

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GCE GAS CONTROL EQUIPMENT INC.,
Petitioner,

v.

VBOX, INC.,
Patent Owner.

IPR2023-00326
Patent 11,389,614 B2

Before GRACE KARAFFA OBERMANN, ELIZABETH M. ROESEL, and
JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION

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

I. INTRODUCTION

A. Overview

GCE Gas Control Equipment Inc. (“the Petitioner”) filed a Petition (Paper 1, “Pet.”) for *inter partes* review of claims 1–16 (the “challenged claims”) of U.S. Patent No. 11,389,614 B2 (Ex. 1001, “the ’614 patent”). VBOX, Inc. (“the Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim Resp.”). With Board pre-authorization, the Petitioner filed a Reply (Paper 7, “Reply”) and the Patent Owner filed a Sur-reply (Paper 9, “Sur-reply”), limited to addressing the Patent Owner’s alleged “mischaracterization of FIG. 6 of Deane . . . and related arguments as to GCE’s annotations/analysis thereof,” and “assertion(s) the Petition should be denied under 35 U.S.C. § 325(d).” Ex. 1069, 1–2 (e-mail correspondence with the Board).

We have authority to determine whether to institute *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2022) (“The Board institutes the trial on behalf of the Director.”). *Inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

Upon consideration of the information presented in the Petition, Preliminary Response, Reply, and Sur-reply, we determine that the Petitioner has provided sufficient information to demonstrate a reasonable likelihood of prevailing with respect to at least one of the challenged claims. We therefore grant institution of *inter partes* review. We provide our

preliminary findings and conclusions of law in this Decision for the sole purpose of explaining our reasons for instituting an *inter partes* review, and any final determinations will be based on the full trial record.

B. Real Parties-in-Interest

The Petitioner identifies itself, GCE Gas Control Equipment Inc., as the real party-in-interest. Pet. 73. The Petitioner states that, “[t]o the extent identification of GCE’s ownership is necessary, GCE is . . . a wholly-owned indirect subsidiary of ESAB Corp.” *Id.* The Patent Owner identifies itself, VBOX, Inc., along with 3B Medical Manufacturing, LLC, React Health Holdings, LLC, 3B Medical, Inc., Ventec Life Systems, Inc., Watermark Medical, Inc., Medicomp, Inc., and Medi-Lynx Cardiac Monitoring, LLC as the real parties-in-interest. Paper 3, 1.

C. Related Matters

The parties identify the following proceeding involving the ’614 patent: *GCE Gas Control Equip. Inc. v. 3B Medical Mfg., LLC*, No. 8:22-cv-02550-TDC (D. Md.). Pet. 73; Paper 3, 1. The Petitioner indicates that the ’614 patent is in the same family as U.S. Patent No 10,357,628, which is the subject of IPR2023-00527. Paper 5, 1.¹ The Patent Owner indicates that the ’614 patent is a continuation of application number 14/193,504 (now U.S. Patent 10,702,669), which is a continuation of application number 13/795,977, which is a continuation of application number 13/096,362, which is a continuation of application number 11/054,341 (now U.S. Patent

¹ The Petitioner mis-identifies the co-pending proceeding as IPR2023-00327 in the Petition (Pet. 73), but correctly identifies IPR2023-00527 in its Updated Mandatory Notices (Paper 5, 1).

7,954,490). Paper 3, 1. The Patent Owner also indicates that pending application number 17/836,246 is a continuation of the '614 patent. *Id.*

II. BACKGROUND

A. The '614 patent (Ex. 1001)

According to the '614 patent, patients suffering from certain diseases and lung disorders require supplemental oxygen, and a need exists for home and ambulatory oxygen systems for such patients. Ex. 1001, 1:22–26. The '614 patent indicates that conventional systems used to provide such supplemental oxygen include oxygen concentrators that have the disadvantages of consuming relatively large amounts of electricity, being relatively large and heavy, emitting excessive heat, and being relatively noisy. *Id.* at 1:36–49.

The '614 patent purports to resolve these and other drawbacks of conventional oxygen concentrators by providing a wearable oxygen concentrator that “is small, lightweight, quiet, and flexible.” *Id.* at 2:46–50. The '614 patent explains that the concentrator separates oxygen from ambient air using vacuum swing adsorption, and includes a belt, a power module containing a power pack, a reservoir module, a control module containing a user interface, and a separation cartridge module. *Id.* at 3:38–41, 60–66, Fig. 2. The '614 patent discloses that the separation cartridge module includes a “removable” gas separation cartridge containing “a housing having an inlet port, an outlet port, and a bed of adsorbent material.” *Id.* at 2:54–58, Fig. 15.

Figure 7 of the '614 patent is reproduced below.

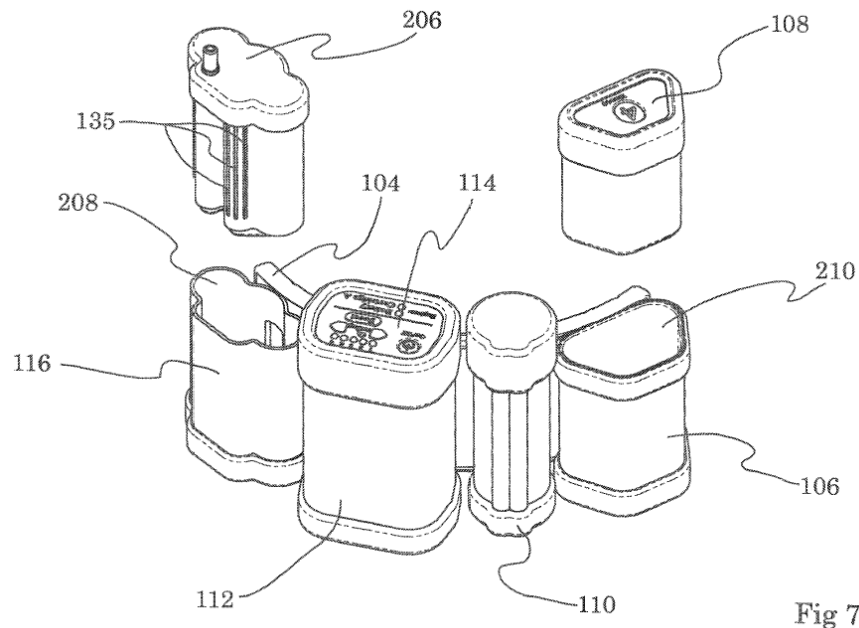


Fig 7

Figure 7 illustrates an exploded view of the '614 patent's oxygen concentrator "in which the power pack [108] and the adsorbent cartridge [206] have been removed." Ex. 1001, 3:6–8. The oxygen concentrator includes belt 104 for carrying the concentrator modules, power module 106 that receives power pack 108, control module 112 that receives user interface 114, separation cartridge module 116 having receptacle 208 for receiving adsorbent cartridge 206, and reservoir module 110 for storing oxygen-rich gas separated by cartridge module 116. *Id.* at 3:60–4:12, 11:61–12:3. Adsorbent cartridge 206 includes air inlet ports 135 which receive ambient air for separation. *Id.* at 12:11–12.

Figure 15 of the '614 patent is reproduced below.

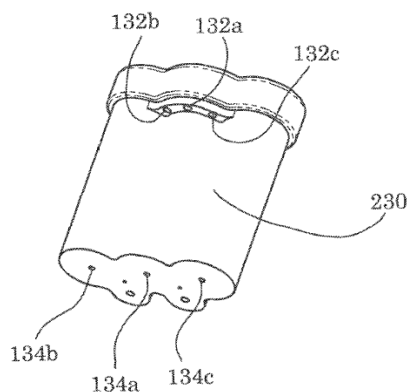


Fig 15

Figure 15 “is a perspective view of the cartridge [206] contained within a cartridge module [116].” Ex. 1001, 3:26–27. Cartridge 206 includes inlet ports 132a–132c, outlet ports 134a–134c, and casing 230. *Id.* at 18:60–62, 18:30–56. “[T]hree adsorption columns [130a–130c] are contained within casing 230 with one inlet port 132a–132c, and one outlet port 134a–134c, for each adsorption column 130a–130c.” *Id.* at 18:34–37. Each adsorption column 130a–130c contains a bed of adsorption material, which is preferably a zeolite capable of adsorbing nitrogen gas, and inlet ports 132a–134c receive either ambient air 162 or vacuum, while outlet ports 134a–134c expel product gas. *Id.* at 18:47–49.

B. Prosecution History of the '614 Patent

The application that issued as the '614 patent is a continuation of patent application number 14/193,504 (“the '504 application”), which issued as U.S. patent 10,702,669 (“the '669 patent”) (Ex. 1056). Ex. 1002, 532–533. The Examiner of the '504 application entered five Office Actions during prosecution of the application setting forth numerous rejections for anticipation and obviousness, among others, none of which applied Deane as a prior art reference. Ex. 1052, 162, 289, 381, 490, 553.

After entry of the fifth Office Action on December 31, 2019, the applicant filed an amendment (on January 20, 2020) in which the applicant cancelled all of the pending claims and introduced a new set of claims. *Id.* at 148–55. Independent claims 24 and 38 of the new claim set read as follows:

24. A cartridge configured for use with an oxygen concentrator and configured to be removable from the oxygen concentrator by movement in a first direction, the cartridge comprising:
- a first bed of adsorbent material disposed along a first axis, wherein the first axis is substantially parallel to the first direction;
 - a second bed of adsorbent material disposed along a second axis spaced-apart from the first axis, wherein the second axis is substantially parallel to the first direction;
 - a first port disposed along the first axis, the first port configured to receive fluid flowing to the first bed or to expel fluid flowing away from the first bed;
 - a second port spaced-apart from the first axis and configured to receive fluid flowing to the first bed or to expel fluid flowing away from the first bed;
 - a third port disposed along the second axis and configured to receive fluid flowing to the second bed or to expel fluid flowing away from the second bed; and
 - a fourth port spaced-apart from the second axis and configured to receive fluid flowing to the second bed or to expel fluid flowing away from the second bed;
- wherein the first, second, third, and fourth ports are oriented in a second direction opposite the first direction.
38. A portable oxygen concentrator, comprising:
- a receptacle;
 - a cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction, the cartridge comprising:

a first bed of adsorbent material disposed along a first axis, wherein the first axis is substantially parallel to the first direction;

a second bed of adsorbent material disposed along a second axis spaced-apart from the first axis, wherein the second axis is substantially parallel to the first direction;

a first port disposed along the first axis, the first port configured to receive fluid flowing to the first bed or to expel fluid flowing away from the first bed;

a second port spaced-apart from the first axis and configured to receive fluid flowing to the first bed or to expel fluid flowing away from the first bed;

a third port disposed along the second axis and configured to receive fluid flowing to the second bed or to expel fluid flowing away from the second bed; and

a fourth port spaced-apart from the second axis and configured to receive fluid flowing to the second bed or to expel fluid flowing away from the second bed;

wherein the first, second, third, and fourth ports are oriented in a second direction opposite the first direction.

Id. at 149, 152–153

The next paper issued by the Patent Office was a Notice of Allowance (*Id.* at 9–19), which was accompanied by an Examiner’s Interview Summary indicating that an interview had been held on April 24, 2020 in which the applicant and the Examiner had “a brief discussion of prior art to Deane (US 20050072426) [(Deane ’426, Ex. 1047)].” *Id.* at 19. We point out that the Petitioner indicates that Deane “has the same relevant disclosure as” Deane ’426 (Ex. 1047) (Pet. 8), and the Knaebel Declaration indicates that Deane “includes the same relevant disclosure as” Deane ’426 (Ex. 1047) and Deane ’745 (Ex. 1039). Ex. 1003, 68. The Patent Owner also indicates that Deane

has “substantially the same disclosure as” Deane ’059 (Ex. 1038), Deane ’745 (Ex. 1039), and Deane ’426 (Ex. 1047). Paper 6, 9. The Petitioner and the Patent Owner thus agree that Deane ’426 has substantially the same disclosure as Deane.

The Examiner provided a “Reasons for Allowance” in the Notice of Allowability, which stated that:

The closest prior art to new claims 24–42 is considered to be prior art to Deane (US 20050072426). Deane [’426] is considered to disclose an oxygen concentrator cartridge, best shown in Figure 6, having a first port corresponding to the filter portion 618a (par. 67) disposed along the first axis defined by the bed of adsorbent material 612 (par. 66) and a second port the upper port of feed tube 608 (par. 68) that lies in the same plane as filter portion 618a and spaced apart from the first port (fig. 6).

Id. at 16.

The Examiner further indicated that the applicant “approved amending independent claims 24 and 38 to include the substance of claim 30,” which, according to the Examiner, “defines over Deane [’426] because Deane [’426] requires the aforementioned first and second ports to be located in a single plane with the manifold to reduce the number of tubing connections and potential leak points in the unit (par. 64).” *Id.* To enter the agreed-upon amendments, the Examiner included an Examiner’s amendment in the Notice of Allowability, which added the following to the end of each of independent claims 24 and 38:

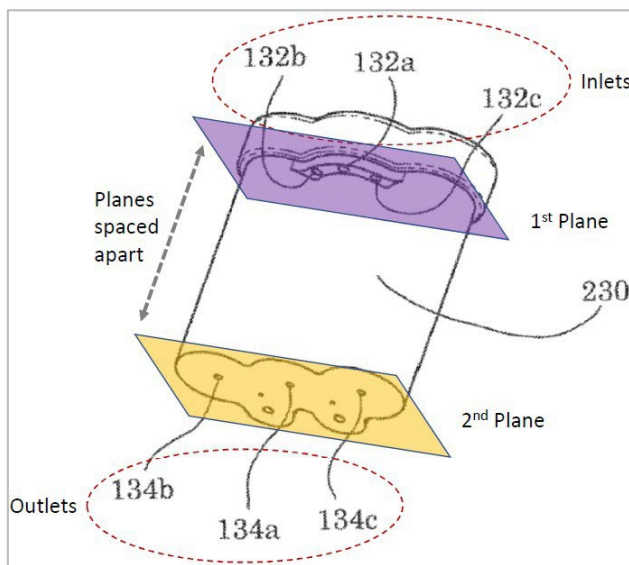
wherein a first plane extends through the first and third ports, the first plane is substantially perpendicular to the first and second axes,

a second plane extends through the second and fourth ports, the second plane is substantially perpendicular to the first and second axes,

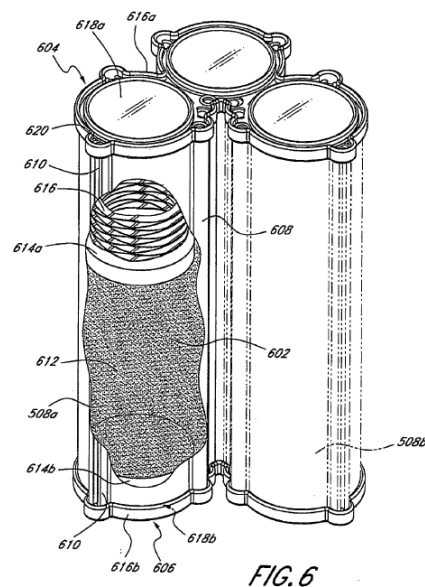
the first and second planes are spaced-apart from one another.

Id. at 14–15. We refer to these claim elements in this Decision as “the first and second plane limitations.”

To illustrate how the Examiner’s amendment defined over Deane ’426 (as indicated by the Examiner), the Petitioner provides the following annotated drawing that depicts a portion of Figure 15 of the ’669 patent (and a portion of the corresponding drawing in the ’614 patent) and shows a first (purple) plane extending through first 132a and third 132b ports (inlets), and a second (orange) spaced-apart plane extending through second 134a and fourth 134b ports (outlets). Pet. 9. The annotated drawing further includes Figure 6 of Deane, which shows opening of feed tube 608 (inlet) and filter portion 618a (outlet) located in a single plane:



'669/'614 patent



Deane '426

Id. The Petitioner’s annotated version of Figure 15 of the ’669 patent and the ’614 patent shows a portion of a perspective view of a separation cartridge for an oxygen concentrator. Ex. 1001, 3:26–27. Figure 6 of Deane ’426 illustrates an adsorbent bed column of a PSA unit. Ex. 1004 ¶ 17.

The ’669 patent issued July 7, 2020. Ex. 1052, 1. We reiterate that although the Examiner indicated in the Notice of Allowability that Deane ’426 was “[t]he closest prior art to new claims 24–42,” the Examiner did not apply Deane ’426 as a prior art reference in an Office Action during prosecution of the ’504 application.

Patent application number 15/931,716 (“the ’716 application”), which issued as the ’614 patent, was filed as a continuation of the ’504 application (that issued as the ’669 patent). Ex. 1001, 1; Ex. 1002, 532–533. During prosecution of the ’716 application, the applicant filed two Information Disclosure Statements on May 14, 2020, one of which listed Deane, and the other of which listed Deane ’426. Ex. 1002, 104–124 (particularly 121), 504–520 (particularly 512). The Examiner entered copies of both Information Disclosure Statements into the application file wrapper on May 24, 2022 that included a statement by the Examiner that all of the listed references had been considered, except where lined through. *Id.* at 34–56, 59–76. The listing of neither Deane nor Deane ’426 was lined through. *Id.* at 51, 67.

The Examiner issued a single Office Action during prosecution of the ’716 application, and the only rejections set forth in the Office Action were two non-statutory double patenting rejections. *Id.* at 19–23. In the first double patenting rejection, the Examiner rejected claims 21–32 over claims 1–23 of U.S. patent 10,357,682 (“the ’682 patent”). *Id.* at 22. The

application that issued as the '682 patent (application number 16/006,915) was also filed as a continuation of the '504 application (that issued as the '669 patent), and is the subject of IPR2023-00527 (discussed above).
Ex. 1053, 355–356.

In the second double patenting rejection, the Examiner rejected claims 33–36 over claims 1–17 of the '669 patent. Ex. 1002, 22. In so doing, the Examiner stated that “[a]lthough the claims at issue are not identical, they are not patentably distinct from each other because all the limitations of claims 33–36 are found in claims 1–17 of U.S. Patent No. 10,702,669 B2.”
Id.

Claim 33 of the '716 application, which issued as claim 13 of the '614 patent, read as follows:

33. A portable oxygen concentrator, comprising:
- a first bed of adsorbent material configured to preferentially adsorb nitrogen;
 - a first inlet oriented in a direction, wherein the first inlet is configured to direct a flow of ambient air to the first bed;
 - a first outlet oriented in the direction, wherein the first outlet is configured to expel product gas flowing downstream of the first bed;
 - a second bed of adsorbent material configured to preferentially adsorb nitrogen;
 - a second inlet oriented in the direction, wherein the second inlet is configured to direct a flow of ambient air to the second bed;
 - a second outlet oriented in the direction, wherein the second outlet is configured to expel product gas flowing downstream of the second bed;
 - a power pack removable from the portable oxygen concentrator;

a pump electrically coupled to the power pack, the pump operable to cause a flow of fluid to move relative to the first and second beds of adsorbent material;

a user interface configured to allow a patient to adjust and monitor operation of the portable oxygen concentrator;

a carrying device for transporting the portable oxygen concentrator;

wherein a first line extending parallel to the direction passes through the first outlet,

wherein a second line spaced-apart from the first line and extending parallel to the first line passes through the first inlet,

wherein the portable oxygen concentrator is configured such that, during use, fluid flowing along the first line contacts the adsorbent material of the first bed and fluid flowing along the second line does not contact the adsorbent material of the first bed,

wherein a third line extending parallel to the direction passes through the second outlet,

wherein a fourth line spaced-apart from the third line and extending parallel to the third line passes through the second inlet, and

wherein the portable oxygen concentrator is configured such that, during use, fluid flowing along the third line contacts the adsorbent material of the second bed and fluid flowing along the fourth line does not contact the adsorbent material of the second bed.

Id. at 92–93.

As discussed above, with the applicant’s approval, during prosecution of the ’504 application, which issued as the parent ’669 patent, the Examiner amended the independent claims to include the first and second plane limitations to distinguish over Deane ’426. Ex. 1052, 14–15. As the Petitioner points out (Pet. 12–13), contrary to the Examiner’s indication during prosecution of the ’716 application when rejecting claims 33–36 over claims 1–17 of the ’669 patent for non-statutory double patenting that “all

the limitations of claims 33–36 are found in claims 1–17 of U.S. Patent No. 10,702,669 B2,” the first and second plane limitations were not included in independent claim 33 of the ’716 application (as indicated above). Ex. 1002, 92–93. Nor were the limitations included in claims 34–36, which depend from claim 33. *Id.* at 93–94.

The Examiner of the ’716 application entered Notices of Allowance and Allowability on June 8, 2022, which indicated that claims 21–36 had been allowed. *Id.* at 7–11. The Examiner did not include a statement of Reasons for Allowance with the Notice of Allowability. *Id.*

C. Challenged Claims

The Petitioner challenges claims 1–16 of the ’614 patent. Pet. 13. Claims 1, 12, and 13 are independent, claims 2–11 depend from claim 1, and claims 14–16 depend from claim 13. Ex. 1001, 26:14–28:47.

Claims 1 and 12 are representative of the claimed subject matter and read as follows:

1. A portable oxygen concentrator, comprising:
a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet oriented in a second direction opposite the first direction, an outlet oriented in the second direction, and a bed of adsorbent material configured to preferentially adsorb nitrogen;
wherein a first line extending parallel to the first and second directions passes through the outlet,
wherein a second line spaced-apart from the first line and extending parallel to the first line passes through the inlet, and
wherein the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of

the bed and fluid flowing along the second line does not contact the adsorbent material of the bed.

12. A separation cartridge for a portable oxygen concentrator, comprising:
an inlet oriented in a direction;
an outlet oriented in the direction;
a bed of adsorbent material configured to preferentially adsorb nitrogen; and
wherein a first line extending parallel to the direction passes through the outlet,
wherein a second line spaced-apart from the first line and extending parallel to the first line passes through the inlet, and
wherein the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed.

Ex. 1001, 26:14–31, 27:12–28.²

D. Asserted Grounds of Unpatentability

The petitioner asserts that the challenged claims are unpatentable on the following grounds (Pet. 13–14):

Ground	Challenged Claim(s)	35 U.S.C. §	Reference(s)
--------	---------------------	-------------	--------------

² Pet. 26–72, CLAIM APPENDIX.

1	1–5, 7–16	103 ³	Deane, ⁴ Dubois, ⁵ Berntson ⁶
2	2, 3, 15	103	Deane, Dubois, Berntson, Hill ⁷
3	6	103	Deane, Dubois, Berntson, Basset ⁸
4	1–5, 7–16	103	Deane
5	2, 3, 15	103	Deane, Hill
6	6	103	Deane, Basset

The Petition is supported by the Declaration of Dr. Kent S. Knaebel (Ex. 1003).

III. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (Sept. 16, 2011), includes revisions to Sections 102 and 103 that became effective on March 16, 2013. Because the challenged claims issued from an application filed before March 16, 2013, we apply pre-AIA law. *See* Pet. 14, n.5; Ex. 1001, codes (22), (63).

⁴ US 2005/0072306 A1, published April 7, 2005 (Ex. 1004, “Deane”).

⁵ US 6,520,176 B1, issued February 18, 2003 (Ex. 1005, “Dubois”).

⁶ WO 2005/009590 A2, published February 3, 2005 (Ex. 1006, “Berntson”).

⁷ US 6,311,719 B1, issued November 6, 2001 (Ex. 1008, “Hill”).

⁸ US 2005/0028868 A1, published February 10, 2005 (Ex. 1007, “Basset”).

The Petitioner proposes that a person of ordinary skill in the art “would have had at least a bachelor’s degree, or the equivalent degree, in mechanical engineering, chemical engineering, or a related field, and 2–3 years of experience in the research, design, or development of portable oxygen concentrators and related hardware, software, and firmware, or equivalent experience.” Pet. 21 (citing Ex. 1003 ¶¶ 226–229). The Petitioner further proposes that “[a] person with less education but more relevant practical experience, or more education and less experience, may also meet this standard.” *Id.* At this stage of the proceeding, the Patent Owner does not dispute the Petitioner’s proposed definition of a person of ordinary skill in the art. Prelim. Resp. 14.

We find, at this stage, that the asserted prior art itself is sufficient to demonstrate the level of ordinary skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself can reflect the appropriate level of ordinary skill in the art). To the extent a more precise definition is required, we apply the Petitioner’s unopposed definition for purposes of determining whether to institute review, because it is consistent, on this record, with the disclosures of the asserted prior art references.

B. Claim Interpretation

We interpret claims “using the same claim construction standard that would be used to construe the claims in a civil action held under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under that standard, claim terms generally are given their plain and ordinary meaning as would have been understood by the ordinarily skilled artisan at the time of the invention when read in the context of the specification and prosecution history. *Phillips v. AWH Corp.*,

415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). We construe terms in controversy only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

The Petitioner presents express constructions for three claim terms: “separation cartridge,” “receptacle,” and “selectively removable.” Pet. 21–26. Although the Patent Owner contests the Petitioner’s proposed constructions of these terms, the Patent Owner proposes an alternative construction of only the term “separation cartridge.” Prelim. Resp. 14–23, particularly 20. Nonetheless, the Patent Owner further indicates that construction of “separation cartridge,” “receptacle,” and “selectively removable” is not needed at this stage because the Petitioner’s proposed constructions are “not related to any controversy in this IPR proceeding.” Prelim. Resp. 14–23, particularly 16.

Taking into consideration the information presented, we determine that none of the claim terms requires express construction for purposes of deciding whether to institute review.

C. Principles of Law

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged

claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

C. The Patentability Challenges

The Petitioner's asserted grounds for unpatentability are set forth above, and all rely on Deane as the primary reference. Pet. 13–14.

1. Deane (Ex. 1004)

Deane discloses a portable gas fractionalization apparatus having an intake through which ambient air is drawn, a compressor assembly that pressurizes the intake air to produce a feed gas, and a pressure swing adsorption (PSA) unit that receives and processes the feed gas to produce product gas having a higher oxygen content than the ambient air. Ex. 1004 ¶¶ 2, 32, Fig. 1.

Figure 3 of Deane illustrates an embodiment of Deane's portable gas fractionalization apparatus, and is reproduced below. *Id.* ¶ 14.

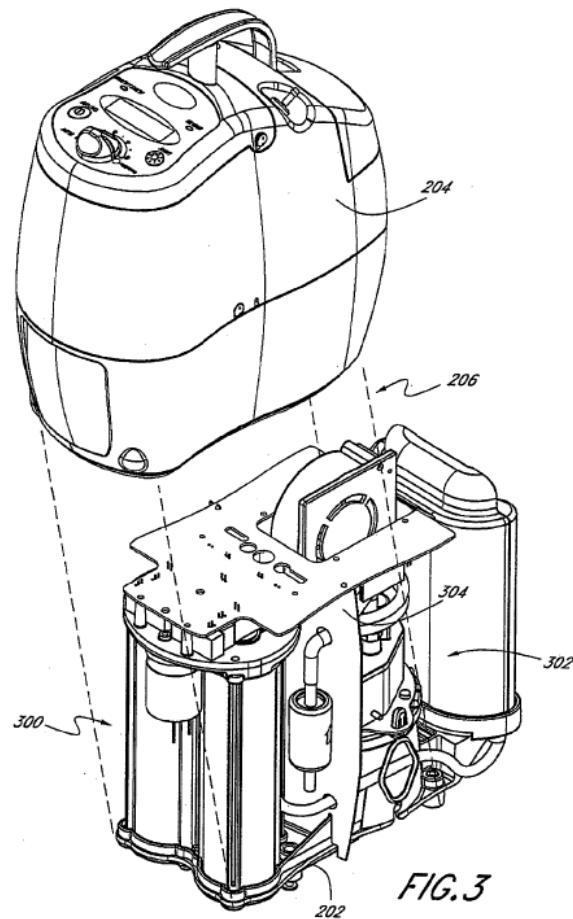


Figure 3 is a perspective view of portable gas fractionalization apparatus 200. Ex. 1004 ¶¶ 13–14. The apparatus includes shell 204 and chassis 202, which together form housing 206 that is separated into compartments 300, 302 by partition 304. *Id.* ¶¶ 57–58. Compartment 300 contains pressure swing apparatus (PSA) unit 506. *Id.* ¶¶ 58, 61, Fig. 5.

Figure 5 of Deane is a perspective view of the components inside compartment 300, including PSA unit 506, and is reproduced below. *Id.* ¶ 16.

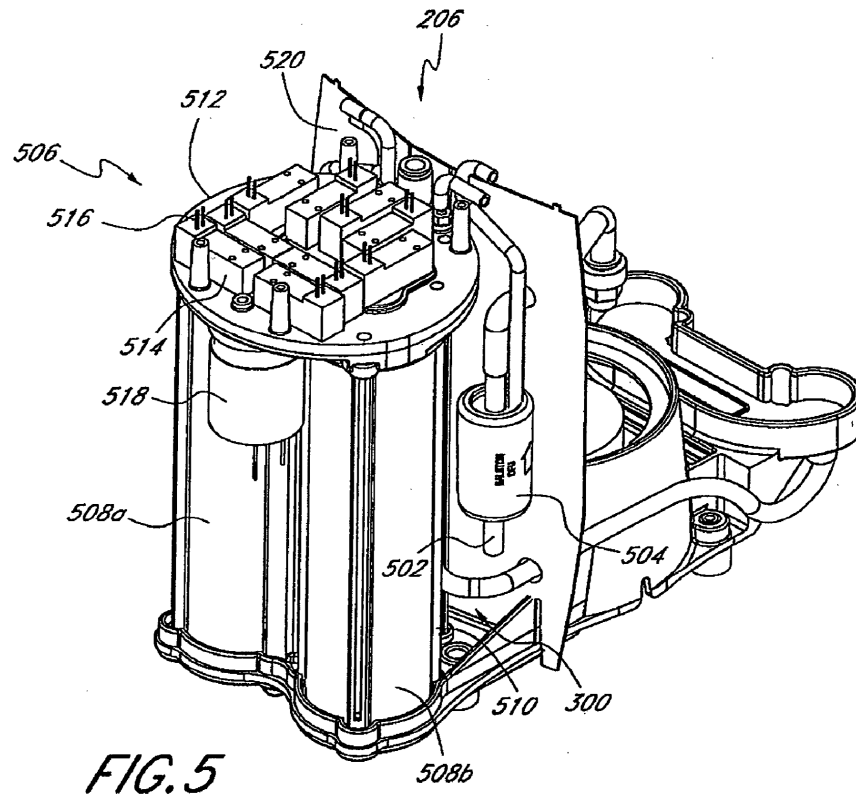


Figure 5 shows PSA unit 506, which includes adsorbent bed columns 508a, 508b, and integrated manifold 512 mounted horizontally on the upper ends of columns 508a, 508b. *Id.* ¶ 62. Integrated manifold 512 contains a plurality of integrated flow passages in fluid communication with openings in the upper end of each column, and a plurality of valves, which control the flow of fluid to and from the columns. *Id.* ¶¶ 7, 62, 63.

Figure 6 of Deane is a “schematic illustration” of adsorbent bed columns 508a, 508b of PSA unit 200, and is reproduced below. *Id.* ¶¶ 17, 66.

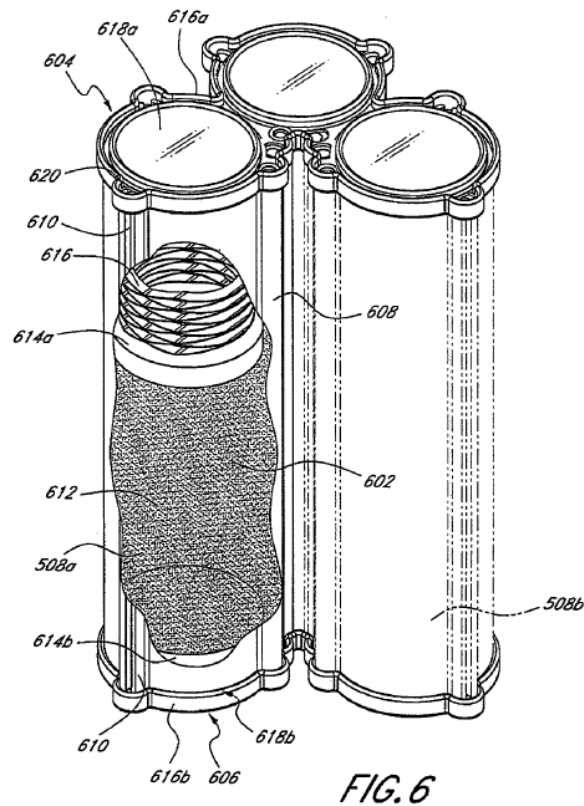


Figure 6 shows a schematic illustration of adsorbent bed columns 508a, 508b of PSA unit 200. *Id.* ¶¶ 17, 66. Adsorbent bed column 508a includes housing 602 and integrated feed tube 608 extending from upper end 604 of housing 602 to lower end 606 of housing 602. *Id.* ¶ 66, Fig. 6. “[F]eed tube 608 provides a gas passageway between the manifold and the housing 602 such that gas from the manifold can be routed through the feed tube 608 into the lower end 606 of the housing 602 and vice versa.” *Id.* Housing 602 contains adsorbent material 612 disposed between upper and lower restraining disks 614a, 614b, which inhibit movement of adsorbent material 612. *Id.* ¶ 68. Spring 616 applies pressure across upper restraining disk 614a to keep disk 614a in position. *Id.* Adsorbent material 612

“selectively removes one or more components” of a feed gas to form a product gas. *Id.* ¶ 70.

Figure 7A of Deane, reproduced below, is a schematic illustration of adsorbent bed column 508a in combination with chassis 202 and manifold 512, and shows “the manner[] in which gas flow is directed in and out of the column 508a.” *Id.* ¶¶ 18, 70.

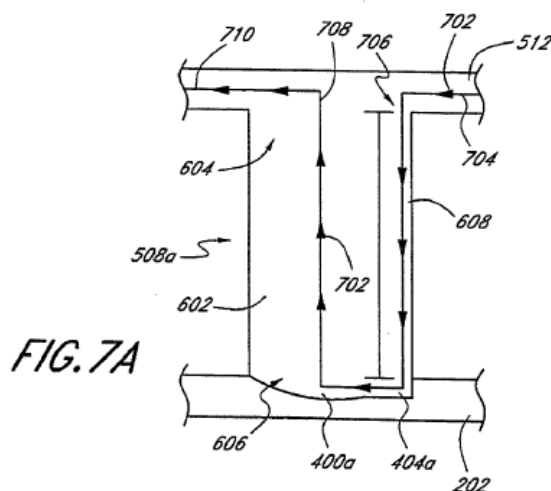


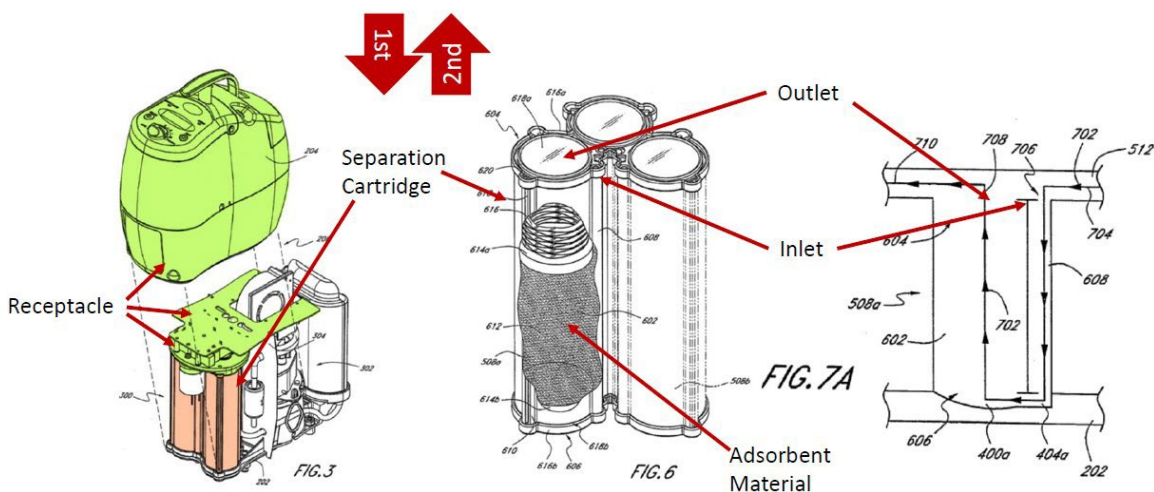
Figure 7A is a schematic diagram of gas flow to and from adsorbent bed column 508a. *Id.* ¶ 18. As shown, feed gas 702 is directed from feed stream 704 in manifold 512 into upper opening 706 (inlet) of feed tube 608, travels downwardly through feed tube 608 and is diverted into recess 400a underneath lower end 606 of adsorbent housing 602, flows laterally from recess 400a through lower end 606 of housing 602, and flows upwardly through the adsorbent material contained in housing 602, during which the adsorbent material selectively removes one or more components in feed gas 702 to form product gas 708, and product gas 708 flows out of upper end 604 of housing 602 (outlet) into product stream 710 in manifold 512. *Id.* ¶ 70, Fig. 7.

2. Claim 12

The Petitioner asserts that claim 12 is unpatentable over Deane alone (Ground 4), or over Deane, Dubois, and Berntson (Ground 1). Pet. 13–14.

Claim 12 requires the recited separation cartridge to include an inlet and an outlet, both oriented in a direction, and a bed of adsorbent material. Claim 12 recites that “a first line extending parallel to the direction passes through the outlet,” and “a second line spaced-apart from the first line and extending parallel to the first line passes through the inlet.” The parties’ dispute at this juncture focuses on the further recitation in claim 12 that “the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed.”

The Petitioner provides the following annotated versions of Deane’s Figures 3, 6, and 7A:

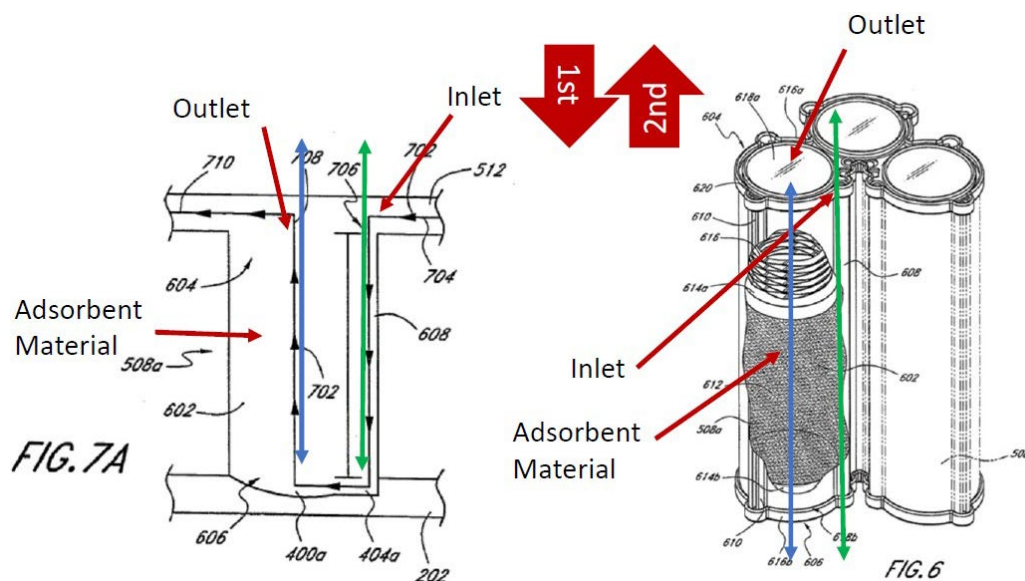


Pet. 33.

Deane's Figures 3, 6, and 7A, reproduced above, show elements of Deane's portable gas fractionalization apparatus.

The Petitioner contends that Deane renders a separation cartridge as recited in claim 12 obvious based on Deane's disclosure of the following: "adsorbent housing 602/adsorbent bed columns 508a, 508b" (separation cartridge) in which each column contains adsorbent material 612 (e.g., zeolite); openings 706 of feed tubes 608 (inlets) at upper end 604 of each adsorbent bed column 508a, 508b oriented in a direction (illustrated by arrow labeled "2nd" in the Petitioner's annotated drawing, below) and connected to lower end 606 of each column 508a, 508b; and filter portion 618a at upper end 604 of each adsorbent bed column 508a, 508b (outlets) oriented in the direction (illustrated by arrow labeled "2nd" in the Petitioner's annotated drawing, above) through which product gas flows out of adsorbent housing 602/adsorbent bed columns 508a, 508b and into manifold 512. Pet. 32–35, 44–46.

The Petitioner contends that Deane discloses that a first line (the blue line in the Petitioner's annotated drawing, below) extends parallel to the direction (illustrated by arrow labeled "2nd" in the Petitioner's annotated drawing, below) and passes through filter portions 618a/top portions 604 of adsorbent housing 602/adsorbent bed columns 508a, 508b (outlets), and a second line spaced-apart from the first line (the green line in the Petitioner's annotated drawing, below) extends parallel to the first (blue) line and passes through openings 706 of feed tube 608 of adsorbent housing 602/adsorbent bed columns 508a, 508b (inlets). Pet. 48–49.



Deane's Figures 6, and 7A, reproduced above, show elements of Deane's portable gas fractionalization apparatus.

The Petitioner contends that Deane discloses that adsorbent housing 602/adsorbent bed columns 508a, 508b (separation cartridge) is configured such that, when fluid flows through adsorbent housing 602/adsorbent bed columns 508a, 508b (separation cartridge), fluid flowing along the blue (first) line contacts adsorbent material 612, and fluid flowing through feed tube 608 along the green (second) line does not contact adsorbent material 612. Pet. 48–50. The Petitioner provides the annotated drawings reproduced above, and cites to paragraphs 59, 62, 66, 68, 70 and Figures 6 and 7A of Deane, to support these contentions. Pet. 48–50.

The Knaebel Declaration cites the same disclosures in Deane to support the Declarant's opinion that Deane renders obvious "a first line extending parallel to the direction passes through the outlet," "a second line spaced-apart from the first line and extending parallel to the first line passes through the inlet," and "the separation cartridge is configured such that,

when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed” as recited in claim 12. Ex. 1003 ¶¶ 347–351, 390–391.

The Patent Owner argues that Figure 6 of Deane shows adsorbent material 612 extending into feed tube 608, and the Petitioner’s annotated version of Figure 6 shows that fluid flowing along the green (first) line contacts adsorbent material 612 of adsorbent column 508a. Prelim. Resp. 31–32. The Patent Owner argues that the “highly schematic drawing” in Deane’s Figure 7A “does not establish that feed tube 608 lacks adsorbent” because adsorbent is not shown in Figure 7A. *Id.* at 32. The Patent Owner argues that the “Petitioner does not attempt to cite to anything in Deane’s written description” to support the Petitioner’s position that fluid flow through feed tube 608 would not contact adsorbent material 612, and “Deane never states there is no adsorbent material in the feed tube 608.” *Id.* at 33.

As discussed above, however, both the Petitioner and the Knaebel Declaration cite to paragraphs 59, 62, 66, 68, 70 and Figures 6 and 7A of Deane to support the position that Deane would have rendered obvious “a first line extending parallel to the direction passes through the outlet,” “a second line spaced-apart from the first line and extending parallel to the first line passes through the inlet,” and “the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed” as recited in claim 12. Pet. 48–50; Ex. 1003 ¶¶ 347–351, 390–391.

The Patent Owner argues that prior art cited by the Petitioner “demonstrates a known reason that green-line-contact with adsorbent would make sense and be beneficial.” Prelim. Resp. 34. Specifically, the Patent Owner argues that a book coauthored by the Petitioner’s Declarant Dr. Knaebel describes an oxygen concentration system having a pre-bed of adsorbent for impurity removal in series with a main adsorption bed, and Dee ’318 “teaches that using multiple adsorbent beds in series can result in higher oxygen product purity.” *Id.* at 33–34 (citing Ex. 1068, 126–129; Ex. 1037, 4:48–50).

In reply to the Patent Owner’s arguments, the Petitioner contends that Deane’s Figure 6 “provides a ‘cut-out’ view of the components inside housing 602 (*e.g.*, adsorbent 612, restraining disks 614a-b, spring 616) by showing portions of housing 602’s outer surface and tube 608 ‘cut-out’ to allow the internal elements to be seen.” Reply 2. The Petitioner contends that “FIG. 6 does not show adsorbent 612 extending into feed tube 608,” and “even if there is a question of FIG. 6’s teachings due to the limitations of representing a 3D structure in 2D (there is not), it is resolved by Deane’s other teachings of an adsorbent-free tube 608.” *Id.* at 2–3. The Petitioner points out that, as discussed above, Deane discloses that “feed gas 702 travels downwardly through the tube 608 and is diverted . . . into a recess 400a . . . feed gas 702 flows upwardly from the recess 400a through the lower end 606 of the housing 602 and upwardly through the adsorbent material contained in the housing 602.” *Id.* at 1–2 (citing Ex. 1004 ¶ 70). The Petitioner argues that “the fact that the gas is a ‘feed gas’ *after* it passes through feed tube 608 and is redirected upward confirms it has yet to pass through adsorbent” because “[f]eed gas’ in *Deane* is gas *supplied to* an

adsorbent bed (‘product gas’ is what *exists*).” *Id.* at 2 (citing Ex. 1004 ¶¶ 8, 32–56, 62, 64, 70; Ex. 1003 ¶ 10).

The Petitioner also contends that Deane’s Figure 7A “shows the portion of housing 602 with adsorbent is separate from tube 608, such that the adsorbent could not extend into tube 608.” *Id.* at 2. The Petitioner further contends that Deane discloses using restraining disks 614a, 614b to inhibit movement of adsorbent material 612, but tube 608 includes “no such disks, meaning no adsorbent is present.” *Id.* (citing Ex. 1004 ¶ 68). Finally, the Petitioner points out that Deane refers to tube 608 as a “gas passageway.” *Id.* (citing Ex. 1004 ¶ 66).

In its Sur-reply, the Patent Owner reiterates that Deane’s “Figure 6 does show adsorbent in the feed tube, and Petitioner’s green line passes directly through adsorbent.” Sur-reply 1. The Patent Owner argues that “[n]othing else in Deane teaches that the feed tube lacks adsorbent.” *Id.* The Patent Owner also repeats its argument that Deane’s feed tube 608 could function as a pre-bed in view of the known benefits of pre-beds in oxygen concentration systems. *Id.* (citing Ex. 1068, 126–129).

On this record, however, it appears that Deane’s Figure 6 shows that adsorbent 612 is formed as a single, unitary bed. The references cited and relied upon by the Patent Owner describe oxygen fractionation systems that, unlike Deane, include two distinct, separate beds arranged in series. The article co-authored by Declarant Dr. Knaebel describes a first pre-bed “for impurity removal” and a second “main adsorption bed.” Ex. 1068, 126–127. The article explains that “H₂O and CO₂ are removed in the pre-bed, and the dry CO₂ free air then passes to the main bed, where N₂ is selectively desorbed to yield the oxygen-rich product stream.” *Id.* at 128.

The second article cited by the Patent Owner, Dee '318, describes a pressure swing adsorption process for recovery of oxygen at high purity from a feed gas comprising oxygen, nitrogen, and argon. Ex. 1037, 4:28–38. Dee '318 discloses that the process utilizes two adsorption zones disposed in series in which the first zone contains an adsorbent selective for the adsorption of nitrogen over argon and oxygen, and the second zone contains an adsorbent selective for the adsorption of nitrogen over argon and selective for the adsorption of argon over oxygen. *Id.* at 4:48–53.

Both references thus describe two separate and distinct beds disposed in series that function to adsorb or remove differing components from a feed stream. Neither reference describes a single bed that functions as both a pre-bed and a main bed, which would remove the same component(s) from a feed stream if the feed stream were to flow through both portions of the bed. This would be the case if Deane's unitary adsorbent bed 612 were disposed not only in housing 602, but also in integrated feed tube 608.

Deane discloses that integrated feed tube 608 “provides a gas passageway” between manifold 512 and housing 602 that allows “gas from the manifold” to be “routed through the feed tube 608” into the lower end 606 of housing 602. Ex. 1004 ¶ 66. Deane further discloses that housing 602 contains adsorbent material 612 constrained against movement by upper and lower restraining disks 614a, 614b. *Id.* ¶ 68. For purposes of institution, these disclosures provide sufficient support for Petitioner's contention that Deane would have suggested to one of ordinary skill in the art that adsorbent material is not present in integrated feed tube 608. Reply 2. Further support is provided by Deane's description of Figure 7A, particularly the indication that feed gas 702 is directed from manifold 512

into upper opening 706 (inlet) of feed tube 608, and then travels downwardly through feed tube 608 and underneath lower end 606 of adsorbent housing 602 before flowing upwardly into lower end 606 of housing 602 and through adsorbent material 612 contained in housing 602. Ex. 1004 ¶ 70. Notably, Figure 7A illustrates a vertical, partition-like line between feed tube 608 and housing 602. *Id.* at Fig. 7A.

Considering the totality of the information presented in the record before us, we conclude that the Petitioner has shown a reasonable likelihood of prevailing in its challenge to the patentability of claim 12.

3. *Claims 13–16*

The Petitioner asserts that claims 13–16 are unpatentable over Deane alone (Ground 4), or over Deane, Dubois, and Berntson (Ground 1). Pet. 13–14. The Petitioner asserts that claim 15 is unpatentable over Deane and Hill (Ground 5), or over Deane, Dubois, Berntson, and Hill (Ground 2). *Id.*

Independent claim 13 includes limitations similar to those in claim 12, but, in contrast to claim 12, recites a portable oxygen concentrator that includes first and second beds of adsorbent material (rather than “a” bed of adsorbent material as recited in claim 12), and also includes a power pack, a pump, a user interface, and a carrying device. In asserting the unpatentability of claim 13, the Petitioner relies on the arguments the Petitioner presents for claim 12, and further identifies disclosures in Deane that it contends teach and/or would have suggested the elements of claim 13 not present in claim 12. Pet. 59–63. The Patent Owner does not present arguments for claim 13 apart from its arguments for claim 12. Prelim. Resp. 29 (asserting that claim 13 “recites similar non-contact limitations” as claim 12).

After reviewing the contentions and evidence the Petitioner presents in the Petition for claim 13, including the relevant portions of the Knaebel Declaration, we conclude that the Petitioner has established a reasonable likelihood of prevailing on its challenge to the patentability of claim 13.

We have considered the Petitioner's contentions and evidence for claims 14–16, which depend from claim 13. Pet. 63–66. At this stage, the Patent Owner does not dispute those contentions. Prelim. Resp. 29–35. Based on the information presented, we conclude that the Petitioner has established a reasonable likelihood of prevailing on its challenge to the patentability of claims 14–16.

4. Claims 1–11

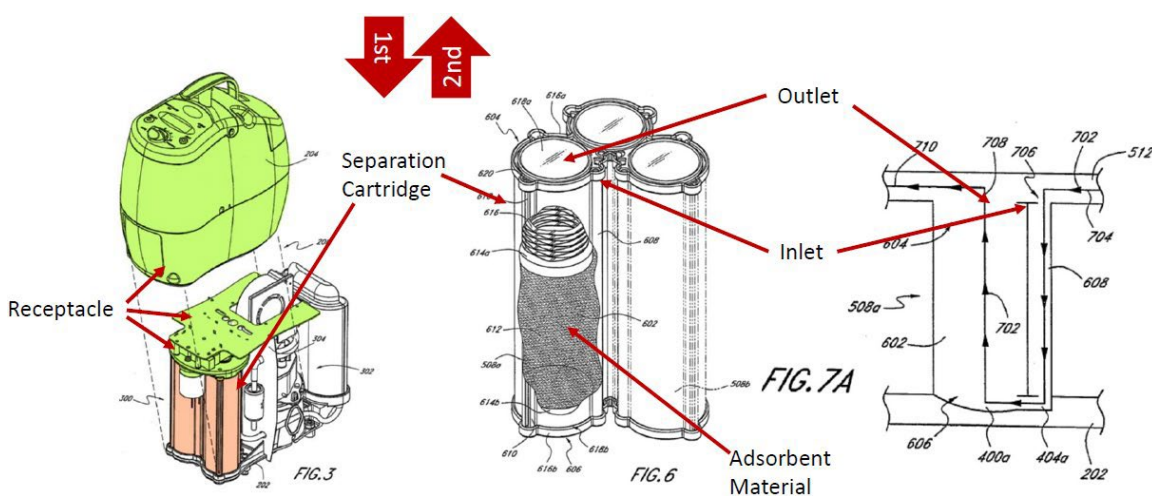
The Petitioner asserts that claims 1–5 and 7–11 are unpatentable over Deane alone (Ground 4), or over Deane, Dubois, and Berntson (Ground 1). Pet. 13–14. The Petitioner asserts that claims 2 and 3 are unpatentable over Deane and Hill (Ground 5), or over Deane, Dubois, Berntson, and Hill (Ground 2). *Id.* The Petitioner asserts that claim 6 is unpatentable over Deane and Bassett (Ground 6), or over Deane, Dubois, Berntson, and Bassett (Ground 3). *Id.*

Independent claim 1 recites, in part, a portable oxygen concentrator comprising “a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet oriented in a second direction opposite the first direction, an outlet oriented in the second direction.”

The Petitioner contends that Deane's manifold 512 is a “receptacle” because manifold 512 at least partially contains the end of adsorbent housing 602/adsorbent bed columns 508a, 508b around its periphery. Pet. 32, 36.

Alternatively, the Petitioner contends that a combination of manifold 512, shell 214, and circuit board 1314 (shaded green in the Petitioner's annotated version of Deane's Figures 3, 6, and 7A, reproduced below) is a "receptacle" because "shell 204 completely laterally surrounds adsorbent housing 602 in addition to the lateral containment offered by manifold," and one of ordinary skill in the art would have considered circuit board 1314 to be and intervening structure that is part of the receptacle. *Id.*

The Petitioner provides the following annotated version of Deane's Figures 3, 6, and 7A:



Id. at 33.

Deane's Figures 3, 6, and 7A, reproduced above, show elements of Deane's portable gas fractionalization apparatus.

The Petitioner contends that Deane renders obvious a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, where the separation cartridge includes an inlet and an outlet both oriented in a second direction opposite the first

direction. *Id.* at 42–43. More specifically, the Petitioner contends that the ordinarily skilled artisan would have understood that Deane’s “adsorbent housing 602/adsorbent bed columns 508a, 508b [separation cartridge] is selectively removable from manifold 512 [receptacle] ‘by movement relative to the receptacle in a first direction,’ which is a direction along the axis of adsorbent housing 602/adsorbent bed columns 508a, 508b.” *Id.* The Petitioner contends that one of ordinary skill in the art would have understood “Deane’s Figures . . . [to] illustrate an assembly direction along the axis of adsorbent housing 602/adsorbent bed columns 508a, 508b.” *Id.* at 42 (citing Ex. 1004, Figs. 3–5, 8, 11, 13–15). The Petitioner contends that the ordinarily skilled artisan would have further understood that, due to the periphery of manifold 512 laterally surrounding the uppermost lateral surfaces of adsorbent housing 602/adsorbent bed columns 508a, 508b, “disconnection in other directions (such as laterally) would be difficult,” and would result in wear and tear on the connecting surfaces of manifold 512. *Id.* at 42–43.

We emphasize that claim 1 recites that the separation cartridge is selectively removable from a receptacle *by movement relative to the receptacle in a first direction*, which is opposite the direction in which the inlet and outlet are both oriented, rather than reciting that the separation cartridge is selectively removable from the receptacle in an “axial” direction.

As discussed above, Deane discloses that its gas fractionalization apparatus 200 includes shell 204 and chassis 202, which together form housing 206 in which manifold 512 and adsorbent housing 602/adsorbent bed columns 508a, 508b are mounted. Ex. 1004 ¶¶ 57, 62, Figs. 2, 3. Deane discloses that base 208 of housing 206 has a substantially planar exterior

bottom surface adapted to rest against a support surface such as a table or floor. *Id.* Deane further discloses that chassis 202 is removably attached to shell 204 and may include bottom mounts or vibration isolation feet 407 disposed on its lower surface that are designed to rest against a support surface. *Id.* ¶¶ 58, 60, Fig. 4.

The Petitioner sets forth reasons why Deane would have suggested removal of the asserted separation cartridge (adsorbent housing 602/adsorbent bed columns 508a, 508b) from the asserted receptacle (manifold 512 or a combination of manifold 512, shell 204, and circuit board 1314) in an axial direction rather than a lateral direction. Pet. 42–43. However, in view of Deane’s disclosure that base 208 and vibration isolation feet 407 of chassis 202 are adapted to rest against a support surface such as a table or floor, the Petitioner does not explain how or why Deane discloses or would have suggested that the asserted separation cartridge (adsorbent housing 602/adsorbent bed columns 508a, 508b) is selectively removable from the asserted receptacle (manifold 512 or a combination of manifold 512, shell 204, and circuit board 1314) by movement of the separation cartridge relative to the receptacle in a direction *opposite* the direction in which opening 706 of feed tube 608 (inlet) and filter portion 618a at upper end 604 of adsorbent bed column 508a (outlet) are oriented. In other words, if Deane’s inlet and outlet are oriented upward (the “second direction”), as the Petitioner contends, then the Petitioner does not show sufficiently that Deane’s separation cartridge is removable from the receptacle by moving in the opposite direction, i.e., downward.

On the record before us, therefore, the Petitioner does not provide sufficient information to demonstrate that Deane discloses or would have

suggested that the asserted separation cartridge is selectively removable from the asserted receptacle by movement of the separation cartridge relative to the receptacle in a first (downward) direction opposite a second (upward) direction in which the asserted inlet and outlet are oriented. We, consequently, have concerns about the sufficiency of the Petitioner's showing for claim 1. We also have concerns about the Petitioner's showing for the claims that depend from claim 1 (claims 2–11), because the Petitioner's contentions for the dependent claims do not address our concerns for independent claim 1. Pet. 51–58.

Notwithstanding our concerns regarding the sufficiency of the Petitioner's showing as to claims 1–11, we institute an *inter partes* review based on all claims and all grounds of unpatentability set forth in the Petition. *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018); 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

D. Discretion to Deny Institution Under 35 U.S.C. § 325(d)

The Patent Owner requests us to exercise our discretion to deny institution under 35 U.S.C. § 325(d). Prelim. Resp. 36–47. The Petitioner requests the opposite. Pet. 6–13, 19–20.

Section 325(d) of Title 35 of the United States Code addresses the relationship between proceedings before the Board and other parts of the Office. Section 325(d) provides, in part, that “[i]n determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter

31,^[9] the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.”

To evaluate arguments under Section 325(d), we use

[a] two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). The following non-exclusive factors guide our application of this two-part framework:

- (a) the similarities and material differences between the asserted references and the prior art involved during prosecution;
- (b) the cumulative nature of the asserted references and the prior art evaluated during prosecution;
- (c) the extent to which the asserted references were evaluated during prosecution, including whether a rejection rested on any reference;
- (d) the extent of overlap between the arguments made during prosecution and Petitioner’s reliance on the asserted references or Patent Owner’s contentions concerning them;
- (e) whether Petitioner has pointed out sufficiently how the

⁹ Chapter 31 (35 U.S.C. §§ 311–319) relates to *inter partes* review.

Examiner erred in analyzing the asserted references; and

- (f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the asserted references or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph); *Advanced Bionics*, Paper 6 at 9–11 (the Board considers the *Becton Dickinson* factors in and *Advanced Bionics* analysis).

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

1. Advanced Bionics Part I: Becton, Dickinson Factors (a), (b), and (d)

As indicated above, each of the Petitioner’s asserted grounds of unpatentability relies on Deane as the sole or primary reference. Pet. 13–14.

In view of the prosecution history discussed in Section II.B. above, the Patent Owner shows that Deane previously was presented to the Office. Prelim. Resp. 39–41, 43–44. In particular, as discussed above, the Petitioner and the Patent Owner agree that Deane ’426 has substantially the same disclosure as Deane. Both references were listed on information disclosure statements submitted during prosecution of the ’716 application, which issued as the ’614 patent, and the Examiner indicated that the references had been considered. Furthermore, the Examiner of the parent ’504 application explicitly stated that Deane ’426 was the closest prior art to the pending claims in that application. As the Patent Owner points out, under MPEP

§ 609.02(II)(2), an examiner is required to “consider information which has been considered by the Office in a parent application . . . when examining: (A) a continuation application.” Prelim. Resp. 43. And under MPEP § 904, “[i]n all continuing applications, the parent applications must be reviewed by the examiner for pertinent prior art.” *Id.* The Examiner of the ’716 application, therefore, was required to consider Deane ’426 under these provisions of the MPEP.

As for the remaining references the Petitioner relies upon in the asserted grounds of unpatentability, the Petitioner and the Patent Owner agree that Dubois and Hill were listed on information disclosure statements filed during prosecution of the parent ’504 application, and the Examiner indicated that the references had been considered by not crossing through the entries for those references on the information disclosure statements. Pet. 19; Prelim. Resp. 39; Ex. 1002, 44–45.¹⁰ The Patent Owner argues that Berntson is cumulative to Cole (Ex. 1020), which was applied in an obviousness rejection during prosecution of the parent ’504 application (Ex. 1052, 185). Prelim. Resp. 39–40. Cole was also listed on an information disclosure statement filed during prosecution of the ’716 application, and the Examiner indicated that the reference had been considered. Ex. 1002, 39. The Patent Owner argues that the Petitioner “relies on Berntson to allegedly teach a distinct and removable cartridge containing adsorbent material,” and the “Petitioner’s Declarant admits that

¹⁰ The Petitioner relies on Basset to support the asserted unpatentability of dependent claim 6 only. Pet. 13–14.

Cole ‘teaches a removable adsorber cartridge.’” Prelim. Resp. 40; Pet. 26, 41; Ex. 1003, 26.

The Petitioner does not contest the Patent Owner’s assertion that Berntson is cumulative to Cole (Paper 7, 3–5), arguing only that Berntson was “not of record” during prosecution of the ’716 application (Pet. 19–20). The Petitioner further argues that the Examiner of the ’716 application did not apply Deane, Dubois, and Hill “in any rejection,” and did not mention the references during prosecution. Pet. 19–20. As discussed above, however, the Examiner implicitly indicated that these references had been considered by not crossing through the entries for the references on information disclosure statements.

Considering the totality of the information on the record before us, we determine that Deane, Dubois, and Hill previously were presented to the Examiner during prosecution, and Berntson is cumulative to Cole, which previously was presented to the Examiner during prosecution.

2. *Advanced Bionics Part 2: Becton, Dickinson factors (c), (e), and (f)*

Having determined that the same or substantially the same art previously was presented to the Office, we turn to the second part of the *Advanced Bionics* framework and consider *Becton, Dickinson* factors (c), (e), and (f) to determine “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 7–8, 10.

The Petitioner contends that the Examiner of the ’716 application (issued as the ’614 patent) clearly erred by not rejecting the pending claims over Deane ’426 because the features of the ’504 parent application (the first

and second plane limitations) that the Examiner of that application required to be added to the claims to distinguish over Deane '426 were not included in the claims of the '716 application, contrary to the Examiner's express indication to the contrary. Pet. 7–13, 20; Reply 4–5.

The Patent Owner argues that the Examiner of the '716 application “did, in fact, consider the Deane disclosure” and clearly appreciated Deane's applicability to the claims of the '716 application because “it is presumed that an Examiner handling the examination of a continuation application would substantively review a reference noted to be the ‘closest prior art’” in the notice of allowance of the parent application,” particularly in view of the Examiner's obligation to do so under MPEP §§ 609.02(II)(2) and 904 (discussed above), and the Examiner's signature on an information disclosure statement listing Deane (Ex. 1002, 67). Prelim. Resp. 42–44 (citing *Ultra-Tex Surfaces Inc. v. Hill Brothers Chemical Co.*, 204 F.3d 1360, 1367 (Fed. Cir. 2000)). The Patent Owner further argues that the Knaebel Declaration does not provide “any meaningful additional evidence” that the Office erred in a manner material to the patentability of the challenged claims because the Declarant merely repeats conclusory assertions from the petition without providing additional facts and evidence. *Id.* at 44–45 (citation omitted); see *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12, 5 (Feb. 10, 2023) (Vidal, Katherine K., Director, affirming denial of institution).

Considering the totality of the information before us, we determine that the Petitioner shows that the Examiner of the '716 application materially erred with respect to Deane. As discussed above, the Examiner of the '716 application rejected pending claims 33–36 over claims 1–17 of the parent

'669 patent, and in so doing, stated that “[a]lthough the claims at issue are not identical, they are not patentably distinct from each other because all the limitations of claims 33–36 are found in claims 1–17 of U.S. Patent No. 10,702,669 B2.” Ex. 1053, 355–356. Independent claim 33, however, did not include the first and second plane limitations, which the Examiner of the parent ’504 application (issued as the ’669 patent) required to be included in the independent claims of that application to distinguish over Deane ’426. Ex. 1052, 14–15. The Examiner of the ’716 application did not reject claims 33–36 over Deane ’426, even though these claims did not include the first and second plane limitations, which were included in the claims of the parent application to distinguish Deane ’426. The Examiner ’716 application, consequently, erred in a manner material to the patentability of claims 33–36. Ex. 1052, 14–15.

The Petitioner has shown that the Examiner erred in a manner material to the patentability of claims of the ’614 patent. We, accordingly, do not exercise our discretion to deny institution of *inter partes* review under § 325(d).

E. Notices

The Board shall deem waived any issue not raised in a timely response to the Petition, or as permitted in another manner during trial, even if asserted in the Preliminary Response or discussed in this Decision.

Nothing in this Decision authorizes Petitioner, in a manner not otherwise permitted by the Board’s rules, to supplement the information supporting any ground advanced in the Petition.

IV. CONCLUSION

For the reasons discussed above, the Petitioner has demonstrated a reasonable likelihood of prevailing in establishing that at least one claim of the '614 patent is unpatentable. We, therefore, institute an *inter partes* review of all challenged claims based on all asserted grounds of unpatentability set forth in the Petition. 35 U.S.C. § 314(a)(1) (2018).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review of the '614 patent is hereby instituted as to claims 1–16 on all grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial on the grounds of unpatentability authorized above; the trial commences on the entry date of this decision.

IPR2023-00326
Patent 11,389,614 B2

PETITIONER:

Robert M. Masters
Timothy Cremen
Eric K. Gill
Roy D. Jung
SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
rmasters@sheppardmullin.com
tcremen@sheppardmullin.com
egill@sheppardmullin.com
rjung@sheppardmullin.com

PATENT OWNER:

Timothy J. Murphy
David L. Atallah
Jessica Fleetham
CARLSON, GASKEY & OLDS, P.C.
tmurphy@cgolaw.com
datallah@cgolaw.com
jfleetham@cgolaw.com