UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NESPRESSO USA, INC.
Petitioner

v.

K-FEE SYSTEM GMBH
Patent Owner

IPR2024-00257

PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 11,548,722

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1002	Prosecution History of U.S. Patent No. 11,548,722	'722 Patent File History
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1006	U.S. Patent Pub. US2013/0064929A1	Jarisch 929
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I. INTRODUCTION

Petitioner requests *inter partes* review and cancellation of claims 1-24 of U.S. Patent 11,548,722 ("the '722 Patent") (EX1001) because the claims recite nothing more than well-known coffee system features combined in ways that would have been obvious to a person of ordinary skill in the art (POSITA).

In 2013, K-fee System GmbH ("K-fee") began filing claims in the U.S. directed to portion capsules with "identifiers" such as gearwheels and machine-readable imprints inside the capsule membrane. EX1050, 29, 173. These claims were rejected by the USPTO, and abandoned by K-fee. *Id.*, 239-250. At that time, K-fee's applications had nothing to do with Nespresso's coffee systems. But in 2014, Nespresso launched the Vertuo System. EX1051. Years later, K-fee began filing continuation applications attempting to reverse-engineer patent coverage over Nespresso's machine and capsule. As a result, K-fee's new claims are untethered from its original priority filings and unpatentable in view of the prior art, including Nespresso's own patent publications.

To distract from the fact that its claim limitations are all found in the prior art, K-fee filed Information Disclosure Statements ("IDSs") with hundreds of prior art references—even those with little relevance. As a result, numerous patents issued that would never have issued had the Examiners utilized the Yoakim reference and its combination with the references cited herein.

K-fee has filed continuation after continuation in an effort to fuel lawsuits against Nespresso. However, the resulting claims repeat the same limitations, and have already received IPR institutions: IPR2022-01574, IPR2023-00502, and IPR2023-00485. In fact, the '722 Patent terminally disclaimed U.S. 11,542,094, which terminally disclaimed the patent being reviewed in IPR2022-01574.

As shown in this Petition and the concurrently filed petitions on U.S. Patents 11,542,094, 11,465,829, 11,465,830, and 11,554,910, K-fee has continued its gamesmanship of seeking patents on anything it can in an attempt to cover Nespresso's products without being held to the limited disclosures of its priority applications. As with the three currently instituted IPRs, K-fee has not fixed its priority and patentability problems, and these patents should never have issued.

Accordingly, all claims are unpatentable over the prior art as presented in Grounds 1-2.

II. TECHNOLOGY BACKGROUND

Coffee extraction has been known for centuries (EX1003, ¶¶53-54), and single-portion coffee offerings began to emerge in the 1960s. *Id.* ¶¶55-56. Single-serve beverage systems by Keurig, Nespresso, and others were widely available by 2010. *Id*. ¶57. The operation and components of these systems are well-known. *Id.* They include a brewing chamber to place the capsule, and piercing needles to allow water injection using a water pump and heater, which extracts beverage into a cup

for drinking. *Id.* ¶¶58-59.

An example from 1979 is shown (right) using an aluminum capsule (10) including a bottom that is pierced by a needle (12) to inject high-pressure hot water, which exits through membrane (8). EX1018, 2:17-31, FIG2; EX1003, ¶60. By 2000, such systems were computer controlled to manipulate sensors and water pumps to optimize the brewing process. EX1019, 2:21-3:11, FIG1, FIG4A; EX1003, ¶¶61-63.

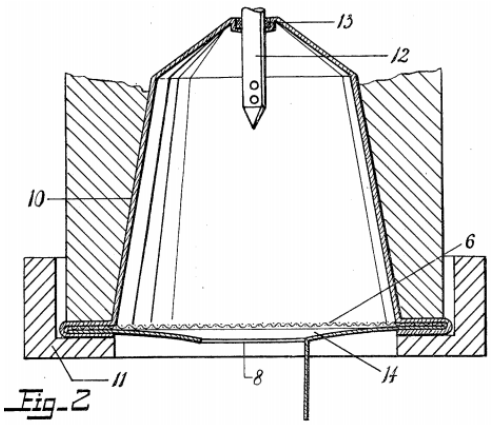


Fig-2

Single-serve capsules must be removed after brewing to allow use of a subsequent capsule. machine features, such as that shown in blue (right), have long been known to position capsules (10) and automatically eject them into waste containers. EX1003, ¶¶64-71; EX1009, [0053]-[0054], FIG7; EX1020, 5:15-31; EX1021, 3:6-8, 24-31, 47-56, 4:39-43; EX1022, [0049]-[0051], FIG8; EX1023, [0042]-[0047], [0008]-[0015], FIG7.

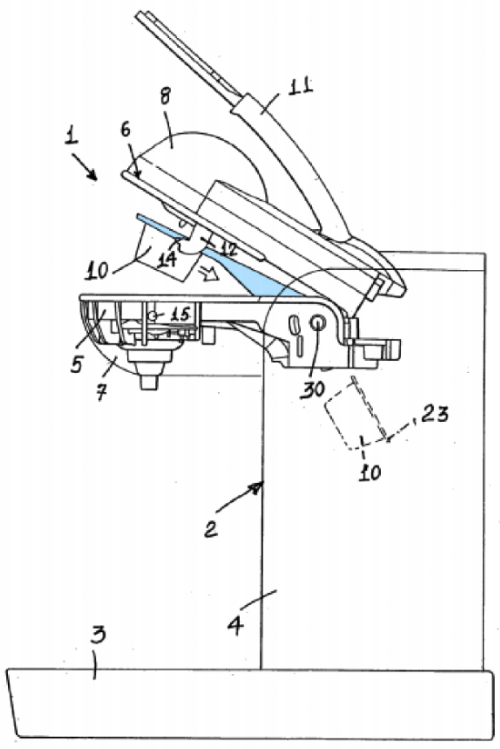


FIG. 7

A. Capsule Components and Manufacturing

Capsule design evolved to allow for different beverage sizes, and to withstand water pressure and temperature, with good barrier properties to protect coffee from

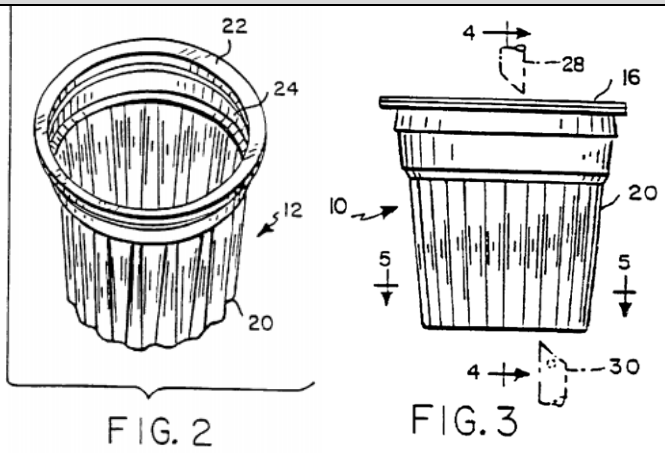
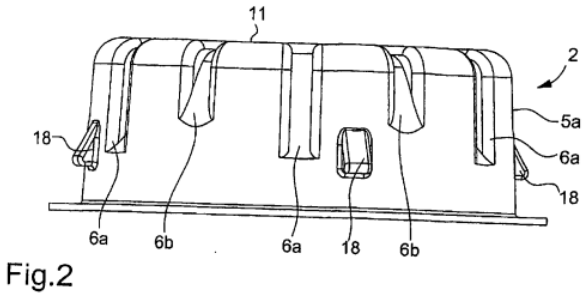
moisture and oxygen. EX1003, ¶¶72-74; EX1018, 1:5-12; EX1015, [0014]-[0015]. Aluminum, manufactured by deep-drawing[1], has long been a common capsule material because of its exceptional barrier properties. EX1003, ¶¶75-76; EX1024, [0005]; EX1025, 1:7-23; EX1044, [0044]-[0045].

POSITAs knew to use barrier layers in coffee packaging to increase freshness and prevent moisture or aroma from escaping. EX1003, ¶83; EX1055, 205; EX1056, 246. To extend shelf life, it was also known to package coffee using inert gasses, such as nitrogen, and to pressurize the contents. EX1003, ¶84; EX1056, 248; EX1055, 208; EX1024, [0005]. Internal pressure also can occur if the coffee outgasses CO2 over time. EX1003, ¶85; EX1056, 249-250. It is known that the capsule's membrane will bow outwardly when the internal pressure is higher than atmospheric pressure. EX1003, ¶¶85-86.

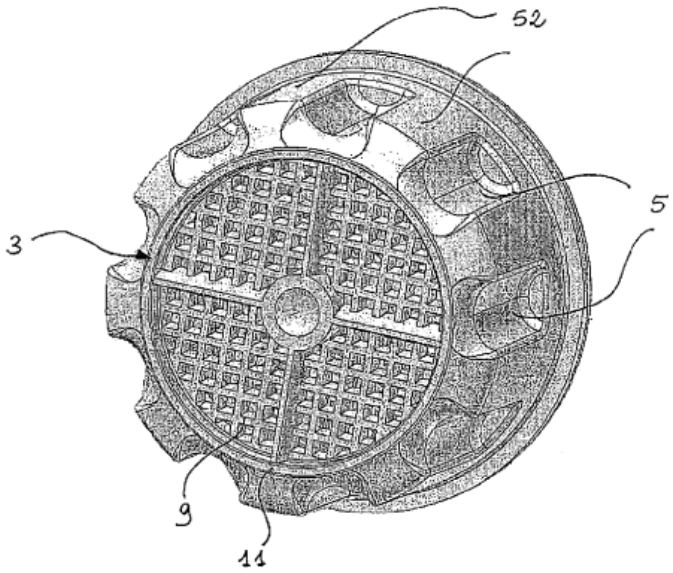
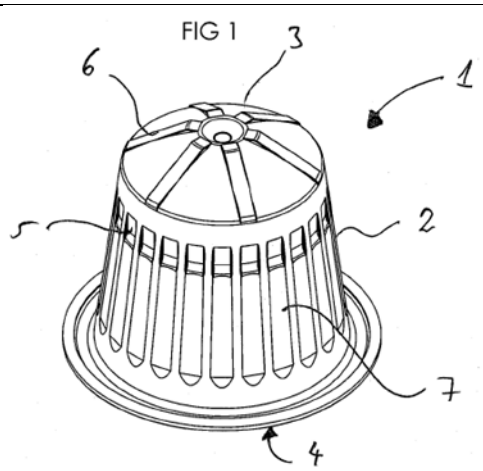
Because capsules endure physical stresses during brewing and handling, it also became common to use grooves and ribs to stiffen the capsule wall. EX1003, ¶¶87-89; EX1030, 1:14-21; EX1031, 1:27-37; EX1032, 5:10-25. Some capsule indentations have been used for purely ornamental purposes. EX1003, ¶87. The

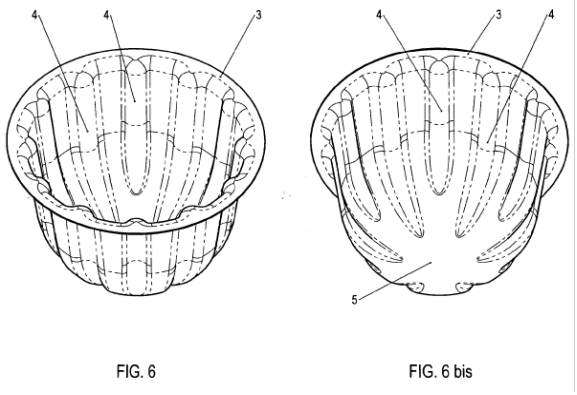
[1] Deep-drawing involves shaping sheets of aluminum with a die. EX1003, ¶¶77-79; EX1026, 323; EX1027; EX1028, [0004]. Thermoforming can be used for plastic. EX1003, ¶¶80-82; EX1029, 383-426.

pervasiveness of such structures is shown below. EX1003, ¶¶90-94.

Date	Capsule	Description
2001		"circumferentially spaced flutes which are strategically positioned to ***enhance resistance to buckling***" EX1033, 2:20-25.[2]
2006		"A first series of ribs 6a plays a part in ***reinforcing the capsule*** 2." EX1011, [0077].

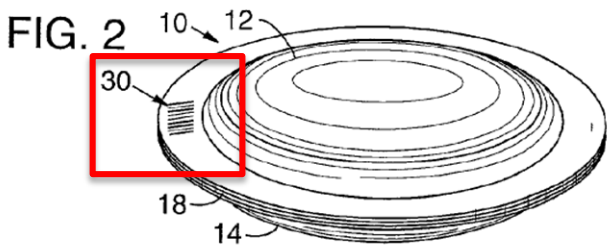
[2] All emphasis in this Petition is added.

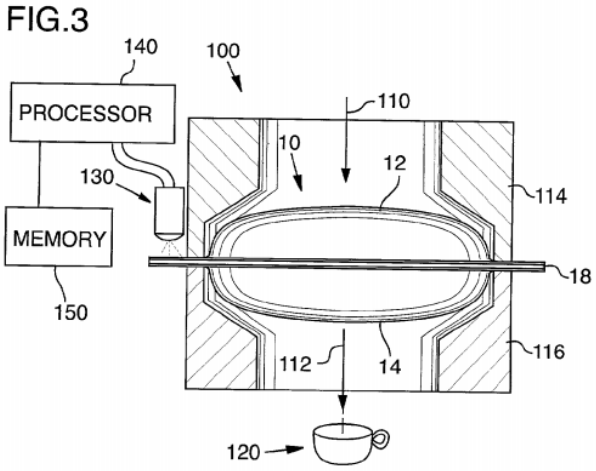
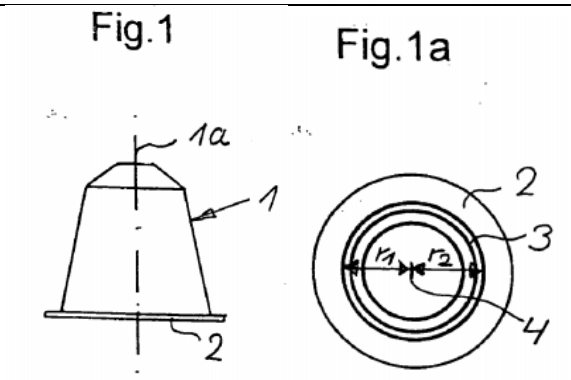
Date	Capsule	Description
2007	 FIG. 2	Indentations on the capsule wall and cavity. EX1034, [0009].
2010		The grooves (7) are "side wall ***stiffening elements***." EX1035, [0027], [0037].

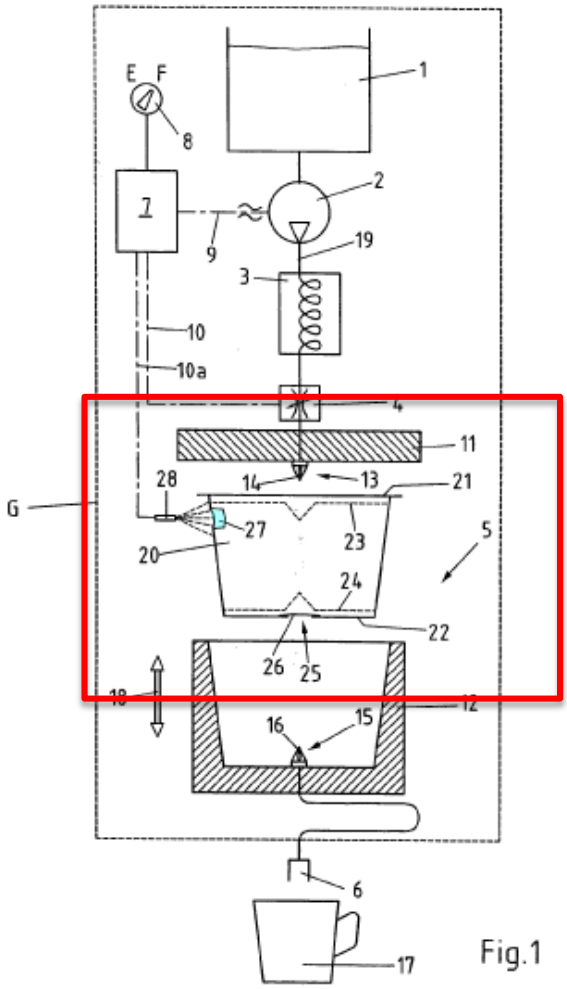
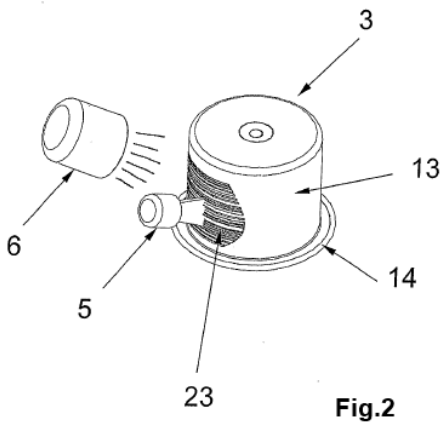
Date	Capsule	Description
2010		"longitudinal ***stiffening ribs***" that "allow[] the ***optimization of the stability*** of the container." EX1008, [0009].

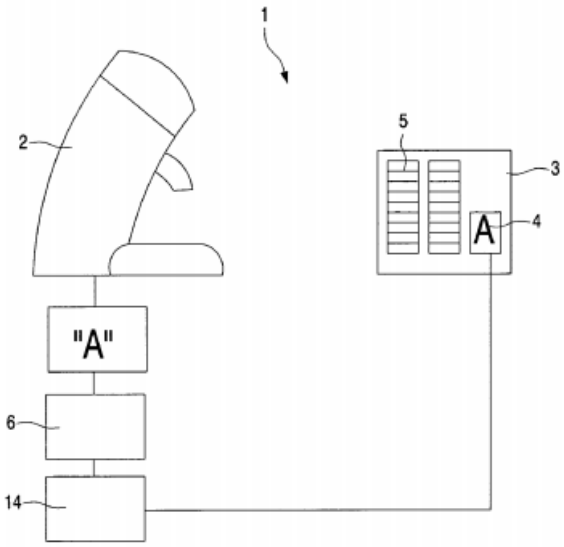
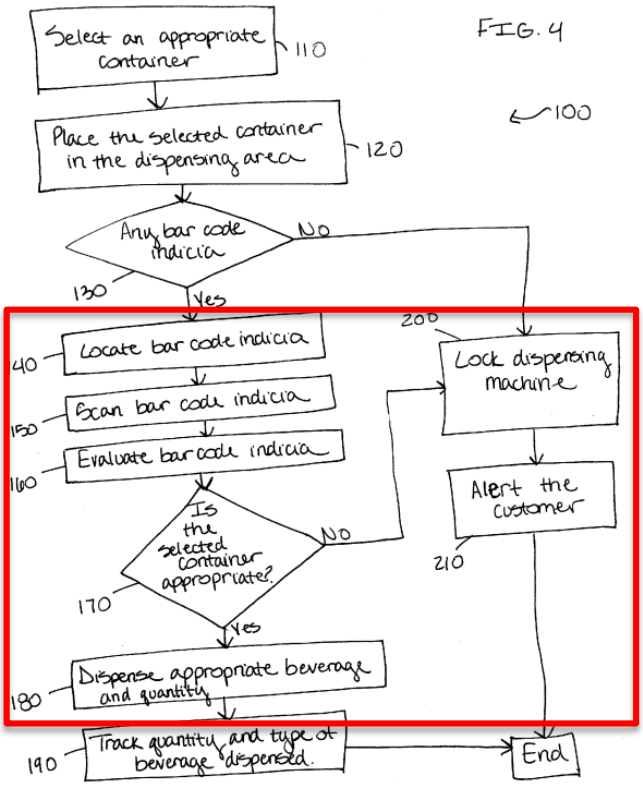
B. Capsule Identification Systems

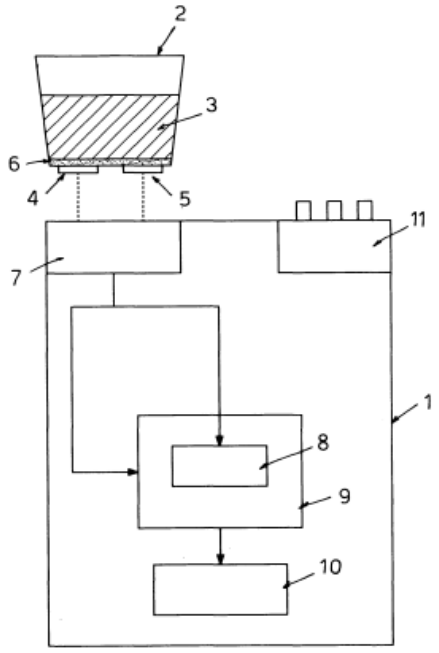
An increase in the number of capsules and brewing systems led to the development of capsule identification methods used to control brewing based on capsule type, or otherwise determine whether a capsule was suitable or safe for a given machine. EX1003, ¶96; EX1015, [0009], [0014]-[0015]. Since the early 1990s, it was known to use optical readers to read identifiers, such as a barcode, off the capsule surface and adjust brewing parameters accordingly. EX1003, ¶¶97-98; EX1036, 4:40-45, 5:1-50, 7:47-8:22. By 2010, using optical codes for capsule identification and machine control was highly developed (*id.* ¶¶99-110):

Date	Capsule/System	Description
2002		Barcode to identify capsule, compare with system memory, and determine "the source of the packet ***so as to prohibit use of counterfeit products***, or packets from unauthorized suppliers."

Date	Capsule/System	Description
		EX1037, [0037]; *see also* [0002], [0005], [0006], [0023]. [0028], [0032], [0033].
2004		Machine identifies capsule based on barcode and ***blocks operation*** if it does not match pre-programmed identifier. EX1024, [0014].

Date	Capsule/System	Description
2005	 Fig.1	Coffee identification system with capsule barcode ***so the system can control extraction parameters, including the water pump***. EX1039, [0019].
2005	 Fig.2	System reads capsule barcode to "determine the origin of the containers used," "encrypt/decrypt, analyze, compare, approve/reject and store information read on [the capsule]" and "***selectively start or not start a cycle of operations***." EX1040, 2:3-19.

Date	Capsule/System	Description
2007	 Fig.1	System stores pre-programmed brewing parameters that are selected based on capsule barcode. EX1038, [0005]-[0006], [0011]-[0012], [0025]-[0028].
2009		System checks coffee barcode and either ***locks machine*** or brews beverage ***based on barcode result***. EX1042, [0054]-[0055].

Date	Capsule/System	Description
2010	 FIG.1	System reads capsule barcodes and "compares the signal from the recognising means for the [barcodes] with pre-stored data in order to allow the machine to ***proceed to activation only if it recognizes the [barcodes]***." EX1041, 9.

POSITAs also understood how to position optical identifiers on capsules to ensure alignment with the reader and avoid code obstruction during reading. *Id*. ¶¶111-112.

POSITAs knew that repeating an optical identifier around the rim's perimeter could increase the chances of a successful read. In 2002, Boyd disclosed using an identifier that "***may span its entire perimeter in . . . repetitive fashion***." EX1003, ¶114; EX1037, [0029]. In 2008, Aker disclosed a capsule identifier "repetitively positioned" on the rim's perimeter (below). EX1003, ¶113; EX1043, [0017], [0006].

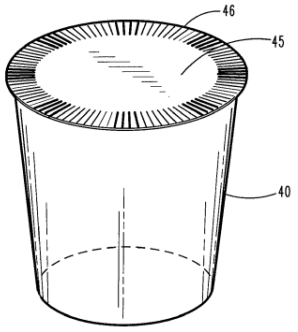


FIG. 2A

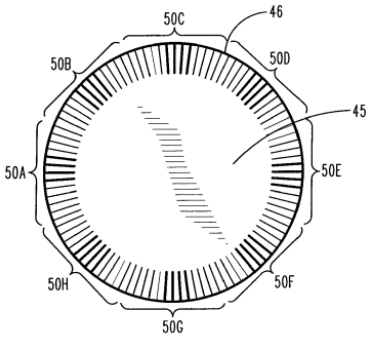


FIG. 2B

Aker identified the benefit to repetition because an optical reader "can read the information coded . . . even if the orientation of the product body is not fixed." EX1043, [0022]. Jarisch 929 also disclosed repeating an optical code on the bottom of the capsule flange, "in order to ensure reliable reading" because "the same sequence can be detected or read more than one time" during capsule rotation. EX1003, ¶115; EX1006, [0068].

POSITAs further understood that positioning an optical identifier away from the liquid inlet and outlet would increase readability of the code by shielding it from liquid and loose coffee grinds. EX1003, ¶116. For example, Panesar disclosed the benefits of positioning the barcode away from the liquid injection areas to avoid soiling or tearing the barcode. EX1003, ¶117; EX1010, 2:29-3:12, 19:22-20:13.

It was also known that positioning the code on the underside of the rim provided the advantage of increasing the readability of the code in the system. For example, Jarisch and Jarisch 929 disclosed a capsule with an optical code located on the underside of the flange—away from the membrane and injection site—to avoid

soiling during the extraction process and thus improve the reliability of code reading. EX1003, ¶¶118-121; EX1005, [0014], [0022]; EX1006, [0017]-[0018].

III. '722 PATENT

A. Overview

The '722 Patent is related to, and possesses highly-similar disclosure as the '491, '430, and '923 Patents.[3] IPR2022-01574, Paper 12, at 3-5 (PTAB Apr. 14, 2023); IPR2023-00485, Paper 9, 3-6 (PTAB Sept. 13, 2023); IPR2023-00502, Paper 9, at 3-6 (PTAB Sept. 13, 2023). Each discloses a single-serve beverage system that can identify a capsule to determine whether it is suitable for use with the machine. EX1001, 1:14-16; 1:26-34; 3:31-38; EX1003, ¶¶122-123. The '722 Patent notes a problem that certain capsules may end up being used in a different manufacturer's brewing system, even though the capsule is not designed for that system. EX1003, ¶123; EX1001, 1:26-29. The disclosed solution is a portion capsule that is only suitable for a specific coffee machine by providing an "identifier" on the capsule—allowing the system to determine whether or not a capsule is suitable for use with the machine. EX1003, ¶124; EX 1001, 1:32-34. 1:38-44; 2:3-8.

The capsule comprises a base element and cavity that contains raw beverage

[3] The '722 Patent terminally disclaims the '094 Patent, which terminally disclaims the '491 Patent. EX1002, 476.

material, *e.g.*, ground coffee, and a lid that seals. EX1001, 1:21-29, 6:36-41; EX1003, ¶122. Grooves reinforce the capsule wall. EX1001, 4:36-39, 12:18-21; 1003, ¶127.

The specification describes sensors/detectors to (i) recognize an "identifier" (*e.g.*, a barcode, recesses and bulges, electrically conductive sections, etc.), and (ii) impact whether and how the machine operates. EX1001, 2:19-24, 2:37-42, 2:57-60, 3:12-17, 3:18-22, 3:31-38, 8:55-56, 9:2-6, 9:27-33; EX1003, ¶¶124-125.

FIG2 discloses a capsule with a barcode (50) on the top surface of the capsule flange (17). Although it states that "the barcode alternatively can be attached to the base element's edge region being averted from the membrane," it does not provide reason to do so, especially in view of the location of detection (13) in FIG2B. EX1001, 8:62-64; EX1003, ¶126.

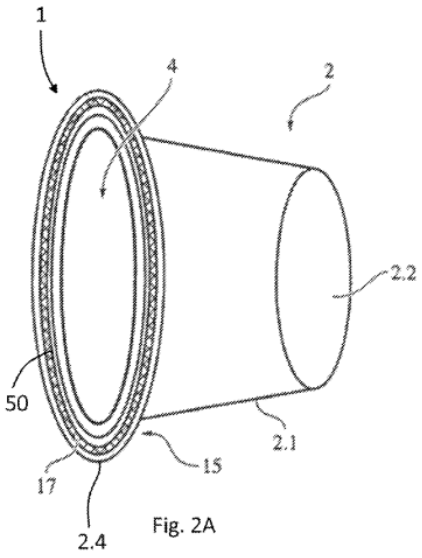


Fig. 2A

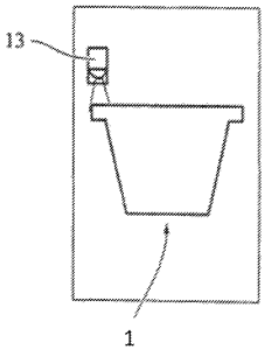


Fig. 2B

B. Prosecution History

U.S. Application 17/844,372 (the "'372 application") was filed June 20, 2022. It claims priority to numerous continuations and divisionals, and to PCT/EP2011/003677, filed July 22, 2011, which improperly claims priority to three foreign applications (Section VII.F). EX1001; EX1003, ¶¶129-130. The '372

application was originally filed with nine claims directed to a capsule with a barcode provided on the peripheral region of the basic element directed away from the membrane. EX1002, 27; EX1003, ¶131. The Applicant canceled claims 1-9 and added new claims 10-29, which include limitations highly-similar to the'491 claims. EX1002, 81-88; EX1003, ¶131; IPR2022-01574, Paper 12, 5-6.

In the first/only Office Action, the Examiner issued a Non-Final Rejection based on nonstatutory double patenting based on co-pending Appl. No. 17/547,363 (the "'363 Application"). EX1002, 187-202; EX1003, ¶¶132-133. In response, Applicant made minimal claim amendments, added new claims 30-33, and filed a Terminal Disclaimer over the '363 Application (which ultimately issued as the '094 Patent). EX1002, 465-479; EX1003, ¶135 The Examiner subsequently issued Reasons for Allowance. EX1002, 483-491; EX1003, ¶135.

Applicant filed an additional IDS, including a self-serving description of the '491 Patent IPR and associated priority and prior art issues, and a Corrected Notice of Allowance followed. EX1002, 572-583;EX1003, ¶¶136-137. ***Critically, the Examiner never received the Institution Decisions of the '491, '430, and '923 Patent IPRs, which post-date Issuance, and discredit K-fee's priority arguments and credits the Petition's reference combinations.***

IV. POSITA

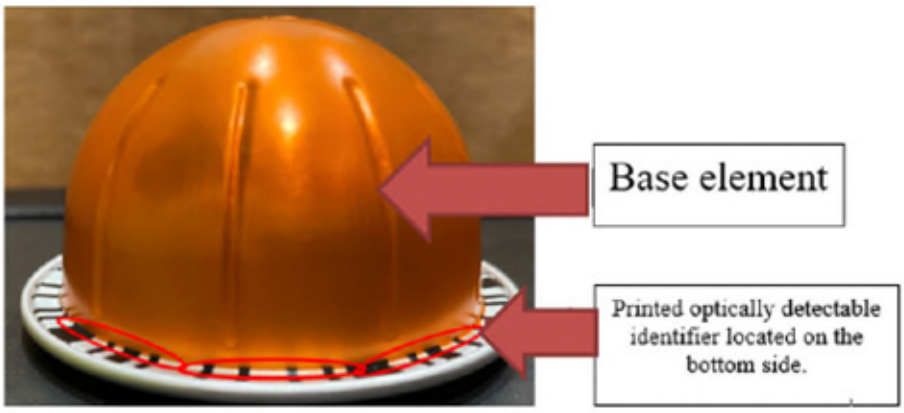
A POSITA, for purposes of this Petition only: a bachelor's degree in

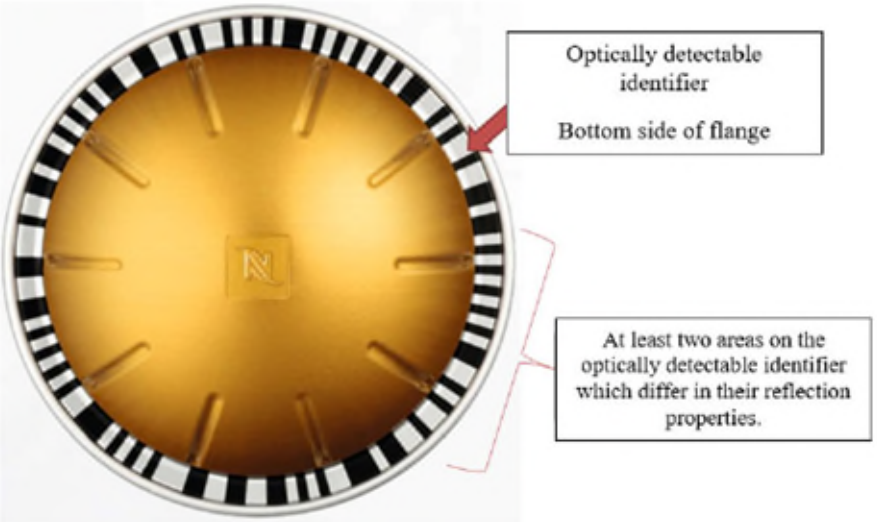
engineering plus five years of experience in design of mechanical beverage systems, or similar products, and experience with sensors for recognizing an identifier. EX1003, ¶40. IPR2022-01574, Paper 12, 15.

V. CLAIM CONSTRUCTION

Petitioner herein applies, for purposes of this Petition, the apparent interpretations that K-fee offered in its infringement contentions (EX1049). *Dish Network L.L.C. v. TQ Delta LLC*, IPR2016-01470, Paper 14, 6-7 (Feb. 9, 2017).

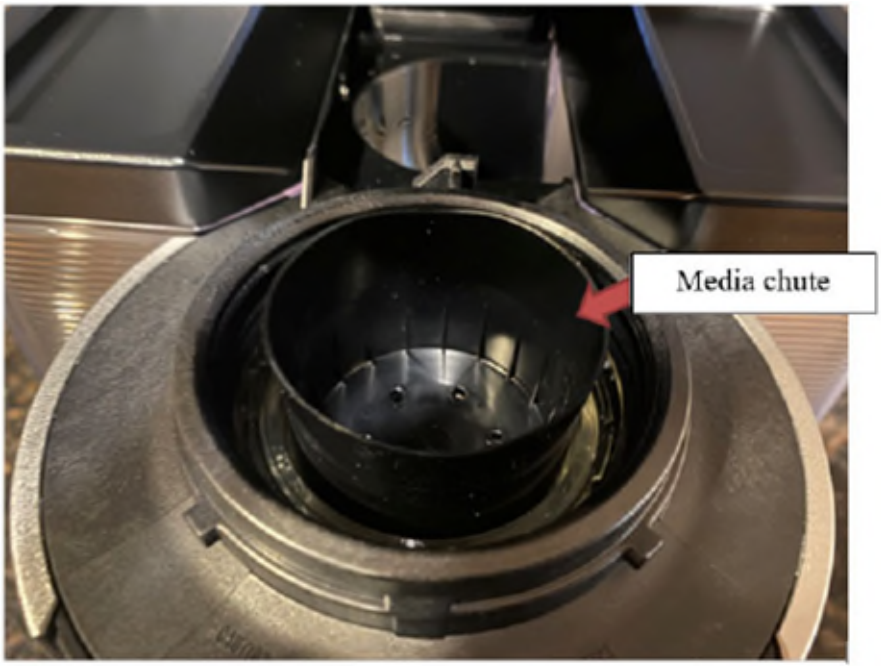
For example, K-fee asserts that the below is a portion capsule with "a printed optically detectable identifier located on the bottom side":





EX1049, 340-341.

For the limitation "a media chute configured to receive and support the portion capsule," K-fee asserts that the limitation can be met by the following:

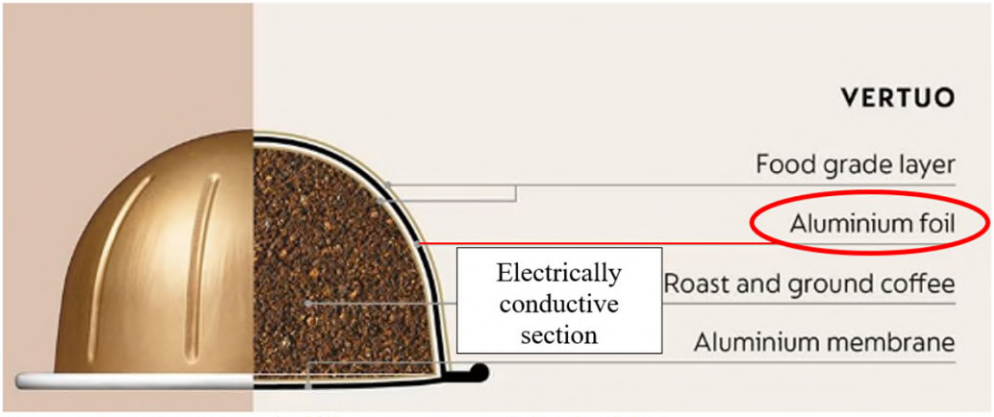


EX1049, 351.

For the limitation "the base element has a wall region with an electrically

conductive section," K-fee asserts that the following meets the limitation:

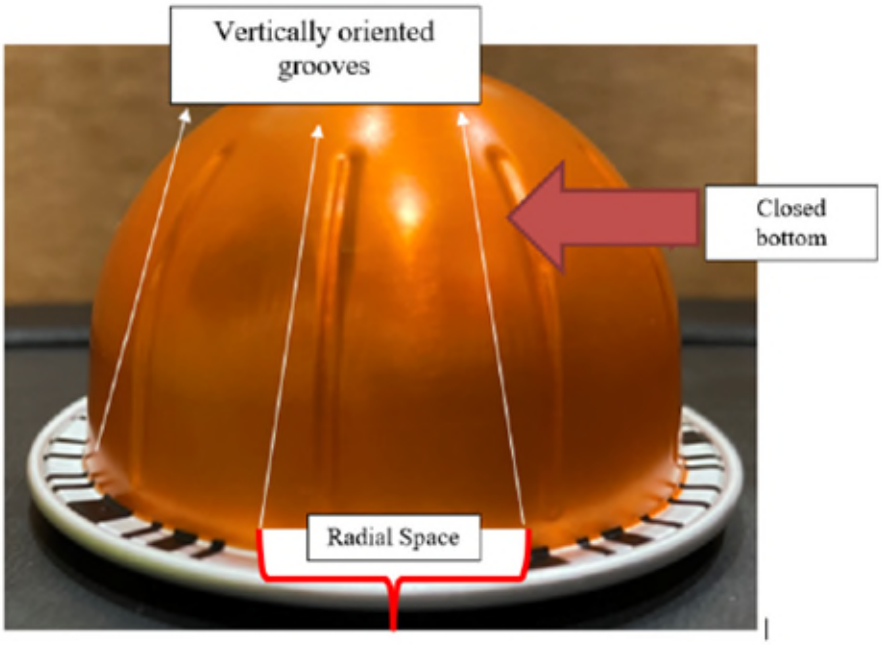
The below annotated image illustrates the Accused Product's infringement of this limitation.

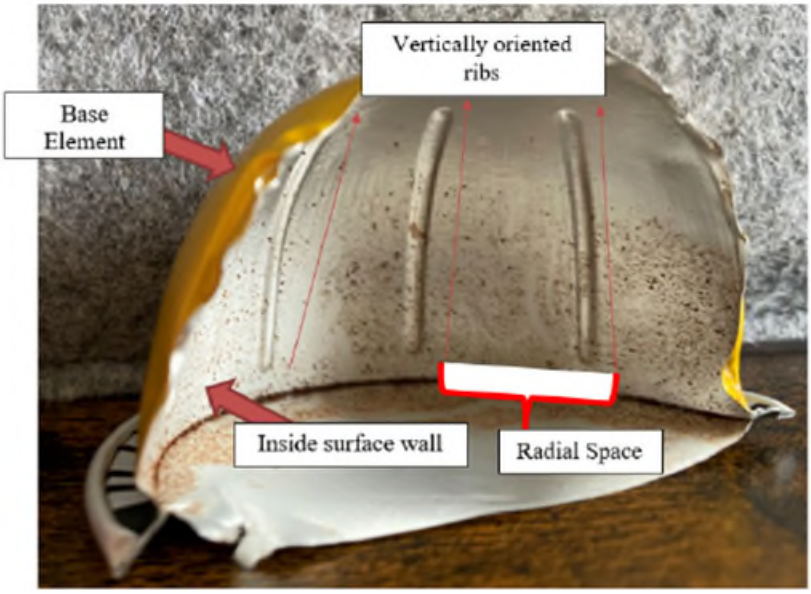


See, e.g., https://www.sustainability.nespresso.com/why-aluminium

EX1049, 358-359.

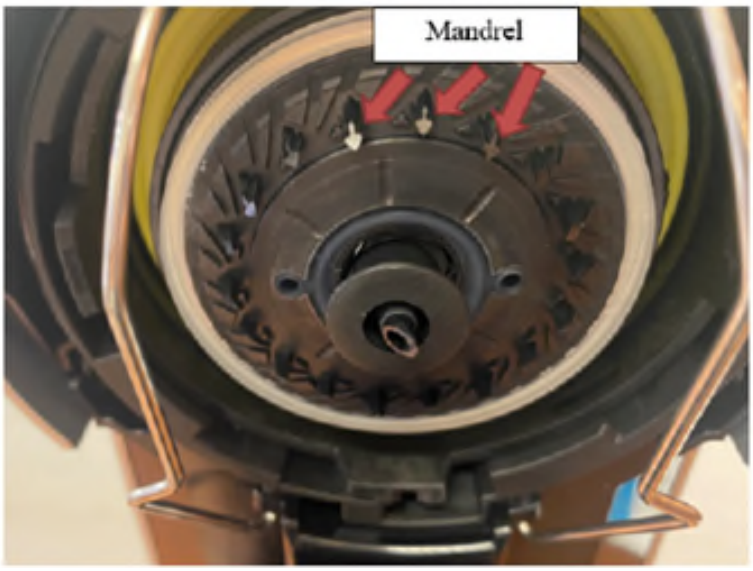
K-Fee asserts that the below product in the shape of a continuous dome is a "portion capsule" including a "base element" that has a "wall region" (as distinct from a "bottom region") with "radial spaced and vertically oriented grooves" and a cavity that has "radially spaced and vertically oriented drawn ribs":

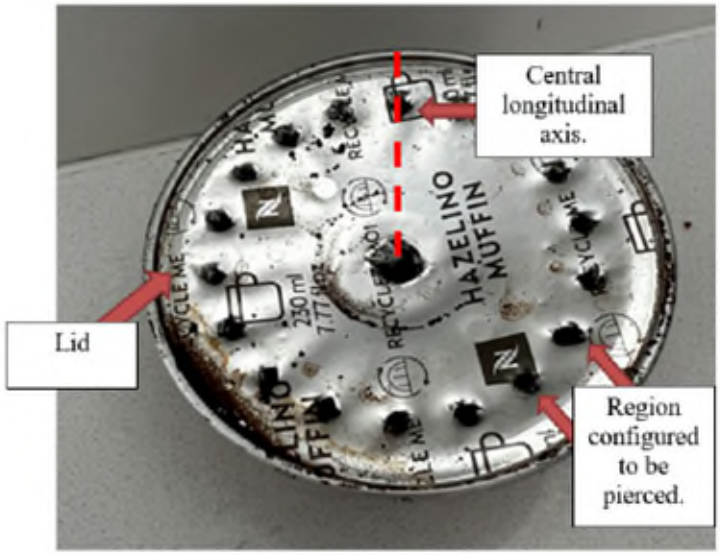




EX1049, 360-361.

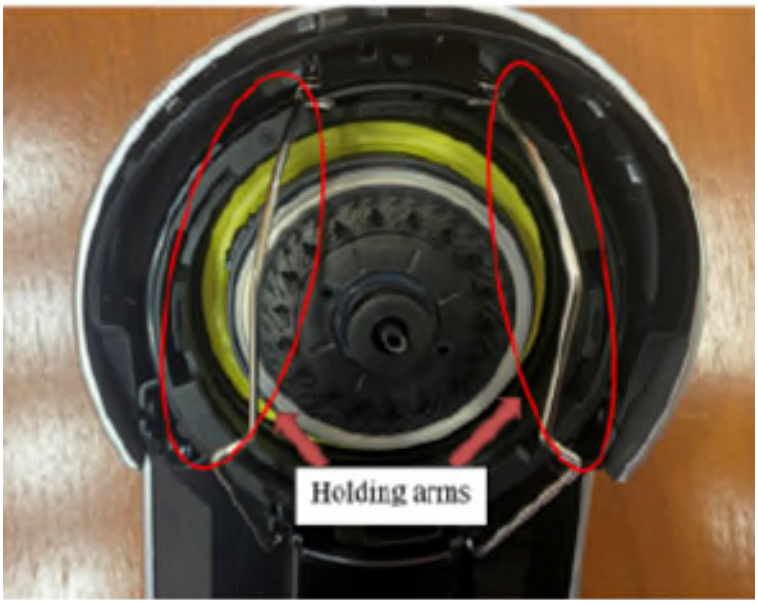
For the limitation "mandrel," K-fee asserts that the term includes a brewing system with needles that pierce the outer perimeter of the capsule to allow liquid to exit the capsule.





EX1049, 368-369.

For "holding arms for engaging the portion capsule," K-fee asserts that the limitation can be met by the following:



EX1049, 363.

In district court, Nespresso proposed that "identifier" be construed as "a feature that individualizes the portion capsule" and "individualize" be construed as "to determine whether the portion capsule is suitable for use with the beverage machine such that the use of unsuitable capsules is prevented." K-fee proposed "plain and ordinary meaning." As explained below, the prior art discloses and/or renders obvious this limitation under either construction.

Petitioner submits that, for this proceeding, no claim terms require formal construction. EX1003, ¶¶147-150. Prior construction of related patents does not impact claim construction here. EX1052.

VI. GROUNDS

Ground	Claims	Basis
1	1, 4-24	35 U.S.C. §103 over US2010/0239734 (Yoakim) in view of US2013/0064929 (Jarisch 929) in view of US2012/0269933 (Rapparini) in view of WO2010/099806 (Rossi).
2	2-3	Ground 1 in further view of US2008/0105131 (Castellani).

VII. PRIOR ART

A. Yoakim

Yoakim (filed May 7, 2010) is prior art at least under pre-AIA 35 U.S.C. §102(e). EX1003, ¶190. Yoakim discloses a centrifugal beverage system with a single-serve capsule, brewing device, and method for preparing a liquid beverage, *e.g.*, coffee. EX1004, [0014]; EX1003, ¶191. The brewing device includes a water heater, pump, barcode reader, and control unit. EX1004, [0180], [0182]; EX1003, ¶¶191-193. Yoakim's capsule has a flange sealed with a membrane lid, and includes a barrier layer that prevents moisture or aroma from escaping. EX1004, [0014], [0121], [0128]-[0129], [0197], [0414]; EX1003, ¶193. The device pierces the membrane, allowing for capsule rotation, injection of water, and a path for coffee to exit the capsule. EX1004, [0186]; EX1003, ¶192.

Yoakim's invention improves control of brewing parameters to provide a high-quality, customized beverage brewing experience. EX1004, [0010]-[0011]; EX1003, ¶194. Yoakim achieved this through a capsule recognition system that uses

an identifier to automatically adjust various brewing parameters, including rotational speed and liquid volume. EX1004, [0192], [0477]; EX1003, ¶194. Brewing parameters are recognized through association with an identification means, which can include an optical code read by a reader. EX1004, [0496], [0525], FIG61-62; EX1003, ¶194.

B. Jarisch 929

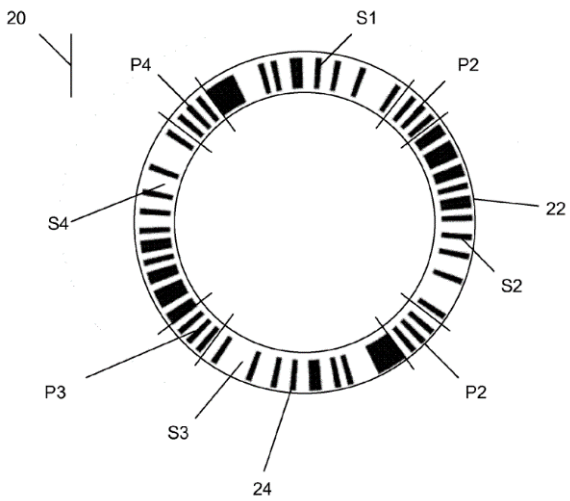
Jarisch 929 (filed May 12, 2011) is prior art under at least pre-AIA 35 U.S.C. §102(e) to Patent Owner's PCT filing date, which is the earliest date the '722 Patent claims are possibly entitled to (*see* Section VII.F). EX1003, ¶195. Jarisch 929 discloses improved optical code positioning, in order to improve readability and retrieval of information. EX1006, [0001], [0003], [0012], [0068]; EX1003, ¶196. Jarisch 929 further discloses using identification to recognize the capsule ***type***. *Id.*, [0022]-[0023]; EX1003, ¶196.

Jarisch 929 discloses that its invention may be used in a centrifugal brewing system, such as Denisart (EX1007), which includes many similar features to Yoakim, including system control based on reading the capsule's code. EX1006, [0047]-[0048]; EX1007, 2:19-22; EX1003, ¶196.

Jarisch 929 discloses clear advantages of positioning the optical code on the bottom of the capsule flange to provide an advantageous location that "offer[s] both a large area for the symbols to be disposed and is less prone to damages," thus

improving "the amount of coded information and the reliability of the readings." EX1006, [0017]-[0019], [0011], [0014], [0069], [0090], FIG4; EX1003, ¶¶197-198.

Jarisch 929 further discloses advantages to repeating the optical code around the circumference of the bottom of the flange (FIG2, right). *Id.*, [0068], FIG2; EX1003, ¶199.



C. Rossi

Rossi (filed March 6, 2009) is prior art under at least pre-AIA 35 U.S.C. § 102(e). Rossi is directed to an edible-product making machine that uses single-use load elements (or capsules) containing water-soluble substances like coffee. EX1041, 3. The capsule is placed inside the machine, pierced to allow water to enter, and the contents are brewed to create the beverage. *Id.* The brewing parameters, such as the amount of water, temperature, pressure, and time required, vary based on the desired product. *Id.*, 3-4; EX1003, ¶200.

Rossi explains that the user must know the capsule details in order to produce a quality beverage, and prevent "potentially selecting the wrong operating conditions for the desired quality of product, or even producing the wrong product." EX1041, 4; EX1003, ¶201. Rossi acknowledges that "[u]se of an incorrect load element may

cause the machine to malfunction and can prejudice the safety and integrity of the machine and [] may harm the user." EX1041, 5.

Rossi proposes to solve this problem by "providing a safe and simple system and process" for ensuring the capsule used is suitable for the system. *Id.*, 5. Rossi discloses a multi-step process that includes (i) recognizing a code on the capsule, and (ii) validating the capsule. *Id.*, 11-12. This is typically accomplished through barcodes or other optical codes on the capsule. *Id.*, 11. The machine will not begin the brewing process unless the capsule identifier is both recognized and validated. *Id.*, 8; EX1003, ¶202.

D. Rapparini

Rapparini (filed October 19, 2010) is prior art under pre-AIA 35 U.S.C. §102(e) to K-fee's PCT filing date. Rapparini discloses a portion capsule that holds substances for preparing beverages, *e.g.*, coffee. EX1008, [0007]-[0008]; EX1003, ¶203. Rapparini's capsule (right) comprises an annular rim (3) and a cup-shaped body with a series of longitudinal stiffening ribs (4). EX1008, [0009]-[0011]; EX1003, ¶204.

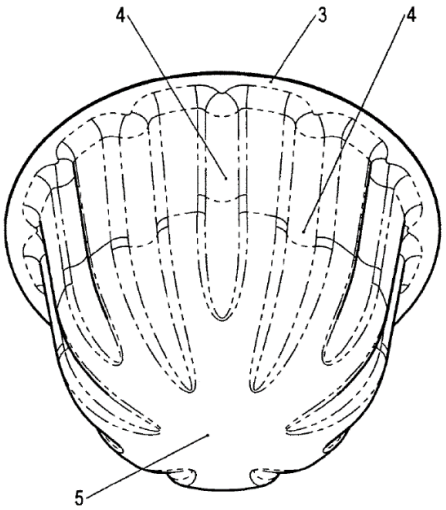


FIG. 6 bis

Rapparini improves upon existing containers by including longitudinal grooves and ribs along the inner and outer surface of the capsule body, which provide

stability and rigidity. EX1008, [0009]-[0011], FIG6, FIGbis; EX1003, ¶204. Rapparini discloses that its invention is applicable to containers made of several kinds of materials, and varying shapes. EX1008, [0067]. Rapparini further discloses that the containers can be employed in domestic automatic espresso machines. EX1003, ¶¶205-206.

E. Castellani

Castellani (published May 8, 2008) is prior art under pre-AIA 35 U.S.C. §102(b). Castellani is directed to a delivery head used in a single-serve coffee brewing machine. EX1009, [0001]-[002]. Castellani improves upon existing systems by including ejecting fork elements (blue) to accurately and safely lift and remove used capsules into a dropping box. EX1009, [0010], [0054], FIG7; EX1003, ¶207.

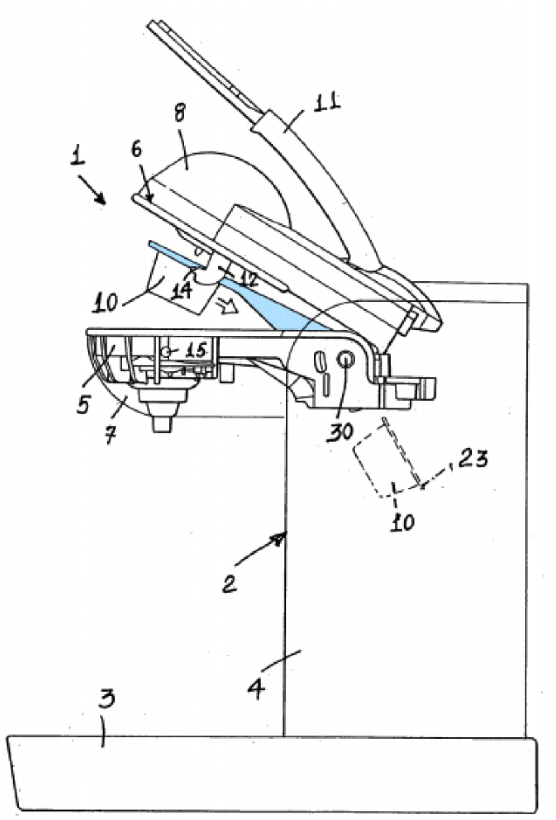


FIG. 7

F. K-fee's Foreign Priority Documents Do Not Support the Claims

The earliest possible priority date for the '722 Patent is the date of its PCT

application filed on July 22, 2011—not its foreign applications.[4] The '722 Patent incorrectly claims priority to three foreign applications:

Application	**Filed**	**Focus**
102011010534.4 (EX1045)	2/7/2011	Mechanical improvements to the capsule/cavity wall
102010031988.0 (EX1046)	7/22/2010	Identifiers/preventing unauthorized use
102010044251.8 (EX1047)	9/2/2010	Identifiers/preventing unauthorized use

No single foreign application discloses each and every feature of the '722 Patent claims—in particular, a portion capsule with radially spaced and vertically oriented drawn grooves and ribs, combined with an optically detectable identifier located on the bottom side of the capsule flange, which is required by every claim of the '722 Patent. EX1003, ¶¶151-153. Because K-fee cannot combine multiple discrete applications for written description support, it cannot establish priority from any of those applications. *Studiengesellschaft Kohle MBH v. Shell Oil Co.*, 112 F.3d 1561, 1562 (Fed. Cir. 1997).

[4] Petitioner does not concede that the July 22, 2011 PCT or any later continuations provide written description support for the claims, and reserves all rights to challenge such support.

The February 2011 Application is the only priority application purportedly disclosing vertical grooves and ribs on the exterior and interior of the capsule body wall, but does not disclose an optically detectable identifier on the bottom side of the flange. Nor does it disclose the claimed electrically conductive section, holding arms, barrier layer, or groove and seal configuration. *See generally* EX1045; EX1003, ¶¶155-156. The figure below disclosing purported grooves and ribs is not found in any other claimed foreign priority document:

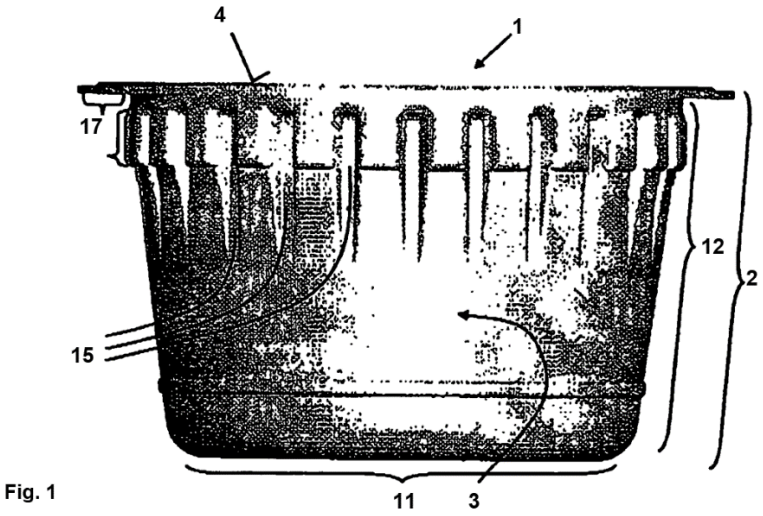


Fig. 1

EX1045

The July Application, by contrast, at best only discloses a barcode located on the capsule flange, but does not disclose a capsule with (i) a base element with radially spaced and vertically oriented drawn grooves, (ii) a cavity with radially spaced or vertically oriented drawn ribs, or (iii) an optically detectable identifier including a repeat pattern located on the bottom side of the flange. EX1046, 28:16-29; EX1003 ¶¶157-158. No disclosure satisfies the requirement of radially spaced

and vertically drawn grooves and ribs as claimed. EX1001, 13:54-56; EX1003, ¶¶159-162. The July Application also fails to disclose many other claim elements. EX1003, ¶163.

The September Application only at best discloses a barcode located on the capsule flange and does not disclose a capsule with (i) radially spaced and vertically oriented grooves, or (ii) a cavity with radially spaced or vertically oriented drawn ribs. EX1003, ¶¶164-165; EX1047, *generally*. It instead discloses gear-like capsule rims located on the outer circumference of the flange of the capsule (2.4.2), which are not vertical grooves or ribs on the capsule body or cavity. EX1001, 12:14-18; EX1003, ¶¶166-168; EX1047, FIG16-18.

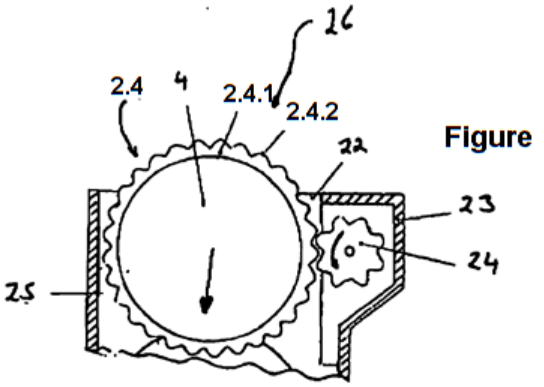


Figure 18

K-fee cannot demonstrate that the ’722 Patent has priority to any earlier-filed applications for claims 1-24 because all claims require: (i) “a printed optically detectable identifier located on the bottom side” of the flange, (ii) a base element with “radially spaced and vertically oriented drawn grooves,” and (iii) a cavity with

"radially spaced and vertically oriented drawn ribs." EX1003, ¶169. Because none of the three foreign applications disclose any embodiments satisfying each and every claim limitation of the '722 Patent, it is not entitled to any foreign priority date. EX1003, ¶170. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008).

Claims 13 and 16 also lack priority because no application discloses an optically detectable identifier located both on the bottom of the flange and on the capsule side wall. EX1003, ¶171.

Claims 14-16 and 20 further lack priority because no application discloses an optically detectable identifier on the bottom of the flange that includes a repeat pattern. *Id.* Other than a passing reference to "repeat pattern," the September Application never discloses any embodiment utilizing an optically detectable identifier including a repeat pattern on the bottom side of the flange. EX1047, 33:6-7; EX1003, ¶¶172-174. It never discloses repeating a barcode, and refers to a "repeat pattern" as distinct from a "barcode." EX1047, 33:6-7 ("The print is preferably a barcode, a logo, ***or*** a repeat pattern."); EX1003, ¶172. FIGS16-18 also do not disclose this limitation. IPR2022-01574, Paper 12, 24-25. Element 2.4.2 of FIG16-18 is a "toothed ring," which is not a printed optically detectable repeat pattern. EX1047, 33:1-7; EX1003, ¶173. As an initial matter, Element 2.4.2 ***is not printed***, but in any event it is also located on the *outer circumference* of the capsule flange,

not the bottom surface. EX1047, 41:22-27, 35:8-11; EX1003, ¶¶173-174.

a) No Disclosure of the Claimed Invention

In addition to lacking all claim elements in any given priority filing, the September Application further fails to disclose the invention as claimed in the '722 Patent. *Hyatt v. Dudas*, 492 F.3d 1365, 1371 (Fed. Cir. 2007) ("[I]t is not enough that applicant show where each claimed element resides in the earliest filed application but [he] must also provide support for the *linkage of the claimed elements creating the embodiment*"). "The written description requirement is not met when, as here, the specification provides at best disparate disclosures that an artisan might have been able to combine in order to make the claimed invention." *Flash-Control LLC v. Intel Corp.*, 2021 WL 2944592, at *4 (Fed. Cir. 2021).

The September Application discloses several distinct embodiments of an identifier, yet fails to disclose the '722 claimed invention. EX1003, ¶175. For example, FIG1 discloses a capsule with an identifier made of several raised areas 8, with which it can be determined if the capsule is suitable for use with the machine. EX1047, 37:27-30, 37:14-19. However, this embodiment (shown below), does not disclose at least the claimed holding arms, a printed optically detectable identifier located on the bottom side of the flange, a base element with radially spaced and vertically oriented drawn grooves or ribs, or the claimed groove and seal configuration. EX1003, ¶176.

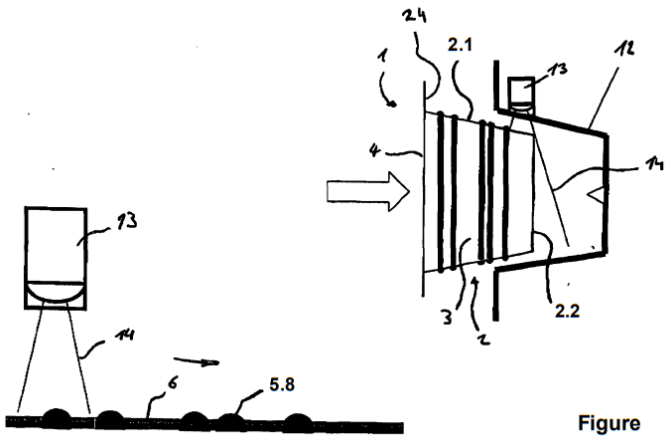


Figure 1

The text describing FIG1 further explains how the identifier would be used to influence machine operation, and clarifies this "applies to all other examples," but does not indicate that multiple distinct identifier embodiments would be combined with one another (let alone in any specific combinations). EX1047, 37:37-38:10; EX1003, ¶177.

FIG2 discloses an alternative embodiment of a capsule with a *barcode* that is read from above, or alternatively, "on the edge area of the base element facing away from the membrane." EX1047, 9:11-27. However, this embodiment also fails to disclose the limitations identified above.[5] EX1003, ¶178.

[5] The same is true for FIGS3-15, which disclose additional distinct embodiments lacking the same limitations identified above. EX1047, 38:29-41:11; EX1003, ¶179.

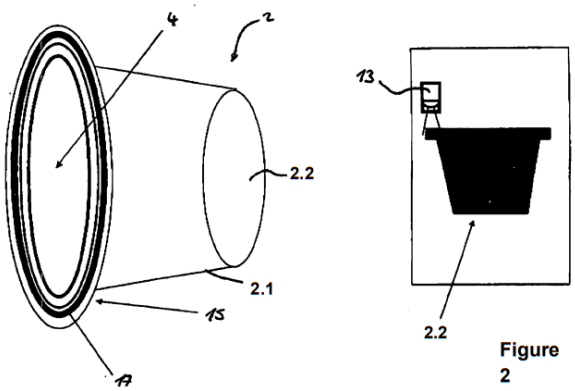


Figure 2

FIGS16-17 and the text describe another distinct embodiment of a capsule that is designed with a "toothed ring" around the "outer region" of the flange. EX1047, 41:22-31; EX1003, ¶¶180-181; EX1047, 41:22-27, 35:9-11, FIG18 (flange's outer edge interacts with pinion 24). In only this embodiment, the specification explains "[i]nside this gear rim, a sealing surface 2.4.1 is preferably provided in the edge region 2.4, which cooperates sealingly with a seal 21." *Id*. The specification further explains that if this feature was not present the capsule could not be inserted into the brewing chamber but "would drop through into a waste container." EX1047, 41:36-42:15; EX1003, ¶¶180-181. The "toothed ring" element 2.4.2 is a "form-fitting and/or friction-fitting means and/or a detection means 2.4.2." EX1047, 41:22-28. It is not a generic identifier (or a repeat pattern), nor is it printed, nor is it located on the bottom side of the flange. EX1003, ¶182. There is also no language that ties the disclosure referencing FIGS16-18 to any other Figure or embodiment, EX1047's specification uses different numbers to indicate different identifiers (*see* p. 44), and

EX1047 never explains how a barcode, repeat pattern, or printed optical identifier could replace means 2.4.2 and still retain the capsule within the device or allow the capsule to enter the insertion shaft. EX1003, ¶183; IPR2023-00485, Paper 9, 13 (PTAB Sept. 13, 2023).

Accordingly, the specification lacks any disclosure linking together the disparate features across these embodiments, particularly (i) a printed optically detectable identifier, (ii) such optically detectable identifier located on the bottom of the flange (and also on the side wall of the base element) and including a repeat pattern, (iv) holding arms, (v) the groove and seal configurations associated with the toothed ring embodiment, as well as (vi) a base element with radially spaced and vertically oriented drawn grooves, and (vii) a cavity with radially spaced and vertically oriented drawn ribs. EX1003, ¶¶184-185. "Taking each claim—as we must—as an integrated whole rather than as a collection of independent limitations, one searches the [September Application] in vain for the disclosure of even a single species that falls within the claims or for any "blaze marks" that would lead an ordinarily skilled investigator toward such a species among a slew of competing possibilities." *Novozymes A/S v. DuPont Nutrition Biosciences APS*, 723 F.3d 1336, 1349 (Fed. Cir. 2013).

Moreover, the boilerplate statements in the September Application do not demonstrate to a POSITA that the Applicant had possession of the '722 claimed

invention, as it fails to link any of the claimed features together. *D-Three Enterprises, LLC v. SunModo Corp.*, 890 F.3d 1042, 1051 (Fed. Cir. 2018).

Nor do the multiple-dependent claims at the end of September Application provide written description support, or provide any "blaze marks" such that a POSITA would arrive at the '722 claims. Those claims are only directed to a portion capsule, and fail to disclose any details of the claimed brewing system. EX1003, ¶186. They also fail to disclose any printed optically detectable repeat pattern identifier, let alone one located on the bottom of the flange, or the portion capsule's radially spaced and vertically oriented drawn grooves. *Id.* The Federal Circuit rejects such attempts at using multiple-dependent claims to satisfy the written description requirement, particularly where, as here, they result in "bizarrely complex chains of cross-reference claims." *FWP IP ApS v. Biogen MA, Inc.*, 749 Fed.Appx. 969, 977 (Fed. Cir. 2018).

"To the extent that [K-fee] contends that a person of skill in the art would isolate and combine aspects from various embodiments in the specifications . . . to obtain the claimed invention, [K-fee] relies upon the wrong test. '[A] description that merely renders the invention obvious does not satisfy the [written description] requirement.'" *Purdue Pharma LP v. Recro Tech. LLC*, 694 Fed.Appx. 794, 797-98 (Fed. Cir. 2017).

Accordingly, the '722 claims do not receive priority to their foreign filings

and are unpatentable over the prior art. EX1003, ¶187.

VIII. CLAIMS 1-24 ARE UNPATENTABLE UNDER §103

A. Ground 1: Claims 1 and 4-24 Would Have Been Obvious Over Yoakim in view of Jarisch 929, Rapparini, and Rossi

1. Motivation to Combine Yoakim, Jarisch 929, Rossi and Rapparini

Yoakim discloses nearly all claim elements. EX1003, ¶¶208-209. A POSITA would have been motivated to combine the brewing system, capsule, and concepts of Yoakim, with Jarisch 929, Rossi and Rapparini to predictably arrive at the '722 claims. *Id.*

Yoakim, Jarisch 929, Rapparini and Rossi are all analogous art in the field of portion capsule beverage extraction, each disclosing inventions applicable in automatic coffee/espresso machines. EX1003, ¶210; EX1004, [0002]-[0003]; EX1006, [0001]-[0002]; EX1008, [0001]; EX1041, 3. Yoakim, Jarisch 929, and Rossi are all designed to use capsule identifiers to optimize beverage machine operation and can use optical codes to achieve this. EX1003, ¶210; EX1004, [0010]-[0011], [0025], [0494]-[0496]; EX1006, [0012], [0016]; EX1041, 3, 5-6.

Yoakim and Jarisch 929 share a common applicant—Nestec SA—and a common inventor. EX1003, ¶211. Jarisch 929 expressly discloses it is intended to be used with a centrifugal-style brewing system (Denisart, EX1007), which shares two common inventors with Yoakim. *Id.*; EX1006, [0047]-[0048].

Denisart (another Nestec patent) is expressly disclosed as part of the Jarisch

929 system and is similar to the Yoakim system, both systems including (1) support for the capsule body; (2) elements to pierce the capsule in its center to inject fluids; (3) elements to pierce the capsule along the periphery to allow liquid to exit under centrifugal forces; and (4) compatibility with code readers to identify the capsule and adjust brewing parameters. EX1007, FIG1; EX1003, ¶¶212-213. Jarisch 929 is explicitly intended to be used with centrifugal brewing systems like Yoakim. *Id.*

Jarisch 929 also discloses motivations for a POSITA to combine the brewing and capsule identification system of Yoakim with the repeat pattern of Jarisch 929 located on the bottom flange of the capsule. EX1003, ¶214. Jarisch 929 explicitly teaches positioning an optical code "on the rim of the capsule, in particular, on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule." EX1006, [0037]. Jarisch 929 explains that its proposed code positioning is desirable because it "is less prone to damages caused by the processing module and in particular by the pyramidal plate, and to ingredients projections." *Id.*, [0017], [0063]. "As a consequence, the amount of coded information and the reliability of the readings are both improved." *Id.* Jarisch 929 further explains that repeating the code is desirable because "upon a 360-degree rotation of the capsule, the same sequence can be detected or read more than one time," which improves reliability of reading the code. *Id.*, [0068]; EX1003, ¶215. Accordingly, a POSITA would be motivated to use Jarisch 929's repeated optical code, and its code positioning on the

bottom of the flange. EX1003, ¶216.

A POSITA would also have an expectation of success when combining Yoakim and Jarisch 929, as Jarisch 929 expressly discloses how to modify a brewing chamber like Yoakim's to position an optical reader to read a code positioned on the bottom of the capsule flange. EX1003, ¶¶217-218. Specifically, Jarisch 929 discloses placing the light source at the bottom of the capsule support chamber, *i.e.*, the centrifugal cell 3, and configuring the chamber to be a light conductive material such that a light source will reach the bottom of the capsule flange. EX1006, [0090]-[0106]; EX1003, ¶217. Jarisch 929 further discloses mirrors to better position the optical light source and sensor. Thus, Jarisch 929 teaches how to position the Yoakim sensor/detector below and ***away*** from the flow path. EX1006, [0106] ("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 or its rim 73."). The Jarisch 929 optical reader configuration is depicted below left in order to read the code on the capsule (yellow) with the light path (red) shown from detector (62) to capsule rim (73), and an example of Yoakim is shown right. EX1006, FIG. 5; EX1004, FIG61.

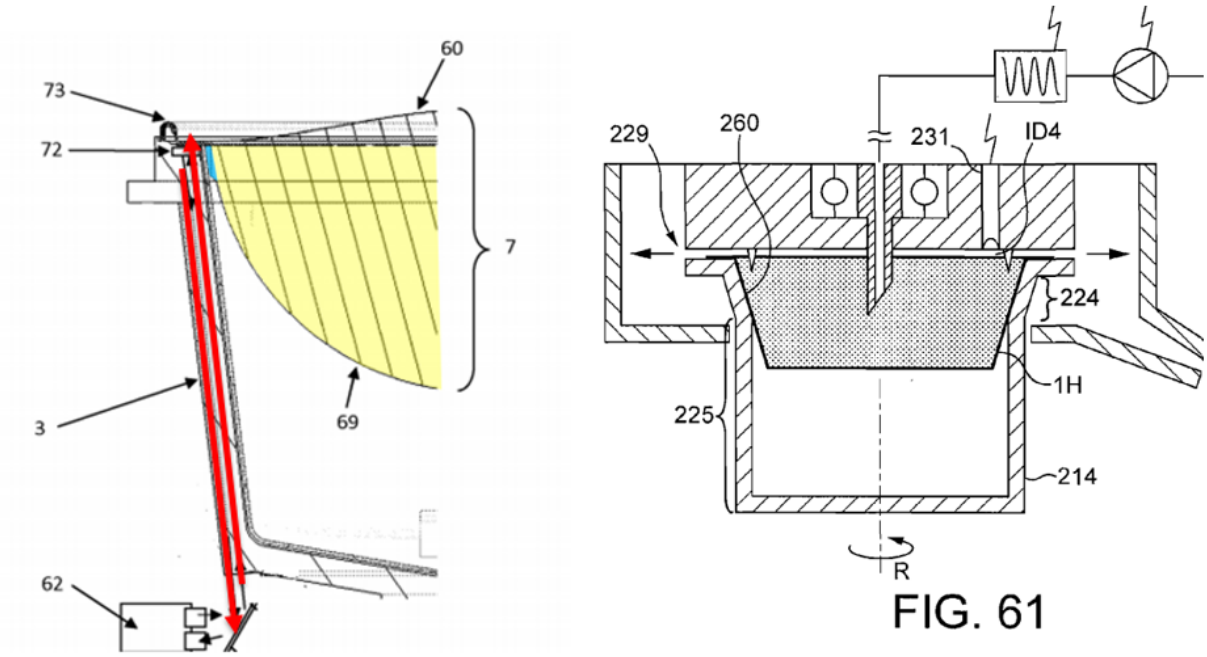


FIG. 61

Jarisch 929 further discloses how to structure the code as a repeat pattern (according to K-fee's interpretation) located on the bottom of the flange. EX1006, FIG2, [0051], [0057]-[0060], [0090]-[0106]; EX1003, ¶218. A POSITA would therefore find it obvious to combine Yoakim and Jarisch 929 to achieve the express benefits of the repeated code location of Jarisch 929. *Id.*

Rossi: A POSITA would further find it obvious to combine the systems of Yoakim and Jarisch 929 with the capsule recognition process of Rossi for the predictable benefit of "providing a safe and simple system and process for ensuring that an appropriate [capsule] is used" in the system. EX1041, 5; EX1003, ¶¶219-220. Yoakim discloses using a piston pump to deliver higher pressure water, if desired. EX1004, [0428]. Yoakim also discloses that its centrifugal brewing

generates pressure within the system, including high pressure for espresso. EX1004, [0188] ("The higher the rotational speed, the more radial pressure is exerted. . . ."); [0191] ("The rotational speed ranges differ as a function of the coffee type to be delivered. . . ." including "espresso."); [0369] ("maintain a pressure of several bars"). Yoakim also uses hot water. EX1004, [0506]. Thus, a POSITA would look to Rossi to address "the use of high pressure, high temperature water, which poses a potential health hazard if the machine is not used correctly or malfunctions." EX1041, 5.

A POSITA would have further been motivated to combine the capsule and brewing systems of Yoakim and Jarisch 929 with the capsule recognition process of Rossi for the predictable benefit of greater specificity and accuracy of brewing conditions, and increased safety in the machine from preventing operation with unsuitable capsules. EX1003, ¶¶219-220. Rossi explains that "use of an incorrect [capsule] may cause the machine to malfunction and can prejudice the safety and integrity of the machine and [] may harm the user." EX1041, 5. Rossi explains that "allowing the machine to take further steps only if it also recognises on the [capsule] the validation element" results in "avoiding the production of an edible product of inferior quality and ensuring the proper functioning of the machine." EX1041, 7. Accordingly, a POSITA would understand that Rossi provides motivation for using an optical code to ensure the capsule is suitable for use with the machine, and only initiate the brewing process upon such a determination. EX1003, ¶¶219-220.

A POSITA would also have an expectation of success when combining Rossi's recognition system with the brewing machine and capsules disclosed in Yoakim and Jarisch 929. EX1003, ¶221. Rossi discloses that its invention is intended to improve systems relating to "edible-product making machines . . . such as coffee machines fed with capsules containing coffee powder." EX1041, 5. Rossi further explains that its system identifies the capsule using "barcodes, antennae, or paints having optically measurable properties" that can be read by a "barcode reader, radio frequency wave transmitter and receiver, or optical sensor." EX1041, 11. Accordingly, Rossi uses technology already disclosed in Yoakim and Jarisch 929 to recognize the capsule. *Id.* Rossi also explains how to recognize a capsule, by comparing the read code "with pre-stored data in order to allow the machine to proceed to activation only if it" recognizes the capsule. *Id.* Furthermore, Yoakim and Jarisch 929 possess capsule identification capabilities that a POSITA would expect to work with Rossi's invention. EX1004, [0477]; EX1006, [0051]-[0055]; EX1003, ¶221.

Rossi teaches safety features—such as identification and validation elements—to determine whether to brew a suitable beverage, and offers additional advantages beyond Yoakim. Rossi's system includes information about the proper capsule and operating conditions that "helps to prevent [] safety hazard[s]," and prevents "re-use" of capsules that can cause "incorrect functioning of the machine

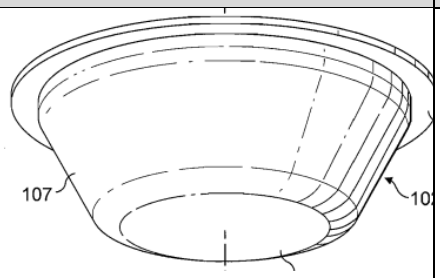
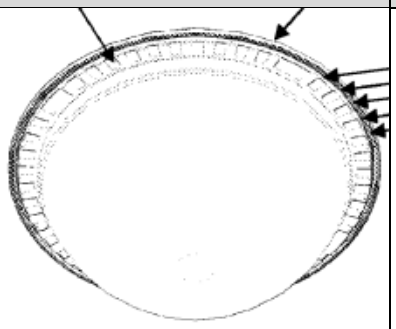
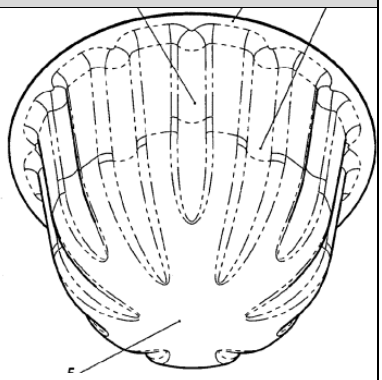
and the associated health hazard." EX1041, 7.

Yoakim would allow unsafe brewing of suitably-*shaped* capsules that otherwise are not designed for the system, or have been improperly re-used because Yoakim's "gripping structure" only checks for a complementary shape. Thus, a POSITA would have been motivated to use Rossi's safety features with Yoakim to improve safety, ensure proper functioning of the machine, and avoid inferior quality beverage. EX1003, ¶222.

Rapparini: Rapparini discloses longitudinal grooves in the body of the capsule wall and corresponding ribs in the inner cavity, thus increasing stability of the capsule. EX1008, [0009]; FIG6bis. This was a widely known technique in the art by 2010, and a POSITA would have recognized that using longitudinal grooves and ribs to stiffen a thin-walled capsule would lead to greater stability. EX1003, ¶¶223-225.

Rapparini further states its invention can be applied to other capsule materials (which includes metal), in addition to other dimensions, and can be employed for use in automated espresso machines (like Yoakim and Jarisch 929). EX1008, [0067]. A POSITA would have been motivated to use Rapparini's configuration because Rapparini "guarantees stability of the structure of filtering and permeable containers," and a POSITA would find it obvious to apply this to impermeable structures as well. EX1008, [0007]; EX1003, ¶¶225-226.

A POSITA would also have an expectation of success when combining Rapparini's grooves and ribs and the capsules disclosed in Yoakim and Jarisch 929. As depicted below, all systems disclose similarly-shaped capsules. EX1003, ¶227.

Yoakim	**Jarisch 929**	**Rapparini**
		

Furthermore, Yoakim already contemplates a capsule using a textured body, such that Rapparini's grooves could easily be incorporated, as Yoakim explains that they can be used to engage the capsule in the centrifugal brewing system. EX1004, [0215]; EX1003, ¶226.

Finally, a POSITA would expect success because Rapparini's capsule is manufactured using a thermoforming process similar to Yoakim's deep-drawing process. EX1004, [0215]; EX1003, ¶228.

It would therefore be obvious to a POSITA to combine the brewing/capsule system of Yoakim, the optically detectable identifier located on the bottom side of the flange in Jarisch 929, the machine operation and activation control as disclosed in Rossi, and the ribs and grooves of Rapparini. EX1003, ¶229.

2. Claim Elements

a) Claim 1—Preamble

Yoakim discloses a brewing system and method using centrifugal rotation to extract a beverage from a single-serve capsule containing a food substance. EX1004, [0002]; EX1003, ¶231. Yoakim's system is depicted below, which comprises a brewing device (2), capsule (3), water heater (7), pump (6), and water reservoir (5). EX1004, [0180]; EX1003, ¶232.

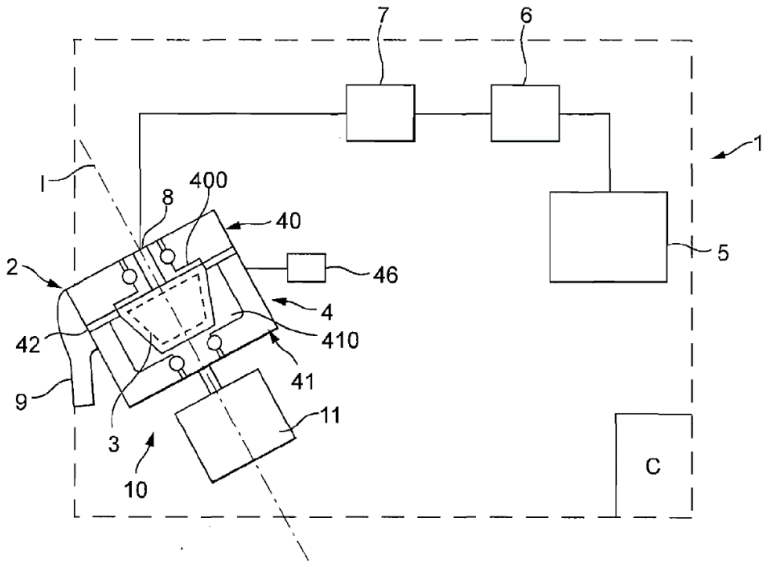


FIG. 1

b) Claim [1.a]

Yoakim discloses a capsule with a base element (70, 102) having a cavity that may be filled with various raw beverage materials such as "ground coffee powder [and] soluble coffee." EX1004, [0125], [0180], [0197]-[0198], [0414], FIG6-7, FIG26-27; EX1003, ¶¶234-236.

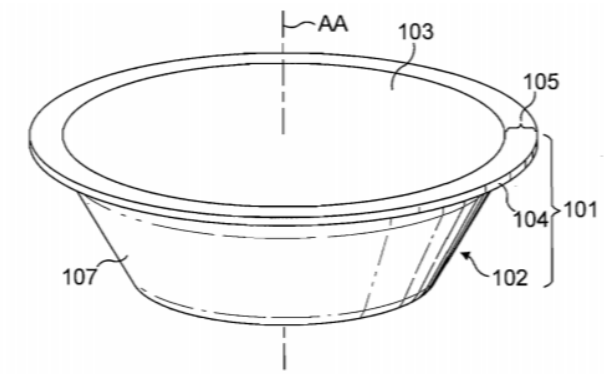


FIG. 26

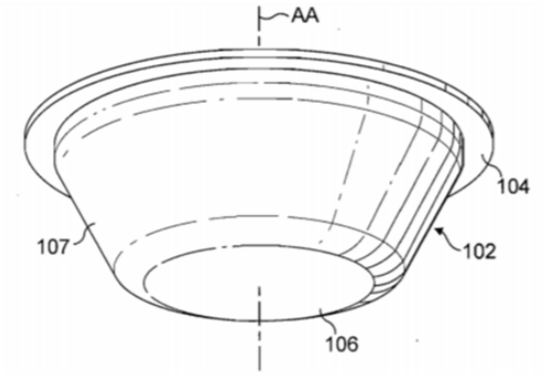


FIG. 27

As shown in FIGS26-27 (above), Yoakim further discloses that the portion capsule comprises a foil lid (103) sealed to the rim (104). EX1004, [0414] ("The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105."), [0128], [0129]. The foil lid may be comprised of aluminum and/or plastic. *Id.* at [0197].

c) Claim [1.b]

As shown below, Yoakim discloses a capsule with a cup-shaped body, *i.e.*, a base element, having a circumferential flange (72) with a top side to which the lid is attached. EX1004, [0129], [0197], [0414], [0473]; EX1003, ¶237.

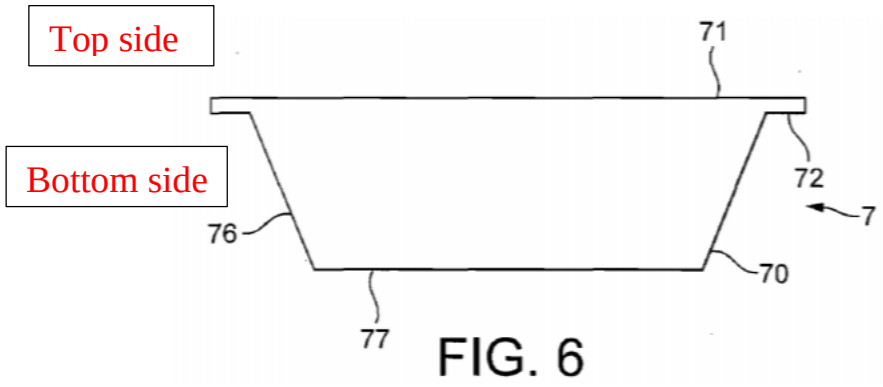


FIG. 6

FIGS26-27 also show a flange having a top side and a bottom side. Yoakim explains the body (102) has a peripheral rim 104 that extends outwardly forming an annular portion. EX1004, [0414]; EX1003, ¶¶238-239.

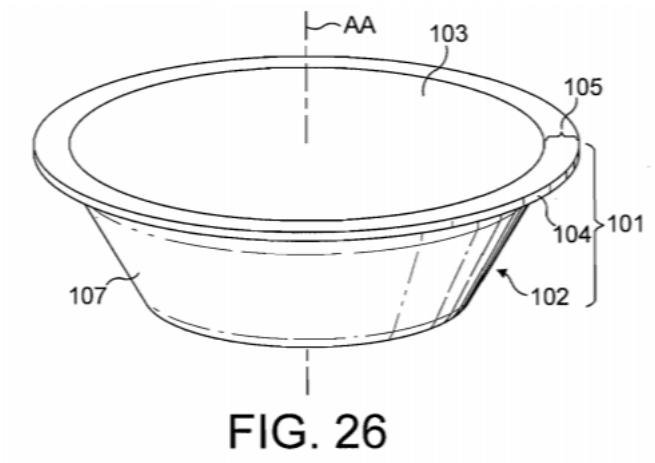


FIG. 26

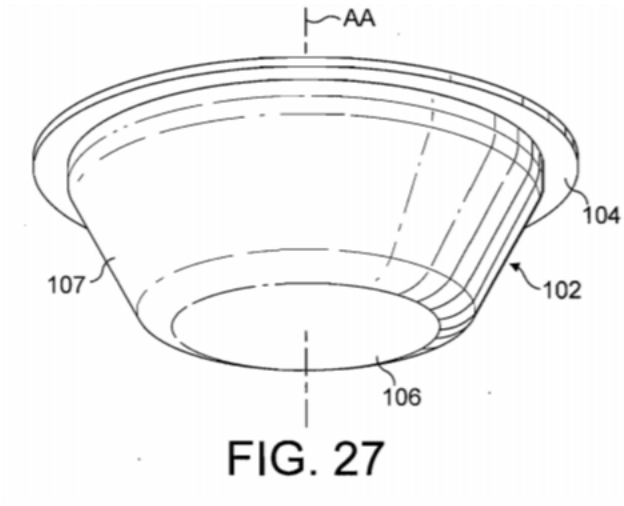


FIG. 27

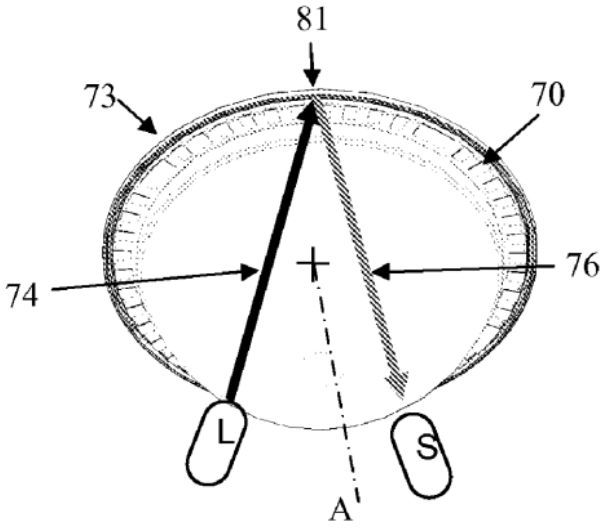
d) Claim [1.c]

Yoakim discloses using an "identification" system to identify each capsule and adjust the brewing parameters accordingly. EX1004, [0477]. Yoakim discloses that this helps deliver a wider range of beverages having differentiated characteristics. *Id.*, [0477], [0526]; EX1003, ¶240. Yoakim further discloses that

the identifier used on the capsule can be a printed optically detectable code, such as a barcode. *Id.*, [0496]; [0525]; EX1003, ¶241.

Jarisch 929 discloses a near-identical centrifuge-style brewing system that includes an optical code reader (62) to identify the capsule. EX1006, [0047]-[0048], [0106]. The identifier, according to K-fee's Contentions, is used to recognize "a type associated to the capsule," brewing parameters, and capsule manufacturing information. *Id.*, [0020]-[0024], [0051]-[0055]; EX1003, ¶242.

Jarisch 929 further discloses that the printed optically detectable identifier, according to K-fee's Contentions, is provided on the bottom side of the flange. It states that the code can be "present on the rim of the capsule, in particular, ***on the bottom of the rim of the capsule which is opposed to the lid or foil of the capsule***." EX1006, [0037], [0063]-[0064]; EX1003, ¶243. Jarisch 929 further discloses that the code may be "printed." EX1006, [0027], [0058], [0067], [0102]-[0103], [0112]-[0115]; EX1003, ¶244. This code location is depicted in FIG4 (below):



A POSITA would be motivated to utilize Jarisch 929 to place a printed optically detectable identifier on the bottom side of the flange facing away from the membrane to improve reliability of reading. *Id.*; EX1003, ¶¶245-246; *supra* Section VIII.A.1.

To the extent "identifier" is construed as a "feature that individualizes the portion capsule" and "individualization" is construed as "to determine whether the portion capsule is suitable for use with the beverage machine such that the use of unsuitable capsules is prevented," as Nespresso has proposed in district court litigation, Rossi explicitly discloses utilizing an identifier for this purpose. For example, Rossi explains that prior art machines "are usually designed so as to operate with a certain design or type of load element" and "[u]se of an incorrect load element may cause the machine to malfunction and can prejudice the safety and integrity of the machine and may harm the user." EX1041, 7. Rossi seeks to solve this problem by "providing a safe and simple system and process for **ensuring that**

an appropriate load element is used." *Id.*; EX1003, ¶247.

Rossi determines **whether it recognizes** the identifier element, and a failed recognition would indicate to a POSITA that the capsule is not proper for use with the machine. EX1041, 7 ("The use of an identification element and recognition means . . . helps to prevent the safety hazard associated with inappropriate operating conditions."); EX1003, ¶247. Rossi additionally discloses this feature through the identification of a "validation element" that ensures only capsules proper for use activate the machine. EX1041, 7; EX1003, ¶248. A POSITA would understand that already-used capsules would constitute a group of capsules that are not suitable for use with the machine. *Id.* Rossi also discloses that the identification and verification elements can be optical codes located on the capsule, and can both be the same element. EX1041, 11, 9, 13; EX1003, ¶249.

Rossi further discloses preventing use of a capsule that is not "suitable for use." EX1041, 7 ("Thus, the production process cannot be activated unless the first step has been completed."). Rossi further explains that production of a beverage will only occur after the identifying element is recognized. EX1041, 6, 8; EX1003, ¶250.

It would have been obvious for a POSITA to combine the process of Rossi with Yoakim and Jarisch 929 to arrive at the claimed invention. *Supra* Section VIII.A.1; EX1003, ¶¶251-252.

e) Claim [1.d]

Jarisch 929 discloses a printed optically detectable identifier with a surface having at least two areas which differ in their reflection properties. EX1006, [0026]-[0027] ("The symbols [on the optically detectable identifier] may be printed or embossed by a pattern which possesses ***surfaces*** having ***different reflective*** and/or absorbing properties to light. The pattern may possesses ***first surfaces*** having inclined ***mirroring*** or ***absorbing properties to light or flat reflective properties to light***. . . ."), [0058] ("The symbols may be printed or embossed by a pattern which possesses surfaces having ***different reflective*** and/or absorbing properties to light. The pattern may possesses ***first surfaces*** having inclined mirroring or absorbing properties to light and ***second surfaces*** having flat mirroring or flat reflective properties to light."), [0092], [0102]-[0103], [0111] ("Optionally (FIG. 8), ***the symbols*** are ***represented by different color patterns*** combined with a color reading device."). EX1003, ¶¶253-254. FIG2 of Jarisch 929 further discloses a plurality of these reflective zones.

A POSITA would be motivated to utilize Jarisch 929 to include a surface having at least two areas which differ in their reflection properties in order for the sensor to read the optical code located on the bottom of the flange. EX1003, ¶¶255-256.

f) Claim [1.e]

Yoakim discloses a beverage machine (FIG4, FIG61) that includes an optical sensor/detector (231) (right) enabled to identify and read an optically detectable identifier (ID4) on a capsule. EX1004, [0025], [0525], [0192], [0477], [0494]-[0496]; EX1003, ¶¶258-260.

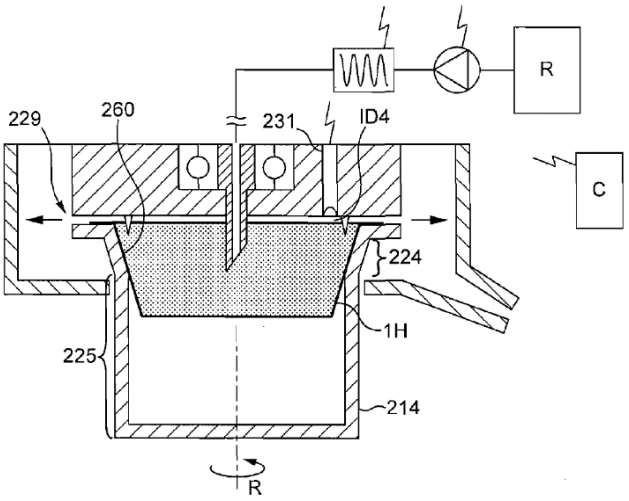


FIG. 61

Rossi also discloses that its system identifies the capsule using "barcodes, antennae, or paints having ***optically*** measurable properties" that can be read by a "barcode reader, radio frequency wave transmitter and receiver, or ***optical sensor***." EX1041, 9; EX1003, ¶261.

Jarisch 929 also discloses an optical code detector (62), designed to read the optically detectable identifier on the portion capsule. EX1006, [106]; EX1003, ¶¶262-263. FIG5 of Jarisch 929 (annotated) is shown below with the optical sensor/detector to read the optically detectable identifier:

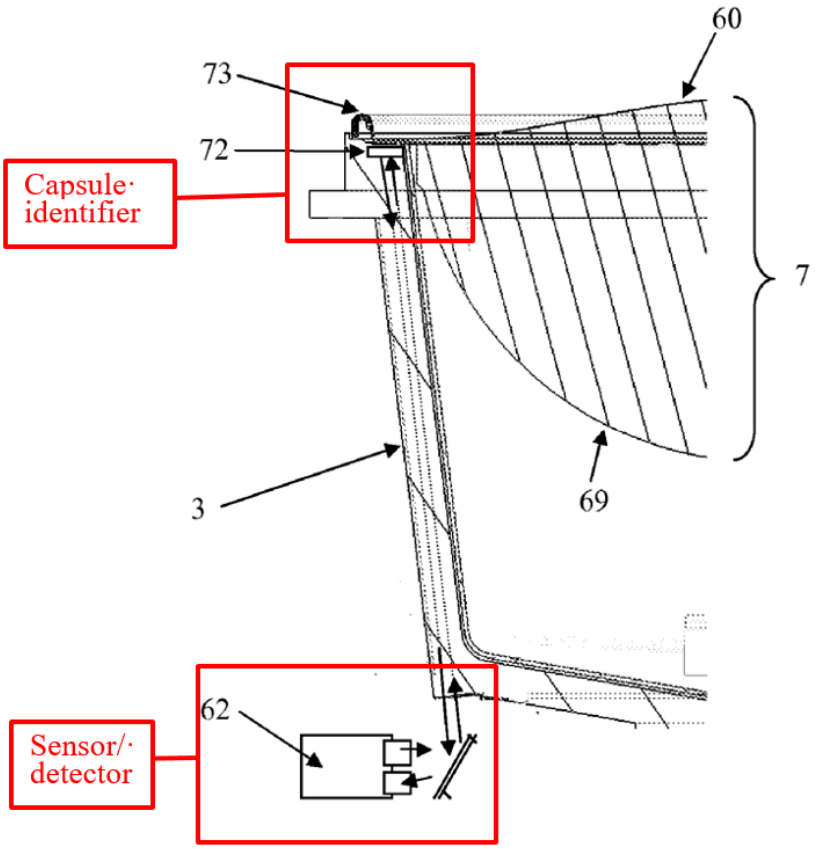


Fig. 5

It would have been obvious to utilize this configuration in Yoakim, as depicted below in FIG61. EX1003, ¶264; Section VIII.A.1.

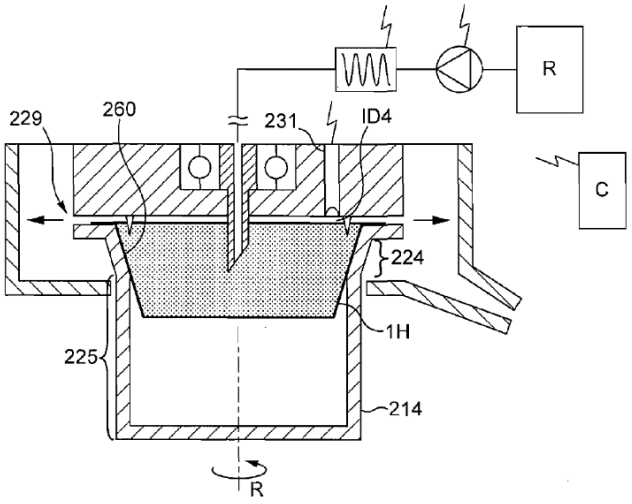


FIG. 61

g) Claim [1.f]

Yoakim discloses a media chute configured to receive and support the portion capsule in at least FIGs. 4 and 61 (annotated below), according to K-fee's Contentions. EX1004, [0478] ("[T]he brewing device comprises a rotary capsule holder with a support surface arranged for supporting a portion of the body of the capsules in the set[.]"), [0187] ("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."), [0194], [0024]; EX1003, ¶¶266-267.

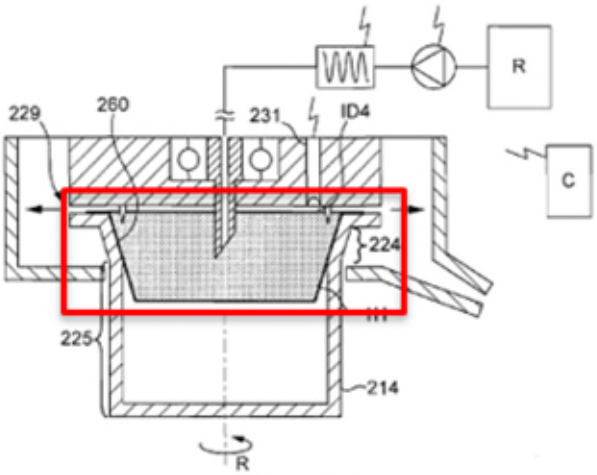


FIG. 61

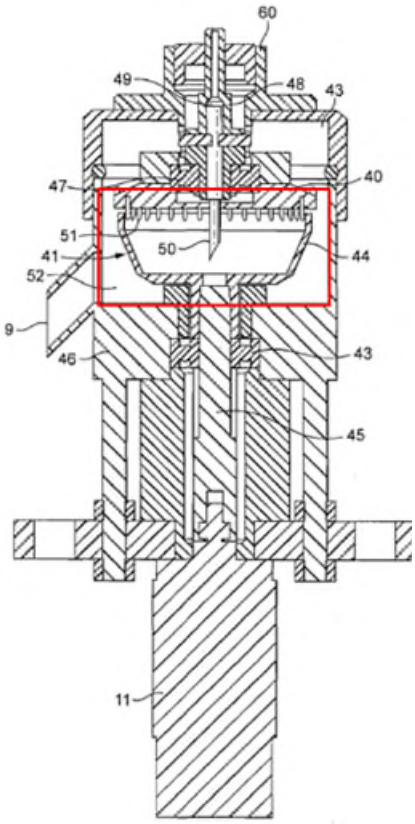


FIG. 4

Additionally, a POSITA would have been motivated to utilize a media chute, according to K-fee's Contentions, in order to hold and support the portion capsule during brewing. EX1003, ¶¶268-270.

h) Claim [1.g]

Yoakim discloses a pump controlled to push water into the portion capsule. EX1004, [0180] ("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. . ."). Yoakim further discloses that the pump is controlled based on the detection of the identifier by the sensor/detector. EX1004, [0477] ("The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly . . . . The identification means are associated to control means . . . by controlling the rotational motor driving the capsule holder ***or/and the pump supplying liquid in the capsule***."), [0025], [0192], [0218]; EX1003, ¶¶271-272. A pump, including the volume and flow rate, are parameters that may be adjusted to push water into the capsule. EX1004, [0477], [0192], [0522].

It would have been obvious to a POSITA reading Yoakim to only utilize the pump to push water into the capsule after the optically detectable identifier is successfully compared to a stored reference in order to allow the system to process the optimal brewing parameters before beginning the brewing process, and because

the brewing device would have no information as to how to control the pump to brew the beverage, and no basis of comparison for the identifier readout. EX1003, ¶273.

Rossi discloses only activating a beverage production cycle if the optically detectable identifier agrees with a stored reference. EX1041, 6 ("wherein said edible-product making machine ***automatically activates a cycle of production*** of said edible product ***only after having recognized on said load element said identifying element in combination with said validation element as validated***"); *id.* 8, 12; EX1003, ¶274. Rossi discloses that the machine's computer system includes a "checking means [that] **compares the signal** from the recognizing means for the identifying element and the validation element **with pre-stored data** in order to allow the machine to proceed to activation only if it recognizes the identifying element and the unvalidated validation element." EX1041, 11; EX1003, ¶275.

A POSITA would understand this disclosure to mean controlling the pump based on the comparison, since the activation cycle involves pumping water into the system. EX1003, ¶276. At a minimum, Rossi renders obvious to a POSITA to only utilize the pump to push water into the capsule after the optically detectable identifier is successfully compared to a stored reference in order to allow the system to process the optimal brewing parameters before beginning the brewing process, because the brewing device would have no information as to how to control the pump to brew the beverage, and no basis of comparison for the identifier readout, and to ensure

safety in the system that prevents use of an unrecognized capsule. EX1003, ¶¶276-277.

i) Claim [1.h]

Yoakim discloses a capsule wherein the base element's wall region may be comprised, including partially, of an electrically conductive metal, such as aluminum, which forms an electrically conductive section under K-Fee's Contentions. EX1004, [0128]-[0129]; [0215]; EX1003, ¶278. Aluminum is known to be an excellent electrical conductor, and it has been acknowledged that an aluminum capsule is electrically conductive. EX1044, [0044]-[0045].

Yoakim further discloses that its recognition means can be "a magnetic element." EX1004, [0496]. It would have been obvious to a POSITA to incorporate a portion of the capsule to include a section of electrically conductive material, such as an aluminum, as a recognition means. EX1004, [0496]; EX1003, ¶279. For example, it would have been obvious to include an electrically conductive section on the capsule to serve as a capsule recognition means as contemplated by the Yoakim system. *Id.*

j) Claim [1.i]

Yoakim discloses a capsule with a deep-drawn toothed structure (right). EX1004, [215]; EX1003, ¶¶281-283.

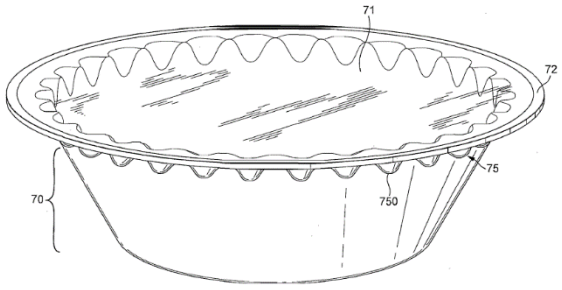


FIG. 23

Rapparini discloses radially spaced and "vertically oriented" grooves on the wall region. EX1008, [0007]-[0011]; EX1003, ¶¶284-285. Rapparini's grooves (4) are radially spaced and "vertically oriented" as shown below. FIGS6, 6bis (annotated); EX1003, ¶285.

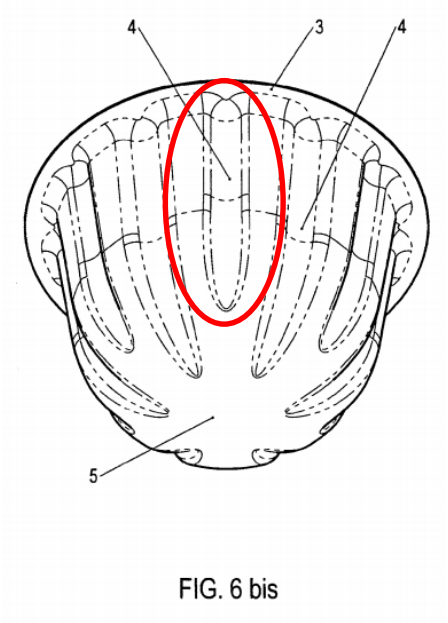


FIG. 6 bis

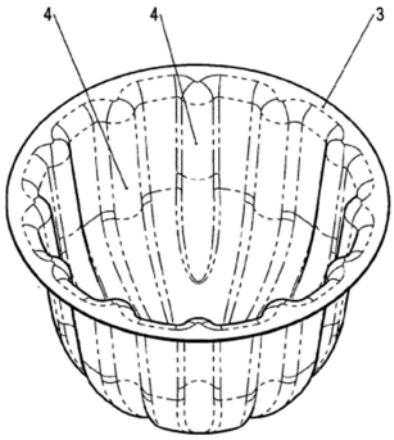


FIG. 6

Additionally, it would have been obvious to a POSITA to configure radially spaced and vertically oriented drawn grooves on the body of a capsule wall because it was well-known to do so to provide structural stability. *Supra* Section VIII.A.1;

EX1003, ¶286; *see also* EX1030, 1:14-21; EX1031, 1:27-37; EX1032, 5:10-25; EX1033, 2:20-25; EX1011, [0077]; EX1034, [0009]; EX1035, [0027], [0037]; EX1008, [0009].

k) Claim [1.j]

As discussed above in connection with Claim [1.i], Rapparini discloses a portion capsule with radially spaced and "vertically oriented" grooves around the capsule body, which also forms corresponding radially spaced and "vertically oriented" ribs in the cavity of the portion capsule. EX1003, ¶289. These ribs are visible at (4) in FIG6 (right).

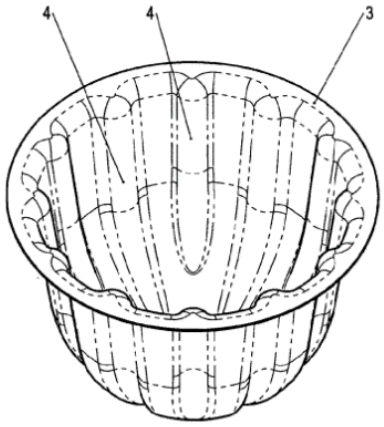


FIG. 6

Rapparini discloses that the ribs provide an optimized capsule structure that is stiffer and more stable. EX1008, [0009] ("[T]he body of the container with ***longitudinal stiffening ribs wherein the length of the ribs is variable along the surface of the body***."), [0007], [0053]-[0054]; EX1003, ¶290.

A POSITA would have been motivated to utilize the ribs of Rapparini in combination with the capsules and concepts of Yoakim. *Supra* Section VIII.A.1; EX1003, ¶291; *see also* EX1030, 1:14-21; EX1031, 1:27-37; EX1032, 5:10-25; EX1033, 2:20-25; EX1011, [0077]; EX1034, [0009]; EX1035, [0027], [0037]; EX1008, [0009].

3. Claim 4

Yoakim discloses an "inlet port aligned with the central axis of the capsule, wherein the liquid to be injected into the capsule is water[.]" EX1004, [0019], [0220]; EX1003, ¶¶293-294. Yoakim further discloses that liquid is introduced through the perpendicular passage via "at least one needle for injecting liquid into the capsule at or near its central axis." EX1004, [0021], FIG4; EX1003, ¶¶295-296. This passage (50) is shown right in FIG4 (annotated). EX1003, ¶¶297-298.

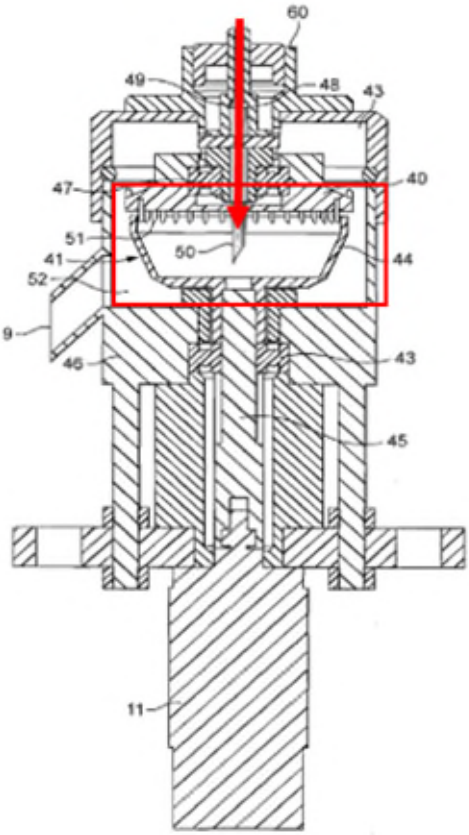
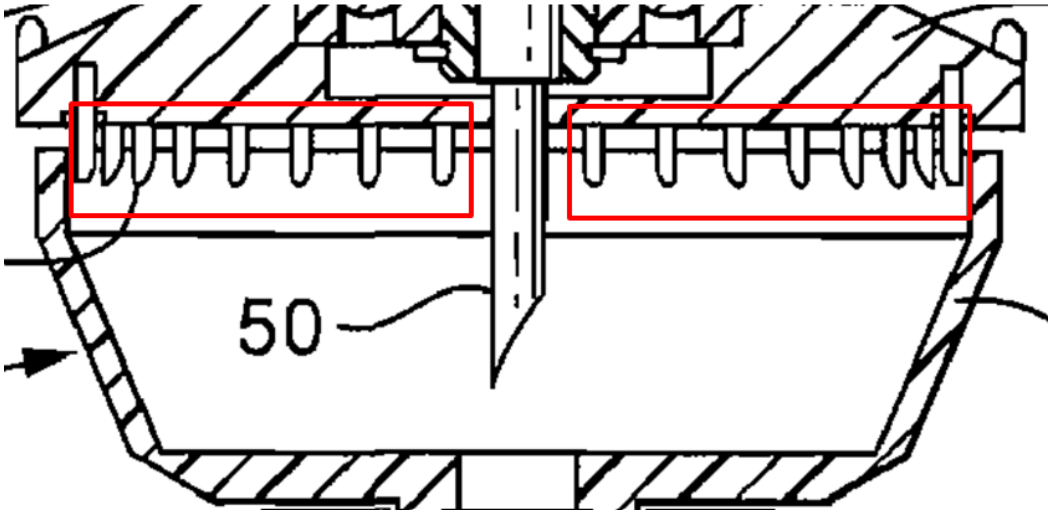


FIG. 4

4. Claim 5

Yoakim discloses a beverage machine comprising a mandrel that pierces the lid in a region that is offset from the central axis, according to K-fee's Contentions. Yoakim discloses that the brewing machine's "lid further comprises outlet piercing elements 51 which are placed on the inside of the lid at a radial position." EX1004, [0186]-[0187], FIG4; EX1003, ¶¶299-300. These needles (51) are shown in FIG4 (enlarged, below). EX1004, [0435], FIG4; EX1003, ¶¶302-304.



Additionally, FIG7 (below) depicts holes (74) in the capsule membrane after piercing by the mandrel, and are offset from the central axis. EX1004, [0199]; EX1003, ¶301.

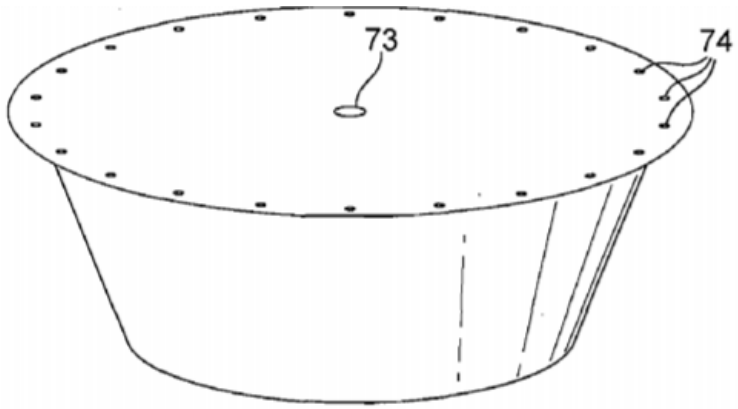


FIG. 7

5. Claim 6

For the same reasons as Claim 5 above, Yoakim discloses a beverage machine that is operable to pierce the lid in a region that is offset from a central axis of the portion capsule. *Supra* Section VIII.A.2.4; EX1003, ¶¶305-307.

6. Claim 7

As discussed in claim element [1.h], Yoakim discloses that the base element wall may be comprised of an electrically conductive metal such as aluminum, which forms an electrically conductive section under K-fee's Contentions. The electrically conductive section of Yoakim can also be located all over the base element, as Yoakim discloses that the entire base element may be made entirely of aluminum. EX1004, [0128]-[0129], [0215]; EX1003, ¶¶308-309.

Yoakim further discloses gas barrier layers to prevent moisture or aroma from escaping out of the capsule. Yoakim discloses that both the sealing lid and cup-shaped body of the portion capsule can include gas barrier layers. EX1004, [0121], [0128]-[0129], [0197]; EX1003, ¶310. Yoakim explains that the capsule has "gas barrier properties and is sealed in a fluid tight manner so that ingress of air in the capsule is prevented." *Id.* [0096], [0121], [0355], [0350]; EX1003, ¶¶311-312. A POSITA would have understood that using a barrier layer to prevent the ingress of air and maintain freshness will also prevent moisture or aroma from escaping out of the portion capsule, and additionally it would have been obvious to do so. EX1003, ¶¶311-314.

7. Claim 8

Yoakim, Jarisch 929 and Rossi disclose and/or render obvious this limitation. Yoakim discloses assigning capsules to a group associated with the beverage

machine. EX1003, ¶316. Yoakim discloses utilizing a complementary shape of the capsule and capsule holder to drive the capsule in rotation and "ensur[e] that only capsules adapted to the system can be used and brewed successfully." EX1004, [0205]. Yoakim further discloses assigning capsules to a set intended to be used with the machine. *Id.*, [0006], [0468]-[0478], [0485]-[0492], [0503]-[0504]. Yoakim further explains "for larger capsules in the set, the identification means can set larger liquid volumes than for smaller capsules." *Id.*, [0523].

Jarisch 929 also discloses assigning capsules to a group associated with the beverage machine. EX1006, [0020], [0051] ("information for recognizing ***a type associated to the capsule***"); EX1003, ¶317.

It would have been obvious to a POSITA to assign capsules to a group that is suitable for use with the machine, and not operate the beverage machine with inappropriate capsules, in order to prevent unsafe brewing conditions or poor beverage quality for the user. EX1003, ¶318.

Additionally, as set forth in Section VIII.A.2.d, Rossi discloses and/or renders obvious assigning capsules to a group that are suitable for the machine, determining whether the capsule is suitable for use, and not operating the machine if the capsule is not appropriate. EX1003, ¶¶319-320.

8. Claim 9

As set forth in connection with Claim element [1.h] and Claim 7 above,

Yoakim discloses a capsule made of aluminum. EX1004, [0128]-[0129], [0215]; EX1003, ¶323.

Jarisch 929 discloses that its optically detectable identifier (according to K-fee's Contentions) includes a metallic surface. Jarisch 929 also discloses that its capsule can be made from aluminum. EX1006, [0002]. Jarisch 929 discloses that its optical code (called a "support") "can be made of a paint and/or a lacquer and/or an embossed ply of material of the capsule itself." EX1006, [0018]. Jarisch 929 discloses that the symbols in the code can vary in color, reflectivity, opacity, light absorption, magnetic field, induced magnetic field, resistivity, and capacity, etc. EX1006, [0027]. Jarisch 929 further discloses that the code ("support 20") shown in FIG2 "is adapted to be associated with, ***or be a part of***, a capsule for the preparation of a beverage." EX1006, [0051]. A POSITA would understand these disclosures to mean an optically detectable identifier including a metallic surface. EX1003, ¶324.

Additionally, Jarisch 929 discloses using the symbols of the code ("support") to be sensed ***on a metallic surface of the support***. EX1006, [0117] ("In another embodiment, the symbols provided on a ***metallic surface*** of the support are sensed using an inductive sensor. The symbols are formed by reliefs or recesses in the ***metallic surface***. For instance, the support comprises a ***circumferential metal rim*** . . . ."). Additionally, it would have been obvious to a POSITA to form an optically

detectable identifier on an aluminum capsule to include a metallic surface in order to allow for detection by electrical means (magnetic, resistivity, capacity), and also to simplify the cost and manufacturing process by utilizing less printed paint on the capsule. EX1003, ¶¶325-327.

9. Claims 10-11

Yoakim discloses a seal in the form of a "flow restriction means which is arranged after the outlet(s) of the capsule." EX1004, [0370]-[0380], [0382], [0396]-[0398]; EX1003, ¶¶328-329, 337-338. Specifically, Yoakim discloses the brewing machine further comprising a sealing valve system 156, which is referred to as an annular engaging portion 157, and can be in the form of a cone or V "for increasing sealing pressure." EX1004, [0388], [0436], [0446]; EX1003, ¶¶330-332. This seal is designed to "control[] the flow of liquid that is discharged from the device. EX1004, [0436], [0384]-[0385].

To the extent K-fee repeats its argument from IPR2022-01574, Paper 17, 52, Yoakim discloses a seal under K-fee's interpretation at least because its "flow restriction means" is designed "to exert a sufficient ***sealing pressure*** on the capsule." EX1004, [0388]. This sealing pressure ***restricts the flow of liquid*** and blocks liquid exit "until a certain pressure" is reached. *Id.*, [0385]; [0436]. This "***improve[s] the interaction between water and the substance contained in the capsule***," *i.e.*, ensures that water flows through the portion capsule instead of around it. *Id.*, [0251];

The seal is configured to bear against a top side of the lid of the capsule. EX1004, [0436] ("The annular engaging portion [seal] includes a pressing peripheral surface 159 which applies a closing force on the peripheral rim 104 of the capsule to be able to restrict the flow of liquid under the force of the elastic loading means."). ***The seal is also positioned to bear against the lid in a region between the peripheral edge of the lid and the region that is pierced by the mandrel***. EX1004, [0388] ("[T]he engaging portion of the valve means can also comprise an annular pressing edge which is arranged to seal on the engaging portion of the capsule."), [0396] ("Preferably, the flow restriction means comprises valve means which is arranged at ***or after at least one outlet of the capsule*** for opening when a certain pressure is exerted thereon by the pressurized liquid for enabling the liquid to be released from the capsule."); EX1003, ¶¶334-335. This is also shown in FIGS35, 37-38, which depicts sealing edge 159 on the surface of the capsule between the peripheral region and the piercing location of the mandrel (153):

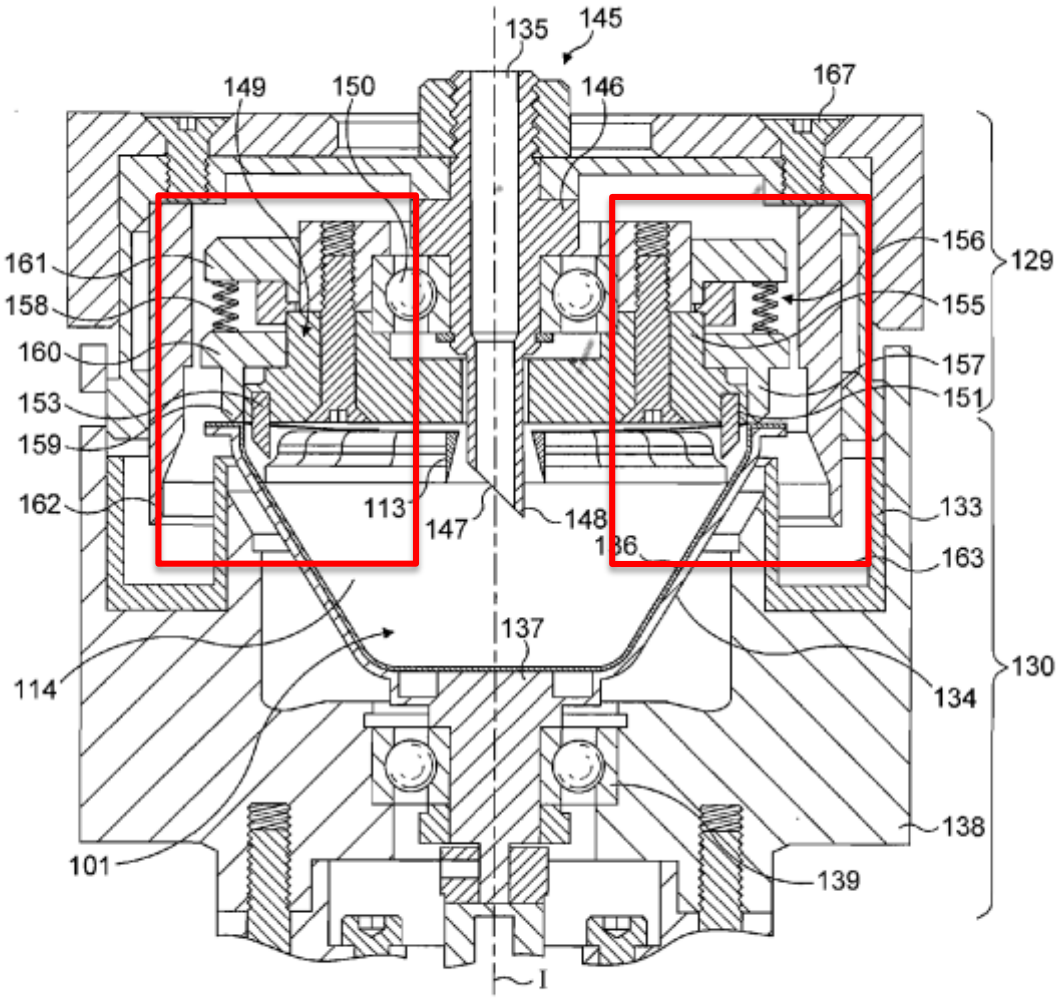
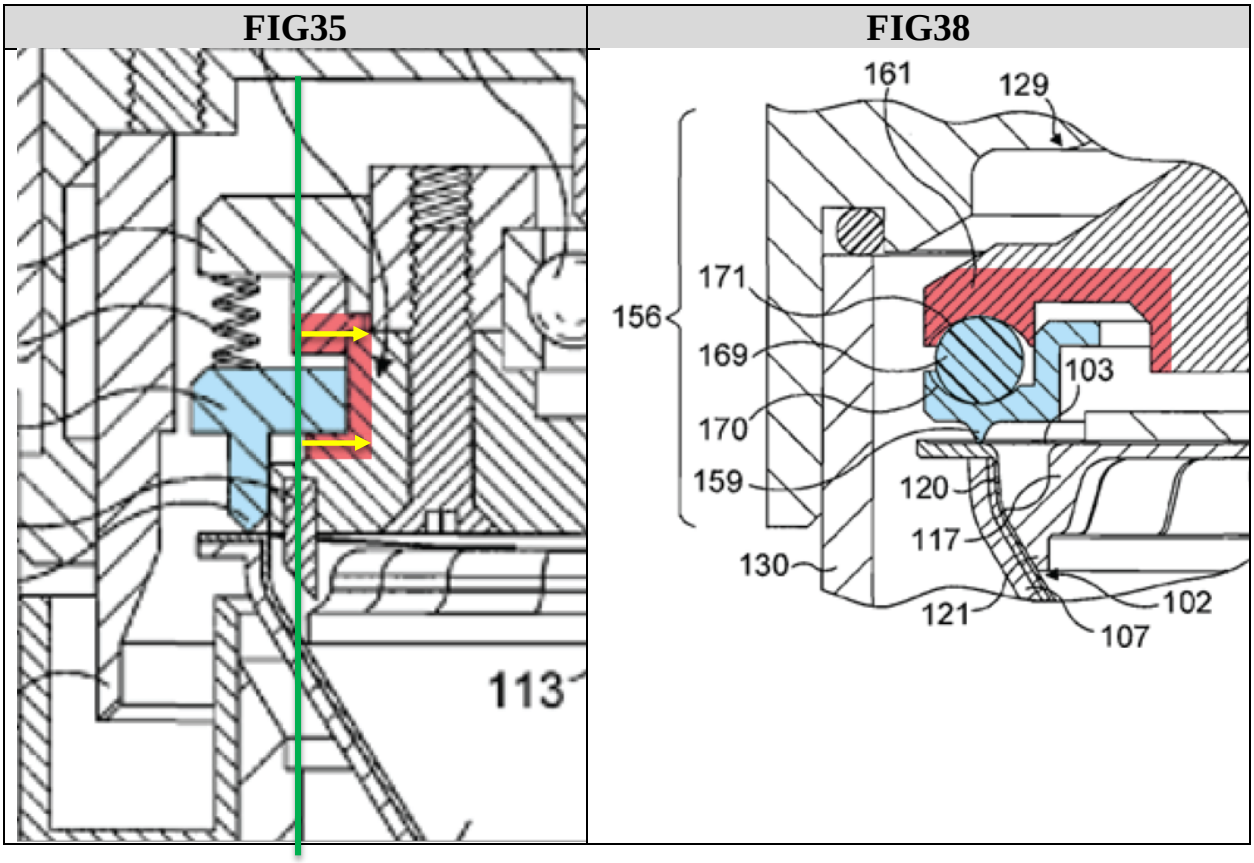


FIG. 35

In connection with claim 11, Yoakim further discloses ***a groove, in which the seal is at least partially located***. EX1004, [0436] ("The elastic loading means 158 is thus inserted in a space located between the base portion 160 and a counter-force portion 161 for the engaging part 149. Therefore, at a rest position, the engaging portion 157 of the valve system keeps closing on the rim of the capsule under the compressive effect of the resilient means."); [0446] ("The O-ring is maintained in

place between two concave surfaces 170, 171 of the valve system."); EX1003, ¶339.

The seals (blue) and grooves (red) are shown in close ups of FIGS35 and 38:



To the extent FIGS35 or 38 do not constitute a groove, it would have been obvious to a POSITA to at least partially locate a sealing member in a groove, in order to solidify the placement of the seal and improve its sealing stability and strength. EX1003, ¶340.

It would also have been obvious to a POSITA to utilize the claimed groove and seal configuration in the brewing head of the centrifugal brewing unit in order to achieve "the advantage of a control of the pressure of liquid exerted in the capsule at the level of the device," as well as "optimize interaction of water and the ground

coffee particles to obtain a good extraction of the coffee and aroma compounds," and "improve the creation of foam or coffee crema." EX1004, [0384]-[0385]; EX1003, ¶341.

10. Claim 12

As discussed in Claim [1.f], Yoakim discloses a media chute configured to receive and support the portion capsule. EX1003, ¶¶344-345. As discussed in Claim 10, Yoakim also discloses a beverage machine comprising a seal that is configured to bear against a top side of the lid in a region between a peripheral edge of the lid and the region of the lid that is pierced by the mandrel. EX1003, ¶346. A POSITA would understand these disclosures to constitute a media chute (according to K-fee's Contentions) configured to receive and support the portion capsule so that the portion capsule is in an opposing contacting relationship with the seal. Additionally, such a configuration would be obvious to a POSITA in order to create a sealed arrangement that holds the capsule for brewing. EX1003, ¶¶346-347; EX1004, FIG35, 38. For example, the below FIGS35, 38 show the seal pressing against the location of a top side of the portion capsule, and a media chute supporting the capsule from below in an opposing contacting relationship:

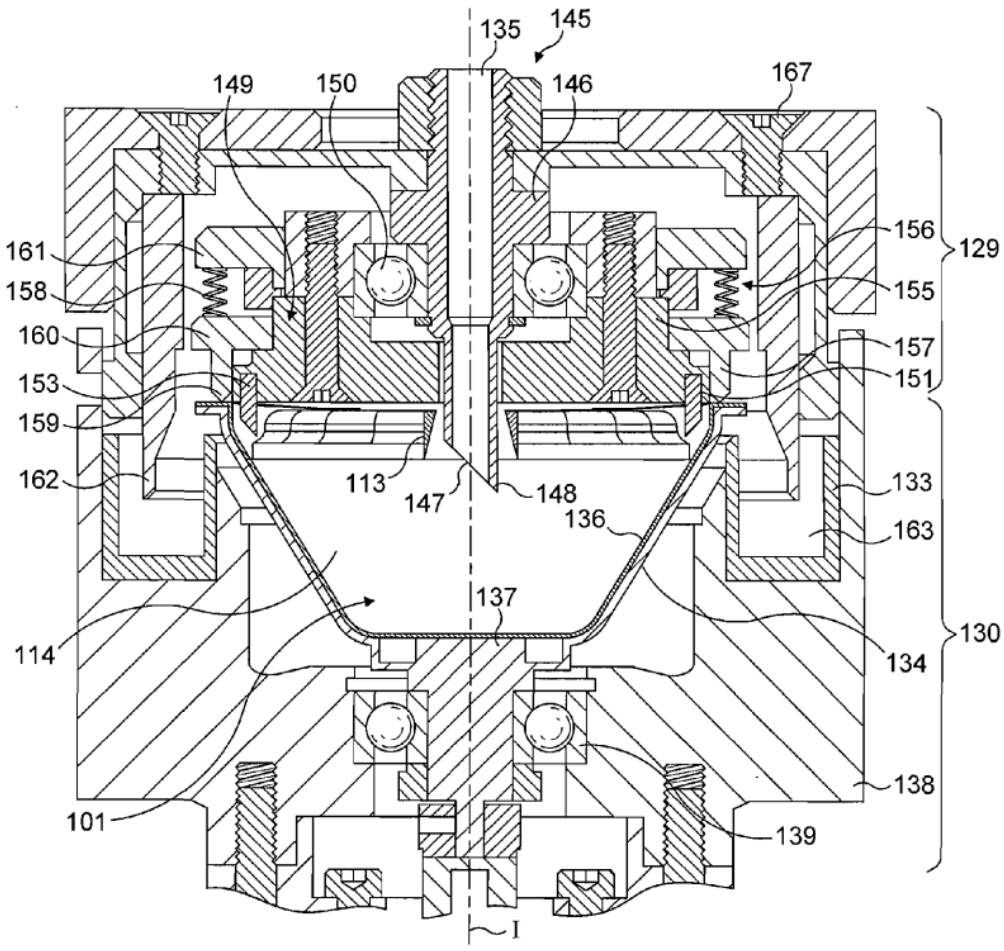

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FIG. 35

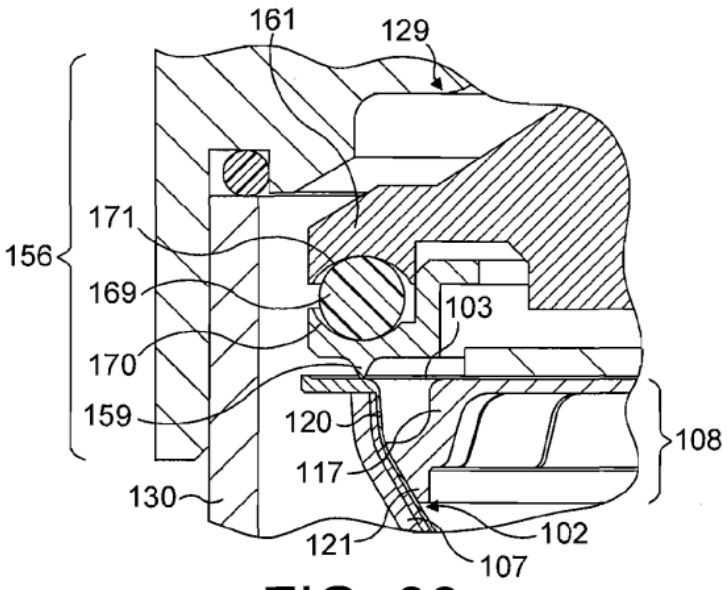


FIG. 38

11. Claim 13

Yoakim in view of Jarisch 929 renders obvious an optically detectable identifier (claim [1.c]) that is located both under the flange, and located on the side wall of the base element, according to K-fee's Contentions. *Supra* Section VIII.A.2.d. Jarisch 929 discloses that the identifier can also be included on the side wall of the base element, in addition to on the periphery of the flange. EX1006, [0064] ("The support can be part of, or be formed directly on, ***the body of the capsule.*** The support ***can also*** be disposed on the bottom side of the rim of the capsule."), [0090]-[0092]; EX1003, ¶¶350-352.

Furthermore, it would have been obvious to a POSITA to utilize an optically detectable identifier both on the bottom of the flange and on the sidewall of the capsule to provide an alternative location to read the code in order to increase the

chances of the code being read. EX1003, ¶¶353-354.

12. Claims 14-16

Claims 14-16 require the following elements:

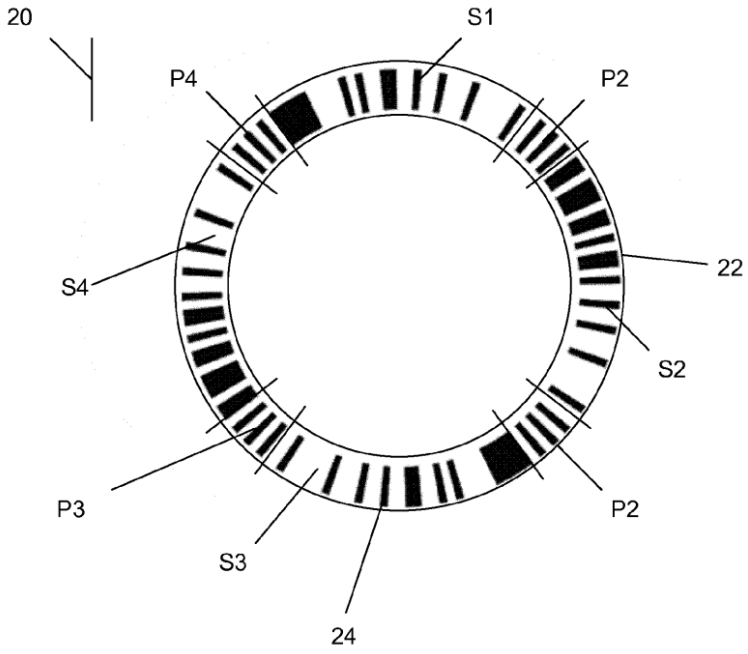
Reflective Zones: As discussed *supra* in Section VIII.A.2.e in connection with Claim element [1.d], Jarisch 929 discloses an optically detectable identifier that has a plurality of reflective zones. *See also* EX1003, ¶¶356-357.

Free of a Filter: Yoakim discloses a capsule that does not include a filter and expressly confirms that a filter is optional. EX1004, [0171] ("An additional filtering layer can be used to filter the liquid depending on the size of the outlets."), [0343] (disclosing optional filter embodiment); [0255], [0288], [0300], EX1003, ¶358. As depicted in FIGS6-7, 54-60, and described in [0197]-[0199], Yoakim expressly discloses embodiments using capsules that do not have a filter. EX1003, ¶358. It would also have been obvious design choice to a POSITA to not use a filter in a centrifuge based brewing system, in order to simplify the capsule design. *Id.*

Made of Metal: Yoakim further discloses that the portion capsule is made of a metal such as aluminum. Ex. 1004 at [0129], [0215], [0461], [0197], [0414]. EX1003, ¶359.

Repeat Pattern: Jarisch 929 discloses that the optically detectable identifier includes a repeat pattern, according to K-fee's Contentions. It discloses using "redundant information" such as "repetition codes." EX1006, [0025]-[0027].

Jarisch 929 explains that "[r]epetition of the sequence means that the same sequence is duplicated and the successive sequences are positioned in series along the circumference so that upon a 360-degree rotation of the capsule, the same sequence can be detected or read more than one time," which ensures a higher probability that at least one code is readable and may potentially reduce reading time. EX1006, [0068], [0056], [0110], [0033]; EX1003, ¶¶360-361. Thus, according to K-fee's Contentions, Jarisch 929 discloses an optically detectable identifier that includes a repeat pattern, depicted in FIG2:



It would have been obvious for a POSITA to utilize the repeated code of Jarisch 929 to increase reliability of reading the code during rotation. EX1003, ¶¶362-363. *supra* Section VIII.A.1.

Claim 15 further requires **the optically detectable identifier extends around**

a central axis of the base element. Jarisch 929 discloses this limitation. EX1006, [0076] ("The sequence is read by rotating the capsule along a central axis."); [0095], [0117] ("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."). This is also depicted in FIG2 and FIG4 of Jarisch 929. EX1003, ¶¶364-367.

Claim 16 further requires **the base element is deep drawn.** Yoakim discloses a portion capsule having a base element that is deep drawn. EX1004, [0355], [0215] ("For example, [the capsule] can be moulded by injection of plastic or deep drawn in aluminium."); EX1003, ¶¶368-370. Furthermore, it would have been obvious to a POSITA to manufacture a capsule by deep drawing, as this is a fast and cost effective form of manufacturing thin-walled products such as coffee capsules. EX1003, ¶¶370-371.

13. Claims 17-20

For the same reasons as element [1.g], Yoakim and Rossi disclose a pump which is controlled to not push water into the capsule upon a determination that the read barcode does not agree with a stored reference. For example, Rossi discloses that its brewing process "automatically activates a cycle of production" of the capsule "***only after*** having recognized" on the capsule the correct barcode. EX1041, 8; EX1003, ¶¶372-374. Rossi further explains that "the production process cannot be activated unless" the system recognizes a correct validation element (which can

be a barcode). EX1041, 9; EX1003, ¶374.

It would have also been obvious to a POSITA that a pump would not push water into a capsule upon a determination that a read barcode does not agree with a stored reference because the purpose of reading the barcode is to compare it to stored references to, *inter alia*, determine whether the capsule belongs to the appropriate group, and determine the correct brewing parameters and release heated water to brew a beverage depending on the parameters with that capsule. EX1003, ¶375.

Further, a POSITA would find it obvious that a device with means to recognize pre-stored barcodes would also have the means to recognize the absence of pre-stored barcodes, or the presence of an incompatible capsule, as a safety feature to prevent possible safety hazards. EX1003, ¶376. This predictable operation was well-known in the art by 2010 and would have been obvious to a POSITA. EX1024, [0014]; EX1040, 23; EX1041, 6; EX1042, [0054]-[0055].

Accordingly, Yoakim and Rossi disclose and/or render obvious claims 17-20. EX1003, ¶¶378-386.

14. Claim 21

Yoakim discloses a barrier layer as discussed in Section VIII.A.2.6, in connection with Claim 7. EX1003, ¶¶387-388.

15. Claim 22

Yoakim discloses and/or renders obvious wherein the beverage machine

comprises a groove and a seal that is at least partially seated in the groove, the seal is configured to bear against a top side of the lid, as discussed in Section VIII.A.9, which overlap with Claims 10-11. EX1003, ¶¶389-390.

16. Claims 23-24

As discussed in claim elements [1.i]-[1.j], Rapparini discloses radially spaced and vertically oriented drawn grooves and ribs. Rapparini discloses that the grooves reinforce the wall region of the base element. EX1008, [0009] ("The modulation of the length of the ribs along the surface of the container allows improving the stability and rigidity of the system."), [0013] ("[T]he side portion of the body is stiffened by the presence of the stiffening ribs . . ."), [0056] ("The annular rim 3 and stiffening ribs 4 guarantee the rigidity of the body 2 of the container so that it can be easily and quickly handled even at very high automated filling or production speeds."). EX1003, ¶¶391-393, 395-396. It was also well-known to a POSITA that grooves would reinforce the wall region. EX1003, ¶394; *supra* 5-7.

B. Ground 2: Claims 2-3 Would Have Been Obvious Over Yoakim, Jarisch 929, Rapparini, Rossi and in further view of Castellani

1. Motivation to Combine Castellani

Yoakim, Jarisch 929, Rapparini and Rossi disclose all elements of claims 2-3 except for the holding arms for engaging the single-serve capsule. EX1003, ¶¶397-398. A POSITA would have been motivated to combine the single-serve brewing system, capsule, and concepts of Yoakim, the code location of Jarisch 929, the

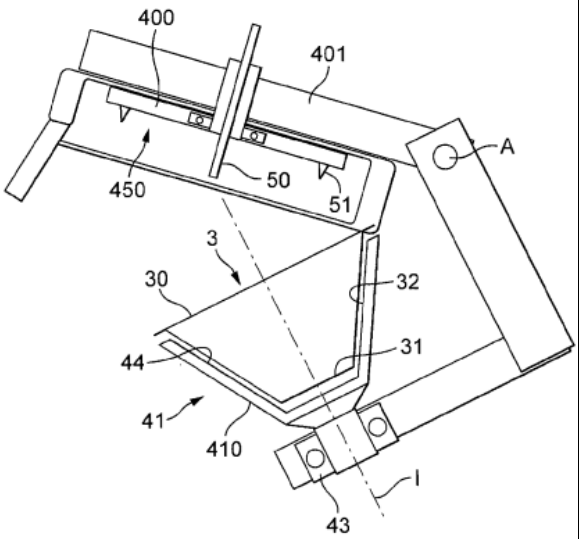
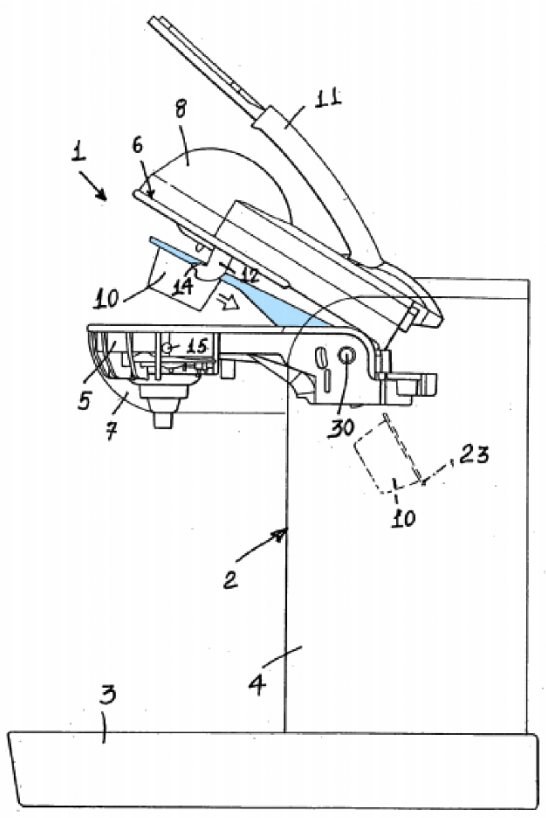
machine operation of Rossi, the radially spaced and vertically oriented drawn grooves and ribs of Rapparini, with the holding arms of Castellani to arrive at the '722 claims. *Id*.

Castellani, like Yoakim, Jarisch, Rapparini and Rossi, is in the field of portion capsule beverage extraction and is analogous art. EX1003, ¶¶399-400. Further, Castellani is intended to be used with beverage extraction systems that utilize single-serve capsules, like the Yoakim, Jarisch 929, Rapparini and Rossi systems. EX1009, [0009] ("[T]he aim of the present invention is to provide a delivery head, particularly for espresso coffee machines."); [0026] ("[T]he delivery head according to the present invention, which has been generally indicated by the reference number 1, can be applied to an espresso coffee machine, generally indicated by the reference number 2, including a base or bottom 3 and an upright 4.").

A POSITA would have been led by the motivations disclosed in Castellani to adopt its ejection system. EX1003, ¶401. Castellani explains its capsule unloading operation "can be performed in a very easy and safe manner" and resolves the "drawbacks" of "jammings" and the difficult "loading of the coffee capsule." EX1009, [0010], [0007]-[0008]. Additionally, the ejection forks facilitate ejection of the capsule into a collecting vessel after extraction, which assists the user such that they do not have to grasp a hot and wet used capsule. *Id.* [0054]; EX1003, ¶401. A POSITA would therefore have been motivated to utilize Castellani's ejection forks

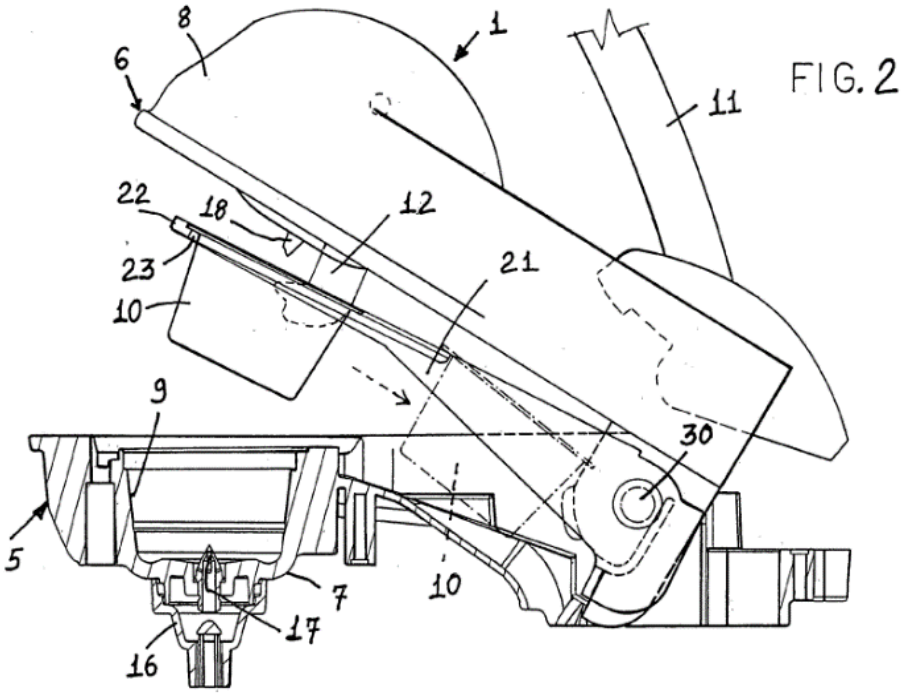
to properly position and secure the capsule in the Yoakim and Jarisch 929 system, and to ease the use of the product by facilitating ejection. EX1003, ¶402.

A POSITA would have an expectation of success when combining the Yoakim, Jarisch 929, Rossi and Castellani systems because the systems are structurally similar and compatible, and are directed to single-serve brewing solutions. EX1003, ¶¶403-404; EX1009, [0012]-[0013], [0043]. For example, both the Yoakim and Castellani systems utilize top-mounting capsule insertion into a brewing head as shown below:

Yoakim	**Castellani**
 FIG. 2	 FIG. 7

2. Claim 2

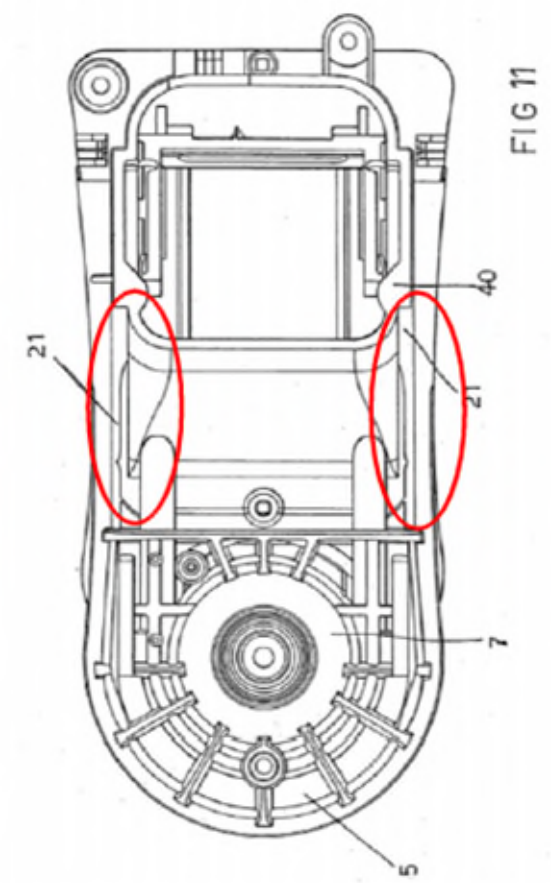
Castellani discloses a beverage system wherein the machine comprises a pair of holding arms (fork elements 21) for engaging the portion capsule, according to K-fee's apparent interpretation. EX1009, [0043]; EX1003, ¶¶406-407. Castellani discloses, "the fork element 21 will rise [a] capsule 10, by its annular portion 22, which engages at the bottom thereof the bearing perimetrical edge portion 23 of the capsule 10." *Id.* [0053]. As shown in FIG2, "the capsule 10 will slide on the fork element 21 and, after having passed the annular portion 22, will fall inside the fork element 21 and, through a specifically designed passage, will be collected in a collecting vessel formed in the upright 2." *Id.* [0054]; EX1003, ¶408. Castellani's ejection fork element arms (21) are shown below in FIG2.



A POSITA would have been motivated to utilize the ejection fork elements of Castellani with Yoakim, Jarisch 929 and Rossi. *Supra* Section VIII.B.1; EX1003, ¶¶409-411.

3. Claim 3

As discussed in connection with Claim 2, and shown in FIG11 below, Castellani discloses a pair of holding arms (fork element 21) that engage opposing sides of the portion capsule. *Supra* Section VIII.B.1; EX1003, ¶¶412-414.



IX. SECTION 325(d) PROVIDES NO BASIS FOR DISCRETIONARY DENIAL

The Board employs a two-part test for §325(d). *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential).

A. Part 1

The prior art was all cited, directly or indirectly, in a series of IDSs containing over 700 references. However, analysis under Part 1 is not necessary because, as detailed below, Part 2 does not support §325(d) denial because the Examiner materially erred in allowing the '722 Patent claims just as the Board found in related

patents—IPR2022-01574, IPR2023-00502, and IPR2023-00485. Indeed, the Examiner materially erred as he never saw the Institution Decisions from these proceedings that rejected K-fee's arguments and credited Petitioner's combinations.

B. Part 2

The Examiner committed material errors by "misapprehending or overlooking specific teachings in the relevant prior art" that, had they been properly considered, would have led the Examiner to conclude that the challenged claims are not patentable. *Advanced Bionics,* 8 n.9, 10.

Factor (c) weighs against denial because none of the Petition art was the basis of any rejection. *Trend Micro Inc. v. Cupp Comput. AS,* IPR2021-00813, Paper 7, 23 (PTAB Oct. 25, 2021) (factor (c) "strongly favors not exercising . . . discretion" where IDS reference does not form basis for rejection).

In the first/only Office Action Rejection during prosecution of the '722 Patent (EX1002, 187-202), the Examiner indicated the claims contained allowable subject matter and the only prior art rejections involved provisional nonstatutory double patenting over the '094 Patent application (which terminally disclaims the '491 Patent being reviewed in IPR2022-01574). ***The Examiner never rejected any claim based on any of the references presented in this Petition.*** *Lyft, Inc., v. Rideshare Displays, Inc.,* IPR2021-01602, Paper 7, 14-15 (PTAB Apr. 11, 2022).

After a terminal disclaimer over the '094 Patent and arguments from

Applicant (EX1002, 471), the Examiner allowed the claims, and provided the following Reasons for Allowance, the Examiner stated that:

> The closest prior art of record are Jarisch et al. (US 2013/0064937), Schmed et al. (US 7856920), Ternite et al. (US 2007/0148290), Ozanne (US 2010/0132564), Tholstup (Des. 306974) and Schifferle (US 2005/0150391). The prior art of record references neither discloses, or suggests, in combination with the other limitations of independent claim 10, a beverage machine comprising: a detector to read the optically detectable identifier, a media chute configured to receive and support the portion capsule, and a pump controlled to push water into the portion capsule only upon a determination that the read optically detectable identifier agrees with a stored reference, wherein the base element has a wall region with an electrically conductive section and radially spaced and vertically oriented drawn grooves, the cavity has radially spaced and vertically oriented drawn ribs.

EX1002, 489. In arriving at this conclusion, the Examiner did not cite or discuss the disclosures of Yoakim, Jarisch 929, Rapparini, Rossi, or Castellani. *Id.* Accordingly, to the extent the asserted *combination* of prior art references was evaluated during prosecution of the '722 Patent application (it was not), such evaluation was *minimal* at best. Thus, this factor weighs against denying institution.

Although different Examiners used Rossi,[6] Jarisch 929 and a different Jarisch reference (EX1005)[7] at times during prosecution of distant related applications,

[6] A different Examiner used Rossi in Appl. 16/538,752, but for claims that did ***not*** include limitations requiring "a pump controlled to push water into the portion capsule only upon a determination that the read optically detectable identifier agrees with a stored reference" ***or*** "if the portion capsule is not appropriate then the beverage machine will not operate." In response, Applicant twice added claim limitations (EX1065, 2-3; EX1066; 2-3) and never disputed the Examiner's use of Rossi, instead arguing that other limitations provided reasons for allowance.

[7] A different Examiner used Jarisch 929 in Appl. 15/211,823 relating to an identifier "included in the membrane as a partial layer of the membrane," but there are no "partial layer" limitations in the '722 Patent claims. A different Examiner also considered Jarisch (EX1005) during examination of Appl. 16/860,441. But reiterated that Jarisch discloses that it was "well established" to place optical codes "on the bottom side of the flange of a portion capsule. . . ." EX1062, 15. K-fee added other limitations to distinguish its claims, and never disagreed on record with the relevance of Jarisch's disclosure to K-fee's limitation of a code on the bottom of the flange. EX1063, 16-17. During examination of 16/538,752, K-fee did not dispute the Examiner's reliance on Jarisch (EX1064, 8) and instead amended its claims to

those claims did not include the current language requiring "***a printed optically detectable identifier***, provided on the bottom side" of the base element, "the optically detectable identifier includes a ***repeat pattern***" and "a pump controlled to push water into the portion capsule ***only upon*** a determination that the read optically detectable identifier agrees with a stored reference."

Factor (e) weighs against discretionary denial. The Examiner materially erred by overlooking the specific prior art disclosures relating to at least the limitations identified in the Reasons for Allowance. The Examiner never discussed the references in this Petition, which explicitly negate the Reasons for Allowance.

This Petition cures all of the Examiner's errors and demonstrates why the challenged claims are unpatentable. As explained above (Section VIII.A.2-16), the Petition identifies where the prior art teaches or suggests every limitation of the challenged claims. Petitioner also explains why a POSITA would have combined the various disclosures of the cited references to arrive at the subject matter of the challenged claims (Sections VIII.A.1, VIII.B).

The Examiner erred because each feature allegedly missing from the prior art

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recite additional limitations. EX1065, 2-3. Neither K-fee nor the Office have never disagreed on record with the relevance of Jarisch's disclosure K-fee's claim limitation of a code on the bottom side of the capsule flange.

in the Reasons for Allowance is disclosed by Yoakim, Jarisch 929, Rossi and Rapparini (EX1003, ¶¶139-145):

Reasons for Allowance	Petition
beverage machine comprising detector to read the optically detectable identifier	Section VIII.A.2.f; EX1003, ¶¶257-265.
media chute configured to receive and support the portion capsule	Section VIII.A.2.g; EX1003, ¶¶266-270.
pump controlled to push water into the portion capsule only upon a determination that the read optically detectable identifier agrees with a stored reference	Section VIII.A.2.h; EX1003, ¶¶271-277.
base element has a wall region with an electrically conductive section	Section VIII.A.2.i; EX1003, ¶¶278-280.
radially spaced and vertically oriented drawn grooves	Section VIII.A.2.j; EX1003, ¶¶281-287.
radially spaced and vertically oriented drawn ribs	Section VIII.A.2.k; EX1003, ¶¶288-292.

Thus, based on these references, supported by the testimony of Michael Jobin, "reasonable minds cannot disagree that the Office erred in a manner material to patentability in its treatment of the art by failing to reject the claims … over the references cited in Petition's challenges." *Apple, Inc. v. Omni MedSci, Inc.*, IPR2020-00029, Paper 7, 55 (PTAB Apr. 22, 2020). None of the Petition references

should form the basis for discretionary denial because they unequivocally teach the limitations in question and demonstrate material error. *Apple v. Koss Corp.*, IPR2021-00381, Paper 15, 29 (PTAB Jul. 2, 2021).

Because the prior art combinations in the Petition explicitly negate the Examiner's Reasons for Allowance, the Examiner materially erred by misapprehending or overlooking their respective disclosures. *3Shape A/S and 3Shape Inc., v. Align Tech., Inc.*, IPR2021-01323, Paper 16, 12 (PTAB Jan. 31, 2022); *Viken Detection Corp. v. Am. Sci. and Eng. Inc.*, IPR2021-01585, Paper 11, 13-14 (PTAB May 5, 2022). Thus, Factor (e) weighs against discretionary denial.

Factor (f) weighs against discretionary denial. This Petition is supported by the Jobin declarations (EX1003), which provides new analysis as to K-fee is not entitled to foreign priority (*Id.*, ¶¶151-187). Thus, Factor (f) weighs against discretionary denial.

The prior art renders the Challenged Claims unpatentable as obvious, and the strength of the Petition alone supports the Board not exercising its discretion under § 325(d). *Apple, Inc. v. Omni MedSci, Inc.*, IPR2020-00029, Paper 7, 55 (PTAB Apr. 22, 2020).

X. DENIAL UNDER *NHK/FINTIV* IS ALSO INAPPROPRIATE

The co-pending litigation does not warrant denial.

Factor 1 weighs against denial or is at least neutral: The litigation is in its

early stages. And while a stay has not yet been granted, Petitioner intends to move the district court for a stay pre-institution, and if denied, will renew its motion if the IPRs are instituted. Here, IPRs are being filed on all asserted patents and Judge Wu has granted stays pending IPR even where a claim construction order has already been issued. *Vivint, Inc. v. SkyBell Technologies, Inc.*, 2022 WL 18587113, at *4 (C.D. Cal. Nov. 10, 2022).

Factor Two weighs against denial: Trial will likely occur "after the projected statutory deadline for the PTAB's final written decision." Interim Procedure, 9. The current case schedule concludes with the *Markman* hearing and thus ***no trial date has been set***. The median time to trial in this district is approximately 28 months. *See* EX1057, 68. For Judge Wu and patent cases in this district, average approximately 33 months to trial (roughly September 2025). *See* EX1058. Thus, it is more likely that the trial will occur long after conclusion of this IPR.[8]

[8] Interim Fintiv Guidance also notes that "when analyzing the proximity of the court's trial date under factor two of Fintiv, when other relevant factors weigh against exercising discretion to deny institution or are neutral, the proximity to trial should not alone outweigh all of those other factors." *See* USPTO Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with

Factor Three weighs against denial: Investment in the case has not been significant. Motion practice has been minimal and discovery is in its early stages. The parties are engaged in claim construction with the *Markman* hearing scheduled in January 2024. Petitioner was also diligent to file these IPRs within approximately two months of the PTAB instituting IPRs addressing similar issues, including on § 325(d) issues. IPR2023-00502; IPR2023-00485.

Factor Four is neutral: There may be little to no substantive overlap with the district court case if a stayed is granted.

Factor Five is neutral: The parties in the litigation and this IPR are the same.

Factor Six strongly weighs against denial: Finally, as evidenced by related IPR institutions (IPR2022-01574, IPR2023-00502, IPR2023-00485) the merits of the Petition are compelling and strongly weigh against denial by clearly showing the unpatentability of the claims, including the limitations the Examiner cited as lacking in the prior art.

Thus, the *Fintiv* factors weigh against exercising §314(a) discretion.

Parallel District Court Litigation, 8 (June 21, 2022).

XI. MANDATORY NOTICES PURSUANT TO 37 C.F.R. §42.8

A. Real Parties-In-Interest under 37 C.F.R. §42.8(b)(1).

Nestlé USA, Inc., Nestlé Nespresso SA, and Société Des Produits Nestlé SA are real parties-in-interest with Petitioner.

B. Related Matters Under 37 C.F.R. §42.8(b)(2).

Nespresso USA, Inc. is seeking declaratory judgment that it does not infringe the '722 Patent in *Nespresso USA, Inc. v. K-Fee System GmbH*, Case No. 2:22-cv-09295-GW.

C. Lead and Back-up Counsel under 37 C.F.R. §42.8(b)(3).

B. Clayton McCraw (Lead counsel) Registration No. 68,258 MAYER BROWN LLP 1221 Avenue of the Americas New York, NY 10020-1001 Telephone: (212) 506-2649 CMcCraw@mayerbrown.com	Amanda S. Bonner (Back-up Counsel) Registration No. 65,224 MAYER BROWN LLP 71 South Wacker Drive Chicago, IL 60606 Telephone: (312) 701-8645 Facsimile: 312-701-7711 asbonner@mayerbrown.com

D. Service Information under 37 C.F.R. §42.8(b)(4).

Please direct all correspondence to lead counsel at the address identified above. Petitioner consents to electronic service on counsel of record.

XII. GROUNDS FOR STANDING

Petitioner certifies that the '722 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review of the '722 Patent. 37 C.F.R. §42.104(a).

XIII. PAYMENT OF FEES

A fee of $46,000 charged to Deposit Account 130019 was paid with the filing this petition. 37 C.F.R. §§42.15(a), 42.103. Should any further fees be required by the present Petition, the Board is hereby authorized to charge the above-referenced Deposit Account.

XIV. STATEMENT OF PRECISE RELIEF REQUESTED

Petitioner requests IPR and cancellation of claims 1-24 because they are unpatentable under 35 U.S.C. §103 based on the foregoing grounds.

Date: December 12, 2023

Respectfully submitted,

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Counsel for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§42.6 and 42.105, I hereby certify that on December 12, 2023, a copy of the attached PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 11,548,722, together with all exhibits, and all other papers filed therewith, including a Power of Attorney on behalf of Petitioners, was served via Priority Mail Express on the attorneys of record for the patent owner at the following address:

Attorney of Record for Patent Owner

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Date: December 12, 2023

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CERTIFICATION PURSUANT TO 37 C.F.R. § 42.11

Pursuant 37 C.F.R. § 42.11, the undersigned certifies that this PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 11,548,722, and accompanying evidence are not being presented for an improper purpose and that all legal contentions, allegations, and denials are warranted and have evidentiary support.

Date: December 12, 2023

Respectfully submitted,

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CERTIFICATION PURSUANT TO 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 11,548,722, complies with the type-volume limitation of 37 C.F.R. § 42.24(a). The word count application of the word processing program used to prepare this paper states that the paper contains 13,948/14,000 words, excluding the parts of the paper exempted by 37 C.F.R. §§ 42.24(a)(1).

Date: December 12, 2023

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CLAIM LISTING APPENDIX

1.	A beverage system for producing a beverage, comprising:
[1.a]	a portion capsule comprising: a foil lid sealed to a base element having a cavity within which a beverage raw material is provided,
[1.b]	the base element comprising a circumferential flange having a top side to which the lid is attached
[1.c]	and a bottom side with a printed optically detectable identifier located on the bottom side,
[1.d]	the optically detectable identifier includes a surface having at least two areas which differ in their reflection properties, and
[1.e]	a beverage machine comprising: a detector to read the optically detectable identifier,
[1.f]	a media chute configured to receive and support the portion capsule, and
[1.g]	a pump controlled to push water into the portion capsule only upon a determination that the read optically detectable identifier agrees with a stored reference,
[1.h]	wherein the base element has a wall region with an electrically conductive section
[1.i]	and radial spaced and vertically oriented drawn grooves,
[1.j]	the cavity has radially spaced and vertically oriented drawn ribs.
2.	The beverage system according to claim 1, wherein the beverage machine comprises a pair of holding arms for engaging the portion capsule.
3.	The beverage system according to claim 2, wherein the holding arms engage opposing sides of the portion capsule.
4.	The beverage system according to claim 1, wherein the water is pushed into the portion capsule along a central axis that is perpendicular to the flange of the portion capsule.
5.	The beverage system according to claim 4, wherein the beverage machine comprises a mandrel that pierces the lid in a region that is offset from the central axis.
6.	The beverage system according to claim 1, wherein the beverage machine is operable to pierce the lid in a region that is offset from a central axis of the portion capsule.
7.	The beverage system according to claim 1, wherein the electrically conductive section is located all over the base element and the portion

	capsule includes a barrier layer to prevent moisture or aroma from escaping out of the portion capsule.
8.	The beverage system according to claim 7, wherein the portion capsule is assigned to a group of portion capsules that are suitable for the beverage machine, and if the portion capsule is not appropriate then the beverage machine will not operate.
9.	The beverage system according to claim 8, wherein the optically detectable identifier includes a metallic surface.
10.	The beverage system according to claim 5, wherein the beverage machine comprises a seal that is configured to bear against a top side of the lid in a region between a peripheral edge of the lid and the region of the lid that is pierced by the mandrel.
11.	The beverage system according to claim 9, wherein the beverage machine comprises a groove, and a seal at least partially located in the groove that is configured to bear against a top side of the lid in a region between a peripheral edge of the lid and the region of the lid that is pierced by the mandrel.
12.	The beverage system according to claim 11, wherein the media chute is configured to receive and support the portion capsule so that the portion capsule is in an opposing contacting relationship with the seal.
13.	The beverage system according to claim 7, wherein the optically detectable identifier is located on a side wall of the base element.
14.	The beverage system according to claim 5, wherein the optically detectable identifier has a plurality of reflective zones, the portion capsule is free of a filter, the portion capsule is made of metal, and the optically detectable identifier includes a repeat pattern.
15.	The beverage system according to claim 12, wherein the optically detectable identifier has a plurality of reflective zones, the portion capsule is free of a filter, the portion capsule is made of metal, the optically detectable identifier includes a repeat pattern, and the optically detectable identifier extends around a central axis of the base element.
16.	The beverage system according to claim 13, wherein the optically detectable identifier has a plurality of reflective zones, the portion capsule is free of a filter, the portion capsule is made of metal, the optically detectable identifier includes a repeat pattern, the optically detectable identifier extends around a central axis of the base element, and the base element is deep drawn.

17.	The beverage system according to claim 1, wherein the pump is controlled to not push heated water into the portion capsule upon a determination that the read optically detectable identifier does not agree with the stored reference.
18.	The beverage system according to claim 5, wherein the pump is controlled to not push heated water into the portion capsule upon a determination that the read optically detectable identifier does not agree with the stored reference.
19.	The beverage system according to claim 12, wherein the pump is controlled to not push heated water into the portion capsule upon a determination that the read optically detectable identifier does not agree with the stored reference.
20.	The beverage system according to claim 15, wherein the pump is controlled to not push heated water into the portion capsule upon a determination that the read optically detectable identifier does not agree with the stored reference.
21.	The beverage system according to claim 1, wherein the portion capsule includes a barrier layer.
22.	The beverage system according to claim 21, wherein the beverage machine comprises a groove and a seal that is at least partially seated in the groove, the seal is configured to bear against a top side of the lid.
23.	The beverage system according to claim 21, wherein the grooves reinforce the wall region of the base element.
24.	The beverage system according to claim 22, wherein the grooves reinforce the wall region of the base element.