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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,
Patent Owner.

Case No. IPR2020-01660
U.S. Patent No. 9,982,179

PATENT OWNER'S PRELIMINARY RESPONSE

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LIST OF EXHIBITS

Exhibit No.	Description
2001	Declaration of Scott P. Amy In Support of Motion for Admission *Pro Hac Vice*
2002	U.S. Patent No. 10,703,949
2003	File History of U.S. Patent Application Serial No. 15/989,655, now U.S. Patent No. 10,703,949
2004	Declaration of Dr. Donald Bivens
2005	Public Patent Application Information Retrieval Application Data Tab
2006	Alternate Website for "Lemmon" Reference; Printout of https://aip.scitation.org/doi/pdf/10.1063/1.1649997
2007	Johnson Controls Technical Services Letter Dated April 10, 2017
2008	Coastline Technical Findings Letter Dated September 19, 2006
2009	Contracting Business.com Award Letter Dated September 8, 2009
2010	Kivlan Group Webpage Press Release Printed September 2, 2020
2011	Dynatemp Webpage Press Release Printed October 4, 2020
2012	Choice R-421A Showcase Website Press Release Printed August 25, 2020
2013	Consolidated Pleadings in *Dynatemp International, Inc. et al v. RMS of Georgia, LLC et al d/b/a Choice Refrigerants*, Case No. 5:2020-cv-00142-FL (E.D. North Carolina)
2014	RMS Choice® Federal Trademark Registration
2015	2017 ASHRAE Handbook, Pages 29.1-29.6

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.107, R 421A LLC ("Patent Owner") and RMS of Georgia, LLC ("RMS") submit this Preliminary Response to the Petition for *inter partes* review IPR2020-01660 ("the Petition" or "this IPR") of U.S. Patent No. 9,982,179 ("the '179 Patent") filed by Dynatemp International, Inc. ("Dynatemp") and FluoroFusion Specialty Chemicals, Inc. ("FluoroFusion" and, collectively, "Petitioners"). This submission is timely under 35 U.S.C. § 313 and 37 C.F.R. § 42.107, as filed within three months of the October 22, 2020, mailing date of the Notice of Filing Date Accorded (Paper 5).

At page 4 of the Petition, Petitioners outline seven grounds of rejection against all Claims 1-37 of the '179 Patent, using seven different primary references. The Petition must be denied because all seven grounds are fatally flawed for several reasons in view of the standards under 35 U.S.C. §§ 102, 103, 312(a)(3), 314(a), and 325(d) and the IPR practice rules for the Board.

First, the Board can and should exercise its discretion to deny the Petition under § 325(d), because Petitioners only rehash issues already determined by the Office. The Goble, Singh, Powell, and Pearson references were all considered—and considered multiple times in some cases—by the Office. Petitioners do not present

any new evidence or reasons to show how the Office erred in the review of those references.

The Board can find other reasons to exercise its discretion to deny the Petition under 35 U.S.C. §§ 312(a)(3) and 314(a) and 37 C.F.R. § 42.104(b). Petitioners' allegations are so vague and conclusory that the Petition fails to set forth a complete *prima facie* case of obviousness as to any claim. Petitioner does not explain how and—more importantly—why a person having ordinary skill in the art (a "PHOSITA") would combine the references to arrive at the claimed invention. Instead, Petitioners merely point to various independent passages in the cited references, leaving the Board to blindly guess as to how and why a PHOSITA might combine the references. The most egregious examples include Petitioners' presentation of Grounds 6 and 7 based on the primary references Roberts and Lemmon. The Petition covers the challenge to all Claims 1-37 of the '179 Patent under Ground 6 *in less than three full pages*, from pages 71-73. The Petition covers the challenge to all Claims 1-37 under Ground 7 *in less than two full pages*, from pages 74-75.

Petitioners present the grounds generally using claim charts including citations to limited isolated passages in the references,[1] which falls short of the standard required for institution of this IPR. In *Cisco Sys., Inc. v. C-Cation Techs.*, IPR2014-00454, slip op. at 12-13 (PTAB Aug. 29, 2014) (Paper 12), the Board explained that claim charts and short argumentative explanations alone are not enough to maintain an invalidity challenge. Instead, the rules require that Petitioners "[p]rovide a statement of the precise relief requested" and identify "where each element of the claim is found in the prior art patents or printed publications relied upon" and "specific portions of the evidence that support the challenge." 37 C.F.R. § 42.104(b).

[1] For Grounds 1-3, claim charts are provided in the Petition for only independent Claims 1, 8, 15, and 31 (and not for independent Claims 21 or 26). Paper 4, 29-46. For Ground 4, a claim chart is provided for only Claim 1, but no charts or listing of claim elements is provided for any other independent claim. *Id.*, 67-70. For Grounds 5-7, no claim charts or listings of claim elements are provided for any claims. Paper 4, 71-75. The Petition completely omits Claims 21-30, and no claim charts or listings of claim elements are presented for any dependent claim in any ground. *Id.*

Second, the Federal Register reference is not prior art to the ’179 Patent. The ’179 Patent ultimately claims the benefit of priority to U.S. Provisional Application Serial No. 60/501,049 (“the ’049 Provisional”), filed September 8, 2003. The Federal Register reference was published on September 28, 2006, years after the ’049 Provisional. The ’049 Provisional fully supports every claim of the ’179 Patent. Thus, the Federal Register reference is not prior art to the ’179 Patent.

Third, every independent claim of the ’179 Patent recites a refrigerant composition “consisting of” two refrigerant gases. The term “consisting of” is well-known in patent claims to mean a closed group, in contrast with “comprising” or open-ended terms. Petitioners do not account for the fact that the Goble, Singh, Powell, Pearson, and Roberts references describe only refrigerant blends having *three or more* refrigerant gases. Specifically, Petitioners do not even attempt to set forth a reason why a PHOSITA would pick out one or more refrigerant gases from the blends described in those references. At the same time, the references teach certain reasons for the inclusion of the additional refrigerant gases.

II. PETITIONERS CHALLENGES TO THE CLAIMS

Petitioners challenge all Claims 1-37 of the '179 Patent based on the following seven grounds:[2]

Ground	Claims	Basis	Primary Reference	Secondary Reference(s)
1.A 1.B	21-37 1-37	102 103	Goble (Claims 21-37) Goble (Claims 1-37)	Singh Takigawa
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

[2] The '179 Patent claims the benefit of priority to a provisional application filed on September 8, 2003. Thus, the version of Title 35 of the United States Code that was effective before the Leahy-Smith America Invents Act (AIA), Public Law 112-29, 125 Stat. 284, is applicable in this IPR.

Paper 4, 4-5. Petitioners' grounds are based upon one or more of the following cited references:

- U.S. Patent No. 6,863,840 to Goble ("Goble")(EX1008).
- U.S. Patent Publication No. 2003/0062508 to Singh *et al.* ("Singh")(EX1011).
- U.S. Patent No. 6,606,868 to Powell *et al*. ("Powell")(EX1007).
- U.S. Patent No. 5,688,432 to Pearson ("Pearson")(EX1009).
- Federal Register Vol. 71, No. 188, September 28, 2006, pp. 56,884-56,893 ("the Federal Register")(EX1018).
- U.S. Patent No. 6,655,160 to Roberts ("Roberts")(EX1019).
- Equations for State for Mixtures of R-32, R-125, R-134a, R-143a, and R-152, by Eric C. Lemmon *et al*. ("Lemmon")(EX1020).
- U.S. Patent No. 6,207,071 to Takigawa *et al*. ("Takigawa")(EX1006).

III. BACKGROUND OF SUBJECT MATTER AND PARTIES

The considerations and concerns in the development and application of refrigerants are interrelated with each other and include regulatory, technical, safety, efficiency, and practical considerations, among others. EX2004, ¶39. A PHOSITA in refrigerant formulation regularly works with precise amounts of chemical components or compounds, including combinations of various hydrocarbons, such

as methanes, ethanes, propanes, and organic and inorganic compounds, among other components to form zeotrope and azeotrope refrigerant gas blends. *Id*. The refrigerant gases and blends evaporate at all different temperatures (and across temperature ranges), many well below 0˚F, and are typically used and characterized under pressure at temperature ranges from -60˚F to 200˚F. *Id*., ¶40. A PHOSITA in refrigerant formulation would not—and for safety reasons could not—overlook even one component in the development of a refrigerant. *Id*., ¶41 A PHOSITA would instead expect every single refrigerant gas component, even in very small amounts, to impact the characteristics and properties of a refrigerant gas blend. *Id*.

The ’179 Patent is directed to a two-component refrigerant gas blend assigned the “R-421a” designation by the American Society of Heating, Refrigerating and Air- Conditioning Engineers (ASHRAE).[3] R-421a was developed as a retrofit replacement substitute for the once-popular R-22 refrigerant. R-22 or HCFC-22 (hydrochlorofluorocarbon 22), which is also marketed under the Freon® brand, is a refrigerant gas within the class of chemicals known as hydrochlorofluorocarbons or

[3] The ASHRAE Standard 34 provides a standardized, shorthand naming convention and safety classification for refrigerants based on fluorochemical composition, toxicity, and flammability data.

"HCFCs." The U.S. Environmental Protection Agency ("EPA") has phased out and banned the production and importation of R-22 into the United States as of January 2020, pursuant to the Federal Clean Air Act of 1990, due to the environmentally damaging effects of HCFCs on the Earth's ozone layer.

R-22 was a ubiquitous refrigerant gas in refrigerators, freezers, and air conditioners in residential, industrial, and commercial buildings, as well as in vehicles for decades before the EPA's ban. *Id*., ¶27 The ultimate ban against the production and importation of R-22 into the United States as of January 2020, posed a significant problem for the continued servicing and operation of the in-use residential and commercial refrigerant systems specifically designed for and charged with R-22. *Id*., ¶28-29. The continued servicing of R-22-based refrigerant systems relies upon recycled or stockpiled R-22, to the extent available. *Id*.

Several substitute R-22 refrigerants were known at the time of the earliest priority date of the '179 Patent. Service technicians started to retrofit existing R-22-based refrigerant systems with substitute R-22 refrigerants long ago, with mixed results for a number of different reasons. Substitute R-22 refrigerants have differences in mass flow, operating pressures, and lubricants as compared to R-22, which present drawbacks when used in the existing R-22-based refrigerant systems. In order to accommodate or account for these drawbacks, it has generally been

necessary to mechanically retrofit the R-22-based refrigerant systems before charging them with substitute R-22 refrigerants. This can be costly, technically difficult, and inefficient. R-421a was designed specifically to avoid these and other drawbacks.

Mr. Kenneth Ponder, the founder and current President of Patent Owner, expended significant efforts to create a new, effective, and environmentally-acceptable alternative to R-22. The new refrigerant blend consists of a two-component blend of R-125 (pentafluoroethane) and R-134a (tetrafluoroethane) in certain proportions. On behalf of RMS, Mr. Ponder submitted the new refrigerant blend to ASHRAE for approval and assignment of an R-number designation, and ASHRAE approved Mr. Ponder's submission. EX1005, 196-229, 210. ASHRAE assigned the R-421a designation to the new refrigerant blend, along with a safety classification, confirming to the industry that the new blend had been reviewed by an industry standards committee and was considered safe. *Id*.

Mr. Ponder also applied for approval of R-421a as a substitute for R-22 under the EPA's Significant New Alternatives Policy ("SNAP") program. EX1005, 271-286, 282. The EPA evaluated R-421a and analyzed its atmospheric effects, population exposure assessments, toxicity data, flammability, and other environmental impacts. The EPA designated R-421a as a "SNAP-approved"

substitute. EX1018, 56,885 ("R-421A ... is acceptable for use in new and retrofit equipment as a substitute for hydrochlorofluorocarbon (HCFC)-22 in" various refrigerant systems).

R-421a, which can include a lubricating oil in some cases, exhibits desirable properties that make it superior in many applications to the other commercially-available substitutes for R-22, including R-410a, R-417, R-407c, R-427a, R438a, and R-422d. The '179 Patent is directed to and covers the R-421a refrigerant blend and a lubricating oil in some claims. R-421a has been well-received in the industry (*see, e.g.,* EXS2007-2008), even winning awards for its usefulness and innovation. EX2009.

Choice® is a registered trademark of RMS for all of its refrigerants (EX2014), and R-421a has been marketed and sold by RMS under the Choice® brand for well over a decade. Around 2012, RMS entered into a multi-year distribution agreement with Dynatemp, a refrigerant supplier and reclaimer. Dynatemp agreed to resell and distribute Choice® brand R-421A products in the United States with support from RMS. Dynatemp promoted and touted the desirable qualities of Choice® R-421A for years under the agreement. *See* EX2010, 2 ("Choice R-421A is the only two-component blend commercially available for R-22 retrofits, which ... make it an especially good candidate for residential A/C R-22 retrofits ... ."); EX2011, 2 ("After

thousands of successful retrofits, Choice R-421A has emerged as 'The Easy Choice' for R22 replacement."); EX2012 ("R-421A contains *no hydrocarbons* and is EPA-approved" and "is the only R-22 replacement that is a two-component refrigerant blend with performance ... that closely mimic R-22.")(emphasis added).

Petitioners Dynatemp and FluroFusion's more recent actions have resulted in litigation between Patent Owner and Petitioners. Patent Owner's claims resulting from Petitioners' damaging actions have been consolidated in *Dynatemp International, Inc. et al v. RMS of Georgia, LLC et al d/b/a Choice Refrigerants*, Case No. 5:2020-cv-00142-FL (E.D. North Carolina). Patent Owner's consolidated claims include direct and indirect infringement of the '179 Patent, federal trade dress and trademark infringement related to the Choice® brand, dilution, passing off, unfair competition, false advertising, tortious interference, and other claims. EX2013.

IV. OVERVIEW OF THE '179 PATENT AND PATENT FAMILY

The '179 Patent is one among a family of applications and patents ("the Patent Family") filed by Patent Owner. Table I, below, identifies the entire family as of January 22, 2021 ("the Patent Family"), with the '179 Patent emphasized in bold.

Reference	App. No.	Filing Date	Status	IPR/PGR No.
’049 Provisional	60/501,049	9/8/2003	N/A (Provisional)	
’736 Application	10/937,736	9/8/2004	N/A (Abandoned)	
’706 Patent	12/961,045	12/6/2010	USP 8,197,706	IPR2001-00199
’179 Patent	**13/493,491**	**6/11/2012**	**USP 9,982,179**	**IPR2020-01660**
’949 Patent	15/989,655	5/25/2018	USP 10,703,949	PGR2021-00008
’049 Application	16/920,905	7/6/2020	Pending	

Table I: ’179 Patent Family

The application for the ’179 Patent was filed on June 11, 2012 (EX1001, INID 22),[4] as a continuation of U.S. Patent No. 8,197,706 (“the ’706 Patent”). *Id*., INID 63. The ’706 Patent was filed as a continuation of U.S. Patent Application Serial No. 10/937,736 (“the ’736 Application”), which was abandoned. *Id*. Stemming from the ’736 Application, the ’179 Patent ultimately claims the benefit of priority to U.S. Provisional Application Serial No. 60/501,049 (“the ’049 Provisional”), filed September 8, 2003. *Id*., INID 60. The ’179 Patent includes six (6) independent claims, including Claims 1, 8, 15, 21, 26, and 31, as discussed below. *Id*., 10:1-14:21.

[4] References to bibliographic data of patents is made with reference to the Internationally agreed Numbers for the Identification of Data (“INID”) codes on the first page.

U.S. Patent No. 10,703,949 ("the '949 Patent") is a continuation of the '179 Patent, and U.S. Patent Application Serial No. 16/920,905 ("the '905 Application") is currently pending as a continuation of the '949 Patent.

A. Subject Matter of the '179 Patent

The '179 Patent is titled "Refrigerant with Lubricating Oil for Replacement of R22 Refrigerant." It is directed to a "substitute refrigerant [that] has a temperature-pressure relationship similar to that of [R-22] chlorodifluoromethane, making the substitute refrigerant suitable for use with chlorodifluoromethane-based air-cooling systems." EX1001, Abstract. The substitute refrigerant can be "mixed with a relatively small percentage of a lubricating oil which is compatible with both the unit refrigerant and typical R-22 system design." *Id*.

The invention of the '179 Patent offers a number of benefits. According to the '179 Patent, "[i]t is expected that the present invention will gradually replace Refrigerant R-22 (chlorodifluoromethane) in Refrigerant R-22 (chlorodifluoromethane)-based air-cooling systems, without the need to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based systems for non-Refrigerant 22 replacement refrigerants." *Id*., at 6:58-63. The ability to replace R-22 in R-22-based refrigerant systems with less (or sometimes no) need for mechanical alterations, flushing refrigerant lines, adding alternative lubricants, or

taking other steps is a significant benefit. *Id.*, 6:27-30 ("The present refrigerant blend is designed ... as a replacement, in which little or no modifications including parts are used to adapt the system.").

The invention can be "utilized to replace Refrigerant R-22 ... that has escaped from [R-22-based refrigerant systems]" and also "utilized to completely refill apparatus that have been designed for use with Refrigerant R-22 ... , since the refrigerant has a temperature-pressure profile that closely approximates that of Refrigerant R-22." *Id.*, 5:7-14.

The invention also offers a number of benefits attributable to the inclusion of a lubricating oil in some claims. "The lubricating of the present system is miscible with the pentafluoroethane and tetrafluorethane blend and with R-22 refrigerant" (*id.*, 6:4-6), meaning that it mixes with both the new substitute refrigerant blend and also with the R-22 refrigerant it replaces, without separation. *See*, *e.g.*, https://www.merriam-webster.com/dictionary/miscible. Among other advantages, "[t]his allows for mixing of residual R-22 refrigerant and the refrigerant of the present invention, without the release of significant amounts of residual water in the dryer and subsequent system damage (as will happen if the [other] patents are used)." *Id.*, 6:6-11. "This solubility allows the replacement refrigerant blend to lubricate the

system, preventing damage to the compressor and component parts of the system." *Id*., 6:14-17.

Turning to the claims of the '179 Patent, Claims 1 and 21 are directed to an apparatus in which R-22 is substituted with refrigerant gases "consisting of" a ratio of R-125 (pentafluoroethane) and R-134a (1, 1, 1, 2-tetrafluoroethane). *Id*., 10:1-30 & 12:9-27. Claims 8 and 26 are directed to a method of refilling an apparatus designed for use with R-22 with refrigerant gases consisting of a ratio of R-125 and R-134a. *Id*., 10:50-11:16 & 12:40-65. Claims 15 and 31 are directed to a refrigerant composition with refrigerant gases consisting of a ratio of R-125 and R-134a. *Id*., 11:35-58 & 13:10-14:3.

The refrigerant gases in the refrigerant composition of independent Claims 1, 8, 15, 21, 26, and 31 consist of "pentafluoroethane ... in an amount of 59% to 57% by weight" and "tetrafluoroethane ... 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%, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane." *Id*., 10:13-20, 29 & 60-68; 11:16, 43-50, 58; 12:20-27 & 50-58, 64-65; 13:16-14:3. This refrigerant blend fits ASHRAE's definition of R-421a. EX2015, 3. Dependent Claims 5, 12, 18, 25, 30, and 35 further narrow the refrigerant compositions to "pentafluoroethane

... present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight."

Notably, Claim 1 of the '179 Patent recites "refrigerant gases *consisting of* a blend of tetrafluoroethane and pentafluoroethane," and all the other independent Claims 8, 15, 21, 26, and 31 identify the same two-component refrigerant gas composition. *Id*., 10:1-14:21. None of the claims of the '179 Patent encompass refrigerants gases other than R-125 (pentafluoroethane) and R-134a (1,1,1,2-tetrafluoroethane). Instead, all claims exclude other refrigerant gases, by use of the "consisting of" transition term. "Consisting of" is a term of art in patent drafting, and commonly relied upon in the chemical fields, to define inventions in part <u>*through the exclusion of other elements in compositions*</u>. *See*, *e.g.*, Section V.A; *CIAS, Inc. v. All. Gaming Corp.*, 504 F.3d 1356, 1361 (Fed. Cir. 2007) ("It is ... well understood in patent usage that 'consisting of' is closed-ended and conveys limitation and exclusion.").

Claim 1 of the '179 Patent also recites that "the ratio of the tetrafluoroethane to the pentafluoroethane [is] selected such that the blend exhibits a dew point at about -32˚F or a bubble point at about -41.5˚F," and the other independent Claims 8, 15, 21, 26, and 31 identify the same characteristics. *Id*., 10:1-14:21. The separate

significance of the claimed dew point or bubble point is discussed below in Section IV.C.

Claim 1 of the ’179 Patent also recites “lubricating oil ... present up to about 20% by weight of the refrigerant gases,” which is soluble in [R-22] chlorodifluoromethane, [R-134a] 1,1,1,2-tetrafluoroethane and [R-125] pentafluoroethane.” *Id*., 10:23-26. Claims 8 and 15 recite a similar lubricating oil. *Id*., 11:9-13, 52-55.

B. <u>Prosecution History of the ’179 Patent and Family</u>

The ’179 Patent ultimately claims the benefit of priority to the ’049 Provisional, filed September 8, 2003. EX1001, INID 60. The ’736 Application was the first to claim priority to the ’049 Provisional. Examiner Dr. John Hardee rejected the claims of the ’736 Application (*see*, *e.g.*, EX1005, 319-323) in view of Takigawa (EX1006), which has been cited as a secondary reference in this IPR. *See* Paper 4, 4-5. Patent Owner appealed Examiner Hardee’s rejections in view of Takigawa (EX1005, 168-181), although the Board affirmed the rejections. *Id*., 84-93. Notably, the claims of the ’736 Application that were pending at the time of the appeal are different than those granted in the ’179 Patent. *Compare* EX1005, 182-188 with EX1001, 10:1-14:21.

The ’736 Application was abandoned in favor of the application for the ’706 Patent. EX1004. Patent Owner filed the application for the ’706 Patent (EX1002) as a continuation of the ’736 application Patent. *See* EX1004. Examiner Hardee also rejected claims in the application for the ’706 Patent in view of Takigawa. *See*, *e.g.*, EX1004, 72-77. To expedite the ’706 Patent to grant, Patent Owner agreed to amend the claims to recite a lubricating oil that is both distinguished from Takigawa (*see* EX1004, 11-27, 26 (discussing that Takigawa teaches away from naphthenic-based lubricants) and different than that claimed in the ’179 Patent. *Compare* EX1002, 9:55-12:40 (independent claims reciting naphthenic-based lubricants) *with* EX1001, 10:1-14:21 (independent claims reciting lubricant of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof).

Patent Owner filed the application for the ’179 Patent as a continuation of the ’706 Patent. *See* EX1003. Examiner Hardee again rejected the claims in the application for the ’179 Patent in view of Takigawa. *See*, *e.g.*, EX1003, 264-270. Patent Owner submitted the Declaration of Kenneth M. Ponder on August 26, 2013 (*id*., 253-256) and submitted the Second Declaration of Kenneth M. Ponder on December 21, 2017 (*id*., 96-104) in support of the patentability of the claimed invention over Takigawa.

The Second Declaration of Kenneth M. Ponder included new evidence that was presented for the first time in the Patent Family. Among other evidence, Mr. Ponder presented data to show how the refrigerant blend of R-421a consisting of 58% R-125 and 42% R-134a unexpectedly outperforms a refrigerant blend consisting of 60% R-125 and 40% R-134a, which is within the wide range described by Takigawa.[5] *Id*., 99, ¶ 9 ("... its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (i.e., when most needed)."). Thus, Patent Owner presented unexpected results in the performance of R-421a, and Petitioners' arguments at pages 24-28 of the Petition are incorrect. The Board does not need to reach the question of unexpected results, however, as the Petition does not set forth a *prima facie* case of obviousness for Patent Owner to rebut for any claim, as detailed below in Section IX.

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[5] Patent Owner does not agree that Takigawa describes or suggests a blend of refrigerants consisting of only R-125 and R-134a and disputes any such finding of the Board in the Decision (*see* EX1005, 85-93) issued on April 29, 2020, to the extent found. Patent Owner reserves the right to present evidence and arguments to demonstrate that Takigawa does not describe refrigerant gases consisting of R-125 and R-134a.

Mr. Ponder also identified a "Table of Substitute Refrigerants Listed in SNAP Notice 25," including many refrigerant blends other than R-421a. *Id*., 100, ¶ 11. Mr. Ponder pointed out that not all refrigerant blends including combinations of R-125 and R-134a "are suitable for use with or as a substitute for R-22." *Id*., 101, ¶ 12. Mr. Ponder also pointed out that the only combinations of refrigerant blends including R-125 and R-134a to the exclusion of other refrigerants are the Choice® brand R-421A and R-421B refrigerants. *Id*. Mr. Ponder also identified that, while the bubble point for R-421a refrigerant "closely approximates that of [R-22], the blend dew point does not." *Id*., 103, ¶ 14. However, "to adjust the ratio of R125 and R134a ... [so that] its dew point of about -32˚F ... more closely matches ... [R-22] would negatively impact the aforementioned Global Warming Potential (GWP) of my refrigerant" (*id*.), which speaks to the counter-intuitive development concerns Mr. Ponder faced in his refrigerant formulation efforts.

Examiner Hardee withdrew the rejections in view of Takigawa in the Office Action mailed on February 23, 2018, after considering the Second Declaration. *Id*., 41-46. Examiner Hardee also issued a Notice of Allowance, leading to the '179 Patent, on April 5, 2018. *Id*., 11-53.

Patent Owner filed the application for the '949 Patent (EX2002) as a continuation of the '179 Patent on May 25, 2018. The prosecution history of the

’949 Patent (EX2003) is similar to that of the ’179 Patent, including rejections of the claims over Takigawa (*id.*, 182-189), the submission of declaration evidence from Mr. Ponder (*id.*, 144-154), and the withdrawal of the rejections and allowance of the ’949 Patent by Examiner Hardee. *Id.*, 23-30.

An important fact supporting the Board’s discretion to deny this Petition, Patent Owner submitted an Information Disclosure Statement (“IDS”) on April 30, 2020, during prosecution of the application for the ’949 Patent. *Id.*, 35-36. The IDS included four (4) of the seven (7) primary references relied upon in the grounds of invalidity in the Petition. *Compare Id.*, 35-36 *with* Paper 4, 17. Examiner Hardee reviewed and considered all the references cited in the IDS (*see* EX2003, 35-36 (indicating at footer that all references were considered) and issued a Notice of Allowance granting the ’949 Patent on May 18, 2020. *Id*., 23-30. The claims of the ’949 Patent are broader than the claims of the ’179 Patent (*Compare* EX1001 *with* EX2002), but Examiner Hardee still did not raise any rejections in view of the IDS.

Patent Owner filed the ’905 Application on July 6, 2020, as a continuation of the ’949 Patent. The ’905 Application is currently pending before Examiner Hardee at the Office.

C. Written Support for the '179 Patent in the '049 Provisional

The Petition states that "August 13, 2007, is the true priority date of the '179 Patent."[6] Paper 4, 13. According to the Petition, "the specification was amended to reflect the R421A formulation" on August 13, 2007. *Id*., 12 (suggesting that August 13, 2007, was the first time the Patent Family provided written support for the formulation of R-421a claimed by the '179 Patent). Petitioners are incorrect, however, because the claims of the '179 Patent were fully supported as of the filing date of the '049 Provisional on September 8, 2003. Thus, the earliest priority date of the '179 Patent is September 8, 2003.

The refrigerant gases claimed by the '179 Patent consist of R-125 "in an amount of 59% to 57% by weight" and R-134a "in an amount of 41% to 43%," or a narrower range of those components. EX1001, 10:1-14:21. The ratio of the R-125 and the R-134a in the refrigerant composition is also "selected such that the blend exhibits a dew point at about -32˚F or a bubble point at about -41.5˚F." *Id*. A

[6] Petitioners can raise grounds only under 35 U.S.C. §§ 102 or 103 in this IPR. 35 U.S.C. § 311. Patent Owner reserves the right to challenge Petitioners' arguments as to the priority date of the '179 Patent to the extent they extend beyond the Board's jurisdiction in this IPR.

PHOSITA would conclude that the inventors of the ’179 Patent had possession of that claimed refrigerant composition as of the filing date of the ’049 Provisional on September 8, 2003, because the original ’049 Provisional describes characteristics exhibited *by only* that claimed refrigerant blend.

Petitioners admit the fact that the ’049 Provisional describes characteristics that are *inherent* properties of the refrigerant composition claimed by the ’179 Patent. Paper 5, 15 (“the -32˚F dew point and the -41.5˚F bubble point recited in the claims of the ’179 patent are inherent properties of the R421A formulation.”). Petitioners’ expert Dr. Groll also takes steps to prove that fact. Paper 4, 13; EX1013, ¶¶86-88 (using Raoult’s Law to confirm the properties of R-421a described in the ’049 Provisional).

To satisfy the written description requirement, an application must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing. *Reiffin v. Microsoft Corp.*, 214 F.3d 1342, 1345 (Fed. Cir. 2000). “The function of the written description requirement is to ensure that the inventor had possession of the specific subject matter later claimed as of the filing date of the application relied on; how the specification accomplishes this is not material.” *In re Herschler*, 591 F.2d 693, 700 (CCPA 1979).

The original ’049 Provisional includes characteristic data exhibited by only a refrigerant composition consisting of R-125 and R-134a in the ratio claimed by the ’179 Patent. Among other characteristic data, the ’049 Provisional states:

> This invention shows the following points of interest concerning this blend for the
>
> Dew Point @ -32F
>
> Bubble Point @ -41.5F
>
> Glide @ 9.5 F

(EX1015, 14).

The dew point of -32˚F and the bubble point of -41.5˚F in a two-component refrigerant blend consisting of R-125 and R-134a can be found, according to Raoult’s Law, only for the ratio of R-125 and R-134a claimed by the ’179 Patent (*i.e.*, within a ratio consisting of R-125 “in an amount of 59% to 57% by weight” and R-134a “in an amount of 41% to 43%” or a narrower range of those components). Dr. Bivens has confirmed this for Patent Owner (EX2004, ¶46), and Dr. Groll has confirmed this for Petitioners. (EX1013, ¶¶84-88, 88 (stating that “the -32˚F dew point and the -41.5˚F bubble point recited in the claims of the’179 Patent are inherent properties of the R421A formulation.”)

To foreclose against any doubt, the reverse blend of 41% to 43% R-125 and 59% to 57% R-134a does not exhibit the dew point and bubble point characteristics described in the ’049 Provisional. Dr. Bivens has confirmed that the reverse blend

instead exhibits a -26˚F dew point and a -35.2˚F bubble point. EX2004, ¶¶48-49. In other words, only one ratio of R-125 to R-134a exhibits the dew point and bubble point characteristics described in the ’049 Provisional, and it is the one claimed by the’179 Patent. Accordingly, a PHOSITA can more than reasonably conclude (as it is in fact the *only* conclusion that can be drawn) that the inventors of the ’179 Patent had possession of the invention as early as the September 8, 2003, filing date of the ’049 Provisional.

Examiner Hardee came to this same conclusion during prosecution of the ’736 Application based on other evidence presented in the Declaration of Andy Gbur.[7] *See* EX1005, 333-335. Andy Gbur pointed to the temperature versus pressure profile curves and table data shown in Figure 1, Figure 2, and Table 2 of the ’736 Application, which is the same as that in the ’049 Provisional and in the ’179 Patent. *Id*. This data separately (*i.e.*, in addition to the dew and bubble point data discussed above) demonstrates that the inventors of the ’179 Patent were in possession of the

[7] Mr. Gbur has significant experience in the field of refrigerants and refrigerant formulation. Mr. Gbur was a voting member of ASHRAE’s Standard Project Committee 34, responsible for assigning R-designations to new refrigerants. EX1005, 472 & 480.

ratio of R-125 and R-134a claimed by the ’179 Patent as early as the September 8, 2003, filing date of the ’049 Provisional.

Petitioners point to the reverse blend of about 42% R-125 / 58% R-134a in the ’049 Provisional and other applications in the Patent Family. *See* Paper 4, 11-13. The inclusion of that description in the ’049 Provisional, whether by way of the description of alternate embodiments, inadvertent error, or for other reason(s), cannot overcome (and does not take away from) the fact that the ’049 Provisional shows possession of the claimed ratio of R-125 and R-134a in the ’179 Patent. The dew point and bubble point characteristics, temperature versus pressure profile curves, and table data in the ’049 Provisional all insist on that finding. *In re Herschler*, 591 F.2d at 700.

V. PERSON OF ORDINARY SKILL IN THE ART

A PHOSITA in the field to which the ’179 Patent is directed would have had at least a Bachelor of Science degree in chemistry, chemical engineering, or a related field or, as a substitute, at least three years of work or research experience in refrigerant formulation.

VI. CLAIM CONSTRUCTION

Beyond the constructions set forth below, Patent Owner reserves the right to offer constructions for other claim terms in other responses in this IPR.

A. **"consisting of"**

The "consisting of" transition is a term of art in patent drafting, and commonly relied upon in the chemical fields, to define inventions in part through the exclusion of other elements in compositions. *See*, *e.g.*, *Conoco, Inc. v. Energy & Envtl. Int'l*, 460 F.3d 1349, 1359 (Fed. Cir. 2006) ("'[C]onsisting of' is a term of art in patent law with its own construction ... ."); *CIAS, Inc.*, 504 F.3d at 1361 ("It is ... well understood in patent usage that 'consisting of' is closed-ended and conveys limitation and exclusion."). Further, when the phrase "consisting of" appears in the body of a claim, as it does in the '179 Patent, there is an "exceptionally strong presumption that a claim term set off with 'consisting of' is closed to unrecited elements." *Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp*., 831 F.3d 1350, 1359 (Fed. Cir. 2016).

Claim 1 of the '179 Patent recites "refrigerant gases consisting of a blend of [R-134a] tetrafluoroethane and [R-125] pentafluoroethane," and all the other independent Claims 8, 15, 21, 26, and 31 identify the same refrigerant gases using the "consisting of" term. *Id*., 10:1-14:21. Thus, the claims of the '179 Patent are directed to the "refrigerant gases" of R-125 and R-134a only, to the exclusion of other refrigerant gases.

A blend of three or more refrigerant gases would not infringe the '179 Patent, just like a prior art reference including a blend of three or more refrigerant gases would not anticipate the '179 Patent. This follows from the Supreme Court's proclamation from over a century ago that: "[t]hat which infringes, if later, would anticipate, if earlier." *Int'l Seaway Trading Corp. v. Walgreens Corp.*, 589 F.3d 1233, 1239 (Fed. Cir. 2009)(citing *Peters v. Active Mfg. Co.*, 129 U.S. 530 (1889)).

B. <u>"phase change"</u>

A "phase change" is a transition of matter from one physical state to another. The transition from the liquid state to the gaseous state is one example of a "phase change," although transitions of matter among other states are also encompassed by that term. The occurrence of a phase change is not inherent, however. Instead, a refrigerant gas can remain in a single state without a phase change for an indefinite period of time. Petitioner is incorrect that a refrigerant gas will necessarily undergo a "phase change," to the extent suggested by Petitioners in the Petition. Paper 4, 14.

C. <u>"dew point"</u>

The "dew point" of a refrigerant in the vapor phase is the temperature at which the refrigerant vapor begins to condense to a liquid, at a given pressure.

D. "bubble point"

The "bubble point" of a refrigerant in the liquid phase is the temperature at which the refrigerant liquid begins to boil away to a vapor, at a given pressure.

E. "glide"

The "glide" of a zeotropic refrigerant blend is the difference between the bubble point and the dew point for the refrigerant blend.

VII. OVERVIEW OF THE CITED REFERENCES

A. Goble

Goble (EX1008) was already considered by the Office. Goble was granted by Examiner Hardee on March 9, 2005. Examiner Hardee started examination on the '736 Application less than a year after granting Goble (*see* EX1005, 575 (first Office Action dated February 24, 2006)). Patent Owner also submitted Goble to the Office in an IDS filed on April 30, 2020 (EX2003, 46-47), and it was considered by Examiner Hardee. *Id*., 35. However, Examiner Hardee did not rely upon Goble in any rejections. Examiner Hardee considered another reference, Powell, discussed below as more relevant. EX2003, 29.

Goble is directed to "mixtures of refrigerants that may be substituted for HCFC-22, R-407C, R-417A, R-502, R-500, CFC-12, R-404A, HFC-134a, and others, and is usable in mineral oil systems." EX1008, Abstract. Goble describes

ternary, quaternary, and quinary mixtures of various refrigerants, including R-125, R-134a, R-E170, R-227ea, R-1270, and R-290. *Id*. Goble does not describe a refrigerant composition consisting of only R-125 and R-134a. *See*, *e.g.*, EX1008, 6:15-40 (describing R-125/R-134a/R-1270/R-290); 7:5-12 (describing R-1270/R-125/R-134a/R-E170); 7:30-35 (describing R-290/R-125/R-134a/R-227ea); 7:40-45 (Example 1 of R-1270/R-125/R-134a/R-E170); 8:15-20 (Example 2 of R-1270/R-125/R-134a/R-E170/R-227ea); 9:30-32 (Example 3 of R-290/R-125/R-134a/R-E170/R-227ea); 9:62-65 (Example 4 of R-1270/R-125/R-134a/R-E170). Goble describes other example refrigerant compositions, but none of them consist of only R-125 and R-134a.

Goble actually teaches away from a refrigerant composition consisting of only R-125 and R-134a. Goble teaches that "refrigerants comprised of hydrofluorocarbons (HFCs), or mixtures thereof, do not mix (are not miscible in) mineral oils used for the earlier CFC and HCFC refrigerants ... ." *Id*., 2:15-18. Goble recognizes the need to include certain components in addition to R-125 and R-134a in substitutes for R-22, for the solubility and movement of mineral oil, while acknowledging the tradeoff between solubility and flammability. *Id*., 6:54-63. Goble's "solution" is to start with R-125 and R-134a and then replace "6 weight percent of the R-125 with R-1270 and 4 weight percent of the R-134a with R-E170."

Id., 6:63-7:12. This mixture was used by Goble for flammability and mineral oil return testing. *Id*., 7:19-40. A mixture of 5% R-1270, however, was found to be "quite flammable," and further adjustments were made to include the hydrocarbon propane. *Id*., 7:28-32.

B. <u>Singh</u>

Singh (EX1011) was already considered by the Office. Singh was examined by Examiner Hardee and abandoned as of August 13, 2003. EX2005. EP Publication No. 1 295 928 is the European Patent Office publication of a counterpart application to Singh (*see* EX1005, 487 (identifying priority to Singh, U.S. App. No. 09/960,217, of September 21, 2001). Patent Owner submitted EP 1 295 928 to the Office on February 12, 2006 (*id*., 483, 487-493), during prosecution of the '736 Application, and it was considered by Examiner Hardee. *Id*., 349. Patent Owner also submitted Singh to the Office in an IDS filed on April 30, 2020 (EX2003, 46-47), and it was considered by Examiner Hardee. *Id*., 35. However, Examiner Hardee did not rely upon Singh in any rejections in the Patent Family. *See* EX1003-EX1005 & EX2003.

Singh is directed to "hydrofluorocarbon compositions suitable for use in a wide range of applications [which] tend to be soluble with hydrocarbon lubricating oils, and thus, are especially useful in replacing CFC and HCFC compositions in refrigeration applications." EX1011, Abstract. Singh recognizes that "it is

particularly advantageous for replacement HFC refrigerants to be not only soluble in lubricants in general, but to be soluble in the particular types of conventional lubricants used with CFC refrigerants." *Id*., ¶5.

Singh relies upon the inclusion of cyclopentane, a hydrocarbon, for lubricant solubility. Singh "overcomes the aforementioned shortcomings [of lubricant solubility] by providing for an HFC refrigerant that is not only soluble in conventional lubricants, but also has low flammability." *Id*., ¶10. "Specifically, the applicants have identified that an HFC refrigerant comprising pentafluoropropane ('R-125'), 1,1,1,2-tetrafluoroethane ('R-134a'), and the cyclopentane has unexpectedly high solubility with conventional lubricant oils while also being sufficiently non-flammable for refrigerant applications." *Id*. Singh does not describe any refrigerant composition consisting of only R-125 and R-134a, because every refrigerant composition of Singh also includes the hydrocarbon cyclopentane. *Id*., ¶¶41, 43, 47, 49, 51.

Like Goble, Singh actually teaches away from the use of only R-125 and R-134a. *Id*., ¶15 ("refrigerants comprising R-125 and/or R-134a have limited solubility—and thus limited use—in conventional lubricants"); ¶16 ("the use of even minor amounts of cyclopentane in refrigerants comprising R-125 and R-134a improves drastically the solubility of such refrigerants in conventional lubricants").

C. Powell

Powell (EX1007) was already considered by the Office. WO Publication No. 01/23493 is a Patent Cooperation Treaty ("PCT") publication of a counterpart application to Powell. Patent Owner submitted WO 01/23493 to the Office on February 12, 2006 (EX1005, 483, 495-526), during prosecution of the '736 Application, and it was considered by Examiner Hardee. *Id*., 349. Although neither WO 01/23493 nor Powell claim priority to each other, the disclosures of WO 01/23493 and Powell are the same (or substantially the same). *Compare* EX1005, 495-526 *with* EX1007.

Patent Owner also submitted Powell to the Office in an IDS filed on April 30, 2020 (EX2003, 46-47), and it was considered by Examiner Hardee. *Id*., 35. However, Examiner Hardee did not rely upon Powell or WO 01/23493 in any rejections in the Patent Family. *See* EX1003-EX1005 & EX2003. Examiner Hardee also issued a Notice of Allowance for the '949 Patent on the same day he returned the IDS indicating that Powell was considered. EX2003, 23-30. Examiner Hardee stated in the Notice of Allowance that:

> Among the references submitted in the IDS of April 30, 2020, the closest prior art is Powell et al., US 6,606,868. The reference discloses percentages of the two recited refrigerants which overlap with those presently recited, but a careful reading shows that these are only proportions of the refrigerants *and a third refrigerant, a hydrocarbon, is present in all compositions* motivated by the reference.

Id., 29 (emphasis added). Thus, Examiner Hardee expressly distinguished the claims of the '949 Patent from Powell, at least because Powell additionally includes a third refrigerant gas, a hydrocarbon. The claims of the '949 Patent are broader than those of the '179 Patent at issue in this IPR. *Compare* EX1001, 10:1-14:21 with EX2002, 10:22-12:40.

Powell describes "a refrigerant composition" comprising "1,1,1,2-tetrafluoroethane (R134a), pentafluoro ethane (R 125) and ... a saturated hydrocarbon or mixture thereof ... ." EX1007, 2:42-45. Powell describes refrigerant compositions including R-125, R-134a, and hydrocarbon pentane in some examples. *Id*., 4:52-53 5:45-46; 6:41-42; 7:40; 8:41-42; 9:42. Powell also describes other refrigerant compositions including R-125, R-134a, and other "hydrocarbon mixtures." *Id*., 10:41-42; 3:38-50. Powell does not describe any refrigerant compositions consisting of only R-125 and R-134a.

Like Goble and Singh, Powell actually teaches away from the use of only R-125 and R-134a. *Id*., 4:13-20 ("CFC and HCFC refrigerants are miscible with hydrocarbon oils and hence carry the oils around the circuit," but "HFC refrigerants ... have low mutual solubilities so effective oil return may not occur."); 4:23-25 (discussing Powell's solution to introduce a hydrocarbon with the R-125 and R-134a).

D. Pearson

Pearson (EX1009) was already considered by the Office. Patent Owner submitted Pearson to the Office in an IDS filed on April 30, 2020 (EX2003, 46), and it was considered by Examiner Hardee. *Id*., 35. However, Examiner Hardee did not rely upon Pearson in any rejections in the Patent Family. *See* EX1003-EX1005 & EX2003.

Pearson is directed to a replacement refrigerant for R22 comprising "pentafluoroethane (R125), tetrafluoroethane (R134a), a hydrocarbon selected from isobutane (R600a) and propane (R290), and optionally octafluoroethane (R218)." EX1009, Abstract. Pearson is specific to "forming mixtures of these three or four components in chosen proportions." *Id*., 1:65-68. Pearson does not describe any refrigerant compositions consisting of only R-125 and R-134a.

E. Federal Register

The Federal Register (EX1018) confirms that R-421a was accepted in the EPA's SNAP program as an approved substitute for R-22, due to Mr. Ponder's efforts. EX1018, 2. As discussed above in Section IV.C, the earliest priority date of the '179 Patent is September 8, 2003. The publication date of the Federal Register is later, September 28, 2006. *Id*., 1. Thus, the Federal Register is not prior art to the '179 Patent and is not applicable in this IPR.

F. Roberts

Roberts (EX1019) was granted on December 2, 2003. Roberts is directed to a three (minimum) component refrigerant composition comprising "(a) pentafluoroethane, octafluoropropane, trifluoromethoxydifluoromethane or hexafluoro-cyclopropane, or a mixture of two or more thereof ... (b) 1,1,1,2- or 1,1,2,2- tetrafluoroethane, trifluoromethoxypentafluoroethane, 1,2,2,3,3-heptafluoropropane or a mixture of two or more thereof, ... and (c) n-butane [R600] or isobutane [R600a] ... ." *Id*., Abstract. Both n-butane and isobutane are hydrocarbon refrigerant gases. Roberts does not describe any refrigerant compositions consisting of only R-125 and R-134a. *Id*., 1:59-63; 2:10-25.

G. Lemmon

Lemmon (EX1020) does not qualify as a "printed publication," as that term is used by the Office and 35 U.S.C. § 311(b)(limiting IPRs to "the basis of prior art consisting of patents or printed publications" only). Petitioners suggest that Lemmon "was published on August 30, 2002" (Paper 4, 74), but Petitioners did not produce sufficient evidence to support that claim. *In re Wyer*, 655 F.2d 221, 227 (CCPA 1981) ("the one who wishes to characterize the information, in whatever form it may be, as a 'printed publication' ... should produce sufficient proof of its dissemination or that it has otherwise been available and accessible to persons

concerned with the art to which the document relates and thus most likely to avail themselves of its contents.”).

Whether a document qualifies as a “printed publication” for the purposes of 35 U.S.C. § 102 is a question of law based on underlying findings of fact. *See In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986). “‘[P]ublic accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’” under 35 U.S.C. § 102. *SRI Int'l, Inc. v. Internet Sec. Sys.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) (citing *In re Hall*, 781 F.2d at 898-99). “A given reference is ‘publicly accessible’ upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.” *Suffolk Techs., LLC v. AOL Inc.*, 752 F.3d 1358, 1364 (Fed. Cir. 2014)(quoting *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d at 1194).

Petitioners appear to rely upon the so-called “Publication Date” identified at the https://www.osti.gov/biblio/808636 website to prove that Lemmon was publicly available on August 30, 2002. Paper 4, 74. Petitioners do not offer any other evidence to corroborate or prove that Lemmon was publicly available at that time. Petitioners have not accounted for the fact that the so-called “Publication Date” could refer to something other than a date of public accessibility. For example, the

"Publication Date" could mean "published internally," "printed but not distributed," or "available online but not indexed for searching."

The facts in this case are analogous to those in *In-Depth Geophysical, Inc. v. ConocoPhillips Company*, IPR2019-00849. In *In-Depth Geophysical*, Petitioners relied upon a certain date identified on a "Researchgate" website as proof that an associated "Li" reference was publicly available as of that date. The Board found this to be insufficient. *Id*., Paper 14, 9-13. The Board concluded that "Petitioners' pointing to a vague date listed on a website page was insufficient to meet Petitioners' burden to show that Li was publicly accessible by a particular date." *Id*., Paper 14, 10. The Board further stated that "the September 2012, date [on the Researchgate website], like the legend copyright notice, sheds virtually no light on whether the document was publicly accessible prior to November 1, 2012" and "[a]dditional evidence thus is necessary to support a showing of public accessibility." *Id*., Paper 14, 10-11. Notably, Lemmon is also identified at the https://aip.scitation.org/doi/pdf/10.1063/1.1649997 website as having a "Published Online" date of June 2004, which is later than the priority date of the Patent Family and conflicts with the so-called "Publication Date" at the https://www.osti.gov/biblio/808636 website. EX2006.

Accordingly, Petitioners have not shown Lemmon to qualify as a "printed publication" as that term is used by the Office and 35 U.S.C. § 311, and Lemmon is not applicable in this IPR.

Lemmon is an article titled "Equations of State for Mixtures of R-32, R-125, R0134a, R0143a, and R0152a." Lemmon describes mixture equations to evaluate the performance of refrigerants containing R-32, R-125, R-134a, R-143a, and R-152a. EX1020, 2. Lemmon does apply the disclosed model for the thermodynamic properties of a binary mixture of R-125 and R-134a (*id*., 9, 17-19), but does not identify any particular percentage-by-weight or ratio combination of R-125 and R-134a. *Id*.

H. <u>Takigawa</u>

Takigawa (EX1006), which is relied upon only as a secondary reference in this case, was already considered by the Office. *See* EX1003-EX1005 & EX2003.

Examiner Hardee rejected the claims in the application for the '179 Patent in view of Takigawa. *See*, *e.g.*, EX1003, 264-270. Patent Owner submitted the Declaration of Kenneth M. Ponder on August 26, 2013 (*id*., 253-256) and submitted the Second Declaration of Kenneth M. Ponder on December 21, 2017 (*id*., 96-104) in support of the patentability of the claimed invention over Takigawa. Examiner Hardee withdrew the rejections in view of Takigawa in the Office Action mailed on

February 23, 2018, after considering the Second Declaration of Kenneth M. Ponder. *Id*., 41-46. Examiner Hardee also issued a Notice of Allowance granting the '179 Patent on April 5, 2018. *Id*., 11-53.

VIII. REASONS TO DENY THE PETITION UNDER 35 U.S.C. § 314(a) AND 325(d)

Institution of *inter partes* review is always discretionary. 35 U.S.C. § 314(a); *Oil States Energy Servs. LLC v. Greene's Energy Grp.*, LLC, 138 S. Ct. 1365, 1371 (2018)("The Decision whether to institute inter partes review is committed to the Director's discretion."); 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, 7 (PTAB Feb. 13, 2020)(precedential)("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."). The Board should exercise its discretion under §§ 314(a) and 325(d) to deny institution of this IPR.

A. The Petition Relies on the Same or Substantially the Same References Already Presented to the Office

The Board should deny institution under 35 U.S.C. § 325(d) in view of the precedential decisions in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017)(precedential) and *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469,

Paper 6 (PTAB Dec. Feb. 13, 2020)(precedential), because the Petition is based on patents or publications that are either the same or substantially the same as those previously presented to the Office.

The Board can consider a number of factors in exercising the discretion to deny institution of this IPR. *Becton, Dickinson*, IPR2017-01586, Paper 8, 17-18. These factors include: (1) the similarities and material differences between the asserted art and the prior art involved during examination; (2) the cumulative nature of the asserted art and the prior art evaluated during examination; (3) the extent to which the asserted art was evaluated during examination; (4) the extent of the overlap between the arguments made during examination and the manner in which a petitioner relies on the prior art or a patent owner distinguishes the prior art; (5) whether a petitioner has pointed out sufficiently how the Examiner erred in evaluating the asserted prior art; and (6) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments. *Id.* As applied to the facts in this IPR, these factors weight heavily against institution of the Petition as discussed below.

In *Advanced Bionics*, the Board emphasized the following two-part framework in the analysis of the *Becton, Dickinson* factors: "(1) 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 first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims." *Advanced Bionics*, IPR2019-01469, Paper 6, 8. "If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review." *Id.*, 8-9.

The Petition relies upon the same references as those previously presented, considered, and dismissed by Examiner Hardee and the Office. Among the seven primary references in the Petition, four were cited by Patent Owner in IDSs filed with the Office, including Singh, Powell, Goble, and Pearson.[8] First, EP 1 295 928 is the European Patent Office publication of a counterpart application to Singh (*see*

[8] The Federal Register, Roberts, and Lemmon references were not made of record during prosecution of the Patent Family. However, the Federal Register reference is not prior art for the reasons discussed above in Section VII.E. Lemmon is not a printed publication for the reasons discussed above in Section VII.G. The Roberts and Lemmon references are merely cumulative to Singh, Powell, Goble, and Pearson in any case.

EX1005, 487 (identifying Singh, U.S. App. No. 09/960,217, of September 21, 2001, as priority application of EP Publication No. 1 295 928). EP 1 295 928 was submitted to the Office by Patent Owner in an IDS filed on February 12, 2006 (*Id*., 487-493), during prosecution of the '736 Application, and it was considered by Examiner Hardee. *Id*., 349.

Second, WO 01/23493 is a PCT publication of a counterpart application to Powell. WO 01/23493 was submitted to the Office by Patent Owner in an IDS filed on February 12, 2006 (*id*., 495-526), during prosecution of the '736 Application, and it was considered by Examiner Hardee. *Id*., 349. The disclosures of WO 01/23493 and Powell are the same (or substantially the same). *Compare id*., 495-526 *with* EX1007.

Third, Singh, Powell, Goble, and Pearson were submitted to the Office by Patent Owner in an IDS filed on April 30, 2020 (EX2003, 46-47), during prosecution of the '949 Patent, and those references were considered (and considered a second time for Singh and Powell) by Examiner Hardee. *Id*., 35. Examiner Hardee also issued a Notice of Allowance for the '949 Patent on the same day Examiner Hardee returned the IDS indicating that Singh, Powell, Goble, and Pearson were considered. *Id*., 23-30. Examiner Hardee stated in the Notice of Allowance that:

> Among the references submitted in the IDS of April 30, 2020, the closest prior art is Powell et al., US 6,606,868. The reference discloses

> percentages of the two recited refrigerants which overlap with those presently recited, but a careful reading shows that these are only proportions of the refrigerants *and a third refrigerant, a hydrocarbon, is present in all compositions* motivated by the reference.

Id., 29 (emphasis added). Thus, Examiner Hardee expressly recognized that the inclusion of a third (or more) refrigerant component in a refrigerant gas blend, as in Powell, is an important factor distinguishing the claimed invention from the prior art.

Petitioners have made no attempt in the Petition to explain how the Office erred in the consideration of Singh, Powell, Goble, and Pearson during prosecution of the Patent Family. Instead, the Petition simply ignores Examiner Hardee and the fact that Singh, Powell, Goble, and Pearson all describe refrigerant blends including at least three refrigerant gas components.

As discussed in Section IX below, the Petition does not explain why a PHOSITA would start with one of the refrigerant blends described in Singh, Powell, Goble, and Pearson—all of which include three or more refrigerant gas components—and remove or omit the additional components to arrive at a refrigerant composition consisting of only R-125 and R-134a.

As applied to the *Becton, Dickinson* factors, there is <u>*no difference*</u> between the Singh, Powell, Goble, and Pearson references submitted to the Office by Patent Owner in the April 30, 2020, IDS and those relied upon in the Petition. *Compare*

Paper 4, 17 *with* EX2003, 46-47. The record also shows that Examiner Hardee evaluated Singh, Powell, Goble, and Pearson to a good extent, given that he provided a direct statement in the Notice of Allowance as to the differences between the claimed invention and those references. EX2003, 29. However, Petitioners have not offered additional facts or evidence in the Petition to warrant reconsideration of Singh, Powell, Goble, or Pearson. Nor have Petitioners pointed out how Examiner Hardee erred in evaluating the references.

As applied to the *Advanced Bionics* framework, the Board should exercise its discretion not to institute this IPR. Patent Owner has established that the same or substantially the same references were already presented to and considered by the Office, but Petitioners have not demonstrated that the Office erred. *Advanced Bionics*, IPR2019-01469, Paper 6, 8. Under these conditions, "the Director generally will exercise discretion not to institute *inter partes* review." *Id.*, 8-9.

Accordingly, the facts, the *Becton, Dickinson* factors, and the *Advanced Bionics* framework weight in favor of the Board denying institution of the Petition under § 325(d).

B. Ambiguity, Failure to Identify Evidence, and Failure to Present Grounds of Unpatentability

The Board should also deny institution under 35 U.S.C. § 314(a) because the Petition is ambiguous, fails to identify evidence with particularity, and fails to

account for how each claim is unpatentable as required under 35 U.S.C. § 312(a)(3)[9] and 37 C.F.R. § 42.104(b).[10]

The Grounds identified in the Table at pages 4 and 5 of the Petition are ambiguous, particularly when taken in the context of the remainder of the Petition. As examples, Ground 2 identifies Goble as a secondary reference to Singh for Claim 1 in the Table, but the detailed analysis at pages 46-50 in the Petition does not reference Goble at all. Similarly, Ground 2 identifies Goble as a secondary reference to Singh for Claim 31 in the Table, but the detailed analysis at page 56 in the Petition does not reference Goble at all. Seebauer (EX1012) is referenced at page 44 in

[9] 35 U.S.C. § 312(a)(3) states that a petition may be considered only if "(3) the petition identifies, in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge ... ."

[10] 37 C.F.R. § 42.104(b) states that the Petition must identify how each "claim is unpatentable under the statutory grounds," "where each element of the claim is found in the prior art patents or printed publications relied upon," and "specific portions of the evidence that support the challenge."

connection with Ground 1, but Seebauer is not identified as a secondary reference in the Table. Several other inconsistencies can be identified with a cursory review.

The Petition presents detailed challenges to Claims 1-37 of the '179 Patent in Section VII. Paper 4, 30-75. The ambiguities in Section VII of the Petition are too great in number to address exhaustively. As examples:

1. The Petition admits at page 34 that Goble "does not teach the 20% limitation explicitly" and references both Takigawa and Singh, but the Petition does not provide any reasoned statement as to what teaching or suggestion is taken from Takigawa and/or Singh, why a PHOSITA would have been motivated to modify Goble, and what the result would have been.
2. In Grounds 1, 2, and 3, the Petition presents a claim chart for Claim 8, referring in each case only to the citations made in the previous chart for Claim 1. However, Claim 1 is an apparatus claim, Claim 8 is a method claim, and Claims 1 and 8 have different claim elements. *Id.*, 33-66.
3. In Ground 1, the Petition treats all the dependent claims in a group and as a whole, not individually or with particular citations to certain references for each claim element. *Id.*, 41-46.
4. For Grounds 2-4, the Petition is completely conclusory as to the dependent claims, without any citations to any references. *Id.*, 56-57, 66-67, 70.

5. In Ground 2, the Petition references Goble for claim elements 8.6 and 8.7, but the Petition does not provide any reasoned statement as to what teaching or suggestion is taken from Goble for combination with Singh, why a PHOSITA would have been motivated to modify Singh, and what the result would have been. *Id.*, 51.
6. In Ground 4, the Petition states that "the claim charts for independent claims 8, 15, 21, 26, and 31 are the same as those set forth for Powell in the previous Section (VII)(C)" and "are not reproduced here." *Id.*, 69-70. Ground 4 is based on Pearson—not Powell—, however, and the Board cannot be expected to extrapolate or guess at the identification of evidence for Petitioners.
7. As a final example, Ground 6 is covered in the Petition for all Claims 1-37 *in less than three full pages*, from pages 71-73. Ground 7 is covered *in less than two full pages*, from pages 74-75. Petitioners have not identified where each claim element is supposedly shown in the Roberts and Lemmon references. Nor have Petitioners provided reasoned statements as to the combinations of Roberts or Lemmon with the secondary references.

The Board cannot "adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner ... ." *In re Magnum Oil Tools Int'l., Ltd.*,

829 F.3d 1364, 1381 (Fed. Cir. 2016). "Instead, the Board must base its decision on arguments that were advanced by a party ... ." *Id.* The Board should not consider grounds, portions of the cited references, or evidence not explicitly identified by Petitioners in the Petition.

IX. DETAILED REASONS FOR DENYING THE PETITION

The Director may not authorize an *inter partes* review to be instituted unless "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). Section VII of the Petition, titled "Explanation of Grounds for Unpatentability," is largely incomplete as to every claim and does not meet the standard to show anticipation under 35 U.S.C. § 102, the standard to show obviousness under 35 U.S.C. § 103, or the burden to show a reasonable likelihood to prevail as to even one claim under 35 U.S.C. § 314.

As a quick introduction, the Petition does not address Claims 21-30 *at all*, for any ground. Every claim chart in the Petition for independent Claims 21 and 26 is in fact directed to (and lists) the elements of Claim 15. *See* Paper 4, 38 (chart for Claim 21 listing the elements of Claim 15), 39 (chart for Claim 26 listing the elements of Claim 15), 53-54, & 63-65. Thus, Petitioners cannot possibly prevail as to independent Claims 21 or 26 or Claims 22-25 or 27-30, which depend therefrom.

Additionally, the Petition overlooks the fact that Goble, Singh, Powell, Pearson, and Roberts all describe only refrigerant compositions including three, four, or more refrigerant gas components. None of the refrigerant compositions described in those references would infringe the claims of '179 Patent, because they all include refrigerant gases in addition to R-125 and R-134a. Thus, neither Goble, Singh, Powell, Pearson, nor Roberts anticipates refrigerant gases *consisting of* R-125 and R-134a, as claimed by the '179 Patent, under 35 U.S.C. § 102. This stems from the Supreme Court's proclamation from over a century ago that: "[t]hat which infringes, if later, would anticipate, if earlier." *Int'l Seaway Trading Corp. v. Walgreens Corp.*, 589 F.3d 1233, 1239 (Fed. Cir. 2009)(citing *Peters v. Active Mfg. Co.*, 129 U.S. 530 (1889)).

Because the cited references do not anticipate a refrigerant composition consisting of R-125 and R-134a, Petitioners *must establish why or how* a PHOSITA would have arrived at the two-component refrigerant composition of the '179 Patent under 35 U.S.C. § 103, but Petitioners have not done so. Petitioners rely upon *In re Wertheim*, 541 F.2d 257 (CCPA 1976), *In re Woodruff*, 919 F.2d 1575 (Fed. Cir. 1990), and *In re Geisler*, 116 F.3d 1465 (Fed. Cir. 1997)(see Paper 4, 22) for the law as to overlapping ranges, but the Board does not need to reach those questions. The Board does not have to reach the question of whether or not a *prima facie* case of

obviousness exists on the basis of wide (or even narrow) ranges of R-125 and R-134a in the cited references (to the extent they are shown), because Petitioners have not explained why a PHOSITA would have isolated or picked out only the R-125 and R-134a from refrigerant compositions of three, four, or more refrigerant gases.

A. Ground 1.A: Goble under 35 U.S.C. § 102

The Petition covers the challenge to Claims 1-37 of the '179 Patent under Ground 1.A at pages 30-46.

1. The Petition does not set forth any grounds for Claims 21-30

The Petition does not set forth any grounds for Claims 21-30, because the Petition completely omits those claims. For Goble as the primary reference, the claim charts in the Petition for independent Claims 21 and 26 are in fact directed to (and list) the elements of Claim 15. *See* Paper 4, 38 (chart for Claim 21 listing the elements of Claim 15), 39 (chart for Claim 26 listing the elements of Claim 15). The Groll Declaration includes the same omissions of Claims 15 and 26. EX1013, ¶¶145 & 146. Thus, Petitioners cannot possibly prevail with Goble as to independent Claims 21 or 26 or Claims 22-25 or 27-30, which depend therefrom, because the Petition does not challenge those claims.

It would be improper for the Board to consider any grounds, portions of the cited references, or other evidence or reasoning not explicitly set forth in the Petition.

The Board cannot "adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner ... ." *In re Magnum Oil Tools Int'l., Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016). Petitioners have not set forth any grounds of invalidity as to Claims 21-30 at all.

2. Goble does not anticipate Claims 31-37

The Petition states that "Goble fulfills the requirement for anticipating the '179 Patent's R421A formulation under 35 U.S.C. § 102 ... ." Paper 4, 31. The Petition is wrong. In order to anticipate under 35 U.S.C. § 102, a reference must disclose not only all elements of a claim, but must also disclose those elements "arranged as in the claim." *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). As applied to compositions of matter, a "reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972).

Goble does not describe refrigerant gases consisting of only R-125 and R-134a. *See*, *e.g.*, EX1008, 6:15-40 (describing R-125/R-134a/R-1270/R-290); 7:5-12 (describing R-1270/R-125/R-134a/R-E170); 7:30-35 (describing R-290/R-125/R-134a/R-227ea); 7:40-45 (Example 1 of R-1270/R-125/R-134a/R-E170); 8:15-20

(Example 2 of R-1270/R-125/R-134a/R-E170/R-227ea); 9:30-32 (Example 3 of R-290/R-125/R-134a/R-E170/R-227ea); 9:62-65 (Example 4 of R-1270/R-125/R-134a/R-E170). Goble describes other example refrigerant gas compositions, but none of them consist of only R-125 and R-134a.

At page 30, the Petition points to column 7, lines 6-9, of Goble, which states: "Applicant set the ratio of R125/R134a to establish a pressure temperature curve approximating R-22, which is roughly 56 weight percent R-125 and 44 weight percent R-134a." The above-quoted ratio is not a finished refrigerant composition of Goble, however, as it is only a precursor for further mixing. Goble goes on in the very next sentence to describe that "[n]ext, Applicant replaced 6 weight percent of the R-125 with R-1270 and 4 weight percent of the R-134a with R-E170." EX1008, 7:9-11. The finished blend "yielded R-1270/125/134a/E170," although this blend was found to be unacceptably flammable. *Id*., 7:11-12; 28-32. Just like in *In re Arkley*, there is nothing in Goble which "clearly and unequivocally" directs those skilled in the art to make the intermediary selection of the R-125/R-134a precursor, nor any indication that Goble ever made the selection himself. *In re Arkley*, 455 F.2d at 588 (C.C.P.A. 1972).

Accordingly, Goble does not anticipate Claim 31 or Claims 32-37, which depend therefrom, and the Board should deny institution of the Petition.

B. Ground 1.B: Goble in view of Singh and Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to Claims 1-37 of the '179 Patent under Ground 1.B at pages 30-46.

1. The Petition does not set forth any grounds for Claims 21-30

For Goble as the primary reference, the claim charts in the Petition for independent Claims 21 and 26 are in fact directed to (and list) the elements of Claim 15. *See* Paper 4, 38 (chart for Claim 21 listing the elements of Claim 15), 39 (chart for Claim 26 listing the elements of Claim 15). The Groll Declaration includes the same errors. EX1013, ¶¶145 & 146. The Petition does not challenge Claims 21 or 26 or Claims 22-25 or 27-30, which depend therefrom.

2. Goble in view of Singh and Takigawa do not present a *prima facie* case of obviousness as to Claims 1-20 and 31-37

The Petition merely assumes that Goble anticipates the refrigerant composition claimed by the '179 Patent. *See*, *e.g.*, Paper 4, 30 ("Goble thus ... discloses the 57-59% R125 and 41-43% R134a claimed"); 31 ("Goble fulfills the requirement for anticipating the '179 Patent's R421A formulation"). For the reasons discussed above in Section IX.A.2, however, Goble does not anticipate the refrigerant composition claimed by the '179 Patent.

The Petition also does not explain why or how a PHOSITA would arrive at a refrigerant composition of refrigerant gases consisting of only R-125 and R-134a in view of Goble, given the fact that Goble only describes refrigerant compositions including other refrigerant gases.

The Petition presents some reasoning to suggest why the ranges of R-125 and R-134a in Goble's R-125/R-134a precursor could present a *prima facie* case.[11] *See* Paper 4, 30-31. However, the Petition does not present any reasoning or analysis to address the *preceding* question, why a PHOSITA would separately pick out only the R-125/R-134a precursor of Goble.[12] *Id*., 30-46. Alternatively, the Petition does not present any reasoning or analysis to explain why a PHOSITA would omit or remove the other refrigerants, such as R-1270 and E170, from the final refrigerant compositions described by Goble. *Id*.

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[11] Patent Owner does not agree that Goble renders the ranges obvious, and Patent Owner reserves the right to present evidence and arguments to the contrary.

[12] Goble teaches away from separately picking out the R-125/R-134a precursor. EX1008, 6:54-7:12 (teaching the need for other refrigerants for moving mineral oil in R-22 substitutes).

The Petition does not attempt to cure this problem using knowledge available to a PHOSITA, some teaching or suggestion in Goble, or any other teaching or suggestion in either Singh or Takigawa. *Id*. Instead, Petitioners assume the ability to selectively pick out certain refrigerant components from Goble. *Id*., 33 (the "'consisting' language excludes the ... additional refrigerants [from Goble]"). Petitioners' approach is improper. *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972). Petitioners do not consider Goble as a whole, and Petitioners' have not established any reason for the "pick" or "choose" approach using the appropriate analysis under 35 U.S.C. § 103.

At the same time, Goble actually teaches away from a refrigerant composition consisting of only R-125 and R-134a, but Petitioners have not addressed this either. Goble teaches that "refrigerants comprised of hydrofluorocarbons (HFCs), or mixtures thereof, do not mix (are not miscible in) mineral oils used for the earlier CFC and HCFC refrigerants ... ." EX1008, 2:15-18. Goble recognizes the need to include certain components in addition to R-125 and R-134a in substitutes for R-22, for the solubility and movement of mineral oil, while acknowledging the tradeoff between solubility and flammability. *Id*., 6:54-63. Goble's "solution" is to start with R-125 and R-134a and then replace "6 weight percent of the R-125 with R-1270 and

4 weight percent of the R-134a with R-E170." *Id*., 6:63-7:12. This mixture was used by Goble for testing mineral oil return. *Id*., 7:38-40.

Accordingly, Ground 1.B does not establish a *prima facie* case of obviousness as to Claims 1-20 and 31-37, and the Board should deny institution of the Petition. The Board should also deny institution of the Petition under § 325(d) because Goble was already considered by the Office and under § 314(a) because the Petition is ambiguous as to the grounds of invalidity including Goble. *See* Sections VIII.A and VIII.B.

C. Ground 2: Singh in view of Goble or Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to Claims 1-37 of the '179 Patent under Ground 2 at pages 46-57.

1. The Petition does not set forth any grounds for Claims 21-30

For Singh as the primary reference, the claim charts in the Petition for independent Claims 21 and 26 are in fact directed to (and list) the elements of Claim 15. *See* Paper 4, 53 (chart for Claim 21 listing the elements of Claim 15), 54 (chart for Claim 26 listing the elements of Claim 15). The Groll Declaration includes the same errors. EX1013, ¶¶175 & 176. The Petition does not challenge Claims 21 or 26 or Claims 22-25 or 27-30, which depend therefrom.

2. Singh in view of Goble and Takigawa do not present a *prima facie* case of obviousness as to Claims 1-20 and 31-37

The Petition does not explain why or how a PHOSITA would arrive at refrigerant gases consisting of only R-125 and R-134a in view of Singh, given the fact that Singh only describes refrigerant compositions including other refrigerant gases.

Singh describes refrigerant gases including cyclopentane, a hydrocarbon, for lubricant solubility. Singh "overcomes the aforementioned shortcomings [of lubricant solubility] by providing for an HFC refrigerant that is not only soluble in conventional lubricants, but also has low flammability." EX1011, ¶10. "Specifically, the applicants have identified that an HFC refrigerant comprising pentafluoropropane ('R-125'), 1,1,1,2-tetrafluoroethane ('R-134a'), and cyclopentane has unexpectedly high solubility with conventional lubricant oils while also being sufficiently non-flammable for refrigerant applications." *Id*. Singh does not describe any refrigerant composition consisting of only R-125 and R-134a, because every refrigerant composition of Singh also includes the hydrocarbon cyclopentane. *Id*., ¶¶41, 43, 47, 49, 51.

The Petition does not present any reasoning or analysis to address the question of why a PHOSITA would separately pick out only the R-125 and R-134a components from the refrigerant gases described by Singh. Paper 4, 46-57.

Alternatively, the Petition does not present any reasoning or analysis to explain why a PHOSITA would omit or remove the other refrigerants, such as cyclopentane, from the refrigerant gases described by Singh. *Id*.

Like Goble, Singh actually teaches away from the use of only R-125 and R-134a. *Id*., ¶15 ("refrigerants comprising R-125 and/or R-134a have limited solubility—and thus limited use—in conventional lubricants"); ¶16 ("the use of even minor amounts of cyclopentane in refrigerants comprising R-125 and R-134a improves drastically the solubility of such refrigerants in conventional lubricants").

Accordingly, Ground 2 does not establish a *prima facie* case of obviousness as to Claims 1-20 and 31-37, and the Board should deny institution of the Petition. The Board should also deny institution of the Petition under § 325(d) because Singh was already considered by the Office and under § 314(a) because the Petition is ambiguous as to the grounds of invalidity including Singh. *See* Sections VIII.A and VIII.B.

D. Ground 3: Powell in view of Goble, Singh, and Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to Claims 1-37 of the '179 Patent under Ground 3 at pages 57-66.

1. The Petition does not set forth any grounds for Claims 21-30

For Powell as the primary reference, the claim charts in the Petition for independent Claims 21 and 26 are in fact directed to (and list) the elements of Claim 15. *See* Paper 4, 63 (chart for Claim 21 listing the elements of Claim 15), 64 (chart for Claim 26 listing the elements of Claim 15). The Groll Declaration includes the same errors. EX1013, ¶¶193 & 194. The Petition does not challenge Claims 21 or 26 or Claims 22-25 or 27-30, which depend therefrom.

2. Powell in view of Goble, Singh, and Takigawa do not present a *prima facie* case of obviousness as to Claims 1-20 and 31-37

The Petition does not explain why or how a PHOSITA would arrive at a refrigerant composition of refrigerant gases consisting of only R-125 and R-134a in view of Powell, given the fact that Powell only describes refrigerant compositions including other refrigerant gases.

Powell describes "a refrigerant composition" comprising "1,1,1,2-tetrafluoroethane (R134a), pentafluoro ethane (R 125) and ... a saturated hydrocarbon or mixture thereof ... ." EX1007, 2:42-45. Powell describes refrigerant compositions including R-125, R-134a, and the hydrocarbon pentane in some examples. *Id*., 4:52-53 5:45-46; 6:41-42; 7:40; 8:41-42; 9:42. Powell also describes other refrigerant compositions including R-125, R-134a, and other "hydrocarbon

mixtures." *Id*., 10:41-42; 3:38-50. Powell does not describe any refrigerant compositions consisting of only R-125 and R-134a.

The Petition does not present any reasoning or analysis to address the question of why a PHOSITA would separately pick out only the R-125 and R-134a components from the refrigerant gases described by Powell. Paper 4, 57-66. Alternatively, the Petition does not present any reasoning or analysis to explain why a PHOSITA would omit or remove the other refrigerants, such as the hydrocarbon or hydrocarbon mixtures, from the refrigerant gases described by Powell. *Id*.

Like Goble and Singh, Powell actually teaches away from the use of only R-125 and R-134a. *Id*., 4:13-20 ("CFC and HCFC refrigerants are miscible with hydrocarbon oils and hence carry the oils around the circuit," but "HFC refrigerants ... have low mutual solubilities so effective oil return may not occur."); 4:23-25 (discussing Powell's solution to introduce a hydrocarbon with the R-125 and R-134a).

Accordingly, Ground 2 does not establish a *prima facie* case of obviousness as to Claims 1-20 and 31-37, and the Board should deny institution of the Petition. The Board should also deny institution of the Petition under § 325(d) because Powell was already considered by the Office and under § 314(a) because the Petition is

ambiguous as to the grounds of invalidity including Powell. *See* Sections VIII.A and VIII.B.

E. Ground 4: Pearson in view of Goble, Singh, and Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to Claims 1-37 of the '179 Patent under Ground 4 at pages 67-70.

1. The Petition does not set forth any grounds for Claims 8-37

For Pearson as the primary reference, the Petition sets forth a claim chart for only claim 1. *See* Paper 4, 67-70 (chart for only Claim 1 of the '179 Patent). The Petition merely states that "[t]he claim charts for independent claims 8, 15, 21, 26 and 31 are the same as those set forth for Powell in the previous Section (VII)(C)" and "are not reproduced here." *Id*., 69-70. However, the citations to Powell cannot be relied upon to set forth a prima facie case as to Pearson. Again, the Board cannot "adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner ... ." *In re Magnum Oil Tools Int'l., Ltd.*, 829 F.3d at 1381. Thus, Petitioners cannot possibly prevail with Pearson as to independent Claims 8, 15, 21, 26, or 31 or Claims 9-14, 15-20, 22-25, 27-30, or 32-37, which depend therefrom, because the Petition does not challenge those claims based on Pearson.

2. Pearson in view of Goble, Singh, and Takigawa do not present a *prima facie* case of obviousness as to Claims 1-8

The Petition does not explain why or how a PHOSITA would arrive at refrigerant gases consisting of only R-125 and R-134a in view of Pearson, given the fact that Pearson only describes refrigerant compositions including other refrigerant gases.

Pearson is directed to a replacement refrigerant for R22 comprising "pentafluoroethane (R125), tetrafluoroethane (R134a), a hydrocarbon selected from isobutane (R600a) and propane (R290), and optionally octafluoroethane (R218)." EX1009, Abstract. Pearson is specific to "forming mixtures of these three or four components in chosen proportions." *Id*., 1:65-68. Pearson does not describe any refrigerant compositions consisting of only R-125 and R-134a.

The Petition does not present any reasoning or analysis to address the question of why a PHOSITA would separately pick out only the R-125 and R-134a components from the larger combination of refrigerant gases described by Pearson. Paper 4, 67-70. Alternatively, the Petition does not present any reasoning or analysis to explain why a PHOSITA would omit or remove the hydrocarbon refrigerant selected from isobutane (R600a) and propane (R290) from the refrigerant compositions described by Pearson. *Id*.

Accordingly, Ground 4 does not establish a *prima facie* case of obviousness as to Claims 1-8, and the Board should deny institution of the Petition. The Board should also deny institution of the Petition under § 325(d) because Powell was already considered by the Office and under § 314(a) because the Petition is ambiguous as to the grounds of invalidity including Powell. *See* Sections VIII.A and VIII.B.

F. Ground 5: Federal Register in view of Goble, Singh, and Takigawa under 35 U.S.C. § 103

As discussed above in Section IV.C, the earliest priority date of the '179 Patent is September 8, 2003. The publication date of the Federal Register is later, at September 28, 2006. EX1018, 1. Thus, the Federal Register is not prior art to the '179 Patent and is not applicable in this IPR. Accordingly, Ground 5 does not establish a *prima facie* case of obviousness, and the Board should deny institution of the Petition.

G. Ground 6: Roberts in view of Goble, Singh, and Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to all Claims 1-37 of the '179 Patent under Ground 6 *in less than three full pages*, from pages 71-73.

1. The Petition does not set forth a complete challenge for any claim

For Roberts as the primary reference, the Petition fails to set forth a complete challenge as to any independent claim of the '179 Patent. *See* Paper 4, 71-73 (failing to cover the elements of any complete claim). Again, the Board cannot "adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner ... ." *In re Magnum Oil Tools Int'l., Ltd.*, 829 F.3d at 1381.

Further, the Petition does not explain why or how a PHOSITA would arrive at a refrigerant composition of refrigerant gases consisting of only R-125 and R-134a in view of Roberts, given the fact that Roberts only describes refrigerant compositions including other refrigerant gases. Roberts describes a three (minimum) component refrigerant composition of "(a) pentafluoroethane, octafluoropropane, trifluoromethoxydifluoromethane or hexafluoro-cyclopropane, or a mixture of two or more thereof ... (b) 1,1,1,2- or 1,1,2,2- tetrafluoroethane, trifluoromethoxypentafluoroethane, 1,2,2,3,3-heptafluoropropane or a mixture of two or more thereof, ... and (c) n-butane [R600] or isobutane [R600a] ... ," with both n-butane and isobutane being a hydrocarbon. EX1019, Abstract. Roberts does not describe any refrigerant compositions consisting of only R-125 and R-134a. *Id.*, 1:59-63; 2:10-25.

The Petition does not present any reasoning or analysis to address the question of why a PHOSITA would separately pick out only the R-125 and R-134a components from the larger combination of refrigerant gases described by Roberts. Paper 4, 71-73. Alternatively, the Petition does not present any reasoning or analysis to explain why a PHOSITA would omit or remove the other refrigerants from the refrigerant compositions described by Roberts. *Id*.

Accordingly, Ground 6 does not establish a *prima facie* case of obviousness as to Claims 1-37, and the Board should deny institution of the Petition.

H. Ground 7: Lemmon in view of Goble, Singh, and Takigawa under 35 U.S.C. § 103

The Petition covers the challenge to all Claims 1-37 of the ’179 Patent under Ground 7 *in less than two full pages*, from pages 74-75.

1. Lemmon is not prior art to the ’179 Patent

For the reasons discussed above in Section VII.G, Petitioners have not established Lemmon as prior art to the ’179 Patent.

2. The Petition does not set forth a complete challenge for any claim

For Lemmon as the primary reference, the Petition fails to set forth a complete challenge as to any independent claim of the ’179 Patent. *See* Paper 4, 73-74 (failing to cover the elements of any complete claim). Again, the Board cannot “adopt

arguments on behalf of petitioners that could have been, but were not, raised by the petitioner ... ." *In re Magnum Oil Tools Int'l., Ltd.*, 829 F.3d at 1381. Lemmon also does not identify any particular percentage-by-weight ratio of R-125 and R-134a. EX1020, 9, 17-19.

Accordingly, Ground 7 does not establish a *prima facie* case of obviousness as to Claims 1-37, and the Board should deny institution of the Petition.

X. CONCLUSION

For at least the reasons discussed above, the Petition fails to establish a reasonable likelihood that Petitioners would prevail with respect to any claim of the '179 Patent. Patent Owner's arguments are without prejudice or disclaimer. Patent Owner has not acquiesced to any allegations in the Petition and reserves the right to address Petitioners' contentions in this IPR.

Dated: January 22, 2021

Respectfully submitted,

/Jason M. Perilla/

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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on the 22nd day of January, 2021, a complete and entire copy of the foregoing Patent Owner's Preliminary Response, including the exhibits relied upon, was served on counsel of record for Petitioners, as follows:

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electronically, via e-mail, at: eroney@smithlaw.com, robert.goozner2@gmail.com, and edward.manzo@huschblackwell.com, by consent of counsel of record for Petitioners.

Dated: January 22, 2021

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Patent Owner's Preliminary Response, excluding the portions exempted under 37 C.F.R. § 42.24(b), contains 13,953 words according to Microsoft Word.

Dated: January 22, 2021

Respectfully submitted,

/Jason M. Perilla/

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