

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GCE GAS CONTROL EQUIPMENT INC.,
Petitioner,

v.

VBOX, INC.,
Patent Owner.

IPR2023-00527
Patent 10,357,628 B2

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

INGLESE, *Administrative Patent Judge*.

DECISION
Denying 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 1–23 (the “challenged claims”) of U.S. Patent No. 10,357,628 B2 (Ex. 1001, “the ’628 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 particular issues. Ex. 1080, 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 not demonstrated a reasonable likelihood that it would prevail in establishing the unpatentability of at least one of the challenged claims. We therefore deny institution of *inter partes* review.

B. Real Parties-in-Interest

The Petitioner identifies itself, GCE Gas Control Equipment Inc., as the real party-in-interest. Pet. 83. 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 4, 1.

C. Related Matters

The parties identify the following proceeding involving the '628 patent: *GCE Gas Control Equip. Inc. v. 3B Medical Mfg., LLC*, No. 8:22-cv-02550-TDC (D. Md.). Pet. 83; Paper 4, 1. The Petitioner indicates that the '628 patent is in the same family as U.S. Patent No 11,389,614, which is the subject of IPR2023-00326. Pet. 83. The Patent Owner indicates that the '628 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 7,954,490). Paper 4, 1. The Patent Owner further indicates that pending application number 15/931,716 (now U.S. Patent No. 11,389,614) was also a continuation of the '504 application, and is the subject of IPR2023-00326, and pending application number 17/836,246 is a continuation of application number 15/931,716. *Id.*

II. BACKGROUND

A. The '628 patent (Ex. 1001)

According to the '628 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 '628 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 '628 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 '628 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 '628 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 '628 patent is reproduced below.

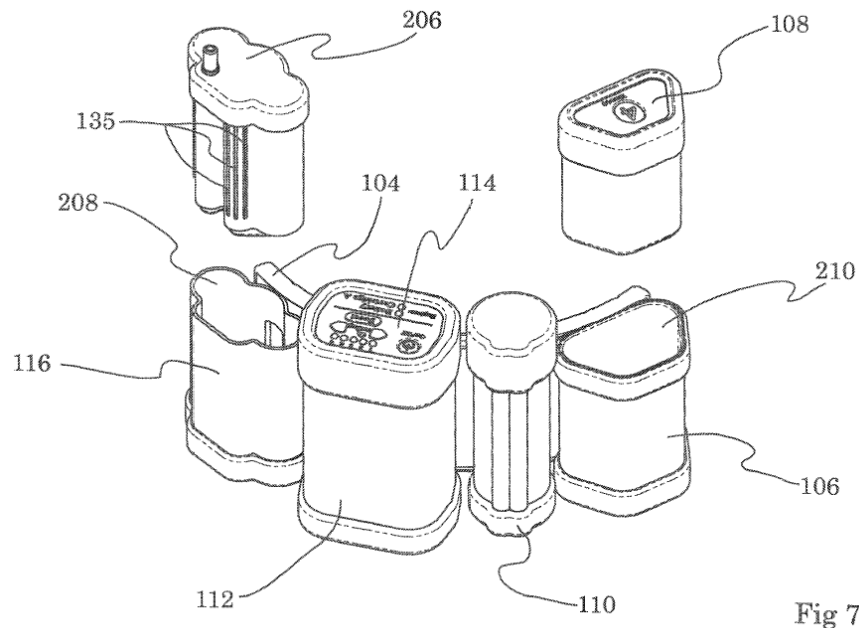


Figure 7 illustrates an exploded view of the '628 patent's oxygen concentrator "in which the power pack [108] and the adsorbent cartridge [206] have been removed." Ex. 1001, 3:6–8. The oxygen concentrator includes belt 104 for carrying the concentrator modules, power module 106 that receives power pack 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 '628 patent is reproduced below.

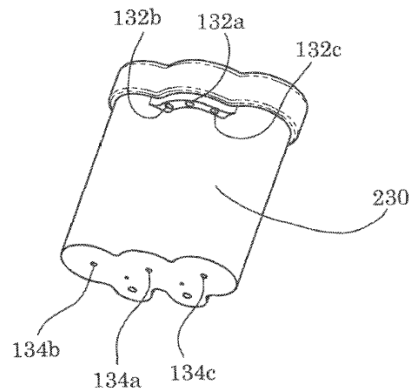


Fig 15

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. Challenged Claims

The Petitioner challenges claims 1–23 of the '628 patent. Pet. 21. Claims 1 and 11 are independent, claims 2–10 depend from claim 1, and claims 12–23 depend from claim 11. Ex. 1001, 26:18–28:35.

Claims 1 and 11 are representative of the claimed subject matter, and

read as follows:

1. A portable oxygen concentrator, comprising:
 - a cartridge module comprising a housing, the housing defining a receptacle;
 - a separation cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising a case at least partially defining an outer volume of the separation cartridge, 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, the case at least partially surrounding the bed of adsorbent material;
 - 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 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 the housing of the cartridge module is configured to at least partially surround the case of the separation cartridge,
 - wherein the bed of adsorbent material is disposed along an axis, one of the inlet and the outlet is disposed along the axis, and the other of the inlet and the outlet is spaced-apart from the axis, and
 - wherein the first direction and the second direction are substantially parallel to the axis.
11. A portable oxygen concentrator, comprising:
 - a cartridge module comprising a housing, the housing defining a receptacle;
 - a separation cartridge selectively removable from the 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; and
a power pack removable from the portable oxygen concentrator,
wherein the bed of adsorbent material is disposed along an axis,
wherein one of the inlet and the outlet is disposed along the axis,
wherein the other of the inlet and the outlet is spaced-apart from the axis, and
wherein the first direction and the second direction are substantially parallel to the axis.

Id. at 26:14–31, 27:12–28.¹

C. Asserted Grounds of Unpatentability

The Petitioner asserts that the challenged claims are unpatentable on the following grounds (Pet. 21–22):

Ground	Challenged Claim(s)	35 U.S.C. §	Reference(s)
1	1–4, 6–17, 19–23	103 ²	Deane, ³ Dubois, ⁴ Berntson ⁵

¹ See also Pet. 86–88, CLAIM APPENDIX.

² 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).

³ US 2005/0072306 A1, published April 7, 2005 (Ex. 1004, “Deane”).

⁴ US 6,520,176 B1, issued February 18, 2003 (Ex. 1005, “Dubois”).

⁵ WO 2005/009590 A2, published February 3, 2005 (Ex. 1006, “Berntson”).

Ground	Challenged Claim(s)	35 U.S.C. §	Reference(s)
2	2, 3, 14, 15, 22, 23	103	Deane, Dubois, Berntson, Occhialini ⁶
3	5, 18	103	Deane, Dubois, Berntson, Basset ⁷
4	1–4, 7–17, 19, 21–23	103	Deane
5	2, 3, 14, 15, 22, 23	103	Deane, Occhialini
6	5, 18	103	Deane, Basset

The Petition is supported by a 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)).

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

⁶ US 2005/0257686 A1, published November 24, 2005 (Ex. 1073, “Occhialini”).

⁷ US 2005/0028868 A1, published February 10, 2005 (Ex. 1007, “Basset”).

years of experience in the research, design, or development of POCs [portable oxygen concentrators] and related hardware, software, and firmware, or equivalent experience.” Pet. 29 (citing Ex. 1003 ¶¶ 227–230). 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. 16.

We find, for purposes of deciding whether to institute review, 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 four claim terms: “separation cartridge,” “receptacle,” “selectively removable,” and “axis.” Pet. 29–35. The Patent Owner contests the Petitioner’s proposed constructions of these terms, and proposes alternative constructions. Prelim. Resp. 16–27, particularly 22, 24, 25, 27. Nonetheless, the Patent Owner indicates that “the Board does not need to construe any terms raised for construction by Petitioner at this stage because Petitioner’s proposed constructions do not bear on the issue of whether *Deane* discloses the removal direction limitations.” *Id.* at 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).

D. The Patentability Challenges

The Petitioner's asserted grounds of unpatentability are set forth above, and all rely on Deane as the primary prior art reference. Pet. 21–22.

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.

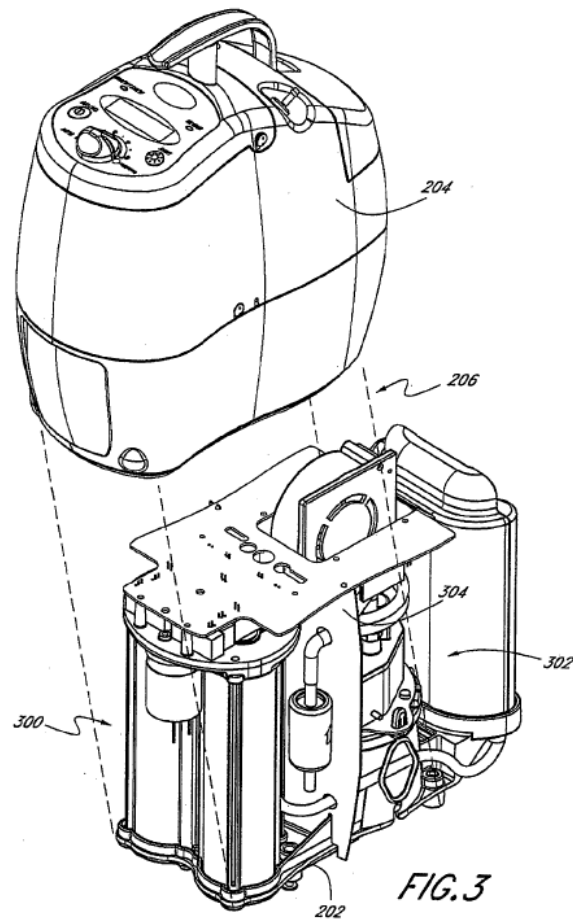


Figure 3 is a perspective view of Deane's portable gas fractionalization apparatus 200. Ex. 1004 ¶¶ 13–14. The apparatus includes shell 204 and chassis 202, which together form housing 206 that is separated into compartments 300, 302 by partition 304. *Id.* ¶¶ 57–58. Compartment 300 contains pressure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

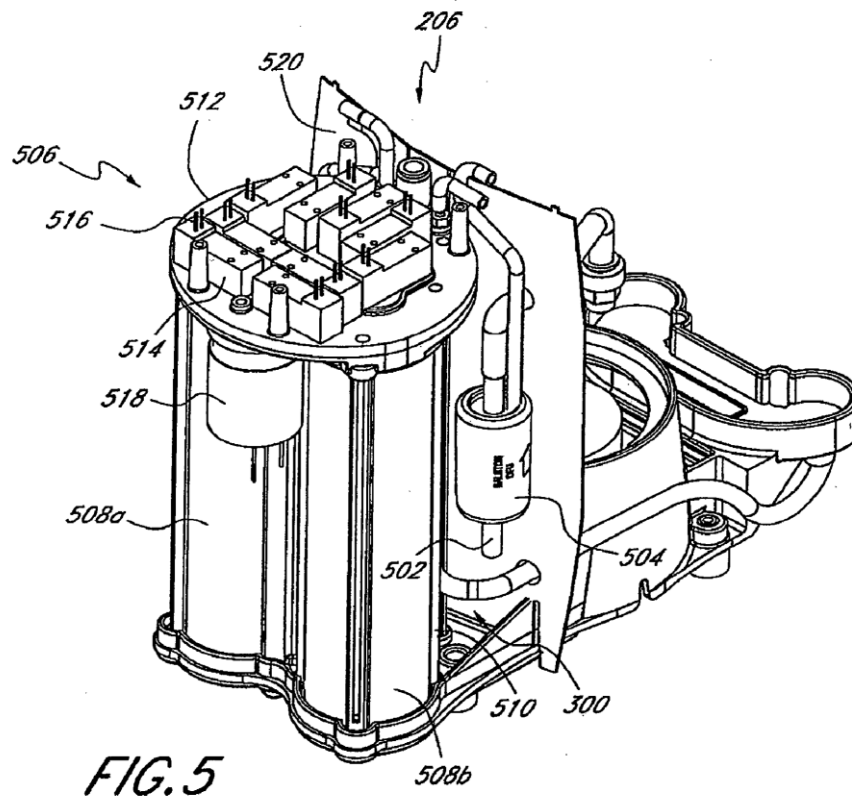


Figure 5 of Deane shows PSA unit 506, which includes adsorbent bed columns 508a, 508b, and integrated manifold 512 mounted horizontally on the upper ends of columns 508a, 508b. *Id.* ¶ 62. Integrated manifold 512 contains a plurality of integrated flow passages in fluid communication with openings in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

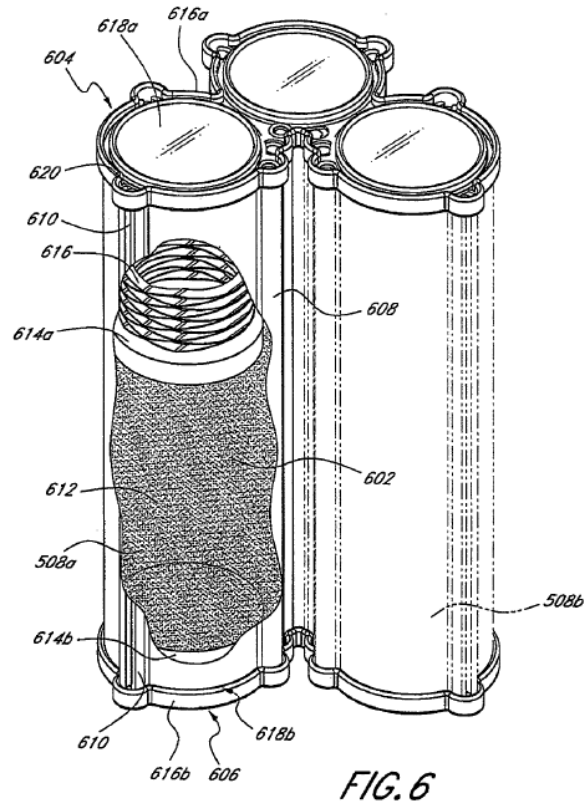


Figure 6 of Deane shows a schematic illustration of adsorbent bed columns 508a, 508b of PSA unit 200. *Id.* ¶¶ 17, 66. Adsorbent bed column 508a includes housing 602 and integrated feed tube 608 extending from upper end 604 of housing 602 to lower end 606 of housing 602. *Id.* ¶ 66, Fig. 6. “[F]eed tube 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.

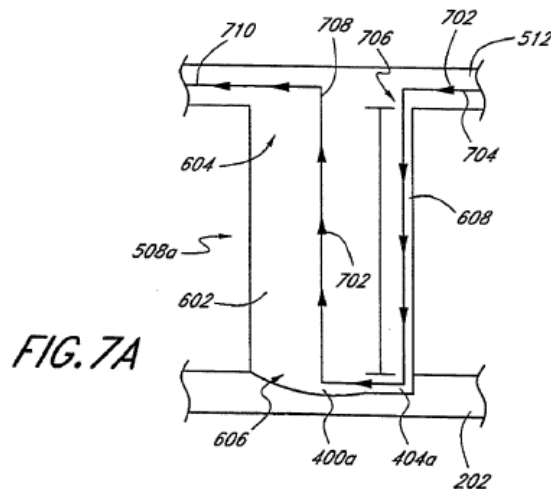


Figure 7A of Deane is a schematic diagram of gas flow to and from adsorbent bed column 508a. *Id.* ¶ 18. As shown, feed gas 702 is directed from feed stream 704 in manifold 512 into upper opening 706 (inlet) of feed tube 608, travels downwardly through feed tube 608 and is diverted into recess 400a underneath 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. *Berntson*

Berntson discloses a medical oxygen concentrator for delivering oxygen-enriched air to a patient. Ex. 1006 ¶ 3. Berntson's oxygen concentrator 10 includes oxygen-rich air generator (ORAG) 32 contained within housing 12 having service access port 30. *Id.* ¶ 11; Fig. 1. Berntson discloses that ORAG 32 includes chassis 34 removably mounted to the inside of cabinet 12. *Id.* ¶ 12; Fig. 1. Berntson discloses that components of ORAG 32, including adsorbent containers 42 containing sieve beds, are removably mounted to chassis 34. *Id.* Berntson discloses that ORAG 32 may be replaced as a unit for maintenance or service by disconnecting ORAG 32 from cabinet 12 and from additional components of ORAG 32 mounted to cabinet 12. *Id.* ¶ 19.

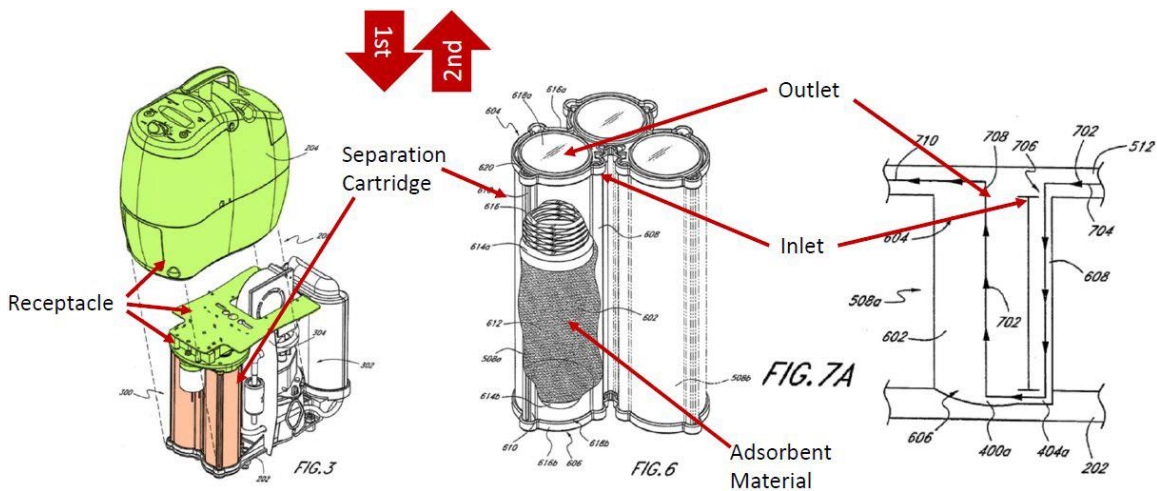
3. *Grounds 1 and 4*

The Petitioner asserts that claims 1–4, 6–17, and 19–23 are unpatentable over Deane, Dubois, and Berntson (Ground 1) and over Deane alone (Ground 4). Pet. 21–22. We focus our discussion on independent claims 1 and 11.

Claims 1 and 11 both recite a portable oxygen concentrator comprising, in part, a separation cartridge including an inlet, an outlet, and a bed of adsorbent material. Claims 1 and 11 require the separation cartridge to be selectively removable from a receptacle by movement relative to the receptacle in a first direction, and require the inlet and outlet to be oriented in a second direction opposite the first direction.

The Petitioner provides the following annotated versions of Deane's

Figures 3, 6, and 7A:



Pet. 49.

The Petitioner’s annotated versions of 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 as recited in claims 1 and 11 based on Deane’s disclosure of “adsorbent housing 602/adsorbent bed columns 508a, 508b” (separation cartridge) where each column contains adsorbent material 612 such as zeolite. Pet. 49–50, 55–56. The Petitioner contends that Deane’s manifold 512 is a “receptacle,” or alternatively, that a combination of manifold 512 and the inner portion of shell 204 (shaded green in the Petitioner’s annotated version of Deane’s Figures 3, 6, and 7A (reproduced above)) is a “receptacle.” *Id.* at 41, 43, 46.

In Ground 1, the Petitioner contends that Deane renders obvious a separation cartridge “selectively removable from a receptacle” because Deane illustrates that adsorbent housing 602/adsorbent bed columns 508a, 508b (separation cartridge) and manifold 512, or a combination of manifold

512 and inner portion of shell 204 (receptacle) are “separate pieces or assemblies,” and Deane teaches that “integrated manifold 512 is ‘mounted’ to adsorbent housing 602/adsorbent bed columns 508a, 508b.” *Id.* at 51–52. The Petitioner further contends in Ground 1 that Berntson also teaches a “separation cartridge ‘selectively removable from a receptacle’...oxygen-rich air generator (ORAG) unit mountable inside a housing of a concentrator and ‘removably fastened’ to the housing within what a POSITA would have understood is a ‘receptacle.’” Pet. 48, 53–54.

In Grounds 1 and 4, the Petitioner contends that ***Deane alone*** renders obvious a separation cartridge selectively removable from a receptacle “by movement relative to the receptacle in a first direction.” Referring to its annotated versions of Deane’s Figures 3, 6, and 7, Petitioner contends that one of ordinary skill in the art 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.* at 54–55, 82. The Petitioner contends that one of ordinary skill in the art would have recognized this to be the intended removal direction based on review of Deane’s Figures, and “because the outer periphery of manifold 512 laterally surrounds the uppermost lateral surfaces of adsorbent housing 602/adsorbent bed columns 508a, 508b,” and “disconnection in other directions (such as laterally) would be difficult.” *Id.* at 55. The Petitioner contends that “if removal in a direction other than the 1st direction [illustrated in the Petitioner’s annotated versions of Deane’s Figures 3, 6, and 7] would even have been possible, a POSITA would have considered it

obvious to separate these components in the ‘1st’ direction to maintain the airtightness of the various connections.” *Id.*

The Patent Owner disputes the Petitioner’s contentions, arguing that the Petitioner does not show that Deane discloses a separation cartridge that is selectively removable from a receptacle *by movement relative to the receptacle* in a *first direction*, as recited in independent claims 1 and 11. Prelim. Resp. 35–36. We agree with the Patent Owner. According to claims 1 and 11, the “first direction” is opposite the “second direction,” which is the direction in which the inlet and outlet are oriented. In Deane, the Petitioner identifies the “first direction” as downward, and the “second direction” as upward. Pet. 49. As explained below, the Petitioner does not show sufficiently that Deane discloses a separation cartridge that is selectively removable from a receptacle by movement relative to the receptacle in a first direction, i.e., a downward direction in Deane.

Deane’s 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. Claims 1 and 11 do not recite that the separation cartridge is selectively removable from the receptacle in an **axial** direction, however. Instead, the claims require movement of the separation cartridge relative to the receptacle in a **first direction**, which is opposite the direction in which the inlet and outlet are oriented. The Petitioner fails to account for 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 and the inner portion of shell 204) 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 both oriented upward (the “second direction”), as the Petitioner contends, then the Petitioner does not provide sufficient information and explanation to demonstrate that Deane’s asserted separation cartridge is removable from the asserted receptacle by movement of the receptacle relative to the separation cartridge in the opposite direction, i.e., downward.

As discussed above, when addressing Ground 1 in the Petition, the Petitioner contends that Berntson (in addition to Deane) teaches a separation cartridge selectively removable from a receptacle, but contends that Deane alone renders obvious a separation cartridge selectively removable from a

receptacle “by movement relative to the receptacle in a first direction.” Pet. 54–55, 82. For the first time in the Reply, however, the Petitioner contends that “applying *Berntson*’s basic teachings to *Deane* . . . would result in a cartridge removable *through* the POC bottom.” Reply 4; *see also id.* at 1 (describing Petitioner’s Scenario A). In neither the Petition nor the Reply, however, does the Petitioner identify with any degree of specificity the “basic teachings” of *Berntson* that a POSITA would have applied to *Deane*, nor without relying on impermissible hindsight, how the combined teachings of *Deane* and *Berntson* would have led the POSITA to the claimed subject matter. In particular, the Petitioner does not describe how or why *Berntson* would have led a POSITA to modify *Deane*’s gas fractionalization apparatus, much less describe any specific modifications that would have resulted in a separation cartridge removable through the bottom of *Deane*’s gas fractionation apparatus. Equally importantly, the Petitioner does not provide a sufficient rationale for combining the prior art teachings. The Petitioner does not explain why one of ordinary skill in the art would have considered any modifications of *Deane*’s apparatus in view of *Berntson*. The Petitioner, therefore, does not provide sufficient information to establish that combining *Berntson* with *Deane* would remedy the deficiencies of the Petitioner’s contentions based on *Deane* alone, discussed above.

We have considered the additional contentions the Petitioner sets forth in the Reply and do not find them persuasive. Reply 1–5. We agree with the Patent Owner that the Petitioner advances an overly broad interpretation of “a separation cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction” as recited in claims 1 and 11 “that strips the words in the claims of any real meaning, and makes

the removal direction limitations superfluous.” Sur-reply 2–3. We further agree with the Patent Owner that the Petitioner’s Example Y described at page 2 of the Reply “in which one would hold the separation cartridge inverted, and stationary, during removal. . . does not modify the plain meaning of the claims, nor come within the scope of the claims, because [in that scenario] the separation cartridge is not the moveable component.” *Id.* at 3.

On the record before us, therefore, the Petitioner does not provide sufficient information and explanation 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, as required by independent claims 1 and 11. The Petitioner’s contentions, therefore, are not sufficient to support institution on Grounds 1 and 4 because the Petitioner does not demonstrate a reasonable likelihood of prevailing in its challenge to the patentability of at least one of the claims asserted in these grounds.

4. Grounds 2, 3, 5, and 6

The Petitioner’s Grounds 2, 3, 5, and 6 challenge various dependent claims based on Deane in combination with one or more other references. The Petitioner’s Grounds 2, 3, 5, and 6 do not remedy the deficiencies in Petitioner’s Grounds 1 and 4 as they relate to independent claims 1 and 11. Petitioner’s Grounds 2, 3, 5, and 6 are therefore deficient for the same reasons.

E. Discretion under 35 U.S.C. § 325(d)

In view of our determination that the Petitioner does not meet the threshold for instituting review on the merits, we need not address the parties' dispute about whether the Board should exercise its discretion to deny institution under 35 U.S.C. § 325(d). Pet. 28–29; Prelim. Resp. 45–57.

F. Discretion under 35 U.S.C. § 314(a)

In view of our determination that the Petitioner does not meet the threshold for instituting review on the merits, we also need not address the parties' dispute about whether the Board should exercise its discretion to deny institution under 35 U.S.C. § 314(a) and *Fintiv*.⁸ Pet. 27–28; Prelim Resp. 57–65; Reply 5; Sur-reply 5.

IV. ORDER

It is ORDERED that the Petition is *denied*, and no trial is instituted.

⁸ *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential).

IPR2023-00527
Patent 10,357,628 B2

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