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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL FARRELL

Appeal 2019-000501
Application 13/572,745
Technology Center 1700

Before LINDA M. GAUDETTE, KAREN M, HASTINGS, and JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to finally reject claims 2, 3, 7, 9–16, 20, and 22–28.[2] We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

Independent claim 16 illustrates the subject matter on appeal, and is reproduced below with contested subject matter italicized:

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Gavilan Tech, LLC as the real party in interest. Appeal Brief filed June 4, 2018 ("Appeal Br.") at 5.

[2] Final Office Action entered February 13, 2018 ("Final Act.").

16. A method of making a maple sap beverage product composition suitable for ingestion by a human, said composition having a Brix value of from 1 to 5, *said composition consisting of*

(a) a first maple sap comprising water, said first maple sap having a Brix value in the range of 1 to 5; or

(b) a second maple sap comprising water wherein said second maple sap is said first maple sap which has had its Brix value adjusted to have a standard predefined Brix value in the range of 1 to 5; and

upon having been subjected to an Ultra-High Temperature pasteurization (UHT) and packaged in aseptic containers under aseptic packaging conditions, at the time of said packaging and said UHT, said maple sap beverage product having a micro-organism load of not more than 10 colony forming units/ml (CFU/ml) and after 12 months of storage at 21°C to 25°C a micro-organism load of not more than 10 CFU/ml;

said method consisting of

A) obtaining said first maple sap;

B) optionally filtering the first maple sap through a filter having a pore size of 100 micron in order to remove gross contaminants;

C) optionally adjusting the result of steps A), or A) and B) to said standard predefined Brix value selected from a Brix value in the range of from 1 to 5 defining said second maple sap;

the results of said step A) and optionally any of said steps B) through C) resulting in a pre-UHT, prior to being packaged product; and

D) subjecting said pre-UHT, prior to being packaged product to either of

(a) an Ultra-High Temperature pasteurization (UHT) step followed by packaging thereof in aseptic containers under aseptic conditions; or

(b) (i) using aseptic conditions to package said pre-UHT, prior to being packaged product in aseptic containers followed by

(ii) using said UHT as a terminal sterilization step;
wherein said UHT step is conducted at a temperature selected from the range of from 130°C to 150°C and an exposure time selected from the range of 1 second to 10 seconds;
wherein said optional step C) can be done at any point after obtaining said first maple sap until after said step D), provided that if step C) is performed after step D), that the respective materials used therein and the conditions of carrying out such step carried out after step D) be aseptic and conducted under aseptic conditions;
said maple beverage product at the time of being placed into said containers but after said UHT having a micro-organism load of not more than 10 CFU/ml and after 12 months storage at 21°C to 25°C a micro-organism load of not more than 10 CFU/mL.

Appeal Br. Claims Appendix 4–6 (emphasis added).

REJECTIONS

The Examiner maintains the following rejections in the Examiner's Answer entered August 23, 2018 ("Ans."):[3,4]

I. Claims 7, 9–11, 13–16, 20, and 22–28 under 35 U.S.C. § 103(a)

[3] The Examiner modified the rejections set forth in the Final Office Action in the Advisory Action entered April 16, 2018 ("Advisory"), and we accordingly refer to the rejections as presented in the Advisory Action.
[4] Although the Examiner sets forth six provisional nonstatutory double patenting rejections in the Advisory Action (Advisory 10–18), Appellant does not contest these rejections. Appeal Br. 21. Nonetheless, we note that the copending patent applications on which the rejections are based have all been abandoned, rendering the rejections moot.

as unpatentable over Tap[5] in view of Appellant's admitted prior art,[6] Fleury,[7] Jeong,[8] Brody,[9] Kim,[10] and Barbeau;[11] and

II. Claims 2, 3, and 12 under 35 U.S.C. § 103(a) as unpatentable over Tap in view of Appellant's admitted prior art, Fleury, Jeong, Brody, Kim, Barbeau, Trollbridgecreek,[12] and Wijesinghe.[13]

FACTUAL FINDINGS AND ANALYSIS

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we affirm the Examiner's rejections of claims 2, 3, 7, 9–16, 20, and 22–28 under 35 U.S.C. § 103(a) for the reasons set forth in the Final Action, the Answer, and below.

We review appealed rejections for reversible error based on the arguments and evidence the appellant provides for each issue the appellant

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[5] Tap, *Maple Trees at Home – Collect Sap & Make Syrup*, published at the Wayback Machine, February 10, 2011, available at http://web.archive.org/web/20110210111030/http://www.tapmytrees.com/coprsap.html ("Tap").
[6] Paragraph 5 of Appellant's Specification.
[7] Fleury et al., US 2011/0052759 A1, issued March 3, 2011 ("Fleury").
[8] Jeong, KR 10-0497048, published June 28, 2004.
[9] Aaron L. Brody & Kenneth S. Marsh, *The Wiley Encyclopedia of Packaging Technology* 41–45 (John Wiley & Sons, Inc., 2nd ed. 1997) ("Brody").
[10] Kim, 10-2010-0093719, published August 26, 2010.
[11] Barbeau et al., US 2014/0010930 A1, published January 9, 2014 ("Barbeau").
[12] Trollbridgecreek, *History*, published at the Wayback Machine, January 23, 2011, available at http://web.archive.org/web/20110123013313/http://trollbridgecreek.ca/history.html ("Trollbridgecreek").
[13] Wijesinghe et al., US 2013/0052298 A1, published February 28, 2013 ("Wijesinghe").

identifies. 37 C.F.R. § 41.37(c)(1)(iv); *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (explaining that even if the Examiner had failed to make a prima facie case, "it has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections")).

Rejection I

We first address the Examiner's rejection of claims 7, 9–11, 13–16, 20, and 22–28 under 35 U.S.C. § 103(a) as unpatentable over Tap in view of Appellant's admitted prior art, Fleury, Jeong, Brody, Kim, and Barbeau.

Claims 13–16, 20, and 22–24

Appellant's arguments are not directed to the separate patentability of any of claims 13–16, 20, and 22–24, and thus, in effect, Appellant argues these claims as a group. Appeal Br. 21–56. We, therefore, select independent claim 16 as representative, and decide the appeal as to claims 13–16, 20, and 22–24 based on claim 16 alone.[14] 37 C.F.R. § 41.37(c)(1)(iv).

Independent claim 16 requires the recited method of making a maple sap beverage product to consist of obtaining a first maple sap (having a recited Brix value), and subjecting the first maple sap to ultrahigh

[14] Appellant does not contest the aspects of the Examiner's rejection of claim 16 that rely on Appellant's admitted prior art and Fleury; consequently, we need not address these references. *Compare* Advisory 4, *with* Appeal Br. 21–56. The Examiner relies on Kim in the rejection of claims 7, 9–11, 13–15, 25, and 26. Advisory 6–7. Because we limit our discussion to claim 16, we also need not address Kim.

temperature pasteurization (UHT), followed by packaging the sap in aseptic containers under aseptic conditions. Claim 16 requires the maple beverage product, at the time of being placed into the containers and after ultrahigh temperature pasteurization, to have a micro-organism load of not more than 10 CFU/ml, and to have a microorganism load of not more than 10 CFU/mL after 12 months of storage at 21°C to 25°C.

Tap discloses collecting sap from maple trees to produce a maple sap beverage. Tap p. 1. Tap discloses that although the maple sap may be consumed "straight from the collection method," the maple sap should be boiled before consumption, to "effectively kill bacteria" and "eliminate any possible bacteria growth." *Id.* The Examiner finds that Tap does not disclose subjecting maple sap to ultrahigh temperature pasteurization, followed by packaging the sap in aseptic containers under aseptic conditions, and the Examiner relies on Jeong, Barbeau, and Brody for suggesting modification of Tap's method to include these steps. Advisory 4–5.

Jeong discloses that the most common drinkable saps include those from bamboo and maple trees. Jeong pp. 3–4. Jeong discloses that sap "is easily decomposed by microorganisms," and, therefore, must be sterilized before it can be stored at room temperature for long periods of time. Jeong pp. 8–9. Jeong discloses sterilizing sap by heating it to 135ºC to 140ºC and maintaining the sap at that temperature for 2 to 3 seconds, which Jeong refers to as "ultrahigh high temperature short time sterilization." Jeong pp. 11–12. Jeong discloses that ultrahigh temperature short time sterilization "can effectively destroy microorganisms while minimizing destruction of the nutritious components . . . [but] to achieve a more complete sterilization effect . . . [a] high voltage pulsed electric field treatment step (20) is carried

out" following the ultrahigh temperature short time sterilization step. Jeong pp. 13–14. Jeong discloses that the "sterilized sap which has gone through said steps can be put into suitable container[s] such as pre-sterilized cans, bottles, resin-coated paper packages and the like as the final step." Jeong p. 19.

Barbeau discloses sterilizing sap produced from maple trees for a time sufficient to greatly reduce, and preferably eliminate, microbial life in the sap "with minimal taste alteration." Barbeau ¶¶ 12, 47, 210, 211, 214, 230. Barbeau discloses that suitable processes for sterilizing maple sap include heat sterilization treatment ("also known as UHT treatment"), which may be conducted alone or in combination with pulsed electric field sterilization. Barbeau ¶¶ 47, 235. Barbeau discloses that heat sterilization treatment may involve heating to from about 130ºC to about 150ºC for about 2 to 8 seconds. Barbeau ¶¶ 49, 236.

Brody discloses an aseptic packaging process for producing shelf-stable packaged food products that involves filling sterilized containers with a pre-sterilized product in a hermetically sealed, commercially sterile environment. Brody p. 41; Fig. 1.

In view of these disclosures in Jeong, Barbeau, and Brody, the Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of Appellant's invention to modify Tap's method of making a maple sap beverage by sterilizing the sap using the ultrahigh temperature sterilization conditions disclosed in Jeong and Barbeau, and packaging the sterilized sap using aseptic techniques as taught by Brody, to ensure that the product does not spoil. Advisory 5.

The Examiner determines that because Tap's method as modified by

Jeong, Barbeau, and Brody involves sterilizing Tap's maple sap beverage using ultrahigh temperature sterilization at a temperature and time that overlap the corresponding ranges recited in claim 16, and also involves packaging the sterilized sap using aseptic packaging under aseptic conditions, the maple sap beverage so treated would have, after ultrahigh temperature sterilization and at the time of being packaged, a micro-organism load of not more than 10 CFU/ml, and would have a microorganism load of not more than 10 CFU/mL after 12 months of storage at 21°C to 25°C, as recited in claim 16. Advisory 6. The Examiner explains that because the "microbial load as recited in the claim is seen to express the intended result of a positively recited process step . . . [and because] the prior art teaches the process step, it is not seen that the particular result of the process would have been patentability distinct." *Id.*

Appellant argues that the Examiner does not meet the Examiner's burden of showing that one of ordinary skill in the art would have been motivated "to combine the [applied prior art] references with a reasonable expectation of success in achieving" a microorganism load as recited in claim 16 of not more than 10 CFU/ml after 12 months storage at 21ºC to 25ºC (referred to hereinafter as "the recited storage sterility"). Appeal Br. 28–29, 32–34, 40, 47 (emphasis omitted).

Appellant argues that the applied prior art references do not teach or suggest the recited storage sterility, but teach, at best, "a possible expectation of not more than 9 months storage stability." Appeal Br. 27–29, 33–34. Appellant argues that the only applied prior art references that disclose ultrahigh temperature sterilization are Jeong and Barbeau, which disclose, respectively, that ultrahigh temperature sterilization of bamboo

yields a room temperature storage stability of not more than three months, and ultrahigh temperature sterilization of maple sap yields a room temperature storage stability of up to six months. *Id.* Appellant argues that data presented in the Declaration of inventor Michael Farrell filed June 4, 2018 show that when maple sap was subjected to ultrahigh temperature sterilization and packaged in aseptic containers without the use of aseptic conditions during packaging, sterility was maintained for 3–7.75 months. *Id.* at 29–30, 38–39, 50, 52. Appellant argues that these "results varied between what was shown in Jeong for bamboo to what is asserted in Barbeau (all without the use of aseptic conditions during packaging)." *Id.* at 29, 38, 50.

Appellant further refers to Kirk-Othmer, 18 *Encyclopedia of Chemical Technology*, 5th ed., pp. 32–33 (2006), discussed in paragraph 26 of Appellant's Specification, and Zoltai et al. (US 7,700,145 B1, issued April 20, 2010), cited by Appellant in an Information Disclosure Statement filed September 19, 2017. Appeal Br. 27–29, 36, 37, 46–47, 51. Appellant argues that Kirk-Othmer and Zoltai are "the only art in the record" that disclose a sterility time point achieved using a combination of ultrahigh temperature sterilization and packaging into aseptic containers under aseptic conditions. *Id.* at 28. Appellant argues that Kirk-Othmer discloses that treating milk according to such a process resulted in a storage stability for up to six months, while Zoltai discloses that treating dairy products according to such a process resulted in a storage stability for up to nine months. *Id.* at 27–28. Appellant argues that these disclosures in Jeong, Barbeau, Kirk-Othmer, and Zoltai do not teach or suggest that the recited storage stability has been achieved or is achievable, and, Appellant argues, the teachings of

the references, therefore, mitigate against a reasonable expectation that the recited storage sterility could be successfully achieved. *Id.* at 28–29, 32–34, 40, 47.

Appellant's arguments do not identify reversible error in the Examiner's rejection, for reasons that follow.

As discussed above, Tap discloses that bacteria present in maple sap following collection from maple trees should be killed before the sap is consumed, and Jeong and Barbeau both disclose that maple sap collected from maple trees requires sterilization to reduce the level of microorganisms present in the sap. Tap p. 1; Jeong pp. 8–9; Barbeau ¶ 12. As discussed above, Jeong discloses that ultrahigh temperature sterilization of maple sap, conducted at 135ºC to 140ºC for 2 to 3 seconds, "can effectively destroy microorganisms while minimizing destruction of the nutritious components" in the sap, and Barbeau discloses that heat sterilization, conducted at from about 130ºC to about 150ºC for about 2 to 8 seconds, greatly reduces microbial life in maple sap "with minimal taste alteration." Jeong pp. 13–14; Barbeau ¶¶ 230, 235, 236. These disclosures in Jeong and Barbeau would have led one of ordinary skill in the art to sterilize maple sap collected from maple trees as disclosed in Tap using Jeong and Barbeau's ultrahigh temperature sterilization conditions, to ensure safe consumption of the sap by greatly reducing the level of microorganisms present in the sap, while minimally altering its taste and nutritional content. Furthermore, in view of Jeong's disclosure of packaging the sterilized maple sap in pre-sterilized containers, and Brody's disclosure that using aseptic packaging techniques yields shelf-stable packaged food products, one of ordinary skill in the art would have been led to package the maple sap sterilized as

disclosed in Jeong and Barbeau in pre-sterilized containers using aseptic packaging techniques as disclosed in Brody, to produce packaged maple sap that would be shelf-stable. Brody p. 41; Fig. 1. One of ordinary skill in the art reasonably would have expected that packaging maple sap sterilized using Jeong and Barbeau's ultrahigh temperature sterilization conditions in pre-sterilized containers using aseptic packaging techniques as disclosed in Brody would successfully extend the storage sterility of the maple sap. *In re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009) ("Obviousness does not require absolute predictability of success . . . all that is required is a reasonable expectation of success.") (emphasis omitted) (citing *In re O'Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988).

As discussed above, Appellant argues that Jeong, Barbeau, Kirk-Othmer, and Zoltai teach, at best, "a possible expectation of not more than 9 months storage stability" for maple sap, and, Appellant argues, the prior art, therefore, "mitigates against" a reasonable expectation that the storage sterility recited in claim 16 could be successfully achieved. As the Examiner explains, however, Kirk-Othmer and Zoltai disclose sterilization and aseptic packaging of milk and dairy products—rather than maple sap. Ans. 4. Due to the significant compositional differences between maple sap and milk and dairy products, one of ordinary skill in the art reasonably would not have expected that the storage stability of maple sap after sterilization and aseptic packaging would be the same, or even similar to, the storage stability of milk and dairy products disclosed in Kirk-Othmer and Zoltai. *Id.*

Furthermore, consistent with the disclosures in Appellant's Specification, the storage sterility recited in claim 16 (a microorganism load of not more than 10 CFU/ml after 12 months storage at 21ºC to 25ºC),

expresses a result of performing the steps recited in the claim of subjecting maple sap to ultrahigh temperature pasteurization, followed by packaging in aseptic containers under aseptic conditions, rather than imposing a further limitation on the claimed method. Spec. ¶¶ 26, 28, 29. The recited storage sterility, therefore, does not impart patentable weight to the method of claim 16. *Tex. Instruments Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1172 (Fed. Cir. 1993) ("whereby" or "thereby" clauses in a method claim "that merely state[] the result of the limitations in the claim add[] nothing to the patentability or substance of the claim"); *Minton v. Nat'l Ass'n of Securities Dealers, Inc.*, 336 F.3d 1373, 1381 (Fed. Cir. 2003) ("A whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited."); *In re Kubin*, 561 F.3d at 1357 ("Even if no prior art of record explicitly discusses the [limitation], [applicants'] application itself instructs that [the limitation] is not an additional requirement imposed by the claims on the [claimed invention], but rather a property necessarily present in [the claimed invention]").

Appellant argues that *In re Stepan Co.*, 868 F.3d 1342 (Fed. Cir. 2017) "controls in this case," and because "the Examiner has not rebutted this argument, the Examiner should be reversed." Appeal Br. 23–25, 34–41.

Contrary to Appellant's arguments, *Stepan* does not "control" in this case, for reasons that follow.

In contrast to Appellant's claim 16, which is a method claim, the claims at issue in *Stepan* were composition claims. *Stepan*, 868 F.3d at 1344–45. The sole independent claim (claim 1) recited an ultrahigh load, aqueous glyphosate salt-containing concentrate comprising water, a glyphosate salt, and a surfactant system, and recited "said concentrate

having a cloud point above at least 70°C, or no cloud point when the concentrate is heated to its boiling point." *Id.* The Federal Circuit vacated and remanded the Board's decision affirming the Examiner's rejection of the claims as obvious because "[t]he Board failed to explain why it would have been 'routine optimization' to select and adjust the claimed surfactants and achieve a cloud point above at least 70°C." *Id.* at 1346. The court indicated that "the Board must provide some rational underpinning explaining why a person of ordinary skill in the art would have arrived at the claimed invention through routine optimization." *Id.*

In contrast to the claims at issue in *Stepan*, which recited a property of a claimed composition, claim 16 recites a result (storage sterility) of performing the positively recited steps of the claimed method. Also in contrast to *Stepan*, the Examiner's rejection in the present case is not based on a determination that one of ordinary skill in the art would have achieved the recited storage sterility through routine optimization. Rather, the Examiner finds that the teachings of Tap, Jeong, Barbeau, and Brody would have suggested producing a maple sap beverage using the method steps recited in claim 16 (subjecting maple sap to ultrahigh temperature pasteurization, followed by packaging the sterilized sap in aseptic containers under aseptic conditions), which necessarily would result in production of a maple sap product having a storage sterility as recited in claim 16. Advisory 3–6; *see Kubin*, 561 F.3d at 1357.

Appellant argues that the "consisting of" transitional phrase recited in claim 16 "requires one of ordinary skill in the art to select the specifically included process steps from the broad range of possible sterilization techniques available," while "specifically exclud[ing] all of the non-recited

sterilization techniques from consideration." Appeal Br. 42–43. Appellant argues that the Examiner's position that because "the various techniques used in the present invention are available in the art, it would be obvious to combine them in achieving the invention process . . . abrogates the claim limitation of 'consisting of.'" *Id.* at 43.

Appellant's arguments again do not identify reversible error in the Examiner's rejection. As discussed above, Tap discloses that although maple sap may be consumed "straight from the collection method," the maple sap should be boiled before consumption, to "effectively kill bacteria" and "eliminate any possible bacteria growth." Tap p. 1. Jeong's disclosure that ultrahigh temperature sterilization, conducted at 135ºC to 140ºC for 2 to 3 seconds, "can effectively destroy microorganisms while minimizing destruction of the nutritious components" in maple sap, and Barbeau's disclosure that heat sterilization conducted at from about 130ºC to about 150ºC for about 2 to 8 seconds, greatly reduces microbial life in maple sap "with minimal taste alteration," would have led one of ordinary skill in the art to sterilize maple sap collected from maple trees as disclosed in Tap using the ultrahigh temperature sterilization conditions disclosed in Jeong and Barbeau, rather than sterilizing the sap by boiling it as disclosed in Tap, to maintain the nutritional content of the sap without altering its taste, while greatly reducing the level of microorganisms in maple sap. Jeong pp. 13–14; Barbeau ¶¶ 230, 235, 236.

As also discussed above, Brody's disclosure that using aseptic packaging techniques yields shelf-stable packaged food products would have led one of ordinary skill in the art to package maple sap sterilized using Jeong and Barbeau's ultrahigh temperature sterilization conditions in pre-

sterilized containers using aseptic packaging techniques, to extend the storage stability of the maple sap. Brody p. 41; Fig. 1.

The proposed modification of Tap's method of producing a maple sap beverage thus involves substituting ultrahigh temperature sterilization as disclosed in Jeong and Barbeau for boiling as disclosed in Tap, and packaging the sterilized sap using aseptic packaging techniques as disclosed in Brody. Contrary to Appellant's arguments, the proposed modification of Tap's method, therefore, does not abrogate the "consisting of" transitional phrase recited in claim 16, because the proposed modified method includes only the steps recited in claim 16—subjecting maple sap to ultrahigh temperature pasteurization, followed by packaging the sterilized sap in aseptic containers under aseptic conditions.

Appellant argues that the Examiner incorrectly interprets Barbeau's disclosure of using ultrahigh temperature sterilization to kill "all spores, micro-organisms, yeasts, and molds" in maple sap as indicating that all levels of these spores, microorganisms, yeasts, and molds are destroyed. Appeal Br. 44–45, 48. Appellant argues that this disclosure in Barbeau "is more reasonably interpreted to mean that 'all types' of these are destroyed" to a large extent, without indicating "that all levels of all types are destroyed." *Id.* at 48.

Claim 16 does not require the recited method to eliminate all spores, microorganisms, yeasts, and molds in the maple sap beverage produced according to the claimed method, however. Appellant's arguments, therefore, do not identify reversible error in the Examiner's rejection because the arguments are directed to subject matter that is not claimed. *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) ("[A]ppellant's arguments fail

from the outset because . . . they are not based on limitations appearing in the claims."). Nonetheless, we point out that Barbeau explicitly discloses sterilizing sap produced from maple trees for a time sufficient "to greatly reduce and preferably eliminate the microbial life in the sap." Barbeau ¶ 230; *see also id.* ¶¶ 210, 211, 214.

Appellant argues that Jeong teaches away from sterilizing maple sap using ultrahigh temperature sterilization without also subjecting the sap to high voltage pulsed electric field treatment, because sterilizing sap using a combination of these two treatments "is the invention in Jeong." Appeal Br. 49–50, 54. Appellant argues that "[n]othing in either Jeong or Brody gives one of ordinary skill in the art any motivation to eliminate the electric field effect," and if the ordinarily skilled artisan "were to apply 'aseptic packaging of the product' to the disclosure in Jeong, the logical addition would be to apply it to the product resulting in a sap being treated by **both** UHT [ultrahigh temperature sterilization] **and** the electric field effect." *Id.* at 54.

As discussed above, however, Jeong discloses that ultrahigh temperature sterilization of maple sap "can effectively destroy microorganisms while minimizing destruction of the nutritious components." Jeong pp. 13–14. Although Jeong discloses that "to achieve a more complete sterilization effect . . . [a] high voltage pulsed electric field treatment step (20) is carried out," this disclosure does not negate Jeong's explicit disclosure that ultrahigh temperature sterilization of maple sap alone effectively destroys microorganisms in the sap. *Id.* at 14. Contrary to Appellant's arguments, Jeong, therefore, does not teach away from sterilizing maple sap by conducting ultrahigh temperature sterilization in the

absence of a high voltage pulsed electric field treatment step, because Jeong does not criticize or disparage such a sterilization process. Rather, Jeong explicitly discloses the effectiveness of ultrahigh temperature sterilization alone for destroying microorganisms in the maple sap. *See Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017) ("A reference that 'merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into' the claimed invention does not teach away.") (quoting *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013)); *Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1327 (Fed. Cir. 2017) ("[T]he teaching away inquiry does not focus on whether a person of ordinary skill in the art would have merely *favored* one disclosed option over another disclosed option.").

Furthermore, as discussed above, Barbeau discloses sterilizing sap produced from maple trees for a time sufficient to greatly reduce, and preferably eliminate, microbial life in the sap "with minimal taste alteration." Barbeau ¶¶ 12, 47, 210, 211, 214, 230. Barbeau discloses that such a sterilization process can be a heat sterilization treatment ("also known as UHT treatment"), which may be conducted alone or in combination with pulsed electric field sterilization. Barbeau ¶¶ 47, 235. One of ordinary skill in the art would have understood Barbeau's disclosure that maple sap may be sterilized using heat sterilization treatment—in the absence of pulsed electric field sterilization—to indicate that heat sterilization treatment alone is effective to greatly reduce microbial life in maple sap. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (an obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the

challenged claim, for [an examiner] can take account of the inferences and creative steps that a person of ordinary skill in the art would employ."); *see also In re Preda*, 401 F.2d 825, 826 (CCPA 1968) ("[I]t is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.").

Thus, contrary to Appellant's arguments, one of ordinary skill in the art would have understood from the above disclosures of Jeong and Barbeau that maple sap could be effectively sterilized using ultrahigh temperature sterilization without also subjecting the sap to a pulsed electric field treatment. Accordingly, the combined disclosures of Tap, Jeong, Barbeau, and Brody would have suggested substituting ultrahigh temperature sterilization as disclosed in Jeong and Barbeau—without a pulsed electric field sterilization treatment—for boiling as disclosed in Tap, and packaging the sterilized sap using aseptic packaging techniques as disclosed in Brody, as recited in claim 16.

Appellant argues that aseptic packaging conditions were known in the art at least as early as 1977, but "Jeong does not mention anything about aseptic conditions for packaging the [maple sap] product [described in the reference] other than utilizing sterile containers." Appeal Br. 55. Appellant argues that "there is no reference relied upon by the Examiner that indicates that anyone thought of making the invention until after Applicant's [sic] filed their applications, a period of approximately 8 years after the publication of Jeong, and over 35 years after the art concerning aseptic conditions in packaging was known," which, Appellant argues, demonstrates that Appellant's invention fulfilled a long-felt, unmet need. *Id.* at 55–56.

The age of prior art references alone, however, is insufficient to show the non-obviousness of a combination of the references' teachings, in the absence of evidence establishing that, notwithstanding knowledge of the references, the art tried and failed to solve the same problem addressed by the claimed invention. *In re Wright*, 569 F.2d 1124, 1127 (CCPA 1977) ("The mere age of the references is not persuasive of the unobviousness of the combination of their teachings, absent evidence that, notwithstanding knowledge of the references, the art tried and failed to solve the problem.").

On the record before us, Appellant does not provide objective evidence establishing that "the art tried and failed to solve the problem" described in Appellant's Specification of sterilizing maple sap in a manner that imparts "sufficient shelf life to last from one production year to another." Spec. ¶ 4. To the contrary, the applied prior art references demonstrate that means for effectively sterilizing maple sap were known in the art at the time of Appellant's invention, and Appellant's unsupported arguments do not show that the known sterilization methods for maple sap would not have resulted in a shelf life sufficient to allow the sap to last from one production year to another. *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965) ("Argument in the brief does not take the place of evidence in the record."). Rather, as discussed above, Jeong discloses that maple sap sterilized by ultrahigh temperature treatment effectively destroys microorganisms in the sap, allowing it to be stored at room temperature for long periods of time. Jeong pp. 8–9, 13–14. And Barbeau discloses that sterilizing sap produced from maple trees using ultrahigh temperature sterilization greatly reduces microbial life in the sap, while Brody discloses that using aseptic packaging techniques to package food yields shelf-stable

products. Barbeau ¶¶ 12, 47, 49, 210, 211, 214, 230, 235; Brody p. 41; Fig. 1. *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) ("Attorney argument is not evidence" and cannot rebut other admitted evidence.).

In view of these disclosures in Jeong, Barbeau, and Brody, Appellant's unsupported arguments do not constitute objective evidence establishing the existence of a persistent problem recognized by those of ordinary skill in the art for which a solution was not known, which was solved by Appellant's invention. Appellant's unsupported arguments, therefore, do not establish that Appellant's invention fulfilled a long-felt, unmet need. *See In re Gershon*, 372 F.2d 535, 538–39 (CCPA 1967) (establishing long-felt need requires objective evidence showing existence of a persistent problem recognized by those of ordinary skill in the art for which a solution was not known); *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988) (the long-felt need must not have been satisfied by another before the invention by applicant); *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006) ("[O]ur precedent requires that the applicant submit actual evidence of long-felt need, as opposed to argument.").

Appellant argues that results presented in the Declaration of inventor John Zabrodsky filed June 4, 2018 show that when maple sap was sterilized by ultrahigh temperature pasteurization (at either 140ºC or 142.7ºC for 3.5 seconds) and packaged in aseptic containers using aseptic conditions during packaging, a micro-organism load of not more than 10 CFU/ml was achieved after storage at ambient temperature for 33 months ("33 months sterility"), which was "surprising and unexpected," in view of results presented in the Declaration of inventor Michael Farrell filed June 4, 2018.

Appeal Br. 29–30, 47; Zabrodsky Decl. ¶ 13; Farrell Decl. ¶¶ 15, 16. Appellant argues that "the Examiner's position has foreclosed any consideration of these results" because the Examiner's approach limits the Zabrodsky Declaration "to a secondary role of having to overcome the prima facie case the Examiner has asserted is present," in violation of the "express requirements of *Graham v. John Deere Co.*, 383 U.S. 1 (1966) . . . that the [obviousness] analysis consider all of the factors, including the so called 'secondary factors' together." Appeal Br. 29–30.

When evidence of secondary considerations is submitted, we begin anew and evaluate the rebuttal evidence along with the evidence upon which the conclusion of prima facie obviousness was based. *In re Eli Lilly & Co.*, 902 F.2d 943, 945 (Fed. Cir. 1990) (citing *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984)) ("After a *prima facie* case of obviousness has been made and rebuttal evidence submitted, all the evidence must be considered anew."); *In re Rinehart*, 531 F.2d 1048, 1052 (CCPA 1976).

The burden of analyzing and explaining data presented in a Declaration to support an assertion of non-obviousness rests with the appellant. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). To meet this burden, the appellant must provide objective evidence demonstrating that the claimed subject matter imparts results that (1) would have been unexpected by one of ordinary skill in the art at the time of the appellant's invention relative to the closest art, and (2) are commensurate in scope with the claimed subject matter. *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005) ("Even assuming that the results were unexpected, Harris needed to show results covering the scope of the claimed range. Alternatively Harris needed to narrow the claims."); *In re Baxter Travenol Labs.*, 952 F.2d 388, 392

(Fed. Cir. 1991) ("[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art."); *In re Greenfield*, 571 F.2d 1185, 1189 (CCPA 1978) ("Establishing that one (or a small number of) species gives unexpected results is inadequate proof, for 'it is the view of this court that objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support.'" (quoting *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971))).

In the present case, Appellant does not meet this burden. Paragraph 13 of the Zabrodsky Declaration describes subjecting two maple sap samples to ultrahigh temperature pasteurization at either 140ºC or 142.7ºC for 3.5 seconds, packaging the sap in sterile containers under aseptic conditions, and storing the packages at ambient temperature. The Zabrodsky Declaration indicates that the first sample was "stable" after 33.75 months storage, while the second sample was "stable" after 15.75 months storage. Zabrodsky Decl. ¶ 13. Jeong, the closest prior art, discloses sterilizing maple sap at a temperature of 135ºC to 140ºC for 2 to 3 seconds (pp. 11–12), and then putting the sterilized sap into pre-sterilized containers (p. 19).

The Farrell Declaration describes "comparative" experiments that involved subjecting maple sap to ultrahigh temperature sterilization at 138.9ºC to 139.4ºC for 3 seconds, packaging the sterilized sap in sterile containers without using aseptic packaging conditions, and storing the packaged sap at ambient temperature. Farrell Decl. ¶ 15. The Farrell Declaration indicates that the sample exhibiting the longest storage stability "fail[ed]" after 7.75 months, defined as exhibiting a microorganism load of at least 10 CFU/ml. Farrell Decl. ¶ 16.

The inventive experiments described in paragraph 13 of the Zabrodsky Declaration, therefore, differ from the process disclosed in Jeong, and the experiments described in the Farrell Declaration, by including use of aseptic conditions when packaging the sterilized maple sap. Although the Zabrodsky Declaration indicates that it was "totally unexpected and surprising" that "extensive additional storage times with excellent sterility" were achieved "by merely assuring sterile (aseptic) conditions in the packaging operations," neither the Declarant nor Appellant provides any objective evidence that corroborates this opinion. Zabrodsky Decl. ¶ 13. Notably, Brody's disclosures discussed above show that it was known in the art that aseptic packaging processes produce shelf-stable food products, and the Zabrodsky Declaration does not address this disclosure in Brody. The opinion provided in the Zabrodsky Declaration that the additional storage sterility afforded by using sterile (aseptic) conditions during packaging was "totally unexpected and surprising," therefore, does not take into consideration the state of the art as a whole at the time of Appellant's invention.

We, consequently, accord the opinion set forth in the Zabrodsky Declaration little weight. *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (the Board has discretion to give more weight to one item of evidence over another "unless no reasonable trier of fact could have done so"); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) ("[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations."); *Velander v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) ("[W]hat the Board consistently did was accord little weight to broad

conclusory statements that it determined were unsupported by corroborating references. It is within the discretion of the trier of fact to give each item of evidence such weight as it feels appropriate.").

Furthermore, claim 16 recites conducting ultrahigh temperature pasteurization at a temperature of from 130ºC to 150ºC with an exposure time of 1 to 10 seconds. As discussed above, paragraph 13 of the Zabrodsky Declaration describes subjecting two maple sap samples to ultrahigh temperature pasteurization conducted at only two temperatures—140ºC or 142.7ºC—for a single time period of 3.5 seconds. Appellant does not explain why the limited ultrahigh temperature pasteurization conditions tested in the Zabrodsky Declaration are reasonably commensurate with the full scope of claim 16, which recites ultrahigh temperature pasteurization temperatures and times that are not limited to those tested in the experiments described in paragraph 13 of the Zabrodsky Declaration. *Harris*, 409 F.3d at 1344; *Greenfield*, 571 F.2d at 1189. Nor has Appellant provided an adequate basis to support a conclusion that other embodiments falling within the claim would be expected to behave in the same manner as the tested embodiments. *See In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) ("If an applicant demonstrates that an embodiment has an unexpected result and provides an adequate basis to support the conclusion that other embodiments falling within the claim will behave in the same manner, this will generally establish that the evidence is commensurate with the claims.").

Thus, considering the totality of the evidence in the record before us, the evidence of obviousness relied on by the Examiner outweighs Appellant's evidence of non-obviousness, and a preponderance of the evidence, therefore, weighs in favor of the Examiner's conclusion of

obviousness. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1372 (Fed. Cir. 2007) (evidence of unexpected results and other secondary considerations will not necessarily overcome a strong prima facie showing of obviousness.); *see also In re Nolan*, 553 F.2d 1261, 1267 (CCPA 1977) ("Considering all of the evidence, we are not persuaded that the evidence of the unexpected higher luminous efficiency and lower peak discharge current rebuts the strong showing of obviousness.").

We, accordingly, sustain the Examiner's rejection of claims 13–16, 20, and 22–24 under 35 U.S.C. § 103(a).

Claims 7, 9–11, and 25–28

Claims 7, 25, and 26 depend from independent claim 16 and recite that the product has a micro-organism load after being packaged in aseptic containers, being subjected to said ultrahigh temperature pasteurization under aseptic conditions, and having been stored at 21ºC to 25ºC for a period of 24 months, 15 months, or 21 months, respectively, of not more than 10 CFU/ml.

Claims 10 and 11 depend from independent claim 16 and recite that the product has a shelf life of at least 12 months or 24 months, respectively, after being packaged under aseptic conditions in aseptic containers and subjected to ultrahigh temperature pasteurization.

Claims 9, 27, and 28 depend from independent claim 23 and recite that the product has a micro-organism load after being packaged in aseptic containers, being subjected to said ultrahigh temperature pasteurization under aseptic conditions, and having been stored at 21ºC to 25ºC for a period of 24 months, 15 months, or 21 months, respectively, of not more than 10

CFU/ml.

Appellant argues that the "art simply does not give anyone any expectation of success in achieving these longer storage sterility time points required by . . . claims [7, 9–11, and 25–28]." Appeal Br. 31, 52–54. Appellant argues that because claims 7, 9–11, and 25–28 recite sterility times longer than the 12 months recited in independent claim 16, "the unexpected nature of the storage time frame [recited in these claims] is ever so much stronger." *Id.* at 52.

As with independent claim 16 discussed above, however, the storage sterility recited in each of claims 7, 9–11, and 25–28 expresses a result that occurs when the steps recited in each claim are performed (subjecting maple sap to ultrahigh temperature pasteurization, followed by packaging in aseptic containers under aseptic conditions), rather than imposing a further limitation on the recited method. *Kubin*, 561 F.3d at 1357. The storage sterility recited in each of claims 7, 9–11, and 25–28, therefore, does not impart patentable weight to the method set forth in each claim. *Tex. Instruments*, 988 F.2d at 1172; *Minton*, 336 F.3d at 1381.

Furthermore, as discussed above, neither Declarant Zabrodsky nor Appellant provide any objective evidence corroborating the opinion set forth in the Declaration that it was "totally unexpected and surprising" that "extensive additional storage times with excellent sterility" were achieved by using aseptic conditions when packaging maple sap sterilized by ultrahigh temperature sterilization. As also discussed above, the Zabrodsky Declaration does not take into consideration the state of the art as a whole at the time of Appellant's invention, particularly Brody's disclosure that it was known in the art that aseptic packaging processes produce shelf-stable food

products. Accordingly, as with independent claim 16, the evidence Appellant relies on to support Appellant's assertion of nonobviousness does not outweigh the evidence the Examiner relies on to establish obviousness. A preponderance of the evidence in this appeal record, therefore, weighs in favor of the Examiner's conclusion that the subject matter of claims 7, 9–11, and 25–28 would have been obvious at the time of Appellant's invention. We, accordingly, sustain the Examiner's rejection of these claims under 35 U.S.C. § 103(a).

Rejection II

Appellant states in the Appeal Brief that the Examiner's rejection of claims 2, 3, and 12 under 35 U.S.C. § 103(a) as unpatentable over Tap in view of Appellant's admitted prior art, Fleury, Jeong, Brody, Kim, Barbeau, Trollbridgecreek, and Wijesinghe "is not being argued at this time, and these claims stand or fall with the claims from which they depend." Appeal Br. 20–21. Accordingly, because we sustain the Examiner's rejection of claim 16 (as discussed above), from which claims 2, 3, and 12 depend, we also sustain the Examiner's rejection of claims 2, 3, and 12 under 35 U.S.C. § 103(a).

CONCLUSION

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
7, 9–11, 13–16, 20, 22–28	103(a)	Tap, Appellant's admitted prior art, Fleury, Jeong, Brody, Kim, Barbeau	7, 9–11, 13–16, 20, 22–28	

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
2, 3, 12	103(a)	Tap, Appellant's admitted prior art, Fleury, Jeong, Brody, Kim, Barbeau, Trollbridgecreek, Wijesinghe	2, 3, 12	
Overall Outcome			2, 3, 7, 9–16, 20, 22–28	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED