

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SALEM FABRICATION TECHNOLOGIES GROUP, INC.,
Petitioner,

v.

UNIGLASS ENGINEERING OY,
Patent Owner.

IPR2022-01516
Patent 8,650,911 B2

Before DONNA M. PRAISS, ELIZABETH M. ROESEL, and
SHELDON M. McGEE, *Administrative Patent Judges*.

ROESEL, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Salem Fabrication Technologies Group, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) seeking an *inter partes* review of claims 1–5 of U.S. Patent No. 8,650,911 B2 (Ex. 1001, “the ’911 Patent”). Uniglass Engineering Oy (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Pursuant to our delegated authority, we may not institute an *inter partes* review “unless . . . the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018); 37 C.F.R. § 42.4(a) (2022). After considering the information presented in the Petition and the Preliminary Response, we determine that the reasonable likelihood standard is not met. Accordingly, we deny institution of an *inter partes* review.

B. *Related Matters*

The parties identify the following as a related matter: *Glaston Corp. v. Salem Fabrication Technologies Group, Inc.*, No. 1:21-cv-942-TDS-LPA (MDNC filed Dec. 9, 2021). Pet. 1; Paper 7, 2 (Patent Owner’s updated mandatory notices).

Also pending before us is IPR2022-01517, which involves the same parties and related U.S. Patent No. 8,479,540 (“the ’540 Patent”).

C. *The ’911 Patent (Ex. 1001)*

The ’911 Patent is titled, “method and apparatus for heating glass” and claims the benefit as a division of an earlier-filed application that issued

as the '540 Patent. Ex. 1001, codes (54), (62). Figure 1 is reproduced below.

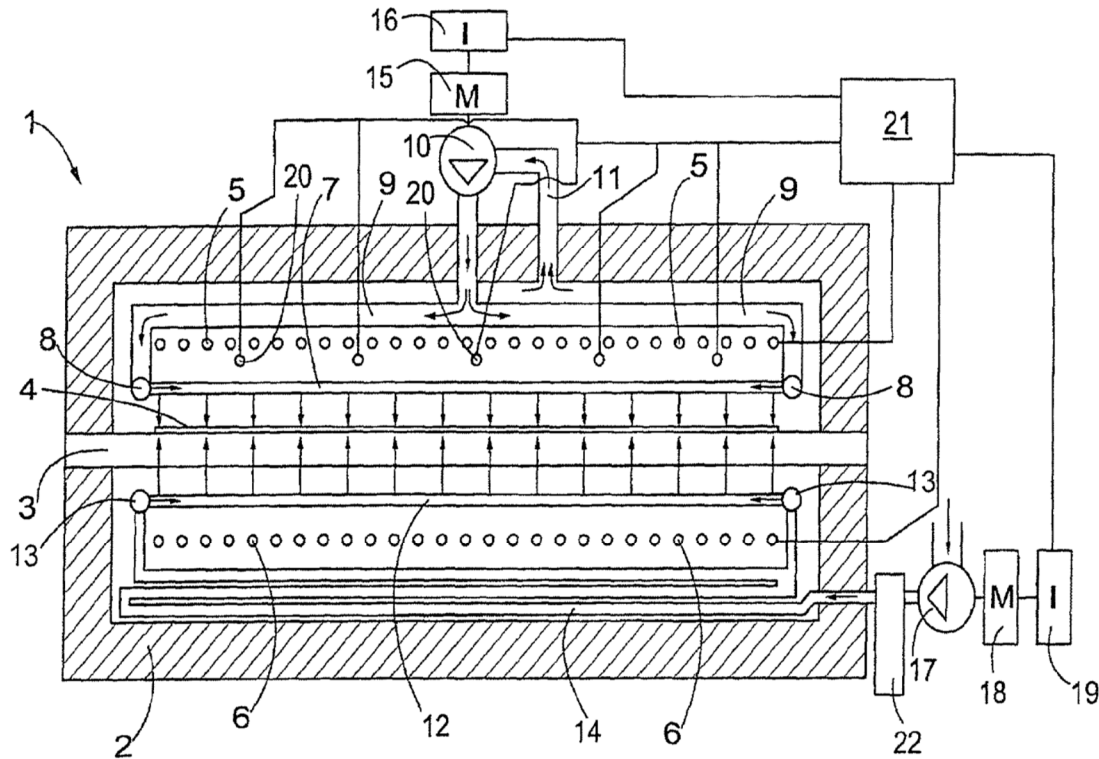


FIG. 1

Figure 1 shows glass tempering furnace 1 in which glass 4 is heated from above by upper resistors 5 and from below by lower resistors 6, while the glass oscillates back and forth on ceramic rolls 3. Ex. 1001, code (57), 2:18–20, 2:64–3:4, 3:7–11.¹ The upper surface of the glass is heated by hot air jets formed by sucking air from inside the furnace and pressurizing the hot air and recycling it back to the upper surface of the glass. *Id.* at code (57), 2:20–23. Air taken from outside the furnace is pressurized by a compressor, heated, and blown onto the lower surface of the glass. *Id.* at

¹ In Figure 1, the direction of travel of the glass is perpendicular to the plane of the page. Ex. 1001, 3:17–20, 3:39–41.

code (57), 2:23–26. In Figure 1, upper side blowpipes 7, upper side delivery pipe 8, upper side feed pipe 9, pressurization unit 10, and return pipe 11 handle recycled air. *Id.* at 3:14–16, 3:38–39, 3:49–50, 3:55–57. Underside blowpipe 12, underside delivery pipes 13, underside feed pipe 14, and compressor 17 handle air from outside the furnace. *Id.* at 4:5–7, 4:17–18, 4:29–30, 4:40–41.

D. Illustrative Claim

Petitioner challenges claims 1–5 (all claims) of the '911 Patent.
Pet. 10. Claim 1 is illustrative and is reproduced below.

1. [1pre] An apparatus for heating glass, the apparatus comprising

[1a] a tempering furnace comprising horizontal rolls arranged to carry the glass and to form a conveyor thereof,

[1b] an upper side return pipe for sucking air from inside the tempering furnace,

[1c] a pressurization unit for pressurizing the air sucked from inside the tempering furnace,

[1d] means for blowing the pressurized air back to an upper surface of the glass,

[1e] a compressor for pressurizing air taken from outside the furnace,

[1f] a pipe system for conveying the air pressurized by the compressor to a lower surface of the glass, and

[1g] means for heating the air pressurized by the compressor.

Ex. 1001, 6:13–23 (bracket designations added and paragraphs adjusted); *see* Pet. v (Petitioner's claim listing).

E. Asserted Grounds and Evidence

Petitioner asserts the following grounds of unpatentability:

Ground	Claims	35 U.S.C. § ²	Reference(s)
1	1, 5	103(a)	Plumat, ³ Vehmas ⁴
2	2–4	103(a)	Plumat, Vehmas, Reunamaki ⁵
3	1, 5	103(a)	Vitkala, ⁶ Vehmas
4	2–4	103(a)	Vitkala, Vehmas, Reunamaki
5	1, 5	103(a)	Vehmas '923, ⁷ Vehmas
6	2–4	103(a)	Vehmas '923, Vehmas, Reunamaki

Petitioner submits the Declaration of Renald Bartoe in support of the Petition. Ex. 1003 (the “Bartoe Declaration”).

II. ANALYSIS

A. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the '911 Patent has an effective filing date before this date, we refer to the pre-AIA version of § 103. Ex. 1001, code (62).

³ Ex. 1004, US 3,326,654, issued June 20, 1967 (“Plumat”).

⁴ Ex. 1007, WO 01/32570 A1, published May 10, 2001 (“Vehmas”).

⁵ Ex. 1008, US 2002/0036194 A1, published March 28, 2002 (“Reunamaki”).

⁶ Ex. 1005, US 2002/0134109 A1, published September 26, 2002 (“Vitkala”).

⁷ Ex. 1006, US 6,282,923 B1, issued September 4, 2001 (“Vehmas '923”).

petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when presented, objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements,” but “must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art (“POSITA”) would have had “at least a two-year technical degree in engineering or science (materials, chemistry, etc.), or at least two years of work experience in the field of materials processing and/or fabrication (such as glass or ceramics), and/or the industrial processes and machinery used for materials processing and/or fabrication.” Pet. 7 (citing Ex. 1003 ¶ 27).

For purposes of the Preliminary Response, Patent Owner does not dispute Petitioner’s definition of a POSITA. Prelim. Resp. 27.

For purposes of this Decision, we apply Petitioner’s definition of a POSITA, which is consistent with the scope and content of the ’911 Patent and the asserted prior art.

C. Claim Construction

In an *inter partes* review, we apply the same claim construction standard as would be used by a district court to construe a claim in a civil action involving the validity or infringement of a patent. 37 C.F.R. § 42.100(b). Under that standard, claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc); *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012). “The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting

Vivid Techs., Inc. v. Am. Sci. Eng’g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999)).

The parties dispute whether, in claim 1, “a pressurization unit for pressurizing the air sucked from inside the tempering furnace” is a separate structure from “a compressor for pressurizing air taken from outside the furnace.” Petitioner contends that claim 1 does not require separate structures, and Patent Owner disputes that contention. Pet. 38–39; Prelim. Resp. 48–50.

We agree with Patent Owner that separate structures are required. The strongest evidence for this requirement is the claim language itself, which plainly recites two different elements: “a pressurization unit” for inside air and “a compressor” for outside air. The separate naming of two elements in the claim strongly implies that they are not one and the same structure. *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.” (punctuation omitted) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004))).

The specification reinforces the inference that the recited “pressurization unit” and “compressor” are separate components. The specification nowhere gives an example of a single component for pressurizing both air taken from inside the furnace and air taken from outside the furnace. Instead, the specification consistently describes two separate components: (1) a pressurization unit for pressurizing air sucked from inside the tempering furnace; and (2) a compressor for pressurizing air taken from outside the furnace. Ex. 1001, code (57), 2:8–26, 3:55–4:4

(describing pressurization unit 10 of Figure 1); 4:40–51 (describing compressor 17 of Figure 1).

Although the '911 Patent describes the pressurization unit and compressor as having a common control unit (Ex. 1001, 4:61–64), there is no suggestion that the pressurization unit and compressor can themselves be embodied in the same structure. To the contrary, the '911 Patent suggests that the pressurization unit and compressor must be separate structures because they operate *at different times*. The pressurization unit blows air onto the upper side of the glass, and the compressor blows air onto the lower side of the glass. *Id.* at 3:55–57, 4:40–41. The '911 Patent teaches that, whereas air is blown onto the upper side of the glass during the entire heating cycle, air is blown onto the lower side of the glass during *only part of the heating cycle*. *Id.* at 5:8–11, (“At the beginning of a heating cycle, upper side convection blowing is set to the maximum. As the heating continues, the upper side convection is gradually decreased.”); *id.* at 6:1–6 (“The underside heating blowing . . . typically lasts for 25 to 60% of the entire heating time.”); *see also id.* at 2:27–30 (“[B]lowing on the underside . . . lasts maximally for 60% of the entire heating time.”). Figure 2 of the '911 Patent illustrates a heating cycle, including a cross-ruled rectangle representing the blowing of air onto the underside of glass during a portion of the heating cycle. *Id.* at 5:12–39, Fig. 2. These disclosures reinforce the need for a pressurization unit separate from the compressor so that air can be blown onto the upper and lower sides of the glass at different times.

Thus, the written description does not show a “clear intent” to depart from the claim’s plain language. *See Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1373 (Fed. Cir. 2014). For these reasons, we construe

claim 1 of the '911 Patent as requiring a “pressurization unit” separate from a “compressor.”

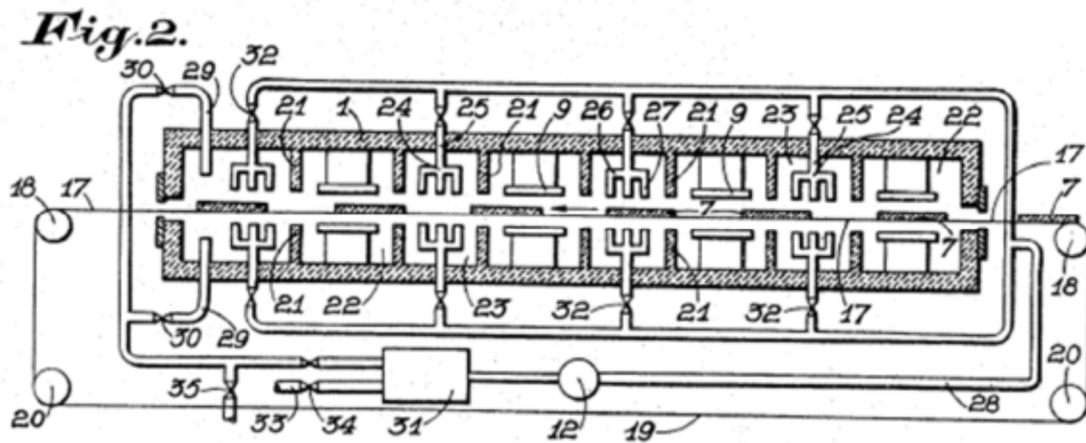
We do not need to resolve any other claim construction disputes for purposes of this Decision.

D. Petitioner's References

We provide an overview of Plumat (Ex. 1004), Vitkala (Ex. 1005), Vehmas '923 (Ex. 1006), and Vehmas (Ex. 1007). An overview of Reunamaki (Ex. 1008) is not necessary for purposes of this Decision.

1. Plumat (Ex. 1004)

Plumat is titled, “Process and arrangement for heating glass sheets with a view to subsequent thermal treatment.” Ex. 1004, code (54). Plumat teaches a process and arrangement by which glass sheets are simultaneously subjected to convection heating and radiant heating in order to bring the core of the glass to a temperature at least equal to that near the surfaces. *Id.* at 1:54–62, 2:39–54, 3:7–18. Figure 2 is reproduced below.



Plumat Figure 2 shows an apparatus for heating glass sheets 7 carried through chamber 1 on a conveyor. Ex. 1004, 3:46–50, 4:22–31. As shown in Figure 2, the chamber is divided into compartments 22 containing radiant

elements 9 and compartments 23 comprising rows of blowing jets 24. *Id.* at 4:32–37. Plumat describes structures for convection heating:

The means for causing a gaseous fluid to circulate in the chamber comprise, outside the chamber, an impeller and a heating means for this fluid, and also a mixing device for fresh added fluid when the fluid is recirculated and, inside the chamber, either nozzles causing the fluid to flow tangentially of the surfaces of the glass elements along the chamber, or rows of fluid projection jets delivering the said fluid onto the surfaces of the glass elements.

Id. at 3:26–33.

Each row of blowing jets 24 comprises a pipe 25 supplying the gaseous fluid, generally air, and a box 26 distributing the gas to the nozzles 27 directed towards the surfaces of the sheets 7. The gaseous medium is displaced by a propulsion means 12, in the present case a rotary pump, connected to the blowing nozzles 24 by a pipeline 28. The gas leaves the furnace through the conduits 29 which are equipped with valves 30 and is supplied to a temperature control device 31, from which it is drawn by the rotary pump in order to carry out a fresh circulation through the furnace. Valves 32 are disposed at each of the conduits 25 and permit the delivery of the blowing jets 24 to be individually controlled. In addition, a pipe 33 with a valve 34 enables the fresh air to be drawn into the control device 31 and to be mixed with the air circulation in a closed circuit and a valve 35 in a branch pipe on the pipeline system 29 serves for regulating the quantity of circulating air.

Id. at 4:38–54.

2. *Vitkala (Ex. 1005)*

Vitkala discloses a method and apparatus for heating glass panels in a tempering furnace. Ex. 1005, codes (54), (57). According to Vitkala, glass panels are carried on a conveyor and heated by bottom-and top-heating radiation elements as well as by bottom-and top-heating convection elements

through which convection air is supplied to the tempering furnace. *Id.* at code (57), ¶¶ 1, 2. Figure 1 is reproduced below.

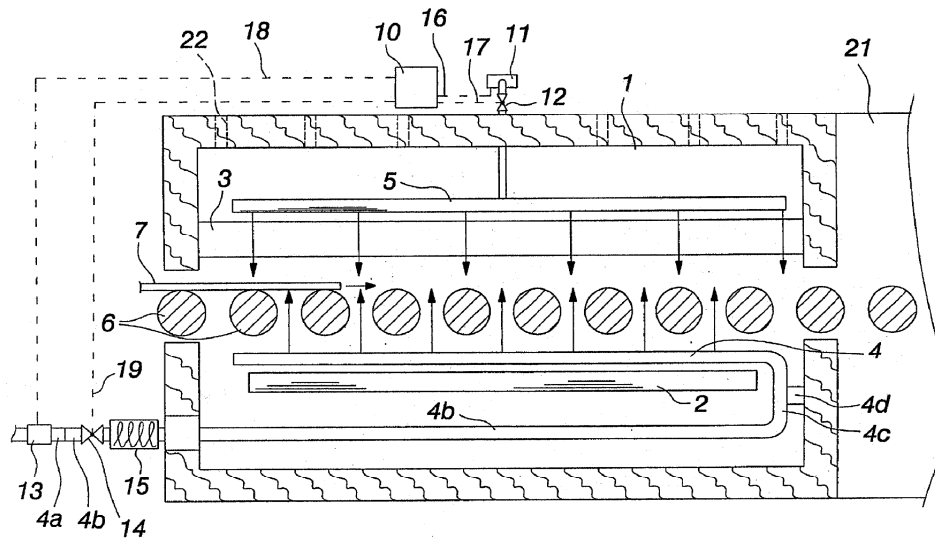


Fig. 1

Vitkala Figure 1 shows tempering furnace 1 in which glass panel 7 is heated while being conveyed on rollers 6 in an oscillating motion. Ex. 1005 ¶¶ 7, 13. The tempering furnace includes bottom-heating radiation elements 2, top-heating radiation elements 3, bottom-heating convection pipes 4 having orifices for releasing convection air onto the glass panel's bottom surface, and top-heating convection pipes 5 having orifices for releasing convection air onto the glass panel's top surface. *Id.* ¶¶ 14, 15. The pressure and flow of top-heating convection air is set by regulator 11 and valves 12, and the pressure and flow of bottom-heating convection air is set by regulator 13 and valves 14, all of which are controlled by control unit 10. *Id.* ¶¶ 19, 22, 23. Bottom-heating convection air is warmed in an elongated tubular heating duct 4b and by pre-heater 15. *Id.* ¶ 17. According to Vitkala, air blown into the furnace is exhausted, either through discharge openings 22 in the roof of the furnace or by way of counter-current heat exchangers 24 in communication with pre-heaters 15. *Id.* ¶ 16.

3. *Vehmas '923 (Ex. 1006)*

Vehmas '923 discloses a method and apparatus for heating glass sheets in a tempering furnace. Ex. 1006, codes (54), (57). The tempering furnace includes means for heating the glass sheets from above and from below; rollers for supporting, conveying, and oscillating the glass sheet in a reciprocating manner during heating; and means for cooling the lower part of the tempering furnace. *Id.* 1:14–21. According to Vehmas '923, an “essential concept” is that, “at the initial stage of the heating period, the lower part of the tempering furnace is cooled, and at the final stage of the heating period[,] the lower surfaces of the glass sheets are heated by forced convection.” *Id.* at 2:42–46. Figure 1 is reproduced below.

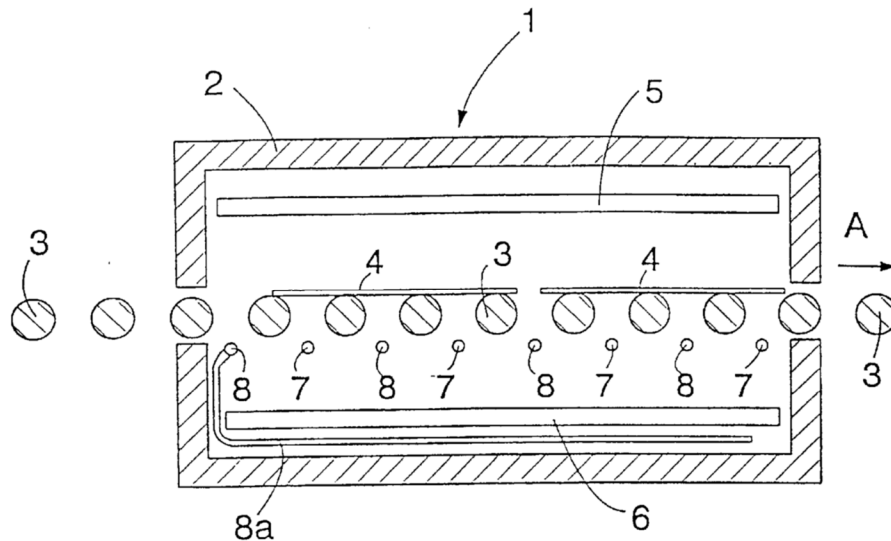


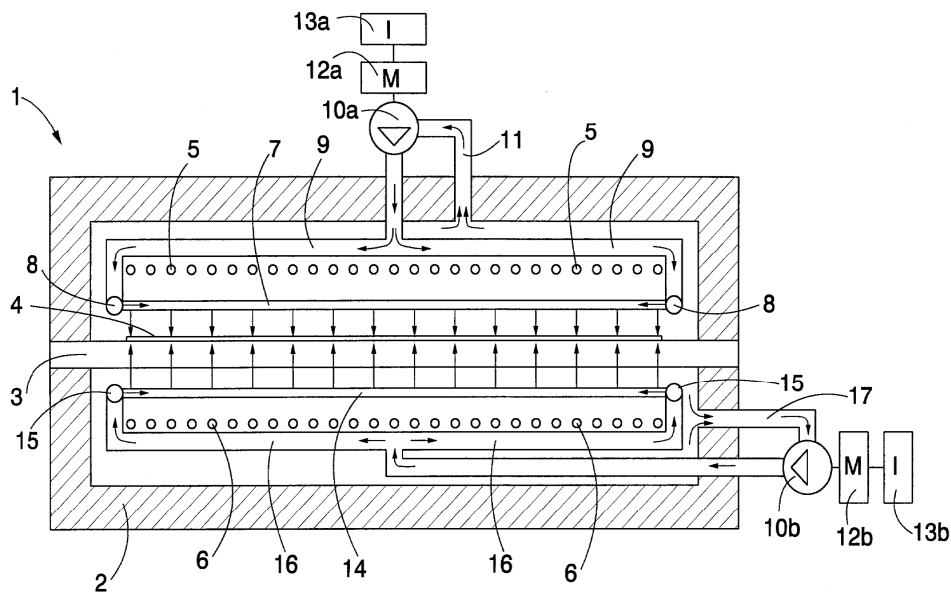
FIG. 1

Vehmas '923 Figure 1 shows tempering furnace 1 for heating glass sheets 4 which oscillate on rollers 3. Ex. 1006, 3:1–2, 3:10–13, 3:32–35. The furnace has upper resistors 5 and lower resistors 6 for heating the glass sheets from above and below, respectively. *Id.* at 3:24–26. Cooling pipes 7 and heating pipes 8 are arranged in alternating fashion between the rollers in the lower part of the furnace. *Id.* at 3:38–40, 3:63–65, Fig. 1. Air at room

temperature is blown through cooling pipes 7, and heated air is blown through heating pipe 8, but not simultaneously with the cooling air. *Id.* at 3:40–41, 3:65–4:1, 4:9–13. The air is pressurized by compressor 10, heated in heating radiator 11, and then fed to heating pipes 8 via delivery pipes 9. *Id.* at 4:43–44, 4:57–62, Fig. 3 (showing delivery pipes 9, compressor 10, and heating radiator 11). The air is also warmed by lower resistors 6 as it passes through pipes 8a. *Id.* at 4:14–17, Fig. 1.

4. *Vehmas (Ex. 1007)*

Vehmas discloses a method and apparatus for heating glass from above and below. Ex. 1007, codes (54), (57). According to Vehmas, a tempering furnace includes a conveyor for supporting the glass and “means for sucking air from the inside of the tempering furnace and for circulating the air to be blown back at least onto the upper surface of the glass.” *Id.* at 1:8–12.⁸ Figure 1 is reproduced below.



⁸ We cite Ex. 1007 using the original pagination at the top center of each page of text.

Vehmas Figure 1 shows tempering furnace 1 including rollers 3 for supporting glass 4 and oscillating it forwards and backwards during heating. Ex. 1007, 6:2–4, 6:10–13. The furnace includes upper resistors 5 for heating the glass from above and lower resistors 6 for heating the glass from below. *Id.* at 6:5–7.

As shown in Vehmas Figure 1, the furnace includes upper side blow pipes 7 having blow holes through which hot air is blown onto the upper surface of glass 4. Ex. 1007, 6:16–18, 6:29–34. Air is supplied to blow pipes 7 from upper side delivery pipes 8, upper side feed pipe 9, and pressurization unit 10a, which sucks hot air from the furnace through upper side return pipe 11. *Id.* at 6:35–36, 7:8–9, 7:13–15. Pressurization unit 10a “may be for example a compressor resistant to heat or a turbine of a turbocharger.” *Id.* at 7:17–21.

As shown in Vehmas Figure 1, the furnace includes lower side blow pipes 14 having blow holes and nozzles through which hot air is blown onto the lower surface of glass 4 without contacting the rollers. Ex. 1007, 7:27–29, 7:31–36. Air is supplied to blow pipes 14 from lower side delivery pipes 15, lower side feed pipes 16, and pressurization unit 10b, which sucks hot air from the lower part of the furnace through lower side return pipe 17. *Id.* at 8:2–3, 8:11–12, 8:16–21.

E. Petitioner’s Obviousness Challenges

1. Independent Claim 1

Petitioner contends that claim 1 is unpatentable as obvious based on (1) Plumat and Vehmas; (2) Vitkala and Vehmas; and (3) Vehmas ’923 and Vehmas. Pet. 21–43, 50–56, 60–64. Patent Owner opposes. Prelim.

Resp. 4–8, 44–73. Our analysis focuses on one of the disputed issues, motivation to combine.

Petitioner contends that a “POSITA would have been motivated to modify the glass furnaces disclosed in each of Plumat, Vitkala, or Vehmas ’923 to include the pressurized, upper-recycling convection described in Vehmas” ’570. Pet. 22. Petitioner asserts that each pair of references⁹ is “in the same field,” and a POSITA would have been motivated to improve the furnace of the base reference¹⁰ “to temper low-E glass more quickly and efficiently.” Pet. 22, 24, 26, 27, 29, 30.¹¹

Patent Owner argues that Petitioner fails to provide a sufficient rationale for modifying each of the base references to include teachings from Vehmas. Prelim. Resp. 51–53, 61–73.

For the reasons discussed below, we agree with Patent Owner that Petitioner’s rationale for combining the references does not meet the threshold for institution. The Petition does not provide a sufficient non-hindsight biased rationale for why a POSITA would have combined each pair of references in a manner that would have led to the claimed invention. *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012) (stating “be careful not to allow hindsight reconstruction of references to reach the claimed invention without any explanation as to how

⁹ By “pair of references,” we mean (1) Plumat and Vehmas ’570, (2) Vitkala and Vehmas ’570, or (3) Vehmas ’923 and Vehmas ’570. Because our analysis focuses on claim 1, we omit Reunamaki from this discussion.

¹⁰ By “base reference,” we mean Plumat, Vitkala, or Vehmas ’923.

¹¹ Petitioner explains that “low-E” glass refers to low emissivity glass, also known as selectivity glass. Pet. 20 n.4 (citing Ex. 1003 ¶ 62 n.1).

or why the references would be combined to produce the claimed invention”).

Petitioner begins its motivation-to-combine analysis with the assertion that a “POSITA would have been motivated to modify the glass furnaces disclosed in each of Plumat, Vitkala, or Vehmas ’923 to include the pressurized, upper-recycling convection described in Vehmas.” Pet. 22 (citing Ex. 1003 ¶¶ 79, 87, 95). This general introductory statement provides no reason whatsoever for why a POSITA would have modified and combined the references. In the cited testimony, Mr. Bartoe opines that a POSITA would have been motivated to combine the furnace described in each base reference with “technological improvements” disclosed in Vehmas. Ex. 1003 ¶¶ 79, 87, 95. But Mr. Bartoe neither identifies the improvements, nor provides a reason why a POSITA would have modified the furnaces of the base references.

Next, Petitioner asserts that each pair of references is “in the same field of glass tempering furnaces and techniques using convection.” Pet. 22, 26, 29 (citing Ex. 1003 ¶¶ 80, 88, 96). Mr. Bartoe elaborates by identifying similarities between each pair of references. Ex. 1003 ¶¶ 80, 88, 96. Petitioner and Mr. Bartoe conclude that “a POSITA would have had a reasonable expectation of success” in combining the references to produce tempered glass and “[i]t was well within the technical ability of a POSITA” to incorporate the improvements of Vehmas into the glass tempering furnace of each base reference. Pet. 22–23, 26, 29; Ex. 1003 ¶¶ 80, 88, 96.

Assuming Petitioner is correct that each pair of references is “in the same field of glass tempering furnaces and techniques using convection,” that fact alone is not enough to demonstrate that a POSITA would have been motivated to combine these references in the manner set forth in Petitioner’s

challenges. Our reviewing court has held that merely asserting that two references are drawn from the same field of art is “simply too conclusory” to show that a POSITA would have combined the references in the way of the claimed invention. *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x 971, 976 (Fed. Cir. 2017); *see also Microsoft Corp. v. Enfish, LLC*, 662 F. App’x 981, 990 (Fed. Cir. 2016) (determining that “the Board correctly concluded” that a petitioner “did not articulate a sufficient motivation to combine” where the only reason given was “that references were directed to the same art or same techniques.”).

At most, the similarities between each pair of references establish, as a threshold matter, that they would have been considered by a POSITA. *See K-Tec, Inc. v. Vita-Mix, Corp.*, 696 F.3d 1364, 1375 (Fed. Cir. 2012) (to qualify as prior art in an obviousness analysis, references must be analogous art—either in the same field of endeavor, or reasonably pertinent to the problem with which the inventor is involved). But the asserted similarities alone are not sufficient to show that a POSITA would have had a reason to combine the teachings in the manner described in the challenged claims. *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017) (It is not enough that a skilled artisan, once presented with two references, would have understood that they could be combined; Petitioner needs to establish a motivation to pick out the two references and combine them to arrive at the claimed invention.).

Next, Petitioner asserts that a POSITA would have been motivated to modify the glass tempering furnace of each base reference “to temper low-E glass more quickly and efficiently.” Pet. 24, 27, 30 (citing Ex. 1003 ¶¶ 82, 90, 98). As discussed below, Petitioner fails to show a sufficient logical connection between the asserted motivation and the proposed

modification(s) of the base references. Stated differently, Petitioner fails to show a sufficient reason why a POSITA would have made the modifications necessary to bridge the gap between the prior art and the claimed subject matter. We discuss each pair of references more specifically below.

Addressing Plumat and Vehmas, Petitioner asserts that a POSITA would have been motivated to combine the references “in order to improve the ability of the glass tempering furnace described in [Plumat] to temper low-E glass more quickly and efficiently.” Pet. 24 (citing Ex. 1003 ¶ 82).¹² Petitioner also asserts that a “POSITA would have combined these references and had a reasonable expectation of success in modifying the glass tempering furnace of [Plumat] to include Vehmas’ teaching of an air compressor.” Pet. 25 (citing Ex. 1003 ¶ 84). Petitioner does not, however, assert that a desire “to temper low-E glass more quickly and efficiently” would have motivated a POSITA to modify the glass tempering furnace of Plumat to include an air compressor as taught by Vehmas. The Bartoe Declaration suffers from the same deficiency. Ex. 1003 ¶¶ 82–84.

Petitioner asserts that Plumat teaches a rotary pump for pressurizing both air taken from inside the furnace and air taken from outside the furnace. Pet. 12–13, 38; Ex. 1004, 4:41–43, Fig. 2 (rotary pump 12). Petitioner does not explain how modifying Plumat’s furnace to include Vehmas’s teaching of an air compressor (Pet. 25) would have improved the furnace’s ability “to temper low-E glass more quickly and efficiently” (Pet. 24), when Plumat already teaches an air compressor. Petitioner fails to provide any persuasive argument or evidence as to how the addition of a second air compressor

¹² Here and throughout this Decision, we correct Petitioner’s misspelling of “Plumat” when quoting from the Petition and the Bartoe Declaration.

would have provided any benefit to Plumat’s furnace, let alone would have improved Plumat’s ability to temper low-E glass more quickly and efficiently. *See In re Schweickert*, 676 F. App’x 988, 995 (Fed. Cir. 2017) (reversing Board’s obviousness determination where proposed modification of prior art is “unnecessary” to prior art system that “already” performs function of proposed additional feature and “would do little more than add unwanted cost and complexity to the system”).

Furthermore, even if Petitioner and Mr. Bartoe had shown a sufficient rationale for modifying Plumat to add a second air compressor, they provide no reason for modifying Plumat to pressurize outside air separately from air drawn from inside the furnace, as recited in claim 1. Petitioner fails to explain persuasively how any such modification would have improved Plumat’s system for convection heating the upper and lower glass surfaces with a mixture of recirculated air and fresh air. Ex. 1004, 3:26–33, 4:38–54. Petitioner’s obviousness contention suffers from hindsight bias.

Petitioner’s element-by-element analysis for Ground 1 and claim 1 relies on Vehmas to teach claim element [1e], “a compressor for pressurizing air taken from outside the furnace.” Pet. 39.¹³ Petitioner asserts that “it would have been obvious to a POSITA that the fresh air drawn into the furnace as described by [Plumat] **could be** pressurized by the separate pressurization unit described in Vehmas to feed air to the lower side of the furnace.” *Id.* (citing Ex. 1003 ¶ 276) (emphasis added). Petitioner’s assertion fails to apply the proper legal standard for obviousness. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015)

¹³ Petitioner’s alternative contention that Plumat teaches the compressor of claim element [1e] is based on a claim construction that we do not adopt. Pet. 38–39; *see* section II.C. *supra*.

(“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”). Although Mr. Bartoe testifies that a POSITA “would have found it obvious to use a separate pressurization unit such [as] that described in Vehmas to feed air to the lower side of the furnace depicted in [Plumat]” (Ex. 1003 ¶ 276), he does not provide a reason why a POSITA would have modified Plumat’s furnace in this manner.

Addressing Vitkala and Vehmas, Petitioner contends that a POSITA would have been “motivated to modify the glass tempering furnace described in Vitkala to include Vehmas’s turbocharger to temper low-E glass more quickly and efficiently.” Pet. 27 (citing Ex. 1003 ¶ 90). Neither Petitioner nor Mr. Bartoe explains how modifying Vitkala’s furnace to include Vehmas’s turbocharger would have enabled the furnace “to temper low-E glass more quickly and efficiently” (Pet. 27; Ex. 1003 ¶ 90), when Vitkala already discloses the use of pressurized air for convection heating glass panels from above and below (Ex. 1005 ¶¶ 1, 2, 22, 23). Indeed, Mr. Bartoe admits that Vitkala achieves the “goals of quick, efficient, controlled heating and tempering of low-E glass.” Ex. 1003 ¶ 89.

Moreover, the addition of Vehmas’s turbocharger would not have been enough to bridge the gap between Vitkala and claim 1. Petitioner does not explain sufficiently how or why the combination of Vitkala and Vehmas would have led a POSITA to the subject matter of claim 1, which recites that air blown onto the upper surface of the glass is taken from inside the tempering furnace and air blown onto the lower surface of the glass is taken from outside the furnace. Mr. Bartoe testifies that a POSITA “would have understood that the convection air in a glass tempering furnace comes from

two possible sources: air recycled from within the furnace, or air taken from a source outside of the furnace.” Ex. 1003 ¶ 91. Vitkala and Vehmas teach that both upper and lower convection air is taken from the *same source*. Vitkala discloses using air taken from outside the furnace to heat both the upper and lower surfaces of the glass. Ex. 1005, code (57), ¶¶ 1, 2.¹⁴ On the other hand, Vehmas discloses using air taken from inside the furnace to heat the upper and lower glass surfaces. Ex. 1007, code (57), 1:2–12. Neither Petitioner nor Mr. Bartoe provides a reason why a POSITA would have wanted to modify the prior art to use a *different source* for upper convection air versus lower convection air.

Petitioner’s element-by-element analysis for Ground 3 and claim 1 relies on Vehmas to teach claim element [1b], “an upper side return pipe for sucking air from inside the tempering furnace;” claim element [1c], “a pressurization unit for pressurizing the air sucked from inside the tempering furnace;” and claim element [1e], “a compressor for pressurizing air taken from outside the furnace.” Pet. 51–54. Petitioner provides no rationale for modifying Vitkala to include “an upper side return pipe for sucking air from

¹⁴ Petitioner asserts that “Vitkala does not expressly disclose *where* the hot air is taken—i.e., whether the air comes from outside the furnace, or sucked from within the furnace.” Pet. 53. We disagree. Vitkala states that “convection air is supplied into the tempering furnace” (Ex. 1005 ¶¶ 1, 2), which we understand to mean that the air is source from outside the furnace. The Examiner had the same understanding. Ex. 1010, 132 (Vitkala teaches “a glass furnace having upper and lower air blast streams drawn from outside the furnace.”). Petitioner agrees that at least Vitkala’s bottom-heating convection air is taken from outside the furnace (Pet. 53; Ex. 1003 ¶ 323) and points to no disclosure in Vitkala of using air recycled from within the furnace.

inside the tempering furnace,” as recited in claim element [1b]. The Bartoe Declaration suffers from the same deficiency. Ex. 1003 ¶¶ 90–92.

Addressing Vehmas ’923 and Vehmas, Petitioner contends that a POSITA would have been “motivated to modify the glass tempering furnace described in Vehmas ’923 to include the turbocharger of Vehmas in order to improve the ability of the glass tempering furnace to temper low-E glass more quickly and efficiently.” Pet. 30 (citing Ex. 1003 ¶ 98). The addition of Vehmas’s turbocharger would not be enough to bridge the gap between Vehmas ’923 and claim 1. Petitioner does not explain sufficiently how or why the combination of Vehmas ’923 and Vehmas would have led a POSITA to the subject matter of claim 1. Vehmas ’923 teaches convection heating for at least the lower surface of the glass using air taken from outside the furnace. Ex. 1006, 3:63–4:17, 4:43–5:15, Figs. 1, 3; *see* Ex. 1003 ¶ 355 (“The depiction of compressor 10 in [Vehmas ’923 Figure 3] would have been understood by a [POSITA] to show air being taken from outside the furnace.”). Vehmas teaches convection heating for both the upper and lower surfaces of the glass using air taken from inside the furnace. Ex. 1007, code (57), 1:2–12. Although Petitioner directs us to Vehmas ’923’s suggestion to use a “different manner of heating, such as forced convection or a combination of different heating means” (Pet. 30–31 (quoting Ex. 1006, 3:27–29)), neither Petitioner nor Mr. Bartoe provides a reason why a POSITA would have wanted to modify the prior art to use a *different source* for upper convection air versus lower convection air.

2. *Dependent Claims 2–5*

Petitioner’s arguments and evidence for dependent claims 2–5 do not remedy the deficiencies in Petitioner’s challenge to independent claim 1, as discussed above.

3. *Conclusion*

Petitioner has not shown a reasonable likelihood of prevailing on its challenges to claims 1–5 of the ’911 Patent.

F. Discretion under 35 U.S.C. § 325(d)

In view of our determination that Petitioner does not meet the threshold for instituting review on the merits, we do not need to address the parties’ dispute about whether the Board should exercise its discretion to deny the Petition under 35 U.S.C. § 325(d). Pet. 69–71; Prelim. Resp. 27–43.

III. CONCLUSION

For the above reasons, we determine that Petitioner does not establish a reasonable likelihood that it would prevail in showing that at least one of claims 1–5 of the ’911 Patent is unpatentable on the grounds asserted in the Petition.

IV. ORDER

It is

ORDERED that the Petition is *denied*, and no trial is instituted.

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