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Paper 15
Date: April 20, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DYNATEMP INTERNATIONAL, INC. and FLUOROFUSION SPECIALTY CHEMICALS, INC.,
Petitioner,

v.

R 421A LLC d/b/a CHOICE REFRIGERANTS,
Patent Owner.

IPR2020-01660
Patent 9,982,179 B2

Before GRACE KARAFFA OBERMANN, MICHELLE N. ANKENBRAND, and MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

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

I. INTRODUCTION

Dynatemp International, Inc. and Fluorofusion Specialty Chemicals, Inc. (collectively, "Petitioner") filed a Petition (Paper 4, "Pet.") requesting the Board institute an *inter partes* review of claims 1–37 of U.S. Patent No. 9,982,179 B2 (Ex. 1001, "the '179 patent"). Pet. 1. R 421A LLC d/b/a Choice Refrigerants ("Patent Owner") filed a Preliminary Response (Paper 9, "Prelim. Resp."). Prelim. Resp. 1. On our authorization, (Paper 13, "the March 11, 2021 Order"), Petitioner filed a Reply to the Preliminary Response (Paper 12, "Reply") and Patent Owner filed a Sur-Reply (Paper 14, "Sur-Reply").

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition 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); *see also* 37 C.F.R § 42.4(a) (2020) ("The Board institutes the trial on behalf of the Director.").

Having considered the Petition, Preliminary Response, Reply, and Sur-Reply, and evidence of record, for the reasons below, we exercise our discretion to deny institution of an *inter partes* review of the '179 patent under 35 U.S.C. § 325(d).

II. BACKGROUND

A. Real-Parties-In-Interest

Petitioner identifies Dynatemp International, Inc. and Fluorofusion Specialty Chemicals, Inc., as the real parties-in-interest. Pet. 1. Patent Owner

identifies R 421A LLC and RMS of Georgia, LLC, as the real parties-in-interest. Paper 6, 2.

B. Related Matters

The parties identify the following pending district court actions involving the '179 patent as related matters: *R 421 LLC d/b/a Choice Refrigerants v. Dynatemp International, Inc.*, Civil Action No. 5:2020-cv-00147-FL (E.D.N.C.)[1] and *Dynatemp International, Inc. v. RMS of Georgia, LLC d/b/a Choice Refrigerants*, Civil Action No. 5:2020-cv-00142-FL (E.D.N.C.) (collectively, "the District Court Action"). Pet. 2; Paper 6, 1. Petitioner has also filed petitions challenging claims of other patents asserted in the District Court Action in IPR2021-00199 and PGR2021-00008. Pet. 2; Paper 6, 3.

C. The '179 Patent (Ex. 1001)

The '179 patent is titled "Refrigerant with Lubricating Oil for Replacement of R22 Refrigerant " and issued May 29, 2018,[2] with claims 1–37. Ex. 1001, codes (54), (45), 10:2–14:21. The '179 patent is directed to an apparatus and method wherein potential ozone layer-damaging chlorodifluoromethane refrigerant (R-22) is substituted with a mix of less environmentally damaging refrigerants pentafluoroethane (R-125) and tetrafluoroethane (R-134a) in chlorodifluoromethane-based air-cooling systems. *Id.* at code (57), 1:18–22, 3:66–4:1.

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[1] Patent Owner indicates that Civil Action No. 5:2020-cv-00147-FL (E.D.N.C.) was administratively closed and consolidated with Civil Action No. 5:2020-cv-00142-FL on Oct. 23, 2020. Paper 6, 1.
[2] The '179 patent claims priority to a provisional application filed on September 8, 2003. Ex. 1001, code (60), 1:8–13.

The ’179 patent discloses that the pentafluoroethane and tetrafluoroethane are mixed in a defined ratio such that the temperature-pressure relationship of the mixture approximates that of R-22, and the mixture is compatible with and can be used as a replacement for R-22. *Id.* at 1:22–27, 4:2–10, 4:19–25, code (57).

The ’179 patent further discloses that the pentafluoroethane and tetrafluoroethane refrigerant is mixed with a soluble lubricating oil to provide lubrication to the refrigerating apparatus, and that the lubricant is soluble in and compatible with both the pentafluoroethane and tetrafluoroethane refrigerant mixture and R-22. *Id.* at 1:30–36, code (57). The ’179 patent explains that because the lubricant is compatible with both the pentafluoroethane and tetrafluoroethane refrigerant mixture and R-22, it may be included with the pentafluoroethane and tetrafluoroethane refrigerant mixture and the mixture utilized in the refrigeration systems without deleterious effect upon moving parts of the refrigeration apparatus that require lubrication from the refrigerant. *Id.* at 4:10–18.

In an exemplary embodiment, the ’179 patent describes a refrigerant composition having a ratio of about 42 weight percent pentafluoroethane to about 58 weight percent 1,1,1,2-tetrafluoroethane and including from about 0 to about 20 weight percent of a lubricating oil that is soluble in R-22, pentafluoroethane, and 1,1,1,2-tetrafluoroethane. *Id.* at 4:34–43.

D. Illustrative Claim

Petitioner challenges claims 1–37 of the '179 patent, of which claims 1, 8, 15, 21, 26, and 31 are independent. Pet. 1, 4–5, 17. Claim 1 is illustrative of the claimed subject matter and recites:

> 1. In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32° F. or a bubble point at about -41.5° F. at about one standard atmosphere of pressure,
>
> wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41 % to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and
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> wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof, and the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

Ex. 1001, 10:2–29.

E. Asserted Evidence

Petitioner relies on the following references in the asserted grounds of unpatentability:

Reference	Exhibit No.[3]
US 6,207,071 B1 (issued Mar. 27, 2001) ("Takigawa")	1006
US 6,606,868 B1 (issued Aug. 19, 2003) ("Powell")	1007
US 6,863,840 B2 (issued Mar. 8, 2005) ("Goble")	1008
US 5,688,432 (issued Nov. 18, 1997) ("Pearson")	1009
US 2003/0062508 A1 (published Apr. 3, 2003) ("Singh")	1011
Federal Register, Vol. 71, No. 188 / Thursday, Sept. 28, 2006 / Rules and Regulations, 71 FR 56884–56893 (2006) ("Federal Register")	1018
US 6,655,160 B2 (published Dec. 2, 2003) ("Roberts")	1019
Lemmon et al., *Equations of State for Mixtures of R-32, R-125, R-134a, R-143a, and R-152a*, MS J. Phys. Chem. Ref. Data (Aug. 30, 2002) ("Lemmon")	1020

Pet. 4–5, 17. Petitioner also relies on the declaration testimony of Dr. Eckhard Groll (Ex. 1013) in support of its contentions. *Id.* at 1, 21.

F. Asserted Grounds of Unpatentability

Petitioner contends the challenged claims are unpatentable based on the following grounds:[4]

[3] For citations to Exhibits 1003, 1004, 1005, 1018, and 1020, we refer and cite to the page numbers added to the documents in the lower right side of each page.

[4] Regarding Ground 1 of the Petition (Pet. 4, 30), for purposes of this Decision, we refer to Petitioner's challenge to claims 1–37 under § 103 as obvious over Goble, Singh, and Takigawa as asserted "Ground 1A" and the challenge to claims 21–37 under § 102 as anticipated by Goble as asserted "Ground 1B."

Grounds	Claims Challenged	35 U.S.C. §[5]	References/Basis
1A	1–37	103	Goble, Singh, Takigawa
1B	21–37	102	Goble
2	1–37	103	Singh, Goble, Takigawa
3	1–37	103	Powell, Goble, Singh, Takigawa
4	1–37	103	Pearson, Goble, Singh, Takigawa
5	1–37	103	Federal Register, Goble, Singh, Takigawa
6	1–37	103	Roberts, Goble, Singh, Takigawa
7	1–37	103	Lemmon, Goble, Singh, Takigawa

Pet. 4–5.

III. ANALYSIS

A. Discretion Under 35 U.S.C. § 325(d)

Section 325(d) provides that the Director may elect not to institute a proceeding if the challenge to the patent is based on matters previously presented to the Office. *Advanced Bionics, LLC v. Med-El*

[5] The Leahy-Smith America Invents Act (AIA) includes revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112–29, §§ 3(b), 3(c), 3(n)(1), 125 Stat. 284, 287, 293 (2011). Because the application from which the '179 patent issued was filed before March 16, 2013, we apply the pre-AIA versions of §§ 102, 103 to this Decision. Prelim. Resp. 5.

Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 7 (PTAB Feb. 13, 2020) (precedential) ("*Advanced Bionics*").[6] In evaluating matters under Section 325(d), the Board uses the following two-part framework: (1) first determining whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Id.* at 8.

Advanced Bionics further provides that:

> Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent. The proceedings in which the art was previously presented include, for example: examination of the underlying patent application, reexamination of the challenged patent, a reissue application for the challenged patent, and AIA post-grant proceedings involving the challenged patent.

Id. at 7–8.

We consider several non-exclusive factors as set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) ("*Becton, Dickinson*"), which "provide useful insight into how to apply the

[6] The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a); *Advanced Bionics*, Paper 6 at 7 n.7.

framework" under Section 325(d). *Advanced Bionics*, Paper 6 at 9. These non-exclusive factors include:

> (a) the similarities and material differences between the asserted art and the prior art involved during examination;
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> (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
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> (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
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> (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
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> (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
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> (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, Paper 8 at 17–18 (formatting added). "If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office." *Advanced Bionics*, Paper 6 at 10.

Patent Owner argues that we should exercise our discretion under Section 325(d) to deny institution because the Petition relies on the same or substantially the same art that was previously presented to the Office and Petitioner has not demonstrated any material error by the Office during prosecution. Prelim. Resp. 1–2, 40–45. For example, Patent Owner contends that the Goble, Singh, Powell, and Pearson references were all previously presented to and considered by the Office. *Id.* at 1, 18, 21, 42. Patent Owner

further contends Takigawa was previously presented to and considered by the Office, including, for example, during prosecution of the '179 patent, where the Examiner rejected the claims under Section 103 as obvious over Takigawa. *Id.* at 39.

Patent Owner also contends Petitioner does not identify or sufficiently explain in the Petition how the Office materially erred. Prelim. Resp. 1–2 (arguing Petitioner does "not present any new evidence or reasons to show how the Office erred in the review of those references"), 44 (arguing Petitioner has "made no attempt in the Petition to explain how the Office erred in consideration of Singh, Powell, Goble, and Pearson"), 45 (arguing Petitioner has not "pointed out how [the Examiner] erred in evaluating the references").

We note Petitioner does not specifically argue or address whether the asserted art is the same or substantially the same art that previously was presented to the Office. *See generally* Pet. Although Petitioner acknowledges that Takigawa, which is a reference Petitioner asserts in all but one of the grounds of unpatentability, was applied by the Examiner during prosecution of the '179 patent (Pet. 7 (admitting "[i]n the prosecution of the '179 Patent, a non-final rejection mailed March 25, 2013, rejected all the claims as obvious under 35 U.S.C. § 103 over Takigawa" and "the Takigawa reference had been applied in both the ['179 patent's] parent and grandparent applications")), Petitioner does not explicitly state or meaningfully discuss whether any of the other asserted references were previously presented to or considered by the Office.

Rather, Petitioner argues the Examiner erred in a manner material to patentability by withdrawing the Section 103 rejection of the claims as

obvious over Takigawa based on the evidence of unexpected results submitted during prosecution. *See* Pet. 24–28. In particular, Petitioner contends that the evidence of unexpected results the applicant submitted and the Examiner considered during prosecution of the '179 patent, was insufficient to rebut the Examiner's prima facie case of obviousness based on Takigawa. *Id.* 25 (arguing "the results presented in the declaration fail to demonstrate an unexpected result"), 28 (arguing "the applicant of the '179 Patent failed to rebut a finding of *prima facie* obviousness").

Having considered the parties' respective arguments, the evidence of record, and the facts and circumstances of this case, for the reasons below, we exercise our discretion to deny institution of trial under Section 325(d). Before turning to the *Advanced Bionics* two-part framework, we briefly discuss the asserted references and the relevant prosecution history of the '179 patent, including the '179 patent's parent and grandparent applications.

1. Asserted References

a. Takigawa

Takigawa is a U.S. Patent titled "Fluid Composition Comprising HFC Refrigerant and Alkylbenzene-Based Refrigerator Oil" and issued March 27, 2001. Ex. 1006, codes (45), (54). Takigawa is directed to a fluid composition comprising an alkylbenzene refrigerator oil and a refrigerant containing 1,1,1,2-tetrafluoroethane and/or pentafluoroethane as a replacement for ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon refrigerants. *Id.* at 1:21–27, 1:11–19, 2:21–34.

Petitioner relies on Takigawa for disclosing a refrigerant composition containing 1,1,1,2-tetrafluoroethane and/or pentafluoroethane, with 1,1,1,2-tetrafluoroethane present in an amount of 40 weight percent or greater and

pentafluoroethane present in an amount of 40 weight percent or greater. Pet. 10, 28. Petitioner also relies on Takigawa for disclosing that lubricant is present in the composition up to about 20% by weight. *Id.* at 34.

b. Powell

Powell is a U.S. Patent titled "R 22 Replacement Refrigerant" and issued August 19, 2003. Ex. 1007, codes (45), (54). Powell is directed to a refrigerant composition comprising a hydrofluorocarbon component including 1,1,1,2-tetrafluoroethane and further comprising an additive selected from a saturated hydrocarbon or mixture thereof boiling in the range -5 to +70 °C, as a replacement for R-22 refrigerant. *Id.* at code (57), 1:6–12, 1:36–41.

Petitioner relies on Powell for disclosing that chlorine containing R-22 refrigerant must be phased out and utilizing a refrigerant mixture containing 1,1,1,2-tetrafluoroethane in an amount of 20–50% by weight and pentafluoroethane in an amount of 50–80% by weight. Pet. 19, 57–58.

c. Goble

Goble is a U.S. Patent titled "Nonflammable, Nonozone Depleting, Refrigerant Mixtures Suitable for Use in Mineral Oil" and issued March 8, 2005. Ex. 1008, codes (45), (54). Goble is directed to mixtures of refrigerants that may be substituted for flammable, ozone-depleting refrigerants, including R-22, and usable in mineral oil systems. *Id.* at code (57), 1:8–12, 1:36–41.

Petitioner relies on Goble for disclosing that chlorofluorocarbon refrigerants cause harm to the Earth's ozone layer and an embodiment of a refrigerant mixture, which is roughly 56 weight percent pentafluoroethane and 44 weight percent 1,1,1,2-tetrafluoroethane. Pet. 18, 30–31. Petitioner

also relies on Goble for teaching the use of lubricating oils in such mixtures, including polyolefin oils and alkylbenzene oils. *Id.* at 32.

d. Pearson

Pearson is a U.S. Patent titled "Replacement Refrigerant Composition" and issued November 18, 1997. Ex. 1009, codes (45), (54). Pearson is directed to a refrigerant composition for use in a refrigeration apparatus as a replacement for chlorofluorocarbon refrigerants, such as R-22 refrigerant, the refrigerant composition comprising a mixture of pentafluoroethane, tetrafluoroethane, and a hydrocarbon selected from isobutene and propane, and optionally octafluoroethane. *Id.* at code (57), 1:25–29, 1:34–39, 1:43–51, 1:68–2:4, 2:59–64.

Petitioner relies on Pearson for disclosing replacing R-22 with a refrigerant mixture containing pentafluoroethane in an amount of 0.5–60% by weight and 1,1,1,2-tetrafluoroethane in an amount of 30–90% by weight and the addition of a hydrocarbon for use in refrigeration systems and equipment. Pet. 19, 67.

e. Singh

Singh is a U.S. Patent Application titled "Hydrofluorocarbon Refrigerant Compositions Soluble in Lubricating Oil" and published April 3, 2003. Ex. 1011, codes (43), (54). Singh is directed to hydrofluorocarbon refrigerant compositions soluble in hydrocarbon lubricating oils for use in replacing ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon compositions in refrigeration applications. *Id.* at code (57), ¶¶ 3, 10–13. In a preferred embodiment, Singh describes a refrigerant composition comprising pentafluoroethane, 1,1,1,2-tetrafluoroethane and cyclopentane refrigerants, and a lubricant selected from the group consisting of mineral oil,

alkylbenzene oil, white (paraffinic) oil, and mixtures of two or more thereof. *Id.* ¶¶ 10, 12, 20.

Petitioner relies on Singh for disclosing hydrofluorocarbon compositions to replace chlorine-containing refrigerants, including a preferred embodiment that comprises about 48 to about 80 parts by weight of pentafluoroethane and about 18 to about 60 parts by 1,1,1,2-tetrafluoro-ethane for use in refrigeration systems. Pet. 19, 46, 48. Petitioner also relies on Singh for teaching use of lubricants and additives, including alkylbenzene oil, in such compositions. *Id.* at 19, 48.

f. Federal Register

Federal Register is a copy of the "Protection of Stratospheric Ozone: Notice 21 for Significant New Alternatives Policy Program" at pages 56884–56891 of Volume 71 of the Federal Register (71 FR 56884–56891), which relates to and discusses a notice of acceptability that expands the list of acceptable substitutes for ozone-depleting substances under the U.S. Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) program for use in various sectors, including refrigeration and air conditioning, and states that the notice of acceptability is effective on September 28, 2006. Ex. 1018, 1.

Petitioner relies on Federal Register for disclosing that Patent Owner's R-421A refrigerant is a blend of 58% by weight pentafluoroethane and 42% by weight 1,1,1,2-tetrafluoroethane. Pet. 20, 71.

g. Roberts

Roberts is a U.S. Patent titled "Refrigerant Compositions" and issued December 2, 2003. Ex. 1019, codes (45), (54). Roberts is directed to refrigerant compositions, which comprise:

> (a) pentafluoroethane, octafluoropropane, trifluoromethoxydi-fluoromethane or hexa-cyclopropane, or a mixture of two or more thereof, in an amount of at least 35% based on the weight of the composition, (b) 1,1,1,2- or 1,1,2,2-tetrafluorethane, trifluoromethoxypentafluoroethane, 1,1,2,3,3-heptafluoro-propane or a mixture of two or more thereof, in an amount of at least 30% by weight based on the weight of the composition and (c) n-butane or isobutane, in an amount from 1% to less than 2.3% by weight based on the weight of the composition.

Id. at code (57), 2:9–25. Roberts discloses its refrigerant compositions for use as replacements in refrigeration equipment currently employing, or designed to employ, certain refrigerants, including R-22. *Id.* at 1:3–6.

Petitioner relies on Roberts for disclosing refrigerant compositions containing 35–60 wt. % pentafluoroethane and 35–60 wt. % 1,1,1,2-tetrafluoroethane, including a composition having 58.9 wt. % pentafluoro-ethane and 40.1 wt. % 1,1,1,2-tetrafluoroethane, as replacements in refrigeration equipment for R-22. Pet. 20, 71–73. Petitioner also relies on Roberts for disclosing use of lubricating oils and additives in its refrigerant compositions. *Id.* at 20, 73.

h. Lemmon

Lemmon is a manuscript of a paper to be submitted to the Journal of Physical and Chemical Reference Data titled, "Equations of State for Mixtures of R-32, R-125, R-134a, R-143a, and R-152a," (Ex. 1020, 1), which Petitioner contends was published on August 30, 2002. Pet. 74. Lemmon is directed to mixture models developed to calculate the thermodynamic properties of refrigerant mixtures containing R-32, R-125, R-134a, R-143a, and R-152a, including a model that may be used to calculate dew and bubble point properties and critical points, within the

experimental uncertainties of the available measured properties of such mixtures. Ex. 1020, 2.

Petitioner relies on Lemmon for disclosing refrigerant mixtures of pentafluoroethane and 1,1,1,2-tetrafluoroethane where ranges of mole fractions of pentafluoroethane and 1,1,1,2-tetrafluoroethane were studied, including mixtures having mole fractions of pentafluoroethane and 1,1,1,2-tetrafluoroethane that encompass 0.545 pentafluoroethane and 0.455 1,1,1,2-tetrafluoroethane. Pet. 21, 74. Petitioner also relies on Lemmon for disclosing that the bubble point and dew point of such mixtures can be calculated. *Id.*

2. Relevant Prosecution History

The '179 patent issued from Application No. 13/493,491, filed June 11, 2012, as a continuation of Application No. 12/961,045, filed December 6, 2010 ("the '045 parent application"), which is a continuation of Application No. 10/937,736, filed September 8, 2004 ("the '736 grandparent application"). Ex. 1001, codes (21), (22), (63), 1:7–11.[7] The '179 patent claims priority to and the benefit of Provisional Application No. 60/501,049, filed September 8, 2003 ("the '049 provisional"). *Id.* at code (60), 1:1–13.

During prosecution of the '179 patent, the Examiner rejected the claims under Section 103 as obvious over Takigawa, which is a reference the applicant presented to the Office on an IDS. Ex 1003, 264–270, 316; *see* Ex. 1001, code (56). In response to the rejection, the applicant submitted two declarations from inventor Kenneth M. Ponder as evidence supporting the

[7] We observe that the same examiner conducted all of the examinations for these applications.

patentability of the ’179 patent claims over Takigawa. Ex. 1003, 96–104 (Second Declaration of Kenneth M. Ponder), 253–256 (Declaration of Kenneth M. Ponder).

In particular, the Second Declaration of Kenneth M. Ponder included, among other evidence, data to show how the claimed refrigerant blend consisting of 58% pentafluoroethane and 42% 1,1,1,2-tetrafluoroethane unexpectedly outperforms a refrigerant blend consisting of 60% pentafluoroethane and 40% 1,1,1,2-tetrafluoroethane, which is within the range Takigawa discloses. *Id.* at 99.

Following the applicant’s response, the Examiner withdrew the rejection of the claims under Section 103 as obvious over Takigawa (Ex. 1003, 41–46) and issued a Notice of Allowance (*id.* at 11–16). According to the Examiner’s Search Notes, during prosecution of the ’179 patent, the Examiner reviewed the prosecution histories of and prior art searches conducted for both the ’045 parent application and ’736 grandparent application. Ex. 1003, 16 (indicating the Examiner “[r]eviewed prosecution and searches in parent cases”).

During prosecution of the ’045 parent application, the Examiner rejected the claims under Section 103 as obvious over Takigawa. Ex. 1004, 63–69, 73–78; Ex. 1002, code (56). In response, the applicant amended the claims and submitted remarks, including analysis in support of the patentability of the claims over Takigawa. Ex. 1004, 34–47.

After considering the applicant’s amendments and analysis in support of the patentability of the claims, the Examiner withdrew the § 103 rejection of those claims in view of Takigawa and issued a Notice of Allowance. *Id.* at 13–26. In the reasons for allowance, the Examiner explained:

> The closest prior art of record is Takigawa, US 6,207,071. The reference discloses the utility of compositions comprising pentafluoroethane and tetrafluoroethane in amounts which make obvious those presently recited. However, the reference further discloses that naphthenic based lubricants and polyol esters were not satisfactory lubricants. As the present claims require those lubricants, they are not obvious over the prior art of record.

Id. at 26. According to the Examiner's Search Notes, during prosecution of the '045 parent application, the Examiner reviewed the prosecution history of the '736 grandparent application. *Id.* at 28 (denoting the Examiner "[r]eviewed prosecution of parent" on "6/01/11").

During prosecution of the '736 grandparent application, the applicant presented to the Office several prior art references on IDSs, including WO 01/23493 A1[8] (Ex. 1005, 349, 369–400, 483, 495–526) and EP 1 295 928 A2[9] (*id.* at 349, 404–411, 483, 487–493), both of which were considered by the Examiner, as evidenced by the Examiner's initials next to each reference on the IDS (*id.* at 349).

The Examiner also considered Takigawa during prosecution of the '736 grandparent application and rejected those claims under Section 103 as

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[8] WO 01/23493 A1 is a PCT International Application titled "R 22 Replacement Refrigerant" and published Apr. 5, 2001. Ex. 1005, codes (10), (12), (43), (54). It is the PCT counterpart to the Powell reference Petitioner asserts in the Petition. *Compare* WO 01/23493 A1 (Ex. 1005, 369–400), *with* Powell (Ex. 1007).

[9] EP 1 295 928 A2 is a European Patent Application titled "Hydrofluoro-carbon refrigerant compositions soluble in lubricating oil" and published Mar. 26, 2003. Ex. 1005, codes (11), (12), (43), (54). It is the European counterpart to the Singh reference Petitioner asserts in the Petition. *Compare* EP 1 295 928 A2 (Ex. 1005, 404–411), *with* Singh (Ex. 1011).

obvious over that reference. Ex 1005, 289–291, 295–299, 319–323, 540. After appealing the Examiner's Section 103 rejection of those claims over Takigawa to the Board of Patent Appeals and Interferences ("BPAI"), which the BPAI affirmed in a Decision on Appeal mailed April 29, 2010 ("the BPAI Decision"), the patent applicant abandoned the '736 grandparent application. *Id.* at 2, 84–93.[10]

In affirming the Examiner's rejection of the '736 grandparent application's claims over Takigawa in that appeal, the BPAI agreed with the Examiner that the proffered evidence of unexpected results of record at the time was not persuasive because it did not compare the claimed invention to the closest prior art (i.e., Takigawa). *Id.* at 91.

3. Whether the Same or Substantially the Same Art Was Presented to the Office

We first consider whether Petitioner asserts the same or substantially the same art that previously was presented to the Office. *Advanced Bionics*, Paper 6 at 10. Petitioner's asserted grounds of unpatentability rely on Goble, Singh, and Takigawa in Grounds 1A and Ground 2; Goble in Ground 1B; Powell, Goble, Singh, and Takigawa in Ground 3; Pearson, Goble, Singh, and Takigawa in Ground 4; Federal Register, Goble, Singh, and Takigawa in Ground 5; Roberts, Goble, Singh, and Takigawa in Ground 6; and Lemmon, Goble, Singh, and Takigawa in Ground 7. Pet. 4–5.

As we note above, Petitioner does not explicitly argue whether it asserts the same or substantially the same art that previously was presented to the Office. Petitioner acknowledges, however, that during prosecution of

[10] A copy of the BPAI Decision is provided as Exhibit 1010.

the ’179 patent, the Examiner rejected all of the claims under Section 103 as obvious over Takigawa. Pet. 7; Ex. 1003, 264–270, 316. Indeed, there is no dispute that Takigawa is listed on the cover page of the ’179 patent as a reference cited by the Examiner. Ex. 1001, code (56). Additionally, the Examiner considered and rejected claims under Section 103 as obvious over the Takigawa reference during the prosecutions of both the ’045 parent application (Ex. 1004, 63–69, 73–78) and the ’736 grandparent application (Ex. 1005, 289–291, 295–299, 319–323, 540). Thus, in the absence of any counterargument from Petitioner, on this record, we are persuaded the Takigawa reference was previously presented to Office.

On this record, we are also persuaded that the Goble and Singh references are cumulative of art that was previously presented to the Office, namely Takigawa. During prosecution of the ’179 patent, the Examiner relied on Takigawa for disclosing, among other claim limitations, a fluid composition comprising an alkylbenzene oil lubricant and a refrigerant containing 40 wt. % or more of 1,1,1,2-tetrafluoroethane and, most preferably, 40 wt. % or more of pentafluoroethane as a replacement for ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon refrigerants. Ex. 1003, 149–150.

Similarly, in asserted Grounds 1A, 1B, and 2, Petitioner relies on Goble for disclosing that chlorofluorocarbon refrigerants cause harm to the ozone layer and an embodiment of a refrigerant mixture, which is roughly 56 weight percent pentafluoroethane and 44 weight percent 1,1,1,2-tetrafluoroethane. Pet. 18, 30–31, 34–41. Petitioner also relies on Goble for teaching the use of lubricating oils in such mixtures, including polyolefin oils and alkylbenzene oils. *Id.* at 32, 34, 36, 40.

Likewise, in asserted Ground 2, Petitioner relies on Singh for disclosing the same or substantially the same claim limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19, 46, 48, *with* Ex. 1003, 149–150. For example, Petitioner relies on Singh for disclosing hydrofluorocarbon compositions to replace chlorine-containing refrigerants, including a preferred embodiment that comprises about 48 to about 80 parts by weight of pentafluoroethane and about 18 to about 60 parts by 1,1,1,2-tetrafluoroethane for use in refrigeration systems. Pet. 19, 46, 48. Petitioner also relies on Singh for teaching use of lubricants and additives, including alkyl benzene oil, in such compositions. *Id.* at 19, 48.

Singh's disclosure also is substantially the same as the disclosure of EP 1 295 928 A2, which is Singh's European counterpart that was previously presented to the Office on an IDS during prosecution of the '736 grandparent application. *Compare* EP 1 295 928 A2 (Ex. 1005, 404–411), *with* Singh (Ex. 1011).

For similar reasons, we determine Powell also is cumulative of art that was previously presented to the Office. In asserted Ground 3, Petitioner relies on Powell for disclosing the same or substantially the same limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19, 57–58, *with* Ex. 1003, 149–150.

In addition, Powell's disclosure is substantially the same as the disclosure of WO 01/23493 A1, which is the PCT counterpart of Powell and was previously presented to the Office on an IDS during prosecution of the '736 grandparent application. *Compare* WO 01/23493 A1 (Ex. 1005, 369–400), *with* Powell (Ex. 1007).

As to the remaining Pearson, Federal Register, Roberts, and Lemmon references Petitioner asserts in Grounds 4, 5, 6, and 7, respectively, we determine these references, too, are cumulative of art that was previously presented to the Office. As with Goble, Singh, and Powell, we determine Petitioner relies on each of Pearson, Federal Register, Roberts, and Lemmon as primary references in the asserted grounds for disclosing the same or substantially the same limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19–21, 67, 71, 73, 74, *with* Ex. 1003, 149–150.

Thus, in view of the foregoing, we determine that the Petition asserts the same or substantially the same art that previously was presented to the Office.

4. Whether the Office Erred in a Manner Material to Patentability

Because we determine that the same or substantially the same art previously was presented to the Office, we turn next to whether Petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 8, 10.

As we note above, Petitioner argues the Office erred in a manner material to patentability principally because it alleges the evidence of unexpected results Patent Owner submitted and the Examiner considered during prosecution of the '179 patent was insufficient to rebut the Examiner's obviousness rejection of the claims over Takigawa. Pet. 24–28.

Petitioner's argument focuses on alleged deficiencies in the Second Declaration of Kenneth M. Ponder (Ex. 1003, 96–104). Pet. 24. In particular, Petitioner contends that although the Second Declaration of Kenneth M. Ponder asserts that the 58/42 mixture unexpectedly better approximates the

pressure-temperature characteristics of R-22, "there was no data showing that this fit had a significant effect on actual performance." *Id.* at 24.

Petitioner further contends the results in the Second Declaration of Kenneth M. Ponder fail to demonstrate an unexpected result because "[t]here is barely any difference" in the coefficient of performance (COP) for 60/40 and 58/42 mixtures over much of the temperature range. *Id.* at 25.

Petitioner contends that, in contrast to the data provided in the Second Declaration of Kenneth M. Ponder, a report submitted during prosecution of the '736 grandparent application "showed no appreciable difference between the performance[s] of R421A against similar R22-substitute refrigerants" (Pet. 25) and "[t]here is no indication that the R421 COP is unexpectedly closer to the R22 COP" (*id.* at 26). Petitioner further contends that although "Applicants of the '179 Patent argued that differences are indicated between 58/42 and 60/40 formulations . . . the Applicants made no observations as to whether these differences would have a significant effect on the performance of the refrigerant." *Id.* at 27.

Petitioner also contends "the closest formulation in the newly found prior art is the 56% R125 and 44% R134 as set forth in Goble" and "there were no experimental results presented by the Applicant of the '179 Patent for this formulation." *Id.* 27–28 (relying on prior declarations submitted during prosecution of the '736 grandparent application).

In response, Patent Owner maintains that Petitioner does not identify or sufficiently explain how the Office materially erred. Prelim. Resp. 1–2, 44, 45. In particular, Patent Owner explains that during prosecution of the '179 patent, Patent Owner submitted the Second Declaration of Kenneth M. Ponder as evidence supporting the patentability of the '179 patent claims

over the Examiner's obviousness rejection based on Takigawa. *Id.* at 18 (citing Ex. 1003, 96–104).

Patent Owner further explains that the Second Declaration of Kenneth M. Ponder included new evidence that was not previously presented to the Examiner in the earlier prosecutions of the '045 parent application and the '736 grandparent application. Prelim. Resp. 19. Patent Owner explains that, in contrast to the declaration evidence submitted during prosecution of the '736 grandparent application, the Second Declaration of Kenneth M. Ponder included, among other evidence, data to show how the claimed refrigerant blend consisting of 58% pentafluoroethane and 42% 1,1,1,2-tetrafluoro-ethane unexpectedly outperforms a refrigerant blend consisting of 60% pentafluoroethane and 40% 1,1,1,2-tetrafluoroethane, which is within the range Takigawa discloses. *Id.* at 19 (citing Ex. 1003, 99).

In particular, Patent Owner points to paragraph 9 of the Second Declaration of Kenneth M. Ponder, which states:

> As shown, R-421A [58% R-125 / 42% R134a (58.0/42.0)] unexpectedly outperforms the 60% R-125 / 40% R134a (60.0/40.0)] composition for the full range, but its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (i.e., when most needed). The higher temperatures also are when utility demand rates kick in when applicable (normally for commercial and industrial but not for residential rates). Stated another way, **unexpectedly the "58/42" [R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to a 60% R125 / 40% R134a composition.

Ex. 1003, 99–100; *see also In re Chupp*, 816 F.2d 643, 646 (Fed. Cir. 1987) (explaining for composition claims that showing unexpected superiority for one property is sufficient to rebut a prima facie case of obviousness).

Patent Owner explains that, after the Second Declaration of Kenneth M. Ponder was submitted to and considered by the Examiner, the Examiner withdrew the Section 103 rejection of the claims as obvious over Takigawa and issued a Notice of Allowance, leading to the '179 patent. Pet. 20 (citing Ex. 1003, 11–53).

Having considered the parties' respective arguments and the prosecution history of the '179 patent, on this record, Petitioner does not show sufficiently that the evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder demonstrates that the Office erred in a manner material to patentability. Rather, we agree with Patent Owner that Petitioner does not identify or sufficiently explain how the Office materially erred. *See* Ex. 1003, 11–53, 96–104.

Petitioner's contentions regarding there being "barely any difference" in the COP for 60/40 and 58/42 mixtures over much of the temperature range (Pet. 25) and that "there was no data showing that this fit had a significant effect on actual performance" (*id.* at 24) are not persuasive because Petitioner does not adequately explain or identify persuasive evidence in the record sufficient to support them. Although Petitioner cites to Dr. Groll's Declaration, Dr. Groll essentially repeats Petitioner's contentions without providing any underlying data or further analysis. *Compare* Ex. 1013 ¶¶ 113–123, *with* Pet. 24–28.

Petitioner's contentions regarding a report and previous declarations submitted during prosecution of the '736 grandparent application and what those documents allegedly show (Pet. 25–26, 28) are not persuasive because Petitioner does adequately explain how they relate to the claimed compositions of the '179 patent or otherwise compare to the compositions,

data, and other evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder, and submitted to and considered by the Examiner during prosecution the '179 patent.

We do not find persuasive Petitioner's contention that "the closest formulation in the newly found prior art is the 56% R125 and 44% R134 as set forth in Goble" (Pet. 27) because Petitioner does not direct us to persuasive evidence in the record to support it. Other than citing to three lines of the Goble reference (*see id.* (citing Ex. 1008, 7:6–9)) and quoting a passage from the BPAI Decision unrelated to Goble (*id.* at 27–28), Petitioner does not provide an adequate explanation or direct us to evidence in the record sufficient to support this statement.

Moreover, we find Petitioner's contentions at pages 24–28 of the Petition amount essentially to a disagreement with the Examiner as to the sufficiency of the evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder to rebut the Examiner's obviousness rejection of the claims over Takigawa, which is an issue on which reasonable minds can disagree. *Advanced Bionics*, Paper 6 at 9 ("If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.").

Accordingly, on this record, we are not persuaded Petitioner has demonstrated the Office erred in a manner material to patentability.

5. Conclusion as to § 325(d)

For the reasons discussed above, we exercise our discretion under 35 U.S.C. § 325(d) to deny institution of trial. Applying the *Advanced Bionics* two-part framework, we determine that the same or substantially the same

art was previously presented to the Office and that Petitioner has not demonstrated the Office erred in a manner material to the patentability of the challenged claims.

IV. CONCLUSION

For the foregoing reasons, we exercise our discretion under 35 U.S.C. § 325(d) to deny institution.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of the '179 patent, and no trial is instituted; and

FURTHER ORDERED that Petitioner's request for authorization to withdraw Grounds 4, 5, and 7 of the Petition, as set forth in the March 11, 2021 Order (Paper 13), is denied as moot.

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