

**United States Court of Appeals
for the Federal Circuit**

HENNY PENNY CORPORATION,
Appellant

v.

FRYMASTER LLC,
Appellee

2018-1596

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2016-01435.

Decided: September 12, 2019

ALLEN MARCEL SOKAL, Potomac, MD, argued for appellant. Also represented by KEVIN W. KIRSCH, Baker & Hostetler LLP, Cincinnati, OH; DONALD E. BURTON, Faruki Ireland Cox Rhinehart & Dusing PLL, Dayton, OH.

JOSEPH ALLEN LOY, Kirkland & Ellis LLP, New York, NY, argued for appellee. Also represented by AARON D. RESETARITS; EUGENE GORYUNOV, Chicago, IL; JASON M. WILCOX, Washington, DC.

Before LOURIE, CHEN, and STOLL, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Henny Penny Corporation (“HPC”) appeals from the *inter partes* review decision of the United States Patent and Trademark Office Patent Trial and Appeal Board (the “Board”) holding claims 1–3, 5–12, 17–21, and 23 of U.S. Patent 8,497,691 (the “’691 patent”) not unpatentable as obvious. *Henny Penny Corp. v. Frymaster L.L.C.*, No. IPR2016-01435, 2017 WL 6551237 (P.T.A.B. Dec. 21, 2017) (“*Decision*”). Because substantial evidence supports the Board’s findings and the Board properly credited evidence of secondary considerations, we affirm.

I. BACKGROUND

This case relates to deep fryers. During frying, cooking oil gradually degrades and loses its cooking capacity, generating impurities called total polar materials (“TPMs”). ’691 patent col. 1 ll. 25–32. The ’691 patent, owned by appellee Frymaster LLC, describes a system for measuring the state of cooking oil degradation with a TPM sensor. When the sensor detects that TPM levels are too high, the system instructs the fryer operator to change the oil. *See id.* col. 4 ll. 53–55. The purpose of the TPM sensor is to ensure that oil is neither “wasted by being prematurely changed” nor “overused thereby tainting food and harming consumers.” *Id.* col. 4 ll. 55–57.

Claim 1 of the ’691 patent is representative and identifies two relevant characteristics of the TPM sensor: (1) the sensor is positioned within an adapter located between drain and return pipes that circulate oil between the fryer pot and the sensor; and (2) the sensor “measure[s] an electrical property that is indicative of [TPMs] as the cooking oil flows past [the] sensor and is returned to [the fryer pot].” *Id.* col. 6 ll. 20–37. The claim reads in full as follows:

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 on[e] 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. col. 6 ll. 17–41 (emphases added).

The dispute here arose when HPC, a competitor of Frymaster, petitioned for *inter partes* review (“IPR”) of the ’691 patent. The Board instituted review and ultimately held that the claims are not unpatentable as obvious. The claimed TPM sensor is central to the two issues on appeal, which are: (1) whether the Board abused its discretion in disregarding certain of HPC’s post-institution arguments about how to incorporate a TPM sensor into a deep fryer;

and (2) whether the Board erred in concluding that the deep fryer system claimed in the '691 patent would not have been obvious.

A.

In its petition, HPC challenged claim 1 as obvious over U.S. Patent 5,071,527 (“Kauffman”) and Japanese Unexamined Patent Application Publication No. 2005-55198 (“Iwaguchi”).

Kauffman discloses an apparatus “for the complete analysis of used oils, lubricants, and fluids,” Kauffman Abstract, for use in equipment such as deep fryers, engines, and gear boxes, *id.* col. 8 ll. 10–13. The apparatus employs an “on-line analysis” to monitor oil quality with an “analyzer” including an electrode positioned between drain and return lines connected to a fluid reservoir. *Id.* col. 6 ll. 24–25, 45–54. The electrode measures conductivity and current, *id.* col. 2 ll. 60–61, 65–66, and the measurements are used to monitor undesirable properties such as “antioxidant depletion, oxidation initiator buildup, product buildup, or liquid contamination, or combinations thereof,” *id.* col. 3 ll. 3–6. Monitoring TPMs, however, is nowhere mentioned. Kauffman indicates that the sample temperature for on-line analysis can vary between 20–400°C. *Id.* col. 7 ll. 26–27.

Iwaguchi, unlike Kauffman, does disclose measuring TPMs to monitor oil degradation in deep fryers. The reference notes the disadvantages of other analytes for oil quality such as peroxide and acid value. Acid value, for example, “does not readily serve as a direct index of deliciousness and/or safety” because it fails to account for carbonyl compounds that are detrimental to oil quality. Iwaguchi ¶ 4. In contrast, Iwaguchi describes TPMs as “the standard for freshness” in Europe. *Id.* The reference thus discloses an apparatus for measuring TPMs in a deep fryer.

Unlike Kauffman, the Iwaguchi apparatus cools the cooking oil before detecting TPMs. The frying pot heats oil to a “high temperature (for example, around 180°C).” Iwaguchi ¶ 19. To detect TPMs, the apparatus diverts oil from the frying pot through a “heat dissipator” to a separate detection vessel with a TPM detector that uses probes to measure electrical characteristics of the oil. *Id.* ¶¶ 20, 24. The heat dissipator “cools the oil . . . and lowers the temperature of the oil . . . to a given temperature (for example, 40°C to 80°C).” *Id.* ¶ 20. Iwaguchi explains the purpose of the cooling: “[1] to relieve heat stress on the detector . . . to prevent degradation and . . . [2] to reduce the capacity of the conversion table” necessary for associating the oil’s temperature and electrical characteristics with the amount of TPMs. *Id.* ¶¶ 20, 25.

HPC advanced a straightforward theory of obviousness in its petition. It contended that Kauffman expressly discloses each claimed limitation except for the sensor “as it relates to [TPMs] as well as the specific structural layout of a fryer pot system.” J.A. 99. The petition further asserted that sensors capable of measuring TPMs were known in the art and that a skilled artisan “could have readily adapted such sensors for use in the Kauffman system if one desired to measure [TPMs].” J.A. 99–100. To support this argument, the petition only cited Iwaguchi. According to the petition, Iwaguchi would have motivated a person of ordinary skill to provide a sensor to measure TPMs in order to monitor cooking oil degradation. And “[t]herefore, to the extent Kauffman dose [sic] not disclose this feature, 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.*” J.A. 100 (emphasis added).

The Board instituted IPR, concluding that HPC “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.*” J.A. 390–91 (emphasis added). Frymaster then filed its patent owner response. It disputed HPC’s contention that a skilled artisan would have been motivated to adapt Iwaguchi’s sensor to Kauffman’s system, arguing that “integration of Iwaguchi’s temperature sensitive ‘probe’ into Kauffman would not yield a predictable outcome of measuring oil quality.” Patent Owner Resp. at 34, *Henny Penny Corp. c. Frymaster L.L.C.*, No. IPR2016-01435, Paper No. 29 (P.T.A.B. Mar. 16, 2017).

In reply, HPC argued that integrating Iwaguchi’s TPM sensor into Kauffman’s system was actually unnecessary. Rather, HPC contended that Kauffman’s sensor alone is capable of monitoring TPMs via conductance measurements. J.A. 569–70; J.A. 571–72. HPC relied on a supposed admission by Frymaster’s expert at a post-institution deposition as its only evidentiary support for that capability. *Id.* Iwaguchi, according to this theory, was only relevant for generally teaching the desirability of observing TPMs to gauge oil quality.

Frymaster objected to HPC’s reply arguments as a new theory of unpatentability not presented in the petition or instituted by the Board. At the oral hearing, the Board pressed HPC to clarify when it first argued that Kauffman taught a sensor that could be modified to measure TPMs. Counsel for HPC confirmed that the obviousness combination presented “in the original petition” was “the idea of taking [Iwaguchi’s] sensor and incorporating it into Kauffman.” J.A. 648-49. Following up, a Board member asked: “So just swapping the sensor rather than a broader teaching is what you presented in the petition?” J.A. 649. HPC’s counsel answered, “That’s right, Your Honor.” *Id.* As for the position that Kauffman’s sensor itself was capable of measuring TPMs, HPC’s counsel explained that the theory was raised in reply based on the deposition testimony of Frymaster’s expert. J.A. 648–49.

B.

After the hearing, the Board issued its final written decision. Because of the apparent differences between the obviousness theories presented in HPC's petition and reply, as well as HPC's counsel's candid statements confirming those differences, the Board disregarded HPC's arguments based on modifying Kauffman's sensor to detect TPMs as an impermissible new theory of unpatentability raised for the first time on reply. *Decision*, 2017 WL 6551237, at *5, *8 (citing 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.")). Consistent with its institution decision, the Board thus addressed whether a person of ordinary skill would have been motivated to integrate Iwaguchi's TPM sensor into Kauffman's system. *Id.* at *7–8.

The Board found that a skilled artisan would not have been so motivated. The Board credited evidence that the operational temperature of a fryer is between 150–180°C and found that Iwaguchi taught cooling the oil—for example, to 40–80°C—to relieve heat stress on its TPM detector and reduce the capacity of the conversion table. *Id.* at *11. Kauffman, however, did not disclose any means for cooling the fluid before taking measurements, and the Board found that adding a diversion and cooling loop to Kauffman, following Iwaguchi, would introduce additional complexity and inefficiencies into Kauffman's system. *Id.* at *10–11. On balance, the Board found that these disadvantages outweighed the uncertain benefits of measuring TPMs instead of the other oil quality parameters already monitored in Kauffman. *Id.* at *11.

Further, the Board found that evidence of secondary considerations supported nonobviousness. Frymaster submitted evidence that it marketed a product called the "Oil

Quality Sensor” (“OQS”) that won praise from two industry organizations and one customer. The Board found that there was a presumption of nexus between the objective evidence and the OQS product because HPC conceded at argument that claim 1 was commensurate in scope with the praised product. *Id.* at *16. The Board also determined that each award specifically praised the TPM sensor in the OQS. *Id.* at *14. While the Board recognized that the individual claim elements were in the prior art, it found that the praise was directed to the claimed combination as a whole. *Id.* at *16. Accordingly, the Board found that the two industry awards weighed in favor of patentability, as did, to a lesser extent, the customer award. *Id.* at *14, *17.

Considering all the evidence, the Board held that claim 1 and the other instituted claims are not unpatentable as obvious. *Id.* at *17. HPC appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II. DISCUSSION

Our review of a Board decision is limited. *In re Baxter Int'l, Inc.*, 678 F.3d 1357, 1361 (Fed. Cir. 2012). We review the Board's legal determinations *de novo*, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), but we review the Board's factual findings underlying those determinations for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding is supported by substantial evidence if a reasonable mind might accept the evidence as adequate to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

HPC makes two arguments on appeal: (1) that the Board procedurally erred by too narrowly construing the petition; and (2) that the Board erred in its conclusion of nonobviousness. We begin with the procedural challenge and then turn to the issue of obviousness.

A.

We review the Board's decision under 37 C.F.R. § 42.23(b) to disregard certain of HPC's arguments as improper reply arguments for abuse of discretion. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). The Board abuses its discretion if its decision: "(1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact finding; or (4) involves a record that contains no evidence on which the Board could rationally base its decision." *Id.* (quoting *Bilstad v. Wakalopulos*, 386 F.3d 1116, 1121 (Fed. Cir. 2004)).

HPC argues that the Board erroneously interpreted the petition as limited to the physical substitution of Iwaguchi's sensor for Kauffman's. Physical substitutability, according to HPC, is neither required to prove obviousness nor called for in the petition. On a more general reading of the petition and the reply, HPC contends that the combination of Kauffman and Iwaguchi renders claim 1 obvious.

Frymaster responds that HPC's petition advanced only the substitution of Iwaguchi's sensor for Kauffman's, as HPC's counsel attested to the Board. Consequently, Frymaster argues that the Board was well within its discretion to disregard HPC's improper reply arguments.

We agree with Frymaster that the Board did not abuse its discretion by holding HPC to the obviousness theory in its petition. Because of the expedited nature of IPR proceedings, "[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.'" *Id.* at 1369 (quoting 35 U.S.C. § 312(a)(3)). Accordingly, an IPR petitioner may not raise in reply "an entirely new rationale" for why a claim would have been obvious. *See id.* at 1370; 37 C.F.R. § 42.23(b). But that is what HPC did here.

Fairly interpreted, the petition proposed a single obviousness theory for claim 1: modifying Kauffman's overall system "to include the processor and/or sensor as taught by Iwaguchi" for measuring TPMs. J.A. 100. HPC's counsel acknowledged this to the Board. J.A. 648–49 ("So you're correct, Your Honor, in the original petition, it was the idea of taking [Iwaguchi's] sensor and incorporating it into Kauffman.").

On appeal, HPC reads the petition quite differently as embracing its reply argument that "[o]ne could add the processor of Iwaguchi . . . and use the electrical signal from the sensor of Kauffman as a basis for the processor to calculate TPMs." Appellant's Br. 38. But the petition says nothing about using Kauffman's measured electrical parameters to calculate TPM levels. Nor did HPC submit any expert testimony with its petition about how to do so.¹ And tellingly, when pressed by the Board on what particular theory was presented in the petition, HPC's counsel never argued that Kauffman implicitly disclosed a TPM sensor, but rather confirmed that "in the original petition" HPC proposed integrating Iwaguchi's sensor into Kauffman's system. We conclude that the Board did not abuse its discretion in holding HPC to its word and disregarding its new theory first

¹ The only support HPC identifies for its contention that Kauffman disclosed a sensor capable of measuring TPMs comes from the post-institution deposition testimony of Frymaster's expert. Counsel asked, "could you use a conductance sensor to derive [TPMs]?" J.A. 1540. Frymaster's expert answered that the values could be correlated but with unknown precision and accuracy. J.A. 1540–41; *see also* J.A. 1582–83 (acknowledging that Kauffman measured conductivity). We are unpersuaded that this deposition testimony by Frymaster's expert on what was theoretically possible sheds meaningful light on the rationale for obviousness set forth in HPC's petition.

raised in reply. We thus turn to HPC's separate argument that, even under the petition's theory, claim 1 would have been obvious.

B.

Obviousness is a question of law based on underlying facts, including the scope and content of the prior art, differences between the prior art and the claims at issue, the level of ordinary skill, and relevant evidence of secondary considerations. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966). Whether a skilled artisan would have been motivated to combine prior art references is also a question of fact. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238–39 (Fed. Cir. 2010).

HPC argues that the Board made two errors in holding claim 1 nonobvious. First, HPC contends that the Board mistakenly found no motivation to combine Iwaguchi's TPM sensor with Kauffman's system. Second, HPC argues that the Board erred in finding Frymaster's evidence of industry praise to be probative of nonobviousness.

Frymaster responds that substantial evidence supports the Board's findings on both points.

We agree with Frymaster. With respect to motivation to combine, HPC argues that the Board placed undue weight on the disadvantages of introducing Iwaguchi's TPM sensor into Kauffman's system. Relying on our decision in *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340 (Fed. Cir. 2000), HPC emphasizes that “[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.” Appellant's Br. 33 (quoting *Winner*, 202 F.3d at 1349 n.8). But immediately after the sentence quoted by HPC, *Winner* continues: “[T]he benefits, *both lost and gained*, should be weighed against one another.” 202 F.3d at 1349 n.8 (emphasis added). That is consistent with the longstanding

principle that the prior art must be considered for all its teachings, not selectively. *See, e.g., Merck & Cie v. Gnosis S.p.A.*, 808 F.3d 829, 834 (Fed. Cir. 2015); *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987); *In re Pagliaro*, 657 F.2d 1219, 1224–25 (CCPA 1981).

The Board’s analysis was consistent with these principles. The Board recognized that Iwaguchi discloses a TPM sensor but found that a skilled artisan would have been dissuaded from integrating Iwaguchi’s sensor into Kauffman’s system. Iwaguchi specifically teaches first diverting the oil through a heat dissipator “to relieve heat stress on the [TPM] detector . . . to prevent degradation and to reduce the capacity of the conversion table,” J.A. 717, but Kauffman, which is not limited to deep fryers, does not contemplate such cooling or disclose any means for doing so. The Board credited Frymaster’s expert’s testimony that following Iwaguchi’s method of diverting and cooling the oil in Kauffman’s system would introduce “additional plumbing and complexity” and lead to “decreased efficiency.” *Decision*, 2017 WL 6551237, at *11. The Board thus found that a person of ordinary skill would not have been motivated to integrate Iwaguchi’s TPM sensor into Kauffman’s system. On appeal, HPC argues that a skilled artisan could have ignored Iwaguchi’s diversion and cooling teachings, integrated only the TPM sensor into Kauffman, and just tolerated the faster degradation of the sensor. But a reasonable fact finder could have found these tradeoffs to yield an unappetizing combination, especially because Kauffman already teaches a sensor that measures other indicia of oil quality. Considering the prior art as a whole, we conclude that substantial evidence supports the Board’s finding of no motivation to combine.

We now turn to the Board’s analysis of Frymaster’s evidence of secondary considerations—specifically, industry praise. “[E]vidence of secondary considerations may often be the most probative and cogent evidence in the record.” *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed.