

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NESPRESSO USA, INC.
Petitioner

v.

K-FEE SYSTEM GMBH
Patent Owner

Case: IPR2024-00257

Patent 11,548,722

DECLARATION OF MICHAEL JOBIN

TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	Background And Qualifications.....	1
B.	Information Considered.....	7
II.	LEGAL STANDARDS.....	8
A.	Person Of Ordinary Skill In The Art.....	9
B.	Claim Construction.....	11
C.	Obviousness.....	12
III.	TECHNOLOGY BACKGROUND.....	15
A.	Coffee Extraction Overview.....	15
B.	Single-Serve Coffee System Overview.....	17
1.	Computer Control of Single-Serve Coffee Was Known	19
2.	Capsule Placement and Ejection Arms Were Known	22
C.	Single-Serve Beverage Capsule Technology	29
1.	Deep Drawing Aluminum Capsules Was Known	29
2.	Barrier Layers and Gas-Filled Packaging Were Known	33
i.	Indentations on Single-Serve Capsules Were Known	35
D.	Single-Serve Beverage Identification System Overview.....	42
1.	Optical Capsule Identification Was Known	42
2.	Code Placement and Positioning	52
i.	Repetition of Optical Capsule Identifiers was Known	52
ii.	It was Known to Place Optical Codes Under the Capsule Flange.....	54
IV.	THE '722 PATENT	57
A.	Background Of The '722 Patent.....	57
B.	Prosecution History of the '722 Patent (Ex. 1002)	60
C.	The Challenged Claims	66
V.	CLAIM CONSTRUCTION.....	69
VI.	THE CORRECT PRIORITY DATE FOR THE '722 PATENT.....	74
1.	No Disclosure of the Claimed Invention	89
VII.	CLAIMS 1-24 ARE UNPATENTABLE BECAUSE THEY WOULD HAVE BEEN OBVIOUS TO A PERSON OF ORDINARY SKILL IN THE ART.....	98
A.	Overview of the Prior Art.....	99
1.	Overview of Yoakim (Ex. 1004)	99
2.	Overview of Jarisch 929 (Ex. 1006)	103
3.	Overview of Rossi (Ex. 1041)	107
4.	Overview of Rapparini (Ex. 1008)	109
5.	Overview of Castellani (Ex. 1009)	112

B.	Ground 1: Claims 1 and 4-24 are Obvious Over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini	112
1.	Motivation to Combine Yoakim, Jarisch 929, Rossi and Rapparini	112
2.	Claim Elements	126
a.	“A beverage system for producing a beverage, comprising:” (Preamble).....	126
b.	“a portion capsule comprising: a foil lid sealed to a base element having a cavity within which a beverage raw material is provided” (Claim [1.a]).....	127
c.	“the base element comprising a circumferential flange having a top side to which the lid is attached” (Claim [1.b])	129
d.	“and a bottom side with a printed optically detectable identifier located on the bottom side” (Claim [1.c])	131
e.	“the optically detectable identifier includes a surface having at least two areas which differ in their reflection properties” (Claim [1.d]).....	137
f.	“a beverage machine comprising: a detector to read the optically detectable identifier” (Claim [1.e]).....	138
g.	“a media chute configured to receive and support the portion capsule” (Claim [1.f])	142
h.	“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” (Claim [1.g])	144
i.	“wherein the base element has a wall region with an electrically conductive section” (Claim [1.h]).....	148
j.	“and radial[ly] spaced and vertically oriented drawn grooves” (Claim [1.i]).....	150
k.	“the cavity has radially spaced and vertically oriented drawn ribs” (Claim [1.j])	152
l.	“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.” (Claim 4)	154

m.	“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.” (Claim 5).....	155
n.	“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.” (Claim 6)	159
o.	“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.” (Claim 7)	160
p.	“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.” (Claim 8)	163
q.	“The beverage system according to claim 8, wherein the optically detectable identifier includes a metallic surface.” (Claim 9).....	165
r.	“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.” (Claim 10)	167
s.	“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.” (Claim 11)	172

t.	“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.” (Claim 12).....	174
u.	“The beverage system according to claim 7, wherein the optically detectable identifier is located on a side wall of the base element.” (Claim 13)	176
v.	“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.” (Claim 14).....	177
w.	“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.” (Claim 15)	180
x.	“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.” (Claim 16)	181
y.	“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.” (Claim 17).....	182

z.	“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.” (Claim 18).....	184
aa.	“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.” (Claim 19).....	184
bb.	“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.” (Claim 20).....	185
cc.	“The beverage system according to claim 1, wherein the portion capsule includes a barrier layer.” (Claim 21)	185
dd.	“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.” (Claim 22)	186
ee.	“The beverage system according to claim 21, wherein the grooves reinforce the wall region of the base element.” (Claim 23)	186
ff.	“The beverage system according to claim 22, wherein the grooves reinforce the wall region of the base element.” (Claim 24)	187
C.	Ground 2: Claims 2-3 Are Obvious Over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini and in further view of Castellani	188
1.	Motivation to Combine	188
2.	Claim 2	192
3.	Claim 3	194
VIII. SUPPLEMENTATION.....		195

I. INTRODUCTION

1. My name is Michael Jobin, and I have been retained by the law firm of Mayer Brown LLP on behalf of Nespresso as an expert in the relevant art.

2. I have been asked to provide my opinions and views on the materials I have reviewed in this case related to Ex. 1001, U.S. Patent No. 11,548,722 (“the ’722 Patent”) (“the patent-at-issue”), and the scientific and technical knowledge regarding the same subject matter before and for a period following the filing date of the first application for the patent-at-issue.

3. I am being compensated at the rate of \$300/hour for my work, plus reimbursement for expenses. This is my standard hourly rate for engagements of this nature. My compensation has not influenced any of my opinions in this matter and does not depend on the outcome of this proceeding or any issue in it.

4. My opinions and underlying reasoning for these opinions are set forth below.

A. Background And Qualifications

5. I am currently the Director of Product Development at 908 Devices in Boston, Massachusetts. I have 32 years of experience in product and technology development as a designer, mechanical engineer, consultant, and entrepreneur. I have summarized in this section my professional background, educational background, and patents that I have received. My full curriculum vitae is attached as Appendix A to this report.

6. I received two degrees from the University of Michigan in 1991, a Bachelor of Science, Engineering with a focus on Mechanical Engineering, and a Bachelor of Fine Arts, Industrial Design with a focus on product development, both *cum laude*. I was the recipient of the Kiefer Award for excellence in Industrial Design as the top product design in a juried competition.

7. After my undergraduate degrees, I was hired as a program manager by Design 4 Plastics, Inc. I leveraged my industrial design and engineering education to develop a wide range of products. My projects included a heavy emphasis on plastic part design (including injection molding, rotational molding and thermoforming) and sheet metal fabrication (stamping, forming). While there, I also designed fluid pumps for laboratory and industrial fluid dispensing applications. I also designed a custom device for scanning bar codes on trade show badges.

8. Next, in 1996, I joined Proteus, Inc. as Senior Mechanical Engineer. There, I focused on product design and engineering of products for consumer, medical, and laboratory applications. For example, I developed a disposable cartridge for laboratory analysis of blood samples. I also designed consumer products such as water filters and electric fans. *See, e.g.*, U.S. Des. Pat. No. D425,979.

9. I founded Boston Innovation in 1998, focusing on developing precision fluidic dispensing instruments for pharmaceutical research applications that leveraged a novel pressure activated valve technology that I invented. In these instruments,

sample fluid was stored in small sealed reservoirs, and precision low volumes dispensed by the translation of a needle and application of a rinse fluid and/or air pressure. *See, e.g.*, U.S. Pat. Nos. 6,085,773 and 6,706,538.

10. In 2000 I joined Arthur D. Little, where I led mechanical engineering of a next-generation network storage product, integrating contributions of mechanical, software, hardware and industrial designers.

11. I founded MicroBioSciences in 2001. There, I invented and developed novel disposable fluid handling cartridges for high throughput screening in pharmaceutical research.

12. Later in 2001, I joined Altitude, Inc., a product development consulting firm, first as Engineering Manager, and then I was promoted to Director of Engineering in 2005. I performed design and engineering activities, and also led a team of designers and engineers to develop a wide range of consumer products, medical devices and instrumentation. Many of these products and technologies were comparable in complexity to coffee makers with replaceable capsules. Some examples are described below.

13. For Sunbeam, I developed a clothing iron with fluid reservoir, heater and steam generation, and a new automatic drip coffee maker. The coffee maker included a brew basket for disposable filter, a water reservoir, an inline heater with electronic controls.

14. For Honeywell I developed a range of mechanical and electric consumer products of similar complexity to single-serve coffee systems. For example, I designed an electric heater fan that included a quartz heating element, fan and electronic controls, similar to the complexity found in single-serve coffee and espresso machines.

15. For PUR I designed bottle-based water cooler for home and office use. This included water reservoirs for hot and cold water, and dispensing valves.

16. For Mr. Coffee, I designed an automatic drip coffee maker, which included a water reservoir, inline heater, programmable timer and a silicone based heater mat. I also performed a detailed study of the coffee carafe pour spout geometry, optimizing it to significantly reduce drips.

17. For Margaritaville, I developed the first integrated ice shaving and blending frozen drink appliances for home use. These products included a reservoir for ice, a robust motor and rotary ice shaving blade, a blender and electronic controls.

18. For Skybar, I developed a wine preservation and dispensing system for home use. The product stored multiple wine bottles at the user-selected optimum temperature using thermoelectric chiller technology, and used valves and air pressure for dispensing, and vacuum for preservation.

19. For Symbol Technologies (now owned by Motorola), I developed a range of handheld barcode scanners typically used in retail or warehouse applications.

20. For Niton (now owned by Thermo Electron), I developed portable X-Ray Fluorescence (XRF) instruments for metals analysis. These incorporated a bar code scanner for sample identification.
21. In 2008 I founded Aston Technology Advisors, and continued with product development and consulting activities.
22. For Second Wind, Inc. (now owned by Vaisala), I developed an instrument that uses sound to measure wind. This included patented custom speakers and a novel heating system for melting snow. *See* U.S. Pat. Nos. 8,958,269 and 9,279,821.
23. For Optimyst, I developed a handheld eye medication dispenser. This product included a custom disposable fluid cartridge and ultrasonic dispensing technology. *See* U.S. Pat. Nos. D597,206; 8,545,463; 8,012,136.
24. For a major beer company, I worked on many aspects of a home-based beer dispenser system, with a special focus on identification technologies to prevent counterfeit or unlicensed beer cartridges. A range of solutions were analyzed, including cartridge shapes, ribs, grooves, bosses, receptacles, barcodes, RFID tags, and associated sensors like switches, optical sensors and antennas.
25. In 2012, I cofounded 908 Devices Inc. to develop portable chemical detection instrumentation. Here I have developed various instruments with applications in pharmaceutical research, forensics and hazardous material identification at the point of need. These instruments include complex fluid handling systems, custom pumps,

fluid cartridges, custom heaters for sample heating and an integrated bar code scanner for reagent and cartridge identification. See U.S. Pat. Nos. D703,074; D703,075; 9,093,253; 9,502,226; 9,698,000; 9,978,574; 10,438,787.

26. Throughout my professional career, I have designed products that have won various awards, including: Industrial Designers Society of America (IDSA) IDEA Awards, R&D 100, The Scientist Top 10 Innovations, and The Instrument Business Outlook Industrial Design Gold Award.

27. I am also a named inventor on nineteen issued utility patents and six issued design patents, listed in my CV. These patents range in technologies from consumer products to medical devices to instrumentation, and address technical issues like precision fluid handling, heating systems, and compact mass spectroscopy.

28. I have served as an expert in multiple cases regarding the design of single-serve coffee systems, with a focus on issues related to disposable cartridges or capsules. For example in *Keurig, Inc. v. Kappos*, I was hired on behalf of the United States Patent & Trademark Office as an expert regarding technical concepts related to a USPTO Examiner's rejection of patent claims around Keurig's K-Cup coffee pods, including analysis of relevant prior art. Ultimately, the USPTO Examiner's rejection was affirmed on appeal.

29. In *Keurig, Inc. v. Sturm Foods*, I was hired on behalf of Sturm Foods in a patent infringement litigation to test and evaluate mechanical features of over one

dozen Keurig and licensed single-serve coffee makers in the context of customer use of compatible capsules. I understand that Sturm won that case on summary judgment, which was affirmed on appeal.

30. I have also conducted extensive analysis of the operation and performance of various single-serve coffee systems and capsules developed between roughly 2004-2015 through other expert and consulting engagements. For example, I evaluated the technical design of the brewing unit, capsule cage, piercing blades, and water pump in connection with single-serve coffee and espresso machines manufactured by Nestle Nespresso SA. I also tested the performance of compatible capsules from around the world, including the materials, specifications and manufacturing techniques. For example, I determined material failure modes and reliability issues with a particular series of compatible capsules, including flow rates, piercing inconsistencies, and structural failures under heat and pressure during the brewing cycle in single-serve coffee systems. In total, I have spent over 500 hours analyzing single-serve coffee systems and capsules for various expert witness and consulting engagements.

B. Information Considered

31. This Declaration sets forth the opinions that I have formed related to the '722 Patent based on my personal knowledge, education, research, personal and professional experience, and the information I have reviewed as of the date of this

Declaration. In addition to my general knowledge gained as a result of my education and experience in this field, I have reviewed and considered, among other things, the '722 Patent, the prosecution history of the '722 Patent, and the prior art I identify in this declaration.

32. The full list of information that I have considered in forming my opinions for this report is set forth throughout the report and listed in the attached Appendix B.

II. LEGAL STANDARDS

33. I am not an attorney. In forming my opinions and considering the patentability of the claims of the '722 Patent, I am relying upon certain legal principles that counsel has explained to me. I have applied those legal principles in arriving at the conclusions expressed in this Declaration.

34. I understand that for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious in light of what came before it. Patents and publications which predated the invention are generally referred to as “prior art.”

35. I understand that in this proceeding the burden is on the party asserting unpatentability to prove it by a preponderance of the evidence. I understand that “a preponderance of the evidence” is evidence sufficient to show that a fact is more likely than not.

36. I understand that in this proceeding, the claims must be given their plain and ordinary meaning consistent with the specification and file history, as understood by a person of ordinary skill in the art. The claims after being construed in this manner are then to be compared to information that was disclosed in the prior art.

A. Person Of Ordinary Skill In The Art

37. I have been informed that the claims of a patent are judged from the perspective of a hypothetical construct involving “a person of ordinary skill in the art.” The “art” is the field of technology to which the patent is related. I understand that the purpose of using a person of ordinary skill in the art’s viewpoint is objectivity. Thus, I understand that the question of validity is viewed from the perspective of a person of ordinary skill in the art, and not from the perspective of (a) the inventor, (b) a layperson, or (c) a person of extraordinary skill in the art. I have been informed that the claims of the patent-at-issue are interpreted as a person of ordinary skill in the art would have understood them in the relevant time period (*i.e.*, when the patent application was filed or earliest effective filing date).

38. I understand that there are several factors to consider in determining who would be a person of ordinary skill in the art. These include (i) the types of problems encountered in the art, (ii) the prior art solutions to those problems, (iii) the rapidity with which innovations are made, (iv) the sophistication of the technology, and (v) the educational level of active workers in the field.

39. I understand that a “person of ordinary skill is also a person of ordinary creativity, not an automaton,” and may be able to fit the teachings of multiple patents together like pieces of a puzzle as familiar items may have obvious uses beyond their primary purposes.

40. Based on these factors together with my experience, it is my opinion that a person of ordinary skill in the art relevant to the '722 Patent would be a person with at least a bachelor's degree in engineering plus five years of experience in design of mechanical beverage systems, or similar products. I understand that in IPR2022-01574 (over U.S. Patent 11,254,491), the Board adopted this definition in its Institution Decision, but also included “experience with sensors for recognizing an identifier” in the definition. I agree with the Board that a POSITA would also have this experience. I had those capabilities myself as of the July 22, 2010 filing date of K-fee's earliest filing in the '722 Patent family. In particular, I met the educational requirement and was actively designing beverage systems and other types of fluid systems and consumer products with comparable elements to the subject matter of the '722 Patent. As detailed above, I also have experience with sensors for recognizing an identifier. I consider myself a person having skill in the art as of before July 22, 2010. Accordingly, my opinions contained herein are based on this level of ordinary skill in the art at the time of the invention.

B. Claim Construction

41. I understand the first step in determining whether a patent claim is valid is to properly construe the claims. I understand that each claim of a patent subject to *inter partes* review is to be interpreted in light of the language of the claim, the written description, the figures, and the prosecution history of the patent.

42. I further understand that in the absence of a specific definition within the specification or the reliance on a specific meaning in the prosecution history, the terms as used in the challenged claims of the '722 Patent are to be afforded their plain and ordinary meaning at the time of the invention. I understand that the “plain and ordinary meaning” of a term means the ordinary and customary meaning given to the term by those of ordinary skill in the art at the time of the invention and that the ordinary and customary meaning of a term may be evidenced by a variety of sources, including the words of the claims, the specification, drawings, and prior art.

43. I understand that in construing claims all words in a claim must be considered in judging the patentability of that claim against the prior art.

44. I understand that extrinsic evidence may be consulted for the meaning of a claim term as long as it is not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence. I also understand that in construing claim terms, the general meanings gleaned from reference sources should be compared against the use of the terms in context, and the intrinsic record should be consulted to

identify which of the different possible dictionary meanings is most consistent with the use of the words by the inventor.

45. I also understand that a patentee is not able to construe the scope of a patent claim one way to allege infringement, but a different way to avoid a finding of invalidity. As explained in more detail below, in the district court litigation, Patent Owner has advanced infringement theories relating to certain terms of the '722 Patent. While I do not agree with how Patent Owner has interpreted its claims, I have attempted to apply the reasoning behind Patent Owner's infringement analysis in connection with the prior art set forth below. Under this analysis, it is my opinion that the '722 Patent claims are invalid.

C. Obviousness

46. I understand that a claim can be invalid in view of prior art if the differences between the subject matter claimed and the prior art are such that the claimed subject matter as a whole would have been "obvious" at the time the invention was made to a person having ordinary skill in the art.

47. I understand that the obviousness standard is defined at 35 U.S.C. § 103(a). I understand that a claim is obvious over a prior art reference if that reference, combined with the knowledge of one skilled in the art or other prior art references disclose each and every element of the recited claim.

48. I also understand that the relevant inquiry into obviousness requires consideration of four factors:

- a. The scope and content of the prior art;
- b. The differences between the prior art and the claims at issue;
- c. The knowledge of a person of ordinary skill in the pertinent art; and
- d. Objective factors indicating obviousness or non-obviousness which

may be present in any particular case, such factors including commercial success of products covered by the patent claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention by the infringer or others in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and that the patentee proceeded contrary to the accepted wisdom of the prior art.

49. I understand that when combining two or more references, one should consider whether a teaching, suggestion, or motivation to combine the references exists so as to avoid impermissible hindsight. I have been informed that the application of the teaching, suggestion or motivation test should not be rigidly applied, but rather is an expansive and flexible test. For example, I have been

informed that the common sense of a person of ordinary skill in the art can serve as motivation for combining references.

50. I have also been informed and understand that it is appropriate to consider, among other factors: (i) whether the teachings of the prior art references disclose known concepts combined in familiar ways, which, when combined would yield predictable results; (ii) whether a person of ordinary skill in the art could implement a predictable variation, and would see the benefit of doing so; (iii) whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art; (iv) whether a person of ordinary skill would have recognized a reason to combine known elements in the manner described in the claim; (v) whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; and (vi) whether the alleged invention applies a known technique that had been used to improve a similar device or method in a similar way.

51. I understand that the content of a patent or other printed publication (i.e., a reference) should be interpreted the way a person of ordinary skill in the art would have interpreted the reference as of the effective filing date of the patent application for the '722 Patent. I have assumed that the person of ordinary skill is a hypothetical person who is presumed to be aware of all the pertinent information that qualifies as

prior art. In addition, the person of ordinary skill in the art makes inferences and creative steps. He or she is not an automaton, but has ordinary creativity.

52. I have been informed that the application that issued as the '722 patent was filed on July 23, 2021, but claims priority to an International Patent Application (PCT/EP2011/003677) filed on July 22, 2011. I understand that the '722 Patent claims further priority to three foreign patent applications filed in 2010; however, as explained in Section VI, the '722 Patent should not receive priority to those foreign patent applications because the foreign patent applications do not provide written description support for the '722 Patent claims. As a result, unless otherwise stated, I will assume the relevant time period for determining what one of ordinary skill in the art knew is prior to July 22, 2011.

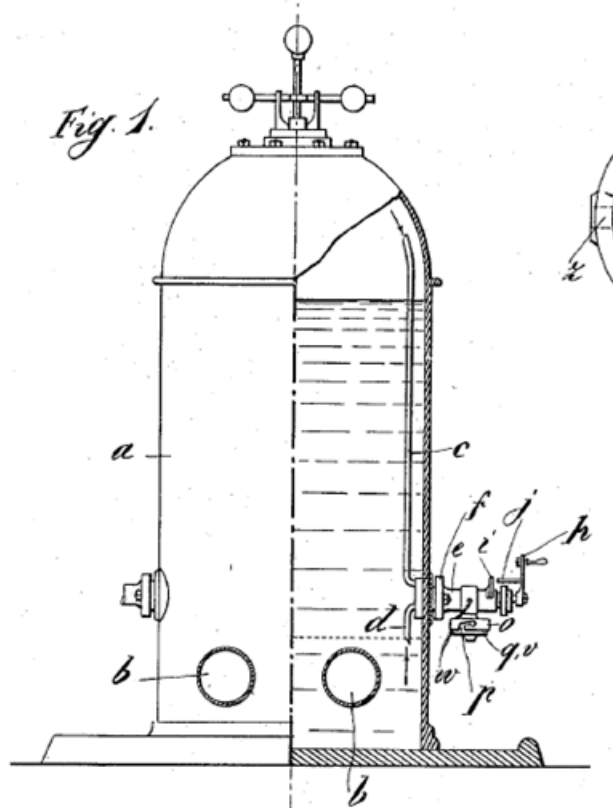
III. TECHNOLOGY BACKGROUND

A. Coffee Extraction Overview

53. It has been known for centuries to interact flavored, soluble materials with water to prepare beverages such as coffee, espresso, tea, cocoa and the like throughout various parts of the world. (See, *e.g.*, Ex. 1012, National Coffee Association (NCA), “The History of Coffee,” <https://www.ncausa.org/about-coffee/history-of-coffee> (last accessed Sept. 19, 2022); see also Ex. 1013, U.S. Pat. Pub. 2002/0078831 to Cai (“Cai”) at [0002].) Generally speaking, the process of

preparing coffee beverages is referred to as “extraction,” which describes removing compounds found in coffee beans and dissolving in water.

54. While many coffee preparation techniques occur under ambient pressure conditions (such as drip coffee), espresso (another type of coffee beverage) was traditionally prepared by forcing steam and hot water through a bed of coffee grounds at high pressure, enabling preparation of a coffee beverage in less than a minute. (See, e.g., Ex. 1014, U.S. 726,793 to Bezzera at FIG. 1.)



Ex. 1014, Bezzera at FIG. 1.

55. Eventually, a desire for convenience led to prepackaged packets of ground coffee as a substitute for manually measuring coffee from bulk packages of loose

ground coffee and espresso. (*See, e.g.*, Ex. 1015, Glucksman at [0006].) The market also evolved to indicate a preference for brewing individual beverage servings. (*Id.* at [0007].)

56. What followed was portioned, or “single-serve” style coffee machines in various formats in the 1960s and 70s. (*See, e.g.*, Ex. 1016, U.S. 3,387,553 to Tavera (prepacked coffee filter package); Ex. 1017, U.S. 3,631,793 to Bednartz (single-serve pot insert for coffee infusion).)

B. Single-Serve Coffee System Overview

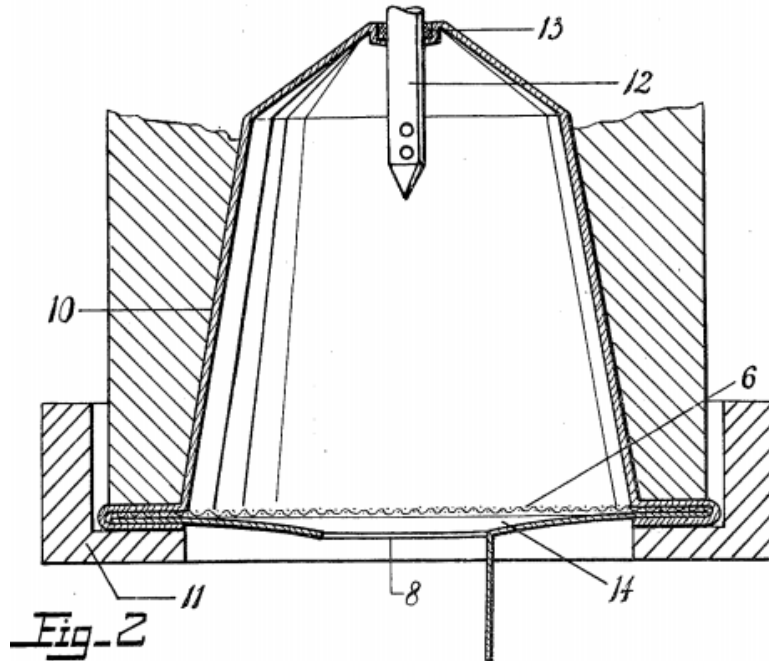
57. Since the introduction of the single-serve coffee options by the 1960s and 70s, the market has seen various evolutions and advancements into single-serve coffee systems and corresponding capsules. By 2010, many single serve coffee extraction systems were known and available for purchase, including those by Keurig, Nespresso, Senseo, Illy, among others. These systems can brew many single-serve beverages, including coffee (both drip and espresso), tea, and hot chocolate.

58. At a high level, single-serve coffee capsule extraction systems operate similarly. Ground coffee is sealed by the manufacturer in small, single use capsules or pods. These capsules are convenient for customers, who don’t have to measure loose coffee grounds or deal with the mess that loose coffee grounds can sometimes create. Consumers typically place the single-serve capsule into a brewing chamber of the machine, close the chamber to seal it, and press a button or switch to initiate

the extraction process, which causes the machine to mix heated water with coffee grounds inside the capsule to brew coffee.

59. The components of a single-serve extraction system are well known. An extraction system includes a location for a user to place the capsule into a brewing chamber where the extraction will occur. The brewing chamber typically includes blades or needles to pierce a location of the capsule upon closing. The system uses a water pump (such as a solenoid) to pump water from a reservoir, which can be under low or high pressure depending on the method of extraction. The system includes a heater (such as a thermoblock) to heat the water to a predetermined temperature. The system then injects heated water into the chamber where the capsule resides, often directly into the interior of the capsule body through the blade or needle. After the water mixes with the coffee grounds inside of the capsule, the extracted beverage exits from the capsule, and out through a nozzle, into the user's cup for drinking.

60. One of the early single-serve coffee capsule extraction systems containing the above-mentioned features was Nespresso's. An example disclosure of this type of system is shown in U.S. Pat. 4,136,202 to Eric Favre. (*See* Ex. 1018 ("Favre").) As shown below, Favre disclosed an aluminum capsule that is placed into a bayonet-style chamber, sealed, and pierced in the rear by a needle (12) that injects water directly into the capsule.



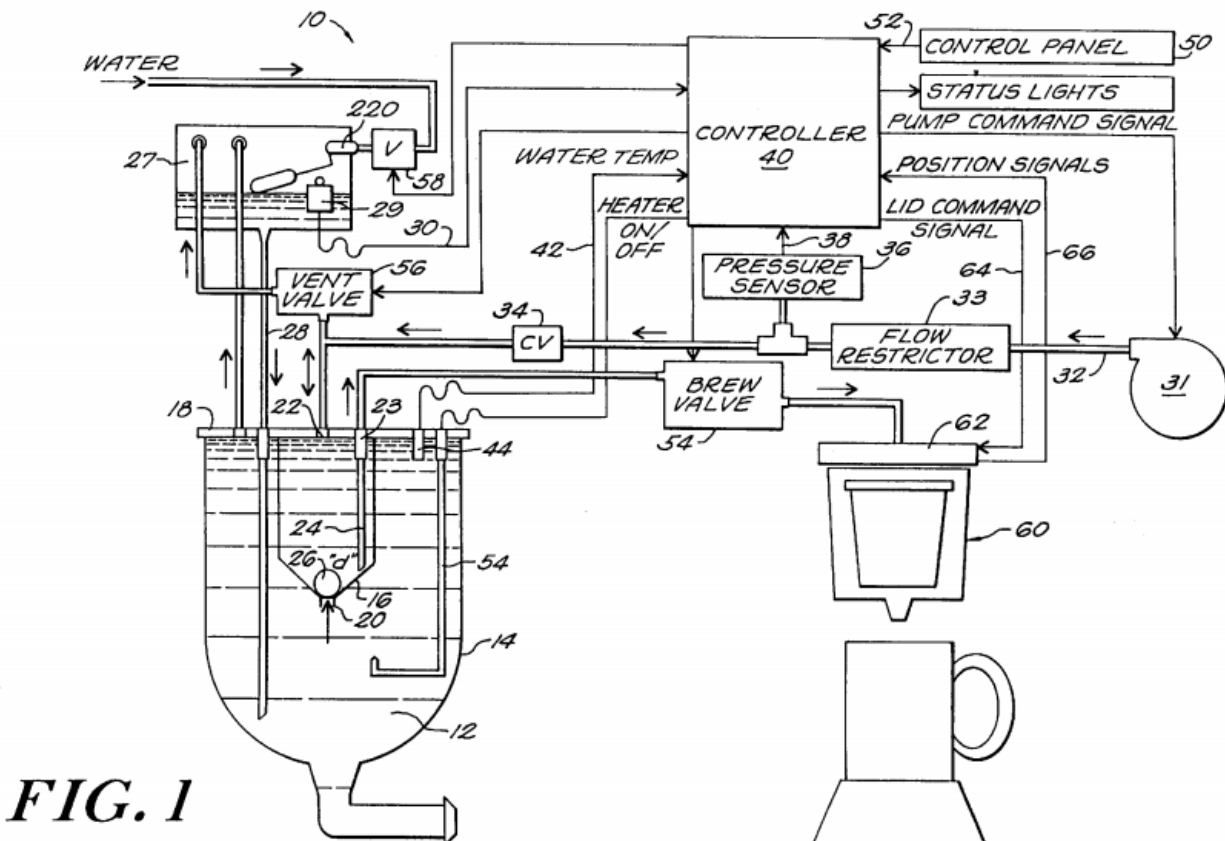
Ex. 1018, Favre at FIG. 2.

The system injected hot water at high pressures up to about 16 bar. (Favre at col. 2, lines 17-23.) This high-pressure coffee extraction process duplicated conditions achieved in larger commercial espresso machines, resulting in an espresso style drink with a characteristic crema on top. The proposed capsule was aluminum in material much like Nespresso's capsules before 2010 and through today. The capsule was closed by an optional filter (6) and a foil membrane (5). The membrane was scored to facilitate it breaking open under pressure in a predictable manner to allow coffee to exit during extraction. (*Id.* at col. 2, lines 24-31.)

1. Computer Control of Single-Serve Coffee Was Known

61. By 2000, automated single-serve beverage extraction systems that utilize computer controls were known, such as those developed by Keurig and disclosed in

U.S. 6,142,063 to Beaulieu (“Beaulieu”). (See Ex. 1019.) An image of the components of Beaulieu’s system is shown below:



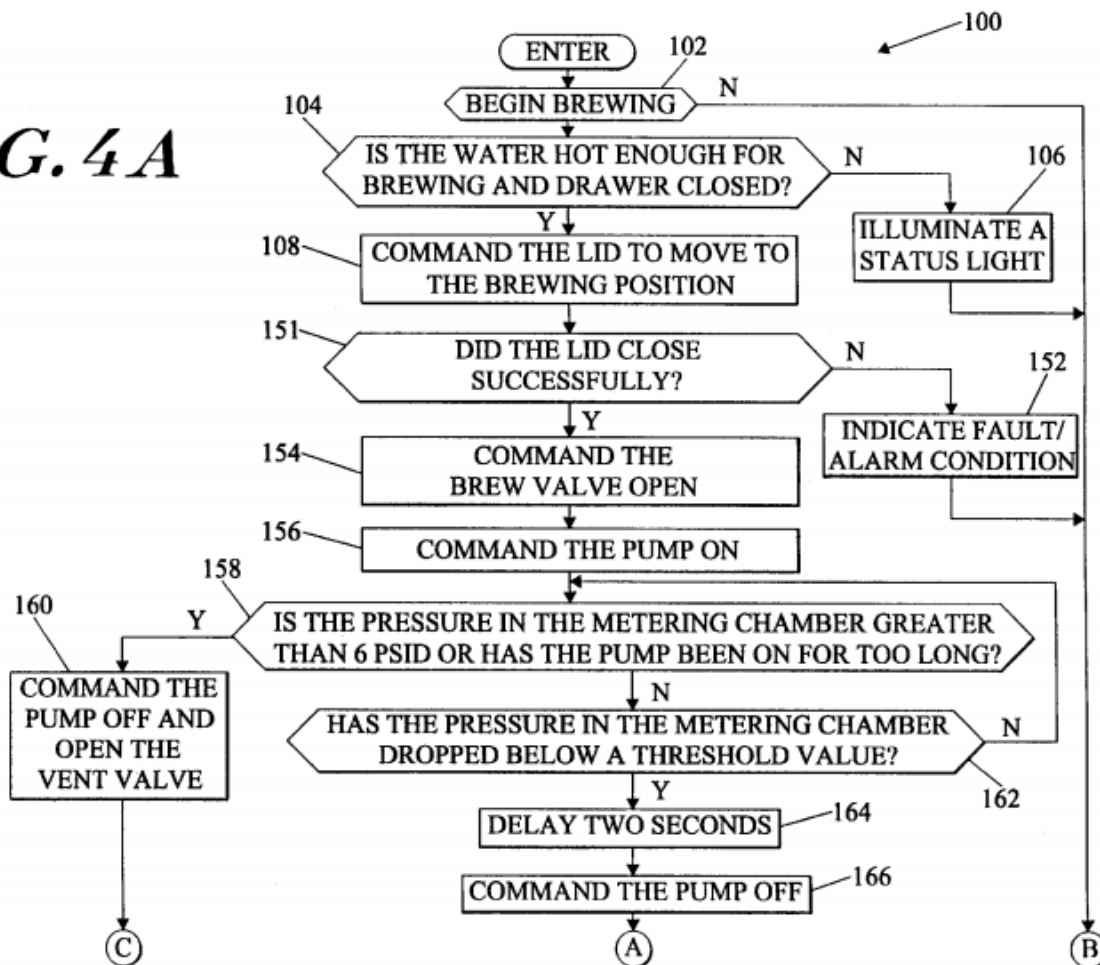
Ex. 1019, Beaulieu at FIG. 1.

62. As shown, a water storage tank (14) receives water from reservoir (27). Water then flows into metering chamber (16), which controls the amount of hot water dispensed per brew cycle. To dispense, pump (31) applies air pressure to the metering chamber, pushing water through conduit (24) and into the beverage capsule holder to facilitate extraction of the coffee therein. Various sensors, valves and the

pump are connected to the controller (40), which monitors and controls the brewing sequence. (Beaulieu at col. 2, line 21 to col. 3, line 11.)

63. Beaulieu disclosed using computer controls for the extraction process, as set forth in the figure below. This included multiple steps of controlling the system's pump during extraction based on sensed values (*e.g.* items 156, 160, 166). Beaulieu explains that the controller waits for the user to press the brew button, checks that the water is hot enough and that the drawer is closed (104), and that the lid closes (151). The system then opens the brew valve (154) and turns on the pump (156). While the pump is operating, the controller monitors pressure and timing (158), and if limits are exceeded, the controller turns the pump off and vents the system (160). If the controller senses a pressure drop indicating the metering chamber is empty (162), it waits two seconds (164), then turns off the pump (166). Beaulieu's use of a controller and corresponding sensors to control the brewing process in a single-serve coffee system, and in particular starting and stopping the water pump, would have been well-known by 2010.

FIG. 4A



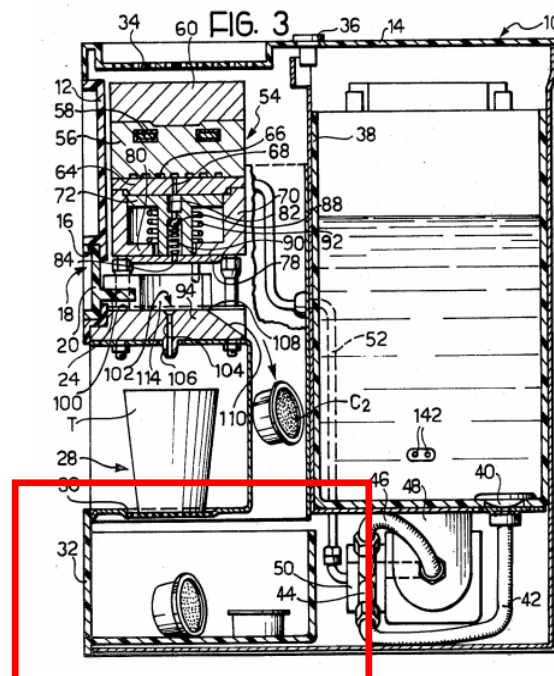
Ex. 1019, Beaulieu at FIG. 4A.

2. Capsule Placement and Ejection Arms Were Known

64. In order for a single-serve brewing machine to extract beverage from capsules, the capsule must be correctly positioned within the system for extraction, and able to be removed after extraction is complete to allow the use of a subsequent capsule. By 2010, it was well-known that capsule removal can involve automatic ejection, and can include a pre-determined location in the machine that stores the used single-

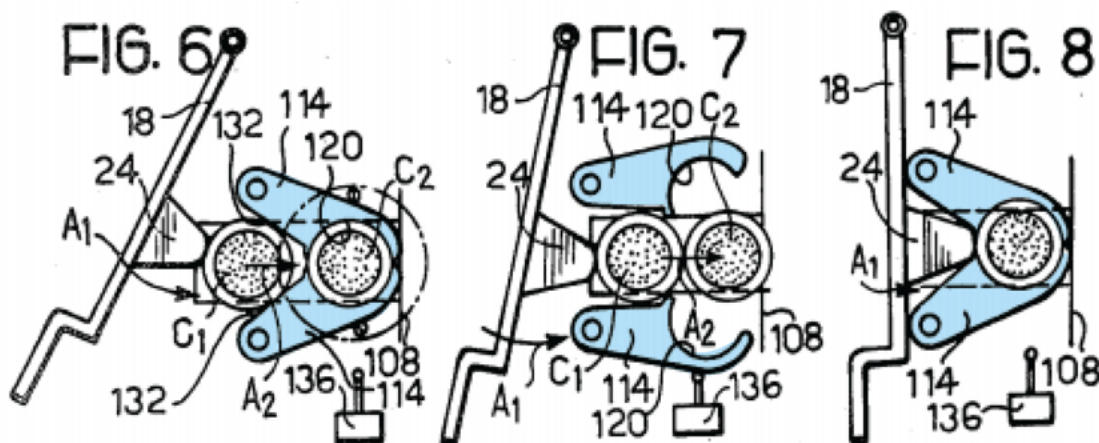
serve capsules so that a consumer does not need to touch a hot, wet capsule immediately after extraction.

65. It has long been known for single-serve beverage systems to include a container or drop-box for used capsules. For example, in 1983, Piana disclosed a drawer (32) “adapted to receive used cartridges dumped from the brewing station of the machine.” (Ex. 1020, Piana at col. 3, lines 4-10.) This feature renders the machine easier to use, as the user does not have to throw out or recycle individual capsules after each extraction, and need not physically handle dirty or high temperature capsules after extraction. Instead, used capsules are collected in the container or drop-box until it is full. Later, the used capsules can be removed all at once, which is less time consuming for the user. The drawer (32), which is configured as a box that used capsules drop into, is circled in red below:



Ex. 1020, Piana at FIG. 3.

66. When a capsule is automatically ejected into a drop box, such as in Piana, the system typically also includes a mechanism to hold and eject the capsule after extraction. This technology also dates back decades, and is shown in the 1983 Piana system below. Piana discloses a pair of arms that grasp the capsule under its rim, position it for extraction, and then move apart in a manner that drops the used capsule into the drop box after extraction. (Ex. 1020, Piana at col. 5, lines 15-31.) Piana's arms for holding and ejection are shown below in blue:



Ex. 1020, Piana at FIGs. 6-8.

67. Many other single-serve brewing systems were known before 2010 that included capsule positioning and ejection features. By 2003, Keurig developed an extraction system including two arms that support and position the capsule before and after extraction. (See Ex. 1021, Lazaris at col. 3, ll. 6-8, ll. 24-31 and ll. 47-56.) The arms were spring-loaded such that they extend outwardly and assist with

ejection of the capsule from the machine after extraction. (*Id.* at col. 4, ll. 39-43.)

The Lazaris ejection arms are shown below in blue in FIG. 7 at 46, 48:

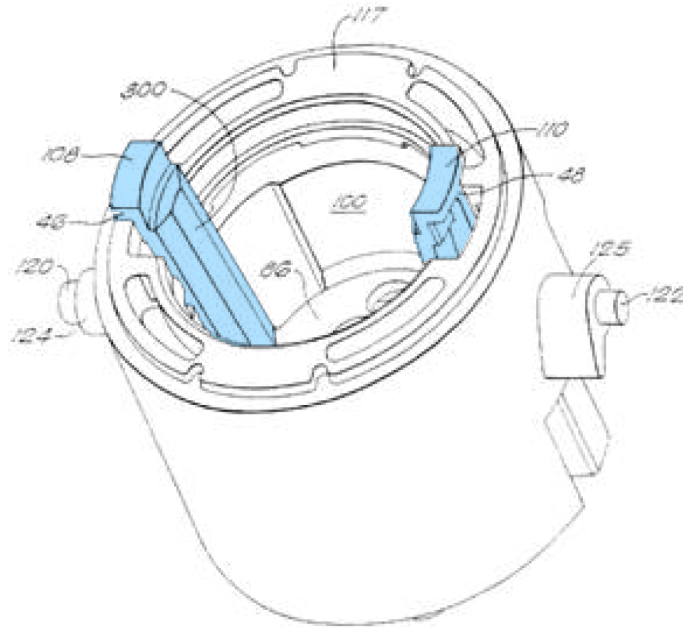


FIG. 5

Ex. 1021, Lazaris at FIG. 5.

68. Ryser disclosed two pivoting capsule guiding means (31) that hold the capsule in brewing position when the capsule is inserted. (See Ex. 1022, U.S. Pat. Pub. 2006/0230941 to Ryser, at [0049] to [0051].) After brewing, as the brewing chamber is retracted, and the guiding means (31) release the capsule, allowing it to drop into a waste bin by the force of gravity. (*Id.*) This is shown below in FIG. 8 in blue.

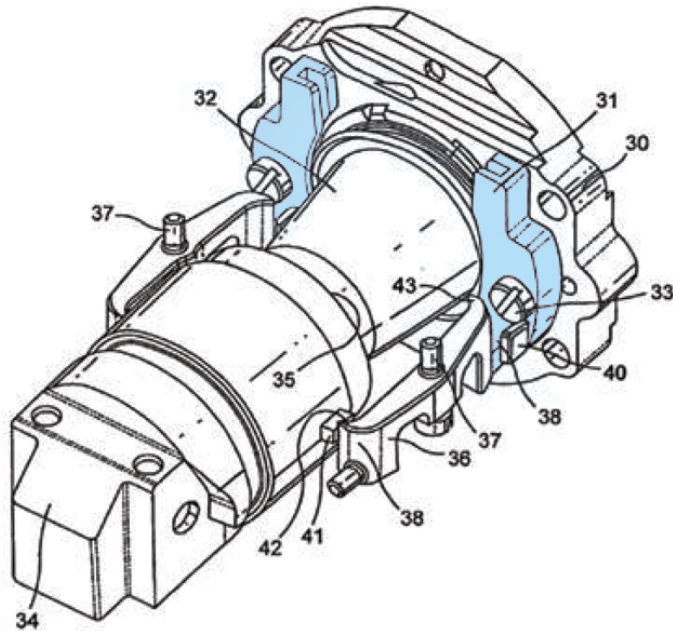
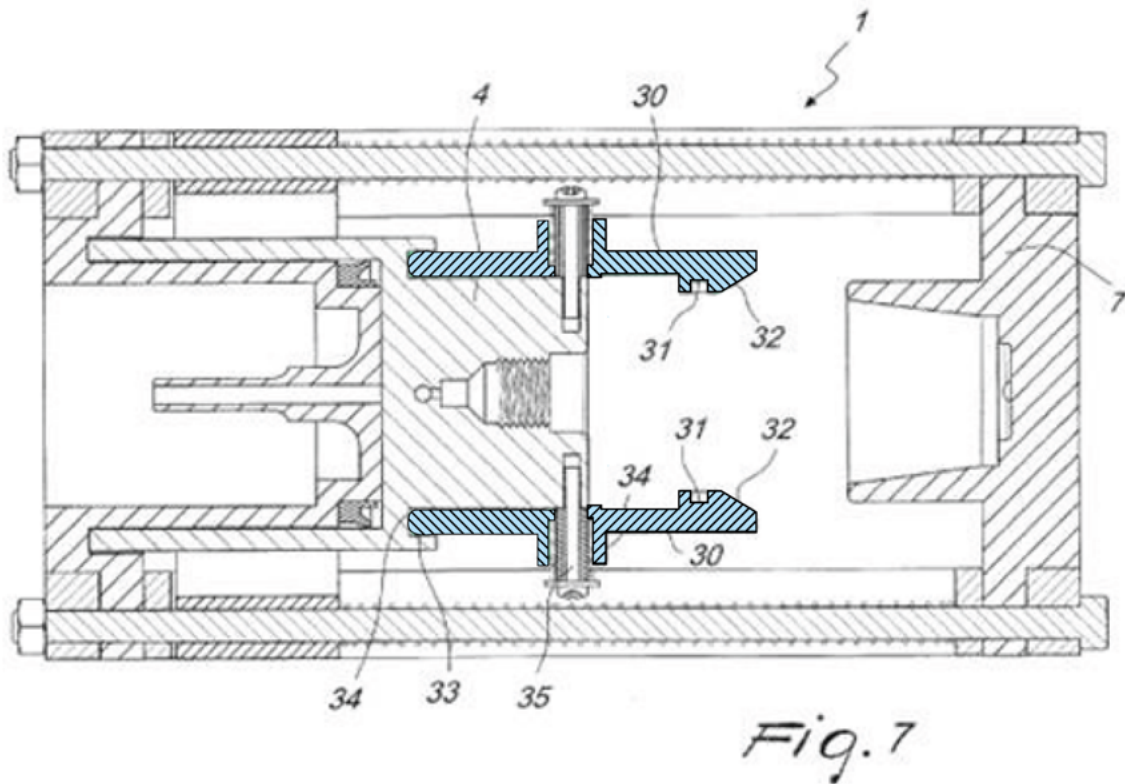


FIG. 8

Ex. 1022, Ryser at FIG. 8.

69. On July 4, 2007, Cheng filed patent application U.S. 2009/0249961, which also discloses a pair of arms for positioning and holding the capsule by the rim. (See Ex. 1023 at [0043], FIG. 7.) Cheng disclosed a system where arms surround the capsule to expel it after use. (*Id.* at [0008] and [0015].) After brewing, the arms pull the capsule out of the receptacle, and allow it to drop into the waste bin. (*Id.* at [0042]-[0047].) This is shown below in blue at FIG. 7:



Ex. 1023, Cheng at FIG. 7.

70. Additionally, U.S. Pat. Pub. 2008/0105131 to Castellani, which published May 8, 2008 and is a divisional of an application filed on March 10, 2005, disclosed a delivery head for espresso machines that utilized two arms in a “fork” configuration to lift the capsule by its rim after brewing and slide the capsule inwards towards a drop-box to collect the capsule. (See Ex. 1009 at [0053]-[0054].) This is further shown in blue in FIG. 7:

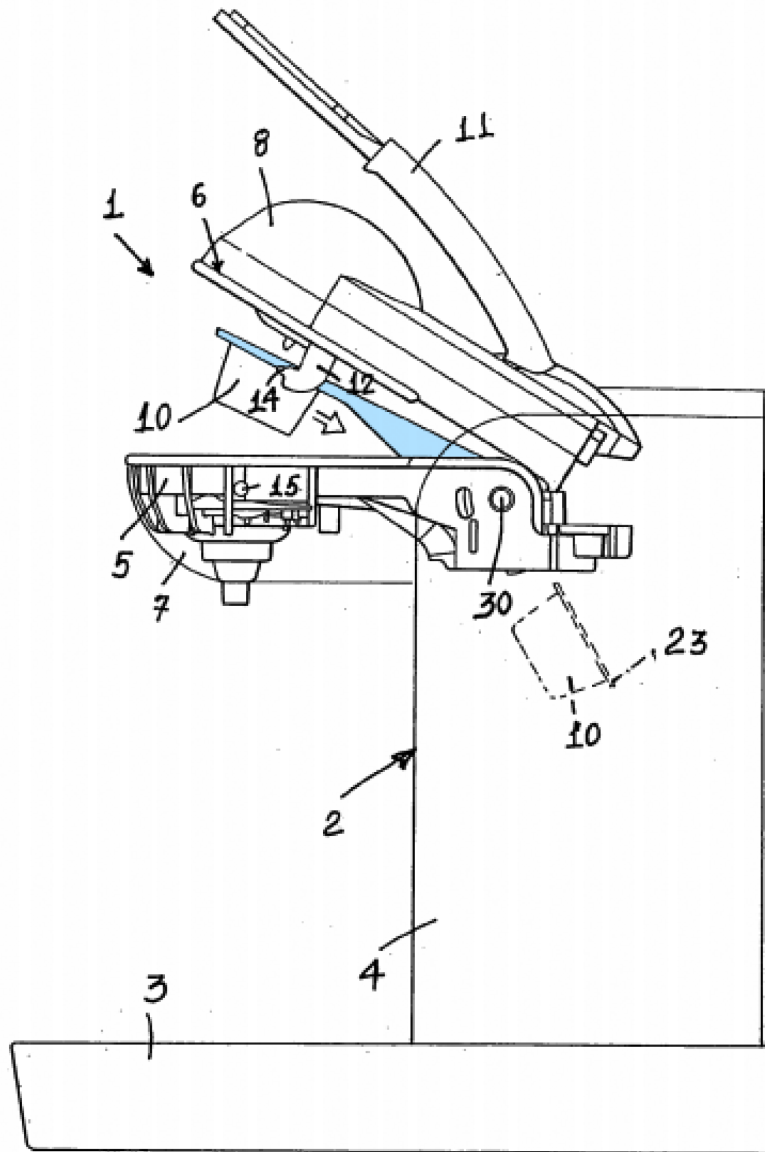


FIG. 7

Ex. 1009, Castellani at FIG. 7.

71. Accordingly, as demonstrated by the many examples above, a person of ordinary skill in the art would have known of single-serve brewing systems using arm mechanisms to position capsules, and to facilitate the automatic movement of used capsules to a waste bin for collection after brewing.

C. Single-Serve Beverage Capsule Technology

72. The art of single-serve beverage capsule design also developed significantly by the time of the '722 Patent filing. As referenced above, single-serve capsules with pierceable aluminum bodies were known from before 1980. (*See* Ex. 1018 to Favre.) These capsules were, and are, typically sealed to protect the coffee grounds from external influences such as moisture, oxygen, aromas and other elements that can impact coffee quality. (*Id.* at col. 1, lines 5-12.)

73. Over time, the desire to use single-serve coffee systems to brew beverages of different types and serving sizes led to the development of different capsule sizes and a wide variety of capsule structures. (Ex. 1015, Glucksman at [0014]-[0015].)

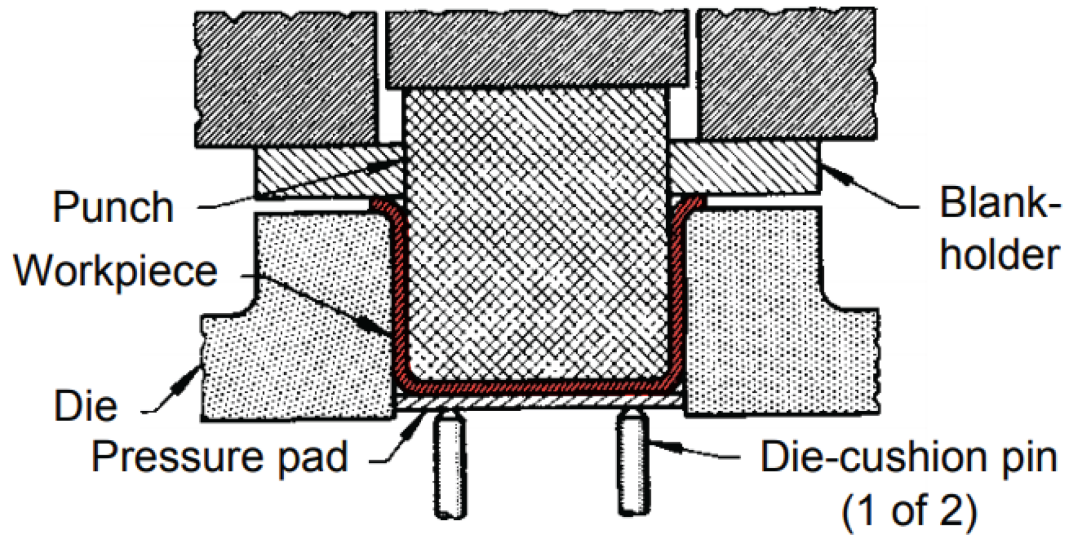
1. Deep Drawing Aluminum Capsules Was Known

74. Single-serve beverage capsules generally need to be low cost, durable enough to withstand the water pressure and temperature during the brewing process, made from food-safe materials, and should have adequate barrier properties to protect the ground beverage materials (such as tea or coffee) from oxygen, humidity, and light, which can lead to degradation of the beverage quality.

75. Aluminum is a well-known choice for single-serve capsules because it is a material with exceptional barrier properties that can preserve the beverage material contained within. Ozanne acknowledged in April 2010 that, “[c]ontainers made of aluminium foils are very current and have been known for a long time. These

containers are very often used in the field of food industry for storing and dispensing food ingredients. . . . Such aluminium containers are particularly used in the field of production of beverages: they can present the form of a capsule containing beverage ingredients designed for insertion in a beverage production device in which a liquid enters the capsule in order to interact with ingredients in the capsule and to drain a beverage from the capsule.” (Ex. 1025, WO 2010/034663 to Ozanne at p. 1, lines 7-13; *see also* Ex. 1044 to Perentes [0044]-[0045].)

76. Aluminum capsules are often manufactured by a process known as deep drawing. (See Ex. 1024, Mahlich at [0005]; Ex. 1025, Ozanne at p. 1, lines 17-23.) Deep drawing entails forming a thin sheet of aluminum with a die to obtain the desired shape. An example deep drawing die is shown in the below figure. A punch pushes the flat workpiece (i.e., the aluminum sheet) into the die, and the flat material is pulled into the vertical walls. (See Ex. 1026, ASM Handbook, Volume 14B: Metalworking: Sheet Forming, S.L. Semiatin, editor at p. 323.) The deep drawn aluminum is highlighted in red below:



(b) Double-action die

Ex. 1026, ASM Handbook at 323.

77. Deep drawing aluminum single-serve capsules starts with a roll of aluminum sheet material that can be coated or decorated on one side with a colored lacquer (for visual appearance). The other side can be coated with a food-safe lacquer or plastic film to facilitate heat welding of the lid as shown in the image below. (See Ex. 1027, <https://www.italcoat.com/wp-content/uploads/2023/02/ITC-Coffee-Capusles-1.pdf>, (Italcoat, last Dec. 2, 2023).)



Ex. 1027, Italcoat.

78. A die punches the aluminum sheet and forms the material into the shape of the capsule, resulting in a thin-walled structure. (See, e.g., Ex. 1028, Geerts at [0004].) A die trims the formed capsule flange, and the edge is formed or rolled for structural stability and to dress the sharp edge. In some capsules, a silicone or elastomeric material is applied to the lip of the rim to enhance sealing functionality during use.

79. Finally, the capsule is filled with beverage raw material (such as ground coffee), and then a flat foil lid is heat sealed in place. The foil lid is typically coated on the inside face with a food-safe lacquer for heat sealing, or it may be a foil/polyolefin film laminate.

80. Other single-serve capsules are manufactured by thermoforming plastic materials, such as polypropylene or EVOH (ethylene vinyl alcohol copolymer) laminates.

81. Similar to deep drawing, thermoforming involves using a die to shape a sheet of material. The primary difference is that the material is typically plastic, and is heated to enable it to deform and stretch into the die. (See Ex. 1029, Penix J.A. (1991) Thermoforming of Plastic Film and Sheet. In: Berins M.L. (eds) SPI Plastics Engineering Handbook of the Society of the Plastics Industry, Inc., pp. 383-426.)

82. During thermoforming of plastic capsules, rolls of plastic material are fed into a machine that heats the plastic, then forms it into the cup shape. This forming could be done by a matched die set, or by the application of pressure or vacuum to form the plastic against an open mold. A die cuts the cup from the sheet, the cups are filled with beverage raw material (such as coffee grounds) while being flushed with nitrogen, and a flat foil lid is heat sealed in place.

2. Barrier Layers and Gas-Filled Packaging Were Known

83. By the time of the '722 Patent, it was also known that multi-ply coffee packaging can include a barrier layer to increase the freshness of coffee grounds and prevent moisture or aroma from escaping the container. By 2009, it was known that “the most commonly used materials are the inexpensive and easy-to-manage flexible poly-aluminum multiple laminates, which . . . ensure an efficient barrier due to the presence of a central layer of aluminum foil.” (See Ex. 1055, Food Packaging, at 205; see also EX. 1056, Espresso Coffee, at 246. (“Commonly used materials are

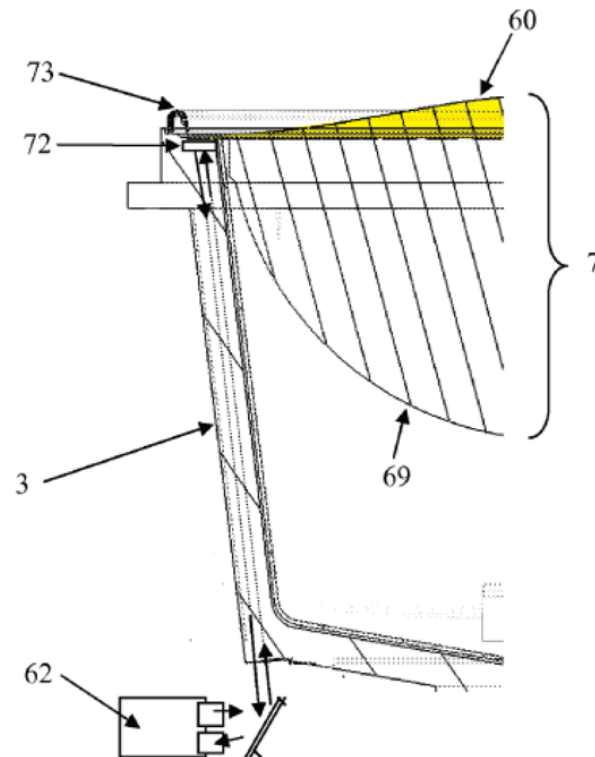
the inexpensive flexible polymer-aluminum multi-ply, ensuring an efficient barrier. . . .”).)

84. It was also known to inject inert gasses, such as nitrogen, into the sealed capsules in order to extend shelf life of the beverage materials. (*See, e.g.*, Ex. 1056, Espresso Coffee at 248. (“The use of an inert gas for coffee packaging increases shelf life three-fold . . . with respect to vacuum packaging.”); Ex. 1024, Mahlich at [0005].) Shelf life is extended because the removal of oxygen avoids oxidation of the food materials and its resulting flavor impact.

85. It was also known to pressurize the gas in the capsule by “creating a pressure inside the packaging that is higher than atmospheric pressure” because such pressurization “allows the shelf life of coffee to be extended for up to 18 months.” (*See* Ex. 1055, Food Packaging at 208.) Pressurization with an inert gas is possible, which could create a pressure differential that would slow down permeation of oxygen into the container. Pressurization can also be caused by CO₂ outgassing from coffee grounds inside of the container. If the coffee grounds are not degassed prior to packaging, this could result in increased pressure in the container. (Ex. 1056 at 249-250.)

86. Such pressurization results in a greater pressure inside the capsule than in the outside atmosphere, thus resulting in the capsule’s foil lid bowing outwardly like a balloon. Accordingly, it is obvious to a person of skill in the art that pressurization

of a coffee capsule would result in an outwardly bowed appearance of the capsule's foil membrane, such as shown in the following figure (highlighted in yellow):



Ex. 1006, Jarisch 929 at FIG. 5.

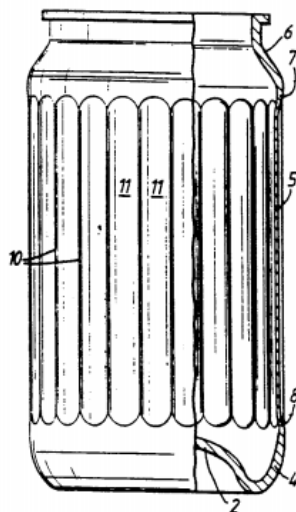
i. Indentations on Single-Serve Capsules Were Known

87. It was also well-known that single-serve capsules must endure pressure, temperature and physical stresses during the brewing process, and withstand the forces of a user's hand grasping and manipulating the capsule. As a result, single-serve capsules evolved to include certain textures such as grooves, ribs, and/or indentations on the capsule body wall to improve structural stability of the capsule, or otherwise provide aesthetic appeal. Depending upon the configuration, such features can strengthen the capsule during handling by the user, during piercing by

the machine, or during the temperature and pressure of the extraction process. Such features may also be used to facilitate orientation of the capsule in the brewing chamber, or used to influence fluid flow inside the capsule. Certain capsule configurations of grooves, ribs or indentations could also be purely aesthetic or ornamental.

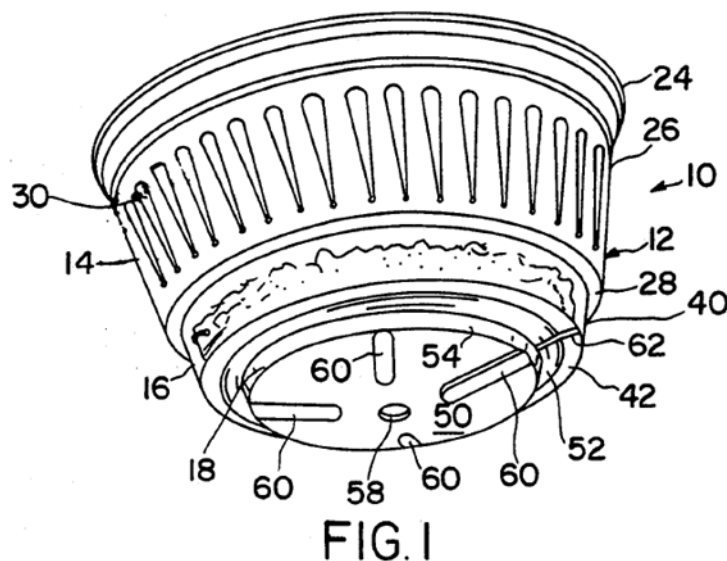
88. The concept of stiffening a thin wall structure with grooves or ribs is an old and well-known engineering principle. For example, Davis discloses a ribbed grip area in a thin wall cup for stiffening. (See Ex. 1030, Davis, at col. 1, lines 14-21.) Similarly, Claydon discloses longitudinal ribs and grooves in the sidewall of a beverage can to provide axial strength. (Ex. 1031, U.S. 5,261,558 to Claydon at col. 1, lines 27-37.) The beverage can of Claydon with vertical grooves in the body is shown below:

i.



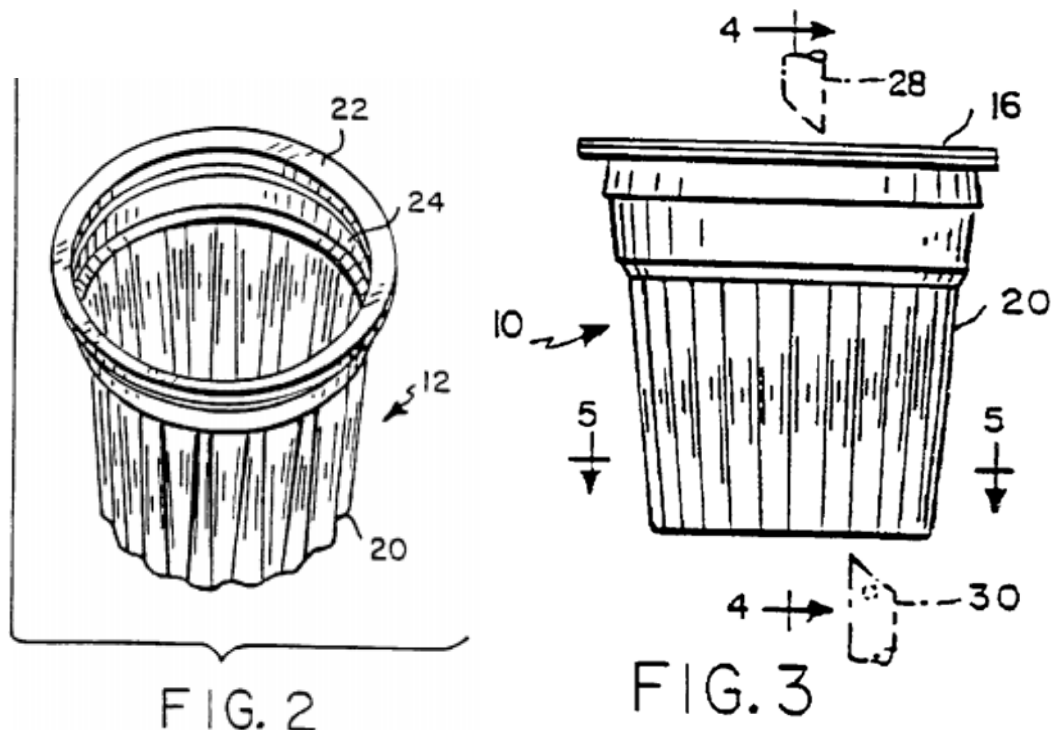
Ex. 1031, Claydon at FIG. 3.

89. In 1993, Erickson disclosed vertical grooves on the body of a single-serve, drip-style coffee maker cartridge for structural stability. (Ex. 1032 at col. 5, ll. 10-25 (“The wall 26 is cylindrical and is stepped and tapered inwardly and includes vertical ribs 30 *for strengthening.*”).)



Ex. 1032, Erickson at FIG. 1.

90. In 2001, Sweeney disclosed plastic single-serve capsules having vertical ribs and grooves on the body of the capsule wall (20), shown below. (See Ex. 1033, Sweeney at FIGs. 2 and 3.) These grooves “are strategically positioned to enhance resistance to buckling without interfering with or compromising the integrity of the seal between the side wall and the filter component.” (*Id.* at col. 2, lines 20-25.)



Ex. 1033, Sweeney at FIGs. 2-3.

91. In 2006, Mock disclosed a single-serve capsule for use with coffee or milk beverages that can be made by “stamping thin metal sheet, for example made of aluminum,” (see [0027]), and can include strengthening ribs” (6a) in the body of the capsule wall to stiffen the packaging. (Ex. 1011, Mock at [0010]-[0012], [0015], [0036], [0077].) The capsule from Mock, with ribs (6a), is shown in the below figure:

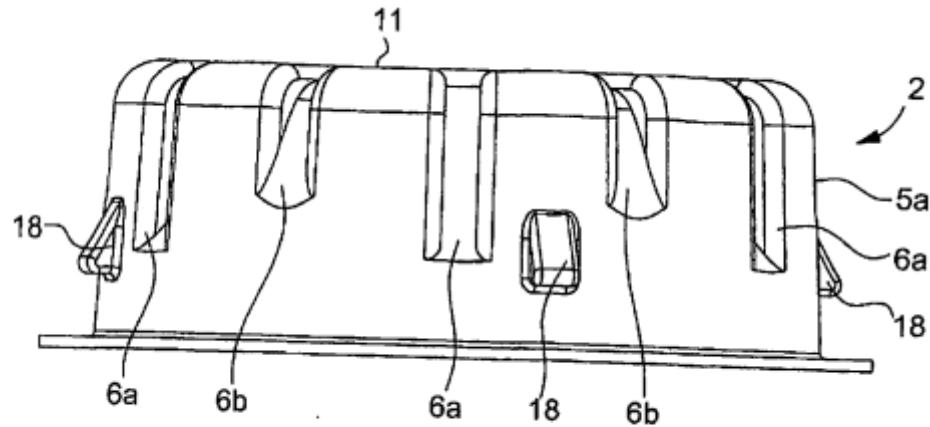


Fig.2

Ex. 1011, Mock at FIG. 2.

92. In 2007, Rubino disclosed a single-serve beverage capsule with grooves on the outside wall of the capsule body and ribs on the inner cavity of the capsule body, for the purpose of optimizing the flow conditions inside the capsule. (See Ex. 1034, Rubino at [0009] and Fig. 8.) Rubino disclosed that the main advantage to her capsule design “lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.” (*Id.* at [0009]; *see also* [0019] and [0020].) Rubino’s grooves and ribs are shown below:

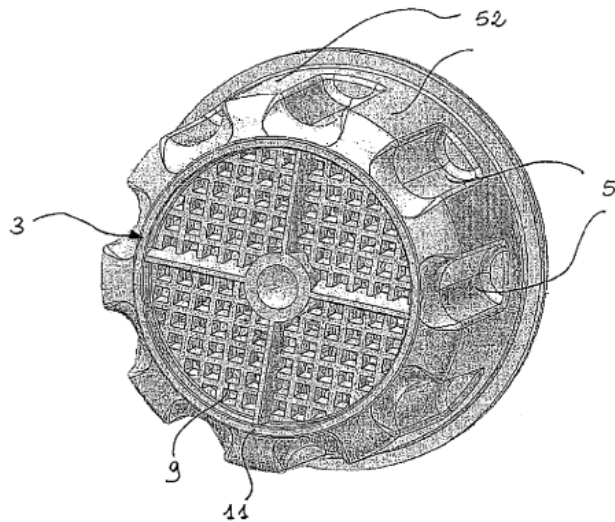


FIG. 2

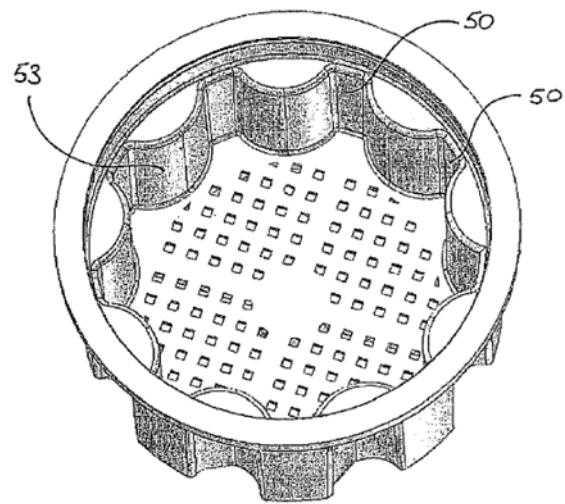
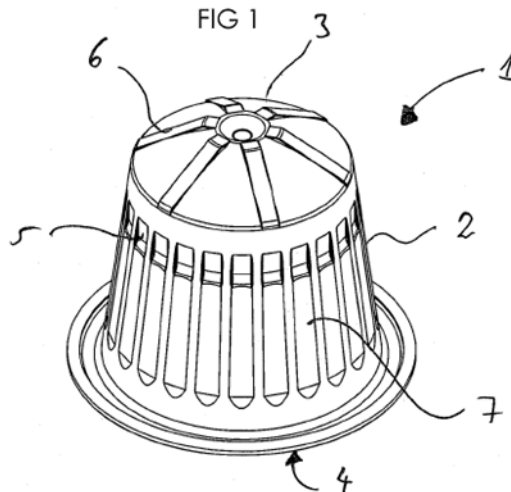


FIG. 8

Ex. 1034, Rubino, FIGs. 2 and 8

93. In April 2010, Alain Mariller's patent application published as WO 2010/041179, which disclosed a single-serve beverage capsule with vertical grooves to serve as stiffening elements in the capsule body wall. Mariller disclosed, "[o]n the outside of the capsule, opposite each projecting element or opposite a circumferential rim, a cavity is created which strengthens the lateral parts of the capsule through a framework effect while at the same time saving on material (see cross section) and in particular allows the use of biodegradable material and fine materials of the PET or metal type or any other petroleum-derived material." (See Ex. 1035, Mariller at [0037].) The grooves (7) in Mariller's capsule are described as "side wall stiffening elements." (*Id.* at [0027].) Mariller's capsule is shown below:

i.



Ex. 1035, Mariller at FIG. 1.

94. WO 2011/047836 to Rapparini, originally filed October 19, 2010, discloses a beverage capsule with grooves and ribs to improve stability of the capsule wall and avoid deformation of the capsules during filling or packaging at high production rates. (Ex. 1008, Rapparini at 1 and 2.) Rapparini discloses that the capsule body has “longitudinal stiffening ribs” that “allow[] the optimization of the stability of the container.” (*Id.* at 2.) Rapparini’s grooves are depicted below in Fig. 6, Fig. 6b:

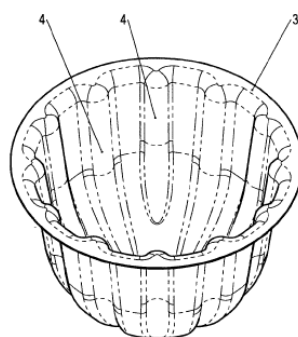


FIG. 6

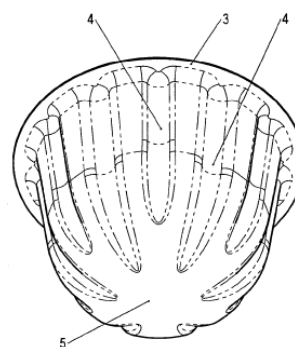


FIG. 6 bis

Ex. 1008, Rapparini at FIGs. 6 and 6bis.

95. Accordingly, by the time of the priority date of the '722 Patent, a person of skill in the art would have known that longitudinal ribs and grooves can advantageously stiffen and provide structural stability to a single serve capsule body.

D. Single-Serve Beverage Identification System Overview

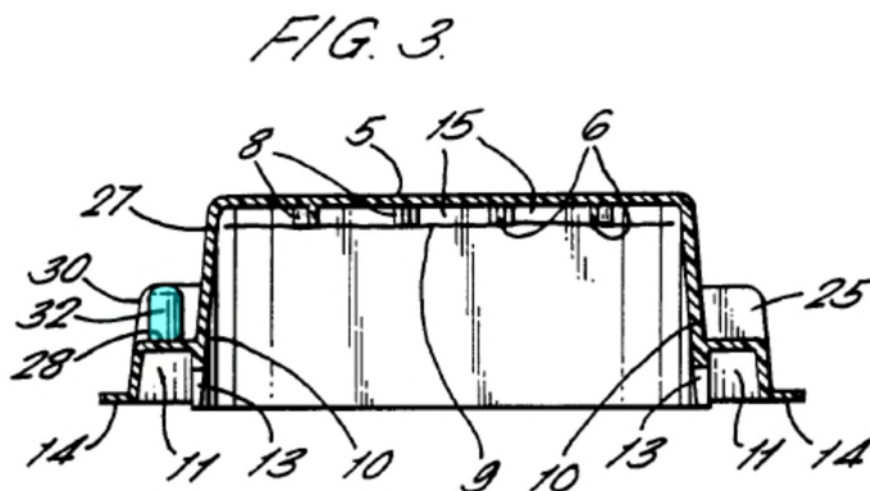
96. An increase in popularity of single-serving capsules resulted in the creation of a “wide variety of capsule structures and related apparatus” that required manufacturers to “adjust various parameters of the manufacturing process to accommodate such sizes.” (See Ex. 1015 at [0009], [0014]-[0015].) Accordingly, skilled artisans developed capsule identifying methods to control the brewing process based on the type of capsule. The proliferation of different capsules in the marketplace also caused system manufacturers to develop capsule identification technologies to determine whether a given capsule was compatible, safe, or otherwise suitable for use with the given machine.

1. Optical Capsule Identification Was Known

97. Optical codes, including barcodes and barcode readers, have long been used in beverage extraction systems for the purpose of identifying capsules and related extraction parameters. These systems operate by optically reading an optical code off of a surface of the capsule, and relay the information to the machine’s computer controller. The read barcode is compared with stored pre-set information in order to adjust system parameters and brew the capsule appropriately, or otherwise determine

whether the capsule is suitable for use with the system. Development of these systems began since at least the early 1990s. Several optical code identifiers for single-serve capsules are discussed below, which predate the '722 Patent.

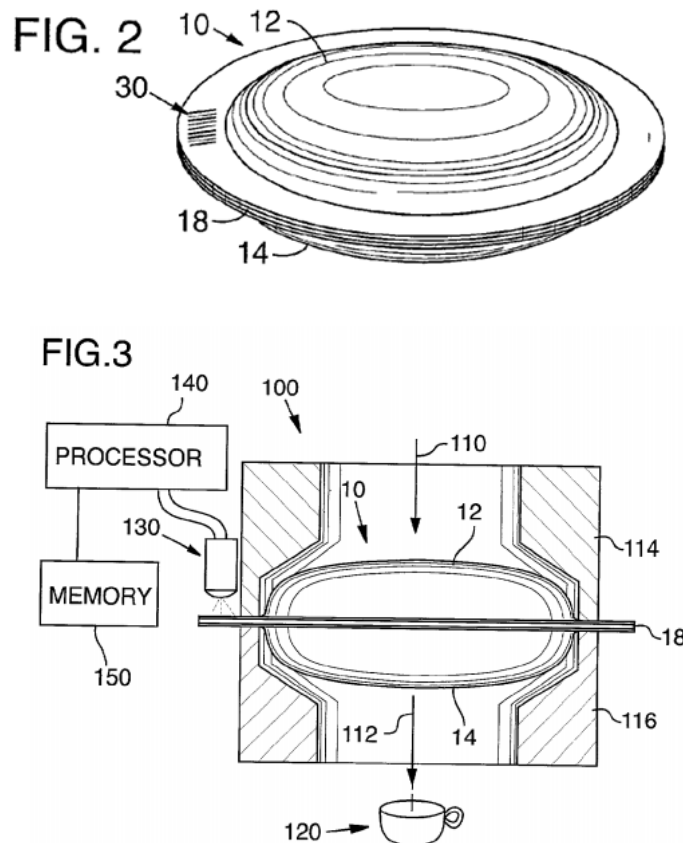
98. As early as 1991, capsule recognition systems in single-serve beverage machines were known. (Ex. 1036, EP 0455337 to Bentley.) Bentley disclosed that one form of capsule recognition could be an optical barcode. (*See id.* at col. 4, lines 40-50; col. 5, lines 1-9.) Bentley explains that the identifier can be any type of mechanical, optical, magnetic, electrical, or inductive sensor, used to send a signal to the machine's controller in order to automatically prepare the beverage according to the correct beverage preparation conditions. (*Id.* at col. 5, lines 9-50.) Bentley discloses that the capsule identification means is on the side of the flange facing away from the capsule membrane, and used to generate codes of 0s and 1s to identify the capsule to the machine's controller. (*Id.* at col. 7, line 47—col. 8, line 22; FIG. 3 at 32 (annotated in blue).)



Ex. 1036, Bentley at FIG. 3.

99. In 2002, Boyd disclosed a single-serve beverage packet and extraction system that included an optical barcode (30) located on its outer gasket perimeter in order to identify the capsule and direct the brewing parameters for individualized extraction. (See Ex. 1037, Boyd at FIGs. 2-3, [0002], [0005], [0006].) One purpose of Boyd's system was to automatically customize the brewing operation based on the particular characteristics of the packet inserted into the machine. (*Id.* at [0023].)

100. Boyd's code is read by an optical sensor (130) positioned around the brewing chamber, and the sensor communicates with a processor to control the brewing parameters. (Ex. 1037, Boyd at [0028], [0032].) Boyd's system is shown below:



Ex. 1037, Boyd at FIGs. 2 and 3.

101. Boyd discloses that the barcode can serve as an “identifier” to look up brewing directives from memory in the machine, which will then compare (“match”) the read barcode with the stored operation instructions, and direct the brewing operation accordingly. (Ex. 1037, Boyd at [0032]-[0033].) Boyd also discloses that “[t]he encoded packet also may contain encoded data defining the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.” *Id.* at [0037]. If the source is not recognized, “directing beverage brewing selectively includes aborting the brewing process.” (*Id.*, Claim 21.)

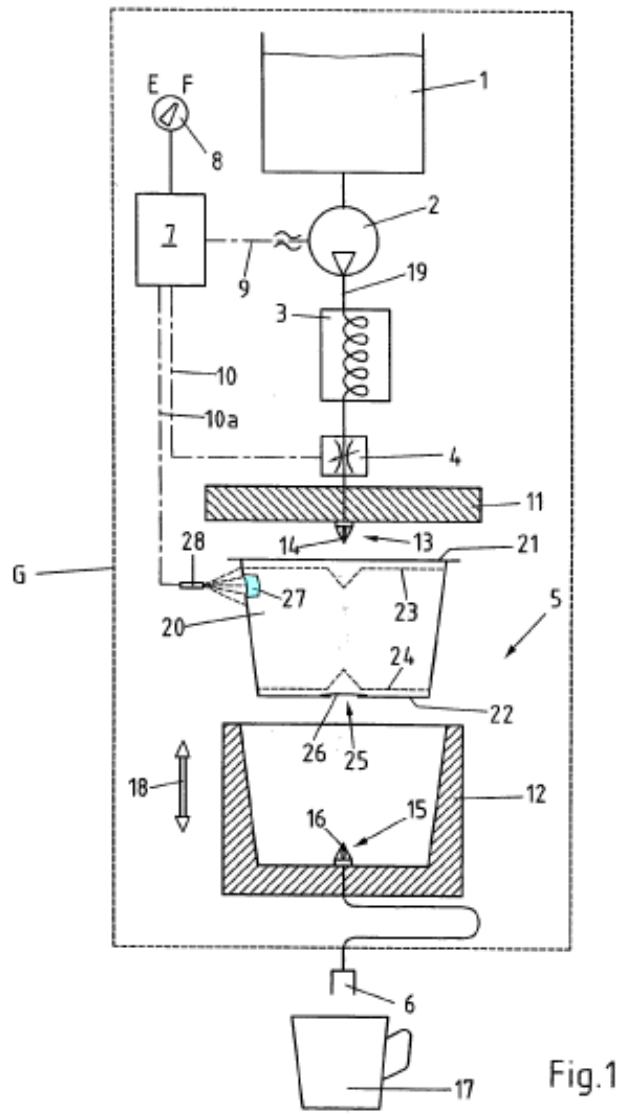
102. In a 2004 patent filing (published in 2007), Erlandsson disclosed a barcode for identifying a capsule, in order to tailor the brewing parameters to match the capsule requirements. (See Ex. 1038, Erlandsson. at [0005]-[0006].) Erlandsson further disclosed a controller in the system that stores pre-programmed brewing parameters that are selected based on comparison of the read barcode. (*Id.* at [0012], [0025]-[0028].)

103. Also in 2004, Mahlich’s published patent application disclosed a code-based coffee capsule identification system configured to block operation of the machine if the read barcode did not agree with a stored reference. See Ex. 1024 at [0014]:

Apart from coffee type identification, the identification on any single-serving unit may also contain producer identification, whereby the latter in conjunction with an adapted evaluation

system for controlling the espresso machine can block operation of the espresso machine if the producer identification on the single-serving unit does not correspond to the machine's preprogrammed producer identification.

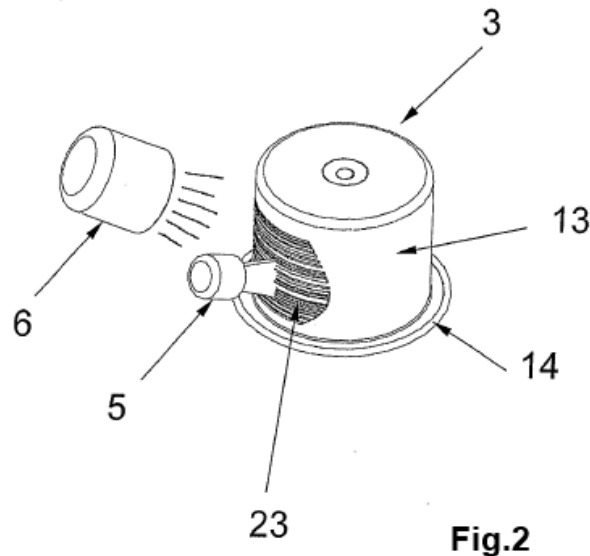
104. In 2005, Schifferle disclosed a single-serve coffee and espresso extraction system where a barcode is positioned on the body of the capsule, below the flange, facing away from the membrane (shown in FIG. 26 below in blue). (See Ex. 1039, Schifferle, FIG. 1 at 27.) Schifferle's system was designed to read the capsule's barcode and control the system components (including the pump) to automatically adjust extraction parameters depending on the results of the barcode read. (*Id.* at [0019].) Schifferle's extraction system is shown below:



Ex. 1039, Schifferle at FIG. 1.

105. Also in 2005, Ruchonnet disclosed a single-serve beverage extraction system that included an optical reader to read a barcode positioned on the capsule in order to “determine the origin of the containers used” in the system. (See Ex. 1040, Ruchonnet at 2:3-19.) Ruchonnet disclosed that the microprocessor was designed to read optical information off of the capsule, and then “encrypt/decrypt, analyze,

compare, approve/reject and store information read on [the capsule]” and to “selectively start or not start a cycle of operations.” (*Id.*) Ruchonnet’s system, shown below “identifies [a capsule, and] compares the information it carries to the manufacturer’s code contained in a system memory,” among other things. (*Id.*)



Ex. 1040, Ruchonnet at FIG. 2.

106. Ruchonnet further discloses that “[t]he information (11) is read and transmitted to the microprocessor (12) which activates, if the information is positively recognized, the aforementioned operations and, in the event of negative recognition, rejects the information (11) and stops the procedure for activating the distribution module (18) to interrupt the perforation of the upper part of the receptacle (3) and extraction of the products (30, 31, 32).”

107. These system elements of the Ruchonnet system are shown below:

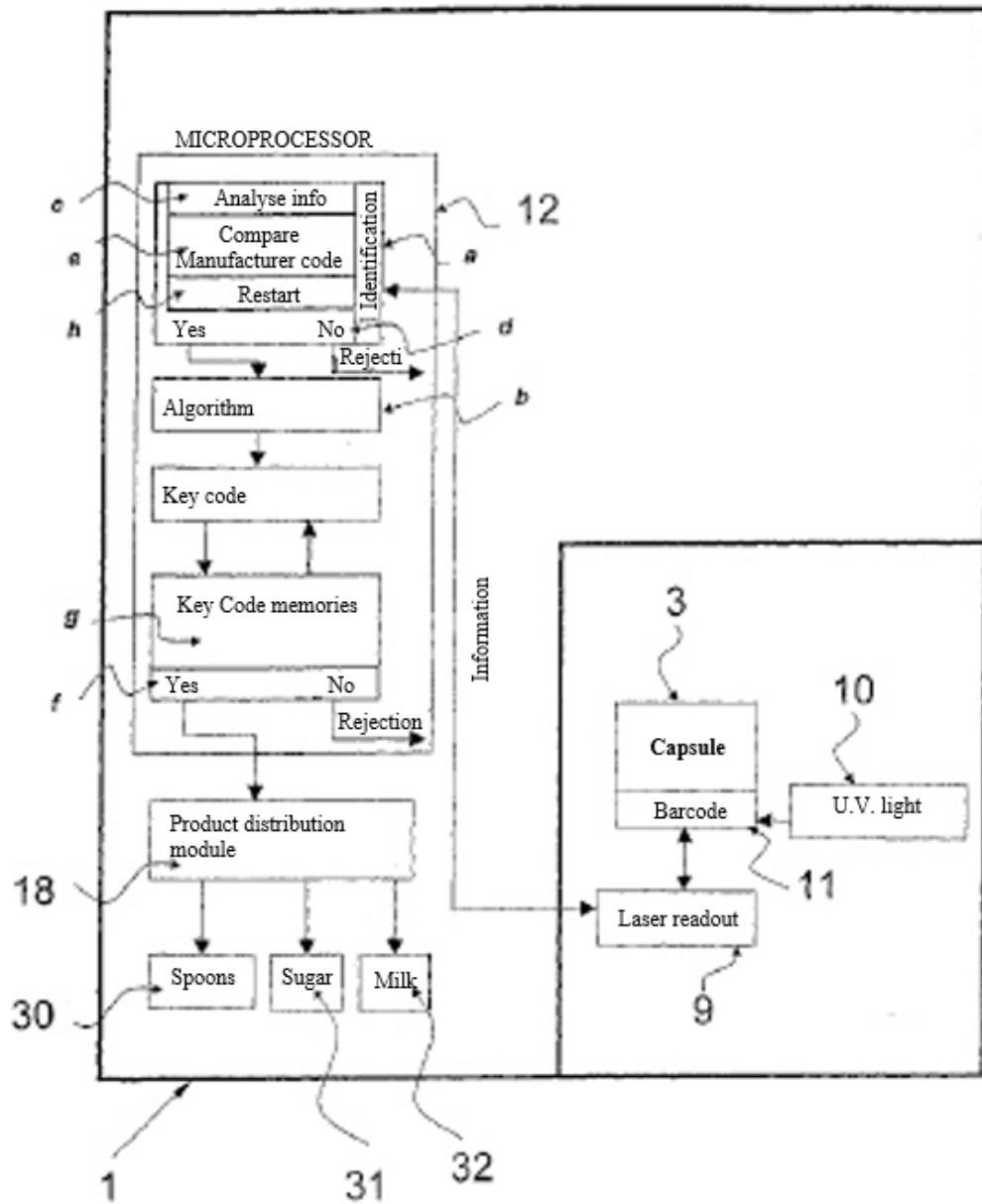


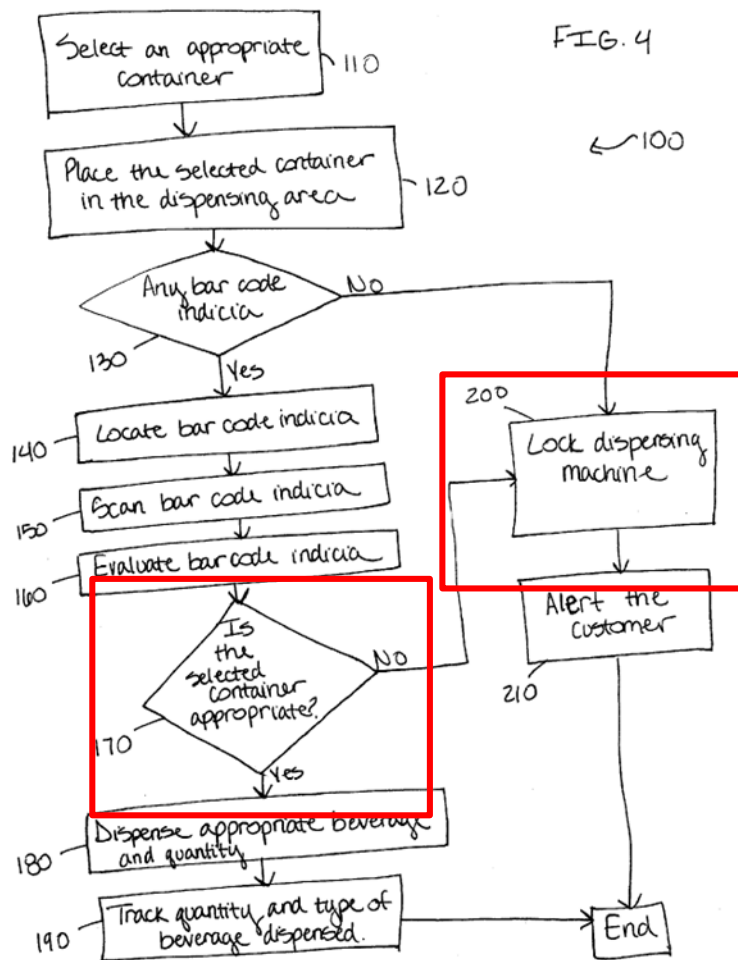
Fig.1

Ex. 1040, Ruchonnet at FIG. 1.

108. In 2009, Rossi filed a patent application directed to a beverage extraction system that can read a barcode located on the base of the capsule in order to avoid capsules that are not suitable for use with the machine, which “may cause the machine to malfunction and can prejudice the safety and integrity of the machine

and [] may harm the user.” (EX1041, Rossi at 3.) Rossi’s system “automatically activates a cycle of production of said [beverage] ***only after having recognized***” the barcode on the capsule. (*Id.* at 4.)

109. Also in 2009, Lillard’s patent published disclosing a beverage dispensing system that reads a barcode on a beverage container to control the dispensing parameters, and lock the machine in the event of an inappropriate container. In particular, Lillard discloses a method whereby the machine will not dispense (200) if presented with a container either lacking a barcode, or having an unrecognized barcode (170). “If the container is deemed inappropriate in 170, the control circuitry could lock the machine...” (Ex. 1042 at [0054]-[0055], FIG. 4.)



Ex. 1042, Lillard at FIG. 4.

110. Accordingly, prior to the filing of the '722 Patent, a person of skill in the art would have known that optical codes can be used in single-serve beverage systems to identify a capsule in order to (i) ensure use of authorized capsules that are suitable for the system, and/or (ii) to control and optimize the brewing process based on the identified capsule. This included configurations to stop or prevent operation of the system if the code read does not match predetermined references in the system.

2. Code Placement and Positioning

111. Once optical identification systems were implemented into single-serve beverage dispensing systems, those skilled in the art also developed the configuration and placement of the optical identifier on the capsule prior to the filing of the '722 Patent. This included placing an identifier such as a code on the rim or flange of the capsule, and repeating the code around the capsule. It also included placing the code on the side of the rim facing away from the lid or membrane.

112. As shown in the below references, prior to the filing of the '722 Patent, it was known to place an optical identifier code on the bottom of the flange of the capsule and repeat it around the perimeter of the flange. This eliminated the need for the user to place the capsule inside the brewing machine in a way that specifically aligned the optical code with the machine's reader, and decreased the chance that the code would be mis-read by the machine due to the location and repetition of the identifier.

i. Repetition of Optical Capsule Identifiers was Known

113. By 2008, Aker filed a patent application directed to single-serve beverage pods including a repeating optical code on the top side of the capsule flange so that a brewer can decode the information and brew the beverage accordingly. (*See, e.g.,* Ex. 1043, U.S. 2010/0078480 to Aker, FIG. 2A, FIG. 2B, [0002]-[0003].) Repeating the optical code provides the advantage that “a barcode reader can read the

information coded in the barcode even if the orientation of the product body is not fixed.” (*Id.* at [0022].)

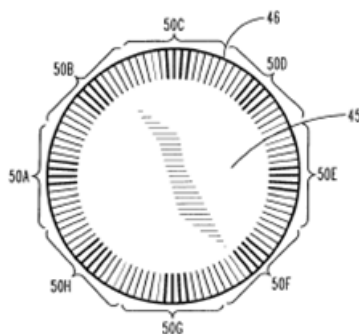


FIG. 2B

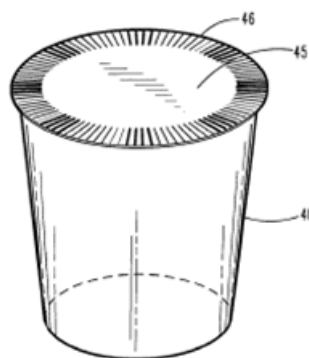


FIG. 2A

Ex. 1043, Aker at FIGs. 2A and 2B.

114. Boyd disclosed using an identifier on the outer perimeter of a coffee packet in order to “[d]efine the source of the packet so as to prohibit use of counterfeit packets, or packets from unauthorized suppliers.” Boyd also disclosed that its capsule identifier “*may span its entire perimeter in . . . repetitive fashion.*” (Ex. 1037 at [0029].)

115. Jarisch 929 also disclosed a capsule that is designed to be rotated to mix water and coffee grounds to brew the beverage. (Ex. 1006.) Jarisch 929 further disclosed

that the reading of an optical identifier on the rim of the capsule could be made more reliable by repeating the code around the perimeter of the capsule, because the same sequence could be read more than once during rotation. (Jarisch 929 at [0068] (“The sequence is preferably repeated along the circumference in order to ensure a reliable reading. The sequence is repeated at least twice on the circumference. Preferably, the sequence is repeated three to six times on the circumference. Repetition 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 once.”).)

ii. It was Known to Place Optical Codes Under the Capsule Flange

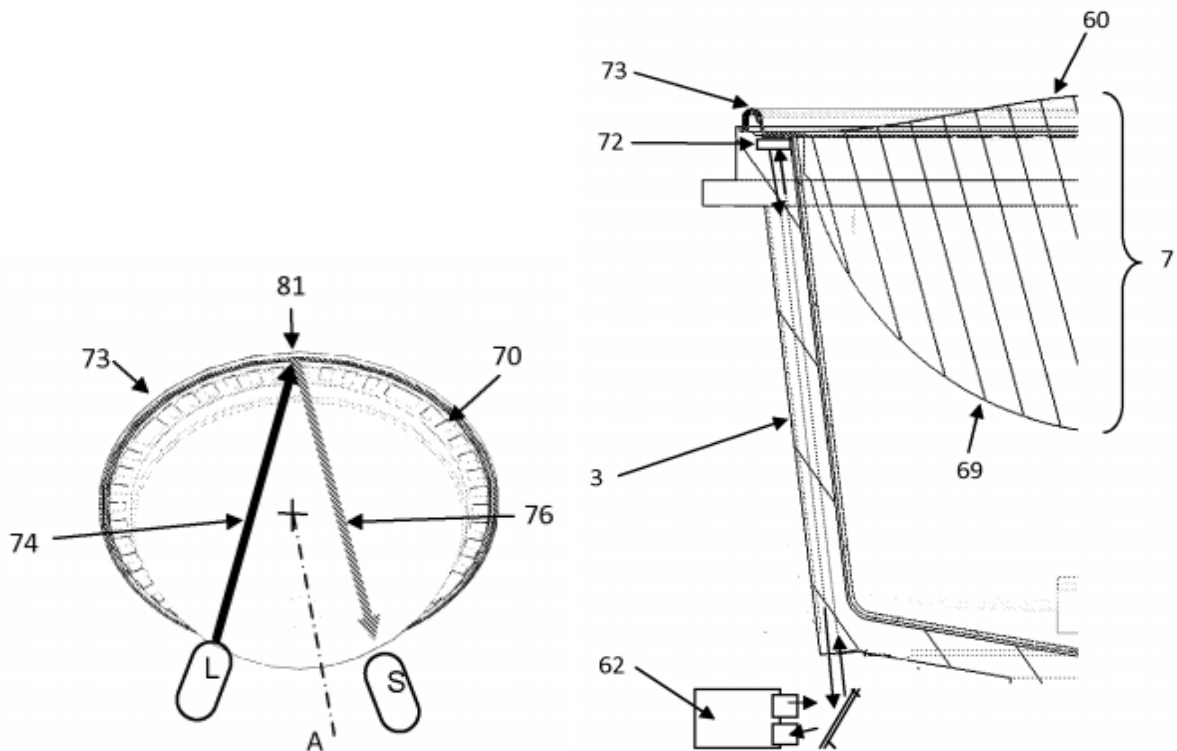
116. Due to the messy nature of the liquid and coffee grounds present during extraction process, it was also known that optical codes must be placed in a location away from the liquid injection and piercing site. This is because hot water, steam, and coffee grounds from piercing or prior extractions can soil the optical reader or code, rendering reading of the code unreliable.

117. For example, WO 2005/079638 to Panesar, which published in 2005, disclosed a barcode reader system for reading single-serve beverage capsules positioned on the bottom-facing surface of the capsule flange. Panesar explicitly disclosed the benefits of positioning the barcode away from the liquid injection areas. (See Ex. 1010, Panesar at p. 2, line 29 - p. 3, line 12; *see also id.* at p. 19, line

22 - p. 20, line 13.) Panesar explained “it has been found that there may be a small degree of leakage of fluid from the inlet area during dispensation since dispensation occurs at pressure. This fluid may spread, in particular due to capillary effect between the insert and a brew head of the machine, leading to partial obfuscation of the barcode . . . by the fluid resulting in a greater chance of the barcode . . . being misread.” (*Id.* at p. 3, lines 3-12.)

118. On May 12, 2011, Jarisch filed PCT/EP2011/057657, which discloses a single-serve capsule with a code used to identify the capsule and control the machine’s beverage extraction parameters, in a centrifugal-based extraction system such as Denisart. (Ex. 1005, U.S. Pat. Pub. 2013/0064937 to Jarisch.)

119. Jarisch explicitly disclosed that the optical code in its system should be positioned on the underside of the flange, facing away from the membrane and injection site, to avoid being soiled during the extraction process and thus improve the reliability of code reading. (Ex. 1005, Jarisch at [0014], [0022].) The Jarisch single-serve beverage capsule with code and corresponding reader is shown in the below figures:



Ex. 1005, Jarisch at FIGs. 4-5.

120. Jarisch 929 also disclosed the same placement of the optical code on the bottom of the flange. Jarisch 929 disclosed that its disclosed code locations result in “the reliability of the readings are ... improved.” (Jarish 929 at [0017].) Jarisch 929 discloses that this code location can include “the bottom side of the rim of the capsule.” (*Id.* at [0018].)

121. Thus, prior to the filing of the '722 Patent, a person of skill in the art would have appreciated the advantages of repeating an optical code around the perimeter of a capsule flange, and locating that code on the side of the flange facing away from the membrane, and thus away from areas likely to be soiled or disrupted during or after the extraction process.

IV. THE '722 PATENT

A. Background Of The '722 Patent

122. The '722 Patent generally relates to a beverage system for making a beverage that includes a portion capsule and beverage machine. (Ex. 1001 at 1:14-16.) The portion capsule is made up of a base element that contains a beverage raw material, such as loose ground coffee, and a membrane that closes the raw material inside the base element. (*Id.* at 1:21-24.) The base element includes a wall region (*see* FIG. 2A at 2.1), a bottom (*see* FIG. 2A at 2.2), and an edge region (*see* FIG. 2A at 17 or FIG. 1B at 2.4), which is described as a circumferential flange. As the '722 Patent acknowledges, “[s]uch capsules are well known and are being launched onto the market in abundant variety.” (Ex. 1001 at col. 1, lines 25-26.)

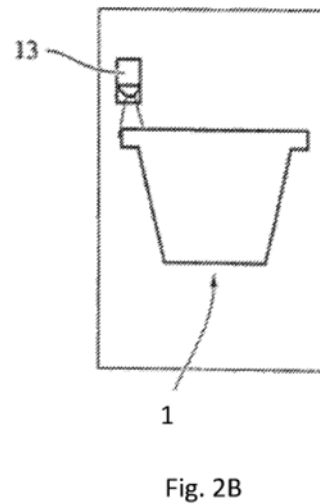
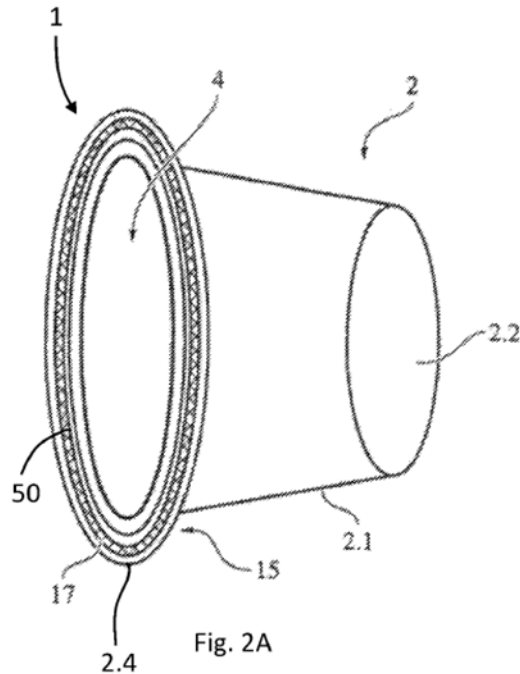
123. According to the '722 Patent, there is a problem that certain portion capsules may end up being used in a different manufacturer’s brewing system, even though such a portion capsule is not designed for that system. (Ex. 1001 at col. 1, lines 26-29.) An object of the '722 Patent invention is to solve this problem by creating a portion capsule that is only suitable for a specific coffee machine. (*Id.* at col. 1, lines 32-34.)

124. The '722 Patent attempts to accomplish its solution by providing an “identifier” on the capsule that allows a brewing system to identify whether or not a portion capsule is of the group designed for that system. (Ex. 1001 at col. 1, lines

38-44; col. 2, lines 3-8.) The '722 Patent further explains that the brewing system preferably includes a sensor or detector to assess whether the identifier on the capsule matches a stored reference, which will impact whether and how the brewing system will operate. (*Id.* at col. 2, lines 19-24.) In particular, if the identifier does not match a stored reference, the coffee machine's water pump will not operate to pump water in order to brew the beverage. (*Id.* at col. 2, lines 21-23; col. 8, lines 46-49.)

125. The '722 Patent discloses different embodiments of various types of identifiers that can be used to identify the portion capsule, including an optical identifier, such as a barcode (*id.* at col. 8, lines 55-59), a mechanical identifier such as recesses or bulges (*id.* at col. 9, lines 2-6), or an electrical identifier such as a section of the capsule that is electrically conductive and completes a circuit in the brewing system (*id.* at col. 9, lines 27-33).

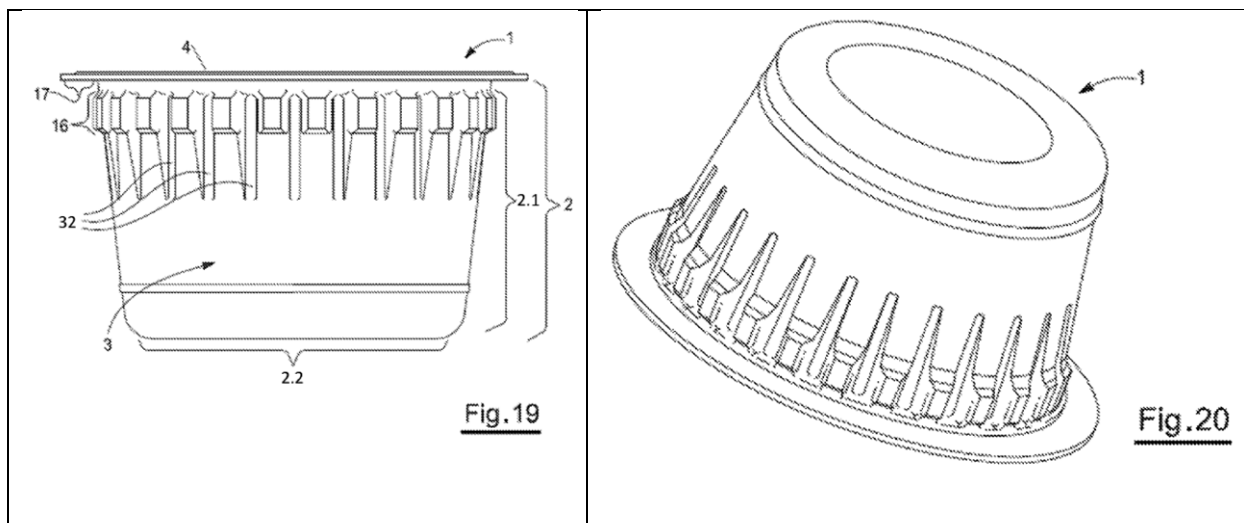
126. The embodiment of a portion capsule including an optical barcode is shown in Figs. 2A and 2B, which show the barcode placed on the top surface of the membrane. The '722 Patent further states that "the barcode 50 alternatively can be attached to the base element's edge region being averted from the membrane," although it provides no explanation for reasons to do so. (Ex. 1001 at col. 8, lines 62-64.)



Ex. 1001, '722 Patent at FIGs. 2A and 2B.

127. The '722 Patent states that the portion capsule can also include grooves that “make the portion capsule more stable towards mechanical forces and prevent the portion capsule from deformation and buckling, in particular.” (Ex. 1001 at col. 4, lines 36-42.) The '722 Patent reiterates that the grooves cause the wall region of the base element to be “reinforced or stiffened.” (*Id.* at col. 12, lines 18-21.) These grooves are vertically oriented and radially spaced, as shown in Figs. 19 and 20 below. (*Id.*)

'722 Patent FIG. 19	'722 Patent FIG. 20
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128. The claims which I discuss in this declaration all relate to the context of a portion capsule where the portion capsule includes a flange and an identifier, and a beverage brewing system that includes a sensor/detector, among other elements.

B. Prosecution History of the '722 Patent (Ex. 1002)

129. The face of the '722 Patent states that U.S. Patent Application No. 17/844,372 (the "'372 application'"), the application which issued as the '722 Patent, was filed on June 20, 2022. The applicant claims the '372 application is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/670,765, filed on February 14, 2022, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/670,629, filed on February 14, 2022, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/547,363, filed on December 10, 2021, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 15/646,980, filed on July 11, 2017, which the applicant claims is a division of, and claims priority

to, U.S. patent application Ser. No. 15/211,823, filed on July 15, 2016, which the applicant claims is a division of, and claims priority to, U.S. patent application Ser. No. 13/744,623, filed on January 18, 2013, which the applicant claims is a continuation of, and claims priority to, international application Ser. No. PCT/EP2011/003677, filed on July 22, 2011. (See Ex. 1001 at 2.)

130. The Applicant further claims priority to three foreign applications. The foreign applications are German application No. 102011010534.4, filed on February 7, 2011, German application No. 102010031988.0, filed on July 22, 2010, and German application No. 102010044251.8, filed on September 2, 2010. I have reviewed Official English translations of these German applications, attached hereto as Exs. 1045, 1046, and 1047, respectively. As set forth in Section VI of this declaration, it is my opinion that the claims of the '722 Patent are not supported by these three foreign applications.

131. The '372 application was originally filed with nine claims on July 20, 2022. (Ex. 1002 at 27.) The claims were directed to a single-serve capsule for making a beverage using a barcode provided on the peripheral region of the basic element which is directed away from the membrane. (*Id.*) On July 20, 2022—the same day of filing the application—the Applicant filed preliminary amendments canceling claims 1-9 and adding claims 10-29, which removed the barcode limitations and instead claimed “a printed optically detectable identifier located on the bottom side”

of the flange, “a pump controlled to push water into the portion capsule only upon a determination that the read identifier agrees with a stored reference,” and “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.” (*Id.* at 81-88.)

132. The Applicant requested prioritized examination for the ’372 application on June 20, 2022 (Ex. 1002 at 43), which was granted on July 26, 2022 (*id.* at 174).

133. In the first Office Action on August 11, 2022, the Examiner issued a Non-Final Rejection based on nonstatutory double patenting based on co-pending Appl. No. 17/547,363 (the “’363 Application”), which issued as the ’094 Patent. (Ex. 1002 at 187-202.) The Examiner included a 45-page Notice of References Cited. (*Id.* at 203-248.)

134. The Applicant filed a Response to the August 11, 2022 Office Action on August 30, 2022, where it made minimal claim amendments (i.e., the optically detectable identifier) and filed a Terminal Disclaimer over the ’363 Application. (Ex. 1002 at 465-479.) It is my understanding that the ’722 Patent terminally disclaims the ’094 Patent (i.e., the ’363 Application), which, in turn, terminally disclaims the ’491 Patent.

135. The Examiner mailed a Notice of Allowance on September 12, 2022, which stated the following Reasons for Allowance: “The closest prior art of record are

Jarisch et al. (US 2013/0064937), Schmed et al. (US 7,856,920), Ternite et al. (US 2007/0148290), Ozanne et al. (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.” (Ex. 1002 at 483-491.)

136. The Applicant filed an additional Information Disclosure Statement, including the petition for *inter partes* review of US 11,254,491 (“the ’491 Patent”) on November 23, 2022. (Ex. 1002 at 572-575.)

137. The Examiner issued a Corrected Notice of Allowance on December 7, 2022 but did not provide any additional reasons for allowance. (Ex. 1002 at 582-583.)

138. The ’722 Patent issued on December 21, 2022. (Ex. 1002 at 598.)

139. It is my opinion that the Examiner erred by allowing the ’722 Patent claims because the allegedly missing limitations identified by the Examiner in the indication of Allowable Subject Matter are disclosed or reasonably suggested by the

prior art combinations I discuss below. The Examiner did not utilize Yoakim in any rejection of the '722 Patent claims, which explicitly discloses at least the claimed pump control, and media chute configured to receive and support the portion capsule (according to K-fee's apparent interpretation). (See my discussion of element [1.f], ¶¶266-270.) The Examiner also failed to discuss Yoakim in connection with a base element that has a wall region with an electrically conductive section. (See my discussion of element [1.h], ¶¶278-280.)

140. Nor did the Examiner utilize Jarisch 929 in any rejection of the '722 Patent claims, which explicitly discloses an optically detectable identifier located on the bottom of the capsule flange away from the membrane, and including a repeat pattern (according to K-fee's apparent interpretation) and a corresponding detector to read the code. (See my discussion of claim elements [1.c]-[1.e]) (See, e.g., EX1006, , , [0025]-[0027], [0056]-[0058], [0063]-[0064], [0092], [102], [106]-[107], FIG. 2, FIG. 5.)

141. Nor did the Examiner utilize Rossi in any rejection of the '722 Patent claims in connection with the claimed operation of the beverage machine, in particular “a pump controlled to push water into the portion capsule only upon that the read optically detectable identifier agrees with a stored reference,” “wherein the portion capsule is assigned to a group of portion capsules that are suitable for the beverage machine,” and “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.” (See my discussion of elements [1.g], claim 8, and claims 17-20.)

142. Nor did the Examiner utilize Rapparini in any rejection of the ’722 Patent claims, which explicitly discloses a portion capsule for preparing beverages, *e.g.*, coffee, whereby the capsule comprises a series of vertically oriented drawn grooves and ribs. (See my discussion of claim elements [1.i]-[1.j]) (Ex. 1008 at [0007]-[0011]; FIG. 6; 6bis.)

143. Nor did the Examiner utilize Castellani in any rejection of the ’722 Patent claims, which explicitly discloses a beverage machine comprising a pair of holdings arms for engaging the portion capsule. (See my discussion of claims 2 and 3.)

144. Accordingly, as set forth herein, the combination of Yoakim, Jarisch 929, Rapparini and Rossi (along with Castellani) teach each and every limitation of the claims, which is contrary to the Examiner’s Reasons for Allowance.

145. In my opinion, Yoakim, Jarisch 929, Rapparini and Rossi (and Castellani) explicitly disclose and/or render obvious all of the claim elements of the ’722 Patent claims, including the exact features that the Examiner identified as lacking in the cited prior art in the Reasons for Allowance. The combination of Rossi with Yoakim, Jarisch 929 and Rapparini explicitly negate the Examiner’s Reasons for

Allowance and demonstrate that the Examiner erred by misapprehending or overlooking their respective disclosures.

C. The Challenged Claims

146. My analysis focuses on claims 1-24 of the '722 Patent. The claims themselves are discussed in detail within the Prior Art Analysis section.

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

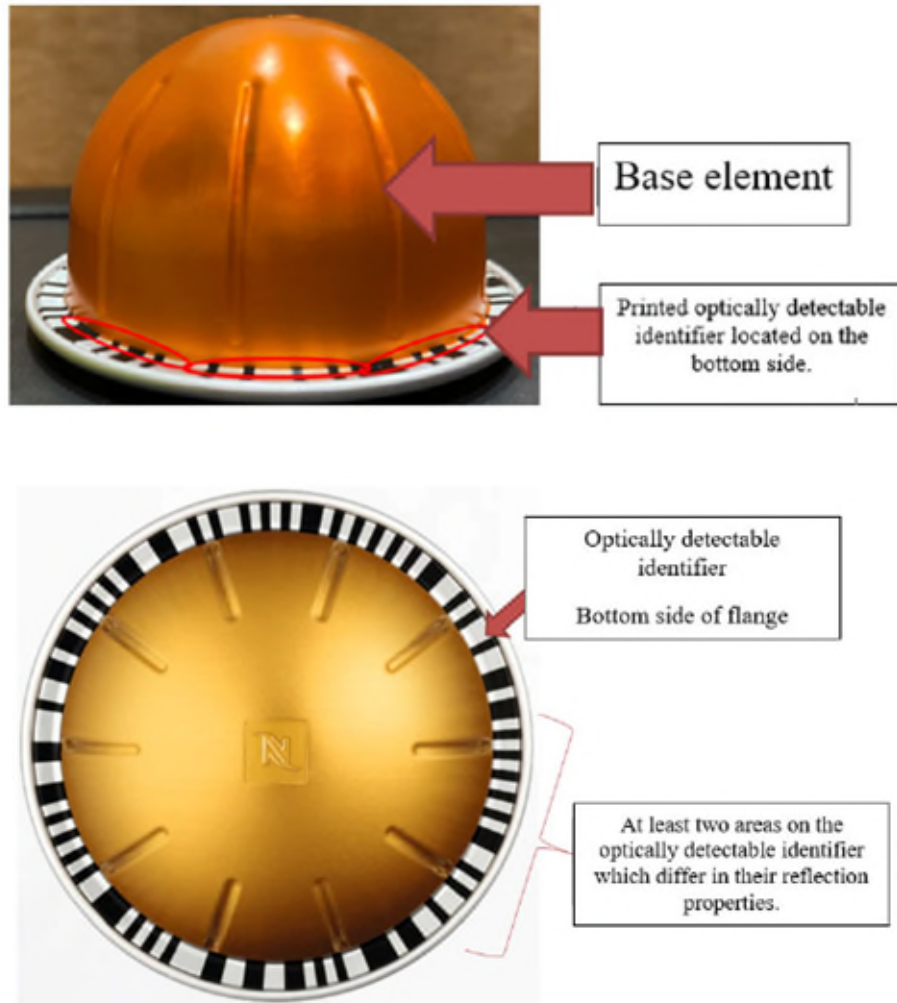
	optically detectable identifier extends around a central axis of the base element.
16.	The beverage system according to claim 13, wherein the optically detectable identifier has a plurality of reflective zones, the portion capsule is free of a filter, the portion capsule is made of metal, the optically 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.

V. CLAIM CONSTRUCTION

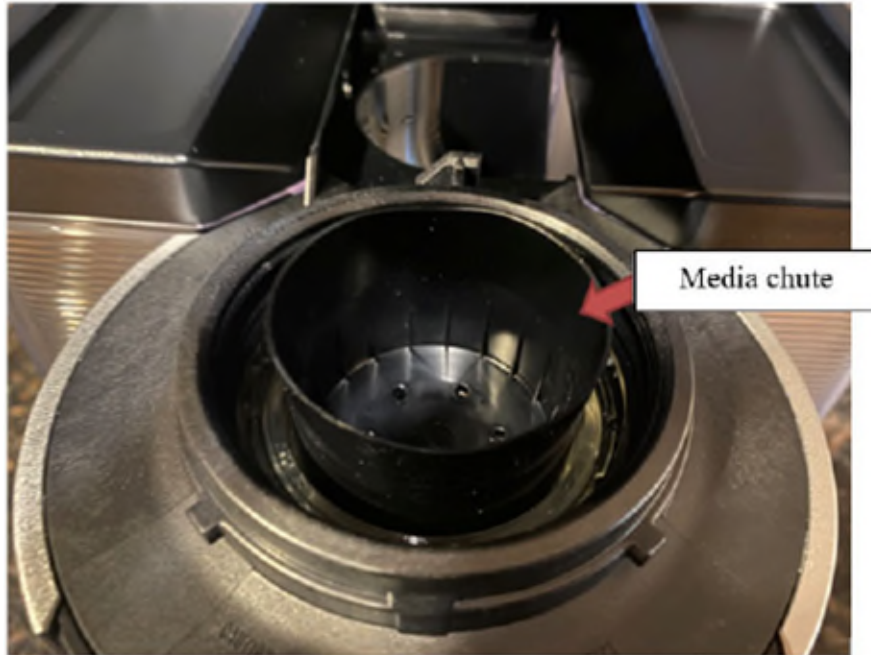
147. I have interpreted the claim terms of the '722 Patent consistent with their plain and ordinary meaning from the point of view of one of ordinary skill as defined earlier in this Declaration.

148. It is my opinion that no terms require construction in order to evaluate the invalidity of the claims of the '722 Patent. However, I understand that Patent Owner served infringement contentions in the related district court litigation that implicitly construed several limitations (*see* Ex. 1049):

- As an initial matter, Patent Owner alleges that its claims encompass a beverage system that brews capsules by centrifugation. *See* Ex. 1049 generally.
- Patent Owner alleges that the below product is a beverage machine that comprises a portion capsule with “a printed optically detectable identifier located on the bottom side” of the base element, and asserts that the following optical code meets the limitation (Ex. 1049 at 340-341):

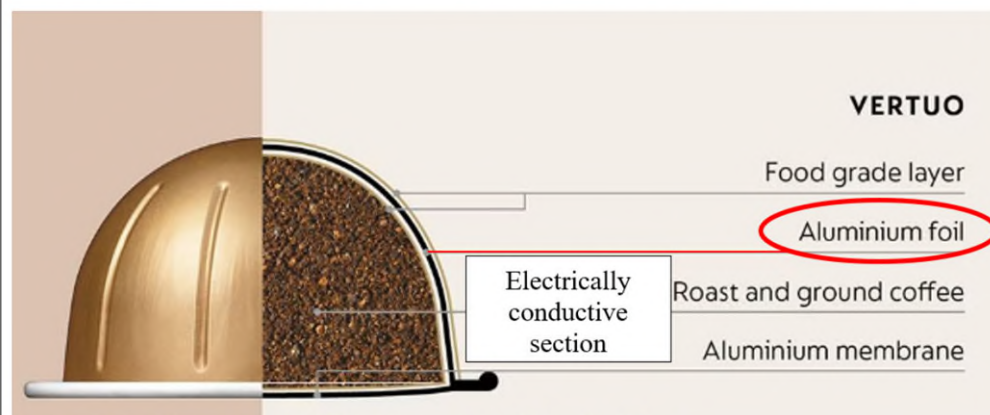


- Patent Owner alleges that the limitation “a media chute configured to receive and support the portion capsule,” can be met by the following receptacle below (EX1049, 351):



- Patent Owner alleges that a capsule made of aluminum constitutes a capsule with an “an electrically conductive section” under Judge Wu’s construction of the term (Ex. 1049 at 358-359):

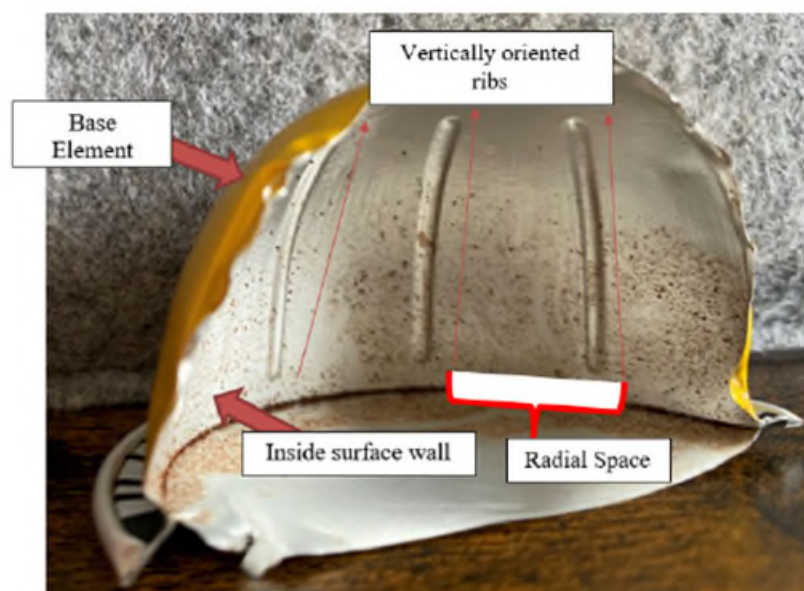
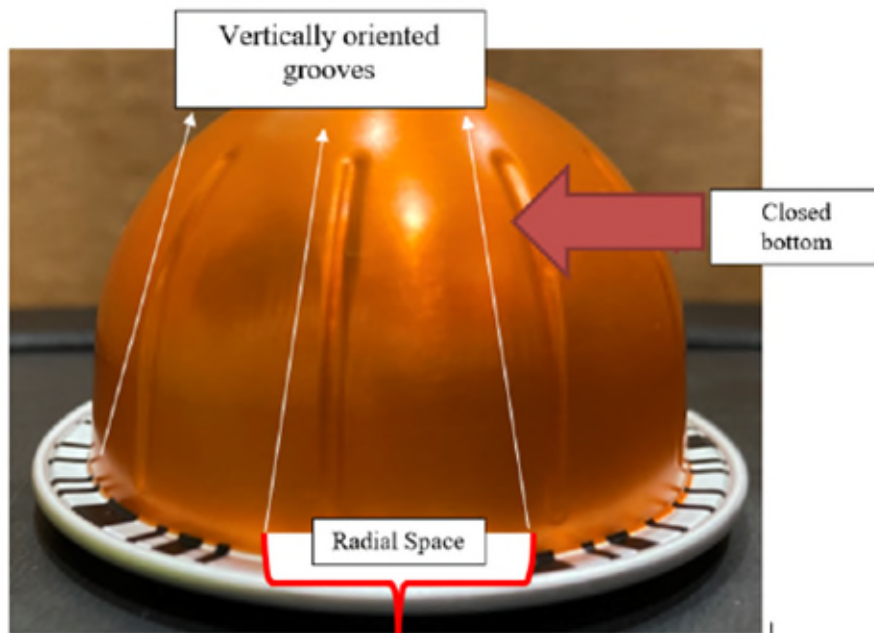
The below annotated image illustrates the Accused Product’s infringement of this limitation.



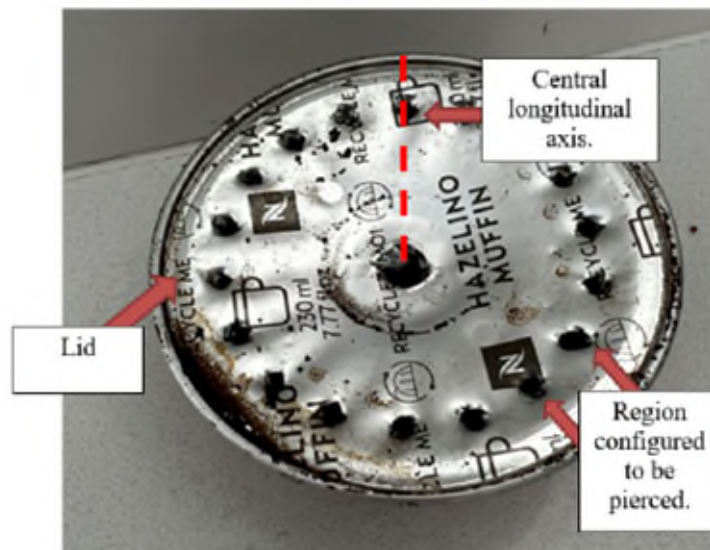
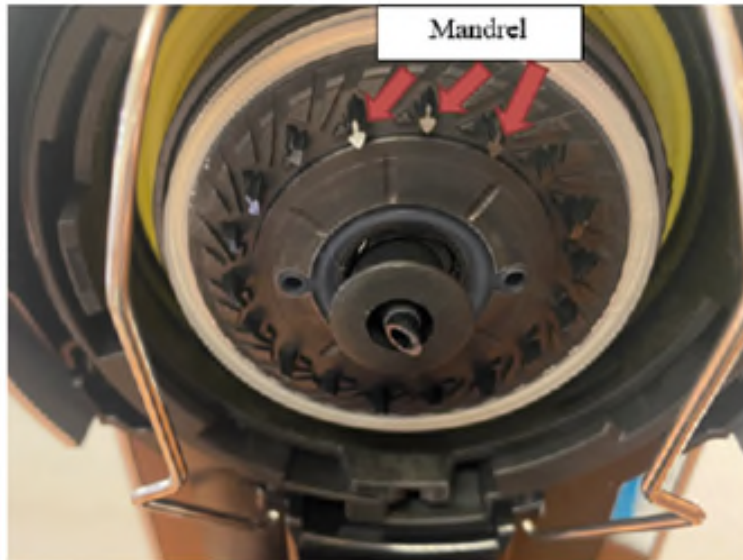
See, e.g., <https://www.sustainability.nespresso.com/why-aluminium>

- Patent Owner alleges 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” (Ex. 1049 at 360-361):



- Patent Owner alleges that “mandrel” can be met by brewing system with needles that pierce the outer perimeter of the capsule to allow liquid to exit the capsule (Ex. 1049 at 368-369):



- Patent Owner alleges that a “holding arms for engaging the portion capsule” can be met by metal rods that lift the capsule (Ex. 1049 at 363):



149. Although I do not agree with Patent Owner’s reading of the claims, for purposes of this proceeding, I apply the apparent constructions underlying Patent Owner’s infringement allegations.

150. It is my understanding that in district court, Nespresso has 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,” and K-fee has proposed “plain and ordinary meaning.” As explained below, the prior art discloses and/or renders obvious this limitation under either construction.

VI. THE CORRECT PRIORITY DATE FOR THE ’722 PATENT

151. The ’722 Patent should not be afforded a priority date any earlier than the date

of its PCT application, which was filed July 22, 2011.¹ It is my opinion that the '722 Patent improperly claims priority to foreign applications 102011010534.4, filed on February 7, 2011 (“the February 2011 Application”), 102010044251.8, filed on September 2, 2010 (“the September 2010 Application”), and 102010031988.0, filed on July 22, 2010 (“the July 2010 Application”). These priority claims are improper because no single foreign application discloses each and every feature of the '722 Patent claims.²

152. I have been informed that a patent may be entitled to the priority date of an earlier patent application when the earlier application contains a written description that would convey to “those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” I have further been informed that an applicant cannot combine multiple prior patent applications to obtain an earlier

¹ I have not formed opinions regarding whether PCT/EP2011/003677, later-filed U.S. patent applications, or the '722 Patent itself provide adequate written description support for the claims, and reserve the right to address these issues in any relevant proceeding.

² Solely for purposes of this proceeding, I have relied on the English translations of the priority submissions that K-fee submitted to the United States Patent and Trademark Office.

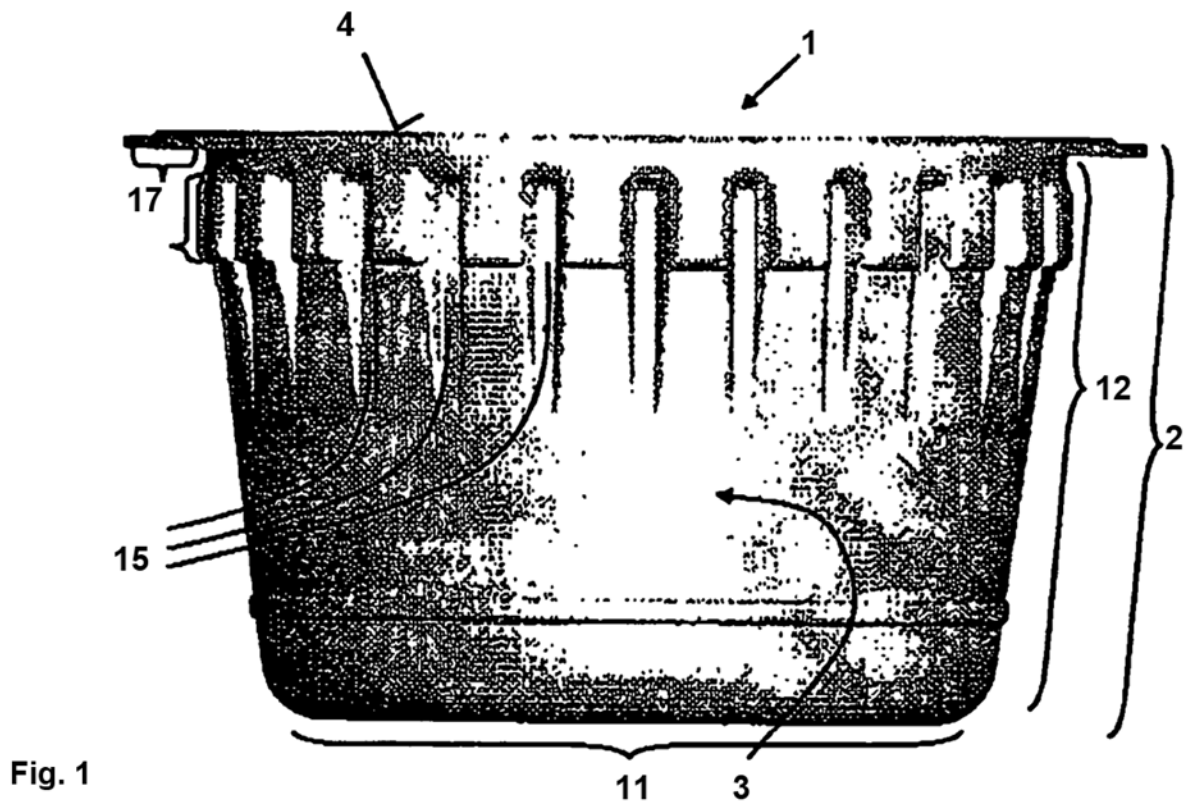
priority date for an individual claim. Instead, the written description for each limitation must be found in a single priority document.

153. No single foreign application discloses each and every feature of the '722 Patent claims or a single embodiment linking together all the features claimed in the '722 Patent. In addition, no single foreign priority application discloses (i) “a printed optically detectable identifier located on the bottom side” of the flange, (ii) a base element with “radial spaced and vertically oriented drawn grooves,” and (iii) a cavity with “radially spaced and vertically oriented drawn ribs.” These features are required by all claims of the '722 Patent. In addition, for claims 13 and 16, there is no disclosure of an optically detectable identifier located both on the bottom of the flange and on the portion capsule’s side wall. 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. Instead, and as explained below, such features are discussed, separately, in separate German priority patent applications.

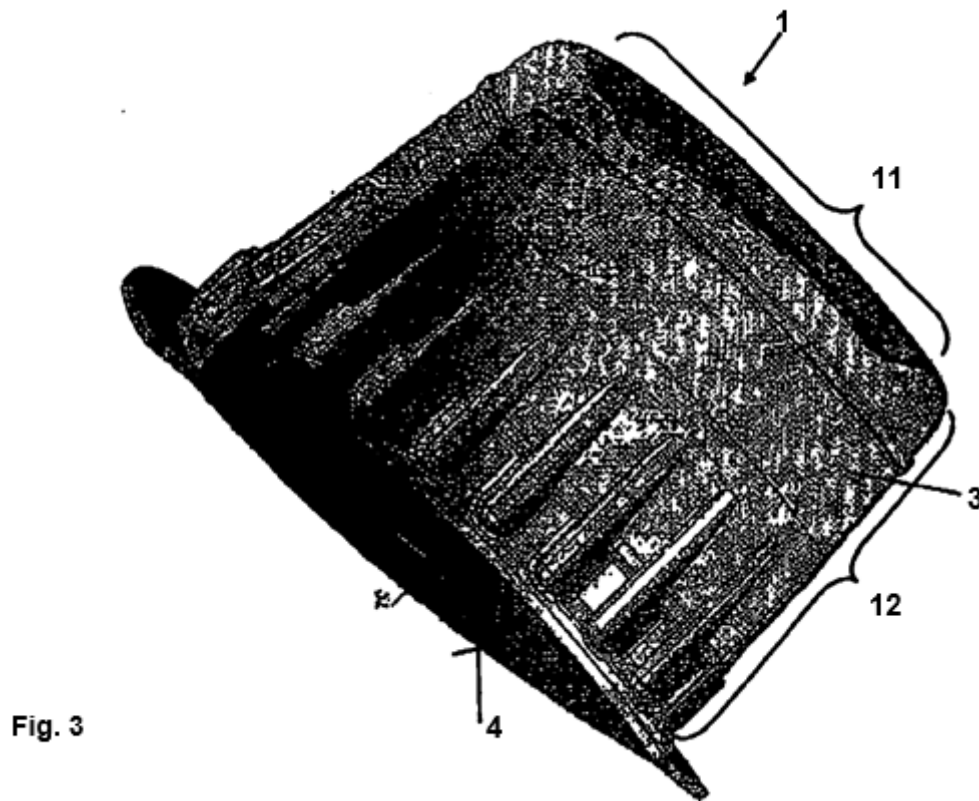
154. I will now address the disclosure as it relates to these features in each of the three foreign priority applications.

155. Unlike K-Fee’s other foreign priority applications, the February 2011 Application provides the first and only disclosure of what K-fee would contend is a capsule with claimed radially spaced and vertically oriented drawn grooves and ribs

on the wall region and cavity of the capsule body, as required by every claim of the '722 Patent. Indeed, the February 2011 Application is the only priority application with the below figures purportedly disclosing vertical grooves and drawn ribs on both the exterior and interior of the capsule body wall, respectively.



Ex. 1045, February 2011 Application at FIG. 1.

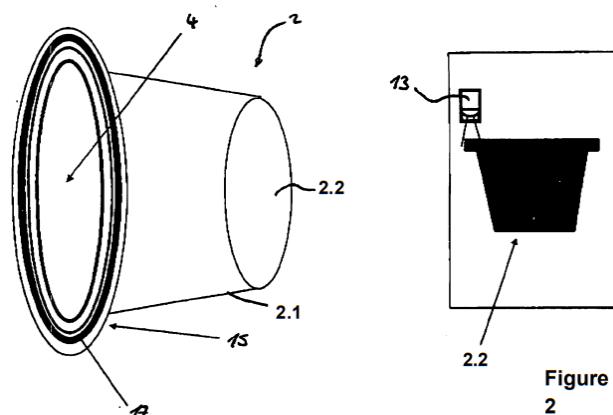


Ex. 1045, February 2011 Application at FIG. 3.

156. However, the February 2011 Application has no disclosure of an optically detectable identifier located on the bottom side of the capsule's circumferential flange. Nor does the February 2011 Application disclose a wall region with an electrically conductive section, holding arms, a barrier layer, or a groove and seal configured to bear against a top side of the portion capsule's lid. (See Ex. 1045 generally.) A person of ordinary skill in the art would find that the February 2011 Application fails to disclose all of the features of the '722 Patent claims.

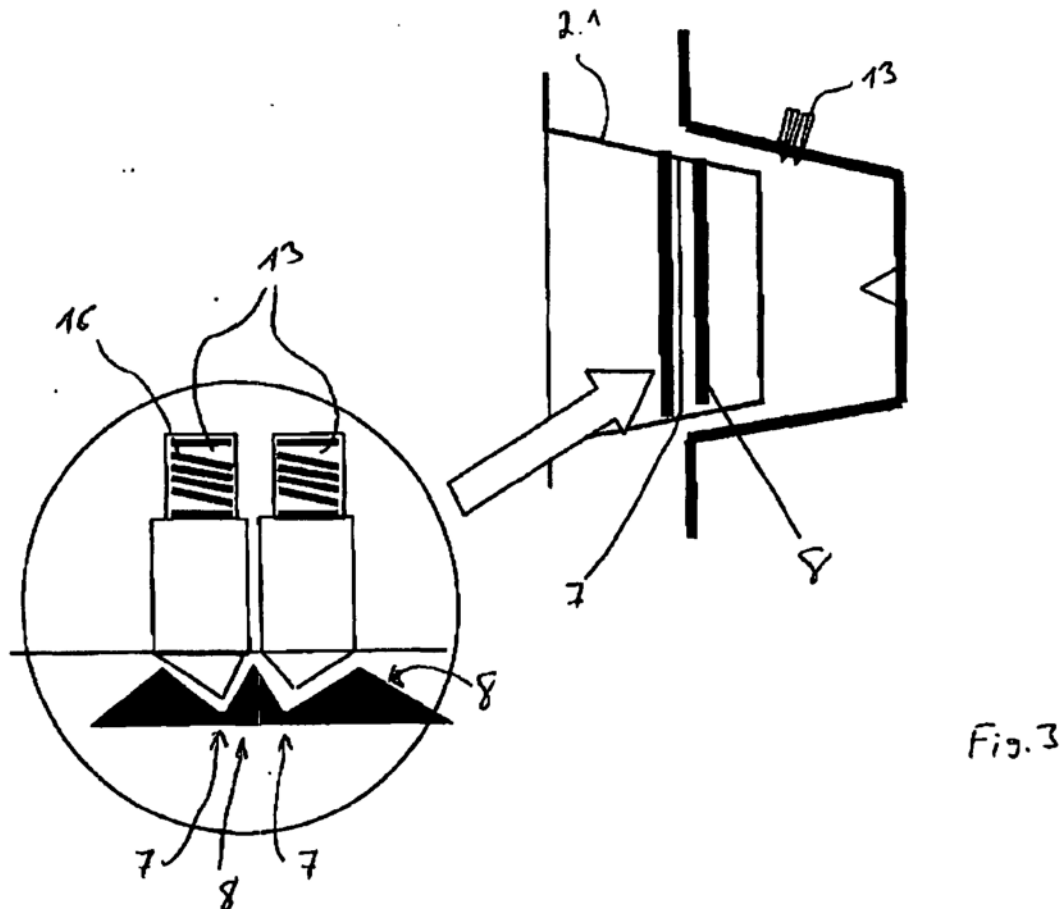
Accordingly, the February 2011 Application does not provide written description support for any claims of the '722 Patent.

157. German application 102010031988.0 was filed on July 22, 2010 (“the July 2010 Application”). EX. 1046 at 1. The July 2010 Application has no disclosure of a portion capsule with a “printed optically detectable identifier located on” the bottom side of the flange that also includes (i) a base element with radially spaced and vertically oriented drawn grooves or ribs, or (ii) a cavity with radially spaced or vertically oriented drawn ribs. Indeed, the Figures from the February 2011 Application disclosing vertical grooves and ribs are not present anywhere in the July 2010 Application, let alone combined with the other claimed features of the '722 Patent claims, such as an optically detectable identifier positioned on the bottom of the capsule flange. Nor does the July 2010 Application disclose an optically detectable identifier that includes a repeat pattern.



Ex. 1047, September 2010 Application at FIG. 2.

158. The July 2010 Application's FIG. 3 embodiment shown below does not disclose the claimed vertical grooves and/or vertical ribs in the '722 Patent.



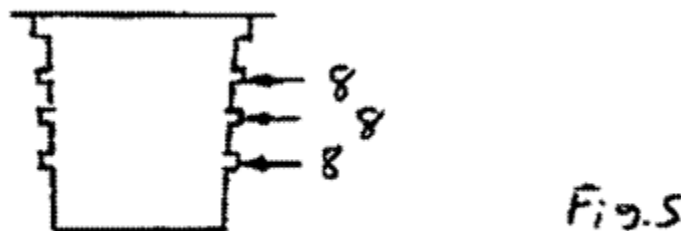
Ex. 1045, July 2010 Application at FIG. 3.

159. First, the features shown in FIG. 3 and discussed on pages 26 and 27-28 are not vertically oriented or radially spaced as required by the claims. Indeed, the '722 Patent explains what a vertical groove or rib would entail: "According to the invention provision is made for the grooves 32 to be extended vertically across the wall region, i.e. they run straight from the flange 17 to the bottom region 2.2, in

which it is not necessary that they are extended over the whole length.” Ex. 1001 at col. 12, lines 14-18. Such features are absent from the July 2010 disclosure.

160. Second, the features found in FIG. 3 of the July 2010 Application are only shown on the exterior of the capsule wall, and thus do not disclose vertically oriented and radially spaced ribs on the capsule’s inner cavity. In fact, the July 2010 Application fails to disclose anything about mechanical groove or rib features on the capsule’s inner cavity at all.

161. Fig 5 of the July 2010 Application below is similar to Fig. 3. Like the bulges in Fig. 3, there is not disclosure of vertically oriented and radially spaced grooves, and no disclosure regarding the interior capsule cavity, let alone vertically oriented and radially spaced ribs on the inner cavity.



Ex. 1046, July 2010 Application at FIG. 5.

162. A person of ordinary skill in the art would find that the July 2010 Application fails to disclose all of the features of the '722 Patent claims.

163. Nor does the July 2010 Application disclose holding arms, or a groove and seal configured to bear against a top side of the portion capsule's lid, or an optically detectable identifier including a repeat pattern. (*See* Ex. 1046 generally.) Accordingly, the July 2010 Application does not provide written description support for any claims of the '722 Patent.

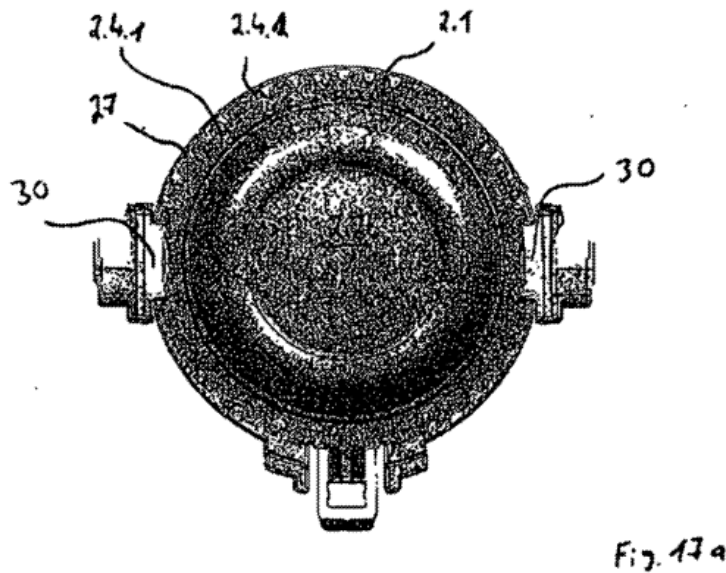
164. German application 102010044251.8 was filed on September 2, 2010 ("the September 2010 Application"). Like the July 2010 Application, the September 2010 Application discloses different embodiments of a portion capsule with an identifier. However, like the July 2010 Application, the September 2010 Application also never discloses a portion capsule with such a barcode according to the '722 Patent claims that also includes (i) a base element with radially spaced and vertically oriented drawn grooves or ribs, or (ii) a cavity with radially spaced or vertically oriented drawn ribs.

165. Similar to the July 2010 Application, the September 2010 Application discloses an embodiment including identifiers that are encrypted bulges, which require detection by a mechanical and/or optical process. Ex. 1047 at 31-32, 38-39 and FIGS. 3 and 5. This includes using the bulges to close a circuit (*id.* at 38-39, FIG. 3), or serve as bits of a key (*id.* at 39, FIG. 5). For the same reasons described above regarding the July 2010 Application, these features do not disclose vertically

oriented and radially spaced grooves on the exterior of the capsule wall or vertically oriented and radially spaced ribs on the interior of the capsule cavity.

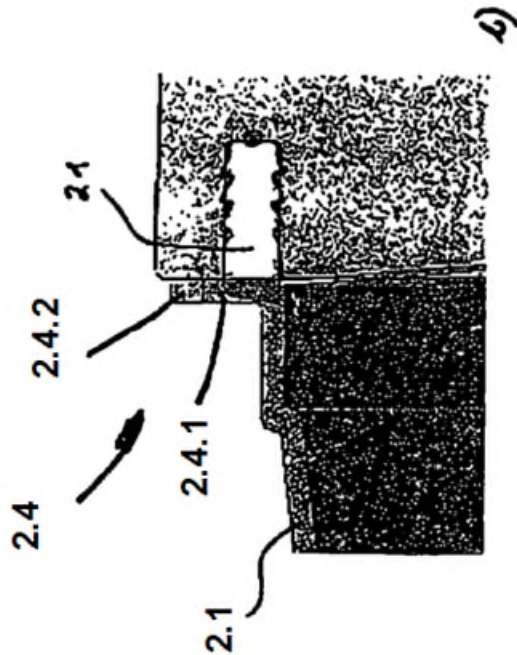
166. The September 2010 Application further includes embodiments regarding a gear-shaped rim or flange of the capsule, which is used as an identifier. Ex. 1047 at 36, 41-43 and FIGs. 16-18. However, such features are located on the rim of the capsule (shown at item 2.4.2 regarding the edge region), and thus are not located on the interior or exterior wall of the capsule. Nor do they constitute vertically oriented and radially spaced grooves or vertically oriented and radially spaced ribs. These features are shown in the below image, which indicate a portion of the capsule flange at 2.4.2 and depict various gear-like mechanisms on that flange.

167. Figs 17a-c depict similar embodiments of the portion capsule engaged with the brewing chamber as depicted in Fig. 16. These show various numbers of gear teeth in the capsule flange outer circumference engaged with mating projections in the elastomeric seal of the brewing chamber.

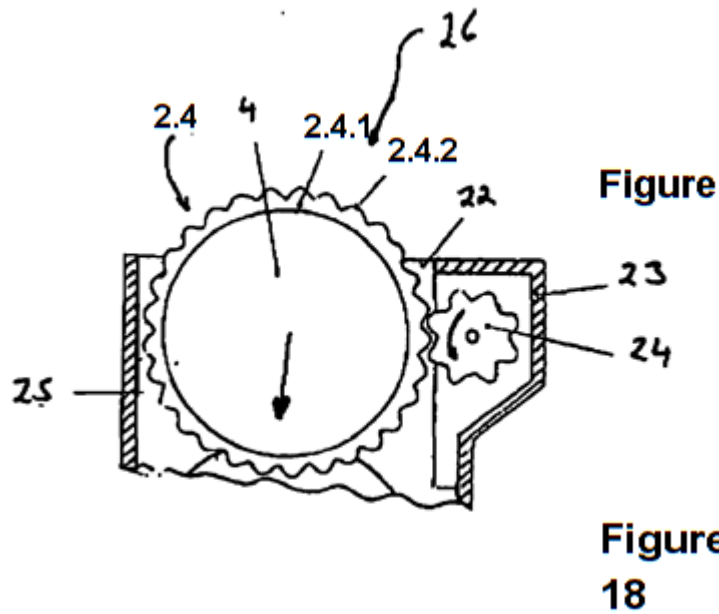


Ex. 1047, September 2010 Application at FIG. 17a.

168. A person of ordinary skill in the art would not recognize the invention disclosed in the September 2010 Application as containing vertically oriented and radially spaced grooves or ribs in the wall or cavity sections of the capsule body. The gear teeth as disclosed cut through the external rim of the “boundary area” (flange). This is seen in Fig. 16b, reproduced below, at 2.4.2, and further clarified by Fig. 18 below, which shows the gear-shaped rim interacting with a mating cogwheel in the brew chamber.



Ex. 1047, September 2010 Application at FIG. 16b.



Ex. 1047, the September 2010 Application at FIG. 18.

169. In my opinion, none of the foreign applications disclose, *inter alia*, (i) “a printed optically detectable identifier located on the bottom side” of the flange, (ii) a base element with “radial spaced and vertically oriented drawn grooves,” and (iii) a cavity with “radially spaced and vertically oriented drawn ribs. These features are required by all claims of the ’722 Patent.

170. As shown, none of the three foreign applications disclose any embodiments satisfying each and every claim limitation of the ’722 Patent. Consequently, the ’722 Patent is not entitled to its foreign priority dates, and the earliest priority date it may claim is its PCT filing date of July 22, 2011.

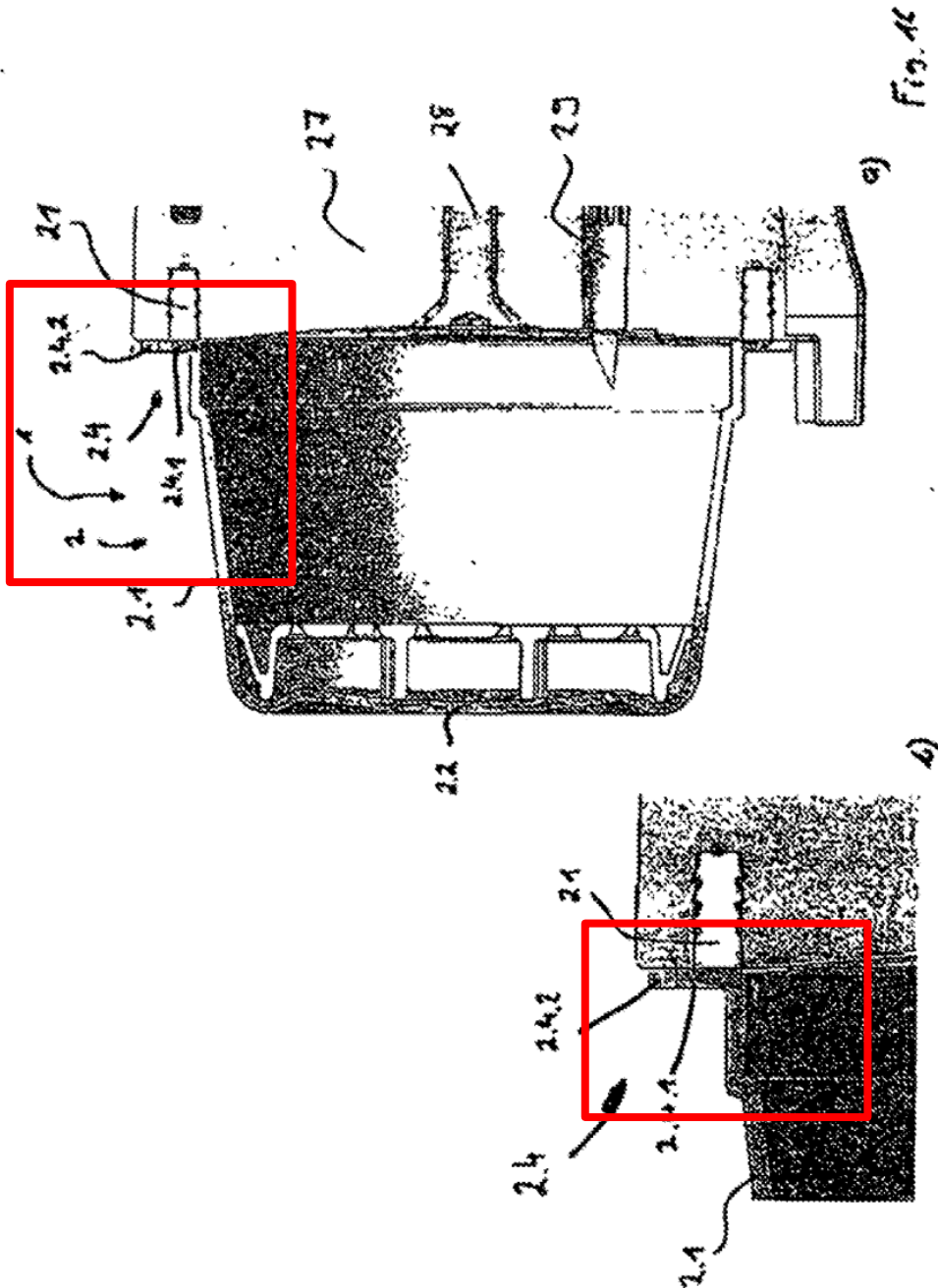
171. Additionally, the September 2010 Application fails to disclose an optically detectable identifier, provided on the bottom side of the flange, which is *also* provided on the capsule side wall, as required by claims 13 and 16. Nor does the September 2010 Application disclose an optically detectable identifier on the bottom of the flange that includes a repeat pattern, as required by claims 14-16 and 20.

172. The September 2010 Application fails to disclose “an optically detectable identifier includ[ing] a repeat pattern” provided on the bottom of the flange (Ex. 1047.) Although the September 2010 Application discloses “[a] **barcode** to be provided on that side of the peripheral region of the basic element which is directed away from the membrane” (Ex. 1047 at p. 38, lines 20-24), it never discloses any embodiment utilizing a repeat pattern, let alone one of the bottom side of the flange.

There are also no figures disclosing an identifier, which includes a repeat pattern, on the bottom side of the flange. At best, the September 2010 Application briefly mentions the possibility of a repeat pattern with no other details about its implementation. The September 2010 Application never discloses repeating a barcode (as opposed to extending one code around the entirety of the flange), and refers to a “repeat pattern” as distinct from a “barcode.” Ex. 1047, 33:6-7 (“The print is preferably a barcode, a logo, **or** a repeat pattern.”).

173. To be sure, FIGs 16-18 do not disclose “a printed optically detectable identifier includ[ing] a repeat pattern” provided on the bottom of the flange. Figure 16 utilizes a physical identifier in the form of a “toothed ring” around the “outer region” of the flange or peripheral region 2.4. (Ex. 1047 at p. 41, lines 22-27.) Specifically, EX1047 states “[t]his peripheral region 2.4 has, **in its outer region**, a form-fitting and/or friction-fitting means and/or a detection means 2.4.2.” (*Id.*) This embodiment does not depict or discuss an identifier located on the bottom surface of the capsule flange, and instead discusses an identifier on the “outer region” of the flange, i.e., its outer circumference. This is also stated on page 6 at 8-11. (“The form-fitting means, friction-fitting means and/or detection means is preferably a toothed ring or toothed-ring segment provided, in particular, on the **outer circumference** of the periphery.”) **Moreover, the toothed ring 2.4.2 is not “printed”**

as required by the '722 Patent claims. The fact that the toothed ring 2.4.2 is shown on the outer region of the flange is also depicted in EX1047, for example in FIG. 16:



174. In addition, not only is the toothed ring not located on the bottom of the flange, and not printed, but it is also not an optically detectable identifier or repeat pattern.

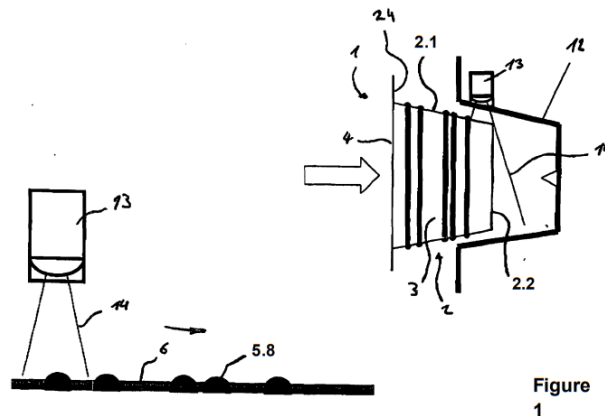
The September 2010 Application only mentions a “repeat pattern” in the context of a machine readable print, and a POSITA reading EX1047 would understand the term “repeat pattern” to mean a type of machine readable print—not including a physical “toothed ring.” EX1047 at 33, lines 1-7 (“The identifier is further preferably a machine-readable print. This print is done preferably using an ink which is permissible in the food sector. Further preferred printing material or printing materials are constituted by fluorescent materials, with optical properties which change under the influence of temperature. ***The print is preferably a barcode, a logo or a repeat pattern.***”)

1. No Disclosure of the Claimed Invention

175. In addition to lacking disclosure of all claim elements in any given priority filing, the September 2010 Application further fails to provide written description support for the ’722 Patent claims because the claimed invention is not disclosed in any cohesive embodiment. A person of ordinary skill in the art would understand the September 2010 Application to disclose several distinct embodiments of an identifier implementation rather than one cohesive embodiment. Accordingly, the September 2010 Application never discloses the ’722 Patent claimed invention.

176. For example, Figure 1 of the September 2010 Application discloses a portion capsule with cavity filled with a beverage material and closed with a membrane. (Ex. 1047, at p. 36, lines 1-9) The portion capsule has an identifier made of several raised

areas 8, with which it can be determined if the capsule is suitable for use with the machine. (*Id.* at lines 27-30 and lines 14-19.) However, in my opinion, the embodiment depicted in Figure 1 (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, a cavity with radially spaced or vertically oriented drawn ribs, or the claimed groove and seal configuration.

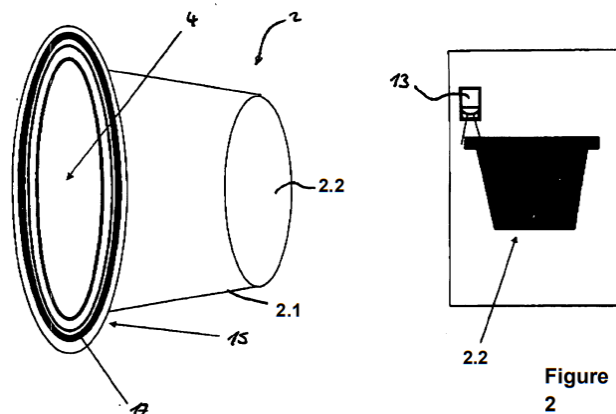


Ex. 1047, September 2010 Application at FIG. 1.

177. The text accompanying FIG. 1 goes on to explain how the identifier would influence operation (e.g., Ex. 1047 at p. 37, line 38 – p. 38, line 6), and clarifies that this “applies to all other examples.” (Ex. 1047 at p. 38, lines 8-10.) A person of ordinary skill in the art would understand this language to explain that any of the disclosed identifier configurations would operate to influence machine operation in the same way—not that multiple distinct machine embodiments would be combined with one another. This is because multiple distinct identifier embodiments are

unnecessary or confusing for the system to operate, and in many cases could not physically be combined in a sensible manner.

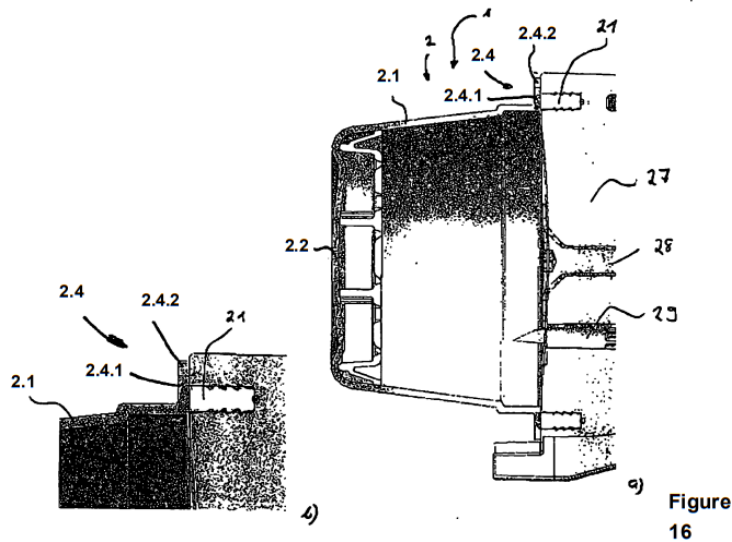
178. Figure 2 discloses an alternative embodiment of a capsule with an identifier that is a barcode on the edge area of the base element. The accompanying text states that “[a]s an alternative, it is possible, as symbolized by the arrow 15, for the barcode to be provided on that side of the peripheral region of the basic element which is directed away from the membrane.” (*Id.* at p. 38, lines 21-24.) This embodiment again fails to disclose at least the claimed holding arms, an optically detectable identifier located on the bottom side of the flange, a base element with radially spaced and vertically oriented drawn grooves or ribs, a cavity with radially spaced or vertically oriented drawn ribs or the claimed groove and seal configuration. (*Id.* at p. 38, lines 11-27.)



Ex. 1047, September 2010 Application at FIG. 2.

179. Figures 3 through 15 also disclose various embodiments with alternative features, including electrically conductive coatings or identifiers consisting of indentations, barcodes, bulges, reflective and blunt zones, widened rings, ferromagnetic material, or a metallic built-in element like a sieve. (Ex. 1047 at p. 38, line 29 – p. 41, line 11.) These identifiers are shown to be in locations such as in the area of the lid foil or film, or on the bottom surface of the capsule, but not on the side of the flange facing away from the membrane. (*Id.* at FIGs. 3-15.)

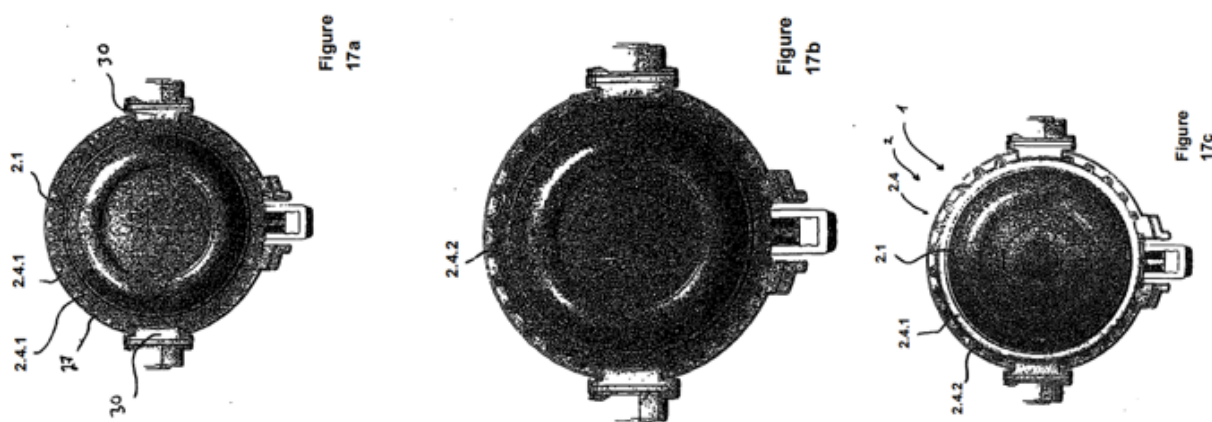
180. Figure 16 (below) shows yet another embodiment of a portion capsule, which uses a physical identifier in the form of a “toothed ring” around the “outer region” of the flange or peripheral region 2.4. (Ex. 1047 at p. 41, lines 22-27.) This embodiment does not depict or discuss a printed optically detectable identifier located on the bottom side of the capsule flange, and instead discusses an identifier on the “outer surface” (i.e., the outer circumference) of the flange. (Ex. 1047, p. 35, lines 8-10 (“The form-fitting means, friction-fitting means and/or detection means is preferably a toothed ring or toothed-ring segment provided, in particular, on the outer circumference of the periphery.”) In only this embodiment, the specification explains “[p]referably a sealing surface 2.4.1 is provided in the peripheral region 2.4, on the inside in respect of this toothed ring, and interacts with sealing action with a seal 21, which is arranged on the brewing chamber 27.” Ex. 1047 at p. 41, lines 27-31.



Ex. 1047, September 2010 Application at FIG. 16.

181. Figures 17a-17c show other designs of toothed ring identifier 2.4.2 located on the “outer region” of the peripheral region 2.4 from FIG. 16, and explains that if this feature was not present “the retaining arms could not retain the capsule and the capsule, rather than being introduced into the brewing chamber, would drop through into a waste container.” (Ex. 1047 at p. 41, line 37 – p. 42, line 12.) In my opinion, Figures 17a-17c, which utilize a physical toothed ring, or gearwheel-type identifier, are the only figures to show a portion capsule being held by means of two holding arms 30, which interact with gearwheel 2.4.2. Additionally, Figures 17a-17c do not disclose or depict a capsule with a printed optically detectable identifier located on the bottom side of the flange to a person of ordinary skill in the art. Furthermore, Figure 18 depicts that the flange’s outer edge interacts with pinion 24. Moreover, a person of ordinary skill in the art would not recognize the invention disclosed in the

September 2010 Application as containing vertically oriented and radially spaced drawn grooves or ribs on the base element or cavity sections of the capsule body. The gear teeth as disclosed cut through the external rim of the “boundary area” (flange). This is seen in Fig. 16b at 2.4.2, and further clarified by Fig. 18, which shows the gear-shaped rim interacting with a mating cogwheel in the brew chamber.



Ex. 1047, September 2010 Application at FIG. 17a-c.

182. To be sure, 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. The “form-fitting and/or friction-fitting means and/or a detection means 2.4.2” is specific to Figures 16-18, which depict and describe physical toothed ring embodiments that interact with retaining arms, or interact with a pinion to allow the capsule to pass into the insertion shaft. See EX1047 at p. 41, line 13 – p. 42, line 29.

183. Although K-fee has previously argued that a “form-fitting and/or friction-fitting means and/or a detection means 2.4.2” could represent any other identifier, such as a barcode, the September 2010 Application provides no support for this to a POSITA. There is also no language that ties the disclosure referencing FIG16-17 to any other Figure or embodiment, 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. Indeed, in some instances, the September 2010 Application refers to a “detection means” as a sensor, not an identifier. (e.g., EX1047 p. 31, lines 29-31 (“A sensor/**detection means** provided on the coffee machine preferably senses this identifier and compares it preferably with a stored identifier.”); *id.* p. 31, line 36 – p. 31, line 1 (“The **detection means** is preferably provided in the region of the portion-capsule-insertion shaft of the coffee machine.”). The September 2010 Application also utilizes different reference numbers for the various identifiers, such as reflective surface (5), matte surface (6), concavity (7), convexity (8), electrically conductive region (10), barcode (17). The “form-fitting means, friction-fitting means and/or detection means” (2.4.2) has its own numbering, and is never associated with any other identifier. (EX1047 at p. 44.)

184. Accordingly, nowhere does the September 2010 Application ever provide any disclosures linking together the disparate features across these embodiments—in

particular (i) a printed optically detectable repeat pattern, (ii) such optically detectable repeat pattern located on the bottom of the flange (and also on the capsule side wall for claims 13 and 16), (iii) a base element with “radial spaced and vertically oriented drawn grooves,” (iv) a cavity with “radially spaced and vertically oriented drawn ribs,” (v) holding arms, and (vi) the groove and seal configurations of the beverage machine associated with the toothed ring embodiment. Because these elements are merely listed separately across disparate embodiments (or are missing altogether, such as the radially spaced and vertically oriented grooves and ribs, or a printed optically detectable repeat pattern located on the bottom of the flange) and are not cohesively tied together in any disclosure, there is no disclosure of an invention meeting the limitations of the ’722 patent in the September 2010 Application. It is my opinion that the September 2010 Application does not provide written description support for the ’722 Patent claims, and the ’722 Patent should not receive the benefit of the priority dates of its foreign applications.

185. The generic statements in the September 2010 Application that “[t]he invention will be explained hereinbelow with reference to figures 1-18. These explanations do not have a limiting effect on the general concept of the invention” do not provide useful information regarding the details of the invention to a person of ordinary skill in the art nor does it demonstrate to a person skilled in the art that

the Applicant had possession of the '722 claimed invention, as it fails to link any of the claimed features together. (EX1047 at p. 35, lines 23-26.)

186. Moreover, the claims located toward the end of the September 2010 Application also do not provide written description support for the '722 Patent claimed invention. Those dependent claims are only directed to a portion capsule, and do not disclose any details of the brewing system claimed in the '722 Patent. They do not provide any indication to a person of ordinary skill in the art that features in the September 2010 Application would be combined in a way that would arrive at the '722 Patent invention. Additionally, those claims also fail to even disclose a printed optically detectable identifier located on the bottom of the flange, or the portion capsule's radially spaced and vertically oriented drawn grooves. Accordingly, the September 2010 Application claims do not demonstrate to a person of ordinary skill in the art that the Applicant had possession of the '722 Patent claimed invention.

187. As shown herein, none of the three foreign applications provide written description support for each and every claim limitation of any claim of the '722 Patent. Consequently, the '722 Patent is not entitled to its foreign priority dates, and the earliest possible priority date it may attempt to claim is its PCT filing date of July 22, 2011 (and which itself may not support the '722 Patent claims—an issue for which I have not formed an opinion).

VII. CLAIMS 1-24 ARE UNPATENTABLE BECAUSE THEY WOULD HAVE BEEN OBVIOUS TO A PERSON OF ORDINARY SKILL IN THE ART

188. I now turn to the references applied in the grounds for obviousness discussed below. In my analysis, I specifically address the following references:

No.	Reference	Referred To As
1	US 2010/0239734	Yoakim
2	US 2013/0064929	Jarisch 929
3	WO 2010/099806	Rossi
4	U.S. Patent Pub. US2012/0269933A1	Rapparini
5	US 2008/0105131	Castellani

189. Based on my review of the '722 Patent and its prosecution history, the materials I have considered, and my knowledge and experience, it is my opinion that the '722 Patent claims are unpatentable as obvious over the prior art based on the following grounds:

- Ground 1: Claims 1 and 4-24 are obvious in view of the combination of Yoakim, Jarisch 929, Rossi and Rapparini.
- Ground 2: Claims 2-3 are obvious in view of the combination of Yoakim, Jarisch 929, Rossi, Rapparini and Castellani.

A. Overview of the Prior Art

1. Overview of Yoakim (Ex. 1004)

190. Yoakim was filed May 7, 2010, before the earliest priority date to which the '722 Patent is entitled. I have been informed that Yoakim is therefore prior art under at least 35 U.S.C. §102(e).

191. Yoakim discloses a centrifugal beverage brewing system with a single-serve portion capsule, brewing device, and method for preparing a liquid food or beverage, *e.g.*, coffee. Ex. 1004 at [0014]. As shown in FIG. 1 below, the Yoakim system (1) operates on a centrifuge principle, by rotating the capsule (3) to facilitate beverage extraction. Ex. 1004 at [0180]. The brewing device (2) uses a centrifugal brewing module (4) that is rotated by a motor (11), and further includes a water reservoir (5), low-pressure pump (6), and water heater (7). Ex. 1004 at [0180], [0182].

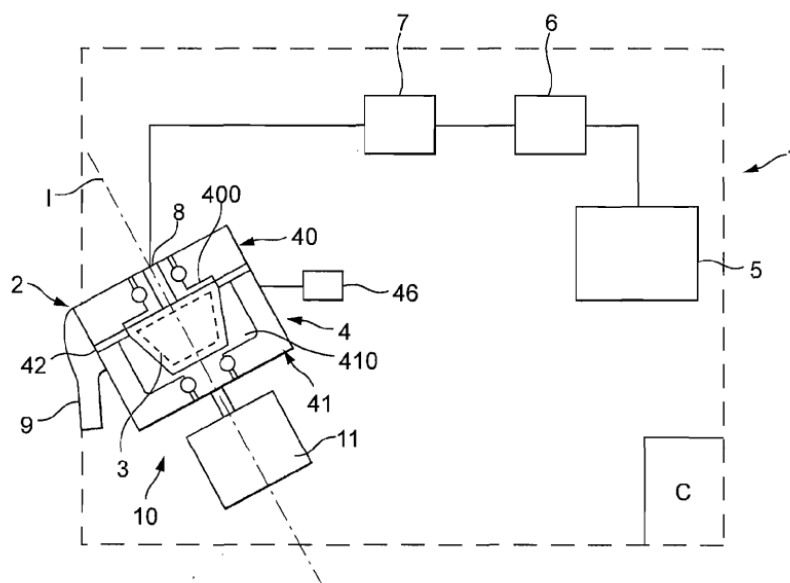


FIG. 1

Ex. 1004, Yoakim at FIG. 1.

192. More specifically, Yoakim's device includes a capsule holder 41 that holds the capsule in place for rotation, and a circular lid 40 that covers the capsule during brewing. The lid 40 includes a piercing structure 50 that pierces the capsule membrane and injects water into the capsule. Ex. 1004 at [0186]. The lid further includes outlet piercing elements 51 that are located along the periphery of the circular lid 40 that all brewed beverage to exit the capsule during centrifugal rotation. *Id.* Brewed beverage collects in region 52 and exits through gravity into a user's cup through outlet 9. *Id.* These features are shown in FIG. 4:

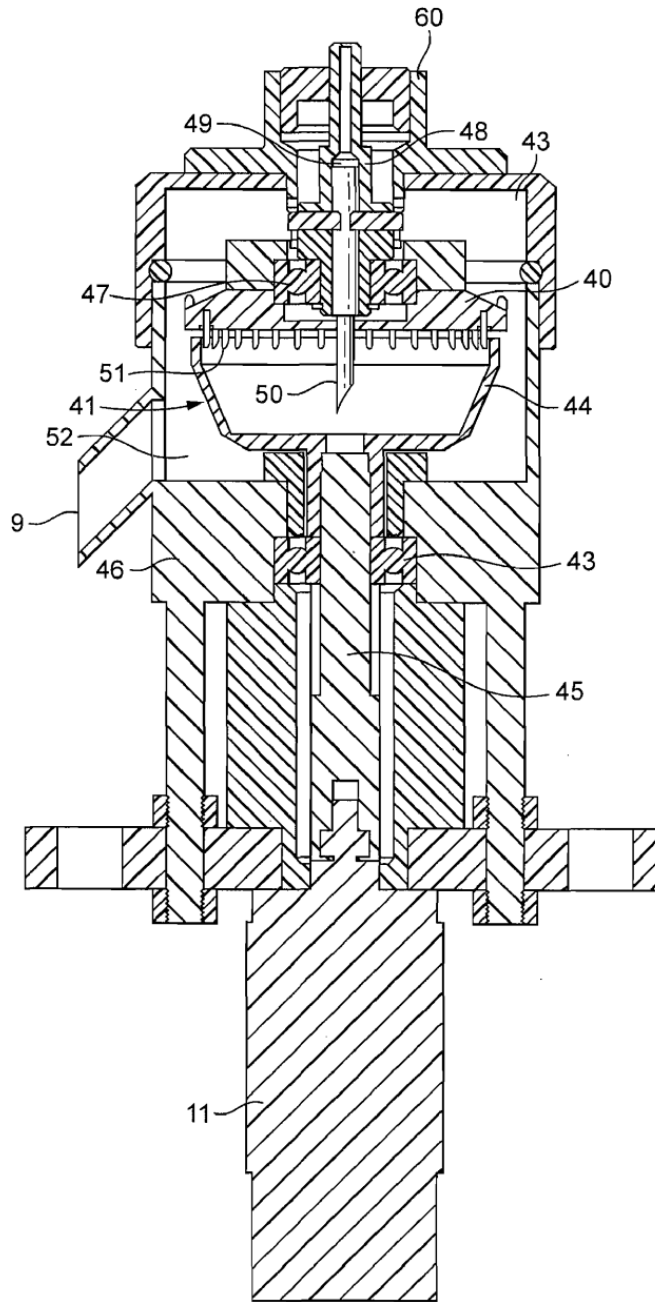
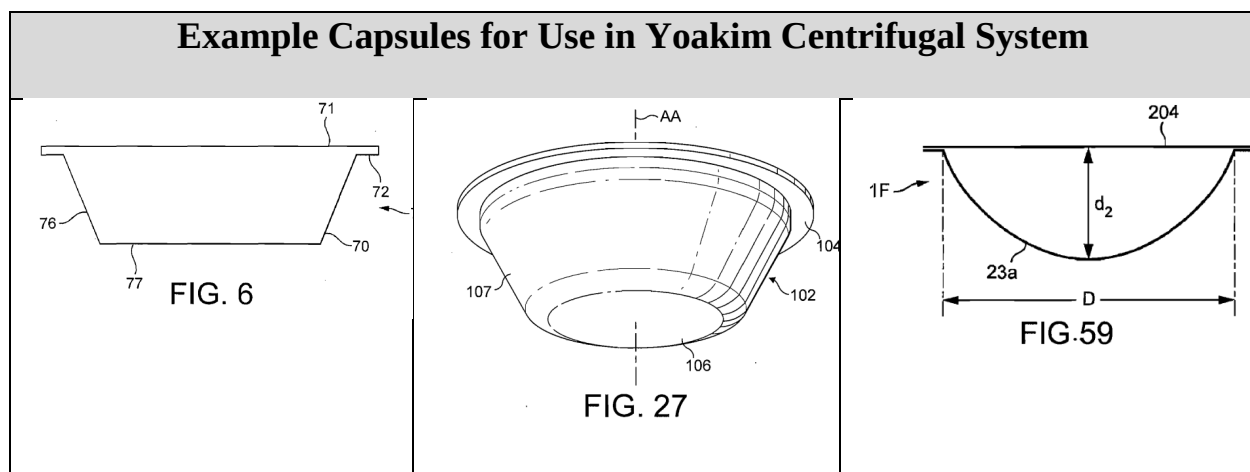


FIG. 4

Ex. 1004, Yoakim at FIG. 4.

193. The capsules used in the Yoakim system include “an enclosure containing one or more extractable or infusible ingredients.” Ex. 1004 at [0014]. The capsules include a rim or flange (“upper edge 72”) onto which a lid enclosure, such as a pierceable membrane, is sealed. *Id.* at [0197]; *see also* [0414]. The capsules can include gas barrier and support layers in the membrane and capsule body, and can include an inert gas to preserve freshness of the beverage raw materials. *Id.* at [0121], [0128]-[0129]. The capsules are configured to be “radially symmetrical about a central axis to facilitate rotation” and to include an opening “near or upon the perimeter of the enclosure to allow the liquid food to leave the capsule radially due to the application of centrifugal forces.” *Id.* at [0014]. Exemplary capsules for use with the Yoakim system are shown in Figures some of which are in Figures 6, 7, 26, 27, 58-60, some of which are reproduced below:



194. The object of the Yoakim invention is to better and more independently control the brewing parameters among many types of beverage capsules to be

brewed in the system. Ex. 1004 at [0010]-[0011]. Yoakim achieved this through a capsule identification system that can recognize the capsule and use a control unit to vary the brewing parameters accordingly, including using control of the water pump. *Id.* at [0192], [0477]. Yoakim’s capsule identification system can use optical codes, such as “a barcode, a colour, a sign, a logo, etc.” in order to identify the capsule. Ex. 1004 at [0496], [0525], FIGs. 61-62.

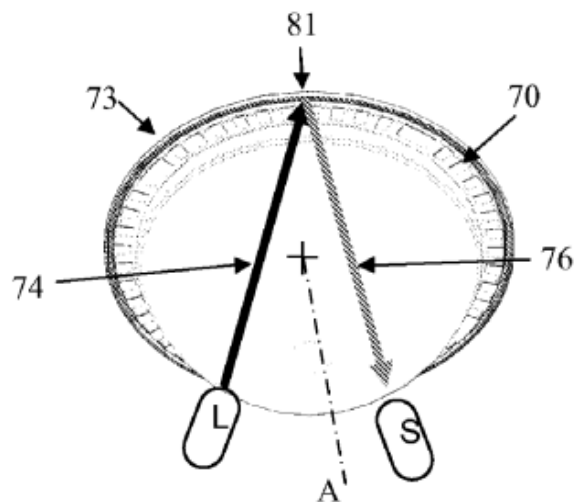
2. Overview of Jarisch 929 (Ex. 1006)

195. U.S. Pat. Pub. 2013/0064929 to Jarisch (“Jarisch 929”) was filed as a PCT on May 12, 2011, before the earliest priority date to which the ’722 Patent is entitled. I have been informed that Jarisch 929 is therefore prior art under 35 U.S.C. §102(e).

196. Jarisch 929 generally discloses an improved way to position an optical code (also referred to as a “support”) on a capsule used in a centrifuge-style brewing system, in order to improve the ability to read and retrieve information about the capsule, and adjust working parameters of the machine. Ex. 1006 at [0001]; [0003]; [0011]-[0012], [0068]. Jarisch 929 discloses that optical codes may be identified by the brewing device, and this identification may include the ability to recognize useful information beyond brewing parameters, including the type of capsule inserted into the beverage machine, as well as manufacturing information. *Id.* at [0022]-[0023]. Jarisch 929 explains that its invention can be used in conjunction with centrifuge-style brewing systems, such as WO2010/026053 to Denisart. Ex. 1006 at [0047]-

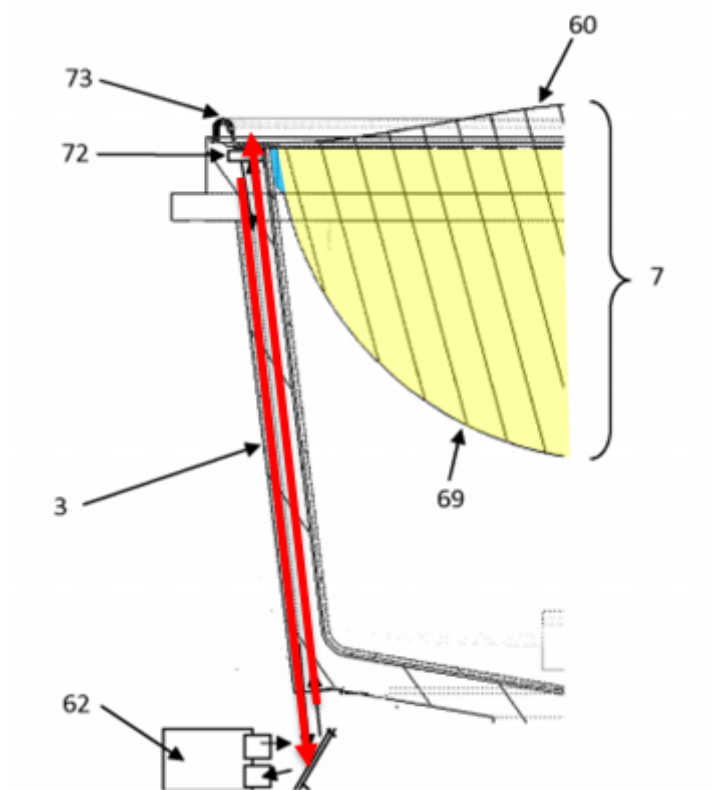
[0048]. Like Yoakim, Denisart discloses a system controlled by a code reader which reads the capsule's code. EX1007, 2:19-22.

197. The Jarisch 929 invention is designed to “provide a solution for reliably reading information related to a capsule with a sensor disposed in the machine” in particular “where available spaces are quite limited and in a harsh environment (ingredients traces, presence of vapors and liquids, . . .).” Ex. 1006 at [0014], *see also* [0011]. Jarisch 929 teaches that the optical code (70) may be disposed on the bottom side of the capsule rim (73), facing away from the membrane. Ex. 1006 at [0018]-[0019]; [0069]; [0090]; FIG. 4. Jarisch 929 explains that “[t]hese locations are particularly advantageous since they offer both a large area for the symbols to be disposed and is less prone to damages caused by the processing module and in particular by the pyramidal plate, and to ingredients projections. As a consequence, the amount of coded information and the reliability of the readings are both improved.” Ex. 1006 at [0017].



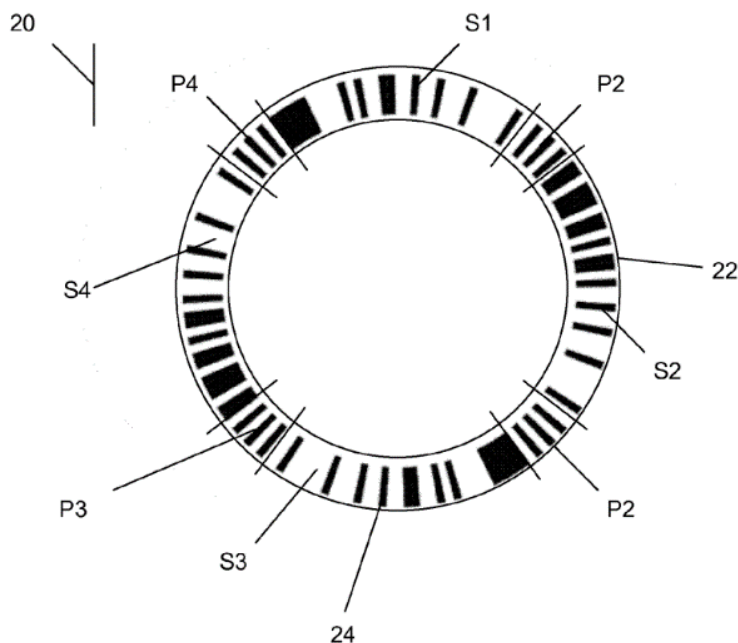
Ex. 1006, Jarisch 929 at FIG. 4.

198. Jarisch 929 accomplishes the machine's reading of an optical code positioned on the bottom of the capsule rim by placing an optical reader, made up of a light source and sensor, at the base of the capsule support chamber (centrifugal cell 3). Ex. 1006 at [0096]-[0098], [0106]. The capsule support chamber is transparent (or otherwise light conductive) to allow the light beam to reach the bottom side of the capsule rim, and then reflect back to an optical sensor. *Id.* at [106]. Mirrors can be used, if needed, to allow the beams to reach between the light source, capsule, and sensor. *Id.* This is shown in FIG. 5.



Ex. 1006, Jarisch 929 at FIG. 5.

199. Jarisch 929 also discloses repeating the optical code around the circumference of the bottom of the flange, and notes that repeating this information allows for greater reliability of readings during the rotation that occurs during centrifugal brewing, so that “the same sequence can be detected more than one time.” (Ex. 1006 at [0068].) The repeated optical code is shown below:



Ex. 1006, Jarisch 929 at FIG. 2.

3. Overview of Rossi (Ex. 1041)

200. Rossi was filed on March 6, 2009, before the earliest priority date to which the '722 Patent is entitled. I have been informed that Rossi is prior art under at least 35 U.S.C. § 102(e). Rossi is directed to a “system of an edible product making machine and load element, and a process for controlling the operation” thereof. (Ex. 1041 at p. 3.) The load element may be a single-use capsule containing beverage materials such as “coffee powder, instant coffee granules, tea leaves, freeze-dried soup granules or other substances designed to be put in contact with water within [the] machine.” (*Id.*) The capsule is sealed and inserted into the machine, and the capsule is then pierced, allowing water to pass through for the brewing process. (*Id.*) The capsule contents then empty into a different container (such as a cup) once the

final product or beverage has been brewed. (*Id.*) Rossi's system varies operating conditions such as amount of water, temperature and pressure of the water, and the time required based on the desired product. (*Id.* at pp. 3-4.)

201. Rossi explains the limitations of beverage making machines which rely on a user's manual input of operating conditions, describing the costly time and effort of such endeavors as well as the potential safety risks. (Ex. 1041 at p. 4.) Due to the possibility of human error when selecting operating conditions, it is possible to select the "wrong operating conditions," especially as load elements are sealed and not readily visible, thus leading to potential quality issues. (*Id.* ("[I]f there is no indication on the load element of its contents, the user cannot be sure of the contents, thus potentially selecting the wrong operating conditions for the desired quality of product, or even producing the wrong product.")) Rossi further explains 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 the [sic] may harm the user" because the machine involves the use of "high pressure, high temperature water, which poses a potential health hazard." (*Id.* at p. 5.)

202. Rossi improves upon existing systems by ensuring that the capsule used is suitable for use with the system before operating. (*Id.* at p. 5 ("A further technical task is that of providing a system and process for ensuring that operating conditions appropriate for the load element are used.")) For example, the system of Rossi only

activates if it recognizes an identifying element such as a barcode. (*Id.* at p. 11.) Upon recognition of the identifying element and validation thereof, the activation of the machine is triggered, and if the capsule is unable to be both identified and validated the machine will not be activated. (*Id.* at 11-12.) Because the system will not operate unless the capsule is both recognized and validated, the possibility for errors is vastly reduced. (*Id.* at 8 (“The use of an activation step of automatically activating the cycle of edible-product production only when the same identifying element is recognised in combination with the validated validation element ensures that the operating conditions actually used are the correct conditions as selected,” which “helps to prevent the user from making the mistake of inserting into the machine a different load element.”).)

4. Overview of Rapparini (Ex. 1008)

203. US. Pat. Pub. 2012/0269933 to Rapparini was filed as a PCT on October 19, 2010, before the correct priority date of the '722 Patent. I have been informed that Rapparini is therefore prior art to Patent Owner's PCT filing date under 35 U.S.C. §102(e). Rapparini discloses an improved portion container for substances suitable for the preparation of beverages such as coffee, tea, and espresso, including automatic home and industrial beverage systems. Ex. 1008 at [0007]-[0008].

204. Rapparini improves upon existing containers by including longitudinal grooves and ribs of varying lengths along the inner and outer surface of the capsule

body, which allow for optimization of system stability and rigidity. Ex. 1008 at [0009]-[0011]; FIG. 6; FIG. 6bis. The capsule body is formed from a flat sheet using a thermoforming process, with the annular flange at the top, and a generally cup shaped body. *Id.* at [0010]. The matched die set used during thermoforming creates longitudinal stiffening ribs that extend from the flange toward the bottom region of the capsule. *Id.* at FIGs. 1-5. Due to the thin wall, the grooves on the outside form a corresponding rib in the cavity. *Id.* at FIG. 6; FIG. 6bis.

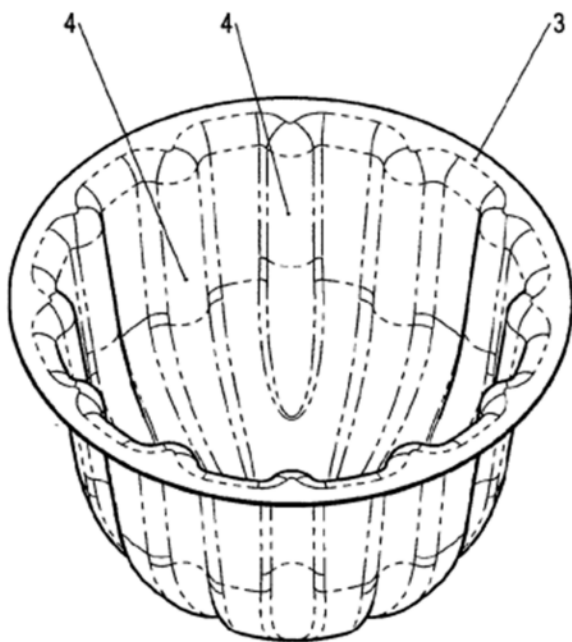


FIG. 6

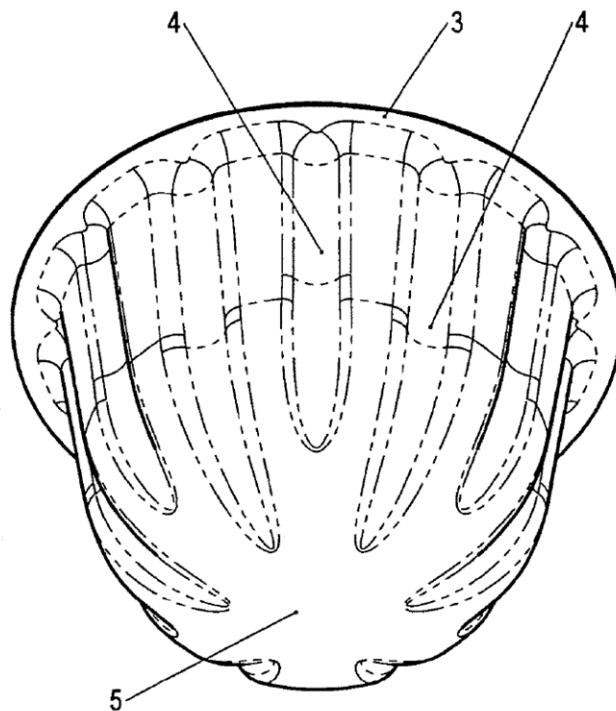


FIG. 6 bis

Ex. 1008, Rapparini at FIGs. 6, 6bis.

205. Rapparini discloses that its invention is applicable to containers made of several kinds of materials, and across varying shapes. Ex. 1008 at [0067]. Rapparini further discloses that the containers can be employed in domestic automatic espresso machines. *Id.*

206. As a result, Rapparini demonstrates that thin wall structures manufactured by punching methods such as thermoforming or deep drawing, which are suitable for beverage production can be formed with ribs in the side wall to enhance the

structural stability. Thus, Rapparini discloses various elements disclosed in the '722 Patent, including the claimed grooves and ribs. These are described in detail in the claim charts, and explained in further detail below.

5. Overview of Castellani (Ex. 1009)

207. Castellani published on May 8, 2008. I have been informed that it 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. (Ex. 1009 at [0001]-[0002].) Castellani improves upon existing systems by including ejecting fork elements to accurately and safely position and remove used portion capsules into a dropping box. (Ex. 1009 at [0010], [0054], FIG. 7)

B. Ground 1: Claims 1 and 4-24 are Obvious Over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini

208. It is my opinion that claims 1 and 4-24 of the '722 patent would have been obvious to a person of ordinary skill in the art at the time of the alleged invention of the '722 patent over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini.

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

209. As discussed in detail below, Yoakim discloses nearly all elements of claims 1 and 4-24. A person of ordinary skill in the art would have been motivated to combine the single-serve brewing system, capsule, and concepts of Yoakim, the printed optically detectable identifier located on the bottom side of the flange in

Jarisch 929, the operation of the pump control based on a machine determination of the capsule's optically detectable identifier as disclosed in Rossi, with the grooves and ribs of Rapparini to obtain the claimed system of the '722 Patent.

210. Yoakim, Jarisch 929, Rapparini and Rossi are all analogous art in the field of portion capsule beverage extraction, with each disclosing an invention that may be applied in automatic coffee/espresso machines. (*See, e.g.*, Ex. 1004 at [0002]-[0003]; Ex. 1006 at [0001]-[0002]; Ex. 1008 at [0001]; Ex. 1041 at page 3.) Yoakim, Jarisch 929, and Rossi are all designed to use capsule identifiers to optimize beverage machine operation in single-serve brewing systems. (Ex. 1004 at [0010]-[0011], [0025]; Ex. 1006 at [0012]; Ex. 1041 at pages 5-6.) Yoakim, Jarisch 929, and Rossi all can use optical codes read by the machine to achieve this. (Ex. 1004 at [0494]-[0496]; Ex. 1006 at [0016]; Ex. 1041 at page 11.)

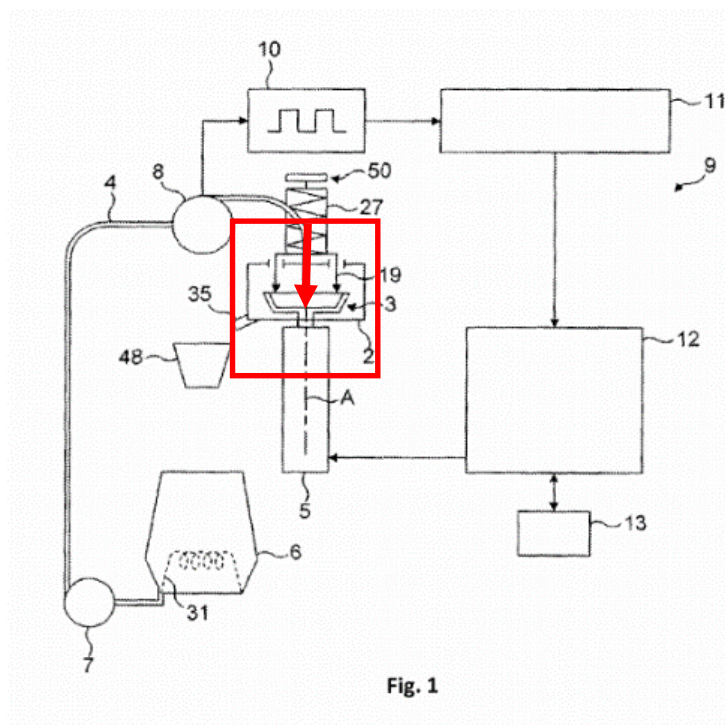
211. Persons of ordinary skill in the art with knowledge of the Yoakim system had reasons to look to Jarisch 929. Yoakim and Jarisch 929 arise from the same Applicant—Nestec SA—and both include a common inventor, Alexandre Perentes. (*See* Ex. 1004 and Ex. 1006 at Cover.) Moreover, the Jarisch 929 publication explains that it is meant to be used with a centrifugal-style brewing system like the one described in WO 2010/026053 (Ex. 1007), which is a WIPO patent publication that includes Jean-Paul Denisart and Antoine Ryser as named inventors. (*See* Ex. 1006 at [0047]-[0048]; *see* Ex. 1007 at Cover.). Both Jean-Paul Denisart and

Antoine Ryser are also named inventors on the Yoakim patent publication. (See Ex. 1004 at Cover.)

212. A person of ordinary skill in the art would understand that the Jarisch 929 invention is explicitly intended to be used with such a centrifuge-style brewing system as described in Yoakim. For example, the Denisart system of WO 2010/026053 (Ex. 1007) is expressly described as part of the Jarisch 929 system (Ex. 1006 at [0047]-[0048]), and is almost identical to the Yoakim system. Both systems support the body of the capsule from below and rotate it to brew beverages. (Ex. 1004 at 0187]; Ex. 1007 at page 4, lines 10-27.) Both systems pierce the capsule in its center to inject liquid. (Ex. 1004 at [0186]; Ex. 1007 at FIG. 1, page 5, lines 14-25.) Both systems pierce the capsule around its periphery to create holes for liquid coffee to exit under centrifugal forces. (Ex. 1004 at [0187]; Ex. 1007 at page 43, lines 4-17.) Both systems can use a code reader to identify the capsule and adjust brewing parameters accordingly. (Ex. 1004 at [0477], [0494]-[0496]; Ex. 1007 at page 8, lines 10-20.)

213. In addition, Jarisch 929 discloses that its invention is for use in a system with the same configuration as Yoakim's. For example, first, like Yoakim, Jarisch 929 discloses a centrifugal beverage preparation system. (Ex. 1006 at [0012], [0038], [0047], FIG. 1). Second, Jarisch 929 discloses a symmetrical capsule with a foil lid and a cavity filled with beverage ingredients such as ground coffee. (*Id.* at [0049].)

Third, Jarisch 929 discloses a detector to read the code on the capsule. (*Id.* at [0050], [0038], [0106]); Fourth, Jarisch 929 discloses a supporting capsule holder. (*Id.* at [0038], [0048], FIG. 1). Fifth, Jarisch 929 discloses a water line for inserting water into the center of the capsule, perpendicular to the flange location. *Id.* at FIG. 1. The brewing system and capsule of Jarisch 929 are shown below.



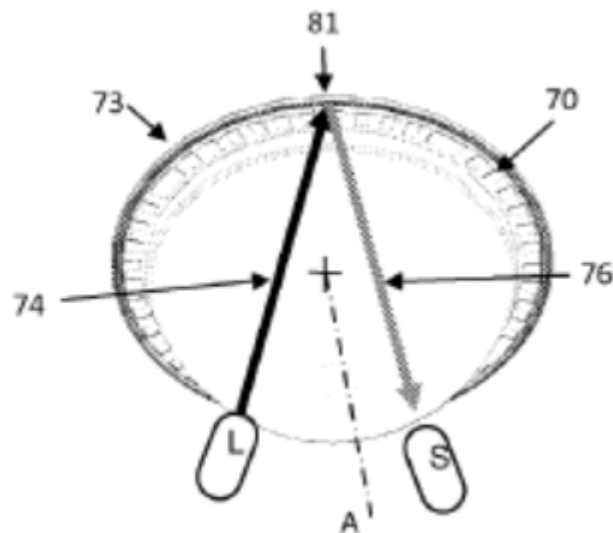


Fig. 5

Ex. 1006, Jarisch 929 at FIGs. 1 and 5.

214. A person of ordinary skill in the art would have been motivated to use the placement of the optical code and reader from Jarisch 929 in the Yoakim system. A person of ordinary skill in the art would have understood that Jarisch 929 provides an advantageous location to place an optical code in a centrifugal brewing system, such that the code is facing away from the membrane of the capsule and away from areas of the brewing chamber that contains piercing elements, liquid and coffee grounds. For example, Jarisch 929 explains that its disclosed code locations “are particularly advantageous since they offer both a large area for the symbols to be disposed and is less prone to damages caused by the processing module and in particular by the pyramidal plate, and to ingredients projections. As a consequence,

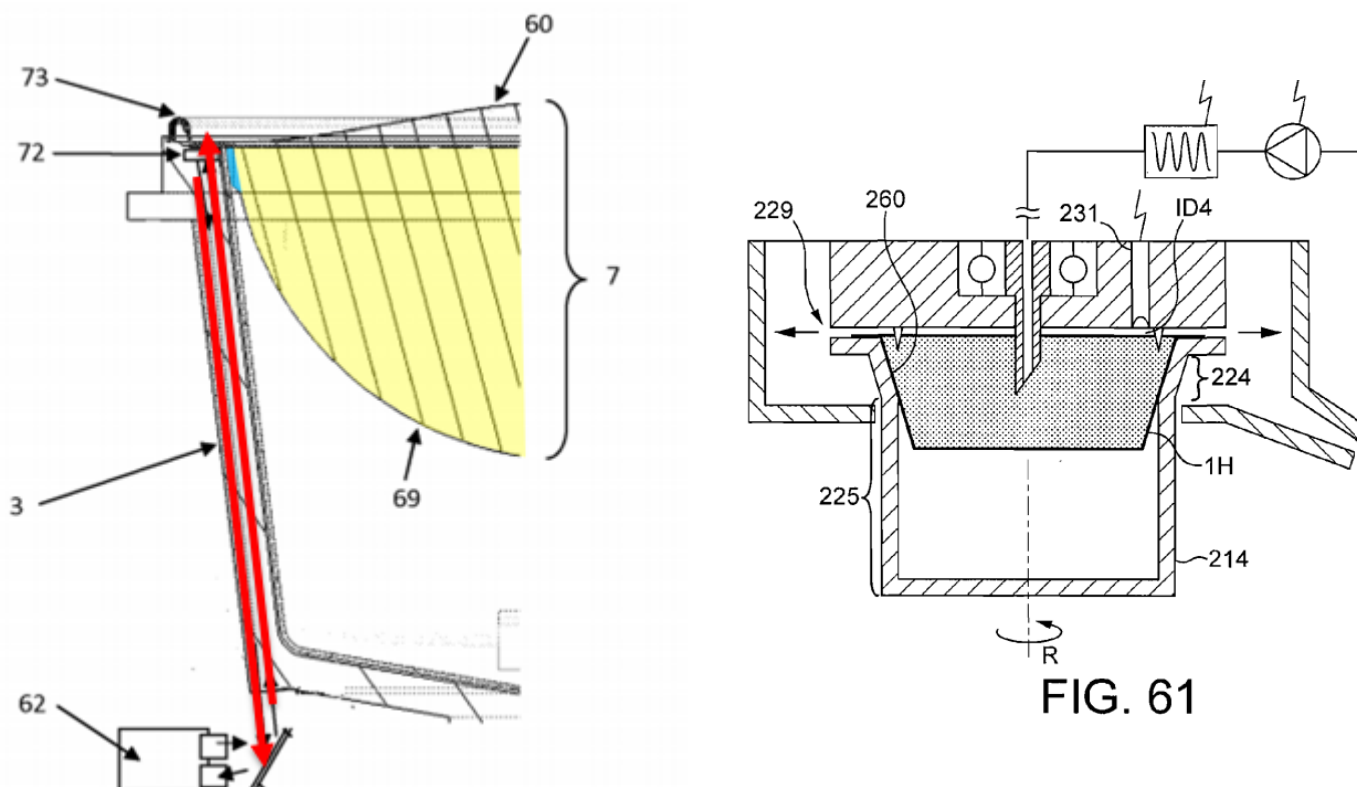
the amount of coded information and the reliability of the readings are both improved.” (Ex. 1006 at [0017], [0063].)

215. A person of ordinary skill in the art would also have been motivated to repeat the code around the perimeter of the capsule as disclosed in Jarisch 929. A person of ordinary skill in the art would have understood that repeating the code around the perimeter of a capsule that is read during rotation would increase the reliability of correcting reading the code, since repetition of the code allows the code to pass over the reading device numerous times during one rotation of the capsule. For example, Jarisch 929 discloses that the repeating code is advantageous 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 of the code. (*Id.*, [0068].)

216. Accordingly, these reasons would have motivated persons of ordinary skill in the art to modify Yoakim to include Jarisch 929’s code location on the bottom of the flange, and repetition of the code around the perimeter.

217. Additionally, a person of ordinary skill in the art would have had an expectation of success in this combination of Yoakim and Jarisch 929. As explained above in this section, Yoakim and Jarisch are both directed to centrifugal brewing systems with similar components and configuration. Jarisch 929 further teaches how to modify a centrifugal brewing chamber, such as the one in Yoakim, to read a code located on the bottom side of a capsule flange, away from the capsule membrane.

Specifically, Jarisch 929 teaches placing the light source at the bottom of the capsule support chamber (called the centrifugal cell 3), and configuring the capsule support chamber to be of a light conductive material such that a light source will pass through the support chamber and reach the bottom of the capsule flange. (Ex. 1006 at [0090]-[0106].) Jarisch 929 also discloses using mirrors as needed in order to position the optical light source and sensor in a suitable location and orientation. The Jarisch 929 optical reader (62) configuration is shown here with the light path (red) from detector (62) to capsule rim (73). A person of skill in the art would appreciate a similar modification to Yoakim FIG. 61 would be possible based on this disclosure:



Ex. 1006, Jarisch 929 at FIG. 5 (annotated); Ex. 1004, Yoakim at FIG. 61.

218. A person of ordinary skill in the art would also have had an expectation of success in implementing the repeated code from Jarisch 929 onto the bottom of the capsule flange from the Yoakim capsule. Specifically, Jarisch 929 discloses how to design and repeat an optical code on the capsule such that it can be read by a reader during capsule rotation, such as the rotation in Yoakim. Ex. 1006, [0090]-[0106]. The Jarisch 929 repeated code is disclosed in FIG. 2 (reproduced below) and discussed in [0051] and [0057]-[0058], for example. Jarisch 929 explains that “each sequence may represent an integer number of bits. Each symbol may encode one or several binary bits. The data may also be represented by transitions between symbols. The symbols may be arranged in the sequence using a modulation scheme, for example a line coding like a Manchester coding.” Ex. 1006, [0026]. Jarisch 929 goes on to explain “at least one preamble symbol is represented in the section, so as to allow the determination of a start and/or stop position in the section of each sequence.” (*Id.* at [0060].) A person of ordinary skill in the art would expect success when placing the code from Jarisch 929 onto the bottom of the flange of a Yoakim capsule, as the bottom of the flange of the Yoakim capsules provide adequate space for such a code to be repeated around the entire perimeter.

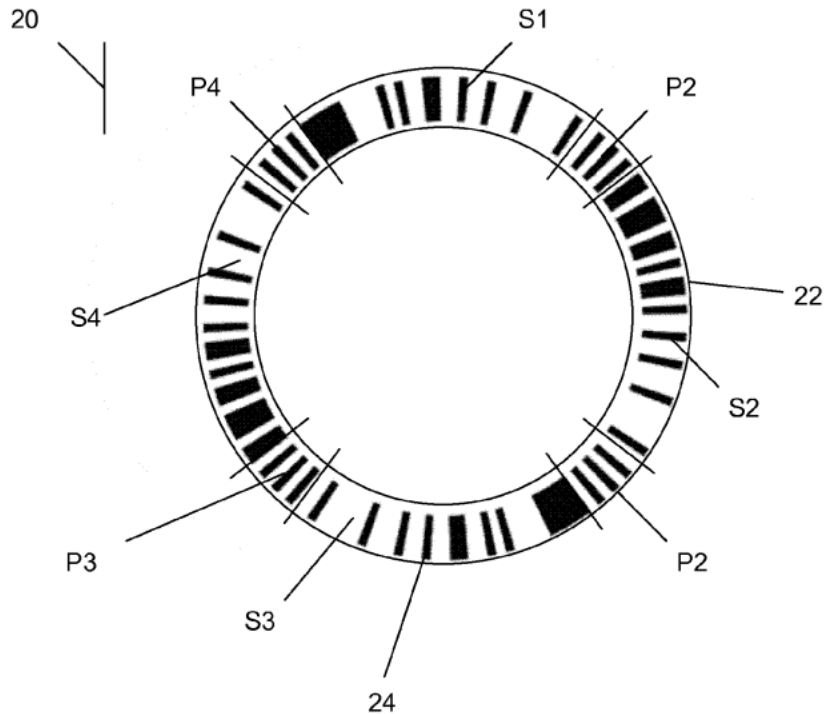


Fig. 2

Ex. 1006, Jarisch 929 at FIG. 2.

219. A person of ordinary skill in the art would have further been motivated to combine the portion 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 machine operation with unsuitable capsules. Rossi discloses a “safe and simple system and process for ensuring that an appropriate [capsule] is used” in the system. (Ex. 1041 at p. 5.) 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, 3.

220. Rossi discloses the benefits of only operating the machine if the capsule is recognized by the machine as a suitable capsule. Rossi notes that beverage brewing systems involve the use of high pressure and high temperature liquids, which can pose certain safety concerns when not appropriately managed. As Rossi explains, “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.” (Ex. 1041 at p. 5.) Rossi further 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.” (Ex. 1041, at p. 7.) A person of ordinary skill in the art would have recognized that the process described in Rossi would help to reduce these safety hazards involved in the use of capsules not suitable for the given

machine, or for the incorrect selection of operation conditions not suited to a particular capsule.

221. A person of ordinary skill in the art would also have an expectation of success when combining Rossi's process and the capsules disclosed in Yoakim and Jarisch 929. Rossi expressly discloses that its invention was intended to improve systems relating to "edible-product making machines . . . such as coffee machines fed with capsules containing coffee powder" (like the systems of Yoakim and Jarisch). (Ex. 1041, p. 5.) Furthermore, the system of Rossi identifies that the capsules use "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." (Ex. 1041, p. 11.) This is technology that was already disclosed in previous beverage systems, including those in Yoakim and Jarisch 929, to identify and brew capsules. Rossi further explains that a capsule may be recognized by comparing the read code to "pre-stored data in order to allow the machine to proceed to activation only if it" recognizes the capsule. (*Id.*) Furthermore, the systems of Yoakim and Jarisch 929 possess capsule identification capabilities that a person of ordinary skill in the art would expect to work with Rossi's invention. (*See, e.g.*, Ex. 1004 at [0477]; Ex. 1006 at [0051]-[0055].)

222. 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.

223. Rapparini is also analogous art to Yoakim, Jarisch 929, and Rossi. Rapparini also attempts to solve problems relating to portion capsule brewing, in particular increasing the strength and stability of the body of thin-walled beverage extract containers, like those used in Yoakim, Jarisch 929, and Rossi.

224. It would have been obvious to combine the portion capsules of Yoakim, Jarisch 929, and Rossi with the longitudinal ribs and grooves of Rapparini for the benefit of greater stability of the capsule body wall as disclosed in Rapparini.

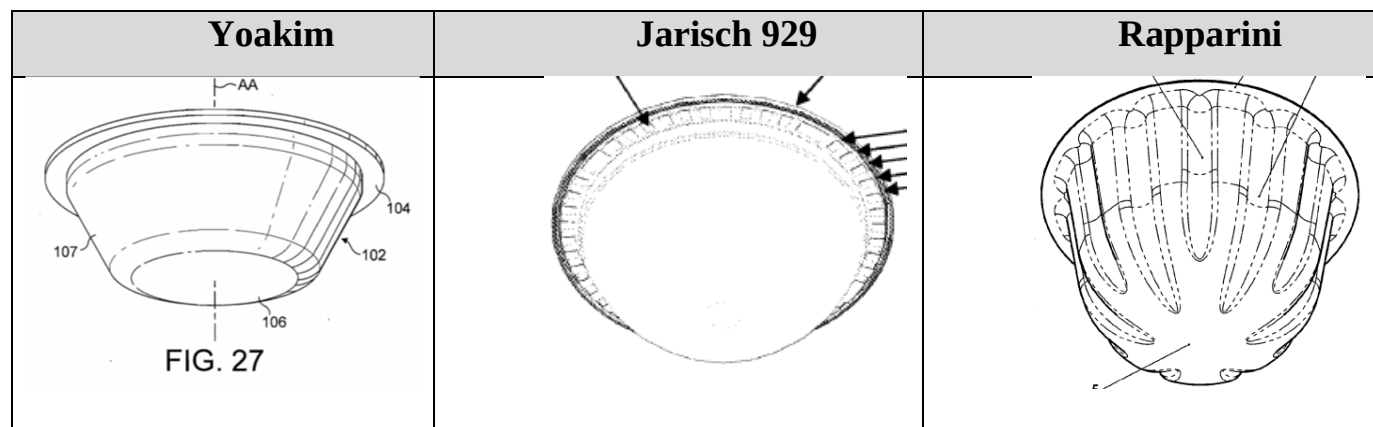
225. Rapparini discloses a coffee capsule or pouch comprised of permeable material. Rapparini describes a series of longitudinal grooves in the body of the capsule wall, and ribs in the inner cavity of the capsule wall, which benefit the overall stability of the portion capsule. By 2010, it was well known that using

longitudinal grooves and ribs to stiffen a thin walled capsule would lead to greater stability. Rapparini provides express motivation to use its capsule configuration in the body of a portion capsule: “[t]he presence of ribs having different lengths on the body of the container allows the optimization of the stability of the container. The modulation of the length of the ribs along the surface of the container allows improving the stability and rigidity of the system.” Ex. 1008 at [0009].

226. Rapparini also expressly states that the invention is applicable to other capsule materials (which would include metal), other dimensions, and can be expressly employed for use in automatic espresso machines, like the ones disclosed in Jarisch. Ex. 1008 at [0067]. As Rapparini “guarantees stability of the structure of filtering and permeable containers,” a person of ordinary skill in the art would find it obvious to apply this to impermeable containers as well. Ex. 1008 at [0007]. Accordingly, a person of ordinary skill in the art would have been motivated to use the configuration disclosed in Rapparini to achieve the benefits expressly taught. Furthermore, Yoakim already contemplates a capsule using a textured body, such as the grooves and ribs disclosed by Rapparini, which Yoakim explains can be used to engage the capsule in the centrifugal brewing system. Ex.1004, [0215] (“The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule It should be noticed that the teeth could be replaced by other equivalent

structures such as series of elements in relief and/or hollow. For example, slits, pins or small needles can be envisaged.”)

227. A person of ordinary skill in the art would have an expectation of success when combining the grooves and ribs of Rapparini into the walls of the capsules taught in Yoakim, Jarisch 929, and Rossi. First, Yoakim, Jarisch 929 and Rapparini all contemplate similarly-shaped capsules—circular, symmetrical, including a flange, and including a rounded base:



228. A person of ordinary skill in the art would also have had an expectation of success because the capsule of Rapparini is manufactured using a thermoforming process that involves using a die to punch a sheet of permeable material into the shaped capsule. Yoakim explicitly discloses that its capsule can be made of aluminum, which is known to typically be formed by deep-drawing, and is a similar process to thermoforming (albeit without heat) that involves using a die to punch a sheet of aluminum into a shaped capsule. Ex. 1004, at [0215].

229. Accordingly, it would have been obvious of one of skill in the art to combine the brewing/capsule system of Yoakim, the optically detectable identifier located on the bottom side of the flange in Jarisch 929, the operation of the pump control based on a machine determination of the capsule's optically detectable identifier as disclosed in Rossi, with the ribs and grooves of Rapparini.

2. Claim Elements

230. The '722 Patent recites:

a. **“A beverage system for producing a beverage, comprising:” (Preamble)**

231. Yoakim describes a beverage system for making a beverage. Specifically, Yoakim discloses a centrifugal brewing system that identifies a single-serve capsule with a code and uses centrifugal force on the capsule containing a solid food substance in order to extract a beverage. (Ex. 1004 at [0002] (“The present invention relates to a capsule, device, system, and method for preparing a beverage or food liquid from a food substance which is brewed or extracted by using centrifugal forces exerted on a capsule which contains the substance.”).)

232. As shown in the figure below, the system includes a brewing module (4), a capsule (3), water heater (7), low pressure water pump (6), and water reservoir (5). (*Id.* at [0180].)

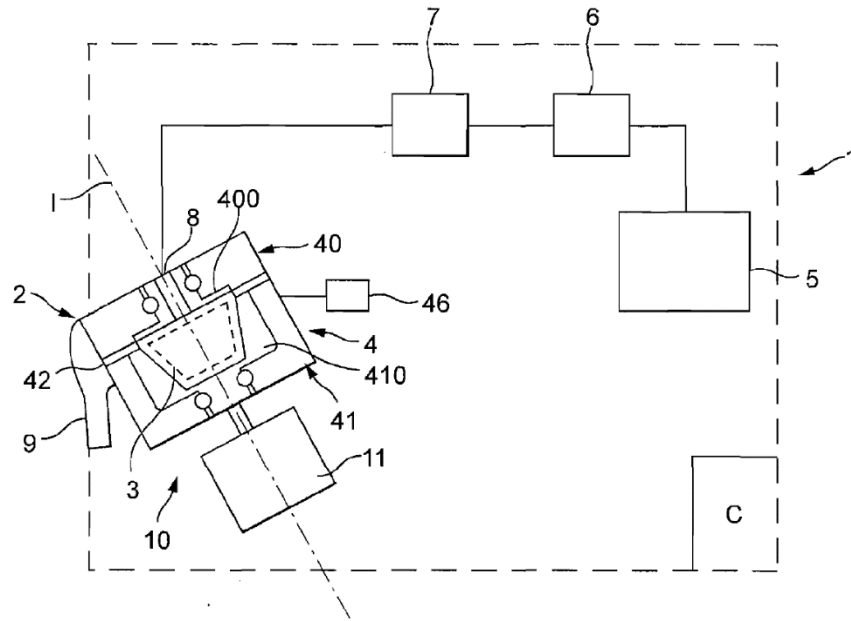


FIG. 1

Ex. 1004, Yoakim at FIG. 1.

233. Accordingly, Yoakim discloses a “beverage system for making a beverage,” as claimed in the preamble of claims 1.

b. “a portion capsule comprising: a foil lid sealed to a base element having a cavity within which a beverage raw material is provided” (Claim [1.a])

234. Yoakim describes a portion capsule with a base element having an inner cavity that contains raw beverage materials. Ex. 1004 at [0197] (“In FIG. 6, the capsule 7 comprises a cup-shaped body 70 with upwardly oriented sidewall 76 and a bottom wall 77. The sidewall forms a portion of cone which promotes the collection of the brewed liquid internally.”). Yoakim explains that the cavity may be filled with various ingredients that may be used to produce a beverage. Specifically, Yoakim discloses the beverage raw material can be “ground coffee powder, soluble coffee,

tea, chocolate, whitener, flavours, and combinations thereof.” Ex. 1004 at [0125]; *see also id.* at [0198]. One embodiment of this capsule is shown below:

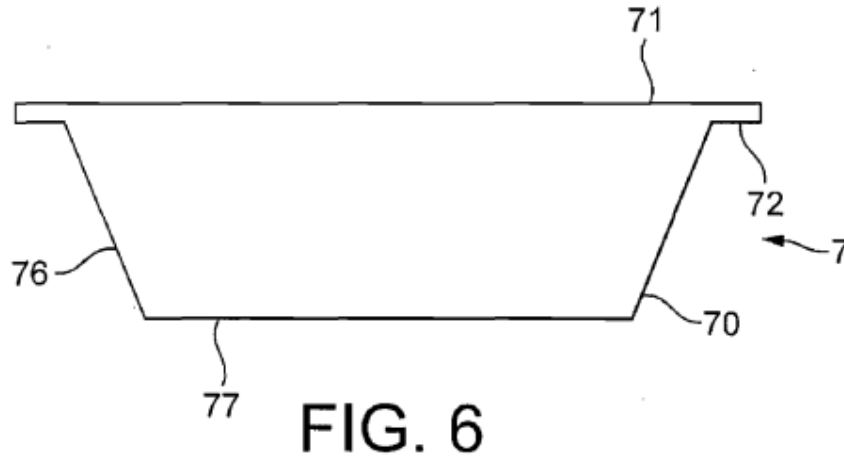


FIG. 58, Ex. 1004, Yoakim at 6.

235. Yoakim at Figures 26 and 27 (shown below) also shows the portion capsule body with the foil lid (103) sealed to the rim (104). *Id.* at [0414] (“The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105.”), [0128], [0129] (“The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed.”), [0197] (“The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. . . . The lid can be welded on the upper edges 72 of the body.”). Yoakim also describes that the foil lid may be comprised of aluminum and/or plastic. *Id.*

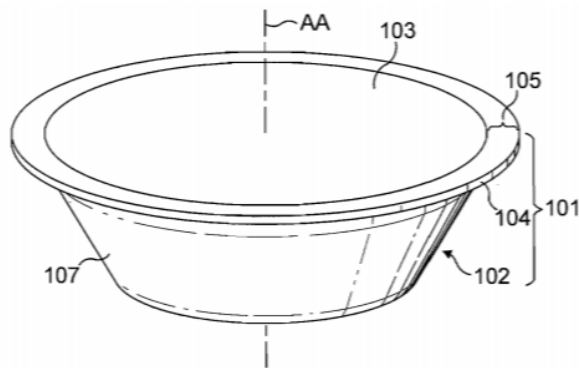


FIG. 26

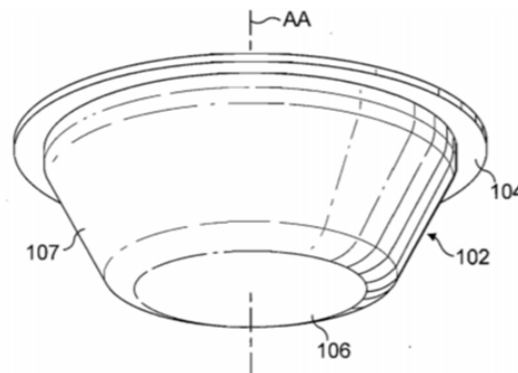


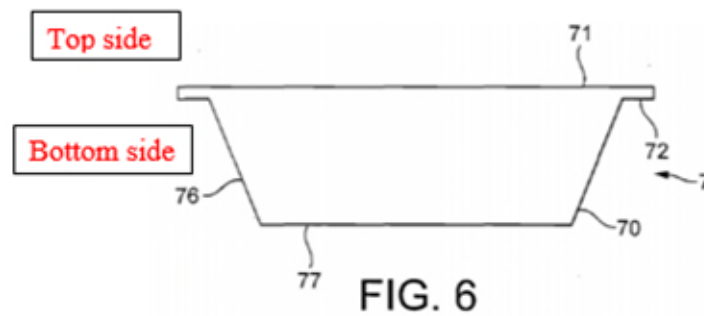
FIG. 27

Ex. 1004, Yoakim at FIGs. 26-27.

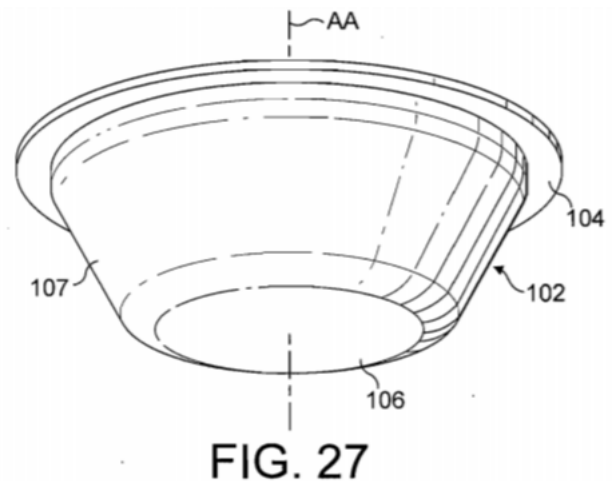
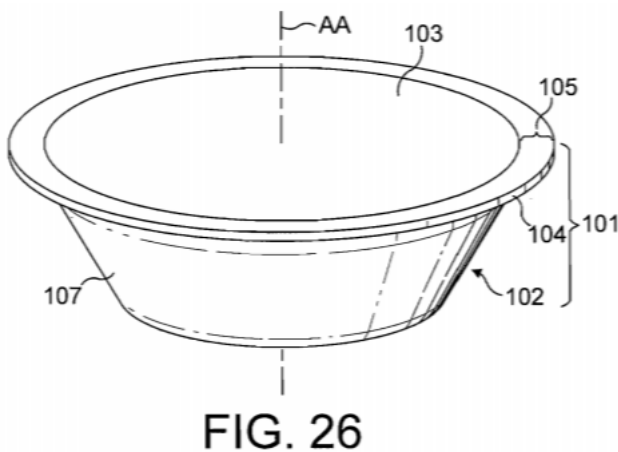
236. Accordingly, Yoakim discloses “a portion capsule comprising: a foil lid sealed to a base element having a cavity within which a beverage raw material is provided” as required by claim [1.a].

c. “the base element comprising a circumferential flange having a top side to which the lid is attached” (Claim [1.b])

237. Yoakim discloses a cup-shaped body, *i.e.*, base element, having a circumferential flange (72) with a top side to which the lid is attached. Ex. 1004 at [0129], [0197], [0414]; *see e.g.*, FIGs. 6-7, 26-27. The flange is visible as the rim shown in Yoakim at element 72 of FIG. 6 and element 104 in FIG. 27, shown below. It extends around the circumference of the capsule. Yoakim explains that the lid is sealed to the top side of the flange. *Id.* at [0414] (“The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105.”).



238. Figures 26 and 27 of Yoakim also shows a capsule flange having a top side and a bottom side. Yoakim explains that the body (102) has a peripheral rim 104 that extends outwardly forming an annular portion. Ex. 1004 at [0414] (“The rim 104 can extend outwards forming a small annular portion . . .”).



Ex. 1004, Yoakim at FIGs. 6 (annotated), 26-27.

239. Accordingly, Yoakim discloses “the base element comprising a circumferential flange having a top side to which the lid is attached” as required by claims [1.b].

d. “and a bottom side with a printed optically detectable identifier located on the bottom side” (Claim [1.c])

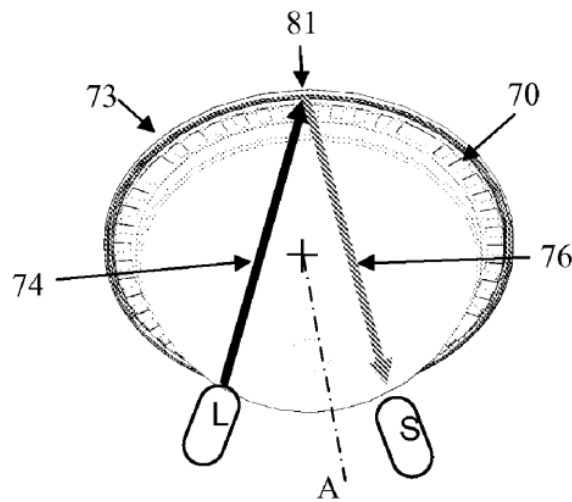
240. Yoakim in combination with Jarisch 929 discloses a capsule including a flange with a bottom side with a printed optically detectable identifier located on the bottom side. Specifically, Yoakim discloses using an identification system to identify each capsule and adjust the brewing parameters accordingly. Ex. 1004 at [0477]. Yoakim discloses that this helps deliver a wider range of beverages having differentiated characteristics. *Id.* at [0477], [0526] (“The main benefit of controlling the adjustment of these different parameters is essentially linked to the possibility to provide a wide variety of beverages, in particular coffees, of different volumes (e.g., ristretto, espresso, lungo, American, etc.), aroma strength and foam/crema volume. The possibilities offered by the invention exceed the traditional brewing methods where these parameters cannot be adjusted all together properly.”).)

241. Yoakim further discloses that the capsule can include a printed optically detectable identifier, such as a barcode or other optically visual code. *Id.* at [0496] (“The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc., or by a radio-frequency code (RFID), a magnetic element or by an identifiable shape.”); *see also* [0525].

242. Jarisch 929 discloses a near-identical centrifuge-style single-serve brewing machine (*see* [0047]-[0048], FIG. 1) that includes an optical code reader (62) to identify the capsule and brew parameters accordingly. (Ex. 1006 at [0106], FIG. 5.)

Jarisch 929 discloses that the information from the identifier is used to recognize “a type associated to the capsule,” brewing parameters, capsule manufacturing information. (*Id.* at [0020]-[0024], [0051]-[0055].)

243. Jarisch 929 discloses that the printed optically detectable identifier 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.*” Ex. 1006 at [0037], [0064]. This is visible in the figure below:



Ex. 1006, Jarisch 929 at FIG. 4.

244. Jarisch 929 further discloses that the code may be “printed.” EX1006, [0027], [0058]; [0067]; [0102]-[0103]; [0112]-[0115].

245. Jarisch 929 explains that the disclosed positioning of the optically detectable identifier that it discloses lowers the risk of the identifier becoming unreadable. (Ex. 1006 at [0063]-[0064] (“These locations are particularly advantageous since they

offer both a large area for the symbols to be disposed and is less prone to damages caused by the processing module and in particular by the pyramidal plate, and to ingredients projections.”).) A person of ordinary skill in the art would be motivated to place the optical code on the bottom side of the flange facing away from the membrane because “[a]s a consequence, the amount of coded information and the reliability of the readings are both improved.” (*Id.*) This is because the code is positioned away from the liquid inlet and outlet where liquid and coffee residue could reside from prior or current brewings. A person of ordinary skill in the art would further understand this principle from other art available at the time, such as Jarisch , Ex. 1005 at [0022].

246. It would have been obvious for a person of ordinary skill in the art to utilize the repeated code of Jarisch 929 in order to achieve the benefit of increasing the reliability of the system reading the code during rotation.

247. 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. Rossi discloses a determination by the machine that the capsule is suitable for use with the machine. Rossi explains that the 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.* Rossi further explains that “[t]he use of an identification element and recognition means Helps to prevent the safety hazard associated with inappropriate operating conditions.” (Ex. 1041, at p. 7). A person of ordinary skill in the art would understand that a determination of whether the machine recognizes the identifying element would constitute a disclosure of determining whether the capsule is suitable for use with the machine, as a failed recognition would indicate that a capsule is not proper for use with the machine.

248. Rossi further discloses a determination by the machine that the capsule is suitable for use with the machine through the use of a validation element. (Ex. 1041, p. 7 (“The use of a validation element and validation means, as well as the step allowing the machine to take further steps only if it also recognizes on the load element the validation element help to prevent the use of an already-used single use load element in the machine, thereby avoiding the production of an edible product of inferior quality and ensuring the proper functioning of the machine.”)). A POSITA would understand that already-used capsules would constitute a group of capsules that are not suitable for use with the machine.

249. Rossi further specifies that the identifying element for its recognition and validation means are “preferably in the form of barcodes, antennae, or paints having optically measurable properties” and are preferably located on the body of the capsule. (Ex. 1041 at p. 11; see also 13 (“The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means 10 to be engaged only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode 5.”) Rossi further discloses that the identification element and validation element can be the same element. (Ex. 1041 at p. 9 (“The validation element could be identical to the identification element, but is preferably different thereto, and could either be either of the same or of a different type to the identification element.”).)

250. Rossi further discloses only allowing the machine to brew a beverage from the capsule after both detecting an identifier and determining whether the capsule is “suitable for use” with the machine. (Ex. 1041, 6 (“wherein said edible-product making machine automatically activates a cycle of production of said edible product only after having recognised on said load element said identifying element in combination with said validation element as validated”), p. 8, (“The use of an activation step of automatically activating the cycle of edible-product production only when the same identifying element is recognized in combination with the

validated validation element ensures that the operating conditions actually used are the correct conditions as selected by the machine in the first recognition step.”); *id.* at p. 10. (“The system also optionally comprises activation means connected to the recognising means through the control unit. This automatically activates the machine, but only if the identifying element is recognised, and in combination with the validation element as validated. The activation means cannot be triggered unless the checking means have first indicated a positive recognition of the identifying element and the unvalidated validation element.”).)

251. A person of ordinary skill in the art would understand Rossi’s disclosure of activating a brewing cycle to constitute preventing the use of unsuitable capsules because the machine must both detect and read the recognizing element (and additionally the validation element) to determine whether the capsule is suitable for use with the machine before the brewing cycle will activate. At a minimum, Rossi renders obvious to a person of ordinary skill in the art preventing the use of unsuitable capsules in order to increase safety of the system by preventing dangerous operating conditions from improper capsules being used with the machine. *Id.*

252. Accordingly, Yoakim, Jarisch 929 and Rossi disclose “a bottom side with a printed optically detectable identifier located on the bottom side” as required by claim [1.c].

e. **“the optically detectable identifier includes a surface having at least two areas which differ in their reflection properties” (Claim [1.d])**

253. Yoakim and Jarisch 929 (and also Rossi) disclose a printed optically detectable identifier. *Supra* claim element [1.c].

254. Jarisch 929 further discloses an optically detectable identifier with a surface that has a plurality of matte and reflective zones. Ex. 1006 at [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 possess [sic] ***first surfaces*** having inclined ***mirroring*** or ***absorbing properties to light*** and ***second surfaces having flat mirroring or flat reflective properties to light***. Other variable physical characteristics may be chosen to distinguish each symbol, for example the color, ***the reflectivity***, the opacity, the light absorption level, the magnetic field, the induced magnetic field, the resistivity, the capacity, etc.”), [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 possess ***first surfaces*** having inclined mirroring or absorbing properties to light and ***second surfaces*** having flat mirroring or flat reflective properties to light.”), [0111] (“Optionally (FIG. 8), ***the symbols*** are ***represented by different color patterns***

combined with a color reading device.”). *See also* [0092]-[0093], [0102]-[0103]. FIG. 2 of Jarisch 929 further discloses a plurality of these reflective zones.

255. 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.

256. Accordingly, Jarisch 929 discloses “the optically detectable identifier includes a surface having at least two areas which differ in their reflection properties” as required by claim [1.d].

f. “a beverage machine comprising: a detector to read the optically detectable identifier” (Claim [1.e])

257. Yoakim, Jarisch 929, and Rossi disclose a beverage machine comprising a sensor/detector to read the optically detectable identifier.

258. Specifically, Yoakim discloses that its beverage machine uses identification means to identify each capsule, in order to adjust the brewing parameters for the capsule according to the sensed/detected identifier. (*See, e.g.*, Ex. 1004 at [0025] (“The device . . . comprises identification means for identifying the different capsules, and control means capable of operating the device in centrifugation for any of the different capsules according to predetermined liquid food preparation parameters . . . with the identification means comprising capsule recognition means which are recognized by sensing means connected to the control means of the device to control the preparation parameters accordingly.”); *id.* at [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.”.)

259. Yoakim’s sensor/detector is depicted in FIG. 61 (shown below) with the optical sensing device to read the optical identifier shown as element 231.

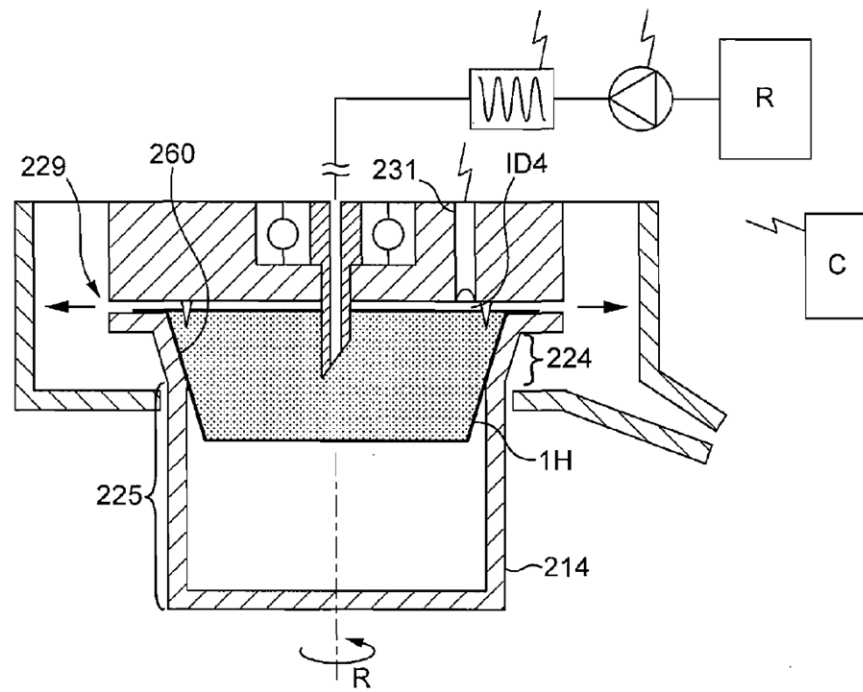


FIG. 61

Ex. 1004 Yoakim at FIG. 61.

260. Yoakim further discloses that the sensor used to detect the identifier can be a visual and/or optical sensor to identify and read a code, such as a barcode, color, or shape on the capsule. (Ex. 1004 at [0192] (“A recognition system uses a code on the capsule and recognized by the device, such as a color, a barcode, an RFID, a magnetic code, ferromagnetic micro-wires or labels, shapes and combinations

thereof.”.) Yoakim further explains that “the identification means can be sensed by sensing means” and that “the identification means comprises capsule recognition means which are recognized by the sensing means.” (Ex. 1004 at [0494]-[0495]. *“The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a logo, etc. . . .”* *Id.* at [0496]); *see also* [0525] (“[T]he recognition means can be any mechanical, optical, magnetic or radio-frequency means capable of delivering information to the brewing device. . .”).

261. Additionally, Rossi 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, 11.)

262. Additionally, Jarisch 929 discloses a brewing machine that uses a sensor/detector to read an optical detectable identifier. For example, Jarisch 929 discloses an optical code sensor 62 designed to read the code positioned on the underside of the flange. (Ex. 1006 at [0106] (“[T]he light source is placed at the bottom of the centrifugal cell 3. **This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73.** The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a

mirror can be placed as illustrated in the FIG. 5 to deflect the forward and backward beams.”).)

263. FIG. 5 of Jarisch 929 (annotated) is shown below and depicts the optical sensor/detector to read the optically detectable identifier:

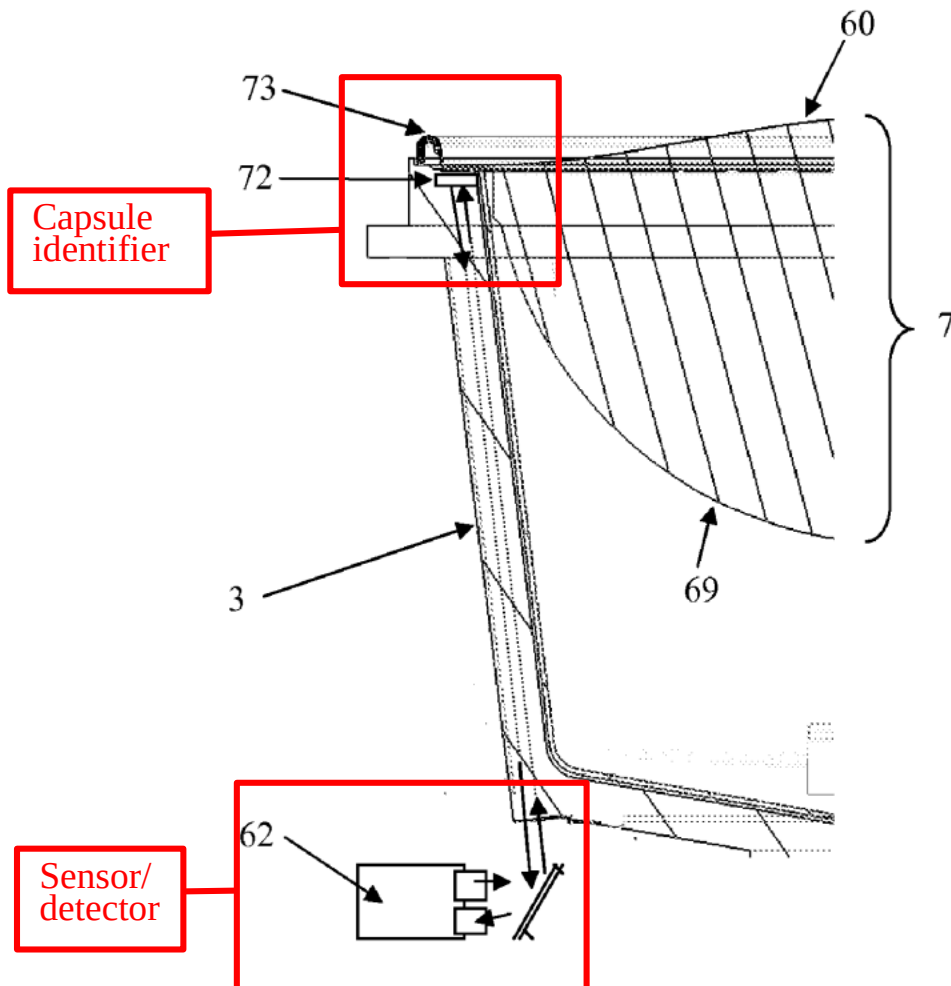


Fig. 5

Ex. 1005, Jarisch 929 at FIG. 5 (annotated).

264. Additionally, it would have been obvious to a POSITA to utilize this configuration in Yoakim (depicted above in FIG. 61) in order to position the

sensor/detector away from the beverage brewing components, and allow reading of the optically detectable identifier.

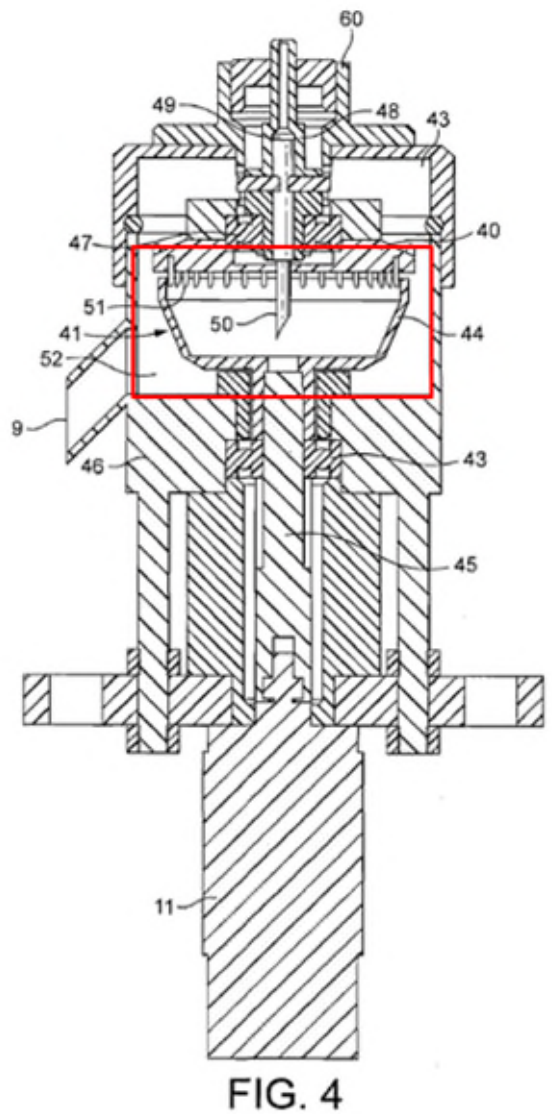
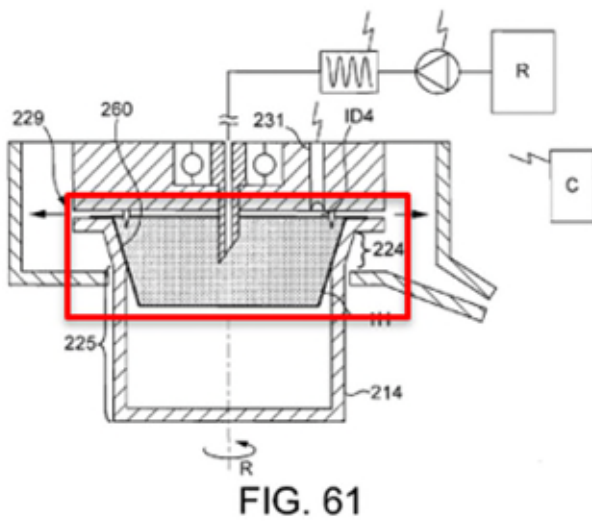
265. Accordingly, Yoakim, Jarisch 929, and Rossi disclose “a beverage machine comprising: a detector to read the optically detectable identifier” as required by claims [1.e].

g. “a media chute configured to receive and support the portion capsule” (Claim [1.f])

266. According to K-fee’s apparent interpretation, Yoakim discloses a media chute configured to receive and support the portion capsule, shown in at least FIGs. 4 and 61 (annotated below). Ex. 1004 at [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.”), *see also* [0194].

267. Specifically, the media chute of Yoakim is part of the brewing chamber assembly that is configured to receive and support the portion capsule. Ex. 1004 at [0024] (“The capsule receiving means of the device comprises a capsule holder which advantageously has an interior surface or structure for engaging the capsule with the interior surface or structure configured to offer resistance to torque during rotation or for frictionally engaging or receiving a complementary surface or

structure of the capsule to enable the driving means to rotate the capsule.”), FIGs. 4, 61.



Ex. 1004, Yoakim at FIGs. 4, 61 (annotated).

268. A person of ordinary skill in the art would recognize the need for an area of the beverage device that would hold and support the portion capsule, which also serves as part of the brewing chamber. Without a capsule holder, the capsule would lack the structural support necessary to offer resistance to torque during rotation of the capsule, which would consequently impact the ability of liquid to centrifugally mix within the portion capsule. As Yoakim describes, there is a reduced risk of disruptive motion to the capsule due to the support of the capsule holder. *Id.* at [0479]. (“[T]he risk of producing vibrations during centrifugation is reduced because all the capsules of the set are snugly fitted in the device with limited possible relative movement between each capsule and the device during rotation, i.e., capsule holder.”).

269. A person of ordinary skill in the art would also recognize the need for an area of the beverage device that would hold and support the portion capsule in other types of beverage preparation devices. For example, in devices that inject hot water at high pressure, it is necessary to support the capsule for piercing, and to form a reliable seal to the capsule to ensure that the hot water flows through instead of around the capsule.

270. Accordingly, Yoakim discloses “a media chute configured to receive and support the portion capsule” as required by claim [1.f].

h. “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” (Claim [1.g])

271. Yoakim discloses a pump which is controlled to push water into the portion capsule. (*See, e.g.*, Ex. 1004 at [0180] (“The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling). The module is in fluid communication with a water reservoir 5 containing fresh or, alternatively heated water. **A fluid transport means such as a low pressure pump 6 can be provided in the water circuit to transport water from the reservoir to the module.** . . . Water can be fed into the module 4 at low or substantially no pressure. For example, a pressure between 0 and 2 bars above atmospheric pressure can be envisaged at the inlet 8 of the module.”) (emphasis added).)

272. Yoakim further discloses that the pump is controlled based on the detection of the optically detectable 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 adjustable parameters can be the rotational speed, the back-pressure at the outlet of the capsule, and/or the volume of liquid fed in the capsule. The identification means participates to deliver a wider range of beverages having differentiated characteristics (volume, taste, strength, crema, colour, etc.). ***The identification means are associated to control means placed in the centrifugal***

brewing device which controls the adjustment of the said parameters, by controlling the rotational motor driving the capsule holder or/and the pump supplying liquid in the capsule.”).) See also [0025], [0192], [0218]. A pump, including the volume and flow rate, are parameters that may be adjusted to push water into the capsule. EX1004, [0477], [0192], [0522].

273. It would have been obvious to a person skilled in the art 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.

274. Rossi discloses only activating the beverage production cycle (i.e., controlling the pump to push water) if the optically detectable identifier agrees with a stored reference. (Ex. 1041, 6 (“wherein said edible-product making machine ***automatically activates a cycle of production*** of said edible product ***only after having recognised on said load element said identifying element in combination with said validation element as validated***”), p. 8, (“The use of an activation step of automatically activating the cycle of edible-product production ***only when the same identifying element is recognised*** in combination with the validated validation element ensures that the operating conditions actually used are the correct conditions

as selected by the machine in the first recognition step.”); *id.* at p. 12. (“The system also optionally comprises activation means connected to the recognising means through the control unit. ***This automatically activates the machine, but only if the identifying element is recognised***, and in combination with the validation element as validated. The activation means cannot be triggered unless the checking means have first indicated a positive recognition of the identifying element and the unvalidated validation element.”).)

275. 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. Rossi further specifies that the identifying element for its recognition and validation means are “preferably in the form of barcodes, antennae, or paints having optically measurable properties” and are preferably located on the body of the capsule. (Ex. 1041 at p. 11; *see also* 13 (“The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8 stored within a control unit 9 of the machine. The checking means allow the machine activation means to be engaged only if the barcode reader 7 recognises the identification barcode 4 and the validation barcode 5.”) Rossi further discloses that the identification element and validation

element can be the same element. (Ex. 1041 at p. 9 (“The validation element could be identical to the identification element, but is preferably different thereto, and could either be of the same or of a different type to the identification element.”).)

276. A person of ordinary skill in the art would understand Rossi’s disclosure to mean controlling the brewing cycle, which includes the water injection mechanism, based on the comparison because since the activation cycle involves injecting water into the system. The pump is a component of the brewing cycle and thus would not operate without brewing cycle activation. 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.

277. Accordingly, Yoakim and Rossi disclose and/or render obvious “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” as required by claim [1.g].

i. “wherein the base element has a wall region with an electrically conductive section” (Claim [1.h])

278. According to K-fee's apparent interpretation, Yoakim discloses a capsule wherein the wall region has an electrically conductive section. For example, Yoakim discloses that the wall of the base element made be made, including partially of metal, including aluminum. Ex.1004, [0128]-[0129] ("The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic."). Yoakim further discloses that the capsule can be manufactured by deep-drawn aluminum. *Id.* at [0215]. Aluminum is known to be an excellent electrical conductor, and it has been acknowledged that an aluminum capsule is electrically conductive. Ex.1044 at [0044]-[0045]. According to K-fee's apparent interpretation, Yoakim thus discloses a wall region that has an electrically conductive section.

279. Separately, it would have been obvious to a POSITA to incorporate a section of electrical conductivity onto the wall of the base element for purposes of identifying the capsule. For example, Yoakim further discloses that its recognition means can be "a magnetic element." Ex.1004 at [0496]. It would have been obvious to a person of ordinary skill in the art to incorporate a section of the capsule to be electrically conductive, so that the capsule included an electrically conductive section, in order to operate as a magnetic or electrically conductive identifier. For example, it would have been obvious to include an electrically conductive section to serve as a capsule recognition means as contemplated by the Yoakim system. Ex.1004 at [0496].

280. Accordingly, Yoakim discloses and/or renders obvious “wherein the base element has a wall region with an electrically conductive section” as required by claim [1.h.]

j. “and radial[ly] spaced and vertically oriented drawn grooves” (Claim [1.i])

281. Yoakim discloses a capsule with a deep-drawn toothed structure (below). Ex. 1004 at [215]. Yoakim explains that teeth can be positioned along the body of the capsule, and extend into the border of the capsule body wall and capsule flange. *Id.* (“The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule.”). They are shown below:

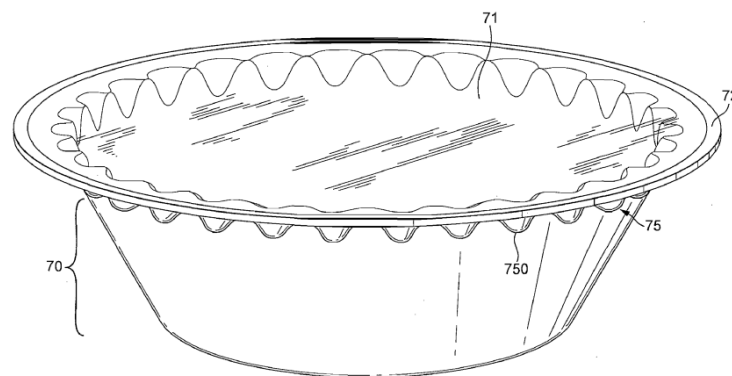


FIG. 23

Ex. 1004, Yoakim at FIG. 23.

282. Yoakim explains that these teeth may be varied in shape, and may even be replaced by other structurally equivalent types of groove-like hollow elements. *Id.* at [0215] (“For example, the shape of the teeth could be slightly triangular, oval,

rectangular or pyramidal. It should be noticed that the teeth could be replaced by other equivalent structures such as series of elements in relief and/or hollow”).

283. Yoakim further discloses that the capsules are manufactured by deep drawing. Ex. 1004 at [0215] (“The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawn in aluminium.”).

284. Rapparini discloses that the outer body of the capsule has a plurality of vertically oriented grooves arranged radially around the body. Rapparini explains these grooves (4), which are located on the outer wall region of base element, may have varying lengths, including short ribs “extending only along the side region of the container.” EX1008, [0007]-[0011]. These are shown in element 4 of FIG. 6 and 6bis of Rapparini, shown below:

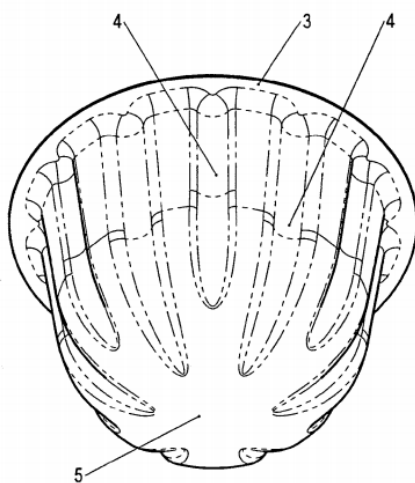


FIG. 6 bis

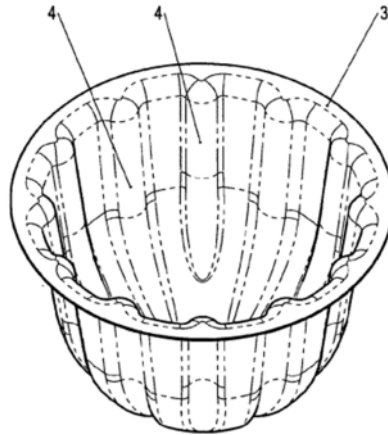


FIG. 6

285. These grooves are also radially spaced around the circumference of the outside surface of the capsule body wall, and are vertically oriented as they extend upward and downward toward the base of the capsule.

286. It would have been obvious to a person of ordinary skill in the art to configure radially spaced and vertically oriented drawn grooves on the body of a capsule wall to provide structural stability, as this is well known in the art at the time. *See, e.g.*, 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].

287. Accordingly, Yoakim in combination with Rapparini disclose and/or render obvious “radial spaced and vertically oriented drawn grooves” as required by claim [1.i].

k. “the cavity has radially spaced and vertically oriented drawn ribs” (Claim [1.j])

288. As I explained above, Yoakim discloses a capsule with a deep-drawn toothed structure. As I also explained above in claim [1.i], Rapparini discloses radially spaced and vertically oriented grooves on the body of the capsule. For the same reasons, Rapparini discloses that the cavity of the capsule has radially spaced and vertically oriented drawn ribs.

289. A person of ordinary skill in the art would recognize that the grooves on the capsule body would also form corresponding vertically oriented ribs on the opposing side of the portion capsule wall, in the cavity. This is due to the thin wall relative to the size of the grooves and ribs. These ribs are radially spaced around the circumference of the inner cavity of the capsule body wall, and are vertically oriented as they extend upward and downward toward the base of the capsule.

290. 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].

291. It would have been obvious to a person of ordinary skill in the art to configure radially spaced and vertically oriented drawn ribs in the cavity of a capsule wall to provide structural stability, as this is well known in the art at the time. *See, e.g.*, 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].

292. Accordingly, Yoakim in combination with Rapparini disclose and/or render obvious “the cavity has radially spaced and vertically oriented drawn ribs” as required by claim [1.j].

l. “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.” (Claim 4)

293. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 1,” as discussed in Section VII.B.2.(a)-(k).

294. Yoakim discloses that “the water is pushed into the portion capsule along a central axis that is perpendicular to the flange of the portion capsule.” Specifically, Yoakim discloses an inlet port perpendicular to the capsule in which water is pushed along a central axis. Ex. 1004 at [0019] (“[T]he inlet port [is] aligned with the central axis of the capsule, wherein the liquid to be injected into the capsule is water[.]”). *See also id.* at [0220] (“a water injector, as part of the water injection head, arranged for introducing water along a central axis relative to the capsule holder[.]”).

295. Yoakim describes that the portion capsule has liquid introduced through a passage (50) that is located along the central axis of the capsule and perpendicular to the capsule flange, as depicted in FIG. 4 (annotated) below.

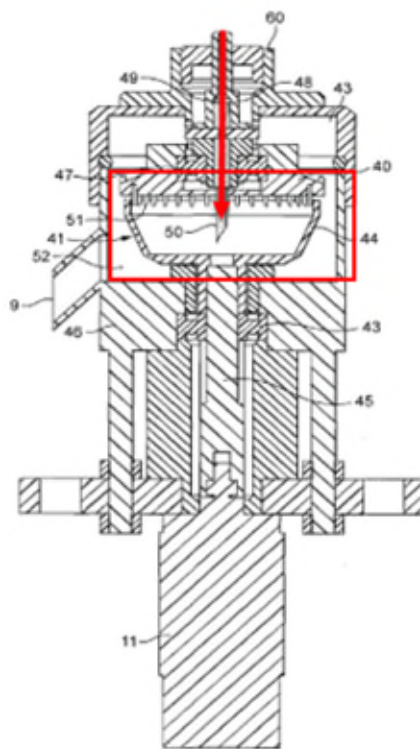


FIG. 4

Ex. 1004, Yoakim at FIG. 4 (annotated).

296. Moreover, Yoakim specifies that the “[t]he liquid introducing means preferably comprises at least one needle for injecting liquid into the capsule at or near its central axis . . .” Ex. 1004 at [0021].

297. Accordingly, Yoakim discloses “wherein the water is pushed into the portion capsule along a central axis that is perpendicular to the flange of the portion capsule.”

298. Therefore, Yoakim in view of Jarisch 929 and Rossi disclose and/or render claim 4 obvious.

m. “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.” (Claim 5)

299. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 4,” as discussed above in Section VII.B.2.(l).

300. Yoakim discloses a beverage machine with a mandrel that is configured to pierce the cover at the location that is offset from the central longitudinal axis of the base element, according to K-fee’s apparent construction. Yoakim discloses a brewing chamber that uses a lid with needles that form small perforations around the outer perimeter of the capsule membrane. Ex. 1004 at [0186] (“At the inside surface of the injection lid 40 is placed a piercing structure 450 ***which has the function of piercing*** the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. The water injector 50 is preferably located in the center of the capsule. . . . ***The lid further comprises outlet piercing elements 51 which are placed on the inside of the lid at a radial position. Presumably, a series of piercing elements 51 are placed uniformly along the periphery of the lid. . . .***”); *id.* at [0187] (“FIG. 4 shows a more sophisticated system of the invention. . . . A series of needles 51 is also positioned on the side of the lid 40 to form small perforations at the periphery of the upper side of the capsule. . . .”). The brewing chamber’s lid (40) and piercing elements (51) are shown in FIG. 4, reproduced below:

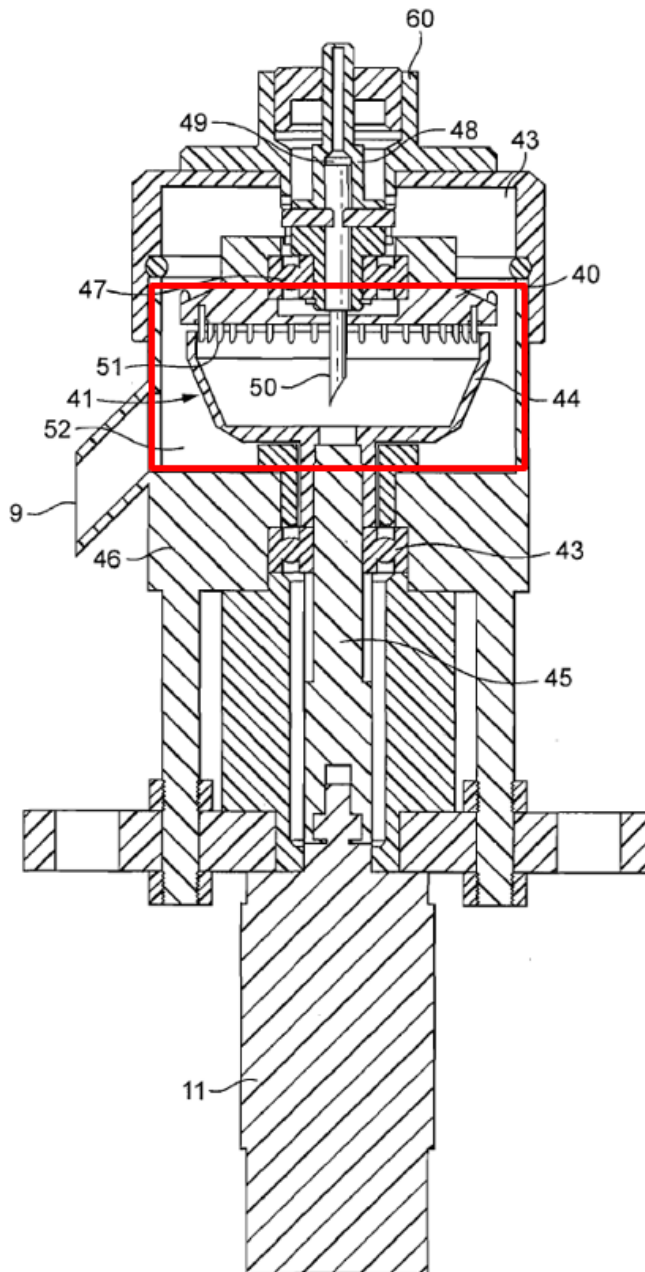


FIG. 4

Ex. 1004 Yoakim at FIG. 4 (annotated).

301. Yoakim also discloses that the capsule used in its brewing machine is pierced in a region offset from the central axis of the base element. “FIG. 7 illustrates the

capsule after brewing of the substance in the device. A central water inlet 73 is pierced through the lid for passage of the water injector 50. On the side of the lid are pierced outlets 74 communicated with the inside cavity for the brewed liquid to exit the capsule.” EX. 1004 at [0199]. FIG. 7 is reproduced below:

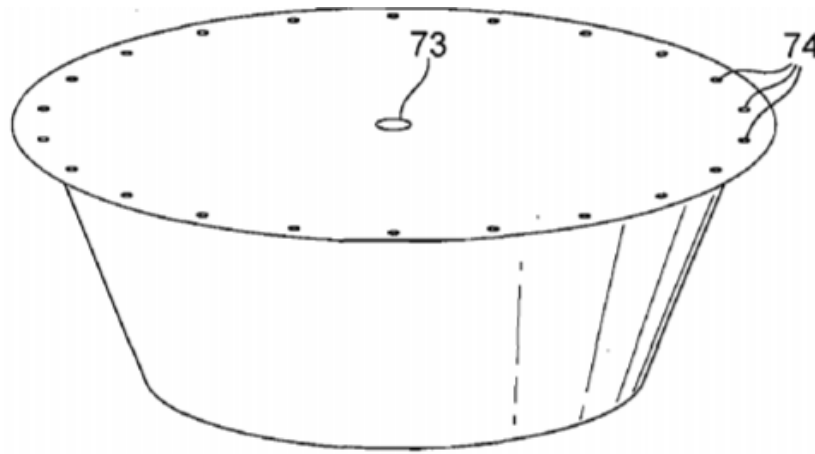
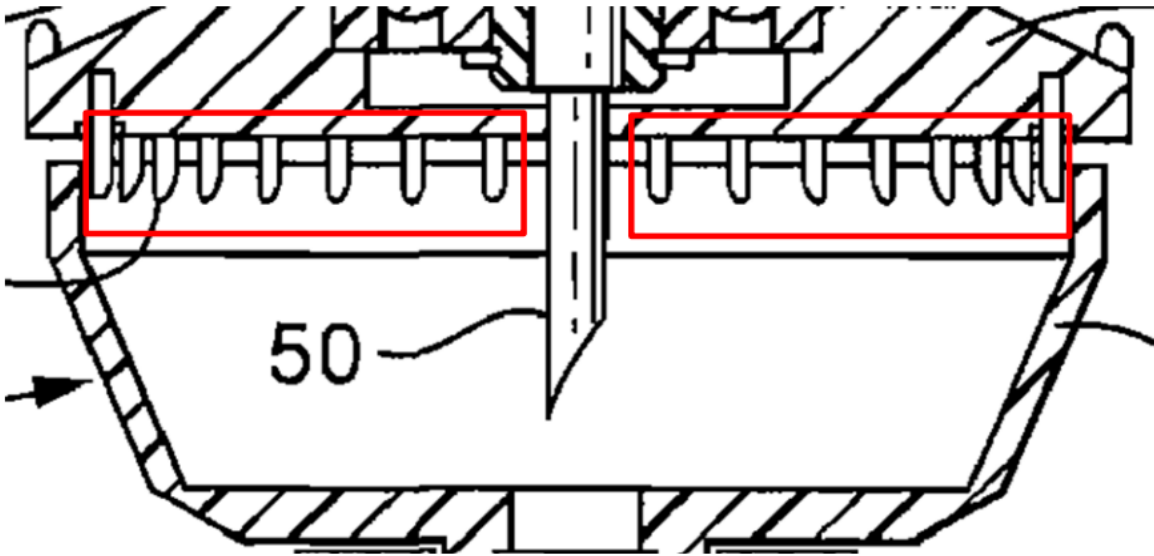


FIG. 7

Ex. 1004, Yoakim at FIG. 7.

302. Yoakim further discloses that the piercing needles used with the system can have “slanted cutting surfaces.” EX. 1004 at [0435] (“The piercing members can be small cylindrical portions with a slanted cutting surface able to cut or perforate small holes in the sealing foil 103 of the capsule. The piercing members are arranged at the periphery of the wall 155, preferably evenly distributed to provide several openings in the capsule for the centrifuged liquid to leave the capsule forming several streams of liquid. . . .”). A closeup view of FIG. 4 (annotated) also discloses a slanted cutting surface of the piercing needles:



Ex. 1004 Yoakim at FIG. 4 (enlarged).

303. Accordingly, Yoakim discloses “wherein the beverage machine comprises a mandrel that pierces the lid in a region that is offset from the central axis.”

304. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 5 obvious.

n. “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.” (Claim 6)

305. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 1,” as discussed in Section VII.B.2.(a)-(k).

306. As I explained above in claim 5, Yoakim discloses a beverage machine with a mandrel that is configured to pierce the cover at the location that is offset from the central longitudinal axis of the base element. For the same reasons, 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.” See my discussion of claim 5 above.

307. Accordingly, Yoakim in view of Jarisch 929 and Rossi disclose and/or render claim 6 obvious.

o. “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.” (Claim 7)

308. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 1,” as discussed in Section VII.B.2.(a)-(k).

309. As I explained in claim element [1.h], Yoakim discloses that the wall of the base element may be comprised of an electrically conductive metal such as aluminum, which forms an electrically conductive section under K-fee’s apparent construction. *Supra* Section VII.B.2.(i). 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. See EX1004, [0128]-[0129], [0215].

310. Yoakim further discloses a barrier layer to prevent moisture or aroma from escaping out of the single-sever capsule. Specifically, Yoakim discloses that both the sealing lid and the cup shaped body can be comprised of “gas barrier materials.”

(See Ex. 1004 at [0128] (“The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and support layers made of polymers, aluminium and/or aluminium alloys.”); *Id.* at [0129] (“The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.”); *see also* [0197] (“It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.”).)

311. Yoakim explains that this barrier layer prevents air from entering the capsule. (Ex. 1004 at [0096] (“[T]he capsule is made of materials having gas barrier properties and is sealed in a fluid tight manner so that ingress of air in the capsule is prevented.”); [0121] (“The sealed capsule is made of materials having gas barrier properties and is sealed in a fluid tight manner so that ingress of air in the capsule is prevented. Furthermore, the capsule preferably contains an inert gas that improves the freshness of substance in the capsule. The capsule can also be wrapped with an outer protective membrane which is removed before the capsule is placed in the device.”). A person of ordinary skill in the art would have understood that a barrier sealed in a “fluid tight manner” which prevents air from entering the capsule would also prevent moisture or aroma from entering or escaping out of the single-serve capsule as well.

312. Yoakim also specifies that this barrier is advantageous because it is gastight such that air or liquid does not escape or enter the capsule, which helps to prevent the oxidation of the food substance contained within the capsule and preserve freshness of the ingredients. (Ex. 1004 at [0350] (“In a preferred mode, a gastight sealing foil covers at least a portion of the lid. In particular, the sealing foil covers at least the collecting recess. The collecting recess can thus be gas tightly closed before the capsule is used in the beverage production device. As a result, no air from the external atmosphere actually enters the capsule, before its use, through the outlet openings provided in the enclosure, e.g., through the inner portion of the lid. The substance, such as coffee or milk, is thus less subject to possible oxidation.”); [0355] (“... The capsule can be formed of gastight packaging materials for maintaining the freshness of the substance in the capsule as long as possible. In particular, the dished body can be formed of food grade plastics and at least one gas barrier layer. For example, the dished body is a thermoformed plastic laminate comprising at least one layer of polypropylene (PP) and at least one EVOH gas barrier layer. The dished body and/or lid can be thermoformed or injected in plastics. The lid can be also a porous membrane made of polymer such as PET. In an alternative, the body and/or lid can be deep drawn from thin metal such as aluminium alloy or a complex of plastic and aluminium alloy.”).) Accordingly, it would have also been obvious to a POSITA to incorporate a barrier layer.

313. Accordingly, Yoakim discloses “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.”

314. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 7 obvious.

p. “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.” (Claim 8)

315. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 7,” as discussed above in Section VII.B.2.(o).

316. Additionally, Yoakim, Jarisch 929 and Rossi disclose and/or render obvious a portion capsule, 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. 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]. These are examples in Yoakim of assigning capsules to a group of capsules associated with the machine.

317. Jarisch 929 also discloses assigning capsules to a group of capsules associated with the beverage machine. EX1006, [0020], [0051] (“information for recognizing ***a type associated to the capsule***”). A person of ordinary skill in the art reading Jarisch 929 would understand that a type associated to the capsule, would be a type of capsule associated with the machine.

318. It would have been obvious to a person of ordinary skill in the art reading Yoakim and Jarisch 929’s disclosure of assigning capsules to a group that is associated with the machine, and to further assign capsules to a group that is ***suitable for use*** with the machine, and to not operate the beverage machine with inappropriate capsules, in order to prevent unsafe brewing conditions or poor beverage quality for the user.

319. Additionally, as set forth *supra* in paragraphs 247-252, 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. A person of ordinary skill in the art would have been motivated to combine Rossi’s machine operation based on suitability for use with the machine and concepts of Yoakim with the code location of Jarisch 929 to arrive at the claimed invention, as set forth above in Section VII.B.1.

320. Accordingly, Yoakim in view of Rossi discloses “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.”

321. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 8 obvious.

q. “The beverage system according to claim 8, wherein the optically detectable identifier includes a metallic surface.” (Claim 9)

322. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 8,” as discussed in Section VII.B.2.(p).

323. As I discussed *supra* in connection with claim element [1.h] and Claim 7 above, Yoakim discloses a capsule made of aluminum. EX1004, [0128]-[0129], [0215].

324. 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 also 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 person of ordinary skill in the art would understand these disclosures to constitute an optical code including a metallic surface because the optical code on the aluminum capsule (which includes an aluminum rim) can be made of a paint *and/or* lacquer *and/or* embossed ply of material of the capsule, and an embossed ply of the aluminum capsule would include a metallic surface. A person of ordinary skill would also understand that varying the color, reflectivity, opacity, or light absorption of the code could involve varying a painted absorbing color and a metallic light reflective surface. Further, a person of ordinary skill would understand that a code varying in electric properties such as magnetic field, induced magnetic field, resistivity, and capacity would involve a code with metallic surface.

325. Jarisch 929 discloses a beverage machine wherein the optically detectable identifier includes a metallic surface. Ex. 1006 at [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 . . .*”). It would have been obvious to a person of ordinary skill in the art 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 reduce cost and simplify the manufacturing process by utilizing less printed paint on the capsule.

326. Accordingly, Yoakim in view of Jarisch 929 discloses “wherein the optically detectable identifier includes a metallic surface.”

327. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 9 obvious.

r. **“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.” (Claim 10)**

328. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 5,” as discussed in Section VII.B.2.(m).

329. Specifically, Yoakim discloses that its system can include a “flow restriction means which is arranged after the outlet(s) of the capsule.” (Ex. 1004 at [0370].)

Yoakim discloses that this flow restriction means “can be part of the device itself.”

(*Id.* at [0371].) Yoakim further discloses that “[i]n a preferred mode, the flow restriction means of the device comprises **a valve means** which opens or enlarge[s] a liquid passage when a sufficient pressure of the centrifuged liquid is exerted on the valve means so that the liquid can release from the capsule out of the device.” (*Id.* at

[0372], [0382], [0396]-[0398].) This seal is designed to “control[] the flow of liquid that is discharged from the device. EX1004, [0436], [0384]-[0385].

330. Yoakim explains the benefit of using such a valve means for flow restriction in the brewing device because it “provides the advantage of a control of the pressure of liquid exerted in the capsule at the level of the device. The valve means can be designed to open at a certain pressure threshold, for example by calibration or adjustment, for matching the features of various or specific beverages, e.g., coffee extract, tea extract, instant beverages, etc.” (Ex. 1004 at [0384].) Yoakim further explains that this configuration “provides a solution for preparing a food liquid wherein a controlled release of the food liquid can be carried out” which can “be advantageous to optimize interaction of water and the ground coffee particles to obtain a good extraction of the coffee and aroma compounds” and also “improve the creation of foam or coffee crema.” (*Id.* at [0385].)

331. Yoakim discloses that the “valve means” in the flow restriction system includes a seal. “For example, the 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. The pressing edge may take different forms such as a V, W or U shape in order to ***exert a sufficient sealing pressure on the capsule*** when the pressure of liquid is still under a predetermined threshold.” (Ex. 1004 at [0388].)

332. Details of the seal in the brewing unit are shown in FIG. 34-35 and 37-38. Yoakim explains that, “[t]he valve system 156 can be arranged on the capsule rotary engaging part 149 in the form of an annular engaging portion 157 which is biased under the force of elastic loading means 158 such as springs. The annular engaging portion 157 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 surface 159 can form a cone or “V” for **increasing the sealing pressure in a localized area.**” Ex. 1004 at [0436]; *see also* [0446] (disclosing an O-ring seal configuration). A person of ordinary skill in the art would understand the annular engaging portion 157 and pressing peripheral surface 159 to be a seal on the face of the capsule.

333. Additionally, I understand that K-fee has previously argued in a related Patent Owner Response (IPR2022-01574, Paper 17, 52) that a seal must “make sure that the water coming from a water inlet 28 flows through the portion capsule by passing an opening, which has been made by a mandrel 29, [rather] than around it.” *Id.*, citing ’491 Patent, at 10:31-34. Such a requirement is not found in the claim language. Nonetheless, to the extent K-fee repeats its argument from IPR2022-01574, 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]. Accordingly, Yoakim discloses a system whose seal ensures that the water enters the capsule, rather than going around the capsule, which serves to improve the interaction between water and the substance contained in the capsule.

334. Yoakim further discloses that the seal is configured to bear against a top side of the capsule’s lid. (Ex. 1004 at [0436] (“The annular engaging portion 157 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.”); *see also* [0388].) Yoakim further discloses that that the seal bears against the capsule’s cover in a region between a peripheral edge of the cover and the region of the cover that is pierced by the mandrel. [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.**”); [0446] (“The pinching surface can be shaped with a sharp tip or edge that can create a concentration of the pinching forces onto the rim.”). This is also shown in FIGs. 35, 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).

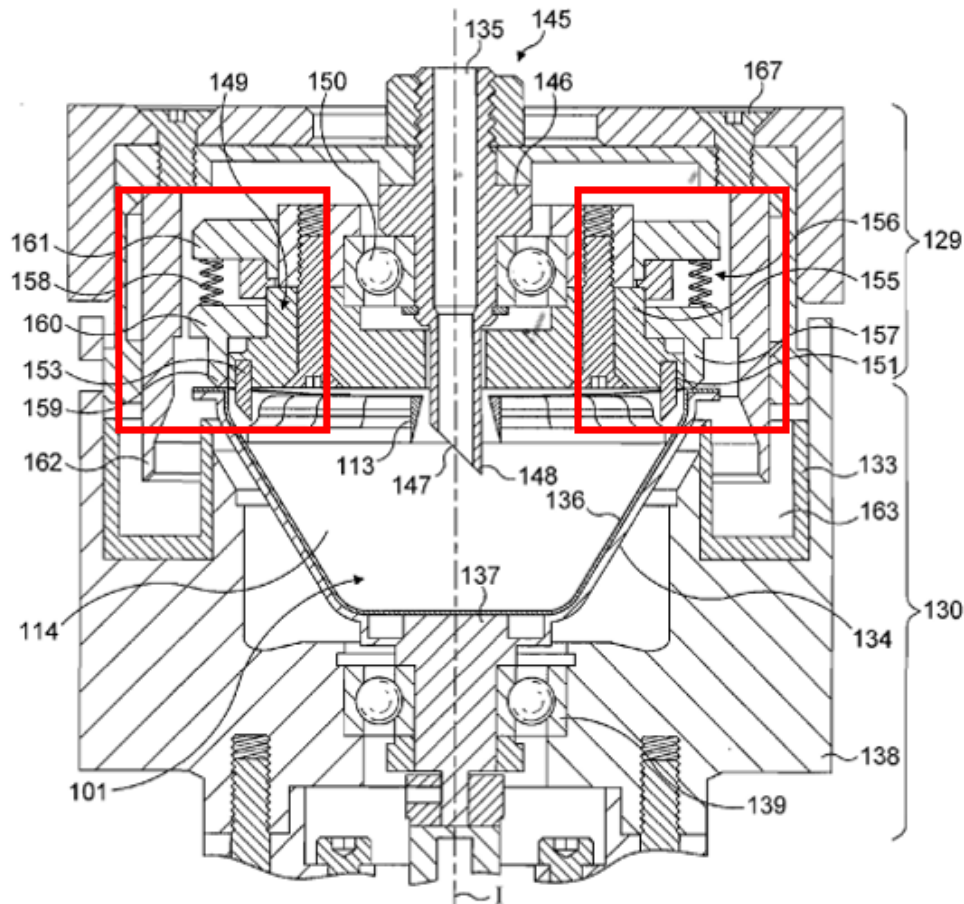


FIG. 35

Ex. 1004, Yoakim at FIG. 35 (annotated).

335. Accordingly, Yoakim discloses a beverage machine that “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.”

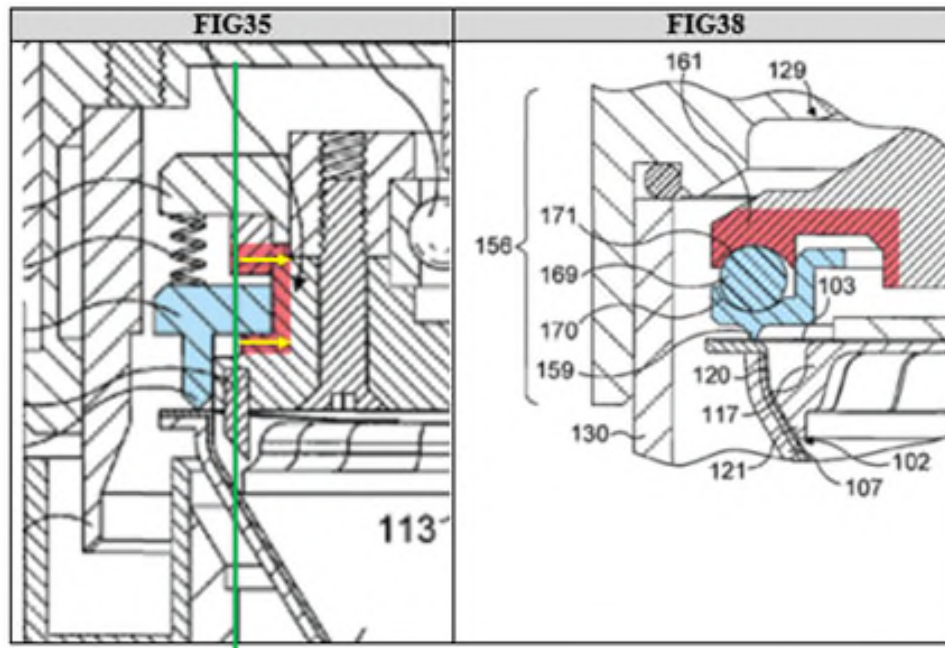
336. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 10 obvious.

- s. **“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.” (Claim 11)**

337. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 9,” as discussed in Section VII.B.2.(q).

338. As I explained above in claim 10, Yoakim discloses a beverage machine that “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.” See my discussion of claim 10.

339. Yoakim further discloses ***a groove in which the seal is at least partially located***. Ex. 1004 at [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.”). The seals (blue) and grooves (red) are shown in close ups of FIGs. 35 and 38:



340. To the extent FIGs. 35 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.

341. 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.” Ex. 1004 at [0384]-[0385].

342. Accordingly, Yoakim discloses and/or renders obvious a beverage machine that “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.”

343. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 11 obvious.

- t. “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.” (Claim 12)**

344. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 11,” as discussed in Section VII.B.2.(s).

345. As I explained in claim [1.f], Yoakim discloses a media chute configured to receive and support the portion capsule. *Supra* Section VII.B.2.(g).

346. As I also explained in claim 10, Yoakim 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. *Supra* Section VII.B.2.(r). A person of ordinary skill in the art would understand these disclosures to constitute a media chute (according to K-fee’s infringement 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 to provide such a

configuration in order to create a sealed arrangement that holds the capsule for brewing.

347. For example, the below images 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:

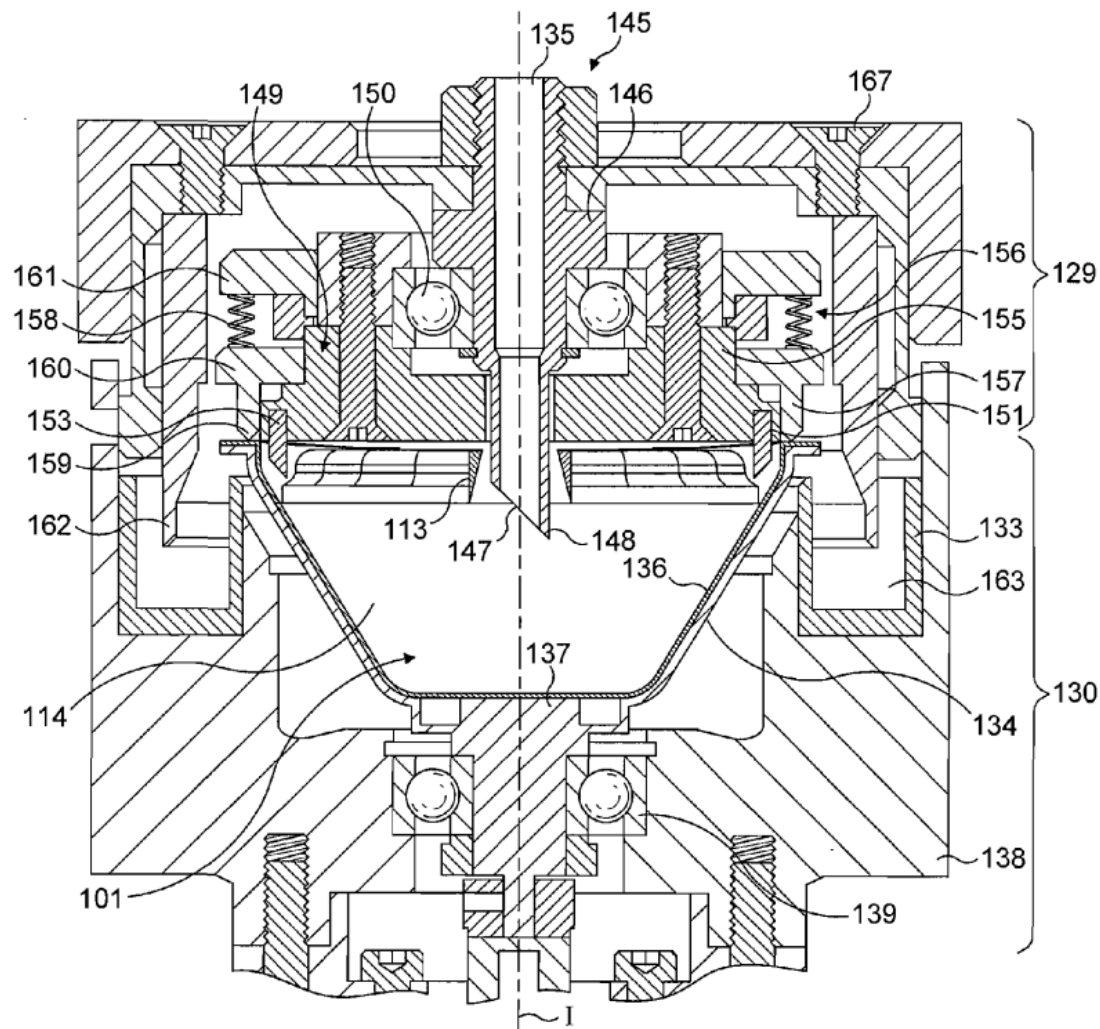


FIG. 35

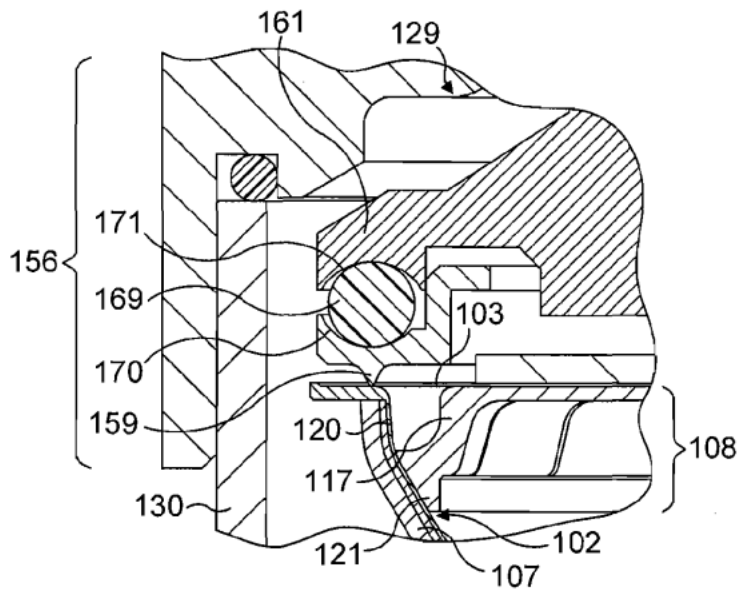


FIG. 38

Ex. 1004, Yoakim at FIGS. 35-38.

348. Accordingly, Yoakim discloses “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.”

349. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 12 obvious.

u. “The beverage system according to claim 7, wherein the optically detectable identifier is located on a side wall of the base element.” (Claim 13)

350. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 7,” as discussed in Section VII.B.2.(o).

351. Yoakim in view of Jarisch 929 renders obvious an optically detectable identifier that is located both under the flange, and also located on the side wall of the base element, according to K-fee's apparent interpretation. See Section VII.B.2.(d).

352. Jarisch 929 discloses that the optically detectable identifier can also be included on the side wall of the base element, in addition to on the periphery of the flange. Ex. 1006 at [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.”), see also [0090]-[0092];

353. 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.

354. Accordingly, Jarisch 929 discloses “wherein the optically detectable identifier is located on a side wall of the base element.”

355. Therefore, Yoakim in view of Jarisch 929, Rapparini, and Rossi renders claim 13 obvious.

- v. **“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.” (Claim 14)**

356. Yoakim in view of Jarisch 929 and Rossi disclose the “beverage system according to claim 5,” as discussed in VII.B.2.(m).

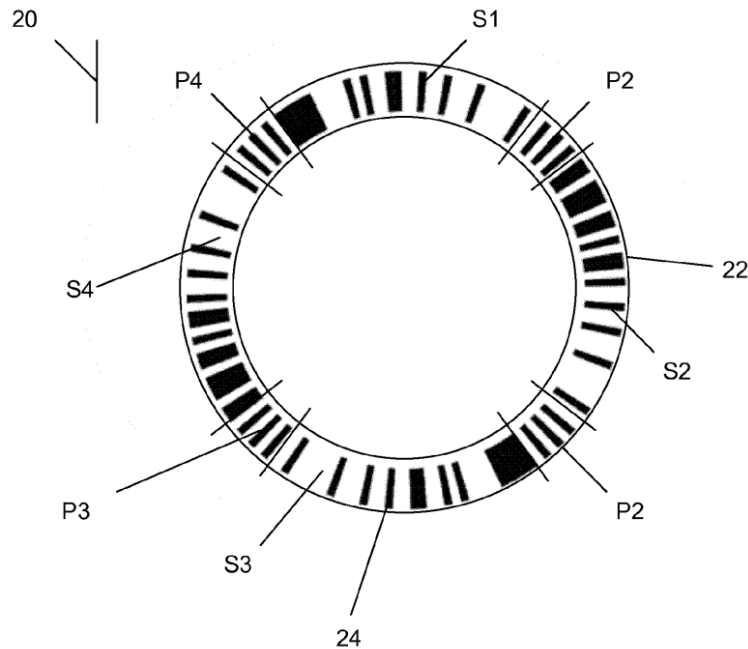
357. **Plurality of Reflective Zones:** As discussed above in connection with claim element [1.d], Jarisch 929 discloses an optically detectable identifier that has a plurality of reflective zones. *See supra* claim element [1.d].

358. **Free of a Filter:** Yoakim discloses a portion capsule that does not include a filter and expressly confirms that a filter is optional. Ex. 1004 at [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]. As depicted in FIGS6-7, 54-60, and described in [0197]-[0199], Yoakim expressly discloses embodiments using capsules that do not have a filter. It would also have been obvious design choice to a person of ordinary skill in the art to not use a filter in a centrifuge based brewing system, in order to simplify the capsule design.

359. **Made of Metal:** Yoakim further discloses that the portion capsule is made of a metal such as aluminum. Ex. 1004 at [0129] (“The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminum or plastic.”), [0215], [0461] (“The capsule is gastight by choosing materials for the walls, e.g., aluminium and/or suitable plastics, which have gas barrier properties.”), [0197], [0414].

360. **Repeat Pattern:** Jarisch 929 further discloses using “redundant information” such as “repetition codes.” Ex. 1006 at [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.” (*Id.* at [0068], [0110].) These repetition codes “improve[] by the way the probability of a successful reading of the sequence, should some parts of the sequence be unreadable.” (*Id.* at [0056].) furthermore, these readings are “more reliable and generate[] less reading errors than reading[] the whole sequence at time [sic].” (*Id.* at [0033].)

361. According to K-fee’s apparent interpretation, Jarisch 929 discloses an optically detectable identifier which includes a repeat pattern, depicted in FIG2 (below):



Ex. 1006, Jarisch 929 at FIG. 2.

362. It would have been obvious for a person of ordinary skill in the art to utilize the repeated code of Jarisch 929 in order to achieve the benefit of increasing the reliability of the system reading the code during rotation.

363. Accordingly, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 14 obvious.

w. “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.” (Claim 15)

364. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 12,” as discussed in Section VII.B.2.(t).

365. Claim 15 requires the same limitations as Claim 14, which, as discussed above in connection with Claim 14, are taught by the cited art.

366. Claim 15 further requires that the optically detectable identifier extends around a central axis of the base element. Jarisch 929 further discloses an optically detectable identifier that extends around a central axis of the base element. Ex. 1006 at [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.

367. Accordingly, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 15 obvious.

- x. **“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.” (Claim 16)**

368. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 13,” as discussed in VII.B.2.(u).

369. Claim 16 requires the same limitations as Claims 14 and 15, which, as discussed above in connection with Claims 14 and 15, are taught by the cited art.

370. Claim 16 further requires that the base element is deep drawn. Yoakim further discloses a portion capsule having a base element that is deep drawn. Ex. 1004 at [0355], [0215] (“For example, [the capsule] can be moulded by injection of plastic or deep drawn in aluminium.”). Furthermore, it would have been obvious to a POSITA to manufacture a portion capsule by deep drawing, as this is a fast and cost effective form of manufacturing thin-walled products such as coffee capsules.

371. Accordingly, Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose and/or render claim 16 obvious.

y. **“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.” (Claim 17)**

372. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 1,” as discussed in Section VII.B.2.(a)-(k).

373. For the same reasons discussed above in connection with Claim element [1.g], Yoakim and Rossi disclose “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.”

374. For example, as noted above in connection with Claim element [1.g], Rossi explicitly discloses activating the brewing cycle of production (which includes the

pump) **only after** a successful barcode read. Ex. 1041 at 6. Rossi further explains that “the production process cannot be activated unless” the system recognizes a correct validation element, such as a barcode. Ex. 1041 at 9.

375. A person of ordinary skill in the art would have found it obvious that a pump, which is a component of the brewing cycle, 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 doing so is to determine whether the capsule belongs to the group of capsules operable with the machine, and to determine the correct brewing parameters and release water to brew a beverage based on the capsule’s brewing parameters.

376. A person of ordinary skill in the art would understand that if a device or system has the means to recognize capsules, it has the means to recognize the absence of a capsule, or the presence of a capsule that is not compatible. This capability would be an important safety feature, preventing high pressure hot water from being injected into an unsealed chamber, for example, or preventing the use of an incompatible capsule that could damage the device or cause a safety hazard. Indeed, a person of ordinary skill in the art would have found this type of operation to be obvious given that it was well-known in the art by 2010. (Ex. 1024 at [0014]; Ex. 1040 at 23; Ex. 1041, at 6; Ex. 1042 at [0054]-[0055].)

377. Accordingly, Yoakim and Rossi disclose and/or render obvious “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.”

z. “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.” (Claim 18)

378. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 5,” as discussed in VII.B.2.(m).

379. As explained in claim 17 above, Yoakim and Rossi disclose and/or render obvious “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.”

380. Accordingly, Yoakim and Rossi disclose and/or render obvious Claim 18.

aa. “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.” (Claim 19)

381. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 12,” as discussed in VII.B.2.(t).

382. As explained in claim 17 above, Yoakim and Rossi disclose and/or render obvious “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.”

383. Accordingly, Yoakim and Rossi disclose and/or render obvious Claim 19.

bb. “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.” (Claim 20)

384. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 15,” as discussed in VII.B.2.(w).

385. As explained in claim 17 above, Yoakim and Rossi disclose and/or render obvious “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.”

386. Accordingly, Yoakim and Rossi disclose and/or render obvious Claim 20.

cc. “The beverage system according to claim 1, wherein the portion capsule includes a barrier layer.” (Claim 21)

387. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 1,” as discussed in Section VII.B.2.(a)-(k).

388. Yoakim discloses a barrier layer as discussed above in connection with Claim 7. *See* Section VII.B.2.(o). Accordingly, Jarisch 929, Rapparini, Yoakim, and Rossi disclose and/or render obvious Claim 21.

dd. “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.” (Claim 22)

389. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 21,” as discussed in VII.B.2.(cc).

390. 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 connection with Claims 10-11. *See supra* in Section VII.B.2.(r)-(s). Accordingly, Jarisch 929, Rapparini, Yoakim, and Rossi disclose and/or render obvious Claim 22.

ee. “The beverage system according to claim 21, wherein the grooves reinforce the wall region of the base element.” (Claim 23)

391. Yoakim in view of Jarisch 929, Rapparini, and Rossi disclose the “beverage system according to claim 21,” as discussed in Section VII.B.2.(cc).

392. 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.”)

393. The elements of claim 23 are addressed *supra* in Sections VII.B.2.(j)-(k), which overlap with claims [1.i] and [1.j].

394. It was also well-known to a person of ordinary skill in the art that grooves on a capsule wall would reinforce the wall region. I discuss this above in paragraphs 87-95. *See* Ex. 1030, 1:14-21; Ex. 1031, 1:27-37; Ex. 1032, 5:10-25; Ex. 1033, 2:20-25; Ex. 1011, [0077]; Ex. 1034, [0009]; Ex. 1035; [0027], [0037]; Ex. 1008, [0009]. Accordingly, Jarisch 929, Rapparini, Yoakim, and Rossi disclose and/or render obvious Claim 23.

ff. “The beverage system according to claim 22, wherein the grooves reinforce the wall region of the base element.” (Claim 24)

395. Yoakim in view of Jarisch 929, Rapparini and Rossi disclose the “beverage system according to claim 22,” as discussed above in Section VII.B.2.(dd).

396. The elements of claim 24 are addressed *supra* in Sections VII.B.2.(j)-(k), which overlap with claims [1.i] and [1.j]. I further discuss my reasoning for this limitation in the preceding section for Claim 23. Accordingly, Jarisch 929, Rapparini, Yoakim, and Rossi disclose and/or render obvious Claim 24.

C. Ground 2: Claims 2-3 Are Obvious Over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini and in further view of Castellani

397. It is my opinion that claims 2-3 of the '722 patent would have been obvious to a person of ordinary skill in the art at the time of the alleged invention of the '722 patent over Yoakim in view of Jarisch 929 in view of Rossi in view of Rapparini in further view of Castellani.

1. Motivation to Combine

398. As discussed in detail below, Yoakim, Jarisch 929, Rapparini and Rossi disclose and/or render obvious all elements of claims 2-3 except for a pair of holding arms for engaging the portion capsule. However, a person of ordinary skill in the art would have been motivated to combine the single-serve brewing system, capsule, and concepts of Yoakim, the repeated identifier and code location of Jarisch 929, the operation of the pump control based on a machine determination of the capsule's identifier as disclosed in Rossi, the radially spaced and vertically oriented drawn

grooves and ribs of Rapparini, with the holding arms of Castellani to obtain the claimed system of the '722 Patent, according to K-fee's apparent interpretation.

399. As discussed above for Ground 1, a person of ordinary skill in the art would be motivated to combine Yoakim, Jarisch 929, Rapparini and Rossi. *See* Section VII.B.1.

400. Castellani is analogous art and, like Yoakim, Jarisch 929, Rapparini and Rossi, is in the field of portion capsule beverage extraction and discloses an invention that may be applied in automatic coffee/espresso machines. (Ex. 1009 at [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.”).) Castellani explains it is intended to be used with beverage extraction systems that utilize single-serve capsules. (Ex. 1009 [Castellani] at [0010]; (“[A] main object of the invention is to provide such a delivery head, in which the single-use or disposable capsule loading or unloading operations can be performed in a very easy and safe manner, from a user standpoint.”).)

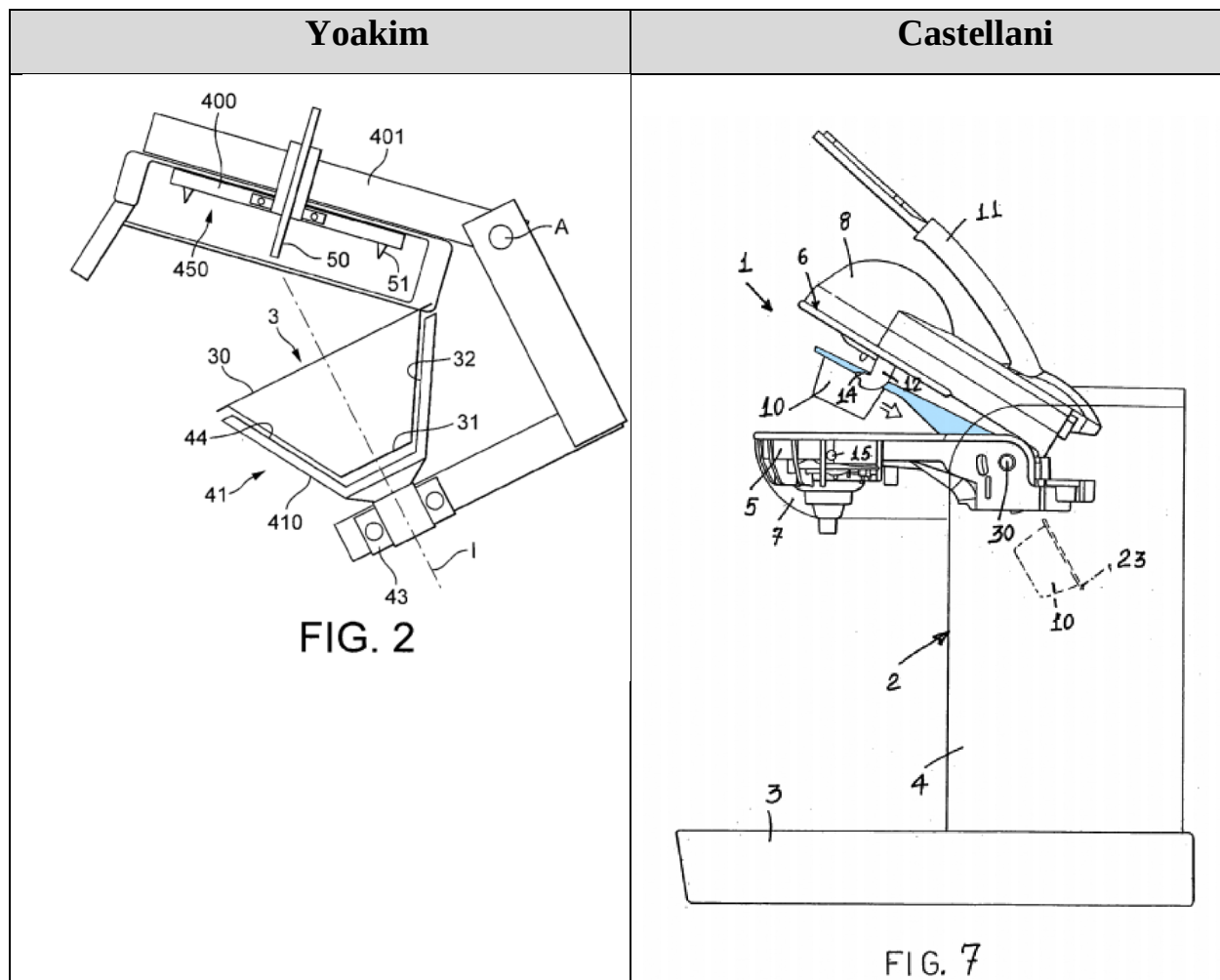
401. Castellani discloses explicit motivations that would lead a person of ordinary skill in the art to adopt the forks and ejection system taught by Castellani. Castellani explains that its capsule unloading operation “can be performed in a very easy and safe manner, from a user standpoint.” (Ex. 1009 at [0010].) Further, Castellani

resolves the “drawbacks” of “jammings” and the difficult “loading of the coffee capsule.” (*Id.* at [0007]-[0008].) Additionally, the ejection forks facilitate ejection of the capsule into a collecting vessel after extraction, which assists the user of the system such that they do not have to reach into the system to grasp a hot and wet used capsule after extraction. (*Id.* at [0054] (“Upon achieving a set inclination, as is clearly shown in FIG. 2, 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.”).)

402. Accordingly, a person of ordinary skill in the art would therefore have been motivated to utilize the ejection forks taught by Castellani in order to properly position and secure the capsule in the Yoakim/Jarisch 929 system (in order to facilitate controlled centrifuge extraction and barcode reading), and to ease the use of the product by facilitating ejection and avoiding a user having to touch hot, wet capsules.

403. Persons of ordinary skill in the art would have expected success in combining the Yoakim/Jarisch 929 and Castellani systems, as they are both directed to structurally similar solutions and are compatible systems each directed to single-serve beverage solutions. Like Yoakim and Jarisch 929, the Castellani system includes a housing recess (9) for the capsule body to sit inside, with an upper surface

that supports the capsule flange (23'). (Ex. 1009 at [0012]; [0043].) Additionally, both the Yoakim and Castellani systems utilize brewing heads that open vertically, with top-mounting capsule insertion into the brewing head as shown below, which would further facilitate success of the incorporation of Castellani's ejection forks into the Yoakim system:



404. Accordingly, as discussed in more detail below, it is my opinion that claims 2-3 would have been obvious to a person of ordinary skill in the art in view of

Yoakim, Jarisch 929, Rossi, Rapparini and Castellani. I provide my claim by claim analysis of these opinions below.

2. Claim 2

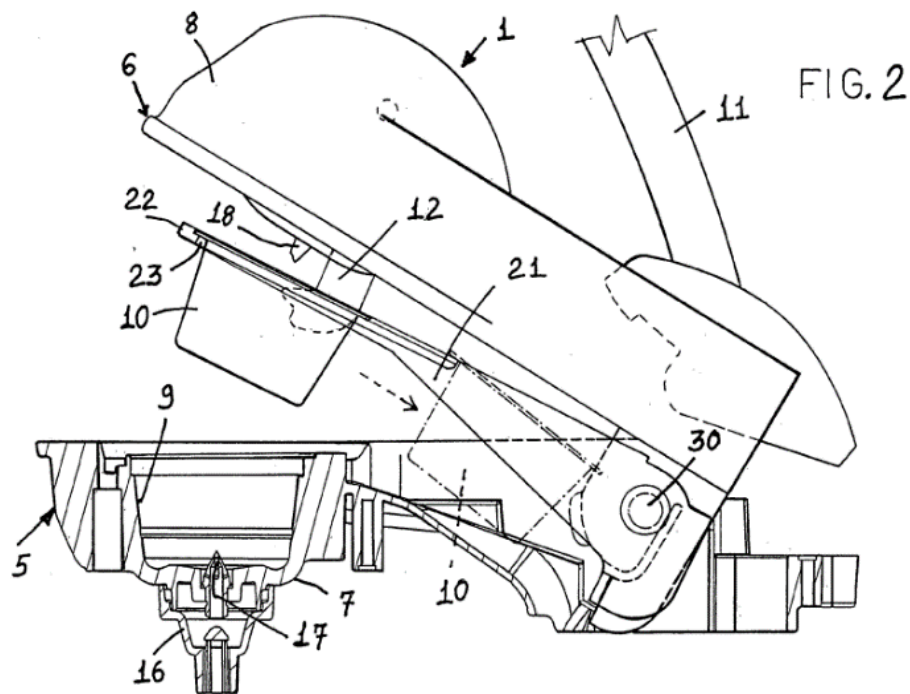
405. Claim 2 of the '722 Patent recites:

2. The beverage system according to claim 1, wherein the beverage machine comprises a pair of holding arms for engaging the portion capsule.

406. Yoakim in view of Jarisch 929 and Rossi discloses “[t]he beverage system according to claim 1,” as shown above at Section VII.B.2.(a)-(k).

407. Castellani discloses a pair of holding arms for guiding the single-serving capsule, according to K-fee’s apparent interpretation. For example, Castellani discloses a capsule ejecting fork elements (21). (*See, e.g.*, Ex. 1009 at [0043] (“Further, according to the present invention, the delivery head 1 comprises moreover coffee capsule 10 ejecting means, including a capsule ejecting fork element 21 pivoted to the pivot pin 30 applied to the bottom supporting element 5 and including an annular portion 22 designed for encompassing the top of the coffee capsule 10, which is suitably provided with a perimetrical bearing edge portion 23.”); [0053] (“Thus, the fork element 21 will rise said capsule 10, by its annular portion 22, which engages at the bottom thereof the bearing perimetrical edge portion 23 of the capsule 10.”).)

408. Furthermore, Castellani discloses that the single-serving capsule will slide on the fork element (21) through a specifically designed passage into a collecting vessel. (Ex. 1009 at [0054] (“Upon achieving a set inclination, as is clearly shown in FIG. 2, 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.”); FIGs. 2 and 7 (annotated). The ejection fork elements of Castellani are shown in the below figures at 21:



Ex. 1009, Castellani at FIG. 2.

409. A person of ordinary skill in the art would have been motivated to utilize the ejection fork elements of Castellani with Yoakim, Jarisch 929 and Rossi. See Section VII.C.1.

410. Accordingly, Castellani discloses “wherein the beverage machine comprises a pair of holding arms for engaging the portion capsule.”

411. Therefore, Yoakim in view of Jarisch 929 in view of Rapparini in view of Rossi in further view of Castellani renders claim 2 obvious.

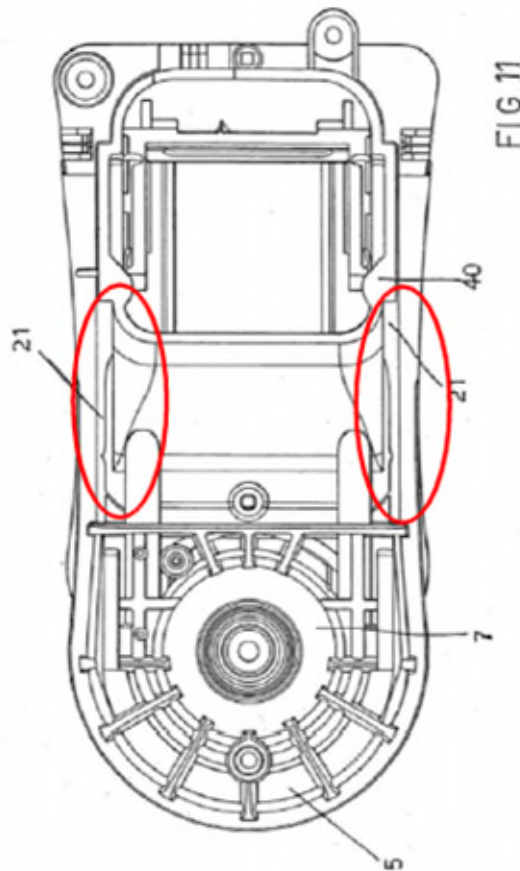
3. Claim 3

Claim 3 of the '722 Patent recites:

3. The beverage system according to claim 2, wherein the holding arms engage opposing sides of the portion capsule.

412. Yoakim in view of Jarisch 929, Rapparini, and Rossi in further view of Castellani discloses “[t]he beverage system according to claim 2[.]”

413. As discussed in connection with Claim 2, and shown in FIG.11 (annotated below), Castellani discloses a pair of holding arms (fork element 21) that engage opposing sides of the portion capsule.



Ex. 1009, Castellani at FIG. 11 (annotated).

414. Accordingly, Castellani discloses “wherein the holding arms engage opposing sides of the portion capsule.”

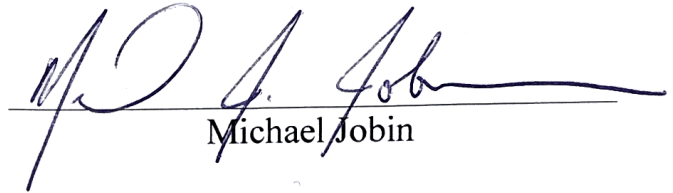
415. Therefore, Yoakim in view of Jarisch 929 in view of Rapparini in view of Rossi in further view of Castellani renders claim 3 obvious.

VIII. SUPPLEMENTATION

416. This declaration, along with the attached appendices, is based on my present assessment of material and information currently available to me.

417. I hereby declare that all statements made herein of my own knowledge are true and that all statements made herein on information and belief are believed to be true. Further, these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified patent.

Dated: 12/12/2023



Michael Jobin

APPENDIX A

Michael Jobin

1682 Washington Street, #3
Boston, MA 02118
617-406-9415

Experience

2012-Present

908 Devices Inc., Boston, MA

Co-Founder & Director of Product Development

- As a co-founder of 908 Devices, I lead mechanical engineering and design efforts for chemical detection instrumentation.

2008-2012

Aston Technology Advisors, Boston, MA

President

- Provide invention and technology integration services for clients including a medical device company, a major international consumer products company and an alternative energy company

2001-2008

Altitude, Inc., Somerville, MA

Engineering Manager (2001 - 2005)

Director of Engineering (2005 - 2008)

- Successfully developed new business proposals and contracts totaling several million dollars
- Managed clients in medical, consumer and commercial industries, including Boston Scientific, Jarden Consumer Solutions (home appliances) and Thermo Electron (XRF instrument)

2001-2002

MicroBiosciences, Inc., Cambridge, MA

Co-Founder and Chief Technology Officer (seed-funded startup)

- Invented microfluidics technologies & prototypes for High Throughput Screening
- Conducted extensive prior art searches & co-wrote three provisional patent applications
- Led business development; arranged meetings with top pharmas & biotechs to define product specifications & organize development consortium

2000-2001

Arthur D. Little, Inc., Cambridge, MA

Sr. Mechanical Engineer for Pyxsys Corporation (venture-backed spinout)

- Led mechanical engineering of next-generation network storage product, integrating contributions of mechanical, software, hardware and industrial designers

1998-2000

Boston Innovation, Inc., Cambridge, MA

Co-Founder and Chief Operating Officer (customer-funded startup)

- Developed new technologies for key clients, including: Bard (surgical instrument), Gillette (precision dispensing instrument), Merck, J&J, AstraZeneca ("fluid transistor" for life sciences microdispensing applications such as drug discovery and drug delivery)
- Co-developed technology for five pending patents and wrote provisional applications

1996-1998

Proteus, Inc., Boston, MA

Program Manager

- Co-founded & managed 6 person engineering department

	Managed concurrent development projects for: Xylum (diagnostic instrument), Avery Dennison (writing instruments), Honeywell (electronic thermostat), and Physiometrix (anesthesia monitor)
1992-1996	Design 4 Plastics, Inc., Chicago, IL <i>Program Manager</i> - Engineered products for Packard Instruments, Barnant (laboratory instruments), Nortech (surgical pump), Seaquist (miniature valves) and Coca-Cola (fluid delivery) - Strong focus on plastic part design, materials, design for assembly, prototyping and tooling
Education 1987-1991	University of Michigan, Ann Arbor, MI BS Engineering, Mechanical, <i>cum laude</i> BFA Industrial Design, <i>cum laude</i>
Other	Inventor on 25 issued (19 utility, 6 design) U.S. patents
1	US D932046 Fluidic cartridge assembly
2	US 9698000 Integrated mass spectrometry systems
3	US 10438787 Integrated mass spectrometry systems
4	US 9502226 Sample collection in compact mass spectrometry systems
5	US 9978574 Sample collection in compact mass spectrometry systems
6	US 9279821 Deicing system in sodar systems
7	US 9093253 High pressure mass spectrometry systems and methods
8	US 8958269 Transducer for phased array acoustic systems
9	US D703074 Handheld sensor
10	US D703075 Sensor device
11	US 8525111 High pressure mass spectrometry systems and methods
12	US 8012136 Ophthalmic fluid delivery device and method of operation
13	US 8545463 Ophthalmic fluid reservoir assembly for use with an ophthalmic fluid delivery device
14	US D597206 Ophthalmic misting device
15	US 7175270 Flexible frame assembly for eyeglasses
16	US 7210777 Floating lens brow bar attachment for eyeglasses
17	US 7237892 Temple bar with ball and socket hinge and method of making same
18	US 7246901 Adjustable length upper frame member for eyeglasses
19	US 7758789 Temple bar assembly for eyeglasses
20	US D534446 Handheld instrument
21	US 7080904 One piece spectacle with temple pre-load
22	US 6706538 Microvolume liquid dispensing array
23	US 6085773 Automatic fluid switching valve
24	US D425979 Window fan
25	US 5794897 Transmission line hanger, a method of attaching the hanger and the resulting assembly

APPENDIX B

No.	Reference	Referred To As
1001	U.S. Patent No. 11,548,722	'722 Patent
1002	Prosecution History of U.S. Patent No. 11,548,722	'722 Patent File History
1003	Declaration of Michael Jobin	Jobin Decl.
1004	U.S. Patent Pub. US2010/0239734A1	Yoakim
1005	U.S. Patent Pub. US2013/0064937A1	Jarisch
1006	U.S. Patent Pub. US2013/0064929A1	Jarisch 929
1007	PCT Pub. WO2010/026053A1	Denisart
1008	U.S. Patent Pub. US2012/0269933A1	Rapparini
1009	U.S. Patent Pub. 2008/0105131	Castellani
1010	PCT Pub. WO2005/079638A1	Panesar
1011	U.S. Patent Pub. 2006/0233921	Mock
1012	National Coffee Association	NCA
1013	U.S. Patent Pub. 2002/0078831	Cai
1014	U.S. Patent No. 726,793	Bezzera
1015	U.S. Patent Pub. 2009/0007793	Glucksman
1016	U.S. Patent No. 3,387,553	Tavera
1017	U.S. Patent No. 3,631,793	Bednartz
1018	U.S. Patent No. 4,136,202	Favre
1019	U.S. Patent No. 6,142,063	Beaulieu
1020	U.S. Patent No. 4,389,925	Piana

1021	U.S. Patent No. 6,655,260	Lazaris
1022	U.S. Patent Pub. 2006/0230941	Ryser
1023	U.S. Patent Pub. 2009/0249961	Cheng
1024	U.S. Patent Pub. 2004/0089158	Mahlich
1025	PCT Pub. WO 2010/034663	Ozanne
1026	ASM Handbook, Volume 14B: Metalworking: Sheet Forming, S.L. Semiatin, editor.	ASM Handbook
1027	https://www.italcoat.com/wp-content/uploads/2023/02/ITC-Coffee-Capusles-1.pdf	Italcoat
1028	EU Patent App. EP2145759A1	Geerts
1029	Penix J.A. (1991) Thermoforming of Plastic Film and Sheet. In: Berins M.L. (eds) SPI Plastics Engineering Handbook of the Society of the Plastics Industry, Inc.	Penix
1030	U.S. Patent No. 3,437,253	Davis
1031	U.S. Patent No. 5,261,558	Claydon
1032	U.S. Patent No. 5,243,164	Erickson
1033	U.S. Patent No. 6,645,537	Sweeney
1034	EU Patent App. EP1849718A1	Rubino
1035	PCT Pub. WO2010/041179A2	Mariller
1036	EU Patent App. EP0455337B1	Bentley
1037	U.S. Patent Pub. 2002/0048621A1	Boyd
1038	U.S. Patent Pub. 2007/0203587A1	Erlandsson

1039	U.S. Patent Pub. 2005/0150391A1	Schifferle
1040	PCT Pub. WO2005/044067A1	Ruchonnet
1041	PCT Pub. WO2010/099806A1	Rossi
1042	US Patent Pub. 2009/0205747	Lillard
1043	U.S. Patent Pub. 2010/0078480A1	Aker
1044	U.S. Patent Pub. 2013/0099597	Perentes
1045	Official English translation of German application No. 102011010534.4	February 2011 Application
1046	Official English translation German application No. 102010031988.0	July 2010 Application
1047	Official English translation German application No. 102010044251.8	September 2010 Application
1048	<i>Nespresso USA, Inc. v. K-fee System GmbH</i> , Case No. 2:22-cv-09295; Dkt. 13.	First Amended Complaint
1049	<i>Nespresso USA, Inc. v. K-fee System GmbH</i> , Case No. 2:22-cv-09295 – Infringement Contentions (August 20, 2023)	Infringement Contentions
1050	Excerpt from Prosecution History of U.S. Appl. No. 13/744,623	'623 Appl.
1051	https://nestle-nespresso.com/our_products/product	Nespresso Vertuo System
1052	<i>K-Fee System GmbH v. Nespresso USA, Inc. et al.</i> , Case No. 2:21-cv-3402; Dkt. 111.	Claim Construction Order
1053	Excerpt from Prosecution History of U.S. Appl. No. 16/438,818	'818 Appl.

1054	<i>K-Fee System GmbH v. Nespresso USA, Inc. et al.</i> , Case No. 2:21-cv-3402; Dkt. 211.	Summary Judgment Order
1055	Food Packaging and Shelf Life: A Practical Guide (2009), Chapter 11 – “Packaging and the Shelf Life of Coffee”	Food Packaging
1056	Illy, Andrea, and Rinantonio Viani, eds. <i>Espresso coffee: the science of quality</i> . Academic Press, 2005.	Espresso Coffee
1057	United States District Courts – National Judicial Caseload Profile (Central District of California), <i>available at</i> https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2020.pdf	Central District of California Time to Trial Statistics
1058	Docket Navigator Time to Trial (Judge George H. Wu; Central District of California), <i>available at</i> https://search.docketnavigator.com/patent/binder/0/0?profileType=time_to_trial&profileId=0	Docket Navigator Time to Trial Statistics
1059	<i>Lateral</i> , Concise Oxford English Dictionary (11 th ed. Revised 2008).	Oxford Dictionary
1060	<i>Lateral</i> , Merriam-Webster’s Collegiate Dictionary (11 th ed. 2004).	Merriam-Webster Dictionary
1061	<i>Lateral</i> , Random House Webster’s unabridged dictionary (2d. 2001).	Random House Dictionary
1062	Excerpt from Appl. No. 16/860,441: Jul. 13, 2020 Office Action Rejection	441 Appl. First Rejection
1063	Excerpt from Appl. No. 16/860,441: Oct. 13, 2020 Response to Office Action	441 Appl. Response

1064	Excerpt from Appl. No. 16/538,752: Nov. 8, 2019 Office Action Rejection	752 Appl. First Rejection
1065	Excerpt from Appl. No. 16/538,752: Jan. 23, 2020 Response to Office Action	752 Appl. First Response
1066	Excerpt from Appl. No. 16/538,752: Jul. 27, 2020 Response to Office Action	752 Appl. Second Response