

Filed on behalf of Decent Espresso International Ltd.

By: Perry S. Clegg, Reg. No. 65,304
Johnson & Martin, P.A.
50 W. Broadway
Suite 900
Salt Lake City, UT 84101
Tel.: 801-783-3200
Email: perry.clegg@johnsonmartinlaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Decent Espresso International Ltd.,
Petitioner,

v.

Duvall Espresso IP Enforcement, LLC,
Patent Owner

Case IPR2024- 01483

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT 11,576,524
CHALLENGING CLAIMS 1-12**

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NOTE REGARDING CITATIONS: Exhibits and page numbers are cited herein in the form Ex[number]-[page(s)] or Ex[number], for example, Ex1001-9-11 means Exhibit 1001 pages 9-11. and Ex1008 means Exhibit 1008.

I. Introduction

Decent Espresso International Ltd. (“Decent” or “Petitioner”) respectfully requests *inter partes* review of claims 1-12 of U.S. Patent No. 11,576,524 (the “‘524 patent”) (Ex1001) pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.1 *et seq.*

All of the concepts claimed in the 524 patent were well-known and included in a large variety of prior art, including both numerous machines that were sold into the market (not available as prior art in IPRs) and numerous patents and publications before the Effective Filing Date. Expert witness Tinkler worked for Keurig and collaborated with numerous coffee machine companies during the period from 2005-2015, surrounding the filing dates of the 524 patent’s earliest provisional and non-provisional applications, in 2012 and 2013. Ex1002-6-7. During that time, expert Tinkler directed the design of over 60 coffee machines and collaborated on many others. *Id.*

Expert Tinkler confirms that numerous control systems of the type claimed in the 524 patent were known by August 2012. Ex1002-30.

The undersigned notes that at least five different primary prior art publications and patents, along with several actual machines, that anticipate or render obvious various claims of the 524 patent were located, but due to the prohibition against using machines as prior art along with the word count limitations for petitions, Petitioner provides one primary patent reference in this petition that clearly evidences unpatentability.

The 524 patent exists in a crowded technology field, and the submitted prior art patents and publications provide compelling evidence of unpatentability.

II. Certification of Grounds for Standing

Petitioner certifies pursuant to Rule 42.104(a) that the patent for which review is sought is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

III. Overview of Challenge and Relief Requested

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner challenges claims 1-12 of the ‘524 Patent.

A. Prior Art Patents and Printed Publications

The application for the ‘524 patent claims priority to a provisional application that was filed before the America Invents Act (“AIA”) and a non-provisional application that was filed after the AIA. As discussed further, below

§VIII-A, the ‘524 patent contains a priority claim to a patent application in which at least one claim was not entitled to claim priority to the pre-AIA filing; thus, AIA §3(n)(1) mandates treatment of all claims of the ‘524 patent under the AIA first-to-file rules, regardless of whether those claims are entitled to the priority date of the pre-AIA provisional application.

The following references are pertinent to the grounds of unpatentability:

1. U.S. Patent No. 8,973,487 B2 (Ex1003) (collectively with Ex1004, “Startz”), filed May 21, 2012, issued March 10, 2015, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(e) (pre-AIA)).

2. U.S. Patent Application Publication No. 2012/0291634A1 (Ex1004) (collectively with Ex1003, “Startz”), filed May 21, 2012, published Nov. 22, 2012, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(e) (pre-AIA)).

3. U.S. Patent Application Publication No. 2014/0053734 (Ex1005) (“Santi”), filed April 26, 2012, published Feb. 27, 2014, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(e) (pre-AIA)). Santi was filed under the PCT, in English, and identified the United States as a designated state. Ex1006-1 (items 25, 81).

4. U.S. Patent Application Publication No. 2012/0171332A1 (Ex1007) (“Lai”), filed Dec. 28, 2011, published Feb. 27, 2014, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(e) (pre-AIA)).

5. International Publication No. WO2011/151703A2 (Ex1008) (“Majer”), published Dec. 8, 2011, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(a) or (b) (pre-AIA)).

6. U.S. Patent Application Publication No. 2014/0069279A1 (Ex1009) (“Upston”), filed May 10, 2012, published Mar. 13, 2014, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(e) (pre-AIA)). Upston was filed under the PCT, in English, and identified the United States as a designated state. Ex1010-1-2 (items 25, 81).

7. International Publication No. WO2011/158131 (Ex1011) (“Porzio”), published Dec. 22, 2011, is prior art under at least 35 U.S.C. §102(a) (and 35 U.S.C. §102(a) or (b) (pre-AIA)).

B. Grounds for Challenge

Petitioner requests cancellation of claims 1-12 of the ’524 patent as unpatentable under 35 U.S.C. §103. This Petition, supported by the Declaration of Ian Tinkler (Ex1002), demonstrates a reasonable likelihood that Petitioner will prevail with respect to cancellation of at least one challenged claim and that each challenged claim is not patentable. See 35 U.S.C. §314(a).

The grounds for challenge are:

<u>Ground #</u>	<u>References for §103 Grounds</u>	<u>Challenged Claims</u>
1.	Startz in view one or more of the knowledge of a POSA, Lai, Santi, Porzio, and/or Majer	1-5
2.	Startz in view one or more of the knowledge of a POSA, the applicant admitted prior art (“AAPA”), Lai, Santi, Porzio, and/or Majer	6-10
3.	Startz in view one or more of the knowledge of a POSA, Upston, Lai, Santi, and/or Majer	11
4.	Startz in view one or more of the knowledge of a POSA, AAPA, Upston, Lai, Santi, Porzio, and/or Majer	12

IV. Discretion Under 35 U.S.C. §314(a) and §325(d)

The prior art provides compelling evidence of unpatentability. Moreover, Petitioner is filing a Sotera stipulation herewith.

Petitioner urges the board to grant review according to the compelling substantive merit of this petition.

V. Overview: ‘524 Patent

A. Brief Technology Description

The ‘524 patent relates to brewing coffee in an electro-mechanical device.

B. The Alleged Problem

The ’524 patent acknowledges well-known problems/goals:

- a. “Therefore, a beverage brewing system that affords precise, accurate and dynamic temperature control would enable

optimization of beverage flavor and is needed.”

- b. “As previously explained, there is an acute need for a brewing system that affords the brewer independent, dynamic variation of brewing variables of temperature, pressure and flow rate during the production of infused beverages.”
- c. “Furthermore, there is a need for a brewing system that mitigates and/or eliminates the impact of external factors such as solute particle size variations and solute compaction on the beverage flavor.”

The claims of the ‘524 patent are directed to the first problem, as they address neither independent variation of brewing variables nor solute particle size/compaction. Ex1002-15. As expert Mr. Tinkler confirms, this problem was well-known in the art, with numerous devices on the market seeking precise, accurate, dynamic control. Ex1002-30.

C. The 524 Patent

The ‘524 patent claims a device and system for brewing infused beverages. Various beverages, including teas and coffees, may be infused by passing a solvent (heated water) over a solute (tea or coffee). The word “coffee” does not appear in the 524 Patent. However, the technology and terminology used in the patent (e.g., pressure, flow, temperature, steam for frothing, etc.), the infringement allegations

regarding espresso machines, and FIG. 4 (similar to an espresso machine group head) demonstrate that at least one object of the 524 Patent is to describe coffee-making devices. Ex1002-13-14.

The specification describes a system, illustrated in FIG. 2, in which two solvents (201, 202) are pumped through two conduits by two pumps (211, 212) through at least one thermal modulator (221, 222). The conduits are joined at a conduit joint to form a resulting conduit (203) for mixing the solvents. The mixed solvents are pumped into a brewing chamber (230) where they encounter a solute (ground coffee) to create a solution (espresso coffee) that is discharged into a receptacle (250).

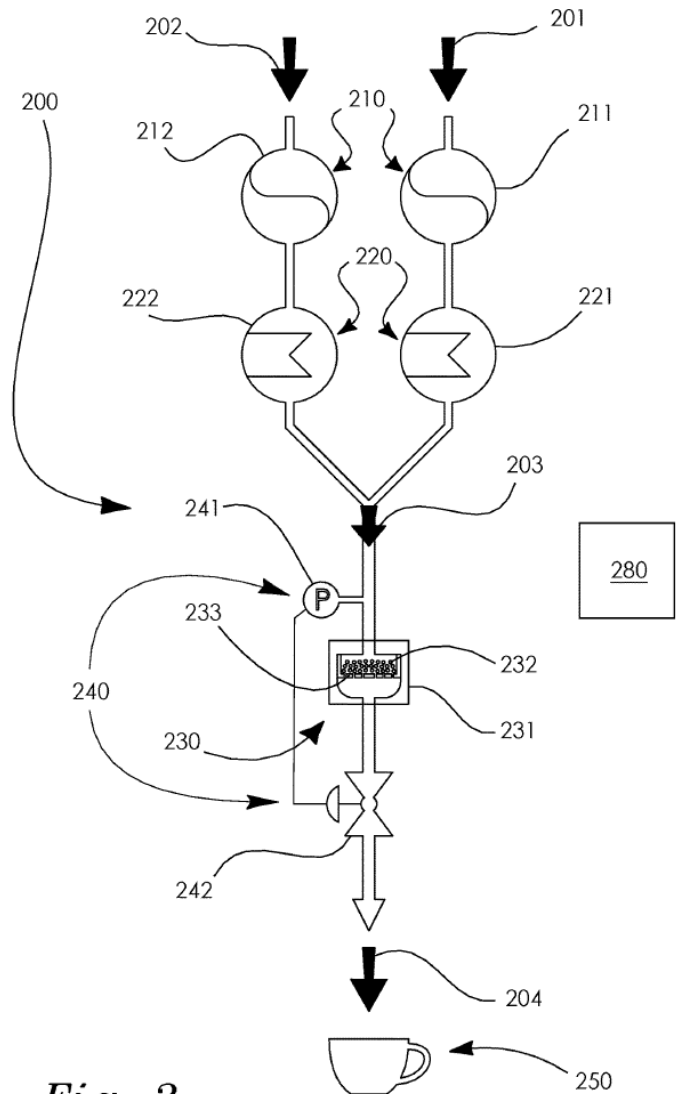


Fig. 2

Ex1001; Ex1002-14-15.

The 524 Patent uses an electronic controller (280) to modify flow rate,

temperature, and/or pressure, by receiving data from flow meters, pressure sensors, and/or temperature measuring devices, then using that data to control/modulate the pumps and/or thermal modulators to affect temperature, flow, and/or pressure.

Ex1002-15.

D. The Alleged Invention

The '524 patent claims purportedly novel concepts: (1) formation of a solvent joint by directly connecting conduits; (2) including an electronic controller configured to control flow and heating of solvent in two conduits; and (3) “dynamic” modulation of the solvent heat based on specific placements of a flow meter and temperature sensors. Ex1001, Claims 1-12.

These claimed concepts were well-known and included in a large variety of prior art, including both numerous machines that were sold (unavailable as prior art in IPRs) and numerous patents and publications before the Effective Filing Date. Expert Tinkler worked for Keurig and collaborated with numerous coffee machine companies during the period from 2005-2015, surrounding the potential effective filing dates in 2012 and 2013. Ex1002-6-7. During that time, expert Tinkler directed the design of over 60 coffee machines and collaborated on many others.

Id.

Expert Tinkler confirms that numerous control systems of the type claimed

in the 524 patent were known by August 2012. Ex1002-30.

The undersigned notes that at least five different primary publications/patents and several physical machines, that anticipate or render obvious claims of the 524 patent were located, but due to the prohibition against using physical machines and the word count limitations for petitions, it was possible to list only one primary reference in this petition.

The 524 patent exists in a crowded technology field, and the prior art is compelling evidence of unpatentability.

E. Summary of Prosecution History

The ‘524 patent issued from Application No. 17/020,799 (Ex1013). The original claims claimed the same subject matter as the issued claims. Ex1013-35-38. The first office action was a notice of allowance. Ex1013-103-110.

VI. Claim Construction

In an *inter partes* review, a patent claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action...” 37 C.F.R. § 42.100(b).

A. “Conduit”

The patent applicant acted as lexicographer: “The term ‘conduit’ is defined

as any channel through which something is conveyed.” Ex1001, 7:42-43.

“Conduit” should be so construed.

B. “Coupled”

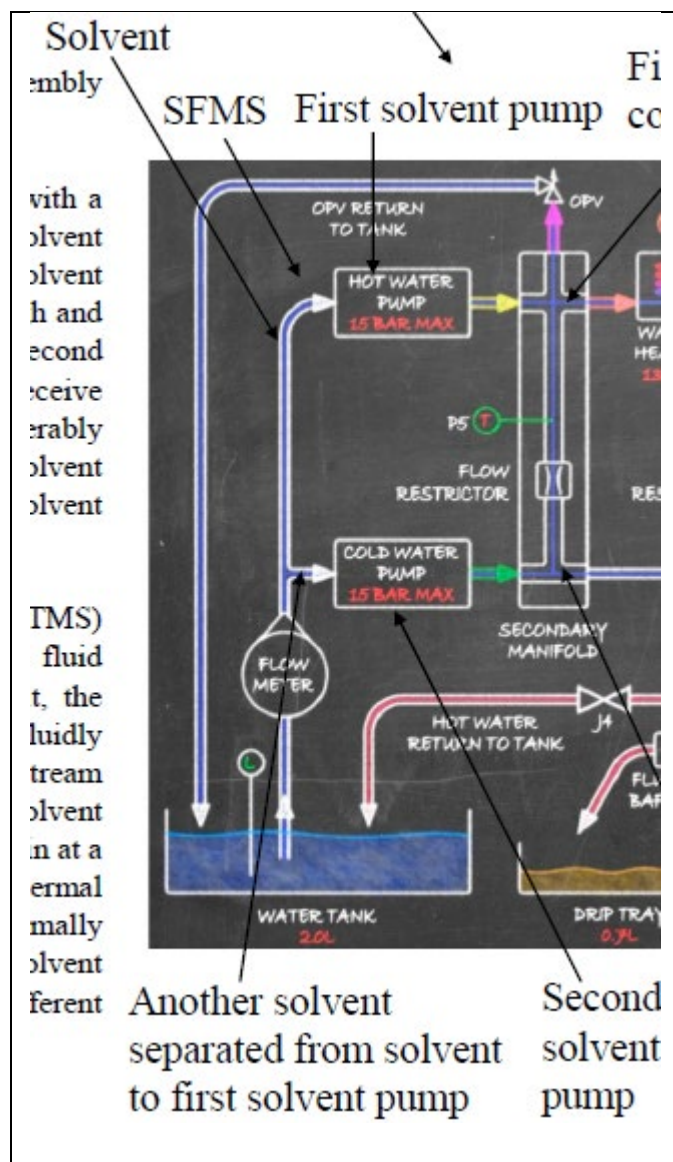
The patent applicant acted as lexicographer: “The term ‘coupled,’ as used herein, is defined as connected, although not necessarily directly, and not necessarily mechanically.” Ex1001, 6:25-27. “Coupled” should be so construed.

C. “Another solvent”

The claims refer to “a solvent” and “another solvent.” Patent Owner’s position should be adopted, so that Patent Owner is held to consistent constructions in the district court and here.¹

Patent Owner’s infringement contentions state, “As set forth...within Exhibit B..., Plaintiff asserts claims 1-12 the 524 Patent [sic] against the infringing Accused Products.” Ex1015-2. This Exhibit B shows a branching pipe carrying water in both branches, labeled “Solvent” and “Another solvent separated from solvent to first solvent pump.” Ex1016-1. An excerpt is reproduced below:

¹ Petitioner reserves the right to seek different claim constructions in district court, but relies upon Patent Owner’s construction for this petition.



Ex1016-1. As demonstrated, Patent Owner necessarily construes both “a solvent” and “another solvent” to mean the same solvent, but in different conduits. The image shows a single pipe drawing water from a “WATER TANK” through a “FLOW METER” before branching into two branches leading to a “HOT WATER PUMP” and a “COLD WATER PUMP”, respectively. The same liquid, water, flows through both.

The term “another solvent” should be construed as “either a second type of solvent or the same solvent as ‘a solvent’ but disposed in a different conduit.”

D. Dynamically Modulate

Claims 4, 6, 9, 10, and 12 use “dynamically” to modify the verb “modulate.”

The patent appears to use “dynamically” outside of its ordinary meaning, defining “dynamically” as “during the brewing cycle,” by stating: “However, few, if any, brewing systems facilitate dynamic, i.e., within the brewing cycle, modulation...during an infusion.” Ex1001, 1:35-40. The patent states, “As previously explained, there is an acute need for a brewing system that affords the brewer independent, dynamic variation of brewing variables of temperature, pressure and flow rate during the production of infused beverages.” Ex1001, 2:37-41. “The present invention...facilitate[es] dynamic, independent control of pressure, temperature and flow rate...during the infusion process.” Ex1001, 2:47-53. “During an infusion process, ...parameters may be selectively modified during said infusion. This dynamic modification of said variables...” Ex1001, 8:5-11. “A preferred beverage may be produced by...dynamically adjustable systems...Said another way, any of the system 100 components...are operable to adjust solvent/infusion parameters during an infusion process.” Ex1001, 8:44-50. “[The] control system is preferably capable of enabling the user to dynamically

(i.e., during the brewing process) modify all the brew variables...” Ex1001, 16:46-50.

The patent defined “dynamically modulates” as “keep constant or change,” describing, “...a Solvent Temperature Management System (STMS) that selectively and dynamically modulates (i.e., keep constant or change) the infusion temperature.” Ex1001, 2:56-59.

Accordingly the term “dynamically modulate” should be construed as “keep constant or change during the brewing cycle.”

VII. Level of Ordinary Skill in the Art

A POSA at the time of the alleged invention would have had at least the following (or equivalents): a B.S. degree in mechanical engineering with at least five years of experience in product design; or an M.S. degree in mechanical engineering with at least two years of experience in product design. Ex1002-13.

VIII. Prior Art Overview

Prior art disclosed all limitations of the challenged claims before the effective Filing Date.

A. Effective Filing Date and AIA Treatment

Despite claiming priority to a pre-AIA provisional application, the challenged claims are subject to the America Invents Act (“AIA”). The application leading to the ‘524 patent claimed priority to a patent and patent application that contain at least one “claim to a claimed invention that has an effective filing date after [March 15, 2013].” AIA §3(n)(1). Thus, the AIA applies to the ‘524 patent. *Id.*

The ‘524 patent claims priority to U.S. Pat. No. 10,772,456 (the 456 patent) and application serial no. 16/383,607. Ex1001-1. Both contain claims with an effective filing date after March 15, 2013.

Claims 1-10 and 14-16 of the 456 patent are not entitled to the priority date of provisional application serial no. 61/742,688 (the 688 application) (Ex1012). These claims require a “resulting solvent valve.” Ex1014, 18:29-41, 20:41-53. Claim 8 of the ‘456 patent is not entitled to the filing date of the 688 application because this claim requires “a recirculation conduit” and “a recirculation pump.” The 688 application neither teaches nor discloses any such valve, recirculation conduit, or recirculation pump. *See generally* Ex1012. The “resulting solvent

valve”, “recirculation conduit”, and “recirculation pump” were new matter added to application serial no. 14,421,362 (the 362 application), which was filed on August 16, 2013. Ex1001-1.

Thus, ‘456 patent claims 1-10 and 14-16 are entitled to an effective filing date no earlier than August 16, 2013. *See, e.g.*, 35 U.S.C. §119(e); *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 1294 (Fed. Cir. 2002) (“[T]o be afforded the priority date of the provisional application,...the written description of the provisional must adequately support the claims of the non-provisional application...”).

Pursuant to AIA §3(n)(1), all claims of the ‘524 patent are subject to the first-to-file invalidity provisions of the AIA, because at least one of the claims is not entitled to a filing date before March 15, 2013, and the ‘524 patent contains a priority claim to the ‘456 patent and the 362 application.

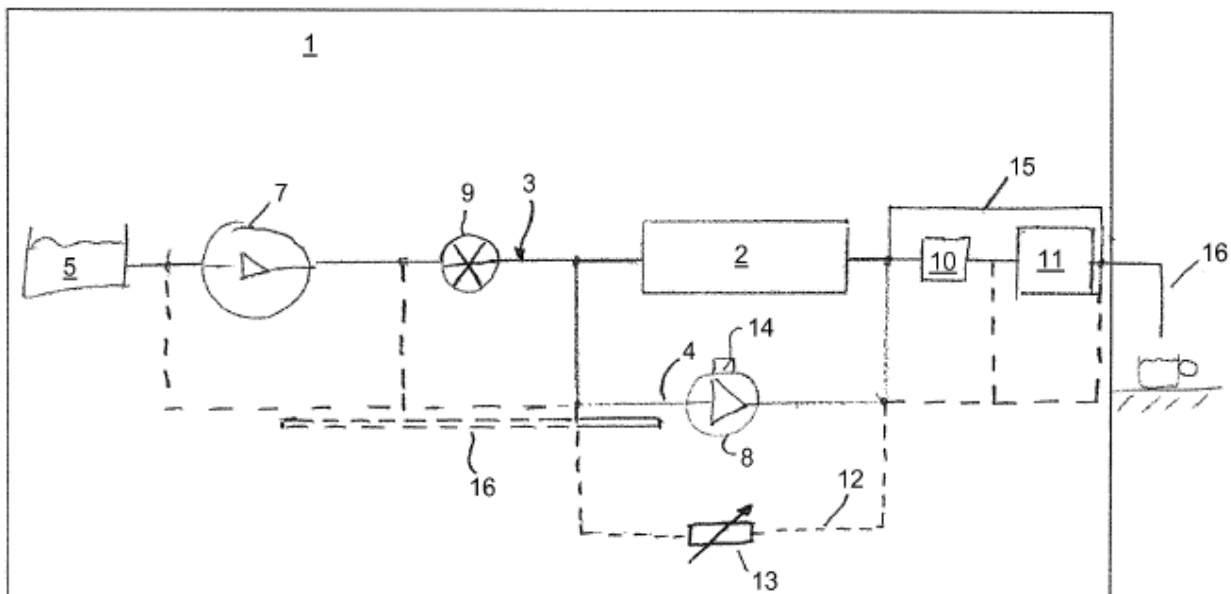
Petitioner does not herein argue as to whether the 688 application adequately supports the claims of the ‘524 patent, but merely that the claims of the ‘524 patent are not entitled to pre-AIA treatment.

B. Startz (Ex1003, Ex1004)

Startz describes “A beverage machine (1), in particular to a coffee machine...” Startz describes a system in which solvent (mixing water and

admixing water) is pumped through two conduits (paths 3, 4) by two pumps (7, 8) through at least one heating device (2, 16). The conduits are joined at a conduit joint (return of bypass flow path between 2 and 10) to form a resulting conduit for mixing the solvent. The mixed solvent is pumped into a brewing device (11) where the mixed solvent encounters a solute (e.g., ground coffee) to create an infused beverage (e.g., coffee) that is dispensed at dispensing location (6, mislabeled as 16). Ex1002-19-20.

The system is illustrated in FIG. 1:



Startz uses a control device (14) to modify one or more of flow rate, temperature, and pressure, by receiving data from a flow meter (9) and/or temperature sensors (not shown), using that data to control/modulate one or more pumps and/or thermal modulators to affect temperature or flow. Ex1002-20.

C. Santi (Ex1005)

Santi describes embodiments of a system in which solvent (water from tank 101) is pumped through two conduits by a pump (200) through at least one heating means (40). The conduits are joined at a conduit joint (21) to form a resulting conduit (between 21 and 15) for mixing the solvents. The mixed solvents are pumped into a brewing chamber (16) where they encounter a solute (coffee powder) to create a solution (espresso coffee) that is discharged by dispensing spout (18). Ex1002-21.

One embodiment is illustrated in FIG. 6:

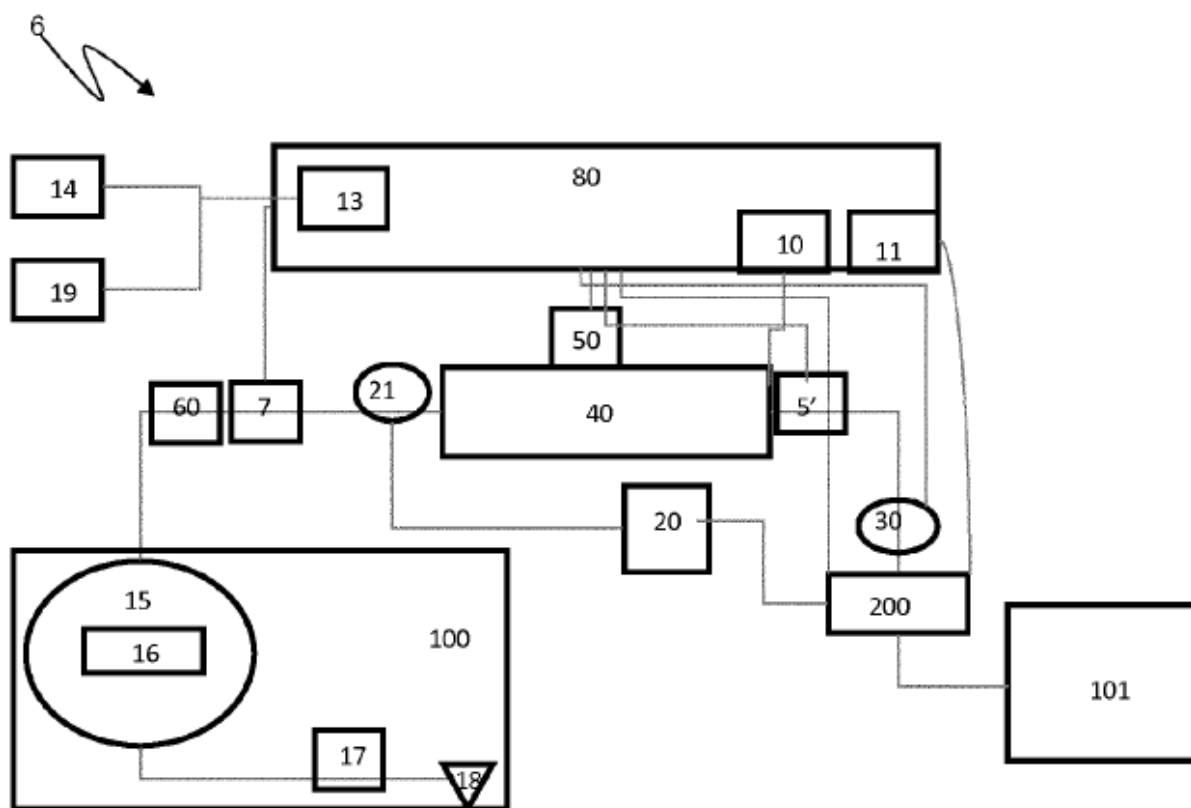


FIG. 6

Santi refers to using an electronic control means (80) to modify one or more of flow rate, temperature, and pressure, by receiving data from pressure sensors (e.g., 30), and/or temperature measuring devices (e.g., 5', 50, 60), then using that data to control/modulate one or more of the pumps and/or thermal modulators to affect temperature, flow, and/or pressure. Ex1002-22.

D. Lai (Ex1007)

In Lai's system, solvent (water from reservoir 116) is pumped through a conduit by a pump (138) through at least one heater (136). The solvent is pumped into a brewing chamber (filter cup 10, FIG. 1) where it encounters a solute (coffee beans 18) to create a solution (coffee) that is discharged into a cup (108). Ex1002-22.

FIG. 60 illustrates the system:

Lai uses an electronic controller (control panel 118, PCB 196) to modify one or more of flow rate, temperature, and pressure, by receiving data

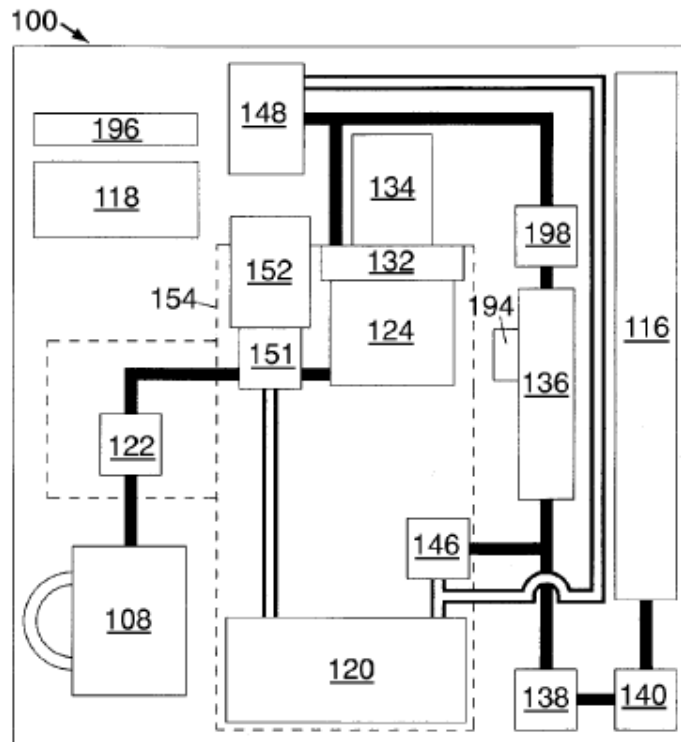


FIG. 60

from flow meters (140) and/or temperature sensors (194, 198), using that data to

control/modulate the pump and/or heater to affect temperature and/or flow.

Ex1002-23.

E. Majer (Ex1008)

In Majer's system, two solvents (water from water source 3 and milk) are pumped through two conduits (C1, C2) by two pumps (4, 4bis) through at least one heating means (5, 5bis). The solvent (hot water) is pumped into a brewing means (2) where it encounters a solute (ground coffee) to create a solution (espresso coffee) that is discharged into a beverage container (7). Ex1002-23-24.

The system is illustrated in FIG. 1:

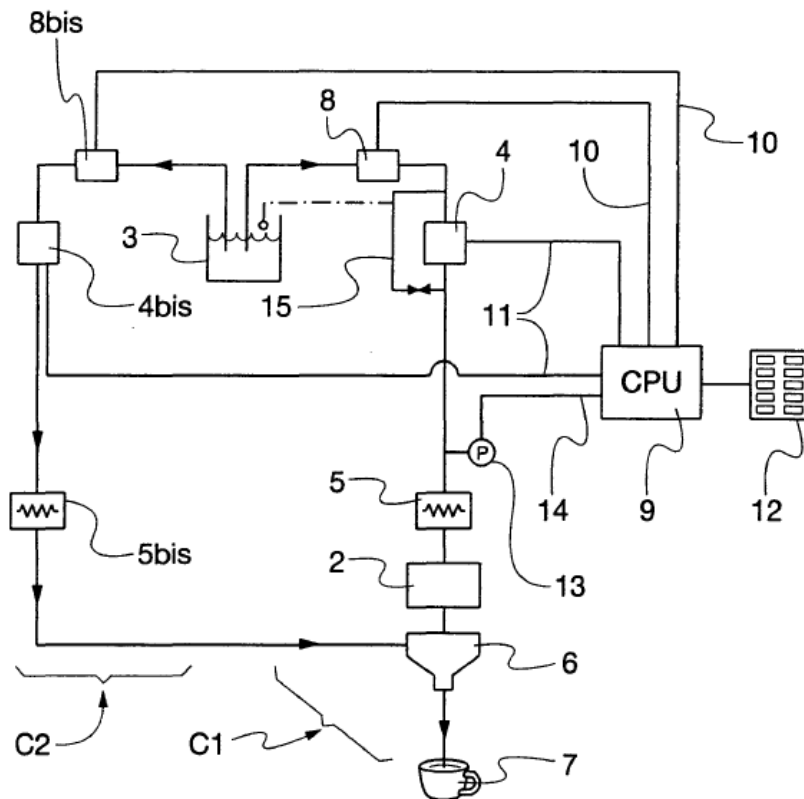


Fig. 1

Major uses an electronic controller (CPU 9) to modify one or more of flow rate, temperature, and pressure, by receiving data from flow meters (8, 8bis), pressure meter (13), and/or temperature monitors, using that data to control/modulate one or more of the pumps and/or heating means to affect temperature, flow, and/or pressure. Ex1002-25.

F. Upston (Ex1009)

In Upston's system, solvent (water from reservoir 210) is pumped through a conduit (236) by a pump (234) through at least one thermal modulator (boiler 250). The solvent is pumped into a brewing chamber (700) where it encounters a solute (coffee) to create a solution (coffee beverage 294) that is discharged into a receptacle. Ex1002-25.

FIG. 7 illustrates the system:

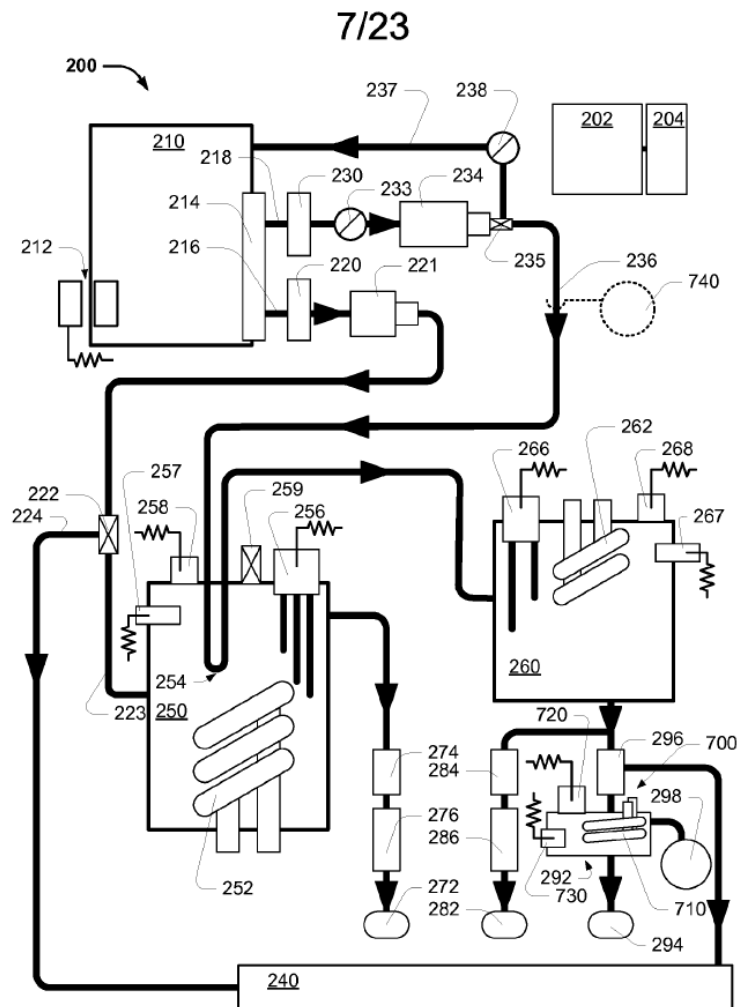


FIG. 7

(via spout 14a). Ex1002-27.

FIG. 1B illustrates the system.

Porzio uses an electronic controller (control unit 18) to modify one or more of flow rate, temperature, and pressure, by receiving data from temperature measuring devices (23), using that data to control/modulate one or more of the pumps and/or thermal modulators to affect temperature, flow, and/or pressure.

Ex1002-28.

H. Motivation to Combine

A POSA seeking to solve one or more of the 524 patent's goals/problems would consider patents, publications, and knowledge related to heated beverage-making, in particular related to brewed beverages that use "solute particles" and "solute compaction." This would lead a POSA to patents and publications related to coffee and/or tea making, and possibly to related beverage making, and would lead the POSA to consider their own knowledge of technologies in the art.

Ex1002-29-30.

Each of the prior patents and publications discussed in the preceding section is related to coffee and/or tea making. Ex1002-30.

A POSA seeking a "beverage brewing system that affords precise, accurate and dynamic temperature control" would consider various control systems for achieving precision, accuracy, and dynamic control. Such control systems would

include electronic controllers, various sensors, and various types of control mechanisms, such as controllable pumps, controllable heaters, controllable valves, etc. Numerous such controls systems and their components were known to a POSA as of August 2012, as numerous coffee (drip, espresso, etc.) machines were being sold that incorporated various types of control systems. Some of these coffee machines incorporated control systems that allowed higher precision, accuracy, and dynamic control, while other systems incorporated control systems that allowed for lesser precision, accuracy, and dynamic control. During Expert Tinkler's decade at Keurig, the POSAs working for him assisted with the design of over 60 machines or systems, many of which were publicly known before August 2012. Ex1002-30.

Startz discloses much or all of the subject matter claimed by multiple claims of the 524 patent. However, Startz does not explain his controller, sensors, or control mechanisms in depth. A POSA attempting to solve the problem of precision, accuracy, and dynamic temperature control with Startz's system would seek control systems, sensors, and components that enhanced the precision, accuracy, and dynamic temperature control of Startz's system. Ex1002-30-31.

Each identified prior patent/publication provides at least one enhancement in the form of control systems, sensors, and components for enhancing precision, accuracy, and dynamic temperature control. Many other coffee machine systems

that would be within the knowledge of a POSA (in August 2012) incorporated various enhancements in the form of control systems, sensors, and components for enhancing precision, accuracy, and dynamic temperature control. Ex1002-31

A POSA would have had motivation to combine Startz's disclosure with one or more of the POSA's knowledge, the applicant admitted prior art (AAPA), Lai, Santi, Porzio, Majer, and/or Upston. Ex1002-31.

IX. Grounds

A. Ground I: Claims 1-5 are Obvious Over Startz in View of One or More of the Knowledge of a POSA, Lai, Santi, Porzio, and/or Majer

1. Claim 1

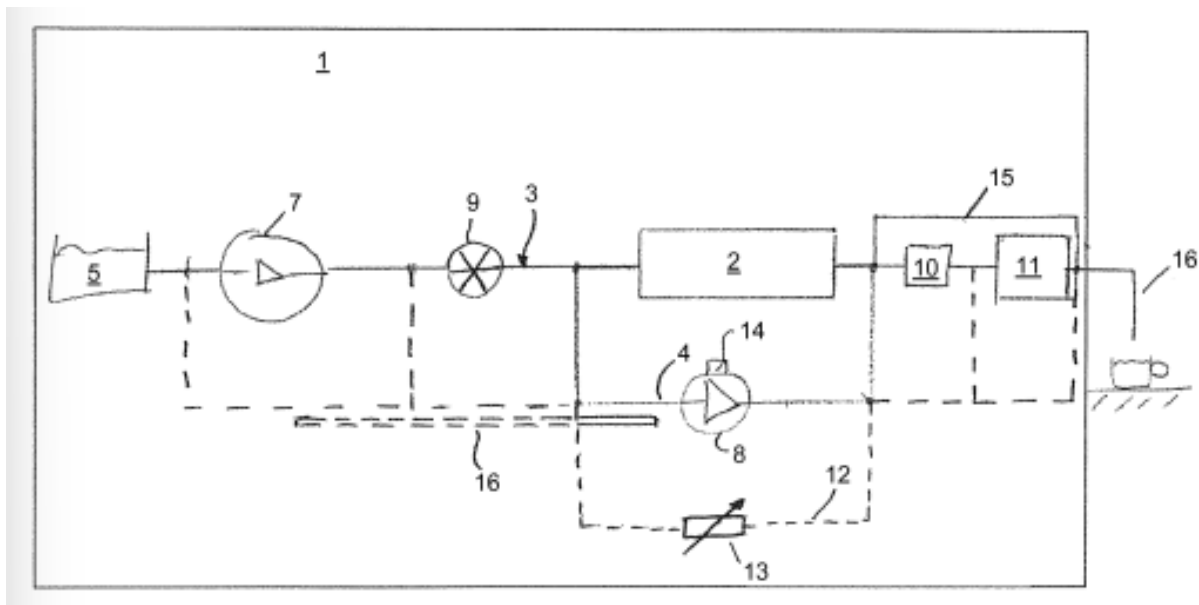
(a) “An infused beverage brewing assembly comprising:”

Startz discloses an infused beverage brewing assembly. Ex1003, 1:5-15, 3:9-13, Abstract; Ex1002-32.

Startz discloses, “According to FIG. 1, a beverage machine 1 according to the invention, which can be embodied as a coffee machine,...” Ex1003, 3:9-11. It is well known that coffee is an infused beverage formed by infusing a solute (ground coffee) with a solvent (water). Ex1002-32.

- (b) “a solvent flow management system with a first solvent pump fluidly coupled to a first solvent conduit and operably configured to receive a solvent and induce the flow of the solvent therethrough and”

As FIG. 1 demonstrates (below), Startz provides a first solvent pump (main flow pump 7) fluidly coupled to a first solvent conduit (main flow path 3) and operably configured to receive a solvent (water from tank 5) and induce the flow of the solvent (water) therethrough. Ex1002-32.



Startz states, “In the main flow path 3, a main flow pump 7 is thereby arranged between the water tank 5 and the heating device 2.” Ex1003, 3:17-19; Ex1002-33. Startz claimed, “a main flow path having an input end connected to a water supply and an output end connected to a dispensing location, a heating device disposed along the main flow path between the input end and the output end and a main flow pump arranged between the input end and heating device.”

Ex1003 claim 1; Ex1002-33.

- (c) **“a second solvent pump fluidly coupled to a second solvent conduit and operably configured to receive another solvent, separate from the solvent operably configured to be received within the first solvent pump, and induce the flow of the another solvent therethrough;”**

As FIG. 1 shows (above), Startz provides a second solvent pump (bypass flow pump 8) fluidly coupled to a second solvent conduit (bypass flow path 4) and operably configured to receive another solvent (water from tank 5), separate from the solvent operably configured to be received within the first solvent pump (7), and induce the flow of the another solvent therethrough. Ex1002-33.

Startz states, “...a bypass flow pump 8 is now arranged in the bypass flow path 4...” Ex1003, 3:19-21; Ex1002-33. Startz states, “...the bypass flow pump 8 can...convey exactly the quantity or a slightly higher quantity of bypass water...” Ex1003, 4:14-16; Ex1002-33. Startz claimed, “a bypass flow path branching from the main flow path upstream of the heating device, and a bypass pump arranged in the bypass flow path...” Ex1003, claim 1; Ex1002-33-34.

Alternatively, the application of elements 1(b) and 1(c) to Startz can be reversed such that conduit 4 is the first conduit, pump 8 is the first pump, conduit 3 is the second conduit, and pump 7 is the second pump. Ex1002-34.

If the Board determines that the “another solvent” cannot be water when “the solvent” is water, it would have been obvious to a POSA that two different solvents could be used in Startz’s device. Ex1002-34.

Majer states, “Although it is explicitly mentioned that water is used as the brewing and additional liquid in the first and second circuits C1 and C2, other suitable liquids can be used, such as a liquid ingredient, for example milk, can be dispensed by said second circuit C2.” Ex1008, 16:19-22. Thus, Majer explicitly discloses using a different solvent in a second conduit. Ex1002-34.

And Porzio discloses, “[In] another embodiment it is provided that second conduit 29 is for example connected to...a container of aromatic liquid such as to permit the brew group to be fed with the aromatic liquid. In the rest of the description,...the brew group is fed with water through conduits 25 and 29...” Ex1011 8:10-20. Porzio explicitly discloses using aromatic liquid in conduit 29 and water in conduit 25. Ex1002-34-35.

Accordingly, if the “another solvent” cannot be the same as “the solvent,” a POSA would have known that it would have been obvious to use two different solvents in Startz’s two different conduits. Ex1002-35.

- (d) **“a solvent temperature modulation system with at least one thermal modulator in fluid communication with the first solvent conduit,”**

As FIG. 1 shows (above), Startz provides a solvent temperature modulation system with at least one thermal modulator (heating device 2) in fluid communication with the first solvent conduit (3). Ex1002-35.

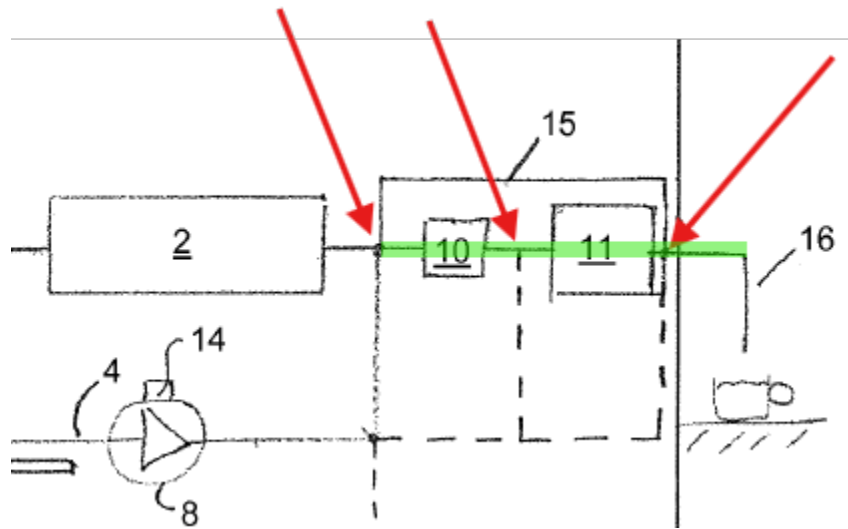
Startz teaches, “...a main flow path 3, which leads through a heating device 2,...In the main flow path 3, a main flow pump 7 is thereby arranged between the water tank and the heating device.” Ex1003, 3:9-19. Startz demonstrates “fluid communication” by stating, “...the pressure difference upstream of and downstream from the heating device 2 is comparatively low...” Ex1003, 4:24-30. Startz claims, “a heating device disposed along the main flow path between the input end and the output end...” Ex1003, claim 1; Ex1002-35.

Alternatively, if conduit 4 was the first conduit, Startz’s further heating device 16 could be the at least one thermal modulator. Ex1002-35.

- (e) **“the first and second solvent conduits directly and fluidly coupled together to form a conduit joint downstream of the thermal modulator to form a resulting solvent conduit with a resulting solvent disposed therein at a resulting temperature and”**

As annotated FIG. 1 shows (below), the first (3) and second (4) solvent conduits are directly and fluidly coupled together to form a conduit joint (a

coupling point between 2 and 10, between 10 and 11, or to the right of 11, *see* red arrows) downstream of the thermal modulator (2) to form a resulting solvent conduit (green) with a resulting solvent (mixed hot and cold water) disposed therein at a resulting temperature (mixing temperature). Ex1002-36.



Startz teaches, “A return of the bypass flow path 4 into the main flow path 3 thereby preferably takes place either between the heating device 2 and the brewing valve 10 or downstream from the brewing device 11, whereby alternative positions for...a return into the main flow path 3 are illustrated by means of a broken line.” Ex1003, 3:35-41. Startz teaches, “...individual mixing temperatures can be specifically generated at the dispensing location/mixing area by correspondingly changing the capacity of the bypass flow pump.” Ex1003, 2:27-32. Startz teaches, “By changing the capacity at the bypass flow pump 8 or by pulsing this bypass flow pump 8, different mixing temperatures can furthermore be generated

specifically...” Ex1003, 3:67-4:5, Claim 4; Ex1002-36-37.

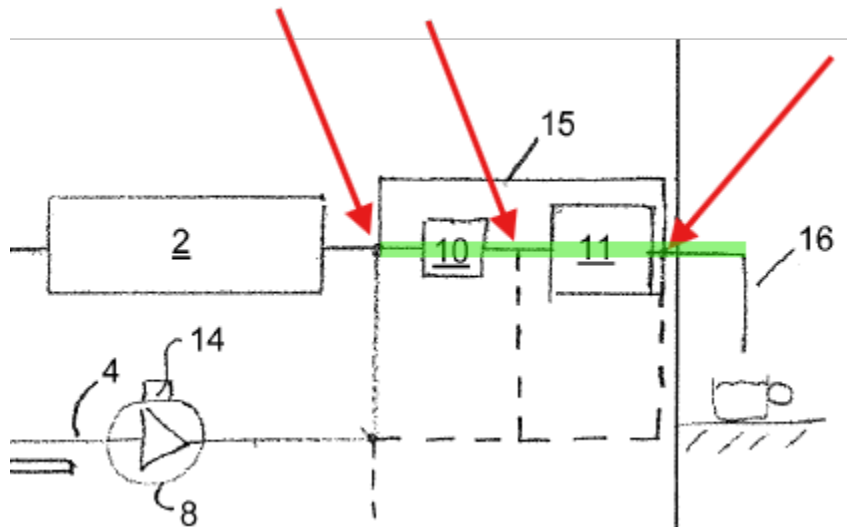
- (f) **“the at least one thermal modulator operably configured to thermally modulate the solvent disposed in the first solvent conduit to a raised temperature higher and different than the resulting temperature; and”**

Startz discloses that the at least one thermal modulator (2) is operably configured to thermally modulate (heat) the solvent (water) disposed in the first solvent conduit (3) to a raised temperature higher and different than the resulting temperature (mixing temperature). Ex1002-37.

Startz states, “The heating device 2 can be embodied as a common continuous-flow water heater...” Ex1003, 3:50-52. A POSA would have known that it is inherent that a “heating” device will raise the temperature of water flowing through it. Ex1002-37. The main flow path 3 leads through the heating device 2; thus, a POSA would have known that the heating device 2 is configured to heat the water in the first conduit. Ex1002-37. And a POSA would have known that it is inherent that the “raised temperature” exiting the heating device 2 will be higher than the “resulting temperature” realized by mixing heated water with cold water from path 4. Ex1002-37-38.

- (g) **“a brewing chamber in fluid communication with the resulting solvent conduit and for housing a solute disposed to receive the resulting solvent to produce an infused beverage;”**

Startz discloses a brewing chamber (brewing device 11) that is in fluid communication (arranged downstream) with the resulting solvent conduit (green highlighting) and for housing a solute (ground coffee) disposed to receive the resulting solvent (mixed water) to produce an infused beverage (coffee). Ex1002-38.



Startz teaches, “In the main flow path 3,...a brewing valve 10 as well as a brewing device 11 are arranged downstream from the heating device 2.” Ex1003, 3:24-27, Claim 2; Ex1002-38. A POSA would have understood that Startz taught that his invention “can be embodied as a coffee machine” and would have recognized that a “brewing chamber” in a coffee machine is designed to house ground coffee disposed to receive hot water to produce a coffee beverage.

Ex1002-38-39.

(h) “an outlet for discharging the infused beverage; and”

Startz discloses an outlet (dispensing location 6, mislabeled as 16) for discharging the infused beverage (coffee).

Startz teaches “a dispensing location 6 on the output side.” Ex1003, 3:16. Startz references, “a beverage temperature at the dispensing location 6.” Ex1003, 3:55-56. Startz claims “a main flow path having an input end connected to a water supply and an output end connected to a dispensing location...[with] a beverage temperature at the dispensing location...” Ex1003, claim 1; Ex1002-39.

A POSA would have recognized that label 6 is missing from the output side of FIG. 1, and that label 16 must be the mislabeled dispensing location. Ex1003, FIG. 1; Ex1002-39. A POSA would have recognized the appearance of a crudely drawn mug below label 16 and would have understood that label 16 represented the location where coffee, tea, or other infused beverages would be discharged. Ex1002-39.

(i) “an electronic controller communicatively coupled to the first and second solvent pumps and the at least one thermal modulator, and”

Startz in view of Lai, Santi, and/or Majer discloses this limitation.

Startz discloses a controller: “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.” Ex1003, 3:53-56. Startz states, “The bypass flow pump can be controlled as a function of the chosen product, of the occurring flow or the temperature at the input of the main flow path or at the dispensing location respectively.” Ex1003, 2:14-18. Startz states that both pumps can be controlled, “Generally, the bypass flow pump 8 and/or the main flow pump 7 can be...a cost-efficient and at the same time an accurately controllable pump.” Ex1003, 3:46-50. Startz teaches, “The mixing portion and thus the admixing quantity of the bypass flow pump 8 can be controlled accurately if the total rate of flow is known...via the fluid flow meter 9...By changing the capacity at the bypass flow pump or by pulsing this bypass flow pump 8, different mixing temperatures can furthermore be generated specifically and a sensor element (not illustrated)...connected downstream, can be regulated through this.” Ex1003, 3:63-4:5; Ex1002-40. Startz claims, “a control device that controls the bypass flow pump as a function of beverage temperature at the dispensing location and at least one of a flow volume, and a water temperature in the water supply.” Ex1003, claim 1.

Startz discloses that both pumps can be controlled, discloses a controller,

and discloses various feedback data, including flow volume, beverage temperature, water tank temperature, chosen product, occurring flow, input temperature, dispensing temperature, total rate of flow, etc. Ex1002-41.

While Startz does not explicitly disclose that controller 14 is electronic, a POSA would have recognized that electronic controllers were widely used in the field. A POSA would also have recognized it would have been appropriate to connect an electronic controller to communicate with multiple pumps and receive Startz's numerous types of specified feedback data. Ex1002-41.

A POSA would have recognized that many electronic controllers were connected to communicate with heating devices in beverage machines. Ex1002-41.

Lai teaches, "[T]he water temperature is regulated throughout the brewing process for optimum brewing and taste...[A] water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB² 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range. The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196." Ex1007, ¶0098. A POSA would have understood that Lai discloses a heater

² Lai refers to PCB 196 as "printed circuit board 196." Ex1007 ¶0082. And control panel 118 is described as having an LCD display 200, confirming that Lai's controller is electronic. Ex1007, ¶0100; Ex1002-41.

communicatively connected to the electronic controller, along with the pump(s).

Ex1002-41-42.

Santi teaches a “device for producing hot beverages” having “at least one brewing chamber”, wherein “said device also comprising control means, operatively connected to said first sensor means and to said second sensor means, for continuous monitoring of said first temperature data and of said first pressure data during the operating phase...; said control means being operatively connected to said heating means and to said pumping means for continuous and combined control of said temperature and of said pressure during said operating phase...”

Ex1005, ¶¶0026-0031. Santi confirms that the control means is electronic, noting, “the first storage means 13...operatively connected to the control means, and also comprise selection actuator means 19. The first storage means 13 are produced by means of a non-volatile memory...selection actuator means 19, such as...a touch screen system...Moreover, the different extraction profiles can be modified in the machine through access to programming mode...these selection means comprise second storage means 14...second storage means 14 consist of a portable non-volatile memory, such as a memory card[,],...a Bluetooth device, a USB key or the like...” Ex1005, ¶¶0084-0086. Santi teaches, “the control means 80 performs continuous and combined control of the temperature and of the pressure during the operating phase...” Ex1005, ¶¶0088; Ex1002-42-43.

Majer teaches a machine for “the preparation of e.g. a regular coffee...” in which, “The dispensing unit comprises also an electrical circuit, preferably including an electronic controller 9 connected to it...The electric circuit is also apt to monitor the hydraulic circuit particularly with respect to the temperature..., the time of operation of pumps 4 and 4bis via lines 11, the flow-rate at the inlet of the pump as read via said flow-meter 8 and 8bis...” Ex1008 11:28-12:12. Majer teaches, “Controller unit 9 can operate motor M of pump 4bis to control the amount and the flow rate of water sent to circuit C2...” Ex1008 11:8-9. Majer teaches, “...pressure sensor 13 can be used to operate pump 4 through controller unit 9 and lines 11 and 14, so as to stop the pump when the desired pressure is reached and to activate again the pump...” Ex1008 17:29-31; Ex1002-43.

A POSA would have recognized that it would be obvious to combine Startz’s machine with the electronic controller of any of Lai, Santi, and/or Majer, and that such electronic controller would be communicatively coupled to both the thermal modulator and the pumps. Ex1002-43.

- (j) **“operably configured to modulate the flow of the solvent through the first solvent pump and the at least one thermal modulator and the another solvent through the second solvent pump.”**

Startz in view of Lai, Santi and/or Majer renders this limitation obvious.

As noted immediately above, Lai, Santi, and/or Majer renders it obvious that

the electronic controller (14) in Startz would have been operably configured to modulate the flow of the solvent (water) through the first solvent pump (7) and the at least one thermal modulator (2) and the another solvent (water) through the second solvent pump (8). Ex1002-44.

Majer teaches, “Controller unit 9 can operate motor M of pump 4bis” and “...operate pump 4 through controller unit 9 and lines 11 and 14.” Ex1008 10:8-9, 16:29-31. Both pumps are explicitly controllable through Majer’s electronic controller to modulate flow through each pump. Ex1002-44.

Santi teaches: the “control means” is “operatively connected to said heating means and to said pumping means for continuous and combined control of said temperature and of said pressure during said operating phase...” Ex1005, ¶¶0026-0031; Ex1002-44.

Lai teaches using the electronic “control panel 118” so that, “The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range.” Ex1007, ¶0098; Ex1002-44.

A POSA would have recognized that it would be obvious to combine the machine of Startz with the electronic controller of any of Lai, Santi, and/or Majer, and that such electronic controller would be operably configured to modulate solvent flow through the first pump/thermal modulator and through the second pump. Ex1002-45.

Startz in view of one or more of the knowledge of a POSA, Lai, Santi,
Porzio, and/or Majer renders claim 1 obvious. Ex1002-45.

2. Claim 2

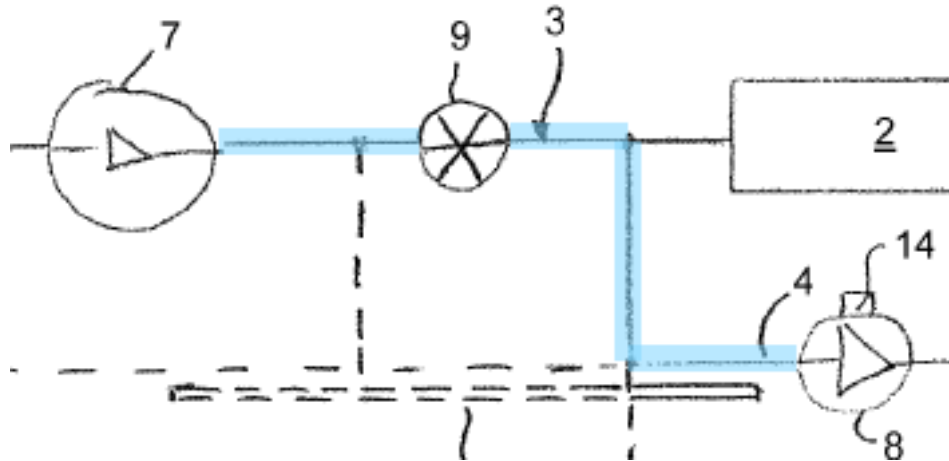
- (a) **“The infused beverage brewing assembly according to claim 1, further comprising: at least one solvent flow meter communicatively coupled to the first and second solvent pumps.”**

Startz discloses a solvent flow meter (fluid flow meter 9) communicatively coupled (described below) to the first (7) and second (8) solvent pumps. Ex1002-45.

The patent does not define “communicatively coupled”, nor does the term have any special meaning in the field beyond the patent’s definition of “coupled.” Ex1002-45. The term “communicate” has multiple plain and ordinary meanings. Per Merriam-Webster, one definition is “to transmit information, thought, or feeling so that it is satisfactorily received or understood,” and a second definition is “to open into each other : connect” (example: “The rooms communicate.”). Ex1017-2, Ex1002-45-46.

Startz’s fluid flow meter 9 and two pumps 7 and 8 meet both definitions of being communicatively coupled. Ex1002-46. First, when the pumps are inactive, that information is transmitted to the flow meter through recording reduced or

stopped flow. When the pumps are active, that information is transmitted to the flow meter through recording increased or active flow. As to the second definition, the flow meter opens into the pumps through main flow path 3 and bypass flow path 4 (illustrated below):



As noted above (claim construction), the patent states that “coupled” means connected, although not necessarily directly. Here, flow meter 9 opens into conduit 3 which opens into pump 7; logically, flow meter 9 indirectly opens into pump 7. As to the second pump 8, flow meter 9 opens into conduit 3 that opens into conduit 4 that opens into pump 8; logically, flow meter 9 indirectly opens into pump 8. Startz satisfies at least two definitions of “communicatively coupled.” Ex1002-46-47.

If the Board determines that “communicatively coupled” requires electronic communication, it would have been obvious to a POSA to provide electronic communication from flow meter to an electronic controller and from electronic

controller to pumps. (As noted, the “coupling” need not be direct.) Ex1002-47.

Majer teaches, “The hydraulic circuits C1 and C2 preferably comprise at least one type of means apt to detect and control the flow-rate of said primary solvent at the inlet of the pump, such as...a volumetric flow-control 8 and 8bis, and circuit C1 can be 20 also provided with means to adapt said flow in order to alter it at the outlet level of the preparation chamber.” Ex1008 11:17-21. Majer clarifies: the “flow-control” is flow meters and that “adapt[ing] said flow in order to alter it” is performed by pumps: “The electric circuit is also apt to monitor the hydraulic circuit particularly with respect to..., the time of operation of pumps 4 and 4bis via lines 11, the flow-rate at the inlet of the pump as read via said flow-meter 8 and 8bis...” Ex1008 11:28-12:12. Majer teaches, “Controller unit 9 can operate motor M of pump 4bis to control the amount and the flow rate of water sent to circuit C2...” Ex1008 10:8-9. Majer teaches, “Flow rates are detected through flow-rate meters 8 and 8bis...and controller 9 regulates flow rate in C2 according to the detected values in C1 to provide the required amount of water from C2 in the required time.” Ex1008 12:25-29; Ex1002-47-48.

Lai teaches that the flow meter relays flow information to the controller and the controller adjusts pump rate to keep temperature within the optimal range: “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste...[A] water temperature sensor 198 detects a

temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range. The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196.” Ex1007, ¶0098; Ex1002-48.

A POSA would have recognized that it would be obvious to use the controller to collect flow information and to use that information to control the pumps, thereby communicatively coupling the flow meter and pumps through the controller. Ex1002-48.

Startz in view of one or more of the knowledge of a POSA, Lai, Santi, Porzio, and/or Majer renders claim 2 obvious. Ex1002-48.

3. Claim 3

- (a) **“The infused beverage brewing assembly according to claim 2, wherein: the electronic controller is communicatively coupled to the at least one solvent flow meter and operably configured to receive an electronic signal from the at least one solvent flow meter indicative of a flow rate and”**

Startz discloses that a controller (control device 14) is communicatively coupled to the at least one solvent flow meter (fluid flow meter 9) and operably configured to receive an electronic signal from the at least one solvent flow meter

(9) indicative of a flow rate (total rate of flow). Ex1002-49.

Startz states, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume...The mixing portion and thus the admixing quantity of the bypass flow pump can be controlled accurately if the total rate of flow is known, which can be determined via the fluid flow meter 9...” Ex1003, 3:53-67. It would have been obvious to a POSA that Startz was describing an electronic controller communicatively coupled to a solvent flow meter and configured to receive an electronic signal from the flow meter indicating the flow rate. Ex1002-49.

If this element is not obvious over Startz in view of the knowledge of a POSA, Majer and Lai each disclose the elements of this claim as set forth above (claim 2 analysis). Majer states, “The electric circuit is also apt to monitor the hydraulic circuit particularly with respect to...the flow-rate at the inlet of the pump as read via said flow-meter 8 and 8bis...” Ex1008 11:28-12:12;. Majer teaches, “Flow rates are detected through flow-rate meters 8 and 8bis...and controller 9 regulates flow rate in C2 according to the detected values in C1...” Ex1008 12:25-29. Lai teaches, “The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196.” Ex1007, ¶0098; Ex1002-49-50.

- (b) **“to modulate the flow of the solvent through at least one of the first solvent pump and the another solvent through the second solvent pump based on the flow rate ascertainable from the at least one solvent flow meter.”**

Startz discloses that the flow of the solvent (mixing portion of water) through at least one of the first solvent pump (7) and the another solvent (admixing quantity of water) through the second solvent pump (8) is modulated (controlled) based on the flow rate (total rate of flow) ascertainable from the at least one solvent flow meter (fluid flow meter 9). Ex1002-50.

Startz states, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume...The mixing portion and thus the admixing quantity of the bypass flow pump can be controlled accurately if the total rate of flow is known, which can be determined via the fluid flow meter 9...” Ex1003, 3:53-67. It would have been obvious to a POSA that Startz was describing an electronic controller modulating flow through “at least one” pump based on the total flow rate from the flow meter. Ex1002-50-51.

If this element is not obvious over Startz in view of the knowledge of a POSA, Majer and Lai each disclose the elements of this claim as set forth above (claim 2 analysis). Ex1002-51.

Majer teaches, “Controller unit 9 can operate motor M of pump 4bis to

control the amount and the flow rate of water sent to circuit C2...” Ex1008 10:8-9.

Majer teaches, “Flow rates are detected through flow-rate meters 8 and 8bis (or the pump of fig. 6 for C2) and controller 9 regulates flow rate in C2 according to the detected values in C1 to provide the required amount of water from C2 in the required time.” Ex1008 12:25-29; Ex1002-51.

Lai teaches, “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste...The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range. The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196.” Ex1007, ¶0098; Ex1002-51.

A POSA would have recognized that it would be obvious to modulate the flow of the solvent through at least one of the first solvent pump and the another solvent through the second solvent pump based on the flow rate ascertainable from the at least one solvent flow meter. Ex1002-52.

Startz in view of one or more of Lai, Santi, Porzio, and/or Majer renders claim 3 obvious. Ex1002-52.

4. Claim 4

- (a) **“The infused beverage brewing assembly according to claim 3, wherein: the electronic controller is operably configured to dynamically modulate the flow of the solvent through at least one of the first solvent pump and the another solvent through the second solvent pump based on the flow rate ascertainable from the at least one solvent flow meter.”**

The only meaningful difference between this claim 4 and claim 3 is the word “dynamically.”

Startz discloses that the electronic controller (14) is operably configured to dynamically modulate (keep constant or change during the brewing cycle) the flow of the solvent (mixing portion of water) through at least one of the first solvent pump (7) and the another solvent (admixing portion of water) through the second solvent pump (8) based on the flow rate ascertainable from the at least one solvent flow meter (9).

The analysis of claim 3 sets forth all limitations of claim 4 except for “dynamically.”

Startz teaches, “The mixing portion and thus the admixing quantity of the bypass flow pump 8 can be controlled accurately if the total rate of flow is known, which can be determined via the fluid flow meter 9, for example. By changing the capacity at the bypass flow pump 8 or by pulsing this bypass flow pump 8, different mixing temperatures can furthermore be generated specifically...”

Ex1003, 3:63-4:4. Startz confirms that flow rate either stays constant or changes during the brewing cycle. Ex1002-53.

If this element is not obvious over Startz in view of the knowledge of a POSA, Majer and Lai each disclose the elements of this claim as set forth above (claim 3(b) analysis). Majer teaches, “Controller unit 9 can operate motor M of pump 4bis to control the amount and the flow rate of water sent to circuit C2...” Ex1008 10:8-9. Majer teaches, “...controller 9 regulates flow rate in C2 according to the detected values in C1 to provide the required amount of water from C2 in the required time.” Ex1008 12:25-29; Ex1002. Majer states, “The flow rate of the first and second circuit C1 and C2...can be constant during the dispensing time or can be varied during the dispensing time...the flow rates fr1 and fr2 can be controlled...” Ex1008 13:21-26, *see also* claims 7-10. Lai teaches, “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste...The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range. The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196.” Ex1007, ¶0098; Ex1002-53-54.

A POSA would have recognized that it would be obvious to “dynamically” modulate the flow. Ex1002-54.

Startz in view of one or more of Lai, Santi, Porzio, and/or Majer renders

claim 4 obvious. Ex1002-54.

5. Claim 5

- (a) **“The infused beverage brewing assembly according to claim 1, wherein the solvent temperature modulation system further comprises: a thermal modulator in fluid communication with the first solvent conduit and a thermal modulator in fluid communication with the second solvent conduit, each of the thermal modulators operably configured to thermally modulate the solvent and the another [sic] solvent disposed within the first and second solvent conduits, respectively, to a raised temperature higher and different than a temperature of the solvent and the another solvent upstream of the thermal modulators.”**

Startz discloses a thermal modulator (heating device 2) in fluid communication with the first solvent conduit (3) and a thermal modulator (further heating device 16) in fluid communication with the second solvent conduit (4), each of the thermal modulators (2, 16) operably configured to thermally modulate the solvent (mixing portion of water) and the another [sic] solvent (admixing portion of water) disposed within the first (3) and second (4) solvent conduits, respectively, to a raised temperature higher and different than a temperature of the solvent (mixing portion of water) and the another solvent (admixing portion of water) upstream (i.e., to the left on FIG. 1) of the thermal modulators (2, 16).

Ex1002-54-55.

Most of the analysis of this element is set forth above (claim limitations 1(d) and 1(f) analysis). The upstream/downstream direction is established by Startz, claiming, “a brewing valve and a brewing device are arranged downstream from the heating device.” Ex1003, claim 2. The left side of FIG. 1 is upstream and the right side of FIG. 1 is downstream. Regarding the second thermal modulator, Startz states, “Provision can be made, for example, for a further heating device 16 for heating the bypass flow path 4 at least area by area.” Ex1003, 4:11-13. Startz does not detail heating device 16, but described “a main flow path 3, which through a heating device 2...” Ex1003, 3:11-12. A POSA would have known and understood that the same type of device could be used for both heating device 2 and heating device 16; it would have been obvious that heating device 16 would be in fluid communication with conduit 4. It is inherent that water passing through an active “heating device” will be at a higher/raised temperature upon exiting the heating device. Ex1002-55-56.

A POSA would have recognized that it would be obvious to include two thermal modulators that were each in fluid communication with one of the conduits, and that the temperature of the solvent would be raised by the thermal modulators. Ex1002-56.

Startz in view of one or more of the knowledge of a POSA, Lai, Santi,

Porzio, and/or Majer renders claim 5 obvious. Ex1002-56.

B. Ground II: Claims 6-10 are Obvious Over Startz in View of One or More of the Knowledge of a POSA, AAPA, Lai, Santi, Porzio, and/or Majer

1. Claim 6

- (a) **“The infused beverage brewing assembly according to claim 5, wherein: the electronic controller is communicatively coupled to the thermal modulator in fluid communication with the first solvent conduit and the thermal modulator in fluid communication with the second solvent conduit and”**

Startz in view of one or more of the knowledge of a POSA, Lai, Santi, and/or Majer discloses this limitation. The analysis of this disclosure with respect to the communicative coupling of the electronic controller and “the thermal modulator in fluid communication with the first solvent conduit” is set forth above, in the analysis of claim element 1(i). And, as set forth in the analysis of claim 5, Startz discloses the use of two thermal modulators for the two conduits.

As noted above, a POSA would have recognized that many electronic controllers were connected to communicate with heating devices in beverage machines. Ex1002-57.

Lai teaches, “...a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the

control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range...” Ex1007, ¶0098. A POSA would have understood that Lai discloses that the heater is also communicatively connected to the electronic controller and would have further understood that, in a two heater system, both heaters could be connected to Lai’s electronic controller. Ex1002-57.

Santi teaches, “The control means 80 are, moreover, operatively connected to the heating means 40...for continuous and combined control of the temperature...” Ex1005, ¶63. A POSA would have understood that Santi discloses that the heating means is communicatively connected to the electronic controller and would have further understood that, in a system with two heating means, both could be connected to Santi’s electronic controller. Ex1002-57.

Majer teaches, “Having two separate and different heating means for the two circuits makes it possible to obtain a wide range of different tastes in the final beverage; in fact, the invention makes it possible to change the temperature of the first circuit with respect to the temperature of the second circuit and to adapt both temperatures and volumes of the liquids dispensed by the two circuits according to the required taste of the final beverage.” Ex1008 7:14-19. A POSA would have understood that Santi’s disclosure of adapting both temperatures is a disclosure that both heating means would have been connected to Santi’s electronic controller.

Ex1002-58.

- (b) **“the electronic controller is operably configured to dynamically modulate the temperature of the solvent in the first solvent conduit and the another solvent in the second solvent conduit.”**

Startz in view of one or more of AAPA, Lai, Santi, and/or Majer discloses this limitation.

While this limitation requires dynamically modulating the temperature of solvent, the claim limitation does not require that such modulation be performed with the thermal modulators. Modulating the temperature can be accomplished by opening or closing valves and/or by changing the pumping rates of the two conduits while leaving the thermal modulators in a steady state. Ex1002-58.

The applicant admitted prior art (“AAPA”) discloses such dynamic modulation of temperature. “As a patentee's admissions about the scope and content of the prior art provide a factual foundation as to what a skilled artisan would have known at the time of invention, it follows that AAPA may be used in similar ways in an inter partes review. Such uses include...supplying a missing claim limitation.” *Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1376 (Fed. Cir. 2022) (internal citations omitted). The patent applicant admitted, “Some known devices...enable the user to create and execute brew formulas which modulate...temperature with respect to time...Temperature control of infusion

water is performed by utilizing a proportional mixing valve that is controlled by a controller to mix hot and cold water.” Ex1001, 1:65-2:10.

Lai teaches, “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste. In connection with this, a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range.” Ex1007, ¶0098; Ex1002-59.

Santi teaches, “said control means being operatively connected to said heating means and to said pumping means for continuous and combined control of said temperature and of said pressure during said operating phase of said device;...” Ex1005, ¶¶0026-0031. Santi teaches, “the control means 80 performs continuous and combined control of the temperature and of the pressure during the operating phase...” Ex1005, ¶¶0088; Ex1002-59-60.

A POSA would have recognized that it would be obvious to communicatively couple the controller to two thermal modulators, where the controller was configured to dynamically modulate the solvent temperature in the two conduits. Ex1002-60.

Startz in view of one or more of the knowledge of a POSA, AAPA, Lai, Santi, Porzio, and/or Majer renders claim 6 obvious. Ex1002-60.

2. Claim 7

- (a) **“The infused beverage brewing assembly according to claim 6, further comprising: at least one solvent flow meter communicatively coupled to the first and second solvent pumps.”**

Claim 7 is almost identical to the language of claim 2. The above analysis regarding claim 2 applies equally to claim 7.

3. Claim 8

- (a) **“The infused beverage brewing assembly according to claim 7, wherein: the electronic controller is communicatively coupled to the at least one solvent flow meter and operably configured to receive an electronic signal from the at least one solvent flow meter indicative of a flow rate and to modulate the flow of the solvent through at least one of the first solvent pump and the another solvent through the second solvent pump based on the flow rate ascertainable from the at least one solvent flow meter.”**

Claim 8 is almost identical to the language of claim 3. The above analysis regarding claim 3 applies equally to claim 8.

4. Claim 9

- (a) **“The infused beverage brewing assembly according to claim 8, further comprising: a temperature measuring device communicatively coupled to the electronic controller and fluidly coupled to the resulting solvent conduit,”**

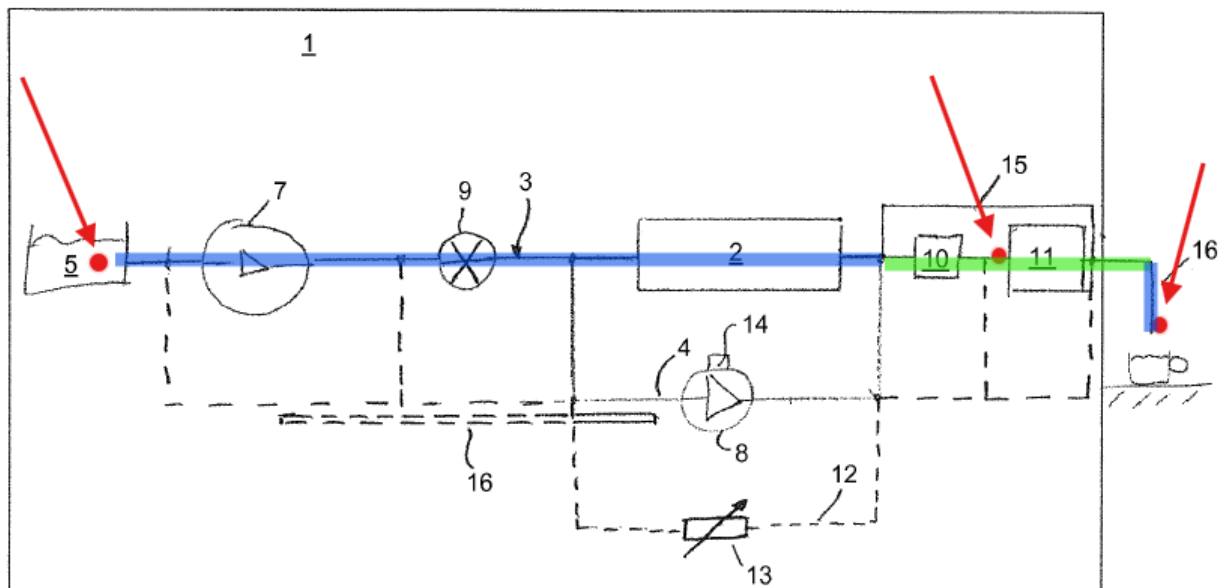
Startz discloses a temperature measuring device (either through a beverage

temperature, a water temperature, or a sensor element) communicatively coupled to the electronic controller (14) and fluidly coupled to the resulting solvent conduit (conduit on either side of elements 10 and 11 in FIG. 1). Ex1002-61.

Startz states, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.” Ex1001, 3:52-57. Startz states, “...different mixing temperatures can furthermore be generated specifically and a sensor element (not illustrated), for example, which is connected downstream, can be regulated through this.” Ex1001, 4:1-5. In these statements, Startz confirms the presence of at least one “sensor element” that is not illustrated for regulating temperatures. By stating that control/regulation of the pump by controller 14 is “a function of...beverage temperature at the dispensing location 6 or a water temperature in the water tank 5,” Startz confirms the inherent presence of temperature sensors both “at the dispensing location 6” and “in the water tank 5,” as well as inherently confirming that the measurements of those temperature sensors are used by the controller, meaning that the temperature measuring device and controller are communicatively coupled. Ex1002-61-62.

These sensor “at the dispensing location,” “in the water tank,” or for sensing “mixing temperatures...not illustrated” are all fluidly coupled to the resulting

solvent conduit. The patent applicant stated that coupling need not be direct (see claim construction above). Thus, the claimed “temperature measuring device” can be located anywhere within the assembly, so long as it is directly or indirectly fluidly coupled to the resulting solvent conduit. As illustrated in the annotated FIG. 1 (below), the resulting solvent conduit is highlighted in green (see also analysis of claim element 1(e), above), while the locations of Startz’s inherent sensor(s) are illustrated with red dots and arrows, and the fluid coupling is highlighted in blue:



Water in Startz’s system flows from left to right, from tank 5 to dispensing location (misabeled 16); the entire highlighted flow path is “fluidly coupled,” and Startz’s temperature sensors lie along that flow path. Ex1002-62-63.

If Startz does not disclose the claimed temperature measuring device, the use

of such a device would have been obvious to a POSA in view of one or more of the knowledge of a POSA, Lai, and/or Santi. Ex1002-63.

Lai teaches, “[T]he heater may include a sensor 194 that controls the heater 136 so that a suitable temperature (or temperature range) for brewing is obtained. The heater sensor 194 is electrically coupled to the PCB 196 of the control panel 118 such that the PCB 196 may control the temperature of the heater 136 through the heater sensor 194.” Ex1007, ¶97. Lai states, “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste. In connection with this, a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range.” Ex1007, ¶98. Lai confirms fluid coupling: “a temperature sensor in fluid communication with an outlet of said heater and electrically coupled to said control unit.” .” Ex1007, claim 31. Lai also confirms complete fluid coupling between sensor and outlet: “Normal brewing is then commenced wherein water is continuously pumped through the heater 136 and into the filter cup 10.” Ex1007, ¶98, Ex1002-63-64.

Santi describes a prior art system, “This is subsequently sent, again by pumping, to a brewing chamber inside which there is inserted a temperature

sensor. This sensor is connected to a control device capable of interrupting the flow of the pump and/or the heating of the heating device when the temperature exceeds a given threshold value.” Ex1005, ¶0012. Santi describes a second prior art system, “This machine also has a temperature sensor, connected to a control device, capable of detecting the temperature of the water supplied to the brewing chamber. By means of the control device, the temperature of the water is therefore regulated...to perform brewing.” Ex1005, ¶0014; Ex1002-64-65.

Santi, referring to FIG. 4, describes embodiments having three temperature sensors, “FIG. 4 illustrates a fourth embodiment in which the device 4 also comprises third sensor means 5' for measuring third temperature data of the input water to the heating means 40. The advantage of a further temperature sensor that detects the temperature of the input water lies in greater precision of the operating phase. In fact, in this way the variations in temperature of the input water can be kept under control, whatever the supply source...Therefore, by means of the control means 80, the number of calories to be produced and the energy required for this purpose are calculated. In this case, the second temperature sensor 60 performs a control for the feedback which can subsequently trigger corrective actions...” Ex1005, ¶0092, claims 10-14. The first sensor means 50 comprise a temperature sensor at the heating means 40. Ex1005, ¶0066. Santi confirms that the sensors are in fluid communication with the water flowing through the system:

“These can be positioned at the input of the brewing portion to ensure precise control of the temperature to be used in contact with the coffee. The temperature sensor can also, or concurrently, be positioned at the heating means. In particular, it can be positioned in contact with the heating means and/or at the hot water dispensing point thereof.” Ex1005, ¶0038. Santi teaches an embodiment using temperature sensors in the “resulting solvent conduit” (mixing means): “in this embodiment, the device 5 comprises mixing means 21 for mixing the hot water produced by the heating means 40 with the input cold water...[T]he mixing means 21 can comprise at least one temperature sensor, operatively connected to the control means 80.” Ex1005, ¶0098. And Santi confirms communication between other sensors and controller: “The control means 80 receive from the temperature sensor 50 the temperature data relating to the water...” Ex1005, ¶0073; Ex1002-65-66.

Startz, Lai, and Santi each describe at least one temperature sensor that meets this limitation. Ex1002-66.

- (b) **“the electronic controller operably configured to dynamically thermally modulate, through at least one of the thermal modulators, at least one of the solvent and the another solvent disposed within the first and second solvent conduits, respectively.”**

This limitation requires thermal modulation “through” a thermal modulator,

but does not require that the controller perform the thermal modulation by directly controlling the thermal modulator. And, as noted (claim construction, above), the patentee defined “modulate” to mean keep constant or change. This limitation is met by prior art that discloses manners of passing a solvent through one of the two thermal modulators to either keep the temperature constant or change the temperature during brewing.

Startz discloses an electronic controller (control device 14) operably configured to dynamically thermally modulate (change or maintain temperature during brewing), through at least one of the thermal modulators (pumping solvent through bypass flow pump 8 and further heating device 16), at least one of the solvent (mixing portion of water) and the another solvent (admixing portion of water) disposed within the first (flow path 3) and second (flow path 4) solvent conduits, respectively. Ex1002-67.

Startz states, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.” Ex1003, 3:53-56. As can be seen, the control device 14 regulates the bypass flow pump 8 as a function of variables that include dispensing temperature; this changes or maintains the temperature of the dispensed coffee during brewing. Ex1002-67.

If Startz does not disclose the claimed controller configuration, such a configuration would have been obvious to a POSA in view of one or more of the knowledge of a POSA, Lai, and/or Santi. Ex1002-67.

Lai teaches, "...the PCB 196 may control the temperature of the heater 136 through the heater sensor 194." Ex1007, ¶97. Lai states, "Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste. In connection with this, a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range." Ex1007, ¶98, Ex1002-67-68.

Santi describes a prior art system with, "...a control device capable of interrupting the flow of the pump and/or the heating of the heating device when the temperature exceeds a given threshold value." Ex1005, ¶0012. Santi describes a second prior art system, "This machine also has a temperature sensor, connected to a control device, capable of detecting the temperature of the water supplied to the brewing chamber. By means of the control device, the temperature of the water is therefore regulated...to perform brewing." Ex1005, ¶0014; Ex1002-68.

Santi, referring to FIG. 4, describes control during brewing, "The advantage

of a further temperature sensor that detects the temperature of the input water lies in greater precision of the operating phase. In fact, in this way the variations in temperature of the input water can be kept under control...[B]y means of the control means 80, the number of calories to be produced and the energy required for this purpose are calculated. In this case, the second temperature sensor 60 performs a control for the feedback which can subsequently trigger corrective actions...” Ex1005, ¶0092, claims 10-14; Ex1002-68-69.

Startz, Lai, and Santi each describe a controller configured to meet this limitation. Ex1002-69.

A POSA would have recognized that it would be obvious to configure the electronic controller to dynamically thermally modulate, through at least one thermal modulator, at least one of the solvents. Ex1002-69.

Startz in view of one or more of the knowledge of a POSA, AAPA, Lai, Santi, Porzio, and/or Majer renders claim 9 obvious. Ex1002-69.

5. **Claim 10**

- (a) **“The infused beverage brewing assembly according to claim 1, further comprising: a temperature measuring device communicatively coupled to the electronic controller and fluidly coupled to the resulting solvent conduit, the electronic controller operably configured to dynamically thermally modulate, through the at least one thermal modulator, the solvent disposed within the first solvent conduit.”**

Claim 10 is almost identical to claim 9, except claim 10 requires thermal modulation of the solvent in the first solvent conduit, while claim 9 allows the choice of which solvent to thermally modulate. The analysis of claim 9 shows that the solvent in the first conduit is dynamically thermally modulated by at least Lai and Santi. Moreover, if the alternative reading of Startz, set forth in the analysis of claim elements 1(c) and 1(d) is applied, Startz also dynamically thermally modulates the solvent in the first conduit.

The above analysis regarding claim 9 applies equally to claim 10.

C. Ground III: Claim 11 is Obvious Over Startz in View of One or More of the Knowledge of a POSA, Upston, Lai, Santi, and/or Majer

1. Claim 11

- (a) “The infused beverage brewing assembly according to claim 10, wherein: the electronic controller is operably configured to receive a desired temperature for the resulting temperature in the brewing chamber and a desired flow rate for the resulting solvent in the brewing chamber.”**

Startz discloses that the electronic controller (14) is operably configured to receive a desired temperature for the resulting temperature in the brewing chamber (a beverage temperature at the dispensing location 6) and a desired flow rate (a defined rate of flow) for the resulting solvent in the brewing chamber (11, 6).

Ex1002-70.

Startz teaches, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.” Ex1003, 3:53-56. Startz states, “By means of the active reactions of the bypass flow pump 8, a defined rate of flow can furthermore be established quickly...the admixing quantity of the bypass flow pump 8 can be controlled accurately if the total rate of flow is known...” and “A defined rate of flow can furthermore be generated via the bypass flow path 4...” Ex1003, 3:61-65, 4:34-38. Startz discusses the controller controlling/regulating based on various variables.

The values of such variables must have been received by the controller prior to being used. Ex1002-71. Startz does not disclose the dispensing location 6 being separated from the brewing chamber, meaning that the dispensing location temperature can be the same as the brewing chamber temperature. And Startz refers to a “defined rate of flow” that can be implemented in the bypass flow path by controlling the bypass flow pump with the control device. The “defined rate of flow” must be received by the controller before the controller can use that value to control the bypass flow pump. Ex1002-71.

If Startz does not disclose the claimed controller configuration, such a configuration would have been obvious to a POSA in view of one or more of the knowledge of a POSA, Upston, Lai, Santi, and/or Majer. Ex1002-71.

Upston teaches, “In an embodiment, the apparatus 200 includes a processor 202 for receiving inputs from user interface 204 and water level probes, thermistors, and thermal fuse/thermostats. The processor is also used to control/activate heating elements and pumps.” Ex1009, ¶0124. Upston describes using a calculated flow rate (i.e., flow over time) to stop the pump: “By calculating resultant flow over a time period of coffee production, a dose measure can be determined. It will be appreciated that this calculation can be performed in real time, and used to stop the pump when a suitable dose has been delivered through the showerhead.” Ex1009, ¶012. Upston states, “It will be appreciated that it is

beneficial for an espresso machine (commercial or consumer/domestic) to:
maintain accurate brew temperature consistently over multiple coffee extractions and intra extraction (such as, during a pour)..." Ex1009, ¶¶0150-0151. Upston describes controlled heating, "B. pre-heated water from heat exchanger (below optimum brew temperature) is then heated in a brew boiler 260 to an optimum brew temperature (for example to about 92 deg Celsius); and C. water from brew boiler passes through heated group head 700 (to maintain optimum brew temperature) and is infused into coffee grinds...The brew boiler and group head are typically temperature controlled using proportional integral—derivative (PID) control module." Ex1009, ¶¶0160-163. Upston's controller uses both (1) a flow rate to control a pump and (2) an optimum brew temperature in the brewing chamber (i.e., group head) to control heaters. Both (1) and (2) must necessarily have been received by the controller before being used. Ex1002-71-73.

Santi describes prior art: "This machine also has a temperature sensor, connected to a control device, capable of detecting the temperature of the water supplied to the brewing chamber. By means of the control device, the temperature of the water is therefore regulated so that, to perform pre-brewing, this has a preset value comprised between 50 and 75° C. and a value greater than 85°C., to perform brewing. This solution is capable of setting the temperature according to a predetermined interval." Ex1005, ¶¶0014-0015. Santi teaches that the controller

receives a desired temperature, “The control means 80 receive from the temperature sensor 50 the temperature data relating to the water which will be used in the dispensing means 100. These are then compared with the values associated with the beverage to be produced. By means of a first actuator 10 the control means 80 control the supply of the heating means 40 of the thermoblock or boiler. In particular, the heating element...of the heating means 40 can be controlled according to different methods. In the embodiment described this is frequency controlled to obtain greater precision over control of the temperature to be reached. Alternatively, it can be controlled all the time at full power (in on/off mode) or current controlled. Control of the heating means 40 allows the desired temperature T_{pi} , T_{es} , T_{er} to be reached, according to the subphase to be performed,...”

Ex1005, ¶0073. Santi teaches control and variance of flow rates by the controller based on the beverage being produced: “The control means 80 are, moreover, operatively connected to the heating means 40 and to the pumping means 200 for continuous and combined control of the temperature and of the pressure during the operating phase of the dispensing means 100. In particular, the control means 80 comprise a first actuator 10 for controlling the heating means 40 and a second actuator 11 for controlling the pumping means 200. The pumping means 200 are preferably constituted by a vibratory pump with frequency control. By way of example, frequency control allows a reduction in feed and flow rate, reducing the

frequency, for the first subphase, increasing the flow rate in the second subphase and, finally, reducing the frequency, and therefore the flow rate, again in the last subphase...In any case, the flow rate of the pump is varied, according to the present invention, as a function of the phases of the operating cycle and according to the type of beverage to be produced.” Ex1005, ¶¶0063-0064. Santi explicitly discloses that the controller receives a desired brewing temperature. A POSA would have understood that Santi’s controller must have received desired flow rate data to control the flow rates for various phases. Ex1002-73-74.

Lai teaches, “Normal brewing is then commenced wherein water is continuously pumped through the heater 136 and into the filter cup 10. Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste. In connection with this, a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range. The flow meter 140 also keeps track of the flow rate and relays this information to the PCB 196.” Ex1007, ¶0098. A POSA would have understood that Lai’s controller must have received the optimal temperature range and a flow rate to compare to the tracked flow rate. Ex1002-74-75.

Majer, referring to controller 9, states, “Alternatively, the flow rates are pre-

set in the machine instructions.” Ex1008 12:27-29. Majer states, “...the drink’s liquid content is usually pre-determined by appropriate programming means...” Ex1008 14:18-19. A POSA would have understood that Majer’s controller received flow rates. Ex1002-75.

A POSA would have recognized that it would be obvious to configure the controller to receive a desired temperature for the resulting temperature in the brewing chamber and a desired flow rate for the resulting solvent in the brewing chamber. Ex1002-75.

Startz in view of one or more of the knowledge of a POSA, Upston, Lai, Santi, and/or Majer renders claim 11 obvious. Ex1002-75.

D. Ground IV: Claim 12 is Obvious Over Startz in View of One or More of the Knowledge of a POSA, AAPA, Upston, Lai, Santi, Porzio, and/or Majer

1. Claim 12

- (a) **“The infused beverage brewing assembly according to claim 11, wherein: the electronic controller operably [sic] configured to dynamically thermally modulate, through the at least one thermal modulator, the solvent disposed within the first solvent conduit until the resulting temperature in the brewing chamber reaches the desired temperature for the resulting temperature in the brewing chamber.”**

The language of claim 12 is almost identical to claims 9 and 10, except claim 12 requires thermal modulation “until the resulting temperature in the

brewing chamber reaches the desired temperature for the resulting temperature in the brewing chamber”, while claims 9 and 10 do not. The analysis of claims 9 and 10 shows that the solvent in the first conduit is dynamically thermally modulated by at least Lai, Santi, and the alternative reading of Startz.

The above analysis regarding claims 9 and 10 applies equally to claim 12, with the additional analysis stated below.

Startz teaches, “Provision can furthermore be made for a control device 14, which controls/regulates the bypass flow pump 8 as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.” Ex1003, 3:53-56. Startz does not disclose dispensing location 6 being separated from the brewing chamber, meaning that the dispensing location temperature can be the same as brewing chamber temperature. A POSA would have understood that controlling/regulating the temperature based on dispensing location temperature would render claim 12 obvious. Ex1002-77.

If Startz does not disclose the claimed controller configuration, such a configuration would have been obvious to a POSA in view of one or more of Upston, Lai, and/or Santi. Ex1002-77.

Upston teaches, “The processor is also used to control/activate heating elements and pumps.” Ex1009, ¶0124. Upston states, “It will be appreciated that it is beneficial for an espresso machine (commercial or consumer/domestic) to:

maintain accurate brew temperature consistently over multiple coffee extractions and intra extraction (such as, during a pour)..." Ex1009, ¶¶0150-0151. Upston describes controlled heating, "B. pre-heated water from heat exchanger (below optimum brew temperature) is then heated in a brew boiler 260 to an optimum brew temperature (for example to about 92 deg Celsius); and C. water from brew boiler passes through heated group head 700 (to maintain optimum brew temperature) and is infused into coffee grinds...The brew boiler and group head are typically temperature controlled using proportional integral—derivative (PID) control module." Ex1009, ¶¶0160-163. Upston's controller thermally modulates the water until it reaches the desired temperature in the brewing chamber (i.e., group head). Ex1002-77-78.

Santi describes a prior art item, "This machine also has a temperature sensor, connected to a control device, capable of detecting the temperature of the water supplied to the brewing chamber. By means of the control device, the temperature of the water is therefore regulated so that, to perform pre-brewing, this has a preset value comprised between 50 and 75° C. and a value greater than 85°C., to perform brewing. This solution is capable of setting the temperature according to a predetermined interval." Ex1005, ¶¶0014-0015. Santi teaches that the controller receives a desired temperature, "The control means 80 receive from the temperature sensor 50 the temperature data relating to the water which will be used

in the dispensing means 100. These are then compared with the values associated with the beverage to be produced...Control of the heating means 40 allows the desired temperature T_{pi} , T_{es} , T_{er} to be reached, according to the subphase to be performed,...” Ex1005, ¶0073. Santi explicitly discloses “the desired temperature [is] reached.” Ex1002-78.

Lai teaches, “Importantly, the water temperature is regulated throughout the brewing process for optimum brewing and taste. In connection with this, a water temperature sensor 198 detects a temperature of the water exiting the heater 136 and relays this temperature to the PCB 196 of the control panel 118. The heater power and pump rate may then be adjusted to keep the water temperature within the optimal range.” Ex1007, ¶0098. Lai explicitly discloses that the optimal temperature range is maintained. Ex1002-78-79.

A POSA would have recognized that it would be obvious to dynamically, thermally modulate the water until the resulting temperature reaches the desired temperature for the brewing chamber. Ex1002-79.

Startz in view of one or more of the knowledge of a POSA, AAPA, Lai, Santi, Upston, Porzio, and/or Majer renders claim 12 obvious. Ex1002-79.

X. Mandatory Notices

A. Real Party-In-Interest

Decent Espresso International Ltd. is the real party-in-interest.

B. Related Matters

Duvall Espresso IP Enforcement, LLC (“Duvall” or “Patent Owner”) asserted the ‘456 patent against Petitioner in *Duvall Espresso IP Enforcement, LLC v. Decent Espresso International Ltd. et al.*, Case No. 9:23-cv-81246-DMM (S.D. Fla.).

C. Counsel

Lead Counsel: Perry S. Clegg (Reg. No. 65,304)

Backup Counsel: Matthew S. Nelles (Reg. No. 38,570)

James David Johnson, Reg. No. 47,685

D. Service Information

Email: perry.clegg@johnsonmartinlaw.com

matt.nelles@johnsonmartinlaw.com

david.johnson@johnsonmartinlaw.com

Mail and hand delivery:

Johnson & Martin, P.A.

50 W. Broadway, Suite 900

Salt Lake City, UT 84101

Tel: 801-783-3200

Fax: 954-206-0013

Petitioner consents to email delivery on lead and backup counsel.

XI. Conclusion

Based on the foregoing, claims 1-12 of the '524 patent are unpatentable, and
Petitioner requests institution of an *inter partes* review to cancel them.

Respectfully submitted,

By: /s Perry S. Clegg/

Perry S. Clegg, Reg. No. 65,304

**Appendix of Exhibits for U.S. Patent 11,576,524 – Petition for *Inter Partes*
Review**

Exhibit	Description
1001	U.S. Patent No. 11,576,524
1002	Declaration of Ian Tinkler, dated September 24, 2024
1003	U.S. Patent No. 8,973,487 B2 (collectively with Ex1004, “Startz”)
1004	U.S. Patent Application Publication No. 2012/0291634A1 (collectively with Ex1003, “Startz”)
1005	U.S. Patent Application Publication No. 2014/0053734A1 (“Santi”)
1006	International Publication No. WO2012/146660A1
1007	U.S. Patent Application Publication No. 2012/0171332A1 (“Lai”)
1008	International Publication No. WO2011/151703A2 (“Majer”)
1009	U.S. Patent Application Publication No. 2014/0069279A1 (“Upston”)
1010	International Publication No. WO2012/151629A1
1011	International Publication No. WO2011/158131A1 (“Porzio”)
1012	File History for U.S. Patent Application Serial No. 61/742,688
1013	File History for U.S. Patent Application Serial No. 17/020,799
1014	U.S. Patent No. 10,772,456
1015	Patent Owner Infringement Contention Pleading
1016	Patent Owner Claim Chart for 524 Patent
1017	Communicate Definition & Meaning - Merriam-Webster

CERTIFICATE OF COMPLIANCE REGARDING WORD COUNT

I hereby certify that the foregoing, Petition for *Inter Partes* Review of U.S. Patent 11,576,524, contains 13,908 words as measured by the word processing software used to prepare the document, in compliance with 37 C.F.R. § 42.24 (d), and excluding the table of contents, mandatory notices, certificate of service, certificate of compliance regarding word count, and appendix of exhibits.

Respectfully submitted,

By: /s Perry S. Clegg/

Perry S. Clegg, Reg. No. 65,304

CERTIFICATE OF SERVICE

I hereby certify that on September 25, 2024, I caused a true and correct copy
of the foregoing materials:

- Petition for Inter Partes Review
- Certificate of Compliance Regarding Word Count
- Decent Espresso International Ltd. Power of Attorney
- Fee Authorization
- Exhibits 1001-1017

to be served via FedEx on the following correspondence address as listed on PAIR,
by depositing same with FedEx for overnight delivery:

Gideon Duvall
6850 North Grande Drive
Boca Raton, FL 33433

Respectfully submitted,

By: /s Perry S. Clegg/

Perry S. Clegg, Reg. No. 65,304