

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: IPR2023-00485

Patent 11,230,430

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.....	10
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
IV.	THE '430 PATENT	55
A.	Background Of The '430 Patent.....	55
B.	Prosecution History of the '430 Patent (Ex. 1002)	58
C.	The Challenged Claims	64
V.	CLAIM CONSTRUCTION.....	67
VI.	THE CORRECT PRIORITY DATE FOR THE '430 PATENT.....	69
VII.	CLAIMS 1-10 ARE UNPATENTABLE BECAUSE THEY WOULD HAVE BEEN OBVIOUS TO A PERSON OF ORDINARY SKILL IN THE ART.....	81
A.	Overview of the Prior Art.....	82
1.	Overview of Yoakim (Ex. 1004)	82
2.	Overview of Jarisch (Ex. 1005)	86
3.	Overview of Rossi (Ex. 1041)	88
4.	Castellani (Ex. 1009)	90
B.	Ground 1: Claims 1-10 are Obvious Over Yoakim in view of Jarisch, Rossi and Castellani	91
1.	Motivation to Combine Yoakim, Jarisch and Rossi	91
i.	Motivation to Combine with Castellani.....	99
2.	Claim Elements	103

a.	“A beverage system for making a beverage, comprising:” (Preamble, Claims 1, 7)	103
b.	“a single-serve capsule comprising a base element with a cavity, in which a raw beverage material is provided” (Claims [1.a], [7.a])	104
c.	“a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side” (Claims [1.b], [7.b])	106
d.	“a cover that is fastened to the top side of the flange to close the cavity” (Claims [1.c], [7.c])	108
e.	“and a barcode provided on the bottom side of the flange” (Claim [1.d]), “and an identifier provided on the bottom side of the flange, the identifier being a barcode” (Claim [7.d])	110
f.	“a beverage machine comprising: a sensor/detector configured to read the barcode” (Claim [1.e]), “a beverage machine comprising: a sensor/detector” (Claim[7.e])	112
g.	“a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange” (Claims [1.f], [7.f])	116
h.	“a pump controlled to supply water into the single-serve capsule” (Claim [1.g], [7.g])	120
i.	“wherein the single-serve capsule is free of a filter that is located inside of the cavity” (Claims [1.h],[7.h])	122
j.	“the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element;” (Claims [1.i], [7.i])	123
k.	“a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule” (Claims [1.j], [7.j])	125
l.	“wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element” (Claims [1.k], [7.l])	128

m.	“(ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel” (Claims [1.l], [7.m]).....	130
n.	“(iii) a pair of holding arms for engaging the single-serve capsule” (Claims [1.m], [7.n])	136
o.	“(iv) a dropping box for the single-serve capsule to fall into” (Claims [1.n], [7.o]).....	137
p.	“wherein the pump is controlled to push water into the single-serve capsule only upon a determination that the read barcode agrees with a stored reference” (Claim [1.o])	139
3.	“The beverage system according to claim 1, wherein the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree with a stored reference.” (Claim 2).....	142
4.	“The beverage system according to claim 1, wherein the sensor/detector of the beverage machine is configured to compare the read barcode with the stored reference.” (Claim 3)	144
5.	“The beverage system according to claim 1, wherein the base element comprises a bottom having an indentation.” (Claim 4)	145
6.	“The beverage system according to claim 4, wherein the side wall of the base element includes indentations.” (Claim 5) and “(iii) a side wall having indentations.”(Claim [7.k])	145
7.	“The beverage system according to claim 1, wherein the base element is made of a biodegradable material.” (Claim 6)	147
8.	Independent Claim 7	149
a.	Claim elements [7.a]-[7.o].....	149

b.	“wherein the beverage machine, by reading or detecting the identifier with the sensor/detector, is configured to determine if the single-serve capsule belongs to a group of single-serve capsules operable for use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single-serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule” (Claim [7.p])	149
9.	Claim 8.....	152
10.	Claim 9.....	152
11.	Claim 10.....	153
VIII. SUPPLEMENTATION.....		153

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. 11,230,430 (“the ’430 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 31 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 a 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 '430 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 '430 Patent, the prosecution history of the '430 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 '430 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 ’430 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 had those capabilities myself as of the July 22, 2010 filing date of K-fee’s earliest filing in the ’430 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 ’430 Patent. 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 '430 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 '430 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 '430 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 '430 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 '430 patent was filed on July 26, 2021, but claims priority to an International Patent Application (PCT/EP2011/003677) filed on July 22, 2011. I understand that the '430 Patent claims further priority to three foreign patent applications filed in 2010; however, as explained in Section VI, the '430 Patent should not receive priority to those foreign

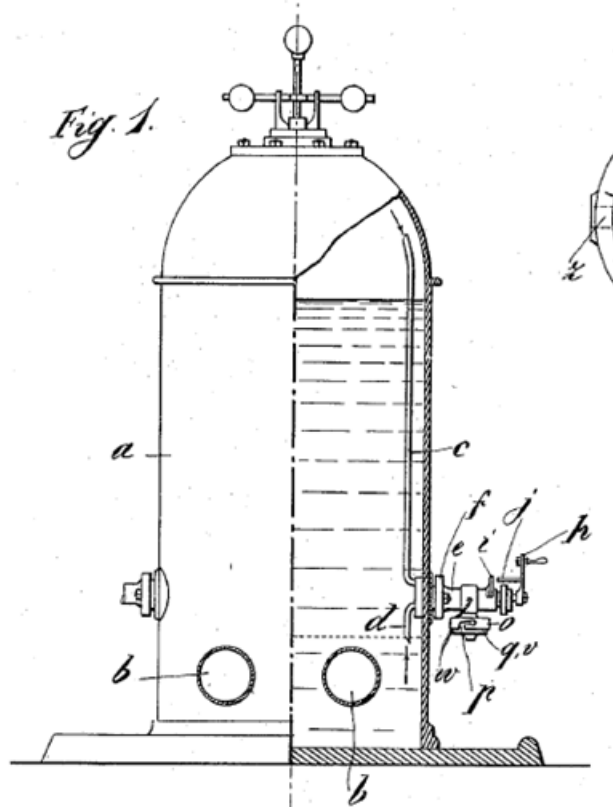
patent applications because the foreign patent applications do not provide written description support for the '430 Patent claims. As a result, unless otherwise stated, I will assume the relevant time period for determining what one of ordinary skill in the art knew is prior to July 22, 2011.

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 January 15, 2023); *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

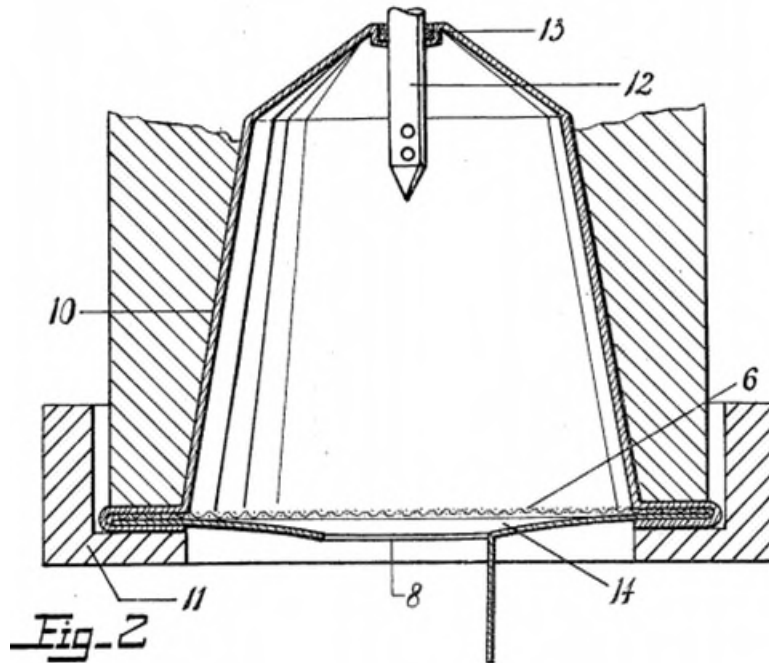
57. Since the introduction of the single-serve coffee options by the 1960s and 70s, the market has seen various evolutions and advancements into single-serve coffee systems and corresponding capsules. By 2010, many single serve coffee extraction systems were known and available for purchase, including 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.



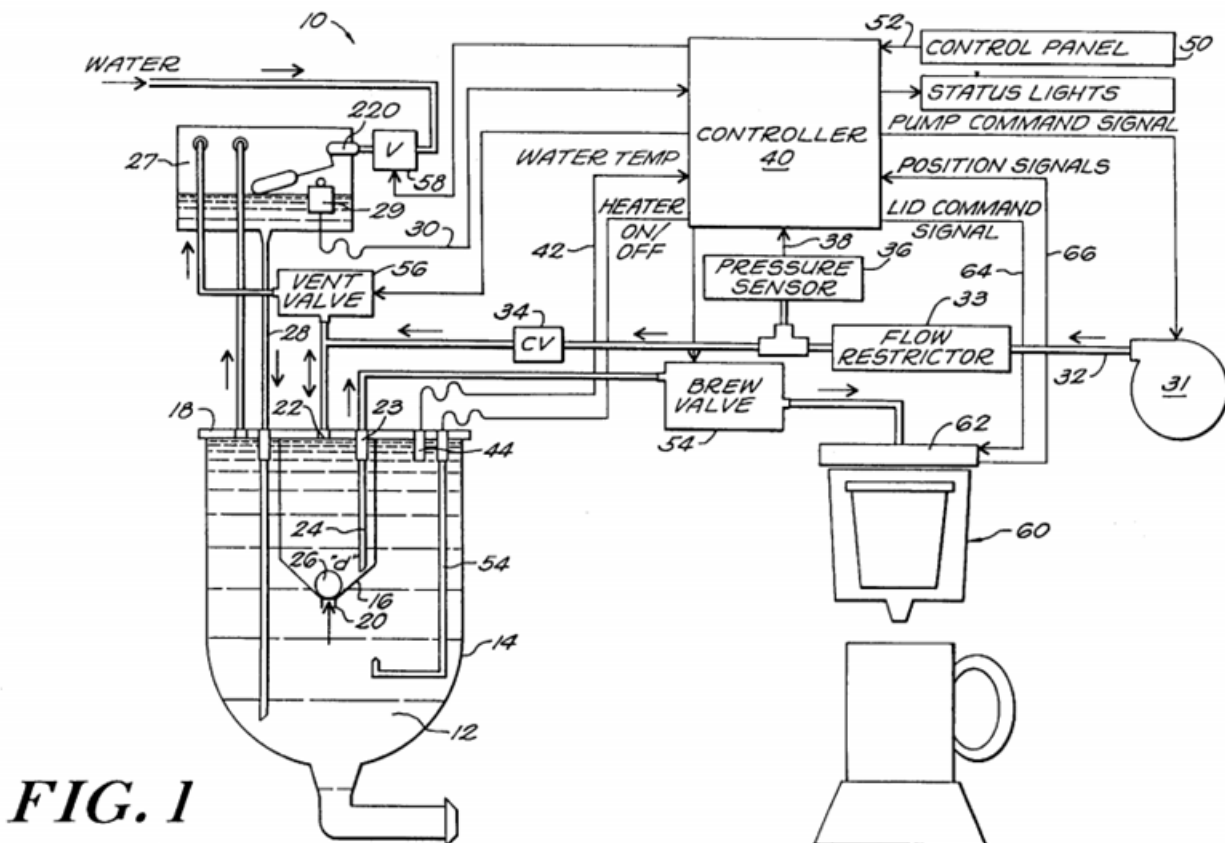
Ex. 1018, Favre at FIG. 2.

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:



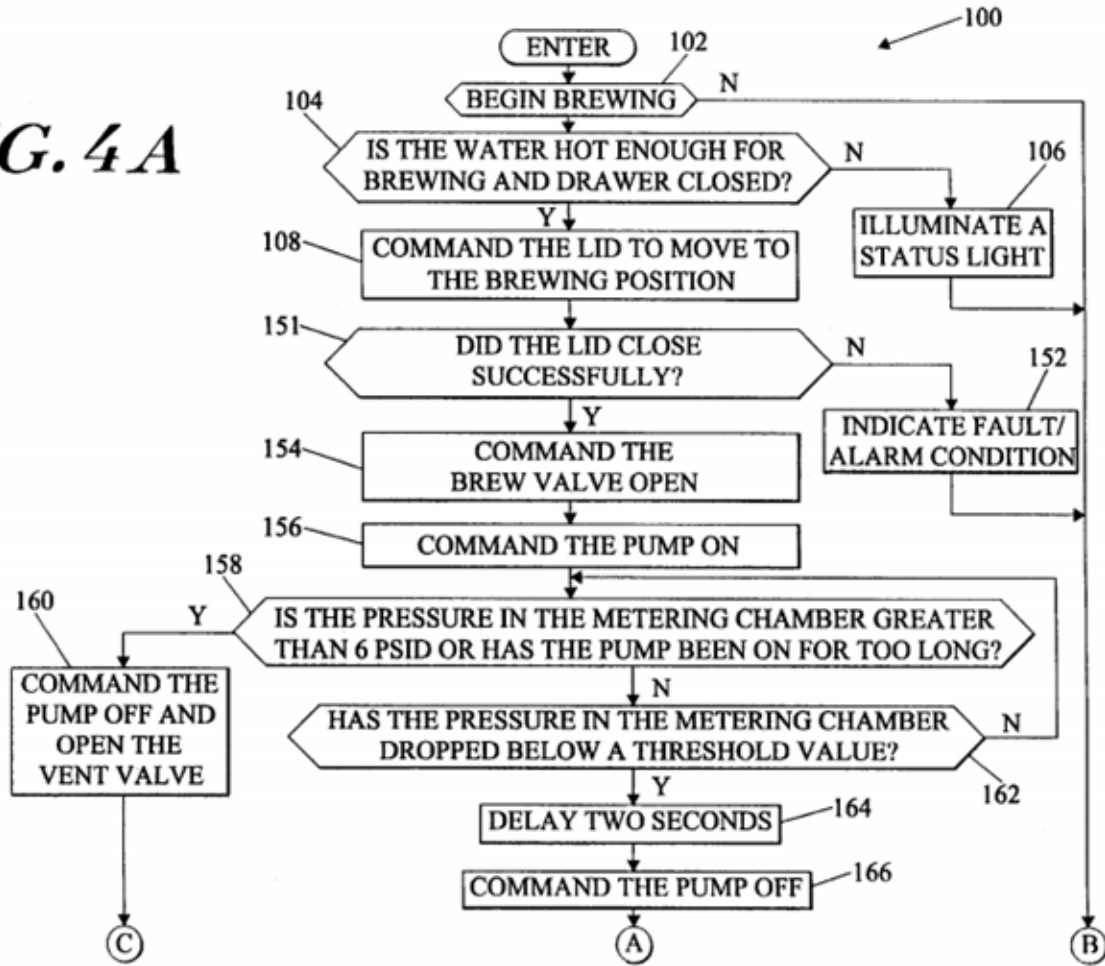
Ex. 1019, Beaulieu at FIG. 1.

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



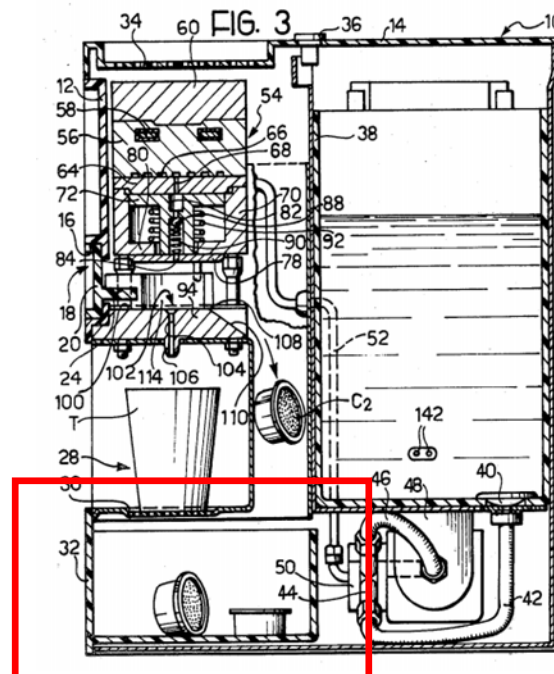
Ex. 1019, Beaulieu at FIG. 4A.

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-

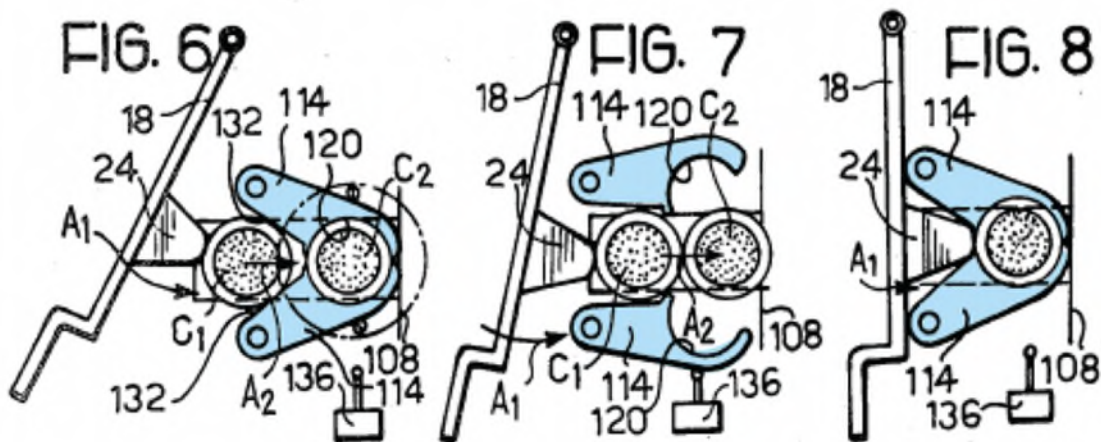
serve capsules so that a consumer does not need to touch a hot, wet capsule immediately after extraction.

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. 5 at 46, 48:

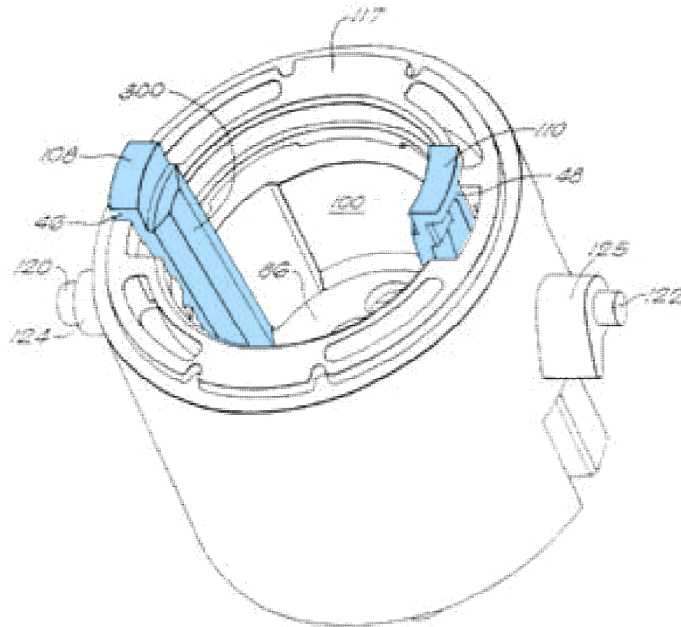


FIG. 5

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.

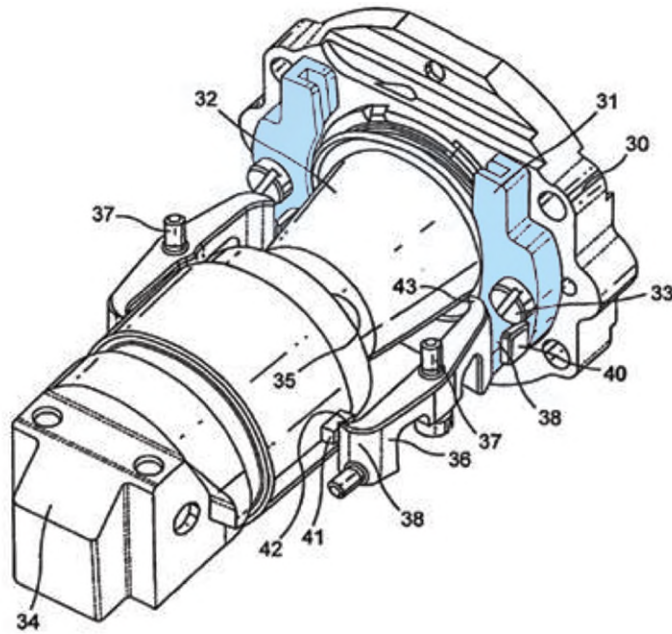
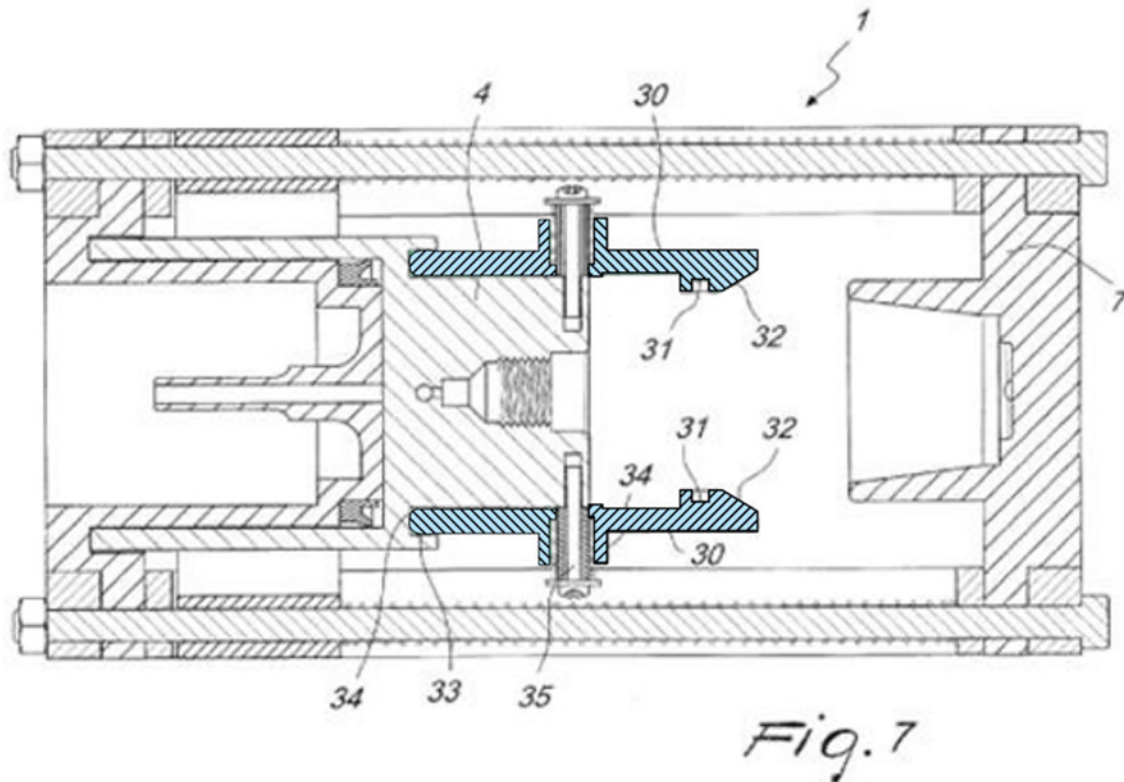


FIG. 8

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:

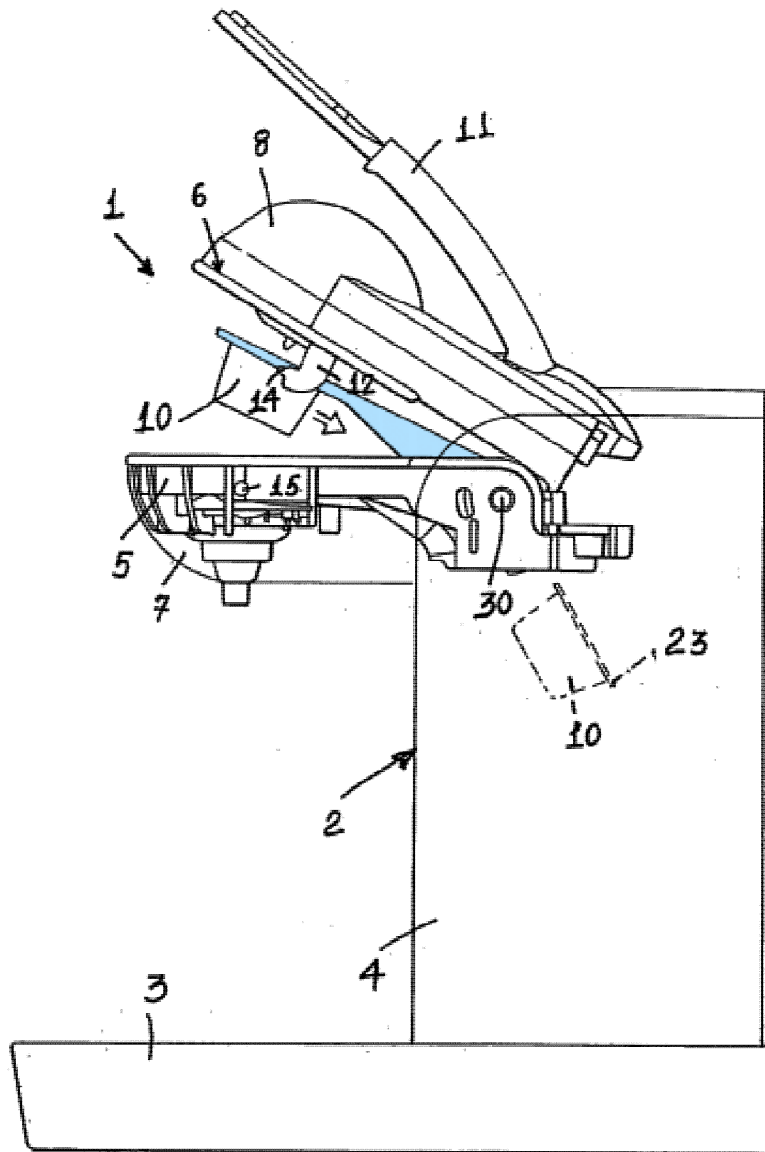


FIG. 7

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 '430 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 6-12.)

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].)

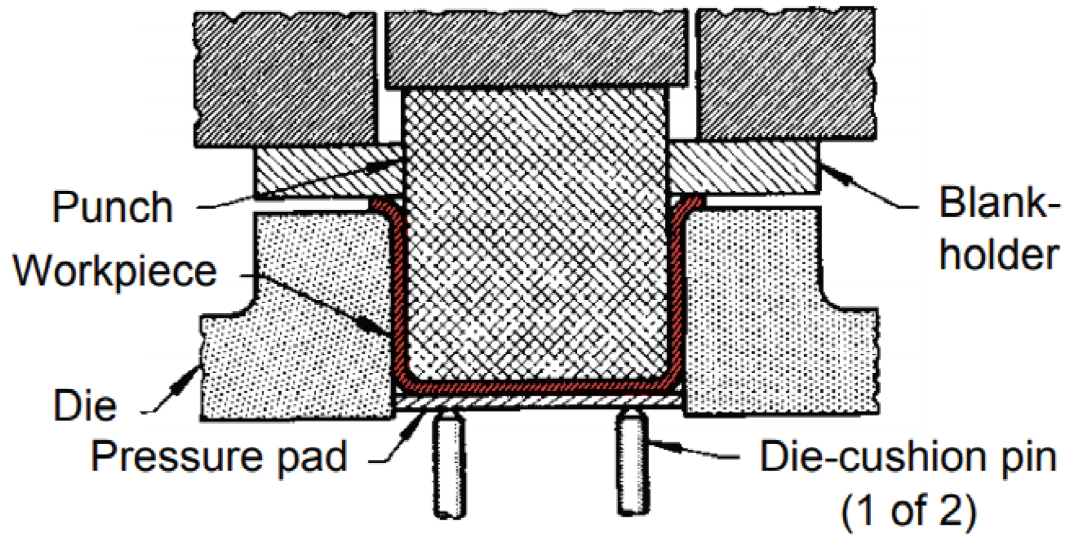
1. Deep Drawing Aluminum Capsules Was Known

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/2022/08/ITC-Coffee-Capusles.pdf>, (Italcoat, last accessed January 15, 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. 383-427.)

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

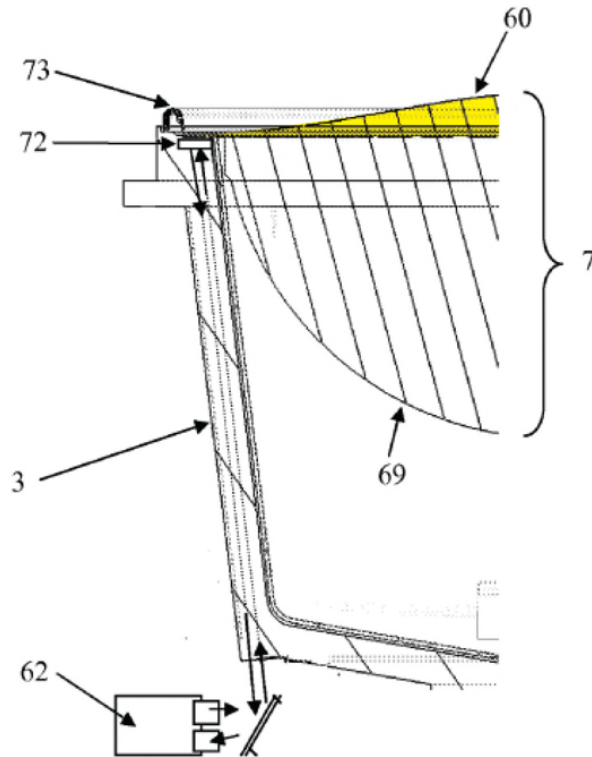
83. By the time of the '430 Patent, it was also known that multi-ply coffee packaging can include a barrier layer to increase the freshness of coffee grounds and prevent moisture or aroma from escaping the container. By 2009, it was known that “the most commonly used materials are the inexpensive and 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, Espresso Coffee, 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):



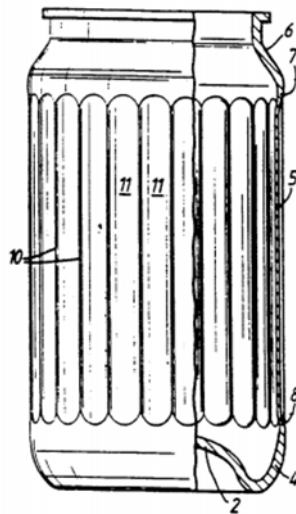
Ex. 1005, Jarisch at FIG. 4.

i. Indentations on Single-Serve Capsules Were Known

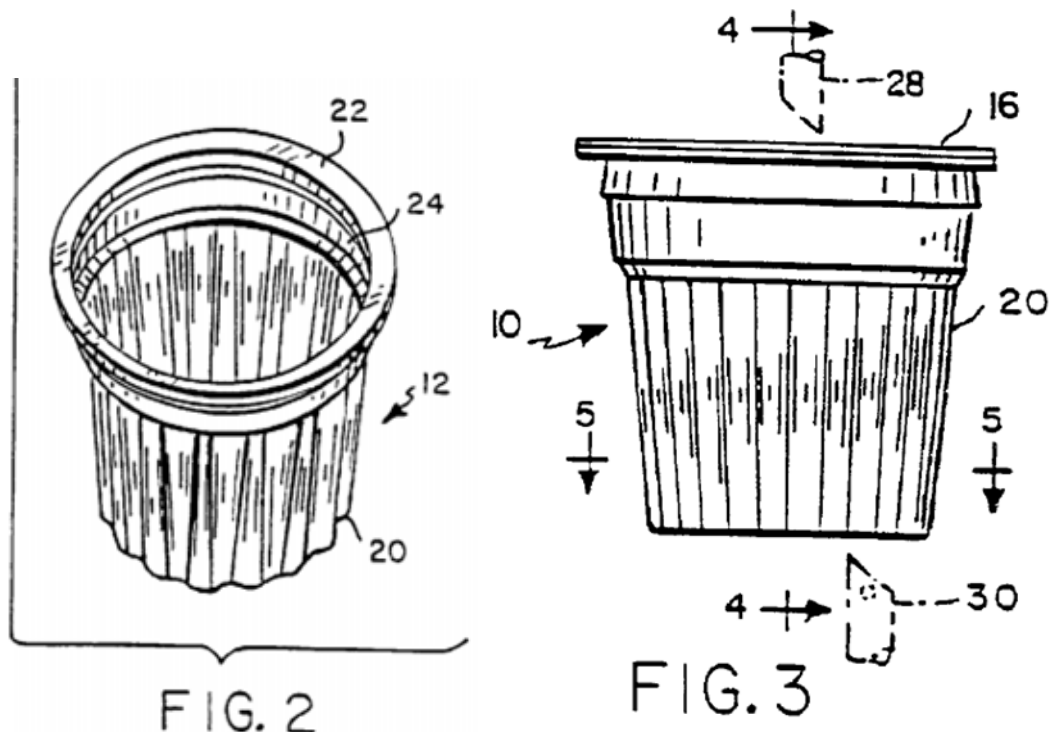
87. It was also well-known that single-serve capsules must endure pressure, temperature and physical stresses during the brewing process, and withstand the forces of a user's hand grasping and manipulating the capsule. As a result, single-serve capsules evolved to include certain textures such as grooves, 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:



Ex. 1031, Claydon at FIG. 3.



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:

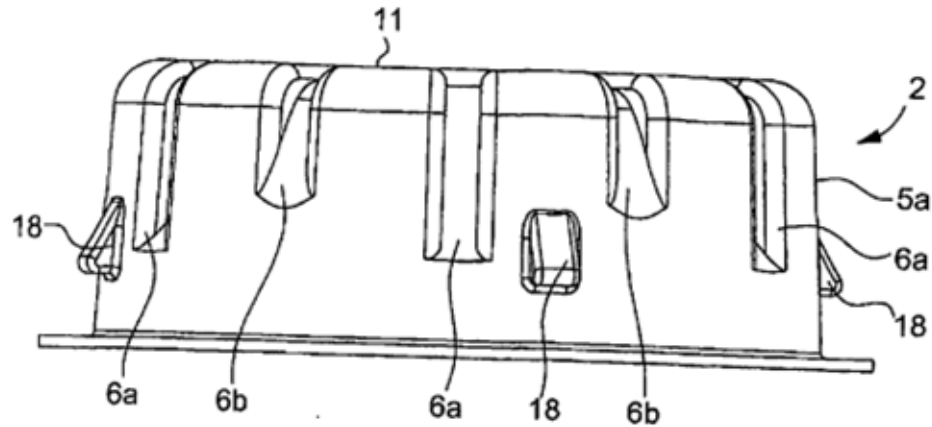


Fig.2

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:

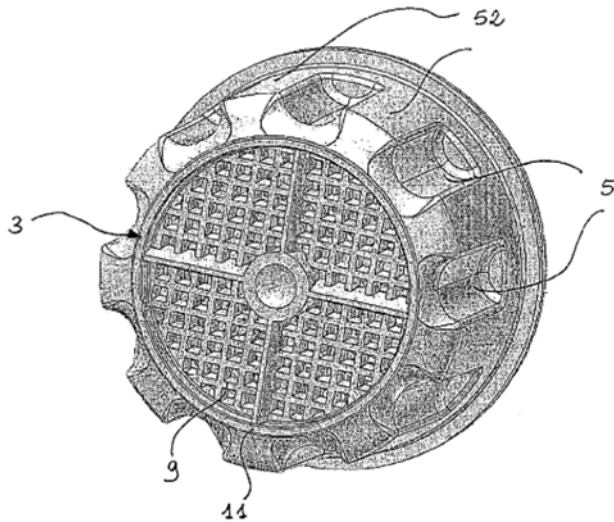


FIG. 2

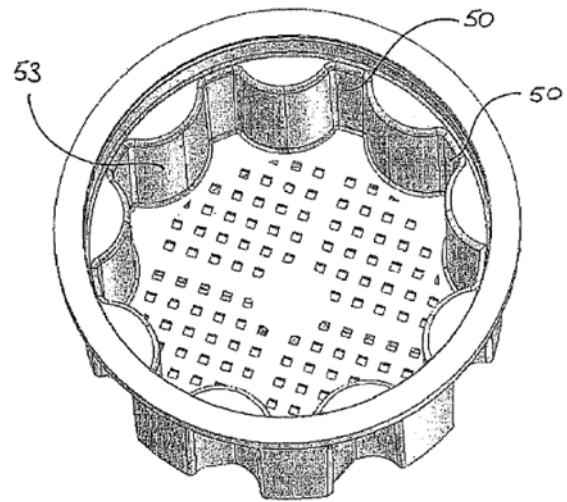
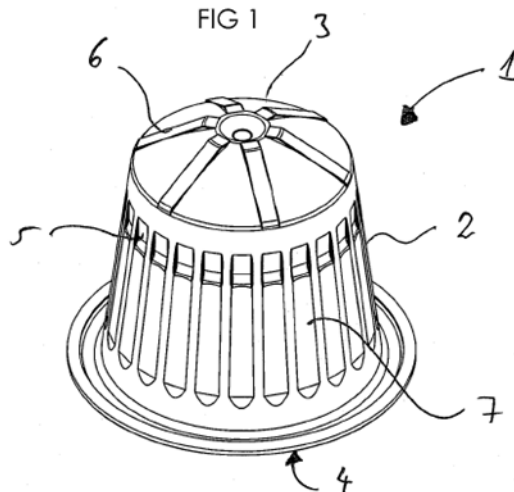


FIG. 8

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 [0001]-[0003], [0009].) Rapparini discloses that the capsule body has “longitudinal stiffening ribs” that “allow[] the optimization of the stability of the container.” (*Id.* at [0009].) Rapparini’s grooves are depicted below in Fig. 6, Fig. 6b:

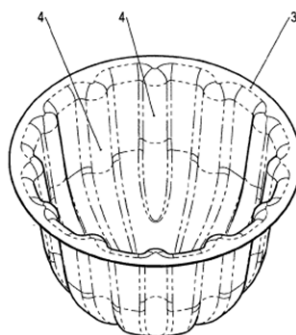


FIG. 6

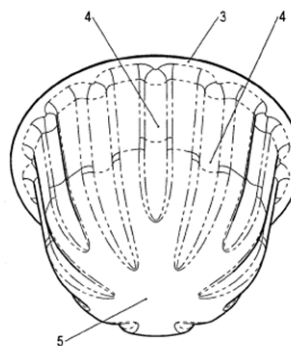


FIG. 6 bis

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

95. Accordingly, by the time of the priority date of the '430 Patent, a person of skill in the art would have known that structural features such as longitudinal ribs and grooves can advantageously stiffen and provide structural stability to a single serve capsule body.

D. Single-Serve Beverage Identification System Overview

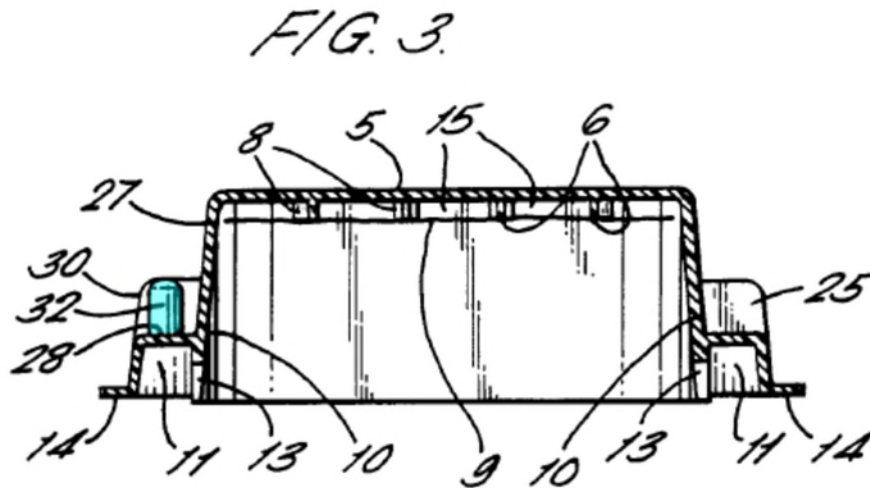
96. An increase in popularity of single-serving capsules resulted in the creation of a “wide variety of capsule structures and related apparatus” that required manufacturers to “adjust various parameters of the manufacturing process to accommodate such sizes.” (See Ex. 1015 at [0014]-[0015].) Accordingly, 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 relaying 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 identifying features for single-serve capsules are discussed below, which predate the '430 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 1-7.) Bentley explains that the identifying feature 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 1-54.) 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 20; 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:

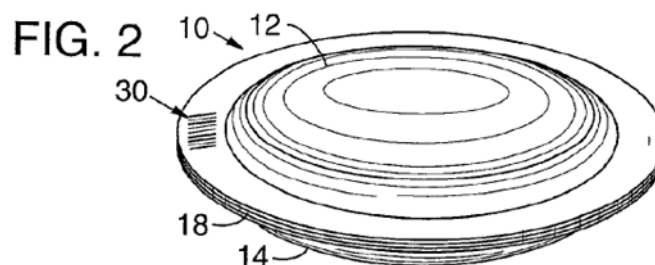
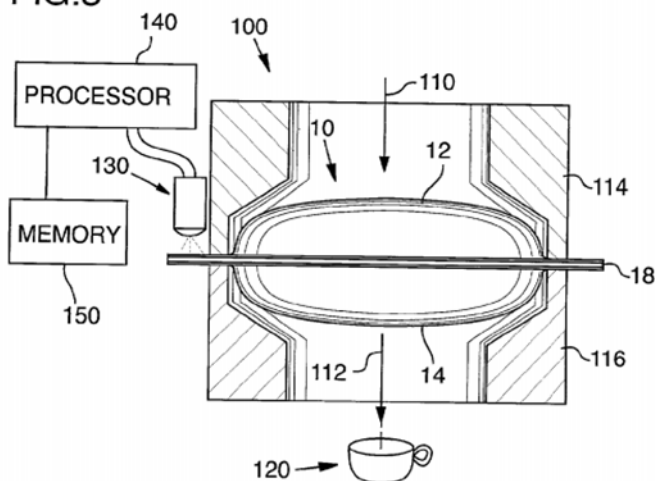


FIG.3



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.)

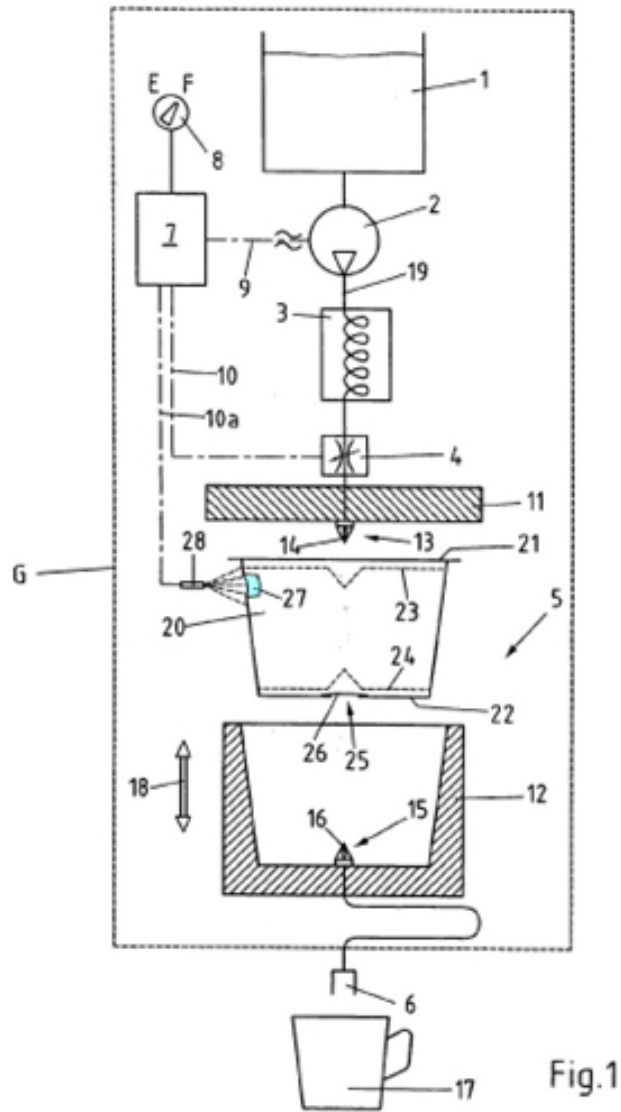
102. In a 2004 patent filing (published in 2007), Erlandsson disclosed a barcode for identifying a capsule, in order to tailor the brewing parameters to match the capsule requirements. (See Ex. 1038, Erlandsson. at [0005]-[0006].) Erlandsson further disclosed a controller in the system that stores pre-programmed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

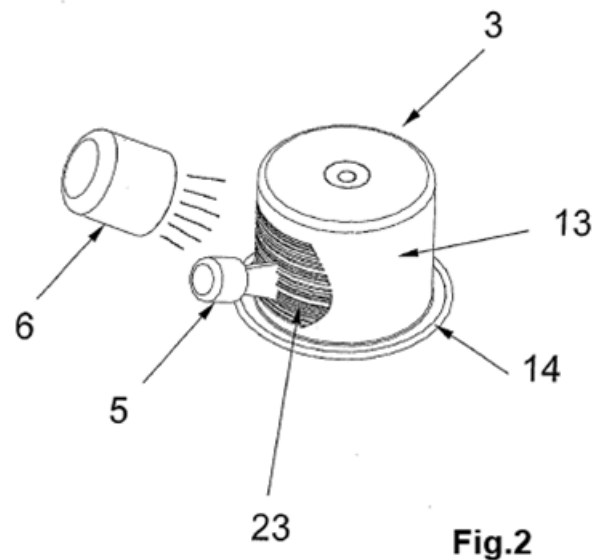
104. In 2005, Schifferle disclosed a single-serve coffee and espresso extraction system where a barcode is positioned on the body of the capsule, below the flange, facing away from the membrane (shown in FIG. 1 below in blue). (*See* Ex. 1039, Schifferle, FIG. 1 at 27.) Schifferle's system was designed 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 23, lines 3-5.) 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.*, lines 15-19) 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.*, lines 20-21)



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).” (*Id.*, lines 21-26)

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

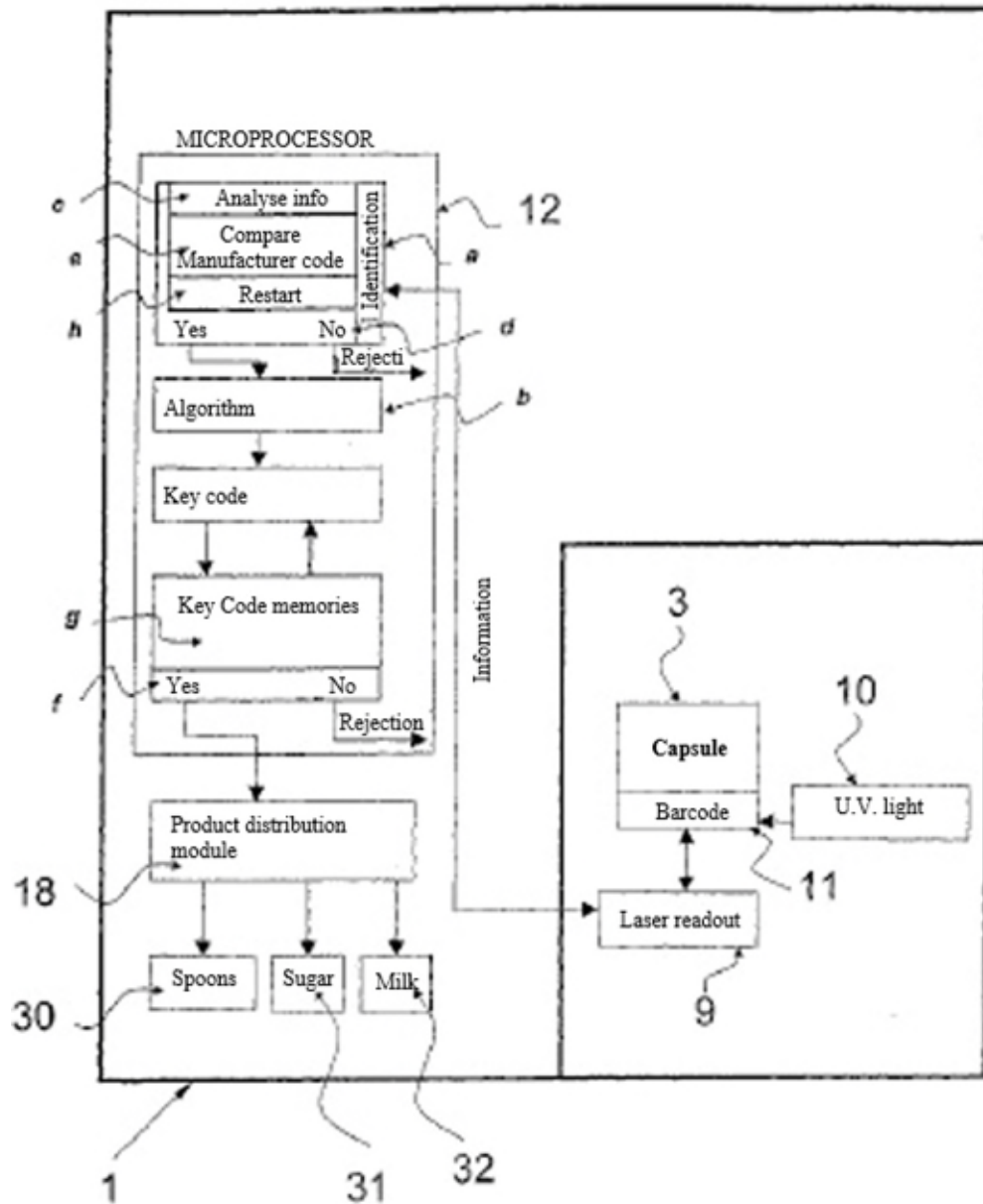


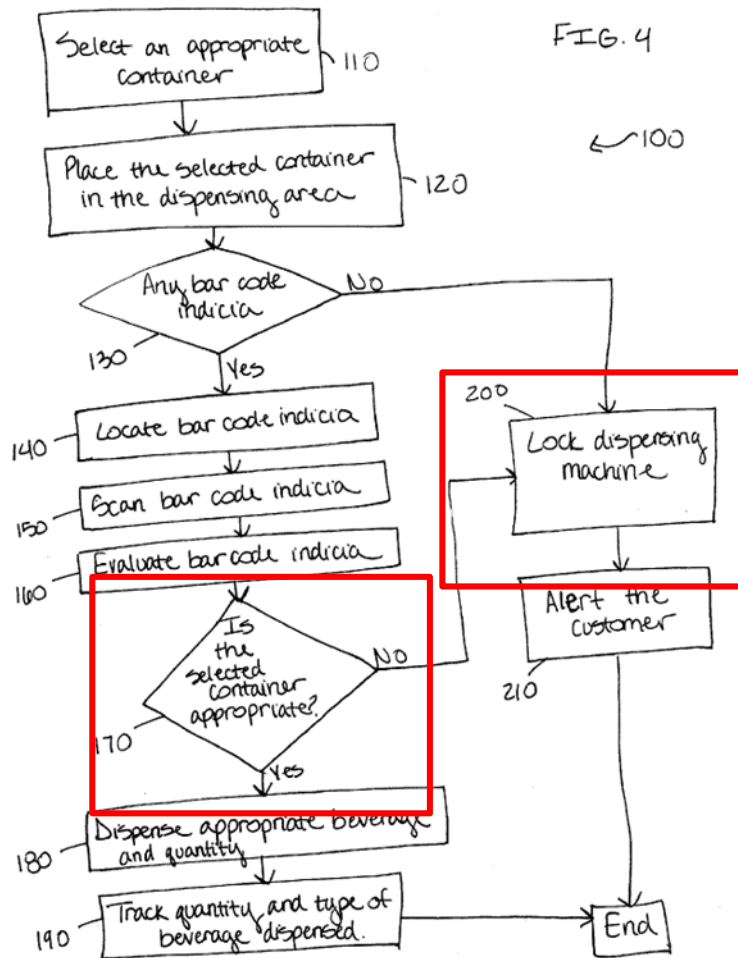
Fig.1

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 5.) Rossi’s system “automatically activates a cycle of production of said [beverage] ***only after having recognized***” the barcode on the capsule. (*Id.* at 6.)

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 '430 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 codes on the capsule prior to the filing of the '430 Patent. This 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 '430 Patent, it was known to place an optical code on the bottom of the flange. This decreased the chance that the code would be mis-read by the machine due to the location and repetition of the optical code.

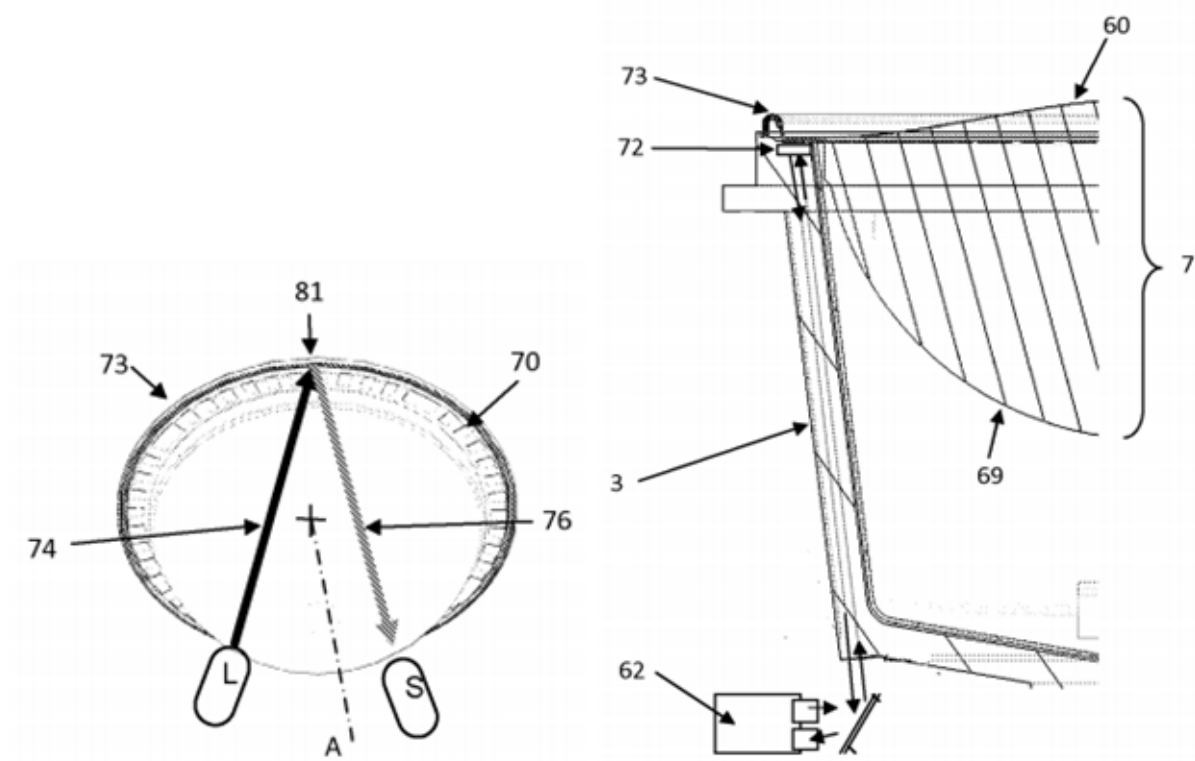
113. Due to the messy nature of the liquid and coffee grounds present during extraction process, it was also known that optical codes must be placed in a location away from the liquid injection and piercing site. This is because hot water, steam, and coffee grounds from piercing or prior extractions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

114. 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 3-10.)

115. 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.)

116. 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.

117. 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.” (Ex. 1006, Jarisch 929 at [0017].) Jarisch 929 discloses that this code location can include “the bottom side of the rim of the capsule.” (*Id.* at [0018].)

118. Thus, prior to the filing of the ’430 Patent, a person of skill in the art would have appreciated the advantages of placing an optical code on the bottom side of the flange facing away from the membrane, and thus away from areas likely to be soiled or disrupted due to the extraction process.

IV. THE '430 PATENT

A. Background Of The '430 Patent

119. The '430 Patent generally relates to a single-serve portion capsule used in a beverage brewing system in order to produce a beverage, such as coffee. (Ex. 1001 at 1:6-7.) 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 1:11-14.) 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 '430 Patent acknowledges, “[s]uch capsules are well known and are being launched onto the market in abundant variety.” (Ex. 1001 at col. 1, lines 15-17.)

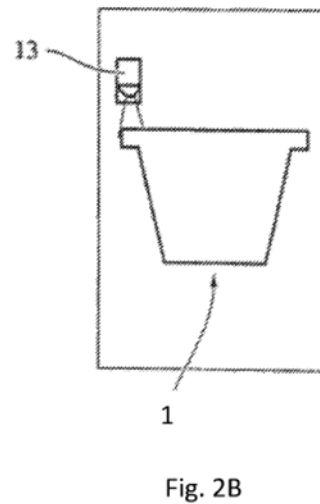
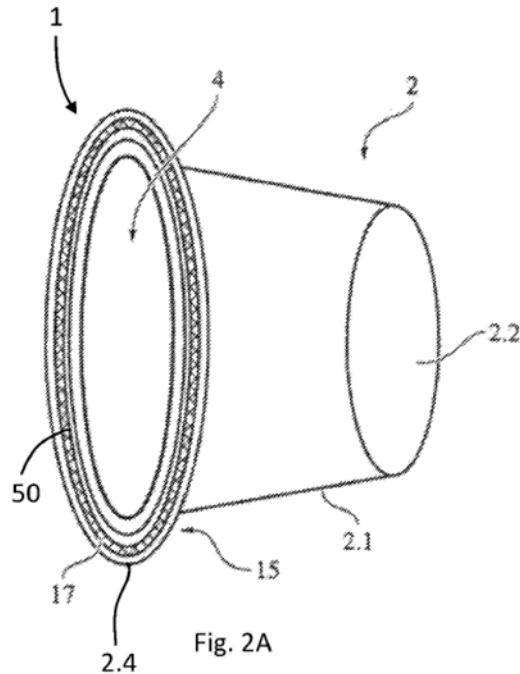
120. According to the '430 Patent, there is a problem that certain portion capsules may end up being used in a different manufacturer’s brewing system, even though such a portion capsule is not designed for that system. (Ex. 1001 at col. 1, lines 16-21.) An object of the '430 Patent invention is to solve this problem by creating a portion capsule that is only suitable for a specific coffee machine. (*Id.* at col. 1, lines 22-24.)

121. The '430 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

28-34; col. 1, lines 60-65.) The '430 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 8-14; col. 3, lines 20-25.) 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 10-12; col. 8:38-41.)

122. The '430 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 47-48), a mechanical identifier such as recesses or bulges (*id.* at col. 8, lines 61-65), 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 19-25).

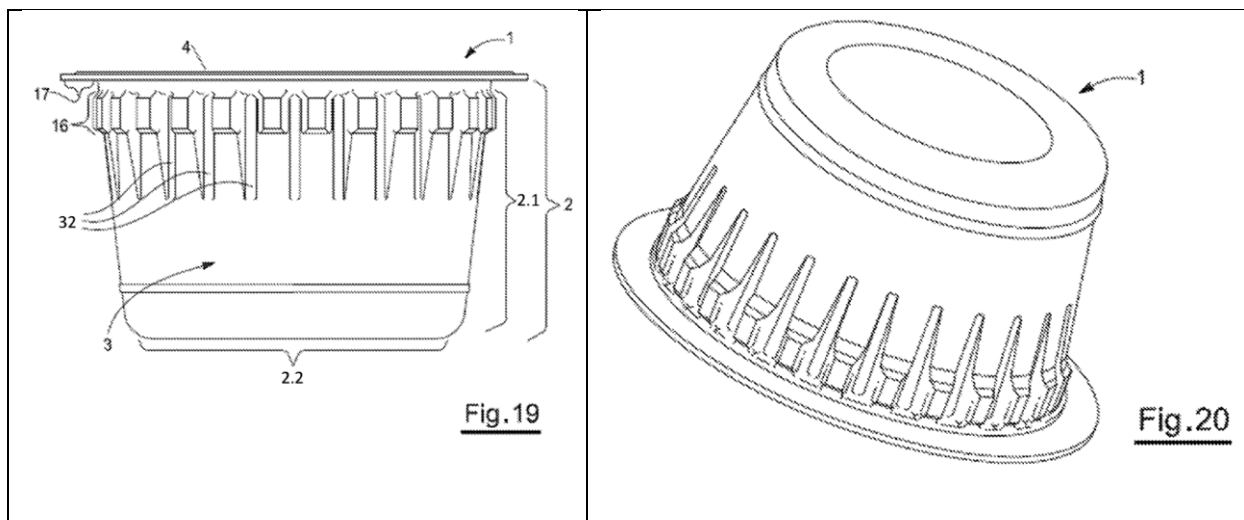
123. The embodiment of a portion capsule including an optical barcode is shown in Figs. 2A and 2B, which show the barcode placed on the top surface of the membrane. The '430 Patent further states that “the bar-code alternatively can be attached to the base element's edge region being averted from the membrane,” although it provides no explanation for reasons to do so. (Ex. 1001 at col. 8, lines 54-56.)



Ex. 1001, '430 Patent at FIGs. 2A and 2B.

124. The '430 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 29-32.) The '430 Patent reiterates that the grooves cause the wall region of the base element to be “reinforced or stiffened.” (*Id.* at col. 12, lines 12-15.) These grooves are vertically oriented and radially spaced, as shown in Figs. 19 and 20 below. (*Id.*)

'430 Patent FIG. 19	'430 Patent FIG. 20
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125. 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 '430 Patent (Ex. 1002)

126. The face of the '430 Patent states that U.S. Patent Application No. 17/385,109 ("the '109 application"), the application which issued as the '403 Patent, was filed on July 26, 2021. The applicant claims the '109 application is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/383,951, filed on July 23, 2021, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/330,572, filed on May 26, 2021, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/324,182, filed on May 19, 2021, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 17/108,175, filed on December 1, 2020, which the applicant claims is a continuation of, and claims

priority to, U.S. patent application Ser. No. 16/860,432, filed on April 28, 2020, which the applicant claims is a continuation of, and claims priority to, U.S. patent application Ser. No. 16/438,818, filed on June 12, 2019, 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 1-2.)

127. 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 '430 Patent are not supported by these three foreign applications.

128. The '109 application was originally filed with twenty claims. (Ex. 1002 at 116.) The claims were directed to a single-serve capsule made of biodegradable material with an identifier provided on the bottom side of the flange.

129. The Applicant filed preliminary amendments on October 21, 2021, canceling claims 2 – 20, adding claims 21-29, and amending claim 1, such that the scope of the claims changed to a beverage system with features such as: a capsule with an “annular concavity” and an “annular convexity”; a barrier layer; a barcode located on the bottom of the flange; and a brewing machine containing a seal and a pump controlled to push water into the capsule “only if the beverage machine determines that the single serve capsule belongs to the group of single serve capsules operable for use with the beverage machine.” (Ex. 1002 at 220.)

130. The Examiner mailed a first action Notice of Allowance without issuing any rejection of the claims on November 10, 2021. (Ex. 1002 at 228.) The Examiner indicated in the Allowance that the claims were allowable because none of the cited prior art discloses or suggests the following:

[T]he flange comprising a top side and an opposing bottom side; a cover that is fastened to the top side of the flange to close the cavity; and an identifier provided on the bottom side of the flange, the identifier being a barcode, wherein the beverage machine, by reading or detecting the identifier with the sensor/detector, is configured to determine if the single-serve capsule belongs to a group of single serve capsules operable for

use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule.

(Ex. 1002 at 233.)

131. However, it should be noted that claims 1 – 6 do not include the allowable language, namely a beverage machine “configured to determine if the single-serve capsule belongs to a group of single serve capsules operable for use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule.” (Ex. 1002 at 233.)

132. Despite indicating that all of the nearly 700 references cited in the filed Information Disclosure Statements (IDSs) were considered, the Examiner did not include any of the prior art discussed below in Section VII of this declaration in the Examiner’s Notice of References Cited in connection with this Allowance. (Ex. 1002 at 235.)

133. On November 12, 2022, the Applicant submitted a supplemental IDS that cited a document from a district court case dealing with related patents that contained over 1500 pages of preliminary invalidity contentions. (Ex. 1002 at 302.) The Applicant also made some minor grammatical amendments to the claims on the same

date. (*Id.* at 310.) The Examiner issued a Corrected Notice of Allowability on December 13, 2021. This Corrected Notice did not give reasons for allowance beyond the previously-stated indication of Allowable Subject matter. (*Id.* at 1897.)

134. It is my opinion that the Examiner materially erred by allowing the '430 Patent claims because he overlooked or misapprehended the specific prior art disclosures relating to the limitations that he identified in the indication of Allowable Subject Matter as not being disclosed or suggested by the cited prior art. The allegedly missing limitations identified by the Examiner are disclosed or reasonably suggested by the prior art combinations that I discuss below.

135. For example, the Examiner did not utilize Rossi in any rejection of the '430 Patent claims, which discloses a coffee brewing system that uses barcodes to determine whether the capsule is suitable for use with the machine, and only places the machine in operation—which includes control of the machine's pump—after such a determination. (*See infra* ¶¶263-265.)

136. Nor did the Examiner utilize Jarisch in any rejection of the '430 Patent claims, which explicitly discloses an improved way to position an optical code on the bottom side of the flange of a capsule, facing away from the membrane, in order to improve readability and retrieval of information about the capsule. (EX1005, [0022].)

137. Nor did the Examiner utilize Yoakim in any rejection of the '430 Patent claims, which explicitly discloses the coffee capsule and brewing machine features

claimed in the '430 Patent claims. This includes a brewing system with a barcode reading system that controls brewing parameters—and the corresponding components that impact those parameters, such as the heater, rotational motor, and water pump.

138. Accordingly, the combination of Yoakim, Jarisch and Rossi (along with Castellani) teach each and every limitation of the claims, which is contrary to the Examiner's Reasons for Allowance.

139. In my opinion, Yoakim, Jarisch and Rossi explicitly disclose and/or render obvious the exact features that the Examiner identified as lacking in the cited prior art in the Reasons for Allowance, namely:

- a flange comprising a top side and an opposing bottom side (*e.g.*, Yoakim at [0197], [0414], FIG6 at 72);
- a cover that is fastened to the top side of the flange close to the cavity (*e.g.*, Yoakim at [0128]-[0129]);
- and an identifier being a barcode (*e.g.*, Yoakim, [0525]), provided on the bottom side of the flange (*e.g.*, Jarisch, [0022], FIG. 5),
- wherein the machine, by reading or detecting the identifier with the sensor/detector, is configured to determine if the single-serve capsule belongs to the group of single-serve capsules operable for use with the beverage machine and only if the beverage machine determines that the single-serve

capsule belongs to the group of single serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule. (See, e.g., EX1041, abstract (“... automatically activates a cycle of production of the edible product only after having recognised on the load element (2) the identifying element (4) in combination with the validation element (5) as validated.”).)

The combination of Rossi with Yoakim and Jarisch (along with Castellani) 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

140. My analysis focuses on claims 1-10 of the ’430 Patent. The claims themselves are discussed in detail within the Prior Art Analysis section.

1	A beverage system for making a beverage, comprising:
[1.a]	a single-serve capsule comprising: a base element with a cavity, in which a raw beverage material is provided;
[1.b]	a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side;
[1.c]	a cover that is fastened to the top side of the flange to close the cavity;
[1.d]	and a barcode provided on the bottom side of the flange; and
[1.e]	a beverage machine comprising: a sensor/detector configured to read the barcode;
[1.f]	a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange; and
[1.g]	a pump controlled to supply water into the single-serve capsule;

[1.h]	wherein the single-serve capsule is free of a filter that is located inside of the cavity,
[1.i]	the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element; and
[1.j]	(ii) a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule;
[1.k]	wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element;
[1.l]	(ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel;
[1.m]	(iii) a pair of holding arms for engaging the single-serve capsule; and
[1.n]	(iv) a dropping box for the single-serve capsule to fall into;
[1.o]	wherein the pump is controlled to push the water into the single-serve capsule only upon a determination that the read barcode agrees with a stored reference.
2.	The beverage system according to claim 1, wherein the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree with a stored reference.
3.	The beverage system according to claim 1, wherein the sensor/detector of the beverage machine is configured to compare the read barcode with the stored reference.
4.	The beverage system according to claim 1, wherein the base element comprises a bottom having an indentation.
5.	The beverage system according to claim 4, wherein the side wall of the base element includes indentations.
6.	The beverage system according to claim 1, wherein the base element is made of a biodegradable material.
7.	A beverage system for making a beverage, comprising:
[7.a]	a single-serve capsule comprising: a base element with a cavity, in which a raw beverage material is provided;
[7.b]	a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side;
[7.c]	a cover that is fastened to the top side of the flange to close the cavity;

[7.d]	and an identifier provided on the bottom side of the flange, the identifier being a barcode; and
[7.e]	a beverage machine comprising: a sensor/detector,
[7.f]	a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange; and
[7.g]	a pump controlled to supply water into the single-serve capsule;
[7.h]	wherein the single-serve capsule is free of a filter that is located inside of the cavity,
[7.i]	the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element;
[7.j]	(ii) a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule; and
[7.k]	(iii) a side wall having indentations;
[7.l]	wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element;
[7.m]	(ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel;
[7.n]	(iii) a pair of holding arms for engaging opposite sides of the single-serve capsule; and
[7.o]	(iv) a dropping box for the single-serve capsule to fall into;
[7.p]	wherein the beverage machine, by reading or detecting the identifier with the sensor/detector, is configured to determine if the single-serve capsule belongs to a group of single serve capsules operable for use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule.
8.	The beverage system according to claim 7, wherein the base element comprises a bottom having an indentation.
9.	The beverage system according to claim 7, wherein the base element is made of a biodegradable material.
10.	The beverage system according to claim 7, wherein the sensor/detector of the beverage machine is configured to read the barcode and compare the read barcode with a stored reference.

V. CLAIM CONSTRUCTION

141. I have interpreted the claim terms of the '430 Patent consistent with their plain and ordinary meaning from the point of view of one of ordinary skill as defined earlier in this Declaration. I have reviewed a district court's claim construction order regarding terms in patents that are related to the '430 Patent (*see* Ex. 1052), and those constructions do not change my opinion here.

142. It is my opinion that no terms require construction in order to evaluate the invalidity of the claims of the '430 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 single-serve capsule in the shape of a continuous dome includes a “base element with a cavity” and a “cover that is fastened to the top side of the flange to close the cavity” *See* Ex. 1049 at 11.
- Patent Owner alleges that the below single-serve capsule also constitutes a capsule with “an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element.” *See* Ex. 1049 at 30.

- Patent Owner alleges that “a mandrel” can be met by a brewing system with needles that pierce the outer perimeter of the capsule to allow liquid to exit the capsule (as shown below). *See* Ex. 1049 at 33.



- Patent Owner alleges that “holding arms for engaging the single-serve capsule” can be met by metal rods that lift the capsule by its rim after brewing (Ex. 1049 at 36):





143. 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.

VI. THE CORRECT PRIORITY DATE FOR THE '430 PATENT

144. The '430 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 '430 Patent improperly claims priority to foreign applications 102011010534.4, filed on

¹ I have not formed opinions regarding whether PCT/EP2011/003677, later-filed U.S. patent applications, or the '430 Patent itself provide adequate written description support for the claims, and reserve the right to address these issues in any relevant proceeding.

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 ’430 Patent claims.²

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

146. No single foreign application discloses each and every feature of the ’430 Patent claims or a single embodiment linking together all the features claimed in the ’430 Patent. In addition, no single foreign priority application discloses a capsule

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.

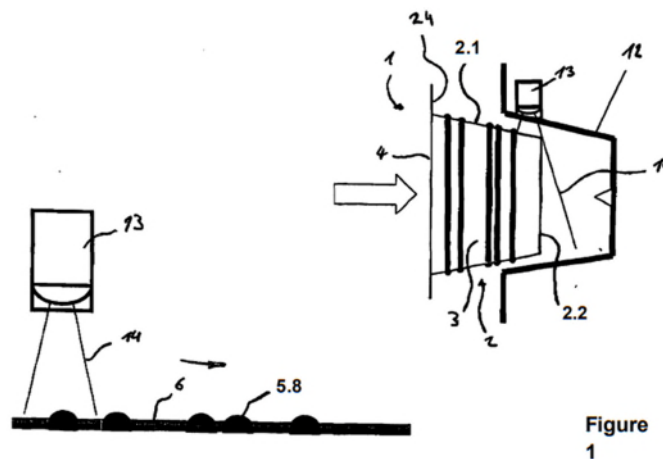
with “an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to a central axis of the base element.”

147. The February 2011 Application does not disclose at least a barcode on the bottom side of the capsule flange, holding arms, dropping box, a capsule with an annular convexity and concavity, a barrier layer, or a seal configured to bear against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel. (See Ex. 1045 generally.) Accordingly, the February 2011 Application does not provide written description support for any claims of the '430 Patent.

148. The July 2010 Application does not disclose at least a capsule with an annular convexity and concavity, holding arms, dropping box, or a seal configured to bear against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel. (See Ex. 1046 generally.) Accordingly, the July 2010 Application does not provide written description support for any claims of the '430 Patent.

149. The September 2010 Application also fails to provide written description support for the '430 Patent claims. A person of ordinary skill in the art would understand the September 2010 Application to disclose several distinct embodiments of an identifier, but not the '430 Patent claimed invention. For example, Figure 1 of the September 2010 Application (below) discloses a portion

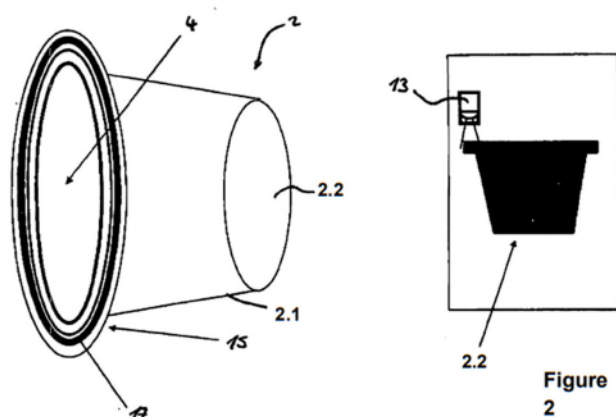
capsule with an identifier made of several raised areas 8, with which it can be determined if the capsule is suitable for use with the machine. (Ex. 1047, at 8:27-30, 8:14-19). However, in my opinion, the embodiment depicted in Figure 1 does not disclose at least the claimed holding arms, dropping box, barcode under the flange, or a capsule with an annular convexity and annular concavity. (Ex. 1047, at p. 8.)



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

150. The text accompanying Figure 1 goes on to explain how the identifier would influence the machine's operation (e.g., Ex. 1047 at p. 8, line 8 – p. 9, line 6), and clarifies that this “applies to all other examples.” (Ex. 1047 at p. 9, 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 (let alone any specific combinations).

151. Figure 2 discloses an alternative embodiment of a capsule with a barcode on the edge area of the base element facing away from the membrane. 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. 9, lines 21-24. This embodiment again fails to disclose at least the claimed holding arms, dropping box, a capsule with an annular convexity and annular concavity, a seal, or indentations on the side wall of the capsule. (*Id.* at p. 9, lines 11-27.)

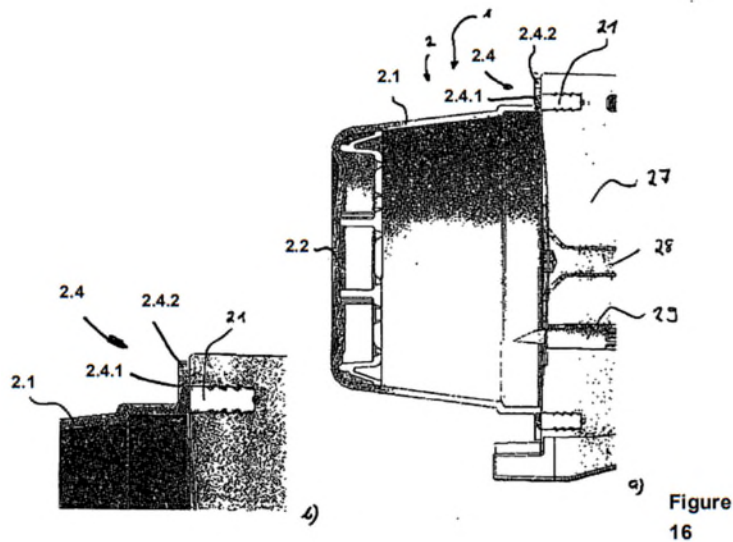


Ex. 1047, September 2010 Application at FIG. 2.

152. 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. 10, line 29 – p. 12, line 11.) These identifiers are shown to be in locations such as

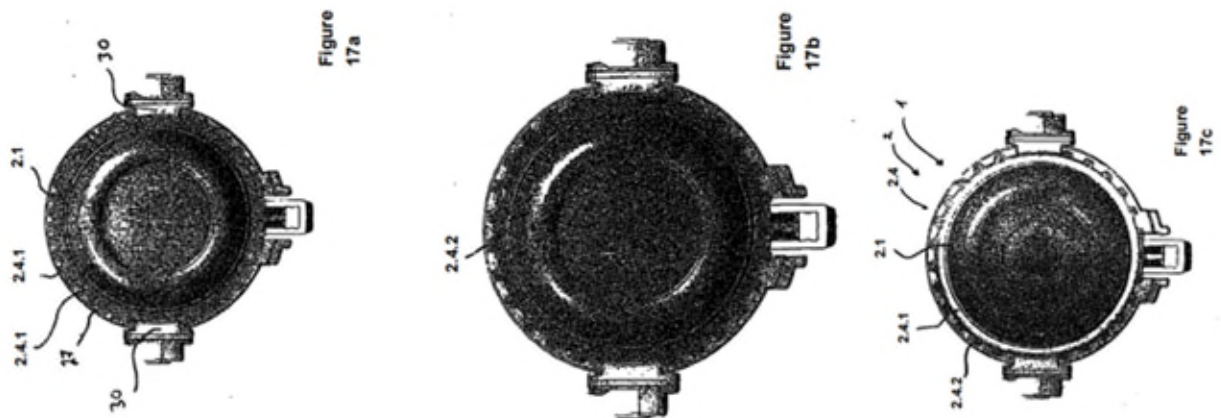
in the area of the lid foil or film, or on the bottom surface of the capsule, but not on the side of the flange facing away from the membrane. (*Id.* at FIGs. 3-15.)

153. Figures 16 (below) and 17 disclose yet another distinct embodiment of a 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. 12, lines 22-27.) 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 surface” of the flange. 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. 12, lines 27-31.) It is further noted in the specification that if this feature was not present “the capsule, rather than being introduced into the brewing chamber, would drop through into a waste container.” (Ex. 1047 at p. 13, lines 10-12.)



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

154. 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 capsule could not be inserted into the brewing chamber but would fall through into a waste container.” (Ex. 1047 at p. 12, line 37 – p. 13, line 14.) 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 barcode located on the bottom side of the flange to a person of ordinary skill in the art.



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

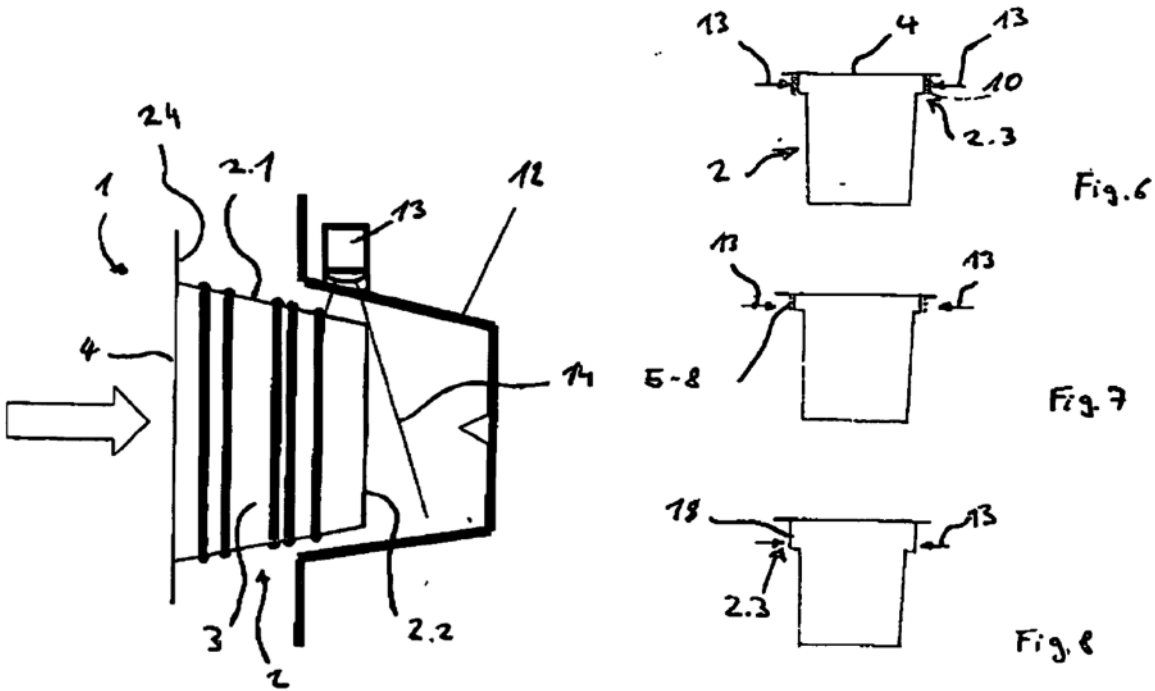
155. Nowhere does the September 2010 Application ever provide any disclosures linking together the disparate features across these embodiments—in particular (i) a barcode located on the bottom of the capsule flange, (ii) holding arms associated with the toothed ring embodiments, (iii) a seal associated with the toothed ring embodiments, as well as (iv) a capsule with an annular convexity and concavity, and (v) a capsule including indentations in the side wall (which are described as yet another identifier). Because these elements are merely listed separately across disparate embodiments and are not cohesively tied together in any disclosure, there is no disclosure of an invention meeting the limitations of the '430 patent in the September 2010 Application. It is my opinion that the September 2010 Application does not provide written description support for the '430 Patent claims, and the '430 Patent should not receive the benefit of the priority dates of its foreign applications.

156. The generic statement in the September 2010 Application that “[t]hese explanations do not restrict the general idea of inventiveness” does not provide useful information 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 ’430 claimed invention, as it fails to link any of the claimed features together (Ex. 1047, 6:23-26.) The same goes for the statement “[w]hat has been said in relation to the identifier applies to all the other examples,” which appears after the description of Figure 1. (Ex. 1047, 9:8-9.) This statement simply conveys to a POSITA that the machine operation (e.g., pump control) based on any of the disparate identifier embodiments would be the same. It does not convey that one would cherry-pick features throughout the disparate embodiments of the specification to arrive at the ’430 Patent claims.

157. Moreover, the claims located toward the end of the September 2010 Application also do not provide written description support for the ’430 Patent claimed invention, as none of them disclose the claimed invention. Nor do these claims provide any guidance or “blaze marks” that would lead a POSITA to arrive at the claimed invention by combining a multitude of disparate embodiments. Moreover, those dependent claims are only directed to a portion capsule, and do not disclose any details of the brewing system claimed in the ’430 Patent. Accordingly,

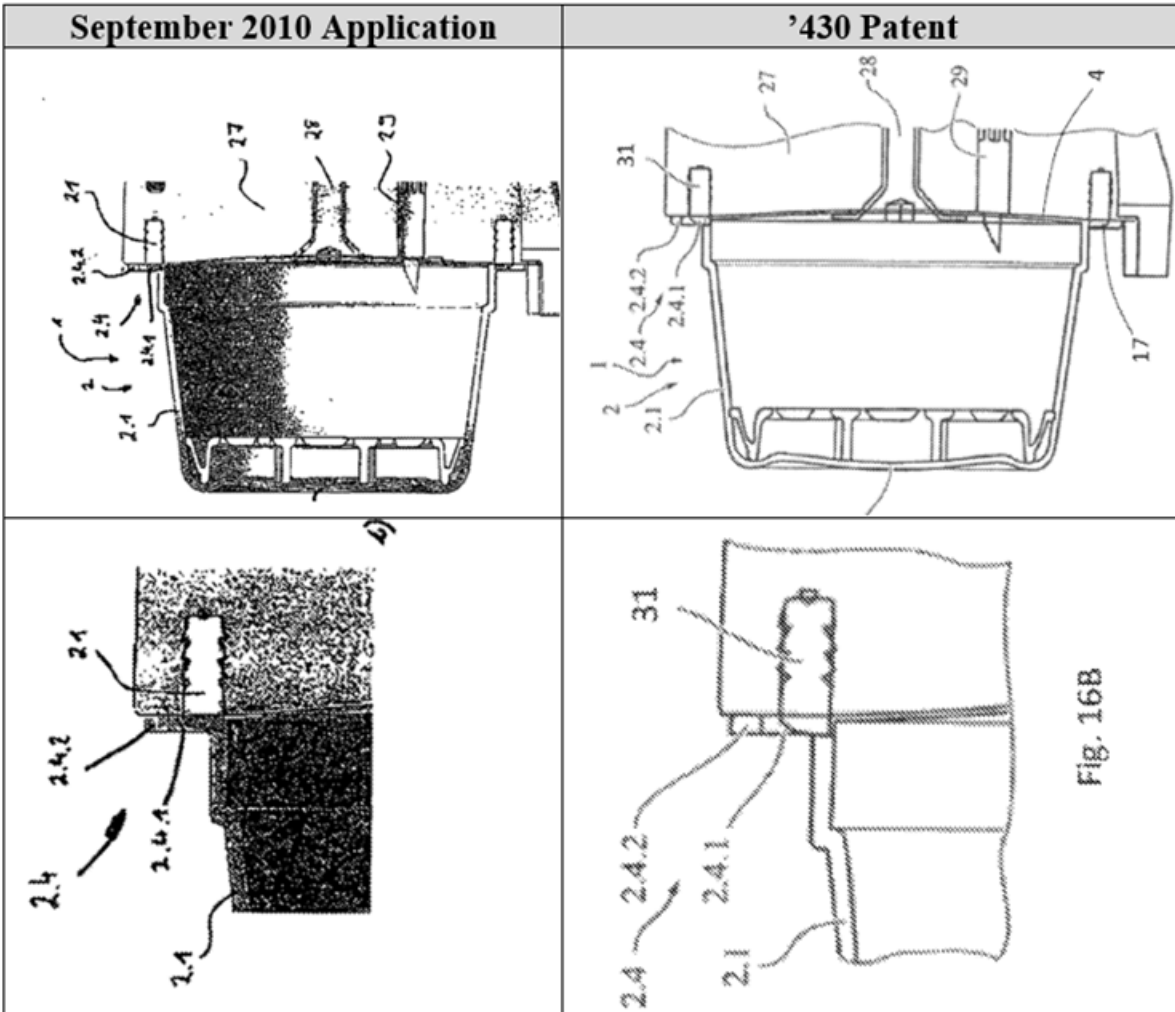
the September 2010 Application claims do not demonstrate to a person of ordinary skill in the art that the Applicant had possession of the '430 Patent claimed invention.

158. Furthermore, a person of ordinary skill in the art would also not consider the September 2010 Application to disclose a capsule with “an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element.” There is no discussion of a capsule with annular convexity and annular concavity in the text of the September 2010 Application. All Figures in the September 2010 Application disclose to a person of ordinary skill in the art a capsule with a flat cover. As such, a POSITA would understand that the September 2010 Application, taken as a whole, discloses capsules with flat covers – without convexity. Examples of such flat covers are depicted below in Figures 1 and 6 – 8:



Ex. 1047, September 2010 Application at FIGs. 1, 6-8.

159. A person of ordinary skill in the art would not consider Figure 16 to disclose a capsule with “an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element,” because it also only depicts flat covered capsules – without convexity. Rather, taken in the context of the September 2010 Application as a whole, Figure 16 appears to disclose a flat-membrane capsule further showing the depth and inner circumference of the capsule body and rim. This is shown below in Figure 16B (clearer images shown right from ’430 Patent):



This is further confirmed because FIG. 16 depicts the brewing head and water inlet structure flush with the flat top of the capsule and **below** the area that could be misconstrued as convex. The brewing head could not have this configuration if the cover or membrane of the capsule had an annular convexity.

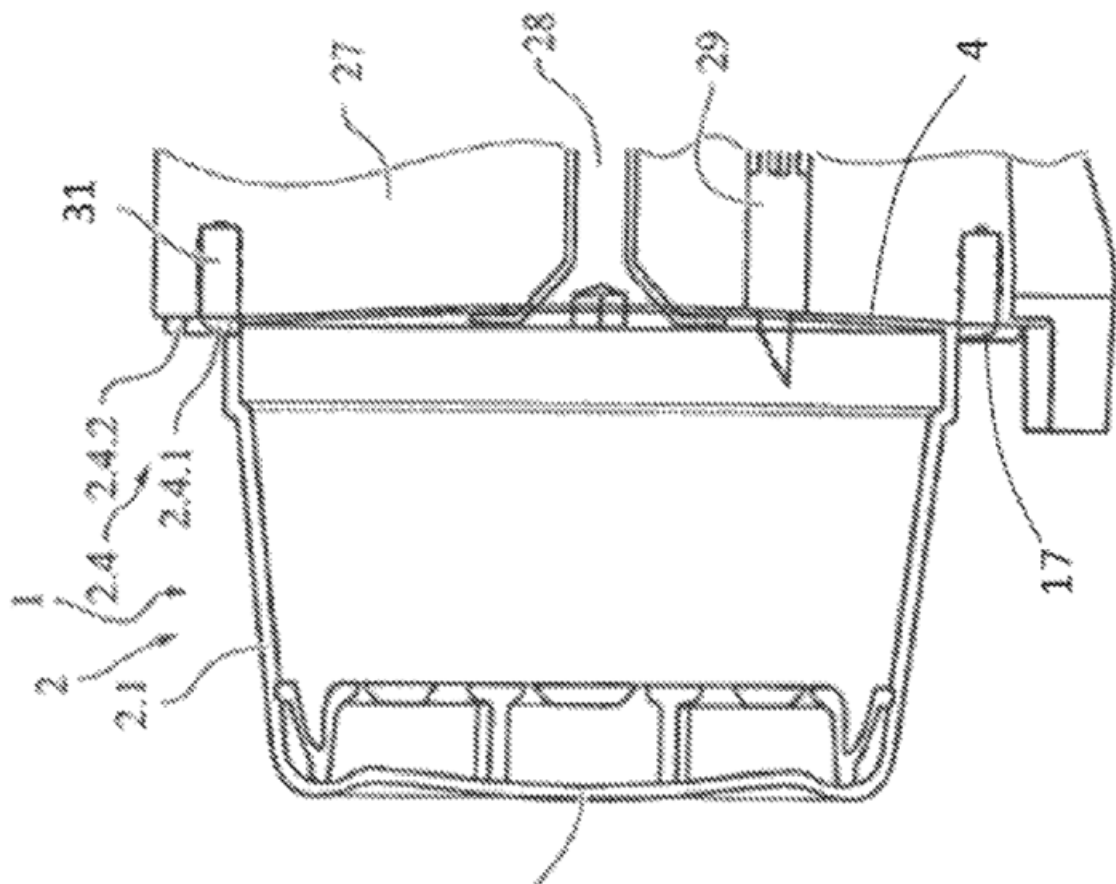


FIG. 16A

160. As shown herein, none of the three foreign applications provide written description support for each and every claim limitation of any claim of the '430 Patent. Consequently, the '430 Patent is not entitled to its foreign priority dates, and the earliest possible priority date it may claim is its PCT filing date of July 22, 2011.

VII. CLAIMS 1-10 ARE UNPATENTABLE BECAUSE THEY WOULD HAVE BEEN OBVIOUS TO A PERSON OF ORDINARY SKILL IN THE ART

161. 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
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1	US 2010/0239734	Yoakim
2	US 2013/0064937	Jarisch
3	WO 2010/099806	Rossi
4	US 2008/0105131	Castellani

162. Based on my review of the '430 Patent and its prosecution history, the materials I have considered, and my knowledge and experience, it is my opinion that the '430 Patent claims are unpatentable as obvious over the prior art based on the following Ground:

- Ground 1: Claims 1-10 are obvious in view of the combination of Yoakim, Jarisch, Rossi and Castellani.

A. Overview of the Prior Art

1. Overview of Yoakim (Ex. 1004)

163. Yoakim was filed May 7, 2010, before the earliest priority date to which the '430 Patent is entitled. I have been informed that Yoakim is therefore prior art under at least 35 U.S.C. §102(e).

164. 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]-[181]. 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].

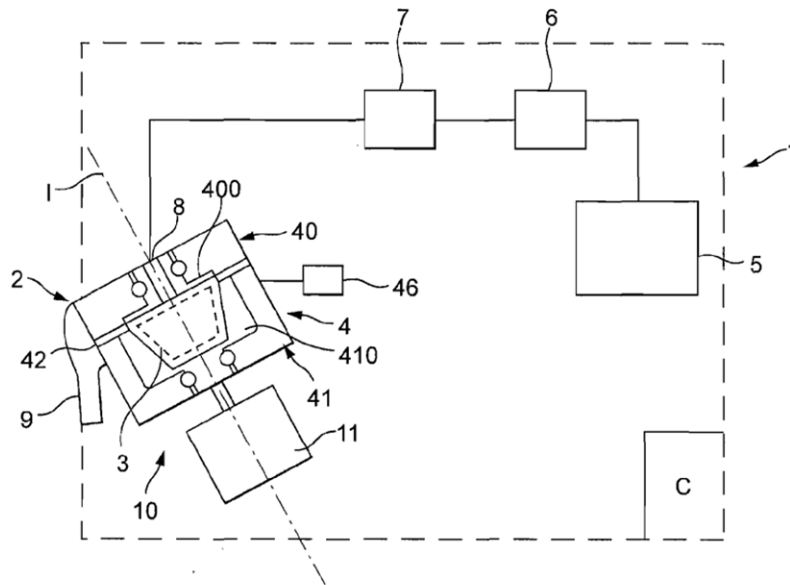


FIG. 1

165. 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 allow 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:

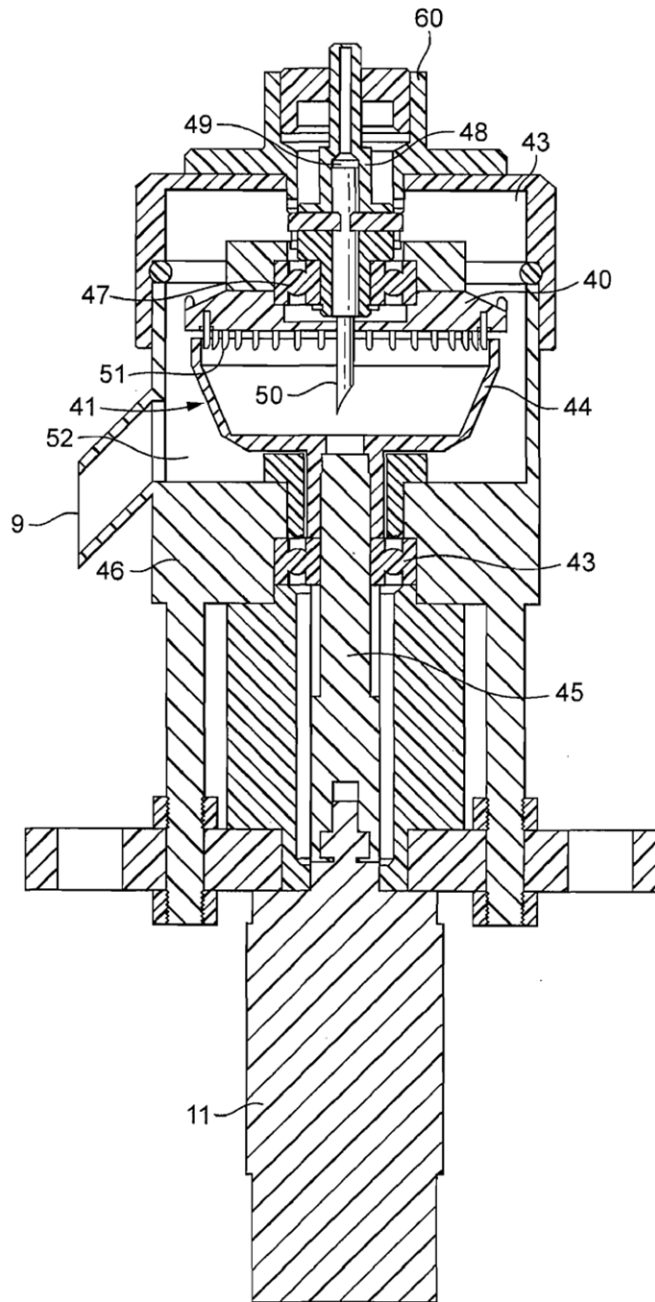
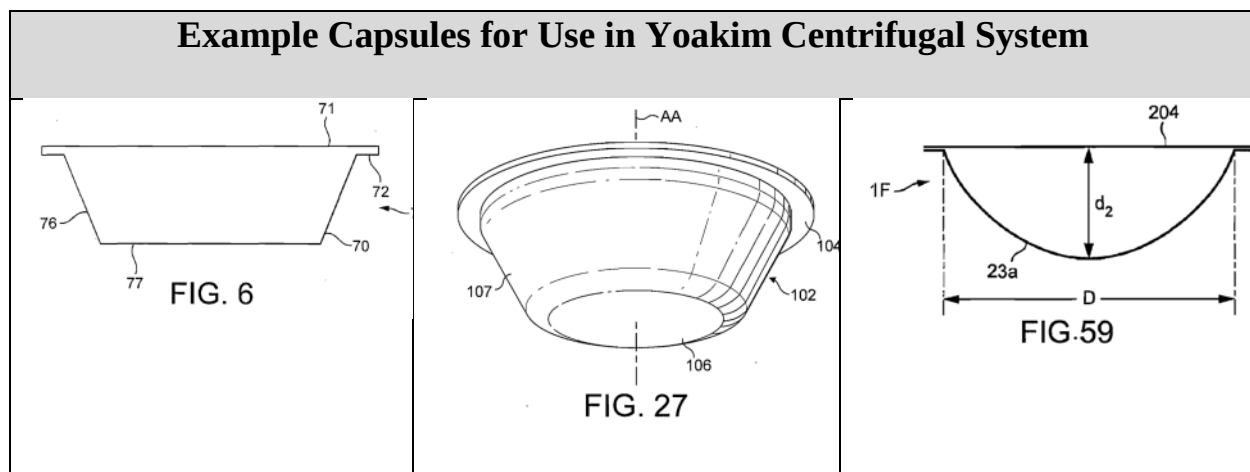


FIG. 4

166. 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:



167. 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.

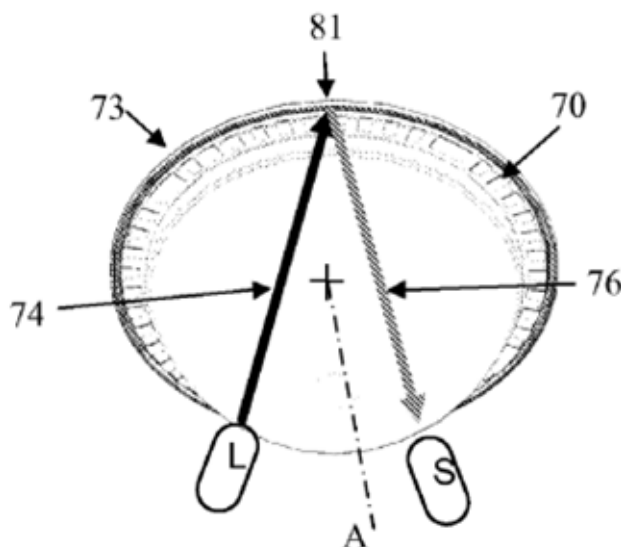
Id. at [0192], [0477]. Yoakim’s capsule identification system can use optical codes, such as “a barcode, a colour, a sign, a logo, etc.” in order to identify the capsule. Ex. 1004 at [0496], [0525], FIGs. 61-62.

2. Overview of Jarisch (Ex. 1005)

168. Jarisch was filed as a PCT on May 12, 2011, before the earliest priority date to which the ’430 Patent claims are possibly entitled. I have been informed that Jarisch is therefore prior art under at least pre-AIA 35 U.S.C. §102(e).

169. Jarisch generally discloses an improved way to position an optical code 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. 1005 at [0002] – [0003], [0014]-[0015]. Jarisch further discloses using identification of the optical code to recognize information to identify the *type* of capsule inserted into the beverage machine. *Id.* at [0014]-[0015], [0099]. Jarisch explains that its capsule identification invention can be used in conjunction with centrifuge-style brewing systems, such as the system disclosed in WO2010/026053 (Denisart). Ex. 1005 at [0034]-[0035]. Denisart discloses a centrifugal brewing system that, like Yoakim, is controlled based on reading the capsule’s code. Ex. 1007 at 1:9-15, 4:19-24. The system disclosed in Denisart also includes many similar features to Yoakim, such as a capsule holder, a liquid supply, a water heater and pump, and a computer processor with a control unit. Ex. 1005 at [0035].

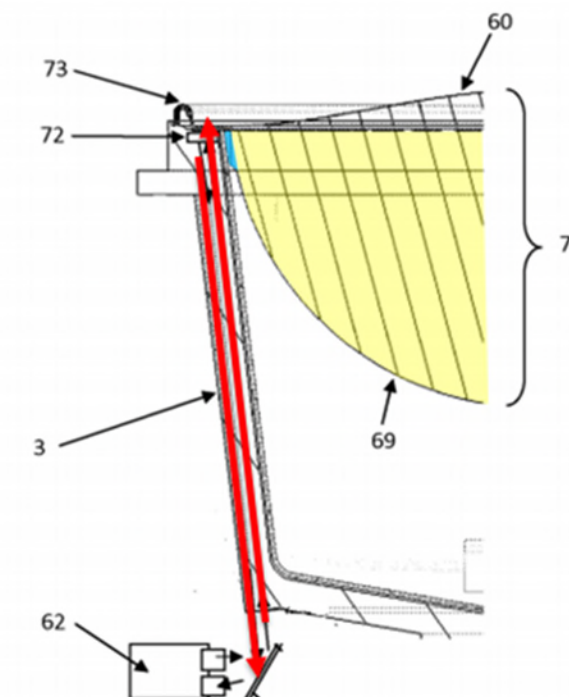
170. The Jarisch invention is designed to provide a solution to the problem that “the retrieving or reading information from the capsule is not always reliable or convenient.” Ex. 1005 at [0013]. Jarisch teaches that the optical code may be positioned under the capsule flange. Ex. 1005 at [0022]; FIG. 5 (below). Jarisch explains the clear advantages of such positioning, stating: “[t]he bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g. coffee particles). As a result, the reading is made more reliable.” Ex. 1005 at [0022].



Ex. 1005, Jarisch at FIG. 5.

171. Jarisch accomplishes the machine’s reading of an optical code positioned under the capsule’s flange by placing an optical reader, made up of a light source

and sensor, at the bottom of the capsule support chamber (centrifugal cell 3). Ex. 1005 at [0082]. The capsule support chamber is transparent (or otherwise light conductive) to allow the light beam to reach the bottom side of the capsule flange, and then reflects back to an optical sensor. *Id.* Mirrors can be used, if needed, to allow the beams to reach between the light source, capsule, and sensor. *Id.* This is shown in Figure 4 (below).



Ex. 1005, Jarisch at FIG. 4.

3. Overview of Rossi (Ex. 1041)

172. Rossi was filed on March 6, 2009, before the earliest priority date to which the '430 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.)

173. 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 [sic] 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.)

174. 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 recognized 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. Castellani (Ex. 1009)

175. 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].)

B. Ground 1: Claims 1-10 are Obvious Over Yoakim in view of Jarisch, Rossi and Castellani

176. It is my opinion that claims 1-10 of the '430 patent would have been obvious to a person of ordinary skill in the art at the time of the alleged invention of the '430 patent over Yoakim in view of Jarisch, Rossi and Castellani.

1. Motivation to Combine Yoakim, Jarisch and Rossi

177. As discussed in detail below, Yoakim discloses nearly all elements of claims 1-10. A person of ordinary skill in the art would have been motivated to combine the single-serve brewing system, capsule, barcode reading system, and machine control of Yoakim, with the code location under the flange disclosed in Jarisch and the control of the brewing system's activation—which includes pump control—based on a machine determination of the capsule's barcode as disclosed in Rossi to obtain the claimed system of the '430 Patent.

178. Yoakim, Jarisch, 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. 1005 at [0001]-[0002]; Ex. 1041 at page 3.) Yoakim, Jarisch, and Rossi are all designed to use code reading to optimize beverage machine operation in single-serve brewing systems. (Ex. 1004 at [0010]-[0011], [0025]; Ex. 1005 at [0006]; Ex. 1041 at pages 3-4.) Yoakim, Jarisch, and Rossi all can use optical codes read by the machine to achieve this. (Ex. 1004 at [0494]-[0496]; Ex. 1005 at [0017], [0024]; Ex. 1041 at page 3, 5-6, 11.)

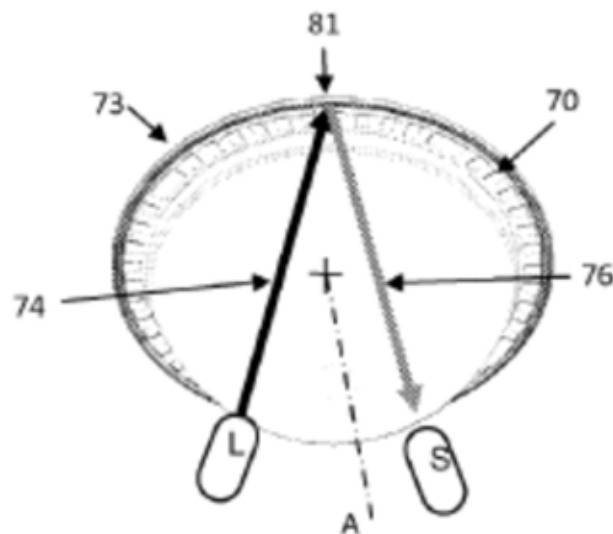
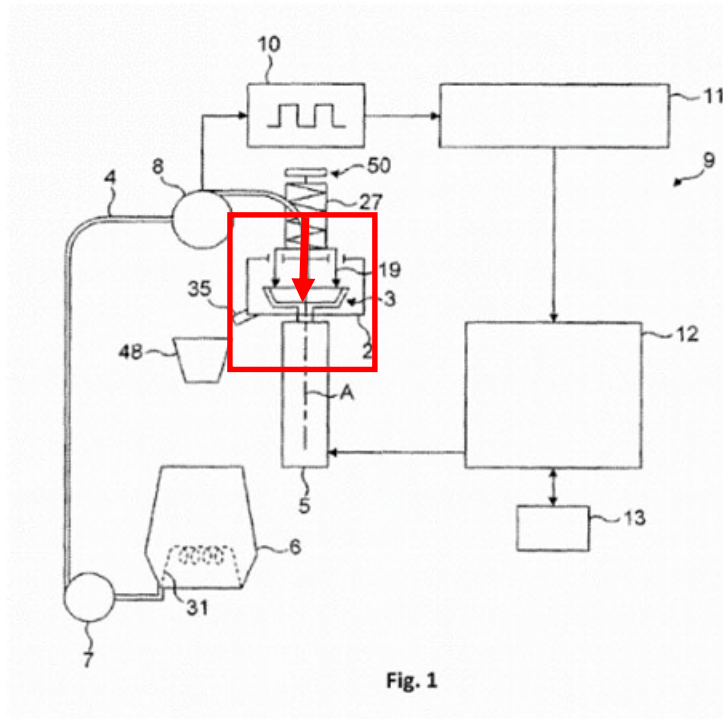
179. Persons of ordinary skill in the art with knowledge of the Yoakim system had reasons to look to Jarisch. Yoakim and Jarisch arise from the same Applicant—Nestec SA—and both include a common inventor, Alexandre Perentes. (*See* Ex. 1004 and Ex. 1005 at Cover.) Moreover, the Jarisch publication explains 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. 1005 at [0034]-[0035]; *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.)

180. A person of ordinary skill in the art would understand that the Jarisch 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 system (Ex.

1005 at [0034]-[0035]), 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 11-28.) 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 10-19.)

181. In addition, Jarisch discloses that its invention is for use in a system with the same configuration as Yoakim's. For example, first, like Yoakim, Jarisch discloses a centrifugal beverage preparation system. (Ex. 1005 at [0003], FIG. 1). Second, Jarisch discloses a symmetrical capsule with a foil lid and a cavity filled with beverage ingredients such as ground coffee. (*Id.* at [0021], [0036].) Third, Jarisch discloses a detector to read the code on the capsule. (*Id.* at [0024], [0082]); Fourth, Jarisch discloses a supporting capsule holder. (*Id.* at [0023], [0025], [0035], FIG. 1). Fifth, Jarisch discloses a liquid supply means for feeding water into the capsule,

perpendicular to the flange location. *Id.* at FIG. 1. The brewing system and capsule of Jarisch are shown below.



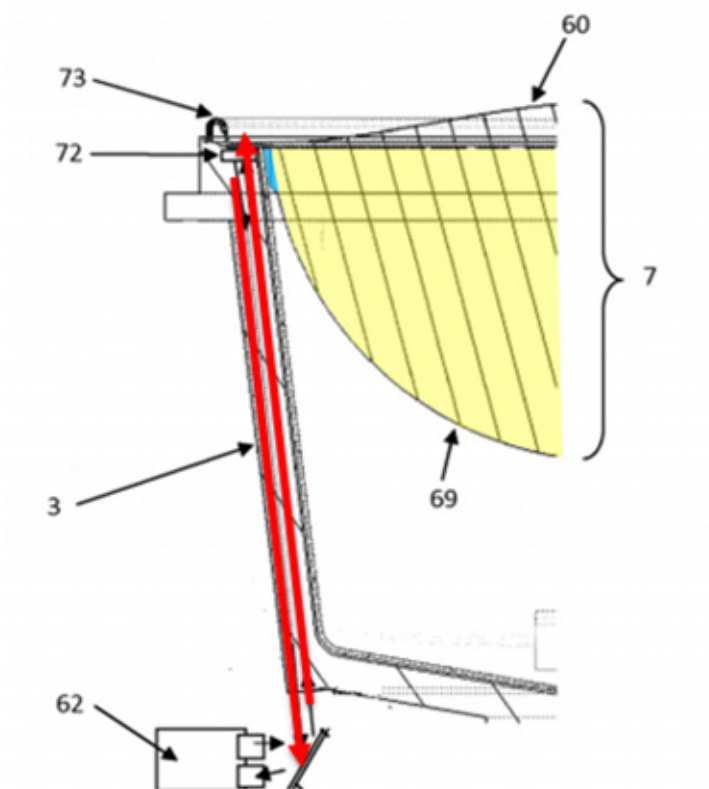
Ex. 1005, Jarisch at FIGs. 1 and 5.

182. A person of ordinary skill in the art would have been motivated to use the placement of the optical code and reader from Jarisch in the Yoakim barcode reading system. A person of ordinary skill in the art would have understood that Jarisch 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 explains that placing the code on the bottom of the rim of the capsule is particularly advantageous since “there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g. coffee particles). As a result, the reading is made more reliable.” (Ex. 1005 at [0022].)

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

184. Additionally, a person of ordinary skill in the art would have had an expectation of success in this combination of Yoakim and Jarisch. As explained above in this section, Yoakim and Jarisch are both directed to centrifugal brewing systems with similar components and configuration. Jarisch 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 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. 1005 at [0082]-[0084].) Jarisch also discloses using mirrors as needed in order to position the optical light source and sensor in a suitable location and orientation. (*Id.*) The Jarisch optical reader (62) configuration is shown here with the light path (red) from detector (62) to capsule rim (73).



Ex. 1005, Jarisch at FIG. 4 (annotated).

185. 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 with the machine activation control 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.)

186. Rossi discloses the benefits of only operating the machine if the capsule is recognized by the machine as one that is operable for use with the machine. 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. 7.) Rossi further explains that “allowing the machine to take further steps **only** if it also recognizes 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 that do not

belong to the group of capsules operable for use with a given machine, or for the incorrect selection of operation conditions not suited to a particular capsule.

187. 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. 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, 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 possess capsule identification and pump control 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. 1005 at [0051]-[0055].) Indeed, even use of the validation element does not require modification of the brewing machine because Rossi explicitly discloses

that it can be performed “independently from the machine, such as by hand or by the user using a tool not associated with the machine.” EX1041, p. 9.

188. Accordingly, as discussed in more detail below, it is my opinion that it would have been obvious to a person of ordinary skill in the art to combine the teachings of Yoakim, Jarisch, and Rossi to arrive at the '430 Patent claims identified herein. I provide my claim analysis of these opinions below.

i. Motivation to Combine with Castellani

189. As discussed in detail above, Yoakim, Jarisch and Rossi disclose all of the claim elements except for (1) a waste container for the single-serve capsule to fall into; and (2) a pair of holding arms for guiding the single-serving 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 code location of Jarisch, the machine activation control (including the pump) based on a machine determination of the capsule's barcode as disclosed in Rossi, with the waste container and holding arms of Castellani to obtain the claimed system of the '430 Patent, according to K-fee's apparent interpretation.

190. Castellani is analogous art and, like Yoakim, Jarisch 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.”); *see also* [0009] (“[T]he aim of the present invention is to provide a delivery head, particularly for espresso coffee machines.”))

191. 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,

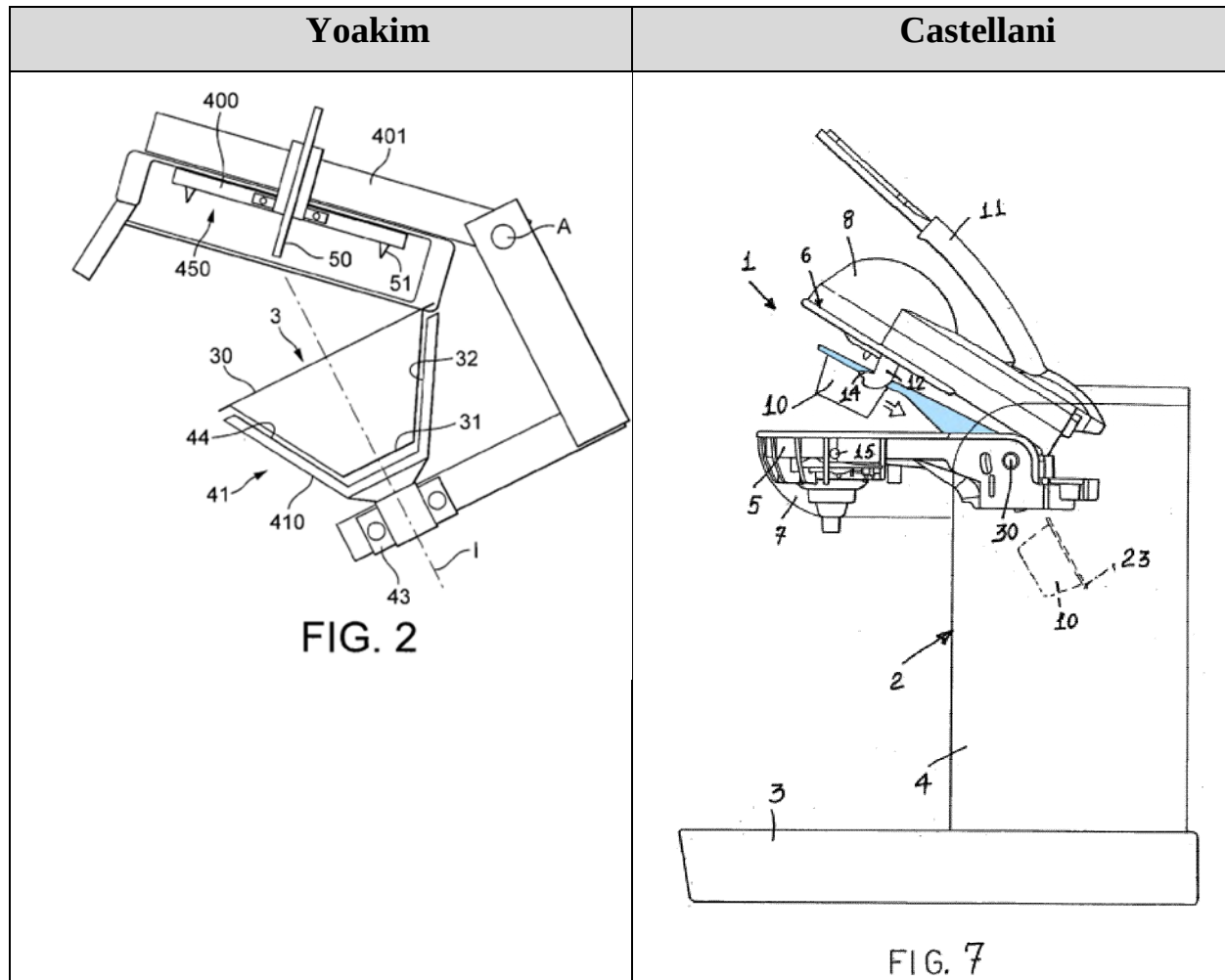
through a specifically designed passage, will be collected in a collecting vessel formed in the upright 2.”.)

192. 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 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.

193. A person of ordinary skill in the art would have been further motivated to combine the dropping box of Castellani with Yoakim and Jarisch because users of the Yoakim and Jarisch system would benefit from having a dropping box that used capsules would eject into, so that 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.

194. Persons of ordinary skill in the art would have expected success in combining the Yoakim/Jarisch 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, 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],[0030],[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:



2. Claim Elements³

195. The '430 Patent recites:

a. “A beverage system for making a beverage, comprising:” (Preamble, Claims 1, 7)

196. 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.”).)

197. 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].)

³ See Claims Appendix for claim language. Due to the repetition of claim language in the independent and dependent claims, claim elements also found in later-addressed claims are only identified once herein.

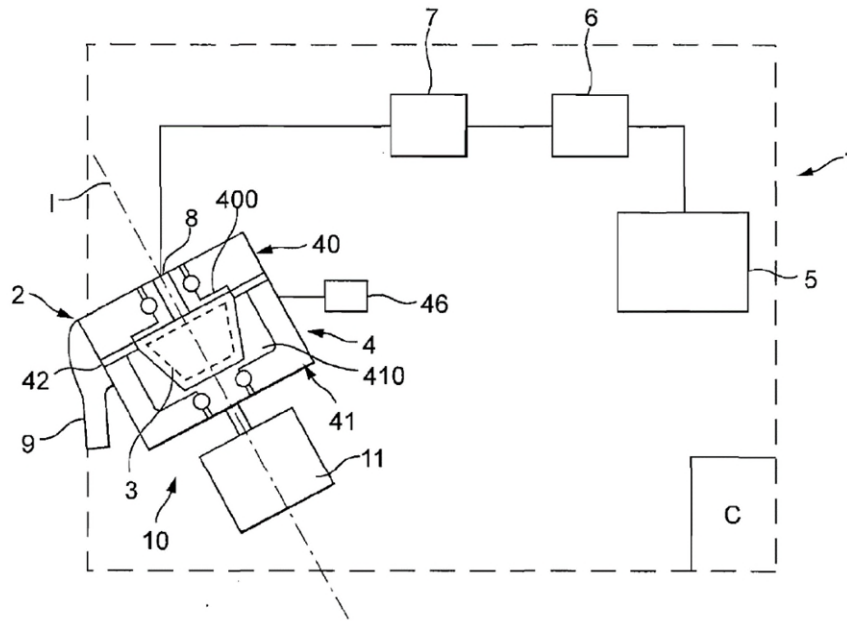


FIG. 1

Ex. 1004 Yoakim at FIG. 1.

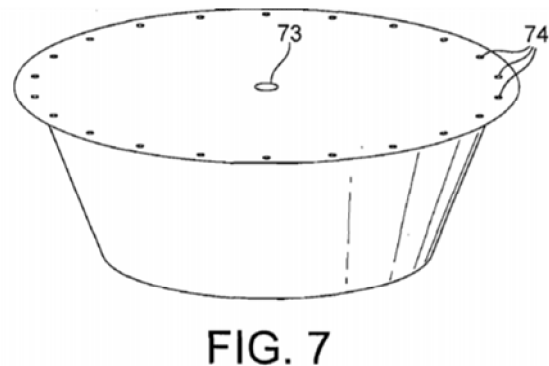
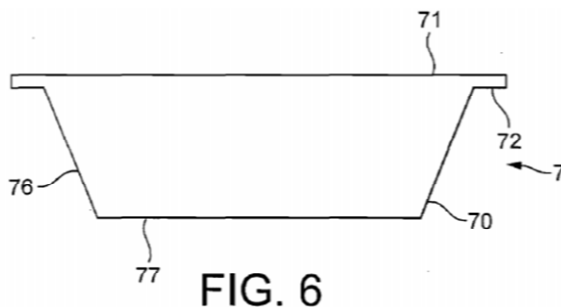
198. Accordingly, Yoakim discloses a “beverage system for making a beverage,” as claimed in the preambles of claims 1 and 7.

b. “a single-serve capsule comprising a base element with a cavity, in which a raw beverage material is provided” (Claims [1.a], [7.a])

199. Yoakim discloses a single-serve capsule comprising a base element with a cavity for use with the system. Specifically, Yoakim describes a capsule, which can be inserted for brewing that is removed after use. (Ex. 1004 at [0180] (“The system 1 of the invention is illustrated in FIG. 1 in the more general sense. The system comprises a device 2 and a capsule 3. The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling).”).) Further, the capsule in Yoakim is

described as “single-use.” (*See, e.g.*, Ex. 1004 at [0219] (“The invention also relates to a food liquid preparation device for preparing a food liquid from a food substance contained in a single-use capsule, removably insertable in the device...”)).)

200. Yoakim’s capsule includes a cavity in which a raw beverage material is provided. Yoakim at Figures 6, 7, 26 and 27 (below) depict examples of the cavity of the capsule with a cover (71 or 103) on the top side of the rim (72 or 104). (*See, e.g.*, EX. 1004 at [0414] (“As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body”)); *see also* [0197].)



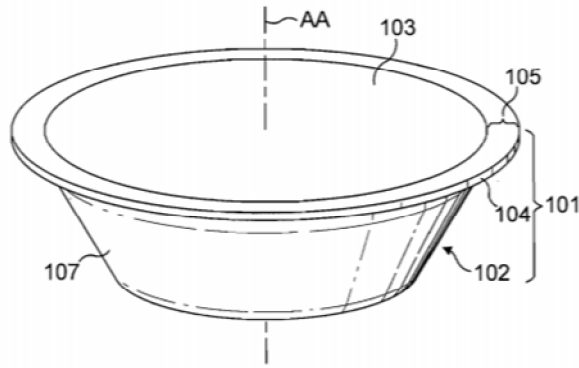


FIG. 26

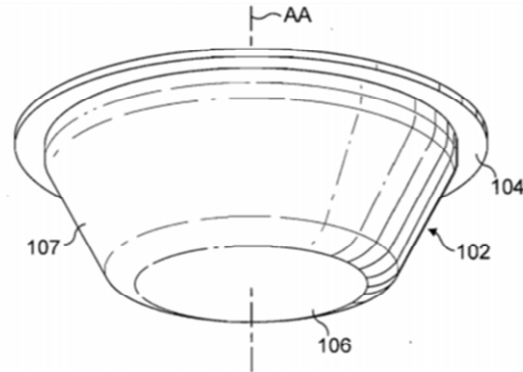


FIG. 27

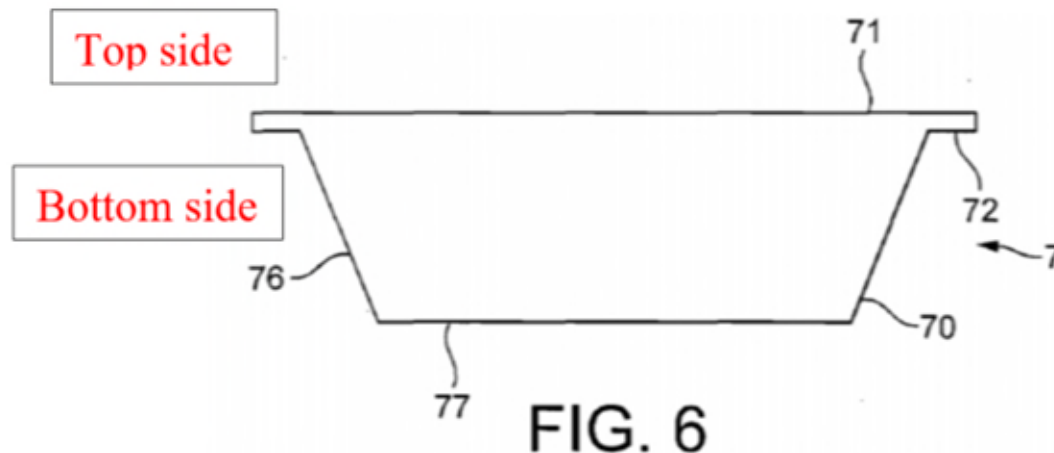
201. Yoakim further discloses the capsule containing a raw beverage material. (See Ex. 1004 at [0125] (“The food substance in the capsule can be ground coffee powder, soluble coffee, tea, chocolate, whitener, flavours, and combinations thereof.”); [0198] (“The capsule contains a substance chosen among the list consisting of ground coffee, soluble coffee, tea, a whitener such as dairy or non-dairy ingredient(s), herbal tea, nutritional substance, culinary ingredients and a mixture thereof.”).)

202. Accordingly, Yoakim discloses “a single-serve capsule comprising a base element with a cavity, in which a raw beverage material is provided” as required by claims [1.a] and [7.a].

c. “a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side” (Claims [1.b], [7.b])

203. Yoakim discloses a capsule with a cup-shaped body, including a circumferential flange extending outwardly from the base element and comprising a top side and an opposing bottom side. For example, the flange is visible as the upper

edge or rim shown in Yoakim as element 72 in FIG. 6 (shown below). Ex. 1004 at [0197], FIG. 6, FIG. 7. This extends horizontally outwardly from the sidewall (76) of the capsule body (70). As annotated below, this flange has a top side and an opposing bottom side.

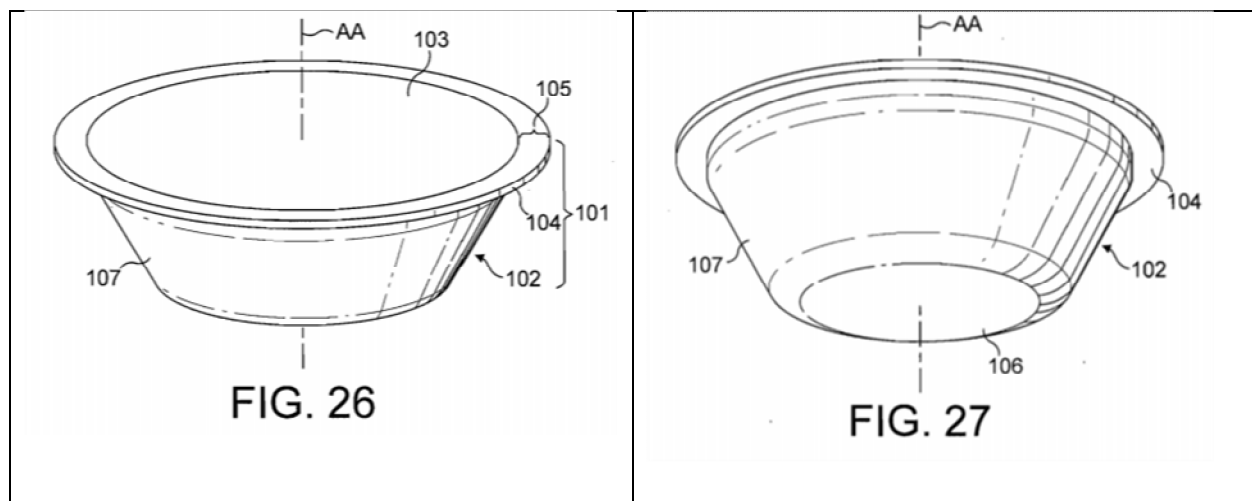


Ex. 1004, Yoakim at FIG. 6.

204. Yoakim also discloses this limitation in connection with the capsule depicted in FIGs. 26 and 27. (See, e.g., Ex. 1004 at [0414] (“As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. ***The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm.*** The dished body comprises a bottom wall 106 and a side wall 107 which preferably widens in direction of the large open end of the body opposed to the bottom wall. The dished body is preferably rigid or semi-rigid. It can be formed of a food grade plastics, e.g.,

polypropylene, with a gas barrier layer such as EVOH and the like or aluminium alloy or a complex of plastic and aluminium alloy.”.)

205. FIGs. 26 and 27 are reproduced below. The flange (104) extends outwardly from the sidewall (107) of the capsule body (102). Yoakim explains that the body (102) has a peripheral rim that extends outwardly forming an annular portion. Ex. 1004 at [414]. The top side of the flange (104) is shown in FIG. 26 and the bottom side of the flange (104) is shown in FIG. 27.



206. Accordingly, Yoakim discloses “a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side” (Claims [1.b], [7.b].)

d. “a cover that is fastened to the top side of the flange to close the cavity” (Claims [1.c], [7.c])

207. Yoakim discloses a cover fastened to the top side of the flange to close the cavity. (See, e.g., Ex. 1004 at [0128] (“The capsule can comprise a sealing lid. The

sealing lid can comprise a flexible membrane.”.) Yoakim further discloses that the foil lid is attached to the peripheral rim of the capsule body. (*Id.* at [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.”); *see also* FIGs. 6 and 7.)

208. Another example of the cover fastened to the top side of the capsule flange is shown below in FIG. 26. Yoakim explains that “[t]he sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm.” (Ex. 1004 at [0414].)

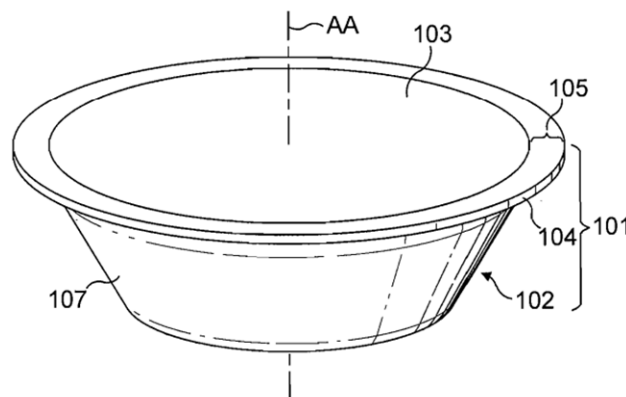


FIG. 26

Ex. 1004, Yoakim at FIG. 26.

209. Accordingly, Yoakim discloses “a cover that is fastened to the top side of the flange to close the cavity” as required by claims [1.c] and [7.c].

- e. **“and a barcode provided on the bottom side of the flange” (Claim [1.d]), “and an identifier provided on the bottom side of the flange, the identifier being a barcode” (Claim [7.d])**

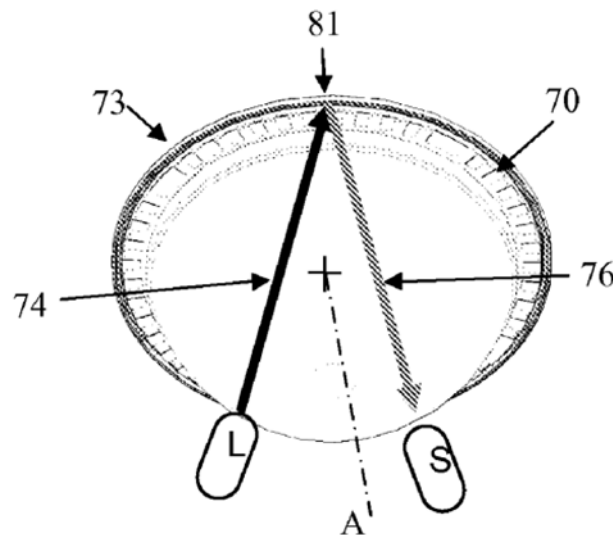
210. Yoakim in combination with Jarisch discloses a barcode on the bottom side of the flange, according to the Patent Owner’s apparent interpretation. Specifically, Yoakim discloses using an identification system to identify each capsule and adjust the brewing parameters accordingly. (Ex. 1004 at [0477]. (“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.”).) Yoakim explains the advantage of this identification system is that the beverage system may deliver a wider range of beverages with different characteristics. (Ex. 1004 at [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, americano, 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.”).)

211. Yoakim further discloses that the capsule can include an identifier, which can be 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].)

212. Jarisch discloses a near-identical centrifuge-style single-serve brewing machine (*see* Ex. 1005 at [0002]-[0003], [0034]-[0035], FIG. 1) that includes a reader or sensor (62) to read an optical code on the capsule and adjust brew parameters accordingly. (Ex. 1005 at [0006], [0024], [0082], FIG. 4.) Jarisch discloses that the information from the identifier is used to recognize the type of capsule and provide brewing parameters specific to the capsule. (*Id.* at [0014].)

213. Jarisch further discloses that the optical code can be “present ***on the bottom of the rim of the capsule which is opposed to the lid of the capsule.***” (Ex. 1005 at [0022].) This is visible in the figure below:



Ex. 1005 Jarisch at FIG. 5.

214. Jarisch explains that the positioning of the code on the bottom of the rim of the capsule that it discloses lowers the risk of the code becoming unreadable. (Ex. 1005 at [0022]) (“In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g. coffee particles).”) 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 Jarisch discloses that, in so doing, “the reading is made more reliable” (*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 929. Ex. 1006 at [0063]-[0064]. Thus, a POSITA would be motivated to place the barcode of Yoakim on the bottom side of the flange facing away from the membrane as disclosed in Jarisch. Ex. 1005 at [0022].

215. Accordingly, Yoakim and Jarisch disclose “a barcode provided on the bottom side of the flange” and “an identifier provided on the bottom side of the flange, the identifier being a barcode” as required by claims [1.d] and [7.d].

f. “a beverage machine comprising: a sensor/detector configured to read the barcode” (Claim [1.e]), “a

**beverage machine comprising: a sensor/detector”
(Claim[7.e])**

216. Yoakim discloses a beverage machine comprising a sensor/detector enabled to identify and read a barcode on a capsule. (*See, e.g.*, Ex. 1004 at [0025], FIG. 4, FIG. 61.)

217. 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.”).)

218. 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] and [0477].)

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

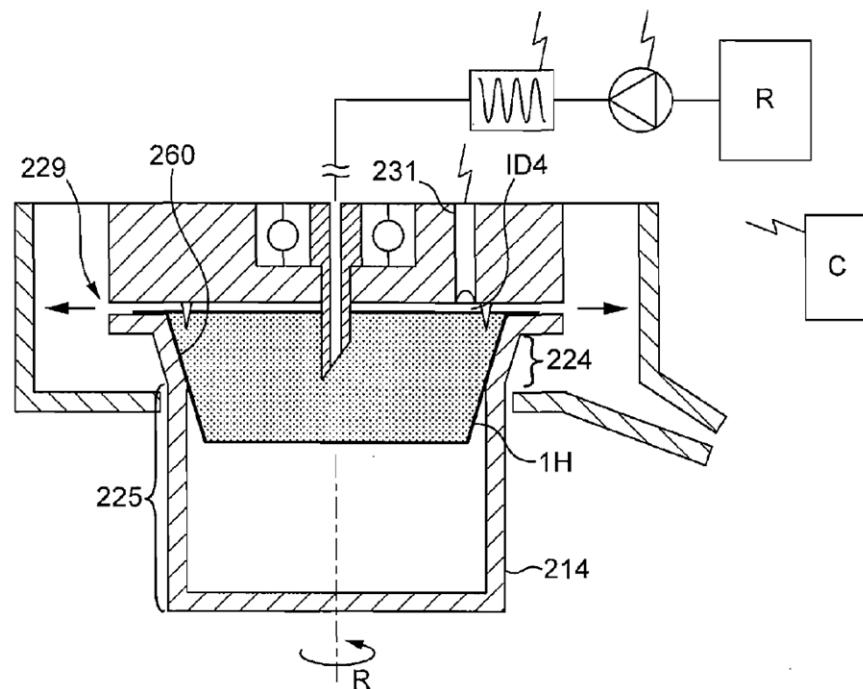
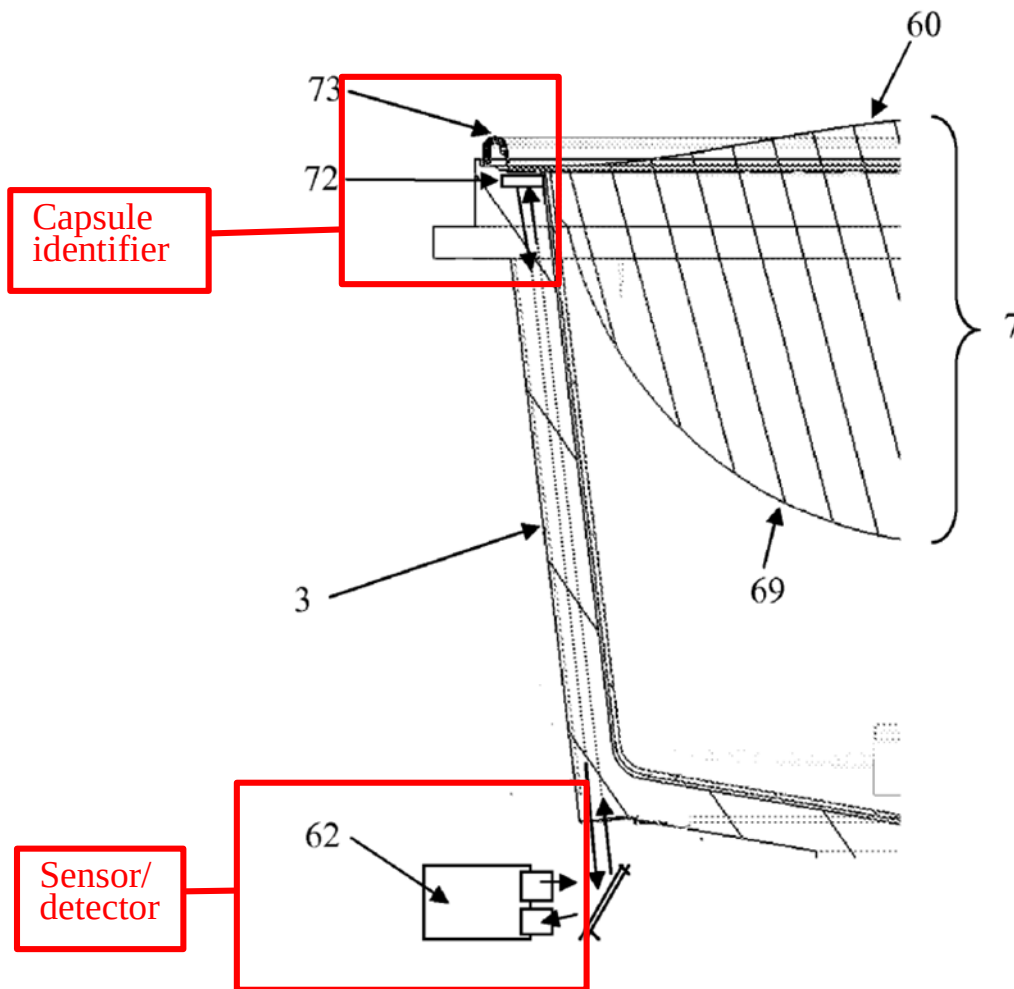


FIG. 61

Ex. 1004 Yoakim at FIG. 61.

220. Additionally, Jarisch discloses an optical code sensor/detector designed to read an optical code positioned on the bottom side of the flange. (Ex. 1005 at [0082].)

221. For example, Jarisch discloses an optical code sensor 62 designed to read the code positioned on the underside of the flange. (Ex. 1005 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. 4 to deflect the forward and backward beams.”).) The sensor/detector (62) of Jarisch is depicted below:



Ex. 1005 Jarisch at FIG. 4.

222. Accordingly, Yoakim and Jarisch both disclose “a beverage machine comprising: a sensor/detector configured to read the barcode” and “a beverage machine comprising: a sensor/detector” as required by claims [1.e] and [7.e].

g. “a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange” (Claims [1.f], [7.f])

223. Yoakim discloses a brewing chamber configured to receive the single-serve capsule. Specifically, Yoakim explains that its brewing machine includes a capsule

holder in which to insert a capsule for brewing. (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.”).) This capsule holder engages the capsule for rotation to allow for brewing by centrifugation. (*Id.*; *see also* [216].)

224. Yoakim further explains the capsule holder’s configuration for centrifugal brewing. (*See, e.g.*, Ex. 1004 at [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. On the lower end of the rod 45 is associated an electric rotary motor 11.”); *see also* [0478].) Yoakim’s capsule holder, which is part of the brewing chamber, is depicted below in FIG. 4 at element 41:

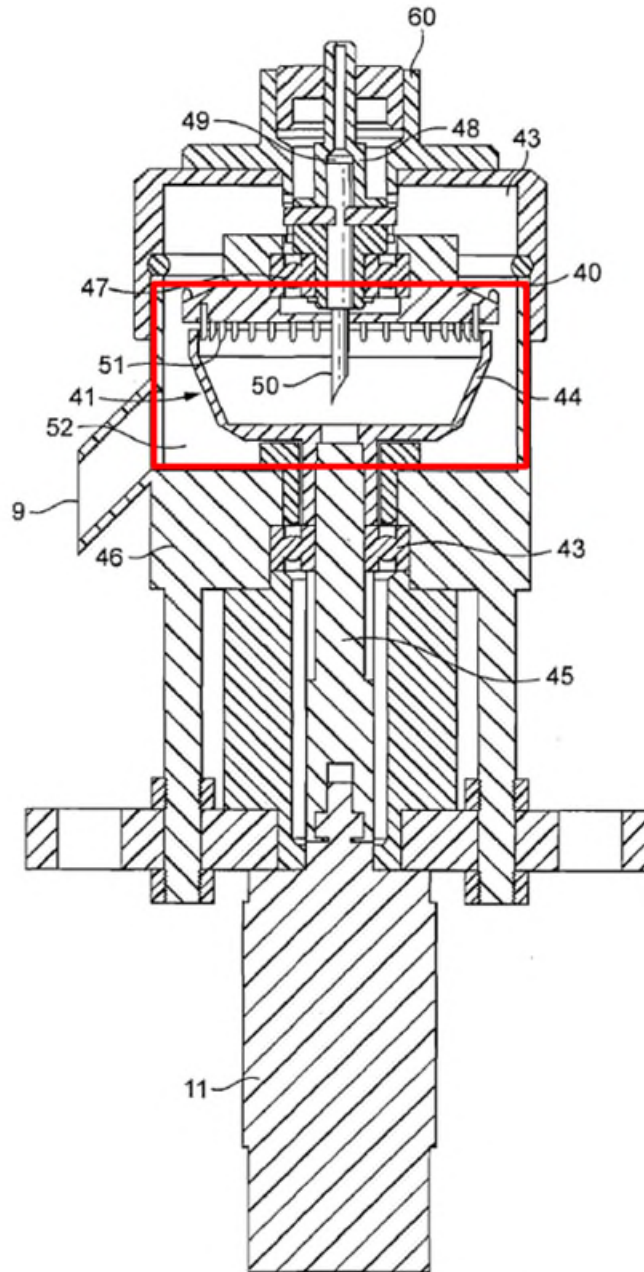


FIG. 4

Ex. 1004, Yoakim at FIG. 4.

225. Yoakim further discloses “an end portion that opposes the bottom side of the flange,” according to K-fee’s apparent interpretation. In these figures the end

Ex. 1004, Yoakim at FIG. 35.

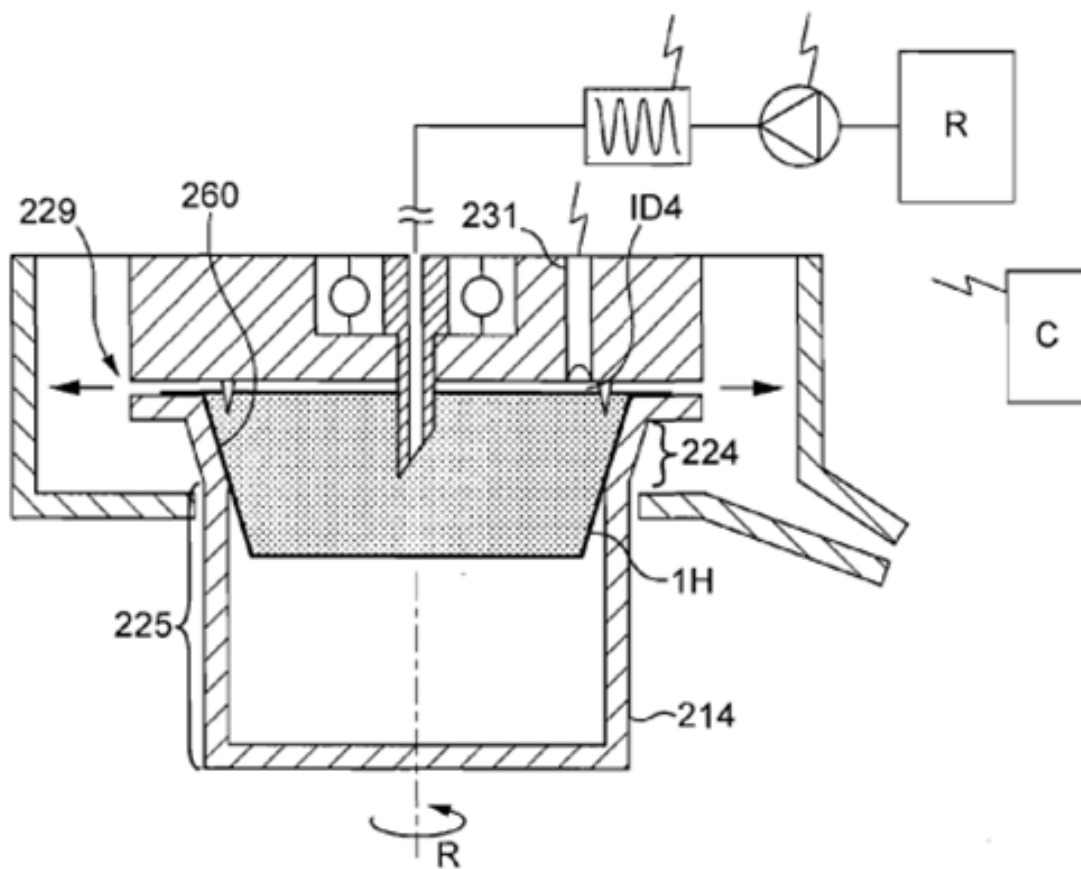


FIG. 61

Ex. 1004, Yoakim at FIG. 61.

226. Accordingly, Yoakim discloses “a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange,” as required by claims [1.f] and [7.f].

h. “a pump controlled to supply water into the single-serve capsule” (Claim [1.g], [7.g])

227. Yoakim discloses a pump which is controlled to supply water into the single-serve 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).)

228. Yoakim further discloses that the beverage machine, including the pump, is controlled based on the detection of an identifier by a sensor/detector. (Ex. 1004 at [0025] (“The device is useful for preparing beverages from a plurality of different capsules, in which case it further 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, **including the flow rate and the volume of liquid to be injected into the capsule, 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.**”).)

A person of ordinary skill in the art would understand that control of the flow rate and volume of liquid would occur by control of the machine’s water pump. (See, e.g., *id.* at [0218] (“ The control unit may control the delivery of the added

volume of water so that the volume is added at the same time as the coffee extract is delivered by centrifugation”); [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.***”).)

229. Accordingly, Yoakim discloses “a pump controlled to supply water into the single-serve capsule” as required by claims [1.g] and [7.g].

i. “wherein the single-serve capsule is free of a filter that is located inside of the cavity” (Claims [1.h],[7.h])

230. To the extent the ’430 Patent describes and enables a capsule free of a filter, Yoakim discloses a single-serve capsule that is “free of a filter that is located inside of the cavity.” Specifically, Yoakim describes extraction of coffee capsules using methods that do not include a filter, and in fact confirm that the addition of a filter structure is optional. Ex. 1004 at [0171] (“An additional filtering layer can be used to filter the liquid depending on the size of the outlets.”)

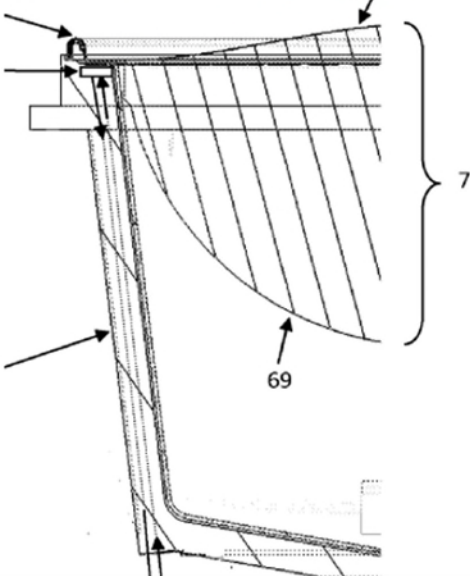
231. Yoakim further describes the optional filter embodiment, which is not otherwise present in the Yoakim embodiments that I have discussed. *See* Ex. 1004 at [343] (“In a possible mode, the portion of the wall with the outlet openings can be formed from a paper filter or woven, non-woven fibres, meshed material, porous polymer membrane or combination thereof. In this case, part of the portion of wall can be formed by a band or different parts of the filter, fibres or meshed material.”)

232. Yoakim also explicitly discloses embodiments including portion capsules that do not have a filter. *See, e.g.*, Ex. 1004 at FIG. 42, 54.

233. Accordingly, Yoakim discloses “the single-serve capsule is free of a filter that is located inside of the cavity,” as required by claims [1.h] and [7.h].

j. “the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element;” (Claims [1.i], [7.i])

234. To the extent the ’430 Patent describes and enables a capsule with an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element, Yoakim in view of Jarisch discloses this limitation according to K-fee’s apparent interpretation. The Patent Owner alleges that a domed capsule base with a pressurized foil cover meets this limitation. Based on this interpretation, Jarisch discloses such a configuration, as shown below:

K-fee's Infringement Contentions (EX1049)	
Jarisch (EX1005)	

235. According to the Patent Owner's apparent interpretation, Jarisch also explicitly discloses a capsule with an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element. Ex. 1005 at FIG. 4 (shown above). The use of a capsule shown in Jarisch would have been obvious to a person of ordinary skill in the art because such a configuration can result from known ingredient quality preservation techniques, like those that rely on inert gas and pressurization.

236. Yoakim also renders obvious capsule with an upper end portion that has annular convexity and a lower end portion that has an annular concavity relative to

the central axis of the base element, according to the Patent Owner's apparent interpretation. Yoakim discloses that "[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." Ex. 1004 at [121]; *see also* [0128]-[0129]. Yoakim further explains that CO₂ coming from ground coffee can fill free volume in the enclosure of the capsule. Ex. 1004 at [270]. Thus, a person of ordinary skill in the art would have understood that a capsule with a foil membrane that is sealed tight and filled with an inert gas would exhibit convexity under pressure of the gas or CO₂ emitted from the ground coffee.

237. Accordingly, both Jarisch and Yoakim disclose and/or render obvious "the single-serve capsule [that] also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element," as required by claims [1.i] and [7.i].

k. "a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule" (Claims [1.j], [7.j])

238. To the extent this term can be understood, Yoakim discloses a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule, based on K-fee's apparent interpretation. 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.”).)

239. 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.

240. 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.

241. Accordingly, Yoakim discloses a “barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule” as required by claims [1.j] and [7.j].

l. “wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element” (Claims [1.k], [7.l])

242. Yoakim discloses a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element, according to the Patent Owner’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:

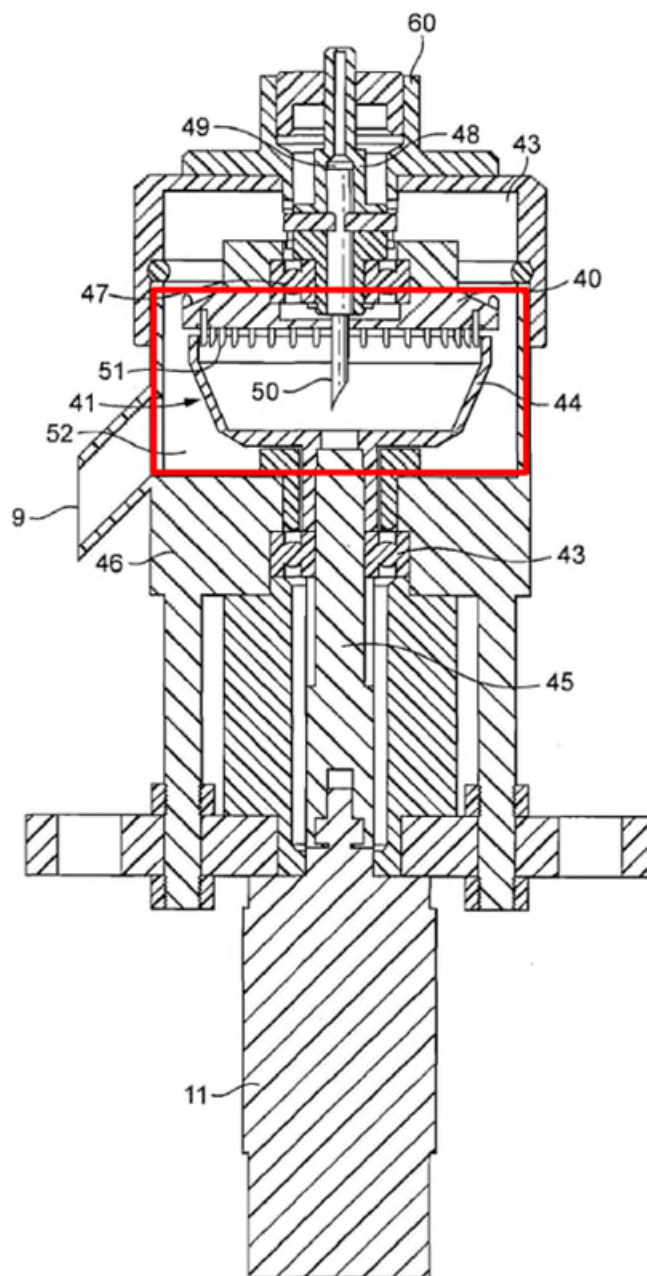


FIG. 4

Ex. 1004 Yoakim at FIG. 4.

243. 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:

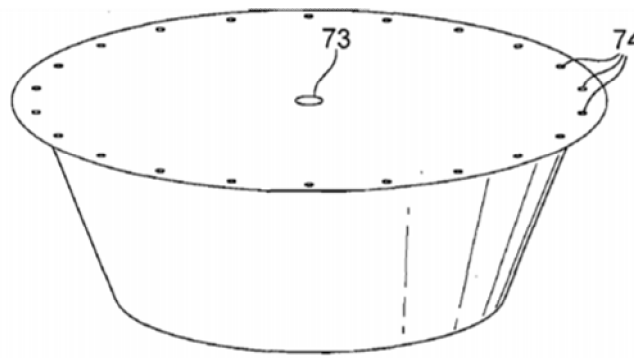


FIG. 7

Ex. 1004 Yoakim at FIG. 7.

244. Accordingly, Yoakim discloses “wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element” as required by claims [1.k] and [7.l].

m. “(ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel” (Claims [1.l], [7.m])

245. To the extent this limitation can be understood, Yoakim discloses the claimed seal configuration in the form of a “flow restriction means which is arranged after

the outlet(s) of the capsule.” (Ex. 1004 at [0370]-[0380].) Specifically, Yoakim 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], *see also* [0382], [0396]-[0398].)

246. 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].)

247. Yoakim further 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].)) This seal is designed to “control[] the flow of liquid that is discharged from the device.” Ex. 1004 at [0436], *see also* [0384]-[0385].

248. 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.

249. Yoakim discloses that the seal is configured to seal against the capsule cover. (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] (“[T]he engaging portion of the valve means can also comprise an annular pressing edge which is arranged to seal on the engaging portion of the capsule.”).)

250. Yoakim further discloses a seal positioned to seal against the cover in a region between a peripheral edge of the flange 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 FIG. 35 (below), which depicts a sealing edge 159 on the surface of the capsule between the peripheral edge of the flange and the piercing location of the mandrel (153).

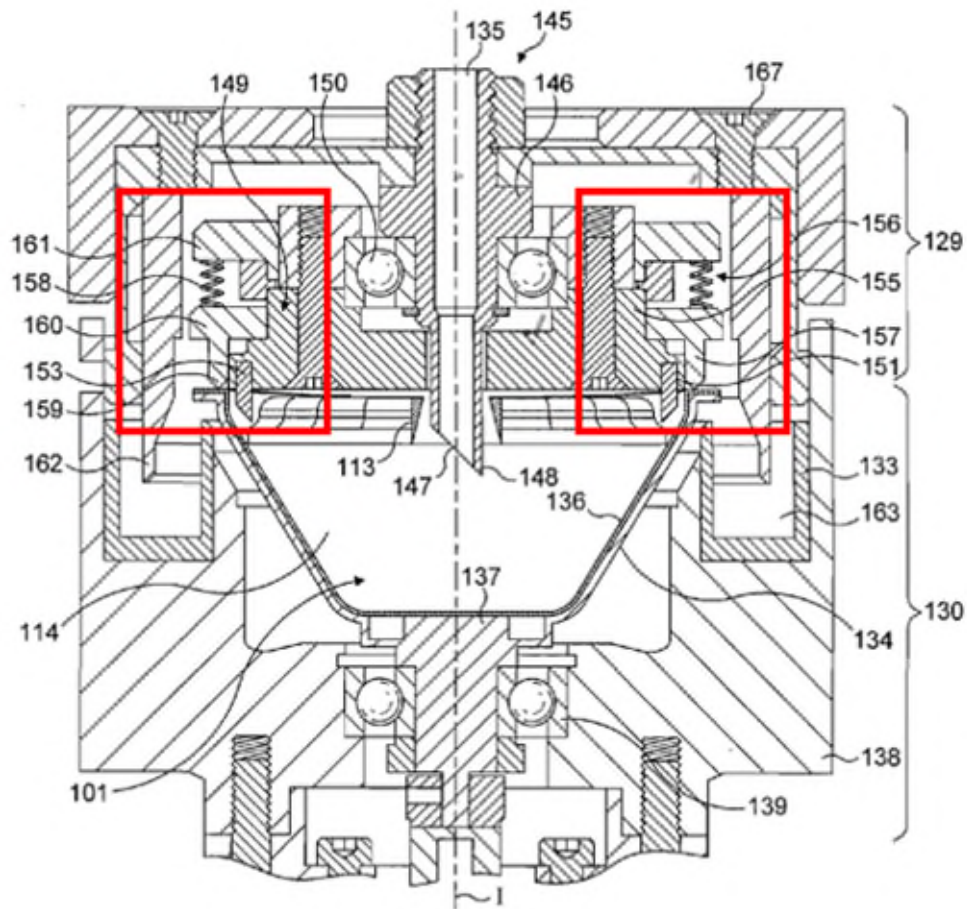
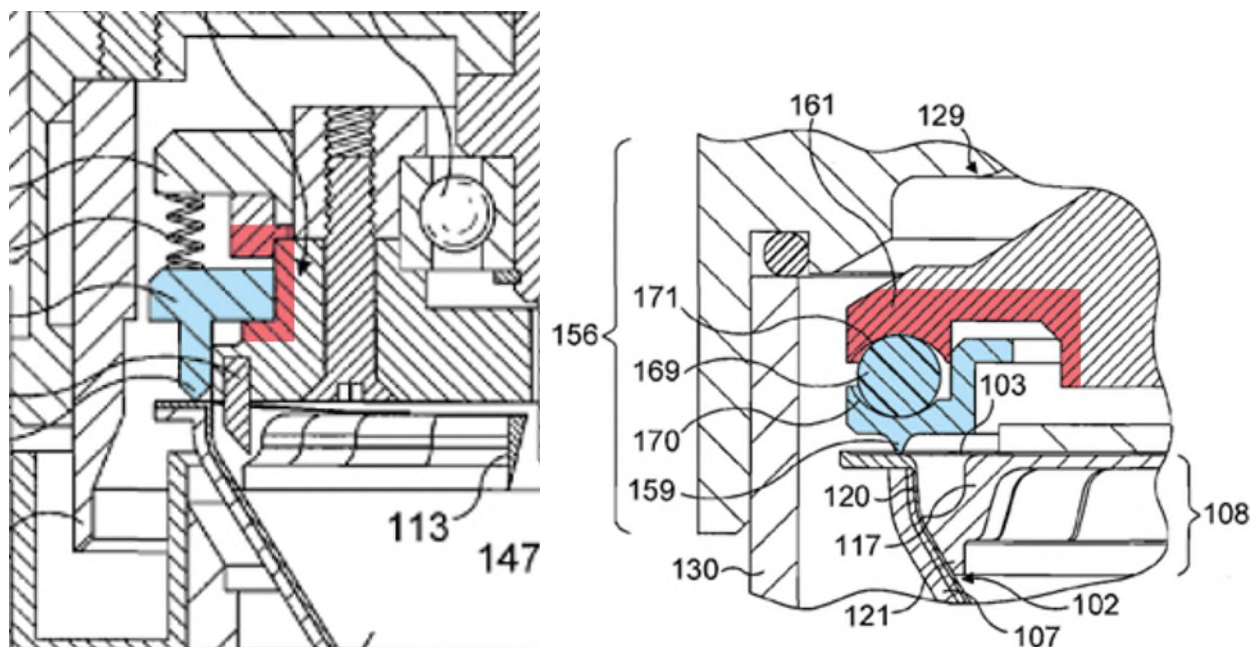


FIG. 35

Ex. 1004 Yoakim at FIG. 35.

251. The seal (blue) is shown in a close up of FIGs. 35 and FIG. 38 below:



Ex. 1004 Yoakim at FIG. 35 and 38 (annotated).

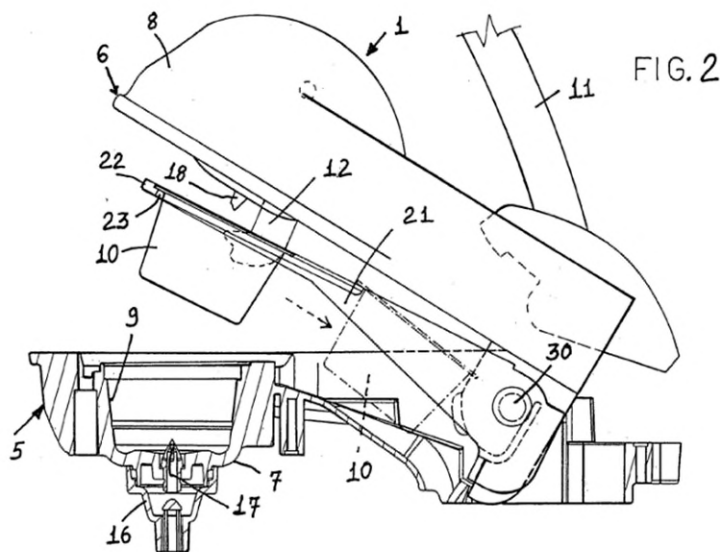
252. It would also have been obvious to one skilled in the art to utilize the claimed seal configuration in the brewing head of the centrifugal brewing unit in order to achieve “the advantage of a control of the pressure of liquid exerted in the capsule at the level of the device,” as well as “optimize 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].

253. Accordingly, Yoakim discloses and/or renders obvious “a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel,” as required by claims [1.1] and [7.m].

n. “(iii) a pair of holding arms for engaging the single-serve capsule” (Claims [1.m], [7.n])

254. Castellani discloses “a pair of holding arms for engaging the single-serving capsule”, according to the Patent Owner’s apparent interpretation. For example, Castellani discloses a capsule ejecting fork element (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.”).)

255. 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.

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

257. Accordingly, Castellani discloses “a pair of holding arms for engaging the single-serve capsule,” as required by claims [1.m] and [7.n].

o. “(iv) a dropping box for the single-serve capsule to fall into” (Claims [1.n], [7.o])

258. Castellani discloses “a dropping box for the single-serve capsule to fall into.” Specifically, Castellani discloses that after use, the capsule slides down into a collecting vessel. See, e.g., 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.”); FIG. 7 (annotated).

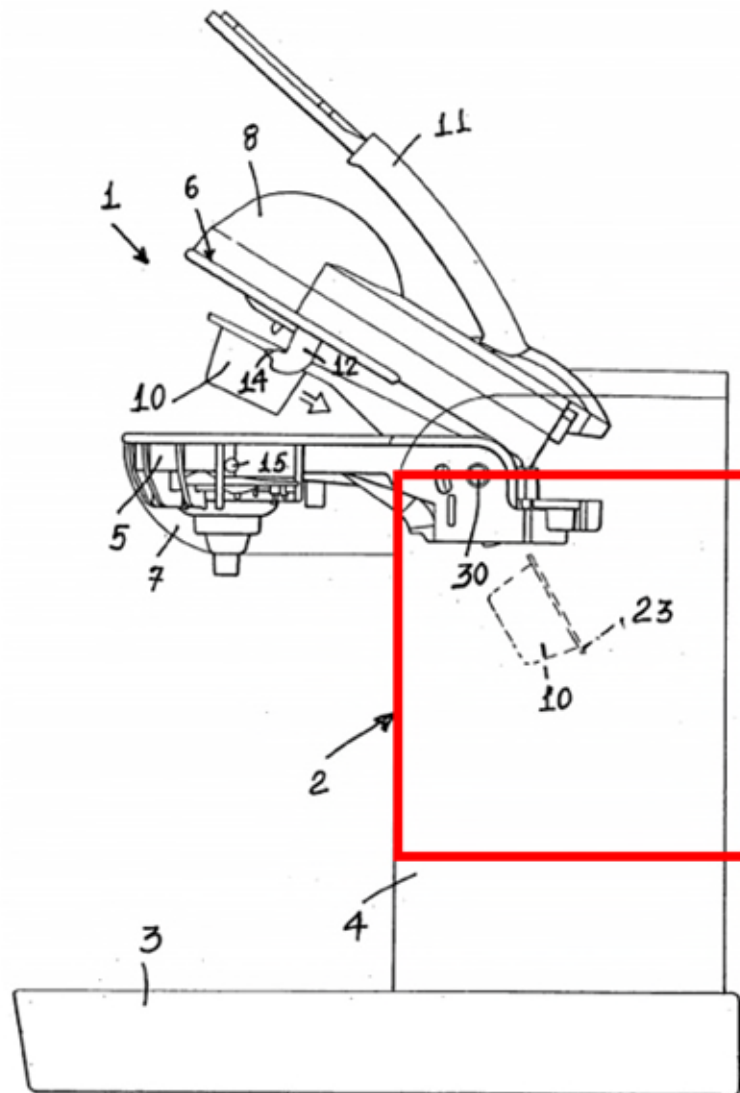


FIG. 7

Ex. 1009 Castellani at FIG. 7.

259. It would have been obvious to a person of ordinary skill in the art to incorporate the dropping box of Castellani into the brewing system of Yoakim, Jarisch and Rossi. *See* Section VII.B.1.i.

260. Accordingly, Castellani discloses “a dropping box for the single-serve capsule to fall into,” as required by claims [1.n] and [7.o].

p. “wherein the pump is controlled to push water into the single-serve capsule only upon a determination that the read barcode agrees with a stored reference” (Claim [1.o])

261. Yoakim and Rossi disclose this limitation. Yoakim discloses a “pump [that is] controlled to push water into the single-serve only upon determination that the read barcode agrees with a stored reference.” Specifically, Yoakim describes a capsule system which includes an “identification means” allowing a barcode to be read and compared with stored references, allowing the brewing parameters to be adjusted accordingly. Yoakim discloses a capsule system with “identification means” that are associated with different capsules so the system can identify the capsule and adjust the brewing process according to the parameters of that particular capsule. Ex. 1004 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.”) Yoakim explains that “[t]he 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 ***and/or the pump supplying liquid in the capsule.***” *Id.* (emphasis added). As such, the pump of the brewing system is controlled based on reading the “identification means” on the capsule and adjusting the flow rate of the water into the capsule based on the predetermined parameters for that “identification means.” It is necessary that references for the code be stored in memory so that the system understands what steps to perform and parameters to adjust based on the barcode readout. Without a successful barcode read, the brewing device has no information to control the pump to brew the beverage.

262. Yoakim discloses examples of the various parameters that may be adjusted, and these include controlling the pump to adjust flow rate. Ex. 1004 at [0192] (“Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverages to be brewed, the control unit can be programmed to adjust the optimal centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according [*sic*] the capsule which is inserted in the device. 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.”).

263. Rossi discloses not operating the machine unless there is a determination that the identifier agrees with a stored reference. (Ex 1041 at p. 11, (“The system further optionally comprises checking means connected to a control unit of the machine. This may be in the form of a computer programme within the control unit. The checking means **compares the signal** from the recognising 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 recognises the identifying element and the unvalidated validation element.”).)

264. Rossi further discloses that both the identifying element and the validation element can be a barcode (Ex. 1041 at p. 11, (“The load element of the system comprises an identifying element for its recognition and a validation element for its validation. These are preferably in the form of **barcodes**, antennae, or paints having optically measurable properties.”).) and both elements are preferably located on the body of the capsule. (Ex. 1041 at p. 11; *see also* 1s (“The machine 1 comprises recognizing 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. 1006 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.”).)

265. A person of ordinary skill in the art would understand Rossi’s disclosure of not activating a brewing cycle unless there is a determination that the identifier agrees with a stored reference to constitute not operating the pump that pushes water into the single-serve capsule unless the read identifier, which can be a barcode, agrees with a stored reference. The pump is a component of the brewing cycle and thus would not operate without brewing cycle activation.

266. It would have been obvious for a POSITA to combine the process of Rossi with the capsule brewing system of Yoakim (and Jarisch) to arrive at the claimed limitation. *Supra* Section VII.B.1.

267. Accordingly, Yoakim and Rossi (and Jarisch) disclose “wherein the pump is controlled to push water into the single-serve capsule only upon a determination that the read barcode agrees with a stored reference,” as required by claim [1.o].

3. “The beverage system according to claim 1, wherein the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree with a stored reference.” (Claim 2)

268. For the same reasons discussed above at ¶¶261-267 for claim element [1.o], Yoakim and Rossi disclose “[t]he beverage system according to claim 1, wherein

the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree with a stored barcode.”

269. For example, as noted above at ¶¶263-264, Rossi explicitly discloses activating the brewing cycle (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.

270. 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 single-serve capsule upon a determination that 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.

271. 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].)

272. Accordingly, Yoakim and Rossi disclose and/or render obvious “[t]he beverage system according to claim 1, wherein the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree with a stored reference,” as required by claim 2.

4. “The beverage system according to claim 1, wherein the sensor/detector of the beverage machine is configured to compare the read barcode with the stored reference.” (Claim 3)

273. For the same reasons discussed above at ¶¶261-267 for claim element [1.o], Yoakim and Rossi disclose a “sensor/detector of the beverage machine [that] is configured to compare the read barcode with the stored reference.” Both Yoakim and Rossi disclose the system making “a determination that the read barcode agrees with a stored reference.” (See Section VII.B.2.p.) A person of ordinary skill in the art would have understood that such a determination is the same as, and necessarily involves, comparing the read barcode with a stored reference and it would have been obvious that making such a determination would involve undertaking such a comparison.

274. Accordingly, Yoakim and Rossi disclose and/or render obvious claim 3.

5. “The beverage system according to claim 1, wherein the base element comprises a bottom having an indentation.” (Claim 4)

275. Yoakim discloses a capsule with a base element comprising a bottom having an indentation. Specifically, Yoakim discloses that the bottom of the portion capsule may be indented, explaining that “[t]he *lower portion can be* convex, flat or *concave.*” Ex.1004 at [0471]-[0473]. FIG.27 depicts the base element 106, comprising a bottom, which is opposite the flange 104. It would have been an obvious design choice to include a lower portion of the capsule that is concave in order to, for example, facilitate movement of the coffee grounds toward the perimeter of the inner capsule wall during centrifugal extraction, or to stiffen the bottom of the capsule to better resist distortion due to pressurization.

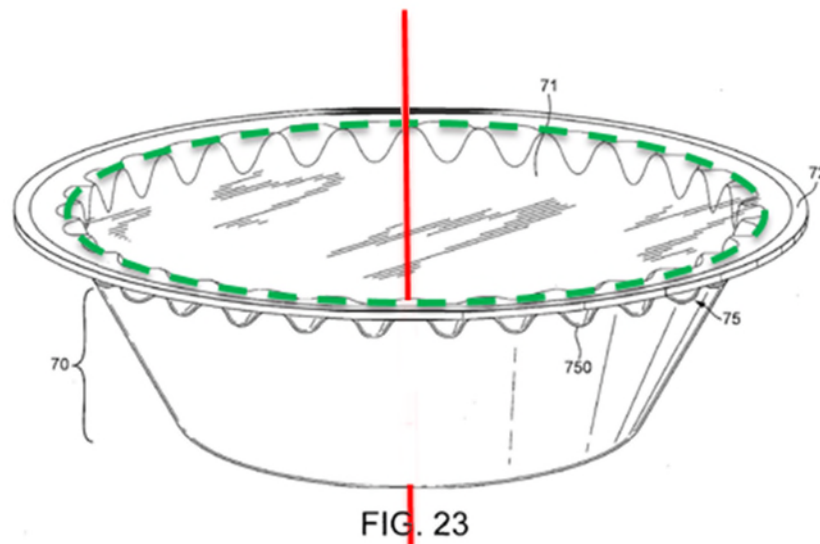
276. Accordingly, Yoakim, in view of Jarisch, Rossi and Castellani, renders claim 4 obvious.

6. “The beverage system according to claim 4, wherein the side wall of the base element includes indentations.” (Claim 5) and “(iii) a side wall having indentations.”(Claim [7.k])

277. Yoakim discloses a base element that comprises a side wall that includes a plurality of indentations. Specifically, Yoakim discloses a capsule including a toothed structure around the perimeter of the body, which Yoakim explains can be used to engage the capsule in the centrifugal brewing system to facilitate controlled rotation during brewing. See, e.g., Ex. 1004 at [0215] (“FIG. 23 illustrates another

capsule of the invention. The capsule comprises means for connecting it to the external rotational driving means of the device. For this, capsule has a toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule.”).

278. FIG.23, shown below, depicts a capsule with indentations (green dashes) that are arranged around the central longitudinal axis (shown in red).



Ex. 1004 Yoakim at FIG. 23.

279. Yoakim further discloses that the structures can be indentations such as “reliefs” and “slits” among other things. (Id. (“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.”.) Such features would also constitute “indentations” according to the Patent Owner’s apparent interpretation.

280. It would also have been obvious to a person of ordinary skill in the art to utilize indentations about the longitudinal axis on the body of the capsule in order to provide a “means for connecting [the capsule] to the external rotational driving means of the device” to facilitate controlled rotation during beverage extraction. EX1004, [0215].

281. Accordingly, Yoakim discloses “[t]he beverage system according to claim 1, wherein the base element comprises a bottom having an indentation” and “(iii) a side wall having indentations,” as required by claims 5 and [7.k].

7. “The beverage system according to claim 1, wherein the base element is made of a biodegradable material.” (Claim 6)

282. Yoakim, in view of Jarisch, and in further view of Rossi and Castellani, discloses “[t]he beverage system according to claim 1, wherein the base element is made of a biodegradable material.”

283. Yoakim discloses a base element made of biodegradable material. Specifically, Yoakim describes a capsule made of biodegradable or recyclable material. *See, e.g.*, Ex. 1004 at [0237] (“The device of the invention may receive capsules made of rigid, semi-rigid and/or soft materials. **The capsule may be made**

of materials such as plastics, aluminium, cellulose-based materials or other **biodegradable materials**, and combinations therefore [sic].”); [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**).”); [0427] (“The capsule contains a food substance for being brewed and the capsule is removed from the module after use for being discarded (e.g., for waste **or recycling** of the organic and inorganic raw materials).”).

284. Furthermore, it would have been obvious to one of ordinary skill in the art to utilize a capsule of biodegradable material in order to obtain the known environmental benefits that biodegradable materials provide. For example, other prior art such as Jarisch 929 discloses that its capsule can be made of a biodegradable material. Ex. 1006 at [0002]. (“A ‘capsule’ is meant to include any pre-portioned beverage ingredient or combination of ingredients (hereafter called ‘ingredient’) within an enclosing packaging of any suitable material such as plastic, aluminium, a recyclable and/or bio-degradable material and combinations thereof, including a soft pod or a rigid cartridge containing the ingredient.”).

285. Accordingly, Yoakim, in view of Jarisch, Rossi and Castellani, renders claim 6 obvious.

8. Independent Claim 7

a. Claim elements [7.a]-[7.o]

286. Yoakim, Jarisch, Rossi and Castellani disclose and/or render all elements of claim 7 obvious. The elements of limitations [7.a]-[7.j] and [7.l]-[7.o] are discussed above in connection with Claim 1 in Section VII.B.2.a-p. The elements of [7.k] are discussed above in connection with claim 5 in Section VII.B.6.

b. “wherein the beverage machine, by reading or detecting the identifier with the sensor/detector, is configured to determine if the single-serve capsule belongs to a group of single-serve capsules operable for use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single-serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule” (Claim [7.p])

287. As explained *supra* in connection with claim element [1.o], both Yoakim and Rossi disclose pump control based on the capsule’s identifier. Rossi discloses controlling a pump to supply water into the capsule only upon detection of the identifier by the sensor, and a determination by the machine that the capsule is operable for use with the machine (the limitation that the Examiner found was missing from the prior art).

288. Rossi discloses the use of a sensor for detecting an identifier on the capsule. (Ex. 1041 at 6, (“a process for controlling the operation of an edible-product making machine ... characterized in that it comprises a first step of recognition wherein said

edible-product making machine **recognizes an identifying element** on said load element”). Rossi further explains that the machine detects an identification element on the capsule with a machine’s recognition means. (Ex. 1041 at 7, (“The use of an **identification element and recognition means**, as well as the step of recognizing the identification element allows the machine to recognize the load element and, hence, its contents.”).)

289. Rossi also discloses determining whether the capsule belongs to a group of capsules that are “operable for use” with the beverage machine. Rossi explains that prior art machines “are usually designed so as to operate with a certain design or type of load element” and “[u]se of an incorrect load element may cause the machine to malfunction and can prejudice the safety and integrity of the machine and may harm the user.” (Ex. 1041 at 5). As a solution to this problem, Rossi discloses “providing a safe and simple system and process for **ensuring that an appropriate load element is used.**” *Id.* A POSITA would understand that a disclosure of an “incorrect” capsule that causes the machine to “malfunction” is a capsule that is not operable for use with the brewing machine.

290. For example, Rossi determines **whether it recognizes** the identification element, and a failed recognition would indicate to a POSITA that the capsule is not proper for use with the machine. (Ex. 1041 at 7, (“The use of an identification element and recognition means helps to prevent the safety hazard associated

with inappropriate operating conditions.”). Rossi additionally discloses this limitation through the identification of a “validation element” that ensures only capsules operable for use activate the machine: “[t]he 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.**” (*Id.*) A person of ordinary skill in the art would understand that already-used capsules would constitute a group of capsules that are not operable for use with the machine.

291. Rossi further discloses that the identification and verification elements, which can both be the same element, can be optical codes located on the capsule. Ex. 1041 at 9, 11 and 13.

292. Rossi discloses only operating the pump after both detecting an identifier and determining whether the capsule is of a group “operable for use” with the machine. (Ex. 1041 at 9, (“Thus, **the production process cannot be activated** unless the first step has been completed.”); at 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.”).)

293. Rossi’s disclosure would be understood by a person of ordinary skill in the art to constitute disclosing operating the pump only upon a determination that the capsule belongs to a group that is operable for use with the beverage machine because the machine must both detect and read the recognizing element (and the additional validation element) to determine whether the capsule belongs to a group of capsules that are operable for use with the machine before the machine’s brewing process, which uses the pump, is activated. Rossi, at a minimum, renders obvious to a person of ordinary skill in the art not operating a pump without a determination that a capsule belongs to a group that is operable for use with the machine, in order to increase safety of the system by preventing dangerous operating conditions from improper capsules being used with the machine.

294. Accordingly, it would have been obvious for a POSITA to combine the process of Rossi with Yoakim and Jarisch to arrive at this limitation. *Supra* Section VII.B.1.

9. Claim 8

295. The elements of claim 8 are addressed *supra* in Section VII.B.5, which overlap with Claim 4.

10. Claim 9

296. The elements of claim 9 are addressed *supra* in Section VII.B.7, which overlap with Claim 6.

11. Claim 10

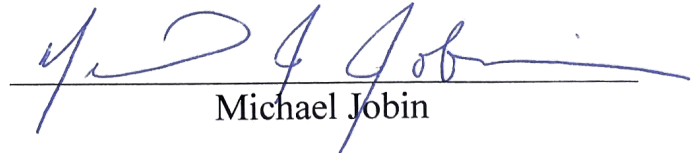
297. The elements of claim 10 are addressed *supra* in Section VII.B.4, which overlap with Claim 3.

VIII. SUPPLEMENTATION

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

299. 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: 1/24/2023


Michael Jobin

APPENDIX A

Michael Jobin
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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

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 pharma & biotech 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**
Program Manager
- 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, *cum laude*
BFA Industrial Design, *cum laude*
- 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. 11,230,430	'430 Patent
1002	Prosecution History of U.S. Patent No. 11,230,430	'430 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/2022/08/ITC-Coffee-Capusles.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

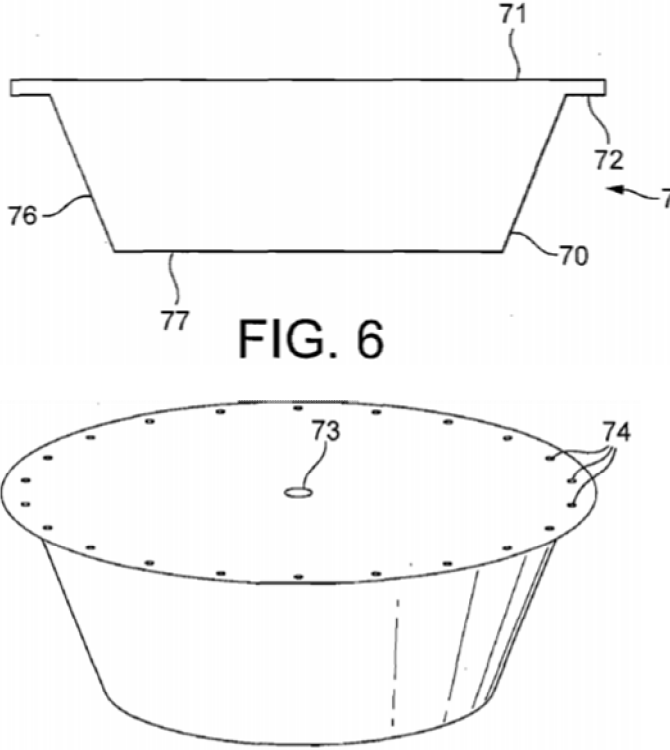
1038	U.S. Patent Pub. 2007/0203587A1	Erlandsson
1039	U.S. Patent Pub. 2005/0150391A1	Schifferle
1040	PCT Pub. WO2005/044067A1	Ruchonnet
1041	PCT Pub. WO2010/099806A1	Rossi
1042	US Patent Pub. 2009/0205747	Lillard
1043	U.S. Patent Pub. 2010/0078480A1	Aker
1044	U.S. Patent Pub. 2013/0099597	Perentes
1045	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>K-Fee System GmbH v. Nespresso USA, Inc. et al.</i> , Case No. 2:22-cv-00525	Complaint
1049	<i>K-Fee System GmbH v. Nespresso USA, Inc. et al.</i> , Case No. 2:22-cv-00525 – Supplemental Disclosure of Infringement Contentions (July 11, 2022)	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

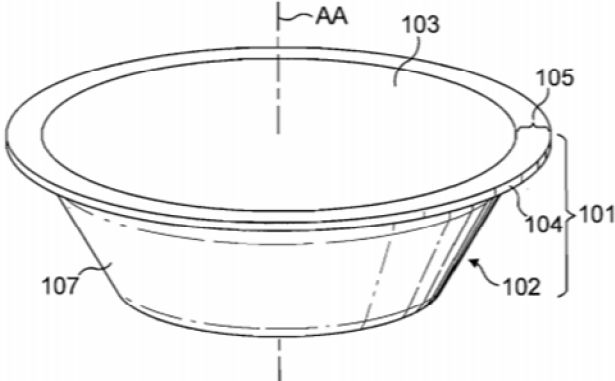
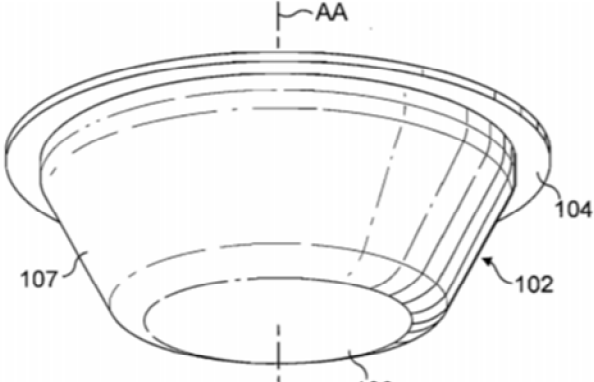
1053	Excerpt from Prosecution History of U.S. Appl. No. 16/438,818	'818 Appl.
1054	<i>K-Fee System GmbH v. Nespresso USA, Inc. et al.</i> , Case No. 2:21-cv-3402; Dkt. 211.	Summary Judgment Order
1055	Food Packaging and Shelf Life: A Practical Guide (2009), Chapter 11 – “Packaging and the Shelf Life 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	Excerpt from Appl. No. 16/538,752: Nov. 8, 2019 Office Action Rejection	752 Appl. First Rejection
1058	Excerpt from Appl. No. 16/538,752: Jan. 23, 2020 Response to Office Action	752 Appl. First Response
1059	Excerpt from Appl. No. 16/538,752: Apr. 28, 2020 Office Action Rejection	752 Appl. Second Rejection
1060	Excerpt from Appl. No. 16/538,752: Jul. 27, 2020 Response to Office Action	752 Appl. Second Response
1061	Excerpt from Appl. No. 16/538,752: Nov. 3, 2020 Notice of Allowance	752 Appl. Notice of Allowance
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. 16/860,441: Nov. 12, 2020 Notice of Allowance	441 Appl. Notice of Allowance

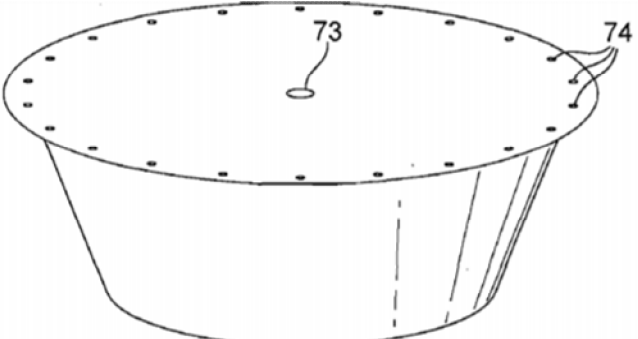
APPENDIX C

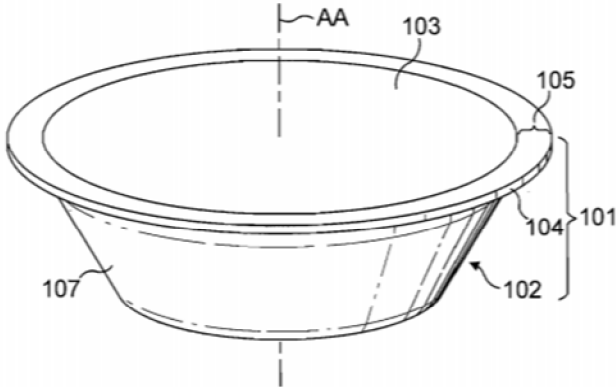
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
1. A beverage system for making a beverage, comprising:	<i>Yoakim:</i> “The present invention relates to a capsule, device, system, 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.” <i>See, e.g.</i>, [0002]. “The invention also concerns a system for preparing a beverage or food liquid from a food substance contained in a filtering receptacle by passing water through the substance using centrifugal forces . . . wherein the system further comprises referencing means for positioning and referencing the capsule in a removable manner in the device and in operational relationship with the water feed means and along an axis of rotation along the driving means.” <i>See, e.g.</i>, [0139]-[0144]. “The system 1 of the invention is illustrated in FIG. 1 in the more general sense. The system comprises a device 2 and a capsule 3. The device has a brewing module 4 into which the capsule can be inserted for being brewed and is removed after use for being discarded (e.g., for waste or recycling). The module is in fluid communication with a water reservoir 5 containing fresh or, alternatively heated water. A fluid transport means such as a low pressure pump 6 can be provided in the water circuit to transport water from the reservoir to the module. A water heater 7 is further provided to heat water to the desired temperature. It can be noted that water could be heated in the reservoir itself and water could be transported from the reservoir by effect of vaporization. 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.” <i>See, e.g.</i>, [0180].

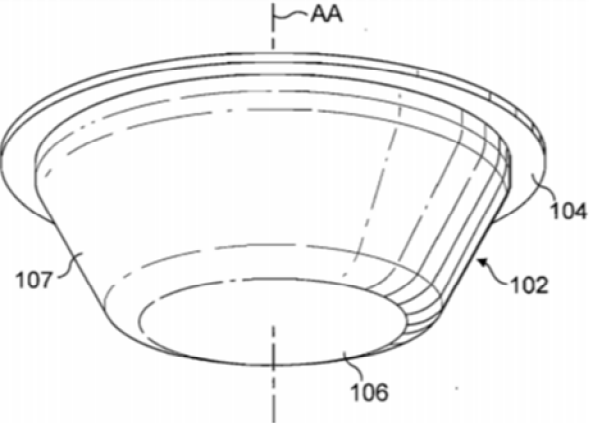
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	“The capsule contains a substance chosen among the list consisting of ground coffee, soluble coffee, tea, a whitener such as dairy or non-dairy ingredient(s), herbal tea, nutritional substance, culinary ingredients and a mixture thereof.” <i>See, e.g.</i>, [0198]. “FIGS. 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of FIGS. 2 to 5. 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. The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.” <i>See, e.g.</i>, [0197]. “The invention also relates to a food liquid preparation device for preparing a food liquid from a food substance contained in a single-use capsule, removably insertable in the device, by passing water through the substance in the capsule, comprising a water injection head in the capsule and a capsule holder for holding the capsule in the device...” <i>See, e.g.</i>, [0219].

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	See, e.g., FIGS. 6-7:  FIG. 6 FIG. 7 “As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105.” See, e.g., [0414]. See, e.g., FIGS. 26 and 27:

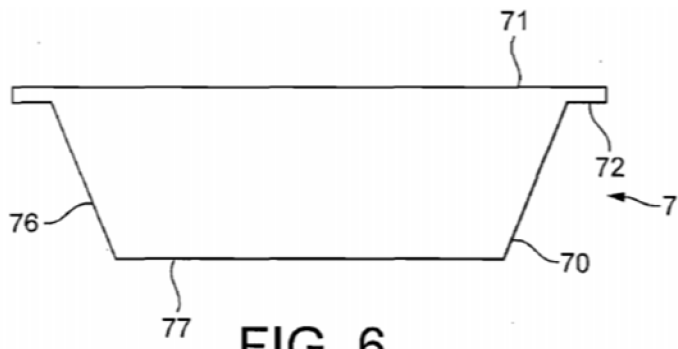
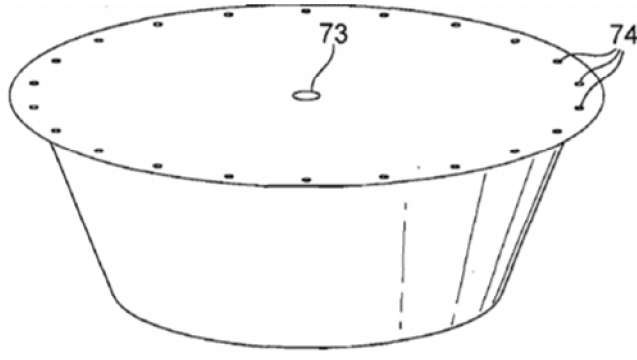
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 26  FIG. 27
[1.b] a flange extending outwardly from the base element, the flange comprising a top side and an	<i>Yoakim:</i> “FIGS. 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of FIGS. 2 to 5. 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. The body

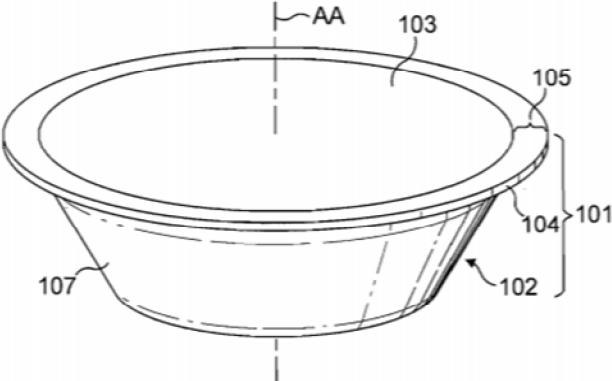
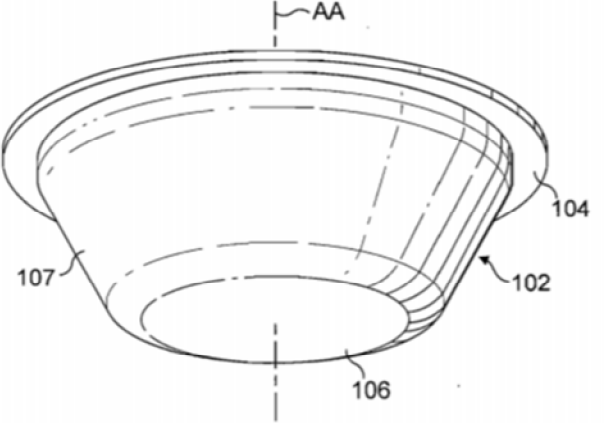
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
opposing bottom side;	terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.” <i>See, e.g.</i>, [0197]. <i>See, e.g.</i>, FIGS. 6-7:  FIG. 6  FIG. 7 “As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm. The dished body comprises a bottom wall 106 and a

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	side wall 107 which preferably widens in direction of the large open end of the body opposed to the bottom wall. The dished body is preferably rigid or semi-rigid. It can be formed of a food grade plastics, e.g., polypropylene, with a gas barrier layer such as EVOH and the like or aluminium alloy or a complex of plastic and aluminium alloy. The sealing foil 103 can be made of a thinner material such as a plastic laminate also including a barrier layer or aluminium alloy or a combination of plastic and aluminium alloy. The sealing foil is usually of a thickness between 30 and 250 microns, for example. The sealing foil membrane can be pierced for creating the water inlet and the beverage outlet(s) as will be described later in the description.” <i>See, e.g., [0414].</i> <i>See, e.g., FIGS. 26 and 27:</i>  FIG. 26

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 27
[1.c] a cover that is fastened to the top side of the flange to close the cavity;	<i>Yoakim:</i> “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.” <i>See, e.g.</i>, [0128]. “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.” <i>See, e.g.</i>, [0129]. “FIGS. 6 and 7 illustrate a capsule that can suit the device according to the different embodiments of FIGS. 2 to 5. 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. The body terminates by an upper edge 72 raising outwards onto which is sealed a lid 71. The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the

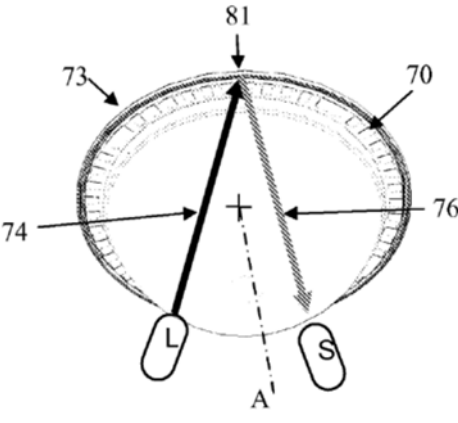
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.” <i>See, e.g.</i>, [0197]. “As shown in FIGS. 26 and 27, a preferred capsule 101 of the invention generally comprises a dished body 102 onto which is sealed a sealing foil 103. The sealing foil 103 is sealed onto a peripheral rim 104 of the body at a sealing annular portion 105. The rim 104 can extend outwards forming a small annular portion, e.g., of about 2-5mm. The dished body comprises a bottom wall 106 and a side wall 107 which preferably widens in direction of the large open end of the body opposed to the bottom wall. The dished body is preferably rigid or semi-rigid. It can be formed of a food grade plastics, e.g., polypropylene, with a gas barrier layer such as EVOH and the like or aluminium alloy or a complex of plastic and aluminium alloy. The sealing foil 103 can be made of a thinner material such as a plastic laminate also including a barrier layer or aluminium alloy or a combination of plastic and aluminium alloy. The sealing foil is usually of a thickness between 30 and 250 microns, for example. The sealing foil membrane can be pierced for creating the water inlet and the beverage outlet(s) as will be described later in the description.” <i>See, e.g.</i>, [0414]. <i>See, e.g.</i>, FIGs. 6-7:

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 6  FIG. 7 <i>See, e.g., FIGS. 26 and 27:</i>

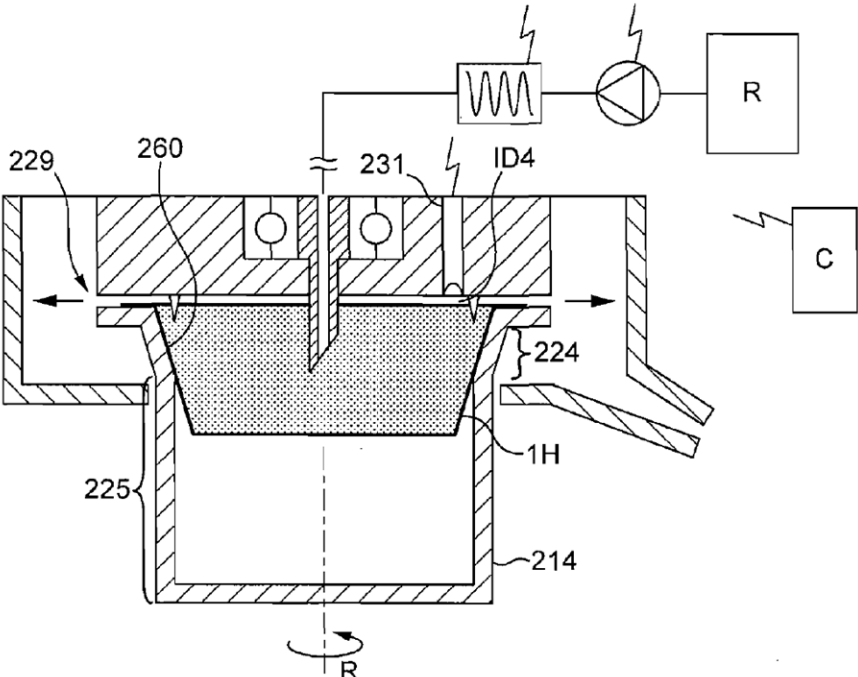
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 26  FIG. 27
[1.d] and a barcode provided	<i>Yoakim:</i>

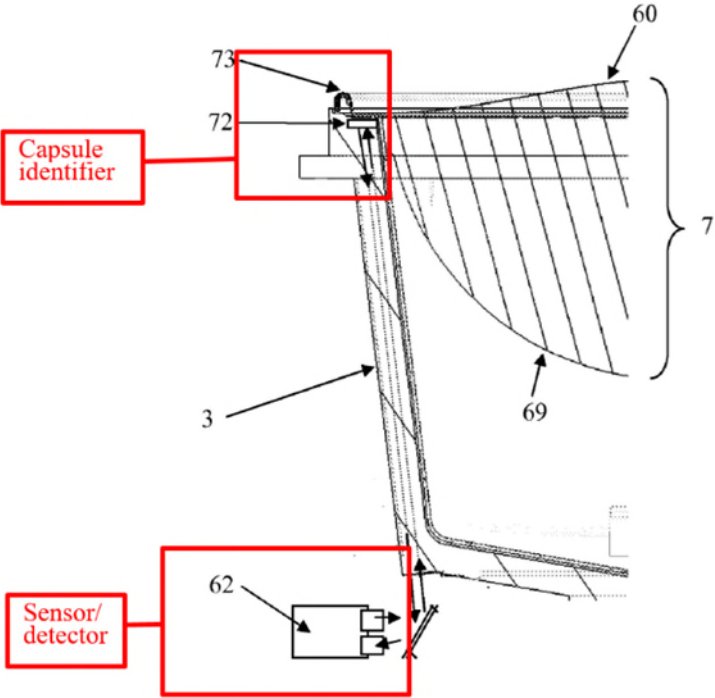
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
on the bottom side of the flange; and	“The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly.” <i>See, e.g.</i>, [0477]. “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.” <i>See, e.g.</i>, [0496]. “The recognition means can be any mechanical, optical, magnetic or radio-frequency recognition means capable of delivering information to the brewing device, via a sensing device 231, as to which type of capsule is inserted in the device. For example, the recognition means is a barcode, a colour code, a RFID tag, a magnetically sensitive element, or a mechanical key or shape. 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, americano, 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.” <i>See, e.g.</i>, [0525]-[0526]. <i>Jarisch:</i> <i>See</i> [0002]-[0003]; [0034]-[0035]. “The invention relates more particularly to the identification of the capsule by means of a code. The code may be necessary to control parameters in the beverage preparation device such as liquid or beverage flow rate, pressure, rotational speed, temperature and combinations thereof.” <i>See, e.g.</i>, [0006]. “The aim of the present invention is to propose an improved way to identify the capsule within a beverage production machine to ensure a more reliable and convenient retrieval or reading of information so as to adjust working parameters of the machine. This aim is achieved

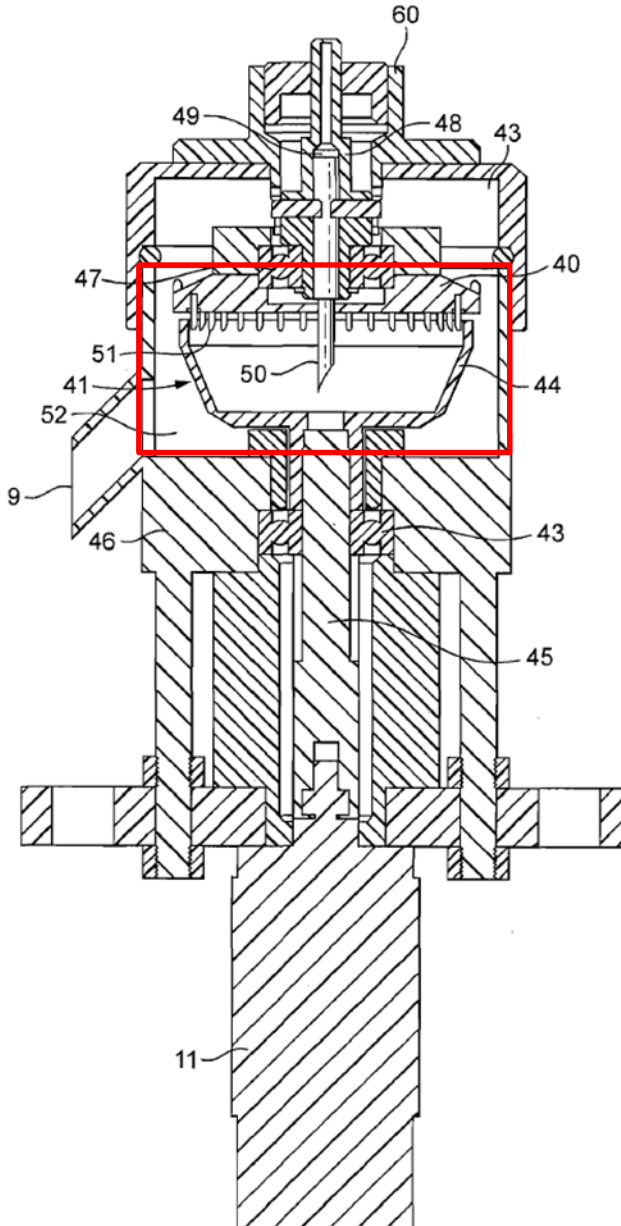
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	by a capsule for the preparation of a beverage comprising a container and a beverage ingredient contained therein, wherein the container comprises a code adapted for being identified or read by external reading means, wherein the code is arranged on the container to be read while the capsule is rotated around an axis of rotation traversing the capsule.” <i>See, e.g.</i>, [0014]-[0015]. “In the most preferred embodiment, the code is present on the bottom of the rim of the capsule which is opposed to the lid of the capsule. The bottom of the rim is sufficiently away from the liquid injection and beverage delivery areas so that there is a lower risk for the code to become unreadable such if partly or totally hidden or soiled by beverage residues or otherwise (e.g., coffee particles). As a result, the reading is made more reliable. The reading may also be carried out while the capsule is in place in the beverage production device. Therefore, the preparation of the beverage is simplified and the preparation time can be reduced.” <i>See, e.g.</i>, [0022]. “In particular, the reading means may comprise a light emitter and a light sensor. In an alternative, the reading means comprises an inductive sensor. The optical reading means or inductive sensor may be arranged to detect a code on the rim of the capsule.” <i>See, e.g.</i>, [0024]. “In the embodiment of FIG. 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the FIG. 4 to deflect the forward and backward beams.” <i>See, e.g.</i>, [0082]. <i>See also</i> FIG. 5:

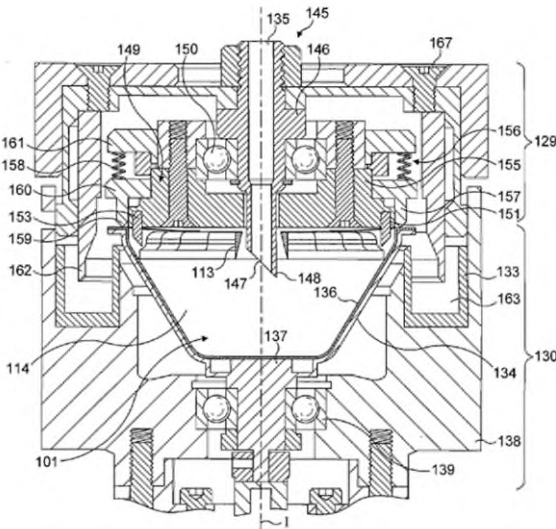
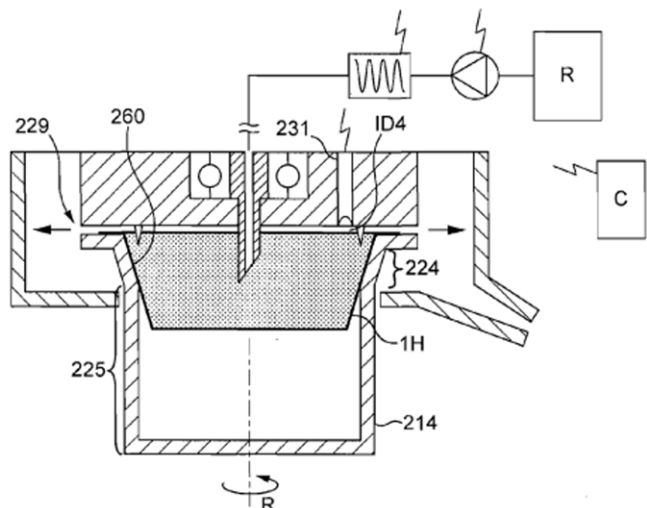
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani	
	 <i>See also</i> FIG. 4.	
[1.e] a beverage machine comprising: a sensor/detector configured to read the barcode;	<i>Yoakim:</i> “The device is useful for preparing beverages from a plurality of different capsules, in which case it further 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 including the flow rate and the volume of liquid to be injected into the capsule, 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.” <i>See, e.g.</i>, [0025]. “In an alternative illustrated in FIGS. 61 and 62, the identification means are directly associated to the different capsules. In this case, the identification means ID4 and ID5 are capsule recognition means attached to or embedded in the capsules. The recognition means can be any mechanical, optical, magnetic, or radio-frequency recognition means capable of delivering information to the brewing device, via a sensing device 231, as to which type of capsule is inserted in the device. For example, the recognition means is a barcode, a colour code, a RFID tag, a magnetically sensitive element, or a mechanical key or shape.” <i>See, e.g.</i>, [0525].	

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	“Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according the capsule which is inserted in the device. 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.” <i>See, e.g.</i>, [0192]. “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.” <i>See, e.g.</i>, [0477]. “The identification means can be sensed by sensing means connected to the control means for an active control of the parameters or can be passive identification means, e.g., selective flow restriction means. In particular, the identification means comprises capsule recognition means which are recognized by the sensing means connected to the control means of the brewing device which controls the brewing parameters accordingly. The recognition means can be differentiable by a visual code such as a barcode, a colour, a sign, a

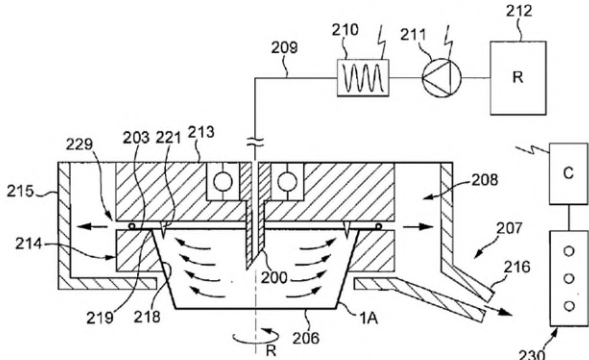
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	logo, etc., or by a radio-frequency (RFID), a magnetic element or by an identifiable shape.” See, e.g., [0494]-[0496]. See, e.g., FIG. 61 at 231:  FIG. 61 <i>Jarisch:</i> “In the embodiment of the FIG. 4, the light source is placed at the bottom of the centrifugal cell 3. This cell is light conductive allowing the beam to reach the bottom side 72 of its rim 73. The reflected light is conducted by the transparent (or light conductive) centrifugal cell 3 to reach the sensor 62. In case that the sensor 62 cannot be aligned with the transparent part of the centrifugal cell 3, a mirror can be placed as illustrated in the FIG. 4 to deflect the forward and backward beams. See, e.g., [0082]

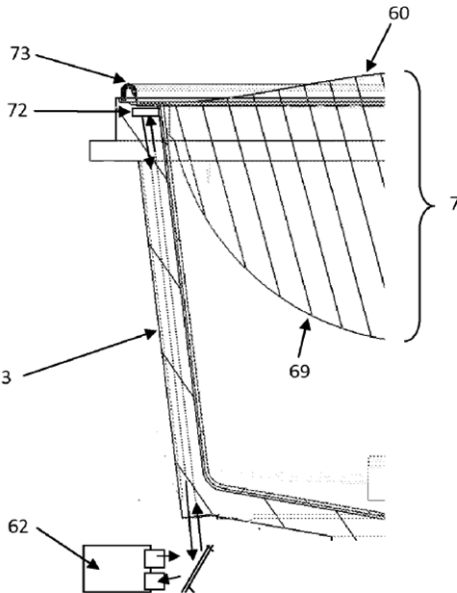
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	See, e.g., FIG. 4 (annotated): 
[1.f] a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange; and	<i>Yoakim:</i> “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, e.g., [0187] “The brewed liquid is collected in a collecting chamber 52 of the support 46 and drained through a collecting tube 9.” See, e.g., [0194] “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.” See, e.g., [0024]

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	See also [0216], [0478]. See, e.g., FIG. 4 (annotated):  FIG. 4

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	<i>See, e.g., FIG. 35:</i>  <i>See, e.g., FIG. 61:</i>  FIG. 61
[1.g] a pump controlled to	<i>Yoakim:</i>

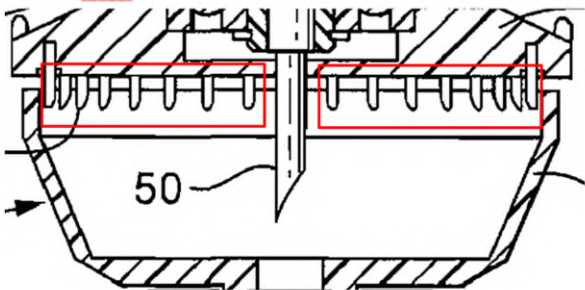
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
supply water into the single-serve capsule;	“The device has a brewing module 4 into which the capsule can be inserted for being brewed 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. ” <i>See, e.g.</i>, [0180] “The capsule system further comprises an identification means associated to the different capsules in the set for identifying each capsule and adjusting brewing parameters accordingly The identification means are associated to control means . . . by controlling the rotational motor driving the capsule holder <i>or/and the pump supplying liquid in the capsule.</i>” <i>See, e.g.</i>, [0477] “The device is useful for preparing beverages from a plurality of different capsules, in which case it further 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, including the flow rate and the volume of liquid to be injected into the capsule, 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.” <i>See, e.g.</i>, [0025] “The flow rate of injected liquid in the capsule can be controlled by measuring it with a flow meter. In order for this flow rate to be maintained within a given range or value during beverage centrifugation, the rotational speed is monitored continuously or at very short time intervals. Since the flow rate influences directly the residence time of liquid in the capsule, thereby the brewing conditions, it is preferred to control the flow rate at predetermined values as a function of the desired beverage (e.g., coffee type) rather

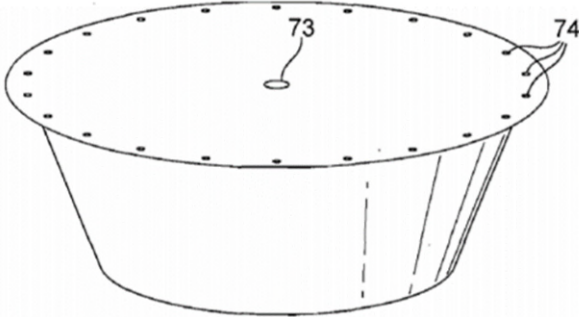
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	than controlling the rotational speed at predetermined values.” <i>See, e.g.</i>, [0191] “ The control unit may control the delivery of the added volume of water so that the volume is added at the same time as the coffee extract is delivered by centrifugation”) <i>See, e.g.</i>, [0218]
[1.h] wherein the single-serve capsule is free of a filter that is located inside of the cavity,	<i>Yoakim:</i> “In this mode, premade radial outlets for the brewed liquid are provided in the capsule. For instance, a series of slits are provide in the lid and/or body. When the capsule is driven in rotation, the brewed liquid can pass through the slits whereas the solid particles are retained in the capsule. An additional filtering layer can be used to filter the liquid depending on the size of the outlets.” <i>See, e.g.</i>, [0171]. “In a possible mode, the portion of wall with the outlet openings can be formed from a paper filter or woven, non-woven fibres, meshed material, porous polymer membrane or combination thereof. In this case, part of the portion of wall can be formed by a band or different parts of the filter, fibres or meshed material. . . .” <i>See, e.g.</i>, [0343]. <i>See, e.g.</i>, FIG. 54:  FIG. 54

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
[1.i] the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element; and	<i>Jarisch:</i> See, e.g., FIG. 4:  <i>Yoakim:</i> “The sealed capsule is made of materials having gas barrier properties and is <i>sealed in a fluid tight manner so that ingress of air in the capsule is prevented.</i> Furthermore, the capsule <i>preferably contains an inert gas that improves the freshness of substance in the capsule.</i>” See, e.g., [0121] “The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and support layers made of polymers, aluminium and/or aluminium alloys. The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, e.g., thin aluminium and/or plastic.” See, e.g., [0128]-[0129]

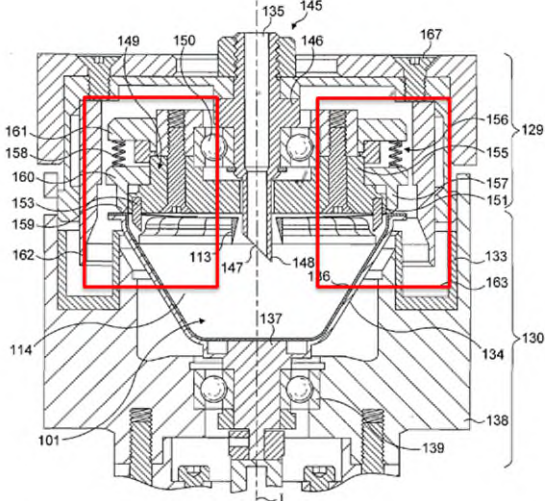
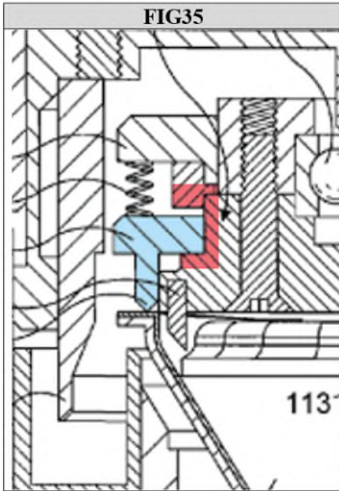
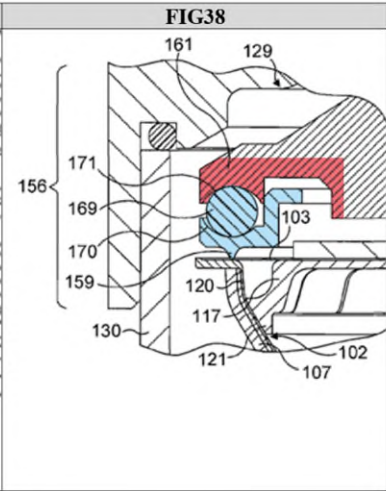
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	“Preferably, the enclosure is partially filled with a substance for enabling the substance to move against a peripheral wall of the capsule during the centrifugation process. The free volume in the enclosure of the capsule is preferably at least partially filled by a protective gas to preserve the freshness of the substance. A suitable protective gas is nitrogen for example. The free volume can also be partially occupied by a gas coming from the substance after degassing of the substance in the capsule. Such gas for ground coffee can be carbon dioxide.” <i>See, e.g.</i>, [0270]
[1.j] a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule;	<i>Yoakim:</i> “The capsule can comprise a sealing lid. The sealing lid can comprise a flexible membrane. The membrane can comprise gas barrier and Support layers made of polymers, aluminium and/or aluminium alloys. The capsule can also comprise a cup-shaped body onto which the sealing lid is sealed. The cup-shaped body may also comprise gas barrier materials, such as metal, <i>e.g.</i>, thin aluminium and/or plastic.” <i>See, e.g.</i>, [0128]-[0129] “The lid may be a flexible pierceable membrane of several microns in aluminium and/or plastic. The lid can be welded on the upper edges 72 of the body. It can be pointed out that the membrane and body preferably comprise gas barrier layers such as aluminium and/or EVOH.” <i>See, e.g.</i>, [0197] “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.” <i>See, e.g.</i>, [0121] “As used herein, the term "sealed" capsule means that the capsule is made of materials having gas barrier properties and is sealed in a

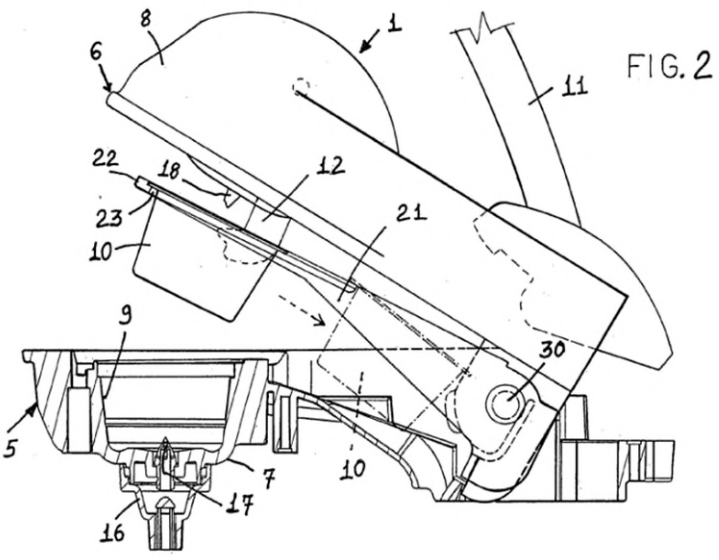
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	fluid tight manner so that ingress of air in the capsule is prevented.” See, e.g., [0096] “In a preferred mode, a gastight sealing 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 lid. The substance, such as coffee or milk, is thus less subject to possible oxidation.” See, e.g., [0355] “In the context of the invention, the capsule can contain food substances among a large choice of food ingredients or mixtures of food ingredients. In particular, the substance can be chosen among the ingredients consisting of ground coffee, soluble coffee, dairy based powder, dairy or non-dairy creamer, cocoa, Sweetener, leaf tea, herbal tea, Soluble tea, culinary powder, Soluble or dispersible nutritional composition, liquid food concentrate and combinations thereof. 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. . . .” See, e.g., [0355]
[1.k] wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in a region that is offset from the central axis of the base element;	<i>Yoakim:</i> “At the inside surface of the injection lid 40 is placed a piercing structure 450 which has the function of piercing the injection side 30 of the capsule. A water injector or lance 50 is provided which traverses the injection side 30 and which comprises an injection conduit for carrying water from the water circuit into the capsule. The water injector 50 is preferably located in the centre of the capsule...The lid further comprises outlet piercing elements 51 which are placed on the inside of the lid at a radial position. Preferably, a series of piercing elements 51 are placed uniformly along the periphery of the lid. . . .” See, e.g., [186].

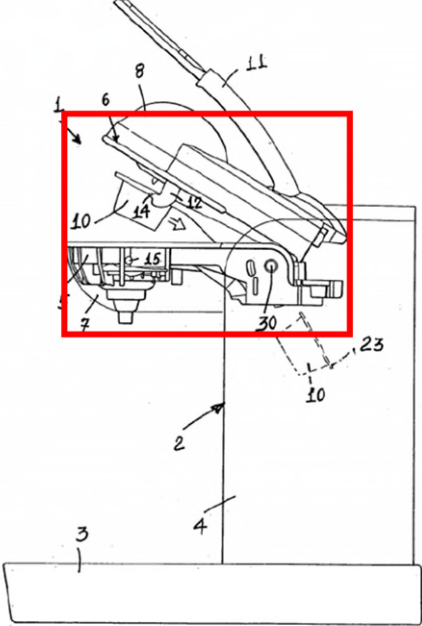
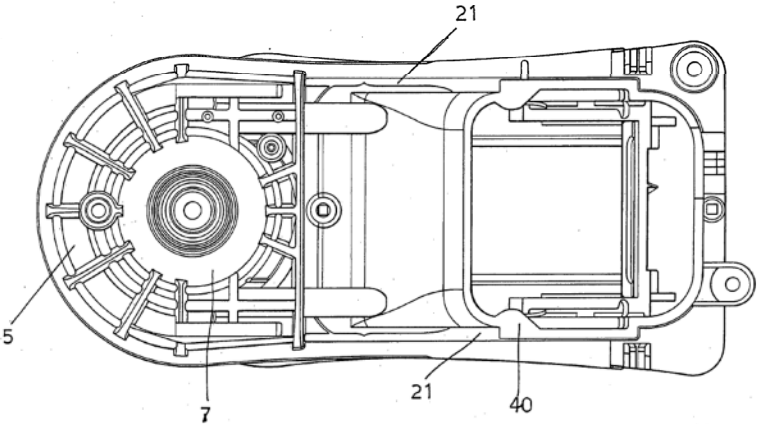
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	“FIG. 4 shows a more sophisticated system of the invention. . . . A series of needles 51 is also positioned on the side of the lid 40 to form small perforations at the periphery of the upper side of the capsule. . . .” <i>See, e.g.</i>, [0187]. <i>See, e.g.</i>, FIG.4 (annotated):  “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. . . .” <i>See, e.g.</i>, [0435] “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 communicating with the inside cavity for the brewed liquid to exit the capsule.” <i>See, e.g.</i>, [0199]. <i>See, e.g.</i>, FIG.7:

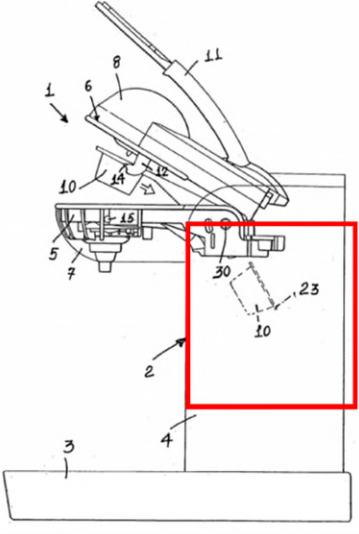
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 7
[1.1] (ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel;	<i>Yoakim:</i> “Preferably, the flow restriction means of the device comprises a valve means of the device, which is arranged at or after the outlet(s) of the capsule, for opening when a certain pressure is exerted on the valve means so that the liquid can release from the capsule out of the device.” <i>See, e.g.</i>, [0382] “Preferably, the flow restriction means comprises valve means which is arranged at <i>or after at least one outlet of the capsule</i> for opening when a certain pressure is exerted thereon by the pressurized liquid for enabling the liquid to be released from the capsule... In a preferred mode, the valve means can be formed by at least one engaging portion of the device which is adapted to move relatively to an engaged portion of the capsule under the effect of the pressurized liquid exiting the capsule, for making a thin annular laminating passage for the liquid.” <i>See, e.g.</i>, [0396]-[0398]. “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. . . .” <i>See e.g.</i>, [0388]. “The annular engaging portion [seal] includes a pressing peripheral surface 159 which applies a closing force on the peripheral rim 104 of

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	the capsule to be able to restrict the flow of liquid under the force of the elastic loading means. . . .” <i>See e.g.</i>, [0436]. “In this mode, the valve system 156 differs in that the elastic loading means is obtained by a rubber elastic O-ring 169 inserting between a lower member comprising a pinching surface 159 and an upper fixed portion 161 of the water injection subassembly 129. . . .” <i>See, e.g.</i>, [0446]. “A valve means in the device 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. As a result, the system of the invention provides a solution for preparing a food liquid wherein a controlled release of the food liquid can be carried out. For example, the release of liquid can be delayed until a certain pressure is exerted on the valve means which is sufficient to form a passage for flow of liquid. A delayed opening of the valve means enables to improve the interaction between water and the substance contained in the capsule. . . .” <i>See, e.g.</i>, [0384]-[0385] <i>See e.g.</i>, FIG. 35 and 38 (annotated):

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 35 FIG35  FIG38 
[1.m] (iii) a pair of holding arms for engaging the single-serve capsule; and	<i>Castellani:</i> “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

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	portion 22 designed for encompassing the top of the coffee capsule 10, which is suitably provided with a perimetrical bearing edge portion 23.” <i>See, e.g.</i>, [0043]. “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.” <i>See, e.g.</i>, [0053]. “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.” <i>See, e.g.</i>, [0054]. <i>See e.g.</i>, FIG. 2:  <i>See e.g.</i>, FIG. 7 (annotated):

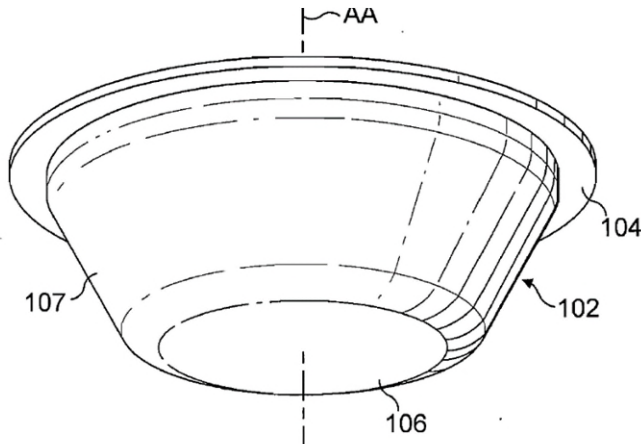
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	 FIG. 7 See e.g., FIG.11: 
[1.n] (iv) a dropping box for the single-serve capsule to fall into;	<i>Castellani:</i> “Upon achieving 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

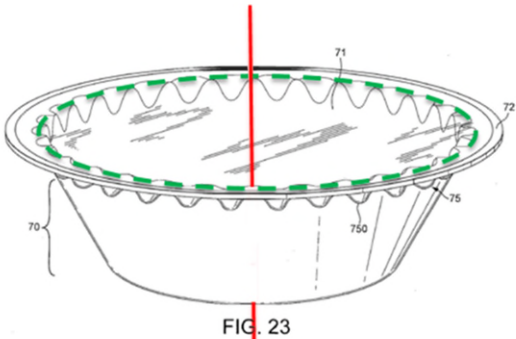
Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	collecting vessel formed in the upright 2.” See, e.g., [0054]. See e.g., FIG. 7 (annotated): 
[1.o] wherein the pump is controlled to push the water into the single-serve capsule only upon a determination that the read barcode agrees with a stored reference.	Yoakim: “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, e.g., [0477]. “Therefore, as much as two, three, four or even more different flow rates and/or speed ranges can be provided in function of the types of

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	coffee to be delivered. Therefore, depending on the types of beverage to be brewed, the control unit can be programmed to adjust the optical centrifugal conditions. For instance, the control unit may be associated to a capsule recognition system enabling to recognize the types of capsules, i.e., espresso, lungo, cappuccino, long coffee (e.g., 180-400 ml), latte, tea, etc., and to adjust the speed and/or other brewing parameters (e.g., water temperature) according to the capsule which is inserted in the device. 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.” <i>See, e.g.</i>, [0192]. “The device is useful for preparing beverages from a plurality of different capsules, in which case it further 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, including the flow rate and the volume of liquid to be injected into the capsule, 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.” <i>See, e.g.</i>, [0025]. “ The control unit may control the delivery of the added volume of water so that the volume is added at the same time as the coffee extract is delivered by centrifugation” <i>See, e.g.</i>, [0218]. <i>Rossi:</i> “The load element of the system comprises an identifying element for its recognition and a validation element for its validation. These are preferably in the form of barcodes, antennae, or paints having optically measurable properties. The machine comprises means for recognising the load element and the validation element, such as at least one infra read barcode reader, radio frequency wave

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	transmitter and receiver, or optical sensor.” <i>See, e.g.</i>, p. 11. “The system further optionally comprises checking means connected to a control unit of the machine. This may be in the form of a computer programme within the control unit. The checking means compares the signal from the recognising 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 recognises the identifying element and the unvalidated validation element.” <i>See, e.g.</i>, p. 11. “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. . . .” <i>See, e.g.</i>, p. 9. “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.” <i>See., e.g.</i>, p. 13.
2. The beverage system according to claim 1, wherein the pump is controlled to not push water into the single-serve capsule upon a determination that the read barcode does not agree	Rossi: “The technical task, as well as these and other objects, are achieved according to the present invention by a process for controlling the operation of an edible-product making machine of the type being fed with a single use load element having a brewable or water soluble aromatic substance for preparation of said edible product, characterised in that it comprises a first step of recognition wherein said edible-product making machine recognises an identifying element on said load element allowing said edible-product making machine to take further steps only if it also recognises on said load element a validation element to be validated, a second step of

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
with a stored reference.	validation of said validation element, and a third step of activation 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.” <i>See, e.g.</i>, p. 6 “The edible-product making machine is only allowed to take further steps if it in the first step also recognises on the load element a validation element to be validated. In practice, this may take the form of unlocking the machine when both the identification element and the unvalidated validation element are recognised. Thus, the production process cannot be activated unless the first step has been completed. The process could also require that the validation element be of a specific kind or be related to or associated to the identification element in a specific way in order for this first step to be completed. . . .” <i>See, e.g.</i>, p. 9 <i>Yoakim:</i> “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.” <i>See, e.g.</i>, [0477].
3. The beverage system according to claim 1, wherein the sensor/detector of the beverage machine is configured to compare the read barcode with the stored reference.	<i>See</i> [1.0]

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
4. The beverage system according to claim 1, wherein the base element comprises a bottom having an indentation	<i>Yoakim:</i> “Such a configuration of capsules enables to deliver a wider range of beverages, e.g., ristretto, espresso and lungo coffees (or even larger coffee volumes) in a more convenient manner. In particular, the capsules geometrical configuration enables to accommodate in a same brewing device capsules of different volumes without requiring specific adaptations of the device. In a mode, the different capsules in the set have at least one upper body portion having substantially the same angle or the same stepped profile in the set. The upper body portion can be, for instance, a truncated or cylindrical portion. In mode, the body comprises a lower portion of variable length whereas the upper portion can be of constant length for all capsules in the set. The lower portion can be convex, flat or concave.” See, e.g., [0471]-[0473] See e.g., FIG. 27:  FIG. 27
5. The beverage system according to claim 4, wherein the side wall of the base	<i>Yoakim:</i> “FIG. 23 illustrates another capsule of the invention. The capsule comprises means for connecting [the capsule] to the external rotational driving means of the device. For this, capsule has a

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
element includes indentations	toothed structure 75 on at least one of its outer surface. The capsule has a body 70 comprising an upper edge 72 which can be closed by an upper membrane 71. The toothed structure comprises a series of teeth which is positioned below the edge or rim 72 of the body of the capsule. The teeth are placed along the whole periphery of the body of the capsule. The body of the capsule can be made of plastic and/or aluminium or aluminium alloy. For example, it can be moulded by injection of plastic or deep drawing in aluminium. For example, the shape of the teeth could be slightly triangular, oval, rectangular or pyramidal. It should be noticed that <i>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.</i> See, e.g., [215] See e.g., FIG. 23 (annotated):  FIG. 23
6. The beverage system according to claim 1, wherein the base element is made of a biodegradable material.	Yoakim: “The device of the invention may receive capsules made of rigid, semi-rigid and/or soft materials. The capsule may be made of materials such as plastics, aluminium, cellulose-based materials or other biodegradable materials, and combinations therefore [sic] . . .” See, e.g., [0237].

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	“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)” <i>See, e.g.</i>, [0180]. “The capsule contains a food substance for being brewed and the capsule is removed from the module after use for being discarded (e.g., for waste or recycling of the organic and inorganic raw materials)” <i>See, e.g.</i>, [0427].
7. A beverage system for making a beverage, comprising:	<i>See</i> claim 1.
[7.a] a single-serve capsule comprising: a base element with a cavity, in which a raw beverage material is provided;	<i>See</i> [1.a]
[7.b] a flange extending outwardly from the base element, the flange comprising a top side and an opposing bottom side;	<i>See</i> [1.b]
[7.c] a cover that is fastened to the	<i>See</i> [1.c]

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
top side of the flange to close the cavity;	
[7.d] and an identifier provided on the bottom side of the flange, the identifier being a barcode; and	See [1.d]
[7.e] a beverage machine comprising: a sensor/detector,	See [1.e]
[7.f] a brewing chamber configured to receive the base element of the single-serve capsule and having an end portion that opposes the bottom side of the flange; and	See [1.f]
[7.g] a pump controlled to supply water into the single-serve capsule;	See [1.g]

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
[7.h] wherein the single-serve capsule is free of a filter that is located inside of the cavity,	See [1.h]
[7.i] the single-serve capsule also comprises: (i) an upper end portion that has an annular convexity and a lower end portion that has an annular concavity relative to the central axis of the base element;	See [1.i]
[7.j] (ii) a barrier layer to prevent moisture or aroma from escaping out of the single-serve capsule; and	See [1.j]
[7.k] (iii) a side wall having indentations;	See claim 5.
[7.l] wherein the beverage machine also comprises: (i) a mandrel that is configured to pierce the cover in	See [1.k]

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
a region that is offset from the central axis of the base element;	
[7.m] (ii) a seal that is configured to seal against the cover in a region between a peripheral edge of the flange and the region of the cover that is pierced by the mandrel;	See [1.l]
[7.n] (iii) a pair of holding arms for engaging opposite sides of the single-serve capsule; and	See [1.m]
[7.o] (iv) a dropping box for the single-serve capsule to fall into;	See [1.n]
[7.p] wherein the beverage machine, by reading or detecting the identifier with the sensor/detector, is	Rossi: “The technical task, as well as these and other objects, are achieved according to the present invention by a process for controlling the operation of an edible-product making machine of the type being fed with a single use load element having a brewable or water

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
configured to determine if the single-serve capsule belongs to a group of single serve capsules operable for use with the beverage machine, and only if the beverage machine determines that the single-serve capsule belongs to the group of single serve capsules operable for use with the beverage machine is the pump controlled to push the water into the single-serve capsule.	soluble aromatic substance for preparation of said edible product, characterized in that it comprises a first step of recognition wherein said edible-product making machine recognises an identifying element on said load element allowing said edible-product making machine to take further steps only if it also recognises on said load element a validation element to be validated, a second step of validation of said validation element, and a third step of activation 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.” <i>See, e.g.,</i> p. 6. “Furthermore, edible-product making machines of the prior art, such as coffee machines fed with capsules containing coffee powder, are usually designed so as to operate with a certain design or type of load element. Use of an incorrect load element may cause the machine to malfunction and can prejudice the safety and integrity of the machine and the may harm the user. Within the scope of this technical task is therefore that of providing a safe and simple system and process for ensuring that an appropriate load element is used.” <i>See, e.g.,</i> p. 5. “The use of an identification element and recognition means, as well as the step of recognizing the identification element allows the machine to recognize the load element and, hence, its contents. . . . This prevents the user from having to verify the contents of the load element, and from having to know and select the operating conditions appropriate therefor. It also helps to prevent the safety hazard associated with the use of inappropriate operating conditions. 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

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	of inferior quality and ensuring the proper functioning of the machine.” <i>See, e.g.</i>, p. 7. “The load element of the system comprises an identifying element for its recognition and a validation element for its validation. These are preferably in the form of barcodes, antennae, or paints having optically measurable properties. The machine comprises means for recognising the load element and the validation element, such as at least one infra read barcode reader, radio frequency wave transmitter and receiver, or optical sensor.” <i>See, e.g.</i>, p. 11. “The system further optionally comprises checking means connected to a control unit of the machine. This may be in the form of a computer programme within the control unit. The checking means compares the signal from the recognising 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 recognises the identifying element and the unvalidated validation element.” <i>See, e.g.</i>, p. 11. “ The edible-product making machine is only allowed to take further steps if it in the first step also recognises on the load element a validation element to be validated. In practice, this may take the form of unlocking the machine when both the identification element and the unvalidated validation element are recognised. Thus, the production process cannot be activated unless the first step has been completed. The process could also require that the validation element be of a specific kind or be related to or associated to the identification element in a specific way in order for this first step to be completed. 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.” <i>See, e.g.</i>, p. 9. “The machine 1 comprises recognising means in the form of an infrared barcode reader 7. This is connected to checking means 8

Claim Limitation	Obvious over US 2010/0239734 to Yoakim in view of US 2013/0064937 to Jarisch in view of WO 2010/099806 to Rossi in view of US 2008/0105131 to Castellani
	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.” <i>See, e.g., p. 13.</i> “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.” <i>See, e.g., p. 8.</i>
8. The beverage system according to claim 7, wherein the base element comprises a bottom having an indentation.	<i>See claim 4.</i>
9. The beverage system according to claim 7, wherein the base element is made of a biodegradable material.	<i>See claim 6.</i>
10. The beverage system according to claim 7, wherein the sensor/detector of the beverage machine is	<i>See claim 3.</i>

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configured to read the barcode and compare the read barcode with a stored reference.	