

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DABICO AIRPORT SOLUTIONS INC.,
Petitioner,

v.

AXA POWER APS,
Patent Owner.

Inter Partes Review No. IPR2025-00408

U.S. Patent No. 9,771,169

**PATENT OWNER'S BRIEF REQUESTING
DISCRETIONARY DENIAL UNDER 35 U.S.C. § 325(d) AND/OR § 314(a)**

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2002	U.S. Patent No. 4,006,603
2003	https://www.inventionh.com/5-critical-variable-frequency-drive-limitations/
2004	U.S. Patent No. 7,207,183
2005	U.S. Patent No. 6,362,432
2006	U.S. Patent No. 4,272,967
2007	U.S. Patent No. 4,352,273
2008	U.S. Patent No. 4,835,977
2009	U.S. Patent No. 5,031,690
2010	U.S. Patent No. 5,383,335
2011	U.S. Patent Pub. No. 2010/0031676A1
2012	https://www.adelte.com/airports/preconditioned-air-zephir/#:~:text=Preconditioned%20Air%20Unit%20specifications&text=Zephir%20Series%20are%20designed%20and,while%20consuming%20the%20minimum%20energy.
2013	https://fcxinc.com/pre-conditioned-air/20-150-ton-rating-pre-conditioned-air/
2014	https://www.avicorp.com/civil-aviation/preconditioned-air
2015	Judgment on Interim Injunction (High Court of Delhi)
2016	U.S. Patent No. 6,446,447
2017	U.S. Patent No. 2007/0209383
2018	U.S. Patent No. 6,600,278
2019	Understanding Variable Speed Drives (Part 3) (“UVSD”)

I. INTRODUCTION

Patent Owner AXA Power ApS,¹ (“Patent Owner”) submits this brief under the March 26, 2025 Memorandum from the Acting Director of the USPTO (“Director Memorandum”), in support of Patent Owner’s request that the Board exercise its discretion under 35 U.S.C. § 325(d) and/or 35 U.S.C. § 314(a) to deny institution. The Petition filed by Dabico Airport Solutions Inc. (“Dabico” or “Petitioner”) is a perfect example of one that raises “substantially the same” art and arguments that the Examiner considered. Denial is appropriate for at least the following reasons:

1. The prior art relied on in the Petition is identical in substance to the art relied on by the Examiner during prosecution. For each element of the issued claims, the Examiner during prosecution had cited a prior art reference. The Petition just cites to different prior art disclosing the same claim elements. Petitioner does ***not point to any element in any claim*** that was missing in the art cited by the Examiner but allegedly disclosed in the art cited in the Petition.

¹ As set forth in Patent Owner’s Mandatory Notice (Paper 4), Patent Owner recorded a Change of Name reflecting that its name has officially changed to ITW GSE ApS. The company also still carries on business under the secondary legal name AXA Power ApS. No assignment or change of ownership was involved.

2. The arguments raised in the Petition are identical to those raised by the Examiner in his rejections. During prosecution the Examiner asserted *the same* obviousness theories and same motivations to combine the same prior art elements, but ultimately allowed the claims.

3. Petitioner does not allege any Examiner error.

4. The Petition lacks substantive merit, which highlights the lack of any Examiner error. *See* Director Memorandum at 2 (in exercising discretionary denial, the Board may consider “the strength of the unpatentability challenge” and “[a]ny other considerations bearing on the Director’s discretion.”).² Granting discretionary denial avoids unnecessary further burden on PTAB resources. Among other things:

- Petitioner’s own cited prior art expressly teaches away from the claims of the ‘169 patent, e.g., using a separate variable frequency drive (“VFD”) for each compressor in a multi-compressor refrigeration system.

- Petitioner’s motivations to combine are conclusory and make no sense. Petitioner’s expert (Leeb) does not address a motivation for every claim element, e.g., a motivation to specifically use a separate VFD for each compressor, as opposed to just a motivation to use VFD in general. And Petitioner’s asserted

² Patent Owner reserves its rights with respect to prejudice or timing regarding the Director’s Memorandum.

combinations/modifications would have only added unnecessary complexity, cost, and components without any benefit or functionality beyond what the prior art already included.

- Petitioner does not explain how, given that the advantages of VFDs were known since the 1960s, ***nobody*** had used separate VFDs on each compressor in a multi-compressor aircraft preconditioned air unit (“PCA”)—***none*** of the numerous PCA references cited by the Examiner or Petitioner disclose this element.

Indeed, Petitioner’s entire theme for the Petition is misleading. Petitioner suggests that the Examiner allegedly allowed the claims of the ‘169 patent only in view of certain limitations that were introduced via amendment. *See* Petition at 1-2, 8-10. Petitioner implies that the Examiner found that the prior art before the Office does *not* disclose these limitations, whereas the art relied upon in the Petition allegedly *does*. But that story is not correct. The Examiner had already found that the prior art before the Office separately disclosed all the elements of the issued claims, including those that were moved via amendment from dependent claims to independent claims. The Examiner simply reconsidered his obviousness rejection and found the ‘169 patent claims were not obvious. Yet now, Petitioner repeats those same obviousness arguments, using the same motivations to combine, but just with

different art disclosing the same features.³

In short, part one of the two-part *Advanced Bionics* framework for discretionary denial under 35 U.S.C. § 325(d) is met here, with both the art and argument for combining that art being substantially the same. For part two, Petitioner has not even argued a material error by the Office, and there is none here. The Board should exercise its discretion and not institute review.

II. BACKGROUND

A. The ‘169 Patent

Patent Owner is the world’s leading supplier of aircraft ground power units and pre-conditioned air units (“PCAs”). See <https://itwgse.com/>. An example of one of Patent Owner’s innovative PCA products is its patented ITW GSE 3500 PCA, shown below:

³ Petitioner may attempt to use a response brief (see Director Memorandum at 2) to seek a do-over of its deficient discretionary denial arguments in the Petition. The Board should reject that attempt. See, e.g., *Edwards Life Sci., Corp. v. Boston Scientific Scimed, Inc.*, IPR2017-00444, Paper 8 at 3 (P.T.A.B. May 22, 2017) (finding that a Petitioner’s arguments on substantial similarity of art and arguments under §325(d) are limited to those raised in the Petition).



See id. The GSE 3500 PCA has been extremely successful since its release in November 2022. The GSE 3500 PCA was named the 2023 *Ground Support Worldwide* Product Leader of the Year. *See* Exhibit 2001, <https://www.aviationpros.com/gse/gpus-pcas-power-carts-accessories/article/53057274/2023-ground-support-worldwide-leaders-of-the-year-itw-gse-2023-product-leader-of-the-year>. Among the features of the GSE 3500 PCA that third parties in the industry have recognized as being innovative are (1) its “Variable Frequency Drive (VFD) technology, which enables stepless regulation of discharge temperatures,” (2) its “automated aircraft type detection [that] makes the 3500 the only PCA on the market to automatically adapt its airflow to the specific aircraft type – and not just an aircraft category,” (3) its “Intellegent Power Management (IPM),” which “allocates power dynamically to the different units” drawing power at the aircraft gate, and (4) its failure detection circuitry so that “[i]n the event a module is not working, the PCA

does not shut down entirely.” *See id.*

These innovations of the ITW GSE 3500 PCA are claimed in the ‘169 patent, which issued from a PCT application filed March 18, 2010. The inventors of the ‘169 patent began by recognizing that “cost, efficiency, flexibility, and serviceability” were all issues with then-existing preconditioned air units. *See* ‘169 patent at 1:32-33. The solution that the inventors of the ‘169 patent arrived at is a synergistic combination of several concepts that flew in the face of conventional PCA wisdom, i.e., a PCA having: (1) multiple refrigeration units that could each individually be varied using their own variable frequency driver (“VFD”), which works hand-in-hand with implementing (2) the option for modular, self-contained refrigeration units that could be quickly pulled out and replaced by someone with no refrigeration experience, (3) failure detection and failure bypass for individual refrigeration units, and (4) cooling that can automatically adapt to not just the aircraft category, but the specific aircraft type.

1. Limitations of VFD Technology Were Well Known

Before the ‘169 patent it was known for decades that variable frequency drives could provide the ability to vary a refrigeration compressor motor’s power, which in turn could be used to vary the cooling output of a refrigeration system. *See, e.g.,* ‘169 patent at 8:23-25; Exhibit 2002, U.S. Patent No. 4,006,603 (a 1977 patent directed to using VFDs in a railcar cooling compressor to vary cooling output).

Additionally, it was known that a VFD can also increase efficiency in some instances. *See* Exhibit 2003, <https://www.inventionh.com/5-critical-variable-frequency-drive-limitations/> (“A VFD can also make a motor more efficient, but only at reduced load and/or reduced speed. A drive system will not use less power when the motor is running at rated speed and rated load. In fact, it uses slightly more due to the losses within the drive.”).

But it was also known before the ‘169 patent that VFDs have a number of serious drawbacks, resulting in reasons to avoid using multiple VFDs in an electrical system when just one VFD will provide the same benefits. For example, one of Petitioner’s cited references, WO2007/046794A1 to Taras (“Taras”), discloses some of the problems with VFDs:

In machinery that is driven by variable speed drives, there is approximately a five to ten percent penalty in power and efficiency due to losses associated with the operation of the variable speed drive. This efficiency loss or additional power draw is one of the *drawbacks that has limited the application of variable speed drives* in industrial or other installations Further, *variable speed drive electronics generate heat* and are frequently required to be cooled with an external source... *Also, variable speed drives often present a source of unreliability reducing overall system maintenance and uninterrupted service intervals.*

Taras at para 2 (emphasis added). Taras taught that it was preferable to just use one VFD to vary the power output of all motors in a refrigeration system at once—especially when all that matters is the overall cooling output of the system. *See* Taras at Fig. 2. Similarly, other patents known in the art, such as U.S. Patent No. 7,207,183

recognized that it was undesirable to use a VFD on each compressor of a multi-compressor refrigeration system because “the overall chiller system becomes more expensive” compared to “a single drive of the same output power rating.” Exhibit 2004 at 1:35-40. And U.S. Patent No. 6,362,432 recognizes that VFDs can cause “electromagnetic noise and radio frequency interference.” Exhibit 2005 at 1:20-24.

Coupled with these known problems with VFDs is that before the ‘169 patent, *POSITAs did not see any reason or benefit in providing a separate VFD associated with each compressor* of a multi-compressor refrigeration system, much less any reason that would overcome the above-discussed drawbacks with VFDs. Despite VFDs existing since the 1960/1970’s, *none* of Petitioner’s references, the references cited during prosecution of the ‘169 patent, or the references cited in proceedings on a related Indian patent disclose using *a VFD with each compressor* in a multi-compressor aircraft PCA:

Date	PCA Reference	Cited in	Discloses
1981	Exhibit 2006, US 4,272,967	Indian proceedings	No VFD
1982	Exhibit 2007, US 4,352,273	Indian proceedings	No VFD
1989	Exhibit 2008, US 4,835,977	Indian proceedings	No VFD
1991	Exhibit 2009, US 5,031,690	Indian proceedings	No VFD

1995	Exhibit 2010, US 5,383,335	Prosecution	No VFD; “variable” fan disclosed by using variable pitch fan blades
1998	US 5,715,701 (“Kreymer”)	IPR Petition	No VFD
1998	DE29622089 (“Lechmotoren”)	IPR Petition	One “regulator” associated with the central controller
2010	Exhibit 2011, US 2010/0031676A1	Prosecution	VFD on fan only (<i>see</i> [0049])

This makes sense, given that conventionally there would have been no reason to provide a VFD on each compressor in a PCA. In a PCA, the key factors are the temperature and airflow going from the PCA to the aircraft, which is much easier, less complex, less bulky, and less expensive to provide with either just a VFD on the blower fan or a single VFD that controls all motors (including compressors) at once. *See, e.g.*, Exhibit 2003, US 7,207,183 (disclosing that there is no need to provide a VFD for each compressor when “a single drive of the same output power rating” for all compressors can achieve the same thing).

Indeed, most of Patent Owner’s competitors have historically avoided using

VFDs on each compressor and/or have seen no reason to do so. For example:

- **Adelte's** PCA uses four compressors with four phases of cooling, but only one VFD, associated with its blower. *See* Exhibit 2012, <https://www.adelte.com/airports/preconditioned-air-zephir/#:~:text=Preconditioned%20Air%20Unit%20specifications&text=Zephir%20Series%20are%20designed%20and,while%20consuming%20the%20minimum%20energy.>
- **FCX System's** PCA includes a VFD on its blower with no mention of using one on its compressors. *See* Exhibit 2013, <https://fcxinc.com/pre-conditioned-air/20-150-ton-rating-pre-conditioned-air/> (“All units are equipped with a Variable Frequency Drive (VFD) to reduce blower speeds for substantial energy savings.”).
- **Avicorp** only puts VFDs on its blowers and fans, as opposed to its compressors. *See* Exhibit 2014, <https://www.avicorp.com/civil-aviation/preconditioned-air> (“Utilizing environmentally sensitive refrigerants, VFD support of blowers and fans, the unit has proven itself superior to all others.”).

2. The ‘169 Patent Inventors Went Against Conventional Wisdom

The inventors of the ‘169 patent went against this conventional wisdom to provide *separate VFDs on each compressor* in their new, inventive ITW GSE 3500

PCA. They did so because they were the first to conceive of several entirely new synergistic reasons to provide separate VFDs with separate compressors.

One reason was to enable as an option the ability make a PCA with self-contained cooling modules that could be swapped in-or-out, added, or removed based on the cooling demands for a specific customer, repairs, or cleaning. *See* ‘169 patent at 6:47-51, 6:52-7:17.⁴ The inventors realized that by providing each self-contained cooling module with its own VFD—rather than a central VFD to vary power to the overall system—any module experiencing a failure, including a VFD failure, could simply be swapped out with a replacement pod by a person with no refrigeration experience and little-to-no electrical experience. *See id.* at 6:34-40. This was an advantage over prior art refrigeration systems with *one VFD for the system*. In these systems, failure of the single VFD would require shutting the entire

⁴ While the ‘169 patent claims structure that *enables* a modular or self-contained PCA system (by reciting separate VFDs for each compressor), the claims do not require a modular or self-contained system. A patentee is not required to claim every *reason* behind an invention and can claim some or all of the structure of the invention. *See, e.g., IQRIS Techs. LLC v. Point Blank Enters.*, 2025 U.S. App. LEXIS 5316, *13 (Fed. Cir. March 7, 2025) (“It is the claims, not the preferred embodiments, that define the metes and bounds of the patentee’s invention.”).

system down, taking the entire system apart, and having a trained electrician repair the VFD. *See id.*

Additionally, the inventors realized that by having separate self-contained modules having their own VFDs, each module would also then have its own VFD controller. That is, the inventors conceived of including, as part of the controller for each cooling module, that each module could transmit a failure signal to the PCA's overall central control, so that if one of the cooling modules fails, the central controller can shut down that module and automatically adjust the cooling among the remaining modules of the PCA. *See* '169 patent at 4:16-24. Finally, the inventors realized that they could also provide (1) a power sharing control input with the central controller for controlling the PCA power consumption, i.e., the central controller could signal the VFD controllers of the individual modules to vary the power to the individual compressors to lower the PCA power consumption and (2) automatic adjustment of the cooling (not just airflow) based on specific aircraft type. *See id.* at 4:36-57, 3:64-4:3, 10:18-23. The '169 patent claims are directed to a PCA system having these features.

B. Prosecution of the '169 Patent

The claims of the '169 patent were extensively prosecuted, with multiple non-final and final Office Actions and an appeal brief filed by ITW GSE. *See* '169 patent FH at *passim*. Ultimately, the Examiner's last rejection of the claims was based on

U.S. Patent No. 5,383,335 to Anderson (“Anderson”) combined with U.S. Pat. App. No. 2010/0031676 to Urbain (“Urbain”) and a paper titled “Understanding Variable Speed Drives (Part 3)” (“UVSD”). According to the Examiner, Anderson teaches a preconditioned air unit having a plurality of refrigeration systems, each of which includes a compressor, but does not disclose “at least one variable frequency driver for power supply of the at least one compressor” and a central controller configured to control the variable frequency drivers. Exhibit 1002 at 502-504. The Examiner, however, alleged that UVSD teaches that a VFD (also called a “VSD”) offers significant electrical efficiency savings, while Urbain teaches providing a central controller to manage the functioning of constituent elements of an air conditioning unit. *See id.* The Examiner assumed, without discussion or analysis, that it would have, therefore, been obvious to add a VFD to each compressor as claimed. *See id.*

Petitioner asserts that the only reason the Examiner ultimately allowed the claims was because of an amendment to add specific additional limitations to claims 1, 2, and 16 (i.e., the “power sharing control input” of claim 1, the automatic adjustment of output of claim 2, and the failure detection of claim 16.) *See* Petition at 1-2, 8-10. Petitioner implies that the Examiner found that these limitations were not found in any of the art before the Examiner. That is not correct.

In fact, the Examiner had already separately asserted that these claim limitations were also found in the prior art and would have been obvious. For

example, the Examiner initially asserted that it would have been obvious to incorporate a “power sharing control input for control of the preconditioned air unit power consumption” in view of US 2007/0209383 to Hutton (“Hutton”), as recited in issued claim 1. *See* ‘169 patent FH at 510. Similarly, the Examiner asserted that Anderson teaches adapting “for use with different types of aircraft” while Urbain teaches “how to control the system so as to accommodate the needs of different aircraft,” as recited by issued claim 2. *Id.* at 505. And the Examiner asserted that U.S. Patent No. 6,446,447 to Goth (“Goth”) teaches individual refrigeration units sending failure signals to a central controller, with the central controller adjusting cooling among the remaining systems in response to the failure signal. *Id.* at 511.

Ultimately, the Examiner reconsidered these obviousness rejections and found that the combination of these concepts in a PCA system was *not* obvious. *See id.* at 602-604. The Examiner did *not* issue the claims because the Examiner found that the only inventive features were new limitations added via amendment. To the contrary, he allowed the pending claims because, taken as a whole, the limitations of the claims (which were again already included in various claims and were simply moved from certain claims to others) were not taught in the prior art.

Regardless, Petitioner’s story is also irrelevant. At no point did Patent Owner admit that the pre-amendment claims were unpatentable. *See, e.g., TorPharm Inc. v. Ranbaxy Pharms., Inc.*, 336 F.3d 1322, 1330 (Fed. Cir. 2003) (where applicant

amended claims to add narrowing density limitation instead of refuting Examiner's obviousness argument, applicant was not precluded from later arguing that the claims were non-obviousness apart from the density limitation; a "patentee is not required to fight tooth and nail every possible adverse thought an examiner commits to paper, nor to advance redundant arguments for patentability"); *Woodrow Woods & Marine Exhaust Sys., Inc. v. Deangelo Marine Exhaust, Inc.*, 692 F.3d 1272, 1287 (Fed. Cir. 2012) (rejecting argument that amending the claims constitutes an admission or acquiescence to an examiner's rejection). The concept of a VFD in each refrigeration system of a multi-refrigeration PCA system was never disclosed in the art before the Examiner (or the art cited by Petitioner in the Petition) and the applicant maintained that position throughout prosecution.

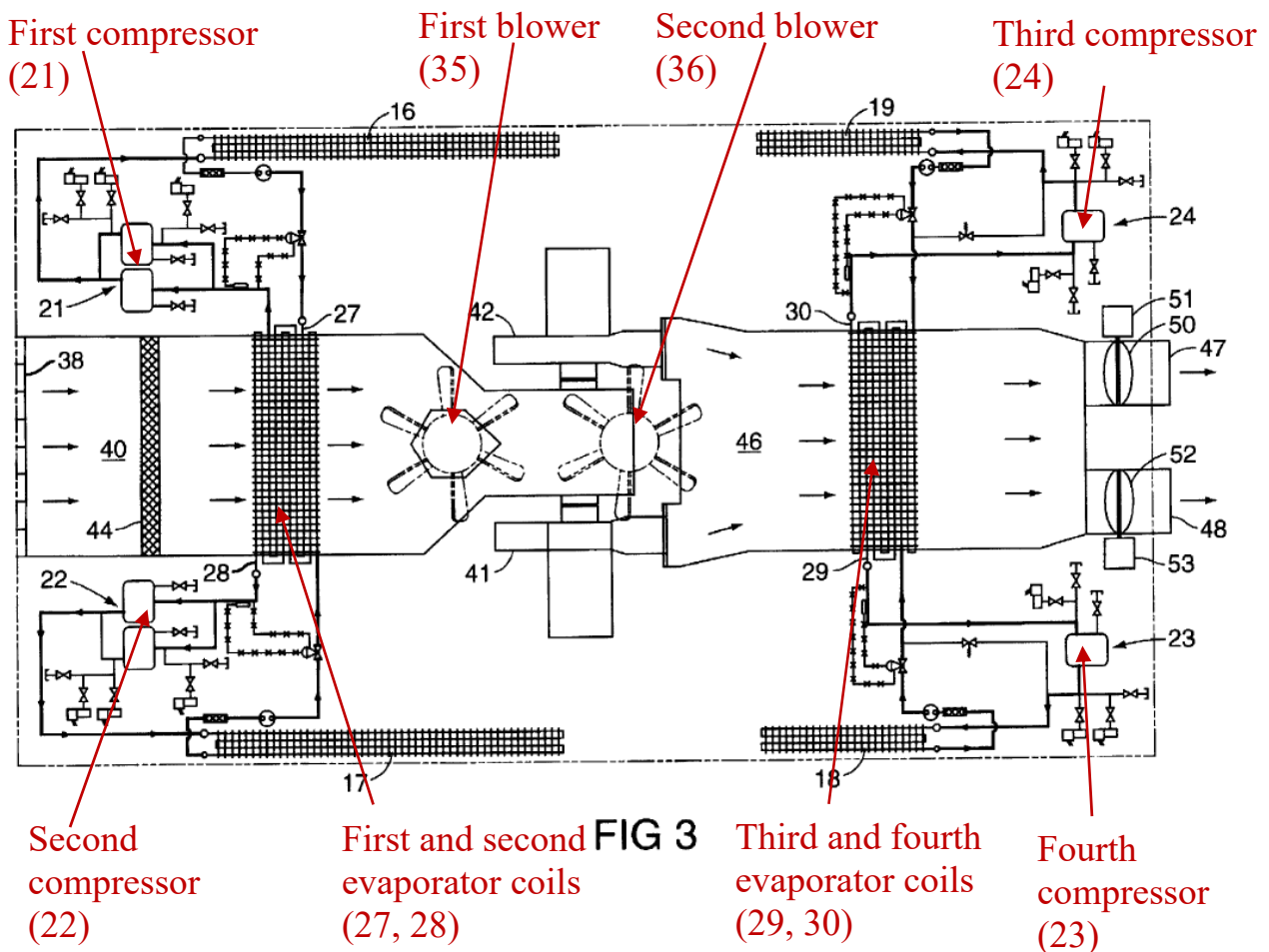
C. The Prior Art Asserted in the Petition

1. Kreymer

The Petition's Grounds 1-3 are based on alleged obviousness in view of U.S. Patent No. 5,715,701 to Kreymer ("Kreymer") combined with additional secondary references. Petitioner argues that Kreymer discloses "four refrigerant circuits, each with a compressor (compressors 21-24), evaporator coil (27-30), and condenser coil (16-19) and that Kreymer's "use of multiple compressors allows for some adjustment in the amount of cooling provided, i.e., by turning individual units off or on to provide less or more cooling. Petition at 14. Petitioner also argues that Kreymer

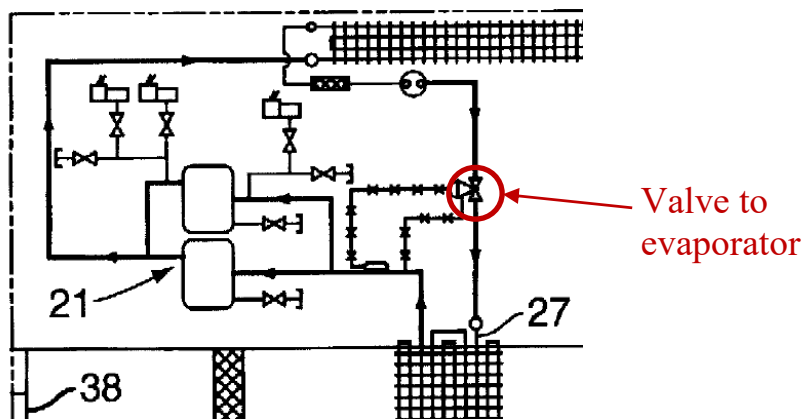
discloses a “mode selector switch” that can be used to “adjust operation (including the number of operating compressors) for a specific aircraft type.” Petition at 15.

But in fact, Kreymer discloses *neither* “turning individual units off or on to provide less or more cooling” nor adjusting the “number of operating compressors” based on the specific aircraft type. Kreymer’s PCA system is shown below, with relevant features identified:



Kreymer provides the ability to vary cooling by increments of four levels or stages (or more, if additional cooling units are added). Kreymer avoids the need to turn any

cooling units on/off to do so (as the '169 patent discloses is undesirable from a power efficiency standpoint, *see* '169 patent at 2:12-15), by instead using *valves* to supply or not supply refrigerant to successive linked evaporator coils and/or by turning on or off one or two *blowers* (and opening or closing corresponding dampers) to increase the volume of air that is cooled. Kreymer isolates the refrigerant in the respective condenser coils until additional cooling is needed. Kreymer at 2:63-3:12. If additional cooling is needed, Kreymer opens successive valves in the condenser coils to supply refrigerant to successive evaporators (and their corresponding compressors for cycling back into the condenser coils). Kreymer's valves are shown below:



Kreymer at Fig. 3 (excerpted). Nowhere does Kreymer disclose turning any of the compressors on or off to adjust cooling. Instead it discloses that its cooling method avoids “cycling an entire cooling system on and off” to provide “a more efficient capacity control system.” Kreymer at 3:10-12.

Additionally, Kreymer discloses that depending on the size of the aircraft to be cooled, successive *blowers* can be activated or deactivated and corresponding dampers opened or closed to draw in additional air to be cooled (while maintaining static pressure). Kreymer at 3:13-4:3. Kreymer does not disclose turning the *compressors* on or off based on the aircraft size, as Petitioner incorrectly states. Kreymer only allows selecting one or two blowers to be activated depending on a selection between a few *sizes* of aircraft—not adjusting the cooling based on the specific *type* of aircraft.⁵

Kreymer is substantially the same as the prior art (Anderson and Urbain) already considered during prosecution. Again, the Examiner found that Anderson—like Kreymer—teaches a preconditioned air unit having a plurality of refrigeration systems, each of which includes a compressor. *See* ‘169 patent FH at 502-504. Similarly, the Examiner asserted that Anderson—like Kreymer—teaches adapting a PCA system “for use with different types of aircraft”. Urbain also teaches “how to control the system so as to accommodate the needs of different aircraft,” as recited by issued claim 2. *Id.* at 505. Petitioner points in the Petition to no element of the ‘169 patent that is uniquely taught or disclosed by Kreymer.

⁵ Patent Owner’s April 30, 2025 Preliminary Response will address claim construction issues.

2. Taras

All of Petitioner's invalidity theories (Grounds 1-5) rely on WO2007/046794A1 to Taras ("Taras") as a secondary reference for disclosure of using VFDs in a refrigerant system. Taras does not disclose a PCA—it discloses a conventional HVAC system. *See* Exhibit 1006. Notably, conventional HVAC systems involve different cooling considerations (e.g., PCAs normally do not recirculate air and only introduce fresh air, in contrast to conventional HVACs). Nevertheless, Petitioner relies on Taras for its disclosure of using VFDs to vary the power to compressors in a refrigeration system. *See* Petition at 16. Petitioner argues that it would have been obvious to add Taras' disclosure of VFDs in a conventional refrigeration system to any refrigeration system, including a PCA system. And that it would have been obvious to add *separate* VFDs to each compressor in any multi-refrigeration unit system.

Taras, however, teaches away from putting separate VFDs on each motor of a PCA unless absolutely necessary. That is because Taras discloses that VFDs have serious drawbacks and should be used sparingly. Taras states:

In machinery that is driven by variable speed drives, there is approximately a five to ten percent penalty in power and efficiency due to losses associated with the operation of the variable speed drive. This efficiency loss or additional power draw is one of the *drawbacks that has limited the application of variable speed drives* in industrial or other installations Further, *variable speed drive electronics generate heat* and are frequently required to be cooled with an external source... Also,

variable speed drives often present a source of unreliability reducing overall system maintenance and uninterrupted service intervals.

Taras at para 2 (emphasis added). In this regard, Taras discloses that its invention uses a VFD with bypasses to circumvent the VFD when normal frequency operation is sufficient, to avoid the unnecessary use of VFDs. Taras at Abstract. And Taras discloses that one way to avoid the drawbacks of VFDs is to just use *one* VFD to vary the power output of *all* motors at once—especially when overall output is all that matters (as in cooling systems where there is just one air stream to be cooled at one temperature). This is shown in Figure 2 of Taras below:

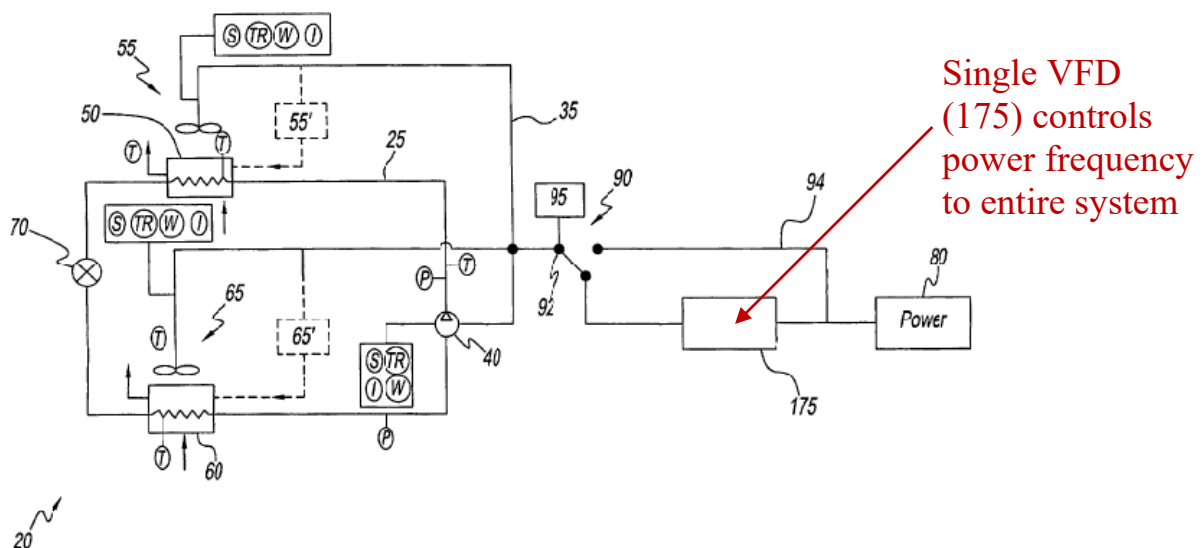


Figure 3 of Taras discloses at most providing separate VFDs for different functions of a refrigeration system, e.g., the compressor (40) versus fans (55 and 66) to separately adjust cooling and air flow:

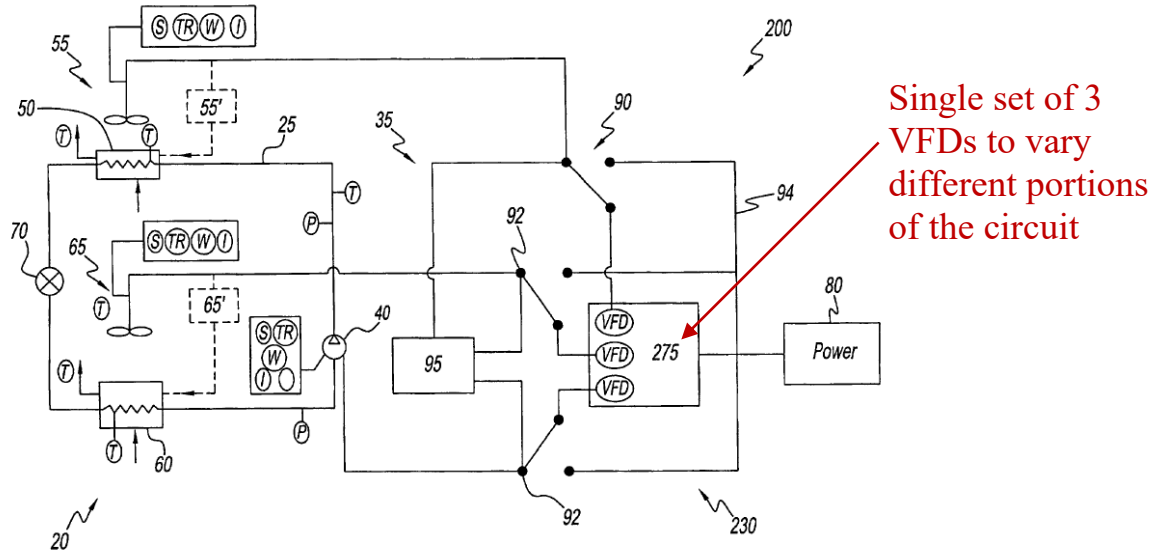


Fig. 3

Taras never discloses providing separate VFDs for *each compressor* in a multi-compressor, multi-refrigeration unit system—Taras only discloses a single refrigeration system having one compressor (40) and two *blowers* that can be separately varied (just as in Kreymer). *See* Taras at Fig. 3.

Taras is, therefore, “substantially the same” as the UVSD reference cited during prosecution. Again, the Examiner already alleged that UVSD (1) discloses a HVAC system having VFD (just like Taras) and (2) teaches that VFD offers significant electrical efficiency savings. *See id.* at 502-504. Petitioner points in the Petition to no element of the ‘169 patent that is uniquely taught or disclosed by Taras.

3. Carrier

Petitioner relies on Carrier Corp., Variable Frequency Drive: Operation & Application of Variable Frequency Drive (VFD) Technology (Oct. 2005) as an

obviousness reference in Ground 3 regarding claims 9-10 of the ‘169 patent, which require (in addition to the VFD of claim 2) a “rectifier connected to a mains power supply input of the air unit for generation of a power DC voltage supply.” *See* ‘169 patent at claims 9-10. Petitioner relies on Carrier for disclosure that “a VFD generally includes a rectifier.” Petition at 52. Otherwise, Petitioner also cites to Carrier as support for the general proposition that VFDs offer the “greatest operational savings” compared to alternatives, while ignoring that Carrier never specifically addresses whether VFDs are preferable to the approach of Kreymer or Lechmotoren, discussed below. *See* Petition at 18.

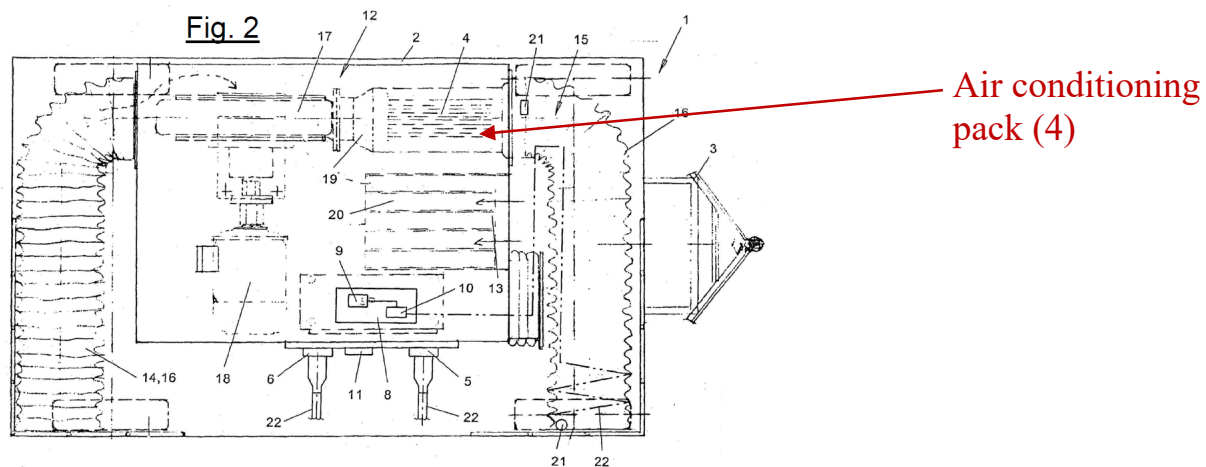
But the Examiner already cited a combination of very similar references during prosecution. For example, the Examiner asserted that U.S. Patent No. 6,600,278 to Bretzius (“Bretzius”) discloses, like Carrier, a rectifier for use with a VFD. Exhibit 1002 at 512. The Examiner also relied on UVSD for teaching that a VFD offers significant electrical efficiency savings. *See id.* at 502-504.⁶

⁶ That the Examiner relied on two references instead of one is not a basis for institution. *See, e.g., Sandoz, Inc. v. Acerta Pharma BV*, IPR2023-00478 (P.T.A.B. Aug. 7, 2023) (“[W]e agree with Patent Owner that Cheson is cumulative to the teaching in Smyth and Evarts relied on by the Examiner for multiple daily dosing of a BTK inhibitor and, therefore, is ‘substantially the same art’...”).

4. Lechmotoren

Petitioner relies on German Utility Model Patent DE 29622089U1 to Lechmotoren (“Lechmotoren”) for two reasons: (1) as the only reference that allegedly discloses the “power sharing” element of claim 1 of the ‘169 patent and (2) as a back-up primary reference to Kreymer. *See* Petition at Grounds 4-5.

Much of Petitioner’s characterization of Lechmotoren, however, is incorrect. Contrary to Petitioner’s assertions, Lechmotoren does not unambiguously disclose the use of two or more *refrigeration* systems as required by the ‘169 patent claims. Lechmotoren’s figures and description describe a PCA unit with at least one “air-conditioning pack”:



Lechmotoren at Fig. 2. But Lechmotoren uses the term “air-conditioning pack” to refer to both heating and cooling units. *See id.* at 1:22-25. And Lechmotoren only discusses in detail an “air-conditioning pack” that is a *heating* pack. *See id.* at 9:4-17. For example, Lechmotoren only describes “variable and controllable output” of

its air-conditioning via “four *heating* levels” provided by “several plate-shaped or rod-shaped heating elements” that can be “activated individually by the control system (8).” Lechmotoren at 9:4-17.

In fact, Lechmotoren’s only express disclosure of *refrigeration* is a single non-enabling statement that its “air-conditioning pack (4) can also be designed *as a cooling device (not shown)* or can have a cooling pack in addition to the heating pack.” Lechmotoren at 10:3-6. And Lechmotoren’s only reference to including multiple “air-conditioning packs” is to provide both “heating and/or cooling devices” at the same time so that the overall “air conditioning unit can be used in both warm and cold zones,” i.e., one heating pack and one cooling pack. *See id.* at 4:9-12. Nowhere does Lechmotoren disclose multiple cooling packs.

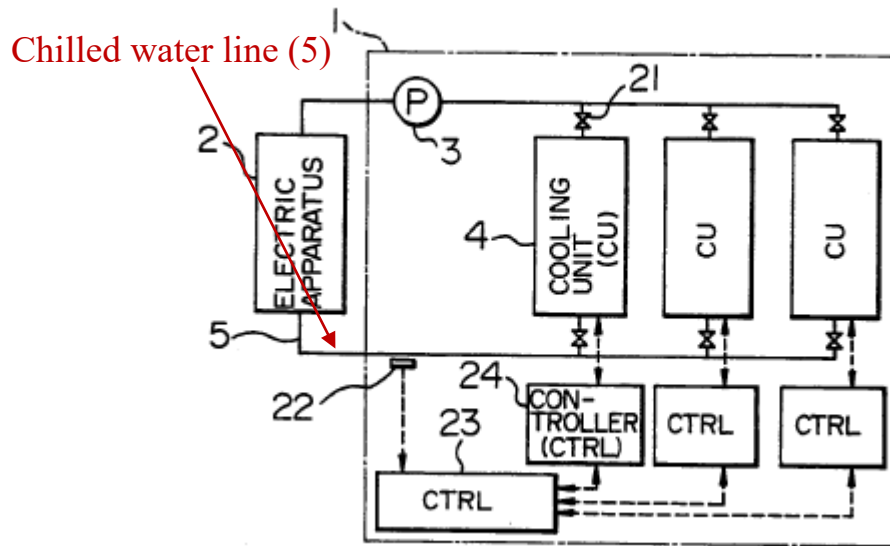
Additionally, Lechmotoren does not disclose VFDs to control any output (heating or cooling). Again, Lechmotoren’s heating modules are adjustable to “four levels” by activating individual heating elements—not adjusting any motors using VFD. Indeed, Lechmotoren has no disclosure at all of how to adjust cooling.

As a result, Lechmotoren is “substantially similar” to the Anderson and Hutton prior art considered by the Examiner. *See* Exhibit 1002, ‘169 FH at 502-504, 510. Lechmotoren redundantly discloses a PCA with multiple sub-units, like Anderson, and the concept of power sharing, like Hutton. *See* Exhibit 2010, Anderson at Fig. 1, 4:25-5:15; Exhibit 2017, Hutton at 1:60-2:5, 12:15-30.

5. Takahashi

Petitioner relies on U.S. Patent No. 5,351,498 to Takahashi (“Takahashi”) in Grounds 2 and 5 challenging claims 14-22 of the ‘169 patent. Those claims require that “each refrigeration system of the plurality of refrigeration systems is configured for failure detection so that, in the event that one of the refrigeration systems fails, *the failing refrigeration system transmits a failure signal to the central controller.*” See ‘169 patent at dependent claims 14 and 15 and independent claim 16. Petitioner alleges that Takahashi discloses a cooling system having multiple refrigeration units that separately send failure detection signals if one fails. See Petition at 38.

Takahashi’s system, however, differs from a PCA. First, Takahashi’s system is *a small, compact system* for cooling an “electrical apparatus *such as a computer.*” Takahashi at 1:7-8 (emphasis added). Therefore, the efficiency and heat generation “drawbacks” of VFD raised in Taras regarding a larger HVAC unit (much less an even larger PCA unit) are inapplicable to Takahashi. Because of its smaller size, Takahashi can have features (such as separate VFDs on each cooling unit) that would be undesirable in a much larger PCA system. Second, Takahashi does not cool *airflow* at all—its cooling units instead cool *water* in a tube circulated through the computer, as shown below:

FIG. 1

Takahashi at Fig. 1.

In any event, Takahashi is substantially the same as the reference that was cited during Examination for the failure detection limitations of the claims, i.e., Goth. During prosecution the Examiner cited Goth for its teaching of a cooling system having multiple refrigeration units that separately send failure detection signals if one fails, with a central controller adjusting cooling among the remaining systems in response to the failure signal. *See* '169 FH at 511. Goth (like Takahashi) was directed to a computer cooling system and Goth also included disclosure of “variable speed” compressors. *See* Exhibit 2016, Goth at claims 15, 20. But at least Goth disclosed a refrigeration system for cooling air around a computer. Takahashi cools water circulated around a computer. Takahashi is “substantially similar” to but even less relevant than Goth.

III. SUBSTANTIALLY THE SAME ART AND ARGUMENTS WERE PRESENTED DURING PROSECUTION

In determining whether to deny institution under 35 U.S.C. § 325(d), the Board applies a two-part framework to determine: “(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 [the] 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, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (P.T.A.B. Feb. 13, 2020) (precedential). To apply this framework, the *Becton, Dickinson* factors “provide useful insight.” *Id.* at 9-10. The nonexclusive *Becton, Dickinson* factors are:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17-18 (P.T.A.B. Dec. 15, 2017) (precedential as to §III.C.5, first paragraph). “*Becton, Dickinson* factors (a), (b), and (d) relate to the first part of the *Advanced Bionics* framework (whether the same or substantially the same art or arguments previously were presented to the Office), and *Becton, Dickinson* factors (c), (e), and (f) relate to the second part of that framework (previous Office error).” *Autel Intelligent Technology Corp., Ltd., v. Orange Electronic Co., Ltd.*, IPR2021-01545, Paper 8 at 13 (P.T.A.B. Apr. 8, 2022). “If a condition in the first part of the [*Advanced Bionics*] 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.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8-9.

Part one of the *Advanced Bionics* framework is met here, with both the art and argument for combining that art being substantially the same. For part two, Petitioner

has not even argued a material error by the Office.

A. The First *Advanced Bionics* Factor Is Met Because All of Petitioner’s References are Substantially the Same as the Prior Art Previously Considered

1. Factor (a) - The Similarities of the Art

The Petition contains a single sentence addressing discretionary denial under *Advanced Bionics*—a conclusory statement that “[t]he arguments and references presented herein were never previously presented to the Patent Office to support denial under *Advanced Bionics*...” Petition at 75. Petitioner appears to rely on the fact that the *specific* prior art references asserted in the Petition (i.e., Kreymer, Taras, Carrier, Lechmotoren, and Takahashi) were not cited during prosecution of the ‘169 patent. But the Examiner cited to “substantially the same” prior art—just different references disclosing the exact same features. *See, e.g., Helena Lab. Corp. v. Sebia SA*, IPR2024-00801, Paper 10 at 16-17 (P.T.A.B. Oct. 23, 2024) (“Petitioner relies on Landers as disclosing putrescine as a flow inhibitor—the same reason the Office relied on Camilleri during prosecution ... [W]e agree with Patent Owner that Landers is cumulative of Camilleri, which was previously presented to the Office.”); *Sandoz, Inc. v. Acerta Pharma BV*, IPR2023-00478, Paper 17 at 15 (P.T.A.B. Aug. 7, 2023) (“[W]e agree with Patent Owner that Cheson is cumulative to the teaching in Smyth and Evarts relied on by the Examiner for multiple daily dosing of a BTK inhibitor and, therefore, is ‘substantially the same art’...”).

Patent Owner Brief on Discretionary Denial

Below is a comparison of the prior art that Petitioner asserts versus the prior art the Examiner cited for the same features of the ‘169 patent claims, showing that Petitioner’s asserted prior art are simply drop-in replacements:

Claim Features	References Cited (Petition)	References Cited (Examiner)	References the Same?
a preconditioned air unit having a “plurality of refrigeration systems” with core components (e.g., compressor, condenser, expansion valve) <i>See claims 1-22.</i>	Kreymer and Lechmotoren <i>See Petition at 13-27, 52-66</i>	Anderson <i>See Exhibit 2010 at Fig. 1, 4:25-5:15</i>	Yes
variable frequency driver for varying power supply of a compressor motor <i>See claims 1-22</i>	Taras <i>See Petition at 16-21</i>	UVSD <i>See Exhibit 2019 at 1.</i>	Yes
power sharing control input <i>See claim 1</i>	Lechmotoren <i>See Petition at 64-66</i>	Hutton <i>See Exhibit 2017 at 1:60-2:5, 12:15-30</i>	Yes
automatically adjusting cooling according to the selected type of aircraft <i>See claim 2.</i>	Kreymer <i>See Petition at 27</i>	Anderson <i>See Exhibit 2010 at 2:5-17</i>	Yes
a rectifier <i>See claims 9-10</i>	Carrier <i>See Petition at 51-52</i>	Bretzius <i>See Exhibit 2018 at 3:10-25</i>	Yes
failure detection and transmission of a failure signal to the central controller	Takahashi <i>See Petition at 37-44</i>	Goth <i>See Exhibit 2016 at claim 15, claim 20.</i>	Yes

<i>See claims 14-22</i>			
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The Examiner’s last rejection of the claims was based on Anderson combined with Urbain and UVSD. According to the Examiner, Anderson (just like Kreymer and Lechmotoren) teaches a preconditioned air unit having a plurality of refrigeration systems, each of which includes a compressor and other claim elements but does not disclose “at least one variable frequency driver for power supply of the at least one compressor” and a central controller configured to control the variable frequency drivers. Exhibit 1002 at 501-504. The Examiner, however, alleged that UVSD teaches (like Taras) that a VSD offers significant electrical efficiency savings, while Urbain (like Taras) teaches providing a central controller to manage the functioning of constituent elements of an air conditioning unit. *See id.* The Examiner further asserted that it would have been obvious to incorporate a “power sharing control input for control of the preconditioned air unit power consumption” as recited in issued claim 1 in view of Hutton (like Petitioner asserts here regarding Lechmotoren). Exhibit 1002 at 510. Similarly, the Examiner asserted that Anderson teaches adapting “for use with different types of aircraft” (like Kreymer) as recited by issued claim 2. *Id.* at 505. The Examiner asserted that Bretzius (like Carrier) discloses the rectifier recited in issued claims 9-10. *Id.* at 512. And the Examiner asserted that Goth teaches (like Takahashi) individual refrigeration units sending

failure signals to a central controller, with the central controller adjusting cooling among the remaining systems in response to the failure signal. *Id.* at 511.

Significantly, for every teaching in every reference cited by Petitioner in the present Petition, the Examiner had already considered a corresponding prior art reference or references containing the same disclosure.

2. Factor (b) - The Cumulative Nature of the Art

The Examiner during prosecution of the ‘169 patent rejected the claims as obvious over similar references used for identical purposes, i.e., Anderson, Urbain, UVSD, Hutton, Bretzius, and Goth. These six references were each considered and fully overcome during prosecution of the ‘169 patent. Here, the Petition relies on Kreymer, Lechmotoren, Taras, Carrier, and Takahashi for disclosing and combining the same elements said during prosecution to be disclosed and combined by Anderson, Urbain, UVSD, Hutton, Bretzius, and Goth.⁷ Put simply, the prior art relied upon in the Petition is duplicative of that already considered by the Examiner

⁷ The fact that the Examiner relied on a different number or combination of references does not mean the references are not cumulative. *See Sandoz*, IPR2023-00478, Paper 17 at 15 (“[W]e agree with Patent Owner that Cheson is cumulative to the teaching in Smyth and Evarts relied on by the Examiner for multiple daily dosing of a BTK inhibitor and, therefore, is ‘substantially the same art’...”)

during prosecution.

During examination, Applicant overcame the rejection based on these prior art references, ultimately persuading the Examiner that, considering the claims as a whole, they were not obvious. *See* Ex. 1002, 602-604. Notably, Petitioner never addresses why its prior art is not cumulative or “substantially the same” as that cited by the Examiner. Nor does Petitioner point to any claim element that the Examiner found was missing in the prior art before the Examiner.

3. Factor (d) - Overlap of the Arguments

The arguments asserted in this Petition and the arguments initially made by the Examiner are identical. Petitioners’ argument regarding the motivation to combine Taras’ VFD with Kreymer’s or Lechmotoren’s multi-cooling-unit PCAs, as well as Petitioner’s argument to add failure detection from Takashi or the use of power sharing or automatic detection of aircraft size, simply rehash the same arguments the Examiner initially made when rejecting the claims during prosecution. Below is a comparison chart:

Examiner’s Rejection	Petition
“It would have been obvious to one of ordinary skill in the art ... to modify Anderson, such that <i>a single controller</i>	“[A] POSITA would have been motivated to add Taras’ VFDs, <i>and related control system</i> , to Kreymer,

Examiner's Rejection	Petition
<p><i>of Urbain can manage all of the functions of the system including the variable frequency driver for power supply of the at least one compressor, in order to advantageously provide the system with the flexibility to adjust compressor and other components operations for changing conditions, and to provide for reduced electric costs by using a variable frequency driver ("VFD").</i>" Exhibit 1002, at 503-504.</p>	<p>obtaining a PCA with multiple refrigeration units that employ VFDs <i>to drive its various motors</i>, including its compressors, with the objective of <i>improving the efficiency</i> of the overall system." Petition at 19.</p>
<p>"It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Anderson, in view of Urbain, in order to provide a unit with the <i>flexibility of servicing different types of aircraft.</i>" <i>Id.</i> at 505.</p>	<p>"The combination of Kreymer and Taras discloses and renders obvious this limitation. For example, Kreymer discloses a 'mode selector switch 62' that <i>can be used by an operator to select a type of aircraft...</i>" Petition at 27.</p>

Examiner's Rejection	Petition
<p>“Anderson as modified teaches a preconditioned air unit ...but does not teach the central controller has a power sharing control input for control of the preconditioned unit power consumption ...It would have been obvious ... to modify Anderson, in view of Hutton, <i>so that the AC will use less power so such power can [be] shared with other devices...</i>” <i>Id.</i> at 511.</p>	<p>“Lechmotoren discloses and renders obvious this limitation. For example, Lechmotoren discloses <i>power sharing with the aircraft.</i>” Petition at 64.</p>
<p>“Anderson...does not teach wherein each refrigeration system...is configured for failure detection so that, in the event that one of the refrigeration systems fails, the failing refrigeration system transmits a failure signal to the central controller...It would have been obvious to one of ordinary skill in the</p>	<p>“A POSITA would have been motivated to combine Takahashi with Lechmotoren and Taras to obtain a fault-tolerant PCA system. ... For example, the fault-tolerant architecture of Takahashi's allows a refrigeration system with multiple refrigeration circuits...<i>to preserve its cooling output</i></p>

Examiner's Rejection	Petition
art, at the time of the invention, to modify Anderson, in view of Goth, <i>the motivation being to provide automatic system back-up...</i> ” <i>Id.</i> at 512.	<i>upon failure of one of the refrigerant circuits.</i> ” Petition at 68.
“It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Urbain, in view of Bretzius, <i>the motivation being to provide a means for converting AC to DC and to provide rectification that cancels many of the characteristic harmonics</i> a six-pulse bridges produce.” <i>Id.</i> at 512-513.	“A POSITA would have known of the problem of harmonics generated by rectifiers and recognized that the multi-pulse technique to <i>mitigate harmonics</i> described in Carrier would improve the VFDs disclosed in Taras.” Petition at 51.

The Petition not only presents substantially the same art, but “the . . . arguments presented in the petition are the same . . . as those previously presented to the Office.” *Advanced Bionics*, Paper 6 at 8-10. Petitioner merely swaps in similar references and repeats the same arguments already overcome in prosecution. Because Patent Owner has established that *Becton, Dickinson* factors (a), (b) and (d)

are met and the first *Advanced Bionics* condition is satisfied, the Petition should be denied on discretionary grounds.

B. Petitioners Failed To Meet Their Burden To Show a Material Error Required by the Second *Advanced Bionics* Factor

1. Factor (c) - The Art Was Considered During Examination

Factor (c) also weighs against institution. While the specific references cited in the Petition were not considered by the Office, *Advanced Bionics* clarifies that merely swapping out one reference for another where both references disclose the same limitations does not clear the “substantially the same prior art or arguments” threshold of Rule 325(d). *See Advanced Bionics*, IPR2019-01469, Paper 6 at 15.

2. Factor (e) - Petitioner has Failed To Point Out How the Examiner Erred

Because the first *Advanced Bionics* condition is satisfied, Petitioner must demonstrate how the Examiner erred. *Nespresso USA, Inc. v. K-Fee Sys. GmbH*, IPR2021-01223, Paper 9 at 29 (P.T.A.B. Jan. 18, 2022) (“Petitioner bears the burden of showing that the Office erred.”). Petitioner, however, fails to address Factor (e) *at all*, which alone is sufficient to deny institution. *See Sony Interactive Entm’t LLC v. Terminal Reality, Inc.*, IPR2020-00711, Paper 15 at 11-12 (P.T.A.B. Oct. 13, 2020) (denying institution under § 325(d) where Petitioner was silent on *Becton, Dickinson* factors (e) and (f)).

3. Factor (f) - No Other Evidence or Facts were Presented

Finally, regarding Factor (f), the Board “look[s] for some explanation of how or why ‘the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments.’” *Nespresso*, IPR2021-01223, Paper 9 at 29-30. Here, Petitioner points to no additional evidence or facts in the petition that warrant a do-over based on Petitioner’s duplicative art.

The *Advanced Bionics* factors, therefore, support non-institution.

C. Petitioner Should Not Be Permitted To Use A Responsive Brief as a Do-Over For The Petition Regarding § 325(d) Denial

Under the Director’s Memorandum, Petitioner will be allowed a response to this brief. *See* Director’s Memorandum at 2. That response, however, should be limited to responding to Patent Owner’s arguments. Petitioner should not be allowed a do-over of the deficient § 325(d) arguments in the Petition (e.g., Petitioner’s failure to identify or even discuss any error by the Examiner).

The Board has recognized numerous times that § 325(d) disputes are “foreseeable” and Petitioner must identify *in the Petition* why it believes the art and arguments in the Petition are substantially different from those considered by the Examiner. *See, e.g., Progenity, Inc. v. Natera, Inc.*, IPR2021-00266, Paper 7 at 5 (P.T.A.B. Apr. 1, 2021) (denying request for pre-institution reply because Patent Owner’s § 325(d) arguments were “foreseeable” and “could have been

comprehensively addressed by Petitioners in the Petition(s)"); *Edwards Life Sci., Corp. v. Boston Scientific Scimed, Inc.*, IPR2017-00444, Paper 8 at 3 (P.T.A.B. May 22, 2017) ("Petitioner was on notice prior to filing its Petition that, by statute, consideration may be given to whether the prior art or arguments presented in the Petition are the same, or substantially the same, as those previously raised during prosecution. Accordingly, Petitioner had the opportunity to address the issue in the Petition..."). Superficial treatment of a dispositive issue "with the expectation that additional briefing will be permitted in reply" should not be sanctioned. *Id.*, see also *Helmerich & Payne Int'l Drilling Co. v. Nabors Drilling Techs. USA, Inc.*, IPR2021-00621, Paper 8 at 2-3 (P.T.A.B. July 15, 2021) (distinguishing bases for good cause in denying Petitioners' request for pre-institution reply to address § 325(d) because Patent Owner's arguments were foreseeable, but granting Petitioners' request to address new facts relating to § 314(a) and *Fintiv* that developed after the Petition was filed because they were not foreseeable).

Petitioner conceded that the § 325(d) dispute was "foreseeable" because Petitioner included a short passage regarding discretionary denial. *See* Petition at 75. It was Petitioner's choice to not substantively address the issue of substantial similarity between the arguments in the Petition and those raised in prosecution and Petitioner should be held to that choice. Petitioner's response should therefore be limited to only directly responding to Patent Owner's arguments, in a similar manner

to a Petitioner's Reply. *See* Consolidated Trial Practice Guide at 73 ("Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.").

IV. THE MERITS OF THE PETITION ARE WEAK AND DO NOT SUPPORT ANY ALLEGED EXAMINER ERROR IN ALLOWING THE CLAIMS BASED ON SUBSTANTIALLY THE SAME ART

The Petition contains no analysis or discussion of any Examiner error in allowing the claims. And Petitioner should not be permitted to backfill the Petition on this issue. But the Director's Memorandum specifies that the Patent Office may consider as part of its discretionary denial analysis the "strength of the unpatentability challenge" and "other workload needs." *See* Director's Memorandum at 2. Here, the facial deficiencies in the Petition separately warrant non-institution.⁸ Granting discretionary denial avoids unnecessary further burden on PTAB resources.

A. *All Grounds, All Claims: Taras Teaches Away From Providing VFDs With Each Compressor In A Multi-Refrigeration Unit System And The Petition Provides No Motivation To Provide A VFD With Each Compressor*

The Petition is largely based on the false premise that the '169 patent is merely directed to adding the general concept of VFD to a PCA, which Petitioner alleges

⁸ Patent Owner will be filing a separate Patent Owner Preliminary Response by the April 30, 2025 deadline.

would have been obvious in view of Taras. But the claims of the ‘169 patent do not only require adding VFD in general to a PCA. To the contrary, the claims require “a plurality of refrigeration systems, *each of which includes* ... at least one variable frequency driver for power supply of the at least one compressor.” ‘169 patent at claims 1, 2, 16. And the Examiner already addressed during prosecution the alleged obviousness of merely adding the concept of VFD to a PCA. *See* Exhibit 1002 at 502-504.

None of the prior art, either asserted in the Petition or cited during prosecution, discloses a plurality of refrigeration systems that *each* has its *own* VFD. Both the prior art relied upon by Petitioner for disclosure of VFD in a refrigeration system (Taras) and the prior art relied upon by the Examiner for the same concept (UVSD) disclose only a single refrigeration system with a single compressor. *See* Taras at Figs. 1-3, ¶ 0017 (“compressor 40”); UVSD at *passim*. More significantly, Taras *affirmatively teaches away* from using more VFDs than are absolutely necessary for several reasons.

First, Taras teaches that VFDs have serious drawbacks and that one should minimize their use. The whole point of Taras—the invention of Taras—was directed to an optional bypass to go around its VFD whenever normal power was sufficient and a VFD was not required. Taras states:

In machinery that is driven by variable speed drives, there is approximately a five to ten percent penalty in power and efficiency due to losses associated with the operation of the variable speed drive. This efficiency loss or additional power draw is one of the drawbacks that has limited the application of variable speed drives in industrial or other installations Further, variable speed drive electronics generate heat and are frequency required to be cooled with an external source... Also, variable speed drives often present a source of unreliability reducing overall system maintenance and uninterrupted service intervals.

Taras at ¶ 002. Taras discloses that its invention relates to bypass circuitry to avoid using any VFD when normal frequency operation is sufficient. Taras at ¶ 002.

Second, Taras teaches that one way to minimize VFD use is to provide a single VFD that varies the power frequency to all the motors in the device at once—something that is particularly suitable when the overall power consumption and cooling output is all that matters and there is no need or point to vary individual cooling sub-units separately, e.g., in an air conditioning system all that matters is that the air that is output from the system is at 65°F and blowing at a certain volume. This is shown in Taras Figs. 1 and 2, below:

Motors (compressor
(40), fans (55, 65)

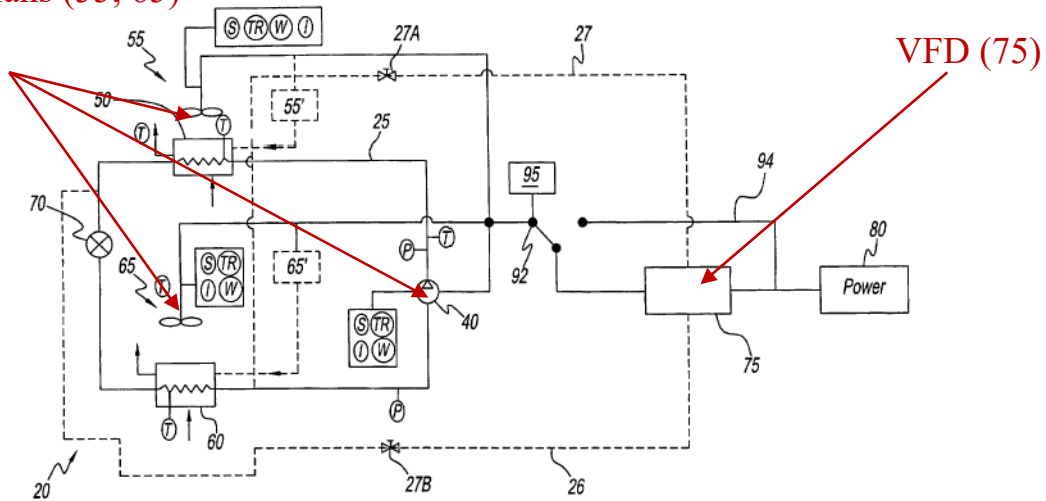


Fig. 1

Motors (compressor
(40), fans (55, 65)

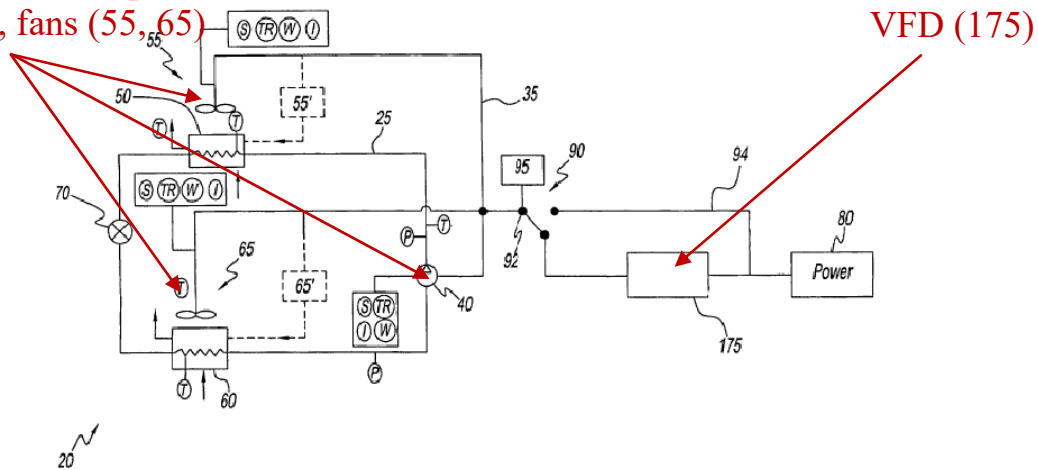


Fig. 2

Third, while Taras does disclose using separate VFDs when control over different “components of the refrigerant system” would increase “system flexibility,” the only instance in which it discloses such flexibility is desirable is to

separately vary the *cooling* (via the compressor) and the *airflow* (via the fans). This is shown below in Fig. 3 of Taras:

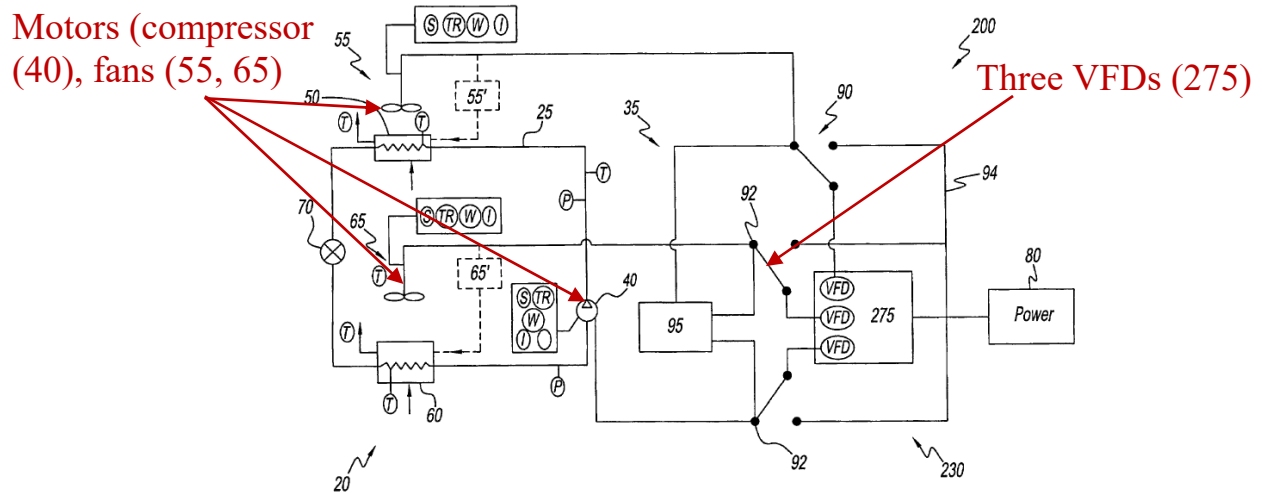


Fig. 3

By having separate VFDs for the fans and the compressor, Taras' Fig. 3 would allow the system to operate the fans at lower power frequency (and higher power efficiency) if high fan speed was not required, while still operating the cooling (condensor) at normal power, or vice veras. Taras reflects the well-known concept that it may be desirable to separately adjust *cooling* (air temperature) versus *blowing* (air flow). But Taras provides no reason or disclosure to extend that concept to vary each compressor in a multi-refrigeration unit separately. That is because doing so would not provide any "system flexibility" in a typical PCA. For example, if one is trying to achieve an output air temperature of 65°F with a two-compressor system, instead of setting one to 60°F and one to 70°F they could much more easily both be set to 65°F—the resulting output air temperature is exactly the same.

Taken as a whole, therefore, Taras would have taught away from using a VFD on each compressor of a multi-compressor system, or at the very least Taras shows that a POSITA would not have been motivated to do so. *See Galderma Labs., L.P. v. Tolman, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013) (the prior art teaches away “when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken” in the claim); *Provisur Techs., Inc. v. Weber, Inc.*, No. 2021-1851, 2022 WL 17688071 (Fed. Cir. Dec. 15, 2022) (affirming Board finding of no motivation to combine in an IPR where the proposed combination would have added “needless complexity”); *In re Schweickert*, 676 Fed. Appx. 988 (Fed. Cir. 2017) (where proposed combination would result in “additional complexity,” was “unnecessary” to achieve benefits and “would do little more than add unwanted cost and complexity to the system” the Board “needed to explain why a skilled artisan would still have a reason to combine [the references] to achieve the claimed invention.”).

B. *Grounds 1-3 (Based on Kreymer), Claims 2-12, 14-22: The Petition Has No Valid Motivation to Add Separate VFDs to Kreymer’s Compressors—Separate VFDs Would Provide No Benefit Or Functionality in Kreymer*

Grounds 1-3, all based on Kreymer, also fail for another reason. Petitioner fails to show it would have been obvious to add separate VFDs to Kreymer’s

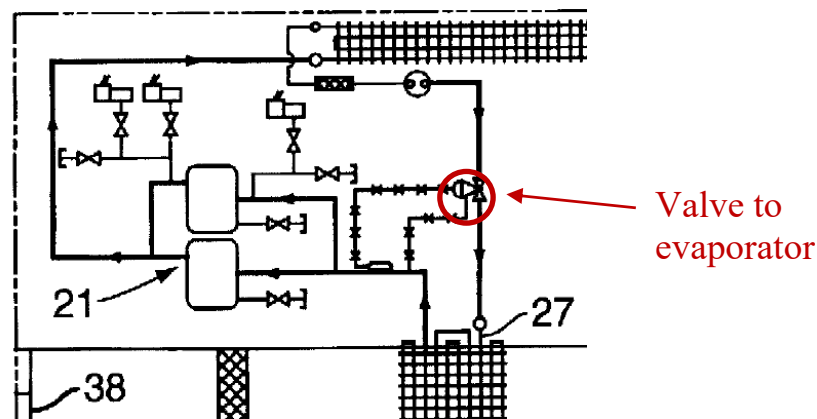
compressors. Petitioner provides no evidence that a POSITA would have been motivated to make this modification, when it would have been redundant of what Kreymer already provided and/or less desirable than other easier, less complex, and less expensive prior art alternatives. *See, e.g., In re Schweickert*, 676 F. Appx at 995 (reversing obviousness where proposed modification of prior art is “unnecessary” to prior art system that “already” performs function of proposed additional feature and “would do little more than add unwanted cost and complexity to the system”); *Salem Fabrication Techs. Grp., Inc. v. Uniglass Eng’g Oy*, No. IPR2022-01516, 2023 WL 2604400 (P.T.A.B. March 22, 2023) (“Petitioner fails to provide any persuasive argument or evidence as to how the addition of a second air compressor would have provided any benefit...”).

First, Kreymer discloses that it can already adjust its cooling with no VFDs. Kreymer adjusts the amount of its cooling over four or more stepwise levels by supplying or not supplying refrigerant to successive evaporator coils. For example, Kreymer discloses:

The first condenser coil 16 supplies a refrigerant to the first evaporator coil 27, where it evaporates. The refrigerant is then drawn into the first compressor 21, and then supplied to the first condenser coil 16. *If additional cooling is desired, the second coil 17 supplies refrigerant to the second evaporator coil 28, where it evaporates.* The refrigerant then passes to the second compressor 22 and then back to the condenser coil 17. *If additional cooling is desired, the third condenser coil 18 supplies refrigerant to the third evaporator coil 29, where it evaporates.* The refrigerant then passes to the third compressor 23 and then back to the

third condenser coil 18. If additional cooling is desired, the fourth condenser coil 19 supplies refrigerant to the fourth evaporator coil 30, where it evaporates. The refrigerant then passes to the fourth compressor 24 and then back to the fourth condenser coil 19. The adding of cooling systems as needed to obtain the desired cooling, instead of cycling an entire cooling system on and off, provides a more efficient capacity control system.

Kreymer at 2:52-3:13 (emphasis added). Kreymer isolates the refrigerant in the respective condenser coils until additional cooling is needed. If additional cooling is needed, then Kreymer discloses opening successive valves in the four condenser coils to supply refrigerant to successive evaporators (and their corresponding compressors for cycling back into the condenser coils). Kreymer's valves are shown below:



Kreymer at Fig. 3 (excerpted). There is no indication in Kreymer that its ability to adjust cooling was not already sufficient. *See In re Schweickert*, 676 Fed. Appx. 988 (where prior art reference “worked without trouble” without the proposed modification and the proposed modification would “add additional complexity”, the

Board “needed to explain why a skilled artisan would still have a reason to combine” the prior art); *South-Tek Systems, LLC v. Engineered Corrosion Solutions*, 748 Fed. Appx. 1003, 1006 (Fed. Cir. 2018) (substantial evidence supported PTO’s finding in an IPR that one of skill would not have added to a primary reference a drain described in a secondary reference because the primary reference already disclosed a different drain that served the same purpose; because the proposed modification would be redundant there was no motivation to combine); *In re Anova Hearing Labs, Inc.*, 809 Fed. Appx. 840, 843 (Fed. Cir. 2020) (no motivation to modify primary reference where it already provided the alleged benefit and the Board did not explain why a POSITA would conclude that the primary reference needed to be modified).

Second, Petitioner and Petitioner’s expert (Leeb) provide no reason to add *separate* VFDs to each of Kreymer’s compressors, i.e., any benefit or advantage that cannot be accomplished in Kreymer much more simply with a *single* VFD. Below is the entirety of Leeb’s discussion of an alleged motivation to provide a VFD with each of Kreymer’s compressors. Leeb states:

[A] POSITA would have been motivated to add a VFD to each refrigeration circuit to maximize energy gains and efficiency of each refrigeration circuit and the system as a whole. *See, e.g.*, Ex. 1020 (“Schnetzka”) at FIG. 1B (illustrating variable-speed drive applied to multiple motors). A POSITA would have also been motivated to add a VFD from Taras to each of Kreymer’s refrigeration circuits because multiple refrigeration circuits provides well-understood failure and cooling capacity redundancies. Kreymer at 3:67-4:2. A POSITA would have been motivated to fine tune the capacity of each refrigeration

circuit, as taught by Taras, based on Kreymer's teachings that having multiple refrigeration levels is beneficial in having a PCA for cooling multiple aircraft types with varying cooling capacity needs.

Leeb Decl. at ¶ 126. A careful reading of Leeb's statement shows he never actually provides a reason for including a VFD in each of Kreymer's refrigeration circuits. Rather, he only separately provides (1) a reason to have multiple refrigeration circuits in the first place and (2) a reason to use VFD in general (not specifically a reason to include a VFD on *each* compressor as opposed to one VFD for the entire system). *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366 (Fed. Cir. 2016) (conclusory statements by expert supporting obviousness analysis may not be relied upon).

As a result, Leeb's stated motivations either ignore the full language of the claims or are merely circular. *See Wireless Protocol Innovations, Inc. v. TCT Mobile, Inc.*, 771 Fed. Appx. 1012, 1016 (Fed. Cir. 2019) (obviousness must address "every limitation required by [the] claims"); *see also TRW Automotive US LLC v. Magna Electronics, Inc.*, IPR2014-00259, Paper No. 19 (P.T.A.B. June 26, 2014) ("In other words, TRW argues that one of ordinary skill in the art would include a control functioning as claimed to accomplish the function claimed. Accordingly, TRW's rationale is circular at best"); *2Wire, Inc. v. TQ Delta, LLC*, IPR2015-00421, Paper 18 (P.T.A.B. May 29, 2015) ("Denying institution and finding that the argument was merely circular, "as it merely states the result of the asserted

combination, i.e., the basic components of Suzuki '614 performing the random number calculations described in Suzuki '415.”).

Third, the state of the art shows that a POSITA would not have been motivated to add a VFD to each of Kreymer's compressors. Again, Taras discloses that VFDs have drawbacks such as power and efficiency losses, heat generation, and are a source of unreliability, such that unnecessary VFDs are to be avoided. *See supra* at §II.2. And that adding unnecessary VFDs adds additional components that can fail and additional expense. *See id.* Here, if a POSITA wanted to increase power efficiency or fine tune the output of Kreymer, for example, a single VFD at the power source of Kreymer—which would adjust the power frequency the same to all components of Kreymer—would accomplish the same result, as taught in Taras'

Figure 1, below:

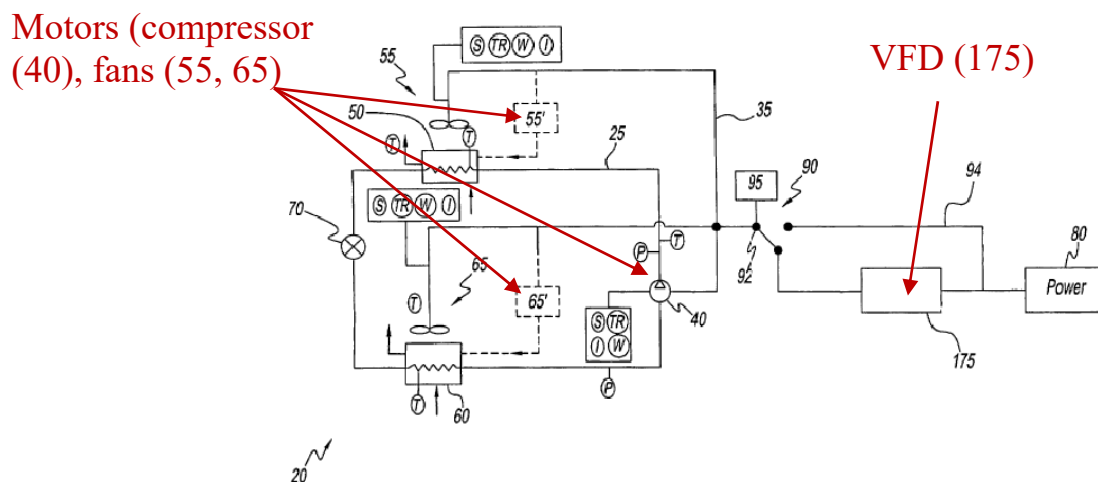


Fig. 2

See Exhibit 1006, Taras at Fig. 2. Where a simpler, easier, and more advantageous alternative solution exists, a party alleging invalidity must provide a motivation to *specifically* use the *claimed* solution—something Petitioner has failed to do here. See, e.g., *In re Nouvel*, 493 Fed. Appx. 85, 93 (Fed. Cir. Aug. 29, 2012) (“[T]he key question in this appeal (as well as before the Board) is why an ordinary artisan would thicken only one arm of Liou’s pliers. ... In its briefs and at oral argument, Nouvel provided multiple reasons, grounded in mechanics, why an ordinary artisan aiming to increase strength by increasing size would enlarge both arms of the pliers.”).

C. *Grounds 1-3 (Based on Kreymer), Claims 2-15: Neither Kreymer nor Taras Discloses Automatically Adjusting Cooling Based on Aircraft Size*

Grounds 1-3 based on Kreymer also fail for another reason. Independent claim 2 (and thus dependent claims 3-15) requires that the PCA unit has “a central controller that is configured for controlling the operation of the preconditioned air unit including variable frequency drivers of the plurality of the refrigeration systems, wherein *the central controller automatically adjusts the **cooling** performed by the preconditioned air unit according to at least one of: the selected type of aircraft, the ambient temperature, the humidity, the cabin temperature, or the outgoing airflow from the preconditioned air unit.*”

Tellingly, claim 2 within its text distinguishes between “cooling” and the “outgoing airflow from the preconditioned air unit”—where “cooling” refers to the

temperature decrease that the PCA imparts on the air, the “outgoing airflow” is the volume and speed of the air. *See* ‘169 patent at 4:4-15.

Petitioner points to Kreymer’s “mode selector” that can be used to select between several sizes of aircraft, after which (according to Petitioner) Kreymer’s unit allegedly “automatically configures itself to provide the amount of cooling.” Petition at 27. But Kreymer does not automatically adjust the cooling based on aircraft size at all. Rather, Kreymer only discloses that it automatically adjusts the *airflow* based on a selection of the aircraft size. *See* Kreymer at 1:11-14, 3:27-51 (“If the mode selector switch 62 is set to a wide body aircraft, then the first blower 41 and second blower 42, being in parallel fluid connection with the first blower 41, are activated and the first damper motor 51 opens the first damper 50 while the second damper motor 53 keeps the second damper 52 closed ... If the mode selector switch 62 is set to a jumbo body aircraft, then the first blower 41 and second blower 42 are activated and the first damper motor 51 opens the first damper 50 while the second damper motor 53 opens the second damper 52.”). And even then, Kreymer does not adjust for the specific aircraft “type,” but only adjusts between several aircraft sizes. *See id.*

Petitioner alternatively alleges that Taras also satisfies this claim element because Taras has a “power/control system 230” that drives a “vapor compression system 20” that allegedly “adjusts the PCA cooling performance based on the

required ‘conditioned space thermal load.’” Petition at 28. But Taras does not disclose that its system *automatically* adjusts anything in response to the “conditioned space thermal load”—only that the speed *can be reduced or increased* (i.e., manually) to satisfy the thermal load demands.

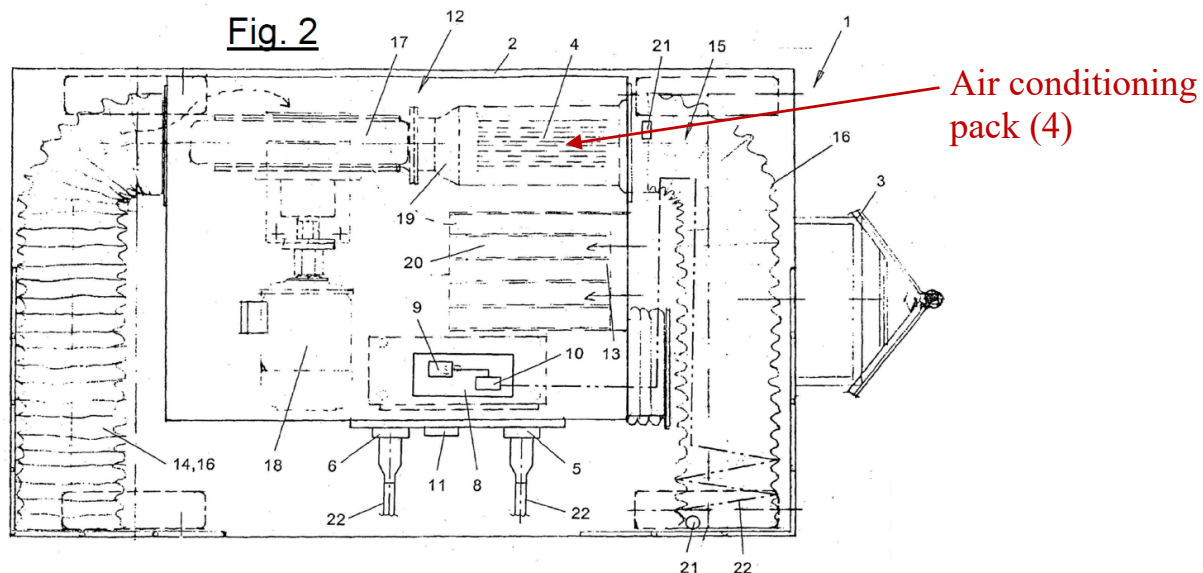
In short, the Petition is no stronger than the arguments the Examiner considered during prosecution regarding claim 2—and in fact is somewhat weaker. Petitioner points to *no reference* in Grounds 1-3 that discloses *automatically* varying *cooling* in response to any of the claimed variables.

**D. *Grounds 4-5 (Based on Lechmotoren), Claims 1, 2, 13, 14-22:*
The Petition Provides No Motivation to Add Separate VFDs to
Lechmotoren’s Compressors Because Lechmotoren Already
Discloses “Variable and Controllable Output” With One
“Regulator” Associated With the Central Controller**

Petitioner’s Grounds 4-5 based on Lechmotoren similarly fail. Just as with Kreymer, Petitioner provides no motivation to add separate VFDs to multiple refrigeration systems in Lechmotoren.

First, Lechmotoren does not unambiguously disclose the use of two or more *refrigeration* systems as required by the ‘169 patent claims. Lechmotoren states that its system can include “one or more air-conditioning packs (4),” but uses the term “air-conditioning” to refer both to cooling and heating. *See* Exhibit 1008, Lechmotoren at 1:22-25. Lechmotoren’s only disclosure of a refrigeration system is a vague reference that this “air-conditioning pack (4) can also be designed as a

cooling device (not shown) or can have a cooling pack in addition to the heating pack.” Lechmotoren at 10:3-6. The only specific reason Lechmotoren discloses for having multiple packs is to provide “heating and/or cooling devices” so that “air conditioning unit can be used in both warm and cold zones.” *Id.* at 4:9-12. Otherwise, Lechmotoren’s figures and description only describe a PCA unit with one air-conditioning pack, a heating pack, as shown below:

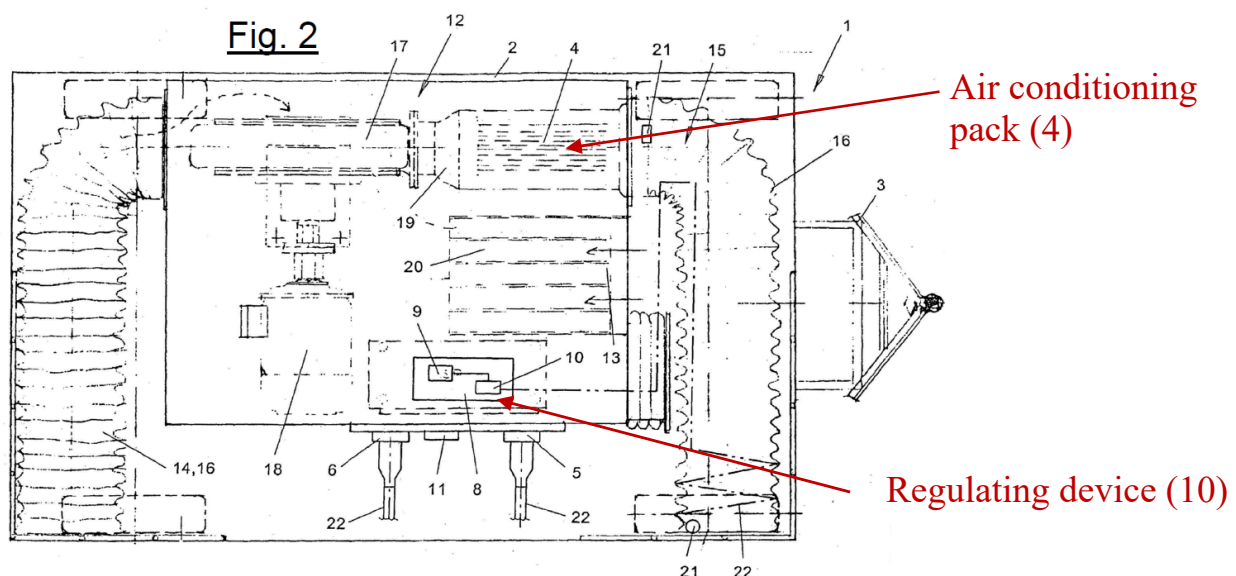


Lechmotoren Fig. 2. Vague disclosures in the prior art, however, cannot support obviousness. *See, e.g., Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1361 (Fed. Cir. 2011) (“To render a claim obvious, prior art cannot be ‘vague’ and must collectively, although not explicitly, guide an artisan of ordinary skill toward a particular solution.”).

Second, Lechmotoren states that its units have “variable and controllable output.” But again, it only expressly discloses this in connection with *heating*—not

cooling. Lechmotoren discloses that its heating can be adjusted by using “four heating levels” provided by “several plate-shaped or rod-shaped heating elements” that can be “activated individually by the control system (8).” Lechmotoren at 9:4-17. But even if varying the heating is done by varying the power to the electrical resistive heating elements that would require no VFD—Petitioner does not explain why it would not just involve a simple dimmer switch. Either way, Lechmotoren has no disclosure of providing variable or controllable output of *cooling*, much less any disclosure of VFD. Lechmotoren at 10:3-6.

Third, even if Lechmotoren is referring to varying the power of a refrigeration (i.e., cooling) unit, Lechmotoren only discloses that it regulates its air-conditioning pack via a *single* “regulating device” at the central controller and not as part of the individual air-conditioning packs. Lechmotoren at Fig. 2, 8:27-31. This is shown below:



Lechmotoren at Fig. 2. Even when Lechmotoren discloses that multiple air conditioning packs can be implemented, it does not disclose adding additional “regulating devices.”

Thus, Lechmotoren teaches using a *single* regulating device at the central controller to vary the power to all of the air-conditioning units. Petitioner points to no reason to instead provide multiple, *individual* regulating devices (e.g., VFDs) on individual cooling packs in Lechmotoren. *See, e.g., Provisur*, 2022 WL 17688071 (affirming Board finding of no motivation to combine where proposed combination would have doubled steps involved and added unnecessary complexity); *In re Schweickert*, 676 Fed. Appx. 988 (“The Board found that a ‘lockless’” Birrell worked without trouble and that the application of Cunniff’s semaphore to Birrell’s RAM would “add[] additional complexity and computations” to Birrell. Given these findings, the Board [in its decision] needed to explain why a skilled artisan would still have a reason to combine Birrell and Cunniff to achieve the claimed invention.”); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019) (the benefits “both lost and gained” must be weighed in analyzing obviousness).

E. *Grounds 3, 5 (Based on Takahashi), Claims 14-22: A POSITA Would Not Be Motivated to Apply Takahashi to Kreymer or Lechmotoren Because Takahashi is Not Analogous Art*

Petitioner’s Grounds 3 and 5 also fail for an additional reason. Grounds 3 and 5 are directed to claims 14-22, which require that “each refrigeration system of the

plurality of refrigeration systems is configured for failure detection so that, in the event that one of the refrigeration systems fails, *the failing refrigeration system transmits a failure signal to the central controller.*” Petitioner relies on Takahashi as allegedly disclosing this feature. Takahashi, however, is not analogous art to the ‘169 patent and is thus irrelevant for purposes of alleged obviousness.⁹

To be considered for purposes of obviousness, prior art must be “analogous” to the challenged patent. *Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1377 (Fed. Cir. 2023). “Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

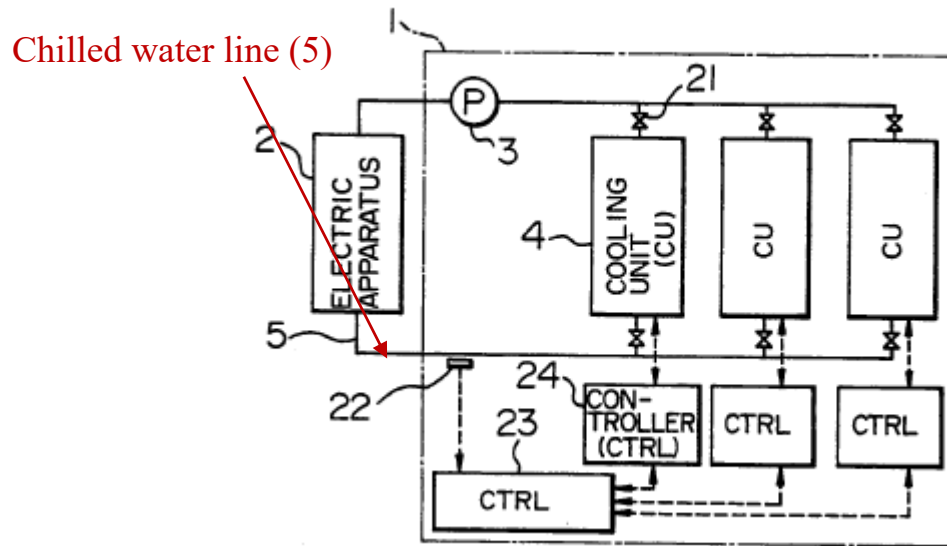
Here, the ‘169 patent states that its invention “related to a preconditioned air unit supplying preconditioned air, i.e., heated air or cooled air, to an aircraft parked

⁹ As discussed above, Takahashi is less relevant than the reference the Examiner relied upon in initial rejecting these claims, i.e., U.S. Patent No. 6,446,447 to Goth (“Goth”). *See supra* at § III. While Goth also related to a computer cooling system, it at least involved *air* cooling.

on the ground.” ‘169 patent at 1:13-15. The cooling output must be sufficient to cool an aircraft. *See* ‘169 patent at Fig. 4. And the problems raised in the ‘169 patent with respect to the prior art include “cost, efficiency, flexibility, and serviceability ... in known preconditioned air units.” Takahashi’s disclosed apparatus, in contrast, is wholly different from an aircraft preconditioned air unit. It does not involve the same field of endeavor and is not reasonably pertinent to solving cost, efficiency, flexibility, or serviceability issues in preconditioned air units.

First, Takahashi only discloses a very small, compact system for cooling an “electrical apparatus such as a computer.” Takahashi at 1:7-8. The power levels and frequencies involved, size of components, etc., are all different. And the efficiency and heat generation “drawbacks” of VFD raised in Taras regarding a larger HVAC unit would have been different in Takahashi.

Second, Takahashi does not cool *airflow*. Takahashi’s cooling units cool *water* in a tube that is then circulated through the computer:

FIG. 1

Takahashi at Fig. 1. Petitioner offers zero evidence that cooling a line of *water* would implicate the same cooling concerns compared to cooling *air*.

These are exactly the types of significant differences in the prior art that routinely overcome obviousness challenges. *See Apple Inc. v. INVT SPE LLC*, 851 Fed. Appx. 200, 202-203 (Fed. Cir. April 13, 2021) (affirming no obviousness where “[a]lthough Keskitalo and Lindell both involve measuring transmission power, they do so for different reasons, on different time scales, and compare the results to different thresholds.”).

F. *Ground 2 (Based on Kreymer, Taras, Takahashi), Claims 14-22: The Petition Provides No Motivation to Add Takahashi's Refrigeration Unit Failure Compensation to Kreymer—Adding Takahashi's Structure Would Fundamentally Change the Principle of Operation of Kreymer*

But even if Takahashi were analogous art to the '169 patent, Petitioner's Ground 2 also fails because Petitioner has failed to show that it would have been obvious to add to Kreymer the concept required by claims 14-22 that "each refrigeration system of the plurality of refrigeration systems is configured for failure detection so that, in the event that one of the refrigeration systems fails, *the failing refrigeration system* transmits a failure signal to the central controller." See '169 patent at claims 14-22. Nor does Petitioner point to anything unique in Kreymer, Taras, or Takahashi with respect to this limitation that was not already disclosed in the art before the Examiner.

Petitioner points to no reason to have Kreymer's refrigeration circuits separately (themselves) send a signal that one of them is failing, as is allegedly disclosed in Takahashi. Petitioner conclusorily alleges that "Takahashi's fault-tolerant architecture allows a refrigeration system with multiple refrigerant circuits, such as Kreymer's, to preserve its cooling output upon failure of one of the refrigerant circuits, by increasing the operation of the remaining coolers to compensate the loss resulting from the failure." Petition at 41. And Petitioner conclusorily alleges that "the POSITA would have modified the Kreymer-Taras

controller with features taught by Takahashi's control system, including use of individual unit controllers to control respective refrigerant circuits." *Id.*

Petitioner, however, ignores that Kreymer operates in the complete opposite manner as Takahashi. Takahashi discloses that it has separate, independently operating cooling units that can all be cooling with the compressors at low power to increase power efficiency. Takahashi at 2:8-11. If one cooling unit fails, Takahashi's controller needs to know which one failed to adjust the power to the other cooling units to increase their cooling output—because they are all separate, independently operating cooling units operating in parallel and Takahashi cannot increase the overall power frequency to all of the cooling units at once. *Id.* at 7:17-8:4.

Kreymer, on the other hand, adjusts cooling by introducing refrigerant into evaporators one-by-one using valves based on a desired level of overall cooling output. *See* Kreymer at 2:63-3:12. If one of Kreymer's compressors or evaporators fails, Kreymer's system would detect that the cooling output does not meet the desired level and so the next refrigeration circuit would be activated to introduce refrigerant into the next evaporator—all without any of the compressors needing to send a failure signal. *See id.* That is, Kreymer *has no need of Takahashi's failure detection scheme because Kreymer already achieves the same thing a different way.* *See supra* at §IV.B (citing law that obviousness is not shown where alleged

combination is redundant, superfluous, or would increase added complexity or disadvantages).

Moreover, modifying Kreymer to be compatible with Takahashi's scheme would require changing Kreymer's fundamental principle of operation. Takahashi's refrigeration circuits operate independently of each other. Kreymer's refrigeration circuits are co-dependent. In Takahashi, if one refrigeration circuit fails, the other refrigeration circuits can be adjusted to compensate for that failure. But Kreymer's circuits *share connected evaporator coils* that operate in sequence. 2:63-3:12. If one compressor fails, the other compressors would not be adjusted at all to compensate for that failure—they would already be operating at full power capacity. *See id.* Instead, the *valves* from subsequent compressors would be opened to provide additional refrigerant to the evaporator coils. *See id. See also Plas-Pak Indus. v. Sulzer Mixpac AG*, 600 Fed. Appx. 755, 758 (Jan. 27, 2015) (rejecting obviousness findings where the necessary alterations would fundamentally change a prior art reference's principle of operation).

G. Ground 5 (Based on Lechmotoren, Taras, Takahashi), Claims 14-22: The Petition Provides No Motivation to Add The Ability to Send Failure Signals From Each “Failing Refrigeration System” In Lechmotoren

Petitioner's Ground 5 based on Lechmotoren fails for a similar reason as Ground 2. Petitioner has not provided a non-conclusory motivation to add to

Lechmotoren the concept that “*the failing refrigeration system transmits a failure signal to the central controller.*” See ‘169 patent at claims 14-22.

Petitioner argues that “[a] POSITA would have been motivated to combine Takahashi with Lechmotoren and Taras to obtain a fault-tolerant PCA system.” Petition at 68. And that a “POSITA would have been motivated to modify [] Lechmotoren to implement the architecture disclosed in Takahashi, to implement this fault-tolerant feature. ... the POSITA would modify the controller by introducing individual unit controllers to control a respective refrigerant circuit, and that are themselves controlled by a central controller.” *Id.*

But Petitioner ignores that Lechmotoren’s configuration would already be fault tolerant—with no need for adding individual unit controllers or the ability to transmit failure signals from the individual units. Again, Lechmotoren has one “measuring device” that measures power demands, and one “regulator” to adjust output, both of which are associated with the central controller of the PCA instead of the individual air-conditioning packs. See Lechmotoren at 8, 27-29 (“The control system (8) also has a suitable regulating device (10) that adjusts the output of the air-conditioning pack (4) to the available residual energy and controls it in a suitable manner.”), 4:37-5:3 (“Preferably, the sensor and/or switch measures the temperature of the heating or cooling air coming from the air conditioning unit at the aircraft in order to maintain predefined conditions.”); see also Lechmotoren at claim 7 (“the

“air conditioning unit” (i.e., the overall unit) has a “measuring device (9) for the power demand of the aircraft (23) and a regulating device (10) for adjusting the power supply of the air-conditioning pack (4)”).

Even if one assumes that Lechmotoren’s disclosure of multiple “air conditioning packs (4)” includes and enables multiple *cooling* systems (*see above*), if one of these cooling systems fails, then the measuring device would measure a decreased power draw from the PCA and/or the sensor would show that the output air temperature has increased. Lechmotoren’s control system (8) would adjust the power to all the air-conditioning packs (4) with the regulating device (10) to effectively increase the power to the remaining working air-conditioning packs (4) to “maintain predefined conditions”. In Lechmotoren there is no need for a separate “failure detection signal” to be transmitted by “*the failing refrigeration system*” because the *central* control system (8) already adjusts for any failures based on the overall cooling output.

Accordingly, Petitioner has not shown a sufficient motivation to modify Lechmotoren in view of Takahashi. *See* Annotated Patent Digest (Matthews), Feb. 2025 at § 18:53.50 (“Generally, a motivation to modify or combine will not be found if the resulting feature will be merely redundant to what the prior art device already had.”); *South-Tek Systems, LLC v. Engineered Corrosion Solutions, LLC*, 748 Fed. Appx. 1003, 1006 (Fed. Cir. 2018) (affirming finding of no motivation to modify

prior art reference to provide redundant structure; petitioner's attempt to belatedly argue a specific motivation was rejected where it was not raised in the petition); *In re Anova Hearing Labs., Inc.*, 809 Fed. Appx. 840, 843 (Fed. Cir. 2020) (where the primary reference already solved the problem solved by the [challenged patent] there must be evidence as to why there would be a motivation to include an additional or redundant solution).

V. FOREIGN COUNTERPART ALREADY ADJUDICATED VALID IN ANOTHER FORUM/OTHER CONSIDERATIONS

The Director's Memorandum also specifies that discretionary denial may consider "[w]hether the PTAB or another forum has already adjudicated the validity or patentability of the challenged patent claims" and "[a]ny other considerations bearing on the Director's discretion." Director's Memorandum at 2-3. Here, it is notable that Petitioner has already unsuccessfully challenged the validity of a foreign counterpart of the '169 patent that has nearly identical claims.

While the parties are not involved in any litigation in the United States, Patent Owner has sued an affiliate of Petitioner, Dabico Airport Solutions Pvt Ltd. & Ors, for infringement in India on Indian Patent No. 330145 (a related patent to the '169 patent) and obtained a preliminary injunction. Among the unsuccessful arguments against the preliminary injunction, Petitioner's affiliate argued invalidity of the Indian patent based on alleged lack of inventive step (akin to obviousness) in view

of several prior art U.S. patents and other publications. *See* Exhibit 2021. Yet in response to this challenge to the patentability of the Indian patent—on what was presumably Petitioner’s “first tier” prior art—the Indian tribunal found the validity theories were not even “credible.” *See* Exhibit 2015, Judgment on Interim Injunction (High Court of Delhi) at 63.

More significantly, the Indian court found that (1) none of the prior art taught or rendered obvious a VFD on each of a plurality of refrigeration systems in a PCA separately, as opposed to one VFD to control all the refrigeration systems at the same variable frequency, (2) non-PCA (e.g., general HVAC) prior art was not analogous to PCA prior art and general teachings of HVAC prior art cannot necessarily be applied blindly to PCA systems, and (3) Petitioner’s sister company (Ipalco BV) filed and obtained a similar patent two years after ITW GSE (U.S. Patent No. 10,569,905), which supported that innovations to the control of PCAs are not obvious in view of HVAC general technology. *See id.* at 26-27, 58.

While the findings of the Indian Patent Office are not binding or persuasive authority in the United States *per se*, the Indian Patent Office proceedings do provide relevant evidence of the understanding of a POSITA regarding the applicable technology and evidence of Petitioner’s own prior positions. *See Tanabe Seiyaku Co. v. U.S. Int’l Trade Comm’n*, 109 F.3d 726, 733 (Fed. Cir. 1997) (finding that representations made to foreign patent office relate to determining how one of skill

in the art would understand interchangeability of chemical solvents). That Petitioner switched to new, second-tier prior art to that raised before the Indian Court shows that Petitioner simply wants multiple bites at the apple—relying on duplicative, redundant prior art for each bite. However, none of the prior art raised in the Petition is any better than the art already considered by the United States Examiner and in the related Indian proceedings.

VI. CONCLUSION

For these reasons, the Board should exercise its discretion and deny institution under 35 U.S.C. § 325(d) and/or 35 U.S.C. § 314(a).

Dated: April 28, 2025

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CERTIFICATE OF SERVICE

I certify that the Patent Owner Preliminary Response to Petition for *Inter Partes Review* under 35 U.S.C. § 42.107 in connection with *Inter Partes Review* Case IPR2025-00408 and exhibits 2001-2019 were served on April 28, 2025 by electronic mail to:

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CERTIFICATE OF WORD COUNT

Under 37 C.F.R. § 42.24(d), the undersigned attorney for the Patent Owner, AXA POWER APS, declares this Patent Owner Preliminary Response has 13,669 words, according to Microsoft Word® word count tool, excluding the parts of the Response exempted by 37 C.F.R. § 42.24(a)(1).

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