

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NATIONAL ENVIRONMENTAL PRODUCTS LTD
and N.E.P., INC., D/B/A NEPTRONIC,
Petitioner,

v.

DRI-STEEM CORPORATION,
Patent Owner.

Case IPR2014-01503
Patent 8,641,021 B2

Before LINDA M. GAUDETTE, KRISTINA M. KALAN, and
KERRY BEGLEY, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Petitioner National Environmental Products Ltd and N.E.P., Inc., d/b/a NEPTRONIC filed a Petition (Paper 8, “Pet.”)¹ to institute an *inter partes* review of claims 1–15 of U.S. Patent No. 8,641,021 B2 (Ex. 1002, “the ’021 patent”). Patent Owner Dri-Steem Corporation filed a Preliminary Response (Paper 13, “Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314, which provides that *inter partes* review may not be instituted unless the information presented in the petition and any preliminary response shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a). We decline to institute an *inter partes* review as discussed below.

II. BACKGROUND

A. Related Matters

The parties indicate that the ’021 patent is the subject of the following district court proceeding: *Dri-Steem Corp. v. NEP, Inc., d/b/a NEPTRONIC, and National Environmental Products Ltd.*, Case No. 1:14-CV-194-CL (D. Or.). Pet. 4; Paper 4, 2.

B. The ’021 Patent (Ex. 1002)

The ’021 patent, titled “Heat Exchanger for Removal of Condensate from a Steam Dispersion System,” issued on February 4, 2014. The ’021 patent describes a steam dispersion apparatus that includes a steam chamber communicating in an open-loop arrangement with a first steam source for supplying steam to the steam chamber. Ex. 1002, Abstract. The steam chamber includes a steam dispersion location at which steam exits. *Id.*

¹ “First Amended Petition for Inter Partes Review of U.S. Patent 8,641,021,” filed October 14, 2014.

The apparatus further includes a heat exchanger communicating in a closed-loop arrangement with a second steam source, and in fluid communication with the steam chamber so as to contact condensate from the steam chamber.

Id. An embodiment of the apparatus is depicted below in Figure 1:

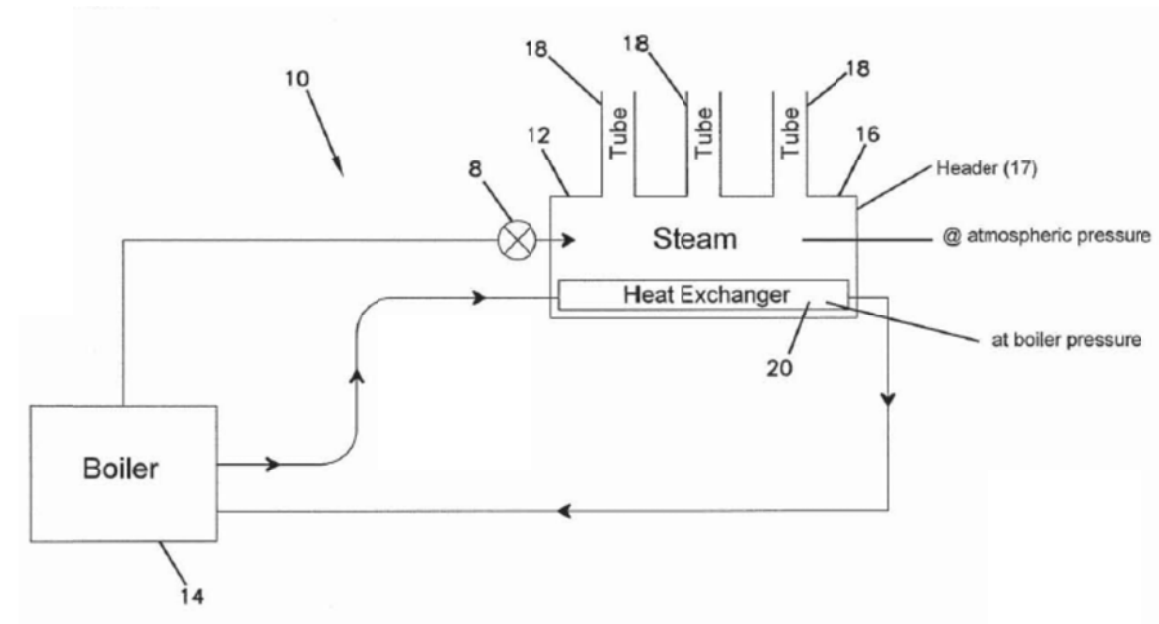


Figure 1 is a diagrammatic view of a steam dispersion system of the subject patent. *Id.* at 3:34–35.

Steam source 14 supplies steam to steam dispersion apparatus 12 through modulating valve 8, which reduces the steam pressure to about atmospheric pressure before it enters manifold 16. *Id.* at 4:5–10. Steam source 14 also supplies steam to heat exchanger 20, located within header 17, through a continuous loop with steam source 14. *Id.* at 4:16–20. In one embodiment, condensate that forms in steam dispersion tubes 18 drips down via gravity, “contacts the exterior surface of the piping 24 of the heat exchanger 20” located at the bottom of header 17, and is vaporized back to humidification steam. *Id.* at 6:19–28.

C. Illustrative Claim

Claim 1 of the '021 patent is reproduced below:

1. A steam dispersion system comprising:
a manifold including a header and a plurality of steam dispersion tubes, the header having a header interior, the steam dispersion tubes being mounted to a top side of the header and being oriented to project upwardly from the top side of the header, the steam dispersion tubes having tube interiors in fluid communication with the header interior, the steam dispersion tubes defining steam dispersion openings in fluid communication with the tube interiors, wherein the steam dispersion system is configured such that humidification steam flows through the header interior to the tube interiors and exits the manifold through the steam dispersion openings; and
a heat exchanger positioned within the header interior, the heat exchanger including a heat exchanger interior and a heat exchanger exterior, the steam dispersion system being configured to operate with the heat exchanger interior at a higher pressure than the header interior, and the steam dispersion system being configured such that humidification steam that condenses within an interior of the manifold is re-evaporated into humidification steam within the header interior by heat transferred outwardly from the heat exchanger.

Ex. 1002, 9:39–10:4.

D. The Prior Art

Petitioner relies on the following prior art:

1. U.S. Patent No. 6,488,219 B1, issued December 3, 2002 (“Herr”) (Ex. 1003); and
2. U.S. Patent No. 5,372,753, issued December 13, 1994 (“Morton”) (Ex. 1015).

E. The Asserted Grounds

Petitioner challenges claims 1–15 of the '021 patent as follows:

Reference(s)	Basis	Claims Challenged
Herr	§ 102(b)	1–15
Herr	§ 103(a)	1–15
Morton and Herr	§ 103(a)	1–15

F. Claim Interpretation

The Board interprets claims in an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also In re Cuozzo Speed Techs., LLC*, 778 F.3d 1271, 1281 (Fed. Cir. 2015) (“We conclude that Congress implicitly adopted the broadest reasonable interpretation standard in enacting the AIA.”). Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning in view of the specification, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner asks us to construe the claim terms “steam dispersion system,” “pressures higher than atmospheric,” and “steam generation arrangement.” Pet. 9. Patent Owner contends that Petitioner’s proposed constructions should be rejected, and Patent Owner’s positions should be adopted. Prelim. Resp. 11. We determine that no express claim construction is required for purposes of this decision.

III. ANALYSIS

We turn now to Petitioner's asserted grounds of unpatentability and Patent Owner's arguments in the Preliminary Response to determine whether Petitioner has met the threshold standard of 35 U.S.C. § 314(a).

A. Asserted Grounds Based on Herr

Petitioner challenges claims 1–15 as anticipated under 35 U.S.C. § 102(b) by Herr. Petitioner also challenges claims 1–15 as obvious under 35 U.S.C. § 103(a) over Herr. Pet. 11–29. To support these assertions, Petitioner relies on the Declaration of Reinhold Kittler (Ex. 1025, “Kittler Declaration”).

Petitioner argues invalidity under Sections 102 and 103 in light of Herr concurrently. Petitioner argues that Herr discloses “all the features and structures in independent claim 1,” as well as dependent claims 2–15. Pet. 11, 20–29. In the alternative, Petitioner argues, if “Herr's explicitly described features and functions are not found in the Claims under Review, then a person of ordinary skill in the art (a ‘POSITA’) would find the Challenged Claims not patentable as being obvious in light of Herr and a POSITA[’s] common sense, knowledge and skill.” *Id.* at 11.

Herr discloses a humidifier for providing moisture to an airstream within an airduct. Ex. 1003, Abstract. Figure 1 of Herr is reproduced below:

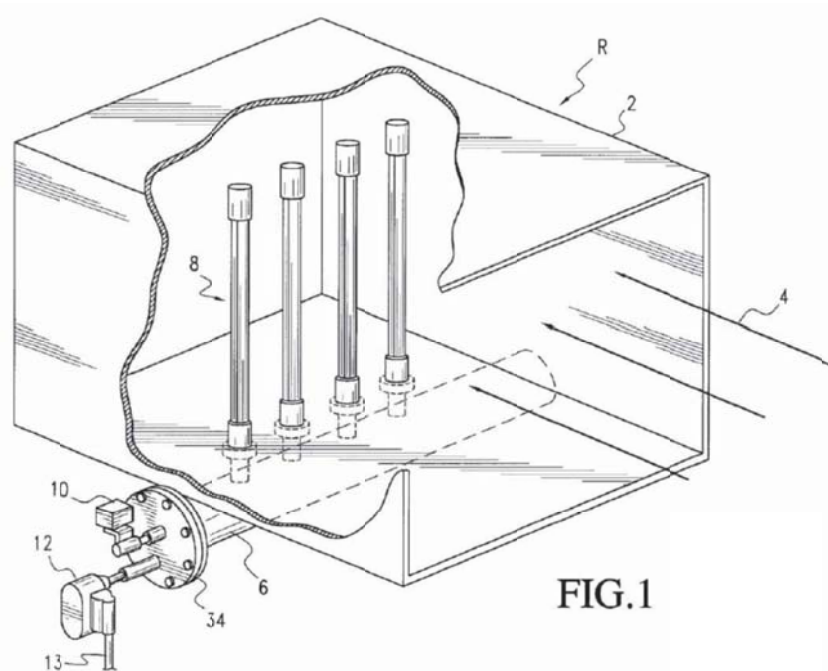


Figure 1 of Herr shows a schematic perspective view of a steam humidifier installed in an airduct with portions shown in cross-section and broken out. *Id.* at 2:44–46. Figures 10 and 11A of Herr are reproduced below:

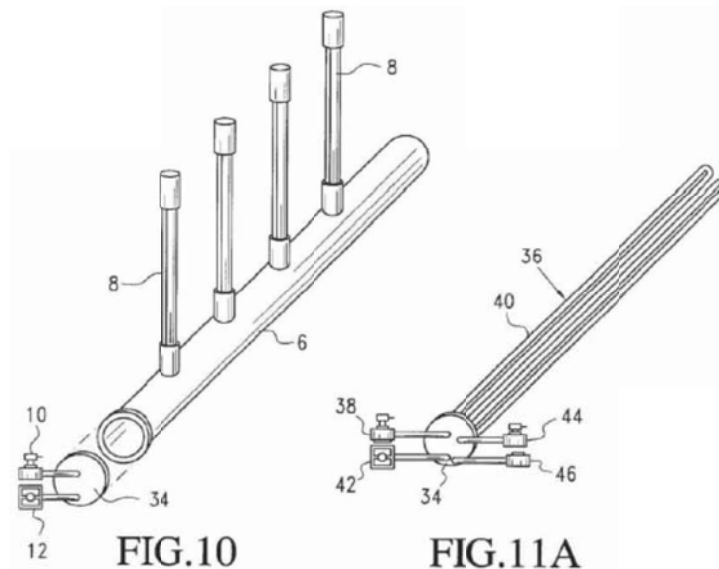


Figure 10 is a schematic perspective view of the Herr humidifier, showing a feed cap removed from the base manifold; Figure 11A is a schematic perspective view of a steam heat-exchanger for placement within the base

manifold for generation of steam. Ex. 1003, 3:1–6. Herr’s Figures 1, 4, and 10 disclose a “direct steam” embodiment, in which “steam, generated remotely in a boiler, is directly fed into the base manifold 6 and the several distributor pipes 8.” *Id.* at 4:49–52. Herr’s Figure 11A discloses a “steam-to-steam heat exchanger” embodiment, wherein water inlet valve 44 fills base manifold 6 to an operating level and heat from coils 40 boils the water to create steam. *Id.* at 4:53–64. The various means for providing steam for humidification in Herr can be retrofit to a “different source of steam” to meet the user’s changing needs. *Id.* at 5:11–15.

i. Section 102

In support of its argument that Herr anticipates the challenged claims, Petitioner alleges that Herr discloses a steam humidifier in Figure 1 and a steam-fed heat exchanger for placement within the base manifold for generation of steam in Fig. 11A. Pet. 12, 15. According to Petitioner, “Herr’s explicit disclosure is a water-filled manifold wherein the steam-fed heat exchanger boils the manifold water for the S-D,” but “Herr’s discussion of a retro-fit operation inherently gives a POSITA knowledge of a steam-fed heat exchanger disposed in a steam-fed manifold.” *Id.* at 16. Petitioner argues that this “retro-fit of a steam-fed heat exchanger into a steam-fed manifold fits the teachings of Herr together like pieces of a puzzle and a POSITA would pursue this known option within his or her grasp.” *Id.* at 17.

Patent Owner argues that Herr cannot anticipate as it does not disclose “(A) a heat exchanger within a steam-fed header and (B) the heat exchanger at a higher pressure than the header interior.” Prelim. Resp. 27. Patent Owner also takes issue with Petitioner’s inherency arguments. *Id.* at 28–29.

On the present record, Petitioner's analysis is insufficient to establish a reasonable likelihood that it would prevail in showing at least one of the challenged claims is anticipated by Herr. To anticipate, the prior art reference must disclose all elements of the claim within the four corners of the reference, and must also disclose those elements arranged as in the claim. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Moreover, inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). Petitioner has not demonstrated persuasively that Herr discloses all of the elements of the disputed claims, arranged as in the claim. Furthermore, Petitioner has not demonstrated persuasively that every claim element not expressly disclosed by Herr is inherently present in Herr.

With respect to independent claim 1, Petitioner has not made a sufficient showing to support its contention that Herr describes, either expressly or inherently, a heat exchanger within a steam-fed header. Petitioner argues that, because Figure 10 is adjacent Figure 11A in Herr, persons of ordinary skill in the art "would know that the combination [of] a steam-fed heat exchanger disposed in an interior of a steam-fed manifold is an inherent aspect of the Herr '219 disclosure, especially in light of (i) the reference to retro-fitting at 5/13-23 and (ii) the adjacency of Figs. 10 and 11A." Pet. 16. Therefore, Petitioner concludes that Herr "discloses a steam-fed heat exchanger in the header-manifold." *Id.* Herr, however, does not provide an express disclosure of a heat exchanger in a steam-fed header-manifold. Herr's disclosure indicates that the different steam sources are

alternative embodiments, rather than embodiments that can be used simultaneously:

The various means for providing steam for humidification makes the humidifier R advantageously flexible so that the user can easily retrofit the humidifier to a different source of steam to meet his changing needs. For example, the user may start with a direct steam embodiment, where steam is generated remotely from the apparatus. If the boiler treatment chemicals later become a problem, the user can change to a steam or electric heat exchanger or to a gas fired gear exchanger simply by removing the feed bell 34 and inserting within the base manifold 6 one of the heat exchangers disclosed herein.

Ex. 1003, 5:12–22. Petitioner also does not explain sufficiently why or how a steam-fed heat exchanger in the steam-fed header-manifold is inherently disclosed in Herr.

Similarly, Petitioner does not demonstrate that the heat exchanger in the Herr system is necessarily at a higher pressure than the header interior. Petitioner argues that persons of ordinary skill in the art “know that the header-manifold operates near atmospheric pressure because in Herr the S-D tubes extend into the airduct and release steam.” Pet. 18. Petitioner continues: “Steam-fed heat exchangers must be coupled to a source of steam. POSITAs know the supply of steam may be pressurized.” *Id.* Herr, however, allows for the header-manifold to operate at a pressure sufficient to flex the light gauge stainless steel distributor pipes, causing the pipe’s slots to open or close with the steam flow. Ex. 1003, 4:12–15. Herr does not appear to discuss the pressure within the heat exchanger. Petitioner does not explain, therefore, how Herr discloses a heat exchanger at a higher pressure than the header interior, either expressly or inherently.

Accordingly, we are unpersuaded that Petitioner has demonstrated a reasonable likelihood of prevailing on its assertion that independent claim 1, or its dependent claims, are anticipated under 35 U.S.C. § 102(b) by Herr. Thus, we decline to institute *inter partes* review on this ground.

ii. Section 103

Petitioner presents its Section 103 arguments concurrently with, and in the alternative to, its Section 102 arguments based on Herr. Patent Owner argues, with respect to claim 1, that Herr: (1) fails to render obvious a steam dispersion system with a heat exchanger within a steam-fed header, and (2) fails to render obvious a heat exchanger operating at a higher pressure than the header. Prelim. Resp. 40–45.

Petitioner argues that a person of ordinary skill in the art would combine the heat exchanger and the steam-fed header-manifold of Herr. Specifically, Petitioner argues: “The retro-fit of a steam-fed heat exchanger into a steam-fed manifold fits the teachings of Herr together like pieces of a puzzle and a POSITA would pursue this known option within his or her grasp.” Pet. 17. Petitioner also argues that “when two figures for different embodiments are adjacent each other, the claimed invention is obvious based on a single prior art patent because the combination did not require ‘a leap of inventiveness.’” *Id.* (citing *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991 (Fed. Cir. 2009)). Patent Owner, however, argues that Herr’s “retrofit” involves eliminating the direct steam capability of the humidifier and replacing it with a heat exchanger in a water-filled manifold to boil water. Prelim. Resp. 41.

We are not persuaded that Petitioner’s reliance on *Boston Scientific* overcomes its lack of explanation for how or why one of ordinary skill in the

art would have combined the two disparate embodiments of Herr. As discussed *supra*, Herr's disclosure indicates that the different steam sources are alternative embodiments, rather than embodiments that can be used simultaneously. Ex. 1003, 5:12–22. It is not sufficient to demonstrate that each of the components in a challenged claim is known in the prior art. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art”). The Petitioner also must explain how a person of ordinary skill in the art would have combined the elements disclosed in Herr, and why such a person would have been motivated to do so. See *In re Chaganti*, 554 F. App'x 917, 922 (Fed. Cir. 2014) (“It is not enough to say that . . . to do so would ‘have been obvious to one of ordinary skill.’ Such circular reasoning is not sufficient—more is needed to sustain an obviousness rejection.”); see also *Boston Scientific*, 554 F.3d at 991 (explaining the motivation to add the coating of the Figure 3B embodiment to the Figure 4 embodiment was the expectation of achieving the same benefit realized by use of the coating in the Figure 3B embodiment). We are not persuaded that Petitioner has provided an articulated reasoning with some rational underpinning to justify the legal conclusion of obviousness. See *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Regarding the pressure of the interior of the heat exchanger, Petitioner argues that persons of ordinary skill in the art “know that the header-manifold operates near atmospheric pressure because in Herr the S-D tubes extend into the airduct and release steam” and also that “[s]team-fed heat exchangers must be coupled to a source of steam. POSITAs know the supply of steam

may be pressurized.” Pet. 18. Petitioner concludes that persons of ordinary skill in the art “would know to operate the Herr heat exchanger at a higher pressure than the outside of the exchanger (outside the exchanger but inside the header-manifold) which is near atmospheric pressure.” *Id.* at 19.

Petitioner, however, provides no specific reasoning or evidence to support these assertions. Although Petitioner cites to additional references (Ex. 1008, Ex. 1009) as disclosing steam supply pressures, Petitioner provides no reasoning as to how or why a person of ordinary skill in the art would combine the teachings of those references with Herr.

Concerning independent claim 1, and its dependent claims 2–15, we determine that the supporting evidence fails to demonstrate a reasonable likelihood that Petitioner would prevail in its showing of obviousness over Herr, including its assertions regarding the understanding of a person of ordinary skill in the art. As a result, we are unpersuaded that Petitioner has demonstrated a reasonable likelihood of prevailing on its assertion that claims 1–15 would have been obvious under 35 U.S.C. § 103(a) over Herr.

B. Asserted Ground Based on Morton and Herr

Petitioner challenges claims 1–15 as unpatentable over Morton and Herr under 35 U.S.C. § 103(a). Pet. 29–41. Morton is directed to a rapid absorption steam humidifying system, an embodiment of which is shown below in Figure 1:

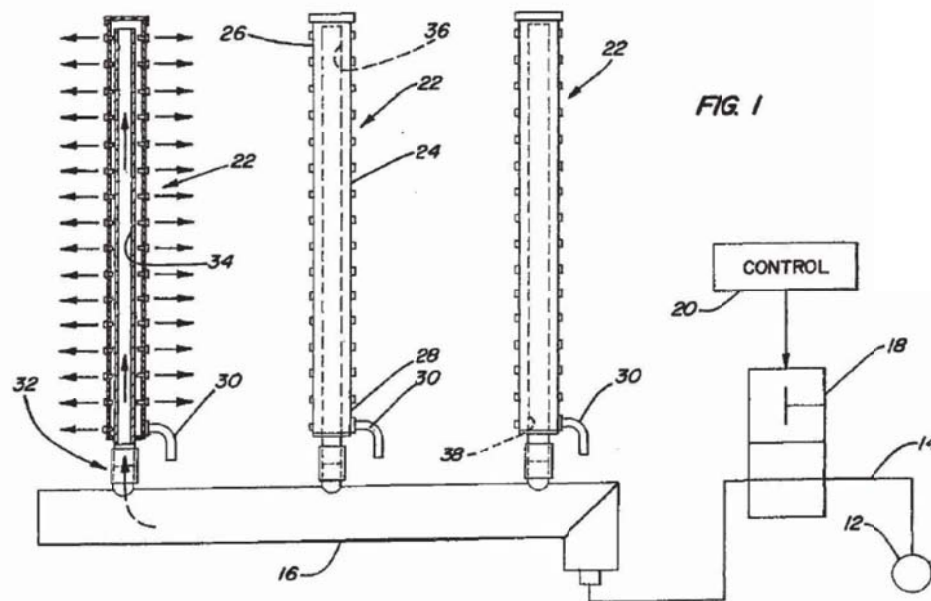


Figure 1 is a schematic depiction of the humidification system of Morton. Ex. 1015, 3:13–15. The humidification system of Morton includes steam source 12 feeding steam to supply header 16 via passage 14. *Id.* at 3:34–35. A plurality of dispersion assemblies 22, including substantially vertical steam dispersion tubes 24, are mounted above supply header 16. *Id.* at 3:45–54. Drain tube 30 communicates with bottom end 28 of each steam dispersion tube 24, for draining away liquid which may condense on inner wall 42 of steam dispersion tube 24, and for connecting to a main drain line for disposing or recovering the condensed liquid. *Id.* at 55–61.

Petitioner relies on Morton to disclose the steam dispersion apparatus of claim 1, and relies on Herr to disclose the heat exchanger of claim 1. Pet. 29–34. Petitioner argues that a person of ordinary skill in the art would combine the steam-fed heat exchanger of Herr with the steam-fed manifold of Morton because both prior art references have the same purpose as the '021 patent, i.e., the removal or vaporization of condensate in the '021 patent. *Id.* at 31. Specifically, Petitioner asserts that Morton's purpose is to drain

condensate from the S-D apparatus, and Herr's purpose is to reduce condensate by flashing or re-evaporating condensate into steam. *Id.* Petitioner also states that it "would have been obvious to a POSITA to combine the steam-fed manifold of Morton with the steam-fed heat exchanger of Herr because doing so is nothing more than combining known techniques to yield a predictable result." *Id.*

Patent Owner argues that Morton and Herr fail to render any of the challenged claims obvious. Prelim. Resp. 50. Specifically, with respect to claim 1, Patent Owner argues: (1) that Petitioner fails to provide articulated reasoning with rational underpinning to combine Morton and Herr; and (2) that Morton and Herr do not disclose or render obvious a steam dispersion system with a heat exchanger and configured such that humidification steam flows through the header, referring back to its arguments for the asserted grounds based on Herr alone. *Id.* at 50–54.

As discussed *supra*, Herr discloses a heat exchanger, and Petitioner's obviousness arguments are directed to the combination of Morton's direct steam embodiment with Herr's heat exchanger. With respect to Petitioner's articulated reasoning for combining the references, however, we do not accept as sufficient, on the current record, Petitioner's assertion that one of ordinary skill in the art would have combined the references "because doing so is nothing more than combining known techniques to yield a predictable result." Pet. 31. Nor are we persuaded that a person of ordinary skill in the art would have combined these references because both "have the same purpose as the '021 Patent." *Id.* Petitioner's assertion that the references are directed to the same purpose is insufficient to show that a person of ordinary skill in the art would have been motivated and able to combine the references

to reach the claimed invention. Although Petitioner cites to the Kittler Declaration, Ex. 1025 ¶¶ 21–23, 27–32, 37–41, 43, for support for its reasoning, Mr. Kittler fails to provide any persuasive additional explanation or evidence demonstrating it would have been obvious to combine the teachings of Morton and Herr.

Based on the record before us, Petitioner has not demonstrated a reasonable likelihood that it will prevail on its assertion that claims 1–15 would have been obvious over Morton and Herr.

C. Conclusion

For the foregoing reasons, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to its challenge of claims 1–15 of the '021 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* as to all challenged claims of the '021 patent; and

FURTHER ORDERED that no *inter partes* review is instituted.

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