertion in the device or it may be pervious

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to liquid by means of small openings or pores provided in the center and/or periphery of the lid. The code is spread along the circumference or a part of the circumference. The code may comprise successive arch-shaped segments. The code may also comprise successive segments which are individually rectilinear but extend along at least a part of the circumference.

According to one embodiment, the sensor cannot read the code without the rotation of the capsule. This is the case where the code is spread along at least a eighth, preferably at least a quarter of the circumference or even more. The fact that the code is placed along an arc-shaped line render the reading by a sweep beam very difficult. This is why the rotation of the capsule plays an important role. In case that the code is located on the body, it is then necessary to rotate the capsule to have access, for the sensor, to the entire set of marks composing the code. The code is further located close to the peripheral edge of the capsule. The peripheral edge is defined as the outermost circular line of the capsule. Preferably, the distance of the code from the peripheral edge is not more than 10 mm, more preferably not more than 8 mm.

According to an embodiment, the code is printed by an ink which is not visible by human eyes under natural light (e.g., ink visible under UV). In this case, the sensor further comprises a UV-light beam source and a UV detector.

The code is preferably repeated along the circumference in order to ensure a reliable reading. The code is repeated at least twice on the circumference. Preferably, the code is repeated three to six times on the circumference. Repetition of the code means that the same code is duplicated and the successive codes are positioned in series along the circumference so that upon a 360-degree rotation of the capsule, the same code can be detected or read more than one time.

EXAMPLES:

1) Optical reading on foil, respectively on top side rim of capsule (figures 2 and 3):

A light beam is projected onto the capsule's lid, e.g., membrane or foil 60, as illustrated on figure 2.

Onto the capsule foil 60, a plurality of bits forming the code 61 is applied along a circular or arc-shaped path.

Preferably, the code is placed on a flat portion of the lid and close to the peripheral edge of the capsule. The code is preferably placed the lid that is supported by the flange-like

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rim of the capsule or overlaps with the rim. Hence, the code is not distorted due to mechanical constraints and can be read more reliably.

The marks may consist of:

- Mirroring or absorbing surfaces for providing bit "0" and,
- Diffusing and reflective surfaces for providing bit "1"

The binary values “0” and “1” are arbitrary chosen and can be inversed.

The code is read by rotating the capsule along a central axis A (figure 1).

The reader or sensor 62 is part of the centrifugal unit 2 and consists of

- A light source with or without focusing optic and
- A light sensor with or without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or
- Embossing (mirroring + rough reflecting + diffusing) or
- Laser engraving.

Optionally, the bit code may also consist of different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined “mixed color”. As an example, a capsule with half the circumference in blue and the other half in yellow would result in reading a green color during rotation. In the same manner, one third in blue and the remaining part in yellow will give another color. In this case, the light could be a simple light source without specific convergence means.

As illustrated in figure 2, when the light beam 63, sent by the light source of the sensor 62, touches the mirror code pattern (small rectangles 65) it reflects in a reflective beam 64 which is not received by the sensor.

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As the capsule is rotated (figure 3), the light beam 63 touches a diffuse reflecting surface (surface between the small rectangles) and is partially reflected to the sensor. A reflective beam 66 is received by the sensor whereas other beams 67, 68 are diffused or reflected outside the sensor.

2) Optical reading on rim bottom side of capsule (figures 4 to7):

The capsule 7 may comprise a code 70 on the bottom side 72 of its rim 73. The bit code is formed of a succession of small rectangular surfaces having light mirroring properties and intermediate surfaces having flat mirroring and/or diffusing properties. The surfaces are arranged in a circular pattern or an arc-shaped pattern at least along an angular portion of the rim.

A light beam 74 is projected to the capsule's rim 73.

Onto the capsule rim, a bit code is applied along a circular or arc-shaped path of the rim.

The bit code may consist of:

- Inclined mirroring or (flat) absorbing surfaces for bit "0" and
- Flat mirroring or flat reflective (diffusing) surfaces for bit "1"

The bit code is read by rotating the capsule along its central axis A.

The reader may consist of

- A light source with/without focusing optic and,
- A light sensor with/without focusing optic.

The light can be:

- Non polarized or
- Polarized (laser) or
- Spectrum: Any, but preferably infra red.

The code can be applied on the capsule by:

- Printing (absorbing / reflecting + diffusing), visible, invisible or,
- Laser engraving (e.g. for absorbing / reflecting-diffusing) surfaces or,
- Embossing: Flat and inclined mirroring surfaces.

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In the embodiment of the figure 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the figure 4 to deflect the forward and backward beams.

On figure 5, the light beam 74 from the light source "L" touches the mirror surface of the code (small rectangle 81) and is reflected into a reflective beam 76 to the sensor "S" with high intensity. A bit such as "0" or "1" is thereby provided to the control unit.

On figure 6, the light beam 74 from the light source "L" touches diffusing or absorbing surfaces (surface 82 between two small rectangles). The light beam 77 that reaches the sensor S is of small intensity. Other beams such as beam 78 are diffused outside the sensor S due to the diffusing properties of the surface.

In each configuration (e.g., Figs. 5-6), a bit such as "1" or "0" is provided to the control unit.

Therefore, the number of bits and their bit code depend on the number and specific arrangement of mirror surfaces (e.g. rectangles) and diffusing or absorbing surfaces (e.g., zones between the rectangles). The same sequence of bits forming a "code" can be repeated several times on the circumference of the rim. This repetition provides redundancy and more reliability to the reading.

Optionally (figure 7), the code comprises different color patterns combined with a color reading device. The combination of different colors and reading at a specific rotational speed results in a well defined "mixed color". As an example, a capsule with half the "dots" in blue and the other half in yellow would result in reading a green color during rotation.

3) Application modes of codes onto a capsule

The codes described in the previous examples can be applied by different methods onto a capsule such as by:

- Printing or mechanical deforming on a formed capsule or,

- Printing or mechanical deforming on the capsule raw material (foil) before container forming or,

- Printing on outer surface of a capsule container or,

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- Printing on the inner surface of a capsule container, using the curl as information support (Aluminum capsule technology).

4) Inductive code reading:

Another mode consists in sensing a code provided on a metallic surface of the capsule using an inductive sensor. The code is formed by reliefs or recesses in the metallic surface. For instance, the capsule comprises a circumferential metal rim which comprises a succession of discrete slots and/or bumps. When the capsule is rotated about its central axis, the rim is moved relative to the sensor such that the slots and/or bumps are detected. The code can be read on a time base of a CPU of the beverage preparation device. The maximum rotational speed to read the code depends on the used sensor and the internal CPU of the device.

5) Other general characteristics to all embodiments:

The speed for reading can, for instance, be comprised between 0.1 and 1000 rpm.

When reading the code, liquid can already be fed in the capsule for providing a pre-wetting of the beverage ingredients.

The code preferably comprises three sections, the synchronization section, the payload section and the verification section. The synchronization section serves for the synchronization purpose i.e. to inform the sensor when the code begins. Since the speed of the rotation of the capsule can vary, the synchronization is achieved through a known sequence of bits such as 0,1,0,1. Then the payload of the code identifying the capsule can be read. In order to avoid misinterpretation of the code, the payload can be followed by verification bits. These bits can be a checksum on the payload or a similar verification function.

The code can be replicated along the code path so that if one code gives a wrong verification value, the other code(s) can be taken into account.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/697,297

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	390
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	18 minus 20 =	*			OR	x 62 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1140

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
13/697,297	Christian Jarisch	3712036-01693

29157
K&L Gates LLP
P.O. Box 1135
CHICAGO, IL 60690

INTERNATIONAL APPLICATION NO.	
PCT/EP2011/057657	
I.A. FILING DATE	PRIORITY DATE
05/12/2011	05/12/2010

CONFIRMATION NO. 1065
371 ACCEPTANCE LETTER

OC000000057967678

Date Mailed: 12/06/2012

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

11/09/2012	11/09/2012
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** *The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363).* Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Copy of the International Application filed on 11/09/2012
- Copy of the International Search Report filed on 11/09/2012
- Preliminary Amendments filed on 11/09/2012
- Oath or Declaration filed on 11/09/2012
- Request for Immediate Examination filed on 11/09/2012
- U.S. Basic National Fees filed on 11/09/2012
- Priority Documents filed on 11/09/2012
- Authorization to Permit Access filed on 11/09/2012

FORM PCT/DO/EO/903 (371 Acceptance Notice)

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IPR2023-00502, U.S. PATENT 10,994,923

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

TAMALA D HOLLAND

Telephone: (571) 272-9120

FORM PCT/DO/EO/903 (371 Acceptance Notice)

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MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
13697297	

Applicant(s) Christian Jarisch

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1	1		1			
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Total Indep	1		3		0	
Total Depend	18	↵	15	↵	0	↵
Total Claims	19		18		0	

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/697,297	11/09/2012		1140	3712036-01693	18	3

CONFIRMATION NO. 1065

29157
K&L Gates LLP
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FILING RECEIPT

OC00000057967677

Date Mailed: 12/06/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

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Assignment For Published Patent Application

NESTEC S.A., Vevey, CH

Power of Attorney: The patent practitioners associated with Customer Number 29157

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/EP2011/057657 05/12/2011

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
EUROPEAN PATENT OFFICE (EPO) 10169374.5 07/13/2010

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IPR2023-00502, U.S. PATENT 10,994,923

EUROPEAN PATENT OFFICE (EPO) 10162741.2 05/12/2010

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/697,297**

Projected Publication Date: 03/14/2013

Non-Publication Request: No

Early Publication Request: No
Title

CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

Preliminary Class

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/697,297	11/09/2012	Christian Jarisch	3712036-01693

CONFIRMATION NO. 1065

29157
K&L Gates LLP
P.O. Box 1135
CHICAGO, IL 60690

PUBLICATION NOTICE

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Title:CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

Publication No.US-2013-0064937-A1
Publication Date:03/14/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Christian Jarisch
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Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	LONG, LUANA ZHANG
Docket No.:	3712036.01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL LETTER

Sir:

Submitted herewith is an Information Disclosure Statement for consideration in the above-identified application. In accordance with the provisions of 37 C.F.R. 1.56, 37 C.F.R. 1.97, and 37 C.F.R. 1.98, Applicants request that a citation and examination of the references cited on the enclosed PTO-1449 form be made during the course of examination of the above-identified application for United States patent. Pursuant to 37 C.F.R. 1.98, copies of any cited foreign patent documents and non-patent documents are enclosed.

This Information Disclosure Statement is submitted as follows:

Submission without Certification

[X] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

[ ] After the period specified above, but before the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by payment of the fee set forth in 37 C.F.R. 1.17(p).

Submission with Certification

[ ] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

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[ ] After the period specified above, but before the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the Certification specified in 37 C.F.R. 1.97(e) which is set forth below.

[ ] After the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the fee set forth in 37 C.F.R. 1.17(p) and the Certification specified in 37 C.F.R. 1.97(e) which is set forth below.

Certifications under 37 C.F.R. 1.97(e) & 37 C.F.R. 1.704(d)

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **thirty days** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

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[ ] A copy of a Search Report from a corresponding foreign patent application is enclosed.

[ ] A check in the amount of $180 to cover the required fee is enclosed.

[ ] The Commissioner is hereby authorized to charge the amount of $180 to cover the required fee to Deposit Account No. 02-1818.

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[X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1818.

Respectfully submitted,
K&L GATES LLP

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(54) Method for producing a coffee-based beverage and a coffee machine for implementing the method thereof

(57) The method comprises a step of introducing water into a reservoir tank (8) to a certain level, a step in which the water present in the reservoir tank (8) is taken to a temperature higher than 50°C, a step in which such temperature higher than 50°C is maintained for a time depending on the degree of hardness of the water, a step in which the temperature of the water circulating in a heat exchanger (14) is increased to a temperature from 70 to 90°C, a step of inserting a dose (17) of coffee in a chamber (16), and a step in which a pump (12) is controlled so that the water is channelled towards the chamber (16) from which the beverage is released.

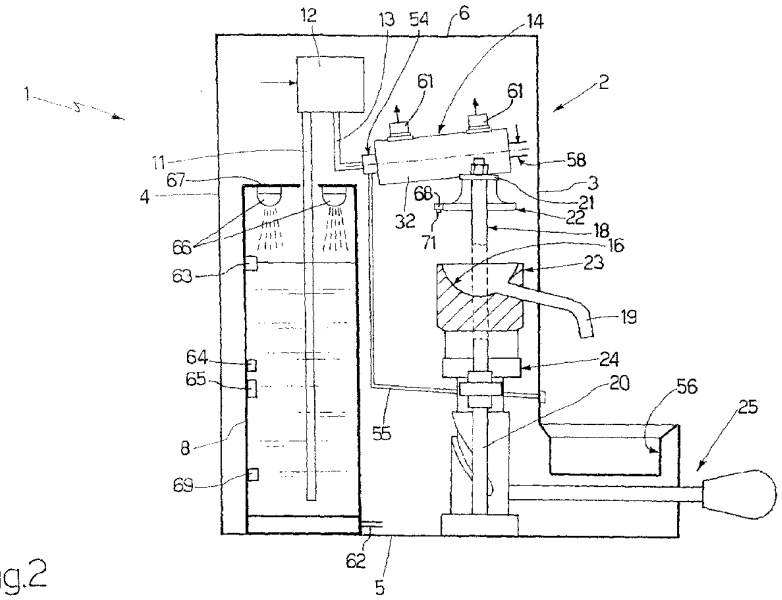


Fig.2

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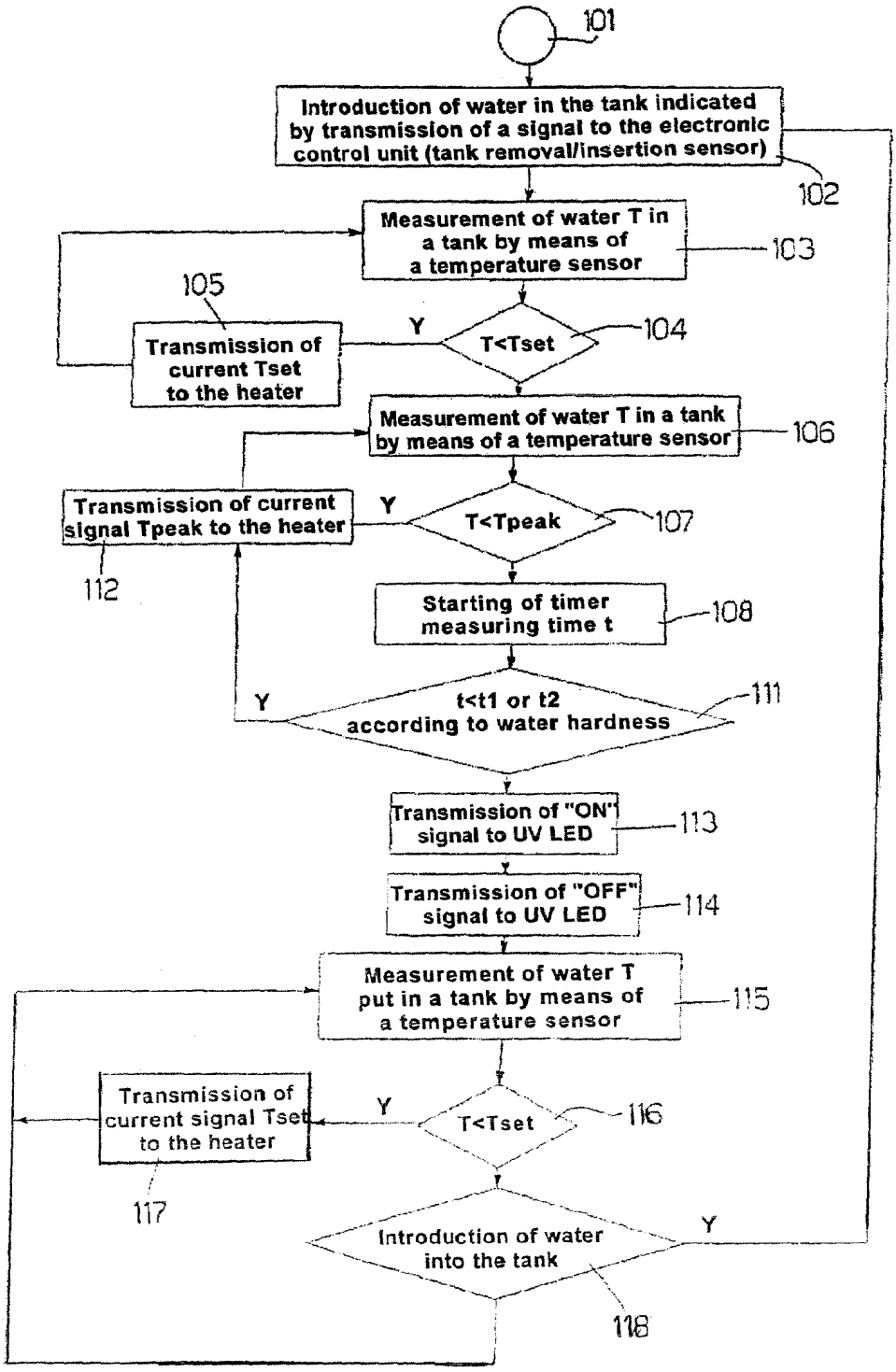


Fig.6

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Description

[0001] The present invention relates to a method for producing a coffee-based beverage.

[0002] The present invention also relates to a coffee machine which implements the aforesaid method.

[0003] As known, coffee machines, and in particular those for offices and homes, comprise a tank containing water, a heat exchanger, a pump adapted to take water from the reservoir tank and convey it through the heat exchanger to a chamber in which is present either a coffee wafer or a predetermined amount of coffee powder; such chamber being then provided with a nozzle through which liquid coffee is released. The heat exchanger consists of a metallic block presenting a first housing seat of an electrical resistor and a second housing seat in a body presenting a helical groove through which the water is heated and is channelled towards aforesaid chamber.

[0004] In the preparation of coffee, after powering the electrical resistor so that the heat exchanger is taken to a predetermined temperature, the water is channelled through the heat exchanger so as to take the water to a temperature of approximately 90°C. Such water flows through the coffee power so that it extracts the aromatic substances contained therein and the beverage is made. The quality of the beverage depends on a number of factors, including the quality of the coffee powder (grinding and preservation), the temperature of the water, the pressure at which the water flows through the coffee powder, and the hardness of the water which in essence is represented by the calcium content present in the water. We remark that a certain degree of water hardness is however required to make a high quality beverage and that consequently water which is non entirely calcium-free is required.

[0005] The preparation system of the beverage described above presents a plurality of drawbacks.

[0006] In particular, as concerns the temperature of the water reaching the heat exchanger, coffee machines are structured to operate in predetermined conditions and therefore the introduction of water at variable temperatures may negatively affect the extraction of aromatic substances present in the powdered coffee and consequently may negatively affect the quality of the beverage. A second drawback found in the aforesaid system consists in the ease at which lime is deposited within the heat exchanger which firstly causes the formation of scaling along the water channel and then in time fully obstructs said channel with consequent intervention at a service centre for maintenance. A third drawback found in the system described above consists in the formation in various points of the machine of bacteria colonies and mould which negatively affect the quality of the beverage and which may carry diseases. A last drawback found in coffee machines using wafers is that a previously used wafer is not recognised and a wafer may mistakenly be used several times.

[0007] It is the object of the present invention to make a method for producing a coffee-based beverage which allows to avoid the aforesaid drawbacks.

[0008] It is a further object of the present invention to make a coffee machine which implements the aforesaid method.

[0009] According to the present invention, it is obtained a method for producing a coffee-based beverage characterised in that it comprises:

- a step of introducing water into a reservoir tank up to a certain level;
- a step during which the water present in said reservoir tank is taken to a temperature higher than 50°C;
- a step during which such temperature higher than 50°C is maintained for a time depending on the degree of hardness of the water;
- a step in which the temperature is increased to a temperature higher than 70°C;
- a step of inserting a dose of coffee in a chamber; and
- a step during which the pump is controlled so that the water is channelled towards said chamber from which the beverage is released.

[0010] According to the present invention it is also made a coffee machine of the known type comprising:

- a water reservoir tank;
- a first water conduit which takes from said reservoir tank;
- a pump connected to said first conduit and from which a second conduit originates;
- a heat exchanger provided with an electrical resistor, connected to said second conduit and from which it is originated a channel adapted to convey the heated water towards a chamber where a dose of coffee is placed in use; and
- a nozzle which originates from said chamber and from which the coffee-based beverage is adapted to be released;

characterised in that said reservoir tank is provided with means adapted to increase the temperature of the water present in said reservoir tank.

[0011] The present invention will now be described with reference to the accompanying drawings which show a preferred embodiment thereof, and in which:

- figure 1 is a perspective view of a coffee machine made according to the dictates of the present invention;
- figure 2 is a block diagram with parts removed and with simplified outlines of the various components of the machine in figure 1;
- figure 3 is a magnified cross-section of a heat exchanger of the machine in figure 1;
- figure 4 is a plan view of a coffee wafer;
- figure 5 is a block diagram of an electronic control unit of the machine in figure 1; and

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figure 6 is a block diagram showing some steps of operation of the machine in figure 1.

[0012] With reference to figures 1 and 2, it is indicated as a whole by 1 a coffee machine comprising a box structure 2 defined by a front wall 3, a rear wall 4, a base wall 5, an upper wall 6 and two side walls 7.

[0013] The machine 1 comprises:

a reservoir tank 8 installed within the structure 2 and containing water;
a first conduit 11 taking from the reservoir tank 8;
a pump 12 connected to the conduit 11 and from which a second conduit 13 originates;
a heat exchanger 14 connected to the second conduit 13 and from which it is originated a channel 15 adapted to convey the heated water to a chamber 16 where a coffee wafer 17 is placed in use (figure 4);
a frame 18 adapted to support at a determined level said heat exchanger 14; and
a nozzle 19 which originates from aforesaid chamber 16 and which is adapted to release liquid coffee.

[0014] The frame 18 comprises two vertical columns 20 which on one upper end support a plate 21 which in turn supports the heat exchanger 14. The chamber 16 is defined between two metallic bodies 22 and 23 of which body 22 is fastened to the heat exchanger 14 and body 23 is carried by a rod 24, by means of a displacement mechanism 25 of the known type, mobile between a lower position in which body 23 is at a distance from body 22 and an upper position in which body 23 is in contact with body 22, and a chamber 16 is defined between the same; the aforesaid nozzle 19 extending from the body 23.

[0015] The body 22 comprises an externally threaded upper segment 26 fastened in a threaded hole 27 made in the heat exchanger 14, a central segment 28, and a lower segment 31 on whose base surface a cavity is made which defines the chamber 16 with the corresponding cavity made on the upper surface of the body 23. The body 22 presents an axial through hole which forms the aforesaid channel 15 and which leads into the aforesaid cavity of segment 31.

[0016] With reference to figure 3, the heat exchanger 14 comprises an essentially cylindrical metallic body 32 presenting an axial through hole 33 accommodating an essentially cylindrical metallic body 34. The body 34 presents a first axial end portion 35 presenting in sequence a segment 36 externally threaded to the hole 33, an intermediate segment 37 presenting an annular groove within the hole 33, and a segment 38 which supports an annular seal 41. The body 34 presents a central portion 42 within the hole 33 and presenting a reduced segment 43 with external diameter smaller than the internal diameter of the hole 33 and a long segment 44 on whose external surface a helical groove 45 is made. The body 34 presents a second axial end portion 46 within hole 33 and supporting an annular seal 47. The central portion 42 defines within the hole 33 and between the seals 41 and 47 a space which is reached by water from conduit 13 through an axial hole 48 made in portion 35 and a diametrical hole 51 made in the central portion 42 at segment 43.

[0017] With reference to figure 3, the axial position of the body 34 along the hole 33 is defined by a screw 52 fastened along a threaded hole 53 made in the body 32 and presenting a shank portion which engages the annular groove defined by the segment 37. Figure 2 schematically shows a three-way union 54 in which one way is engaged along segment 36, one way is connected to conduit 13 and one way is connected to a further conduit 55 whose free end leads onto wall 3 immediately over a tank 56 underneath. Such conduit 55 channels the water possibly remained within the heat exchanger 14 towards the tank 56 while the machine 1 is not in use. This channelling is favoured by the inclined position with respect to a horizontal plane of the heat exchanger 14. In essence, the end of the hole 33 accommodating the portion 35 of the body 34 is at a lower level than the end accommodating the portion 46 and therefore the circulating water follows an upward course.

[0018] With reference to figure 3, in body 34 and more precisely in portions 42 and 46 an axial blank hole 57 is made which accommodates the electrical resistor 58. The hole 27 made in the body 32 is made near the portion of the hole 33 accommodating the portion 42 of the body 34 near the portion 46. The heat exchanger 14 is preferably provided with two sensors 61 adapted to measure the temperature, one installed in the body 32 at the segment 43 and the second installed in the body 43 at, but diametrically opposite to, the hole 27. The helical groove 45 presents a progressively decreasing depth from segment 43 to portion 46, i.e. in the direction of circulation of the water.

[0019] With reference to figure 2, the reservoir tank 8 is made of thermally insulating material and is provided within with its base wall of an electrical resistor 62. Within the reservoir tank 8 there are installed a sensor 63 positioned at a certain level and adapted to measure the exceeding of such level by the water, a sensor 64 adapted to measure the temperature of the water contained in the reservoir tank 8, a sensor 65 adapted to measure, for example by measuring the pH, the degree of hardness of the water and in essence the percentage of calcium present in the water, a sensor 69 adapted to measure whether the level of water in the reservoir tank 8 is under a predetermined level and therefore the introduction of water into the reservoir tank 8 is required, and at least one source 66 of ultraviolet light installed on an upper wall 67 of the reservoir tank and facing the water underneath. The body 22 supports a bar code reader 71 at its appendix 68. Figure 4 shows the wafer 17 which is provided with an identifying bar code 72 along its circular crown.

[0020] With reference to figure 1, the machine 1 is provided with a button 73 adapted to control the electrical

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powering of an electronic control unit 74 and of the electrical resistor 58, a button 75 adapted to control the pump 12 by means of the control unit 74, an indicator light 76 adapted to indicate the electrical powering derived from the button 73, an indicator light 77 adapted to indicate the reaching of a predetermined temperature in the heat exchanger 14 measured by means of at least one of the sensors 61, and a light indicator 70 adapted to indicate that the water in the reservoir tank 8 is under a certain level.

[0021] With reference to figure 5, the control unit 74 is adapted to manage the various components of the machine 1 and in particular to control, by means of a block 78, the various actuators (pump 12, electrical resistors 58 and 62, sources 66, and indicators 70, 76 and 77) and to receive signals, by means of a block 81, from the various sensors 61, 63, 64, 65, 69 and from the reader 71. The control unit 74 comprises a counter block 79 and a memory block 82 in which there are stored the temperatures to which the water in reservoir tank 8 and in the heat exchanger 14 is taken, and in which there are stored the codes 72 of the previously used wafers 17. The control unit 74 finally comprises a block 83 for comparing the various quantities measured in the machine 1.

[0022] The surfaces of the reservoir tank 8, the internal surfaces of the structure 2 and the surfaces of the various components installed in the structure 2 are covered with a polymer-based antibacterial coating which prevents bacteria from depositing on such surfaces. For the components made in plastic instead of the coating, it may be more convenient to mix a predetermined quantity of antibacterial polymers to the plastic granules.

[0023] Figure 6 shows a water treatment cycle within the reservoir tank 8. A starting block 101 is followed by a block 102 in which water is introduced into the reservoir tank 8 until a certain level indicated by sensor 63 is reached. Block 102 is followed by block 103 in which sensor 64 measures the temperature T of the water present in the reservoir tank 8. Block 103 is followed by block 104 in which the temperature T measured by the sensor 64 is compared against a first predetermined temperature Tset which is assumed from 20 to 50°C. If the temperature of the water within the reservoir tank is lower than the aforesaid first predetermined temperature Tset, block 104 is followed by a block 105, otherwise it is followed by a block 106.

[0024] In block 105, the resistor 62 is powered and then from block 105 the method goes back to block 103. In block 106, the temperature T of the water in the reservoir tank 8 is measured again by sensor 64. Block 106 is followed by a block 107 in which the temperature T measured by the sensor 64 is compared against the second predetermined temperature Tpeak which is assumed higher than 50°C and in particular between 70 and 90°C. If the temperature T measured by the sensor 64 is lower than the aforesaid second predetermined temperature Tpeak, block 107 is followed by a block 112, otherwise block 107 is followed by a block 108. In block 112, the resistor 62 is powered and then from block 112, the method goes back to block 106.

[0025] In block 108, the counter block 79 which measures the time t is activated and the degree of hardness of the water present in the reservoir tank 8 is measured by means of the sensor 65. In the memory block 78, a table is stored in which a time td is associated to each degree of hardness of the water. Block 108 is followed by block 11 in which the time measured by counter block 79 is compared against the time td related to the measured degree of hardness. If the time t measured by the counter block 79 is lower than the time td, block 11 is followed by block 112, otherwise block 11 is followed by block 113. In block 113, the sources 66 are controlled for a predetermined time. Block 113 is followed by block 114 in which the sources 66 are deactivated. Source 114 is followed by a block 115 in which the temperature of the water present in the reservoir tank 8 is measured by means of the sensor 64.

[0026] Block 115 is followed by block 116 in which the temperature T measured by the sensor 64 is compared against the aforesaid first predetermined temperature Tset, which as mentioned is assumed from 20 to 50°C. If the temperature T of the water in the reservoir tank 8 is lower than the aforesaid first predetermined temperature Tset, block 116 is followed by block 117, otherwise it is followed by a block 118. In block 117, the resistor is powered and then from block 117 the method goes back to block 115. In block 118, it is measured whether the level of the water in the reservoir tank 8 by sensor 69 is under a certain level. When the level of the water is lower than a certain predetermined level in block 118, block 102 follows, otherwise block 118 is followed by block 115.

[0027] The method according to the present invention comprises:

a step of introducing water into the reservoir tank 8 up to a certain level measured by the sensor 63;
a step during which the water in the reservoir tank 8 is taken to a first temperature from 20 to 50°C;
a step during which the water temperature present in the reservoir tank 8 is taken to a second temperature higher than 50°C and preferably to a temperature between 70 and 90°C;
a step of activating the sources 66;
a step during which such temperature higher than 50°C is maintained for a time depending on the degree of hardness of the water;
a step during which the temperature of the water within the reservoir tank 8 is maintained at the aforesaid first predetermined temperature;
a step during which, by powering the electrical resistor 58, the temperature of the water circulating in the heat exchanger 14 is increased to a temperature from 70 to 90°C;
a step of inserting a wafer 17 into chamber 16;
a step of checking the wafer 17 so as to stop the operation of the pump 12 if the wafer 17 was previ-

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ously used; and
a step during which the pump 12 is operated so that the water, by crossing the heat exchanger, is taken from aforesaid first temperature to a temperature determined by the electrical resistor 58 and then channelled towards the chamber 16 from which the beverage is released.

[0028] It may be observed that the method described above firstly envisages the sanitation of the water present in the reservoir tank 8 before the real preparation of the beverage. The sanitation firstly consists in taking the temperature of the water within the reservoir tank 8 to a fixed value regardless of ambient temperature and of the temperature of the water introduced into the reservoir tank, and then in taking the temperature of the water present in the reservoir tank 8 to such a value and for such a time that some lime is deposited on the bottom of the reservoir tank 8, and finally in maintaining the temperature of the water present in the reservoir tank 8 constant and in activating the ultraviolet ray sources 66. It must be stressed that the steps envisaging sanitation are performed whenever water is added into the reservoir tank 8. Furthermore, the fact contributing to the sanitation is that the various surfaces of the machine 1 are coated with a layer of antibacterial material and that previously used wafers 17 are recognised and rejected. The method also allows to measure and then indicate the minimum and maximum level of the water in the reservoir tank 8.

[0029] In use, after connecting the machine 1 to the electrical mains, the resistor 58 is powered and starts by Joule effect to increase the temperature of the heat exchanger 14. When the temperature measured by the sensors 61 exceeds a predetermined threshold value and preferably 70°C, the indicator 77 lights up. It is now possible to operate the pump 12 which takes water from the reservoir tank 8 and channels it to the heat exchanger 14. Naturally, a wafer is firstly inserted in the chamber 16 and such chamber 16 is closed by means of the mechanism 25. Now the water flows along the helical groove 45 and then through the channel 15 into chamber 16 from where it is released through the nozzle 19. Once the pump 12 is deactivated, the water present in the heat exchanger 14 flows through conduit 55 towards the tank 56 due to the angular position of the heat exchanger with respect to a horizontal plane.

[0030] According to the above, it will be apparent that numerous advantages may be obtained by means of the construction from the present invention.

[0031] In particular, it is made a method and a machine in which the entire preparation process of the beverage is effectively sanitised. The sanitation process also allows to decrease the presence of calcium sent to the heat exchanger 14 and therefore preserves the latter and all the conduits and elements concerned by the flow of water from scaling and possible obstructions. Furthermore, it is made a coffee machine in which the electrical resistor 58 is accommodated directly in the body 34 on whose external surface water is channelled. Consequently, the heating of the water is more efficient, faster and above all requires less power, also considering that the water reaches the heat exchanger 14 already at a certain temperature. It must also be stressed that the body 32 of the heat exchanger 14 is of much smaller dimensions than that of the exchanger currently mounted in marketed machines. Consequently, both the dimensions and the cost of the heat exchanger 14 in the machine 1 object of the present invention are reduced. Furthermore, the inclined position of the heat exchanger 14, with the entrance of the water at a lower level than the output level, allows the flow of water present in the heat exchanger 14 towards a drain so that such water does not stagnate in the heat exchanger 14 and favour the deposit of lime along the groove 45 after using the water for preparing the beverage.

[0032] Finally, it is apparent that changes and variants may be made to the method and to the coffee machine 1 here described and illustrated without however departing from the protective scope of the present invention.

[0033] In particular, there may be arranged a sensor 63 for detecting the insertion in the structure 2 of the reservoir tank 8. In essence, the reservoir tank 8 may be removed, filled with water and reintroduced into the structure 2.

Claims

1. A method for producing a coffee-based beverage, **characterised in that** it it comprises:

   a step of introducing water into a reservoir tank (8) to a certain level;
   a step during which the water present in said reservoir tank (8) is taken to a temperature higher than 50°C;
   a step during which such temperature exceeding 50°C is maintained for a time depending on the degree of hardness of the water;
   a step in which the temperature of the water is increased to a value higher than 70°C;
   a step of inserting a dose (17) of coffee in a chamber (16); and
   a step during which the pump (12) is controlled so that the water is channelled towards said chamber (16) from which the beverage is released.

2. A method according to claim 1, **characterised in that** it comprises a step following said step in which said temperature higher than 50°C is maintained for a time depending on the degree of hardness of the water, during which the temperature of the water present in said reservoir tank (8) is maintained at a predetermined value from 20 to 50°C.

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3. A method according to claim 1 and/or 2, **characterised in that** it comprises a step following said step of introducing water into said reservoir tank (8), during which the temperature of the water present in the reservoir tank (8) is taken to a temperature from 20 to 50°C.

4. A method according to at least one of the preceding claims, **characterised in that** it comprises a step in which it is activated at least one ultraviolet ray source (66) directed towards the water present in said reservoir tank (8).

5. A method according to at least one of the preceding claims, **characterised in that** it comprises a step of measuring the temperature of water present in said reservoir tank (8).

6. A method according to at least one of the preceding claims, **characterised in that** it comprises a step of measuring the minimum and maximum level of water present in said reservoir tank (8).

7. A method according to at least one of the preceding claims, **characterised in that** it comprises a step of measuring the degree of hardness of the water present in said reservoir tank (8).

8. A method according to at least one of the preceding claims, **characterised in that** it comprises a step of reading and storing a code (72) associated to a determined wafer (17), containing said dose of coffee, during the insertion of the latter in said chamber (16) and of stopping the preparation of the beverage in the event of a previously stored code (72).

9. A coffee machine of the type comprising:

a water reservoir tank (8);
a first water conduit (11) which takes from said reservoir tank (8);
a pump (12) connected to said first conduit (11) and from which a second conduit (13) originates;
a heat exchanger (14) provided with an electrical resistor (58), connected to said second conduit (13) and from which it is originated a channel (15) adapted to convey the heated water towards a chamber (16) where in use is placed a dose (17) of coffee; and
a nozzle (19) which originates from said chamber (16) and from which the coffee-based beverage is adapted to be released;

characterised in that said reservoir tank (8) is provided with means (62) adapted to increase the temperature of the water present in said reservoir tank (8).

10. A machine according to claim 9 **characterised in that** said reservoir tank (8) is provided with sensors (63 and 69) for detecting the maximum and minimum level of the water present in said reservoir tank (8).

11. A machine according to claim 9 and/or 10 **characterised in that** it comprises at least one active source (66) of ultraviolet rays directed towards the water present in said reservoir tank (8).

12. A machine according to at least one of the claims from 9 to 11, **characterised in that** it comprises a sensor (64) adapted to measure the temperature of the water present in said reservoir tank (8).

13. A machine according to at least one of the claims from 9 to 12, **characterised in that** it comprises a sensor (65) adapted to measure the degree of hardness of the water present in said reservoir tank (8).

14. A machine according to at least one of the claims from 9 to 13, **characterised in that** it comprises means (71) for reading a code (72) associated to a certain wafer (17) containing said dose of coffee.

15. A machine according to claim 14 **characterised in that** it comprises an electronic control unit (74) adapted to manage the various components of the machine itself and comprising a block (78) for controlling the various actuators installed, a block (81) which receives the signals from the installed measuring sensors, a counter block (79), a memory block (82) in which there are stored the temperature values to which the water in said reservoir tank (8) and in said heat exchanger (14) must be taken and in which there are stored said codes (72) of said previously used wafers (17), and a block (83) for comparing the various measured quantities.

16. A machine according to at least one of the claims from 9 to 15, **characterised in that** at least part of the surfaces of the installed components are coated with a layer of antibacterial polymers which prevent bacteria from depositing on such surfaces.

17. Coffee-based wafer **characterised in that** it comprises one portion in which an identification code is shown.

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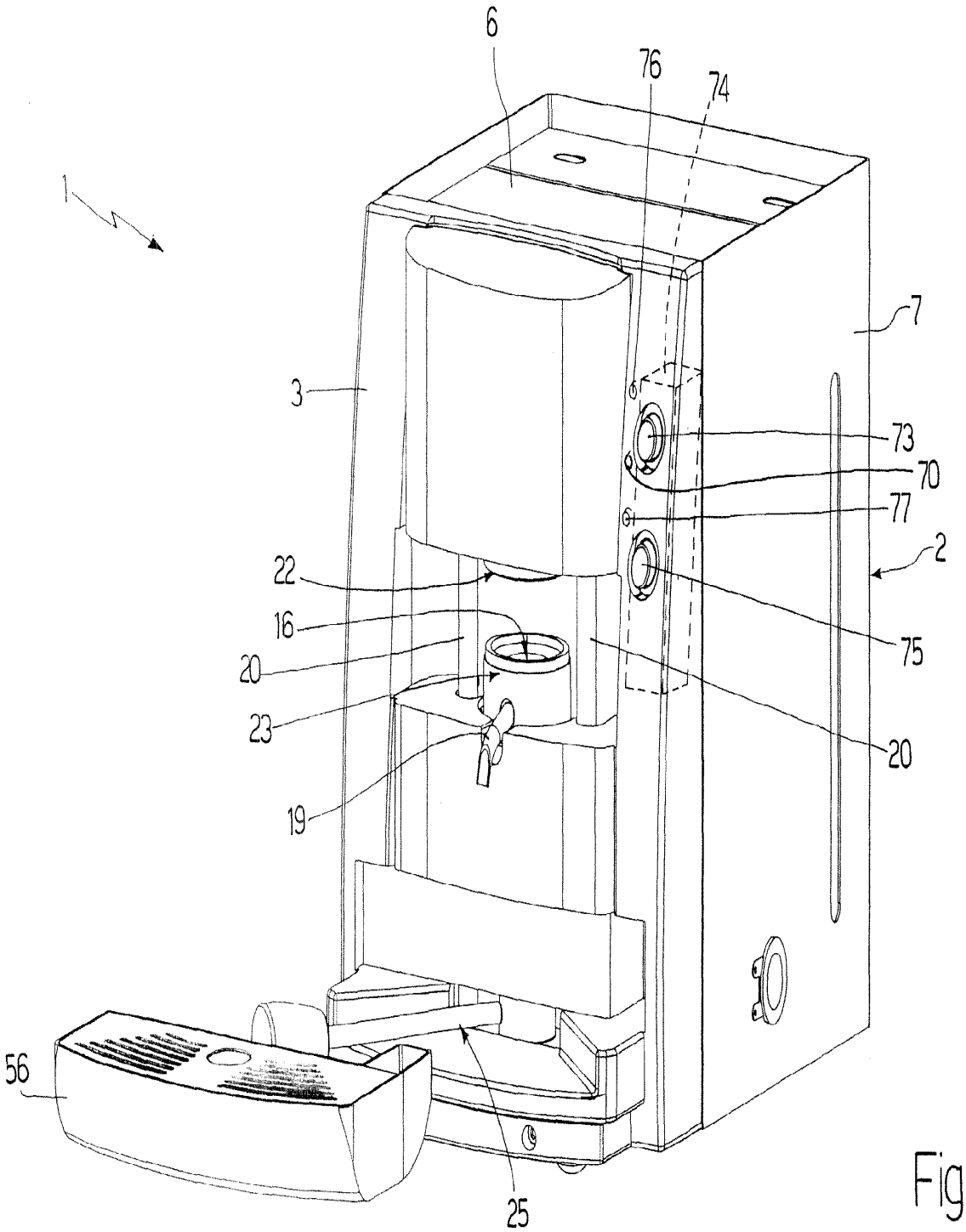


Fig.1

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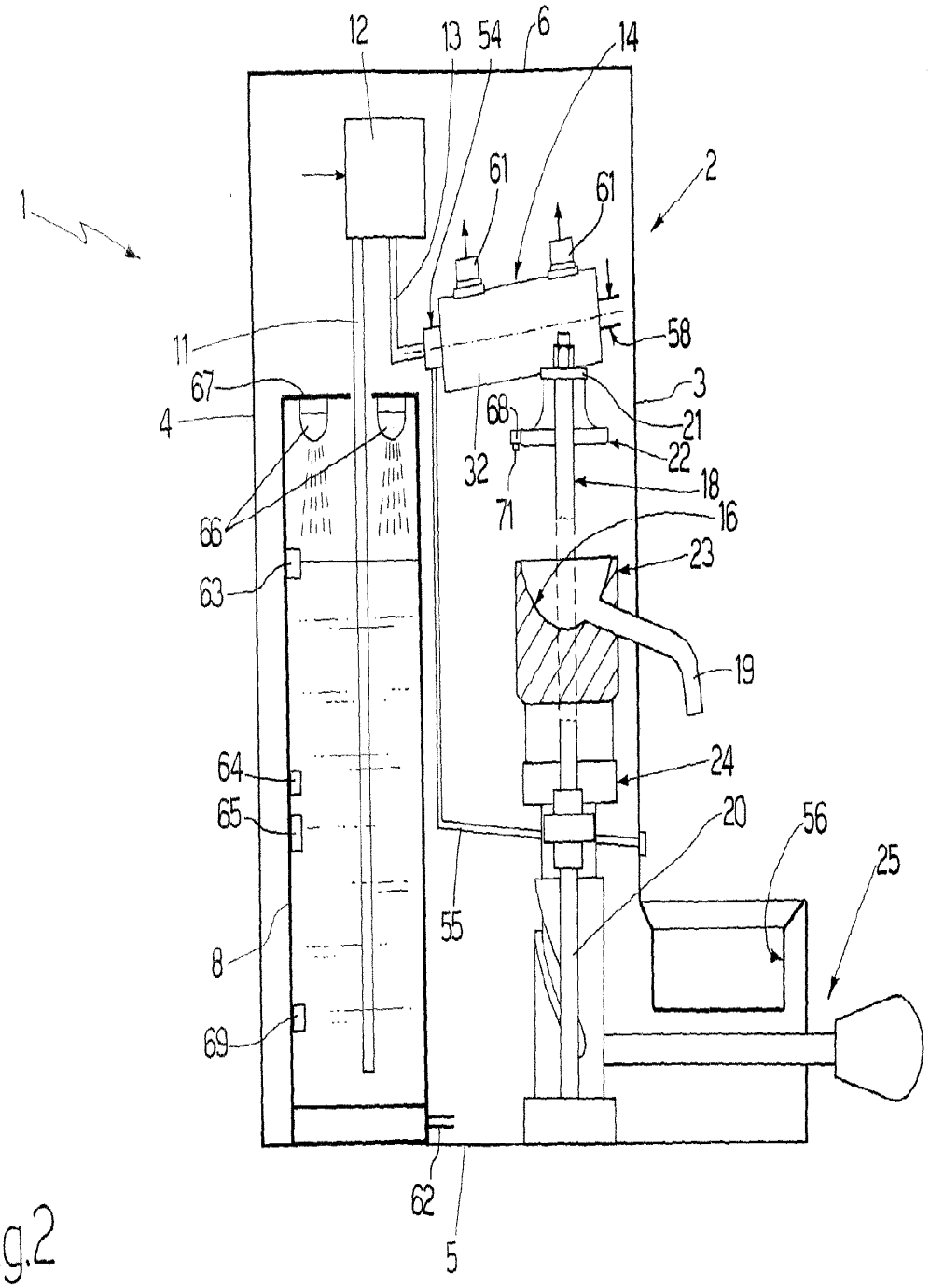

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Fig.2

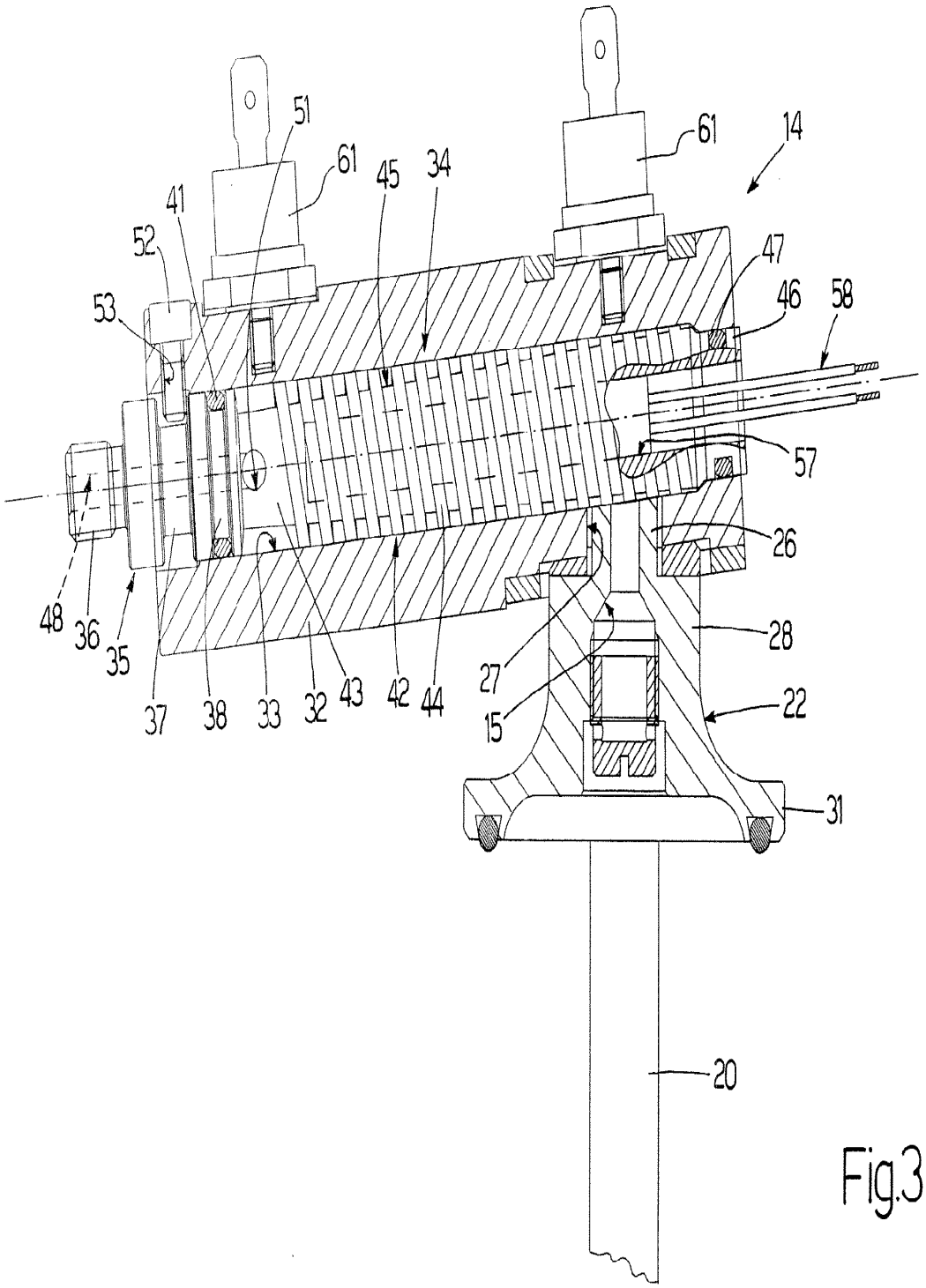


Fig.3

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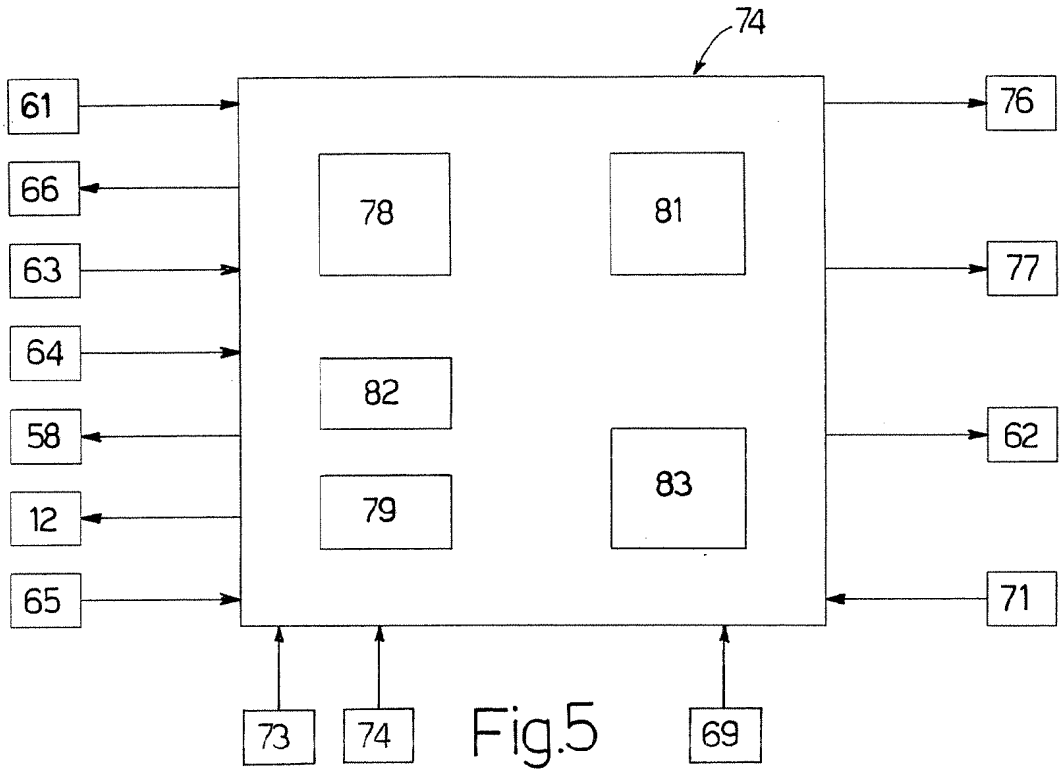


Fig.5

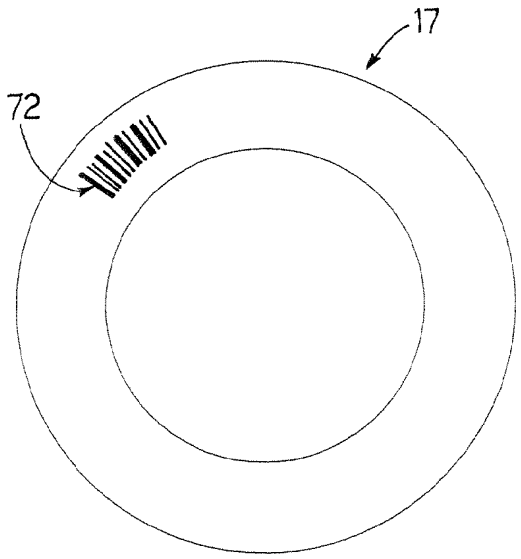


Fig.4

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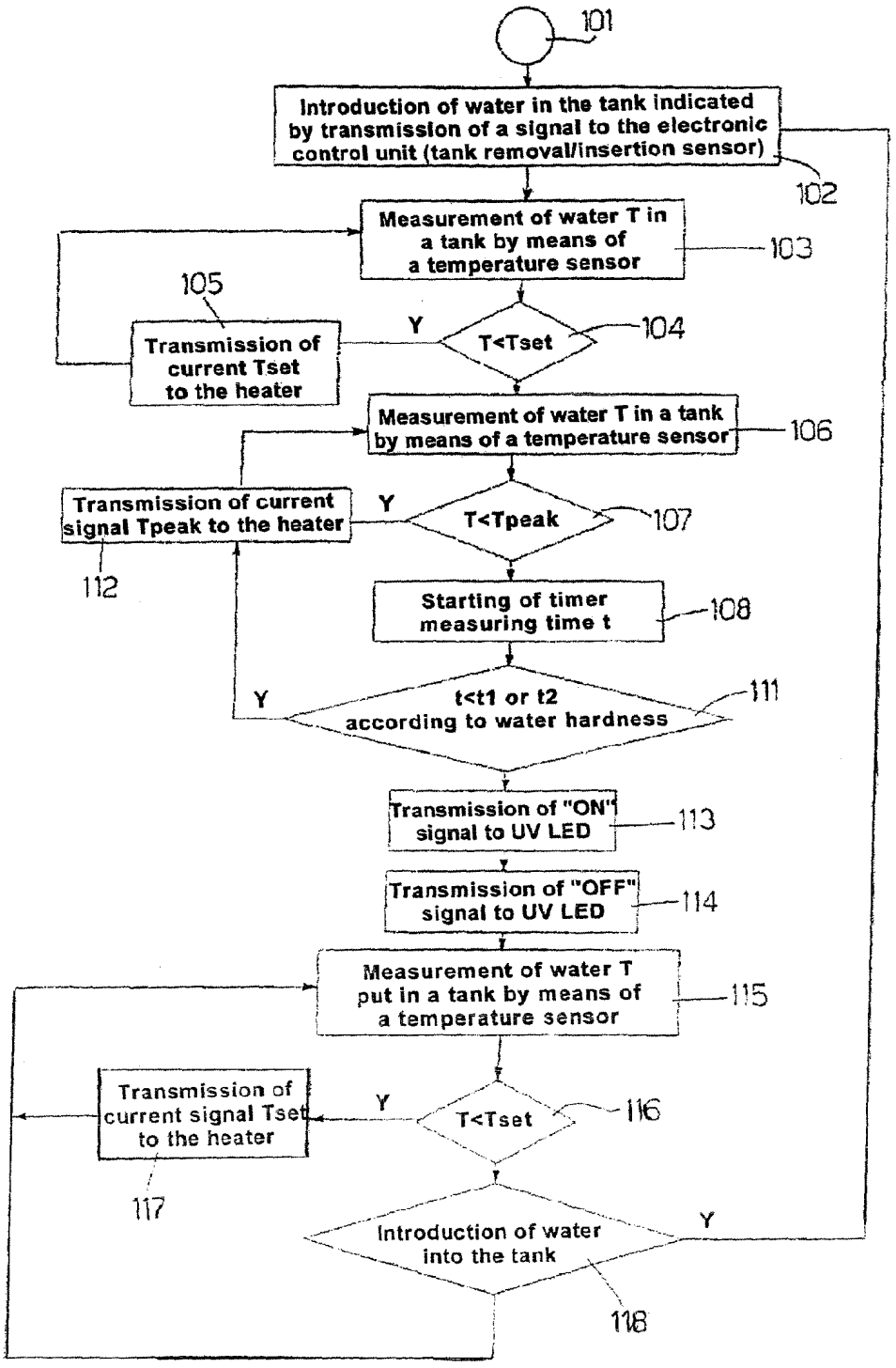


Fig.6

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 0604

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 198 57 165 A1 (BRAUN GMBH) 21 June 2000 (2000-06-21) * column 4, line 44 - column 6, line 1; figure 1 *	9,16	INV. A47J31/06
Y		10-12, 14,15	
A		1-8,13	

Y	NL 8 401 201 A (VERHEIJEN B.V. TE HEERHUGOWAARD) 1 November 1985 (1985-11-01) * page 3, line 24 - page 5, line 20; figures 1,2 *	10,12	

Y	US 5 889 684 A (BEN-DAVID ET AL) 30 March 1999 (1999-03-30) * column 3, line 31 - column 4, line 21; figure 1 *	11	

X	US 2004/089158 A1 (MAHLICH GOTTHARD) 13 May 2004 (2004-05-13)	17	TECHNICAL FIELDS SEARCHED (IPC)
Y	* paragraph [0029] - paragraph [0037]; figures 1-4 *	12,14,15	A47J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 December 2006	Lehe, Jörn

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

EPO FORM 1503 03.82 (P04C01)

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 12 0604

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-12-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19857165 A1	21-06-2000	NONE	
NL 8401201 A	01-11-1985	NONE	
US 5889684 A	30-03-1999	NONE	
US 2004089158 A1	13-05-2004	AR 033451 A1	17-12-2003
		AT 318535 T	15-03-2006
		CA 2442389 A1	10-10-2002
		DE 10116239 A1	17-10-2002
		WO 02078498 A1	10-10-2002
		EP 1379153 A1	14-01-2004
		ES 2254687 T3	16-06-2006
		JP 2004525829 T	26-08-2004
		NO 20034325 A	05-11-2003
		TW 222603 B	21-10-2004
		ZA 200307553 A	31-08-2004

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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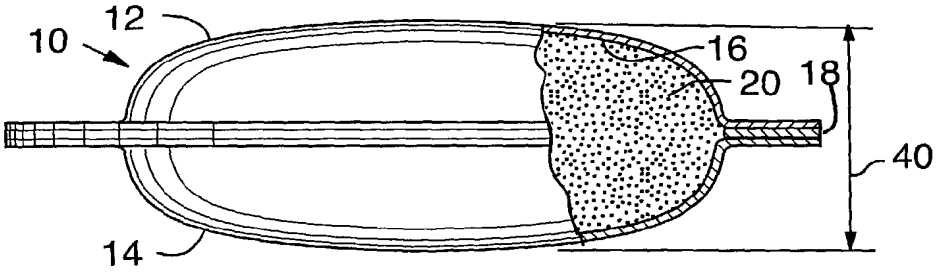
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(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ENCODED COFFEE PACKET



(57) Abstract: A brewing packet (10) is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient (20) chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature (30) that contains encoded data capable of being read by a beverage producing device (100). Furthermore, the data on the packet is capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.

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ENCODED COFFEE PACKET

Cross Reference to Related Application

This application claims priority from Provisional Patent Application Serial No. 60/238,802, filed October 6, 2000 for ENCODED COFFEE PACKET. The full contents of that provisional patent application are incorporated by reference.

Field of the Invention

The present invention relates generally to coffee machines, and more particularly, to an encoded coffee packet for use in a coffee machine to direct the coffee brewing process.

Background of the Invention

Automated coffee machines have long been used for brewing coffee, both in large-scale commercial settings and in smaller business and home settings. These machines typically operate on the principle of placing a quantity of ground coffee into a filter, and passing hot water through the ground coffee to produce a coffee beverage.

In recent years, such machines have brewed coffee using pre-measured, pre-packaged quantities of ground coffee, typically in the form of packets which may be inserted into the coffee machine at the time of brewing, or selected from an onboard coffee packet supply. These packets, also known as pods or cartridges, simplify the task of cleaning the machine and replacing used coffee grounds, and ensure more consistent coffee quality and taste.

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Despite these advantages, however, coffee machines which employ such pre-measured coffee packets typically do not consider variations in individual taste, or the particular characteristics of the packaged coffee grounds. The use of such packets also has heretofore been reserved for espresso coffee making machines, which typically employ consistent size, shape and grind characteristics. Accordingly, applicants have developed a system whereby coffee packets may be encoded with data for use in directing the coffee brewing process to accommodate individual tastes and the particular characteristics of the ground coffee used.

Summary of the Invention

A brewing packet is provided for use in the preparation of hot or cold beverages. The brewing packet envelops a brewing ingredient chosen according to the tastes of a beverage drinker. The packet includes a machine interpretable feature that contains encoded data capable of being read by a beverage producing device. Furthermore, the data on the packet may be capable of directing the beverage producing device to employ a specific brewing operation suited for the particular brewing packet. This allows for producing the optimal beverage from the brewing ingredient. The packet may be utilized with a variety of brewing ingredients to produce a variety of beverages. Similarly, the packet may be configured to produce single or multiple servings of a beverage.

Brief Description of the Drawings

Fig. 1 is a side view of a packet according to an embodiment of the present invention with a section cut away to reveal the contents of the packet.

Fig. 2 is an isometric view of the packet depicted in Fig. 1.

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Fig. 2a is a fragmentary view of the packet shown in Figs. 1 and 2, illustrating an optical bar code encoding configuration.

Fig. 2b is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of a shape.

Fig. 2c is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of a text string.

Fig. 2d is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of a glyph.

Fig. 2e is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of a digital watermark.

Fig. 2f is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of notches.

Fig. 2g is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of grooves.

Fig. 2h is a fragmentary view of an alternative embodiment packet, illustrating encoded data in the form of holes.

Fig. 3 is a schematic representation of a coffee machine constructed in accordance with an embodiment of the present invention, the coffee machine being configured to receive and decipher an encoded packet.

Fig. 4 is a flowchart of a method according to the present invention.

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Detailed Description of the Invention

Although the present invention may be used in virtually any brewing machine, it is described herein for use in the context of machines such as those disclosed in U.S. Patent No. 5,974,949 to Weber et al. and U.S. Patent No. 6,035,762 to Ruckstuhl. Those patents disclose machines for brewing espresso using espresso espresso packets in the form of filter capsules which are received through a funnel into a brewing chamber where water is passed through the filter capsule to produce an espresso beverage. The subject matter of each of these patents is incorporated herein by this reference.

The invention also may be practiced in connection with espresso machines such as those disclosed in U.S. Patent Nos. 4,253,385, 4,254,694, 4,353,293, 4,429,623, 4,484,515, 4,555,894 and 4,852,333, all to Illy. These patents disclose various aspects of espresso machines which include brewing chambers configured to receive pre-fabricated espresso packets through which water is passed to produce an espresso drink. The subject matter of each of these patents also is incorporated herein by this reference.

While the aforementioned machines generally are described for use in connection with espresso packets which contain a single serving of espresso, it will be appreciated that the present invention considers application of the relevant principles to machines which employ coffee packets for use in brewing multiple cups, which employ coffee packets of various size and shape, which employ various filter media and which contain coffee of various varieties, roasts, and grinds. Furthermore, the packet and methodology described herein may also

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produce other types of beverages such as tea, cider, and/or any beverage which is produced by mixing various ingredients. The packet and methodology is not limited to hot beverages and may be used to produce cold beverages.

As indicated above, a variety of factors beyond the grind of the coffee play a part in the taste of coffee, including factors such as freshness, brew temperature, brew duration, amount of water used, etc. These factors may be dependent on the characteristics of the coffee itself, or may be determined by the tastes of the coffee drinker, even absent an understanding of the effects of changes in the brew operation.

With the foregoing in mind, it will be appreciated that it would be desirable to automatically customize the brew operation based on particular characteristics of the packet, the characteristics of the coffee, and/or the tastes of the user, whether or not the user is aware of what changes in the brew operation will lead to the desired taste. The present invention provides a vehicle for such customization in the form of an encoded packet configured to provide the brewing machine with data useful in directing the brewing operation in accordance with packet or packet content characteristics and/or the user's tastes.

Focusing now particularly on the invented encoded coffee packet, it will be appreciated that such packet typically takes the form of a coffee-filled packet configured for placement in a fluid path of a coffee machine whereby hot water (or steam) flows through the packet to produce a coffee beverage. An exemplary packet is depicted in Figs. 1-3, such packet being indicated generally at 10.

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In accordance with the present invention, packet 10 is of somewhat conventional construction, including a filter with a first filter portion 12 and a second filter portion 14 which collectively define a cavity 16 containing ground coffee 20. The filter is selected to permit flow of water therethrough, but to restrict flow of the ground coffee therethrough, other than in the form of a coffee beverage.

Typically, the filter takes the form of opposing, water-permeable paper sheets, as indicated, but the filter may be formed of stainless steel, or some other filter material configured to define a cavity for containment of coffee grounds while water and brewed coffee beverage pass therethrough. It is desirable, however, that the filter impart no undesirable taste characteristics to the resulting coffee beverage.

As indicated above, opposing filter portions 12 and 14 are secured together about their respective perimeters to form cavity 16. In the depicted embodiment, the filter portions are secured to an orbicular gasket 18. The gasket is deformable to allow for an optimum seal. In an alternative embodiment, the packet may be integrally formed from a continuous filter in which no gasket is required. Although the depicted packet is circular, it will be appreciated that the cavity may take virtually any shape capable of containing coffee grounds. The size and bed depth 40 of the packet is determined by the quantity of coffee grounds, the density of coffee grounds, and the desired coffee beverage taste.

As shown in Fig. 2, packet 10 includes a machine interpretable feature 30 which directs operation of the coffee machine in accordance with predefined brewing directives. In the first depicted embodiment, the machine

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interpretable feature is a barcode 31 as depicted in Fig. 2 and 2a. It will be understood that the machine interpretable feature may be any machine readable feature associated with packet 10.

Examples of alternative embodiments are depicted in Figs. 2b through 2h. In Fig. 2b the feature is geometric shape 32. The shape may be raised or lowered and may, or may not incorporate color, or some other machine-interpretably characteristic. Fig. 2c shows text string 33. The text string may consist of alpha-numeric characters and may be of various lengths including a single character. Fig. 2d shows glyph 34. The glyph may be any symbolic figure including a symbol used as a trademark. A digital watermark 35 is depicted in Fig. 2e. Fig. 2f shows notches 36. The notches may be localized to a particular area of the packet or may span its entire perimeter in singular or repetitive fashion. Grooves 37 are depicted in Fig. 2g. One or more grooves may be incorporated to create a texture. Fig. 2h shows holes. One or more holes may be used, which holes may be, of various shapes and sizes. The above-noted machine interpretable features; or other machine interpretable features, may similarly may be employed in combination or alone, such features being selected for their ability to store brewing directives and packet and/or ingredient-characteristic data, and for their cost of manufacture, aesthetic appearance, and ability to carry machine interpretal features which are capable of being successfully detected, read, and interpreted.

Machine interpretable feature 30, it will be appreciated, is capable of storing a significant amount of data, including specific brewing directives and/or packaging or ingredient characteristics. Examples of the types of brewing directives

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stored in machine interpretable feature 30 may include, for example, contact time, contact pattern, fluid volume, fluid temperature, fluid pressure, and/or fluid pass-through rate. The above brewing directives are all well known in the coffee brewing industry to affect the taste and quality of the coffee beverage. Examples of ingredient characteristics which may be stored in machine interpretable feature 30 include grind, blend, roast, quantity, bed depth, freshness, and expiration date. These examples are meant to be exemplary, not limiting in scope.

Fig. 3 schematically depicts a coffee machine 100 designed to utilize packet 10. In the depicted embodiment, packet 10 is positioned between input fluid path 110 and output fluid path 112. Gasket 18 helps form a seal between chamber 114, defining the input fluid path, and chamber 116, defining the output fluid path. Gasket 18 also helps secure packet 10 in place. In other embodiments, packet 10 is held in place by gravity, water pressure, friction, adhesion, magnetism, or other suitable mechanisms. As depicted, water passes into packet 10 along input fluid path 110, passing through filter portion 12. The water contacts ground coffee within packet 10, producing a coffee beverage. The coffee beverage then flows through packet 10 and out through filter portion 14. Thereafter, the coffee beverage continues along output fluid path 112 and into beverage receptacle 120. In one embodiment, water is stored in a reservoir (not shown) within coffee machine 100 and heated before entering input fluid path 110. Alternatively, water is externally heated before entering input fluid path 110, or not heated at all. Beverage receptacle 120 may be dimensioned to accommodate multiple servings of

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the brewed coffee beverage, or may be dimensioned to receive a single serving of brewed coffee.

Coffee machine 100 includes a sensor 130 designed to read machine interpretable feature 30 of packet 10. Sensor 130 is in turn operatively connected to a processor 140 which controls coffee machine 100. Machine interpretable feature 30 may store data which is read by sensor 130 and passed to processor 140. Processor 140 may then direct the brewing operation in accordance with its interpretation of the data derived from machine interpretable feature 30. For example, processor 140 may direct coffee machine 100 to brew using a pre-selected contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate expressed in machine interpretable feature 30. Alternatively, the processor may itself make determinations of contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, and/or fluid pass-through rate based on information contained in machine interpretable feature 30. The processor may also, based on information contained in machine interpretable feature 30, direct the coffee machine to add water, milk, cream, sugar, or any suitable condiment to the coffee beverage.

As alluded to above, machine interpretable feature 30 need not store data specifically including brewing directives and ingredient characteristics. Instead machine interpretable feature 30 may act as an identifier so that brewing directives and ingredient characteristics may be looked up from data storage 150 within (or external to) coffee machine 100. Sensor 130 thus may read machine interpretable feature 30 and processor 140 may match the machine interpretable feature with

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predefined brewing operation instructions stored in such memory. Processor 140 may then direct the brewing operation based on brewing operation instructions. In one embodiment, the brewing operation instructions are matched to a machine interpretable feature using a look-up table in which brewing operation instructions correspond in a one-to-one ratio with each known ingredient variety, packet size, packet construction, user preference, etc. It will be appreciated, however, that other arrangements for matching machine interpretable feature 30 with brewing directives similarly may be used.

Referring now to Fig. 4, a method of operation for the present invention is illustrated at 200. At 202, a brewing packet encoded with packet-characteristic data is placed into a brewing device. At 204, the packet-characteristic data is read by a sensor. At 206, the packet-characteristic data is interpreted by a processor. Finally, at 208, brewing is directed in accordance with the packet-characteristic data read by the sensor and interpreted by the processor.

Because the processor may be employed to effect the aforementioned predefined brewing directives based on the machine interpretable feature associated with each packet. The brewing operation may be made consistent based on consistent machine interpretable features from packet to packet. Similarly, the brewing operation may be altered in accordance with desired brewing characteristics each time the packet is replaced. Particular brew characteristics thus may be controlled simply by selection of a packet with the desired encoded brewing directives (whether or not such directives are known to the coffee machine operator). Control of the brewing process thus may be handed off to the brewing

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professionals who produce the packets, rather than relying on untrained machine operators. This may be done without sacrificing variety in brew operation based on differing characteristics of the packet contents or consumer tastes.

For example, a person desiring weaker coffee may purchase packets designated such in order to direct the machine to add water to the brewed coffee beverage in accordance with proper brewing procedure. This avoids problems associated with ill-advised attempts to dilute coffee by decreasing the quantity of coffee used, a change which may result in a corresponding change in bed depth, and thus in an undesirable change in coffee taste.

The encoded packets also may be used to track brewing information which may be useful in ensuring satisfaction with the brewed coffee beverage. For example, the packet may include an encoded date for use in tracking freshness of the coffee grounds contained within the packet. Upon determining that the packet is stale, the processor may direct the machine to note such staleness, thus avoiding an unsatisfactory beverage. Similarly, the packet may contain encoded data related to the coffee blend contained within the packet, such data being stored in memory to provide a history of coffee blends. The encoded packet also may contain encoded data defining the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.

While the invention has been disclosed in its preferred form, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense as numerous variations are possible. The subject matter of the invention is regarded to include all novel and non-obvious

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combinations and subcombinations of the various elements, features, functions and/or properties disclosed herein. No single feature, function, element or property of the disclosed embodiments is essential. The following claims define certain combinations and subcombinations which are regarded as novel and non-obvious. Other combinations and subcombinations of features, functions, elements and/or properties may be claimed through amendment of the present claims or presentation of new claims in this or a related application. Such claims are also regarded as included within the subject matter of applicant's invention irrespective of whether they are broader, narrower, or equal in scope to the original claims.

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IPR2023-00502, U.S. PATENT 10,994,923

WE CLAIM:

1. A brewing packet comprising:

a filter defining a cavity;

a brewing ingredient within the cavity; and

a machine-interpretable feature associated with the filter, wherein the feature includes encoded data regarding the brewing packet.

2. The packet of claim 1, wherein the machine-interpretable feature is located on the filter.

3. The packet of claim 1, wherein the filter defines an annular flange, the machine-interpretable feature being located on the annular flange.

4. The packet of claim 1, wherein the filter includes a first filter portion, a second filter portion, and a gasket which seals the first filter portion to the second filter portion.

5. The packet of claim 1, wherein the machine-interpretable feature is optically detectable.

6. The packet of claim 5, wherein the machine-interpretable feature includes one or more of a color, a shape, a glyph, a text string, a barcode, and a digital watermark.

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7. The packet of claim 1, wherein the machine-interpretable feature is electromagnetically detectable.

8. The packet of claim 7, wherein the machine-interpretable feature includes a magnetic data storage medium.

9. The packet of claim 1, wherein the machine-interpretable feature is mechanically detectable.

10. The packet of claim 9, wherein the machine-interpretable feature includes one or more of notches, grooves, holes, bumps, and textures.

11. The packet of claim 1, wherein the encoded data includes at least one predefined brewing directive.

12. The packet of claim 11, wherein the predefined brewing directive is one or more of contact time, contact pattern, fluid quantity, fluid temperature, fluid pressure, or fluid pass-through rate.

13. The packet of claim 1, wherein the encoded data defines at least one characteristic of the brewing ingredient.

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IPR2023-00502, U.S. PATENT 10,994,923

14. The packet of claim 13, wherein the characteristic is one or more of grind, blend, roast, quantity, bed depth, freshness, and expiration date.

15. A beverage producing device comprising:

a fluid path configured to direct fluid through an ingredient enveloping beverage packet into a beverage receptacle;

a sensor configured to detect encoded data stored on the beverage packet; and

a processor configured to interpret the encoded data and to direct production of a beverage according to the encoded data.

16. A method of automatically directing beverage-brewing comprising:

placing a brewing packet encoded with packet-characteristic data into a beverage-brewing device;

reading the packet-characteristic data;

interpreting the packet-characteristic data; and

directing beverage-brewing in accordance with interpreted packet-characteristic data.

17. The method of claim 16, wherein reading the packet-characteristic data includes detecting an optically recognizable feature containing the data.

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18. The method of claim 16, wherein reading the packet-characteristic data includes detecting an electromagnetically recognizable feature containing the data.

19. The method of claim 16, wherein reading the packet-characteristic data includes detecting a mechanically recognizable feature containing the data.

20. The method of claim 16, wherein directing beverage-brewing includes setting at least one predefined brewing directive.

21. The method of claim 16, wherein directing beverage-brewing selectively includes aborting the brewing process.

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IPR2023-00502, U.S. PATENT 10,994,923

22. A multiple beverage coffee-brewing packet comprising:

a first substantially rounded filter portion;

a second substantially rounded filter portion operatively connected to the first substantially rounded filter portion by an orbicular gasket to collectively define a cavity, the first and second substantially rounded filter portions being at least partially constructed of water-permeable material; and

a coffee-brewing ingredient within the cavity, wherein the coffee-brewing ingredient is proportioned to produce multiple servings of drip coffee.

23. The coffee-brewing packet of claim 22, wherein a coffee-brewing operation is directed by a machine interpretable feature associated with the coffee-brewing packet.

24. The coffee-brewing packet of claim 23, wherein the machine interpretable feature is the dimension of the orbicular gasket.

25. The coffee-brewing packet of claim 23, wherein the machine interpretable feature is a barcode located on the coffee-brewing packet.

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FIG. 1

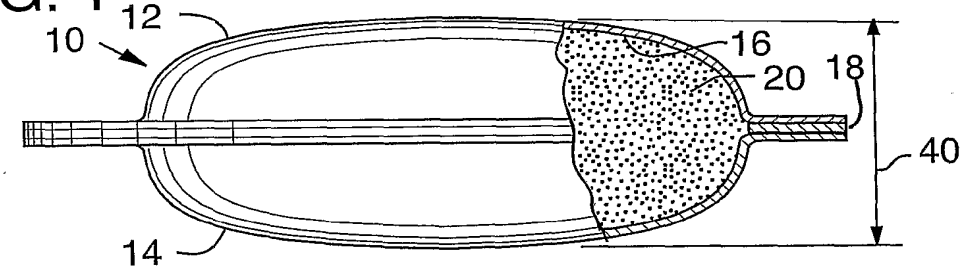


FIG. 2

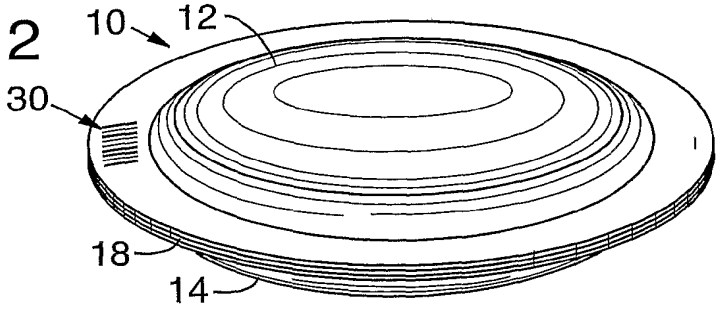


FIG. 2a

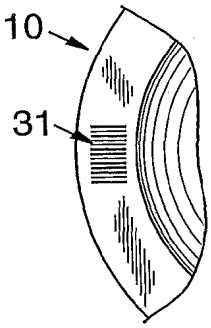


FIG. 2b

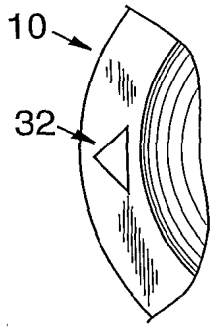


FIG. 2c

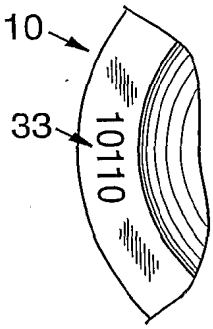


FIG. 2d

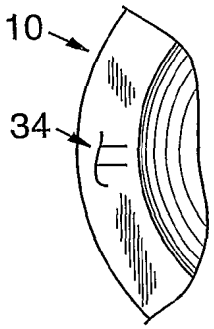


FIG. 2e

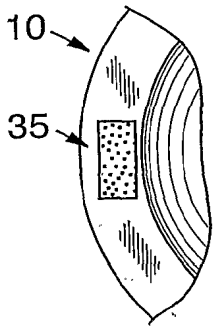


FIG. 2f

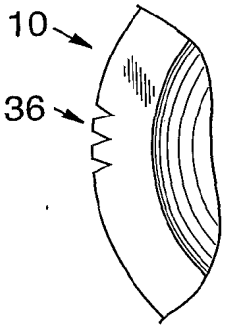


FIG. 2g

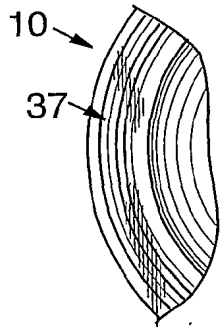


FIG. 2h

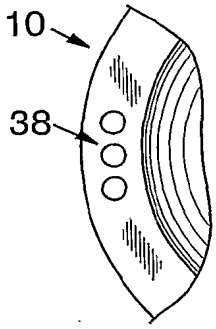
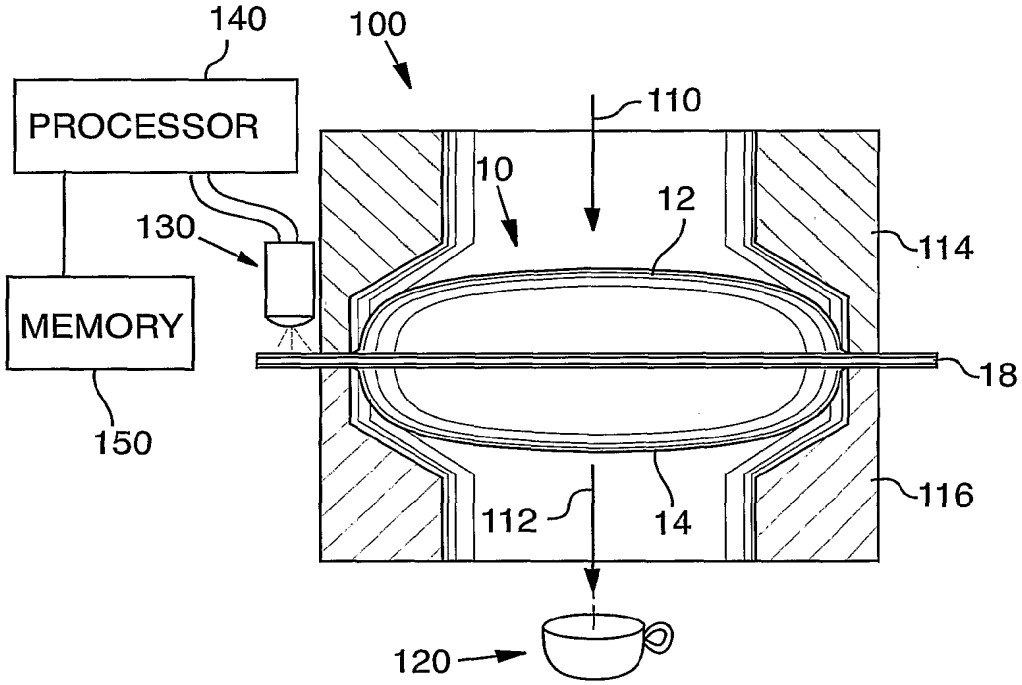


FIG.3


140
100
PROCESSOR
110
10
12
130
114
MEMORY
18
150
112
14
116
120

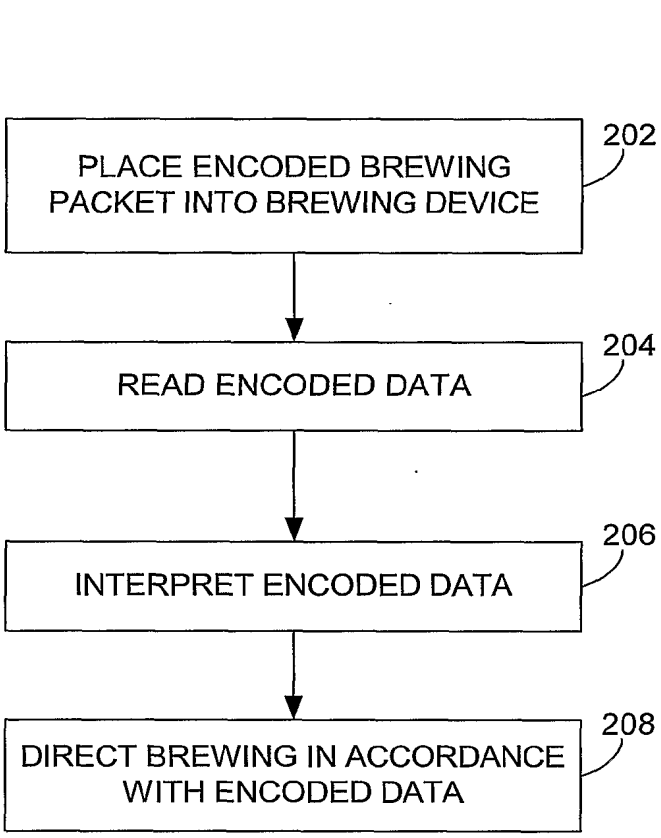

200
PLACE ENCODED BREWING PACKET INTO BREWING DEVICE
202
READ ENCODED DATA
204
INTERPRET ENCODED DATA
206
DIRECT BREWING IN ACCORDANCE WITH ENCODED DATA
208

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/31348

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :A47J 31/00; B65B 29/02
US CL :99/295, 285; 426/78, 81
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)

U.S. : 99/295, 285, 323, 279; 426/78, 81, 79, 82; 210/85

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

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

EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,974,950 A (KING) 02 November 1999, see entire document.	1-6, 11, 13-17, 20, 21 --- 7-10, 18, 19
A	US 5,798,037 A (PEACOCK) 25 August 1998, see entire document.	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 04 JANUARY 2002	Date of mailing of the international search report 16 JAN 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer REGINALD L. ALEXANDER Telephone No. (703) 308-0651

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(74) Agent: **BORNE, Patrice**; Ave Nestlé 55, CH-1800 Vevey (CH).

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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

[Continued on next page]

(54) **Title**: CONTROLLED BEVERAGE PRODUCTION DEVICE USING CENTRIFUGAL FORCES

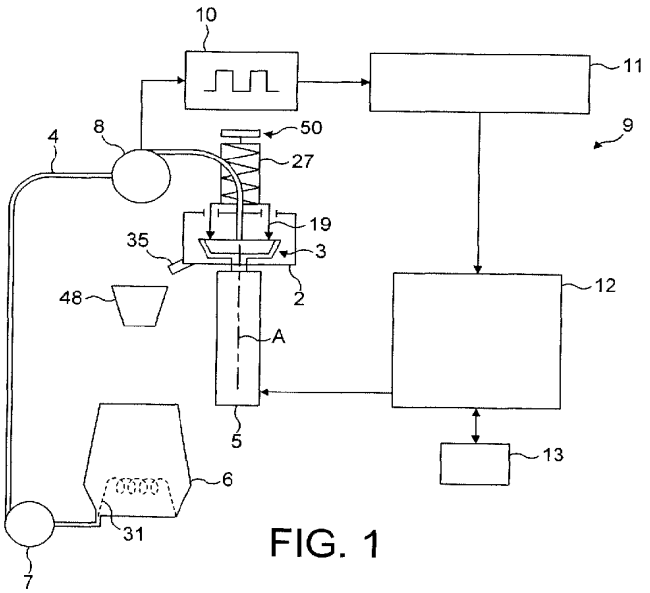


FIG. 1

(57) **Abstract**: The present invention relates to a beverage production device for preparing a liquid comestible from a portioned food substance contained in a sealed capsule (3), comprising a centrifugal unit (2) for receiving the sealed capsule (3), driving means (5) connected to the centrifugal unit (2) for enabling a rotational motion of the centrifugal unit (2), liquid supply means (4,6,7) being connected to the centrifugal unit (2), means (8) for measuring the flow rate or the pressure of the supplied liquid and control means (9) for controlling the rotational speed of the driving means dependent on the measured flow rate or the measured pressure of the liquid.

WO 2010/026053 A1

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

Controlled beverage production device using centrifugal forces

Field of the invention

The present invention relates to a device and a capsule system for preparing a liquid comestible from a food substance contained in a receptacle by passing liquid through the food substance using centrifugal forces. In particular, the invention relates to a device and a method for controlling the flow rate of a liquid during the beverage preparation.

Background of the invention

It is known to prepare beverages by separating a mixture consisting of brewed coffee and coffee powder with centrifugal forces. Such a mixture is obtained by the interaction of hot water and coffee powder for a defined time. The water is then forced through a screen, on which screen powder material is present.

The existing centrifugal systems suffer the inconvenience that the strength of coffee cannot be regulated properly.

For instance, GB1506074 relates to a centrifugal device comprising a filter for filtering coffee. However, the contact time between coffee and hot water is not controllable. For example, the coffee granulometry can influence the residence time of liquid in the coffee and so the extraction quality.

On the other hand, solutions are known for increasing the pressure in the cell such as by a fixed or pressure-responsive restriction means.

It is known to increase the pressure in the centrifugal cell by increasing the rotational speed such as in EP651963. In this document, the pressure increase is obtained by a rubber-elastic element interposed at the interface between the lid and the cup of the centrifugal cell. Such an element deforms elastically to leave a filtering passage for the liquid when a certain pressure is attained at the interface.

FR2487661, US4545296 and WO2006/112691 relate to centrifugal systems wherein a fixed restriction is placed downstream of the filter to increase the pressure. However, in these systems, the contact time of the coffee and water is not truly controlled. As in EP651963, the taste of the coffee can be modified by changing the speed consequently the pressure in the cell.

GB2227405 discloses an apparatus for preparing a coffee infusion wherein the speed and/or duration of rotation is set to give a predetermined strength of infusion.

WO2007/041954 relates to a coffee maker with combined milling stage and brewing stage. Different approaches can be used to control the flavours of the brewed coffee. A first approach is to control the grain size of coffee powder during milling stage. A second approach is to control the speed of water penetration through the milled coffee powder. Therefore, different rotational speeds of the brewing basket are set up by the controller. A

disadvantage is that depending on the flow characteristics in the ground coffee taking into account the powder characteristics, coffee compaction, water quality, temperatures, etc., the strength and other quality attributes (e.g., crema) of the coffee can fluctuate a lot.

In PCT/EP08/056310, a solution is proposed into which a flow restriction is placed in or outside the centrifugal cell, e.g., a capsule containing coffee powder. The flow restriction can comprise a regulating valve offering a back-pressure. The valve opens under the effect of pressure in the cell. The valve can be preloaded by a resilient element (rubber or spring). A control unit can be provided in the device for setting the rotational speed according to the nature of the liquid to be brewed and/or the substance of the capsule.

Based on the prior art, the present invention aims at providing a device and a method for allowing an efficient control of the strength of a liquid comestible such as a coffee or tea beverage in a centrifugal beverage production device which takes into account the flow attributes through the ingredients.

The present invention also aims at providing a device and a method for allowing the production of different levels of foam or "crema" of the liquid comestible, in particular for coffee beverages.

In particular, one aspect of the invention, is to ensure that the key quality attributes of the beverage can be controlled properly. In particular, one aspect of the invention is to ensure that the strength or concentration

of the beverage is reproducible, i.e., that this characteristic does not fluctuate much for a same desired beverage. Still an aspect of the invention is to ensure the key quality attributes (i.e., concentration, coffee crema level) as well as the volume of the beverage can be produced and selected in a controllable manner depending on the type of beverages desired.

Object and summary of the invention

In a first aspect, the present invention relates to a beverage production device for preparing a liquid comestible from a portioned food substance contained in a capsule or cell, comprising a centrifugal unit for receiving the capsule or cell, driving means connected to the centrifugal unit for enabling a rotational motion of the capsule or cell in the unit, liquid supply means being connected to the centrifugal unit to supply liquid in the capsule or cell, means for measuring the flow rate, or respectively the pressure, of the liquid, and a control unit for controlling the flow rate of liquid, or respectively the pressure of liquid, to match a flow rate reference, or respectively a pressure reference, in a control loop by automatically adjusting the rotational speed of the driving means during the extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure, of the liquid.

With a device according to the present invention it is possible to enable a controlled interaction between a preferably portioned food substance provided in a capsule or cell and a liquid such as water. Thereby, the interaction is particularly enabled due to the

centrifugal forces exerted on the capsule or cell during and after liquid has been provided thereto and, the substance:liquid interaction control is particularly obtained by monitoring and adjusting the flow rate of liquid that feeds the capsule or cell.

In a preferred embodiment, the capsule is removably insertable into the centrifugal unit of the device. The centrifugal unit of the device preferably comprises two enclosing members which are movably arranged relatively to each other and which are designed to enclose the capsule within the device.

One enclosing member is preferably equipped with a liquid injection assembly which enables the provision of liquid to the capsule enclosed within the centrifugal unit of the device. Preferably, the injection assembly is arranged centrically with respect to a rotational axis of the centrifugal unit. The injection assembly preferably comprises a tubular member for providing liquid to a central inlet port of the capsule. In a possible embodiment, the injection assembly comprises a piercing member designed to pierce the inlet port in a face of the capsule. The injection assembly is connected to the liquid supply means of the device.

A second enclosing member of the centrifugal unit is preferably a rotary drum which is of complementary shape to the capsule. Hence, a user may insert the capsule into said rotary drum which is held in the drum a stable manner.

The driving means for driving the centrifugal unit is preferably a motor such as an electric motor which is

connected to the control means of the device. Thereby, the driving means are connected to the rotary drum by means of a motor axle which thus enables a rotational movement of the rotary drum and the capsule housed by the rotary drum.

The liquid supply means of the device comprise a reservoir for storing liquid. Preferably, the reservoir is a boiler which comprises heating means in order to heat the liquid therein. However, the liquid supply means may as well comprise a liquid reservoir and an in-line heating element such as a thermoblock or an instant heater placed downstream of the reservoir in the fluid circuit.

Moreover, the liquid supply means preferably comprise a pump for providing liquid from the reservoir to the injection assembly and thus, to the centrifugal unit of the device. The pump is preferably connected to the control means of the device.

The means for measuring the flow rate of the liquid are preferably arranged in the fluid circuit between the liquid supply means and the centrifugal unit of the device.

The control unit preferably comprises an event-triggered state machine connected to the driving means and the means for measuring the flow rate of the liquid provided to the centrifugal unit. Moreover, the control unit is preferably connected to a manual interface which can be operated by a user.

In particular, the flow rate reference can be a flow rate set point which is set as a constant during an extraction phase. The extraction phase is here defined as the main phase during which liquid is supplied by the supply means to the capsule and said liquid passes through the ingredients in the capsule and beverage liquid is thus dispensed from the capsule.

In a possible alternative, the flow rate reference represents a variable profile of flow rate, i.e., set points varying in function of time. Indeed, it might be advantageous in some case to vary the flow rate set point during the extraction phase in order to achieve particular extraction profiles. In this case, the control unit can store a variable profile of flow rate which corresponds to a particular selected beverage. However, for avoiding too much control complexity, preference is given to a constant flow rate set point for a same desired beverage.

In a preferred mode, the control unit is preferably configured for selecting or calculating different preset flow rates corresponding to respectively different beverage (e.g., coffee) strengths. The control unit is preferably connected to a user's interface for a selection of the different beverages by the user.

Therefore, the control unit enables the regulation of the flow rate (as a constant or variable profile) by adjusting the speed of the driving means during at least one essential phase of the beverage preparation in order to set the strength (i.e., the concentration) of the beverage to be prepared. Thereby, the strength can be

selected by a user of the device by means of the manual interface.

Moreover, the control unit is configured for controlling the volume of the beverage by receiving data from the flow measuring means and controlling accordingly the volume of liquid supplied by the liquid supply means, in particular, the pump, to the capsule or cell.

However, it may as well be possible that the strength and/or volume are set by identification means arranged within the device which interact with the capsule provided to the device. Such identifications means may be a barcode scanner for example which reads a barcode provided on an outside face of the capsule and which enables a detection of the type of capsule and/or the nature of ingredients provided within the capsule in order to apply a predefined extraction profile for the beverage to be prepared.

During the beverage extraction phase of a beverage preparation cycle, the speed of the driving means is thus regulated in control loop to correct the flow rate at a substantially constant value or, eventually to follow a predefined flow rate profile. Hence, a preset nominal flow rate is obtained during the extraction phase of the beverage production. Since the flow rate is directly linked to the contact time of the liquid with the ingredient in the capsule, the strength of the beverage is thus essentially determined by maintaining the flow rate to said predefined set point or profile corresponding to the selected strength of the beverage.

During the extraction phase, a centrifugal cell which is placed within the centrifugal unit acts as a centrifugal pump by drawing liquid such as water from the liquid supply. Accordingly, the rotational speed of the motor driving the centrifugal unit in rotation compensates for the flow rate fluctuation to the set point. In particular, when the measured flow rate becomes lower than the set point, the rotational speed is increased by the control unit to raise the flow rate up to the set point and, inversely, when the measured flow rate becomes higher than the set point, the rotational speed is decreased by the control unit to lower the flow rate down to the set point. Obviously, the lowest possible fluctuations of flow rates to the set point are preferred.

The centrifugal cell according to the present invention may be a single-use capsule provided to the centrifugal unit. Furthermore, the centrifugal cell may as well be a refillable filter cell.

The single-use capsule to be used with the present invention can be closed before use in a gas impervious manner to maintain freshness of the food ingredients housed therein. The capsule preferably contains a protective atmosphere for the ingredients such as inert gas. The capsule can be closed by a membrane which is pierced or peeled off during the beverage preparation process. The capsule may comprise coding means such as a barcode for example which is read by the machine. Accordingly, corresponding parameters, such as for example the beverage strength, the beverage volume and/or the beverage crema or foam, can be adjusted by the control means.

In case a refillable filter cell is provided to the centrifugal cell, said filter cell is preferably removably arranged within the device. Furthermore, the filter cell is preferably designed to be accessible from the outside of the device. Therefore, removing and loading of food substance from or to the centrifugal cell is enabled.

The pump of the liquid supply means is set to supply a sufficient quantity of water during the beverage preparation cycle to the centrifugal cell whereas the rotational speed of the centrifugal cell actually regulates the flow rate of the dispensed liquid. The pump is preferably a low pressure pump such as a centrifugal pump or any other suitable low pressure pump.

The contact time between the food ingredients and hot water contained in the capsule varies in inverse proportion to the water flow rate which circulates in the liquid supply circuit and thus, through the centrifugal cell. In general, for obtaining a higher concentration or strength of the beverage to be prepared, the water flow rate can be set at a relatively low value, whereas for obtaining a lighter concentration or strength of the beverage, the water flow rate is set at a relatively higher value.

This is in particular advantageous for preparing a hot beverage such as coffee, tea, hot chocolate or the like with a desired concentration respectively a desired strength.

The flow rate is measured by flow rate sensing means which are placed in the liquid flow path of the device.

Such flow metering means provide continuous indications to the control means which, in response, regulate the speed of the motor.

The flow rate sensing means is preferably a pulse-coded flow-metering turbine placed between the water supply, e.g., a water reservoir and the liquid injection assembly of the centrifugal cell. The turbine thus generates electrical impulses which period is proportional to the velocity of the flow. Accordingly, the control means are designed to calculate the flow rate based on the electrical impulses provided by the pulse coded flow-metering turbine.

Preferably, the control means are also configured to control the volume of the delivered beverage. Accordingly, the volume is set up by receiving information of the flow meter such as by counting the number of impulses generated by the flow meter or by measuring the period of the impulses.

The manual interface of the device preferably comprises a selection means for the user to select the strength of the beverage and preferably also the volume of the beverage. The user may thus select the concentration and/or volume of the beverage to be prepared. For example for a coffee beverage, different strength of coffees can be selected (e.g., light, medium, strong) and different volumes (e.g., 25, 40, 110, 250 mL) corresponding to different cup sizes. For example, for simplifying the selection of the user interface but still meeting the larger possible preference of the users, the choices can be made possible amongst a limited number of selectable combinations relative to coffee strengths and volumes,

for example, under coffee selections which are explicit for the user (e.g., ristretto, espresso light/strong, lungo light/strong, Americano, etc.).

When different kinds of beverage are proposed such as coffee, tea, milk, etc., the selection means may also be used to select the kind of beverage to be prepared in such as coffee, tea, herbal tea, soup or hot chocolate for example. Thereby, the selections means may provide information about different liquid comestibles to be prepared for which different extraction profiles are stored.

In a possible embodiment relating to the preparation of a coffee beverage with the present device, the manual interface may be used for selecting a desired kind of coffee, such as a 'ristretto', an 'espresso', a 'lungo' or an 'Americano' which may express a particular combination of coffee strength and volume. Furthermore, the strength of coffee can eventually be further adjusted selectively for one or more of these kinds of coffees.

Moreover, the desired coffee strength is preferably chosen by selection means such as a potentiometer of the manual interface. Accordingly, the strength of a coffee beverage to be prepared can be varied by a continuous or incremental variation of the flow rate set point which has been set initially by the device. In a possible embodiment, the strength of coffee beverage can be set, for instance, after the selection of coffee volume is carried out.

Considering in particular, coffee preparation from ground coffee contained in the cell, i.e., a single-use capsule,

the extraction profile set by the control means of the device preferably comprises at least a pre-wetting phase, an extraction phase and a dry-spinning phase which differ normally in at least the associated rotational speed of the driving means.

The pre-wetting phase of the extraction profile takes place at the beginning of the beverage preparation cycle. Thereby, liquid such as water is supplied to the centrifugal cell, i.e. the capsule, which is maintained static or is rotated at relatively low speed, preferably lower than 200 rpm, most preferably lower than 100 rpm. Accordingly, the pre-wetting phase enables a homogeneous wetting of the dry food ingredients, i.e., ground coffee, housed within the capsule. Hence, the compacting of dry ingredients and a resulting blockage during the beverage preparation cycle can be effectively prevented.

The amount of liquid provided to the centrifugal cell respectively to the capsule during the pre-wetting phase is preferably chosen such that the cell respectively the capsule is full of liquid and gas is essentially expelled out of the capsule. Accordingly, the food ingredients are completely flooded. During this phase, there is essentially no extracted liquid being dispensed from the capsule as the centrifugal pressure at low speed in the capsule remains too low to enable to overcome the pressure losses created in the capsule and the possible restriction means in the flow path (e.g., valve means).

After the pre-wetting phase, the extraction phase of the extraction profile takes place. It preferably comprises a ramp up of the driving means to the extraction speed level which is a higher rotational speed than during the

pre-wetting phase. Preferably, a predefined extraction speed is set to avoid important fluctuation of the flow rate during the ramp-up phase. Once the predefined extraction speed is reached, the rotational speed of the driving means is controlled by the control means in order to provide a relatively constant flow rate of the liquid.

In order to control the contact time between food ingredients and water during the beverage preparation cycle, the value of the liquid flow rate is calculated by the detection of the period of the impulses generated by the flow meter.

Depending on the type of beverage to be delivered, during the extraction phase, the rotational speed can be comprised between 5,000 and 15,000 rpm, preferably 8,000 and 12,000 rpm. In particular, the speed can be influenced by the flow resistance in the capsule and by the restriction means.

After the extraction phase, the spin-drying phase of the extraction profile takes place. Thereby, the water pump of the liquid supply means is stopped by the control means in order to stop supply of water to the centrifugal cell. Moreover, a second ramp-up phase or acceleration of the rotational speed is carried out followed by a phase where the rotational speed is maintained at a relatively elevated constant value to perform spin-drying of the food ingredients in the centrifugal cell respectively within the capsule. The beverage preparation cycle can be ended up by a deceleration phase where the rotational speed is progressively lowered to the zero value.

Accordingly, any residual liquid present in the centrifugal cell or the capsule is eliminated and discharged via a spout of the device. The rotational speed of the spin-drying phase is set higher than the rotational speed controlled during the extraction phase.

Since the concentration of the residual liquid discharged by the centrifugal cell may have a different concentration than the liquid comestible discharged during the extraction phase, the residual liquid may be discharged by purging means which can be selectively connected to a spout of the device. Therefore, the concentration of the beverage to be prepared is not influenced by the residual liquid discharged during the spin-drying phase.

It should be understood that the spin-drying phase can be carried out for a predetermined time (e.g., a few seconds).

The extraction profile and particularly the rotational speed may vary for each kind of beverage to be prepared in order to influence the concentration or strength of the beverage. Accordingly, different extraction profiles may be chosen by means of the manual interface. The predefined extraction profiles are preferably stored in the control means or memory means connected thereto.

Furthermore, the centrifugal unit of the device preferably comprises flow restriction means at a delivery side of the centrifugal unit.

The flow restriction means at the delivery side of the centrifugal unit may comprise a pressure-responsive valve

which opens under the pressure of the liquid coming out of the unit. Such a valve is for example described in PCT/EP08/056310.

In an embodiment, the restriction means is a fixed Venturi duct (eductor) formed of one or more small outlets. The restriction means can be provided at the delivery outlets of the capsule or downstream of the capsule.

The advantage is that a certain pressure is necessary before the liquid can exit the centrifugal unit and therefore, the contact time of liquid is promoted in the cell by creating a delayed release. Accordingly, an improved interaction between water and the substance contained in the capsule is obtained. For coffee, for example, it may be advantageous to optimize interaction of water and the ground coffee particles contained in the centrifugal cell to obtain a good extraction of the coffee and aroma compounds.

Moreover, the restriction such as the valve provides a relatively high pressure drop which promotes the generation of a nice amount of crema or foam of the beverage.

During the extraction phase, the food ingredients within the centrifugal cell are traversed by liquid provided by the liquid supply means. The beverage resulting from the interaction of liquid and food ingredients, which is discharged from the centrifugal cell due to the centrifugal forces acting thereon, forces the flow restriction valve to open when the pressure of liquid exceeds the preload of the valve. The beverage extract is

thus discharged from the centrifugal cell via the spout with a relatively consistent flow.

In a preferred embodiment, the flow restriction valve can be formed by at least one engaging portion of the device which is adapted to move relatively to an engaged portion of the device or, alternatively, of an engaged portion of the capsule under the effect of the pressurized liquid exiting the capsule, for making a thin annular laminating passage for the liquid.

The preload of the flow restriction valve is preferably adjustable. Thus, the preload of the valve can be increased to force the rotational speed to increase for maintaining the same flow rate. Conversely, the preload can be decreased to lower the rotational speed for maintaining the same flow rate. Thereby, the adjustment of the preload of the valve can impact on the level of crema or foam of the beverage which can be created.

Thereby, it has been found that a higher rotational speed of the driving means during the extraction phase provides a higher amount of crema or foam of the beverage. This is particularly advantageous for coffee beverages for which a distinctive crema or foam is desired.

According to the described embodiment, it can be possible to control both the beverage strength (for example the coffee concentration in the coffee liquid extract in the cup) and the amount of foam or crema on the beverage.

It is thus possible to provide for example a 'ristretto' coffee extract with a relatively high concentration of coffee and a high amount of crema by adjusting,

respectively, the volume of 25mL, a relatively low flow rate and a relatively high preload of the flow restriction valve. On the contrary, it is for example also possible to prepare a relatively light 'lungo' coffee extract with a low amount of crema by adjusting the volume to 110mL, a relatively high flow rate and a relatively low preload of the restriction valve.

In a preferred embodiment, the preload on the flow restriction valve is adjustable by mechanical actuation means driven manually or by a motor controllable by the control unit. Hence, the amount of foam or crema of the beverage to be prepared can be adjusted by the user.

In a possible alternative, the speed of the driving means may be controlled in relation to a detected pressure of liquid in the centrifugal cell respectively in the capsule or of the pressure of liquid reigning in the liquid supplying line before the cell. Thereby, the pressure in the cell or before the cell is preferably measured by a pressure sensor positioned within the cell or upstream of the cell, e.g., in the liquid supplying line between the pump and the water injection point in the cell. It should be noted the present invention can be adapted to a control of the pressure of liquid as an alternative to a control of flow rate or as an additional control means to regulate the rotational speed and, consequently, the strength of the beverage.

In a second aspect, the present invention relates to a system for producing a beverage from portioned ingredients provided within a capsule, the system comprising a beverage producing device having a centrifugal unit comprising at least two enclosing

members for enclosing the capsule by a relative movement of the enclosing members,

driving means connected to the centrifugal unit for enabling a rotational motion of the centrifugal unit,

a liquid injection assembly designed to interact with the capsule provided to the device and connected to liquid supply means,

means for measuring the flow rate, or respectively the pressure, of the liquid,

control means for controlling the flow rate, or respectively the pressure, of liquid to match a flow rate reference, or respectively a pressure reference, in a control loop by automatically adjusting the rotational speed of the driving means during the extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure,

wherein the capsule is designed to be removably inserted into the centrifugal unit of the device.

The capsule to be used with the device according to the present invention is preferably a single-use capsule sealed in a protective atmosphere before use. The capsule can have a rigid dished body and a lid, wherein the lid of the capsule comprises outlet openings arranged at a peripheral portion of the lid. In a possible alternative, the capsule can be capsule permeable to liquid and gas when inserted in the device such as a filter capsule.

The capsule preferably contains ground coffee, soluble coffee, tea, cocoa, milk and combinations thereof.

For coffee, the amount of coffee can differ in the capsule depending on the type of coffee beverage to be delivered. For instance, a lungo-type coffee can be

prepared from a higher amount of coffee contained in the capsule compared to a ristretto or an espresso-type coffee. The coffee powder may also be prepared from many different blends and origins.

The capsule to be used in the device can be associated to a code containing information relative to one or more of the following parameters: flow rates, beverage volumes, speeds, beverage temperatures, etc.

The injection of the liquid provided by the device preferably takes place at an upper face of the capsule which may already have an inlet port and the injection of liquid can be done by connecting an injection member such as a tube to an inlet port of the capsule. In a possible alternative, a foil of the capsule which covers the lid can be pierced by a piercing member connected to the injection member of the device. The output of the beverage to be prepared takes place at a peripheral section of the lid of the capsule which is provided with a plurality of outlet openings.

It should be understood that the single-use capsule according to the present invention may contain any of a culinary liquid such as soup or sauce, a beverage liquid such as coffee, chocolate, milk, tea, etc., or a nutritional liquid such as an infant formula.

In a third aspect, the present invention relates to a method for preparing a liquid comestible from a portioned food substance contained in a capsule or cell by passing liquid through the substance using centrifugal forces, comprising the steps of

connecting the capsule or cell to a liquid supply,

rotating the capsule or cell about its rotational axis to enable an interaction between the liquid and the portioned ingredients provided within the capsule,

controlling the flow rate, or respectively the pressure, of liquid to match a flow rate reference, or respectively a pressure reference, by automatically adjusting the rotational speed of the driving means during the extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure, of liquid.

In particular, the flow rate is controlled in relation to a selection of strength of the beverage carried out by the user.

Furthermore, the level of crema or foam can also be controlled by adjusting the load on the restriction valve at the exit of the capsule or cell.

In order to avoid unnecessary repetitions, the method can be defined as including all the possible operations as aforementioned described in relation to the operations of the device or system of the invention.

Brief description of the drawings

Further features, advantages and objects of the present invention will become apparent for a skilled person when reading the following detailed description of embodiments of the present invention, when taking in conjunction with the figures of the enclosed drawings.

Fig. 1 is a schematic representation of the centrifugal system;

Fig. 2 is a graphical representation of the speed as a function of time during a typical brewing cycle for a concentrated strong coffee beverage and a comparatively lighter coffee beverage;

Fig. 3 is a cross sectional view of the centrifugal unit according to a non-limiting example;

Fig. 4 is an enlarged view of a detail of figure 3.

Fig. 5 is a sectional side view of a capsule according to the present invention.

Fig. 6 is a perspective side view of a capsule according to figure 5 with its top membrane being removed.

Fig. 7 is a sectional side view of a centrifugal unit according to a variant of the invention.

Fig. 8 is an enlarged view of a detail of figure 7 when centrifuged liquid is delivered.

Fig. 9 shows an example of a user's interface of the device of the invention.

Detailed description of the figures

Figure 1 is a schematic drawing of the centrifugal system according to the present invention.

As can be seen in figure 1, the system comprises a centrifugal unit 2 in which a centrifugal cell 3 can be

placed. The centrifugal cell 3 may be a single-use capsule which contains portioned food ingredients. Before its insertion in the unit, the capsule is preferably sealed in a gastight manner to maintain freshness of the food ingredients contained therein. Alternatively, the centrifugal cell 3 may be a re-fillable filter cell removably connectable to the centrifugal unit 2.

The centrifugal unit 2 is connected to driving means 5 which is preferably an electric motor. The driving means 5 is designed to rotate a rotary drum of the centrifugal unit 2 along an axis of rotation A and thus, the centrifugal cell 3 housed within the rotary drum of the centrifugal unit 2 about the same axis A of the centrifugal cell 3. It should be noted that the cell could be part of or all the rotary drum, in particular, when the cell is not specifically a single-use capsule but a refillable part of the device.

The centrifugal unit 2 further comprises a collecting part and an outlet duct 35 through which the beverage to be prepared is discharged into a provided receptacle 48 such as a cup or mug, for example.

The system further comprises liquid supply means which comprise a water reservoir 6 and a fluid circuit 4. The reservoir 6 preferably comprises water heating means 31 for heating the water contained within the reservoir 6. The heating means 31 may be a heating coil. The heating of the water may as well be obtained by a thermoblock in the fluid circuit 4 and placed downstream relatively to the water reservoir 6.

The liquid supply means further comprise a pump 7 connected to the reservoir 6. The pump 7 is preferably a centrifugal pump. Moreover, the pump 7 is connected to the centrifugal unit 2 by means of the fluid circuit 4.

The pump 7 is preferably a low pressure pump which serves the purpose of providing sufficient liquid to the centrifugal unit 2 at low pressure. In addition, during operation of the centrifugal unit 2, the centrifugal cell 3 acts as a centrifugal pump by drawing water from the liquid supply.

In the centrifugal unit 2, a flow restriction means 19 is provided to create a restriction of the flow of the centrifuged liquid which leaves the cell 3 before it is collected in the collecting part of the unit. The flow restriction means 19 enables to increase the dwell time of liquid in the cell and therefore improves the extraction, in particular, for coffee or tea, between the liquid and the ingredients contained in the cell. Furthermore, due to the high rotational forces necessary for the flow to pass through restriction means, the velocity of the flow is significantly high. As a result, a nice amount of foam or crema can be obtained. Preferably, the flow restriction means 19 is a valve which opens or at least provides an increase of a flow opening(s) by pressure of the centrifuged liquid in the cell. For this, the valve 19 comprises elastic biasing means 27 for counter-acting the pressure of the centrifuged liquid up to a given load. Furthermore, the valve's load acting in restriction or closing on the flow can be made adjustable by means of a load actuating means 50. For instance, the load actuating means 50 acts on the elastic biasing means 27 to vary positively or negatively

the pre-load on the valve 19. Therefore, the higher the elastic means are pre-stressed, e.g., by a compressive constraint of the actuating means 50 on the resilient member, the higher the pressure of liquid is necessary for overcoming the restriction means, i.e., for opening the valve, and maintaining the flow rate, therefore, the higher the rotational speed must be. As a result, the level of foam or crema can be controlled by adjusting the load of the valve means 19.

In the fluid circuit 4 between the liquid supply means and the centrifugal unit 2, metering means 8 for the flow rate of the liquid are situated. The metering means 8 is preferably a pulse-coded flow-metering turbine which generates electrical impulse data 10. Thereby, the period of the generated impulses is preferably proportional to the velocity of the liquid flow within the fluid circuit 4.

The system further comprises control means 9 which comprise a counter 11, a central controller 11 such as a PID (proportional-integral-derivative) controller able to provide control loop feedback mechanism, and a manual user interface 13. The control means 9 are preferably connected to the flow-metering turbine 8 to receive the process variable relative to the flow rate and to the driving means 5 of the rotational motor for input of the manipulated variable to the motor, i.e., the rotational speed. Furthermore, the controller 12 is connected to the pump 7 to start and stop the liquid supply in the circuit.

The counter 11 connected to the flow-metering turbine 8 enables an analysis of the generated impulse data 10. The analysed data is then transferred to the central

controller 12. Accordingly, the exact actual flow rate of the liquid within the fluid circuit 4 can be calculated in real-time.

Therefore, the central controller 12 connected to the driving means 5 may adjust the rotational speed of the driving means depending on the measured flow rate of the liquid.

Moreover, the central controller 12 preferably comprises a memory (not shown) in which certain parameters of the extraction profile can be saved such as rotational speeds of the centrifugal cell, initial extraction speed of the cell, calibration of the flow meter, prewetting time, dry spinning time, acceleration and deceleration speed ramps, etc. In particular, the controller 12 may contain the set points and values of the rotational speed of the driving means 5 at different phases of the beverage preparation cycle. These parameters serve as part of different predetermined beverage preparation profiles in relation to control algorithms for processing the different profiles on demand.

In addition, a manual interface 13 is connected to the central controller 12 which enables a user of the device of the invention to choose at least the strength of the beverage and, preferably also, the dispensing volume of the beverage to be prepared. Thus, the central controller 12 controls the flow rate during the extraction phase which corresponds to the selected beverage strength in response to an input of the manual interface by varying the rotational speed of the driving means accordingly. The manual interface can be any mechanical, interactive or multimedia user: machine interfacing means which is

associated to the device or remote. Thus, the manual interface can be a keyboard, touch screen, cellular phone, personal computer, laptop, palm, etc.

Figure 2 is a graph showing examples of variation of the rotational speeds of the driving means as a function of time during typical beverage preparation cycles for a highly concentrated beverage and for a comparatively lighter beverage.

The characteristic curve 14 of figure 2 may for example represent an extraction profile for a strong short coffee, such as an 'espresso' or ristretto' type coffee. By contrast, the characteristic curve 15 of figure 2 may for example represent an extraction profile for a lighter 'lungo' type coffee.

Next, a beverage preparation cycle according to the present invention will be described with reference to figure 1 and the characteristic curves 14 and 15 of figure 2.

At the beginning of the beverage preparation cycle, and after the user's selection, the centrifugal pump 7 is switched on by the controller 12 and thus, hot water is pumped from the reservoir 6 to the centrifugal cell 3 through the flow-metering turbine 8.

Simultaneously or shortly after, the motor speed is started at a low speed to ensure a pre-wetting of the dry food ingredients, e.g., roast and ground coffee, provided within the centrifugal cell respectively the capsule 3. Preferably, said pre-wetting phase A lasts for a given time t_1 between 3 and 10 seconds. The prewetting time is

preferably a time as determined by a count of impulse data generated by the flow sensing means, which is already stored or storable such as by transfer from a code on the capsule or cell in the memory of the controller 12.

During said pre-wetting phase A, the motor speed S_A is preferably as low as 10-200 rpm (round-per-minute) to ensure a homogeneous distribution of water in the ingredients. Normally, the speed is too low to enable the liquid to overcome the restriction valve 19. Therefore, during this phase, the liquid remains in the cell and simply fills the volume non-occupied by the ingredients.

Thereby, the counter 11 analyses the impulse data 10 generated by the flow-metering turbine 8. For example, the counter 11 counts the amount of impulses for a pre-defined period of time. At a predefined count N_1, the end of the pre-wetting phase A is reached. Thereby, the count N1 can be adjusted by software loaded in the memory of the control means. Moreover, it may be possible to define the time of the pre-wetting phase A and/or the volume to be provided to the centrifugal cell 3 during the pre-wetting phase by means of the manual interface 13.

The parameters regarding the rotational speed S_A, the volume of the provided liquid and the time t_1 of the pre-wetting phase A are preferably equal for all different kinds of beverages to be prepared. For example, for different types of coffee beverages such as e.g. 'ristretto', 'espresso' or 'lungo', N_1 or t_1 may be the same. However, the parameters of the pre-wetting phase A may as well be set different for different kinds of beverages to provide different wetting profiles.

After the pre-wetting phase A, the extraction phase B of the beverage preparation cycle takes place. Hence, when the number N_1 of counted impulses is reached, the control means 12 accelerate the driving means 5 in a ramp-up phase B' to the extraction phase B to reach a predetermined speed set-point S_1 respectively S_2 for the rotational speed of the driving means 5.

It should be understood that the time for the described ramp up B' may differ for different kinds of beverages to be prepared.

The set point S_1,S_2 is the initial speed value for the extraction phase which can be determined in relation to the selection made at the manual interface. The set point S_1,S_2 preferably differs for different beverages such as different coffee beverages for example. As can be seen in figure 2, the set point S_2 of the lighter beverage 15 relates to a higher rotational speed of the driving means 5 than the set point S_1 of the comparatively strong beverage 14, as the contact time between water and the food ingredients within the centrifugal cell 3 is proportionally shorter at a higher rotational speed (at set point S_2).

The increase of the rotational speed from S_A to S_1 or S_2, provides the liquid a sufficient momentum to traverse the ingredients in the cell and forces the valve means 19 to open under the pressure of the centrifuged liquid. Therefore, the ramp-up phase causes the opening of the valve or enlargement of the valve's opening and, thereby, the centrifuged liquid starts being discharged through the duct 35.

At the beginning of the extraction phase B, the distinctive flow rate at the set point S_1,S_2 is calibrated by the impulse data 10 received from the flow meter 8. Accordingly, the flow rate at the beginning of the extraction phase B is linked to a predefined rotational speed of the driving means.

It should be understood that the initial flow rate through the centrifugal cell 3 during the centrifugal beverage preparation process can be affected due to progressive compaction of the food ingredients within the centrifugal cell 3 for example. Accordingly, the pressure drop at the centrifugal cell 3 changes and thus, the flow rate through the centrifugal cell 3 diverges. Therefore, in order to maintain a substantially constant flow rate through the centrifugal cell 3, the rotational speed of the driving means 5 is varied such as being increased or decreased in order to compensate for the changes of the flow rate.

Hence, after the above described calibration of the flow rate at the set point S_1,S_2, the control means 9 may vary the rotational speed of the driving means 5 continuously or at small intervals to maintain a relatively constant nominal flow rate during the extraction phase B. In order to provide a relatively stable flow rate and avoid too much oscillation, the correction of flow rate can be typically controlled by using a PID control algorithm implemented in the controller wherein the process value (PV) is the measured flow rate, the desired flow rate is the set point (ST) and the manipulated variable (MV) is the speed output from the controller to the rotational motor.

More precisely, the counter 11 particularly measures the periods of the impulses generated by the flow meter 8. Hence, if the measured period is higher than a set reference value, which was calibrated before, an acceleration of the speed is necessary and vice versa. The speed can be varied stepwise or continuously. In a stepwise speed control, the flow rate correction can be made by the control unit varying the speed of + or - 200 rpm, for instance.

Accordingly, during the extraction phase B, the rotational speed of the driving means 5 is constantly adjusted by the control means 9 in response to the sensed flow rate data 10.

Accordingly, a substantial constant value of the flow rate which differs only by a certain tolerance of, for instance, +/- 10% can be obtained. The rotational speed of the driving means 5 is adjusted preferably at intervals of less than 1 second, for instance, in the order of a few milliseconds.

After a second count N_2 of the flow-metering means 8 is reached, the water pump 7 is stopped by the control means 9. Thereby, the count N_2 of the flow-metering means 8 determines the total volume of the beverage to be dispensed.

It should be understood that the count N_2, N'_2 may vary for different kinds of beverages.

Preferred volumes of different types of coffee beverages are for example 25mL for a 'ristretto', 40mL for an

'espresso', 110mL for a 'lungo', and 250mL for an 'Americano' type coffee beverage.

Accordingly, the indicated reference numeral N_2 may refer to a short beverage such as a 'ristretto' or 'espresso' type coffee for example, whereas the reference numeral $N_{2'}$ which relates to a greater number of counted impulses and thus, to a greater liquid volume may refer to a 'lungo' type coffee beverage for example.

After the pump 7 is stopped, a dry-spinning phase C of the beverage preparation cycle takes place in order to empty the cell from residual liquid. The rotational speed of the driving means 5 is preferably higher than during the extraction phase B. Hence, at second count N_2, an acceleration ramp up C' takes place until a predefined set point S_C of rotational speed is reached. Then, spin-drying of the ingredients within the centrifugal cell 3 is carried out for a predefined period of time t_C. Thereby, said predefined time t_C for the spin-drying phase C can be predetermined in the software of the control means, e.g., 5-10 seconds.

After the spin-drying phase C, the rotational speed of the driving means 5 is decelerated as indicated by the deceleration phase D in figure 2. Accordingly, the beverage preparation cycle is finished.

Of course, the spin-drying phase C could be run at the same rotational speed as the extraction phase or at a lower speed.

Before the start of each beverage preparation cycle, the manual interface 13 of the system preferably comprises a

pre-selection for enabling a user to choose preferably two parameters:

- the volume of beverage (e.g., 25, 40, 110, 250 mL) and,
- the coffee concentration (e.g., from light to strong).

The selection is then received by the control means 9 which calculates the corresponding flow rate by measuring the periodicity of the impulses which then serves as a reference for controlling the rotational speed of the driving means 5. Thereby, in order to avoid a too big oscillation of the control loop at the start of the extraction phase B according to the selection made, the system is first set up around the set point value of speed S_1,S_2.

In a preferred embodiment, the following data is saved in the memory of the control means 9 and can be adjusted by means of dedicated software:

- The motor speed S_A at the pre-wetting phase (i.e., a few rpm),
- The calibration of the flow meter in volume unit per impulse (e.g., mL/Impulse),
- The number N of impulsions during prewetting,
- The acceleration ramp up to the extraction phase B',
- The acceleration phase to the spin-drying phase C',
- The spin-drying speed S_C,
- The spin-drying time t_C,
- The deceleration rate D.

Of course, these functions can be assured by an integrated circuit.

Figure 3 is a cross sectional view of an embodiment of the centrifugal unit 2 according to the present invention.

The centrifugal unit 2 of the device comprises an upper enclosing member 20 and a lower enclosing member 32 which can be moved relative to each other.

The capsule 3 to be used with the device or the system according to the present invention may be any of the capsules described in PCT/EP08/056310 (WO 2008/148646).

The capsule 3 as shown in figure 3 is pre-opened before it is inserted in the device, i.e., a sealing foil arranged at an upper face of the capsule is removed by peeling, or a central hole is perforated in the foil of the capsule when the capsule is inserted in the device .

The capsule 3 optionally comprises an inner member forming a lid 17 which is inserted in the dished body of the capsule. The lid 17 and body 42 delimit together an internal enclosure 33 for receiving a portioned food substance. The lid 17 comprises outlet openings 34 (see figure 4) at a peripheral section 47 of the lid 17 for filtering the beverage and maintaining the food (coffee) particles within the capsule 3 during the beverage preparation. Accordingly, only the liquid comestible to be prepared is discharged through the outlet openings 34.

The lower enclosing member 32 of the centrifugal unit 2 is a receiving assembly which comprises a liquid duct 35, for example, protruding on a side of the assembly 32 for guiding the centrifuged liquid coming out of the capsule 3 to a receptacle 48 such as a cup or glass (see figure 1).

The liquid outlet 35 is in communication with a liquid receiver 36 forming a cylindrical wall placed at a short distance about a rotating drum 16 into which the capsule is inserted as illustrated in figure 3. Thereby, the rotary drum 16 is preferably a hollow capsule holder with an internal cavity complementary shaped to receive the capsule. The liquid receiver 36 defines with the drum 16 an intermediate cavity 37 for collecting the liquid.

Below the liquid receiving assembly 32, are placed means for driving the capsule receiving drum 16 in rotation inside the receiving assembly 32. The driving means 5 comprise preferably a rotary motor which can be supplied by electricity or gas power. The drum 16 and the driving means 5 are connected by a motor axle 23 which preferably protrudes through an aperture in the bottom of the liquid receiver 36.

The upper enclosing member of the centrifugal unit 2 is a liquid injection assembly 20 which comprises a water line 22 which is in fluid connection with the pump 7 and the flow meter 8 (see figure 1). Moreover, the water line 22 is connected to a water injector 21 which is arranged co-centrically to the rotational axis A of the capsule 3 within the centrifugal unit 2.

In the shown embodiment, the water injector 21 is designed as a simple water inlet of the capsule. However, the water injector 21 may as well be equipped with puncturing means which are designed to puncture or tear a membrane or foil provided at an upper face of the capsule 3.

About the water injector 21 is mounted a capsule rotary engaging part 39. The engaging part 39 has a central bore 39a for receiving the water injector 21 and rotational guiding means such as a ball or needle bearing 25 inserted between the engaging part 39 and the injector 21.

In order to enable sealing of the water inlet of the capsule, a sealing member 24 is arranged around the water injector 21 at a lower face of the rotary engaging part 39. The sealing member 24 is thus arranged between the rotary engaging part 39 and an upper face of the capsule 3. Thereby, the sealing member 24 applies a certain sealing pressure on the upper lid 17 of the capsule. Hence, water is effectively prevented from leaking along the upper surface of the capsule 3 and from by-passing the capsule to release directly through liquid outlet 35 of the centrifugal unit 2. Furthermore, a venting means (not shown) can be provided through the injection assembly 20 for enabling gas to escape from the capsule as liquid is filled in the capsule.

The liquid receiving assembly 32 and the liquid injection assembly 20 are preferably arranged to encase the capsule or centrifugal cell 3, the receiving drum 16 and the water injector 21. Preferably, the receiving assembly 32 and the injection assembly 20 can be moved relatively to each other such that a user of the device may access the rotary drum 16 in order to exchange the capsule 3 for example. Therefore, a closing mechanism (not shown) may be connected to the receiving and the injection assembly 32,20 in order to enable a relative movement of the receiving and the injection assembly 32,20.

In order to enable a sealing of the receiving assembly 32 and the injection assembly 20 during the operation of the device, sealing means such as an O-ring 49 for example are provided at the contact surfaces of the assemblies.

The water injection assembly 20 further comprises a valve system 19 for controlling the flow of liquid that is discharged from the capsule 3 during operation of the device. The valve system 19 can be arranged on the capsule rotary engaging part 39 in the form of an annular engaging portion 40 which is biased under the force of elastic loading means 27.

As can be seen in figure 4, the annular engaging portion 40 includes a pressing peripheral pinching edge 26 which applies a closing force on the peripheral rim 41 of the capsule 3 to be able to restrict the flow of liquid under the force of the elastic loading means 27.

As can be seen in figure 4, the elastic loading means 27 can be a rubber-elastic ring member which is supported by an upper and a lower annular seat portion 28, 29. Other means such as spring-biased loading means 27 may as well be applied to the device.

It should be understood that the load of the elastic loading means 27 is preferably adjustable. Hence, the pressure of the liquid which has to be exerted on the flow restriction valve 19 in order to enable a discharging of liquid from the capsule 3 to the outlet 35 of the device can be adjusted.

As can be seen in the figure, the pinching edge 26 is preferably 'V'-shaped or cone-shaped. Thus, the sealing

pressure in a localized area is increased. The valve means 19 further comprises an internal base member 30 which is preferably an integral part with the rotary engaging part 39 of the injection assembly 20. The elastic loading means 27 thus are inserted in a space located between the base portion 30 the engaging portion 40.

Therefore, at a rest position, the engaging portion 40 of the valve 19 keeps closing on the rim 41 of the capsule 3 under the compressive effect of the resilient means 27

The operation of the device is described in the following.

The capsule device is opened by moving the two assemblies 20, 32 relatively one another, e.g., by means of a dedicated closing mechanism and separating the two assemblies 20, 32. As a result, a single-use capsule 3 containing a food substance can be inserted in the device, i.e., placed in the cavity of the rotating drum 16. The device is then closed by the assembly 20 being connected back onto the assembly 32 and locked by the closing mechanism. In the locked position, the water injector 21 is connected to a water inlet 44 of the capsule. Water can thus be introduced in the capsule via the central water injector 21. The capsule can be driven in rotation by activating the driving means 5. The centrifugation is carried out by rotating the capsule around the central axis of rotation of the device that is preferably aligned to the central axis Z of the capsule. During the prewetting phase as described, previously, the capsule is filled with water and the ingredients are entirely wetted. The control means control the speed as such a low speed that liquid pressure is insufficient to open the valve 19.

After a sufficient acceleration of the rotational speed is carried out and the extraction phase 'per se' begins, the centrifuged liquid is allowed to pass through the plurality of outlet openings 34 provided in a peripheral portion 47 of the lid 17 of the capsule. Under the effect of high centrifugal forces, the food substance, such as e.g. ground coffee powder, tends to compact itself radially whereas water is forced to flow through the substance. This results in the substance being both compacted and intimately wetted by water. Due to the high rotational movement of the capsule, the centrifugal forces exert themselves uniformly on the mass of the substance. Consequently, the water distribution is also more uniform compared to usual methods using a pressure pump to exert the pressure in the capsule. As a result, there is lower risk of preferential flow path through the substance which could lead to areas which are not properly wetted and so not properly brewed, dispersed or dissolved. As result of the high centrifugal forces during the extraction phase, the valve is forced to open and liquid is so projected as a laminar flow at relatively high velocity in direction of the wall 36.

Figures 5 and 6 relate to a capsule which is preferably used with the device and system according to the present invention. However, it should be understood that the shown embodiment is just an exemplary embodiment and that the capsule according to the invention can take various different embodiments.

The capsule 3 comprises a rigid dished body 42 which comprises an annular rim portion 41. The capsule is preferably design as being rotationally symmetric about

central axis Z. Thereby, it should be noted that the capsule may not necessarily have a circular section around axis Z but may take another form such as a square, rectangle or a polygonal form. Thereby, axis Z is preferably aligned to the axis of rotation A when the capsule is inserted in the device.

Moreover, the capsule 3 comprises a lid 17 which preferably has the form of a disc of plastic comprising a central portion 46 and a peripheral portion 47. The central portion 46 can be substantially flat and may comprise an inlet port 44 for enabling the fitting or introduction of a water injection member 21 of the beverage production device.

It should be noticed that the lid 17 can be a rigid or semi-rigid member made of thermoformed or injected plastic for instance. However, this part could also be made of a flexible membrane which is sealed to the inner surface of the dished body without departing from the scope of the invention.

At the side of the lid 17 which faces the inside of the capsule 3, the inlet port 44 can extend by a tubular inlet portion 43 which serves for ensuring the water is guided toward the direction of the bottom of the body to ensure complete wetting of the substance 38 in the enclosure and so reduced risk of leaving for example "dry powder spots".

The upper surface of the capsule 3 may be equipped with a foil 45 which enables sealing of the capsule 3. The foil preferably covers the lid 17 and is welded or adhesively connected onto the peripheral edge 41 of the body of the

capsule. The foil can be permanently connected to the edge if the foil is intended to be pierced for forming the inlet and outlets or, alternatively, the connection is peelable. Before the capsule is inserted into the rotary drum 16 of the device, said foil 45 needs to be pierced or removed in order to enable a preparation of the beverage.

The lid 17 further comprises a peripheral portion 47 including a collecting recess 18. The collecting recess 18 forms a U-shape in transversal section (figure 6) which opens in the direction of the sealing foil 45. The recess is preferably continuously extending at the periphery of the lid 17 although it can be replaced by several discontinuous recessed portions which may be separated by reinforcing elements or walls, for example.

The collecting recess 18 comprises an inner peripheral portion of wall 47 of the lid 17 into which is provided a series of outlet openings 34 forming a fluid communication between the enclosure 33 and the collecting recess 18.

Furthermore, the outlet openings 34 may be formed by a filter paper, a woven or non-woven portion or another meshed or porous membrane (not shown). Thus, the lid 17 which is inserted in the dished body 42 comprises a circumferential band of a porous material. The porous material provides restriction of the flow, creating a certain pressure drop, e.g., between 0.5 and 4 bar, and leading to a filtering of the solid particles. In particular, the size of the pores of the material can be chosen to retain also the coffee fines, i.e., the particles of particle size as low as 90 microns. The

paper, fabric, meshed or porous material can be formed of a band or bands which can be welded or otherwise combined to the lid.

During operation of the device, the capsule 3 is rotated about its axis Z. Thereby, the liquid which is centrically injected into the capsule 3 will tend to be guided along the inner surface of the side wall of the body, up to the inner side of the lid, and then through the outlet openings 34. Due to the centrifugation of the liquid provided centrically to the capsule 3, the liquid and the ingredients 38 provided within the capsule are made to interact in order to form a liquid comestible.

Figs. 7 and 8 provide a variant of the beverage preparation system of the invention in which the load of the valve means is adjustable for enabling a control of the opening pressure in order to control the foam or crema level. For simplifying the present description and avoid repetitions, the same numerical references have been used to refer to similar technical means as in the previous embodiments. The novel aspects of the present embodiment essentially lie in piercing means of the device for piercing inlet/outlets in the capsule and in a different configuration of the flow restriction valve 19 compared to the other embodiments.

As illustrated, the water injector 21 extends coaxially in the capsule 3 by a hollow piercing member 51. The piercing member extends below the upper surface of the capsule 3, in the cavity 33. The piercing member is formed as a hollow tube to supply liquid in the capsule at its tip. The piercing member can so be used to pierce a sealing membrane 52 of the capsule which closes the lid

in a gastight manner before the capsule is inserted in the device.

The capsule rotary engaging member 39 can further comprise outlet piercing members 53 placed in axial alignment with the liquid collector of the capsule when the member 39 is engaged in closure on the capsule. The outlet piercing members 53 serve to pierce the membrane 52 of the capsule to define a plurality of outlets at the periphery of the capsule from which liquid collected in the collector can leave the capsule. The outlet piercing members are introduced in the collecting recess 18 of the capsule which is sized in such a way that the peripheral portion 47 of the lid cannot be perforated. The centrifuged liquid can thus be discharged from the collecting recess 18 via the holes which are formed in the sealing foil 52 by the piercing members.

The device further comprises a flow restriction means forming a valve assembly 19 which operates in opening when the pressure of centrifuged liquid has reached a certain threshold. For this, the rotary engaging member 39 has a protruding peripheral edge 40 which engages on the peripheral edge 41 of the capsule. The engagement is forced by an elastic biasing mechanism 27 which provides elastic compressive forces onto the rotary engagement member 39. In this particular embodiment, the elastic biasing mechanism 27 comprises a base 54 at one end into which is fitted a compression spring 55 and an abutting member 56 at the opposite end. The base 54, spring 55 and abutting member 56 are housed into a tubular frame 57. The abutting member 56 is further connected to a screw element 58 which protrudes externally from the frame. The screw element and tubular frame 57 form together an

actuating means 50. They comprise a complementary thread 80 assembly enabling to tune the compressive load of the elastic member on the engagement member 39.

As illustrated in Fig. 8, the engagement member 39 which normally applies a closing force onto the edge 41 of the capsule by pressing edge 81, is pushed upwards by the pressure exerted by the centrifuged liquid during the extraction phase, as soon as the rotational speed has reached a sufficient value. The annular gap 59 which is formed between the protruding peripheral edge 41 of the capsule and the pressing edge 81 of the valve determines the laminar flow of liquid. A very thin gap of about 0.1 to 1 mm is maintained opened by the pressure of the centrifuged liquid, thus enabling the liquid to be released at a high velocity in the direction of the impact wall 61 of the receiver. Therefore, as the flow rate of liquid increases during the ramp up phase B', the flow gap 59 increases proportionally. When the flow rate is stabilized during extraction phase B as controlled by the controller, a relatively consistent jet of liquid 60 is projected onto the impact wall 61 of the receiver. This results in a reproducible level of crema, extraction after extraction. When the load of the elastic member is increased by forcing the spring in compression, this results in an increase of the speed by the controller to maintain the flow rate at the set point. For coffee, it is noticed that a higher amount of coffee crema can be obtained accordingly. If a lower amount of crema is desired, the user can reduce the compression on the elastic member by the actuating means, which results in an automatic reduction of the speed for maintaining the same flow rate. Therefore, it is possible to control simply the level of foam of the beverage by adjusting the

load on the flow restriction valve. Of course, the screw element can be actuated manually by the user or by use of a motor. If a motor is utilized, it is also possible to automatically control the actuation by the controller which can send input command to the motor. In such case, it is also offered the possibility to use the valve compressive load as a manipulated variable to control the speed and/or flow rate in a control loop scheme.

It should also be noted that the valve 19 can leave one or more minimal outlets in its closed state and that the opening of the valve by the pressure of liquid causes the enlargement of the one or more outlets. For example, a few radial channels forming minimal oulets can be provided in the edge 81 pressing on the surface of the capsule. Channels forming outlets may also be provided within the surface of the edge 41 of the capsule or both in the edges 81 or 41.

It should also be noted that the flow restriction valve could also be made downstream of the capsule without necessarily engaging a part of the capsule but it could be entirely designed in the device itself.

As illustrated in Fig. 9, a user's manual interface 13 can provide a choice of beverages, such as coffee, regarding a volume selection area 70, a strength selection area 71 and, optionally, a selection area 72 for a "crema" or foam level. The volume selection area 70 can present a plurality of discrete selecting keys 700, 701, 702 such pressure-sensitive switches, each one prompting for a user to select a predetermined volume of the beverage. For instance, key 700 represents the shortest cup, e.g., for a ristretto coffee volume of

about 25 mL; key 701 represents a short espresso coffee cup of about 40 mL and key 702 represents a lungo coffee cup of about 110 mL. The strength selection area 71 can so be actuated independently to set the desired concentration for each desired volume, e.g., amongst low, medium or high strength levels. The actuation of this strength selection key 710, e.g., a potentiometer, will fix the flow rate set point in the controller, as aforementioned, which finally determine the interaction time of the liquid with the ingredients in the capsule. The crema or foam selection area 72 may also comprise a selection key 720, e.g., a potentiometer, for adjusting the level of crema desired. The different levels, e.g., low, medium, high, will be obtained by varying, e.g., continuously or stepwise, the load constraint applied on the restriction valve and, consequently, will have a direct influence on the rotational speed necessary to open the restriction valve during beverage extraction for regulating the flow rate at the set point as fixed by the strength selection. It should be noted that the selection key 720 for crema can be the mechanical actuation means 50 of Fig. 7 if the adjustment system is not automated. Of course the user interface may include a touch screen or an array of membranes or mechanical buttons for receiving input from the user. Additionally, the user interface 112 may include a graphical or character display, such as in the form of a color, monochrome, or LCD display. The user interface may also include a voice prompt interface, wherein the local food waste monitoring device includes a speaker and provides audio instructions, data, and prompts to a user. The user may then press buttons to provide input in response. Alternatively, the user may speak instructions in response to the prompts, and the instructions may be collected via a microphone

and interpreted to commands through voice recognition software installed on the controller or interface.

Although the present invention has been described with reference to preferred embodiments thereof, many modifications and alternations may be made by a person having ordinary skill in the art without departing from the scope of this invention which is defined by the appended claims.

Claims

1. A beverage production device for preparing a liquid comestible from a portioned food substance contained in a capsule or cell, comprising

a centrifugal unit (2) for receiving the capsule or cell (3),

driving means (5) connected to the centrifugal unit (2) for enabling a rotational motion of the capsule or cell in the centrifugal unit,

liquid supply means (4,6,7) being connected to the centrifugal unit to supply liquid in the capsule or cell,

means (8) for measuring the flow rate, or respectively the pressure, of the liquid,

and

a control unit (9) for controlling the flow rate, or respectively the pressure, to match a flow rate reference, or respectively a pressure reference, in a control loop by automatically adjusting the rotational speed of the driving means during an extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure.

2. A beverage production device according to claim 1, wherein the reference flow rate is a constant set point or a variable profile of flow rates stored in or calculated by the control unit (9).

3. A beverage production device according to claim 2,

wherein the control unit is arranged for selecting or calculating different flow rate set points

corresponding to respectively different beverage strengths.

4. A beverage production device according to claim 3,

wherein it comprises a manual interface (13) configured to enable at least a selection of the strength of the beverage during the beverage production process and the volume of the beverage to be prepared.

5. A beverage production device according to claim 3,

wherein it comprises an identification means for receiving information from a capsule code as to the strength and/or volume of the beverage to be prepared.

6. A beverage production device according to any of claims 1 to 5,

wherein the liquid supply means comprise a pump (7) which is designed for supplying fluid to the centrifugal unit (2) and which is operated by the control means (9).

7. A beverage production device according to any of claims 1 to 6,

wherein the centrifugal unit (2) is designed to act as a centrifugal pump by drawing water from the liquid supply means (4,6,7).

8. A beverage production device according to any of claims 1 to 7,

wherein the control means (9) are designed to detect the electrical impulses (10) of the flow meter in order to calculate the flow rate and the dispensing volume during the beverage production.

9. A beverage production device according to claim 8,

wherein the means for measuring the flow rate is a pulse-coded flow metering turbine (8).

10. A beverage production device according to any of claims 1 to 9,

wherein the control unit is arranged to control extraction profile comprises at least a pre-wetting phase (A) and an extraction phase (B) which differ in at least the associated rotational speeds (S_A,S_1,S_2) of the driving means (5).

11. A beverage production device according to any of claims 1 to 10,

wherein device further comprises flow restriction means (19) at a delivery side of the centrifugal unit (2).

12. A beverage production device according to claim 11, wherein the flow restriction means comprises a valve (19).

13. A beverage production device according to claim 12, wherein the valve (19) is adjustable.

14. A system for producing a beverage from portioned ingredients provided within a capsule, the system comprising a beverage producing device having a centrifugal unit (2) comprising at least two enclosing members (20,32) for enclosing the capsule by a relative movement of the enclosing members (20,32),

driving means (5) connected to the centrifugal unit (2) for enabling a rotational motion of the centrifugal unit (2),

a liquid injection assembly (20) designed to interact with the capsule (3) provided to the device and connected to liquid supply means (4,6,7),

means (8) for measuring the flow rate, or respectively the pressure, of the liquid,

control means (9) for controlling the flow rate, or respectively the pressure, to match a flow rate reference, or respectively a pressure of reference, in a control loop by automatically adjusting the rotational speed of the driving means during the extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure,

wherein the capsule (3) is designed to be removably inserted into the centrifugal unit (2) of the device.

15. A system according to claim 14,

wherein the capsule (3) is a single-use capsule sealed in a protective atmosphere before use.

16. A system according to claims 14 or 15,

wherein the capsule (3) contains ground coffee, soluble coffee, tea, cocoa and/or milk.

17. A method for preparing a liquid comestible from a portioned food substance contained in a capsule or cell (3) by passing liquid through the substance (38) using centrifugal forces, comprising the steps of

connecting the capsule or cell (3) to a liquid supply (4,6,7),

rotating the capsule or cell (3) about its rotational axis (Z) to enable an interaction between the liquid and the portioned ingredients (38) provided within the capsule (3),

controlling the flow rate, or respectively the pressure of supplied liquid, to match a flow rate reference, or respectively a pressure of reference, in a control loop by automatically adjusting the rotational speed of the driving means during the extraction phase of the beverage production depending on the measured flow rate, or respectively the measured pressure.

18. The method according to claim 17,

wherein controlling the flow rate is carried out in relation to a selection of the strength of the beverage.

19. The method according to claims 17 or 18,

wherein the level of crema or foam can be controlled by adjusting the load on a flow restriction valve (19) at the exit of the capsule or cell.

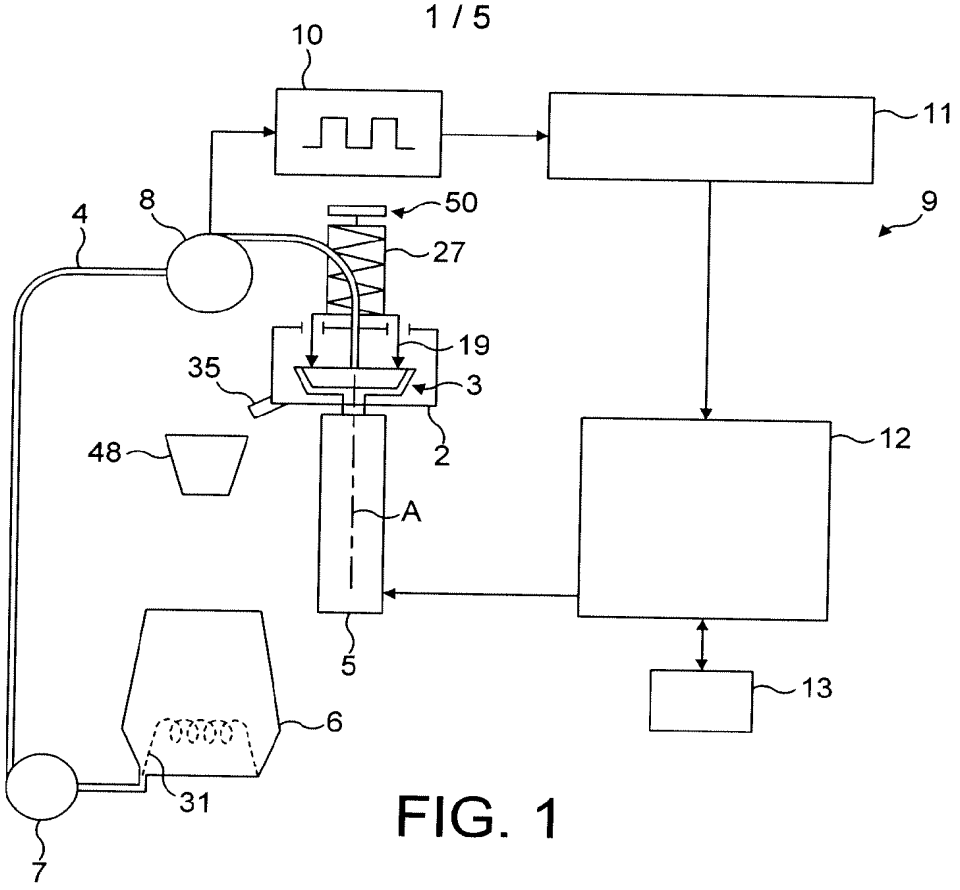

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FIG. 1

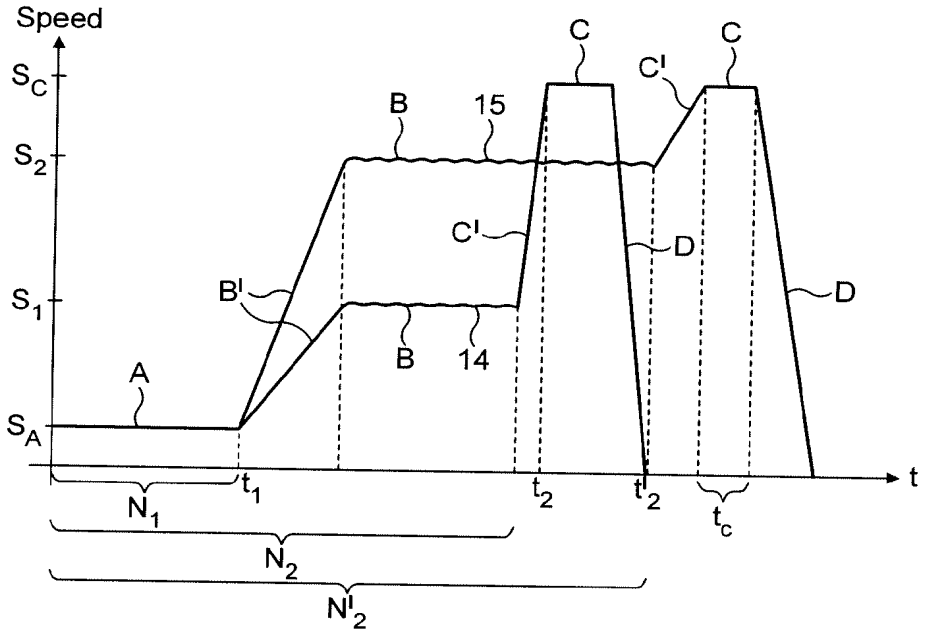

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FIG. 2

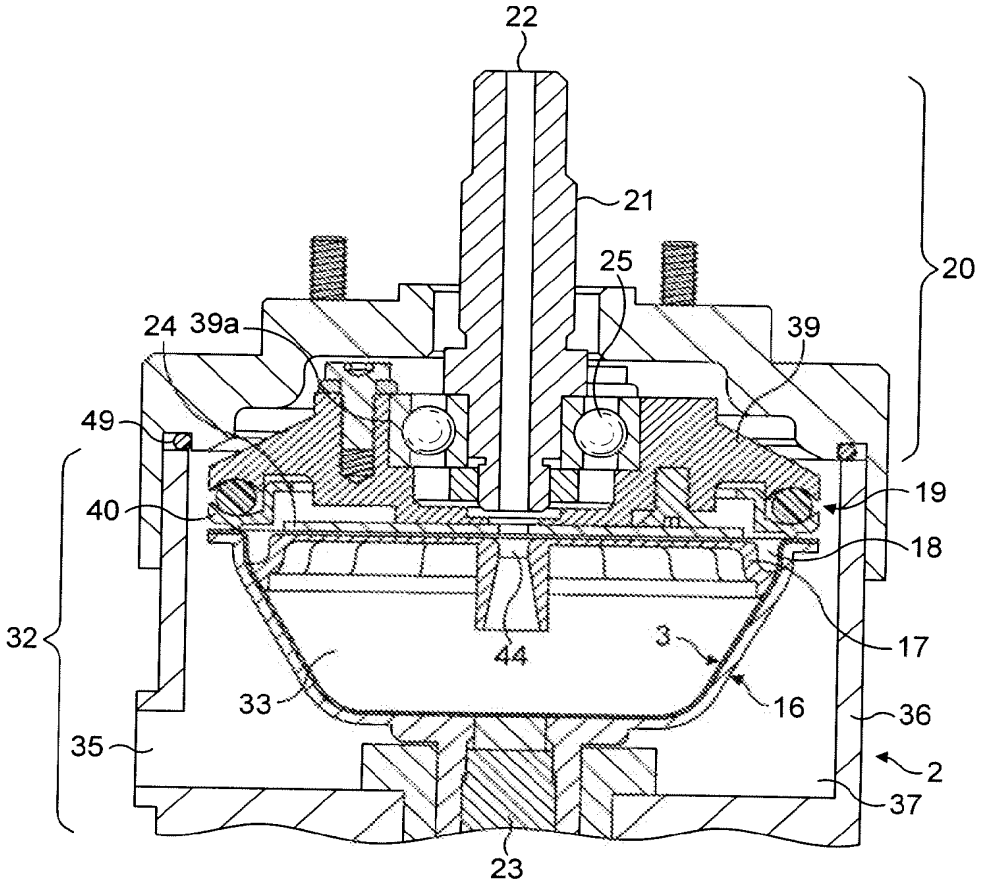

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FIG. 3

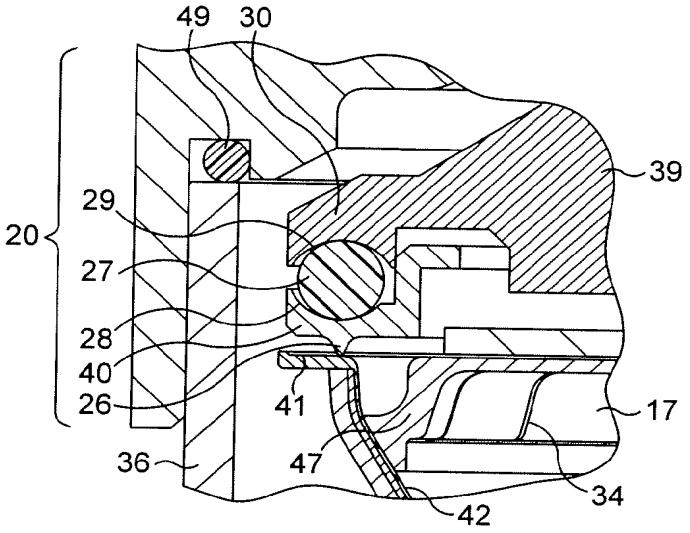

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FIG. 4

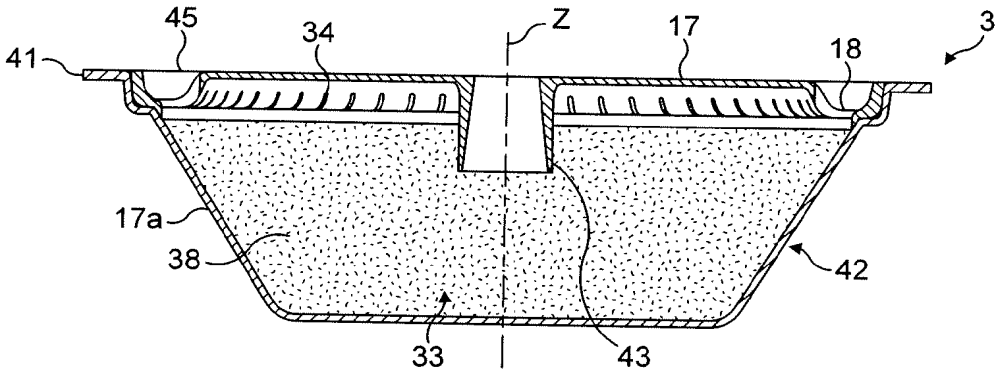


FIG. 5

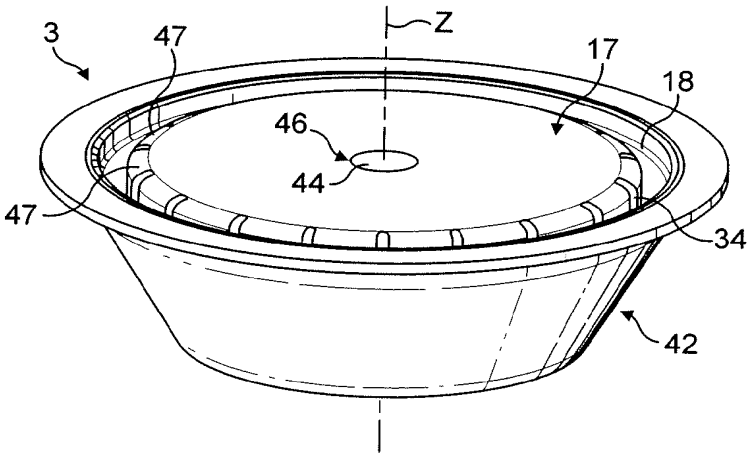


FIG. 6

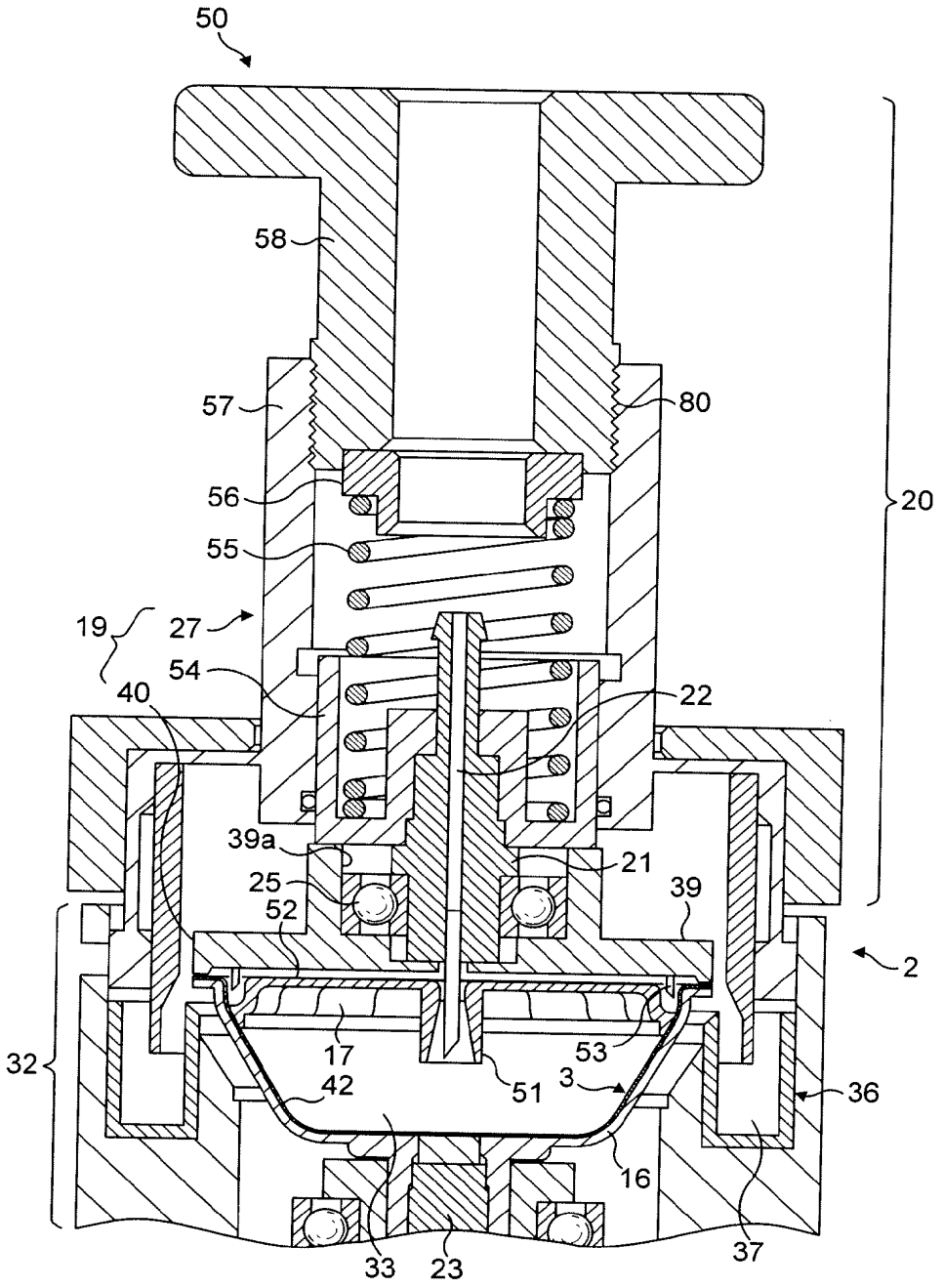

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FIG. 7

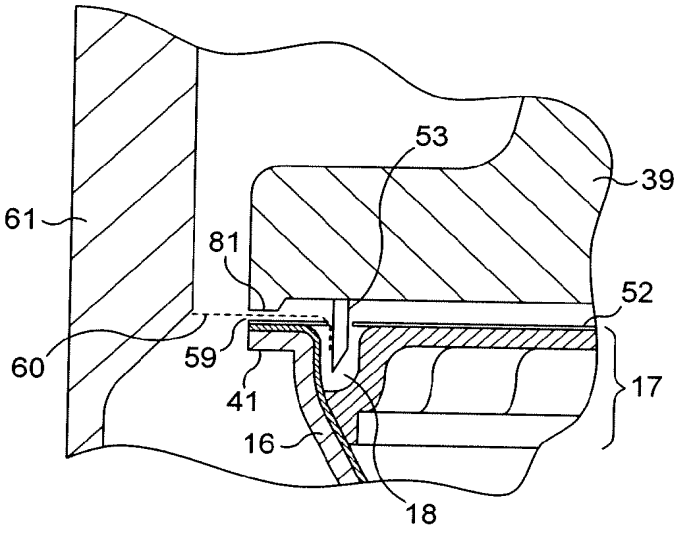

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FIG. 8

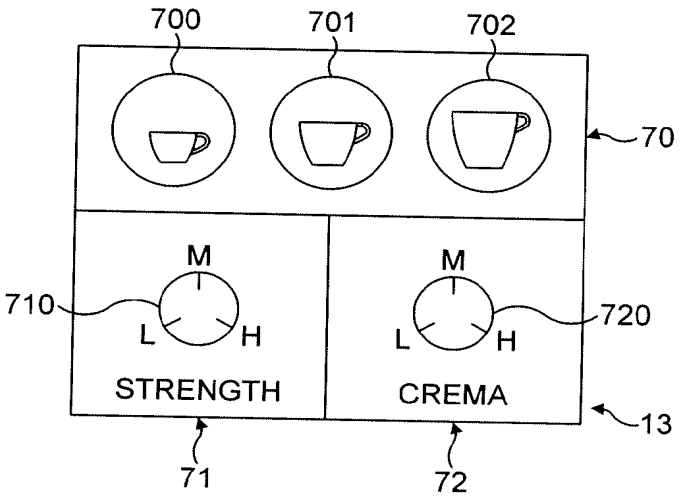

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FIG. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/060771

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J31/22

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)
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 367 600 A (TOKYO SHIBAURA ELECTRIC CO [JP]) 9 May 1990 (1990-05-09) column 7, line 23 - line 31 column 10, line 33 - column 11, line 28 figure 1	1,14,17
A	WO 2007/041954 A (LI ZHIPING [CN]) 19 April 2007 (2007-04-19) page 13, paragraph 3 figure 1a	1,14,17
A	BE 894 031 A1 (GUERIN A) 4 February 1983 (1983-02-04) the whole document	14

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 February 2010	08/02/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Kempeneers, Johanna

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/060771

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 545 296 A (BEN-SHMUEL SONJA [US]) 8 October 1985 (1985-10-08) column 7, line 36 - line 59 figures 1,2	1,14,17
A	WO 2007/110768 A2 (TUTTOESPRESSO SPA [IT]; DOGLIONI MAJER LUCA [IT]) 4 October 2007 (2007-10-04) page 4, line 8 - line 10 page 4, line 17 - line 29 page 9, line 3 - page 11, line 27 figures 1,4,5	1,14,17
A	EP 0 651 963 A1 (SEB SA [FR]) 10 May 1995 (1995-05-10) column 3, line 52 - column 6, line 53 figures 1,4,5	1,14,17
E	WO 2009/106598 A1 (NESTEC SA [CH]; COLANTONIO JEAN-LUC [CH]; BONACCI ENZO [CH]; DENISART) 3 September 2009 (2009-09-03) page 4, paragraph 3 page 19, line 17, paragraph 2 - page 20, last line, paragraph 2 page 23, paragraph 2 page 24, line 4 - line 10 page 25, line 4 - line 7 figure 1	1-2,6, 8-17,19

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2009/060771

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0367600 A	09-05-1990	DE 68906509 D1	17-06-1993
		DE 68906509 T2	30-09-1993
		US 4962693 A	16-10-1990
WO 2007041954 A	19-04-2007	CN 101374442 A	25-02-2009
BE 894031 A1	04-02-1983	NONE	
US 4545296 A	08-10-1985	NONE	
WO 2007110768 A2	04-10-2007	AR 060176 A1	28-05-2008
		AU 2007231019 A1	04-10-2007
		CA 2646718 A1	04-10-2007
		CL 8452007 A1	08-02-2008
		EP 2001343 A2	17-12-2008
		JP 2009531106 T	03-09-2009
		US 2009136639 A1	28-05-2009
EP 0651963 A1	10-05-1995	DE 69408088 D1	26-02-1998
		DE 69408088 T2	10-06-1998
		ES 2114155 T3	16-05-1998
		FR 2712163 A1	19-05-1995
WO 2009106598 A1	03-09-2009	NONE	

Electronic Acknowledgement Receipt

EFS ID:	17630456
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Ashley Regan
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	11-DEC-2013
Filing Date:	09-NOV-2012
Time Stamp:	17:43:33
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Trans_Letter.pdf	82449 217e4099df9ba180495d538e8fa5a379e83475a2	no	3

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	SB08a.pdf	66505 b9d2470e9c8b3beef3a59b5e8b00228f17702d03	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	EP1764015A1.pdf	738487 02e2609078f23fd500b995296594cd6faf16ae60	no	14
Warnings:					
Information:					
4	Foreign Reference	WO0228241A1.pdf	814765 32404512bc6bd2370751bf2a3fbf3fe9d60e1ca2	no	22
Warnings:					
Information:					
5	Foreign Reference	WO2010026053A1.pdf	2131568 8a6b05f512719346a2381d42b3431ad66aa492dd	no	62
Warnings:					
Information:					
		Total Files Size (in bytes):	3833774		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Christian Jarisch
Art Unit	1792
Examiner Name	LONG, LUANA ZHANG
Attorney Docket Number	3712036.01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	EP 1 764 015 A1	EP		2007-03-21	GRIMAC S R L		☐
	2	WO 02/28241 A1	WO		2002-04-11	BOYD COFFEE CO		☐
	3	WO 2010/026053 A1	WO		2010-03-11	NESTEC SA		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	13697297
	Filing Date	2012-11-09
	First Named Inventor	Christian Jarisch
	Art Unit	1792
	Examiner Name	LONG, LUANA ZHANG
	Attorney Docket Number	3712036.01693

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99**)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Christian Jarisch
Art Unit	1792
Examiner Name	LONG, LUANA ZHANG
Attorney Docket Number	3712036.01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2013-12-11
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

K-FEE SYSTEM GMBH, EX2009, page 240
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Christian Jarisch
Art Unit	1792
Examiner Name	LONG, LUANA ZHANG
Attorney Docket Number	3712036.01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	2005044067	WO		2005-05-19	GRIFFES CONSULTING SA		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	13697297
	Filing Date	2012-11-09
	First Named Inventor	Christian Jarisch
	Art Unit	1792
	Examiner Name	LONG, LUANA ZHANG
	Attorney Docket Number	3712036.01693

	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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Attorney Docket Number	3712036.01693

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-03-07
Name/Print	Robert M. Barrett	Registration Number	30,142

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K-FEE SYSTEM GMBH, EX2009, page 244
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Christian Jarisch
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	LONG, LUANA ZHANG
Docket No.:	3712036.01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL LETTER

Sir:

Submitted herewith is an Information Disclosure Statement for consideration in the above-identified application. In accordance with the provisions of 37 C.F.R. 1.56, 37 C.F.R. 1.97, and 37 C.F.R. 1.98, Applicants request that a citation and examination of the references cited on the enclosed PTO-1449 form be made during the course of examination of the above-identified application for United States patent. Pursuant to 37 C.F.R. 1.98, copies of any cited foreign patent documents and non-patent documents are enclosed.

This Information Disclosure Statement is submitted as follows:

Submission without Certification

[X] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

[ ] After the period specified above, but before the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by payment of the fee set forth in 37 C.F.R. 1.17(p).

Submission with Certification

[ ] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

[ ] After the period specified above, but before the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the Certification specified in 37 C.F.R. 1.97(e) which is set forth below.

[ ] After the mailing date of a Final Action under 37 C.F.R. 1.113, a Notice of Allowance under 37 C.F.R. 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the fee set forth in 37 C.F.R. 1.17(p) and the Certification specified in 37 C.F.R. 1.97(e) which is set forth below.

Certifications under 37 C.F.R. 1.97(e) & 37 C.F.R. 1.704(d)

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **thirty days** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies that no item of information contained in the accompanying Information Disclosure Statement was cited in a communication from a patent office in a counterpart foreign or international application or by the Office, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the accompanying Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] A copy of a Search Report from a corresponding foreign patent application is enclosed.

[ ] A check in the amount of $180 to cover the required fee is enclosed.

[ ] The Commissioner is hereby authorized to charge the amount of $180 to cover the required fee to Deposit Account No. 02-1818.

K-FEE SYSTEM GMBH, EX2009, page 247
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

[X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1818.

Respectfully submitted,
K&L GATES LLP

BY /Robert M Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
312.807.4204

Dated: March 7, 2014

K-FEE SYSTEM GMBH, EX2009, page 248
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS (PCT)

(19) Organisation Mondiale de la Propriété Intellectuelle
Bureau international

(43) Date de la publication internationale
19 mai 2005 (19.05.2005)

PCT

(10) Numéro de publication internationale
WO 2005/044067 A1

(51) Classification internationale des brevets[7] : A47J 31/40, B65D 81/00

(21) Numéro de la demande internationale :
PCT/IB2004/003524

(22) Date de dépôt international :
26 octobre 2004 (26.10.2004)

(25) Langue de dépôt : français

(26) Langue de publication : français

(30) Données relatives à la priorité :
01896/03 5 novembre 2003 (05.11.2003) CH

(71) Déposant et
(72) Inventeur : RUCHONNET, Jean-François [CH/CH]; Résidence du Soleil, CH-1271 Givrins (CH).

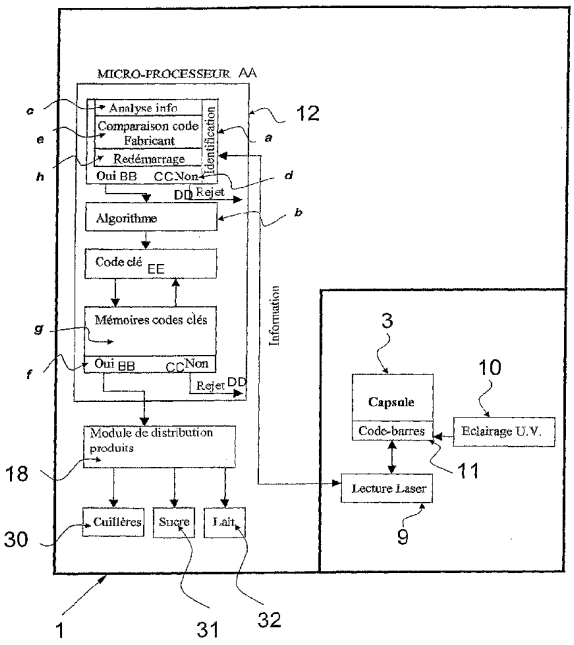
(74) Mandataire : GRIFFES, CONSULTING, SA; Route de Florissant, 81, CH-1206 Genève (CH).

(81) États désignés *(sauf indication contraire, pour tout titre de protection nationale disponible)* : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,

[Suite sur la page suivante]

(54) Title: APPARATUS FOR DETERMINING THE TRACEABILITY OF THE CONTENTS OF A CONTAINER AND THE ORIGIN THEREOF

(54) Titre : APPAREIL PERMETTANT D'ETABLIR LA TRACABILITE D'UN CONTENU DANS UN RECEPTACLE ET L'ORIGINE DUDIT RECEPTACLE



AA MICROPROCESSOR
C PROCESS INFORMATION
E COMPARE MANUFACTURER CODE
H RESTART
BB YES
CC NO
DD REJECTION
B ALGORITHM
EE KEY CODE
G KEY CODE MEMORIES
18 PRODUCT DISPENSER MODULE
30 SPOONS
31 SUGAR
32 MILK
11 BARCODE
10 UV LIGHT
9 LASER READOUT

(57) **Abstract:** The aim of the present invention is to provide an apparatus for determining the traceability of the contents of a container (3) as well as the origin of said container (3), wherein information (11) provided on said container can be read out using an optical and/or magnetic reader but is invisible to the naked eye. Said container (3) comprises a pierceable upper portion for injecting a liquid into the container (3), and a pressure-pierceable lower diaphragm for discharging the liquid flavoured by the contents of the container (3). The apparatus includes an optical and/or magnetic reader (9) for reading said information (11) off a container (3) placed inside the apparatus, a microprocessor for encrypting and decrypting, processing, comparing, approving or rejecting and storing the information (11) read off a container (3), and for selectively initiating or not initiating an operative cycle which includes piercing the upper portion of the container (3) and injecting the liquid, as well as for storing (11) said information to ensure readiness for the initiation of a fresh cycle.

(57) **Abrégé :** Le but de la présente invention est de proposer un appareil permettant d'établir la traçabilité d'un contenu dans un réceptacle (3) et l'origine dudit réceptacle (3) sur lequel figurent des informations (11) lisibles au moyen d'un lecteur optique et/ou magnétique mais invisibles à l'ceil nu. Ledit réceptacle (3) est du type comportant une partie supérieure perforable pour l'injection du liquide dans le réceptacle (3) et une membrane inférieure perforable sous pression pour la sortie dudit liquide aromatisé par le contenu du réceptacle (3). L'appareil comprend un lecteur (9) optique et/ou magnétique pour la lecture desdites informations (11) sur un réceptacle

[Suite sur la page suivante]

WO 2005/044067 A1

K-FEE SYSTEM GMBH, EX2009, page 249
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) États désignés *(sauf indication contraire, pour tout titre de protection régionale disponible)* : ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasien (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), européen (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Déclarations en vertu de la règle 4.17 :

— *relative au droit du déposant de demander et d'obtenir un brevet (règle 4.17.ii)) pour toutes les désignations*

— *relative au droit du déposant de revendiquer la priorité de la demande antérieure (règle 4.17.iii)) pour toutes les désignations*

— *relative à la qualité d'inventeur (règle 4.17.iv)) pour US seulement*

Publiée :

— *avec rapport de recherche internationale*

En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

(3) introduit dans l'appareil, un microprocesseur (12) permettant de crypter/décrypter, analyser, comparer, approuver/refuser et stocker des informations (11) lues sur un réceptacle (3), et agencé pour sélectivement démarrer ou non un cycle d'opérations comprenant le perçage de la partie supérieure du réceptacle (3) et l'injection du liquide, ainsi que pour le stockage des informations (11) lues afin d'être prêt pour démarrer un nouveau cycle.

APPAREIL PERMETTANT D'ETABLIR LA TRAÇABILITE D'UN CONTENU DANS UN RECEPTACLE ET L'ORIGINE DUDIT RECEPTACLE

La présente invention est relative au domaine des réceptacles, plus particulièrement aux réceptacles permettant l'emmagasinage ou le transport de substances destinées à aromatiser des boissons.

Un réceptacle est un contenant qui reçoit son contenu de diverses provenances.

La traçabilité est la possibilité d'identifier l'origine d'un produit tout en reconstituant son parcours, depuis sa production jusqu'à sa diffusion.

Il est connu d'utiliser des appareils permettant d'obtenir du café par infusion, ce dernier étant conservé dans un réceptacle appelé capsule.

Un tel appareil est décrit dans la publication EP 0607159 A1 qui présente une machine pour produire automatiquement des cafés ou boissons similaires à partir d'une pluralité de réceptacles préformés. Ce type d'appareil n'utilise pas de moyens électroniques de reconnaissance des réceptacles dont la seule fonction est de préserver l'arôme du contenu afin qu'il conserve les meilleures saveurs.

Un procédé pour extraire une substance aromatique contenue dans un réceptacle hermétique est décrit dans le document EP 025810 A1 qui préconise l'injection d'eau chaude dans ledit réceptacle et, une fois des conditions de température/pression obtenues, amener une membrane de celui-ci à s'ouvrir permettant au liquide imprégné de la substance aromatique de s'en échapper. Ce dispositif n'utilise pas des réceptacles sécurisés permettant la traçabilité du contenu desdits réceptacles.

Le document DE20105605U présente un dispositif qui garantit l'hermétisme d'un réceptacle, assurant ainsi la qualité du produit qu'il contient. Il est à noter que ce dispositif est muni d'un transpondeur et permet de détruire un système visible de sécurité porté par les réceptacles qu'il utilise.

Le document WO02078498 présente un identificateur lisible situé sur le sommet de réceptacles utilisés par des machines à café Expresso, ce qui permet de garantir la qualité d'un produit en détruisant des informations d'hermétisme portées par ledit réceptacle. Ce dispositif est visible ce qui permet la reprise des informations contenues dans le dispositif.

Le but de la présente invention est de proposer un appareil permettant de lire la traçabilité d'un contenu dans un réceptacle et de déterminer l'origine des contenants que ledit appareil utilise.

Ce but est atteint par un appareil permettant d'établir la traçabilité d'un contenu dans un réceptacle et l'origine dudit réceptacle sur lequel figurent des informations lisibles au moyen d'un lecteur optique et/ou magnétique mais invisibles à l'œil nu, ledit réceptacle étant du type comportant une partie supérieure perforable pour l'injection du liquide dans le réceptacle et une membrane inférieure perforable sous pression pour la sortie dudit liquide aromatisé par le contenu du réceptacle, l'appareil comprenant un lecteur optique et/ou magnétique pour la lecture desdites informations sur un réceptacle introduit dans l'appareil, et un microprocesseur permettant de crypter/décrypter, analyser, comparer, approuver/refuser et stocker des informations lues sur un réceptacle, et agencé pour sélectivement démarrer ou non un cycle d'opérations comprenant le perçage de la partie supérieure du réceptacle et l'injection du liquide, ainsi que pour le stockage des informations lues afin d'être prêt pour démarrer un nouveau cycle.

On obtient ainsi un système qui identifie un réceptacle, compare l'information que porte celui-ci au code du fabricant contenu dans une mémoire du système, accepte ou refuse l'information, mémorise celle-ci afin de ne pas permettre sa récupération, autorise la distribution de produits et recommence un cycle de travail. Il est à noter que l'information contient les données concernant la traçabilité du produit mais également celles concernant l'origine du réceptacle et sont apposées sur ce dernier par le fabricant au moment de la production de celui-ci.

L'identification est opérée, notamment sur une base magnétique portant les informations de traçabilité et d'origine, par un lecteur à tête magnétique tournante qui lit l'information et la transmet.

L'acceptation/refus sont déterminés par un microprocesseur qui, après avoir crypter les informations d'origine, compare celles-ci aux codes clés du fabricant afin de libérer/refuser la distribution de produits.

La mémorisation est fournie par le fabricant au moyen notamment de puces électroniques qui sont installées sur le dispositif.

En fin de séquence, un redémarrage du cycle est entamé par logiciel incorporé ce qui permet à l'utilisateur de ne pas devoir agir manuellement d'une part et garantit la mise en place automatique des fonctions susmentionnées d'autre part.

Dans une forme d'exécution, l'information sur le réceptacle est indiquée sous forme de code-barre U.V. situé notamment autour de la surface latérale extérieure du réceptacle. Dans ce cas le dispositif comporte avantageusement des moyens de lecture à tête laser tridimensionnels. Le code-barre U.V. est inscrit à l'aide d'encre incolore, visible seulement sous exposition de rayons ultra violets (U.V.).

Dans une autre forme d'exécution, le réceptacle est en matière amagnétique et l'information se trouve sur un ruban circulaire à l'intérieur dudit réceptacle.

Enfin, une autre variante de l'invention présente un réceptacle où le code magnétique est placé entre le couvercle et le corps du réceptacle. Dans ce cas l'information est stockée dans une bande magnétique souple en forme d'anneau.

L'invention sera mieux comprise grâce à la description détaillée qui va suivre en se référant aux dessins annexés dans lesquels :

- La figure 1 représente, à titre d'exemple, un schéma de principe d'un système permettant de déterminer la traçabilité d'un contenu dans un réceptacle et l'origine dudit réceptacle.

- La figure 2 représente schématiquement une vue en perspective d'une information en code-barre visible par exposition aux rayons U.V. et lisible par lecture laser.

- La figure 3 représente une vue en perspective de la disposition du marquage code-barre sur un réceptacle.

- La figure 4 représente, en variante, une vue en perspective d'une bande magnétique contenant les informations de traçabilité/origine perpendiculaire à son support et introduite dans son support.

- La figure 5 représente, en variante, une vue en perspective et partiellement en coupe d'un assemblage du support des informations dans la base duquel s'introduit une bande magnétique contenant les informations.

- La figure 6 représente, en variante, une vue en perspective d'une bande magnétique contenant les informations de traçabilité/origine perpendiculaire à son support et située à l'extérieur dudit support.

- La figure 7 représente une vue en perspective et en coupe d'un fil magnétique entourant la base du support et contenant les informations de traçabilité/origine.

Dans une forme d'exécution, illustrée aux figures 1, 2 et 3, un système permettant la traçabilité d'un contenu dans un réceptacle (3) et l'origine dudit réceptacle comprend :

- un support (1),

- un microprocesseur (12),

- un module de distribution (18) de produits,
- un dispositif de lecture laser (9),
- un dispositif d'émission de rayons U.V. (10), et
- un réceptacle (3) comportant les informations (11) de traçabilité/origine.

Le support (1) est notamment une machine à café permettant l'injection de liquide dans le réceptacle (3).

Le microprocesseur (12) contrôle les fonctions suivantes et tel qu'illustré à la figure 1:

- L'identification (a) de la base portant les informations (11) de traçabilité/origine.
- Cryptage ou décryptage (b) des informations (11) situées sur le réceptacle (3).
- Analyse (c) des informations (11).
- Acceptation ou refus (d) des informations (11).
- Comparaison (e) des informations (11) situées sur le réceptacle (3) avec les données que contient le système.
- Approbation ou refus (f) de la distribution des produits (30, 31, 32).
- Stockage (g) des informations (11) après usage, notamment dans la mémoire.
- Redémarrage (h) automatique d'un cycle.

Le module de distribution de produits (18) comporte une électronique de commande des ouvertures notamment du liquide à injecter dans le réceptacle (3), des matières, telles que du sucre (31) et du lait (32), à insérer dans ledit

liquide aromatisé délivré par le réceptacle (3) et des dispositifs tels que des cuillères (30) permettant le brassage des matières au liquide et par simple numérotation de celle-ci, d'identifier le destinataire.

Le dispositif de lecture laser (9) est équipé notamment d'une tête de lecture (5 – Fig. 2) à travers laquelle les informations (11) sont distribuées au microprocesseur (12). La tête de lecture laser (5) est fixée au support (1) et située de manière à permettre la lecture des informations (11) sur un réceptacle (3) lorsque ce dernier est introduit dans le support (1).

Le réceptacle (3) comporte un support (13) de forme notamment cylindrique ou tronc conique sur lequel, dès son conditionnement, les informations (11) ont été apposées sur son pourtour, d'une base (14) circulaire qui permet de retenir la substance, notamment du café, devant être filtrée. Cette base (14) est perforable sous l'action de la pression du liquide de manière à laisser passer le liquide à filtrer et à aromatiser.

Les informations (11) se présentent sous forme de code-barre (23 – Fig. 2) invisible inscrit à l'aide d'une encre réactive à l'éclairage ultra-violet (U.V.). Le code-barre (23) est visible lorsqu'il est soumis à une source (6 – Fig. 2) de rayonnement ultra-violet (U.V.). Les informations (11) comportent toutes les indications relatives à la traçabilité du produit contenu dans le réceptacle (3) et à l'origine de ce dernier.

Le réceptacle (3), disposant du code-barre (23), est acheminé sous la tête de lecture laser (5). Le code-barre (23) est soumis au rayonnement U.V. émis par la source (6).

Les informations (11) sont lues et transmises au microprocesseur (12) qui déclenche, en cas de reconnaissance positive de celle-ci, les opérations susmentionnées et, en cas de reconnaissance négative, rejette lesdites informations (11) et arrête la procédure de déclenchement du module de distribution (18) pour interrompre la procédure de perçage de la partie supérieure du réceptacle (3) et d'extraction des produits (30, 31, 32).

Il est à noter que le microprocesseur (12) émet une clé, recalculée par algorithme, sous forme de chiffres et de lettres ce qui représente l'indication comparée aux données du fabricant. Toutes les clés, après traitement, sont mémorisées dans la mémoire interne du microprocesseur (12).

Une clé est attribuée avantageusement à un seul code-barre (23) ce qui permet d'utiliser le réceptacle (3) une seule fois. Un réceptacle (3) sans code-barre (23) est automatiquement rejeté de même qu'un code-barre (23) erroné et la réutilisation d'un code-barre (23) usagé sont rejetés par comparaison des clés.

Les figures 4 et 5 illustrent une forme d'exécution où le réceptacle (3) est en matière amagnétique et les informations (11) se trouvent sur un ruban notamment magnétique circulaire (20) à l'intérieur dudit réceptacle (3).

La figure 6 illustre une variante de l'invention qui présente un réceptacle (3) où les informations (11) sont placées entre un couvercle (17) perforable et la base (14) du réceptacle (3), sous la forme d'un anneau (15).

La figure 7 illustre une variante qui consiste à loger un fil métallique (8) dans la base (14) du réceptacle (3) de telle façon que les informations (11) soient enregistrées notamment sous forme magnétique.

REVENDICATIONS

1. Appareil permettant d'établir la traçabilité d'un contenu dans un réceptacle (3) et l'origine dudit réceptacle (3) sur lequel figurent des informations (11) lisibles au moyen d'un lecteur optique et/ou magnétique mais invisibles à l'œil nu, ledit réceptacle (3) étant du type comportant une partie supérieure perforable pour l'injection du liquide dans le réceptacle (3) et une membrane inférieure perforable sous pression pour la sortie dudit liquide aromatisé par le contenu du réceptacle (3), l'appareil comprenant :

   - un lecteur (9) optique et/ou magnétique pour la lecture desdites informations (11) sur un réceptacle (3) introduit dans l'appareil,

   - un microprocesseur (12) permettant de crypter/décrypter, analyser, comparer, approuver/refuser et stocker des informations (11) lues sur un réceptacle (3), et agencé pour sélectivement démarrer ou non un cycle d'opérations comprenant le perçage de la partie supérieure du réceptacle (3) et l'injection du liquide, ainsi que pour le stockage des informations (11) lues afin d'être prêt pour démarrer un nouveau cycle.

2. Appareil selon la revendication 1 caractérisé en ce qu'il comporte un dispositif d'émission de rayons UV permettant la lecture d'un code-barre (23) invisible à l'œil nu situé sur le réceptacle (3).

3. Appareil selon la revendication 1 ou 2 caractérisé en ce qu'il comporte une tête de lecture magnétique qui lit les informations (11) magnétiques portées par le réceptacle (3).

4. Appareil selon l'une des revendications précédentes caractérisé en ce qu'il comporte un module (18) pour distribuer des produits, tels que du sucre (31) et du lait (32) et des dispositifs tels que des cuillères (30) permettant le brassage avec le liquide et permettant l'identification du destinataire, ceci conjointement avec la sortie du liquide aromatisé.

5. Appareil selon l'une des revendications précédentes caractérisé en ce qu'il comporte une tête de lecture laser (5) fixée au support (1).

6. Réceptacle du type comportant une partie supérieure perforable pour l'injection du liquide dans le réceptacle (3) et une membrane inférieure perforable sous pression pour la sortie dudit liquide aromatisé par le contenu du réceptacle (3), utilisable par l'appareil selon l'une quelconque des revendications précédentes caractérisé en ce qu'il comporte des informations (11) lisibles au moyen d'un lecteur optique et/ou magnétique mais invisibles à l'œil nu.

7. Réceptacle utilisable par l'appareil selon la revendication 6 caractérisé en ce qu'il est en matière amagnétique et les informations (11) se trouvent sur un ruban circulaire (20) à l'intérieur dudit réceptacle (3).

8. Réceptacle utilisable par l'appareil selon l'une des revendications 6 ou 7 caractérisé en ce qu'il dispose d'un code magnétique (15) placé entre son couvercle (17) et sa base (14).

9. Réceptacle utilisable par l'appareil selon l'une des revendications 6, 7 ou 8 caractérisé en ce que les informations (11) qu'il porte se présentent sous forme de code-barre (23) invisible inscrit à l'aide d'une encre réactive à l'éclairage ultra-violet (UV).

10. Réceptacle utilisable par l'appareil selon l'une des revendications 6 à 9 caractérisé en ce que les informations (11) qu'il porte comportent des indications relatives à la traçabilité.

11. Réceptacle utilisable par l'appareil selon l'une des revendications 6 à 10 caractérisé en ce que les informations (11) qu'il porte comportent des indications relatives à l'origine du réceptacle (3).

12. Réceptacle utilisable par l'appareil selon l'une des revendications 6 à 11 caractérisé en ce que les informations (11) qu'il porte sont stockées sur une bande magnétique (15) souple.

13. Réceptacle utilisable par l'appareil selon l'une des revendications 6 à 12 caractérisé en ce que les informations (11) qu'il porte sont stockées sur un anneau (8).

14. Système permettant d'établir la traçabilité d'un contenu dans un réceptacle (3) et l'origine dudit réceptacle (3), comportant un appareil selon l'une des revendications 1 à 5 et une pluralité de réceptacles selon l'une des revendications 6 à 13.

15. Procédé d'utilisation d'un appareil selon l'une des revendications 1 à 5 et/ou d'un réceptacle selon l'une des revendications 6 à 13 caractérisé en ce qu'il comporte les étapes suivantes :

- identification (a) de la base portant les informations (11) de traçabilité du contenu dans le réceptacle (3) et d'origine dudit réceptacle (3),
- cryptage/décryptage (b) des informations (11) situées sur le réceptacle (3),
- analyse (c) des informations (11),
- acceptation ou refus (d) des informations (11),
- comparaison (e) des informations (11) situées sur le réceptacle (3) avec les données qu'il contient,
- approbation/refus (f) du perçage de la partie supérieure du réceptacle (3) et l'injection du liquide, éventuellement aussi de la distribution des produits (30, 31, 32) conjointement avec la sortie du liquide aromatisé.
- stockage (g) des informations (11) dans la mémoire interne après usage,
- redémarrage (h) automatique d'un cycle.

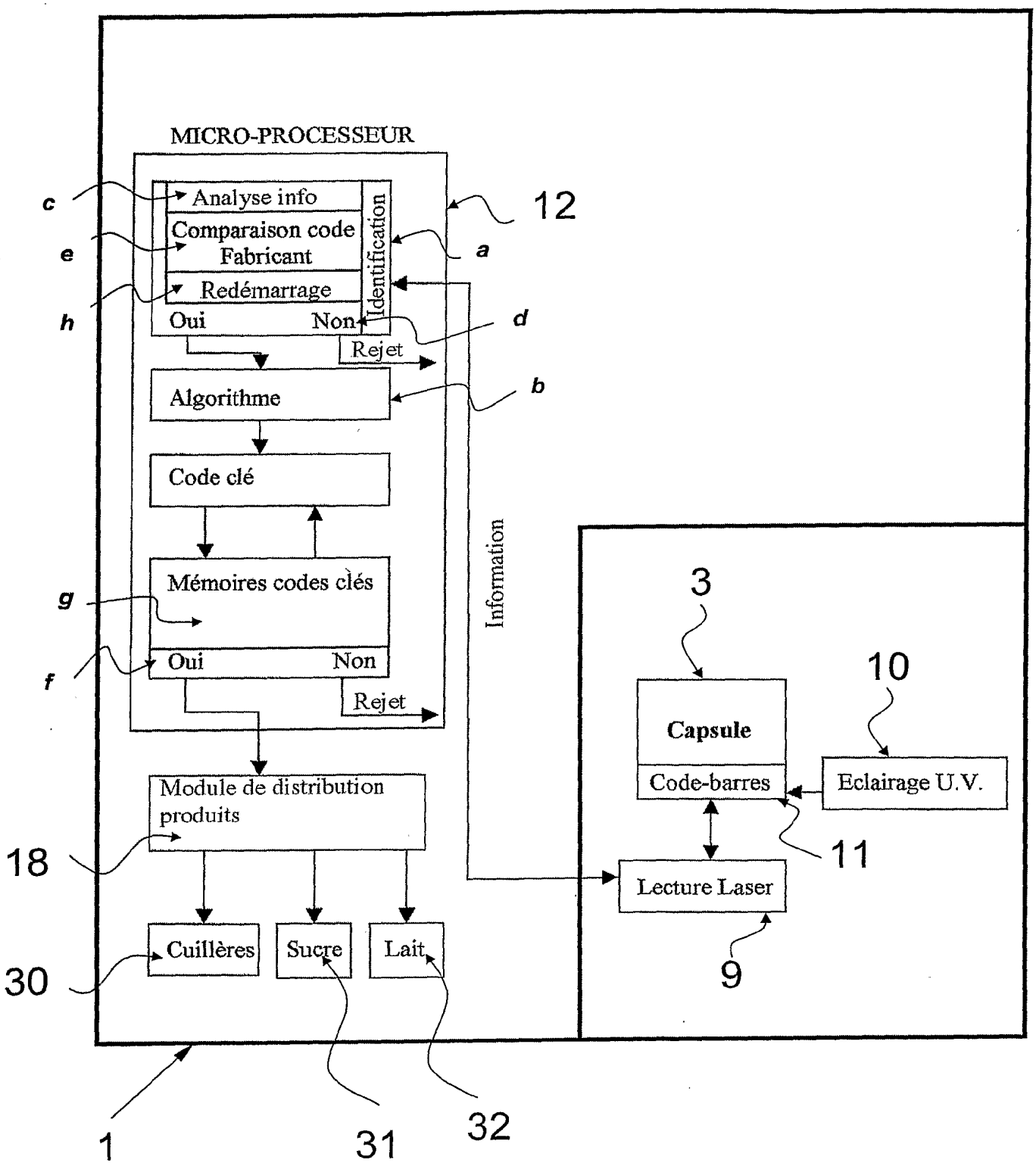

MICRO-PROCESSEUR
Analyse info
Comparaison code Fabricant
Redémarrage
Identification
Oui
Non
Rejet
Algorithme
Code clé
Mémoires codes clés
Oui
Non
Rejet
Module de distribution produits
Cuillères
Sucre
Lait
Information
Capsule
Code-barres
Eclairage U.V.
Lecture Laser
12
a
b
c
d
e
f
g
h
3
10
11
9
18
30
1
31
32

Fig. 1

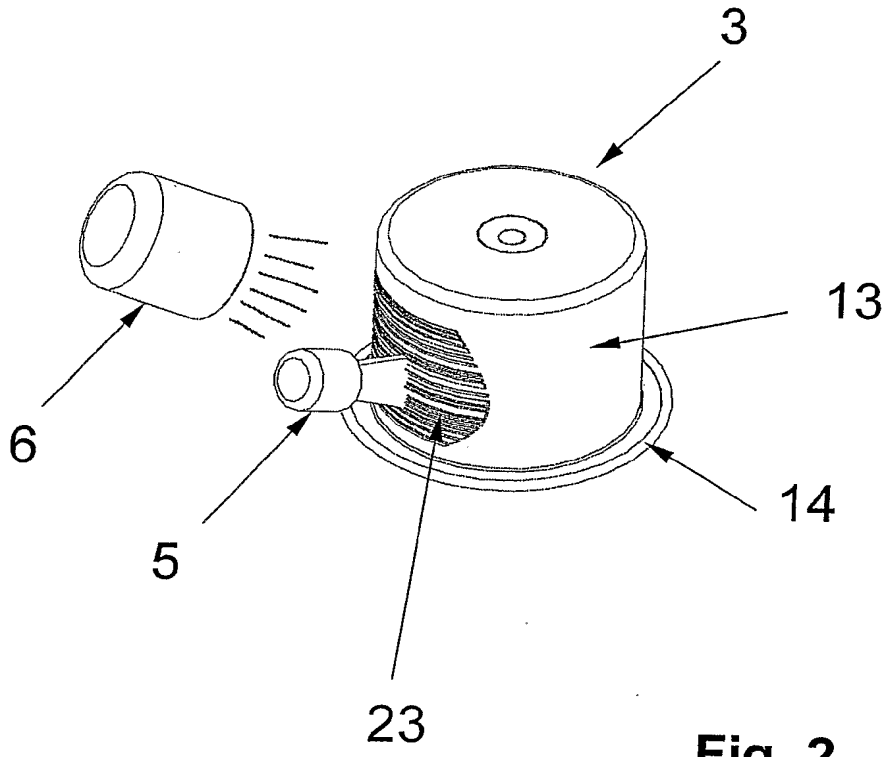


Fig. 2

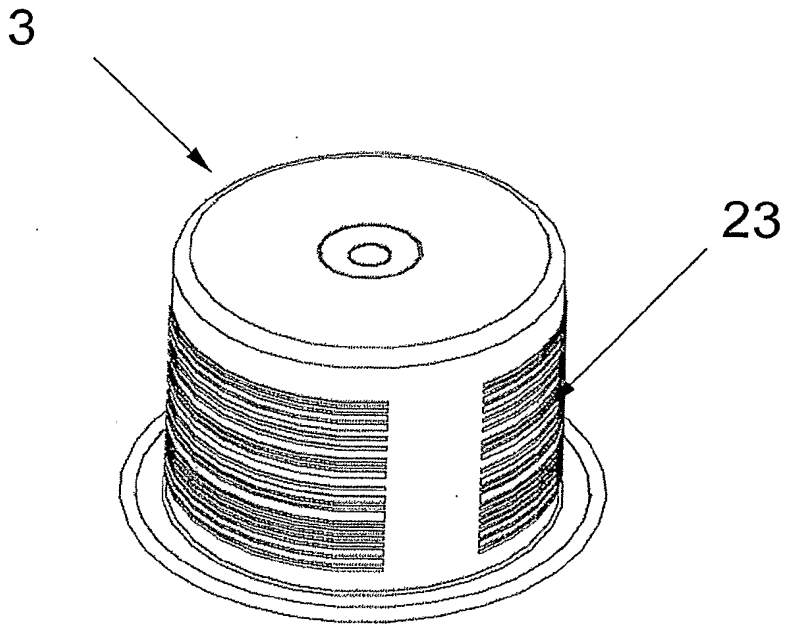


Fig. 3

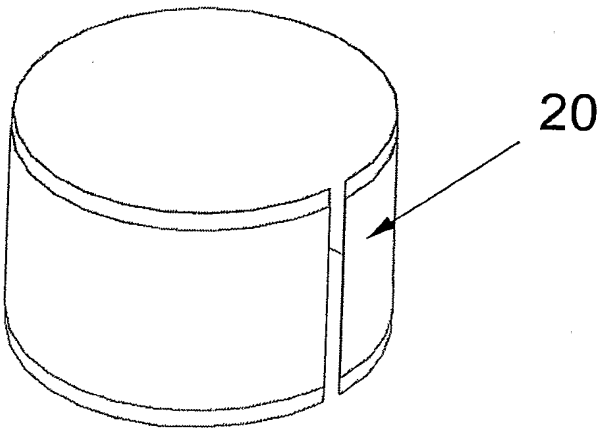


Fig. 4

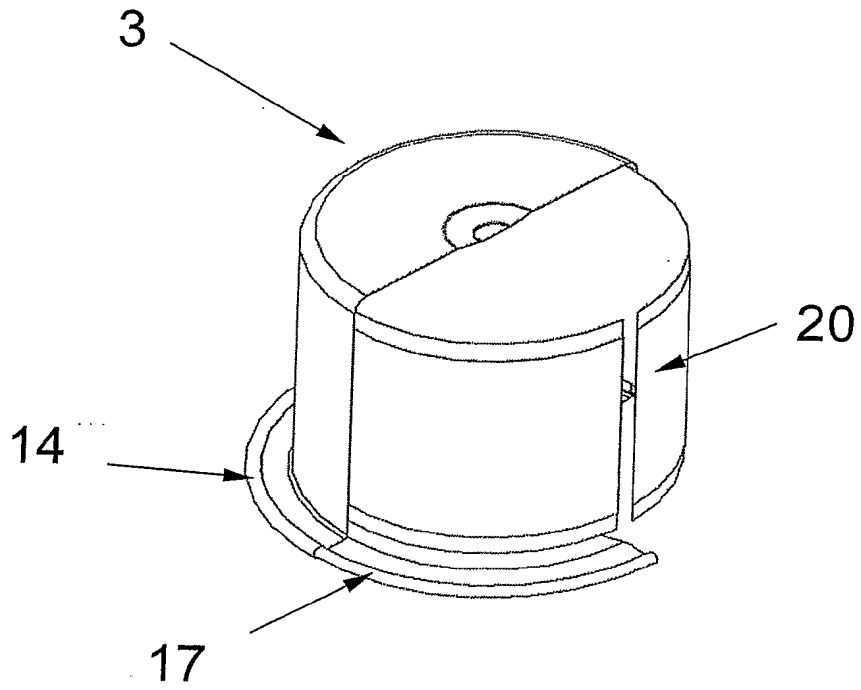


Fig. 5

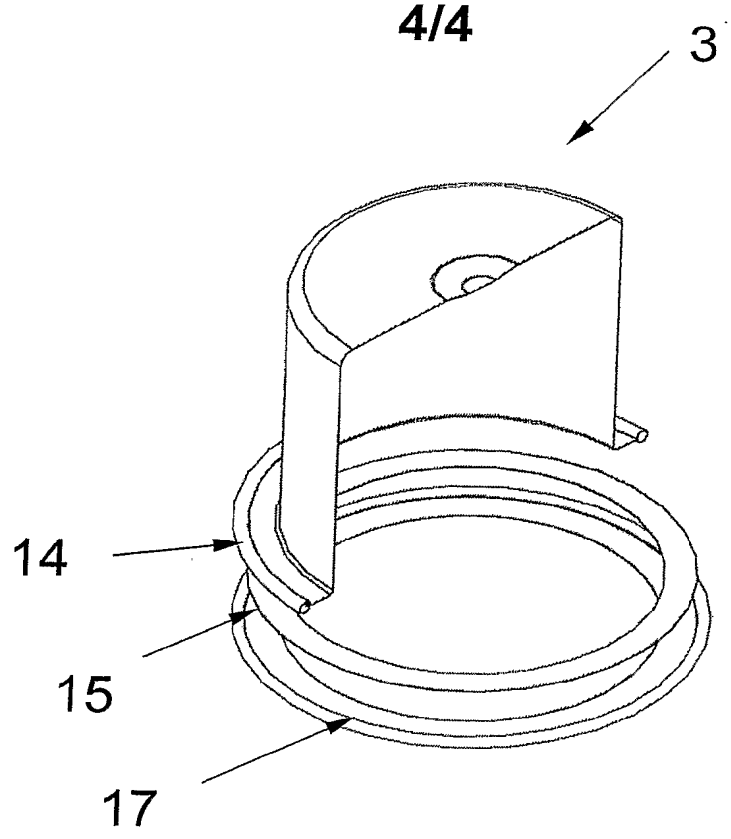


Fig. 6

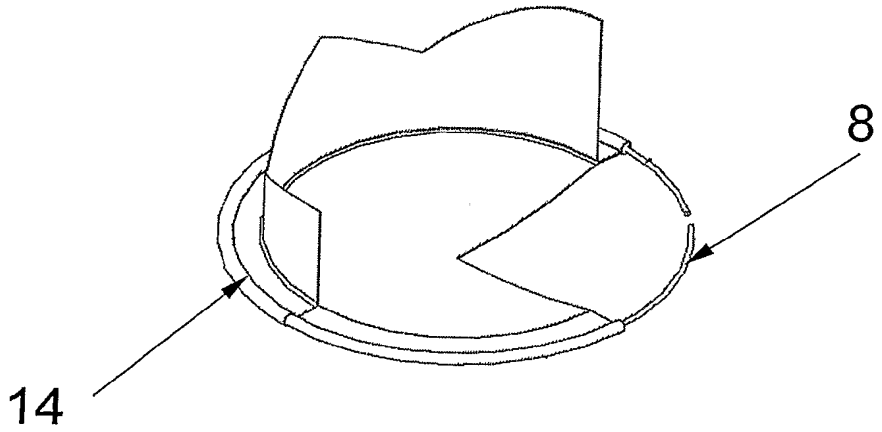


Fig. 7

INTERNATIONAL SEARCH REPORT

International Application No
IB2004/003524

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47J31/40 B65D81/00

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 B65D

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	WO 02/28241 A (BOYD COFFEE CO) 11 April 2002 (2002-04-11) page 5, paragraph 4 - page 11, paragraph 3 page 11, paragraph 3; figures claim 7	1,3,4,6, 8,10-15
A	WO 02/078498 A (EUGSTER FRISMAG AG ; MAHLICH GOTTHARD (DE)) 10 October 2002 (2002-10-10) cited in the application page 8, line 6 - page 10, line 9; figures	6-13
A	US 6 117 471 A (KING ALAN M) 12 September 2000 (2000-09-12) column 3, line 39 - column 5, line 23; figures	1,6,14, 15

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 January 2005	21/01/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	De Terlizzi, M

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International Application No
IB2004/003524

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 858 523 A (HELBLING EDWARD) 22 August 1989 (1989-08-22) column 10, lines 25-35; claims 11,12; figure 2	1,6

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International Application No
IB2004/003524

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0228241 A	11-04-2002	AU 1148902 A	15-04-2002
		WO 0228241 A1	11-04-2002
		US 2002048621 A1	25-04-2002
WO 02078498 A	10-10-2002	DE 10116239 A1	17-10-2002
		CA 2442389 A1	10-10-2002
		DE 20121494 U1	17-10-2002
		WO 02078498 A1	10-10-2002
		EP 1379153 A1	14-01-2004
		JP 2004525829 T	26-08-2004
		NO 20034325 A	05-11-2003
		US 2004089158 A1	13-05-2004
US 6117471 A	12-09-2000	US 5974950 A	02-11-1999
US 4858523 A	22-08-1989	US 4967648 A	06-11-1990
		US 5080008 A	14-01-1992
		US 5072660 A	17-12-1991
		US 5158793 A	27-10-1992

Form PCT/ISA/210 (patent family annex) (January 2004)

RAPPORT DE RECHERCHE INTERNATIONALE

Demande Internationale No
IB2004/003524

A. CLASSEMENT DE L'OBJET DE LA DEMANDE
CIB 7 A47J31/40 B65D81/00

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée (système de classification suivi des symboles de classement)
CIB 7 A47J B65D

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si réalisable, termes de recherche utilisés)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie °	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
X	WO 02/28241 A (BOYD COFFEE CO) 11 avril 2002 (2002-04-11) page 5, alinéa 4 - page 11, alinéa 3 page 11, alinéa 3; figures revendication 7	1,3,4,6, 8,10-15
A	WO 02/078498 A (EUGSTER FRISMAG AG ; MAHLICH GOTTHARD (DE)) 10 octobre 2002 (2002-10-10) cité dans la demande page 8, ligne 6 - page 10, ligne 9; figures	6-13
A	US 6 117 471 A (KING ALAN M) 12 septembre 2000 (2000-09-12) colonne 3, ligne 39 - colonne 5, ligne 23; figures	1,6,14, 15

-/--

[X] Voir la suite du cadre C pour la fin de la liste des documents

[X] Les documents de familles de brevets sont indiqués en annexe

° Catégories spéciales de documents cités:

"A" document définissant l'état général de la technique, non considéré comme particulièrement pertinent

"E" document antérieur, mais publié à la date de dépôt international ou après cette date

"L" document pouvant jeter un doute sur une revendication de priorité ou cité pour déterminer la date de publication d'une autre citation ou pour une raison spéciale (telle qu'indiquée)

"O" document se référant à une divulgation orale, à un usage, à une exposition ou tous autres moyens

"P" document publié avant la date de dépôt international, mais postérieurement à la date de priorité revendiquée

"T" document ultérieur publié après la date de dépôt international ou la date de priorité et n'appartenant pas à l'état de la technique pertinent, mais cité pour comprendre le principe ou la théorie constituant la base de l'invention

"X" document particulièrement pertinent; l'invention revendiquée ne peut être considérée comme nouvelle ou comme impliquant une activité inventive par rapport au document considéré isolément

"Y" document particulièrement pertinent; l'invention revendiquée ne peut être considérée comme impliquant une activité inventive lorsque le document est associé à un ou plusieurs autres documents de même nature, cette combinaison étant évidente pour une personne du métier

"&" document qui fait partie de la même famille de brevets

Date à laquelle la recherche internationale a été effectivement achevée	Date d'expédition du présent rapport de recherche internationale
14 janvier 2005	21/01/2005

Nom et adresse postale de l'administration chargée de la recherche internationale	Fonctionnaire autorisé
Office Européen des Brevets, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	De Terlizzi, M

Formulaire PCT/ISA/210 (deuxième feuille) (Janvier 2004)

C.(suite) DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie °	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
A	US 4 858 523 A (HELBLING EDWARD) 22 août 1989 (1989-08-22) colonne 10, ligne 25-35; revendications 11,12; figure 2	1,6

K-FEE SYSTEM GMBH, EX2009, page 269
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

RAPPORT DE RECHERCHE INTERNATIONALE

IB2004/003524

Document brevet cité au rapport de recherche		Date de publication	Membre(s) de la famille de brevet(s)		Date de publication
WO 0228241	A	11-04-2002	AU	1148902 A	15-04-2002
			WO	0228241 A1	11-04-2002
			US	2002048621 A1	25-04-2002
WO 02078498	A	10-10-2002	DE	10116239 A1	17-10-2002
			CA	2442389 A1	10-10-2002
			DE	20121494 U1	17-10-2002
			WO	02078498 A1	10-10-2002
			EP	1379153 A1	14-01-2004
			JP	2004525829 T	26-08-2004
			NO	20034325 A	05-11-2003
			US	2004089158 A1	13-05-2004
US 6117471	A	12-09-2000	US	5974950 A	02-11-1999
US 4858523	A	22-08-1989	US	4967648 A	06-11-1990
			US	5080008 A	14-01-1992
			US	5072660 A	17-12-1991
			US	5158793 A	27-10-1992

K-FEE SYSTEM GMBH, EX2009, page 270
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Electronic Acknowledgement Receipt

EFS ID:	18399612
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Ashley Regan
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	07-MAR-2014
Filing Date:	09-NOV-2012
Time Stamp:	17:04:01
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01693Trans_Letter.pdf	82415 2f4d71639f2de2ad9f747212931e0e2ef17d9939	no	3

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	01693SB08a`.pdf	66277 f3ffbc0e35ec29b697f1952a14f1832c1e54e629	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	WO2005044067A1.pdf	863582 96b523480c4909b20b8c6578eea8734c68eb4e61	no	22
Warnings:					
Information:					
		Total Files Size (in bytes):	1012274		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7607385		2009-10-27	HALLIDAY ET AL.	
	2	6081326		2000-06-27	ROUSSEAU ET AL.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

K-FEE SYSTEM GMBH, EX2009, page 274
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-06-13
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

K-FEE SYSTEM GMBH, EX2009, page 275
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

K-FEE SYSTEM GMBH, EX2009, page 276
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	L. Long
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL LETTER

Sir:

Submitted herewith is an Information Disclosure Statement for consideration in the above-identified application. In accordance with the provisions of 37 C.F.R. 1.56, 37 C.F.R. 1.97, and 37 C.F.R. 1.98, Applicants request that a citation and examination of the references cited on the enclosed PTO/SB/08a form be made during the course of examination of the above-identified application for United States patent. Pursuant to 37 C.F.R. 1.98, copies of all foreign patent documents and non-patent documents are enclosed.

This Information Disclosure Statement is submitted as follows:

Submission without Certification

[X] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by payment of the fee set forth in 37 CFR 1.17(p).

Submission with Certification

[ ] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

K-FEE SYSTEM GMBH, EX2009, page 277
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the Certification specified in 37 CFR 1.97(e) which is set forth below.

[ ] After the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the fee set forth in 37 CFR 1.17(p) and the Certification specified in 37 CFR 1.97(e) which is set forth below.

Certification under 37 CFR 1.97

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **thirty days** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies each item of information contained in the accompanying Information Disclosure Statement was issued by a patent office and/or first cited in any communication from a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in Sec. 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies that no item of information contained in the accompanying Information Disclosure Statement was cited in a communication from a patent office in a counterpart foreign or international application or by the Office, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the accompanying Information Disclosure Statement was known to any individual designated in 37 CFR 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] A copy of a Search Report from a corresponding foreign patent application is enclosed.

[ ] A check in the amount of $ to cover the required fee is enclosed.

[ ] The Commissioner is hereby authorized to charge the amount of $180.00 to cover the required fee to Deposit Account No. 02-1818.

K-FEE SYSTEM GMBH, EX2009, page 278
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

[X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1818.

Respectfully submitted,
K&L GATES LLP

BY /Robert M Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157

Dated: June 13, 2014

K-FEE SYSTEM GMBH, EX2009, page 279
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Electronic Acknowledgement Receipt

EFS ID:	19296159
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Ashley Regan
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	13-JUN-2014
Filing Date:	09-NOV-2012
Time Stamp:	13:01:32
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	1693-1449.pdf	67982 8f8c159676a2b6dd6ed7284827b49588cf96c2b3	no	4

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Transmittal Letter	1693idstransmittal.pdf	13671 7e607d1934afec8586c8a244014b52b7f1796322	no	3

Warnings:	
Information:	
Total Files Size (in bytes):	81653

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100078480		2010-04-01	SYMBOL TECHNOLOGIES INC	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	13697297
	Filing Date	2012-11-09
	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99**)

Application Number	13697297
Filing Date	2012-11-09
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Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-11-11
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Electronic Acknowledgement Receipt

EFS ID:	20660789
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Evan Rhodus
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	11-NOV-2014
Filing Date:	09-NOV-2012
Time Stamp:	13:11:08
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01693Transmittal_Letter.pdf	81644 fc86d545dc96c2127628cf86f1f43d10c7090b4e	no	3

Warnings:	
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2	Information Disclosure Statement (IDS) Form (SB08)	01693SB08a.pdf	66003 94eaac73932809e55d0831b43090a4ab2df2f07d	no	4

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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	L. Long
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL LETTER

Sir:

Submitted herewith is an Information Disclosure Statement for consideration in the above-identified application. In accordance with the provisions of 37 C.F.R. 1.56, 37 C.F.R. 1.97, and 37 C.F.R. 1.98, Applicants request that a citation and examination of the references cited on the enclosed PTO-1449 form be made during the course of examination of the above-identified application for United States patent. Pursuant to 37 C.F.R. 1.98, copies of any cited foreign patent documents and non-patent documents are enclosed.

This Information Disclosure Statement is submitted as follows:

Submission without Certification

[X] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by payment of the fee set forth in 37 CFR 1.17(p).

Submission with Certification

[ ] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

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IPR2023-00502, U.S. PATENT 10,994,923

[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the Certification specified in 37 CFR 1.97(e) which is set forth below.

[ ] After the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the fee set forth in 37 CFR 1.17(p) and the Certification specified in 37 CFR 1.97(e) which is set forth below.

Certification under 37 CFR 1.97(e)

[ ] The undersigned counsel for applicant(s) hereby certifies that each item of information contained in the accompanying Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies that no item of information contained in the accompanying Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the accompanying Information Disclosure Statement was known to any individual designated in 37 CFR 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

Statement under 37 CFR 1.704(d)

[ ] The undersigned counsel for applicant(s) hereby states that each item of information contained in the accompanying Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and/or is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in § 1.56(c) more than **thirty days** prior to the filing of the information disclosure statement.

[ ] A copy of a Search Report from a corresponding foreign patent application is enclosed.

[ ] The Commissioner is hereby authorized to charge the amount of $ to cover the required fee to Deposit Account No. 02-1818.

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IPR2023-00502, U.S. PATENT 10,994,923

[X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1818.

Respectfully submitted,
K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30142
Customer No. 29157

Dated: November 11, 2014

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(71) Applicant *(for all designated States except US)*: **BOEGLI-GRAVURES S.A.** [CH/CH]; Rue de la Gare 24-26, CH-2074 Marin (CH).

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(74) Agent: **AMMANN PATENTANWÄLTE AG BERN**; Schwarztorstrasse 31, CH-3001 Bern (CH).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report*

WO 2008/134910 A1

(54) Title: METHOD AND DEVICE FOR THE RECOGNITION OF AN AUTHENTICATING MARK ON AN ENVELOPED SURFACE OF AN OBJECT

(57) Abstract: The method for the recognition of an authenticating mark on the surface of a packaging foil or an article by means of visual and/or electronic recognition means through an envelope is carried out by ultrasonic or X-ray techniques. In particular, the authenticating mark comprises at least one embossed authenticating mark having finest structures in the micrometer range, and the surface of the packaging foil or of the area of the article in which the authenticating mark is embossed is metallized or made of metal. In such a method, the package need not be opened or destroyed for inspection and the authenticating marks are not distinguishable from the outside in visible light.

METHOD AND DEVICE FOR THE RECOGNITION OF AN AUTHENTICATING MARK ON AN ENVELOPED SURFACE OF AN OBJECT

The present invention relates to a method and device for the recognition of an authenticating mark that is embossed on a surface of a packaging foil or of an article through an envelope, according to the preamble of claim 1, and mainly also to the authentication of cigarette packages, respective of cigarettes.

An object to be identified whose surface is recognized through an envelope that is impermeable to visible light is known in the art from US 2005/206500 A1. On one hand, the latter refers to relatively large objects and marks, and on the other hand, the employed radiations capable of passing through the envelope are only mentioned but not specified. More particularly, X-rays, different types of RF radiation, RMI technology or an acoustic imaging method are proposed.

DE 36 13 549 A1 discloses a method for reading bar-code information by means of sound waves that makes use of the fact that the bar-code is designed such that the spaces have different transmissive properties.

From EP-B-1 236 192 to the applicant of the present invention it is known to recognize an article by means of at least one authenticating mark that is applied in addition to other security elements, the authenticating marks being embossed by means of an embossing device that produces a special embossing pattern. In the introduction of this patent specification, different documents referring to the production of authenticating marks and elements are cited which consequently will not be enumerated here.

As explained in the specification and in claims 5 and 6 of EP-B-1 236 192, the authenticating mark should be recognized through the cigarette packet and more particularly through a corresponding window in the cigarette packet. However, an indication of a concrete method for recognizing the features through the package is not given in this reference.

According to EP-A-1 216 819, marks that are embossed on a first layer are read through windows in a second layer, the layers being cigarette packaging foils.

Similar authenticating marks may also be provided on packaging foils for foods such as chocolate or butter or for other articles - e.g. from the pharmaceutical industry, such as capsules or pills - or else for objects such as PC cards, that are to be recognized through a package of cardboard or the like.

Another problem area is the authentication of timepieces, more particularly wrist or pocket watches. In order to be able to recognize the authenticating marks, the latter have to be applied to the housing externally or the timepiece has to be opened, which generally requires specialized personnel. Therefore, a recognition through the dial or through the bottom would be very advantageous.

Recently, methods and devices for embossing ever smaller and thus increasingly fraud resistant authenticating marks have been developed by the applicant, e.g. according to US 7 229 681, and based thereon, it is the object of the present invention to provide a method and a device that allow recognizing even very small security elements such as authenticating marks and/or elements in the micrometer range on the surface of packaging foils around tobacco products, foods, pharmaceutical products or PC components through the

package, or on the surface of timepieces through the envelope, e.g. the dial or the bottom, with sufficient accuracy and dependability. This object is attained by the method according to claim 1 and by the device according to claim 15.

The invention will be explained in more detail hereinafter with reference to exemplary embodiments. Representatively for the above-mentioned articles, these examples refer to the authentication of cigarette packets or cigarettes, respectively. The term "authenticating mark" stands for security or authentication features that have been embossed on packaging foils by means of the embossing methods and devices mentioned in the introduction, or according to a conventional method on a part of a timepiece, on one hand, and on the other hand, for the entirety of characteristics that make up the nature of the object that is to be examined, such as e.g. embossing patterns on identical or different packaging foils.

The term "envelope" stands for packages of cardboard or paper that are impermeable to visible light and in the case of timepieces for dials or watch bottoms made of a material that is permeable to the applied sound waves or rays.

In EP-B-1 236 192, cited in the introduction, different commercial levels are defined, and these are incorporated, as far as they are applicable to the present invention, into the present description as part of an exemplary embodiment.

According to US 2007/0289701 A1, the method according to EP-B-1 236 192 can be further developed in that an array of authenticating marks is embossed as a pattern on-line, read by a suitable apparatus, and evaluated by means of an image processing method. With regard to the embossing pattern, all

known embossing types can be applied. In addition to the embossing apparatus, the device used for carrying out the method comprises a reading unit and an evaluating unit. In particular, this method reducing the requirements with respect to the embossing or reading quality without prejudicing the required safety.

According to the prior art, as mentioned in the introduction, either relatively large objects are recognized through an envelope or the mentioned articles are read and recognized directly, which implies that the package must be opened to access the foil or the article in order to be able to read the authenticating marks. The proposal to recognize the articles through a window in the package makes the manufacture more expensive as the window must be manufactured additionally, and the local application of the features is furthermore limited by the location of the window. This also applies analogously when the article is a timepiece.

In order to recognize ever smaller structures through a light-impermeable envelope, it is apparent to one skilled in the art in view of the prior art cited in the introduction that the radiation or the sound waves that are to be applied must be capable of resolving such structures. However, this knowledge alone is not sufficient for attaining the intended object. On the contrary, this requires the realization that there must be an interaction between a particular surface of the article and the adapted sound waves or radiation.

There are essentially two ways of using the sound waves for detection purposes, namely in transmission mode or in reflection mode. In view of the fact that the sound waves or rays have to pass through the envelope first to subsequently produce a useful signal, it has been recognized that the

detection signal obtained through reflection offers advantages when the reflecting surface is metallized or metallic, e.g. a metallized packaging foil or an aluminum foil.

Recently, ultrasonic apparatus having a high resolution of less than 0.1 mm have been developed, thereby also allowing to resolve and thus recognize the authenticating marks and elements that are being considered here and have been referred to above. Such an ultrasonic camera is disclosed in a publication that is accessible in the Internet and can be downloaded under the title "Optel Ultrasonic Technology / Fingerprint recognition".

Another publication from the year 2004, entitled "ultrasonic microscopy", of the Technical University of Dresden describes an apparatus with a transducer having a nominal frequency of up to 230 MHz, thereby achieving a lateral resolution of up to 10 µm. According to one of these methods, i.e. the so-called impulse echo technique, the surfaces or indentations to be examined are scanned by means of a suitable transducer and a three-dimensional image of the inspected area is reconstructed through an evaluation of the amplitude, the phase, and the delays of the backreflected signals.

Digital signal processing and image processing methods may also be applied to this end. The latter may be used to separate the image areas of interest and to extract the relevant information, respectively. In this regard, additional correlation methods may be applied for a better extraction of certain hidden patterns.

According to EP-A1-1 437 213 to the applicant of the present invention it is possible to modify the teeth of embossing

rolls in such a manner that macro- and microstructures are produced which are transmitted to the metallized surface of the packaging foil in the embossing procedure. Such a technique allows embossing the authenticating marks and elements with macro- or microstructures that have been mentioned in the introduction.

These authenticating marks or elements must then be readable by the ultrasonic apparatus in reflection mode through the package. To this end, a suitable sonic transducer will be used that is capable of reading the structures, i.e. the authenticating marks or elements, in the desired frequency range. More specifically, a sonic transducer having a nominal frequency comprised in a range of 5 to 500 MHz can be used, thereby allowing to achieve a large bandwidth of the resolving capacity, which is necessary depending on the structure and size of the authenticating marks. Furthermore, the ultrasonic beam should be focused and directed such that it may reach the features through the package without excessive losses and its backreflected rays can be detected.

Authenticating marks may furthermore be produced by differences in the arrangement of teeth, e.g. by individual teeth or groups of teeth of different shapes in the intended locations, e.g. teeth having a round or rounded horizontal projection in the midst of teeth having a rectangular horizontal projection, or different distances between the teeth.

Moreover, authenticating marks may also be produced by creating indentations, deformations or holes on the surface of the packaging foil by tools other than embossing rolls, e.g. by controlled pins or the like.

In the case of timepieces, the authenticating mark is applied to a watch component that is either covered by the dial or by the bottom and is therefore invisible to the eye. In this case, the recognition is achieved by an adapted ultrasonic or X-rays apparatus through the dial or through the bottom, whose material must be permeable to these sound waves or rays.

Problems might arise when operating at the limit of the resolution, but error corrections may be performed for a reliable recognition of the features, e.g. by means of an adapted mathematical algorithm. In this regard, the above-mentioned method according to CH-01086/06 facilitates the application of an error correction.

An evaluation by means of an adapted mathematical error correction allows an analysis of the embossing pattern, which differs from one embossing roll to another and thus constitutes an identification characteristic of the embossing system. In the embossing process, the surface profile of the embossing roll is transmitted to the paper.

Papers that have been embossed by different embossing rolls differ on a microscopic scale since the surface profiles of different embossing rolls differ from one another without a specific treatment of the teeth of these rolls. These small differences, which serve as the authenticating mark, are to be measured and quantified.

The profile of the embossed paper is not only a function of the embossing roll that has been used but also of the paper properties and of the process parameters adjusted in the embossing process. By means of measurements it has been experimentally shown that the surface profiles of the embossing roll and of the embossed paper differ from one

another. Therefore, generally, measurements of embossed papers cannot be related directly to the embossing roll that has been used for embossing but to an embossed reference paper. This reference measurement is periodically renewed in order to compensate for process-related variations. It is therefore an aim to determine, by means of the authenticating mark, i.e. by means of deviations or correlations between the pattern on the paper and that of the embossing roll, whether the paper was embossed by a particular embossing roll.

Theoretical considerations have lead to the assumption that with a refinement of ultrasonic technology, more particularly of the impulse echo method, these small differences could also be detected by means of ultrasonic technology through a package.

However, if these differences are very small, especially in the case of a recognition of differences after embossing with embossing rolls whose teeth have not been altered, they may no longer be detectable through the package by ultrasonic techniques so that another detection method must be applied.

If X-rays are employed, the X-ray apparatus used in the references of the prior art cited in the introduction cannot be applied as they cannot sufficiently resolve the fine structures.

In recent years, developments in X-ray tomography and micro-CT (Computer Tomography) have allowed the creation of X-ray apparatus of the size of a cigarette packet on the basis of carbon nanotubes (CNT). Such apparatus are capable of producing self-focusing measuring spots in the submicrometer range.

Tests have shown that such X-ray microdevices are capable of detecting authenticating marks through a cigarette packet in transmission mode. It is essential therefor that these authenticating marks are applied to a metallized foil or a foil made of aluminum. The effect may be reinforced if the authenticating marks are located in structures such as folds or the like.

In analogy thereto, on a timepiece component, the authenticating marks, i.e. the embossed marks, are identified through the dial or the bottom.

The detection of the rays is achieved by means of suitable semiconductor detectors that are connected to a processing unit of a similar design as that used in the ultrasonic detection of the inspected features.

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Claims

1. Method for the recognition of an authenticating mark on the surface of a packaging foil or an article by means of visual and/or electronic recognition means through an envelope, the recognition method being carried out by ultrasonic or X-ray techniques, characterized in that the authenticating mark comprises at least one embossed authenticating mark having finest structures in the micrometer range and the surface of the packaging foil or of the area of the article in which the authenticating mark is embossed is metallized or made of metal.

2. Method according to claim 1, characterized in that the packaging foil contains tobacco products such as cigarettes, foods such as chocolate or butter, capsules or pills from the pharmaceutical industry, or PC cards, and is enclosed in a package of cardboard, paper, or plastics material.

3. Method according to claim 1, characterized in that the article is a timepiece and the authenticating mark embossed thereon is recognized through the dial or through the bottom thereof.

4. Method according to one of claims 1 to 3, characterized in that the ultrasonic source operates in a range of 5 - 500 MHz and in reflection mode.

5. Method according to claim 4, characterized in that the so-called impulse echo method is employed, the surfaces or indentations to be examined being scanned by means of a suitable sonic transducer and a three-dimensional image of the inspection area being reconstructed through an evaluation of the amplitude, the phase, and the delays of the reflected signals.

6. Method according to one of claims 1 to 4, characterized in that the identification method is carried out in transmission mode using an X-ray apparatus whose radiation can be focused onto a spot in the submillimeter range.

7. Method according to claim 6, characterized in that the X-ray apparatus operates on the basis of carbon nanotubes delivering radiation spots in the submicrometer range.

8. Method according to one of claims 1 to 7, characterized in that digital signal processing and image processing methods are applied in order to separate the image areas of interest and to extract the relevant information, respectively.

9. Method according to one of claims 1 to 8, characterized in that an array of authenticating marks is embossed on-line as a pattern and evaluated by an image processing method.

10. Method according to one of claims 1 to 9, characterized in that additional correlation methods are applied for a better extraction of certain hidden patterns.

11. Method according to one of claims 1 to 10, characterized in that teeth of the driven embossing roll are modified such that authenticating marks are embossed in the corresponding locations of the packaging foil.

12. Method according to one of claims 1 to 10, characterized in that no teeth of the driven embossing roll are modified and differences in the embossing pattern that are due to the manufacture of the rolls and/or to the paper quality are used as a authenticating mark, and identified.

13. Method according to one of claims 1 to 10, characterized in that the authenticating marks are created by differences in the arrangement of teeth, individual teeth or groups of teeth in the intended locations having a different shape, more particularly teeth that have a round or rounded horizontal projection in the midst of teeth that have a rectangular horizontal projection, or the teeth having different distances between them.

14. Method according to one of claims 1 to 10, characterized in that the authenticating marks are produced by tools other than embossing rolls, e.g. by controlled pins, in the form of indentations, deformations or holes on the surface of the packaging foil.

15. Device for carrying out the method according to any one of claims 1 to 5, 8-14, characterized in that it comprises an ultrasonic transducer.

16. Device according to claim 15, characterized in that the ultrasonic transducer operates in a range of 5 to 500 MHz.

17. Device according to any one of claims 6 to 14, characterized in that it comprises an X-ray apparatus whose radiation can be focused onto a spot in the submillimeter range.

18. Device according to claim 17, characterized in that the X-ray apparatus operates on the basis of carbon nanotubes delivering radiation spots in the submicrometer range.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/CH2008/000204

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07D7/08 G07D7/06

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)
G07D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/073414 A1 (SPAHN MARTIN [DE]) 7 April 2005 (2005-04-07) abstract paragraph [0009] paragraph [0012] - paragraph [0013] paragraph [0016] - paragraph [0017] paragraph [0031] - paragraph [0036] paragraph [0039] - paragraph [0055] figures ----- -/--	1-4,15, 16

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 July 2008	18/07/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Königer, Axel

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INTERNATIONAL SEARCH REPORT

International application No
PCT/CH2008/000204

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 33 08 278 A1 (ZEPPELLINI SERGE [FR]) 13 September 1984 (1984-09-13) abstract page 4 - page 5, paragraph FIRST page 6, paragraph FIRST - page 7, last paragraph page 8, last paragraph - page 9, last paragraph figures	1-3, 6-14,17, 18
X	US 2005/206500 A1 (FERREN BRAN [US] ET AL) 22 September 2005 (2005-09-22) paragraph [0012] - paragraph [0014] paragraph [0016] figure 1	1,4,5, 15,16
X	DE 36 13 549 A1 (STORCK WOLFGANG [DE]; BICZ WIESLAW [DE]) 29 October 1987 (1987-10-29) abstract column 1, line 45 - line 54 column 2, line 19 - column 3, line 24	1,4,15, 16

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/CH2008/000204

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005073414 A1	07-04-2005	DE 102004044978 A1	14-04-2005
DE 3308278 A1	13-09-1984	NONE	
US 2005206500 A1	22-09-2005	WO 2005089301 A2	29-09-2005
DE 3613549 A1	29-10-1987	NONE	

K-FEE SYSTEM GMBH, EX2009, page 306
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Close

Patent	**JP2000094838A2** View Image View ActionablePatents Full-Text
Patent Evaluation	B0 (Score 4) Detail
Issued	April 4, 2000
Title	**STEALTH HEAT-SENSITIVE RECORDING MEDIUM AND TRANSPARENT BAR CODE**
Applicant	TOSHIBA CORP , JP
Abstract	**Problem to be solved**: To manufacture a stealth heat-sensitive recording medium of superior heat resistance for writing and erasing at high speed to be readable simply by the fluorescent emission utilizing the ultraviolet emission. **Solution**: A stealth heat-sensitive recording medium contains a fluorescent compound of 400 nm absorption maximum wavelength or less and a reversible agent or an extinction agent, and the reversible agent or an extinction agent is mixed with the fluorescent compound at the time of flowing, and two equilibrium states, namely the equilibrium state in which the phase of the reversible agent or the extinction agent and the phase of the excessive fluorescent compound beyond the equilibrium solubility are separated each other and the quasi- equilibrium state or the non-equilibrium state, in which the fluorescent compound is incorporated into the reversible agent or the extinction agent to the degree of being beyond the equilibrium solubility, can be generated and the fluorescent strength or fluorescent wavelength is different between the two states.
Inventor	**NAITO KATSUYUKI**
Appl. No.	JP1998271513 (9/25/1998)
IPC	B41M-005/30; B41M-005/36; G06K-001/12; G06K-007/12; G06K-019/06;
Family	Show Known Family Members (1 patent(s))
Legal Status	Show Legal Status / Legal Status of Family Members

K-FEE SYSTEM GMBH, EX2009, page 307
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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（P2000－94838A）
(43)公開日　平成12年４月４日(2000.4.4)

(51)Int.Cl.[7]	識別記号	ＦＩ		テーマコード（参考）
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5/36		Ｇ０６Ｋ　1/12	Ｃ	２Ｈ１１１
Ｇ０６Ｋ　1/12		7/12	Ｃ	５Ｂ０３５
7/12		Ｂ４１Ｍ　5/26	１０２	５Ｂ０７２
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審査請求　未請求　請求項の数５　ＯＬ　（全 13 頁）

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Ｆターム(参考)　2H026 AA09 BB48 DD45
2H111 HA07 HA12 HA32 HA34
5B035 AA02 AA07 AA15 BA03 BA05 BB01 CA02 CA06 CA24
5B072 AA01 AA05 BB00 CC04 CC24 GG07

(54)【発明の名称】　ステルス感熱記録媒体および透明バーコード

(57)【要約】
【課題】　耐熱性に優れ、高速で書き込みおよび消去が可能で、紫外線照射による蛍光発光で簡単に読み出し可能なステルス感熱記録媒体を提供する。
【解決手段】　吸収極大波長が４００ｎｍ以下である蛍光性化合物と、可逆剤または消光剤を含有し、流動時には可逆剤または消光剤と蛍光性化合物が混合し、固化時には可逆剤または消光剤の相と平衡溶解度を超える余剰の蛍光性化合物の相が相分離した平衡状態、および可逆剤または消光剤が平衡溶解度以上に蛍光性化合物を取り込んだ準平衡または非平衡状態の２つの状態を取ることができ、これらの２つの状態間で蛍光強度または蛍光波長が異なるステルス感熱記録媒体。

【特許請求の範囲】
【請求項１】　吸収極大波長が４００ｎｍ以下である蛍光性化合物と、可逆剤または消光剤を含有し、流動時には可逆剤または消光剤と蛍光性化合物が混合し、固化時には可逆剤または消光剤の相と平衡溶解度を超える余剰の蛍光性化合物の相が相分離した平衡状態、および可逆剤または消光剤が平衡溶解度以上に蛍光性化合物を取り込んだ準平衡または非平衡状態の２つの状態を取ることができ、前記２つの状態間で蛍光強度または蛍光波長が異なることを特徴とするステルス感熱記録媒体。
【請求項２】　前記可逆剤が結晶－非晶質転移を起こすことを特徴とする請求項１記載のステルス感熱記録媒体。
【請求項３】　前記可逆剤がステロール化合物であることを特徴とする請求項１記載のステルス感熱記録媒体。
【請求項４】　吸収極大波長が４００ｎｍ以下であり、かつ２つの状態間で蛍光強度または蛍光波長が異なる蛍光性化合物を含有する感熱記録媒体からなり、記録および消去が可能であることを特徴とする透明バーコード。
【請求項５】　着色画像の上に形成されていることを特徴とする請求項４記載の透明バーコード。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は蛍光性化合物による目に見えない（ステルス）情報を熱履歴の制御により記録および消去できる可逆性の感熱記録媒体およびそれを用いた透明バーコードに関する。
【０００２】
【従来の技術】近年、オフィスオートメーション化が進むにつれて、各種の情報量が著しく増大しており、これに伴い情報を出力する機会も増加している。情報の出力としてはプリンターによる紙へのハードコピー出力やディスプレイ出力がある。しかしハードコピーでは、情報の出力が増加すると記録媒体としての紙を大量に使用することになるので、資源保護の観点から問題となる。一方ディスプレイ出力は、表示部に大規模な回路基板が必要であるために、携帯性およびコストの観点から問題がある。これに対して、高い視認性を有する画像を多数回にわたって記録および消去が可能であり、表示の保持にエネルギーを必要としない全固体または半固体の記録媒体であるリライタブル記録媒体が、上述した問題を解消できる第３の記録媒体として期待されている。
【０００３】一方、透明バーコードは、セキュリティーおよび美化の観点ならびに印刷物の上にも形成でき限られた面積により多くの情報を載せることができる観点から需要が伸びている。このような目的のために、蛍光物質や赤外線吸収物質を含有する透明バーコードの使用が検討されている。ところで、透明バーコードにおいても繰り返し使用が可能であることや、バーコード情報を書き換えられることが求められるようになってきている。
【０００４】しかし、これまで耐熱性に優れ、高速で書き込みおよび消去が可能で、紫外線照射による蛍光発光で簡単に読み出し可能なステルス感熱記録媒体およびこれを用いた透明バーコードは知られていない。
【０００５】
【発明が解決しようとする課題】本発明の目的は、耐熱性に優れ、高速で書き込みおよび消去が可能で、紫外線照射による蛍光発光で簡単に読み出し可能なステルス感熱記録媒体およびこれを用いた透明バーコードを提供することにある。
【０００６】
【課題を解決するための手段】本発明のステルス感熱記録媒体は、吸収極大波長が４００ｎｍ以下である蛍光性化合物と、可逆剤または消光剤を含有し、流動時には可逆剤または消光剤と蛍光性化合物が混合し、固化時には可逆剤または消光剤の相と平衡溶解度を超える余剰の蛍光性化合物の相が相分離した平衡状態、および可逆剤または消光剤が平衡溶解度以上に蛍光性化合物を取り込んだ準平衡または非平衡状態の２つの状態を取ることができ、前記２つの状態間で蛍光強度または蛍光波長が異なることを特徴とする。本発明において、可逆剤が結晶－非晶質転移を起こすものが好ましく、たとえばステロール化合物が用いられる。
【０００７】本発明の透明バーコードは、吸収極大波長が４００ｎｍ以下であり、かつ２つの状態間で蛍光強度または蛍光波長が異なる蛍光性化合物を含有する感熱記録媒体からなり、記録および消去が可能であることを特徴とする。本発明の透明バーコードは、着色画像の上に形成されていてもよい。
【０００８】
【発明の実施の形態】以下、本発明をさらに詳細に説明する。最初に、本発明のステルス感熱記録媒体の基本原理について説明する。本発明のステルス感熱記録媒体は、吸収極大波長が４００ｎｍ以下である蛍光性化合物、可逆剤または消光剤を含有する。可逆剤または消光剤は流動時に蛍光性化合物と混合する性質を有する。また、蛍光性化合物と可逆剤または消光剤を含有する組成系は、固化時には可逆剤または消光剤の相と可逆剤または消光剤への平衡溶解度を超える余剰の蛍光性化合物の相が相分離した平衡状態と、可逆剤または消光剤が平衡溶解度以上に蛍光性化合物を取り込んだ準平衡または非平衡状態という２つの状態を取り得る。
【０００９】一般に、蛍光性化合物は系の状態により蛍光強度または蛍光波長が変化し、この変化は上述した平衡状態と準平衡または非平衡状態との２つの状態の間でも起こり得る。すなわち、可逆剤または消光剤の相と蛍光性化合物の相が相分離した平衡状態では、蛍光性化合物はそれ自身が密に充填されており、蛍光性化合物が結晶性であれば結晶状態を取る。一方、可逆剤または消光剤が平衡溶解度以上に蛍光性化合物を取り込んだ準平衡

または非平衡状態では、蛍光性化合物の密度は低い。この準平衡または非平衡状態は、非晶質状態でもよいし、平衡状態にある第１の結晶状態とは異なる第２の結晶状態でもよい。

【００１０】本発明に係るステルス感熱記録媒体は、たとえば基材上に蛍光性化合物および可逆剤または消光剤などの成分を含有する組成物を薄膜状の記録層として形成し、この記録層に熱エネルギーを供給することにより記録・消去を行う。また、本発明の透明バーコードは、たとえば本発明のステルス感熱記録媒体の薄膜状記録層を記録すべきバーコードのパターンに従って選択的に熱エネルギーを与えることにより形成される。

【００１１】本発明においては、蛍光性化合物が濃度消光を起こすものであれば、相分離した結晶状態では蛍光強度が低く、可逆剤との混合状態では蛍光強度が高くなる。このため、バーコード情報などを記録すると、蛍光強度によって情報を認識できる。

【００１２】逆に、蛍光性化合物が高濃度すなわち結晶状態で蛍光強度が高く、低濃度すなわち可逆剤との混合状態で蛍光強度が低いものであれば、バーコード情報などを記録した場合、蛍光強度によって情報を認識できる。

【００１３】また、蛍光性化合物と消光剤との２成分系では、相分離した結晶状態では蛍光強度が高く、消光剤との混合状態では蛍光強度が高くなる。この場合も、バーコード情報などを記録すると、蛍光強度によって情報を認識できる。

【００１４】さらに、蛍光性化合物が高濃度（すなわち結晶状態）と低濃度（すなわち可逆剤との混合状態）で蛍光波長が異なるものであれば、バーコード情報などを記録した場合、光学フィルターを用いることにより容易に情報を識別できる。

【００１５】本発明の感熱記録媒体および透明バーコードは、着色画像の上に形成してもよい。このようにすれば、人間の目から透明バーコードの存在をより見えにくくすることができ、かつ多くの情報を与えることができる。

【００１６】図１に、蛍光性化合物と可逆剤とを含有する２成分系の状態変化のメカニズムの簡易モデルを示す。この図では、蛍光性化合物をＡ、可逆剤をＢと表している。室温（Ｔrt）においては、溶解度から見て蛍光性化合物の相と可逆剤の相が相分離した状態が平衡状態に近い。この状態から組成系を融点（Ｔm）以上に加熱すると、蛍光性化合物は流動状態の可逆剤と混合した状態となる。この溶融状態から急冷によって組成系を強制的に固定すると、蛍光性化合物と混合していた可逆剤は、平衡溶解度を越えた量の蛍光性物質を取り込んで非晶質化する。非晶質の組成系は非平衡状態にあるが、ガラス転移点（Ｔｇ）以下の温度では極めて長寿命であり、室温がＴｇ以下であるならば容易に平衡状態に移ることはない。次いで、非平衡状態にある非晶質の組成系を加熱してガラス転移点を超えると、系内での蛍光性化合物の拡散速度が急激に高まるため、本来の平衡状態へ戻る方向に可逆剤との相分離が加速される。結晶化温度Ｔｃ以上融点Ｔm未満の温度では、蛍光性化合物と相分離した可逆剤は急速に結晶化する。結晶化温度Ｔｃ以上融点Ｔm未満で所定時間を経過した組成系は、より平衡状態に近いより安定な相分離状態となる。

【００１７】以上のように、可逆剤を結晶化温度Ｔｃ以上融点Ｔm未満および融点Ｔm以上の温度に加熱することが可能な、互いに大きさの異なる２値の熱エネルギーを適宜供給すれば、平衡－非平衡の状態変化、したがって蛍光性化合物の状態を可逆的に繰り返すことができる。

【００１８】しかし、一般的には状態変化の速度と状態の保存安定性とは相反する性質であり、蛍光性化合物および可逆剤の２成分系で両特性を同時に向上させることは困難であることが多い。そこで、本発明においては、蛍光性化合物および可逆剤にさらに相分離制御剤を配合した組成系を用いることが好ましい。相分離制御剤とは、相分離制御剤は蛍光性化合物および可逆剤からなる２成分系の融点よりも低い融点を有し、その融点以上において可逆剤および蛍光性化合物を溶解し、その融点前後において組成系での蛍光性化合物の拡散速度を大幅に増加させ、その融点以下において蛍光性化合物の蛍光特性に及ぼす影響が少ないという性質を有する熱可塑性低分子有機材料である。蛍光性化合物および可逆剤に上記のような性質を有する相分離制御剤を添加すれば、混合状態から相分離状態への変化の過程で組成系の相分離速度を急激に上昇させることができる。

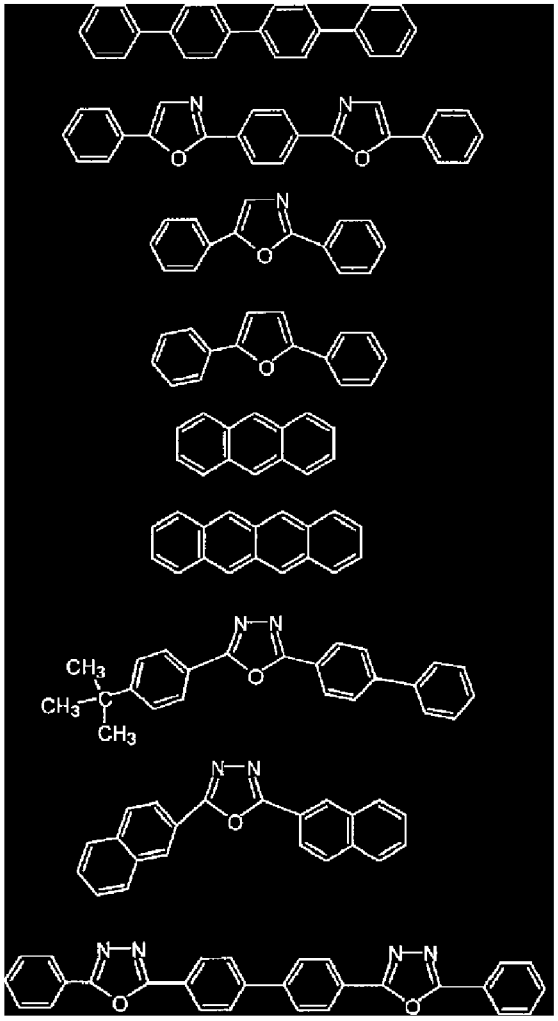
【００１９】図２に、蛍光性化合物、可逆剤および相分離制御剤の３成分系の状態変化のメカニズムの簡易モデルを示す。この図では、相分離制御剤をＣと表している。室温（Ｔrt）においては、蛍光性化合物の相と可逆剤の相と相分離制御剤の相が互いに相分離した状態が平衡状態に近い。この状態から、組成系の融点（Ｔm）以上に加熱すると、各成分は溶融して混合した状態になる。次いで、３成分系を溶融状態から冷却すると、ガラス転移点（Ｔｇ）以下の低温で凝固し、可逆剤は平衡溶解度以上の蛍光性化合物および相分離制御剤を取り込んで非晶質化する。非晶質の３成分系は非平衡状態にあるが、ガラス転移点（Ｔｇ）以下の温度では極めて長寿命であり、室温がＴｇ以下であるならば容易に平衡状態に移ることはない。次いで、非平衡状態にある非晶質の３成分系を加熱してガラス転移点を超えると、系内での蛍光性化合物および相分離制御剤の拡散速度が急激に高まるため、本来の平衡状態へ戻る方向に可逆剤との相分離が加速される。相分離制御剤は結晶性が高くかつ拡散速度も大きいため、相分離制御剤を含有する３成分系の状態変化の速度は、２成分系と比べて大幅に増加する。

【００２０】本発明において用いられる蛍光性化合物は、吸収極大波長が４００ｎｍ以下のものである。吸収極大波長が４００ｎｍ以下の蛍光性化合物は、可視光の吸収が小さいため、人間の目に見えにくくなる（ステルス性が高くなる）。蛍光性化合物の４００ｎｍでの吸光度は、透過で０．２以下、反射で０．４以下であることが好ましい。

【００２１】上述した原理的な説明からわかるように、本発明において用いられる蛍光性化合物としては、（１）濃度の違いにより蛍光強度または蛍光波長が変化するもの、または（２）結晶状態と非晶質状態で蛍光強度または蛍光波長が変化するものが用いられる。（１）に分類される蛍光性化合物は大きな双極子モーメントを有することが好ましい。一般に、通常の凝集状態でも蛍光を発する化合物は、結晶の方が非晶質よりも蛍光強度が高い。（１）に分類される蛍光性化合物を下記「化１」および「化２」に、（２）に分類される蛍光性化合物を下記「化３」および「化４」にそれぞれ示す。

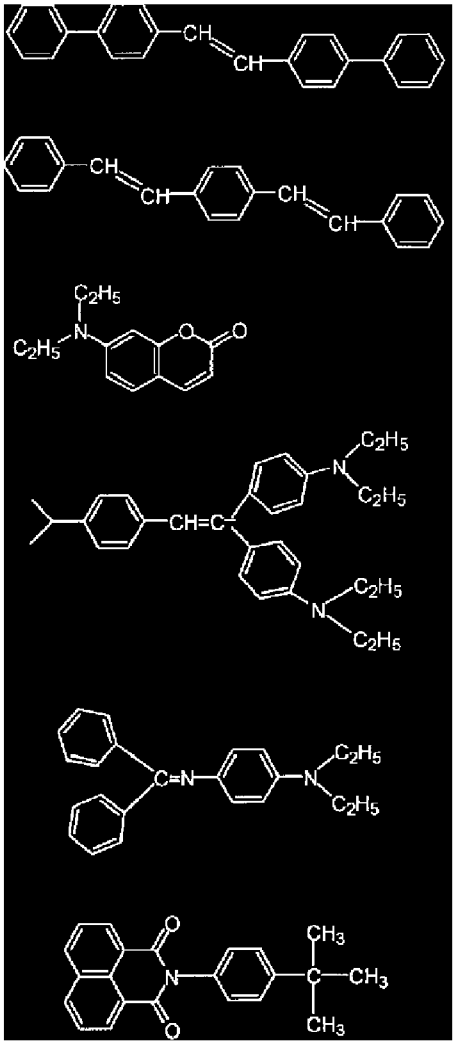
【００２２】

【化１】



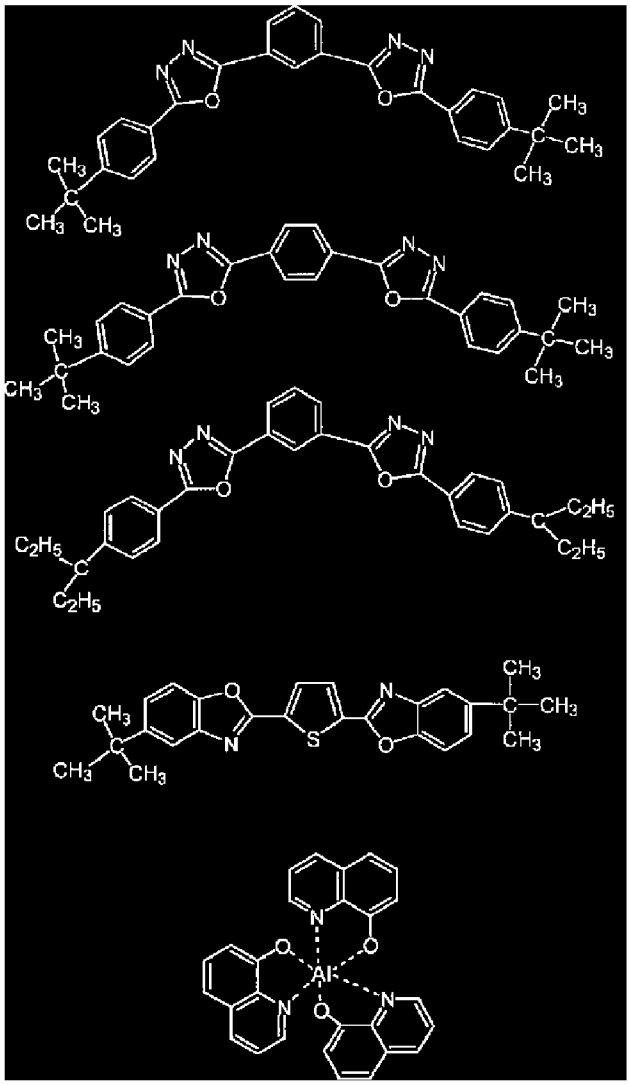
【００２３】

【化２】

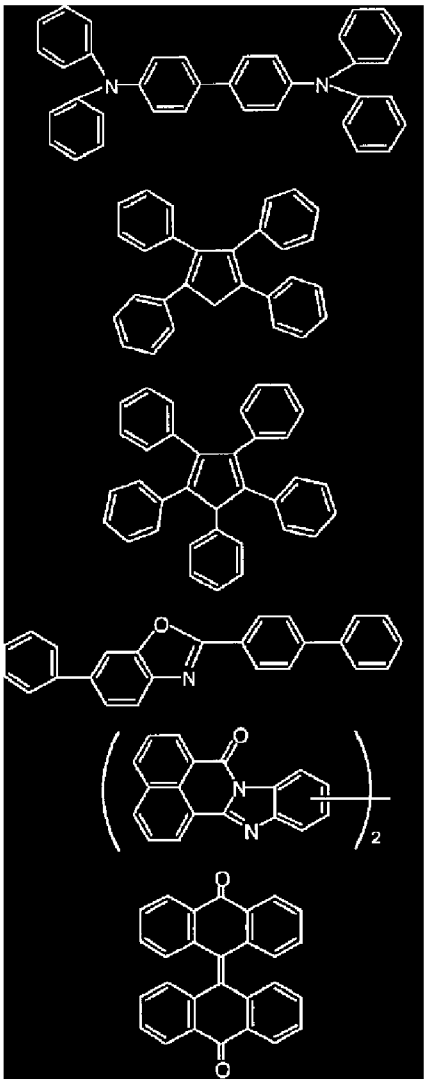


【００２４】

【化３】



【００２５】
【化４】



【００２６】本発明において用いられる可逆剤は、ステロイド骨格のように円柱状に近く嵩高い分子骨格を有しアルコール性ヒドロキシル基を含有する化合物（代表的にはステロール化合物）が好ましい。逆に、分子量が１００未満の低分子化合物や、分子量が１００以上であっても直鎖状長鎖アルキル誘導体や平面状芳香族化合物は、可逆剤として適さない。

【００２７】可逆剤として好適に用いられるステロール化合物としては、コレステロール、ステグマステロール、プレグネノロン、メチルアンドロステンジオール、エストラジオールベンゾエート、エピアンドロステン、ステノロン、β－シトステロール、プレグネノロンアセテート、β－コレスタロール、５，１６－プレグナジエン－３β－オール－２０－オン、５α－プレグネン－３β－オール－２０－オン、５－プレグネン－３β，１７－ジオール－２０－オン　２１－アセテート、５－プレグネン－３β，１７－ジオール－２０－オン　１７－アセテート、５－プレグネン－３β，２１－ジオール－２０－オン　２１－アセテート、５－プレグネン－３β，１７－ジオール　ジアセテート、ロコゲニン、チゴゲニン、エスミラゲニン、ヘコゲニン、ジオスゲニンなどが挙げられる。これらは単独でまたは２種以上混合して用いることができる。

【００２８】本発明において、消光剤としては、一般に励起三重項状態が安定な化合物が用いられる。具体的には、アクセプター分子、たとえばアントラキノン、ナフトキノン、ベンゾキノン、ＴＣＮＱなど；ニトロ化合物、たとえばトリニトロフルオレン、ジニトロアントラセンなど；含ハロゲン化合物、たとえばトリブロモナフタレン、トリヨードナフタレンなどが挙げられる。

【００２９】本発明において用いられる相分離制御剤としては、炭素数が８以上の長直鎖部（CH_2）$_n$と極性基たとえばＯＨ，ＣＯ，ＣＯＯＨなどを有する結晶性の強い低分子有機材料が好適である。具体的には、直鎖高級１価アルコール、たとえば１－ドコサノール、１－テトラコサノール、１－ヘキサコサノール、１－オクタコサノール；直鎖高級多価アルコール、たとえば１，１２－ドデカンジオール、１，１２－オクタデカンジオール、１，２－テトラデカンジオール、１，２－ヘキサデカンジオール；直鎖高級脂肪酸、たとえばベヘン酸、１－ドコサン酸、１－テトラコサン酸、１－ヘキサコサン酸、１－オクタコサン酸など；直鎖高級多価脂肪酸、たとえばドデカン二酸、１，１２－ドデカンジカルボキシル酸；直鎖高級ケトン、たとえばステアロン；直鎖高級脂肪酸アルコールアミド、たとえばステアリン酸イソプロパノールアミド、ベヘン酸イソプロパノールアミド、ベヘン酸ヘキサノールアミド；直鎖高級脂肪酸ジオールジエステル、たとえばエチレングリコールラウリン酸ジエステル、カテコールラウリン酸ジエステル、シクロヘキサンジオールラウリン酸ジエステルなどが挙げられる。これらは単独でまたは２種以上混合して用いることができる。また、混合物の一例として、エステル系ワックス、アルコール系ワックス、ウレタン系ワックスに、相分離制御剤として使用できる材料がある。

【００３０】蛍光性化合物および可逆剤の２成分系では、蛍光性化合物１重量部に対し可逆剤１～２００重量部、さらには１０～１００重量部を配合することが好ましい。可逆剤が１重量部未満では、組成系の結晶質－非晶質転移または相分離状態の変化を起こさせることが困難になる。可逆剤が２００重量部を超えると蛍光特性の変化が小さくなる傾向がある。

【００３１】蛍光性化合物、可逆剤および相分離制御剤の３成分系では、蛍光性化合物に対する可逆剤の配合比は上述した２成分系と同様である。また、蛍光性化合物１重量部に対し相分離制御剤０．１～１００重量部、さらには１～５０重量部を配合することが好ましい。相分離制御剤が０．１重量部未満では、組成系の相分離速度を高める効果がほとんど得られない。相分離制御剤が１００重量部を超えると、組成系の非平衡状態が不安定に

なり、記録の熱安定性が低下するおそれがある。

【００３２】本発明のステレス感熱記録媒体では、組成系のガラス転移点が低く室温に近いと、環境温度のわずかな上昇により、蛍光性化合物の拡散による相分離や組成系の結晶化が進行しやすく、記録の熱安定性が低下する傾向がある。このため、組成系の全体または一部が非晶質を形成したときのガラス転移点Ｔｇは２５℃以上さらには５０℃以上であることが好ましい。この点を考慮すると、蛍光性化合物は分子量が大きくかつ重量当りの融解エンタルピー変化ΔＨが小さいことが好ましい。具体的には、球状に近く嵩高い分子骨格を有する蛍光性化合物や、分子間で水素結合を形成し得る複数のサイトを有する蛍光性化合物を用いることが好ましい。

【００３３】なお、上記とは逆に、ガラス転移点Ｔｇが室温に近い組成系を用いれば、記録された情報が所望の期間だけ保存された後に自然に消去されるステルス感熱記録媒体として利用することもできる。さらに、特殊な用途においては、組成系のガラス転移点Ｔｇが室温より低く組成系を用いることもできる。このような特殊な用途として、冷蔵が必要な物質を収納する冷蔵庫において故障や運搬時などに一時的な温度上昇が発生した場合に、組成系の結晶化に伴う蛍光状態の変化を利用して表示することが考えられる。

【００３４】一方、本発明においては、組成系のガラス転移点Ｔｇが高すぎると、情報の記録・消去を行うにあたって、結晶化温度Ｔｃ以上融点Ｔｍ未満または融点Ｔｍ以上の温度まで組成系を加熱する際に、大きな熱エネルギーが必要となり省エネルギーの点で不利になる。したがって、組成系のガラス転移点Ｔｇは１５０℃以下であることが好ましい。

【００３５】一般的に、混合物のガラス転移点Ｔｇは、配合された各成分のガラス転移点Ｔｇの重量平均的な値を示すことが知られている。本発明においても、組成系のガラス転移点Ｔｇを所望の値に設定するには、組成系の各成分のそれぞれのガラス転移点Ｔｇを制御することが有効である。本発明のステルス感熱記録媒体では配合される蛍光性化合物および可逆剤として、それぞれガラス転移点Ｔｇが２５℃以上さらには５０℃以上である化合物を用いることが好ましい。また、記録の熱安定性を考慮すると、特に可逆剤の融点は１００℃以上であることが望ましい。

【００３６】本発明のステルス感熱記録媒体用いられる組成系や各成分のガラス転移点Ｔｇに関しては、たとえば示差走査型熱量分析装置（ＤＳＣ）を使用して、組成系の全体もしくは一部、または各成分について測定することができる。

【００３７】一般に、明確なガラス転移点Ｔｇを示し非晶質を形成しやすい成分は、ガラス転移点Ｔｇと融点Ｔｍの間にＴｇ＝ａ・Ｔｍ（ａは０．６５～０．８）（Ｔｇ、Ｔｍはともに絶対温度）という経験則が成立する。このため、組成系のガラス転移点Ｔｇを高く設定すると、組成系の融点Ｔｍも上昇する傾向がある。この場合、記録の熱安定性を向上できる反面、組成系を融解する際に非常に高温まで加熱する必要がある。これに伴い、たとえば耐熱性に優れた基板が求められるため、実用性が低下する。この問題を回避するには、複数の結晶形を形成する組成系を用いることが有効である。複数の結晶形を形成する組成系を調製するには、蛍光性化合物や可逆剤として複数の結晶形を形成し得る化合物を用いればよい。

【００３８】本発明のステルス感熱記録媒体においては、蛍光性化合物、可逆剤および相分離制御剤以外の成分として、断熱剤や蓄熱剤を適宜配合してもよい。本発明のステルス感熱記録媒体をシート状に加工するには、上述した各成分からなる組成物の融液を薄く引き延ばしたり、組成物を適切な溶媒に溶解させてキャストすることにより薄膜にする方法が用いられる。このようにして形成される薄膜の膜厚は０．５μｍ以上５０μｍ以下であることが好ましい。薄膜の膜厚が薄すぎると、蛍光特性の変化を十分に利用できなくなる。薄膜の膜厚が厚すぎると、記録・消去時に大きな熱エネルギーが必要となり、高速で記録・消去を行うことが困難になる。

【００３９】本発明のステルス感熱記録媒体は、強度向上の観点から、上述したような組成物を適当な媒質中に担持させた形態で使用してもよい。具体的には、バインダーポリマーへの分散、無機ガラスへの分散、多孔質基材への含浸、層状物質へのインターカレーション、マイクロカプセル化などが挙げられる。

【００４０】組成物をバインダーポリマーに分散させる場合は、組成物の融液、溶液または微粒子を調製し、必要に応じてその他の成分を添加し、バインダーポリマーとともに各種分散法で分散させる。得られた生成物を適当な基材上に塗布してもよい。

【００４１】バインダーポリマーとしては各種の熱可塑性樹脂、具体的には、ポリエチレン；塩素化ポリエチレン類；エチレン共重合体、たとえばエチレン・酢酸ビニル共重合体、エチレン・アクリル酸・無水マレイン酸共重合体など；ポリブタジエン；ポリエステル、たとえばポリエチレンテレフタレート、ポリブチレンテレフタレート、ポリエチレンナフタレートなど；ポリプロピレン；ポリイソブチレン；ポリ塩化ビニル；ポリ塩化ビニリデン；ポリ酢酸ビニル；ポリビニルアルコール；ポリビニルアセタール；ポリビニルブチラール；四フッ化エチレン樹脂；三フッ化塩化エチレン樹脂；フッ化エチレン・プロピレン樹脂；フッ化ビニリデン樹脂；フッ化ビニル樹脂；四フッ化エチレン共重合体、たとえば四フッ化エチレン・パーフルオロアルコキシエチレン共重合体、四フッ化エチレン・パーフルオロアルキルビニルエーテル共重合体、四フッ化エチレン・六フッ化プロピレン共重合体、四フッ化エチレン・エチレン共重合体な

ど；フッ素樹脂、たとえば含フッ素ポリベンゾオキサゾールなど；アクリル樹脂；メタクリル樹脂、たとえばポリメタクリル酸メチルなど；ポリアクリロニトリル；アクリロニトリル共重合体、たとえばアクリロニトリル・ブタジエン・スチレン共重合体など；ポリスチレン；ハロゲン化ポリスチレン；スチレン共重合体、たとえばスチレン・メタクリル酸共重合体、スチレン・アクリロニトリル共重合体など；アセタール樹脂；ポリアミド類、たとえばナイロン６６など；ポリカーボネート；ポリエステルカーボネート；セルロース系樹脂；フェノール樹脂；ユリア樹脂；エポキシ樹脂；不飽和ポリエステル樹脂；アルキド樹脂；メラミン樹脂；ポリウレタン；ジアリールフタレート樹脂；ポリフェニレンオキサイド；ポリフェニレンスルフィド；ポリスルホン；ポリフェニルスルホン；シリコーン樹脂；ポリイミド；ビスマレイミドトリアジン樹脂；ポリイミドアミド；ポリエーテルスルホン；ポリメチルペンテン；ポリエーテルエーテルケトン；ポリエーテルイミド；ポリビニルカルバゾール；ノルボルネン系非晶質ポリオレフィンなどが挙げられる。

【００４２】組成物をバインダーポリマー中に分散させる場合、蛍光性化合物１重量部に対してバインダーポリマー０．０１～１００重量部、さらには０．０５～２０重量部を配合することが好ましい。バインダーポリマーが０．０１重量部未満では、感熱記録媒体の強度を十分に上げることができない。バインダーポリマーが１００重量部を超えると、蛍光強度の変化を十分に利用できなくなる。

【００４３】分散法としては、ミキサー、サンドミル、ボールミル、インペラーミル、コロイドミル、３本ロールミル、ニーダー、２本ロール、バンバリーミキサー、ホモゲナイザー、ナノマイザーなどを用いる方法が挙げられる。これらの分散法は、融液または溶液の粘度、感熱記録媒体の用途、形態などに応じて適宜選択することができる。

【００４４】分散により得られた生成物を基材上に塗布する方法としては、スピン塗布、引上げ塗布、エアドクター塗布、ブレード塗布、ロッド塗布、ナイフ塗布、スクイズ塗布、含浸塗布、リバースロール塗布、トランスファーロール塗布、グラビア塗布、キスロール塗布、キャスト塗布、スプレー塗布、カーテン塗布、カレンダー塗布、押し出し塗布、静電塗布などが挙げられる。これらの塗布法も、感熱記録媒体の用途、形態などに応じて適宜選択することができる。

【００４５】組成物を無機ガラスシートに担持させる場合、ゾル－ゲル法で調製できる無機ガラスを用いることが好ましい。この場合、ゲル化温度はあまり高くないことが望ましい。また、多孔質媒体としては各種無機化合物、層状物質としては雲母、粘土鉱物、滑石、緑石族などが挙げられる。

【００４６】本発明に係る組成物を被膜中に封入したマイクロカプセルを作製するには、界面重合法、ｉｎ－ｓｉｔｕ重合法、液中硬化被覆法、水溶液系からの相分離法、有機溶液系からの相分離法、融解分散冷却法、気中懸濁法、スプレードライング法などを用いることができる。これらの方法は、感熱記録媒体の用途、形態などに応じて適宜選択することができる。

【００４７】マイクロカプセルの被膜としては、各種の熱硬化性樹脂、具体的には、縮合系ポリマー、たとえばメラミン樹脂、エポキシ樹脂、尿素樹脂、フェノール樹脂、フラン樹脂など；三次元架橋ビニルポリマー、たとえばスチレン－ジビニルベンゼン共重合体、メチルメタクリレート－ビニルアクリレート共重合体など；またはバインダーポリマーとして例示した各種の熱可塑性樹脂を適宜用いることができる。また、上記の熱硬化性樹脂および熱可塑性樹脂から選択される２種以上を用いて、多層の被膜を有するマイクロカプセルを作製してもよい。このようにして得られたマイクロカプセルを、バインダーポリマーや無機ガラスに分散させてもよい。このようにすれば、組成物自体はバインダーポリマーや無機ガラスに良好に分散できない場合でも、マイクロカプセル化により良好に分散状態が得られるようになる。

【００４８】本発明のステルス感熱記録媒体は、最も汎用的には、基材上に上述した組成物を記録層として形成した形態で用いられる。基材としては、プラスチック板、金属板、半導体基板、ガラス板、木板、紙、ＯＨＰシートなどを用いることができる。

【００４９】基材と記録層との密着性を向上させ、基材の耐溶剤性を向上させるために、基材と記録層との間に下引き層を設けてもよい。記録層の耐久性の向上や記録層へ熱エネルギーを供給するために用いられるサーマルプリンターヘッド（ＴＰＨ）へのスティッキング防止の観点から、記録層上に保護層を設けてもよい。保護層の材料としては、ワックス、熱可塑性樹脂、熱硬化性樹脂、光硬化性樹脂、水溶性樹脂、ラテックスなどが挙げられる。保護層の厚さは０．１～１００μｍ程度とすることが好ましい。また、保護層中に、離型剤、滑剤、耐熱剤、帯電防止剤などを適宜配合してもよい。

【００５０】保護層を形成するには、保護層の材料を溶媒中に溶解または分散させて塗布液を調製し、この塗布液を記録層上に塗布して乾燥させる方法が挙げられる。また、保護層として用いられる耐熱性フィルムに接着剤を塗布し、ドライラミネートにより記録層に接着させてもよい。

【００５１】耐熱性フィルムとしては、記録材料となる組成物の融点以上の熱変形温度を有するものであれば特に限定されない。具体的には、ポリエーテルエーテルケトン；ポリカーボネート；ポリアリレート；ポリスルホン；四フッ化エチレン樹脂；四フッ化エチレン共重合体、たとえばび四フッ化エチレン・パーフルオロアルコ

キシエチレン共重合体、四フッ化エチレン・パーフルオロアルキルビニルエーテル共重合体、四フッ化エチレン・六フッ化プロピレン共重合体、四フッ化エチレン・エチレン共重合体など；三フッ化塩化エチレン樹脂；フッ化ビニリデン樹脂；シリコーン樹脂；含フッ素ポリベンゾオキサゾール；ポリプロピレン；ポリビニルアルコール；ポリ塩化ビニリデン；ポリエステル、たとえばポリエチレンテレフタレート、ポリブチレンテレフタレート、ポリエチレンナフタレートなど；ポリスチレン；ポリアミド、たとえばナイロン６６など；ポリイミド；ポリイミドアミド；ポリエーテルスルホン；ポリメチルペンテン；ポリエーテルイミド；ポリウレタン；ポリブタジエンなどが挙げられる。これらは、熱エネルギーの供給方法、感熱記録媒体の用途、形態などに応じて適宜選択することができる。

【００５２】接着剤としては、一般にドライラミネート法に用いられる材料が適用できる。具体的には、アクリル樹脂；フェノキシ樹脂；アイオノマー樹脂；エチレン共重合体、たとえばエチレン・酢酸ビニル共重合体、エチレン・アクリル酸・無水マレイン酸共重合体など；ポリビニルエーテル；ポリビニルホルマール；ポリビニルブチラール；ゼラチン；アラビアゴム；ポリエステル；ポリスチレン；スチレン共重合体、たとえばスチレン－アクリル酸共重合体など；酢酸ビニル樹脂；ポリウレタン；キシレン樹脂；エポキシ樹脂；フェノール樹脂；尿素樹脂などが挙げられる。

【００５３】本発明のステルス感熱記録媒体において、結晶質－非晶質転移、または相分離状態の変化に基づく記録・消去を行うためには、互いに大きさの異なる２値の熱エネルギーを供給するか、または融点Ｔｍ以上に加熱した後の冷却速度が互いに異なる２種の熱履歴を供給する。

【００５４】記録時に熱エネルギーを供給するには、サーマルプリンタヘッド（ＴＰＨ）や、レーザービームなどを用いることが好ましい。サーマルヘッドは、分解能はそれほど良好ではないが、感熱記録媒体を大面積にわたって加熱でき、かつ装置を小型化する上で有利である。一方、レーザービームはスポット径を小径化することにより高密度記録への対応が容易であり、また記録・消去速度を高速化できる点で有利である。ただし、レーザービームを用いる場合、透光性の良好な非晶質に対してもレーザービームを効率よく吸収させるために、レーザービームの波長に吸収帯を有する光吸収層を設けるか、または組成系にレーザービームの波長に吸収帯を有する化合物を配合することが望ましい。なお、互いにエネルギーの異なる複数のＴＰＨまたはレーザービームを使用すれば、オーバーライト記録も可能である。

【００５５】消去時に熱エネルギーを供給するには、感熱記録媒体全体を一度に加熱できるホットスタンパーや熱ロールなどを用いることが好ましい。加熱された感熱記録媒体を冷却するには、自然放冷してもよいし、冷スタンパー、冷ロール、冷気流、ペルチェ素子などにより急冷してもよい。

【００５６】

【実施例】以下、本発明の実施例を説明する。

実施例１

蛍光性化合物として化学式（１）で示される最大吸収波長２９４ｎｍのＰＱＰ１．０重量部、可逆剤として化学式（２）で示されるプレグレノロン１０重量部、およびバインダーポリマーとしてポリメチルメタクリレート３重量部をトルエンに分散させた。ＰＱＰは、結晶状態では濃度消光のための蛍光強度が極めて低いが、非晶質状態では蛍光強度が高い。

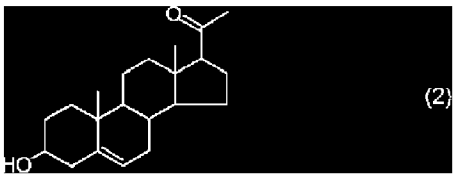
【００５７】

【化５】



【００５８】

【化６】

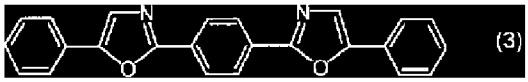


【００５９】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録層１２中の成分を結晶化させた。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。

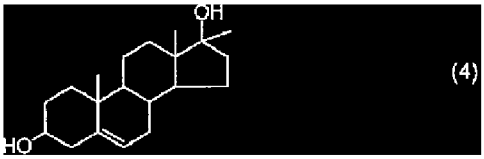
【００６０】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を非晶質化することにより、透明バーコードを形成した。暗箱の中で波長２５４ｎｍの紫外光を照射したところ、印字部から比較的強い紫色発光が認められ、バーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを４秒間押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。

【００６１】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が１０％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。

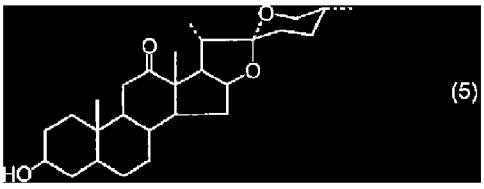
【００６２】実施例２
蛍光性化合物としてＰＱＰの代わりに化学式（３）で示される最大吸収波長３５８ｎｍのＰＯＰＯＰを用いた以外は実施例１と同様にしてステルス感熱記録媒体を作製し、透明バーコードを形成した。ＰＯＰＯＰは、結晶状態では濃度消光のための蛍光強度が極めて低いが、非晶質状態では蛍光強度が高い。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、印字部から比較的強い青色発光が認められ、バーコード情報を確認できた。次に、全面に１３０℃のホットスタンパーを４秒間押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。
【００６３】
【化７】



【００６４】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が１０％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。
【００６５】実施例３
可逆剤としてプレグレノロンの代わりに化学式（４）で示されるメチルアンドロステンジオールを用いた以外は実施例２と同様にしてステルス感熱記録媒体を作製し、透明バーコードを形成した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、印字部から比較的強い青色発光が認められ、バーコード情報を確認できた。次に、全面に１３０℃のホットスタンパーを８秒間押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。
【００６６】
【化８】



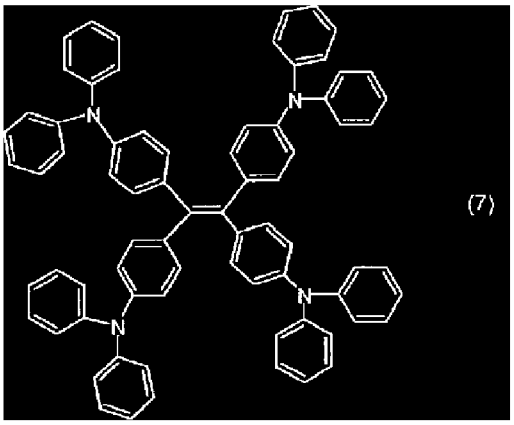
【００６７】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が６％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。
【００６８】実施例４
蛍光性化合物として化学式（１）で示される最大吸収波長２９４ｎｍのＰＱＰ１．０重量部、可逆剤として化学式（５）で示されるヘコゲニン１０重量部、相分離制御剤として化学式（６）で示される１，１８－オクタデカンジオール２重量部、およびバインダーポリマーとしてスチレン－マレイン酸共重合体３重量部をトルエン／シクロヘキサノン混合溶媒に分散させた。
【００６９】
【化９】



【００７０】
【化１０】

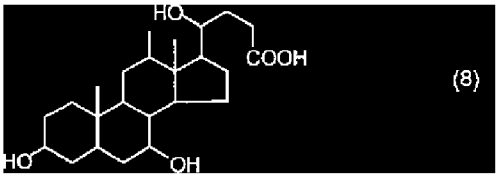


【００７１】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録層１２中の成分を結晶化させた。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。
【００７２】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を非晶質化することにより、透明バーコードを形成した。暗箱の中で波長２５４ｎｍの紫外光を照射したところ、印字部から比較的強い紫色発光が認められ、バーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを０．５秒間押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。
【００７３】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が１０％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。
【００７４】実施例５
蛍光性化合物として化学式（７）で示される最大吸収波長３８５ｎｍのＴＴＰＡＥ１．０重量部、可逆剤として化学式（８）で示されるコール酸１０重量部、およびバインダーポリマーとしてポリメチルメタクリレート３重量部をトルエンに分散させた。ＴＴＰＡＥは、結晶状態では蛍光強度が極めて高く、非晶質状態では蛍光強度が低い。
【００７５】
【化１１】



【００７６】

【化１２】



【００７７】厚さ４０μｍのＰＥＮフィルム上に、スクリーン印刷機を用いて上記で調製した分散液を選択的に印刷して透明バーコードを形成した。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、印字部から青色発光が認められ、バーコード情報を確認できた。次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１５Ｖ、パルス幅０．８ｍｓｅｃで全面を加熱して非晶質化した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、青色発光は認められず、バーコード情報を消去できた。バーコード情報を消去してから、３０℃で１年間放置した後にも、消去状態に変化は認められなかった。

【００７８】また、消去されたバーコード上に、再びスクリーン印刷で別の透明バーコードを印刷した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、新たに印刷した印字部から青色発光が認められ、バーコード情報を確認できた。次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１５Ｖ、パルス幅０．８ｍｓｅｃで全面を加熱して非晶質化した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、青色発光は認められず、バーコード情報を消去できた。

【００７９】実施例６

実施例５と全く同様にして、蛍光性化合物としてＴＴＰＡＥ、可逆剤としてコール酸、およびバインダーポリマーとしてポリメチルメタクリレートを用いて、ＰＥＮフィルム上に透明バーコードを形成した。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、印字部から青色発光が認められ、バーコード情報を確認できた。

【００８０】次に、透明バーコード上にジメトキシエタンを塗布した後、乾燥させた。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、青色発光は認められず、バーコード情報を消去できた。バーコード情報を消去してから、３０℃で１年間放置した後にも、消去状態に変化は認められなかった。

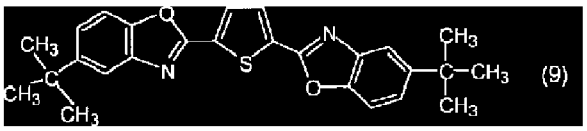
【００８１】また、消去されたバーコード上に、再びスクリーン印刷で別の透明バーコードを印刷した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、新たに印刷した印字部から青色発光が認められ、バーコード情報を確認できた。

【００８２】実施例７

蛍光性化合物として化学式（９）で示される最大吸収波長３７２ｎｍのＢＢＯＴ３．０重量部、およびバインダーポリマーとしてスチレン－マレイン酸共重合体１．０重量部をトルエン／シクロヘキサノン混合溶媒に分散させた。ＢＢＯＴは、結晶状態では蛍光強度が極めて高く、非晶質状態では蛍光強度が低い。

【００８３】

【化１３】



【００８４】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録層１２中のＢＢＯＴを結晶化させた。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。

【００８５】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を非晶質化することにより、透明バーコードを形成した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、非印字部から比較的強い青色発光が認められ、ネガ表示のバーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを８秒間押圧し、室温で放置

したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。

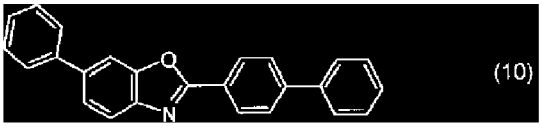
【００８６】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が５％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。

【００８７】実施例８

蛍光性化合物として化学式（１０）で示される最大吸収波長３２７ｎｍのＰＢＢＯ３．０重量部、およびバインダーポリマーとしてスチレン－マレイン酸共重合体１．０重量部をトルエン／シクロヘキサノン混合溶媒に分散させた。ＰＢＢＯは、結晶状態と非晶質状態とで蛍光強度にそれほど変化はないが、非晶質状態の方が蛍光波長が長波長である。

【００８８】

【化１４】



【００８９】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録層１２中のＰＢＢＯを結晶化させた。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。

【００９０】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を非晶質化することにより、透明バーコードを形成した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、印字部の最大蛍光波長は４５０ｎｍ、非印字部の最大蛍光波長は４２３ｎｍであった。両者の間で蛍光強度はあまり差がなかった。そこで、波長４３５ｎｍ以下の光をカットするフィルターを介して蛍光を観測したところ、印字部の方が明るく青色発光し、バーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを８秒間押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード情報を消去することができた。

【００９１】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が５％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。

【００９２】実施例９

蛍光性化合物として化学式（１０）で示される最大吸収波長３２７ｎｍのＰＢＢＯ３．０重量部、蛍光消光剤として化学式（１１）で示されるアントラキノン誘導体０．３重量部、バインダーポリマーとしてスチレン－マレイン酸共重合体１．０重量部をトルエン／シクロヘキサノン混合溶媒に分散させた。

【００９３】

【化１５】



【００９４】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録層１２中の成分を結晶化させた。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。

【００９５】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を非晶質化することにより、透明バーコードを形成した。暗箱の中で波長３５０ｎｍの紫外光を照射したところ、非印字部から比較的強い青色発光が認められ、ネガ表示のバーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを８秒押圧し、室温で放置したところ、印字部が結晶質に戻り、バーコード記録を消去できた。

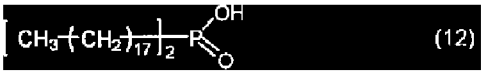
【００９６】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が２％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。

【００９７】実施例１０

蛍光性化合物として化学式（１）で示される最大吸収波長２９４ｎｍのＰＱＰ１．０重量部、可逆剤として化学式（１２）で示されるリン酸の長鎖アルキル誘導体１０重量部、およびバインダーポリマーとしてポリメチルメタクリレート３重量部をトルエンに分散させた。

【００９８】

【化１６】



【００９９】図３に示すように、厚さ４０μｍのＰＥＮフィルム１１上に、スクリーン印刷機を用いて上記で調製した分散液を印刷して膜厚約１０μｍの記録層１２を形成した。その上に光硬化性エポキシ樹脂を塗布した後、光硬化させて膜厚０．４μｍの保護層１３を形成し、ステルス感熱記録媒体を作製した。このフィルム全面に熱ロールを押圧した後、室温で自然放冷することにより、記録媒体を平衡状態にした。フィルムを適当な大きさに裁断した後、着色画像が形成された紙の上に接着剤で貼り付けた。

【０１００】次に、東芝製サーマルヘッド（６ｄｏｔ／ｍｍ、３８０Ω）を使用し、印加電圧１２Ｖ、パルス幅０．８ｍｓｅｃでバーコード情報を加熱印字して印字部を準平衡状態にすることにより、透明バーコードを形成した。暗箱の中で波長２５４ｎｍの紫外光を照射したところ、印字部から比較的強い紫色発光が認められ、バーコード情報を確認できた。次いで、全面に１３０℃のホットスタンパーを４秒押圧し、室温で放置したところ、印字部が平衡状態に戻り、バーコード記録を消去できた。

【０１０１】上記と同様の記録・消去を２００サイクル行った後にも、印字部からの発光強度が８％低下しただけであり、著しい劣化は認められなかった。また、３０℃で１年間放置した後にも、バーコード情報に変化は認められなかった。

【０１０２】

【発明の効果】以上詳述したように本発明によれば、耐熱性に優れ、高速で書き込みおよび消去が可能で、紫外線照射による蛍光発光で簡単に読み出し可能なステルス感熱記録媒体およびこれを用いた透明バーコードを提供することができる。

【図面の簡単な説明】

【図１】本発明に係る蛍光性化合物および可逆剤を含有する２成分系における状態変化のメカニズムの簡易的なモデルを示す説明図。

【図２】本発明に係る蛍光性化合物、可逆剤および相分離制御剤を含有する３成分系における状態変化のメカニズムの簡易的なモデルを示す説明図。

【図３】本発明の実施例で作製されたステルス感熱記録媒体の断面図。

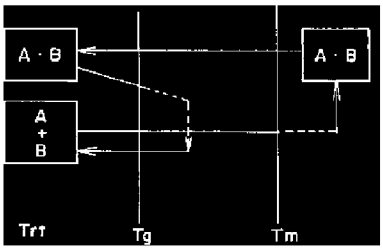
【符号の説明】

１１…ＰＥＮフィルム

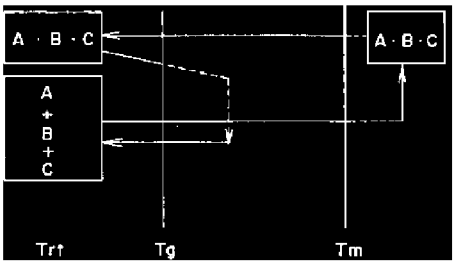
１２…記録層

１３…保護層

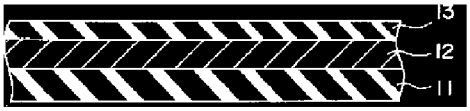
【図１】



【図２】



【図３】



Espacenet

Bibliographic data: JPH02108873 (U) — 1990-08-29

No title available

Inventor(s):

Applicant(s):

Classification:	**- international:** ***B65D51/24;*** (IPC1-7): B65D51/24
	- cooperative:
Application number:	JP19890015643U 19890213
Priority number(s):	JP19890015643U 19890213

Abstract not available for JPH02108873 (U)

K-FEE SYSTEM GMBH, EX2009, page 021
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

⑲日本国特許庁（JP）　⑪実用新案出願公開

⑫公開実用新案公報（U）　平2−108873

⑤Int. Cl.⁵	識別記号	庁内整理番号	㊸公開　平成2年(1990)8月29日
B 65 D 51/24		D 6929−3E	

審査請求　有　請求項の数 3　（全3頁）

㊹考案の名称　容器内の内容物を触覚的に識別する装置

㉑実　願　平1−15643
㉒出　願　平1(1989)2月13日

㉒考案者　金子　昭伯　愛知県西尾市下町下山5番地
㉑出願人　金子　昭伯　愛知県西尾市下町下山5番地
㉔代理人　弁理士　竹中　一宣

㊼実用新案登録請求の範囲

① 流体、粉体、顆粒等の粉流体形態をなす調味料、その他清流飲料水、コーヒー等の食料品が収納されている容器本体と、この容器本体に設けられる蓋体又はキャップとで構成される容器又は缶、瓶等の容器であつて、この蓋体並びにキャップに容器内の内容物を識別できる凹状及び／又は凸状又は凹凸状の組合せ等で形成される触覚的な記号が、瞬時に判断できる蓋体又はキャップのほぼ中央部の位置等に設けられている容器内の内容物を触覚的に識別する装置。

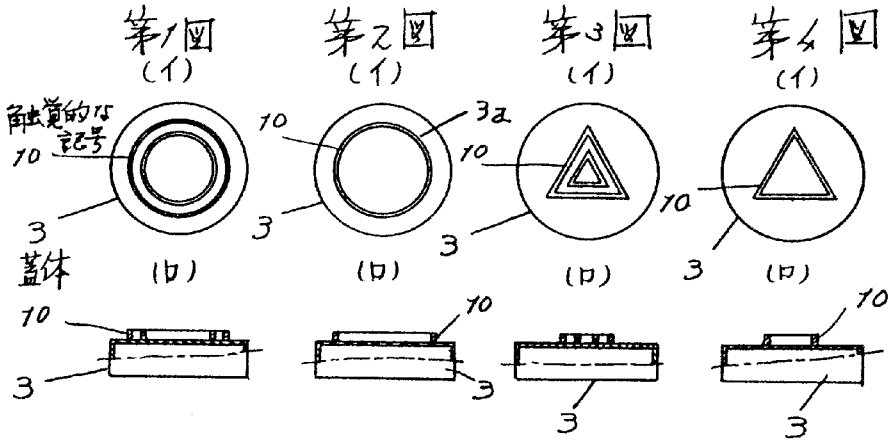
② 流体、粉体、顆粒等の粉流体形態をなす調味料、その他清流飲料水、コーヒー等の食料品が収納されている缶、瓶等の容器であつて、この容器の容器本体側に容器内の内容物を識別できる凹状及び／又は凸状又は凹凸状の組合せ等で形成される触覚的な記号が設けられ、かつこの触覚的な記号の上方が蓋側に向くように設けられている容器内の内容物を触覚的に識別する装置。

③ 触覚的な記号が、全国的に統一された触覚的な記号となつている実用新案登録請求の範囲第1項、第2項又は第3項記載の容器内の内容物を触覚的に識別する装置。

図面の簡単な説明

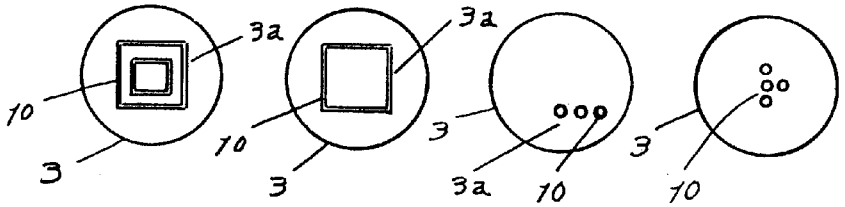
図面は本考案の一例を示すものであり、第1図イ～第4図イはそれぞれ一例を示す平面図、同ロはそれぞれ側面視した要部の一部を切り欠いた断面図、第5図～第10図はその他の一例の平面図、第11図、第12図は斜視図、第13図～第15図はアルミ缶の容器一例をそれぞれ示す斜視図、第16図～第18図は一升瓶等の容器一例をそれぞれ斜視図、第19図イ～オは凸状の触覚的な記号のその他の例を示す平面図である。

1：容器、2：容器本体、3：蓋体、3a：ほぼ中央部、4：容器本体側、5：蓋側、6：キャップ、6a：ほぼ中央部、8：飲み口、10，20，30：触覚的な記号。

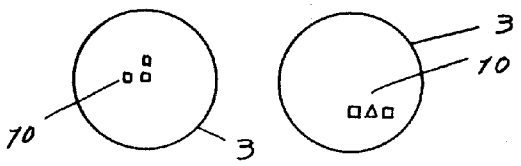


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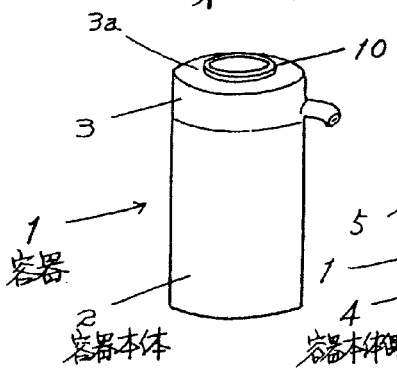
第5図　第6図　第7図　第8図



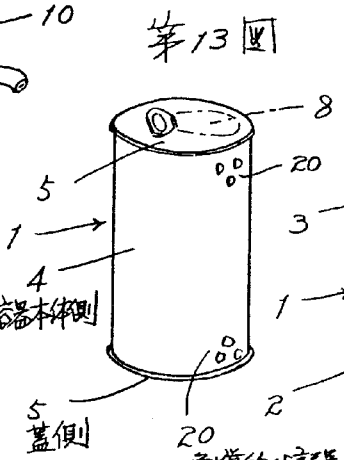
第9図　第10図



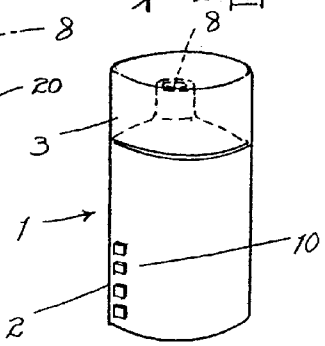
第11図



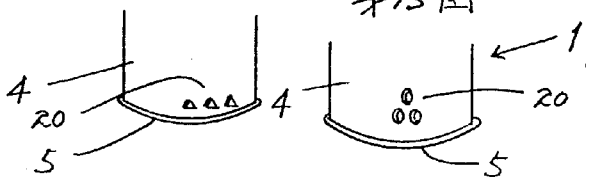
第13図



第12図

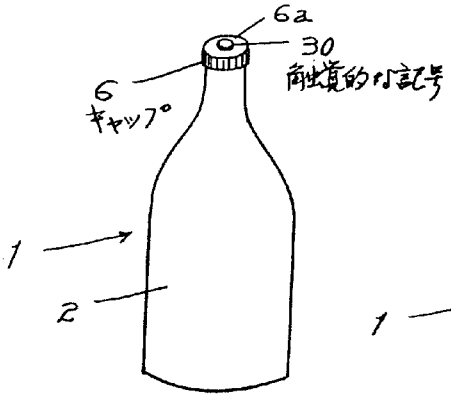


第14図　第15図

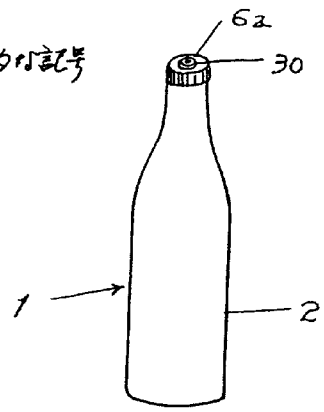


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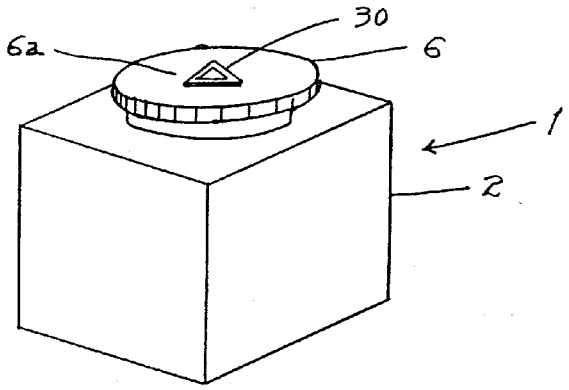
第16図



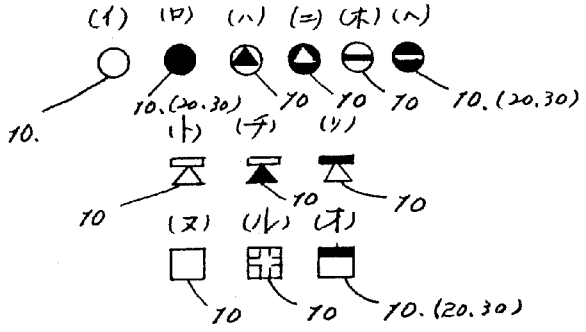
第17図



第18図



第19図



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	L. Long
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL LETTER

Sir:

Submitted herewith is an Information Disclosure Statement for consideration in the above-identified application. In accordance with the provisions of 37 C.F.R. 1.56, 37 C.F.R. 1.97, and 37 C.F.R. 1.98, Applicants request that a citation and examination of the references cited on the enclosed form PTO/SB/08a be made during the course of examination of the above-identified application for United States patent. Pursuant to 37 C.F.R. 1.98, copies of all foreign patent documents and non-patent documents are enclosed.

This Information Disclosure Statement is submitted as follows:

Submission without Certification

[X] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by payment of the fee set forth in 37 CFR 1.17(p).

Submission with Certification

[ ] Within three months of filing of a national application; within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; before the mailing date of a first Office Action on the merits, or before the mailing of a first Office Action after the filing of a Request for Continued Examination.

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[ ] After the period specified above, but before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the Certification specified in 37 CFR 1.97(e) which is set forth below.

[ ] After the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application and is accompanied by the fee set forth in 37 CFR 1.17(p) and the Certification specified in 37 CFR 1.97(e) which is set forth below.

Certification under 37 CFR 1.97(e)

[ ] The undersigned counsel for applicant(s) hereby certifies that each item of information contained in the accompanying Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than **three months** prior to the filing of the Information Disclosure Statement.

[ ] The undersigned counsel for applicant(s) hereby certifies that no item of information contained in the accompanying Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the accompanying Information Disclosure Statement was known to any individual designated in 37 CFR 1.56(c) more than **three months** prior to the filing of the Information Disclosure Statement.

Statement under 37 CFR 1.704(d)

[ ] The undersigned counsel for applicant(s) hereby states that each item of information contained in the accompanying Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and/or is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in § 1.56(c) more than **thirty days** prior to the filing of the information disclosure statement.

[ ] A copy of a Search Report from a corresponding foreign patent application is enclosed.

[ ] The Commissioner is hereby authorized to charge the amount of $_____ to cover the required fee to Deposit Account No. 02-1818.

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[X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-1818.

Respectfully submitted,

K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157

Dated: March 12, 2015

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Espacenet

Bibliographic data: JP2007257439 (A) — 2007-10-04

INVISIBLE BAR CODE AND DETECTION METHOD

Inventor(s): ENDO KAZUO; NOGUCHI MASAO ± (ENDO KAZUO, ; NOGUCHI MASAO)

Applicant(s): DAINIPPON INK & CHEMICALS ± (DAINIPPON INK & CHEM INC)

Classification: **- international:** ***G06K19/06; G06K7/10***
- cooperative:

Application number: JP20060082718 20060324

Priority number(s): JP20060082718 20060324

Abstract of JP2007257439 (A)

PROBLEM TO BE SOLVED: To provide an invisible bar code capable of being read by a detector not having a special image processing function though normally not visualized, and to provide a detection method therefor. ;SOLUTION: In this invisible bar code having a data part and a ground pattern part on a base material, the ground pattern part is formed of a film containing a fluorescent material and a binder resin. In the method for detecting the invisible bar code having the data part and the ground pattern part on the base material by the detector having an ultraviolet irradiation part and an optical detection part, the invisible bar code is formed with the film containing the fluorescent material and the binder resin in the ground pattern part, and the optical detection part of the detector does not have an image reversal function. ;COPYRIGHT: (C)2008,JPO&INPIT

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IPR2023-00502, U.S. PATENT 10,994,923

(19)日本国特許庁(JP)　(12)公開特許公報(A)　(11)特許出願公開番号
特開2007-257439
(P2007-257439A)
(43)公開日　平成19年10月4日(2007.10.4)

(51)Int.Cl.		F I			テーマコード（参考）
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G06K 7/10	(2006.01)	G06K	7/10	R	5B072

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(21)出願番号　特願2006-82718 (P2006-82718)
(22)出願日　平成18年3月24日 (2006.3.24)

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Fターム(参考)　5B035 AA13 BB01
5B072 CC24 DD02 GG06 JJ11 LL07
LL11

(54)【発明の名称】不可視バーコード及び検出方法

(57)【要約】
【課題】　通常可視化されていないにも係わらず、特別な画像処理機能を有しない検出機で読み取り可能な不可視バーコード及びその検出方法を提供する。
【解決手段】　第一に、基材上に、データ部と地模様部を有する不可視バーコードであって、地模様部が蛍光物質及び結着樹脂を含有する皮膜で形成された不可視バーコード。第二に、基材上に、データ部と地模様部を有する不可視バーコードを、紫外線照射部と光学的検出部を有する検出器で検出する方法であって、該不可視バーコードが、地模様部に蛍光物質及び結着樹脂を含有する皮膜が形成された不可視バーコードであり、検出器の光学的検出部が画像反転機能を有しない光学的検出部である不可視バーコードの検出方法。
【選択図】　なし

【特許請求の範囲】
【請求項1】
基材上に、データ部と地模様部を有する不可視バーコードであって、地模様部が蛍光物質及び結着樹脂を含有する皮膜で形成されたことを特徴とする不可視バーコード。
【請求項2】
前記した蛍光物質が、２３０～４００ｎｍに励起波長の最大値を有する蛍光物質である請求項１に記載の不可視バーコード。
【請求項3】
前記した蛍光物質の結着樹脂に対する含有比率が０．５～２０質量％である請求項１に記載の不可視バーコード。
【請求項4】
前記した蛍光物質が、２３０～４００ｎｍに励起波長の最大値を有する蛍光物質であり、結着樹脂がウレタン、ニトロセルロース、ポリアマイド、アクリル、ポリエステル、塩化ビニル、石油樹脂から選ばれる１種又はこれ等の混合物である請求項１に記載の不可視バーコード。
【請求項5】
前記した地模様部に形成された蛍光物質及び結着樹脂を含有する皮膜の厚さが０．１～２．０μｍである請求項１に記載の不可視バーコード。
【請求項6】
前記した基材が、可視の印刷模様が施された印刷基材である請求項１に記載の不可視バーコード。
【請求項7】
基材上に、データ部と地模様部を有する不可視バーコードを、紫外線照射部と光学的検出部を有する検出器で検出する方法であって、該不可視バーコードが、地模様部に蛍光物質及び結着樹脂を含有する皮膜が形成された不可視バーコードであり、検出器の光学的検出部が画像反転機能を有しない光学的検出部であることを特徴とする不可視バーコードの検出方法。
【請求項8】
可視の印刷模様が施された印刷基材上に、データ部と地模様部を有する不可視バーコードを、紫外線照射部と光学的検出部を有する検出器で検出する方法であって、該不可視バーコードが、地模様部に蛍光物質及び結着樹脂を含有する皮膜が形成された不可視バーコードであり、検出器の光学的検出部が画像反転機能を有しない光学的検出部であることを特徴とする不可視バーコードの検出方法。

【発明の詳細な説明】
【技術分野】
【0001】
本発明は、蛍光物質を含有するクリアインキで印刷された不可視バーコード及び検出方法に関する。
【背景技術】
【0002】
近年、バーコードによる情報入力の迅速さ、正確さ、簡便さが広く認識されてきた為、バーコードによる商品管理が盛んになって来ている。多くの分野で使用されるようになって来た結果、印刷物の意匠性確保、バーコードを印刷する特定のスペースを確保、又、製品履歴の保証、偽造防止の確保等への展開がなされている。そこで、可視光下では目視不可能であり所定の波長の光の照射により蛍光を発し目視可能となる不可視バーコードが提案されている。
【0003】
例えば不可視バーコードは、可視光下では目視不可能であるが紫外線を照射すると励起されて可視光の発光を発して目視可能となる蛍光物質を含んだインキで印刷することによ

り形成することが出来る（例えば、特許文献１参照）。
【0004】
しかしながら、不可視バーコードの読み取りは、特定励起光源で照射した際に、データ部が発する蛍光と、前記特定励起光源で蛍光を発光せず黒地と認識される下地部とのコントラストを検知している。そのため、本来のバーコード情報の読み取りとしては、光学的な画像検知の後工程として、画像情報の反転工程を必要としている。
【0005】
一方、不可視バーコードは、バーコードの存在を検出する必要から、バーコードのデータ部に形成される模様の連続部よりも十分長く連続した導入部を有する不可視バーコードが提案されている。特に、複数本のバーで形成されるデータ部と、該バーが形成される地模様部とが、蛍光物質を含有するインキで反転して媒体上に印刷形成された不可視バーコードが提案されている（例えば、特許文献２参照）。
【0006】
【特許文献1】特開平７－５７０６５号公報
【特許文献2】特開平７－２７１８９６号公報
【発明の開示】
【発明が解決しようとする課題】
【0007】
本発明の課題は、通常可視化されていないにも係わらず、特別な画像処理機能を有しない検出機で読み取り可能な不可視バーコード、検出方法を提供することにある。
【課題を解決するための手段】
【0008】
上記課題である、特別の画像処理機能を有しない汎用の読み取り機の活用に当たり、バーコードのデータ部と地模様部を反転印刷することにより、データ部を黒地として認識することが出来、上記課題を解決するに至った。
【0009】
すなわち、本発明は第一に、基材上に、データ部と地模様部を有する不可視バーコードであって、地模様部が蛍光物質及び結着樹脂を含有する皮膜で形成されたことを特徴とする不可視バーコードを提供する。
【0010】
本発明は第二に、基材上に、データ部と地模様部を有する不可視バーコードを、紫外線照射部と光学的検出部を有する検出器で検出する方法であって、該不可視バーコードが、地模様部に蛍光物質及び結着樹脂を含有する皮膜が形成された不可視バーコードであり、検出器の光学的検出部が画像処理機能を有しない光学的検出部であることを特徴とする不可視バーコードの検出方法を提供する。
【発明の効果】
【0011】
本発明により、特別の画像処理機能を有しない汎用の光学的検出器であっても、容易に不可視バーコードを読み取ることが可能となる不可視バーコード及び該バーコードと特別の画像処理機能を有しない汎用の光学的検出器との組み合わせでの検出方法を提供することができる。
【発明を実施するための最良の形態】
【0012】
本発明は、不可視バーコード、及び、特別の画像反転機能を有しない汎用の光学的検出器による検出方法に関する。
【0013】
本発明の不可視バーコードは、基材上に、データ部と地模様部を有する不可視バーコードであって、地模様部が蛍光物質及び結着樹脂を含有する皮膜で形成されたことを特徴としている。バーコードを有する基材としては、紙、フィルム等の包装材料基材、ガラス、金属等の各種基材を用いることが出来る。基材表面である印刷前の地模様部は、紫外線照

射に対して蛍光を発しない素材であれば、明所で視認される色は何であっても良い。更に、可視の印刷模様が施されていても良い。

【0014】

蛍光物質及び結着樹脂を含有する皮膜は、該蛍光物質と結着樹脂に更に水系又は溶剤系等の希釈剤を含有する蛍光物質含有インキを用いて、凸版印刷、フレキソ印刷、グラビア印刷、スクリーン印刷、オフセット、インキジェット、熱転写等々の各種印刷方法により形成する。

【0015】

地模様部に蛍光物質及び結着樹脂を含有する皮膜を形成するための蛍光物質含有インキとしては、例えば、前記した蛍光物質が、２３０～４００ｎｍ程度に励起波長の最大値を有する蛍光物質であると、照射光源の選択に自由度が増し、検出器の照射部分を容易に調達することが出来る。

【0016】

前記した蛍光物質の結着樹脂に対する含有比率は、０．１～２０．０質量％であると、検出精度と皮膜の耐久性のバランスが特に良好となる。

【0017】

例えば、熱転写の用途には、前記した結着樹脂がニトロセルロース、ポリアマイドであることが好ましい。

【0018】

前記した地模様部に形成された蛍光物質及び結着樹脂を含有する皮膜の厚さは、０．１～２．０μｍであることが好ましい。

【0019】

本発明の不可視バーコードの検出方法は、基材上に、データ部と、蛍光物質及び結着樹脂を含有する皮膜が形成された地模様部を有する不可視バーコードを、紫外線照射部と光学的検出部を有する検出器で検出する方法であって、検出器の光学的検出部が画像処理機能を有しない光学的検出部であることを特徴としている。

【0020】

本検出方法は、暗所で、前記不可視バーコードに前記検出器の紫外線照射部を用いて、紫外線を照射し、前記画像反転機能を有しない光学的検出部でデータを読み取るものである。本検出方法における検出の原理は以下のようである。紫外線照射で、蛍光物質及び結着樹脂を含有する皮膜が形成された地模様部が蛍光を発する一方、本来のデータ部は前記紫外線照射に対して、蛍光を発することなく、「黒地」部分と認識されることにより、黒地部分をデータとして認識することで、後の画像反転の工程を経ずに直接に、バーコード情報を読み取っている。

【0021】

前記した検出器の紫外線照射部としては、外部からの光を遮断する機能と、紫外線を発する励起光源を備えればよい。励起光源としては２３０～４００ｎｍ波長の紫外線を発する光源が好ましい。例えば、波長３７５ｎｍ程度の紫外線を発するＬＥＤ、例えば、セミコンダクター社製、ナイトライトＮＳ３７５Ｌ－５ＲＬＯ等を用いることが出来る。

【0022】

前記画像処理機能を有しない光学的検出部としては、既存の可視バーコード読み取り装置を用いることが出来る。より簡易な装置として、カメラ機能を有する携帯電話も使用することが出来る。

【0023】

不可視バーコードは、基本的に、第三者には、その存在自体を知られないために、通常の可視光の下では、視認できないが、バーコード付与者及び付与者から特定の認証を得ている者は、その存在箇所を認識している状態にある。

【0024】

食品や、医薬品等、特に流通後の履歴追跡を必要とする場合、生産者は、包装材料の特定位置に、本願発明の不可視バーコードを設けることができる。外部光を遮断する枠部と

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特定の波長の紫外線を発する励起光源を配置し、光学系の焦点距離に応じてピントの合う位置に光学的検出部を配置することで、画像処理機能を有しない光学的検出部でデータを容易に読み取ることができる。この場合、不可視バーコードとすることで、例えば、偽造の防止を図ることが出来る。

【0025】

又、最近、新聞、雑誌、広告等の印刷物に、可視の二次元バーコードが印刷されている。これは、普及が著しい携帯電話のカメラ機能を利用して、バーコードを読み取るとともに、バーコード掲載元への容易なアクセスを可能にしている。通常は、略白地の印刷基材に黒色のデータ部分を有するバーコードが印刷されており、画像処理機能を有しない携帯電話のカメラ機能で黒色のデータを読み込んでいる。

【0026】

本発明の不可視バーコードは例えば、以下のような利用の方法が考えられる。新聞、雑誌、広告等の印刷基材に、本発明の不可視バーコード、すなわち、データ部と地模様部を有する不可視バーコードであって、地模様部が蛍光物質及び結着樹脂を含有する皮膜で形成されたことを特徴とする不可視バーコードを設ける。バーコード付与者と何らかの契約関係にある者、すなわち、特定の会員、イベントの参加者等に、特定印刷物の特定箇所に不可視バーコードの存在を通知する。通知された者は、携帯電話のカメラ機能で不可視バーコードを読み取り、例えば、広告主への直接のアクセスによって、新商品、新サービス等を一般よりも事前に早く情報を優先的に入手するなど、何らかの特典を得ることができる。

【実施例】

【0027】

以下、実施例によって、本発明を具体的に説明する。

（蛍光物質含有クリアインキ（１）の調製）

以下の組成を有する蛍光物質含有クリアインキ（１）を調製した。（不揮発分：３３％）

硝化綿	（ＳＮＰＥ社製　Ｓ１／４：Ｎ．Ｖ．７０％）	２１部
可塑剤Ａ	（大日本インキ社製　エポサイザーＷ－１００ＥＬ）	６部
可塑剤Ｂ	（大日本インキ社製　モノサイザーＡＴＢＣ）	１部
酢酸エチル		３０部
トルエン		３０部
ＩＰＡ		７部
蛍光体	（クラリアントジャパン社製　CartaxCXDP）	５部
（合計）		１００部

を配合し、蛍光物質含有クリアインキ（１）を調製した。

【0028】

（不可視バーコードの作成）

基材として、２軸延伸ポリエステルフィルム１２μｍを用い、特定情報を有するバーコードを反転した画像を、前記蛍光物質含有クリアインキ（１）で、乾燥皮膜厚０．５μｍにて、グラビア印刷して、本発明の不可視バーコードを得た。

【0029】

（紫外線照射部）

一例として、茶筒の蓋状形態であり、天面の中央に検出窓部を設け、天面内側に、発光波長３７５ｎｍのＬＥＤ（セミコンダクター社製、ナイトライトＮＳ３７５Ｌ－５ＲＬＯ）を４個設け、円筒の高さを携帯電話のカメラ機能の光学系に応じたピントの合う高さとした紫外線照射部を作成した。円筒部分及び天面によって、外部からの光を遮断した状態で、窓部を通して蛍光及び黒地部を検出できる。

【0030】

（光学的検出部）

光学的検出部としてカメラ機能を有する携帯電話を使用した。前記した紫外線照射部と、カメラ機能を有する携帯電話（ＮＴＴＤｏＣｏＭｏＮ９００ｉＧ、ａｕＷ２１Ｔ）で、

目的の不可視バーコードの正しい読み取りが可能であった。更に、携帯電話での、バーコードの広告主へのアクセスが可能で、本来の目的である新規広告情報の入手が可能であった。

【0031】

（比較例）

基材として、実施例と同様に、２軸延伸ポリエステルフィルム１２μｍを用い、特定情報を有するバーコードの画像を反転せず、前記蛍光物質含有クリアインキ（１）で、乾燥皮膜厚０．５μｍにて、グラビア印刷して、本発明の比較例不可視バーコードを得た。前記実施例と同様の手順で、読み込んだところ、地模様部を黒地と認識し、バーコードの本来のデータとしての認識は出来なかった。

【産業上の利用可能性】

【0032】

本発明により、特別の画像反転機能を有しない汎用の光学的検出器であっても、容易に不可視バーコードを読み取ることが可能となる不可視バーコード及び該バーコードと特別の画像反転機能を有しない汎用の光学的検出器との組み合わせでの検出方法を提供することができる。現在普及の著しいカメラ機能を有する携帯電話での検出も可能であり、高度のセキュリティを要する工業的分野ばかりでなく、末端消費者サイドでの活用も図られる。

PTO/SB/08a (01-10)
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(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	02180073	JP		1990-08-29	UNKNOWN		☐
	2	2000094838	JP		2000-04-04	TOSHIBA CORP		☐
	3	2007257439	JP		2007-10-04	DAINIPPON INK & CHEMICALS		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13697297
	Filing Date	2012-11-09
	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

	4	2008134910	WO		2008-11-13	BOEGLI-GRAVURES S. A.		☐
	5	6248878	JP		1987-10-15	TOUYOU GLASS KK		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99**)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M. Barrett/	Date (YYYY-MM-DD)	2015-03-12
Name/Print	Robert M. Barrett	Registration Number	30,142

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Espacenet

Bibliographic data: JPS6248878 (B2) — 1987-10-15

CONTAINER CODE IDENTIFYING METHOD

Inventor(s): KURIBAYASHI YUKIYOSHI, ; KURIBAYASHI YUKYOSHI

Applicant(s): TOUYOU GLASS KK, ; TOYO GLASS CO LTD

Classification: - international: ***B07C3/18; B07C5/342; B65G47/48; B65G47/49; G06K19/00; G06K7/10***
- cooperative: **G06K7/10861**; B65G2201/0244

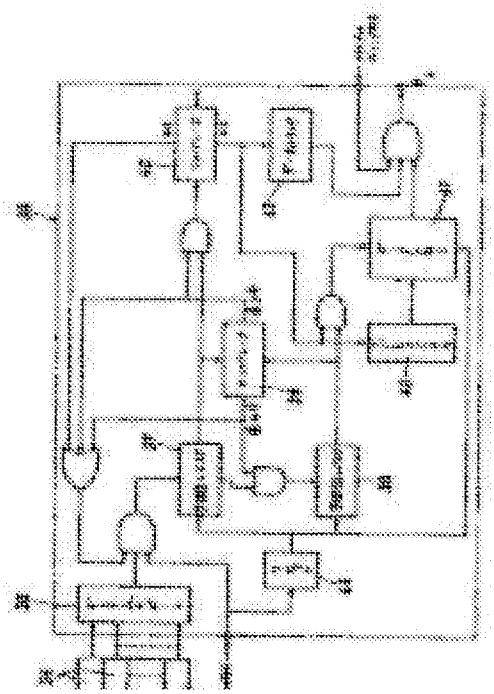
Application number: JP19830066320 19830416

Priority number (s): JP19830066320 19830416

Also published as: JPS59191676 (A)

Abstract of JPS59191676 (A)

PURPOSE:To detect and identify accurately a code despite of the revolving speed of a container by arraying the digitized marks on a circular track on the outer surface of the container with the patterns different from each other in the direction orthogonal to said circular track and then detecting those marks. CONSTITUTION:Two long and short code marks are put on a glass bottle at the lower edge part of the outer circumferential surface of the body part of the bottle orthogonally to the circular track of the outer circumferential surface of a container. When this bottle is positioned at the 1st check point, an input timing signal is fed to a microcomputer 35. Therefore the code read data is fed via a data input port 36 and stored first to a



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present value register 37.; The contents of the register 37 are compared with those of a preceding value register 38 through a comparator 39 and then stored successively to a data memory 41. This procedure is repeated 10 times to obtain a 10-bit code with 10 marks. Owing to this 10-bit code data, the code can be detected and identified accurately despite the variation of revolving speed of the glass bottle.

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⑲日本国特許庁（JP）　⑪特許出願公告

⑫特許公報（B2）　昭62－48878

⑤1Int.Cl.⁴	識別記号	庁内整理番号	㉔㊹公告 昭和62年(1987)10月15日
G 06 K 7/10		V－2116－5B	
B 65 G 47/48		7820－3F	
G 06 K 7/10		T－2116－5B	発明の数 1 （全12頁）

⑤4発明の名称　容器符号識別方法

㉑特　願　昭58－66320　　⑥5公　開　昭59－191676
㉒出　願　昭58(1983)4月16日　　㊸昭59(1984)10月30日

⑦2発明者　栗林　征喜　横浜市戸塚区名瀬町377番地　エミネンス東戸塚107号
⑦1出願人　東洋ガラス株式会社　東京都千代田区内幸町一丁目3番1号
⑦4代理人　弁理士　原田　信市
審査官　吉見　信明

1

⑤7特許請求の範囲

1　容器の外面の円軌道上に、その円軌道と直交する方向に長さを異ならせることによつて符号化したm個のマークを、ノーマーク区間を介在させて設け、容器を回転させつつその外面に光を照射し、その反射光を、上記直交する方向に並列するn個の光電変換素子でnビツトの並列2進電気信号として同時に検知することにより、各マークの長短に応じたデジタルデータ及びノーマーク区間に対応するデジタルデータをえ、その各デジタルデータの内容からマーク区間であるかノーマーク区間であるかの判定を行うとともに、前回のデジタルデータと今回のデジタルデータとの大小を比較することにより、マーク区間とノーマーク区間とが交互になつているか否かを判定し、交互になつていたときにマーク区間に対応するデジタルデータのみを取り出し、それをm回行うことによつて識別符号をうることを特徴とする容器符号識別方法。

2　マークを円軌道と直交する方向の長さの長短によつてデジタル化してなる特許請求の範囲第1項に記載の容器符号識別方法。

3　マークをドツトパターンにし、そのドツトパターンの数の違いによつてデジタル化してなる特許請求の範囲第1項に記載の容器符号識別方法。

4　マークをセグメントパターンにし、そのセグメントパターンの数の違いによつてデジタル化してなる特許請求の範囲第1項に記載の容器符号識別方法。

2

発明の詳細な説明

本発明は、ガラスびん等の容器の外面にその型番、製造年月日などを表すコードマークを付しておき、このコードマークを光電検知して符号（コード）の識別を行う容器符号識別方法に関する。

このような容器符号識別方法として、本出願人は特開昭56－57171号公報に記載のものを既に提供している。

これを第1，2図によつて概説すると、符号識別しようとするガラスびん1の底面2には、コードマークとして細長い凸部3……が成形時に形成されている。

これら凸部3……はガラスびん1の軸線を中心とする円軌道Rに沿つて配列し、全体として2値論理コード体系になつている。

すなわち、そのコードは、底面2上にその中心より一定の位相差をもつて放射する放射等分線P……を仮想し、これら放射等分線P……上に凸部3を形成するかしないかによつて体系づけられている。

ガラスびん1はゲージングプレート4の検出口5上に1個ずつ送られ、ここで静止したままロータリスキヤナ6によつて底面2を円軌道Rに沿い光学走査（第2図矢印方向）される。

ロータリスキヤナ6は、底面2を照射する投光器7とその反射光を受光する受光器8とを備え、モータ9によつて常時回転せられている。

ロータリスキヤナ6への電源供給はロータリトランス10によつて行われる。

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受光器8は1個の光電変換素子を有し、その出力はフオトアイソレータ11を構成する投光器12と受光器13によつて改めて光電変換され、外部の符号変換回路へ入力される。

ロータリスキヤナ6と同時にロータリエンコーダ14が回転してクロツクパルスが出力され、同じく符号変換回路へ入力される。

符号変換回路は、受光器13の出力を上記放射等分線P……の等分角度に対応する間隔でサンプリングする。

これによつて凸部3……のあるなしに応じた2進電気信号がえられ、それがマイクロコンピユータによつて解析され、最終的に符号が識別される。

本出願人が先きに提供した方法はこのような構成になつているものであるが、これによると次のような欠点がある。

(1) マーク（凸部）のあるなしをロータリスキヤナの回転によつて旋回走査するので、回転するロータリスキヤナへの電源供給に、可動部と固定部とを有する複雑な電源供給手段（ロータリトランス）を必要とする。

(2) このような電源供給手段は概して電圧ノイズを発生し易く、これがもとで誤検知を招くことがしばしばある。

(3) 投光器とともに受光器も回転するので、その受光器の出力を外部へ取り出すにも特別の手段（フオトアイソレータ）を必要とする。

(4) 各種ガラスびんのなかには底面に凸部を形成することが好ましくないものがあり、そのようなものの場合にはその胴部の外周面に凸部を形成することになる。このようなガラスびんに対し、それを静止しておいてその胴部外周面を走査するという方法を採るとなると、投光器と受光器とがガラスびんの周りを旋回する構成にしなければならず、その旋回作動に複雑な機構を必要とする。

ガラスびんを静止しておいて旋回走査するという方法はこのような欠点があることから、これを解消するものとして本出願人は、実開昭56－83858号公報に記載のものを別途提供している。

これを第3，4図によつて概設すると、ガラスびん1′の胴部の外周面の下端部（いわゆる裾部）に、第1，2図に示したものと同じ原理で細長い凸部3′……が形成されている。

ガラスびん1′は、モータ15によつて回転されるターンテーブル16上に倒れないように載置され、矢印方向に回転せられる。

このように回転するガラスびん1′の裾部の凸部のあるなしは、一定の位置に固定したセンサ17によつて検知される。

センサ17は、第4図に示すようにガラスびん1′の裾部を照射する投光器18とその反射光を受光する受光器19とを内蔵している。

受光器19は1個の光電変換素子を有し、その光電変換素子の出力は、ターンテーブル16と同時回転するロータリエンコーダ20よりのクロツクパルスにもとづいてサンプリングされ、以下第1，2図に示したものと同様にして符号が識別される。

しかし、この第3，4図に示す方法の場合には、

(a) ガラスびんとそれを回転させる手段（ターンテーブル）とがスリツプすると、放射等分線P……の等分角度とロータリエンコーダ20のクロツクパルスにもとづくサンプリング間隔とにずれが生じ、誤検知する、

という欠点がある。

さらに、特開昭53－1047号公報に開示されているように、ガラスびんの外周面に、コードマークとそれを読み取るためのタイミングマークとを上下に設け、しかもその両端のタイミングマークを、コードマーク読み取り開始用の始動信号と終了用の終了信号として機能させ、これらコードマークとタイミングマーク、さらに始動信号及び終了信号となるマークを、それぞれに対応するフオトダイオードで別々に検知し、タイミングマークを検知してタイミングパルスをえながらコードマークの検知にかかる信号をサンプリングするものもある。

しかし、この方法によると次のような欠点がある。

(A) コードマーク及びタイミングマークを読み取るための上下に配置されたフオトダイオードの他に、その横にさらに始動信号または終了信号を検知するためのフオトダイオードが別に必要で、検知構造が複雑となる。

(B) コードマークの他に、タイミングマーク、さ

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らに始動用信号及び終了信号となるマークが必要である。

(C)　コードマークとタイミングマークとを別々に検知する動作が必要なため、装置が複雑になりやすい。

本発明の目的は、上記(1)～(4)に示したような欠点がないのはもちろん、(a)さらに(A)～(C)に示したような欠点もなく、しかも上述した従来の３つの方法では必要であつたロータリエンコーダやサンプリング回路等を省略することができる容器符号識別方法を提供することである。

このような目的を達成するため、本発明は、容器の外面の円軌道上に、その円軌道と直交する方向に長さを異ならせることによつて符号化したm個のマークを、ノーマーク区間を介在させて設け、容器を回転させつつその外面に光を照射し、その反射光を、上記直交する方向に並列するn個の光電変換素子でnビットの並列２進電気信号として同時に検知することにより、各マークの長短に応じたデジタルデータ及びノーマーク区間に対応するデジタルデータをえ、その各デジタルデータの内容からマーク区間であるかノーマーク区間であるかの判定を行うとともに、前回のデジタルデータと今回のデジタルデータとの大小を比較することにより、マーク区間とノーマーク区間とが交互になつているか否かを判定し、交互になつていたときにマーク区間に対応するデジタルデータのみを取り出し、それをm回行うことによつて識別符号をうることを特徴とする。

以下には本発明の実施例を第５～１４図を参照に詳細に説明する。

第５図に示すように、コンベヤ２１によつて１列にではあるがランダムに送られてきたガラスびんB……は搬入バイパス２２へ導かれ、ここにおいてフイードウオーム２３によつて一定の間隔に整列されたのち検査ステーションCSへ送り込まれる。

ここへ送り込まれたガラスびんは、間欠回転するスターホイール２４に嵌合捕捉され、これによつて間欠的に回送されて先ず第１検査ポジションCP_1において本発明方法により型番を検査され、次いで第２検査ポジションCP_2、次に第３検査ポジションCP_3においてそれぞれ所定の欠陥検査を受ける。

このような検査を受けた結果、良品とされたガラスびんは搬出バイパス２５に導入され、これを通じて再びコンベヤ２１上に乗載して他所へ搬送される。

一方、不良品とされたガラスびんは排除ポジションDPまで回送されて排除される。

本発明方法を実施する第１検査ポジションCP_1の詳細は第６図に示されている。

ガラスびんBは、スターホイール２４の上下の円板２４ａ，２４ｂのびん受口２６ａ，２６ｂに嵌合することによつてこれに捕捉され、このスターホイール２４が間欠回転することによりゲージングプレート２７上に乗載したまま一定時間だけ同図に示す位置に保留せられる。

この位置には、びんドライブホイール２８が軸架されているとともに、投光器２９及び受光器３０が架設されている。

びんドライブホイール２８は常時回転しており、上記のように一定時間だけ保留されるガラスびんBはこのびんドライブホイール２８によつて少なくとも１回転せられる。

ガラスびんBの胴部の外周面下端部（裾部）には、長短２様の凸部によるコードマークが次のようなコード体系にして付されている。

なお、以下には長い方の凸部を長マーク、短に方の凸部を短マークと称し、長マークを符号M_1で、短マークを符号M_0で表す。また、これら長短両マークを総称する場合には単にマークという。

長マークM_1と短マークM_0は、第７図に詳しく示すように幅員が同じでいずれもガラスびんBの軸線方向に細長くなつているが、長マークM_1は短マークM_0よりも上側に２倍長くなつていて、この長短の違いによつてデジタル化されている。

因みに、長マークM_1を２進数の「１」とすると短マークM_0は「０」となる。

ガラスびん１本あたりのマーク総数mは決められており、本例の場合は10個になつている。

10個のマークは、ガラスびんの外周面上を円周方向（円軌道）に一定のピツチで一列に（従つて互いに平行に）配列し、全体として10ビットの２進コード体系になつている。

従つて、第６図に示したガラスびんの場合には、そのマーク配列を反時計方向に見ると、「短

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短短長長短短長短短」になつているので、「0001100100」の体系になつていることになる。

投光器29は、ゲージングプレート27の下方よりその窓孔31を透してガラスびんの裾部を照射する。この光線の照射エリアLA（第7図）は、1個の長マークM_1の全体を照射するに充分な大きさになつている。

受光器30は、ガラスびんを反射した反射光線を前面において受光すべくゲージングプレート27の上方に設置されている。

この受光器30の前面には、第7図に簡略化して示す複素子形フオトセンサ32が取り付けられている。

フオトセンサ32は、マークの長手方向に一定のピツチで配列するn個、本例の場合8個の光電変換素子33……と、これらよりの電気信号を増幅及び波形整形する回路（後述する）を実装したワンチツプ構造になつている。

これら8個の光電変換素子33……とマークとは、8個の光電変換素子全部で長マークM_1を検知し、下側半分の4個の光電変換素子で短マークM_0を検知する対応関係になつている。

すなわち、マークのない部分（凸部のない平坦部）を反射した光線はいずれの光電変換素子にも入光しないようになつているのに対し、長マークM_1を反射した光線は、下側から数えて1番目より8番目までの全光電変換素子に入光し、また短マークM_0を反射した光線は、1番目より4番目までの4個の光電変換素子に入光するようになつている。

従つて、各光電変換素子33の出力は第9図に示すようにマークがあるとHレベル、マークがないとLレベルになり、長マークM_1の場合には1番目より8番目までの全光電変換素子の出力がHレベル、短マークM_0の場合には1番目より4番目までの4個の光電変換素子の出力がHレベルになるもので、以下にはマークのない区間をスペースという。

なお、長マークM_1であつても、1番目から8番目までの8個の光電変換素子の出力が全てHレベルにならないときもあり、また短マークM_0であつても、1番目から4番目までの4個の光電変換素子の出力が全てHレベルにならないときもあり、さらに長マークM_1及び短マークM_0の長さも成形の関係上規定長さよりも短かくなつている場合もあり得るもので、8個の光電変換素子の出力による長マークM_1と短マークM_0の後述するような伴定は、所要の許容度をもつて行われるようになつている。

8個の光電変換素子33……の出力は、第8図に示す8個の増幅及び比較回路34……によつてそれぞれ増幅されたのち基準電圧と比較され、第9図に示すようにマークのあるなしに応じた2進電気信号となつてフオトセンサ32の各出力端子より出力される。

従つて、このようにして出力される電気信号は、光電変換素子個々にはマークのあるなしに応じた直列2進電気信号となり、8個の光電変換素子全体としては8ビツトの並列2進電気信号となる。

この8ビツトの並列2進電気信号はマイクロコンピユータ35にインプツトされ、これによつてリアルタイムでデジタル処理されるもので、次にはそのデジタル処理について第10図のフローチヤートを適宜参照しつつ説明する。

なお、マイクロコンピユータ35にインプツトされた8ビツトの並列2進電気信号を16進数で表すと、第9図に示すように長マークM_1が「FF」、短マークM_0が「0F」、スペースが「00」となるが、マイクロコンピユータ35内においては後述するようにマークとスペースが交互になつているかどうかの判定が行われたあと、長短両マークM_1，M_0に対応するもので符号の識別が行われるもので、以下においては便宜上、インプツトされた8ビツトの並列2進電気信号のうちマーク区間（長マークM_1及び短マークM_0）に対応するものをデータX、スペース区間に対応するものをデータYという。また、これらX，Yを総称する場合には単にデータという。

上述のようにガラスびんBが第1検査ポジションCP_1に位置決めされると、マイクロコンピユータ35にインプツトタイミング信号が入る。

このインプツトタイミング信号が入つていることが判定（第10図ステツプ100）されると、データ入力ポート36を通じてデータがインプツト（ステツプ101）される。

このインプツトされたデータ（XあるいはY）は先ず今回値レジスタ37にストアされ、前回値

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レジスタ38の内容とコンパレータ39によつて比較（ステツプ102）される。

コンパレータ39は両レジスタ37，38の内容の大小を比較、つまり前回値＞今回値であるか前回値≦今回値であるかを判定する。

最初は前回値レジスタ38の内容が10進数にして0（16進数で00）になつているので、今回値レジスタ37にストアされたデータがX，Yいずれであつてもそれは前回値レジスタ38にロードされる。

このようにしてロードされると、新たなデータがインプツトされて今回値レジスタ37にストアされ、コンパレータ39によつて同様に比較される。

ここに前回値＜今回値であると、つまり前回値レジスタ38の内容がデータY、今回値レジスタ37の内容がデータXであると、再び同様のことが行われる。すなわち、前回値レジスタ38の内容がデータXになるまでステツプ101及び102が繰り返される。

前回値＞今回値になると、新たにインプツト（ステツプ103）されて今回値レジスタ37にストアされたデータは0であるか否か、つまりデータYであるか否かがコンパレータ40によつて判定（ステツプ104）される。

データYであると、前回値レジスタ38の内容、つまりデータXがデータメモリ41にロード（ステツプ105）され、その決められた記憶番地、すなわちアドレスコントローラ42が指定する記憶番地に記憶される。

また、これと同時にアドレスコントローラ42の指定番地がインクリメント（ステツプ106）されるとともに、データカウンタ43もインクリメント（ステツプ107）される。

このデータカウンタ43のカウントアツプ数はガラスびん1本あたりのマーク総数mに対応させてある。本例の場合その数を「10」に設定してあり、上記一連のステツプ101～107はこのデータカウンタ43が「10」になるまで（ステツプ108）繰り返される。

この一連のステツプ101～107の要約すると、先ずステツプ101と102によつてデータXが検出され、次いでステツプ103と104によつてデータYが検出されるとステツプ105によつてデータXがデータメモリ41に記憶され、そしてこのようなことが10回繰り返されて10個のマークに係るデータXがデータメモリ41に順次記憶される。

換言すると、マイクロコンピユータ35は、データがインプツトされるつどそれがマークであるかスペースであるかの判定及びそれが交互になつているかどうかの判定を行い、交互になつていたときマークに係るデータのみを取り出してデータメモリ41の定められた記憶番地に順次記憶し、このようなことを10回だけ行うことによつて結果的に10個のマークによる10ビツトの符号データをえているものである。

従つて、長マークM_1を2進数の「1」、短マークM_0を「0」とすると、第6図に示したガラスびんBの場合には、第9図の最下段に示すように「0001100100」（10進数で表すと200）の符号データが最終的にえられる。この符号データは、ガラスびんBとびんドライブホイール28とがスリツプしてガラスびんBの回転速度が変動しても、その変動に関係なく的確にえられること明らかである。

なお、第1検査ポジションCP_1に位置決めされたときのガラスびんBの円周方向の向きはランダムで、マイクロコンピユータ35に最初にインプツトされるデータは、ガラスびんの円周方向のどの位置のものであるか定まつていなく、データXのインプツト順位はランダムであるが、最終的にえられる符号データは、マークの配列順序に合うようにそのビツト配列（MSBからLSBまでの順序）を整列されるようになつている。

このようにしてえられた符号データ（すなわち型番）は、マイクロコンピユータ35に外部よりアウトプツトタイミング信号が入力（ステツプ109）されたときにアウトプツト（ステツプ110）される。

このアウトプツトされたデータは例えばプリンタに入力されてプリントアウトされ、あるいはホストコンピユータに送られてこれによつて総合的なデータ処理をされる。

以上のような一連の動作を行つている間入力されていた前記のインプツトタイミング信号がなくなると、リセツト回路44によつてレジスタ37，38及びデータメモリ41がリセツトされ、初期状態に戻つて次のガラスびんについて上記と

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同様のことが行われる。

上述した実施例では、マークを一本の連続した長マークM_1と短マークM_0とによつてデジタル化（符号化）したが、マークは必ずしも連続していなくとも、光電変換素子３３……によつて検知される部分のみ実質的にマークになつていれば、上記と同様に長短によるデジタル化が行える。例えば、第１１図に示すように上記短マークM_0のようなパターンのものを１個のマークセグメントM′とし、その数の違い、すなわち２進数の「１」に対応するものをマークセグメント２個、「０」に対応するものをマークセグメント１個としてデジタル化してもよい。

また、第１２図及び第１３図に示すようにマークをドットパターンM″で構成し、その数の違いによつてデジタル化してもよい。

マーク１個を構成するドットパターンの個数が少ない場合には、第１３図に示すようにドットパターン１個に対して複数の光電変換素子３３……を対応させ、そのうちの１つでもHレベルになればこれはドットパターンであるとする判定方法を採れば、誤検知を少なくできる。

さらに、このようなマークとしては必ずしも凸状である必要はなく、光の反射によつて光学検知できるものであればどのような態様でもよい。

さらにまた、上述した実施例においては、マークとスペースの検知を、前者の反射光だけが光電変換素子に入光し後者の反射光は入光しないようにすることによつて行つたが、これとは逆の関係にして検知してもよく、また両者の反射率を異ならせておいていずれも光電変換素子に入光するようにし、その反射率の相違にもとづく電圧レベルの違いによつて検知するようにしてもよい。

また、第１４図に示すようにガラスびんBの底面B′の円周方向（円軌道上）に、マーク、例えば半径方向に細長い長マークM_1及び短マークM_0を付し、これら両マークを半径方向に配列した光電変換素子３３……で検知するようにしてもよい。

さらに、本発明方法はガラスびん以外の他の容器、また型番以外の他の符号の識別にも適用できること上記より明らかである。

以上述べた通り本発明によれば次のような効果がある。

① 容器の円軌道と直交する方向に並列するｎ個の光電変換素子で、ｍ個のマークの長さを順次デジタルデータとして検知しながら、前回のデジタルデータと今回のデジタルデータとの大小を比較することにより、マーク区間とノーマーク区間とが交互になつているか否かを判定し、交互になつていたときにマーク区間に対応するデジタルデータのみを取り出し、それをｍ回行うことによつて識別符号をうるため、容器の回転に応じたタイミングパルスやサンプリングパルスが不要であるばかりでなく、マークを計数するカウンタ等も不要で、検知回路構成を簡素にできる。

② マークを等間隔に配置する必要はなく、その配設に特別の配慮がいらない。

③ マークをいわばパターンで検知することになるので、マークを計数しなくともよい。

④ １個の光電変換素子よりの電気信号を容器の回転速度に応じてサンプリングして２進電気信号とする従来の方法のように、容器の回転速度の変動によつて誤検知を招くというようなことはなく、容器の回転速度が変動してもｍ個のマークによる符号を的確に検知及び識別できる。

⑤ 従来では必要であつたロータリエンコーダやサンプリング回路等を省略でき、経済的であるとともに、回路設計が容易である。

⑥ 符号化されたマーク以外の他のマーク、すなわちその読み取りタイミングのためのタイミングマークや読み取り開始及び終了のための特別の形態のマークは不要である。

図面の簡単な説明

図面第１，２図はガラスびんを静止しておいて旋回走査する従来例を示し、第１図はその簡略断面図、第２図はガラスびんの底面図、第３，４図はガラスびんを回転させながら検知する別の従来例を示し、第３図はその一部切欠き正面図、第４図はガラスびんとセンサの関係を示す拡大断面図、第５～１０図は本発明の一実施例を示し、第５図はガラスびんの流れを説明するための簡略平面図、第６図は要部の斜視図、第７図はマークと光電変換素子の関係を示す説明図、第８図は本発明方法に使用するマーク検知及び識別装置の一例を示すブロックダイヤグラム、第９図はそれによる信号処理過程を説明するためのタイムチャート、第１０図はその動作を説明するためのフロー

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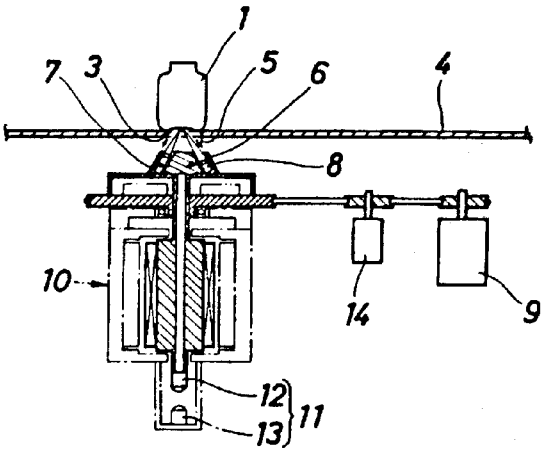
13

チャート、第１１，１２，１３図はそれぞれマークの他の例を示す説明図、第１４図はガラスびんの底面にマークを付した他の例を示すその底面図である。

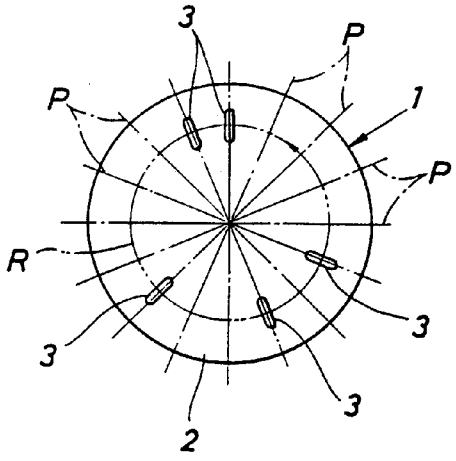
14

B……ガラスびん（容器）、M_1，M_0，M′，M″……マーク、３３……光電変換素子、３５……光電変換素子よりの電気信号をデジタル処理するマイクロコンピュータ。

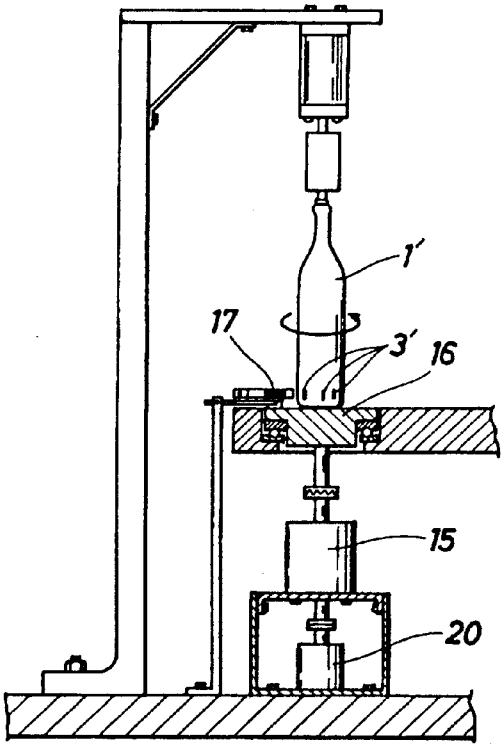
第１図



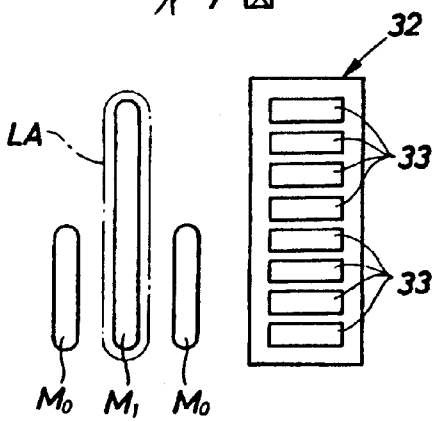
第２図



第３図

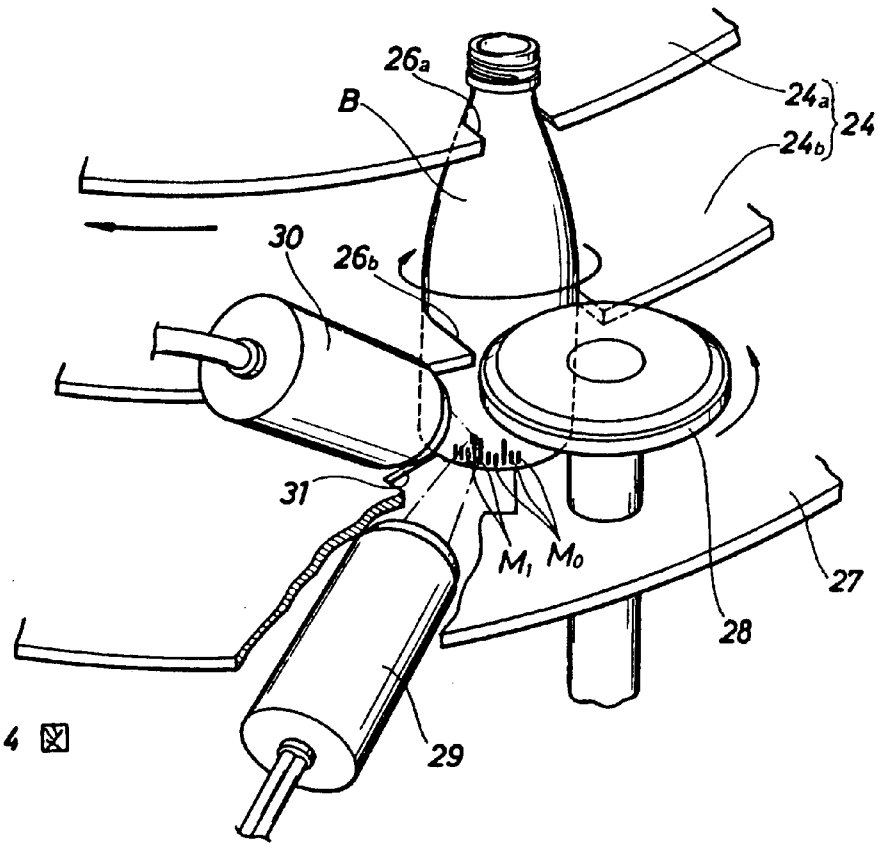


第７図

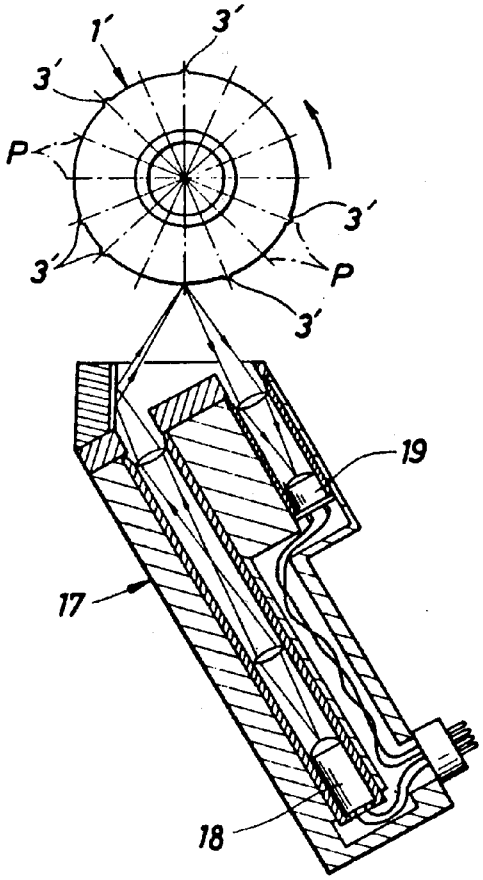


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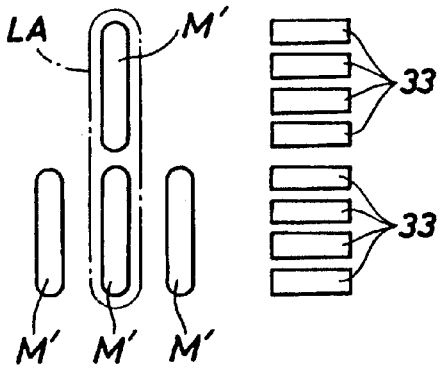
第 6 図



第 4 図

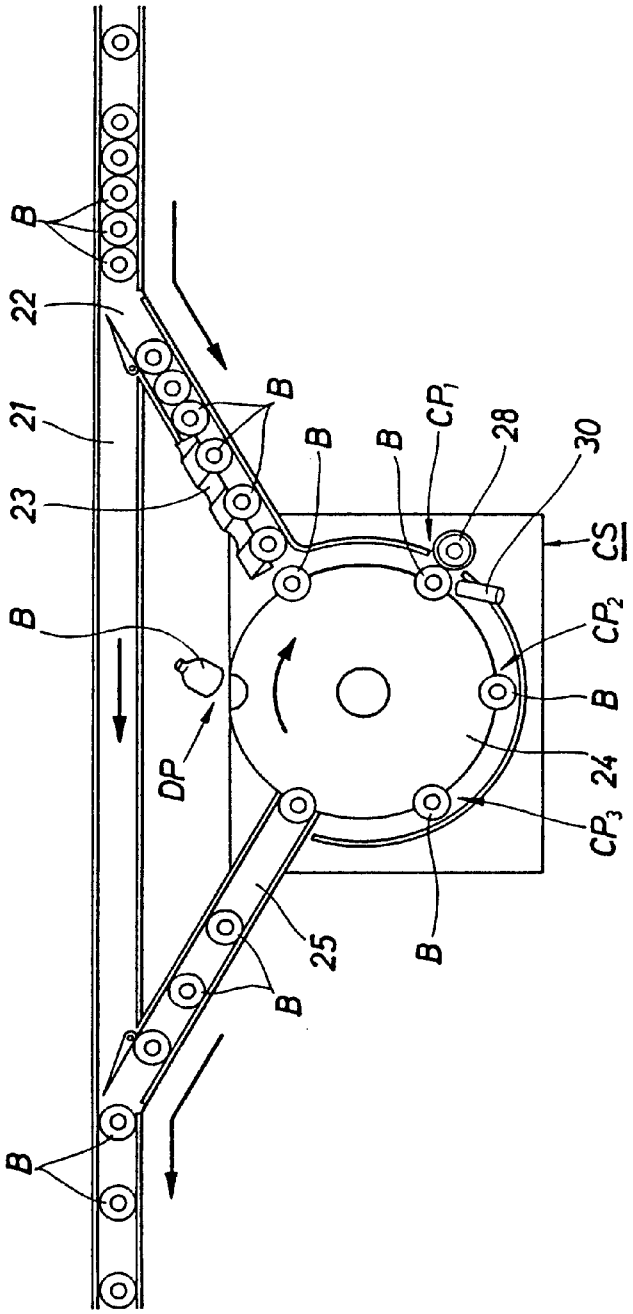


第 11 図



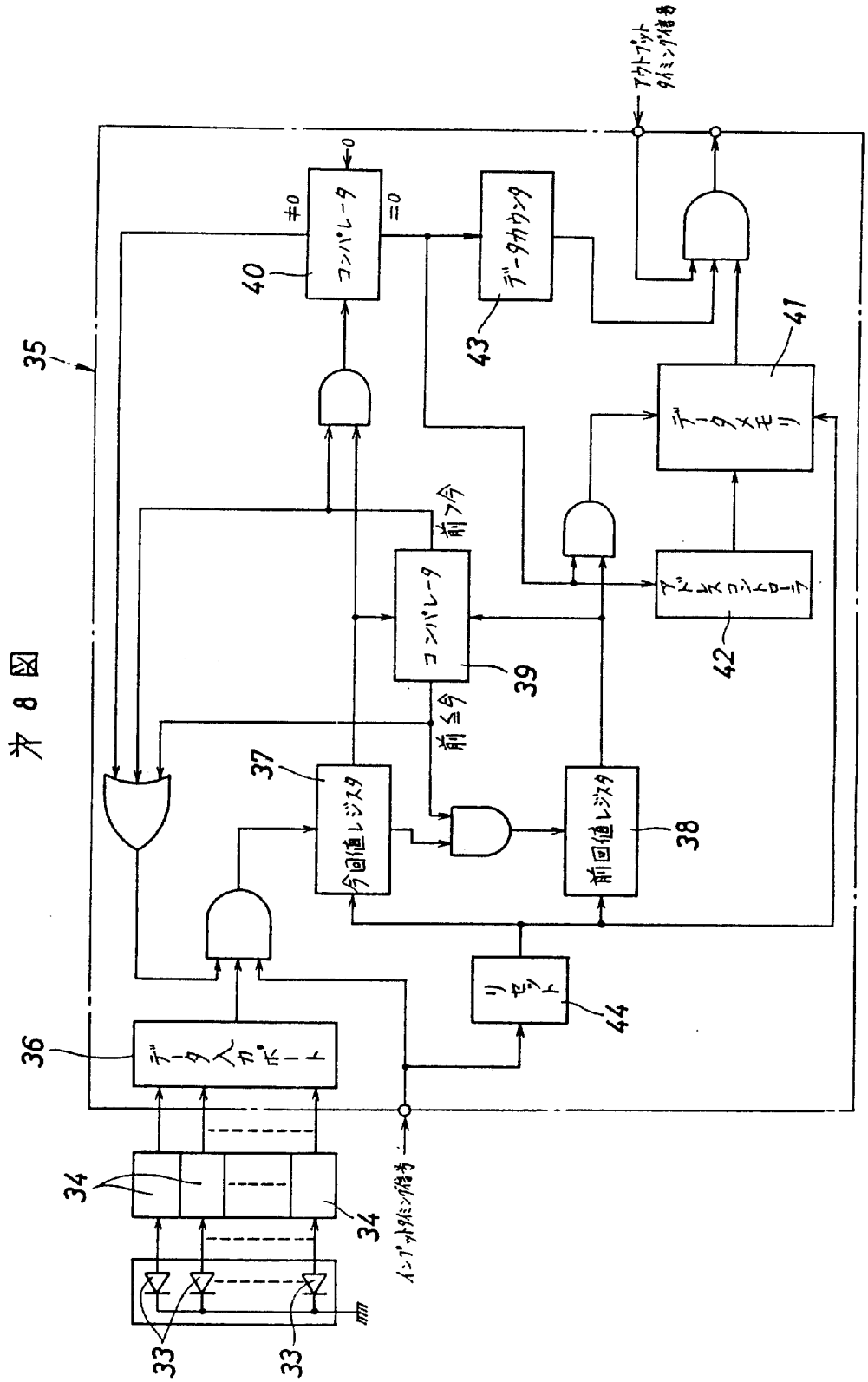
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第５図



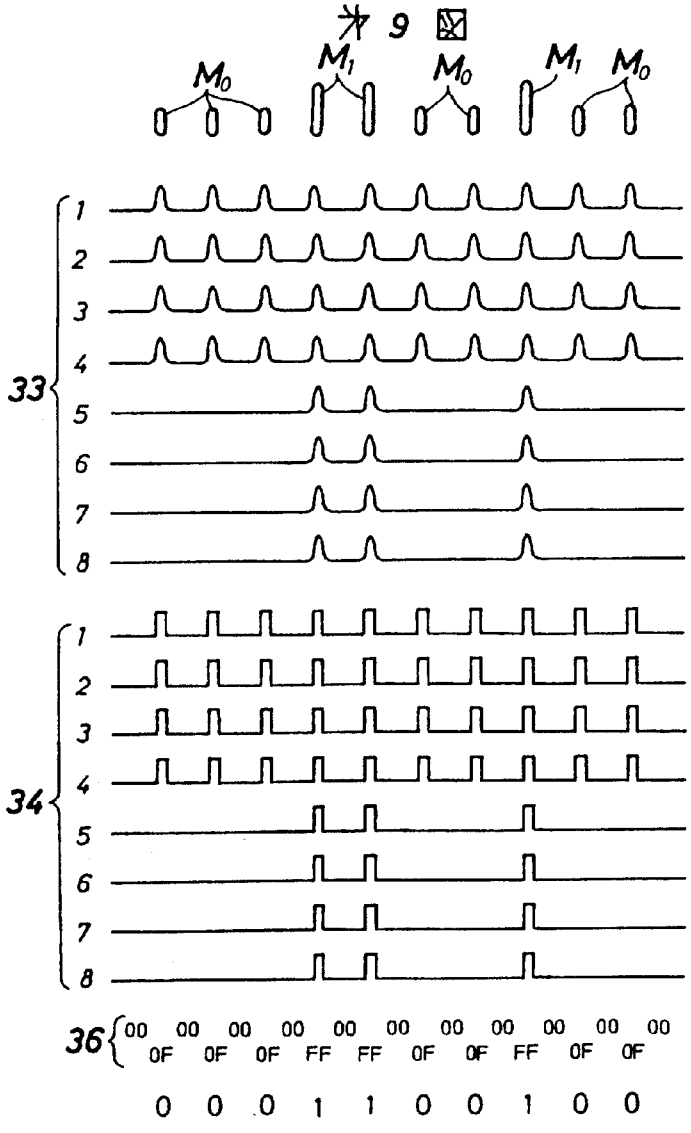
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第８図

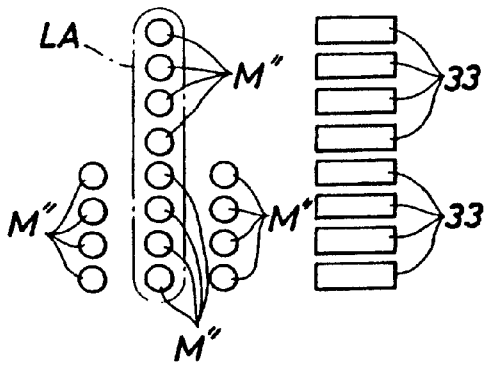


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第 9 図

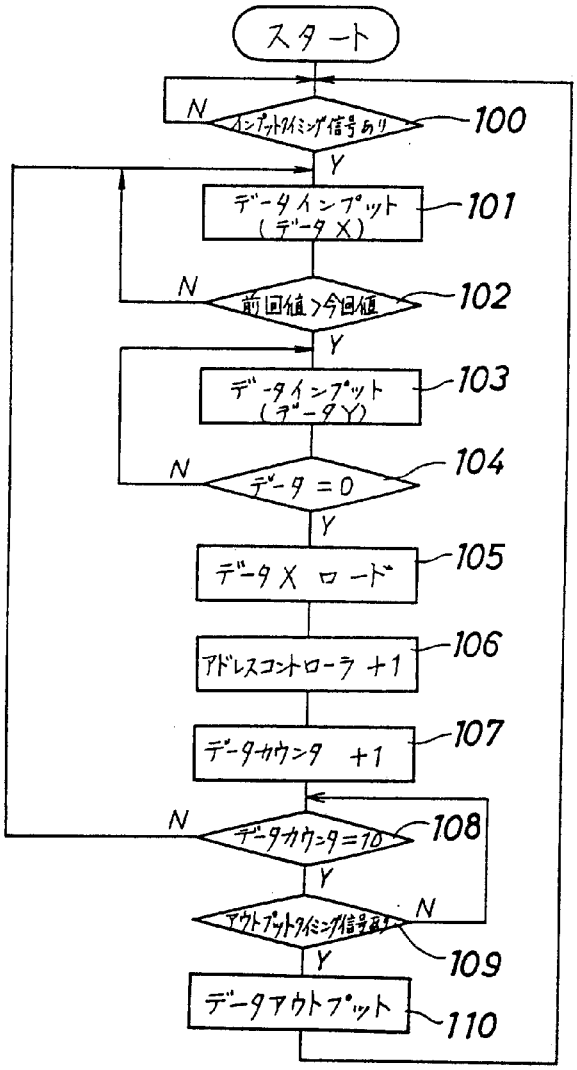


第 12 図

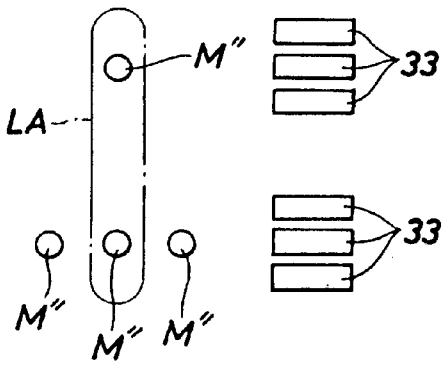


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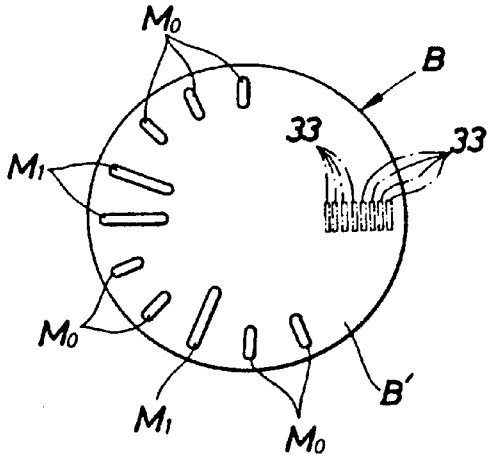
第 10 図



第 13 図



第 14 図



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Electronic Acknowledgement Receipt

EFS ID:	21748899
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Evan Rhodus
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	12-MAR-2015
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Time Stamp:	13:34:50
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	1693-1449.pdf	68820 86be1088bc61d533a8f473b547d45164dccef808	no	4

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 03/18/2015

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER
LONG, LUANA ZHANG

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
03/18/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

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Office Action Summary	Application No. 13/697,297	Applicant(s) JARISCH ET AL.	
	Examiner LUANA Z. LONG	Art Unit 1792	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/11/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-18* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1-18* are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☒ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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IPR2023-00502, U.S. PATENT 10,994,923

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Election/Restrictions

REQUIREMENT FOR UNITY OF INVENTION

As provided in 37 CFR 1.475(a), a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention"). Where a group of inventions is claimed in a national stage application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim. See 37 CFR 1.475(e).

WHEN CLAIMS ARE DIRECTED TO MULTIPLE CATEGORIES OF INVENTIONS

As provided in 37 CFR 1.475(b), a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) A product and a process specially adapted for the manufacture of said product; or

(2) A product and process of use of said product; or

(3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or

(4) A process and an apparatus or means specifically designed for carrying out the said process; or

(5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

Otherwise, unity of invention might not be present. See 37 CFR 1.475(c).

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-13, drawn to a capsule.

Group II, claim(s) 14-16, drawn to a system.

Group III, claim(s) 17-18, drawn to a method.

The groups of inventions listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups I-III lack unity of invention because even though the inventions of these groups require the technical feature of: *a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule*, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of Campari et al. [EP 1764015] (cited in the IDS dated 12/11/2013). As discussed in the Written Opinion of the International Searching Authority, EP 1764015 discloses a capsule (17) comprising a container and a beverage ingredient contained therein, the container comprises a code (72) adapted for being identified or read by an external reader (see Fig. 4), the code is arranged on the container considered capable of being read while the capsule is rotated around an axis of rotation traversing the capsule (see Fig. 4).

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention or species.

Should applicant traverse on the ground that the inventions have unity of invention (37 CFR 1.475(a)), applicant must provide reasons in support thereof. Applicant may submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. Where such evidence or admission is provided by applicant, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be corrected in compliance with 37 CFR 1.48(a) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. A request to correct inventorship under 37 CFR 1.48(a) must be accompanied by an application data sheet in accordance with 37 CFR 1.76 that identifies each inventor by his or her legal name and by the processing fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUANA Z. LONG whose telephone number is (571)270-1152. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. Z. L./
Examiner, Art Unit 1792

/DREW BECKER/

Primary Examiner, Art Unit 1792

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 1065

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/697,297	11/09/2012 RULE	426	1792	3712036-01693

APPLICANTS

INVENTORS

Christian Jarisch, Lutry, SWITZERLAND;
Alexandre Perentes, Lausanne, SWITZERLAND;
Stefan Kaeser, Aarau, SWITZERLAND;
Carlo Magri, Monthey, SWITZERLAND;
Arnaud Gerbaulet, Oye et Pallet, FRANCE;
Thomas Kaeser, Brent, SWITZERLAND;
Daniel Abegglen, Rances, SWITZERLAND;

**** CONTINUING DATA ***************************

This application is a 371 of PCT/EP2011/057657 05/12/2011

**** FOREIGN APPLICATIONS ***************************

EUROPEAN PATENT OFFICE (EPO) 10169374.5 07/13/2010
EUROPEAN PATENT OFFICE (EPO) 10162741.2 05/12/2010

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

12/04/2012

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /LUANA ZHANG LONG/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		SWITZERLAND	4	18	3

ADDRESS

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690
UNITED STATES

TITLE

CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

FILING FEE RECEIVED		
1140	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Electronic Acknowledgement Receipt

EFS ID:	22135785
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Evan Rhodus
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	22-APR-2015
Filing Date:	09-NOV-2012
Time Stamp:	16:48:17
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3712036-01693_Response_to_Restriction_Requirement.pdf	81165 cc86f8b03e7e5b4481131004c6ff25b8434d47e4	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response to Election / Restriction Filed	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	5
Warnings:			
Information:			
	Total Files Size (in bytes):	81165	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

This Amendment is submitted in reply to the Office Action dated February 18, 2015, which is, in part, a restriction requirement. The Commissioner is hereby authorized to charge any fees that may be required or to credit any overpayment to Deposit Account No. 02-1818. Please indicate the Attorney Docket No. 3712036.01693 on the account statement.

In the Office Action, restriction between three alleged groups of invention is required: Group I (Claims 1-13), which is allegedly drawn to a capsule; Group II (Claims 14-16), which is allegedly drawn to a system; and Group III (Claims 17-18), which is allegedly drawn to a method. See Office Action, pages 3-4.

Applicants elect Group I (Claims 1-13). Applicants reserve the right to file one or more divisional applications directed to the subject matter embodied in Group II (Claims 14-16) and/or Group III (Claims 17-18) and to argue the patentability of same.

Applicants have also amended Claims 1-18 for clarification purposes. The amendments do not add new matter. The amendments and newly added claims are supported in the specification at, for example, the originally filed claims.

If a telephone interview would be of assistance in advancing the prosecution of the application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided below. Favorable consideration is respectfully requested.

Respectfully submitted,

K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
Telephone No. 312-807-4204

Dated: April 22, 2015

K-FEE SYSTEM GMBH, EX2009, page 366
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Amendments to the Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): ~~Capsule~~ A capsule for the preparation of a beverage, the capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.

Claim 2 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is arranged on the container along an arc-shaped or circular path of a circumference of the container.

Claim 3 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of a circumference of the container.

Claim 4 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is arranged along at least an eighth of the circumference of the container.

Claim 5 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is repeated along the circumference of the container.

Claim 6 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is a bit code formed by a series of discrete polygonal or dot surfaces printed on and/or embossed in the container.

Claim 7 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is printed by an ink which is not visible by the human eye under natural light.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Claim 8 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.

Claim 9 (currently amended): ~~Capsule according to claim~~The capsule of Claim 8, wherein the pattern possesses a first surface having inclined mirroring or absorbing properties to light and a second surface having flat mirroring or flat reflective properties to light.

Claim 10 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is mechanically embossed or engraved on the container by a laser.

Claim 11 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the container comprises a body and a lid connected to the body and the code is present on the lid of the container.

Claim 12 (currently amended): ~~Capsule according to claim~~The capsule of Claim 1, wherein the code is present on a rim of the capsule.

Claim 13 (currently amended): ~~Capsule according to claim~~The capsule of Claim 12, wherein the code is present on a bottom of the rim of the capsule which is opposed to the lid or foil of the capsule.

Claim 14 (currently amended): ~~System~~ A system for preparing a beverage from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis.

Claim 15 (currently amended): ~~System according to claim~~The system of Claim 14, wherein the reader comprises a light emitter and a light sensor or an inductive sensor.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Claim 16 (currently amended): ~~System according to claim~~The system of Claim 14, wherein the optical reader or inductive sensor is arranged to detect a code on the rim of the capsule.

Claim 17 (currently amended): ~~Method~~ A method for preparing a beverage from a system from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the method comprising rotating the container and reading the code while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device, the device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis, and extracting the beverage from the capsule by rotating the capsule along the axis.

Claim 18 (currently amended): ~~Method according to claim~~The method of Claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	Long, Luana Zhang
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Examiner:

In response to the Office Action dated March 18, 2015, please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the Listing of Claims, which begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/L.Z.L/	1	20100078480		2010-04-01	SYMBOL TECHNOLOGIES INC	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

K-FEE SYSTEM GMBH, EX2009, page 371
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 11/11/2014	Application Number	13697297 13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09
	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Luana Long/	Date Considered	05/28/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

K-FEE SYSTEM GMBH, EX2009, page 372
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 11/11/2014	Application Number	13697297	13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09	
	First Named Inventor	Jarisch et al.	
	Art Unit	1792	
	Examiner Name	L. Long	
	Attorney Docket Number	3712036-01693	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-11-11
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

K-FEE SYSTEM GMBH, EX2009, page 374
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13697297	JARISCH ET AL.
	Examiner	Art Unit
	LUANA Z LONG	1792

CPC- SEARCHED		
Symbol	Date	Examiner
A47J31/4492, A47J31/22	5/28/2015	LZL
B65D85/8043	5/28/2015	LZL

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
426	77-79	5/28/2015	LZL
99	295	5/28/2015	LZL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	5/28/2015	LZL
EAST text search with classificaiton search	5/28/2015	LZL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/L.Z.L./ Examiner.Art Unit 1792	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/L.Z.L/	1	02180073	JP		1990-08-29	UNKNOWN		☐
/L.Z.L/	2	2000094838	JP		2000-04-04	TOSHIBA CORP		☐
/L.Z.L/	3	2007257439	JP		2007-10-04	DAINIPPON INK & CHEMICALS		☐

K-FEE SYSTEM GMBH, EX2009, page 376
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 03/12/2015	Application Number	13697297	13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09	
	First Named Inventor	Jarisch et al.	
	Art Unit	1792	
	Examiner Name	L. Long	
	Attorney Docket Number	3712036-01693	

/L.Z.L/	4	2008134910	WO		2008-11-13	BOEGLI-GRAVURES S. A.		☐
/L.Z.L/	5	6248878	JP		1987-10-15	TOUYOU GLASS KK		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Luana Long/	Date Considered	05/28/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

K-FEE SYSTEM GMBH, EX2009, page 377
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 03/12/2015	Application Number	13697297 13697297 - GAU: 1792
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	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M. Barrett/	Date (YYYY-MM-DD)	2015-03-12
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Christian Jarisch
Art Unit	1792
Examiner Name	LONG, LUANA ZHANG
Attorney Docket Number	3712036.01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/L.Z.L/	1	EP 1 764 015 A1	EP		2007-03-21	GRIMAC S R L		☐
/L.Z.L/	2	WO 02/28241 A1	WO		2002-04-11	BOYD COFFEE CO		☐
/L.Z.L/	3	WO 2010/026053 A1	WO		2010-03-11	NESTEC SA		☐

Receipt date: 12/11/2013	Application Number	13697297 13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09
	First Named Inventor	Christian Jarisch
	Art Unit	1792
	Examiner Name	LONG, LUANA ZHANG
	Attorney Docket Number	3712036.01693

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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Examiner Signature	/Luana Long/	Date Considered	05/28/2015

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	26	(US-20130064937-$ or US-20110189350-$ or US-20040089158-$ or US-20020048621-$ or US-20100239734-$ or US-20130064929-$ or US-20100078480-$).did. or (US-7444925-$ or US-8512784-$ or US-6527181-$ or US-5395181-$ or US-6802454-$ or US-4493989-$).did. or (WO-0228241-$ or GB-2397509-$ or WO-2006032565-$ or WO-2007087890-$ or FR-2912124-$ or EP-2345351-$).did. or (EP-1764015-$ or WO-0228241-$ or EP-2345351-$ or WO-2010026053-$ or WO-2005044067-$).did.	US-PGPUB; USPAT; FPRS; DERWENT	OR	ON	2015/05/28 11:09
L4	7	L3 and (color$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/28 11:09
L6	11	((rotat$3 centrifug$3 spin spinned spinning) near3 (capsule cartridge pod pad sachet container) with code with (identif$7 read$4)) and laser near4 (engrav$4 emboss$4 etch$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/28 11:41
L7	315	(food$6 beverage drink coffee tea) near3 (capsule cartridge pod pad sachet container) and laser near3 (engrav$4 emboss$4 etch$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/28 11:49
L8	18	(food$6 beverage drink coffee tea) near3 (capsule cartridge pod pad sachet container) same laser near3 (engrav$4 emboss$4 etch$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/28 11:49
L9	4	(food$6 beverage drink coffee tea) near3 (capsule cartridge pod pad sachet container) same laser near5 (engrav$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/28 11:51
L10	21	(food$6 beverage drink coffee tea) near3 (capsule cartridge pod pad sachet container) and laser near5 (engrav$4	US-PGPUB; USPAT;	OR	ON	2015/05/28 11:55

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

		etch$4) with code	USOCR; FPRS; EPO; JPO; DERWENT			
S1	1	"13697297".apnr.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 17:49
S2	0	("2013/0064937").URPN.	USPAT	OR	ON	2015/05/14 17:50
S3	9	"7607385".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 17:51
S4	3	"6081326".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 17:51
S5	3	"20100078480".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 17:51
S6	11	ep near "1764015"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:21
S7	74	wo adj "0228241"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:24
S8	55	((Christian) near2 (Jarisch)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:29
S9	427	((Christian) near2 (Jarisch)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:30
S10	63	((Alexandre) near2 (Perentes)).INV.	US-	OR	ON	2015/05/14

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

			PGPUB; USPAT; USOCR			21:30
S11	364	((Alexandre) near2 (Perentes)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:30
S12	16	((Stefan) near2 (Kaeser)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:30
S13	140	((Stefan) near2 (Kaeser)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:30
S14	7	((Carlo) near2 (Magri)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:31
S15	55	((Carlo) near2 (Magri)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:31
S16	31	((Arnaud) near2 (Gerbaulet)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:31
S17	14	((Thomas) near2 (Kaeser)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:31
S18	25	((Daniel) near2 (Abegglen)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/14 21:31
S19	212	((Arnaud) near2 (Gerbaulet)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:31
S20	149	((Thomas) near2 (Kaeser)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:31
S21	186	((Daniel) near2 (Abegglen)).INV.	US-PGPUB;	OR	ON	2015/05/14 21:32

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IPR2023-00502, U.S. PATENT 10,994,923

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT			
S22	69	(S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21) and code	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:32
S23	1066	A47J31/22.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:34
S24	1333	A47J31/4492.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:34
S25	43	S23 and S24	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:34
S26	7531	B65D85/8043.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:35
S27	37	S26 and code same (rim flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:36
S28	3	S23 and S27	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:36
S29	2286	99/295.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:39

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

S30	1188	(426/77-79).ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 21:40
S31	23	wo adj "2010026053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:00
S32	74	wo adj "0228241"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:06
S33	11	ep adj "1764015"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:06
S34	1536	(rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same code same (indicia identif$7 read$4 indicium pattern label)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:13
S35	68	(S23 S24 S26 S29) and S34	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:13
S36	68	(S23 S24 S26 S29) and S34	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:13
S37	3	"20020048621".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/14 22:29
S38	67	S22 and (rotat$3 centrifug$3 spin spinned spinning) same (capsule cartridge pod pad sachet container)	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/05/14 22:30

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

			EPO; JPO; DERWENT			
S39	26	wo adj "02078498"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 15:54
S40	2	"7444925".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 15:56
S41	14	("20020048621" | "4230266" | "4829889" | "5158793" | "5855161" | "5974950").PN. OR ("7444925").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/27 15:57
S42	25	wo adj "2005044067"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 15:59
S43	1	2005-404821.NRAN.	DERWENT	OR	ON	2015/05/27 16:01
S44	23	wo adj "2010026053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 16:05
S45	3	"8512784".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 16:12
S46	433	((rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same code same (indicia identif$7 read$4 indicium pattern label)).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 20:02
S47	136	((rotat$3 centrifug$3 spin spinned spinning) near3 (capsule cartridge pod pad sachet container) with code same (indicia identif$7 read$4 indicium pattern label)).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 20:03
S48	123	((rotat$3 centrifug$3 spin spinned spinning) near3 (capsule cartridge pod pad sachet container) with code with (indicia	US-PGPUB; USPAT;	OR	ON	2015/05/27 20:03

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

		identif$7 read$4 indicium pattern label)).ab.	USOCR; FPRS; EPO; JPO; DERWENT			
S49	117	((rotat$3 centrifug$3 spin spinned spinning) near3 (capsule cartridge pod pad sachet container) with code with (identif$7 read$4)).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 20:03
S50	1	"13697303".apnr.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 20:08
S51	3	("6527181" | "20100078480" | "7607385").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/27 20:09
S52	24	("3743820" | "3752961" | "3963918" | "4478095" | "4493989" | "5046841" | "5235169" | "5798514" | "5861613" | "6081627").PN. OR ("6527181").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/27 20:12
S53	25	("20020190190" | "4115011" | "4864112" | "4914828" | "5015832" | "5203591" | "5395181" | "5552593" | "5825947" | "5854478" | "5861613" | "6070805" | "6088482" | "6295262" | "6527181" | "6556690").PN. OR ("7380717").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/27 20:12
S54	21	("3636317" | "4493989" | "4794239" | "4822987" | "4924078" | "4978917" | "5032854" | "5216234" | "5304786" | "5554841" | "5570632" | "5619416" | "5756981" | "6021283" | "6199765" | "6527181").PN. OR ("6802454").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/27 20:15
S55	26	(US-20130064937-$ or US-20110189350-$ or US-20040089158-$ or US-20020048621-$ or US-20100239734-$ or US-20130064929-$ or US-20100078480-$).did. or (US-7444925-$ or US-8512784-$ or US-6527181-$ or US-5395181-$ or US-6802454-$ or US-4493989-$).did. or (WO-0228241-$ or GB-2397509-$ or WO-2006032565-$ or WO-2007087890-$ or FR-2912124-$ or EP-2345351-$).did. or (EP-1764015-$ or WO-0228241-$ or EP-2345351-$ or WO-2010026053-$ or WO-2005044067-$).did.	US-PGPUB; USPAT; FPRS; DERWENT	OR	ON	2015/05/27 22:45
S56	5	S55 and (repeat$4 repetat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 22:45
S57	4	S55 and ($2visible)	US-PGPUB; USPAT;	OR	ON	2015/05/27 22:59

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

			USOCR; FPRS; EPO; JPO; DERWENT			
S58	1	2005-404821.NRAN.	DERWENT	OR	ON	2015/05/27 23:01
S59	7	S55 and (laser)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/05/27 23:06

EAST Search History (Interference)

< This search history is empty>

5/ 28/ 2015 12:53:40 PM
C:\ Users\ lwilliams6\ Documents\ EAST\ Workspaces\ 13697297.wsp

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Jarisch et al.
Art Unit	1792
Examiner Name	L. Long
Attorney Docket Number	3712036-01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/L.Z.L/	1	7607385		2009-10-27	HALLIDAY ET AL.	
/L.Z.L/	2	6081326		2000-06-27	ROUSSEAU ET AL.	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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NON-PATENT LITERATURE DOCUMENTS

K-FEE SYSTEM GMBH, EX2009, page 392
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 06/13/2014	Application Number	13697297 13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09
	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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Examiner Signature	/Luana Long/	Date Considered	05/28/2015

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

K-FEE SYSTEM GMBH, EX2009, page 393
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
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Receipt date: 06/13/2014	Application Number	13697297 13697297 - GAU: 1792
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	First Named Inventor	Jarisch et al.
	Art Unit	1792
	Examiner Name	L. Long
	Attorney Docket Number	3712036-01693

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-06-13
Name/Print	Robert M. Barrett	Registration Number	30,142

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

K-FEE SYSTEM GMBH, EX2009, page 394
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13697297
Filing Date	2012-11-09
First Named Inventor	Christian Jarisch
Art Unit	1792
Examiner Name	LONG, LUANA ZHANG
Attorney Docket Number	3712036.01693

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/L.Z.L/	1	2005044067	WO		2005-05-19	GRIFFES CONSULTING SA		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

Receipt date: 03/07/2014	Application Number	13697297 13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09
	First Named Inventor	Christian Jarisch
	Art Unit	1792
	Examiner Name	LONG, LUANA ZHANG
	Attorney Docket Number	3712036.01693

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Examiner Signature	/Luana Long/	Date Considered	05/28/2015

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K-FEE SYSTEM GMBH, EX2009, page 397
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Receipt date: 03/07/2014	Application Number	13697297 13697297 - GAU: 1792
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-11-09
	First Named Inventor	Christian Jarisch
	Art Unit	1792
	Examiner Name	LONG, LUANA ZHANG
	Attorney Docket Number	3712036.01693

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☐ See attached certification statement.

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☒ A certification statement is not submitted herewith.

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Signature	/Robert M Barrett/	Date (YYYY-MM-DD)	2014-03-07
Name/Print	Robert M. Barrett	Registration Number	30,142

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K-FEE SYSTEM GMBH, EX2009, page 398
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 06/04/2015

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
LONG, LUANA ZHANG	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
06/04/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

K-FEE SYSTEM GMBH, EX2009, page 400
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Office Action Summary	Application No. 13/697,297	Applicant(s) JARISCH ET AL.	
	Examiner LUANA Z. LONG	Art Unit 1792	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/22/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-18* is/are pending in the application.

5a) Of the above claim(s) *14-18* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-13* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *11/09/2012* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/11/2013, 3/07/2014, 6/13/2014, 11/11/2014, 3/12/2015.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Election/Restrictions

1. Applicant's election of Group I, claims 1-13 in the reply filed on 4/22/2015 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 14-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Groups II and III, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6, 8-9, 11-13 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Boyd et al. [US 2002/0048621] (hereinafter "Boyd").

4. Regarding claims 1-3, Boyd teaches a capsule (packet 10) for the preparation of a beverage, the capsule comprising a container (filter portions 12 and 14) and a beverage ingredient (ground coffee 20, [0025]) contained therein, the container comprises a code (machine interpretable feature 30, [0028]) adapted for being identified or read by an external reader. Since the capsule of Boyd is circular shape (Figs. 1-2), since the code (30) is arranged on the container along an arc-shaped or circular path of a circumference of the container (Figs. 2a-2h), the code is considered to be capable of being read while the capsule is rotated around an axis of rotation traversing the capsule (see Fig. 3). It is also noted that a code reader can potentially also rotate along with the capsule (10) at the same rotation speed while reading the code on the capsule. Boyd shows that the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of a circumference of the container (Figs. 2 and 2a).

5. Regarding claim 4, Boyd shows in Fig. 2g that the code (grooves 37) appears to be arranged along at least an eight of the circumference of the container ([0029]).

6. Regarding claim 6, Boyd teaches that the code is a bit code (31, 38) formed by a series of discrete polygonal surfaces printed on and/or embossed in the container (see Figs. 2a, 2h and [0029]).

7. Regarding claims 8-9, Boyd teaches that the code can be printed or embossed by a pattern (geometric shape) which possesses surfaces having different reflective and/or absorbing properties to light (color), wherein the pattern possesses a first surface having inclined (raised) mirroring or absorbing properties to light and a second surface

having flat (lowered) mirroring or flat reflective properties to light (code 32 can be a geometric shape that may be raised or lowered and may incorporate a color) (see Fig. 2b and [0029]).

8. Regarding claims 11-13, Boyd teaches that the container comprises a body (12 or 14) and a lid (12 or 14) connected to the body and the code (30) is present on the lid (12 or 14) of the container (Figs. 1-2), where the code is present on a rim of the capsule (Figs. 2, 2a-2h), wherein the code is present on what is considered a bottom of the rim of the capsule which is opposed to the lid of the capsule, when the capsule (10) in Figs. 1-2 is flipped upside down.

9. Claims 1-6 and 11 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Aker [US 2010/0078480 A1] (cited in the IDS dated 11/11/2014).

10. Regarding claims 1-6, 11, Aker teaches a capsule (beverage pod) for the preparation of a beverage, the capsule comprising a container (40) and a beverage ingredient contained therein (Figs. 2A-2B, [0017]), the container comprises a code (50A-50H) adapted for being identified or read by an external reader, the code (50A-50H) being arranged on the container so as to be capable of being read while the capsule is rotated around an axis of rotation traversing the capsule ([0007]); wherein the code (50A-50H) is arranged on the container along an arc-shaped or circular path of a circumference of the container (out-ring 46, [0017]); wherein the code comprises successive segments which are individually rectilinear but extend along at least an eight of the circumference of the container; wherein the code is repeated along the circumference of the container ([0017]); wherein the code is a bit code (bar code)

formed by a series of discrete polygonal surfaces printed on the container; and wherein the container comprises a body (40) and a lid (45) connected to the body and the code is on the lid of the container (Figs. 2A-2B, [0017]).

11. Claims 1-4 and 7 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Ruchonnet [WO 2005/0440067] (cited in the IDS dated 03/07/2014, see Machine Translation cited in the PTO-892).

12. Regarding claims 1-4 and 7, Ruchonnet teaches a capsule (3) for the preparation of a beverage, the capsule comprising a container (13) and a beverage ingredient (coffee) contained therein (Figs. 2-3), the container comprises a code (bar code 23) adapted for being identified or read by an external reader, the code (23) being arranged on the container so as to be capable of being read while the capsule is rotated around an axis of rotation traversing the capsule (Figs. 2-3, page 3 of Translation); wherein the code (23) is arranged on the container along an arc-shaped or circular path of a circumference of the container (page 3); wherein the code (23) comprises successive segments which are individually rectilinear but extend along at least an eight of the circumference of the container (Fig. 3); wherein the code is printed by an ink which is not visible by the human eye under natural light (bar code registered with invisible ink that reacts to UV light) (page 3).

13. Claims 1-2 and 11 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Mahlich [US 7,444,925 B2].

14. Regarding claims 1-2, 11, Mahlich teaches a capsule (1 or 5) for the preparation of a beverage, the capsule comprising a container and a beverage ingredient contained

therein (coffee powder) (col. 4, lines 41-50, Figs. 1-1a, 2-2a), the container comprises a code (3 or 9) adapted for being identified or read by an external reader (reading head 27) (col. 5, lines 22-27), the code (3 or 9) is arranged on the container to be read while the capsule is rotated around an axis (1a or 5a) of rotation traversing the capsule (col. 4, lines 42-43, 53-56); wherein the code is arranged on the container along an arc-shaped or circular path of a circumference of the container (Figs. 1a and 2a); wherein the container comprises a body (1) and a lid (2) connected to the body and the code (3) is present on the lid (2) of the container (see Figs. 1 and 1a).

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

15. Claim 10 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Boyd et al. [US 2002/0048621] (cited as [WO 02/28241 A1] in the IDS dated 12/11/2013, hereinafter "Boyd") in view of McMurty et al. [US 6,802,454 B1] (hereinafter "McMurty").

16. Boyd discloses that the code can be mechanically embossed (raised) or engraved (lowered) on the container (geometric shape 32 may be raised or lowered, [0029]), or that the code can be provided by grooves 37 to provide texture on the container ([0029]).

17. Boyd is silent with respect to embossing or engraving by a laser.

18. McMurty is relied on for teaching that it was well-known to laser etch codes onto small objects, the laser-etched code to be read by an optical scanner.

19. Since Boyd discloses that a variety of machine interpretable features can be used for storing data for brewing the capsule ([0028]-[0030]), it would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the laser-etched code of McMurty into the capsule of Boyd, with the predictable result of using the laser-etched code for storing data regarding brewing parameters for making a beverage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUANA Z. LONG whose telephone number is (571)270-1152. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. Z. L./
Examiner, Art Unit 1792

/DREW BECKER/

Primary Examiner, Art Unit 1792

Notice of References Cited	Application/Control No. 13/697,297	Applicant(s)/Patent Under Reexamination JARISCH ET AL.	
	Examiner LUANA Z. LONG	Art Unit 1792	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0048621 A1	04-2002	Boyd et al.	426/77
*	B	US-6,802,454 B1	10-2004	McMurtry et al.	235/494
*	C	US-7,444,925 B2	11-2008	Mahlich, Gotthard	99/289P
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine Translation: Ruchonnet [WO 2005/0440067], Description. Retrieved from EPO on 28 May 2015.
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Electronic Acknowledgement Receipt

EFS ID:	23238596
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Alex Stark
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	18-AUG-2015
Filing Date:	09-NOV-2012
Time Stamp:	14:48:06
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3712036-01693_Response_to_NFOA_mailed_June_4_2015.pdf	115251 6ea308a9b902084495d316962a8d13d68d4efe8d	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	9
Warnings:			
Information:			
	Total Files Size (in bytes):	115251	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	Long, Luana Zhang
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Examiner:

In response to the Non-final Office Action dated June 4, 2015, please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the Listing of Claims, which begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

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Amendments to the Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A capsule for the preparation of a beverage, the capsule comprising a container ~~and a beverage ingredient contained therein~~configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on ~~the container~~a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule,

wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference.

Claim 2 (previously presented): The capsule of Claim 1, wherein the code is arranged on the container along an arc-shaped or circular path of a circumference of the container.

Claim 3 (canceled):

Claim 4 (previously presented): The capsule of Claim 1, wherein the code is arranged along at least an eighth of the circumference of the container.

Claim 5 (previously presented): The capsule of Claim 1, wherein the code is repeated along the circumference of the container.

Claim 6 (previously presented): The capsule of Claim 1, wherein the code is a bit code formed by a series of discrete polygonal or dot surfaces printed on and/or embossed in the container.

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Claim 7 (previously presented): The capsule of Claim 1, wherein the code is printed by an ink which is not visible by the human eye under natural light.

Claim 8 (previously presented): The capsule of Claim 1, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.

Claim 9 (previously presented): The capsule of Claim 8, wherein the pattern possesses a first surface having inclined mirroring or absorbing properties to light and a second surface having flat mirroring or flat reflective properties to light.

Claim 10 (previously presented): The capsule of Claim 1, wherein the code is mechanically embossed or engraved on the container by a laser.

Claim 11 (previously presented): The capsule of Claim 1, wherein the container comprises a body and a lid connected to the body and the code is present on the lid of the container.

Claims 12-13 (canceled):

Claim 14 (withdrawn): A system for preparing a beverage from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis.

Claim 15 (withdrawn): The system of Claim 14, wherein the reader comprises a light emitter and a light sensor or an inductive sensor.

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Claim 16 (withdrawn): The system of Claim 14, wherein the optical reader or inductive sensor is arranged to detect a code on the rim of the capsule.

Claim 17 (withdrawn): A method for preparing a beverage from a system from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the method comprising rotating the container and reading the code while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device, the device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis, and extracting the beverage from the capsule by rotating the capsule along the axis.

Claim 18 (withdrawn): The method of Claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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REMARKS

This Amendment is submitted in reply to the Non-final Office Action dated June 4, 2015. The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036.01693 on the account statement.

Claims 1-13 are currently pending. Claims 14-18 were previously withdrawn from consideration. In the Office Action, Claims 1-9 and 11-13 are rejected under 35 U.S.C. §102. Claim 10 is rejected under 35 U.S.C §103(a). In response, Applicants have amended Claim 1, and have canceled Claims 3 and 12-13. The amendments do not add new matter and are supported in the specification at, for example, the originally filed claims. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

In the Office Action, Claims 1-4, 6, 8-9 and 11-13 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publ. No. 2002/0048621 to Boyd et al. ("*Boyd*"). Claims 1-6 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publ. No. 2002/0048621 to Aker ("*Aker*"). Claims 1-4 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by International Application WO 2005/0440067 to Ruchonnet ("*Ruchonnet*"). Claims 1-2 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 7,444,925 to Mahlich ("*Mahlich*"). In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

Currently amended independent Claim 1 recites, in part, a capsule for the preparation of a beverage, the capsule comprising a container configured for housing a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference. The amendments do not add new matter and are supported in the specification at, for example, the originally filed claims.

As discussed in the specification, a problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always

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reliable or convenient. The present claims, however, are directed to an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine.

In this regard, the present claims are directed to a capsule for the preparation of a beverage. The capsule includes a container configured to house a beverage ingredient. The container has a code adapted for being identified or read by external reading means, and the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule. More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In an embodiment, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. The code may be arranged along at least a eighth of the circumference. Such a configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one code is readable but also may potentially reduce the reading time. See specification, page 2, line 23-page 3, line 14. In contrast, Applicants respectfully submit that *Boyd, Aker, Ruchonnet* and *Mahlich* fail to disclose or suggest each and every element of the present claims.

Boyd, Aker, Ruchonnet and *Mahlich* fail to disclose or suggest a capsule for the preparation of a beverage, the capsule comprising a container for housing a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference as recited, in part, by the present claims.

Instead, *Boyd* is merely directed to a brewing packet that includes a machine interpretable feature that directs operation of the coffee machine in accordance with predefined brewing directives. See *Boyd*, page 2, [0028]-[0029]. At no place, however, does *Boyd* disclose or suggest a container having a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around

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an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference as recited, in part, by the present claims.

Aker is merely directed to a product having a product body with a round ending section and a method of positioning a barcode repetitively along a circle sharing a common center with an outer-ring of the round ending section. See *Aker*, Abstract. At no place, however, does *Aker* disclose or suggest a code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference as recited, in part, by the present claims.

Ruchonnet is merely directed to a receptacle having information registered with invisible ink that reacts to ultraviolet light. The information contains information concerning traceability of the product contained in the receptacle and the origin of latter. See *Ruchonnet*, translation, page 3/4. At no place, however, does *Ruchonnet* disclose or suggest a container having a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference as recited, in part, by the present claims.

Mahlich is merely directed to a machine-readable identification on a single-serving unit containing coffee powder. The identification code consists of concentric circles on a top portion of the unit. See *Mahlich*, Abstract; Figures; col. 4, lines 13-23. At no place, however, does *Mahlick* disclose or suggest a container having a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference and the code comprises successive segments that are individually rectilinear and extend substantially along at least an eighth of the circumference as recited, in part, by the present claims.

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Further, anticipation is a factual determination that "requires the presence in a single prior art disclosure of each and every element of a claimed invention." *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747 (Fed. Cir. 1987) (emphasis added). Federal Circuit decisions have repeatedly emphasized the notion that anticipation cannot be found where less than all elements of a claimed invention are set forth in a reference. See, *e.g.*, *Transclean Corp. v. Bridgewood Services, Inc.*, 290 F.3d 1364, 1370 (Fed. Cir. 2002). As such, a reference must clearly disclose each and every limitation of the claimed invention before anticipation may be found. Because *Boyd, Aker, Ruchonnet* and *Mahlich* fail to disclose or suggest each and every element of the present claims, *Boyd, Aker, Ruchonnet* and *Mahlich* fail to anticipate the present claims.

Accordingly, Applicants respectfully request that the anticipation rejections with respect to Claims 1-9 and 11-13 be reconsidered and withdrawn.

In the Office Action, Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Boyd* in view of U.S. Patent No. 6,802,454 to McMurty et al. ("*McMurty*"). Applicants respectfully submit that the patentability of Claim 1 as discussed above renders moot the obviousness rejection of Claim 10, which is dependent from Claim 1. In this regard, the cited art fails to teach or suggest the elements of Claim 10 in combination with the novel elements of Claim 1. Moreover, the Patent Office merely relies on the cited references to recite elements of the dependent claim.

For at least the reasons set forth above, Applicants respectfully submit that the cited references fail to disclose or suggest each and every element of the present claims.

Accordingly, Applicants respectfully request that the obviousness rejection of Claim 10 under 35 U.S.C. §103 be reconsidered and withdrawn.

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For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly request an early allowance of the same. In the event there remains any impediment to allowance of the claims that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
Telephone No. 312-807-4204

Dated: August 18, 2015

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/697,297	Filing Date 11/09/2012	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	08/18/2015	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ERIC DANTZLER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13697297	JARISCH ET AL.
	Examiner	Art Unit
	LUANA Z LONG	1792

CPC- SEARCHED		
Symbol	Date	Examiner
A47J31/4492, A47J31/22 (updated 10/29/2015)	5/28/2015	LZL
B65D85/8043 (updated 10/29/2015)	5/28/2015	LZL

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
426	77-79 (updated 10/29/2015)	5/28/2015	LZL
99	295 (updated 10/29/2015)	5/28/2015	LZL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	5/28/2015	LZL
EAST text search with classificaiton search	5/28/2015	LZL
Updated EAST search (attached)	10/29/2015	LZL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/L.Z.L./ Examiner.Art Unit 1792	

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	2664	(A47J31/4492 A47J31/22).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:20
L8	8534	B65D85/8043.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:20
L9	1219	(426/77-79).ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:20
L10	2396	99/295.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:20
L11	96	(rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same code same (rim flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:21
L12	8	(7 8 9 10) and 11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:21
L13	1581	(rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same code same (indicia identif$7 read$4 indicium pattern label)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:22
L14	446	((rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same code same (indicia identif$7 read$4 indicium pattern label)).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:23
L15	57	(7 8 9 10) and 14	US-PGPUB; USPAT;	OR	ON	2015/10/29 21:24

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			USOCR; FPRS; EPO; JPO; DERWENT			
L16	279	((rotat$3 centrifug$3 spin spinned spinning) with (capsule cartridge pod pad sachet container) same (barcode (bar adj code)) same (indicia identif$7 read$4 indicium pattern label)).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:25
L17	0	(7 8 9 10) and 16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2015/10/29 21:25

EAST Search History (Interference)

<This search history is empty>

10/29/2015 9:25:40 PM
C:\Users\lwilliams6\Documents\EAST\Workspaces\13697297.wsp

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 11/04/2015

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER
LONG, LUANA ZHANG

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
11/04/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

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Office Action Summary	Application No. 13/697,297	Applicant(s) JARISCH ET AL.	
	Examiner LUANA Z. LONG	Art Unit 1792	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08/18/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,2,4-11 and 14-18* is/are pending in the application.

5a) Of the above claim(s) *14-18* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-2,4-11* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Election/Restrictions

1. Claims 14-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Groups II and III, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/22/2015.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(d):

> (d) REFERENCE IN DEPENDENT FORMS.—Subject to subsection (e), a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), fourth paragraph:

> Subject to the [fifth paragraph of 35 U.S.C. 112 (pre-AIA)], a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

2. Claims 4, 6 and 11 are rejected under 35 U.S.C. 112(d) or pre-AIA 35 U.S.C. 112, 4th paragraph, as being of improper dependent form for failing to further limit the subject matter of the claim upon which it depends, or for failing to include all the limitations of the claim upon which it depends.

3. Claim 4 states "wherein the code is arranged along at least an eighth of the circumference of the container. The claim fails to further limit the subject matter of the claim upon which it depends.

4. Claim 6 recites "wherein the code is a bit code formed by a series of discrete polygonal or dot surfaces printed on and/or embossed in the container." The claim fails to include all the limitations of claim 1, since claim 1 requires that the code comprises successive segments that are individually rectilinear.

5. Claim 11 recites that the code is present on the lid of the container. However, claim 11 depends from claim 1 and claim 1 requires that the code be on the bottom of the rim of the container body, opposed to the lid. Therefore, claim 11 fails to include all the limitations of the claim upon which it depends.

6. Applicant may cancel the claim(s), amend the claim(s) to place the claim(s) in proper dependent form, rewrite the claim(s) in independent form, or present a sufficient showing that the dependent claim(s) complies with the statutory requirements.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-2, 5, 8-9 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Boyd [US 2002/0048621] (already of record) in view of Aker [US 2010/0078480 A1] (already of record).

8. Regarding claims 1-2, Boyd teaches a capsule (packet 10) for the preparation of a beverage, the capsule comprising a container (filter portions 12 and 14) configured to house a beverage ingredient (ground coffee 20, [0025]), the container comprises a cup-shaped body (12) having a flange-like rim (see Figs. 1-2), a lid (14) connected to the body (see packet 10 in Figs. 1-2 upside-down), and a code (machine interpretable feature 30, [0028]) adapted for being identified or read by an external reader, the code is arranged on a bottom of the rim, which is opposed to the lid (14) (see packet 10 in Fig. 2 upside-down), wherein the capsule comprises a circumference and the code (30) comprises successive segments that are individually rectilinear (see bar code 31 in Fig. 2a) and extend along the circumference (Fig. 2a).

9. Since the capsule of Boyd is circular shape (Figs. 1-2), since the code (30) is arranged on the container along an arc-shaped or circular path of a circumference of the container (Figs. 2a-2h), the code is considered to be capable of being read while the capsule is rotated around an axis of rotation traversing the capsule (see Fig. 3). It is also noted that a code reader can potentially also rotate along with the capsule (10) at the same rotation speed while reading the code on the capsule.

10. Boyd is silent with respect to the rectilinear code extending substantially along at least an eighth of the circumference.

11. Aker discloses a capsule (beverage pod) for the preparation of a beverage, the capsule comprising a container (40) for containing a beverage ingredient (Figs. 2A-2B, [0017]), the container comprises a code (50A-50H) adapted for being identified or read by an external reader, wherein the code (50A-50H) comprises successive segments

which are individually rectilinear and extend along at least an eighth of the circumference (out-ring 46) of the container (Figs. 2A-2B).

12. Since Boyd and Aker are both directed to cup-shaped beverage capsules having barcodes printed along the circumference of the capsules, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the barcode 31 of Boyd with the barcode (50A-50H) of Aker so that the code extend along at least an eighth of the circumference of the container, in order to have multiple instances of the same barcode repeated along the circumference of the capsule in order to make it easier for the barcode reader to read the information coded in the barcode even if the orientation of the product body is not fixed (see [0022] of Aker).

13. Regarding claim 5, the barcode of Boyd in view of Aker is repeated along the circumference of the container (see Fig. 2B of Aker).

14. Regarding claims 8-9, Boyd discloses that the code (30) can be printed or embossed by a pattern (geometric shape) which possesses surfaces having different reflective and/or absorbing properties to light (color), wherein the pattern possesses a first surface having inclined (raised) mirroring or absorbing properties to light and a second surface having flat (lowered) mirroring or flat reflective properties to light (code 32 can be a geometric shape that may be raised or lowered and may incorporate a color) (see Fig. 2b and [0029]).

15. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Boyd [US 2002/0048621] (already of record) in view of Aker [US 2010/0078480 A1] (already of record) as applied to the rejection of claims 1-2, 5, 8-9 above, further in view of Ruchonnet [WO 2005/0440067] (already of record).

16. Regarding claim 7, Boyd in view of Aker is silent with respect to the code being printed by an ink which is not visible by the human eye under natural light.

17. Ruchonnet discloses a capsule (3) for the preparation of a beverage, the capsule comprising a container (13) and a beverage ingredient (coffee) contained therein (Figs. 2-3), the container comprises a code (bar code 23) adapted for being identified or read by an external reader, wherein the code is printed by an ink which is not visible by the human eye under natural light (bar code registered with invisible ink that reacts to UV light) (page 3).

18. Since Boyd, Aker and Ruchonnet all disclose beverage capsules having barcodes printed along the circumference of the capsules, it would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the invisible ink of Ruchonnet as the printing ink for the barcode of Modified Boyd, in order to print operative information onto the beverage capsule that is invisible to the naked eye, for the advantage of enhancing the visual appeal of the capsule.

19. Claim 10 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Boyd [US 2002/0048621] (already of record) in view of Aker [US 2010/0078480 A1] (already of record) as applied to the rejection of claims 1-2, 5, 8-9 above, further in view of McMurty [US 6,802,454 B1] (already of record).

20. Regarding claim 10, Boyd in view of Aker is silent with respect to embossing or engraving the barcode by a laser.

21. McMurty is relied on for teaching that it was well-known to laser etch codes onto small objects, the laser-etched code to be read by an optical scanner.

22. Since Boyd discloses that the code (30) can be mechanically embossed (raised) or engraved (lowered) on the container (geometric shape 32 may be raised or lowered, [0029]), or that the code can be provided by grooves 37 to provide texture on the container ([0029]), it would have been obvious to one having ordinary skill in the art at the time of the invention to apply the laser-etching method of McMurty for mechanically embossing or engraving the barcode of Modified Boyd, with the predictable result of making an embossed or engraved barcode onto the capsule.

Response to Arguments

23. Applicant's arguments filed 08/18/2015 have been fully considered but they are not persuasive in view of the new grounds of rejection presented above.

24. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUANA Z. LONG whose telephone number is (571)270-1152. The examiner can normally be reached on M-F 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. Z. L./
Examiner, Art Unit 1792

/DREW BECKER/

Primary Examiner, Art Unit 1792

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/697,297	Filing Date 11/09/2012	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**390**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**390**

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	**01/04/2016**	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TER JACKSON WOODRUFF/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/697,297	11/09/2012	

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**390**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**390**

APPLICATION AS AMENDED – PART II

AMENDMENT **01/04/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

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*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

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/TER JACKSON WOODRUFF/

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/697,297	Filing Date 11/09/2012	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**390**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
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☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**390**

APPLICATION AS AMENDED – PART II

AMENDMENT **01/04/2016**

	(Column 1)		(Column 2)	(Column 3)		
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	(Column 1)		(Column 2)	(Column 3)		
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	24515892
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Jian Jiang/Alex Stark
Filer Authorized By:	Jian Jiang
Attorney Docket Number:	3712036-01693
Receipt Date:	04-JAN-2016
Filing Date:	09-NOV-2012
Time Stamp:	16:44:04
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	After Final Consideration Program Request	1693_Request_After_Final.pdf	226470 cf3c377f9ef71dc00bae63db9512e2536604ebc2	no	2

Warnings:	
Information:	

2		1693_Response_to_FOA_dated_11-4-2015.pdf	111297 f764705b11f02a69ae4ee26f06d20e0b1d9c19b9	yes	9

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Response After Final Action	1	1
Claims	2	4
Applicant Arguments/Remarks Made in an Amendment	5	9

Warnings:	
Information:	
Total Files Size (in bytes):	337767

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
3712036-1693	13/697,297	November 9, 2012
First Named Inventor:	**Title:**	
Jarisch et al.	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
   - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
   - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
     - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
     - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
       - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
       - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Robert M. Barrett/	January 4, 2016
Name (Print/Typed) Robert M. Barrett	**Practitioner Registration No.** 30,142

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

REMARKS

This Amendment is submitted in reply to the Final Office Action dated November 4, 2015. The Director is authorized to charge any fees that may be required or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036.01693 on the account statement.

Claims 1-2 and 4-11 are currently pending and under consideration. Claims 14-18 were previously withdrawn from consideration; and Claims 3 and 12-13 were previously canceled without prejudice or disclaimer. In the Office Action, Claims 4, 6, and 11 are rejected under 35 U.S.C. §112; and Claims 1-2, 5, and 7-10 are rejected under 35 U.S.C. §103. In response, Applicants have amended Claim 1 and have canceled Claims 4 and 11. The amendments do not add new matter and are supported in the specification at, for example, FIG. 4. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

In the Office Action, Claims 4, 6, and 11 are rejected under 35 U.S.C. §112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of the claim upon which it depends, or for failing to include all the limitations of the claim upon which it depends. In response, without acquiescing to the merits of the rejection and solely to advance prosecution of this application, Applicants have amended the present claims to remove any alleged improper dependency.

For at least the reasons set forth above, Applicants respectfully submit that the present claims fully comply with the requirements of 35 U.S.C. §112, fourth paragraph.

Accordingly, Applicants respectfully request that the rejection of Claims 4, 6, and 11 be reconsidered and withdrawn.

In the Office Action, Claims 1-2, 5, and 8-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication. No. 2002/0048621 to Boyd et al. ("*Boyd*") in view of U.S. Patent Publication No. 2010/0078480 to Aker ("*Aker*"). Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Boyd* in view of *Aker*, further in view of International Application WO 2005/0440067 to Ruchonnet ("*Ruchonnet*"). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Boyd* in view of *Aker*, further in view of U.S. Patent No. 6,802,454 to McMurty et al. ("*McMurty*"). In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

K-FEE SYSTEM GMBH, EX2009, page 445
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Currently amended independent Claim 1 recites a capsule for the preparation of a beverage, the capsule comprising a container configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference, the code comprises successive segments that extend substantially along at least an eighth of the circumference, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

As discussed in the specification, a problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always reliable or convenient. The present claims, however, are directed to an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine. See specification, page 2, lines 23-30.

In this regard, the present claims are directed to a capsule for the preparation of a beverage. The capsule includes a container configured to house a beverage ingredient. The container has a code adapted for being identified or read by external reading means, and the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule. More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In an embodiment, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. The code may be arranged along at least a eighth of the circumference. Such a configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one code is readable but also may potentially reduce the reading time. See specification, page 2, line 23-page 3, line 14.

K-FEE SYSTEM GMBH, EX2009, page 446
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

In contrast, *Boyd, Aker, Ruchonnet*, and *McMurty* fail to disclose or suggest each and every element of the present claims. Specifically, *Boyd, Aker, Ruchonnet*, and *McMurty* fail to disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as recited, in part, by independent Claim 1.

Boyd is directed to a brewing packet that includes a machine interpretable feature that directs operation of the coffee machine in accordance with predefined brewing directives. See *Boyd*, paragraphs [0028]-[0029]. The Patent Office alleges that in *Boyd*, the first filter portion 12 is the claimed cup-shaped body, the second filter portion 14 is the claimed lid, and the orbicular gasket 18 is the claimed flange-like rim. See Office Action, for example, page 4; and *Boyd,* for example, FIGS. 1-2. However, *Boyd* merely discloses a **symmetrical** disc-shaped coffee packet with the alleged flange-like rim in the **middle** of the packet. The first filter portion 12 and the second filter portion 14 collectively define a cavity of the packet and are secured to the orbicular gasket 18. See *Boyd*, paragraph [0027]; and FIGS. 1-2.

In contrast, the present claims recite that the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body. For clarity, Applicants submit that the height of the lid herein refers to the distance between (i) the uppermost portion of the lid and (ii) the intersection of the axis of rotation and the horizontal plane in which the lid connects to the body.

In *Boyd*, the first filter portion 12 (the alleged "body") at best extends from an end of the first filter portion 12 (as in Fig. 1) to one side of the orbicular gasket 18 (the alleged "flange-like rim") on which a machine interpretable feature 30 is present; the orbicular gasket 18 (the alleged "flange-like rim") is in the **middle** of the packet between the first filter portion 12 and the second filter portion 14; and the first filter portion 12 (the alleged "body") and the second filter portion 14 (the alleged "lid") have the **same** height. Therefore, the first filter portion 12 is NOT the claimed cup-shaped body, the second filter portion 14 is NOT the claimed lid, and the orbicular gasket 18 is NOT the claimed flange-like rim. Therefore, *Boyd* does not disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends

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from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as recited, in part, by independent Claim 1.

Aker is merely directed to a product having a product body with a round ending section and a method of positioning a barcode repetitively along a circle sharing a common center with an outer-ring of the round ending section. See *Aker*, for example, Abstract. *Aker* is merely relied on for the alleged disclosure of the code extending along the circumference of the container. See Office Action, pages 5 and 6. The barcode in *Aker* is printed on the top of the round ending section. See *Aker*, for example, FIG. 1A. *Aker* does not remedy the deficiency of *Boyd*. Specifically, at no place does *Aker* disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as recited, in part, by independent Claim 1.

Ruchonnet is merely directed to a receptacle having information registered with invisible ink that reacts to ultraviolet light. The information contains information concerning traceability of the product contained in the receptacle and the origin of latter. See *Ruchonnet*, translation, page 3/4. *Ruchonnet* does not remedy the deficiency of *Boyd* and *Aker*. Specifically, at no place does *Ruchonnet* disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as recited, in part, by independent Claim 1.

McMurty relates to a method for sequencing multiple two-dimensional scanning codes to identify small parts. See *McMurty*, for example, col. 1, lines 9-12. *McMurty* is merely relied on for the alleged disclosure of laser etching codes. See Office Action, page 7. *McMurty* does not even disclose a capsule for the preparation of a beverage, let alone the claimed capsule wherein the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim

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extends from the top end of the body, and the lid has a height that is less than the height of the body as recited, in part, by independent Claim 1. Therefore, *McMurty* does not remedy the deficiency of the other references.

For at least the reasons set forth above, Applicants respectfully submit that the cited references fail to disclose or suggest each and every element of the present claims.

Accordingly, Applicants respectfully request that the obviousness rejections of the present claims under 35 U.S.C. §103 be reconsidered and withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly request an early allowance of the same. In the event there remains any impediment to allowance of the claims that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
Telephone No. 312-807-4204

Dated: January 4, 2016

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Amendments to the Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A capsule for the preparation of a beverage, the capsule comprising a container configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule,

wherein the capsule comprises a circumference, [[and]] the code comprises successive segments that ~~are individually rectilinear and~~ extend substantially along at least an eighth of the circumference, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

Claim 2 (previously presented): The capsule of Claim 1, wherein the code is arranged on the container along an arc-shaped or circular path of a circumference of the container.

Claims 3-4 (canceled):

Claim 5 (previously presented): The capsule of Claim 1, wherein the code is repeated along the circumference of the container.

Claim 6 (previously presented): The capsule of Claim 1, wherein the code is a bit code formed by a series of discrete polygonal or dot surfaces printed on and/or embossed in the container.

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Claim 7 (previously presented): The capsule of Claim 1, wherein the code is printed by an ink which is not visible by the human eye under natural light.

Claim 8 (previously presented): The capsule of Claim 1, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.

Claim 9 (previously presented): The capsule of Claim 8, wherein the pattern possesses a first surface having inclined mirroring or absorbing properties to light and a second surface having flat mirroring or flat reflective properties to light.

Claim 10 (previously presented): The capsule of Claim 1, wherein the code is mechanically embossed or engraved on the container by a laser.

Claims 11-13 (canceled):

Claim 14 (withdrawn): A system for preparing a beverage from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis.

Claim 15 (withdrawn): The system of Claim 14, wherein the reader comprises a light emitter and a light sensor or an inductive sensor.

Claim 16 (withdrawn): The system of Claim 14, wherein the optical reader or inductive sensor is arranged to detect a code on the rim of the capsule.

Claim 17 (withdrawn): A method for preparing a beverage from a system from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a

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code adapted for being identified or read by an external reader, the method comprising rotating the container and reading the code while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device, the device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis, and extracting the beverage from the capsule by rotating the capsule along the axis.

Claim 18 (withdrawn): The method of Claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	Long, Luana Zhang
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Examiner:

This Amendment and the enclosed Request for After-Final Consideration (PTO/SB/434) are submitted in reply to the Final Office Action dated November 4, 2015. Please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the Listing of Claims, which begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

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IPR2023-00502, U.S. PATENT 10,994,923

DO NOT ENTER: /C.S./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
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P.O. Box 1450
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Remarks begin on page 5 of this paper.

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IPR2023-00502, U.S. PATENT 10,994,923

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 02/10/2016

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
SMITH, CHAIM A	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
02/10/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

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Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/697,297	**Applicant(s)** JARISCH ET AL.	
	Examiner CHAIM SMITH	**Art Unit** 1792	**AIA (First Inventor to File) Status** No

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 04 January 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;

(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☐ The period for reply expires _____months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☒ They raise the issue of new matter (see NOTE below);
   c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:

_____.

13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

14. ☒ Other: PTO 2323.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: .
Claim(s) objected to: .
Claim(s) rejected: 1, 2, and 4-11.
Claim(s) withdrawn from consideration: .

/ERIK KASHNIKOW/ Supervisory Patent Examiner, Art Unit 1792	/C. S./ Examiner, Art Unit 1792

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Continuation of 3. NOTE: Claim 1 now recites "the lid has a height that is less than the height of the body" This is seen as raising a new issue that would require further seach and consideration. Further The Office is unable to find support within applicants' disclosure for the lid having a height that is less than the height of the body. In fact it is seen in figure 4 that the lid actually is shown as having a height that is greater than the height of the body. Therefore this limitation is seen to raise an issue of new matter and for all the reasons given herein the amendment will not be entered.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

AFCP 2.0 Decision	Application No.	Applicant(s)
	13/697,297	JARISCH ET AL.
	Examiner	Art Unit
	CHAIM SMITH	1792

This is in response to the After Final Consideration Pilot request filed 04 January 2016.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other:

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☒ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other:

   Examiner Note: Please attach an interview summary when necessary as described above.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

PTO/SB/22 (03-13)
Approved for use through 3/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): 3712036-01693

Application Number: 13/697,297

Filed: 2012-11-09

For: CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

Art Unit: 1792

Examiner: Long, Luana Zhang

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☑ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$ 200.00
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☐ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 021618.

☐ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 30142.

☐ attorney or agent acting under 37 CFR 1.34. Registration number .

/Robert M. Barrett/ — Signature

February 15, 2016 — Date

Robert M. Barrett — Typed or printed name

312-807-4204 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	24913570
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Alex Stark
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	15-FEB-2016
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Authorized User	BARRETT, ROBERT M.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	01693rce.pdf	79496 37ae57d7b03df7de576e9846d702cfe192fb2b63	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Extension of Time	01693ext.pdf	151747 3338f988f5992e30432f21d9d8838e86f9508542	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	33068 1df48fd3ee215e4019e51c6b40ac22ef912f20a8	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13/697,297	Filing Date	2012-11-09	Docket Number (if applicable)	3712036-01693	Art Unit	1792
First Named Inventor	Jarisch et al.			Examiner Name	Long, Luana Zhang		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☒ Other Response to Final Office Action filed January 4, 2016

☐ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 021818

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

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Signature of Registered U.S. Patent Practitioner			
Signature	/Robert M. Barrett/	Date (YYYY-MM-DD)	2016-02-15
Name	Robert M. Barrett	Registration Number	30142

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Electronic Patent Application Fee Transmittal

Application Number:	13697297
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Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Filer:	Robert M. Barrett/katie cochrane
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Filing Fees for U.S. National Stage under 35 USC 371

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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

[Continued on next page]

(54) Title: METHOD FOR PREPARING A BEVERAGE OR LIQUID FOOD AND SYSTEM USING BREWING CENTRIFUGAL FORCE

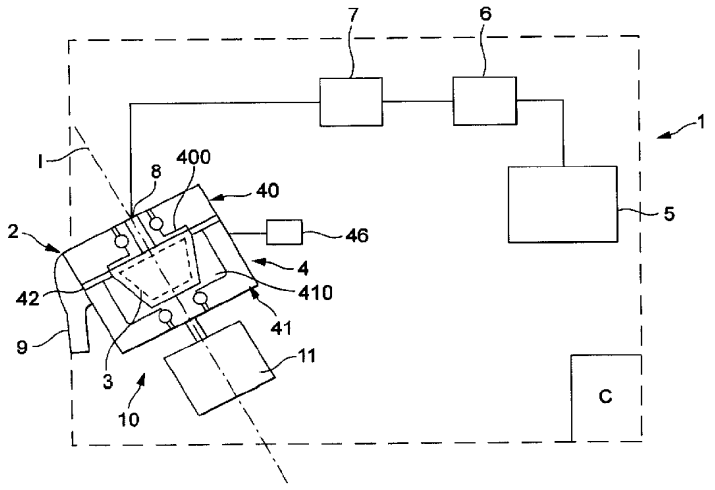


FIG. 1

(57) Abstract: A method for preparing a beverage or liquid from a food substance contained in a filtering receptacle (3) by passing water through the substance using brewing centrifugal forces comprising: feeding water in the receptacle (3), driving the receptacle in centrifugal rotation to force water to flow through the substance in a centrifugal flow path to outlet means of the receptacle, wherein the receptacle is formed by a sealed capsule (3) before its use which is opened for water to be introduced in the capsule; said capsule containing a predetermined dose of food substance and being discarded after use.

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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
— *of inventorship (Rule 4.17(iv))*

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— *with international search report*

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IPR2023-00502, U.S. PATENT 10,994,923

Method for preparing a beverage or liquid food and system using brewing centrifugal force

The present invention relates to a method for preparing a beverage or liquid food from a food substance which is brewed or extracted by using centrifuge forces exerted on a receptacle which contains the substance. The invention also relates to a system for carrying out the method.

It is known to prepare beverages wherein a mixture consisting of brewed coffee and coffee powder is separated with centrifugal forces. Such a mixture is obtained by bringing hot water and coffee powder together for a defined time. The water is then forced through a screen, on which screen powder material is present.

Existing systems consist of placing the coffee powder in a receptacle which is usually a non-removable part of a machine such as in EP 0367 600B1. Such devices have many disadvantages. Firstly, the coffee powder must be properly dosed manually in the receptacle. Secondly, the spinned coffee waste becomes dry and it must be removed by scraping the surface of the receptacle. As a result, the coffee preparation requires a lot of manual handling and is so very time consuming. Usually coffee freshness can also vary a lot and this can impact on the cup quality because coffee comes generally from bulk package or coffee is ground from beans in the receptacle itself.

Also, depending on the manual dosage of coffee and the brewing conditions (e.g., centrifugal speed, receptacle size) the cup quality can vary a lot.

Therefore, these systems have never reached an important commercial success.

In DE 102005007852, the machine comprises a removable holder into which an open cup-shaped part of the receptacle is placed; the other part or lid being attached to a driving axis of the machine. The advantage is to be able to conveniently remove and clean the receptacle. However, a disadvantage is the intensive manual handling. Another disadvantage is the difficulty to control quality of the coffee due to a lack of control for the dosing of the powder and a lack of control of the freshness of the coffee powder.

Other devices for brewing coffee by centrifuge forces are described in WO 2006/112691; FR2624364; EP0367600; GB2253336; FR2686007; EP0749713;

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DE4240429; EP0651963; FR2726988; DE4439252; EP0367600; FR2132310; FR2513106; FR2487661; DE3529053.

The effect of centrifugal forces to brew coffee or other food substances presents many advantages compared to normal "espresso" type brewing methods using high pressure pumps. In "espresso" types brewing methods, it is very difficult to master all the parameters which influence the quality of extraction of coffee. These parameters are typically the pressure, the flow rate which decreases with the pressure, the compaction of the coffee powder which also influences the flow characteristics and which depends on the coffee ground particle size, the temperature, the water flow distribution and so on.

Therefore, there is a need for proposing a new extraction process and a capsule adapted therefore for which the extraction parameters can be better and more independently controlled and therefore can be better mastered for controlling quality of the final brewed liquid.

There is also a need for providing a system capable of brewing different kinds of beverages, in particular, coffee beverages, for example, espresso, filter coffee or café latte, while adjusting the brewing characteristics of each beverage so that the optimum beverage can be obtained. In particular, there is a need for a versatile system which provides an easy, simple way of controlling the brewing parameters, in particular, the brewing pressure range on the bed of substance.

At the same time, there is a need for a method which is more convenient compared to the prior art centrifugal devices and which provides a better in-cup quality with a higher control of important quality parameters such as freshness and dosage in the receptacle.

The invention relates, in the more general sense, to a method for preparing a beverage or liquid from a food substance contained in a filtering receptacle by passing water through the substance using brewing centrifugal forces comprising:

feeding water in the receptacle,

driving the receptacle in centrifugal rotation to force water to flow through the substance in a centrifugal flow path to outlet means of the receptacle, wherein the receptacle is formed by a sealed capsule before its use which is opened for water to be

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introduced in the capsule; said capsule containing a predetermined dose of food substance and being discarded after use.

The capsule can be sealed in a gastight manner to preserve freshness of the substance contained in its enclosure. The capsule can be opened in the device itself, e.g., by piercing of the capsule, or alternatively before the capsule is inserted in the device, e.g., by piercing of the capsule or removing a sealing foil of the capsule.

The capsule can be opened for water to be introduced in the capsule, after insertion of the capsule in the beverage preparation device, by piercing of the capsule.

The capsule can also be opened for water to be introduced in the capsule, before insertion of the capsule in the beverage preparation device by providing at least one passage, by piercing or removing a sealing foil of the capsule.

The method more particularly relates to the preparation of a liquid food or beverage, in a beverage preparation device, from a food substance contained in a filtering receptacle by passing water through the substance using brewing centrifugal forces comprising:

feeding water in the receptacle,

driving the receptacle in centrifugal rotation to force water to flow through the substance in a centrifugal flow path to outlet means of the receptacle,

wherein the receptacle is formed by a capsule which is sealed before use;

wherein the capsule contains a dose of food substance;

wherein the capsule is placed in the beverage preparation device,

wherein the capsule is opened for water to be introduced in the capsule;

wherein the capsule is removed from the beverage preparation device for being discarded after the liquid has been brewed from the capsule by centrifugation of the capsule in the beverage preparation device.

The term "sealed" capsule means that the capsule is made of materials having gas barrier properties and is sealed in a fluid tight manner so that ingress of air in the capsule is prevented. Furthermore, the capsule preferably contains an inert gas that improves the freshness of substance in the capsule. The capsule can also be wrapped with an outer protective membrane which is removed before the capsule is placed in the device.

Preferably, the capsule contains a dose of substance for preparing one or two servings (e.g., cups) of beverage. Cups of beverage are usually sized between about 25 to 220 mL.

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The dose of substance for a single cup of coffee may be, for instance, between 4 to 8 grams of roast and ground coffee.

It must be noted that surprising improved brewing results are obtained by this method which can lead to amounts of coffee solids in the cup which are higher than pressure using methods (e.g. "espresso" type methods using brewing water pressurized by a pump). Without being bound by theory, it is supposed that water flow is more uniformly distributed by centrifuge effect and it creates less or no preferential flow paths in the coffee bed as compared to traditional methods using a positive pressure obtained by a pressure pump.

The food substance in the capsule can be ground coffee powder, soluble coffee, tea, chocolate, whitener, flavours and combinations thereof

The capsule is preferably driven in rotation at a centrifugal speed of at least 5000 rpm, more preferably between 5000 and 16000 rpm. Surprisingly, at such high rotational speeds, improved coffee crema is obtained with a capsule containing ground coffee. Crema has a more creamy consistency like a real emulsion of oil and water compared to usual crema obtained by traditional methods which is more watery with larger bubble size.

Of course, the speed also depends on the nature of the food ingredient. For leaf tea, the centrifugal speed is preferably low to provide infusion rather than a pressure extraction. In particular, for leaf tea, the centrifugal speed is comprised between 10 and 1000 rpm, more preferably between 50 and 500 rpm.

The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and support layers made of polymers, aluminium and/or aluminium alloys.

The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body also comprises gas barrier materials. It can be in metal such as thin aluminium and/or plastic.

In another embodiment, the capsule is made of two sealed flexible foils. The foils can be symmetrically arranged forming two identical sides and welded at a peripheral seam.

In another mode, the capsule comprises a plastic lid attached to a cup-shaped body. The plastic lid and body can be attached through a clipping member comprising a deflectable sealing lip. The deflectable lip is designed so that it opens under the effect of the centrifugal forces transferred to the brewed liquid exiting the capsule. In

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a variant of this mode, the capsule comprises a plastic lid welded on a cup-shaped body whereas a series of premade peripheral outlets are provided in the lid and/or body for the brewed liquid to leave the capsule under the effect of the centrifugal forces. The premade peripheral outlets may be a series of small slits of small size to also filter the brewed liquid and maintain solid particles of the substance in the capsule. The lid and body can thus be welded by ultrasounds or any suitable connection method.

The method of the invention comprises an operation wherein hot water is introduced into the capsule at substantially no pressure. Water can be brought by a hot water feed mechanism using a principle of aspiration or vaporisation.

Alternatively, for a higher flow consistency, hot water can be introduced using a low pressure pump such as a peristaltic pump or a diaphragm pump and the like.

The method also encompasses an operation during which at least one peripheral liquid outlet is made before or when water is introduced in the sealed capsule.

The outlets can be pierced on a lid of the capsule. Outlets can also be pierced on a sidewall of the capsule.

In one mode, a plurality of outlets is formed by piercing at a peripheral area of the capsule. This method has the advantage to require a simpler capsule. The number of outlets can be chosen to control the flow rate of the brewed liquid. Since the outlets are radially oriented in series, a high pressure layer or jets of the brewed liquid is formed that is expelled out of the capsule.

Preferably, in the method of the invention, the brewed liquid is also collected to form a homogeneous flow of the liquid food or beverage which can be directed to the cup.

In a mode, at least one peripheral outlet is formed in the capsule by an opening occurring under the effect of the pressure of liquid carried out by the centrifugal forces.

The invention also concerns a system for preparing a beverage or liquid food from a food substance contained in a filtering receptacle by passing water through the substance using centrifugal forces comprising:

a device comprising:

- water feed means for introducing water in the receptacle,
- driving means for driving the receptacle in centrifugal rotation,

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wherein the receptacle is formed by a capsule which contains the food substance and is insertable in the device for brewing of the liquid food and then removable from the device after brewing of the liquid food,
wherein the system further comprises referencing means for positioning and referencing the capsule in a removable manner in the device and in operational relationship with the water feed means and along an axis of rotation along the driving means.

Preferably, the capsule is a gastight sealed receptacle before being inserted in the device.

In one aspect of the system of the invention, the capsule comprises trunconical sidewalls which promote the drainage of the brewed liquid across the substance to the outlet(s) of the capsule.

In another possible aspect, the capsule has a rigid lid resiliably attached to a cup-shaped body. The lid can be plastic. The lid and body can be attached via a radial deflectable sealing means which opens by effect of the centrifugal effect to let the brewed liquid pass. For example, the deflectable sealing means can comprise at least one peripheral plastic lip of the lid engaging in a seat of the cup-shaped body or vice versa.

The invention also relates to a device for preparing a beverage or liquid food from a food substance contained in a capsule by passing water through the substance in the capsule comprising:
- water feed means for introducing water in the capsule,
wherein it further comprises referencing means for positioning and referencing the capsule along an axis of rotation in the device and driving means for driving the capsule in centrifugal rotation.

The referencing means are designed for receiving the capsule in a removable manner. They are designed for receiving the capsule in the device in operational relationship with the water feed means and the driving means. The referencing means comprise a capsule holder comprising a cavity which is drivable in rotation. The capsule holder can be driven in rotation at a speed of more than 7500 rpm. The capsule holder is, for instance, connected to a motor via a drive shaft arranged for driving the capsule holder about a central rotational axis. The referencing means comprise a water injection lid closing on the injection surface of the capsule. The lid

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and capsule can co-act in closure about the capsule while leaving a collecting chamber. The driving means comprise a motor and a shaft associated in rotational arrangement with the capsule holder and/or lid. The capsule holder and lid can swivel along bearings. The collecting chamber preferably comprises surfaces that surround the capsule radially. The collecting chamber can be associated to a duct for directing the flow of brewed liquid to a recipient (e.g., a cup).

The device may optionally comprise a by-pass conduit arranged to add a part of water in the collector without this part of water passing in the capsule. The additional part of water enables to prepare beverages of larger volumes with a part of brewed liquid and a part of water. For large coffee, for instance Americano-type, since the total volume of the coffee beverage is not passed through the capsule, an over-extraction of the ground coffee can be avoided and bitterness can be reduced. This results in a large coffee beverage having an improved taste.

According to another aspect of the invention, the device comprises a control unit adapted to vary the speed of the driving means for driving the capsule in centrifugal rotation therefore providing different centrifugal pressures in the capsule. As a result, the brewing pressure conditions in the capsule can be easily tailored to the type of beverages to be brewed. More preferably, the control unit is programmed to provide at least two different centrifugal speeds. In an example, a first rotational speed is comprised within a value range of 500 to 15000 rpm and a second rotational speed is comprised within a value range of 5000 and 20000 rpm. For example, low speed values can be set by the control unit to brew coffee with less or no foam such as American coffee. The higher speed values can be set by the control unit to brew coffee with a higher amount of foam such as espresso or lungo coffee. The foam (e.g., coffee crema) is obtained by shearing the liquid through the passages in the capsule and also by the brewed liquid which impacts on the surfaces of the collector at a higher energy therefore creating an emulsion with entrapment of gas. Therefore, the kinetic energy of the liquid impacting on a surface is decisive for the improvement of the foam. In the usual espresso-type methods generating a "water piston", this phenomenon does not take place since there is no sufficient speed of the liquid leaving the capsule.

Additional features of the invention will appear in the detailed description of the figures which follows.

Figure 1 is a schematic representation of system of the invention;

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Figure 2 is a schematic representation of a brewing module in open position of the system of the invention into which is inserted a capsule;

Figure 3 is a schematic representation of a brewing module in closed position of the system of the invention which encloses a capsule;

Figure 4 is a detailed cross sectional view of the system of the invention in a first embodiment;

Figure 5 is an exploded view of another embodiment of the device of the invention;

Figure 6 shows a sealed capsule which can be used in the device of the invention according to figures 4 or 5;

Figure 7 shows a capsule after its use in the system of the invention;

Figure 8 is a detailed cross sectional view of the system of the invention in a second embodiment;

Figure 9 shows a detail of the system of figure 8;

Figure 10 shows a cross sectional view of the cup-shaped body of the capsule in the system of figures 8 and 9;

Figure 11 shows a detail view of the clipping edge of the cup-shaped body;

Figure 12 shows a cross sectional view of a detail, i.e., of the engaging connection, of the cup-shaped body of figure 10;

Figure 13 shows a plane view of the detail of figure 12;

Figure 14 shows a cross sectional view of the lid of the capsule in the system of figures 8 and 9;

Figure 15 shows a detailed view of the deflectable sealing means of the lid of figure 14;

Figure 16 shows a cross sectional view of the cup-shaped body of the capsule according to another embodiment;

Figure 17 shows a cross sectional view of a detail of the body of figure 16;

Figure 18 shows a cross sectional view of the lid of the capsule that connects to the capsule's body of the embodiment of figures 16 and 17;

Figure 19 shows a detail of the lid of figure 18;

Figure 20 shows a sealed capsule and an operational mode for removing the seal of the capsule;

Figure 21 shows a schematic view of the system of the invention according to another possible embodiment;

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Figure 22 shows a schematic view of the system according to still another embodiment;

Figure 23 shows a schematic view of the system according to still another embodiment;

Figure 24 shows a view of a capsule according to another mode of the invention;

Figure 25 shows a schematic representation of a brewing module in closed position of the system of the invention according to yet another embodiment of the invention.

The system 1 of the invention is illustrated in figure 1 in the more general sense. The system comprises a device 2 and a capsule 3. The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling). The module is in fluid communication with a water reservoir 5 containing fresh or, alternatively heated water. A fluid transport means such as a low pressure pump 6 can be provided in the water circuit to transport water from the reservoir to the module. A water heater 7 is further provided to heat water to the desired temperature. It can be noted that water could be heated in the reservoir itself and water could be transported from the reservoir by effect of vaporisation. Water can be fed into the module 4 at low or substantially no pressure. For example, a pressure between 0 and 2 bars above atmospheric pressure can be envisaged at the inlet 8 of the module.

The brewing module 4 can comprise referencing means 40, 41 for retaining the capsule in a predetermined position in the module. The capsule can be maintained in a slightly inclined position to promote the exit flow of the brewed liquid to a brewed liquid outlet 9. For instance, an angle of inclination relative to vertical can be between 2 and 65 degrees. The referencing means can comprise a capsule holder 410 and an injection lid 400. Both holder 410 and lid 400 are mounted to rotate along an axis of rotation I. The capsule holder comprises a cavity having the shape of the capsule to be received. The lid is designed to assemble against the capsule holder in a removable manner. A liquid passage 42 can be created in the module to enable liquid to be drained and collected from the capsule to the fixed outlet 9.

Driving means 10 are provided for driving the lid 400 and capsule holder 410 together in rotation and, by way of consequence, the capsule too. For this, the driving means includes an electrical motor 11 having a shaft connected to the capsule holder

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to force the capsule holder 41 in rotation. Since the lid 40 is attached to the capsule holder 41, the lid is also driven in rotation at the same speed as the capsule holder.

The surfaces of the collecting means of the device can be regulated in temperature so that the brewed liquid exiting the capsule is maintained at a proper temperature and does not cool down before reaching the cup. For this the lid assembly 40 and /or capsule holder assembly 41 can be associated to heating elements 46 for maintaining the capsule holder at a heated regulated temperature, such as with heating wires or thick films and the like.

Figures 2 and 3 show a detailed view of the principle of centrifugation of the capsule. The device comprises a capsule holder assembly 41 with a holder 410 having a trunconical housing 44 in which the capsule 3 is inserted. The holder is mounted along an axis of rotation I by a bearing 43. The injection lid assembly 40 is provided with an internal lid 400 which can be mounted on a fixed support part 401 of the lid assembly 40 in a pivotable manner along the axis I when the device is closed (Figure 3).

The lid assembly and capsule holder assembly are associated along a transversal axis A between an open position as illustrated in figure 2 and a closed position of figure 3.

At the inside surface of the injection lid 40 is placed a piercing structure 450 which has the function of piercing the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. The water injector 50 is preferably located in the centre of the capsule. Water can thus be injected in the capsule at a location placed between the capsule lid 30 and the capsule bottom 31. The outlet of the water injector is placed closer to the bottom 31 than to the lid so that water can first wet the substance in the bottom area of the capsule. The lid further comprises outlet piercing elements 51 which are placed on the inside of the lid at a peripheral position. Preferably, a series of piercing elements 51 are placed uniformly along the periphery of the lid. Further the capsule comprises an inclined sidewall 32 which widens from the bottom 31 to the top 30 in direction of the peripheral openings or outlets pierced by the piercing elements 51. The lid is further provided with a collecting assembly 52 comprising an inside chamber 53 surrounding the capsule's peripheral openings and a nozzle 530 forming a tube for directing the beverage of liquid food to the recipient or cup. It can be noted that there is no need for

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a hermetical arrangement between the upper and lower parts 40, 41 of the device. Since water is pushed by the effect of gravity, water flows radially and uniformly to the sidewall 32 of the capsule to traverse the substance toward the periphery of the capsule and upwards to the peripheral opening along the sidewall 32. The brewed liquid so impacts the outward surface of the collecting assembly 52 and is so collected and pushed still by effect of gravity to the collecting nozzle 530. The advantage of the system is that there is a low axial pressure therefore there is less need for high mechanical closure forces. The technology is relatively simple since a motor working at low current is sufficient to provide the necessary momentum to carry out the brewing process. Furthermore, several types of heaters can be used such as thermos or gas.

Figure 4 shows a more sophisticated system of the invention. The system comprises a capsule holder 41 which is associated to a central rotating rod 45 mounted along a lower bearing 43, which is supported on a support 46. On the lower end of the rod 45 is associated an electric rotary motor 11. At the opposite side, a lid 40 is associated to an upper bearing 47, along a hollow rotating rod 48 for the entry of water in the capsule through a conduit 49 traversing the rotating rod 48. The rotating rod 45 is mounted on an upper frame 60 of the system. A series of needles 51 is also positioned on the side of the lid 40 to form small perforations at the periphery of the upper side of the capsule. The number of needles can be set between 5 and 50, preferably between 10 and 30. The higher the number of needles, the more uniform the distribution of liquid can be. When the needles 51 are engaged in the capsule, the lid is driven in rotation by the capsule itself which is also driven by the rotor 45.

The rotational speed can be set between about 5000 and 20000 rpm. For this a control unit C (figure 1) is provided in the device for adjusting the rotational speed as a function of the beverage to be brewed. The higher the rotational speed, the more centrifugal pressure is exerted in the capsule by the liquid and the more the substance is compacted on the sidewall of the capsule. Also, the higher the speed, the lower the residence time of the liquid in the capsule.

For example, for tea, the rotational speed can be minimal to enable a slow transfer of water through the mass of tea leaves and to provide an infusion of the tea.

For ground coffee, the speed should be high, i.e., higher than 5000 rpm, preferably within a range of about 8000-16000 rpm, in order to perform optimal extraction conditions in term of coffee solid contents in the cup and quality of the

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crema. It has been surprisingly found that crema obtained is much creamier than by using the standard espresso brewing methods.

Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optimal centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, latte, tea, etc, and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device.

The brewed liquid is collected in a collecting chamber 52 of the support 46 and drained through a collecting tube 9.

Figure 5 illustrates another embodiment in which the injection lid 40 is connected to the capsule holder 41 by a bayonet type connection 55 or any equivalent connection means. In this embodiment, only one lower bearing (not shown) is necessary. The capsule holder 41 and the lid 40 are thus connected together and both turn along a lower rotational axle 45. The capsule holder comprises a cavity 550 for receiving the capsule. The injection lid is then connected to the capsule holder along an helicoidal tightening momentum by the bayonet means 55. For example, the bayonet means can comprise a series of radially extending protrusions on the lid which fits into a series of hooks carried on the edge of the capsule holder. Tightening may be performed by a gripping portion 61 placed on the upper side of the lid. However, the assembly must let liquid pass between the lid and the holder. A sealing joint between the lid and holder is therefore not desirable. A predefined clearance may also be ensured for controlling the exit flow of the brewed liquid by foreseeing slots or grooves of predetermined dimensions at the interface between the lid and holder.

A collecting assembly 46 having the shape of a cup larger than the capsule holder is also placed about the brewing enclosure 40, 41 for collecting the brewed liquid. The collecting assembly takes support on a base 62 of the device onto which is connected the motor 11. A liquid duct 9 is provided on a side of the cup which is slightly inclined downwards for the liquid to flow in the direction of a receptacle (e.g., a beverage cup).

Figures 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of figures 2 to 5. In figure 6, the capsule 7 comprises a cup-shaped body 70 with upwardly oriented sidewall 76 and a bottom wall 77. The sidewall forms a portion of cone which promotes the collection of the brewed liquid

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internally. The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.

The capsule contains a substance chosen among the list consisting of ground coffee, soluble coffee, tea, a whitener such as dairy or non-dairy ingredient(s), herbal tea, nutritional substance, culinary ingredients and a mixture thereof.

Figure 7 illustrates the capsule after brewing of the substance in the device. A central water inlet 73 is pierced through the lid for passage of the water injector 50. On the side of the lid are pierced outlets 74 communicating with the inside cavity for the brewed liquid to exit the capsule.

Another embodiment of the present invention is illustrated in relation to figures 8 and 9. In this embodiment, a capsule 8 comprising its own inflow and outflow means. More specifically, the capsule comprises a cup-shaped body 80 made of plastic onto which is secured a plastic lid 81. The lid can be tightly clipped onto the body along its edge by sealing means 82 illustrated in more details in figures 9, 14 and 15. The sealing means act as a valve. More particularly, the edge of the body comprises a peripheral groove 83 formed of two small parallel and circular portions of wall rising upwardly. For this, the lid has a peripheral portion of wall forming a lip 84 that inserts itself in the groove 83. The lip 84 can end by a thicker rounded shape 85 to create a closing pressure on the surface of the groove 83 in the housing, which pressure must be overcome to let the liquid pass through the cavity or annular groove 83. The sealing lip 84 is designed in such a way that it can open a radial passage in the groove for the brewed liquid under the effect of liquid opening them when the liquid is centrifuged.

At the periphery of the lid is provided a secondary closure lip 86 that fits on the outer edge 87 of the body. This second lip 86 is designed to provide locking of the lid on the body of the capsule. For this, the lip 86 comprises an enlarged section 860 which presses on the outer surface 87 of the edge of the body.

The secondary lip 86 creates a clipping function for connection of the lid onto the body and eventually it also forms a second hurdle to be overcome for the brewed liquid to pass. This tortuous path as formed by the series of lips 84, 86 and the groove 83 generates high shear forces on the brewed liquid. The secondary lip can also be

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traversed by radial slits for promoting the flow of the brewed liquid (not shown). For coffee, this may result in generating a thicker and more stable crema. It can be noted that this lip could be omitted in the context of a simpler structure of the capsule.

In the centre of the capsule's lid is provided a water flow distribution member formed of a tubular portion 88 extending from the lid. This tubular portion 88 has a water inlet 89 which can be fitted to the water injection conduit 49 of the injection lid 40 of the system. The tubular portion 88 ends by flow distributing means 880 formed of several slots directed outwards in the cavity of the capsule. Several slots are distributed at the free end of the tubular portion 88. The tubular support may abut against the bottom surface of the body for demarcating the slots and for directing water in many radial directions. For instance, the number of slots may be comprised between 2 and 10. Therefore, water coming from the top will traverse the tube 88 and will exit the tube at the slots in the radial direction of the arrow B identified on figure 9. It can be noticed that water is so injected preferably close to the bottom of the capsule; therefore ensuring a proper wetting of the substance, e.g., coffee powder, and in the direction from the bottom to the top (i.e., between the lid and body) where the brewed liquid leaves the capsule.

The capsule 8 of figures 8 to 15 according to this embodiment can further include means 840 for gripping the bottom of the capsule and so enabling the capsule to be properly driven in rotational motion by the device. For this, the means 840 comprises a small tubular portion protruding in the bottom of the capsule and into which can be inserted a complementary tubular portion 450 of the rotational driving means of the device.

The driving means of the device further comprise a drive shaft 45 associated to a support 451 for holding the bottom of the capsule. Of course, the shape of the gripping means can take many other variations without departing from the scope of the present invention. Figures 12 and 13 show a gripping structure 840 having a central recess 841 and four arched recesses 842, 843, 844, 845 extending from the central recess 841. This gripping structure forms a lock into which is fitted a complementary engaging structure 450, i.e., a key, of the capsule holder 451. The complementary shapes of the capsule and capsule holder enable to fulfil both the gearing function for driving the capsule at high speeds in rotation and a safety function for ensuring that only capsules adapted to the system can be used and brewed successfully.

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In this embodiment for figures 8 and 9, the device itself comprises, as in the preceding modes, upper and lower bearings 43, 47 for enabling the injection lid and support of capsule 451 to rotate in conjunction with the capsule 3. Surrounding the capsule is a collecting assembly 52 with a cup 520 formed of a side and bottom walls 521 and an upper closing cover 522. The cover also serves for receiving the upper bearing 43 while the lower cup 520 has a central recess for receiving the lower bearing 47. The cup 520 and the cover 522 can be assembled in fluid tight manner to avoid uncontrolled projection of brewed liquid. Therefore connection means 523 can be provided and a fluid tight sealing element, such as an O-ring 524, can also serve to ensure tightness between the two parts. Also a beverage outlet tube (not shown) can be provided to drain the beverage outside of the collecting assembly.

As also apparent in figure 8, the driving means of the device comprise a lower electrical motor 11 which is coupled to a driving shaft or drive connector 45 which is itself connected to the capsule holder 451. Note that the capsule holder may be a simple plate support or disc 451 or a support shaped as a cup, for example, if the capsule has no sufficiently rigid sidewalls.

The brewing operation of the system of figures 8 and 9 can be shortly explained as follows:

A capsule 3 as described contains a dose of substance is provided. The capsule can be filled with roast and ground coffee. The capsule is inserted in the cup 520 when the cover is removed and placed on the capsule holder 451 with the engaging structure of the engaging structure 450 fitting the recess portion 840 of bottom of the capsule. By the approach and connection of the cover 522 to the cup 520, The injection lid 40 is then connected or associated to the capsule's lid 81 with the water conduit 89 coming in communication with the water injection tube 88 of the capsule. When the device is in the closed position of figure 8, water can be injected at low pressure or just poured into the conduit through the tubular portion 88. Preferably, some water is poured to start wetting the substance in the capsule before the capsule is driven in rotation by the rotational driving means of the device. Then, the control unit starts the motor and the capsule is so driven in rotation at high speed to perform the centrifugal brewing operation. Under the effect of centrifugal forces, the powder substance tends to compact itself radially whereas water is forced to flow through the substance. This results in the substance being both compacted and intimately wetted by water. Due to high speed rotational movement, the centrifugal forces exert

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themselves uniformly on the mass of substance. Consequently, the water distribution is also more uniform compared to usual methods using a pressure pump to exert pressure on and through the bed of substance. As a result, there is less risk of preferential flow path through the substance which could lead to areas which are not properly wetted and so not properly extracted. With ground coffee powder, the liquid that reaches the internal sidewall of the capsule is so a liquid coffee extract. This liquid extract is then forced to flow upwards along the side of the capsule up to the sealing means 82. The sealing means 82 are thus submitted to an opening force by the liquid under the centrifuge effect. This results in the lip that tends to bend outwardly to create a passage between the surface 85 and the inner surface of the groove. Similarly, the second lip is also forced to bend or alternatively may allow a certain leakage, for example, with premade slits for letting the liquid escape the capsule. The liquid can thus flow through the small peripheral groove 83 and can exit out of the capsule. The brewed liquid can be so collected by the collector 52 and be guided outside of the device into the recipient.

Figures 16 to 19 illustrate another embodiment of the capsule according to the invention. This capsule has a cup-shaped body 80 comprising the same gripping means 840 at its outer surface for enabling the capsule to be driven in rotation in the device. The capsule also comprises a lid 81 shown in figures 18 and 19. Contrary to the capsule of the preceding mode, the lid 80 and body 81 are attached by permanent connecting means such as ultrasonic welding. The brewed liquid that is centrifuged is allowed to pass through a series of slits 810 provided on the upwardly protruding edge 880 of the body. The slits are sized so to act as a filter for retaining the solid particles such as the ground coffee particles but let the liquid leave the capsule. The lid is connected with the edge 880 fitting into a radial groove 840 of the lid 81 (Figure 19). Figure 17 also shows small indents 830 serving as energy directors that can melt during the ultrasonic welding. In the present mode, the capsule does not comprise a deflecting sealing lip but it simply has slits 810 for enabling the brewed liquid to traverse the capsule. The capsule of this mode can be used in a device as illustrated in figures 8 and 9.

In figure 20, a sealed capsule of the invention is shown. The capsule is formed, as described in the preceding modes, of a cup-shaped body 80 onto which is assembled a lid 81. The water inlet 89 of the lid is covered by a sealing membrane 890. The radial outlet area placed between the lid and body is also covered by a

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sealing membrane 891. Note that the same sealing membrane could cover both the water inlet 89 and the outlet area for the brewed liquid. The sealing membrane 891 can be a tamper evidence element such as a ribbon of an adhesive membrane sealed along the line between the lid and body. The ribbon can be cut by a cutting tool 910 in the machine, such as a blade or an equivalent means. As the capsule is driven in rotation (as shown by arrow C), the cutting tool is approached in contact with the ribbon which is thus automatically cut. The capsule is so no longer impervious and liquid can escape the capsule through the radial edge of the capsule as previously explained. One can note that the sealing membrane(s) can also be made of a peelable adhesive material so that the user himself can remove it (them).

According to figure 21, the system may also foresee an injection of water by aspiration under the effect of the rotational momentum. For this, a capsule is housed in the referencing means 40, 41. An injection tube 8 connects a water reservoir to the inside of the capsule. The device is so oriented that the reservoir is below the capsule and water is transported by the vacuum that is produced in the centre of the capsule. The injection tube also engages into the capsule up to a region preferably closer to the more narrow side or bottom so that water can wet the whole mass of substance, e.g., ground coffee powder.

One can note that the capsule can be positioned with its sidewall widening downwardly. In figure 22, the system is similar but the orientation of the capsule is simply inverted and it widens upwardly.

In the two embodiments of figures 21 and 22, water is preferably injected near the more narrow side of the capsule, i.e., opposite the widening side, in order for the liquid to flow through the substance in the direction of the wider side of the capsule and to then exit the capsule.

Figure 23 illustrates another capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium. For example, the shape of the teeth could be

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slightly triangular, oval, rectangular or pyramidal. It should be noticed that the teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.

The device itself that receives the capsule of figure 23 comprises a toothed surface of complementary shape. Figure 24 shows a capsule holder 44 adapted to receive the capsule of figure 23. The capsule holder has a cavity into which are provided hollow teeth 440. The hollow teeth are arranged to fit the teeth 750 on the outer surface of the capsule.

It should be noted that the connecting or engaging structure of figure 23 can replace the structure of the capsule of figure 8 and 9 or reciprocally.

In figure 25, is illustrated another embodiment of the brewing system of the invention. The difference is here that a water by-pass conduit 500 is provided in addition to the main water conduit 50 for adding a volume of water in the collecting assembly 52. A volume of water may be added before, during or after the centrifugal brewing operation in the capsule. The by-pass conduit ends on the upper surface of the rotating lid 400. The upper surface of the lid 400 may comprise a water distribution structure such as radial grooves or recesses to promote the flow of water toward the surface of the collecting assembly. The control unit may control the delivery of the added volume of water so that the volume is added at the same time as the coffee extract is delivered by centrifugation so that the foam that is created on the top of the beverage is not destroyed.

The system and method of the invention provide remarkable brewing results with solid contents which are higher than usual methods and devices. The results are very reproducible from capsule to capsule. Surprisingly, crema is also remarkably improved with a creamier, more stable and thicker texture.

Of course, the invention may encompass many variants which are included in the scope of the patent claims that follow.

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CLAIMS:

1. Method for preparing, in a beverage preparation device, a beverage or liquid from a food substance contained in a filtering receptacle by passing water through the substance using brewing centrifugal forces comprising:

feeding water in the receptacle,

driving the receptacle in centrifugal rotation in the beverage preparation device to force water to flow through the substance in a centrifugal flow path to outlet means of the receptacle,

wherein the receptacle is formed by a sealed capsule before its use which is opened for water to be introduced in the capsule; said capsule containing a predetermined dose of food substance and being discarded after use.

2. Method according to claim 1, wherein the capsule is opened for water to be introduced in the capsule, after insertion of the capsule in the beverage preparation device, by piercing of the capsule.

3. Method according to claim 1, wherein the capsule is opened for water to be introduced in the capsule, before insertion of the capsule in the beverage preparation device by providing at least one passage, by piercing or removing a sealing foil of the capsule.

4. Method according to any of claims 1 to 3, wherein the capsule contains a dose of substance for preparing one or two servings of beverage.

5. Method according to any of claims 1 to 4, wherein the capsule contains ground coffee powder, soluble coffee, tea, chocolate, whitener, flavours and combinations thereof.

6. Method according to any of claims 1 to 5, wherein the capsule is sealed in a gas tight manner.

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7. Method according to any of the preceding claims, wherein the capsule is driven in rotation at a centrifugal speed of at least 500 rpm.

8. Method according to any of the preceding claims, wherein water is introduced in the capsule at substantially no pressure.

9. Method according to any one of claims 1 to 8, wherein at least one peripheral beverage outlet is made before or when water is introduced in the capsule.

10. Method according to claim 9, wherein the peripheral outlets are pierced on a lid of the capsule.

11. Method according to claims 9, wherein peripheral outlets are pierced on a sidewall of the capsule.

12. Method according to any of claims 1 to 9, wherein at least one peripheral outlet is formed by an opening occurring under the effect of the pressure of liquid carried out by the centrifugal forces.

13. Method according to claim 12, wherein the at least one peripheral outlet is obtained by the centrifugal forces which exert a flexure on at least one deflectable portion of the capsule.

14. Method according to any one of the preceding claims, wherein the capsule is referenced with its axis of rotation being vertical or inclined relative to vertical of an angle lower than 90 degrees.

15. System for preparing a beverage or liquid food from a food substance contained in a filtering receptacle by passing water through the substance using centrifugal forces comprising:

a device comprising:

- water feed means for introducing water in the receptacle,
- driving means for driving the receptacle in centrifugal rotation,

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wherein the receptacle is formed by a capsule which contains the food substance and is insertable in the device for brewing of the liquid food and then removable from the device after brewing of the liquid food,

wherein the system further comprises referencing means for positioning and referencing the capsule in a removable manner in the device and in operational relationship with the water feed means and along an axis of rotation along the driving means.

16. System according to claim 15, wherein the referencing means comprises a capsule holder associated to the driving means for allowing the capsule to be rotated around its central axis.

17. System according to claims 15 or 16, wherein the capsule is impermeable to gas and, preferably, comprises a sealing lid.

18. System according to claim 17, wherein the lid comprises a flexible membrane.

19. System according to any one of claims 15 to 18, wherein the capsule comprises a cup-shaped body.

20. System according to claim 19, wherein the capsule comprises trunconical sidewalls.

21. System according to claims 19 or 20, wherein the capsule has a rigid plastic lid resiliably attached to the cup-shaped body.

22. System according to claim 21, wherein the lid and body are attached via a peripheral deflectable sealing means which opens by effect of the centrifugal effect to let the food liquid pass.

23. System according to claim 22, wherein the deflectable sealing means comprises at least one peripheral plastic lip engaged in a seat.

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24. System according to any of the preceding claims 15 to 21, wherein the capsule comprises a pierceable membrane and the device comprises inlet piercing means for piercing the membrane and for enabling the water feed means to introduce water in the capsule.

25. System according to claim 24, wherein the inlet piercing means is arranged to pierce at least one water inlet near or at the axis of rotation of the capsule device.

26. System according to claim 25, wherein the inlet piercing means is a single needle.

27. System according to any one of claims 15 to 26, wherein the device comprises outlet piercing means for enabling liquid to exit the capsule wherein the outlet piercing means are radially positioned with respect to the axis of rotation of the capsule in the device.

28. System according to claim 27, wherein the outlet piercing means comprises a series of needles positioned in a circular pattern and arranged in relation to the capsule to pierce radial holes in the capsule.

29. Device for preparing a beverage or liquid food from a food substance contained in a capsule by passing water through the substance in the capsule comprising:
- water feed means for introducing water in the capsule, wherein it further comprises referencing means for positioning and referencing the capsule along an axis of rotation in the device and driving means for driving the capsule in centrifugal rotation.

30. Device according to claim 29, wherein the driving means comprises a drive shaft and an electrical motor connected to the referencing means for driving the capsule in rotation.

31. Device according to any one of claims 29 or 30, wherein the referencing means are designed for receiving the capsule in a removable manner and for receiving the capsule in the device in operational relationship with the water feed means and the driving means.

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32. Device according to claim 31, wherein the referencing means comprise a capsule holder comprising a cavity which is drivable in rotation.

33. Device according to claim 32, wherein the capsule holder is connected to a motor via a drive shaft arranged for driving the capsule holder about a central rotational axis.

34. Device according to any one of claim 31 or 32, wherein the referencing means comprise a water injection lid closing on the capsule.

35. Device according to claim 34, wherein the water injection lid is traversed by a water conduit.

36. Device according to claim 35, wherein the water injection lid comprises means for puncturing at least one water inlet in the capsule.

37. Device according to any one of claims 29 to 36, wherein it comprises means for piercing peripheral outlets enabling the brewed liquid to leave the capsule.

38. Device according to claim 37, wherein the piercing means are formed by a series of needles on the injection lid.

39. Device according to any one of claims 29 to 38, wherein it comprises a collector for collecting the brewed liquid.

40. Device according to claims 29 to 39, wherein it comprises a by-pass conduit arranged to add a volume of water in the collector without water passing in the capsule.

41. Device according to any one of claims 29 to 40, wherein it comprises a control unit adapted to vary the speed of the driving means for driving the capsule in centrifugal rotation therefore providing different centrifugal pressure in the capsule.

42. Device according to claim 41, wherein the control unit is programmed to provide at least two different centrifugal speeds.

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43. Device according to any of claims 29 to 42, wherein the water feed means comprises a pump.

44. Device according to any of claims 29 to 43, wherein the water feed means comprises an injection tube connected to a water reservoir for injection of water in the capsule under the effect of the rotational momentum.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

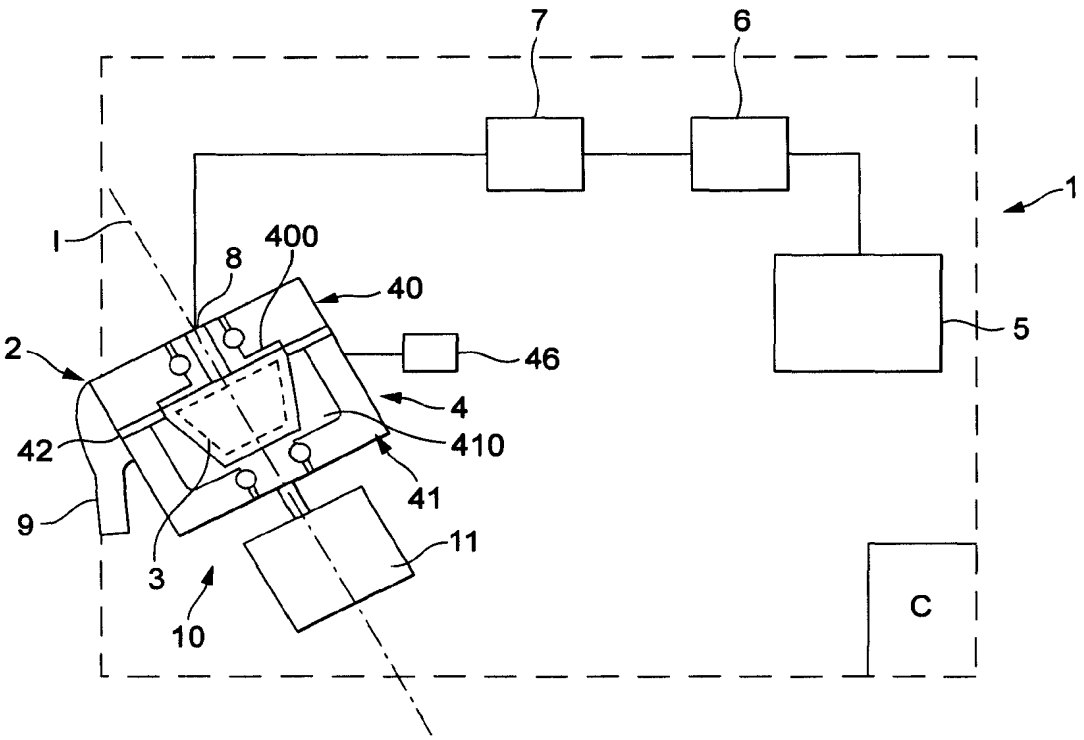


FIG. 1

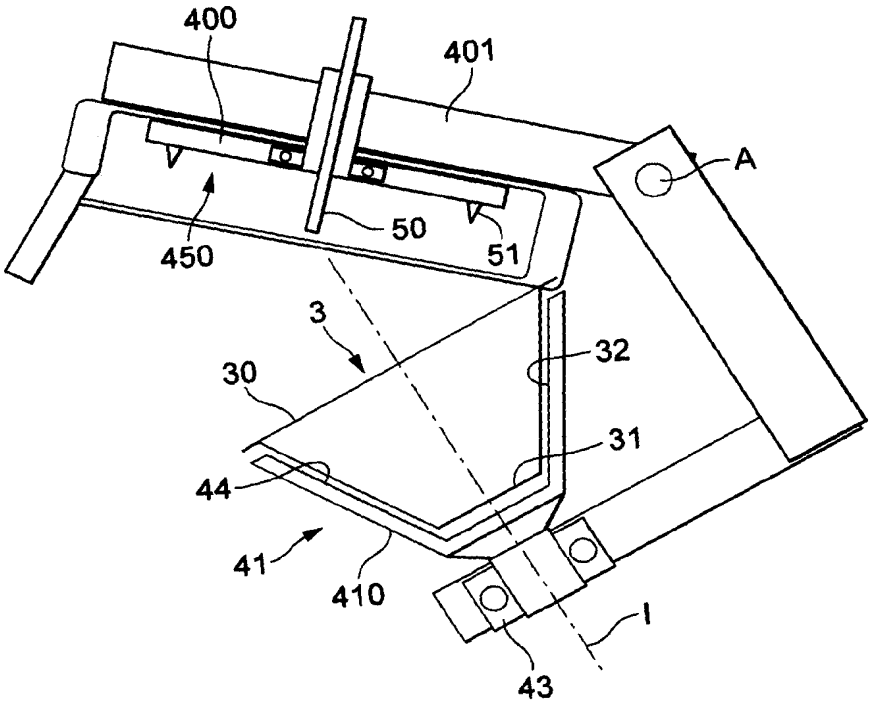

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FIG. 2

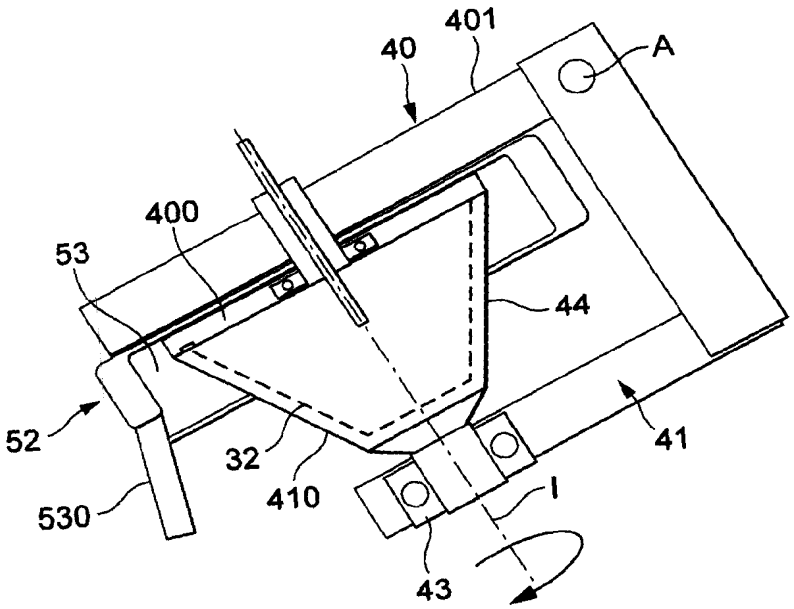

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FIG. 3

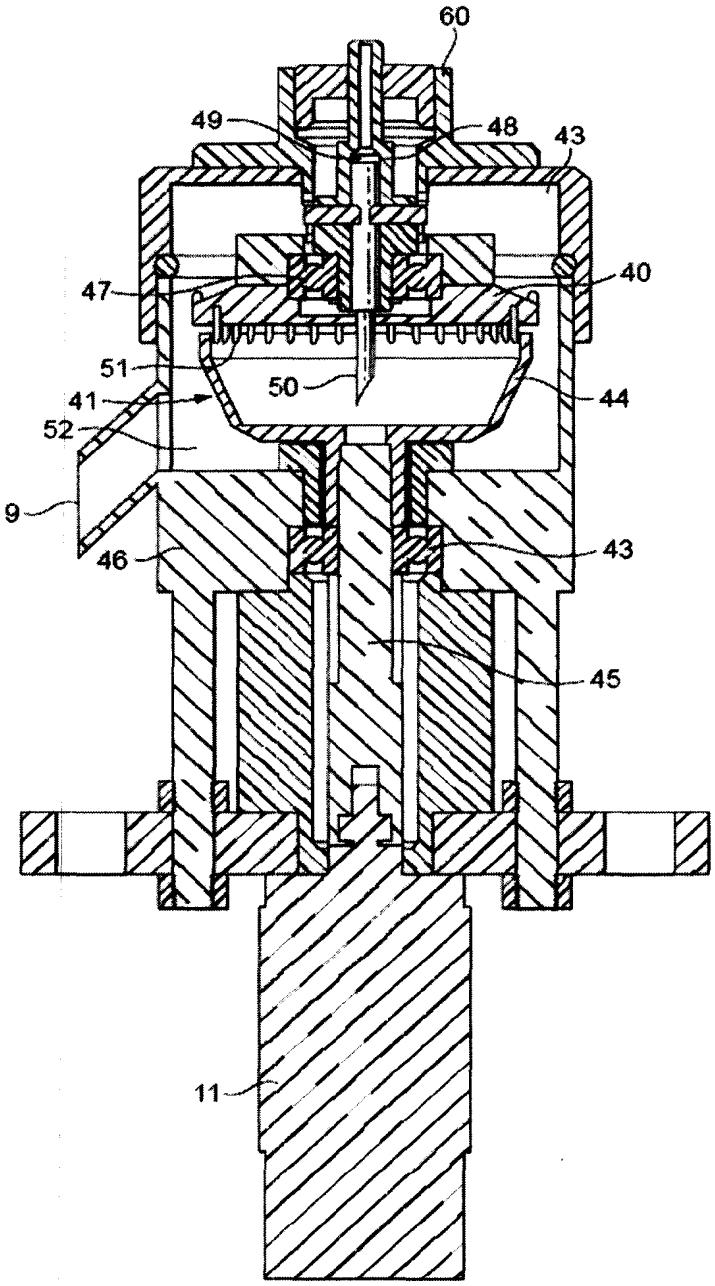


FIG. 4

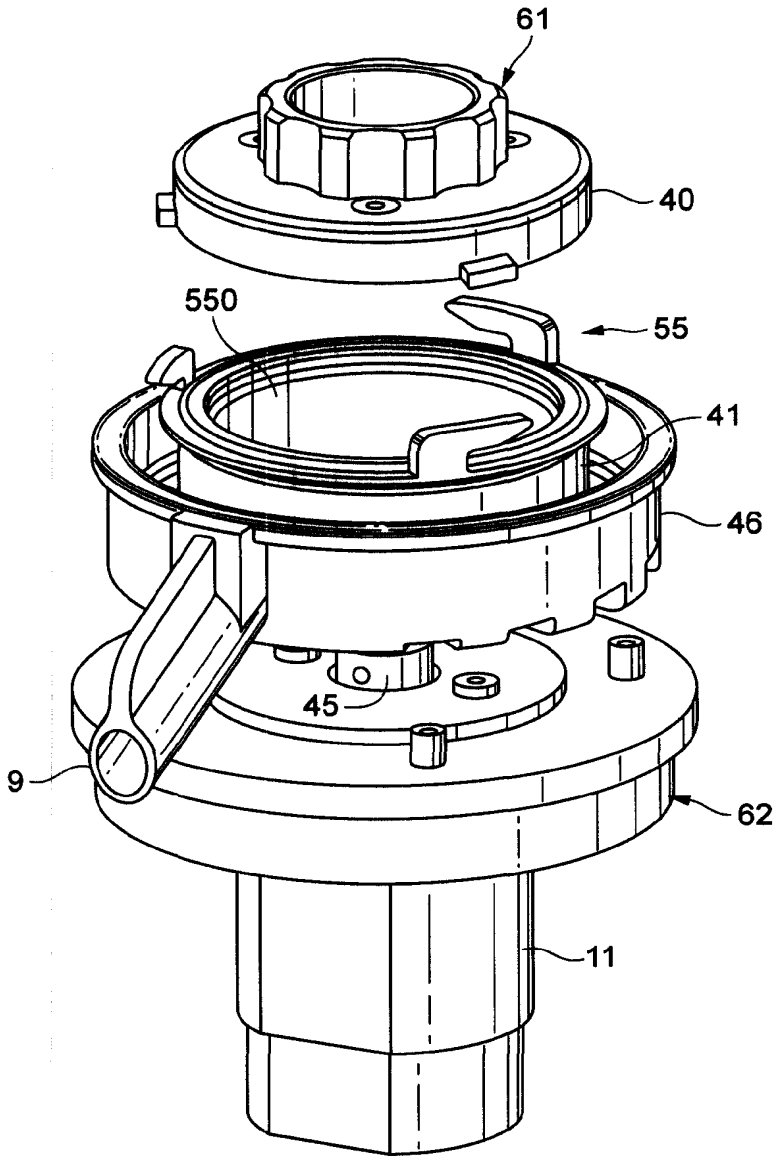


FIG. 5

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

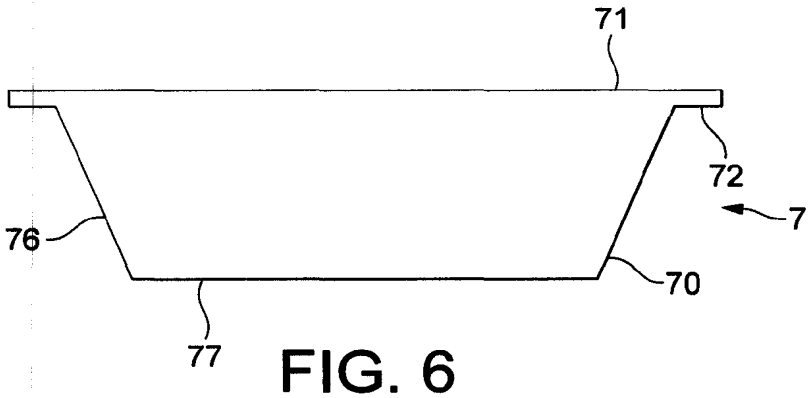


FIG. 6

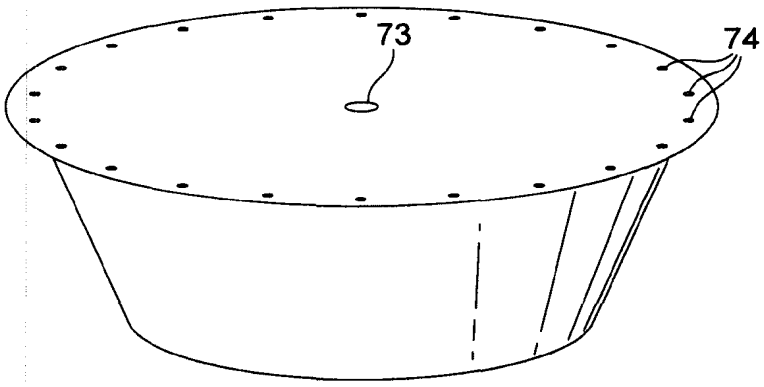


FIG. 7

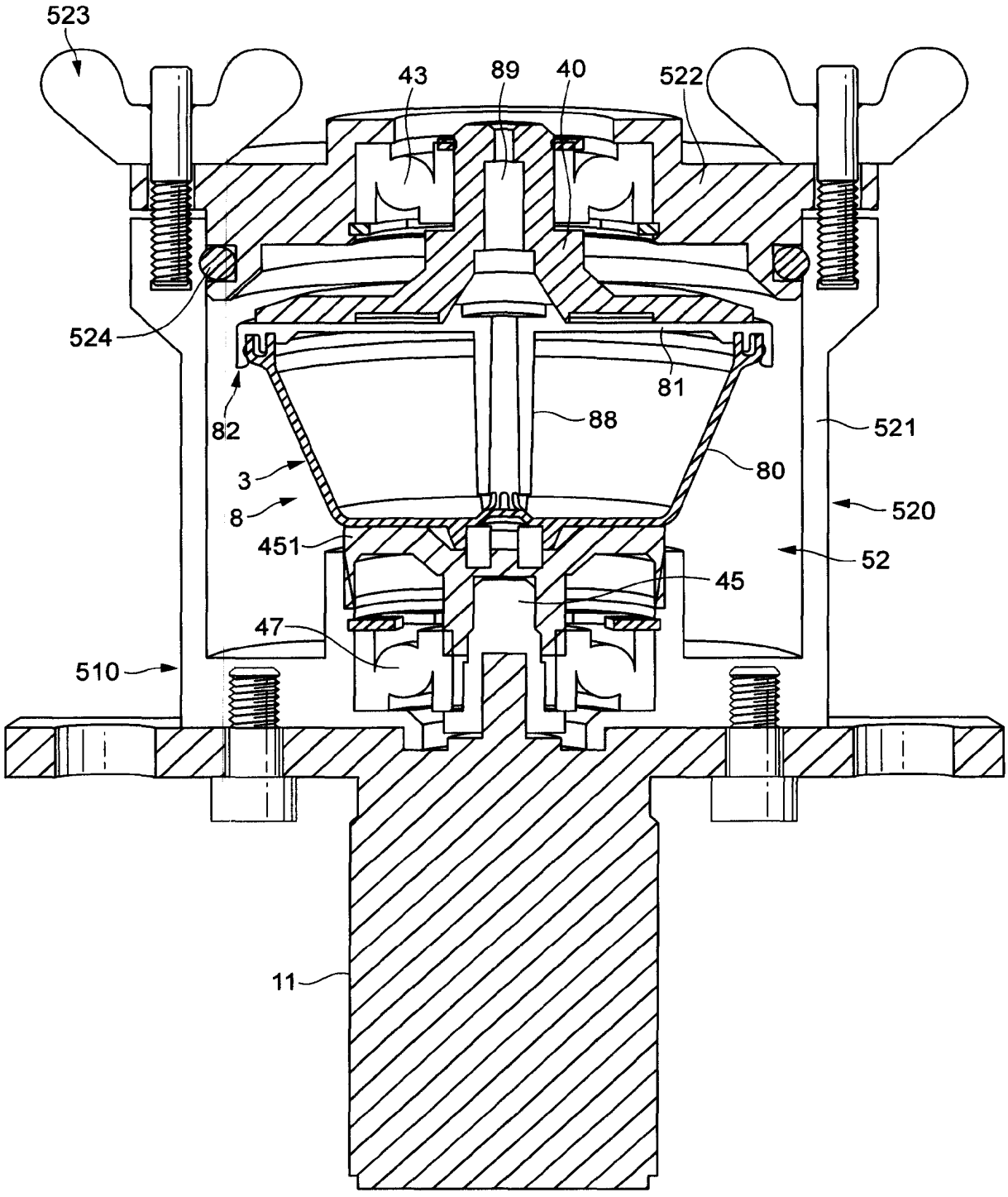


FIG. 8

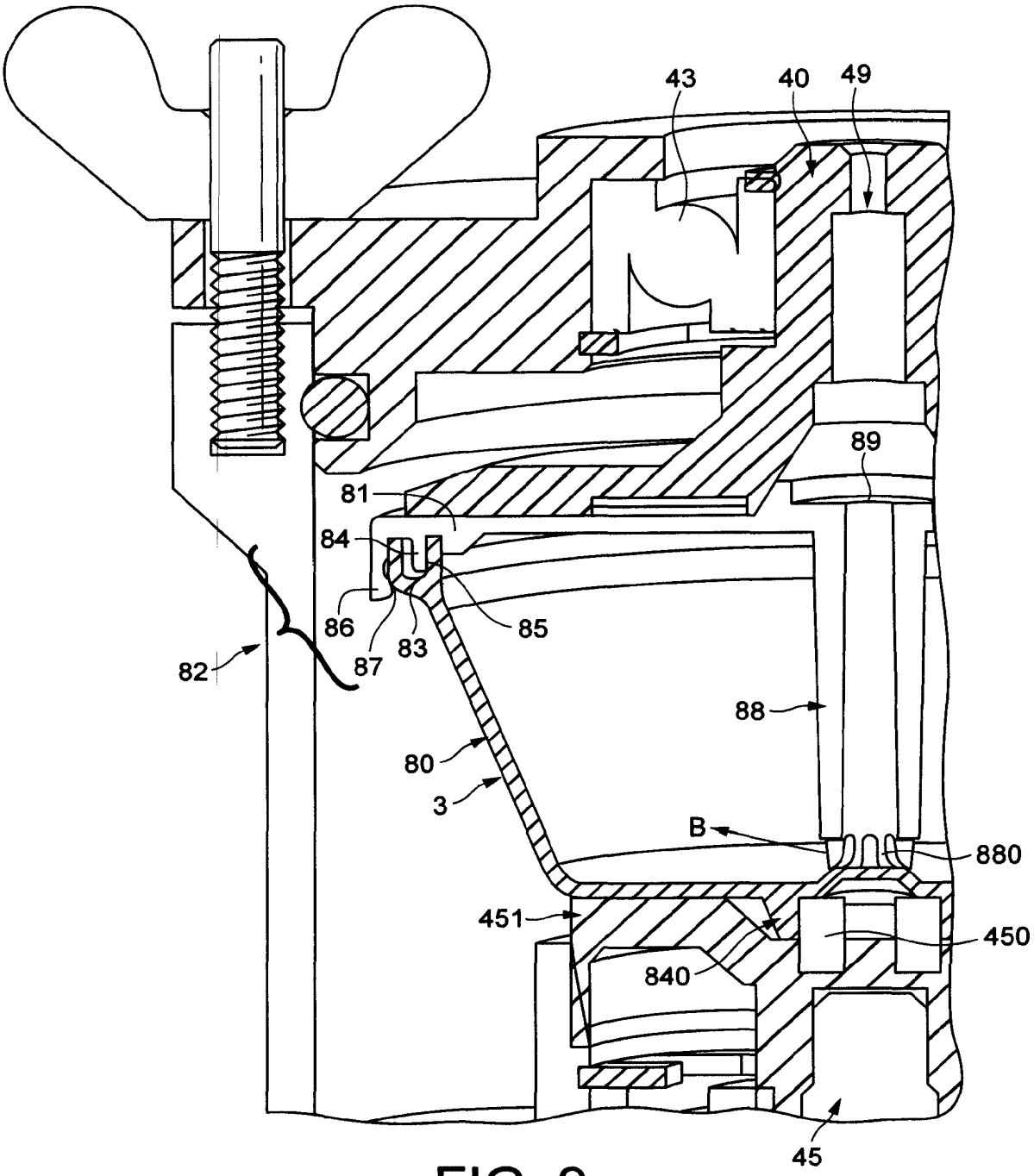


FIG. 9

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

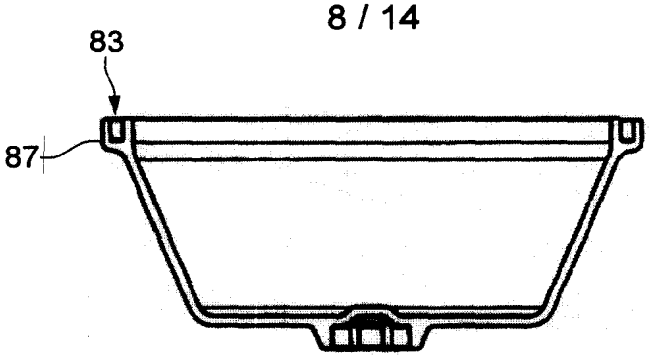


FIG. 10

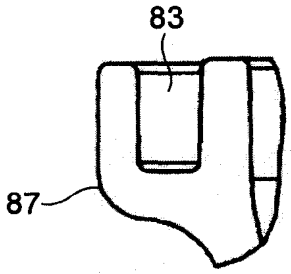


FIG. 11

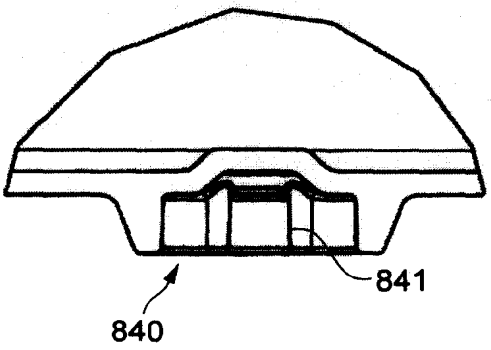


FIG. 12

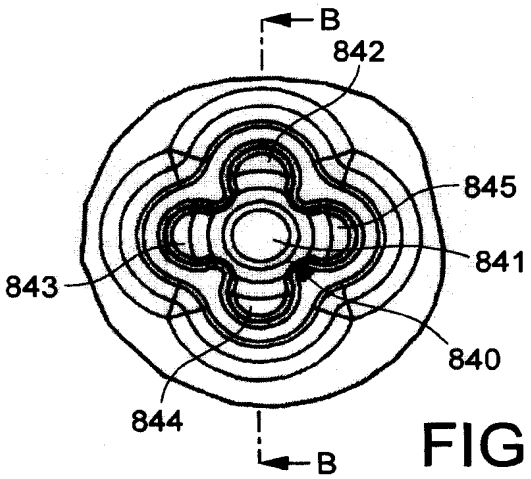


FIG. 13

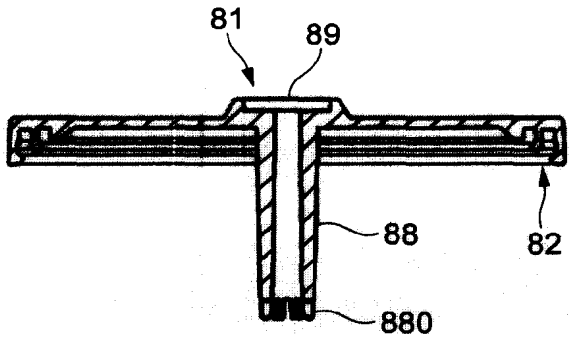


FIG. 14

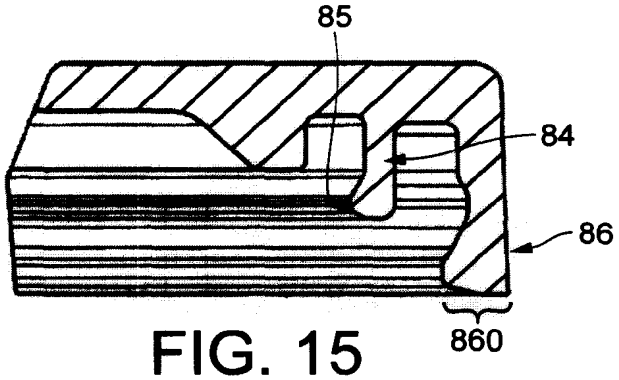


FIG. 15

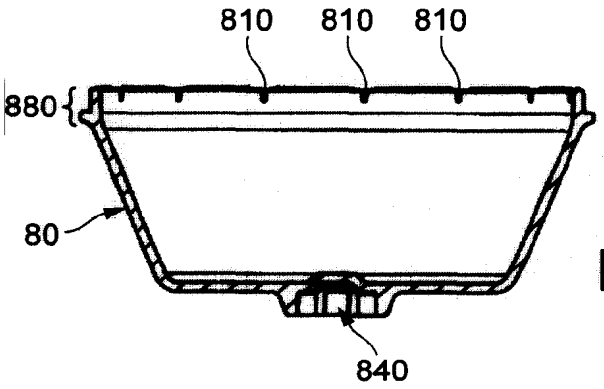


FIG. 16

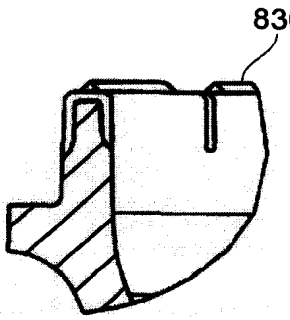


FIG. 17

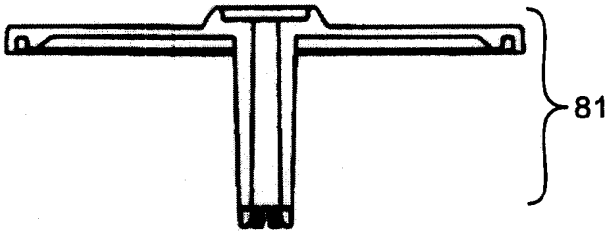


FIG. 18

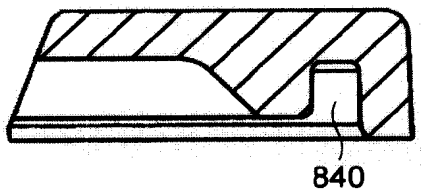


FIG. 19

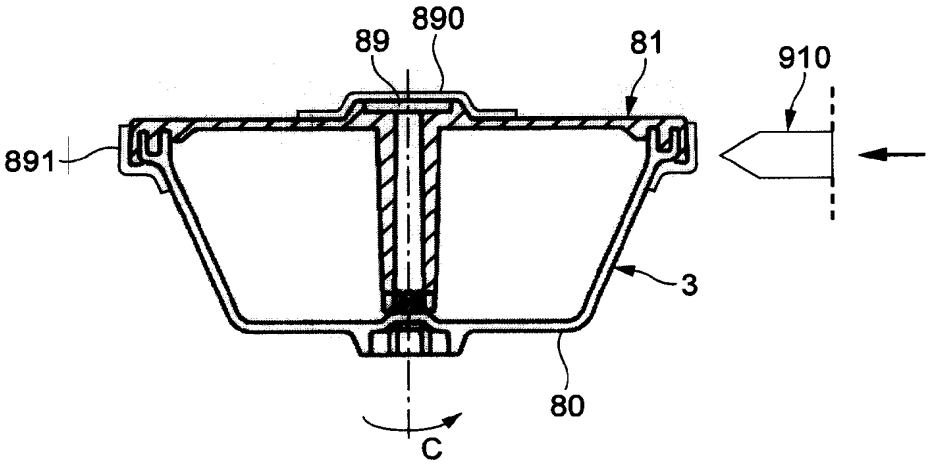


FIG. 20

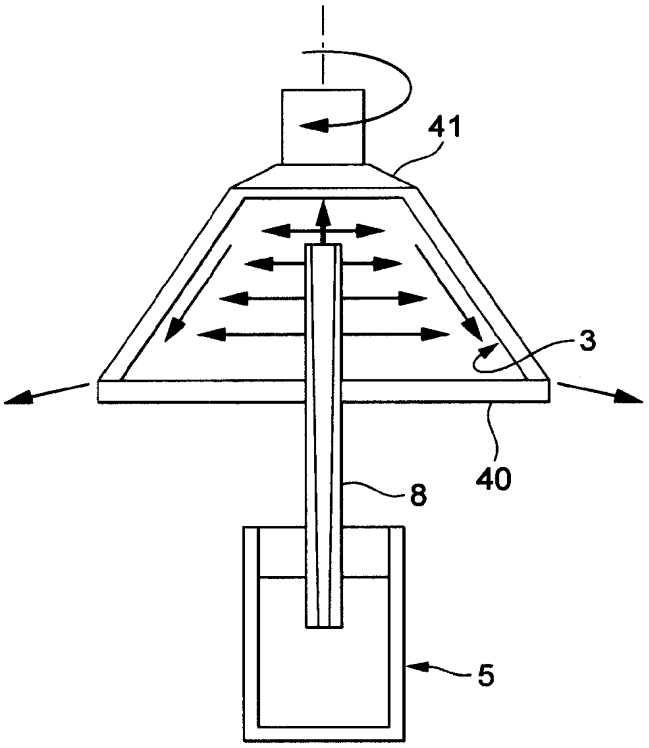


FIG. 21

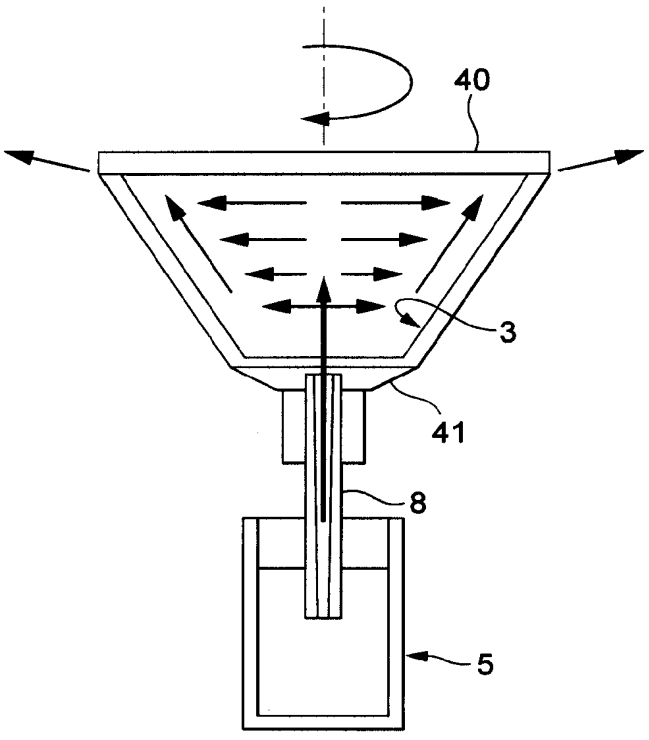


FIG. 22

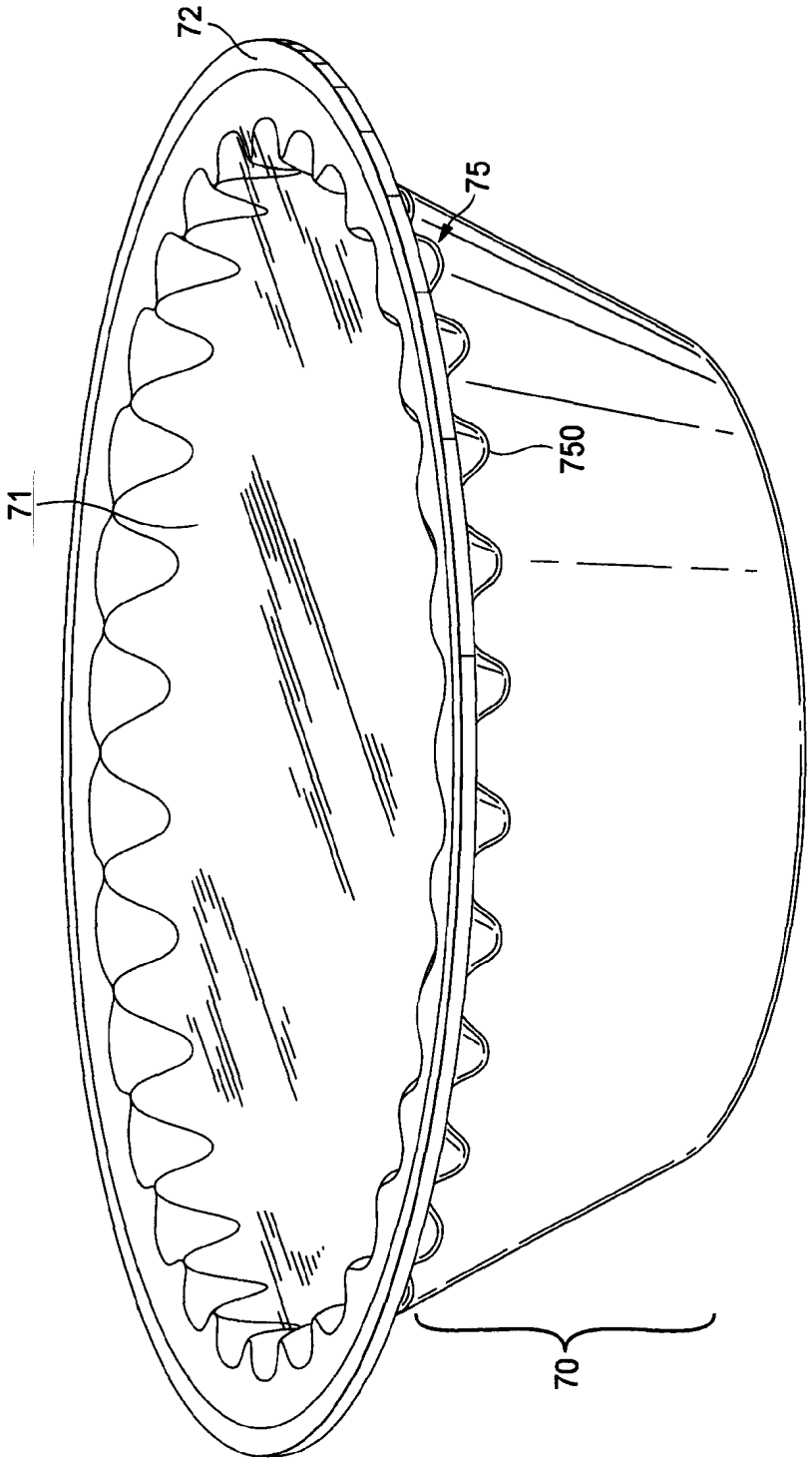


FIG. 23

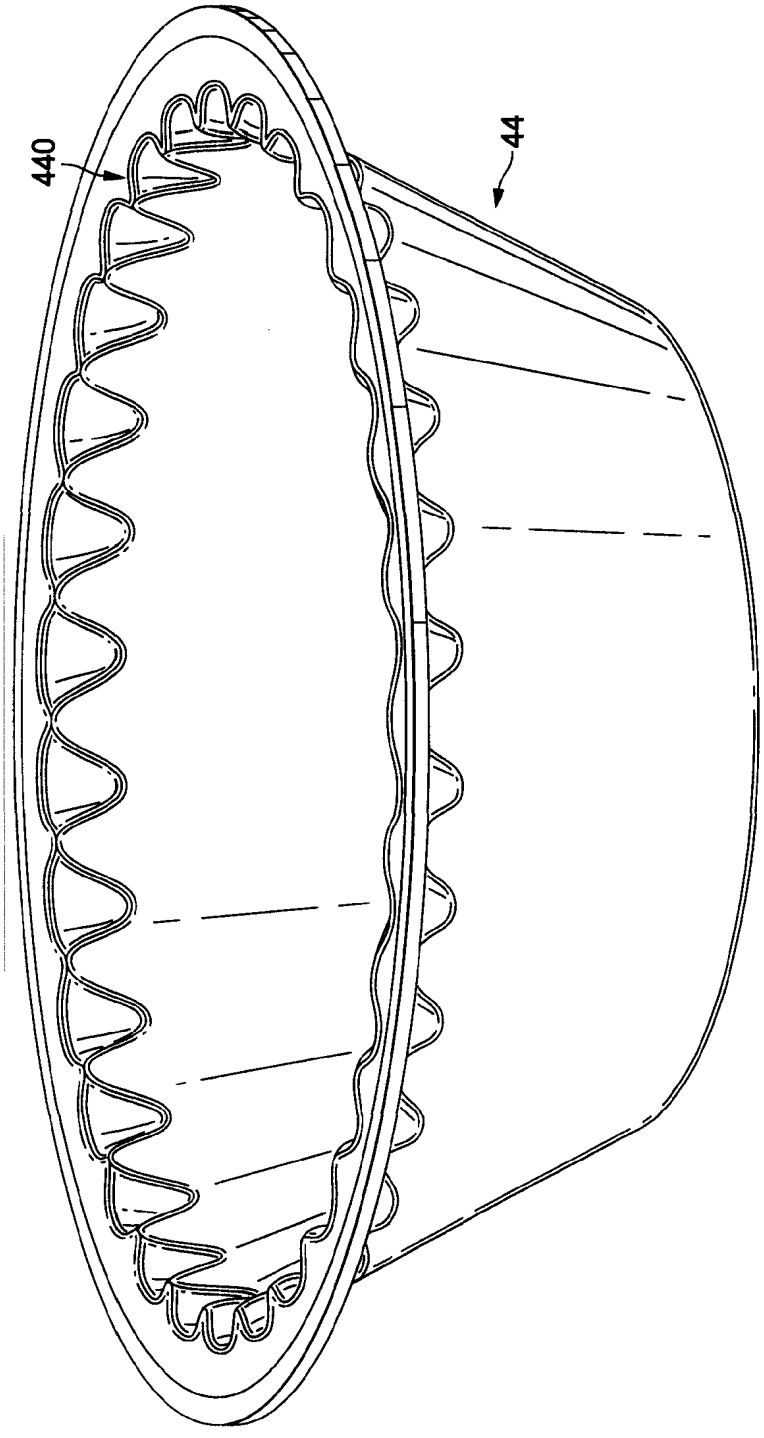


FIG. 24

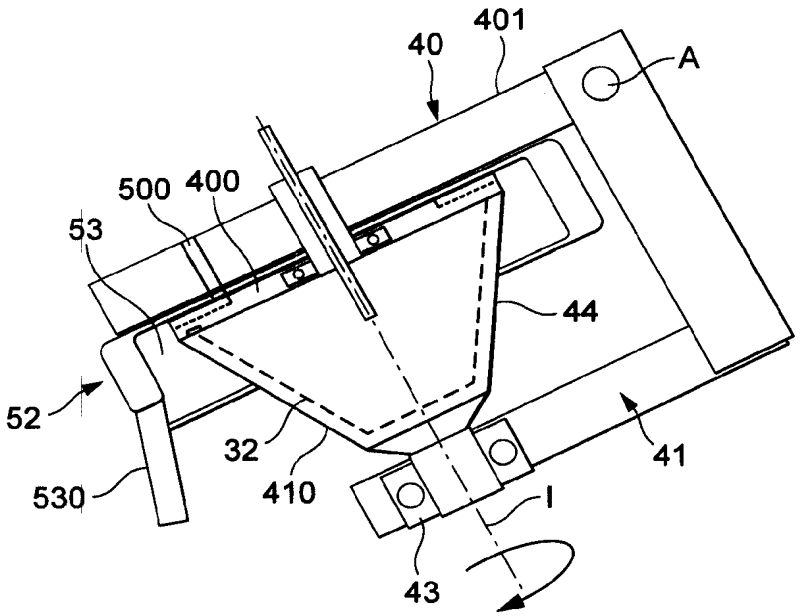


FIG. 25

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/054401

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J31/06 A47J31/22

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)
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 42 40 429 A1 (BRAUN AG [DE]) 9 June 1994 (1994-06-09) cited in the application	15,16, 19, 29-35, 39,40,44
A	column 5, line 17 - column 6, line 6 column 6, line 39 - column 7, line 44 figure 1	1,5,8, 20,41
X	DE 10 2005 007852 A1 (WIESAUPLAST KUNSTSTOFF UND FOR [DE]) 31 August 2006 (2006-08-31) cited in the application	15,17, 19-21, 29-31, 34,35,39
A	paragraphs [0029] - [0033], [0035], [0038] - [0046]; figures 1,2,6	1,5,8, 23,41

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 August 2008	11/09/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Novelli, Bruno

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/054401

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 545 296 A (BEN-SHMUEL SONJA [US]) 8 October 1985 (1985-10-08)	15,29-33
A	column 5, lines 12-65 column 6, lines 38-46 column 6, line 58 - column 7, line 18 figures 1,4	1,6

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2008/054401

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4240429 A1	09-06-1994	NONE	
DE 102005007852 A1	31-08-2006	NONE	
US 4545296 A	08-10-1985	NONE	

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13697297	JARISCH ET AL.
	Examiner	**Art Unit**
	CHAIM SMITH	1792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/18/2015	06/04/2015	11/04/2015	02/22/2016					
	1	÷	✓	✓	✓					
	2	÷	✓	✓	✓					
	3	÷	✓	-	-					
	4	÷	✓	✓	-					
	5	÷	✓	✓	✓					
	6	÷	✓	✓	✓					
	7	÷	✓	✓	✓					
	8	÷	✓	✓	✓					
	9	÷	✓	✓	✓					
	10	÷	✓	✓	✓					
	11	÷	✓	✓	-					
	12	÷	✓	-	-					
	13	÷	✓	-	-					
	14	÷	N	N	N					
	15	÷	N	N	N					
	16	÷	N	N	N					
	17	÷	N	N	N					
	18	÷	N	N	N					

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13697297	JARISCH ET AL.
	Examiner	Art Unit
	CHAIM SMITH	1792

CPC- SEARCHED		
Symbol	Date	Examiner
A47J31/4492, A47J31/22 (updated 10/29/2015)	5/28/2015	LZL
B65D85/8043 (updated 10/29/2015)	5/28/2015	LZL

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
426	77-79 (updated 10/29/2015)	5/28/2015	LZL
99	295 (updated 10/29/2015)	5/28/2015	LZL

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	5/28/2015	LZL
EAST text search with classificaiton search	5/28/2015	LZL
Updated EAST search (attached)	10/29/2015	LZL
Update search	02/22/2016	CS

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/C.S./ Examiner.Art Unit 1792	

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 03/09/2016

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
SMITH, CHAIM A	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
03/09/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

K-FEE SYSTEM GMBH, EX2009, page 513
NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Office Action Summary	Application No. 13/697,297	Applicant(s) JARISCH ET AL.	
	Examiner CHAIM SMITH	Art Unit 1792	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,2,5-10 and 14-18* is/are pending in the application.

5a) Of the above claim(s) *14-18* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,2,5-10* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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IPR2023-00502, U.S. PATENT 10,994,923

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 15 February 2016 has been entered.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

3. Whilst figure 4 may provide support for the new limitations of claim 1 to wit: "the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body" the specification provides no antecedent basis for these limitations.

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1 – 10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yoakim et al. WO 2008/148601 in view of Boyd et al. US 2002/0048621 as further evidenced by Aker US 2010/0078480, Ruchonnet WO 2005/044067, Halliday et al. US 6,698,333, Halliday US 7,097,074, Hayes et al. US 7,335,387, Mahlich 2004/0089158, Evers et al. US 2008/0148948, Erlandsson et al. US 2007/0203587.

7. Regarding claim 1, Yoakim discloses a capsule capable of preparing a beverage which capsule would comprise a container configured to house a beverage ingredient, the container comprises a cup- shaped body having a flange-like rim, a lid connected to the body and the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference. Further regarding the container the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

8. With respect to the recitations beginning “the capsule is rotated around an axis of rotation traversing the capsule”, whilst Yoakim recites the capsule as being capable of said rotation about said axis, these are nevertheless seen to be recitations regarding the intended use of the capsule.

9. In this regard applicant’s attention is invited to MPEP 2114 which states that “an apparatus must be distinguished from the prior art in terms of structure rather than function”. That is to say, apparatus claims cover what a device is, not what a device does. If the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and then further limitations merely state, for example, the purpose or intended use of the invention, rather than any distinct structural definition of any of the claimed invention’s structural limitations, then any limitations regarding the intended use of the device are of no significance to claim construction. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim which Yoakim clearly does. Further, if the prior art structure is capable of performing the intended use, then it meets the claim.

10. It is The Office’s position that the further limitations do not state any distinct definition of any of the claimed invention’s limitations and further that the purpose or intended use, i.e. “the capsule is rotated around an axis of rotation traversing the capsule”, recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art, that is Yoakim and further that the prior

art structure, which is identical and/or obvious in view of the prior art to that set forth in the present claims is capable of performing the recited purpose or intended use.

11. Claim 1 differs from Yoakim in there being a code adapted for being identified or read by an external reader. Boyd discloses a capsule capable of preparing a beverage which capsule would comprise a container configured to house a beverage ingredient, the container would comprise a cup- shaped body having a flange-like rim, a lid would be connected to the body, and a code (30) capable of being identified or read by an external reader around an axis capable of rotation traversing the container would be arranged on the flange-like rim. Boyd is providing a code arranged on the flange-like rim to be identified or read by an external reader for the art recognized purpose of directing the operation of a coffee machine in accordance with predefined brewing directives to produce an optimal beverage from a variety of brewing ingredients which is applicant's reason for doing so as well. To therefore modify Yoakim and provide a code on the flange-like rim capable of being identified or read by an external reader as disclosed by Boyd to be read while the capsule is rotated around an axis of rotation traversing the capsule would have been an obvious matter of choice and/or design to the ordinarily skilled artisan.

12. With respect to the code being arranged on a bottom of the flange-like rim, once it was known to place a code on the flange-like rim of a container and since the position, i.e. arrangement, of the code would not have modified the operation of the capsule when placed in an appropriate brewing apparatus it is not seen that patentability would be predicated on the code being located on the bottom of the flange-like rim (MPEP §

2144.04 VI.C.). Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson all provide further evidence that it was quite old and conventional to arrange a code capable of being identified or read by an external reader on a container.

13. Regarding claims 2 and 5, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose that it was well established to arrange and repeat a code on the container along an arc-shaped or circular path of a circumference of the container ('482 fig. 2A, 2B, 4A, 4B, 4A, and 5B).

14. Regarding claim 6, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose that it was well established to form a code on a container by a series of discrete dot surfaces ('621, fig. 2h).

15. Regarding claim 7, once it was known to arrange a code on the flange-like rim of the capsule it is not seen that patentability would be predicated by the visibility or lack thereof of the code by the human eye under natural light absent strong and compelling evidence to the contrary. The substitution of one known machine readable coding ink for another known machine readable coding ink would have been obvious. Nevertheless, Ruchonnet discloses that it was well known and conventional to print the code with an ink which is not visible by the human eye under natural light (bar code registered with invisible ink that reacts to UV light) ('067 translation page 3).

16. Regarding claims 8 – 9, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson

discloses that the code (30) can be printed or embossed by a pattern (geometric shape) which possesses surfaces having different reflective and/or absorbing properties to light (color), wherein the pattern possesses a first surface having inclined (raised) mirroring or absorbing properties to light and a second surface having flat (lowered) mirroring or flat reflective properties to light (code32 can be a geometric shape that may be raised or lowered and may incorporate a color) ('621, fig. 2b and [0029]).

17. Regarding claim 10 Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose the code would be mechanically embossed on the container (grooves may be incorporated to create a texture) ('621, paragraph [0029] and fig. 2g).

Response to Arguments

18. Applicant's arguments with respect to claim 1 have been fully and carefully considered but are moot because the arguments do not apply to the combination of the references being used in the current rejection.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAIM SMITH whose telephone number is (571)270-7369. The examiner can normally be reached on Monday-Thursday 7:30-5:00.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erik Kashnikow can be reached on 571-270-3475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S./
Chaim Smith
Examiner, Art Unit 1792
25 February 2016

/ERIK KASHNIKOW/
Supervisory Patent Examiner, Art Unit 1792

Notice of References Cited	Application/Control No. 13/697,297	Applicant(s)/Patent Under Reexamination JARISCH ET AL.	
	Examiner CHAIM SMITH	Art Unit 1792	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,698,333 B2	03-2004	Halliday; Andrew M.	B65D85/8043	426/77
*	B	US-7,097,074 B2	08-2006	Halliday; Andrew	A47J31/0673	222/325
*	C	US-7,335,387 B2	02-2008	Hayes; Michael A.	A47J31/002	426/112
*	D	US-2004/0089158 A1	05-2004	Mahlich, Gotthard	A47J31/3623	99/275
*	E	US-2007/0203587 A1	08-2007	Erlandsson; Jan Hakan	A47J31/3676	700/11
*	F	US-2008/0148948 A1	06-2008	Evers; Lucas Alphonsus Maria	A47J31/407	99/275
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	WO 2008/148601	12-2008	WIPO	Yoakim et al.	
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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BIB DATA SHEET

CONFIRMATION NO. 1065

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/697,297	11/09/2012	426	1792	3712036-01693

APPLICANTS

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**** CONTINUING DATA ***************************

This application is a 371 of PCT/EP2011/057657 05/12/2011

**** FOREIGN APPLICATIONS *************************

EUROPEAN PATENT OFFICE (EPO) 10169374.5 07/13/2010
EUROPEAN PATENT OFFICE (EPO) 10162741.2 05/12/2010

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

12/04/2012

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /CHAIM A SMITH/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		SWITZERLAND	4	18	3

ADDRESS

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690
UNITED STATES

TITLE

CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION

FILING FEE RECEIVED		
1140	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	137	b65D85/8043.cpc. and code	US-PGPUB; USPAT; EPO; JPO	OR	ON	2016/02/24 19:15
L2	166	b65D85/8043.cpc. and code	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2016/02/24 20:46
S1	17	b65D85/8043.cpc. and centrifuge	US-PGPUB; USPAT; EPO; JPO	OR	ON	2016/02/22 14:07
S2	35	b65D85/8043.cpc. and centrifuge	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2016/02/23 13:01

EAST Search History (Interference)

< This search history is empty>

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/697,297	Filing Date 11/09/2012	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	04/26/2016	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/NICOLE C. LAWRENCE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

REMARKS

This Response is submitted in reply to the Non-final Office Action dated March 9, 2016. The Director is authorized to charge any fees that may be required or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-01693 on the account statement.

Claims 1-2 and 5-10 are currently pending and under consideration. Claims 14-18 were previously withdrawn from consideration; and Claims 3-4 and 11-13 were previously canceled without prejudice or disclaimer. In the Office Action, the specification is objected to; and Claims 1-2 and 5-10 are rejected under 35 U.S.C. §103. In response, Applicants have amended the specification and Claims 1, 2, and 7 and have added newly submitted Claim 19. The amendments do not add new matter. The amendments to the specification are fully supported in Fig. 4. The amendments to the claims are solely for clarification, not to avoid prior art. The newly submitted claim does not add new matter and is fully supported in the specification at, for example, page 6, lines 11-14. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully request that the objection and rejection be reconsidered and withdrawn.

In the Office Action, the specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See Office Action, page 2. In response, without acquiescing to the merits of the objection and solely to advance prosecution of this application, Applicants have amended the specification to provide proper antecedent basis for the claimed subject matter.

Accordingly, Applicants respectfully request that the objection to the specification be reconsidered and withdrawn.

In the Office Action, Claims 1-2 and 5-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over International Patent Publication No. WO 2008/148601 to Yoakim et al. ("*Yoakim*") in view of U.S. Patent Publication No. 2002/0048621 to Boyd et al. ("*Boyd*") as evidenced by U.S. Patent Publication No. 2010/0078480 to Aker ("*Aker*"), International Patent Publication No. WO 2005/0440067 to Ruchonnet ("*Ruchonnet*"), U.S. Patent No. 6,698,333 to Halliday et al. ("*Halliday '333*"), U.S. Patent No. 7,097,074 to Halliday ("*Halliday '074*"), U.S. Patent No. 7,335,387 to Hayes et al. ("*Hayes*"), U.S. Patent Publication No. 2004/0089158 to Mahlich ("*Mahlich*"), U.S. Patent Publication No. 2008/0148948 to Evers et al. ("*Evers*"), and U.S. Patent Publication No. 2007/0203587 to Erlandsson et al. ("*Erlandsson*"). In view of the

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amendments and/or for at least the reasons set forth below, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

Independent Claim 1 recites a capsule for the preparation of a beverage, the capsule comprising a container configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the container comprises a circumference, the code comprises successive segments that extend substantially along at least an eighth of the circumference, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

As discussed in the specification, Applicants have recognized that a problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always reliable or convenient. The present claims are directed to an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine. See specification, page 2, lines 23-30.

In this regard, the present claims are directed to a capsule for the preparation of a beverage. The capsule includes a container configured to house a beverage ingredient. The container has a code adapted for being identified or read by external reading means, and the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule. More particularly, the capsule has a circumference wherein the code is arranged on the container along an arc-shaped or circular path of the circumference. In an embodiment, the capsule has a circumference wherein the code comprises successive segments which are individually rectilinear but extend substantially along at least a part of the circumference. The code may be arranged along at least an eighth of the circumference. Such a configuration provides a reliable reading or retrieval of information as well as an effective portion for information. In order to ensure a reliable reading or retrieval of information, the code is repeated along said circumference. The repetition ensures a higher probability that at least one

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code is readable but also may potentially reduce the reading time. See specification, page 2, line 23-page 3, line 14.

In contrast, the cited references fail to render obvious the present claims. Specifically, the cited references alone or in combination fail to disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as required by the present claims. Further, the skilled artisan would not have combined the cited references to arrive at the present claims.

Yoakim discloses a capsule that includes a cup-shaped body and a sealing lid sealed onto the body. See *Yoakim*, for example, bottom of page 4. However, *Yoakim* does not disclose any code provided on the capsule. Indeed, the Patent Office admits that Claim 1 differs from *Yoakim* in there being a code adapted for being identified or read by an external reader. Nonetheless, the Patent Office cites *Boyd* to remedy the deficiencies of *Yoakim* for the alleged disclosure of providing a code on the flange-like rim to be identified or read by an external reader. See Office Action, page 5. However, as discussed in the previous response, *Boyd* does not disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as required by the present claims. Further, the other secondary references are merely relied on for the alleged disclosure of the elements in the dependent claims and do not remedy the deficiencies of *Yoakim* alone or in combination with *Boyd* even if combinable. See Office Action, pages 5-7.

The Patent Office attempts to remedy the deficiencies of the references regarding the code being on a **bottom** of the flange-like rim by alleging that the position of the code does not provide patentability. Specifically, the Patent Office cites MPEP 2144.04 VI.C as the basis for this allegation. See Office Action, pages 5-6. However, MPEP 2144.04 VI.C actually states: "the mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of

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appellant's specification, to make the necessary changes in the reference device." Applicants respectfully submit that no such motivation or reason has been provided here.

The Patent Office merely alleges that to modify *Yoakim* and provide a code on the flange-like rim capable of being identified or read by an external reader as disclosed by *Boyd* to be read while the capsule is rotated around an axis of rotation traversing the capsule would have been obvious matter of choice and/or design to the ordinarily skilled artisan. The Patent Office has not provided any reason whatsoever that the skilled artisan would have provided the code on a **bottom** of the flange-like rim according to the teachings of the cited references. See Office Action, page 5.

Indeed, there is not reason or motivation in the record for the skilled artisan to provide the code on the **bottom** of the flange-like rim as required by the present claims. In this regard, as discussed above and previously, *Yoakim* does not even teach a code provided on the capsule; *Boyd* at most teaches a code provided on an orbicular gasket of a brewing packet, but the orbicular gasket is not even the claimed flange-like rim; and the other secondary references do not remedy the deficiencies of *Yoakim* alone or in combination with *Boyd* even if combinable. None of the cited references provide any reason or motivation for the skilled artisan to provide the code on the **bottom** of the flange-like rim not even taught by these references. As such, the skilled artisan would not have modified the cited references alone or in combination to provide the code on the bottom of the flange-like rim to arrive at the present claims.

Moreover, Applicants respectfully submit that the skilled artisan would not have arrived at the present claims as an obvious matter of "design choice" as alleged by the Patent Office because the specification demonstrates attendant advantages of the specifically claimed arrangement of the code on the capsule.

In this regard, design choice does not apply when the claimed structure has improved functionality over the corresponding element in the cited reference. See, e.g, *In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975). As detailed in the specification, the specification discloses that by providing the code on the bottom of the rim of the capsule which is opposed to the lid of the capsule, the bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas, so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles); and as a result, the reading is made more reliable. See specification, for example, top of page 4. As such, the

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
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claimed arrangement has an improved functionality which renders improper the allegation of obviousness based on design choice.

For at least the reasons set forth above, Applicants respectfully submit that the cited references alone or in combination fail to disclose or suggest each and every element of the present claims. Moreover, the cited references fail to even recognize the advantages, benefits, and/or properties of the capsule in accordance with the present claims. Further, the skilled artisan would not have combined the cited references to arrive at the present claims.

Therefore, Applicants respectfully submit that the present claims are novel, nonobvious, and distinguishable from the cited references and are currently in condition for allowance.

Accordingly, Applicants respectfully request that the obviousness rejection of the present claims be reconsidered and withdrawn.

Applicants note that newly submitted Claim 19 has been added. No new matter has been added thereby. Applicants respectfully submit that the subject matter defined in newly submitted Claim 19 is patentable over the cited art for at least substantially the same reasons discussed above for independent Claim 1 from which the newly submitted claim depends.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly request an early allowance of the same. In the event there remains any impediment to allowance of the claims that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

K&L GATES LLP

BY /Robert M. Barrett/
Robert M. Barrett
Reg. No. 30,142
Customer No. 29157
Telephone No. 312-807-4204

Dated: April 26, 2016

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
Title:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
Art Unit:	1792
Examiner:	Long, Luana Zhang
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NON-FINAL OFFICE ACTION

Examiner:

In reply to the Non-final Office Action dated March 9, 2016, please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the Listing of Claims, which begins on page 3 of this paper.

Remarks begin on page 6 of this paper.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
IPR2023-00502, U.S. PATENT 10,994,923

Amendments to the Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A capsule for the preparation of a beverage, the capsule comprising a container configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule,

wherein the container ~~capsule~~ comprises a circumference, the code comprises successive segments that extend substantially along at least an eighth of the circumference, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

Claim 2 (currently amended): The capsule of Claim 1, wherein the code is arranged on the container along an arc-shaped or circular path of [[a]]the circumference of the container.

Claims 3-4 (canceled):

Claim 5 (previously presented): The capsule of Claim 1, wherein the code is repeated along the circumference of the container.

Claim 6 (previously presented): The capsule of Claim 1, wherein the code is a bit code formed by a series of discrete polygonal or dot surfaces printed on and/or embossed in the container.

Claim 7 (currently amended): The capsule of Claim 1, wherein the code is printed by an ink which is not visible by [[the]]a human eye under natural light.

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Claim 8 (previously presented): The capsule of Claim 1, wherein the code is printed or embossed by a pattern which possesses surfaces having different reflective and/or absorbing properties to light.

Claim 9 (previously presented): The capsule of Claim 8, wherein the pattern possesses a first surface having inclined mirroring or absorbing properties to light and a second surface having flat mirroring or flat reflective properties to light.

Claim 10 (previously presented): The capsule of Claim 1, wherein the code is mechanically embossed or engraved on the container by a laser.

Claims 11-13 (canceled):

Claim 14 (withdrawn): A system for preparing a beverage from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule and the beverage preparation device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis.

Claim 15 (withdrawn): The system of Claim 14, wherein the reader comprises a light emitter and a light sensor or an inductive sensor.

Claim 16 (withdrawn): The system of Claim 14, wherein the optical reader or inductive sensor is arranged to detect a code on the rim of the capsule.

Claim 17 (withdrawn): A method for preparing a beverage from a system from a capsule comprising a container and a beverage ingredient contained therein, the container comprises a code adapted for being identified or read by an external reader, the method comprising rotating the container and reading the code while the capsule is rotated around an axis of rotation

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traversing the capsule and the beverage preparation device, the device comprises a capsule holder for holding the capsule and rotational driver for driving the holder and capsule in rotation along the axis of rotation and reader arranged for reading the code when the capsule is rotated along the axis, and extracting the beverage from the capsule by rotating the capsule along the axis.

Claim 18 (withdrawn): The method of Claim 17, wherein the code is read at a first rotational speed and the beverage is extracted from the capsule at a second rotational speed.

Claim 19 (new): The capsule of Claim 1, comprising a peripheral edge that is an outermost circular line of the capsule, wherein the code is positioned within 10 mm of the peripheral edge.

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NESPRESSO USA, INC. v. K-FEE SYSTEM GMBH
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Electronic Acknowledgement Receipt

EFS ID:	25596804
Application Number:	13697297
International Application Number:	
Confirmation Number:	1065
Title of Invention:	CAPSULE, SYSTEM AND METHOD FOR PREPARING A BEVERAGE BY CENTRIFUGATION
First Named Inventor/Applicant Name:	Christian Jarisch
Customer Number:	29157
Filer:	Robert M. Barrett/Alex Stark
Filer Authorized By:	Robert M. Barrett
Attorney Docket Number:	3712036-01693
Receipt Date:	26-APR-2016
Filing Date:	09-NOV-2012
Time Stamp:	12:53:16
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		01693.pdf	116117 61c6d9af37798261e901b4a62db605b9e95dde91	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Specification	2	2
	Claims	3	5
	Applicant Arguments/Remarks Made in an Amendment	6	10
Warnings:			
Information:			
	Total Files Size (in bytes):	116117	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Amendments to the Specification:

Please amend the paragraph on page 5, lines 23-26 as follows:

In the following examples (see FIG. 4), the capsule comprises a cup-shaped body 69 extending by a flange-like rim 73. A lid such as a foil or membrane (liquid-tight or permeable to liquid) 60 is connected to the body, e.g., sealed on the rim. The body 69 extends from a bottom end of the body 69 to a top end of the body 69 where the body 69 terminates such that a height of the body 69 is the distance from the bottom end to the top end, the flange-like rim 73 extends from the top end of the body 69, and the lid 60 has a height that is less than the height of the body 69. The capsule is filled with beverage ingredient such as ground coffee.

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13697297	JARISCH ET AL.
	Examiner	**Art Unit**
	CHAIM SMITH	1792

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/18/2015	06/04/2015	11/04/2015	02/22/2016	05/30/2016				
	1	÷	✓	✓	✓	✓				
	2	÷	✓	✓	✓	✓				
	3	÷	✓	-	-	-				
	4	÷	✓	✓	-	-				
	5	÷	✓	✓	✓	✓				
	6	÷	✓	✓	✓	✓				
	7	÷	✓	✓	✓	✓				
	8	÷	✓	✓	✓	✓				
	9	÷	✓	✓	✓	✓				
	10	÷	✓	✓	✓	✓				
	11	÷	✓	✓	-	-				
	12	÷	✓	-	-	-				
	13	÷	✓	-	-	-				
	14	÷	N	N	N	N				
	15	÷	N	N	N	N				
	16	÷	N	N	N	N				
	17	÷	N	N	N	N				
	18	÷	N	N	N	N				
	19					✓				

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IPR2023-00502, U.S. PATENT 10,994,923

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/697,297	11/09/2012	Christian Jarisch	3712036-01693	1065

29157 7590 06/14/2016

K&L Gates LLP-Chicago
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
SMITH, CHAIM A	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
06/14/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatentmail@klgates.com

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Office Action Summary	Application No. 13/697,297	Applicant(s) JARISCH ET AL.	
	Examiner CHAIM SMITH	Art Unit 1792	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1,2,5-10 and 14-19* is/are pending in the application.

5a) Of the above claim(s) *14-18* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1, 2, 5-10, and 19* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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IPR2023-00502, U.S. PATENT 10,994,923

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5 – 10, and 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yoakim et al. WO 2008/148601 in view of Boyd et al. US 2002/0048621 as further evidenced by Aker US 2010/0078480, Ruchonnet WO 2005/044067, Halliday et al. US 6,698,333, Halliday US 7,097,074, Hayes et al. US 7,335,387, Mahlich 2004/0089158, Evers et al. US 2008/0148948, Erlandsson et al. US 2007/0203587.

3. Regarding claim 1, Yoakim discloses a capsule capable of preparing a beverage which capsule would comprise a container configured to house a beverage ingredient, the container comprises a cup- shaped body having a flange-like rim, a lid connected to the body and the capsule is rotated around an axis of rotation traversing the capsule, wherein the capsule comprises a circumference. Further regarding the container the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body.

4. With respect to the recitations beginning “the capsule is rotated around an axis of rotation traversing the capsule”, whilst Yoakim recites the capsule as being capable of said rotation about said axis, these are nevertheless seen to be recitations regarding the intended use of the capsule.

5. In this regard applicant’s attention is invited to MPEP 2114 which states that “an apparatus must be distinguished from the prior art in terms of structure rather than function”. That is to say, apparatus claims cover what a device is, not what a device does. If the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and then further limitations merely state, for example, the purpose or intended use of the invention, rather than any distinct structural definition of any of the claimed invention’s structural limitations, then any limitations regarding the intended use of the device are of no significance to claim construction. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim which Yoakim clearly does. Further, if the prior art structure is capable of performing the intended use, then it meets the claim.

6. It is The Office’s position that the further limitations do not state any distinct definition of any of the claimed invention’s limitations and further that the purpose or intended use, i.e. “the capsule is rotated around an axis of rotation traversing the capsule”, recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art, that is Yoakim and further that the prior

art structure, which is identical and/or obvious in view of the prior art to that set forth in the present claims is capable of performing the recited purpose or intended use.

7. Claim 1 differs from Yoakim in there being a code adapted for being identified or read by an external reader. Boyd discloses a capsule capable of preparing a beverage which capsule would comprise a container configured to house a beverage ingredient, the container would comprise a cup- shaped body having a flange-like rim, a lid would be connected to the body, and a code (30) capable of being identified or read by an external reader around an axis capable of rotation traversing the container would be arranged on the flange-like rim. Boyd is providing a code arranged on the flange-like rim to be identified or read by an external reader for the art recognized purpose of directing the operation of a coffee machine in accordance with predefined brewing directives to produce an optimal beverage from a variety of brewing ingredients which is applicant's reason for doing so as well. To therefore modify Yoakim and provide a code on the flange-like rim capable of being identified or read by an external reader as disclosed by Boyd to be read while the capsule is rotated around an axis of rotation traversing the capsule would have been an obvious matter of choice and/or design to the ordinarily skilled artisan.

8. With respect to the code being arranged on a bottom of the flange-like rim, once it was known to place a code on the flange-like rim of a container and since the position, i.e. arrangement, of the code would not have modified the operation of the capsule when placed in an appropriate brewing apparatus it is not seen that patentability would be predicated on the code being located on the bottom of the flange-like rim (MPEP §

2144.04 VI.C.). Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson all provide further evidence that it was quite old and conventional to arrange a code capable of being identified or read by an external reader on a container.

9. Regarding claims 2, 5, and 19, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose that it was well established to arrange and repeat a code on the container along an arc-shaped or circular path of a circumference of the container ('482 fig. 2A, 2B, 4A, 4B, 4A, and 5B). Further regarding claim 19 and the particular distance which the code would be positioned with respect to a peripheral edge of the capsule, once it was known to place the code on a peripheral edge of a capsule it is not seen that patentability would be predicated on the particular distance the code would be placed from said peripheral edge. Where the only difference between the prior art and the claims would be a recitation of a relative dimension, in this case a distance, and a capsule having the claim relative distance would not perform differently than the prior art capsule the claimed capsule would not be seen as patentably distinct from the prior art capsule (MPEP § 2144.04 IV.A.).

10. Regarding claim 6, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose that it was well established to form a code on a container by a series of discrete dot surfaces ('621, fig. 2h).

11. Regarding claim 7, once it was known to arrange a code on the flange-like rim of the capsule it is not seen that patentability would be predicated by the visibility or lack

thereof of the code by the human eye under natural light absent strong and compelling evidence to the contrary. The substitution of one known machine readable coding ink for another known machine readable coding ink would have been obvious. Nevertheless, Ruchonnet discloses that it was well known and conventional to print the code with an ink which is not visible by the human eye under natural light (bar code registered with invisible ink that reacts to UV light) ('067 translation page 3).

12. Regarding claims 8 – 9, Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson discloses that the code (30) can be printed or embossed by a pattern (geometric shape) which possesses surfaces having different reflective and/or absorbing properties to light (color), wherein the pattern possesses a first surface having inclined (raised) mirroring or absorbing properties to light and a second surface having flat (lowered) mirroring or flat reflective properties to light (code32 can be a geometric shape that may be raised or lowered and may incorporate a color) ('621, fig. 2b and [0029]).

13. Regarding claim 10 Yoakim in view of Boyd as further evidenced by Aker, Ruchonnet, Halliday '333, Halliday'074, Hayes, Mahlich, Evers, and Erlandsson disclose the code would be mechanically embossed on the container (grooves may be incorporated to create a texture) ('621, paragraph [0029] and fig. 2g).

Response to Arguments

14. Applicant's arguments filed 26 April 2016 have been fully and carefully considered but they are not deemed persuasive.

15. Applicants urge that that Boyd does not even present a flange-like rim, that Boyd does not use, disclose, or suggest a code that would be arranged on the bottom of a flange like rim, that Boyd would have to be modified to have a code on the bottom of a flange-like rim, and there is no basis for a rearrangement of parts on the basis of Boyd. These urgings are not found persuasive.

16. First it is not known how the rim in the form of a flange shown by Boyd would not be considered "flange-like" since said rim is unequivocally shown as a flange in figure 2, for example.

17. With respect to Boyd being required to be modified or not using, or even suggesting a code that would be arranged on the bottom of a capsule it is noted that Boyd discloses code arrangements on a flange-like rim that would be readable from either side of the capsule as clearly shown in figures 2f and 2h (paragraph [0029]). Further Boyd is not disclosing that the capsule would be required to be in any particular orientation in order for the code to be read. It is thus seen that the particular orientation required with respect to the code would be a function of the placement of the sensor in a brewing device which would be an obvious matter of choice and/or design. Therefore should the sensor to read a code from the flange-like rim of the capsule of Yoakim in view of Boyd be mounted in the base of a brewing device the code would have to be on the bottom of the flange-like rim of the capsule of Yoakim in view of Boyd.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAIM SMITH whose telephone number is (571)270-7369. The examiner can normally be reached on Monday-Thursday 7:30-5:00.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erik Kashnikow can be reached on 571-270-3475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S./
Chaim Smith
Examiner, Art Unit 1792
06 June 2016

/ERIK KASHNIKOW/
Supervisory Patent Examiner, Art Unit 1792

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Jarisch et al.
Appl. No.:	13/697,297
Conf. No.:	1065
Filed:	November 9, 2012
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Art Unit:	1792
Examiner:	Long, Luana Zhang
Docket No.:	3712036-01693

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.132

Sir or Madam:

The undersigned hereby states as follows:

1. My experience, qualifications, and current employment are as follows:

MS Microtechnical Engineering

R&D Project Manager , Systems Expert at

Nestlé System Technology Centre Orbe

2. I am a named inventor of the above-identified patent application and am therefore familiar with the inventions disclosed therein.

3. I reviewed the Office Action dated June 14, 2016 pending against the above-identified patent application. In addition to considering the pending Office Action, I reviewed the references cited therein as well as the pending claims. I believe that the obviousness rejections are based on a misunderstanding of these references and the pending claims. The basis for my opinion is set forth below.

4. Independent Claim 15 recites a capsule for the preparation of a beverage, the capsule comprising a container configured to house a beverage ingredient, the container comprises a cup-shaped body having a flange-like rim, a lid connected to the cup-shaped body, and a code adapted for being identified or read by an external reader, the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, to be read while the capsule is rotated around an axis of rotation traversing the capsule, wherein the container comprises a circumference, the code comprises successive segments that extend substantially along at least an eighth of the circumference, the cup-shaped body extends from a bottom end of the cup-shaped body to a top end of the cup-shaped body where the cup-shaped body terminates such that a height of the cup-shaped body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the cup-shaped body, and the lid has a height that is less than the height of the cup-shaped body.

5. For at least the reasons set forth below, I respectfully submit that the cited references are deficient with respect to the present claims. Specifically, the cited references alone or in combination fail to disclose or suggest the code is arranged on a bottom of the flange-like rim, which is opposed to the lid, the body extends from a bottom end of the body to a top end of the body where the body terminates such that a height of the body is the distance from the bottom end to the top end, the flange-like rim extends from the top end of the body, and the lid has a height that is less than the height of the body as required by the present claims. Further, the skilled artisan would not have combined the cited references to arrive at the present claims.

6. The Patent Office alleges that to modify *Yoakim* and provide a code on the flange-like rim capable of being identified or read by an external reader as disclosed by *Boyd* to be read while the capsule is rotated around an axis of rotation traversing the capsule would have been obvious matter of choice and/or design to the ordinarily skilled artisan. See Office Action, page 4.

7. I respectfully submit that providing the code on the bottom of the rim of the capsule as required by the present claims is not merely design choice. In this regard, as detailed in the specification, by providing the code on the bottom of the rim of the capsule which is opposed to

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the lid of the capsule, the bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas, so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles); and as a result, the reading is made more reliable. See specification, for example, top of page 4. Therefore, there are attendant advantages of the specifically claimed arrangement of the code on the capsule.

8. However, there is no teaching in the cited references regarding these effects of the code being on the bottom of the capsule rim or anything that would have prompted the skilled artisan to provide the code on the bottom of the rim of the capsule as required by the present claims. Indeed, *Yoakim* does not even teach a code provided on the capsule; *Boyd* at most teaches a code provided on an orbicular gasket of a brewing packet, but the orbicular gasket is not even the claimed flange-like rim; and the other secondary references do not remedy the deficiencies of *Yoakim* alone or in combination with *Boyd* even if combinable. None of the cited references provide any reason or motivation for the skilled artisan to provide the code on the bottom of the capsule rim to arrive at the present claims.

9. Therefore, the skilled artisan would not have modified the cited references to arrive at the present claims.

10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001, Title 18, United States Code, and that willful false statements may jeopardize the validity of this patent and any patent issuing therefrom.



Date: 15.08.2016

Christian Jarisch

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REMARKS

This Response and the enclosed Request for After-Final Consideration (PTO/SB/434) are submitted in reply to the Final Office Action dated June 14, 2016. The Director is authorized to charge any fees that may be required or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-01693 on the account statement.

Claims 1-2, 5-10, and 19 are currently pending, under consideration, and rejected in the Office Action under 35 U.S.C. §103. Claims 14-18 were previously withdrawn from consideration; and Claims 3-4 and 11-13 were previously canceled without prejudice or disclaimer. In response to the Office Action, a Declaration under 37 CFR 1.132 ("*Declaration*") is enclosed. Additionally, Applicants have amended Claim 1 solely for clarification, not to avoid any prior art. The amendments do not add new matter. For at least the reasons set forth below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

In the Office Action, Claims 1-2, 5-10, and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over International Patent Publication No. WO 2008/148601 to Yoakim et al. ("*Yoakim*") in view of U.S. Patent Publication No. 2002/0048621 to Boyd et al. ("*Boyd*") as evidenced by U.S. Patent Publication No. 2010/0078480 to Aker ("*Aker*"), International Patent Publication No. WO 2005/0440067 to Ruchonnet ("*Ruchonnet*"), U.S. Patent No. 6,698,333 to Halliday et al. ("*Halliday '333*"), U.S. Patent No. 7,097,074 to Halliday ("*Halliday '074*"), U.S. Patent No. 7,335,387 to Hayes et al. ("*Hayes*"), U.S. Patent Publication No. 2004/0089158 to Mahlich ("*Mahlich*"), U.S. Patent Publication No. 2008/0148948 to Evers et al. ("*Evers*"), and U.S. Patent Publication No. 2007/0203587 to Erlandsson et al. ("*Erlandsson*"). For at least the reasons set forth below, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

As discussed in the specification, Applicants have recognized that a problem with identifying a capsule in a beverage preparation machine is that the retrieving or reading information from the capsule is not always reliable or convenient. The present claims are directed to an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine. See specification, page 2, lines 23-30.

In this regard, the present claims are directed to a capsule for the preparation of a beverage. The capsule includes a container configured to house a beverage ingredient. The

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