

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

IPR2024-01483
Patent No. 11,576,524

DECLARATION OF GIDEON DUVALL

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TABLE OF EXHIBITS

Exhibit	Description
2002	<i>Curriculum Vitae</i> of Gideon Duvall
2003	Beaulieu et al., U.S. Patent No. 6,142,063

DECLARATION OF GIDEON DUVALL

I, Gideon Duvall, do hereby declare and say as follows:

I. INTRODUCTION

1. My name is Gideon Duvall, the president and principal owner of Espresso, Inc., a Delaware corporation that owns the current assignee and owner, Duvall Espresso IP Enforcement, LLC.

2. Duvall Espresso, Inc. is a practicing entity based out of Georgia, in that we manufacture and produce espresso machines, see, for example, our domain: <https://www.duvallespresso.com/>.

3. Duvall Espresso, Inc. was created in 2018, but I have been personally involved in the development, creation, manufacture, and/or production of coffee-related machines and innovations since at least 2008.

4. I am providing this declaration, however, as a technical expert to provide my opinion as to the assertions made by Petitioner Decent Espresso International Ltd. (“Petitioner”) in its Petition for Inter Partes Review (“IPR”) (Paper 1), assertions made by Petitioner’s purported expert, Mr. Ian Tinkler, and the validity of U.S. Patent No. 11,576,524 (“the ’524 Patent”).

5. This Declaration is based on information currently available to me and to the extent that additional information becomes available, I reserve the right to continue my investigation and study, and thus may expand or modify my opinions

as my investigation and study continues. I may also supplement my opinions in response to any additional information that becomes available to me, any matters raised by Petitioner and/or opinions rendered by Petitioner's expert(s), or in light of any relevant orders from the Administrative Law Judge.

6. My opinions are based on my years of education, research and experience, as well as my investigation and study of relevant materials.

7. While I have taken time away from the business, I am not being compensated for my time or opinions in this case.

II. QUALIFICATIONS

8. A true and correct copy of my curriculum vitae is attached hereto as Exhibit 2002 to support my education, research, skill, knowledge, and experience in the field of coffee-related machines and innovations, including the state of the art since at least 2008 and the creation, manufacture, and production of coffee-related machines.

9. I have been a named and/or sole inventor on patents related to technology unrelated to coffee-related machines since 2007 (e.g., U.S. Patent No. 7,985,394 entitled "System And Method For Manufacturing Carbon Nanotubes").

10. I am the sole inventor on the '456 Patent, and have been the sole inventor on many U.S. and foreign utility patents since at least 2008, all relating to coffee-related machines and innovations, including the following U.S. Patent Nos.

9,021,938 (entitled “System And Method For Brewing Beverages”), 9,867,491 (entitled “Device And System For Brewing Infused Beverages”), 10,258,187 (entitled “Device And System For Brewing Infused Beverages”), 10,292,523 (entitled “Controlled System For Brewing Infused Beverages”), 10,349,774 (entitled “Device And System For Creating Infused Beverages”), 10,772,456 (entitled “Device And System For Brewing Infused Beverages”), 11,266,265 (entitled “Device And System For Creating Infused Beverages”), 11,375,845 (entitled “Controlled System For Brewing Infused Beverages”), 11,957,271 (entitled “Method Of Generating A Desired Temperature Of An Infused Beverage Within A Brewing Assembly”), 12,150,585 (entitled “Controlled System And Method For Brewing Infused Beverages”).

11. Thus, I believe am qualified to render the opinions set forth herein.

III. MATERIALS CONSIDERED

12. The materials that I have considered and rely upon in preparing my Declaration and forming my opinions include all exhibits cited in this Declaration, Patent Owner’s Preliminary Response, and the Petition and all of its cited exhibits, including the Declaration of Ian Tinkler, the ’524 Patent, the file history for the ’524 Patent, and all of the relevant prior art.

13. I have further relied on my academic and personal/professional experience in reaching the opinions expressed in this Declaration.

IV. SCOPE OF OPINIONS

14. I set forth my opinions throughout this Declaration. It is my opinion that claims 1-12 of the '524 Patent are not obvious in view of any of the asserted references, alone or in combination, discussed herein.

V. LEGAL STANDARDS

15. For purposes of this Declaration, I use the legal principles below as a guide in formulating my opinions. I am not an attorney, and I am not offering any opinions regarding legal matters; however, I have personally been involved in the examination process for U.S. patents and have otherwise been informed by my counsel of the legal principles relevant to the issues herein and have the following understanding.

16. I understand that in deciding whether to issue a patent, the U.S. Patent and Trademark Office ("USPTO") examines the patent specification, its claims, and relevant prior art references to determine whether the patent application and its claims meet the requirements for patentability. I understand that if the USPTO then issues the patent, it has determined that the claims are valid. I understand that the law recognizes that the USPTO possesses special expertise to conduct such determinations, and that, as a result, each claim of a patent issued by the USPTO is presumed valid by law. This presumption of validity can be overcome only if the party seeking to invalidate a claim in a non-administrative proceeding like federal

court, proves invalidity by clear and convincing evidence, which I understand to mean evidence that convinces you that it is highly probable that the particular proposition is true. I understand that clear and convincing evidence is more than a preponderance of the evidence but less than beyond a reasonable doubt. I understand that the clear and convincing evidence standard applies to all aspects of an allegation of anticipation or obviousness, including the prior art status of the relevant reference(s).

17. I understand the first step in determining whether or not a patent claim is valid is to properly construe the claims. I also understand that the claims must be construed the same way in determining validity/invalidity and infringement/non infringement. I also understand that, as a general matter, a claim should not be limited to a preferred embodiment, but that in certain cases, the scope of the right to exclude may be limited by a narrow disclosure or by positions taken, such as by statements made during patent prosecution. I also understand the claims must be supported by the specification. Also, to the extent that a patent claims priority to an earlier filed application, the claims must be supported by the disclosure in that application. For terms that have not been construed I understand that they should be afforded their plain and ordinary meaning to one of ordinary skill in the art.

18. I further understand that a claimed invention is not patentable under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that

the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Obviousness, as I understand it, is based on the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and secondary indicia of obviousness to the extent they exist.

19. I understand that whether there are any relevant differences between the prior art and the claimed invention is to be analyzed from the view of a person of ordinary skill in the art at the time of the invention. A person of ordinary skill in the art is a hypothetical person who is presumed to be aware of all of the relevant art at the time of the invention. The person of ordinary skill is not an automaton, and may be able to fit together the teachings of multiple patents employing ordinary creativity and the common sense that familiar items may have obvious uses in another context or beyond their primary purposes.

20. I understand that if a proposed combination of references does not teach or suggest or suggest all of the elements of a claim, the combination cannot render the claim obvious. I also understand that in order to combine prior art references to show obviousness, a person of ordinary skill in the art, without knowledge of the claimed invention, or without the use of improper hindsight, must have been motivated to combine the prior art by some suggestion or teaching in the prior art, the knowledge of one of skill in the art, or the nature of the problem to be solved.

21. An invention is obvious if a designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to the solutions tried by the applicant. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, it would be obvious to a person of ordinary skill to try the known options. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique would have been obvious.

22. I understand that obviousness of a patent claim cannot properly be established through hindsight using a challenged patents specification/figures as a guide, and that elements from different prior art references, or different embodiments of a single prior art reference, cannot be selected to create the claimed invention using the invention itself as a roadmap. I understand that the claimed invention as a whole must be compared to the prior art as a whole, and courts must avoid aggregating pieces of prior art through hindsight that would not have been combined absent the inventors' insight.

23. I understand that in deciding obviousness, it is appropriate to consider whether some teaching, suggestion, or motivation would have led a person of ordinary skill in the art to combine the invalidating references. I also understand that it is appropriate to look to a variety of factors when evaluating reasons to combine

references in an obviousness analysis, and that it is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed. I understand that in determining whether a combination of prior art references renders a claim obvious, it may be helpful to consider whether there is some teaching, suggestion, or motivation to combine the references and a reasonable expectation of success in doing so. I understand, however, that the teaching, suggestion, or motivation to combine inquiry is not required and may not be relied upon in lieu of the obviousness analysis outlined above. I understand that a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. I also understand that this is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

24. I also understand that in evaluating whether patent claims are invalid as obvious, objective indicia of non-obviousness may be considered. Such objective indicia can include commercial success, long-felt but unsolved needs, copying, praise, unexpected results, industry acceptance, failure of others, and skepticism by experts.

VI. LEVEL OF ORDINARY SKILL IN THE ART

25. I understand that patent claims are to be interpreted from the viewpoint of one of ordinary skill in the relevant art. To determine the level of skill that would be “ordinary,” I understand that a person of ordinary skill (“POSITA”) must generally have the capability of understanding the general principles that are applicable to the pertinent art.

26. In my opinion, a POSITA would be a mechanical or materials engineer, or other similar degree having at least two to three years of personal experience in designing or development of coffee machines. More work or practical experience may qualify one not having the requisite education as a POSITA art while a higher level of education could offset less experience.

27. My opinions set forth below would not change regardless of whether my proposed definition or Mr. Tinkler’s definition of a person of ordinary skill in the art is adopted.

VII. CLAIM CONSTRUCTION

28. I believe a plain and ordinary meaning should be given to the claim terms, but have reviewed the proposed constructions by Petitioner and believe an opinion concerning said terms are not needed to support a finding that Petitioner has failed to show the challenged claim 1 is obvious in light of the cited art.

VIII. U.S. PATENT NO. 11,576,524

29. The '524 Patent was filed on September 14, 2020, entitled “a device and system for brewing infused beverages”, and has an effective filing date of August 16, 2012. Ex. 1001 (cover page). There are twelve total claims in the '524 Patent that were issued without any rejection during the prosecution in the '524 Patent, wherein claim 1 is an independent claim and claims 2-12 are dependent on claim 1.

30. One of the problems with known brewing systems that the '524 Patent was intending to address was the lack of independent control over flow rate and temperature in a proactive manner to produce consistent brewed beverages. *See* Ex. 1001, at 1:60–64, 2:37–41 (“[T]here is an apparent need for a brewing system that affords independent modulation of infusion pressure and flow rate enabling the user to optimize infused solution chemical composition and produce consistent beverages.”) (“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 beverage.”).

31. To that end, the '524 Patent is directed toward a brewing assembly structure that is operable to dynamically and independently control the temperature of multiple solvents in the brewing assembly to a desired temperature before the solvent is introduced into the infusion chamber (i.e., an “infusion temperature”),

while maintaining or controlling other desired brewing parameters. Ex. 1001, at 2:48–52, 2:59. Said differently, the claimed invention provides independent control of both solvent pumps in a proactive approach and control of temperature in a brewing assembly. *Id.*

32. With reference to FIG. 2 of the '524 Patent (reproduced below) which is described as “a schematic diagram depicting an independently controlled beverage brewing system,” the claimed invention works to effectuate the same by providing two solvent pumps 211, 212 “independently controlled” and forming part of the solvent flow management system 210 (“SFMS”) that “work in tandem to provide an additive flow rate that is equivalent to the total desired infusion flow rate in the brewing chamber 230”. *Id.* at 6:62–64, 9:8–13.

33. The assembly 100 is structurally configured such that each respective conduit from the pumps 211, 212 passes through a thermal modulator 221, 222 forming part of a solvent temperature management system 220 (“STMS”) in order to “dictate the solvent temperature range available for an infusion”. *Id.* at 9:28. The system electronic controller 280 is specifically configured to provide for said independent control. Ex. 1001, at 9:17–20 (“The SFMS 210 may be independently controlled or coupled to control system 280, thereby modulating the pumps 211, 212 to achieve a required flow rate of solvents 201, 202 based on total desired flow rate of resulting solvent 203 and the desired infusion temperature as explained below.”),

10:61-63 (“[T]he control system 280 is used to independently and automatically modify flow rate, temperature, and pressure of the infusion.”).

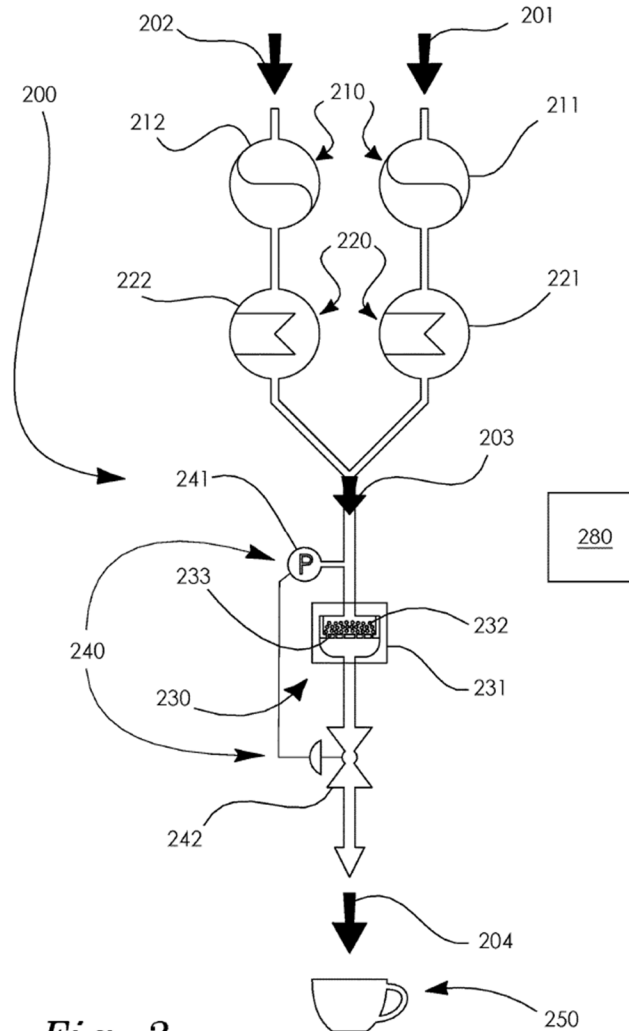


Fig. 2

34. The proactive approach to controlling flow rate and temperature is describe in the specification: “For example, if a user desires to perform the infusion between 20° C. and 100° C. then thermal modulator 221 may yield solvent 201 at a temperature of 20° C. or lower and thermal modulator 222 may yield solvent 202 at a temperature of 100° C. or higher.” *Id.* at 9:29–33. The problem with simply mixing

two fluids together in a high pressure infusion assembly is that other desired infusion brewing parameters, e.g., solvent flow rate, may be problematically changed unintendedly. *Id.* at 1:38–40. Thus, the claimed electronic controller/control system 280 communicatively coupled to the pumps 211, 212 and modulators 221, 222 so as to control the solvent flow pumped by each pump through the respective conduit and thermal modulator to get the desired infusion temperature while maintaining, for example, the desired flow rate. *Id.* at 4:4–11, 10:60–66, 15:39–41, 16:20–22. The specification provides the following informative example.

For example, assuming a negligible thermal loss from the brewing chamber 230 and system conduits, if the user desires an infusion flow rate of 1 cc/sec and an infusion temperature of 90° C., the solvent 201 may be modulated to 100° C. and the solvent 202 may be modulated to 20° C. The pump 212 will flow solvent 202 at a rate of 1/s cc/sec and pump 211 will flow solvent 201 at a rate of 7/8 cc/sec. In order to improve accuracy of the infusion temperature, the specific heat capacity and thermal conductivity of brewing chamber 230 and system conduits may be accounted for when determining solvents' 201, 202 flow rates. The STMS 220 may also be connected to the control system 280, which may modulate and/or monitor temperature of the respective solvents 201, 202, as necessary. Solvent temperatures and/or data from the STMS may be utilized by control system 280 to modulate the performance of the SFMS, thereby advantageously achieving a desired infusion temperature and infusion flow rate.

Id. at 9:37–55.

IX. RELEVANT ASSERTED REFERENCES

35. With reference below to FIG. 1 from Startz (Ex. 1004, the primary reference utilized by Petitioner and its purported expert), said reference is directed to a “fully automatic coffee machine [1], comprising a main flow path [3] that leads through a heating device [2], and a bypass flow path [4] that circumvents the heating device [2]” to “provide a cost-efficient and accurate admixing of cold water.” Ex. 1004, ¶¶ 0002, Abstract; see also *id.* ¶ 0006 (“The invention is based on arranging a bypass flow pump in the bypass flow path of a beverage machine comprising a main flow path and a bypass flow path, and to accurately meter an admixing quantity of cold water via the bypass flow pump.”).

36. Said another way, Startz’s pumping configuration (when two pumps are utilized) is unlike claim 1’s proactive independently controlled approach, but is instead reactive, whereby both pumps, at best, work from the same flow meter data, to adjust flow. Ex. 1004, 57–67. More specifically, Startz discloses two “alternative positions” for circumventing the heating device 2, i.e., by passing the solvent through a bypass flow pump 8 or (as depicted in FIG. 1 with broken lines) passing the solvent through a “bypass 12, which circumvents the heating device 2 and the bypass flow pump 8, and in which a throttle device 13, particular a cover, is arranged.” *Id.* at ¶¶ 0015–16.

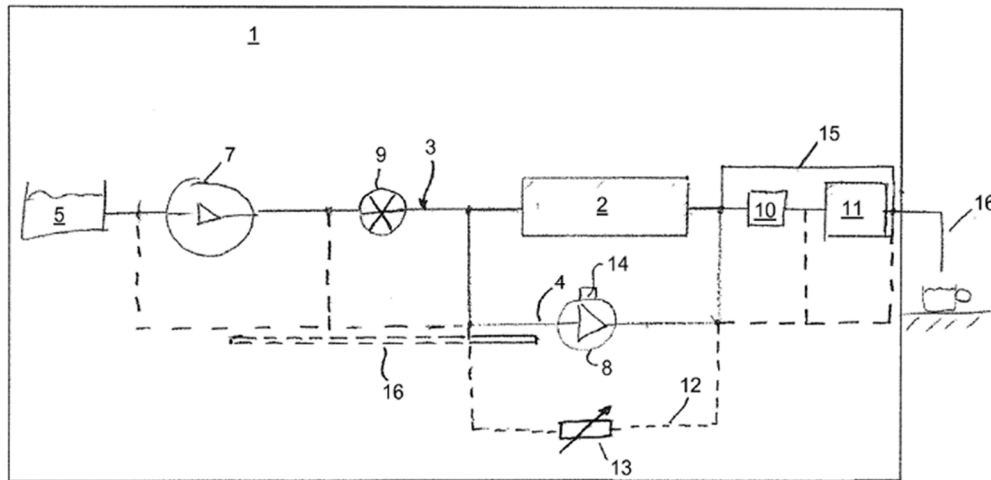


FIG. 1

37. Startz discloses the use of “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.” *Id.* at ¶ 0018. Startz also discloses the use of a heating device 16 for heating the bypass flow path 4 “to keep descaling liquid in motion in the heating device 2 by means of the bypass flow pump 8 and to thus improve a descaling result, in particular provided that the brewing valve 10 is not actuated thereby.” *Id.* at ¶ 0020; *see also id.* at claim 9 (“The beverage machine of claim 1, further comprising a further heating device (16), by means of which the bypass flow path (4) can be heated at least area by area.”). Said another way, the heating device 16 is solely used to heat the bypass path area upstream of the bypass flow pump 8 to circulate a heated liquid

into the heating device 2 to prevent buildup, mineral deposits, etc. inside of the heating device 2 (i.e., descale it).

38. Recirculation of water through heating device 2 for the purposes of descaling and preventing mineral deposits using recirculation flow path 4 along with heating device 16 and bypass flow pump 8 would not require any rate of flow data from a flow meter to be successfully achieved and would thus not describe an ability of recirculation pump 8 to flow fluid at a know rate without the use of a flow meter or other flow sensing device. Further, the heating device 16 in Startz is only taught to be utilized when pump 8 is operating, *not* pump 7, i.e., both pumps would not be operating (much less controlled electronically) as pump 8 takes heated solvent from the heating device 16 and circulates it in the circuit inside of the heating device 2 to descale it—if pump 8 was operating there would be no need to utilize the heater/pump 8 to descale. Ex. 1004, at ¶ 0020.

39. To that end, Startz’s “invention deals with the problem of specifying an improved or at least an alternative embodiment for a beverage machine of the generic type that is characterized by a simple design solution, and that additionally provides reliable setting of an accurate mixing temperature.” *Id.* at ¶ 0005. Startz’s invention is akin to the known devices described in the background section of the ’524 Patent, including deficiencies associated with said devices, i.e.:

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. While the aforementioned device may be capable of providing dynamic temperature and pressure control, it does so at the expense of the ability to regulate flow rate of the exiting infused beverage. The varying exiting flow rate disadvantageously creates inconsistent beverage output, which is costly for many retailers of beverages. The inconsistencies also are problematic for retailers and consumers, alike, as both the taste of the beverage and the amount of the beverage may change at each brewing cycle.

Ex. 1001, at 2:7–19.

40. Petitioner utilizes Lai (Ex. 1007, a secondary reference utilized by Petitioner and its purported expert), and said reference is directed toward a “beverage appliance” teaching a “pivotable receptacle” and a mechanism for reducing solute size within a container inserted within the receptacle. Ex. 1007, at Abstract. With reference to FIG. 60 of Lai, also teaches that a solenoid controls a three-way valve 151 so the flow path is to the coffee spout 122 and “water is heated by the heater 136 and into the filter cup 10”, wherein “the water temperature is regulated throughout the brewing process” using a sensor 198. *Id.* at ¶ 0098. The assembly also utilizes a “**sensor 194 that controls the heater 136** so that a suitable temperature (or temperature range) for brewing is obtained.” *Id.* at ¶ 0097.

on the line 52 to control the pump 31, the tank heater 54 and various valves in the system.”).

43. Petitioner utilizes Santi (Ex. 1005, a secondary reference utilized by Petitioner and its purported expert), and said reference is directed toward a “beverage for producing hot beverages” that teaches, with reference to FIG. 1 immediately below, utilizing a “control means 80” with “a first actuator 10 for controlling the heating means 40.” Ex. 1005, at ¶ 0063. “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.” *Id.*

44. As such, Santi’s disclosure of monitoring and continually controlling both the temperature and pressure (at the expense of other variables) is also akin to the devices the ’524 Patent describes as existing in its background section, including deficiencies associated with said devices, i.e., “brewing systems have been developed that seek to enable flavor modification through selective modulation of one or more brewing variables, [however,] modulation of one or more variables during an infusion results in unintended changes to other brewing variables. This lack of independent variable control makes the optimization and modification of infused beverages difficult”. Ex. 1001, at 1:33–42

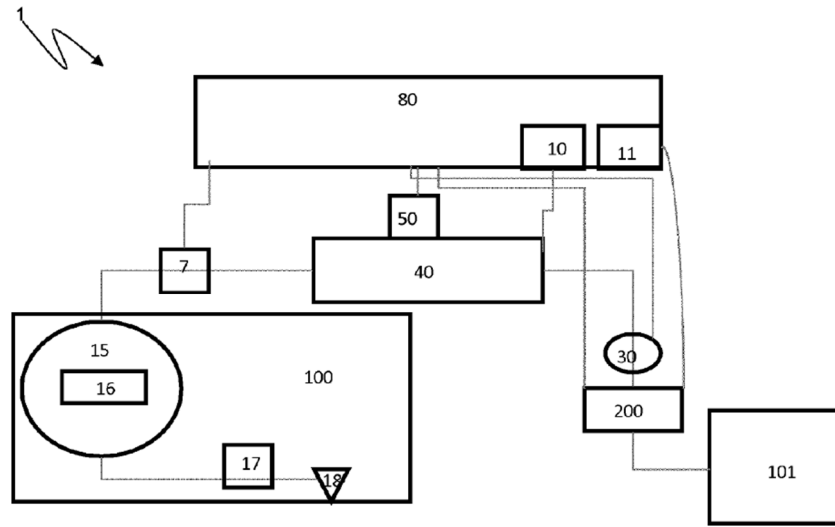


FIG. 1

45. Similar to Lai, the same teachings in Santi that are utilized by Petitioner (i.e., having an electronically controlled solvent flow and thermal modulation of said flow in a brewing process) were also disclosed in the '524 Patent as being known, considered during the prosecution history, and still found not to affect the patentability or render claim 1 obvious based on the additional requirements in limitation 1[e] in combination with limitations 1[a] and 1[b], *infra*. Compare Ex. 1013, at 112 (citing Ex. 2003), *with* Ex. 2003, at 3:46–51.

46. Petitioner also utilizes Majer (Ex. 1008, a secondary reference utilized by Petitioner and its purported expert), and said reference is directed toward a “beverage dispensing machine” that utilizes two circuits in a brewing process, i.e., “circuit C1” where a “pump 4” takes water through a “heating means 5” to a “brewing means 2” and separate “circuit C2” where a “pump 4bis” takes water

through a “heating means 5bis” to utilize with a steam-producing unit and air-intake.” Ex. 1008, at 10:11–17, 11:25–27, 20:4–15; see also *id.* at 10:18–20 (“To put it in other words, second circuit C2 is not provided with brewing means and is not involved with the extraction or brewing process that is carried out only in first 20 circuit C1.”).

47. Majer discloses utilizing an “electronic controller 9” to control the pumps 4, 4bis but not associated with the brewing process because circuit 2 is not associated with said brewing process. This type of system and process was also recognized in the examination of the ’524 Patent and found not to affect the patentability of the ’524 Patent. *See* Ex. 1013, at 108–09 (“This is not the addition and controllability of solvents to a brew process, and the mixability of different ingredients in proportionate control would not have motivated the adjustment of known beverage infusers to control temperature by mixing valve for the solvent, since the adjustment of temperature does not solve a problem in the prior art, and would not have suggested itself to that particular use as now claimed.”).

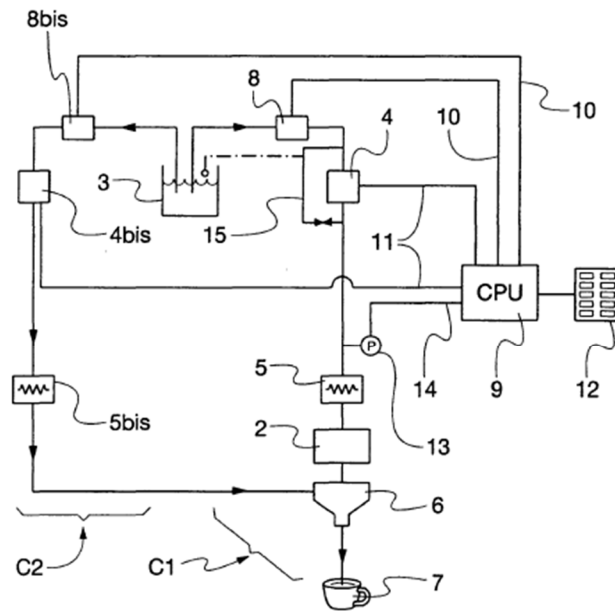


Fig. 1

X. PETITIONER’S GROUNDS FOR CANCELLATION DO RENDER THE CHALLENGED CLAIMS INVALID BECAUSE CLAIM 1 IS NOT OBVIOUS OVER THE CITED ART

48. As described above in Section IX, the prior art cited by Petitioner and its purported expert does not teach or render obvious a brewing assembly as claimed by independent claim 1.

49. In particular, Petitioner and its expert have not shown of the cited art references have an electronic controller communicatively coupled to the first and second solvent pumps and the at least one thermal modulator, or that it would have been obvious to combine any of said components with the assembly in Startz.

50. In particular, with reference to Startz disclosing that “[g]enerally, 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”, Startz was not referring to the main flow pump being controlled by any electronic controller, much less the control device (14) in Startz. Rather, Startz was stating that a magnetic piston pump (out of a number of potential types of pumps) may be the most cost-efficient and accurate to configure or control.

51. Specifically, Startz states:

Generally, the bypass flow pump 8 and/or the main flow pump 7 can be embodied as vane-type pump, as gear type pump or as magnetic piston pump, whereby in particular the latter alternative represents a cost-efficient and at the same time an accurately controllable pump.

Ex. 1004, at ¶ 0017.

52. Startz also does not disclose the connections and operability in limitation 1[e], namely that an electronic controller is communicatively coupled (i.e., connected so as to electronically control performance) to both pumps and a thermal modulated. Rather, Startz discloses use of a control device 14 located physically on the bypass flow pump 8 and configured to “control/regulate[] the bypass flow pump as a function of a flow volume, a beverage temperature at the dispensing location 6 or a water temperature in the water tank 5.”

53. A POSITA would not have been motivated to modify the “control device 14” in Startz to be electronic. For example, said proposed modification is counter to the cost-efficient and structural configuration teachings in Startz. *See* Ex.

1004, at Abstract, ¶¶ 0007, 0017, 0022 (“On principle, such a bypass flow pump can also be produced in a *more cost-efficient manner* than a 2/2-way magnetic valve, for example, so that the solution according to the invention is *also economical*.”); (“Thus a bypass pump (8) is arranged in the bypass flow path (4) to provide a *cost-efficient* and accurate admixing of cold water.”); (“[W]hereby in particular the latter alternative represents a *cost-efficient* and at the same time an accurately controllable pump.”); (“In the event that the bypass flow pump 4 is furthermore manufactured as a gear-type pump or as a vane-type pump or as a magnetic piston pump, a *cost-efficient* manufacture can furthermore be obtained as compared to magnetic valves.”) (emphasis added).

54. More specifically, the structural configuration in Startz providing this “control device 14” is taught as being the actual pumping mechanism itself, not an electronic controller that is connected so as to electronically control performance. Startz states that “[d]ue to the low pressure difference in the main flow path 3 and in the bypass flow path 4, the admixing water quantity can be *controlled* in a highly accurate manner in the case of known pump characteristics, in particular *with the use of a gear-type pump or of a magnetic piston pump*.” Ex. 1004, at ¶ 0019 (emphasis added). Therefore, adding an electronic controller and configuring it to communicate and modify the performance of multiple other electronic devices is counter to the intent and structural configuration of Startz. *See id.*

55. The proposed modification or motivation to modify Startz’s control device 14 as claimed by the ’524 Patent is again not supported with any explicit or inherent teachings in Startz.

56. With respect to Petitioner and its purported expert’s assertions that Lai teaches “a heater communicatively connected to the electronic controller, along with the pump(s)”, there is no disclosure in Lai of communicatively coupling the PCB to a single pump, much less multiple “pumps”. At best Lai discloses that the PCB is communicatively coupled to the *temperature sensor* and *flow meter* and that when a particular temperature of water is sensed by the sensor 198, the heater and pump rate may be adjusted, i.e., it does not state what is adjusted, how it is adjusted, what is doing the adjustment, that the PCB is communicatively coupled to either the heater or a singular pump, or that the PCB carries out the claimed operability claimed by limitation 1[e]. When reading Lai completely, it appears the pump in Lai adjusts by itself, i.e., “[t]owards the end of the brewing process, the pump 138 will stop first to let the heater 136 further heat the water to produce steam, as discussed above.” Ex. 1007, at ¶ 0098.

57. To the extent Petitioner asserts that Santi purportedly teaches the electronic coupling of the of the electronic controller to two pumps and a thermal modulator, that assertion is also inaccurate. As stated above in section IX, Santi, at most, discloses an electronic controller (called a “control means 80”)

communicatively coupled to a single pump (called a “pumping means 200”) and a single heater (called a “heating means 40”), which does not teach the aforementioned claim limitation 1[e] and was teachings already identified by the ’524 Patent and in the prosecution history as being in the prior art, deficient, and not rendering the invention in claim 1 obvious.

58. To the extent Petitioner asserts that Majer purportedly teaches the electronic coupling of the electronic controller to two pumps and a thermal modulator, that assertion is also inaccurate. As stated above in section IX, Majer at most discloses an electronic controller 9 that is connected to control two pumps (not a thermal modulator), wherein one of those pumps is not even part of the brewing cycle. Controlling a pump outside of the brewing cycle was also considered by the examiner in the ’524 Patent and rejected as not being pertinent to the primary objective the ’524 Patent was trying to accomplish, i.e., achieving the precise temperature and flow control in the brewing process for infusing the solute and optimizing beverage flavor.

59. Petitioner and its expert have also completely failed to sufficiently explain why a POSITA would have taken the individual teachings and modify the structural configuration in Startz. As stated above in section IX, such a proposed modification is counter to the teachings in Startz.

60. Additionally, as stated above in section IX, Startz teaches to have a “cost-efficient” and “simple design solution” for mixing solvent flows.

61. In addition the above deficiencies, Petitioner and its expert do not provide the requisite motivation to combine any individual components in the prior art (much less the collective use of them) or how it would have been obvious for any equated electronic controller to be 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.

62. As stated above, Startz does not explicitly disclose an electronic controller. Majer discloses controlling two pumps, but fails to account for the fact that one of those pumps is located outside of the brewing cycle and that it does not control any equated thermal modulator. Santi and Lai disclose the ability to control one pump and one thermal modulator in a brewing process, but fail to account for the fact the equated electronic controller does not control any additional pump in the brewing process to achieve the '524 Patent's objectives, i.e., independently or, with respect to Lai, the equated electronic controller is not operably configured to control any pump or thermal modulator.

63. Even assuming, *arguendo*, a POSITA would have been motivated to add an electronic controller in Startz to control the performance of both pumps 7, 8 and heating device 2, providing for the ability for said electronic controller to

independently control each of those components, in particular the two pumps 7, 8 would also be counter to the teachings in Startz.

64. Specifically, as described above, Startz has a reactive (instead of proactive) pump configuration that reacts to a determined flow rate received from the flow meter 9 flow of solvent downstream of the pump 7, wherein Startz discloses the operability of those pumps 7, 8 (whether through a potential electronic controller or otherwise) being configured in a dependent relationship (instead of independent control as required the portion of limitation 1[e] having the electronic controller “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, at 3:63–67.

65. Specifically, with reference again to FIG. 1 of Startz (reproduced below), Startz states that: “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.” *Id.*

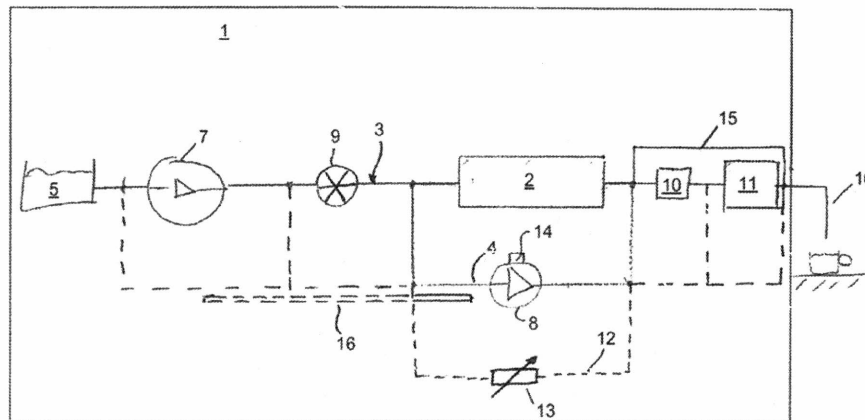


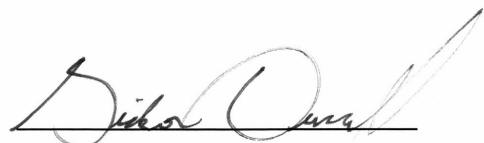
FIG. 1

Said another way, the location of the flow meter 9 downstream of the pump 7, but upstream of bypass pump 8, requires, according to Startz, the reactive approach of running pump 7, determining the overall flow rate from meter 9, and then pumping a quantity of solvent dependent on the flow from the pump 7. *Id.* Petitioner and its expert do not explain or account for said dependent mixing process articulated in Startz that runs counter to independent control in limitation 1[e], further buttressing why a POSITA would not have been motivated to modify Startz or combine the components and operability alleged.

XI. SUMMARY

In Summary, it is my opinion that Petitioner has failed to show claims 1-12 are unpatentable as obvious as explained above.

Dated: February 3, 2025


Gideon Duvall