

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HENNY PENNY CORPORATION,
Petitioner,

v.

FRYMASTER L.L.C.,
Patent Owner.

Case IPR2016-01435
Patent 8,497,691 B2

Before BART A. GERSTENBLITH, DAVID C. McKONE, and
ROBERT J. WEINSCHENK, *Administrative Patent Judges*.

GERSTENBLITH, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

A. *Background*

Henny Penny Corporation (“Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting institution of *inter partes* review of claims 1–23 of U.S. Patent No. 8,497,691 B2 (Ex. 1001, “the ’691 patent”). Frymaster L.L.C. (“Patent Owner”) filed a Preliminary Response (Paper 14, “Prelim. Resp.”). Pursuant to 35 U.S.C. § 314, we instituted this trial (“Institution Decision”) as to claims 1–3, 5–12, 17–21, and 23 of the ’691 patent. Paper 18¹ (“Inst. Dec.”).

After the Institution Decision, Patent Owner filed a Patent Owner Response (Paper 29, “PO Resp.”) and Petitioner filed a Reply to the Patent Owner Response (Paper 34, “Pet. Reply”). An oral hearing was held September 13, 2017, the transcript of which is entered into the record (Paper 46, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6(c). This Decision is a final written decision under 35 U.S.C. § 318(a) as to the patentability of the challenged claims. Based on the record before us, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–3, 5–12, 17–21, and 23 of the ’691 patent are unpatentable.

B. *Related Proceedings*

The parties indicate that there are no related proceedings. Pet. 1; Paper 10, 2.

¹ Papers 18 and 19 were transposed when filed. We refer to the Institution Decision as Paper 18, as it is numbered in the paper itself.

C. Real Parties in Interest

Petitioner identifies itself as the sole real party in interest. Pet. 1.
Patent Owner identifies itself as the sole real party in interest. Paper 10, 2.

D. The References

Petitioner relies on the following references:

Japanese Unexamined Patent Application Publication
No. 2005-55198, published Mar. 3, 2005 (Ex. 1003, “Iwaguchi”)²;
U.S. Patent No. 5,071,527, issued Dec. 10, 1991 (Ex. 1005,
“Kauffman”); and
U.S. Patent No. 4,148,729, issued Apr. 10, 1979 (Ex. 1007,
“Howard”).

E. The Asserted Grounds of Unpatentability

We instituted this proceeding based on the following grounds of
unpatentability:

References	Basis	Claims Challenged
Iwaguchi and Kauffman	§ 103(a)	1–3, 5–12, 17, 19, 21, and 23
Kauffman, Iwaguchi, and Howard	§ 103(a)	18 and 20

Inst. Dec. 51. Petitioner relies on the declaration testimony of Timothy J.
Bowser, Ph.D., P.E., dated July 13, 2016 (Ex. 1011, “Bowser Dec.”). Patent
Owner relies on the declaration testimony of Kevin Keener, Ph.D., P.E.,

² The Japanese-language version of the reference is Exhibit 1002, the
English-language translation is Exhibit 1003, a first certificate of translation
is Exhibit 1004, and a second certificate of translation and a declaration by
the translator were filed together as Exhibit 1015.

filtered cooking oil 75 is able to sample the an [sic] electrical property as oil 75 is being returned to fryer pot 15.” *Id.* at 3:57–59. Additionally, “sensor 100 is contained within T-shaped adapter 105 that extends within housing 5 generally beneath fryer pot 15.” *Id.* at 4:7–9.

Figure 7 of the ’691 patent is reproduced below:

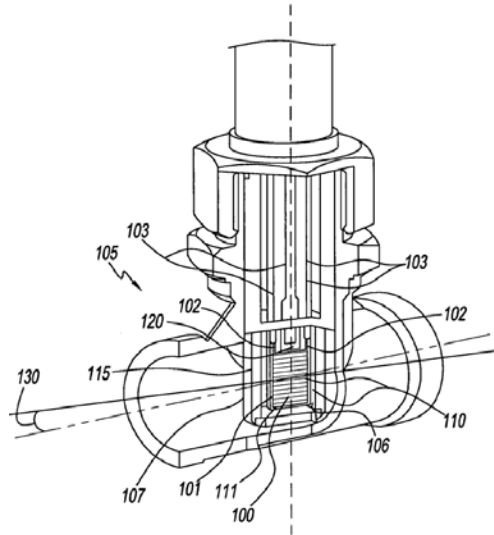


Fig. 7

Figure 7 shows a “partial cross-section view of the sensor of FIG. 6.” *Id.* at 3:20–21. The ’691 patent teaches:

sensor 100 achieves operational temperatures by being in the flow of quickly moving cooking oil 75 caused by pump returning oil to fryer pot 15. The quickly flowing cooking oil 75 also acts as a scrubber to clean sensor front 106 and sensor back 107 as it passes thereby to be returned to fryer pot 15. Sensor 100 must be clean to provide accurate measurements of oil capacitance and an indication of when oil must be changed. Sensor 100 must be properly positioned such that sensor front 106 and sensor back 107 are cleaned. Thus, sensor 100 and support surface 115 on which sensor 100 is disposed are, optimally positioned and angled to take advantage of the approaching flow of oil 75 that is flowing through or in-line with both portions 71 and 72 of return pipe 70.

Id. at 5:16–29.

G. Illustrative Claim

Claims 1, 17, and 23 are the independent claims challenged in this proceeding. Claims 2, 3, and 5–12 depend, directly or indirectly, from claim 1. Claims 18–21 depend, directly or indirectly, from claim 17.

Claim 1 is illustrative of the claimed subject matter and is reproduced below:

1. A system for measuring the state of degradation of cooking oils or fats in a deep fryer comprising:

at least one fryer pot;

a conduit fluidly connected to said at least one fryer pot for transporting cooking oil from said at least one fryer pot and returning the cooking oil back to said at least one fryer pot;

a means for re-circulating said cooking oil to and from said fryer pot; and

a sensor external to said at least one fryer pot and disposed in fluid communication with said conduit to measure an electrical property that is indicative of total polar materials of said cooking oil as the cooking oil flows past said sensor and is returned to said at least one fryer pot;

wherein said conduit comprises a drain pipe that transports oil from said at least one fryer pot and a return pipe that returns oil to said at least one fryer pot,

wherein said return pipe or said drain pipe comprises two portions and said sensor is disposed in an adapter installed between said two portions, and

wherein said adapter has two opposite ends wherein one of said two ends is connected to one of said two portions and the other of said two ends is connected to the other of said two portions.

Id. at 6:17–41; Ex. 2009, 1 (Certificate of Correction).

II. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms in an unexpired patent are construed according to their broadest reasonable interpretation in light of the

specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). There is a presumption that claim terms are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art in the context of the specification. *See In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Nonetheless, if the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess[,] . . . the inventor’s lexicography governs.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). Another exception to the general rule that claims are given their ordinary and customary meaning is “when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Uship Intellectual Props., LLC v. United States*, 714 F.3d 1311, 1313 (Fed. Cir. 2013) (quoting *Thorner v. Sony Computer Entm’t Am., LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)). Additionally, only terms that are in controversy need to be construed, and these need be construed only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In our Institution Decision, we discussed the following claim terms: “means for re-circulating,” “adapter,” “said sensor is disposed in an adapter,” and “a sensor.” Inst. Dec. 8–19. We address each.

“means for re-circulating”

In the Institution Decision, we preliminarily construed the claim term “means for re-circulating” as a means-plus-function limitation, invoking 35 U.S.C. § 112, ¶ 6. *Id.* at 17–18. We construed the function as

“re-circulating said cooking oil” and identified the corresponding structure as “a pump and structural equivalents thereof.” *Id.* at 18–19. Neither party contests our construction of the term, and we maintain that construction here for the same reasons.

“adapter”

The only term for which Petitioner proposes a construction is “adapter.” Petitioner proposes that we construe “adapter” to mean “a structure located outside of a fryer pot and any filtration unit and configured to house a sensor in fluid communication with the fryer pot and/or filtration unit.” Pet. 7–8. We preliminarily rejected Petitioner’s proposed construction in our Institution Decision because (1) Petitioner’s inclusion of the term “structure” failed to assist in understanding the meaning of “adapter” and (2) the other language Petitioner proposes was recited explicitly elsewhere in the claim and we declined to read it into the meaning of “adapter.” Inst. Dec. 8–10.

In its Response, Patent Owner does not propose a construction for “adapter” and contends that we need not provide an express construction for the term because “the prior art would not render the claims obvious under any reasonable construction consistent with the specification.” PO Resp. 9. Petitioner does not argue the construction of the term in its Reply.

We agree with Patent Owner that we need not expressly construe the term “adapter.” We reiterate the following from our Institution Decision:

The term “adapter” appears in each claim of the ’691 patent. Neither party contends that the specification or prosecution history contains a lexicographic definition of the term, and neither party asserts that the specification or prosecution history contains a disclaimer of any portion of the plain and ordinary meaning of the term. From our review of the

record, the structure and location of the adapter recited in the claims is provided by other claim language describing that (1) the adapter is located external to the fryer, (2) the sensor is disposed in the adapter, (3) the adapter is installed between two portions of the return pipe or drain pipe, and (4) the adapter has two opposite ends wherein one of the two ends is connected to one of the two portions of either the return pipe or the drain pipe and the other end is connected to the other portion of pipe.³

Inst. Dec. 9–10. In light of the above discussion, and because the focus of the parties’ dispute is not on the meaning of the term “adapter,” we decline to expressly construe the term further.

“a sensor” and “said sensor is disposed in an adapter”

In its Preliminary Response, Patent Owner proposed constructions for these terms, each of which we declined to adopt. Inst. Dec. 10–17.

Petitioner did not propose a construction for either term in the Petition or Reply. Patent Owner does not maintain either of its proposed constructions in its Response. Additionally, the parties’ dispute does not hinge on the meaning of either term. Accordingly, we decline to expressly construe the terms.

³ The language of each independent claim confirms these locational and structural features of the adapter. *See, e.g.*, claim 1 (“a sensor external to said at least one fryer pot”; “said sensor is disposed in an adapter”; adapter is “installed between two said portions” of the return pipe or drain pipe; and “said adapter has two opposite ends wherein one of said two ends is connected to one of said two portions and the other of said two ends is connected to the other of said two portions”).

III. ANALYSIS

A. *Petitioner's Theory of Obviousness and Impermissible Arguments in Its Reply Brief*

Each of the independent claims—1, 17, and 23—recites a “sensor . . . to measure . . . an electrical property . . . that is indicative of total polar materials of said^[4] cooking oil.” Ex. 1001, 6:26–30 (claim 1), 7:45–48 (claim 17), 8:47–51 (claim 23). We instituted Petitioner’s challenge of these claims, and those that depend therefrom, based on Petitioner’s position that it would have been obvious to one of ordinary skill in the art to modify Kauffman’s system by *substituting* Iwaguchi’s sensor for Kauffman’s analyzer. Inst. Dec. 31 (“Petitioner provides a second argument that relies upon a modification to Kauffman’s system, in which Iwaguchi’s sensor is employed instead of Kauffman’s analyzer. Because Petitioner provides adequate support for this second position, we address Patent Owner’s arguments based on this proposed combination.”).

After the filing of Petitioner’s Reply, Patent Owner requested a conference call to seek authorization to file a sur-reply. *See* Paper 37. One of the issues of concern to Patent Owner was the apparent argument in Petitioner’s Reply that Kauffman *alone* would have rendered the challenged claims obvious, an argument that was not raised in the Petition and which exceeds the scope for a proper reply. *Id.* at 2. During the conference call, Petitioner represented that it was not challenging the claims based on Kauffman alone and we, as well as Patent Owner, accepted Petitioner’s

⁴ Claim 17 recites “that is indicative of total polar materials of *the* cooking oil.” Ex. 1001, 7:45–48 (emphasis added).

representation. *Id.* Thus, based on Petitioner’s representation, we disregard⁵ the following paragraphs of Petitioner’s Reply: (1) the paragraph spanning pages 11 and 12, and (2) the paragraph spanning pages 13 and 14.

Accordingly, the theory of obviousness upon which we based our Institution Decision and this trial is whether the *combination* of Kauffman and Iwaguchi or the *combination* of Kauffman, Iwaguchi, and Howard would have rendered the subject matter of the claims obvious.

B. Obviousness over Kauffman and Iwaguchi

The U.S. Supreme Court set forth the framework for applying the statutory language of 35 U.S.C. § 103 in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966):

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

As explained by the Supreme Court in *KSR Int’l Co. v. Teleflex Inc.*:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion

⁵ Patent Owner did not request that we “strike” the paragraphs of Petitioner’s Reply, but, based on Petitioner’s representation during the conference call, we have disregarded them for purposes of this trial and Final Written Decision.

claimed by the patent at issue. To facilitate review, this analysis should be made explicit.

550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with rational underpinning to support the legal conclusion of obviousness.”)).

“Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted). We must consider a reference in its entirety. *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, No. 2017-1475, slip op. at 8 (Fed. Cir. Dec. 7, 2017) (citation omitted). As the U.S. Court of Appeals for the Federal Circuit explained, “the Supreme Court has long held that ‘known disadvantages in old devices which would naturally *discourage* the search for new inventions may be taken into account in determining obviousness.’” *Id.* (quoting *United States v. Adams*, 383 U.S. 39, 52 (1966)). Further, a single reference can include statements suggesting a combination as well as statement discouraging the same. *Id.* “[W]here a party argues a skilled artisan would have been motivated to combine references, it must show the artisan ‘would have had a reasonable expectation of success from doing so.’” *Id.* at 10 (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

Petitioner asserts that the combination of Kauffman and Iwaguchi would have rendered obvious the subject matter of claims 1–3, 5–12, 17, 19, 21, and 23 to one of ordinary skill in the art at the time of the invention.

Pet. 31–47. Patent Owner raises several arguments in opposition. *See* PO Resp. 23.

1. *Level of Ordinary Skill in the Art*

Petitioner proposes that the level of ordinary skill in the art at the time of the invention would have been a “Bachelors of Science degree in Biosystems & Agricultural Engineering (or equivalent) or other Engineering major with a minor in Food Science and Technology and have had one or more years’ experience in the field of research and development of foods.” Pet. 7 (citing Ex. 1011 ¶ 74). Patent Owner does not propose an explicit level of ordinary skill in the art in its Response. Dr. Keener, however, expressly adopts Petitioner’s proposed level of skill in the art. Ex. 2032 ¶ 63. Consistent with the level of ordinary skill in the art reflected by the prior art of record, *see Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978), we adopt Petitioner’s unopposed position as to the level of ordinary skill in the art.

2. *Scope and Content of the Prior Art*

a. *Kauffman*

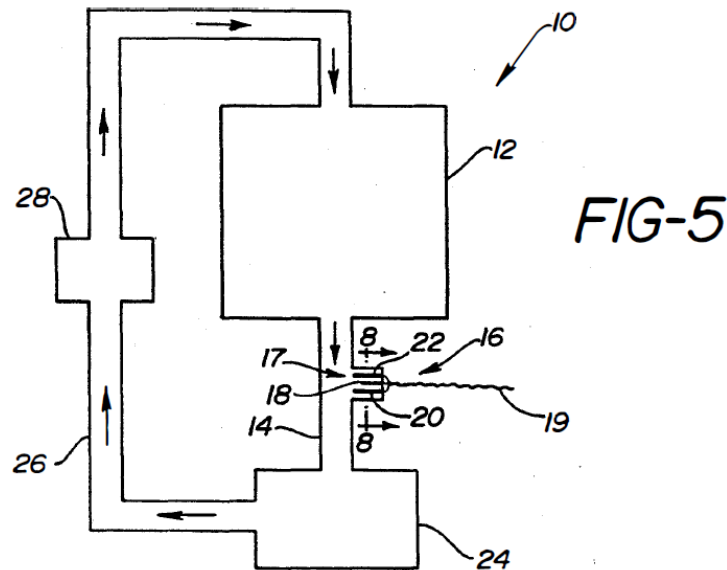
Kauffman is directed to “a method and apparatus for evaluating oils, lubricants, and fluids, and, more specifically, to a method and apparatus for complete analysis, including on-line analysis, of used oils, lubricants, and fluids.” Ex. 1005, 1:9–13. Kauffman explains:

The on-line analysis can involve either a built-in electrode system or a dip-stick type electrode system. In the built-in system, electrodes (preferably a working microelectrode, a reference electrode, and an auxiliary electrode) are permanently attached to a source (such as a return line) of an essentially continuously changing sample of used oil, lubricant or fluid or to

a use container for the oil, lubricant or fluid (such as a deep fryer). The current measurement and recording in this instance can be intermittent at various intervals or continuous.

Id. at 3:21–31.

Kauffman's Figure 5 is reproduced below:



Kauffman's Figure 5 "is a schematic view of an on-line system involving an essentially continuously changing sample." *Id.* at 4:9–10. Kauffman teaches the following regarding Figure 5:

System 10 includes a piece of equipment 12 through which oil, lubricant or fluid passes. The used oil, lubricant or fluid flows through return line 14 into reservoir 24 from whence it may be recirculated through line 26 by oil pump 28. In return line 14 there is found permanently attached thereto analyzer 16 in chamber 17. Analyzer 16 preferably comprises a working microelectrode 18, a reference electrode 20 and an auxiliary electrode 22, and lead(s) 19.

Id. at 6:46–54. Additionally, Kauffman teaches that "[t]he present invention can be used to monitor oils, lubricants, and fluids in many different applications, for example, . . . deep fryers such as those frequently used in restaurants." *Id.* at 8:8–13.

b. *Iwaguchi*

Iwaguchi is directed to “oil and fat degradation detectors and fryers, and in particular to oil and fat degradation detectors and fryers that detect the amount of polar compounds contained in oil and fat being cooked.”

Ex. 1003 ¶ 1. Iwaguchi’s Figure 1 is shown below:

(Fig. 1)

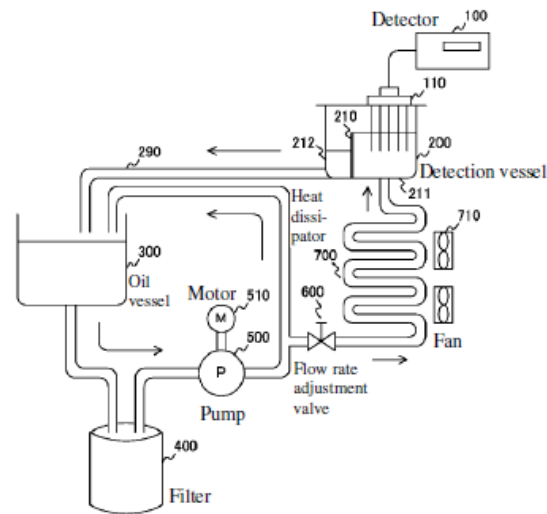


Figure 1 shows “one constitutional example of a fryer.” *Id.* at 8.⁶

Iwaguchi explains that the fryer “is equipped with an oil vessel 300, a filter 400, and a pump 500.” *Id.* ¶ 19. Oil is supplied to heat dissipator 700 and then to detection vessel 200. *Id.* ¶ 20. Detection vessel 200 is partitioned into first and second inner vessels 211 and 212, respectively. *Id.* ¶ 21. “[F]irst inner vessel 211 is for accumulating oil and fat that is subject to detection” and “second inner vessel 212 is for returning the oil and fat subjected to detection to the oil vessel 300 again after the detection.” *Id.* In the first inner vessel, a probe “detects the electrical characteristics and

⁶ Citations to page numbers are to the page numbers of the exhibit as opposed to the page numbers of the reference. In instances where Iwaguchi’s disclosure is in paragraph form, we cite to the specific paragraph.

temperature of the oil and fat [and] is installed by means of a holder 110 such that it is appropriately submerged in the oil and fat accumulated in the first inner vessel 211” of the detection vessel. *Id.* ¶ 22. The signal detected by the probe is communication to detector 100 via holder 110. *Id.* Circulation pipe 290 is connected to second inner vessel 212 and oil and fat “is returned to the oil vessel 300 via this circulation pipe 290.” *Id.* ¶ 21.

3. *Differences Between the Prior Art and the Claims;
Motivation to Modify*

We instituted Petitioner’s challenge of these claims, and those that depend therefrom, based on Petitioner’s position that Kauffman disclosed most of the elements of the independent claims with the exception of a sensor capable of measuring an electrical property that is indicative of total polar materials. *See, e.g.*, Inst. Dec. 31. Thus, the theory of obviousness, as discussed above, relies upon substituting Iwaguchi’s sensor for Kauffman’s analyzer. *See id.* at 31 (“Petitioner provides a second argument that relies upon a modification to Kauffman’s system, in which Iwaguchi’s sensor is employed instead of Kauffman’s analyzer. Because Petitioner provides adequate support for this second position, we address Patent Owner’s arguments based on this proposed combination.”). Petitioner confirmed at the oral argument that its Petition proposed a theory in which Iwaguchi’s sensor is simply swapped for that of Kauffman’s and did not present a more general theory as to modifying Kauffman’s sensor per the teachings of Iwaguchi:

JUDGE WEINSCHENK: Did you include both of those alternative theories in your petition or is that something that you’re – you’ve come up with now in the reply?

MR. VAIDYA: It’s something that we -- again, in the reply, we wanted to make it very clear that we aren’t going on a 102 basis

and we are -- and what -- I think what -- we did have that alternate in the reply, so the alternate -- and I can point to paragraphs if that helps.

And so, the idea is again primarily we're going with the idea of swapping sensors, but that it would be possible to modify the sensor in Kauffman.

JUDGE GERSTENBLITH: Because in the petition, it was a swap of the sensors.

MR. VAIDYA: That's right.

JUDGE GERSTENBLITH: And that's what we instituted --

MR. VAIDYA: That's correct.

JUDGE GERSTENBLITH: -- based on.

MR. VAIDYA: That's correct.

Tr. 13:21–14:12. We disregard Petitioner's alternative position as it was an attempt to raise a new theory of unpatentability improperly for the first time in the Reply. *See* 37 C.F.R. § 42.23(b) ("All arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response.").

Petitioner asserts that "sensors (i) capable of measuring data 'indicative of total polar materials' were well known in the prior art and (ii) those skilled in the art could have readily adapted such sensors for use in the Kauffman system if one desired to measure total polar materials." Pet. 36–37 (citing Ex. 1011 ¶ 246). Petitioner contends that Iwaguchi "explicitly describes determining the 'amount of polar compounds contained especially in the fats and oils under cooking' for the purpose of accurately estimating the degradation state of cooking oil." *Id.* at 37 (citing Ex. 1003 ¶ 1; Ex. 1011 ¶¶ 247–248). Petitioner asserts: "Thus, one skilled in the art would have understood that it was desirable in the field of cooking oil

quality sensing to provide a sensor that performs electrical measurement upon a cooking oil in order to evaluate and assess its degree of degradation, and in particular, ‘detect the amount of polar compounds’ to most efficiently accomplish this task.” *Id.* (quoting Ex. 1011 ¶ 249). Thus, Petitioner argues that “those skilled in the art wishing to measure total polar materials in order to accurately determine the quality of the sensed cooking oil could have modified the Kauffman system to include the processor and/or sensor as taught by Iwaguchi.” *Id.* (citing Ex. 1011 ¶ 250). Dr. Bowser’s declaration testimony echoes the same positions set forth in the Petition. *See* Ex. 1011 ¶¶ 246–250.

In our Institution Decision, we found, on the record before us at that time, that “Petitioner has articulated a reason with rational underpinnings as to why one of ordinary skill in the art would have been prompted to modify the teachings of Kauffman by replacing its analyzer with the sensor of Iwaguchi and that Petitioner’s reasoning is supported on the record before us.” Inst. Dec. 36–37. We also found that Petitioner’s argument and evidence “supports the finding that the proposed substitution is of one known sensor (that of Iwaguchi) for another known sensor (Kauffman’s analyzer), with the result of the substitution being the predictable outcome of sensing or measuring a particular quality of the fluid (in this case oil) flowing past the sensor.” *Id.* at 37. Patent Owner raises arguments in its Response supported by its declarant, Dr. Keener, which raise substantial questions regarding Petitioner’s position and which put forth additional evidence relevant to our consideration of the issues before us.

First, Patent Owner argues that Iwaguchi does not teach measuring total polar materials “for the purpose of *accurately* estimating the

degradation state of cooking oil.” PO Resp. 31 (citing Pet. 37; Ex. 1011 ¶¶ 247–248). Rather, “Iwaguchi *never* purports to solve the problem of ‘accuracy,’ indeed the word never appears in Iwaguchi’s disclosure.” *Id.* (citing Ex. 2032 ¶¶ 109–111). In contrast, Patent Owner asserts that Iwaguchi was directed to solving the problem of constant detection. *Id.* at 32 (citing Ex. 1003 ¶ 8; Ex. 2032 ¶ 111).

In its Reply, Petitioner contends that Patent Owner’s argument seeks to apply a rigid application of the teaching-suggestion-motivation test. Pet. Reply 7. Petitioner sets forth the following position:

That “accuracy” is not discussed in Iwaguchi does not prevent “accuracy” or other unstated motivating factors from providing a basis for combining the teachings of the prior art especially where, as here, the combination yields predictable results:

When a work is available in one field of endeavor, design inventive and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.

...

As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a [POSITA] would employ.

Id. at 8 (quoting *KSR*, 550 U.S. at 417–18). Petitioner asserts that “[a]t a minimum, the Petition supported by Dr. Bowser’s declaration sets forth the necessary motivation to combine.” *Id.* at 11 (citing Inst. Dec. 36–37).

Petitioner continues, “[t]his point is especially true where ‘common sense’ is applied to combine teachings from the prior art to produce predictable results.” *Id.* (citing *Perfect Web Techs., Inc. v. Infousa, Inc.*, 587 F.3d 1324, 1328 (Fed. Cir. 2009)).

Petitioner’s theory in the Petition as to why one of ordinary skill in the art would have been prompted to substitute Iwaguchi’s sensor for Kauffman’s analyzer is that Iwaguchi “explicitly describes determining the ‘amount of polar compounds . . .’ for the purpose of accurately estimating the degradation state of cooking oil.” Pet. 37 (quoting Ex. 1003 ¶ 1) (citing Ex. 1011 ¶¶ 247–248). We accepted that theory when we instituted this trial. *See* Inst. Dec. 36 (finding on the record at that time that Petitioner has articulated a reason with rational underpinnings). Patent Owner successfully challenges Petitioner’s theory that Iwaguchi provides an explicit motivation for making the proposed combination. PO Resp. 31–32. In its Reply, Petitioner concedes that Iwaguchi fails to provide the asserted motivation. Pet. Reply 7–8. And, we agree that Iwaguchi does not describe determining the amount of polar compounds for the purpose of accurately estimating the degradation state of cooking oil. We recognize that Iwaguchi itself does not have to provide the rationale for making the proposed substitution, *see KSR*, 550 U.S. at 419–21, but Petitioner also has not provided other evidence to support a finding that Iwaguchi’s sensor provides an accurate measurement of the degradation state of cooking oil. Even if Dr. Bowser’s testimony could be considered support for Petitioner’s statement regarding accuracy, Dr. Bowser fails to provide any factual basis, aside from pointing to Iwaguchi as discussed above, from which his opinion is based. *See* Ex. 1011 ¶ 246 (relying solely on Iwaguchi). Therefore, we give his opinions as to the accuracy of Iwaguchi’s sensor little, if any, weight.

Petitioner also contends that “other unstated motivating factors” provide a basis for the proposed combination. *Id.* at 8. Petitioner, however, fails to present evidence of what those “unstated motivating factors” are.

Specifically, Petitioner turns to quoting various portions of *KSR*, but fails to provide any evidence in support of the general propositions quoted. For example, Petitioner points to the Supreme Court’s statement that “design incentive and other market forces can prompt variations” of a work (Pet. Reply 8 (citation omitted), but Petitioner fails to (1) explain what design incentive or market force would prompt the combination proposed; and (2) provide any evidence sufficient to show such incentive or market force. Additionally, Petitioner quotes the portion of *KSR* statement that a court can take account of the inferences and creative steps one of ordinary skill in the art would employ as well as attempting to turn to “common sense.” But, as with Petitioner’s previous quotations, Petitioner fails to provide evidence sufficient to show the inferences and creative steps or common sense that would have led one of ordinary skill in the art to substitute Iwaguchi’s sensor for Kauffman’s analyzer. As the U.S. Court of Appeals for the Federal Circuit stated, “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Here, Patent Owner successfully challenged Petitioner’s reliance upon accuracy, and Petitioner’s attempt to fall back on mere conclusory statements is insufficient to establish a reason with rational underpinning to support the legal conclusion of obviousness. *See In re NuVasive, Inc.*, 842 F.3d 1376, 1384 (Fed. Cir. 2016) (“Medtronic’s arguments amount to nothing more than conclusory statements that a PHOSITA would have been motivated to combine the prior art references to obtain additional information.”).

Second, Patent Owner's argument and evidence demonstrates that the combination proposed by Petitioner is not a simple substitution of one known sensor for another with the predictable result of sensing (or measuring) a particular quality of the oil flowing past the sensor. PO Resp. 32–38, *contra* Inst. Dec. 37. In particular, Patent Owner challenges Dr. Bowser's testimony that Iwaguchi's sensor could be "readily adapt[ed]" for use in Kauffman's system. PO. Resp. 33 (citing Ex. 1011 ¶ 246). Patent Owner contends that Dr. Bowser lacks personal experience adapting a sensor for use in a deep fryer. *Id.* (citations omitted). And, Patent Owner itemizes a list of variables that one of ordinary skill in the art would have had to consider when integrating a sensor into a fryer, including the type of sensor, location of the sensor, and temperature of the composition being sensed. *Id.* (citations omitted). Thus, Patent Owner contends that in light of the design considerations and Dr. Bowser's lack of experience, "there is absolutely no foundation for his opinion that a sensor capable of measuring data 'indicative of total polar materials' could be 'readily adapt[ed]' for use" in Kauffman's system. *Id.* at 33 (citing Ex. 1011 ¶ 246).

Petitioner contends that Dr. Bowser has experience working with fryers and companies that use fryers to help evaluate the use of oil, and that Patent Owner's arguments challenging Dr. Bowser's experience are unjustified. Pet. Reply 15–16. Additionally, Petitioner contends that Patent Owner's declarant, Dr. Keener, has similar "shortcomings" with respect to experience. *Id.* at 15.

We do not find that the differences in experience of the parties' declarants weighs strongly in favor of one as opposed to the other in light of the record in this case. Each declarant has the necessary level of experience

in the relevant field of art—Agricultural Engineering/Food Science Technology. *See* Ex. 1011 ¶¶ 2–12 (discussing Dr. Bowser’s education and experience); Ex. 2032 ¶¶ 15–30 (discussing Dr. Keener’s education and experience). Nonetheless, we agree with Patent Owner that Dr. Bowser fails to provide any factual support for his opinion that Iwaguchi’s sensor could be “readily adapt[ed]” for use in Kauffman’s system and similarly fails to provide any testimony in his Declaration as to how one of ordinary skill in the art would have done so.

These failures are particularly notable when considering the teachings of each reference as a whole. In particular, Kauffman is not limited to analyzing oil in a fryer, and, thus, teaches that its device and on-line method can operate within a temperature range of 20° to 400°C. But Patent Owner presents compelling evidence that the operational temperature of a fryer is between 150° and 180°C. PO Resp. 34 (citing Ex. 2032 ¶ 100). Patent Owner explains that Kauffman’s system does not include any teaching regarding lowering the temperature of a fluid from its operational temperature prior to taking a measurement. *Id.*

In contrast to Kauffman’s system, Iwaguchi takes a different approach to measuring fluid. *Id.* at 35. In particular, Iwaguchi teaches to cool oil to “relieve heat stress on the detector” and “reduce the capacity of the conversion table.” *Id.* (quoting Ex. 1003 ¶ 20; citing Ex. 2032 ¶ 102; Ex. 2029, 90:16–91:19). To effectuate cooling, Iwaguchi diverts the fluid to be tested into a heat dissipator where it is cooled. *Id.* (citing Ex. 1003 ¶ 20; Ex. 2032 ¶¶ 101–102). In the example provided in Iwaguchi, the temperature of the fluid is cooled to between 40° and 80°C before it is exposed to the probe for measurement. Patent Owner points to Iwaguchi’s

teaching that when the temperature “is outside the stipulated range of the conversion table 140, [Iwaguchi] cannot be converted to an amount of polar compounds, so the processing unit 130 communicates *an error* to the display control part 150.” *Id.* (quoting Ex. 1003 ¶ 37 (brackets and emphasis added by Patent Owner)) (citing *id.* ¶ 42; Ex. 2032 ¶ 102; Ex. 2029, 98:15–24, 101:6–20).

Additionally, we find persuasive Patent Owner’s contention that introducing a diversion, sampling, and cooling loop, such as that of Iwaguchi, into Kauffman’s system would require additional plumbing and complexity. *Id.* at 38 (citing Ex. 2032 ¶¶ 112–114). Patent Owner explains that cooling, measuring, and then reheating the fluid would also introduce “inefficiencies in the form of added energy costs that would be unacceptable in a fryer design.” *Id.* Typically, “[t]he fact that the motivating benefit comes at the expense of another benefit . . . should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another.” *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000). As discussed above, though, Petitioner has not shown sufficiently that there would have been a reason to make the proposed substitution. Thus, based on the record before us, we find that the benefits lost (i.e., simplicity and efficiency) would have weighed against making the proposed substitution, which would result in added complexity and decreased efficiency.

In its Reply, Petitioner argues that Kauffman and Iwaguchi operate within overlapping temperature ranges. Pet. Reply 8. Additionally, Petitioner explains that Iwaguchi’s temperature range is only exemplary and that a broader range is contemplated. *Id.* at 8–9 (citing Ex. 1003 ¶ 20; PO

Resp. 14 (citing Ex. 1003 ¶ 37)). Petitioner further contends that none of the '691 patent claims requires measuring oil quality within a specific “operational” range of temperature. *Id.* at 9.

Even if we accept that Iwaguchi contemplates a broader temperature range, Petitioner has not explained sufficiently or provided a reason with rational underpinning as to why one of ordinary skill in the art would have looked to Iwaguchi and chosen its sensor to substitute for Kauffman’s analyzer. First, Iwaguchi explicitly teaches a preference for avoiding fluid temperatures in the operational range of a fryer. Iwaguchi provides two express reasons to do so: (1) to relieve heat stress on the detector and (2) to reduce the capacity of the conversion table. Petitioner fails to provide any reason why one of ordinary skill in the art would have selected Iwaguchi’s sensor to be used in such an environment in light of these teachings.⁷

Second, even if Iwaguchi’s sensor could be employed instead of Kauffman’s analyzer and a heat dissipator or other components could be added to avoid the negative aspects Iwaguchi seeks to avoid, Petitioner has not provided any reason why one of ordinary skill in the art would seek to do so, particularly in light of the inefficiencies such additional components would introduce. *See, e.g.*, Ex. 2032 ¶¶ 112–114 (describing the inefficiencies related to cooling oil prior to measurement). We credit Dr. Keener’s testimony in this regard. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the

⁷ Dr. Bowser’s testimony fares no better, providing the same conclusory statements under the guise of expert opinion, but without indicating how such modifications would be made to address the concerns of Iwaguchi. *See, e.g.*, Ex. 1011 ¶¶ 246–250.

combinations or modifications of prior art to arrive at the claimed invention”); *see also Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’”) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012)).

Accordingly, on the full record before us, Petitioner has not demonstrated that the ’691 patent “claims a structure already known in the prior art that is altered by the *mere* substitution of one element for another known in the field.” *KSR*, 550 U.S. at 416.

Petitioner argues that Patent Owner’s position is based on a requirement of “literal operability of the combined teachings of Kauffman and Iwaguchi” and is inconsistent with obviousness law. Pet. Reply 9. Petitioner explains that obviousness does not require a physical substitution of elements; rather, the question is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *Id.* at 9–10 (citations omitted). As explained above, we confirmed at the hearing that the only position Petitioner raised in its Petition is that a skilled artisan would have substituted or swapped Iwaguchi’s sensor for Kauffman’s. Thus, Petitioner’s argument is unpersuasive as Petitioner is proceeding under a theory of a physical substitution of elements.

Moreover, we disagree with Petitioner’s characterization of Patent Owner’s argument. Patent Owner is not arguing for literal operability of the combined teachings of Kauffman and Iwaguchi. Rather, Patent Owner’s position is that one of ordinary skill in the art would not have been prompted

to modify Kauffman's system by substituting Iwaguchi's sensor for Kauffman's analyzer. Patent Owner's argument and evidence addresses each of the references as a whole, pointing out Petitioner's failures generally, as well as Petitioner's failures as directed to the specific references themselves.

Additionally, Petitioner contends that Patent Owner mischaracterizes the inquiry. According to Petitioner, "the issue is not whether a [person of ordinary skill in the art] would modify the 'complete oil analysis technique' of Kauffman[] as a general matter, but whether a [person of ordinary skill in the art] wanting to specifically measure [total polar materials] would modify Kauffman." Pet. Reply 13. With that premise, Petitioner argues that "Dr. Bowser specifically explained why a [person of ordinary skill in the art] wanting to provide in-line [total polar materials ('TPM')] measurements would and could modify Kauffman with a TPM sensor." *Id.*

We disagree with Petitioner's statement of the alleged "issue" because it represents impermissible hindsight analysis. Petitioner frames the issue with the conclusion in mind. Rather, the question is whether one of ordinary skill in the art would have had a reason with rational underpinning for substituting the TPM sensor of Iwaguchi for Kauffman's analyzer. *See WBIP*, 829 F.3d at 1337 ("Whether a skilled artisan would be motivated to make a combination includes *whether he would select particular references* in order to combine their elements." (emphasis added)).

In answering the question of motivation, we have focused on each of Kauffman and Iwaguchi as a whole, taking into account all of their teachings pertaining to the issues before us. In light of the entire record before us, we find that Petitioner fails to present and support sufficiently a reason with

rational underpinning as to why one of ordinary skill in the art would have been prompted to substitute Iwaguchi's sensor for Kauffman's analyzer.

4. *Objective Considerations*

As the ultimate question of obviousness is one of law which must consider all four *Graham* factors including objective indicia, we turn next to those factors, "which can be powerful, real-world indicators of what would have been obvious." *WBIP*, 829 F.3d at 1328. Patent Owner contends that two objective indicia weigh in favor of non-obviousness: industry praise and long-felt, but unresolved, need. PO Resp. 54. Petitioner asserts that the objective indicia do not rebut the showing that the claims are obvious. Pet. Reply 22. We address each.

a. *Industry Praise*

Evidence that the industry praised a claimed invention or a product which embodies the patent claims weighs against an assertion that the same claim would have been obvious. Industry participants, especially competitors, are not likely to praise an obvious advance over the known art. Thus, if there is evidence of industry praise in the record, it weighs in favor of the nonobviousness of the claimed invention.

WBIP, 829 F.3d at 1334 (citation omitted).

Patent Owner contends that its OQS technology "received two coveted industry awards." PO Resp. 55. First, Patent Owner points to the National Restaurant Association's 2015 Kitchen Innovations Award. *Id.* (citing Ex. 2015, 2; Ex. 2034, 1; Ex. 2032 ¶¶ 175–176). Patent Owner explains that those receiving the Kitchen Innovations Award "are chosen by an independent panel of industry experts, and are intended to reflect the trends and topics most important to food-service operators today." *Id.* (citing Ex. 2026, 1–2; Ex. 2032 ¶ 176). Patent Owner points out that

Petitioner's declarant, Dr. Bowser, recognized that the National Restaurant Association is a leading food-service business association. *Id.* (Ex. 2029, 289:15–22). Patent Owner explains that the Kitchen Innovations Award “specifically recognized Patent Owner’s ‘patented’ ‘integrated oil-quality sensor’ that reduces the cost of frying, and improves food quality.” *Id.* (quoting Ex. 2015, 2; Ex. 2034, 1; Ex. 2032 ¶ 175).

Second, Patent Owner points to its receipt of “the ‘Blue Flame Award Product of the Year’ from the Gas Foodservice Equipment Network (‘GFEN’) for its ‘Integrated Oil Quality Sensor.’” *Id.* (quoting Ex. 2014, 1–2; Ex. 2024, 3; Ex. 2032 ¶¶ 170–174). Patent Owner explains that “GFEN is an independent organization that seeks to identify foodservice technology that has improved performance, efficiency, safety, and ease-of-use.” *Id.* at 56 (citing Ex. 2023, 3–4).

Additionally, Patent Owner points to praise received from its customers in the form of the “2014 Innovator of the Year” award, given by McDonald’s. *Id.* at 56–57 (citing Ex. 2017, 2; Ex. 2032 ¶ 177). Patent Owner explains that the award recognizes Patent Owner’s innovations, including its OQS technology, as explained by the senior director of innovation and Chief Engineering Office of McDonald’s: “[Patent Owner] brought forth and demonstrated several unique and exceptional innovations such as . . . the work they did on developing a built-in Oil Quality Sensor for our European markets that improves the consistency of oil management, improved reliability, crew safety, and ease of use.” *Id.* at 57 (quoting Ex. 2017, 2) (citing Ex. 2032 ¶ 177). Further, Patent Owner points to other customer praise directed to its OQS, that “[t]he integrated sensor takes all

the guesswork out of deciding when to change the oil.” *Id.* (quoting Ex. 2011, 4) (citing Ex. 2032 ¶ 178).

In sum, Patent Owner contends that its evidence of industry praise is directed to its OQS technology and resulted from the claimed invention as opposed to the prior art. *Id.* Therefore, Patent Owner asserts that the industry praise and the praise of its customers strongly suggest that the challenged claims are nonobvious.

Petitioner contends that praise relevant to objective indicia of nonobviousness is limited to contemporaries skilled in the field of the invention and that praise from customers and customer associations does not indicate whether an invention is nonobvious. Pet. Reply 25 (citation omitted). Essentially, Petitioner’s argument is that Patent Owner’s evidence of praise is customer-, not industry-, based and, therefore, does not support Patent Owner’s argument that the claimed invention is nonobviousness.

Two industry awards Patent Owner received constitute strong evidence of industry recognition of the significance and value of the claimed invention and weighs in favor of nonobviousness. First, Patent Owner establishes that the 2015 Kitchen Innovations Award and the 2016 Blue Flame Award Product of the Year are industry awards. The evidence reflects that the Kitchen Innovations Award is based on a consideration of the foodservice industry. *See* Ex. 2015, 2 (“Each year our independent panel of judges *scans the entire industry* to find the products that address and solve . . . [culinary and key operator] challenges, advancing the entire foodservice industry.” (emphasis added)). The same is true of the Blue Flame Award Product of the Year. *See* Ex. 2022, 2 (“The Energy Solutions Center (ESC) is pleased to announce that its Gas Foodservice Equipment Network

Consortium (GFEN), dedicated to bringing new gas solutions to the restaurant and foodservice industry, has selected the FilterQuick™ Frymaster Fryer Model FQG30U for its 2016 Blue Flame Award Product of the Year.”).

Second, each of these awards specifically mentions Patent Owner’s OQS technology that Petitioner concedes commercially embodies the claims. *See infra* Section III.B.4.c. (discussing nexus). The 2015 Kitchen Innovations Award was given to the “Frymaster® FilterQuick® with Oil Quality Sensor,” and the description of the product states: “Boasting integrated oil-quality sensors, a patented technology that automatically monitors the health of the oil by measuring its total polar materials (TPMs), these gas and electric fryers reduce the cost of frying and improve food quality by taking the guesswork of out [sic] oil replacement.” Ex. 2015, 2. The description of the 2016 Blue Flame Award Product of the Year similarly mentions Patent Owner’s OQS: “The innovative oil quality sensor measures the total polar material (TPM) contaminants in the oil and advises when the oil needs to be changed, keeping food quality and customer satisfaction at an all-time high.” Ex. 2022, 3.

Accordingly, we find that the 2015 Kitchen Innovations Award and the 2016 Blue Flame Award Product of the Year constitute evidence of industry praise for Patent Owner’s FilterQuick OQS product, and that both awards mention that the OQS measures total polar materials in the oil, specifically tying the praise to the claimed invention. Additionally, we find that the 2014 Innovator of the Year award from McDonald’s, although not as compelling as the two industry awards, is probative of praise received by the commercial embodiment of the claimed invention. In sum, Patent Owner

has presented evidence of industry recognition of the significance and value of the claimed invention, evidence which weighs in favor of nonobviousness.

b. Long-Felt, But Unresolved, Need

“Evidence of long felt but unresolved need tends to show non-obviousness because it is reasonable to infer that the need would have not persisted had the solution been obvious.” *WBIP*, 829 F.3d at 1332.

Patent Owner contends that “the need for an integrated oil quality sensor that accurately, reliably, and safely measured oil quality was recognized by [persons of ordinary skill in the art], and that need was not met until the ’691 Patent’s invention.” PO Resp. 58. Patent Owner principally relies upon “published literature” that it contends “demonstrates that in the years prior to the invention there were no satisfactory methods for monitoring oil quality in deep-fryers.” *Id.* at 59 (citing Ex. 2003, 5; Ex. 2032 ¶¶ 180–182); *see id.* (citing Ex. 2004, 6 (discussing color comparisons). In addressing Kauffman, Patent Owner contends that “Kauffman taught something dramatically different than the ’691 Patent: a ‘dip-stick’ that allowed the ‘electrode’ to be removed from the system and manually cleaned.” *Id.* at 62 (citing Ex. 2032 ¶ 190).

Petitioner contends that Patent Owner’s argument overlooks Kauffman’s teachings. Pet. Reply 26–27. In particular, Petitioner points to Kauffman as teaching an integrated oil quality sensor in a deep-fryer system, and notes that Patent Owner has argued that Kauffman provides a “complete oil analysis technique.” *Id.* at 26 (quoting PO Resp. 40). Thus, Petitioner contends that Patent Owner “cannot have it both ways: either Kauffman is deficient and therefore amenable to a motivation to improve its analyzer,

such as with Iwaguchi's TPM sensor, or it is a 'complete' system that 'solve[d] the decades-old problem of measuring oil quality in a deep fryer.'" *Id.* at 27. Petitioner asserts that "[i]f the latter, then there can be no showing that [Patent Owner] solved a long-felt need." *Id.*

The evidence provided by Patent Owner does not establish a specific need for an oil quality sensor integrated in a deep fryer that is capable of detecting TPMs as opposed to simply an oil quality sensor integrated in a deep fryer. Although Exhibit 2003, an article published in 1996, states that "[n]o satisfactory and easy method of sensing the frying fat quality has been developed so far" (Ex. 2003, 5),⁸ Patent Owner fails to explain why Kauffman's system would not satisfy the need expressed therein. Patent Owner only addresses Kauffman's "dip-stick type electrode system" and fails to address Kauffman's "built-in electrode system," which is shown in Kauffman's Figure 5 and which forms the basis of Petitioner's challenge. *Compare* PO Resp. 62 (discussing Kauffman's dip-stick electrode), *with* Ex. 1005, 6:23–24 (describing two systems, a dip-stick type electrode system and *a built-in electrode system*). Thus, even if we assume that a need "for an integrated oil quality sensor that accurately, reliably, and safely measured oil quality was recognized by [persons of ordinary skill in the art]," as Patent Owner contends (PO Resp. 58), Patent Owner fails to present sufficient evidence to persuade us that Kauffman's system would not have

⁸ Exhibit 2003 mentions that other methods of sensing frying fat quality include "cooks . . . observing the color, odor, excessive foaming and smoking" as well as "tasting." Ex. 2003, 5. Patent Owner does not contend that the article considers a system with a built-in electrode such as Kauffman's before stating that no safe and easy method has been developed thus far. And, our review of Exhibit 2003 does not reflect that it does.

filled that need. In other words, the evidence before us fails to show that Kauffman’s system does not satisfy the alleged need for “an integrated oil quality sensor that accurately, reliably, and safely measure[s] oil quality.”

Accordingly, the evidence of record does not indicate that the claimed invention satisfied a long-felt, but unresolved, need.

c. Nexus

“[T]here is a presumption of nexus for objective considerations when the patentee shows that the asserted objective evidence is tied to a specific product and that product ‘is the invention disclosed and claimed in the patent.’” *WBIP*, 829 F.3d at 1329 (citation omitted). The presumption is rebuttable, but “a patent challenger cannot successfully rebut the presumption with argument alone—it must present evidence.” *Id.* (citation omitted).

Patent Owner asserts that it has a “commercially available Oil Quality Sensor (‘OQS’) that embodies the claims of the ’691 patent.” PO Resp. 55 (citing Ex. 2010, 26–28, 31; Ex. 2011; Ex. 2012; Ex. 2013, 1, 49). Patent Owner contends that the awards it received as evidence of industry praise were specifically directed to the claimed integrated oil quality sensor, confirming the nexus between the praise and the claims. *Id.* at 63 (citing Ex. 2032 ¶¶ 170–179; Ex. 2010, 39; Ex. 2014, 1–2; Ex. 2022, 2–4; Ex. 2024, 2–3; Ex. 2015, 2; Ex. 2025, 2; Ex. 2034, 1; Ex. 2017, 2).

Petitioner’s Reply Brief challenges whether Patent Owner’s OQS embodies the claims the ’691 patent. Pet. Reply 23–24. During oral argument, however, Petitioner agreed that the OQS product praised is commensurate in scope with the claims. Tr. 45:16–19 (Q: “Okay. So we all agree that the product praised and awarded was, in fact, commensurate in

scope with the claims?” A: “I think that’s the case, sure.”); *see also id.* at 44:12–25 (Petitioner agreeing that Patent Owner’s commercial OQS product contains each of the structural elements of claim 1). In light of Petitioner’s acknowledgement that Patent Owner’s OQS product embodies the claims of the ’691 patent, we find that the presumption of nexus applies and that Petitioner has waived any challenge to that presumption.

Petitioner, however, raises a second argument challenging nexus. Pet. Reply 24. Petitioner contends that “[i]f objective indicia of nonobviousness are ‘due to an element in the prior art, no nexus exists.’” *Id.* (quoting *Torrent Pharm. Ltd. v. Novartis AG*, IPR2014-00874, IPR2015-00518 (Paper 12, 26) (Sept. 24, 2015)). Petitioner asserts that Patent Owner’s objective indicia are tied to “an oil quality sensor integrated into a deep-fryer,” but that both Iwaguchi and Kauffman disclose the same structural arrangement. *Id.* at 25. Thus, Petitioner contends that because Patent Owner’s objective indicia are tied to an element existing in the prior art, no nexus exists. *Id.* at 24–25.

The Federal Circuit has clarified the application of nexus to combination inventions:

Where the allegedly obvious patent claim is a combination of prior art elements, we have explained that the patent owner can show that it is the claimed combination as a whole that serves as a nexus for the objective evidence; proof of nexus is not limited to only when objective evidence is tied to the supposedly “new” feature(s). In such a case, the fact that an isolated feature may be present in the prior art may not render irrelevant objective evidence of non-obviousness of that feature in the claimed combination.

WBIP, 829 F.3d at 1330–31 (citing *Rambus v. Rea*, 731 F.3d 1248, 1258 (Fed. Cir. 2013)). These are precisely the circumstances with which we are

presented here. Specifically, Patent Owner does not contend that it invented an element never before seen in the art. Rather, the evidence presented by Patent Owner is directed to the claimed combination as a whole—a system for measuring the state of degradation of cooking oils or fats in a deep fryer—that generally includes the structural requirements of a deep fryer system and a sensor capable of measuring an electrical property indicative of the total polar materials of the cooking oil. *See, e.g.*, Ex. 1001, 6:17–41 (claim 1).

Additionally, we disagree with Petitioner’s premise that the objective indicia are tied simply to “an oil quality sensor integrated into a deep-fryer” and that both Iwaguchi and Kauffman disclose the same structural arrangement. Pet. Reply 25. As discussed above, the industry praise Patent Owner’s OQS product received is tied not just to an oil quality sensor integrated into a deep-fryer; rather, it is tied specifically to a deep fryer including an oil quality sensor capable of measuring TPMs. *See, e.g.*, Ex. 2015, 2 (mentioning TPMs); Ex. 2022, 3 (same). The arguments presented in the Petition and those that remain in Petitioner’s Reply⁹ do not assert that either Kauffman or Iwaguchi embody each and every claim element, including a sensor capable of measuring TPMs; rather, the ground upon which we instituted review is based on the *combination* of these two references.

Accordingly, in light of the evidence presented in the record before us, including Petitioner’s concession that Patent Owner’s OQS product embodies the claimed invention, we find that the industry praise received

⁹ As discussed previously, we have disregarded new arguments raised in Petitioner’s Reply regarding Kauffman’s analyzer.

has a nexus to the claimed invention, and, thus, weighs in favor of the nonobviousness of the claims.

5. *Weighing the Graham Factors*

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat*, slip op. at 10. In weighing the facts here, we determine that the level of skill in the art does not favor either Petitioner’s or Patent Owner’s case. Neither party argues that the level of skill is either so high or low as to weigh in favor of their arguments as opposed to the other’s; nor do the parties argue that the level of skill specifically impacts our legal determination of obviousness in any specific manner. Turning to our findings regarding the scope and content of the prior art and the differences between the prior art and the claimed invention, we determine that they weigh in favor of Patent Owner. Although the scope and content of the prior art are in some ways similar to the claimed invention, we determine that Petitioner has not shown sufficiently that one of ordinary skill in the art would have been prompted to substitute *Iwaguchi’s* sensor for Kauffman’s analyzer. In particular, Petitioner fails to provide a reason with rational underpinning as to why one of ordinary skill in the art would have been prompted to employ *Iwaguchi’s* sensor in Kauffman’s system, and fails to account for *Iwaguchi’s* teachings as well as the evidence set forth by Patent Owner’s declarant regarding, e.g., inefficiencies, that demonstrate that the substitution contemplated is “more than the simple substitution of one know element for another.” *KSR*, 550 U.S. at 417. Additionally, we find that

Patent Owner's objective indicia of industry praise weighs in favor of nonobviousness, for the reasons set forth above.

On balance, we determine that, based on the complete record before us, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–3, 5–12, 17, 19, 21, and 23 of the '691 patent are unpatentable.

C. Obviousness over Kauffman, Iwaguchi, and Howard

Petitioner contends that the combination of Kauffman, Iwaguchi, and Howard would have rendered the subject matter of claims 18 and 20 obvious to one of ordinary skill in the art at the time of the invention. Pet. 53–55. Claims 18 and 20 depend, directly and indirectly, from independent claim 17. Ex. 1001, 8:1, 8:7. Petitioner challenges claim 17 based on the combination of Iwaguchi and Kauffman as discussed in our analysis above. Petitioner's challenge to claims 18 and 20 thus relies upon the same combination of Kauffman and Iwaguchi for meeting the limitations that claims 18 and 20 share with claim 17 based on their dependency therefrom. Pet. 53–55.

Accordingly, for the same reasons discussed in our consideration of Petitioner's obviousness challenge based on Kauffman and Iwaguchi, we determine that, based on the complete record before us, Petitioner has not demonstrated by a preponderance of the evidence that claims 18 and 20 are unpatentable.

IV. CONCLUSION

We determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–3, 5–12, 17–21, and 23 of the '691 patent are unpatentable.

V. ORDER

Accordingly, it is:

ORDERED that we do not consider the portions of Petitioner's Reply that Petitioner represented it was not relying upon, as identified in the Final Written Decision;

FURTHER ORDERED that, based on a preponderance of the evidence, claims 1–3, 5–12, 17–21, and 23 of U.S. Patent No. 8,497,691 B2 (“the '691 patent”) have not been proven unpatentable;

FUTHER ORDERED that, pursuant to 35 U.S.C. § 318(b), upon expiration of the time for appeal of this Decision, or the termination of any such appeal, a certificate shall issue confirming the patentability of claims 1–3, 5–12, 17–21, and 23 of the '691 patent; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2016-01435
Patent 8,497,691 B2

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