
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GCE GAS CONTROL EQUIPMENT INC.,

Petitioner,

v.

VBOX, INC.,

Patent Owner.

Inter Partes Review No. IPR2023-00326
Patent No. 11,389,614

PATENT OWNER RESPONSE

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Exhibit	Description
2001	Declaration of Orhan Talu, Ph.D.
2002	CV of Orhan Talu, Ph.D.
2003	Transcript of Deposition of Kent Knaebel, Ph.D.
2004	Article titled “From Drawing Board to Design Excellence,” dated 2006 (Exhibit 5 from Knaebel Deposition)
2005	U.S. Patent No. 5,226,933 to Knaebel et al. (Exhibit 6 from Knaebel Deposition)
2006	Government Accountability Office Report to the Subcommittee on Courts, Intellectual Property, and the Internet, Committee on the Judiciary, House of Representatives
2007	Transcript of Deposition of Geoffrey Deane, Ph.D. in <i>GCE Gas Control Equipment, Inc., v. 3B Medical Manufacturing, LLC</i> , 8:22-cv-02550-TDC (D. Maryland)

I. INTRODUCTION

This case relates to portable oxygen concentrators, which are devices used by patients that require supplemental oxygen. Portable oxygen concentrators are able to convert ambient air, which contains about 78% nitrogen and 21% oxygen, into relatively pure oxygen.

The portable oxygen concentrator of U.S. Patent No. 11,389,614 (Ex. 1001, the “’614 Patent”) may include a separation cartridge containing a specific material, known as adsorbent, which is configured to separate nitrogen from ambient air. With the nitrogen separated out, relatively pure oxygen can be delivered to a patient. Over time, however, the adsorbent loses its ability to adsorb nitrogen and the separation cartridge must be replaced. Therefore, the portable oxygen concentrator includes a separation cartridge that is easily replaceable by end users.

Ultimately, providing this replaceable cartridge reduces downtime, because a patient can replace the cartridge themselves without needing to send their portable oxygen concentrator in for service every time a cartridge needs replacing.

The claims recite various features that relate to the ability of the separation cartridge to be readily removed and replaced. First, independent claim 1 recites “a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction” (i.e., the “removal direction limitation”). Second, each of the challenged claims recites a separation cartridge and/or adsorbent

bed configured such that fluid flowing along a reference line does not contact any adsorbent material (i.e., the “non-contact limitations”).

In all six proposed grounds, Petitioner alleges *Deane* (Ex. 1004) alone meets both the removal direction and non-contact limitations. It does not.

With respect to the removal direction limitation (claims 1-11), Petitioner appears to assert that claim 1 is met by movement of a receptacle relative to a separation cartridge, rather than movement of a separation cartridge relative to a receptacle. Claim 1 explicitly requires the latter, and this discrepancy is fatal to Petitioner’s obviousness analysis.

The Board recognized this deficiency (and others) in *Deane* in its institution decision. Paper 10 at 34-36. Specifically, the Board recognized Petitioner’s misreading of the removal direction limitation and noted “[o]n the record before us, therefore, the Petitioner does not provide sufficient information to demonstrate that *Deane* discloses or would have suggested” the removal direction limitation. *Id.* Likewise, in a related institution decision, when addressing the same removal direction limitations and the same prior art and arguments, the Board denied institution based on a failure to show a reasonable likelihood of establishing the removal direction limitations. *GCE Gas Control Equipment, Inc. v. VBOX, Inc.*, IPR2023-00527, Paper 9 at 20 (PTAB Sept. 1, 2023) (“’628 Patent institution

decision”). The Board’s initial impression in this case is correct. So was the Board’s ’628 Patent institution decision.

Patent Owner now submits a Declaration of Orhan Talu, Ph.D. Dr. Talu agrees with the Board’s conclusion that *Deane* does not meet the removal direction limitation.

Dr. Talu also opines that Petitioner has not proven that *Deane* meets the non-contact limitations, which are present in all challenged claims. In general, the drawings of *Deane* explicitly contradict Petitioner’s assertions regarding the non-contact limitations, and show contact with adsorbent where the claims require none to be present. Petitioner has not otherwise attempted to demonstrate that *Deane* meets the non-contact limitations. Indeed, there is no evidence in the record that supports Petitioner. For one, *Deane*’s written description does not establish that there would be no contact along the feed tube. In light of this evidence, Petitioner has failed to meet their burden in establishing that *Deane* teaches the non-contact limitations.

The grounds of rejection should also fail because, as to claim 1, Petitioner has not properly accounted for the claimed “receptacle,” and, as to dependent claims 2 and 15, Petitioner has not established that the claimed spring arrangement would have been obvious.

Finally, there is evidence of licensing by a major player in the industry, which reinforces that the claims are non-obvious.

II. BACKGROUND

A. The '614 Patent, Generally

Again, the technology at issue in this case relates to portable oxygen concentrators. Ex. 1001 at 1:17-21. Some individuals suffering from certain diseases or lung conditions may require supplemental oxygen. *Id.* at 1:22-34. Receiving oxygen therapy can help these individuals maintain normal and productive lives. *Id.*

Before the priority date of the '614 Patent, supplemental oxygen was primarily provided through high pressure gas cylinders, liquid oxygen in vacuum-insulated containers, and in-home oxygen concentrators. *Id.* at 1:36-49. The high-pressure cylinder and liquid oxygen options both require refilling, which hinders the mobility of the user. *Id.* The in-home oxygen concentrators also hindered mobility, as these concentrators were relatively large and heavy, emitted excessive heat, and were relatively noisy. *Id.*

This case relates to portable oxygen concentrators, which are less bulky, lighter, and permit users to receive oxygen therapy while traveling with significantly more freedom than traditional oxygen tanks. *Id.* at 3:45-53. Instead of a dedicated oxygen tank, portable oxygen concentrators are able to produce their own oxygen from ambient air. *Id.* Specifically, portable oxygen concentrators include pumps that

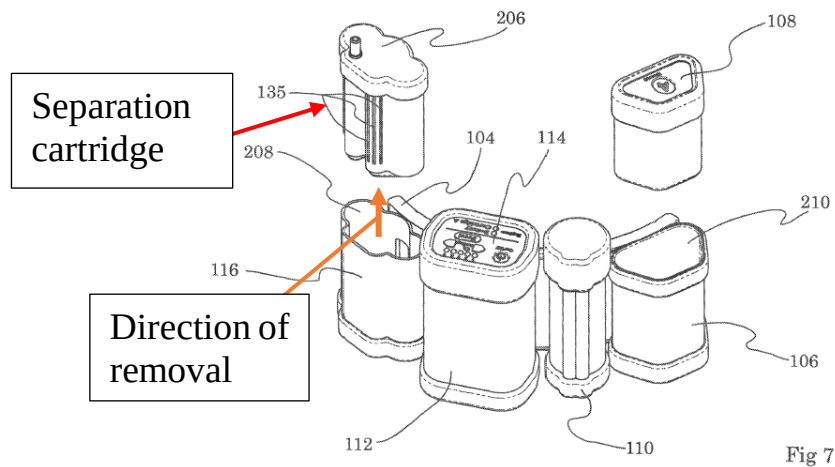
draw in ambient air and feed it to a separation cartridge. Ambient air is mostly nitrogen (i.e., about 78%), and contains only about 21% oxygen. A specific material, known as adsorbent, is provided to separate nitrogen from the ambient air, leaving relatively pure oxygen—specifically, up to 95% oxygen. *Id.* With the nitrogen separated out, the portable concentrator is able to deliver the relatively pure oxygen to the patient.

Over time, the adsorbent material becomes less effective at separating nitrogen from ambient air. *Id.* at 12:1-15. When this happens, the adsorbent must be replaced. *Id.*

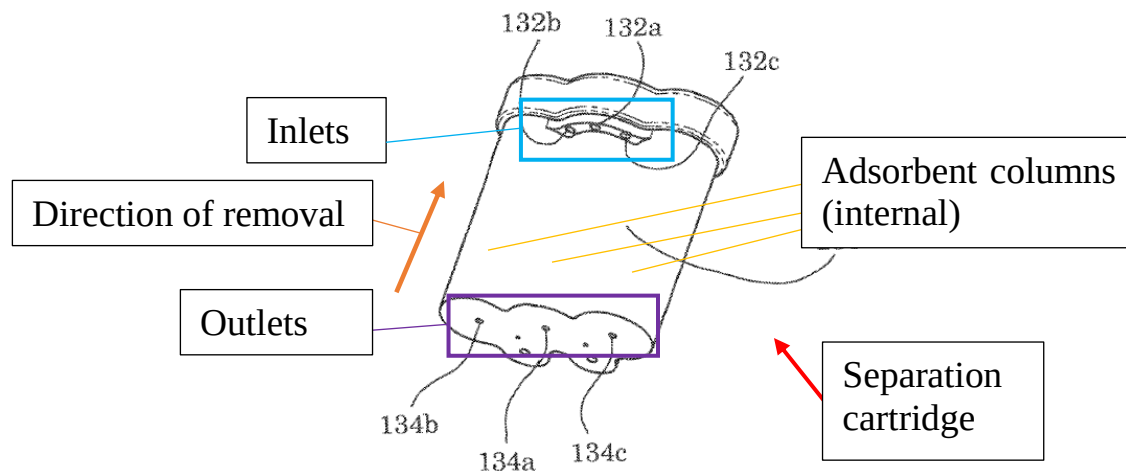
Increasing the ease with which separation cartridges can be removed and replaced is significant because it reduces patient downtime. It also allows the user to easily remove and replace the cartridges without the assistance of the manufacturer. In other words, when a separation cartridge needs replacing, the entire oxygen concentrator unit does not need to be sent away for service. Rather, the patient or their caregiver can replace the cartridge themselves in a matter of minutes.

B. The claimed arrangements

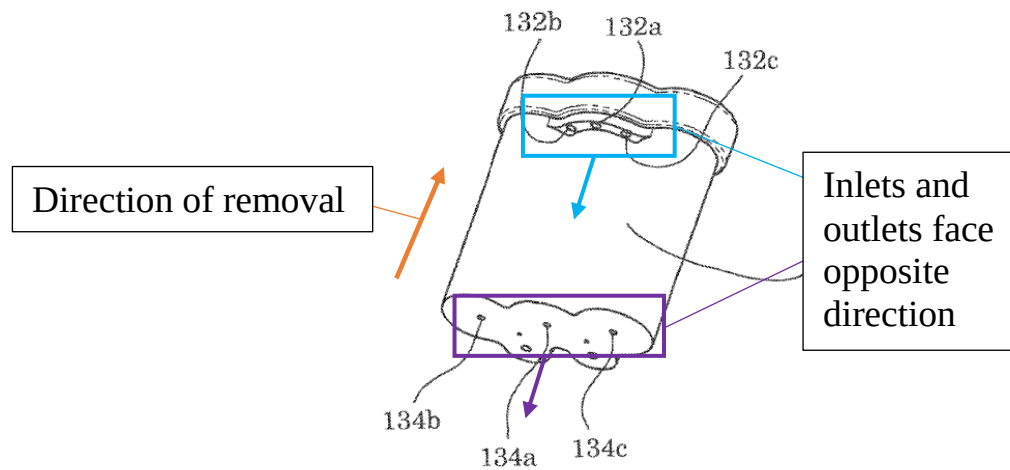
The oxygen concentrator 100 of the '614 Patent includes, among other things, an adsorbent, or separation, cartridge 206, which is removable from a receptacle 208 of a cartridge module 116. Ex. 1001 at 11:61-12:3. The separation cartridge is “easily removable to facilitate replacement.” *Id.*



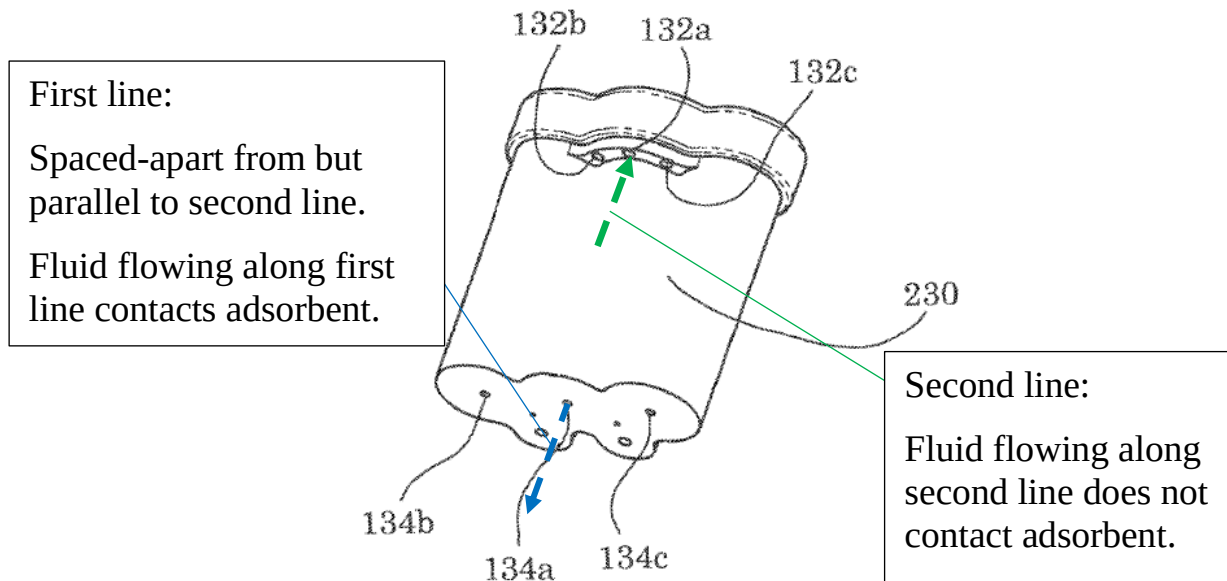
The separation cartridge includes inlet ports 132a-132c and outlet ports 134a-134c configured to direct fluid relative to adsorbent columns 130a-130c. *Id.* at 4:60-66; Figures 15 and 16.



All of the claims require an inlet and an outlet oriented in a common direction. *See, e.g., Id.* at claims 1, 12, and 13. Independent claim 1 requires the common direction of the inlet and outlet to be opposite to the direction of removal, i.e., the removal direction limitation. As shown above and below, the inlets and outlets face toward the receptacle, which is a direction opposite the direction of removal.



In addition to requiring the inlets/outlets to face a particular direction, the claims also require the inlets and outlets to be spaced-apart from one another in a particular manner. Specifically, a first reference line passes through the outlet, and a second reference line passes through the inlet. *Id.* The first and second lines are spaced-apart from one another yet are also parallel to one another. *Id.* Further, the claims specify that, in use, fluid flowing along the first line contacts adsorbent while the fluid flowing along the second line does not contact adsorbent, i.e., the non-contact limitations. *Id.*



Because the inlets 132a-132c are spaced-apart from the outlets 134a-134c while also facing a common direction, the separation cartridge 206 is readily removed simply by moving the separation cartridge 206 vertically relative to the receptacle 208, which detaches both the inlets and outlets in a single motion. In turn, after the old cartridge has been removed, a new replacement cartridge is able to relatively easily interface with the receptacle 208 by a single vertical movement.

C. Prosecution History

The '614 Patent has a relatively large patent family. The *Deane* reference upon which Petitioner relies, and a number of references that are nearly identical to the *Deane* reference, were cited by Patent Owner in Information Disclosure Statements (“IDS”) and used in rejections during prosecution of the various family

members of the '614 Patent. *See, e.g.*, Ex. 1002 at page 59 *et seq.*, Ex. 1052 at pages 2-19, Ex. 1049 at pages 77-81, 108-112, and 186-191, and Ex. 1050 at pages 58-65. Accordingly, the Office was well aware of *Deane* during the prosecution and eventual allowance of the '614 Patent.

While the prosecution history does not appear to bear on the substantive arguments of this response, Patent Owner finds it necessary to rebut Petitioner's false narratives regarding the Office's prior consideration of *Deane* in relation to the challenged claims.

Specifically, Petitioner mischaracterizes the prosecution of U.S. Application No. 14/193,504 (Ex. 1052, "the '504 Application"), which is the parent application of the '614 Patent. Examination of the '504 Application was handled by Examiner Vasat, whereas Examination of the '614 Patent was handled by Examiner Jones. *See* Exs. 1052 and 1002.

During prosecution of the '504 Application, Patent Owner submitted a claim amendment on January 20, 2022. *See* Ex. 1052 at pages 149-153. After that submission, Patent Owner and Examiner Vasat discussed the *Deane* disclosure in an interview. *See* Ex. 1052 at page 19 (Examiner Interview Summary explaining that "There was a brief discussion of the prior art to *Deane*"). Shortly thereafter, a notice of allowance issued including an Examiner's amendment and a discussion of the *Deane* disclosure. *Id.* at page 2 *et seq.* (Under "Reasons for Allowance" the notice

states: “The closest prior art to new claims 24-42 is considered to be prior art to Deane (US 20050072426). Deane is considered to disclose ... The amendment defines over Deane because...”).

Petitioner alleges that the claims submitted on January 20, 2022 in the parent ’504 Application are “very similar to the Challenged Claims.” Petition at page 8. Petitioner’s theory is that because Examiner Vasat appears to have required additional limitations in view of the *Deane* disclosure during prosecution of the parent ’504 Application, that Examiner Jones erred by allowing the claims of the ’614 Patent over the *Deane* disclosure. The Petition appears to suggest that the change in examiner caused an alleged error, and asserts that, despite applicant’s IDS submission of the *Deane* disclosure, “there is no evidence Examiner Jones properly considered *Deane/Deane* ’426 vis-à-vis the ’614 Patent.” Petition at page 13, fn. 4.

Petitioner ignores the fact that the claims of the ’614 Patent all contain at least one completely different limitation than the claims of the ’504 Application, namely at least the non-contact limitations. What’s more, and tellingly, when discussing the applicability of *Deane*’s disclosure in the Notice of Allowance of the parent ’504 Application, Examiner Vasat did not allege that *Deane* taught the removal direction limitation, despite similar language being present in the claims of the parent ’504 Application. See Ex. 1052 at pages 16, 149, 152 (see, e.g., claim 38).

The Petition also fails to address the fact that Examiner Jones placed his initials on Applicant's IDS submissions to indicate that the *Deane* disclosure was, in fact, considered. Ex. 1002 at page 67.

As discussed further below, the Petition has failed to establish that *Deane* teaches at least the removal direction and non-contact limitations. Accordingly, Examiner Jones did not err in considering and then dismissing the teachings of *Deane*.

III. LEVEL OF ORDINARY SKILL

For purposes of this proceeding only, Patent Owner does not dispute Petitioner's definition of a person of ordinary skill in the art. Dr. Talu was a POSA under Petitioner's definition at all relevant times, and still is a POSA. Ex. 2001 at ¶¶ 65, 66.

IV. CLAIM CONSTRUCTION

The Board construes claims in an *inter partes* review in accordance with *Phillips*, such that words of a claim are generally given their ordinary and customary meaning in light of the patent's specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-15 (Fed. Cir. 2005).

At the outset, the Board does not need to construe any of the terms raised for construction by Petitioner because these constructions do not bear on whether *Deane* discloses the claim limitations discussed in this response. *See Nidec Motor Corp. v.*

Zhongshan Broad Ocean Motor Co, 868 F.3d 1013, 1017 (Fed. Cir. 2017). Notably, in the related '628 Patent institution decision the Board was able to find that petitioner had failed to establish a reasonable likelihood of success without construing any of these same claim terms. *See* IPR2023-00527, Paper 9 at 10-11.

That said, if the Board is inclined to construe the terms raised by Petitioner, it should construe them according to Patent Owner's proposals. As demonstrated below, Patent Owner's proposed constructions are correct because they are consistent with the plain and ordinary meaning of the terms. By contrast, Petitioner's proposed constructions advance improper and strained interpretations of the claims in an overt attempt to bait the Board into taking a position that Petitioner will then use to attempt to avoid being held liable for infringement in the corresponding district court litigation between the parties. Indeed, Petitioner's proposed constructions violate fundamental tenets of claim construction law. In particular, Petitioner asks the Court to import limitations from the specification and to construe terms in a manner that is inconsistent with the claims themselves. Moreover, deposition testimony was elicited from Petitioner's own declarant in the

corresponding litigation, Dr. Geoffrey Deane¹, which contradicts Petitioner's positions and supports the constructions proposed by Patent Owner.

A. “Separation Cartridge”

In relevant part, independent claim 1 recites “a separation cartridge ... the separation cartridge comprising an inlet [], an outlet [], and a bed of adsorbent material configured to preferentially adsorb nitrogen.” *See, e.g.*, Ex. 1001 at claim 1. Independent claim 12 also recites similar language. *Id.* at claim 12.

To the extent “separation cartridge” needs to be construed, it should be given its plain and ordinary meaning, which is “a cartridge configured to separate gas.” Ex. 2001 at ¶¶ 68-79.

The written description of the '614 Patent explains that “[t]he cartridge is removable from an oxygen concentrator which separates oxygen from ambient air.” *See* Ex. 1001 at 2:54-58; *see also* 15:40-43 (“...links product control pump 154 to separation cartridge 206 through main valve 140 to transport oxygen rich gas separated by cartridge 206.”). Further, the claims themselves support this plain and ordinary meaning. For instance, claim 1 of the '614 Patent recites, in relevant part,

¹ Dr. Deane is the first-named inventor of *Deane* (Ex. 1004)—the primary reference relied on by Petitioner.

“the separation cartridge comprising ... a bed of adsorbent material configured to preferentially adsorb nitrogen.” *See Id.* at claim 1.

Further, Dr. Deane agreed that a separation cartridge is understood to separate gas and did not contend that Patent Owner’s construction is inaccurate. Ex. 2007 at 129:14-20 (“It’s a cartridge that separates gas, sure, yes.”).

Petitioner proposes that the term “separation cartridge” should be construed as “a housing that holds multiple adsorbent columns for gas separation and provides separate inlet and outlet ports for each adsorbent column.” Petition at pages 21-23.

There are two main problems with Petitioner’s construction. First, Petitioner seeks to read “multiple adsorbent columns” into the claims. This runs contrary to the explicit language of claims 1 and 12, which plainly recite a singular bed, as in: “a bed of adsorbent.” Second, the term “separation cartridge,” on its own, does not need to be construed to include any columns, inlets, or outlets, because the claims already specify the extent to which the separation cartridge includes those features.

Petitioner states that the embodiments of the ’614 Patent support their proposed “multiple column” construction. Petition at pages 22-23. Petitioner further alleges that during prosecution of the ’614 Patent’s family members, Patent Owner did not disagree when an Examiner asserted that modules with more than one adsorbent column were separation cartridges. *Id.* Petitioner also alleges that Patent Owner argued during prosecution of a related application that a separation cartridge

had not been identified when the Examiner pointed to a single-column module. *Id.* Petitioner's reasoning should be rejected for several reasons.

1. No construction needed

Petitioner's proposed construction requiring a separation cartridge to include multiple adsorbent columns and multiple inlets and outlets, while improper and incorrect, does not relate to the applicability of the asserted prior art. It is not coincidental that Petitioner sells separation cartridges with a single bed. Whether a "separation cartridge" must include one or more adsorbent beds is not related to any controversy in this proceeding because *Deane* includes multiple beds. Accordingly, no construction is needed. *See Nidec*, 868 F.3d at 1017. Notably, the Board agreed that no construction was needed at the institution stage and no additional arguments raised in this proceeding should change that determination. *See Paper 10* at page 18.

2. Multiple beds not required

Nevertheless, Petitioner's reasoning is flawed for several reasons. First, the fact that some of the embodiments of the '614 Patent include multiple beds does not limit the claims. Petitioner is improperly attempting to read the specification into the claims. *See Aventis Pharma S.A. v. Hospira, Inc.*, 675 F.3d 1324, 1330 (Fed. Cir. 2012) (It is "not enough that the only embodiments, or all of the embodiments, contain a particular limitation to limit a claim term beyond its ordinary meaning."); *see also Phillips*, 415 F.3d at 1323 ("[A]lthough the specification often describes

very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

Moreover, the specification of the '614 Patent makes clear that while multiple columns are disclosed in some embodiments, the separation cartridge can have just one single column. Ex. 1001 at 7:13-20 (explaining that the adsorption process can “be accomplished with a single column, or with a plurality of columns” but that “[i]f a plurality of columns are used, it is preferable to have a multiple of three.”). This is significant as Petitioner contends that a separation cartridge *must* have more than one adsorbent column per its proposed construction. However, the text of the '614 Patent is clear: a single column is sufficient. Dr. Talu has confirmed that an adsorption process can function with a single column. Ex. 2001 at ¶ 73. Moreover, Dr. Deane conceded during his deposition that prior to the priority date of the '614 Patent it would have been known to have “a discrete container within a single bed of adsorbent material within a concentrator.” Ex. 2007 at 102:5-15. Dr. Deane also testified that if the separation cartridge could “function with a single column” of adsorbent material, then GCE’s proposed construction would be incorrect. Ex. 2007 at 118:5-119:7. Quite plainly, GCE’s proposed construction is incorrect.

Second, the alleged failure to rebut the Examiner’s characterization of prior art during prosecution does not serve to limit the claims. A prosecution statement effecting claim scope requires a “clear and unambiguous disavowal of claim scope.”

Saffran v. Johnson & Johnson, 712 F.3d 549, 559 (Fed. Cir. 2013). The Federal Circuit has declined to find claims limited by prosecution “where the alleged disavowal is ambiguous, or even amenable to multiple reasonable interpretations.” *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016). There is no clear and unambiguous disavowal of claim scope here.

Regardless, Petitioner has misrepresented the relevant prosecution history. Specifically, the Petition states “when an Examiner compared a ‘separation cartridge’ to a single-bed module, applicant argued that the Examiner had not identified a separation cartridge, which supports ‘separation cartridge’ meaning a module with multiple adsorber beds.” Petition at p. 23 (citations omitted). This is a blatant mischaracterization.

During the examination of the parent ’504 Application, the Examiner cited a reference, *Warren* (Ex. 1012), and alleged it would be obvious to modify *Warren* to include an outlet port and inlet port directed in a common direction towards the bottom of the gas separation cartridge as required by the pending claims. Ex. 1052 at 297. In appealing the rejection, Applicant noted “the Examiner does not even identify a ‘separation cartridge’ in *Warren*, and instead generally refers to Figures 7 and 8,” and therefore “there is no way to tell from *Warren*’s Figures 7 and 8 what is the bottom.” Ex. 1052 at 255-256. That is, Applicant was arguing that the Examiner had failed to establish a *prima facie* case of obviousness by failing to specify how

the Examiner proposed modifying *Warren* to meet the claims. The suggestion that Applicant argued that *Warren* failed to disclose a separation cartridge because its device happened to only have one bed is completely unfounded. Dr. Deane agreed. In his deposition, Dr. Deane testified that as to this portion of the file history, the patent applicant was simply pointing out that the examiner had not identified a cartridge because the Examiner was pointing to a sieve bed—as opposed to GCE’s contention that the patent applicant argued a cartridge with a single adsorber bed was not a separation cartridge. Ex. 2007 at 211:25-214:3.

Third, Petitioner’s interpretation is also improper because it renders dependent claims that expressly recite a plurality of adsorbent beds within the separation cartridge completely meaningless. Claim 16 of the ’614 Patent recites multiple beds of adsorbent, and even specifies that “the first and second beds are contained within a common separation cartridge.” Ex. 1001 at claim 16. Likewise, in the related ’628 Patent the independent claims require a “separation cartridge” having “a bed of adsorbent material” while a dependent claim further recites “wherein the bed of adsorbent material is one of a plurality of beds of adsorbent material within the separation cartridge.” See Ex. 1054 at claims 1 and 21.

Applicant knew how to claim multiple beds of adsorbent in a single separation cartridge, but specifically did not do so in the independent claims of the ’614 Patent. Claim differentiation, coupled with the principle that common claim terms should

be construed the same across a patent family, weighs heavily against Petitioner's construction. *Phillips*, 415 F.3d at 1315 (Fed. Cir. 2005) (a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim); *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1293 (Fed. Cir. 2005) (when patents all derive from the same parent application and share many common terms, the claims must be construed consistently between the related patents).

Construing separation cartridge to require more than one bed is simply unsupported and not the correct construction.

3. Redundant additions of inlet and outlet

Other than the issue with reading multiple beds into the claims, Petitioner also reads additional limitations related to "inlet" and "outlet" into their proposed construction of "separation cartridge." This is inappropriate because claims 1 and 12 already separately recite the structural relationships and require the separation cartridge to have an "inlet" and an "outlet." Construing "separation cartridge" to include "inlets" or "outlets" would improperly render those same elements recited in other parts of the claims as redundant or meaningless. *See TMI Prods. v. Rosen Entm't Sys., L.P.*, 610 Fed. Appx. 968, 971-972 (Fed. Cir. 2015) (rejecting construction of a term that would render other language in the claim redundant); *Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (It is

well settled that a “claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

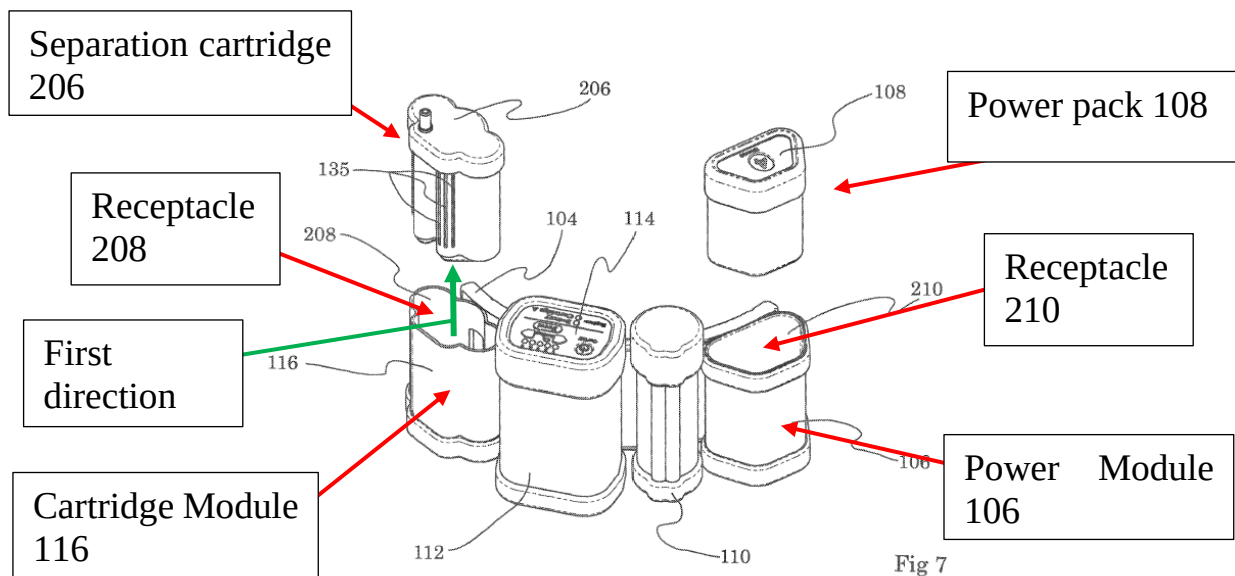
In summary, Patent Owner’s position is that no construction of “separation cartridge” is necessary. However, if the Board does wish to construe the term, the Board should give the term its plain and ordinary meaning of “a cartridge configured to separate gas.”

B. “Receptacle”

Independent claim 1 of the ’614 Patent recites in relevant part “a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction.” *See, e.g.*, Ex. 1001 at claim 1.

To the extent “receptacle” needs to be construed, it should be given its plain and ordinary meaning, which is “a space configured to receive and contain something.” Ex. 2001 at ¶¶ 80-89.

Figure 7 of the ’614 Patent, shown below, illustrates an example oxygen concentrator. Figure 7 illustrates a “[p]ower pack 108 [that] has been removed from receptacle 210 of power module 106” and also an “[a]dsorbent cartridge 206 [that] has been removed from receptacle 208 of cartridge module 116.” Ex. 1001 at 11:65-12:1. The specification explains that “[a]dsorbent cartridge 206 and power pack 108 are easily removable to facilitate replacement.” *Id.* at 12:1-3.



It is clear from these excerpts of the specification and the language of claim 1 that a receptacle, or space, receives and contains something. Receptacle 208 is configured to receive and contain separation cartridge 206, while receptacle 210 is configured to receive and contain power pack 108. Ex. 1001 at 12:4-14. A construction of “receptacle” should consider the specification’s consistent use of the term receptacle in both instances.

Further, the term “receptacle” is a well-known and easily-understood term, which means to receive and contain. See Ex. 1062 (“Webster”) (defining “receptacle” as “one that receives and contains something”). The claims use the word “receptacle” consistent with its plain and ordinary meaning.

Petitioner begins its argument by basically agreeing with this plain and ordinary meaning before taking a sharp and unexplained left turn. Petitioner states that “[o]utside the ’614 Patent’s context, a POSITA would have generally understood a ‘receptacle’ to be a structure that receives and at least partially contains another component.” Petition at page 23. Petitioner further states that “[c]laim 1 comports with this understanding.” *Id.*

Despite these statements, Petitioner ultimately proposes that the term “receptacle” should be construed to mean “a structure that releasably interfaces with the inlet(s) and outlet(s) of the separation cartridge and at least partially contains the separation cartridge.” Relative to the admitted plain meaning of receptacle, this construction adds “releasably interfaces with the inlet(s) and outlet(s)” and removes the word “receives.” Petitioner’s construction is wrong for several reasons.

First, there is nothing about the plain and ordinary meaning of the term “receptacle” that would mean “releasably interface.” Petitioner’s construction appears to be attempting to import features in the specification into the claims, specifically the ’614 Patent’s disclosure that the cartridge 206 may connect to the various lines within the receptacle 208 using quick-connect attachments of the cartridge 206. See Ex. 1001 at 12:4-14 (“In this embodiment... [c]artridge 206 contains a quick-connect attachment...”). So, whereas the claims do not specify the precise mechanism for the separation cartridge connecting to the receptacle nor do

they recite quick-connects, Petitioner seeks to limit Patent Owner to “releasably interfac[ing].” This is not proper. *See Aventis Pharma*, 675 F.3d at 1330; *see also Phillips*, 415 F.3d at 1323.

Second, importing the additional elements of the separately-recited “inlet,” “outlet,” and “separation cartridge” into the construction of “receptacle” is inappropriate. Independent claim 1 already separately identifies a separation cartridge, as well as an inlet and an outlet, and defines the required structural arrangement of these elements. *See TMI Prods.*, 610 Fed. Appx. at 971-972.

While no construction of “receptacle” is necessary, if the Board is inclined to construe it, the Board should construe it as “a space configured to receive and contain something.”

C. “Selectively Removable [From A Receptacle]”

Again, independent claim 1 recites “a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction.” Ex. 1001 at Claim 1. Petitioner seeks a construction of only a portion of this phrase. Namely, Petitioner advances only the sub-phrase “selectively removable [from a receptacle]” for construction.² Petition at pages 24-26.

² Patent Owner includes the words “from a receptacle” in brackets because it is not actually part of the phrase Petitioner indicated for construction but simply follows

To the extent “selectively removable” needs to be construed, it should be given its plain and ordinary meaning which is “can be chosen to be removed.” Ex. 2001 at ¶¶ 90-96.

To be “selectively removable,” something must be able to be chosen to be removed. This construction is consistent with the specification showing components such as a separation cartridge or a power pack which can be chosen to be removed. Again, for example, Figure 7 illustrates a “[p]ower pack 108 [that] has been removed from the receptacle 210 of power module 106,” and an “[a]dsorbent cartridge 206 [that] has been removed from receptacle 208 of cartridge module 116.” Ex. 1001 at 11:65-12:1. The specification further explains that “[a]dsorbent cartridge 206 and power pack 108 are easily removable to facilitate replacement.” *Id.* at 12:1-3.

Further, the terms “selectively” and “removable” are well-known and easily-understood terms. See Ex. 1059 (“*American Heritage*”) (Defining “selective” as “of or characterized by selection,” “select” as “to take as a choice from among several; pick out,” and “removable” as “that can be removed.”). The claims of the ’614 Patent use the term “selectively removable” in a manner consistent with its plain and ordinary meaning.

the term “selectively removable” in the cited claims. Petitioner proposed the term in this manner so Patent Owner also provides its analysis in that context.

Petitioner, on the other hand, proposes that the phrase “selectively removable [from the receptacle]” should be construed to mean that the separation cartridge is “withdrawable or separable as a whole from a receptacle.” Petition at pages 24-26.

Petitioner’s proposed construction should be rejected because, again, it does not bear significantly on the issues raised in this proceeding. *See Nidec*, 868 F.3d at 1017.

What’s more, Petitioner’s proposed construction is incorrect and unsupported. Petitioner’s proposed construction completely reads out the word “selectively” from the phrase “selectively removable,” which is improper. *See Merck*, 395 F.3d at 1372 (“A claim construction that gives meaning to all the terms of the claims is preferred over one that does not do so.”). Petitioner also attempts to import a requirement of “as a whole” without any basis. *See* Petition at pages 24-26. Furthermore, the Petition does not explain why “removable,” as recited in the claim, needs to be replaced with “withdrawable or separable.” *Id.* While there is overlap in the definitions of these terms, one could possibly withdraw a component without removing it, as confirmed by Dr. Deane. *See* Ex. 2007 at 204:10-13.

Again, it does not appear necessary for the Board to construe “selectively removable [from a receptacle]” to resolve the issues present in this IPR proceeding. However, if the Board does decide to construe the term, Patent Owner’s proposal should be adopted.

V. DEFECTS IN PROPOSED GROUNDS

The Petition raises six grounds challenging the patentability of claims 1-16 of the '614 Patent. Each of these grounds rely on *Deane* (Ex. 1004) as a sole or primary reference.

Initially, Petitioner's declarant, Dr. Kent Knaebel, admitted during his deposition that he used the claims as a road map for going to the prior art, to see if he could find the claim elements in the art, which is tantamount to admitting that he used hindsight in his analysis. Ex. 2003 at 37:4-16; *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019) (reversing Board's decision holding all claims obvious in part because expert testimony used claims as "roadmap," and thereby relied on improper hindsight). Dr. Knaebel also admitted that he made certain assumptions, including making assumptions regarding the manner in which *Deane's* oxygen concentrator is assembled and disassembled, in the absence of express disclosure in *Deane*. Ex. 2003 at 37:25-40:12.

Dr. Knaebel's admissions are consistent with the overall theme of the Petition, which improperly alleges, without any basis and at times with significant contrary evidence, that certain claim elements are taught or disclosed in the prior art. In view of Dr. Knaebel's admissions, his testimony regarding obviousness should be given little if any weight. Regardless, Petitioner has failed to establish obviousness for the below reasons:

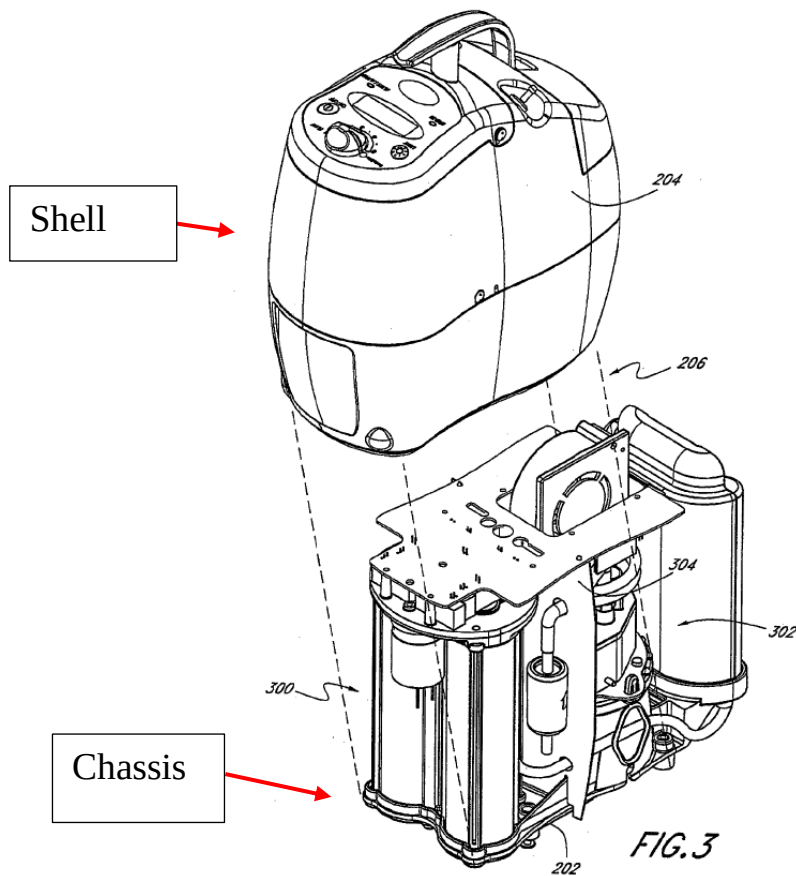
A. Ground 1—*Deane*, *Dubois*, and *Berntson* do not support obviousness of claims 1-5 and 7-16

Ground 1 alleges claims 1-5 and 7-16 are obvious over *Deane* (Ex. 1004), *Dubois* (Ex. 1005), and *Berntson* (Ex. 1006). Petitioner essentially argues that *Deane* teaches all of the claim elements, but includes *Dubois* and *Berntson* as backstops on certain claim elements.

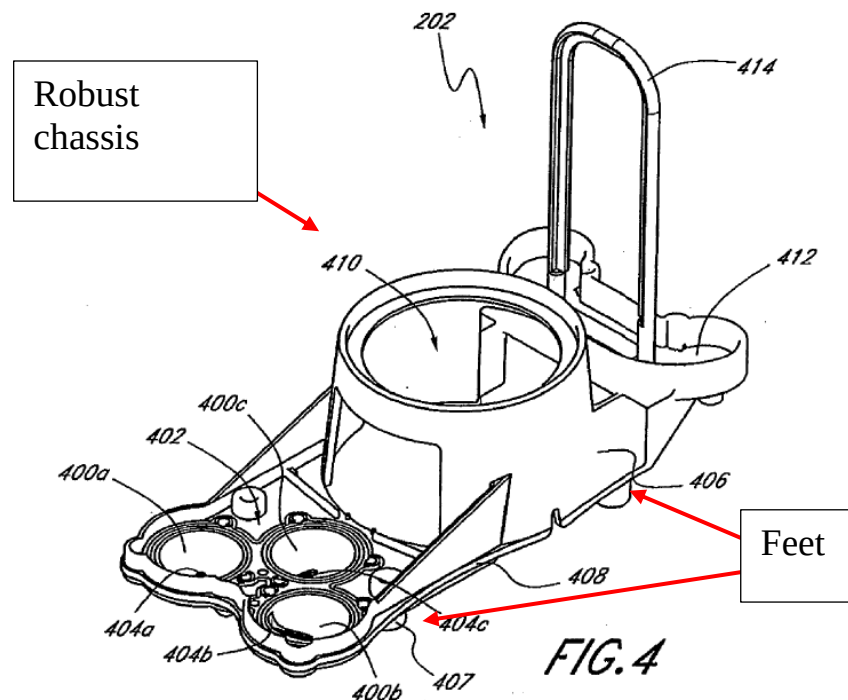
1. *Deane*

Deane discloses a portable gas fractionalization apparatus 200. Ex. 1004 at ¶ [0057]. While referred to as portable, the *Deane* apparatus 200 is rather bulky, and is configured to be carried by a handle or rolled on a wheeled cart 1800. Ex. 1004 at ¶ [0099]; Figure 18B; Ex. 2001 at ¶¶ 98-105.

Deane's apparatus 200 generally includes a chassis 202 and a shell 204, which together form a housing 206. *Id.* at ¶ [0057]; Figure 3 (below); Ex. 2001 at ¶ 100.



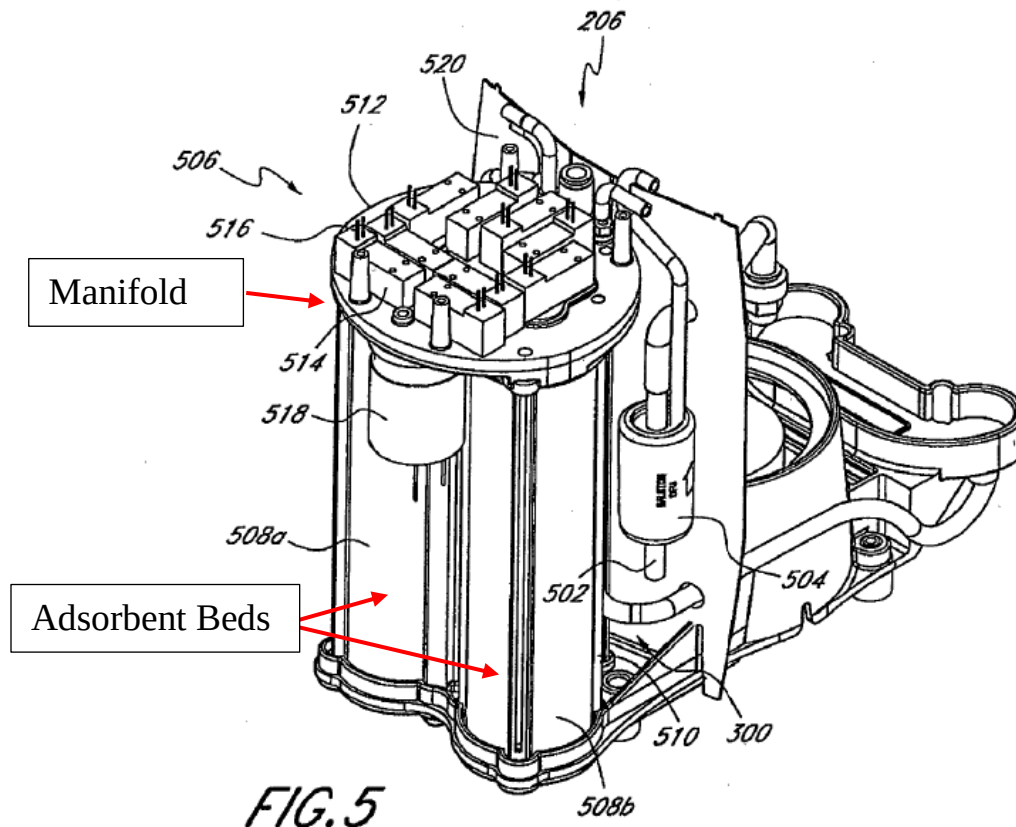
The chassis 202 is a robust frame with isolation feet 407 configured such that the apparatus 200 can rest on a flat surface, such as a floor or table, while supporting the various internal components of the *Deane* device. Ex. 1004 at ¶ [0060]; Ex. 2001 at ¶¶ 101-104.



Deane's apparatus is not designed to be used in any configuration other than its vertically-upright configuration. On this point, *Deane's* shell 204 exhibits curved, non-planar walls to discourage users from resting the apparatus 200 on its side. Ex. 1004 at ¶¶ [0057], [0093] (“... the sidewalls 212 a, c of the housing have a curved configuration so as to discourage users from resting the housing against the sidewall, which can block the air inlet or outlet.”); Ex. 2001 at ¶ 118.

Inside *Deane's* housing 206, the apparatus 200 includes a first compartment 300 which contains the components that adsorb nitrogen from ambient air, and a second compartment 302 which contains heat generating components. Ex. 1004 at ¶ [0058]. Specifically, the first compartment 300 includes adsorbent bed columns

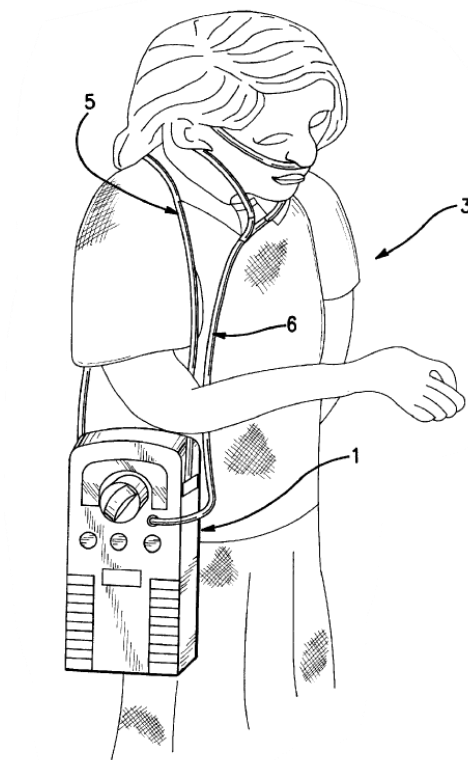
508a, 508b. *Id.* at ¶ [0061]; Fig. 5. Fluid is directed relative to the adsorbent bed columns 508a, 508b via a manifold 512, which includes two plates. *Id.* at ¶¶ [0063, 0071]; Fig. 8; Ex. 2001 at ¶ 103.



There are a number of differences between *Deane* and the claims. While the Petition primarily relies on *Deane*, Petitioner does cite to certain secondary teaching references as well, none of which resolve the problems with Petitioner's reliance on *Deane*.

2. *Dubois*

Dubois generally teaches a portable oxygen concentrator. Specifically, *Dubois*' concentrator appears to be more portable than that of *Deane*, namely because it is smaller and can be worn by a patient or user, as shown in Figure 5, which is partially copied below. Ex. 2001 at ¶ 106.

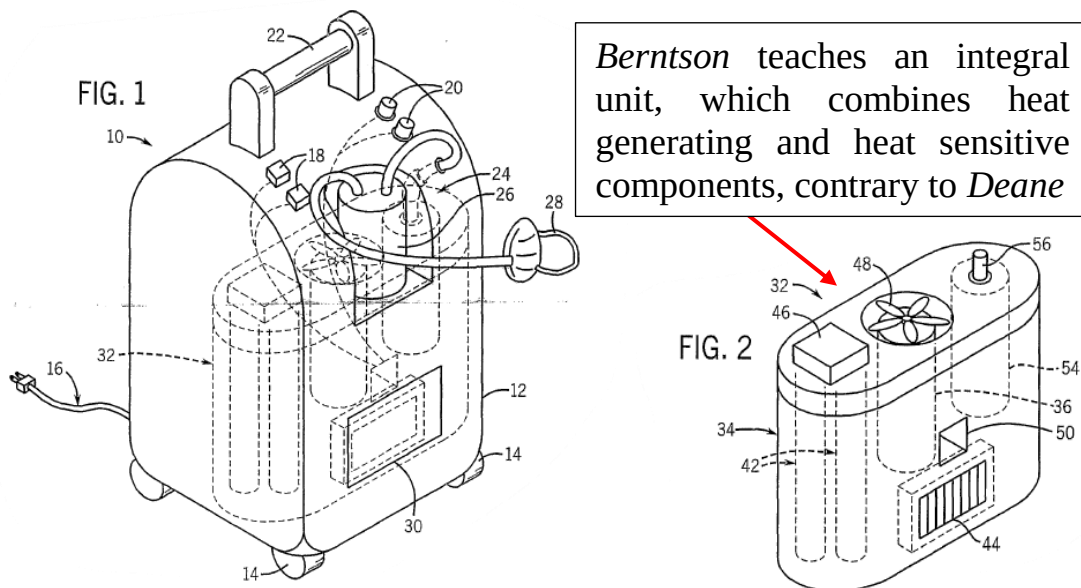


Petitioner does not significantly rely on *Dubois*, and *Dubois* does not (and cannot) cure the defects noted in *Deane* below.

3. *Berntson*

Berntson generally teaches an oxygen concentrator with a consolidated oxygen-rich air generator (ORAG) unit including a pump 36, adsorbent containers

42, a valve system 46, a cooling fan 48, an air tank 54, and an air outlet 56 all consolidated in one removable unit. Ex. 1006 at ¶¶ [0012, 0014]. Petitioner relies on *Berntson* purely as a supplement for *Deane* to allegedly teach a “more distinct cartridge” than *Deane* that is “selectively removable from a receptacle.” Petition at pages 26 and 41. However, *Berntson*’s teachings plainly conflict with a central teaching of *Deane*. Whereas *Deane* teaches separation of heat generating and heat sensitive components (Ex. 1004 at ¶ [0058]), *Berntson* teaches integrating its heat generating and heat sensitive components. Ex. 1006 at ¶ [0018] (“It may also be desirable to integrate components formerly considered separate. For example, ...the sieve beds may be incorporated into the pump housing...”); Ex. 2001 at ¶¶ 107-110.



Petitioner has failed to establish a *prima facie* case of obviousness relative to *Deane*, regardless of the teachings of *Dubois* or *Berntson*.

4. Ground 1 Fails As To Claims 1-11—*Deane* does not establish the removal direction limitation

Failure to adequately establish each and every limitation of a claim is fatal to a determination of obviousness. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366-1367 (Fed. Cir. 2016) (Reversing Board’s determination of obviousness when a claim limitation was missing from the cited prior art and the Board had improperly relied on “common sense” to fill in the missing limitation); *see also In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970) (“All words in a claim must be considered in judging the patentability of that claim against the prior art.”).

Here, *Deane* fails to teach “a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction” (i.e., the removal direction limitation) as required by independent claim 1.

The Petition relies on *Deane* alone as allegedly teaching the removal direction limitation. *See* Petition at pages 42-43. Yet, there is no evidence that the component which the Petition calls out as *Deane*’s separation cartridge moves in the first direction at all, let alone relative to a receptacle, as recited in independent claim 1.

In the context of claim 1, the first direction is a direction opposite to an orientation of the inlet and outlet. *See* Ex. 1001 at claim 1 (“an inlet oriented in a second direction opposite the first direction, an outlet oriented in the second direction...”). Petitioner specifies the “first direction” as a vertically downward

direction of movement in *Deane*'s Figure 3. *See* Petition at pages 32-33. Petitioner argues that *Deane*'s housing 602 and adsorbent columns 508a, 508b read on the claimed "separation cartridge." *Id.* at pages 33-34. Finally, Petitioner argues that *Deane*'s manifold 512 alone may meet the claimed receptacle, and then the Petition alternatively advances a combination of manifold 512 and shell 204 together as constituting the claimed receptacle. *See* Petition at page 35-39.

So, to establish obviousness, the Petitioner must demonstrate that *Deane* teaches movement of the housing 602 and adsorbent columns 508a, 508b in the vertically-downward direction relative to either the manifold 512 or the combination of the manifold 512 and the shell 204, or otherwise establish that this limitation would be obvious in view of other prior art. Petitioner fails on all accounts.

a. The Board's findings regarding the removal direction limitations are correct

At the outset, in the institution decision of this proceeding, the Board noted "[o]n 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." Paper 10 at 35-36. Likewise, in the '628 Patent

institution decision, when addressing the same removal direction limitations and the same prior art and arguments, the Board agreed that “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.” IPR2023-00527, Paper 9 at 20.

The Board should hold consistent with the ’628 Patent institution decision that Petitioner has failed to establish the removal direction limitation and therefore failed to establish a *prima facie* case of unpatentability for claims 1-11. This is the correct finding because *Deane* does not disclose this feature, nor would it be obvious to modify *Deane* to include such a feature. Even if Petitioner attempts to add evidence in this case to try to salvage this flawed argument, Petitioner cannot overcome the disclosure of *Deane* and Dr. Talu’s testimony. Ex. 2001 at ¶¶ 111-138. It would also be untimely because it was not included in the Petition.

Petitioner’s alleged evidence as to the removal direction limitation is at best equivalent to the evidence submitted regarding the same limitations in the related ’628 Patent IPR. *See, e.g.*, IPR2023-00527, Paper 1, pages 47-59. Despite the fact that the Board correctly determined the issue in denying institution in the related IPR, and with some fear of belaboring the point, below Patent Owner has provided a full explanation of how the Petition fails to establish the removal direction limitation for purposes of providing a complete record of the issue.

b. Movement in the first direction is not taught by Deane

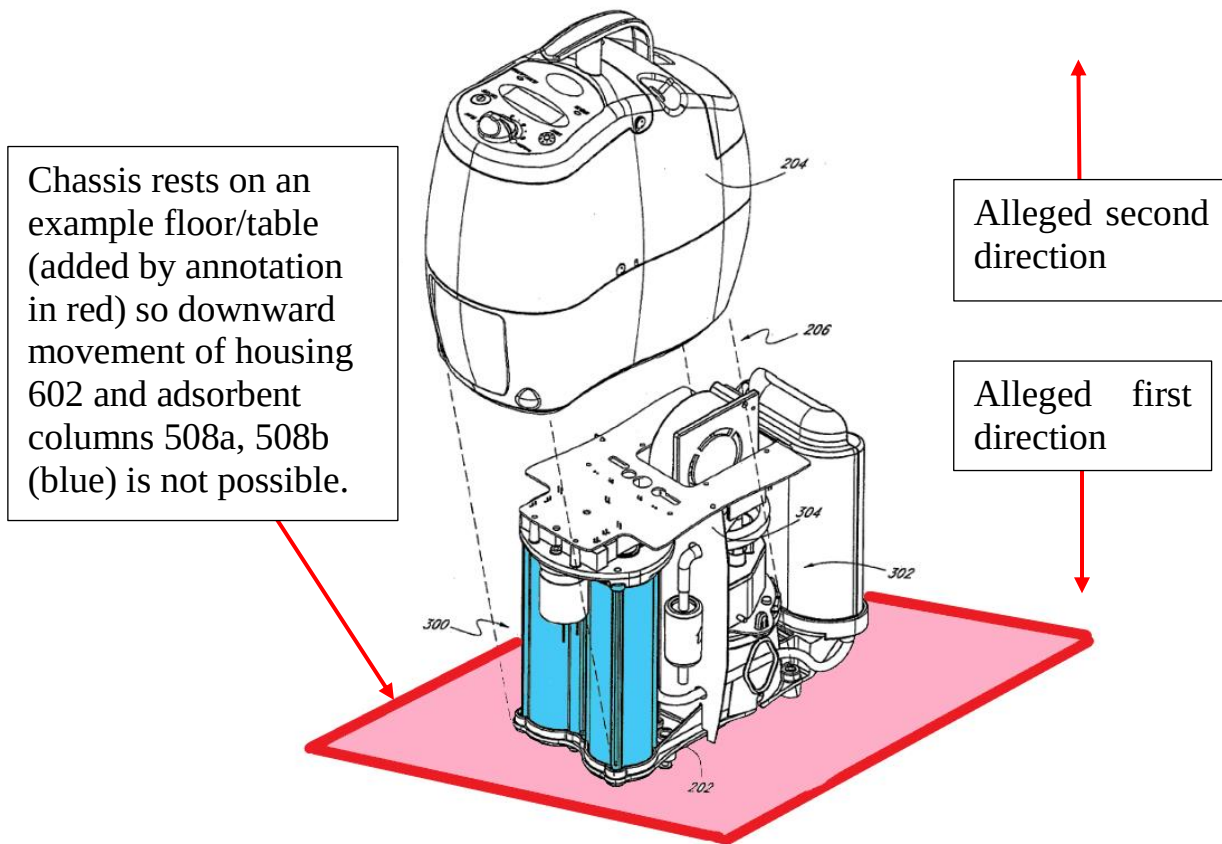
Petitioner appears to improperly equate vertically upward movement of *Deane*'s manifold 512/shell 204 with downward movement of a separation cartridge. See Petition at pages 32-33 and 42-43. Petitioner appears to assume, without any explanation or evidence in support, that movement of an alleged receptacle relative to a stationary cartridge reads on the claims. *Id.* As noted above, Petitioner only proposes a construction for "selectively removable" and fails to provide any analysis for the rest of the phrase, which states "by movement relative to the receptacle in a first direction." The latter portion of the phrase modifies how the separation cartridge is "selectively removable," such that the claimed "movement relative to the receptacle" must be accomplished by movement of the separation cartridge. In other words, the claims require the separation cartridge to be physically movable in the first direction, relative to the receptacle, for removal.

This is how the Board understood the limitation in both the institution decision in this case and in the '628 Patent institution decision. See Paper 10 at 34 ("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*, ... rather than reciting that the separation cartridge is selectively removable from the receptacle in an 'axial' direction."); IPR2023-00527, Paper 9 at 21 ("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.”).

Deane does not teach that the alleged separation cartridge is moveable in the alleged first direction for removal, let alone movable in the first direction relative to any alleged receptacle. Petitioner’s failure to establish that *Deane* meets the actual claim language is a fatal mistake.

Deane’s housing 602 and adsorbent columns 508a, 508b cannot be moved downward in the alleged first direction for removal because the bottom of the alleged separation cartridge directly abuts and is supported on the chassis 202. *See* Ex. 1004 at ¶ [0058] and Figs. 4, 5; Ex. 2001 at ¶¶ 118-131. The chassis 202, in turn, includes vibration isolation feet 407, which are designed to sit on a floor or table surface such that *Deane*’s apparatus 200 is held in the vertical upright position. Ex. 1004 at ¶ [0060]; Fig. 3 (annotated by Patent Owner below); Ex. 2001 at ¶¶ 118, 124. In fact, *Deane*’s shell 204 is specifically designed to discourage resting the unit on anything other than the feet of the chassis 202. *See* Ex. 1004 at ¶¶ [0057], [0093] (non-planar walls “serve to discourage users from setting the housing on its side or placing it in any orientation other than the upright” orientation); Ex. 2001 at ¶ 118.



Accordingly, *Deane* does not teach movement of the separation cartridge in the alleged first direction for removal, and, in fact, such movement is seemingly not even possible in *Deane*. Again, both institution decisions appreciated the impossibility of moving the alleged separation cartridge of *Deane* in the alleged first direction. Paper 10 at page 35; IPR2023-00527, Paper 9 at page 21 (“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.”).

There is no *prima facie* case of obviousness for claims 1-11 for at least this reason.

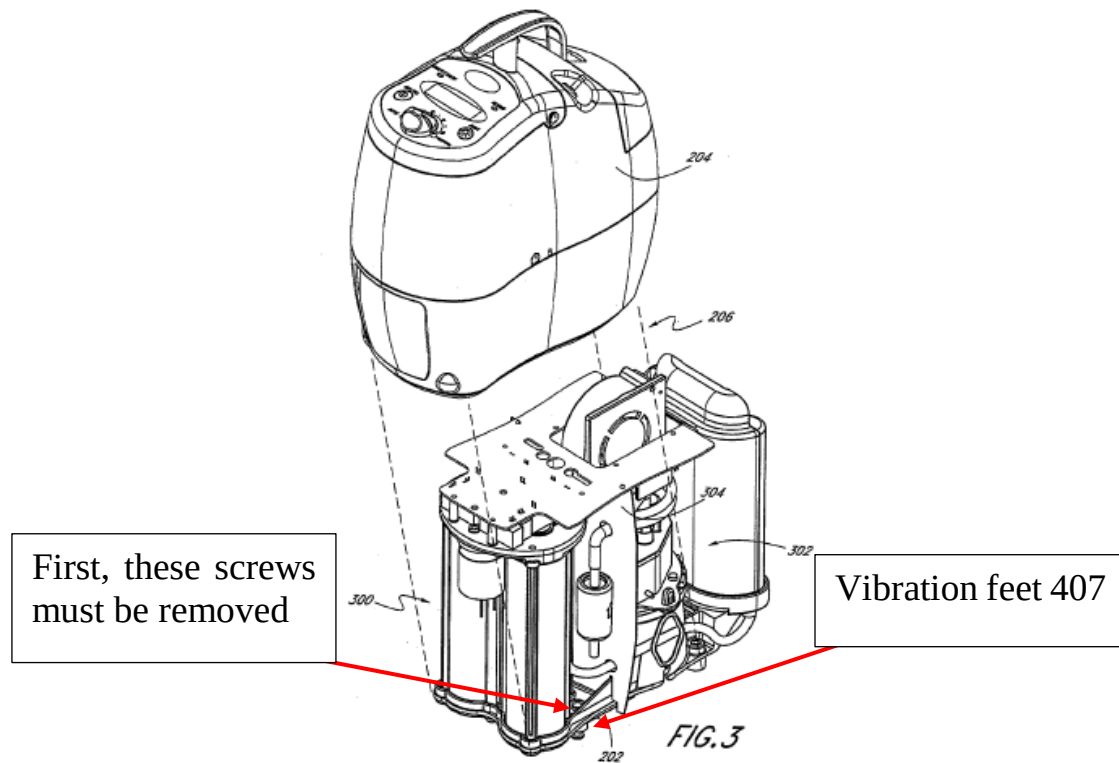
c. Movement relative to a receptacle is not taught by Deane

Not only does *Deane* not teach downward movement of the separation cartridge (i.e., movement in the claimed first direction), but the alleged receptacles must be completely removed before the alleged separation cartridge can be moved at all. Therefore, it is not possible for the housing 602 or adsorbent columns 508a, 508b to be removable from the alleged receptacles by moving “relative to the receptacle in a first direction” as required by independent claim 1.

While *Deane*’s disclosure does not describe a removal process, the teachings of *Deane* suggest that the adsorbent columns 508a, 508b could only be accessed for some sort of removal after a near full tear down of *Deane*’s gas fractionalization apparatus 200. And, again, such access would only be achieved after removing Petitioner’s alleged receptacles.

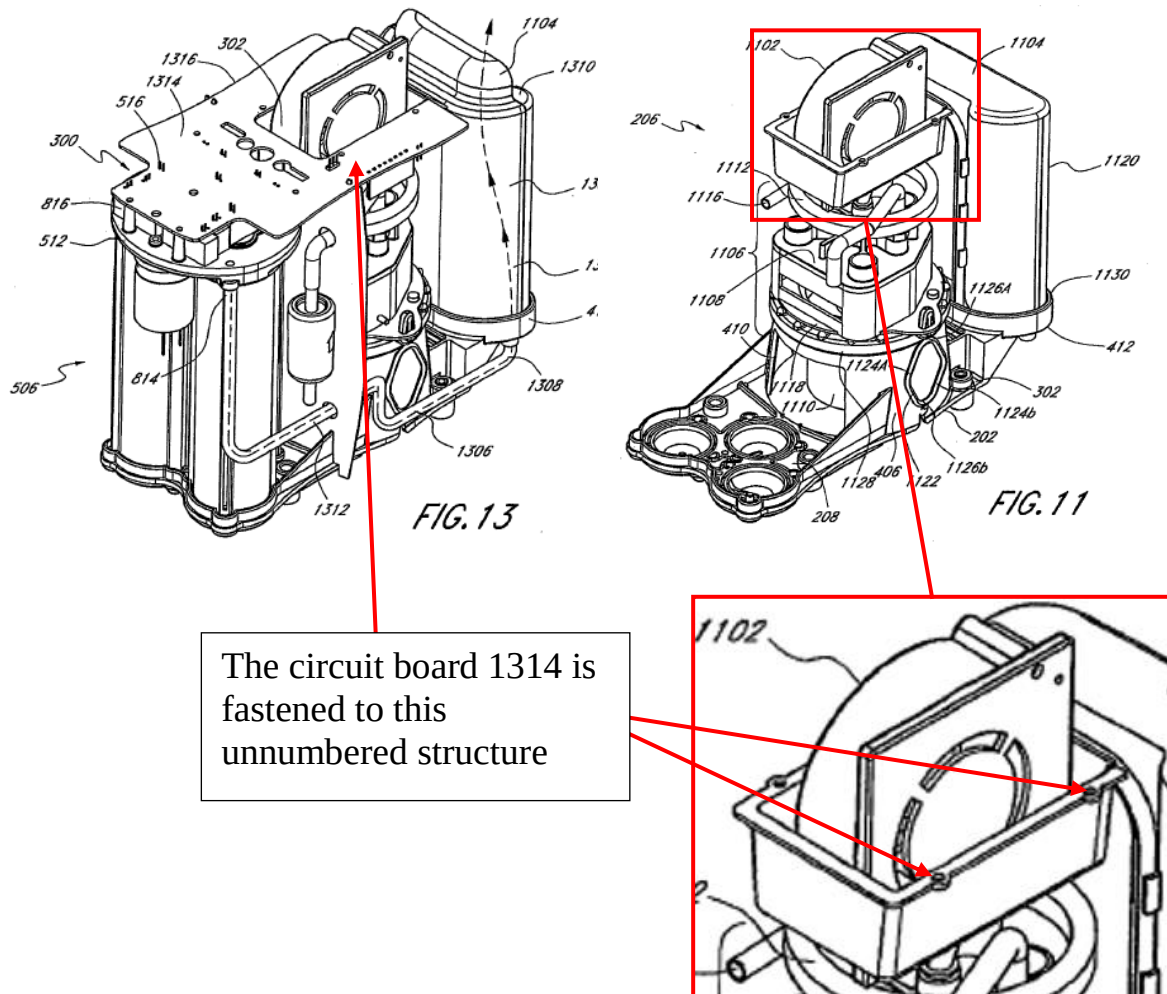
In order to access the inner workings of *Deane*’s fractionalization device 200, including the adsorbent bed columns 508a, 508b, the outer shell 204 must first be removed. See Ex. 1004 at Figure 3 and ¶ [0058]; Ex. 2001 at ¶ 123. *Deane* explains that “the chassis has bottom mounts or vibration isolation feet 407 that are configured to engage with the bottom of the shell” and that “[p]referably, screws are inserted through the bottom of the shell and into the bottom of the vibration feet 407.” Ex. 1004 at ¶ [0060]. Accordingly, to remove the shell 204, one must first

unscrew the screws extending through bottom of the shell 204 into the vibration feet 407 of the chassis 202. Ex. 2001 at ¶ 124.



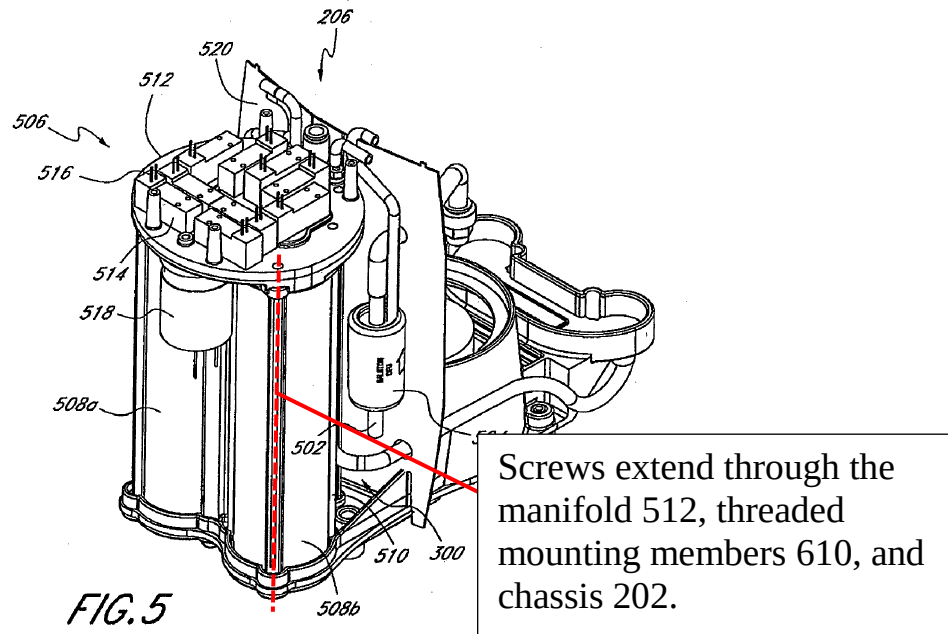
With the shell 202 removed, the adsorbent columns 508a, 508b still remain immovably sandwiched between the chassis 202 and a circuit board 1314. Ex. 1004 at Fig. 3; Ex. 2001 at ¶¶ 125-129. *Deane* discusses the circuit board 1314 as “mounted directly on top of manifold 512” and “extend[ing] horizontally from the first compartment 300 to the second compartment 302.” Ex. 1004 at ¶¶ [0063], [0087]. Further, *Deane*’s figures indicate that the circuit board 1314 is fastened to the structure surrounding the fan 1102 in the second compartment 302. *See Id.* at Fig. 11, 13. Thus, the next step in the process would be to remove the circuit board

1314 by detaching it from at least the manifold 512 and the structure surrounding fan 1102. Ex. 2001 at ¶¶ 126, 127.

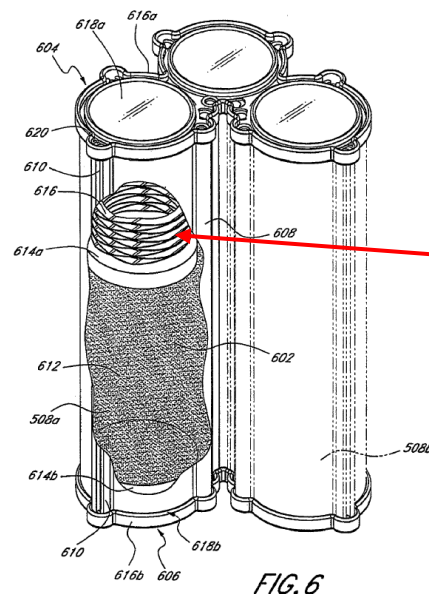


The saga does not end there. With the circuit board 1314 removed, the adsorbent columns 508a, 508b fastened to the manifold 512 and chassis 202. *Deane* discloses that the adsorbent bed column 508a includes a plurality of threaded mounting members 610 that are co-extruded with the housing 602. Ex. 1004 at ¶ [0067]. The threaded mounting members 610 “mat[e] with screws that attach the

column 508a to the chassis and the manifold.” *Id.* These screws would need to be removed. Ex. 2001 at ¶ 127.



However, there are additional complications associated with removing the manifold 512. When the above screws are removed, the manifold 512 would pop-up under the force of spring 616 being released from a state of compression. Ex. 2001 at ¶ 129. Therefore, uncoupling the screws results in upward movement of the manifold 512 relative to the alleged separation cartridge. *Id.*



Removing the screws releases the compression of spring 616, causing manifold to pop up.

What's more, the manifold 512 is not a unitary component but rather is formed of a separable upper plate 802 and lower plate 804. Ex. 1004 at ¶ [0071]; Figure 8. Therefore, as the manifold 512 pops up, it may split into two separate plates. Ex. 2001 at ¶¶ 129, 137. So, when the screws are removed, the alleged separation cartridge remains atop chassis 202, but the manifold 512 has popped-up above the alleged separation cartridge, and may have even separated into two distinct structures. *Id.* One would seek to move the popped-up manifold to a more stable location, such as to a workbench, for example. *Id.*

In sum, just to make the alleged separation cartridge accessible, let alone moveable, one would have to (1) remove the screws from the vibration feet 407 and the bottom of the shell 204, (2) remove the shell 204, (3) remove the circuit board 1314, (4) remove the screws connecting the manifold 512, threaded mounting

members 610, and chassis 202, and (5) remove the manifold 512, which has popped-up and possibly separated into two pieces. Finally, one could then potentially access and remove the housing 602 and adsorbent columns 508a, 508b by lifting them out of the chassis 202. However, according to Dr. Talu, one would not do this because there would be no bottom boundary holding the adsorbent material in the housing 602. Ex. 2001 at ¶ 131. In other words, doing what Petitioner suggests might cause adsorbent material to spill. *Id.*

Even so, once accessed, the housing 602 and adsorbent columns 508a, 508b would be lifted out of the chassis 202 in what Petitioner calls the *second* direction (vertically upward), not the first direction, as claimed. *Id.* at ¶ 130. And again, by this point, the shell 204 has already been removed from the apparatus 200 and manifold 512 has already been removed and possibly separated into plates 802, 804. Thus, the housing 602 and adsorbent columns 508a, 508b are not removable in Petitioner’s alleged first direction, let alone relative to any alleged receptacle.

Further, in view of the arduous disassembly process, the housing 602 and adsorbent columns 508a, 508b would not be considered “removable” at all. *See Novatek, Inc. v. Sollami Co.*, 559 Fed. Appx. 1011, 1017 (Fed. Cir. 2014) (arduous process needed to separate a component did not meet claim requirement of “removable” because “[t]he process ... to render it removable is not the type of removability the patents contemplate.”); Ex. 2001 at ¶ 132. It is also notable that

Deane uses the term “removable” (or the like) many times—but never relative to the alleged separation cartridge. *See, e.g.*, Ex. 1004 at ¶ [0058] (chassis “removably attached” to shell), ¶ [0082] (compressor restraint “removably attached” to compressor and chassis), and ¶ [0095] (removable hatch). *Deane* knew how to implement and describe removability, but did not do so with respect to the alleged separation cartridge.

There is no *prima facie* case of obviousness for these additional reasons.

d. Berntson does not cure the defects

The deficiencies of *Deane* are not cured by *Berntson*. Petitioner alleges that *Berntson* also teaches a separation cartridge “selectively removable from a receptacle” “because it teaches its oxygen-rich air generator (ORAG) unit removable as a whole from the receptacle of a concentrator.” *See* Petition at page 41. As noted above, *Berntson* generally teaches a consolidated ORAG unit including a pump 36 (which may be a compressor and motor), adsorbent containers 42, a valve system 46, a cooling fan 48, an air tank 54, and an air outlet 56 all consolidated in one unit. Ex. 1006 at ¶¶ [0012], [0014]. The Petition’s reference to *Berntson* does not cure the above identified issue in *Deane*.

Petitioner’s vague attempt to set forth a combination in view of *Berntson* in the alternative to *Deane* alone is improper. Petitioner does not make clear how the alleged teachings of *Berntson* would be incorporated into *Deane*, or even explain

what the alleged “separation cartridge” would be in the resulting combination. *See* Petition at pages 26-29, 33, and 41-42. This is insufficient to establish obviousness. *See Apple, Inc. v. ContentGuard Holdings, Inc.*, IPR2015-00355, Paper 9 at 9-11 (PTAB June 26, 2015) (finding no reasonable likelihood of prevailing because “Petitioner leaves it to the Board to ascertain what gaps to fill, and then presents vague statements regarding what the prior art suggests.”). What’s more, *Berntson* does not teach movement of its ORAG unit 32 in a particular direction relative to a receptacle, let alone anything that could be considered the claimed “first direction.”

Indeed, the Board specifically rejected Petitioner’s vague *Berntson* combination in the ’628 Patent institution decision where nearly identical arguments were present. IPR2023-00527, Paper 9 at page 22 (“[T]he 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 modification that would have resulted in a separation cartridge removable through the bottom of *Deane*’s gas fractionalization apparatus.”).

Even if *Berntston* did teach anything relating to the removal direction limitation, which again it does not, one would not have found it obvious to incorporate such teachings into *Deane* for two additional reasons. First, if one were to form an ORAG unit similar to *Berntson*’s with the same internal components of *Deane*, that unit could not be moved downward through *Deane*’s chassis 202, which

is designed to rest on a table/floor. *See, e.g.,* Ex. 1004 at Fig. 3; Ex. 2001 at ¶¶ 133, 134. Second, *Deane* teaches thermal separation of its motor, blower, etc., and the adsorbent columns 508a, 508b (Ex. 1004 at ¶ [0058]), and therefore one would not be motivated to modify *Deane* in view of the ORAG unit of *Berntson* where heat-generating components are combined into a common unit with heat-sensitive adsorbent components. Ex. 1006 at ¶ [0018]; Ex. 2001 at ¶¶ 133, 134; *see TriVascular, Inc. v. Samuels*, 812 F.3d 1056 (Fed. Cir. 2016) (a motivation to combine references is not present when a proposed modification “would destroy the basic objective” of a key feature of the base reference). The Petition’s peripheral citation to *Berntson* does not cure the deficiencies of *Deane* for at least these reasons.

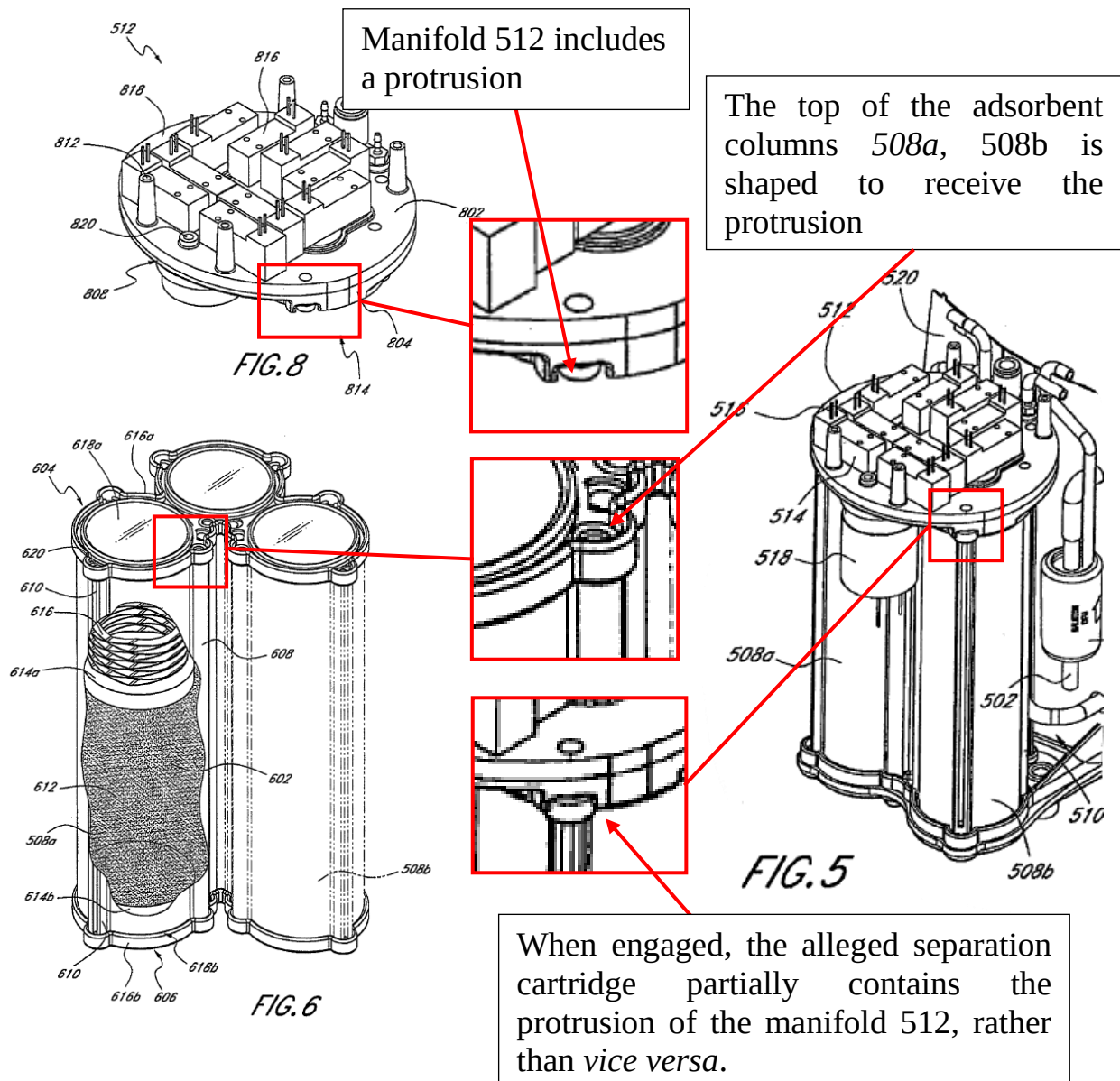
5. Ground 1 Fails As To Claims 1-11 – Petitioner has not established a “receptacle” in *Deane* under either party’s construction

In addition to *Deane* failing to teach the requisite movement of the alleged separation cartridge relative to the manifold 512 and shell 204, these components cannot even properly be considered a “receptacle” as Petitioner alleges. Again, the Petition advances the manifold 512 alone as allegedly reading on the claimed receptacle, and alternatively advances a combination of the manifold 512 and shell 204 as an alleged receptacle. *See* Petition at page 35-39.

As noted above, the parties do not agree on the construction of “receptacle.” However, the parties are in agreement that a “receptacle” must “at least partially

contain” something (here, the separation cartridge). The alleged receptacles in *Deane* do not at least partially contain the alleged separation cartridge.

First, the manifold 512 alone cannot be considered a receptacle because it does not partially contain the alleged separation cartridge. Manifold 512 only engages with the top of the adsorbent columns 508a, 508b. *See, e.g.*, Ex. 1004 at Figs. 5 and 8. Petitioner contends that “the connective structure of manifold 512 [] at least partially contains the end of adsorbent housing 602/adsorbent bed columns 508a, 508b around its periphery.” Petition at page 36. However, contrary to Petitioner’s assertion, *Deane*’s drawings appear to suggest that it is actually portions of the manifold 512 that are received and contained within the adsorbent columns 508a, 508b. From Figures 5, 6, and 8 of *Deane*, annotated below, it appears that the manifold 512 includes a projection that is received in the feed tube 608 of the adsorbent columns 508a, 508b when the components are attached.



Accordingly, *Deane* does not support that the manifold 512 even partially “contains” the adsorbent columns 508a, 508b; if anything, the adsorbent columns 508a, 508b contain a portion of the manifold 512, which is not consistent with the claim language. Ex. 2001 at ¶¶ 151-159.

Further, one would not read the claimed receptacle on the combination of the shell 204 and the manifold 512 because those components are independent structures that are moved relative to the alleged separation cartridge at different times and serve completely different functions. As set forth above, first the shell 204 must be removed before the manifold 512 is even accessible. In view of this sequential removal procedure, there is certainly never any movement of the adsorbent columns 508a, 508b relative to the combination of both the manifold 512 and shell 204. Ex. 2001 at ¶ 157.

The Petition attempts to address this deficiency by stating that “[m]aking individual components separate/integral is obvious as a matter of law where no functionality is gained or lost via that choice.” See Petition at page 40. However, this reasoning is incorrect because functionality would be lost by making the shell 204 and manifold 512 an integral component. Namely, making the shell 204 and manifold 512 an integral component would make *Deane* impossible to disassemble. Ex. 2001 at ¶ 158. As discussed above, removal of the shell 204 is required to access the manifold 512 and disengage the manifold 512 from the columns 508a, 508b. See Ex. 1004 at Fig. 3 and ¶¶ [0058], [0060], [0067]. Accordingly, if the shell 204 and manifold 512 were somehow combined into a one-piece construction, it is unclear how one could access the manifold 512 or adsorbent columns 508a, 508b for removal or how the shell 204 could be removed because the manifold 512 is attached

to other components. It is also unclear how one would remove the circuit board 1314 from *Deane*, which is necessary for removal of the manifold 512. Ex. 2001 at ¶¶ 157, 158. The combined shell 204/manifold 512 component would be held immovably in place by the presence of the circuit board 1314 and the manifold's 512 connection to the adsorbent columns 508a, 508b. *Id.* Thus, making these components integral is far more complex than Petitioner suggests and not *per se* obvious.

Petitioner also vaguely alleges that circuit board 1314 could be part of the receptacle. Petition at 36. The circuit board 1314 is a separate, independent structure from the manifold 512, however, and does not at least partially contain the alleged separation cartridge. The circuit board 1314 is not a receptacle. *Id.* at ¶ 159.

Accordingly, the Petition has also failed to point to a proper “receptacle” in *Deane*, let alone a separation cartridge removable from such a receptacle in accordance with the removal direction limitation. A *prima facie* case of obviousness has not been established for claims 1-11 for at least this additional reason.

6. Ground 1 Fails As To All Claims - *Deane* does not establish the non-contact limitations

Independent claim 1 of the '614 Patent recites “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 second line does not contact the adsorbent material of the bed.” See Ex. 1001 at claim 1. Independent claim 12 includes identical non-contact limitations. *Id.* at claim 12. Independent claim 13 recites similar non-contact limitations. *Id.* at claim 13 (“fluid flowing along the second line does not contact the adsorbent material of the first bed... fluid flowing along the fourth line does not contact the adsorbent material of the second bed”). As such, this argument applies to every challenged claim.

The Petition relies on *Deane* alone as allegedly teaching these non-contact limitations. The Petition has not established that *Deane* teaches the non-contact limitations. The alleged supporting evidence in the Petition is, in reality, ambiguous at best, if not directly contrary to Petitioner’s assertions. Ex. 2001 at ¶¶ 139-150.

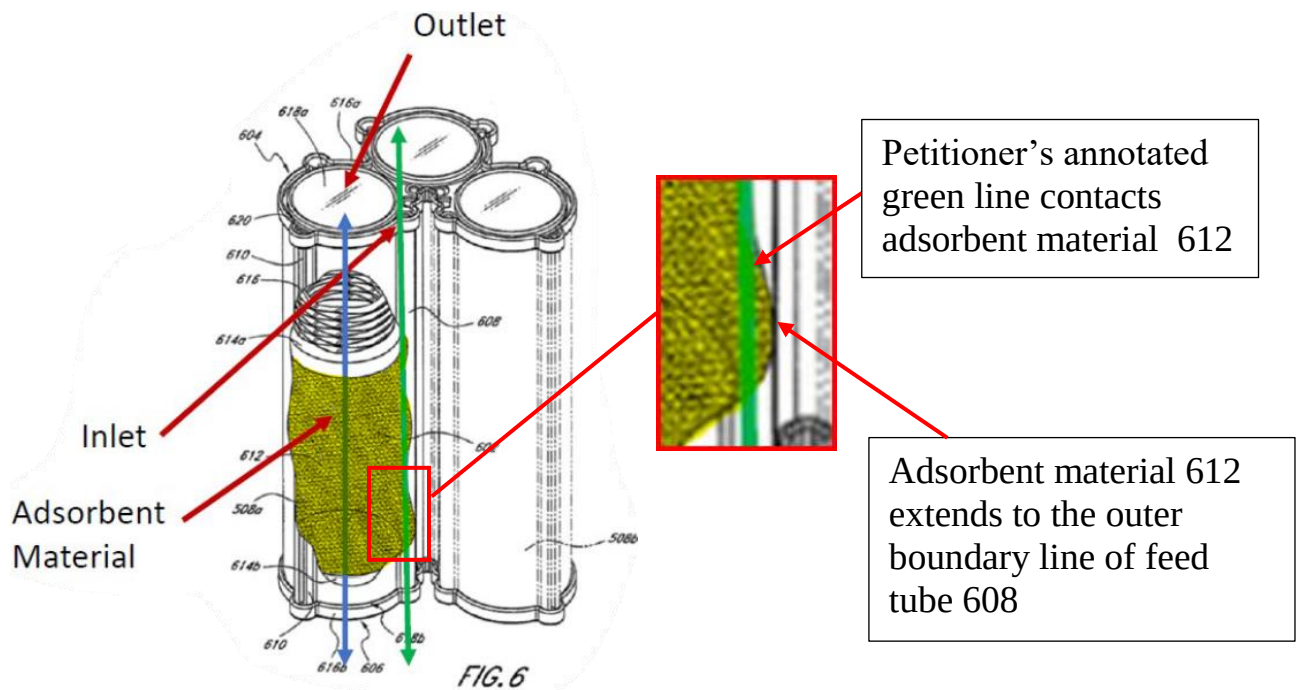
When a prior art reference is ambiguous regarding a limitation, it does not, by itself, render that limitation unpatentable. See *Wasica Fin. GmbH v. Cont’l Auto. Sys.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017) (upholding the Board’s finding that a claim was patentable when it was “unclear” whether or not the cited reference disclosed the pertinent feature because “[a]mbiguous references do not, as a matter of law, anticipate a claim”); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1315 (Fed. Cir. 2019) (affirming jury finding of nonobviousness when challenger relied solely on a prior art photograph “of limited clarity” to establish a claim limitation and “offer[ed] nothing to fill this gap in its obviousness analysis.”). In

this vein, the Federal Circuit has consistently held in the context of inherency that an alleged teaching of the prior art “may not be established by probabilities or possibilities.” *Par Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014). Rather, “in order to rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis – the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art.” *Id.* at 1195-1196. In summary, the principles of law regarding ambiguous disclosures and inherency, which are rooted in anticipation case law, apply equally to an obviousness analysis, especially where, as here, the obviousness ground is based on an allegation that a particular limitation is taught or disclosed in a single reference.

The Petition primarily relies on the adsorbent bed columns 508a, 508b of *Deane* as depicted in Figures 6 and 7A as allegedly reading on the claimed separation cartridge. *See* Petition at page 32, *et seq.* When addressing each of the independent claims, the Petition points to the top of feed tube 608 as the alleged inlet, and annotates a green line extending through the feed tube 608 as allegedly reading on the claimed second line. *Id.* at pages 49, 59, and 62. Without additional discussion, the Petition summarily states “fluid flowing along the green line in the figures below flows through feed tube 608 that does not contain adsorbent material 612.” *See Id.*

at page 49. The Petition cites Dr. Knaebel's declaration for support, but Dr. Knaebel's declaration merely makes the same points as the Petition.

Extraordinarily, the adsorbent material 612 in Figure 6 is illustrated as extending into the feed tube 608, and Petitioner's annotated green line quite clearly does contact the adsorbent material 612 (highlighted in yellow below) of adsorbent column 508a. See Petition at page 49 (yellow coloring added by Patent Owner). Petitioner makes no attempt to address this glaring deficiency.



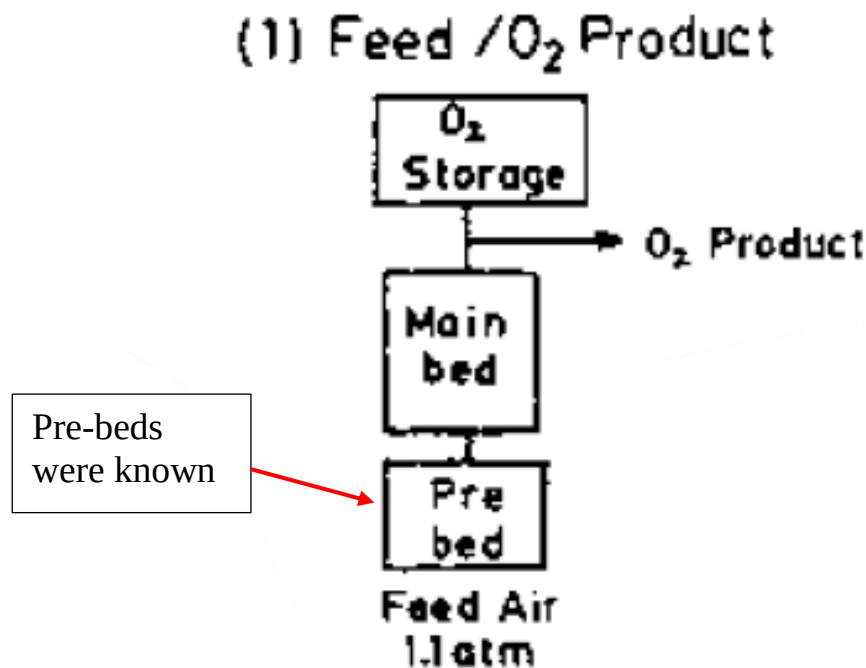
Stated plainly, Figure 6 illustrates that fluid flowing along the green line would contact adsorbent, which is contrary to the claim language. Indeed, the adsorbent material 612 extends to the outer boundary line of the feed tube 608, which demonstrates that the adsorbent is in the feed tube 608. See Ex. 1004 at Fig. 6.

Further, Dr. Knaebel, admitted during his deposition that it is not possible to draw a line through the feed tube 608 as shown in Figure 6 without that line touching adsorbent material 612. *See* Ex. 2003 at 47:17-48:8 (Q: “Figure 6, as shown in Deane, are you able to draw a green line ... that shows the flow going through the feed tube without touching the adsorbent material?” A: “It’s a no, but its not an appropriate diagram on which to show the flow path.”). After a series of questions on the topic, Dr. Knaebel explained his belief that Figure 6 of *Deane* is a two-dimensional representation of a three-dimensional object, which leads to the perception of the green line contacting adsorbent, despite Dr. Knaebel’s belief that there is no adsorbent in *Deane’s* feed tube. Ex. 2003 at 42:16-49:16. Critically, however, Dr. Knaebel admitted that the green line in the annotated version of Figure 6 is touching adsorbent. *Id.* Dr. Knaebel also admitted that the text of *Deane’s* disclosure does not state that adsorbent is not present in the feed tube. Ex. 2003 at 51:17-22. Dr. Knaebel specified that *Deane’s* Figure 7A is not being relied on to teach the location of adsorbent, and that he is only relying on *Deane’s* Figure 6, coupled with skill in the art, to address the non-contact limitations. *Id.* at 43:16-44:20, 51:23-25.

Deane’s Figure 6, coupled with skill in the art, does not rise to the level of proof required to meet the non-contact limitations, consistent with the case law on the requirements for express and inherent disclosures.

a. There was a known reason for contact

Providing adsorbent in *Deane's* feed tube 608, as shown in Figure 6, could serve the function of what is known in the art as a pre-bed of adsorbent, i.e., an initial bed of adsorbent in series with and prior to a main bed of adsorbent. Indeed, Petitioner's own declarant, Dr. Knaebel, co-authored a book which describes an oxygen concentration system with a pre-bed of adsorbent in sequence with a main bed of adsorbent. See Ex. 1068 at pages 126-129. Dr. Knaebel and his co-authors described "a two-bed system" in which "each 'bed' actually consists of a prebed for impurity removal in series with the main adsorption bed." *Id* at pages 126-129 and Figure 6.10, partially copied below:

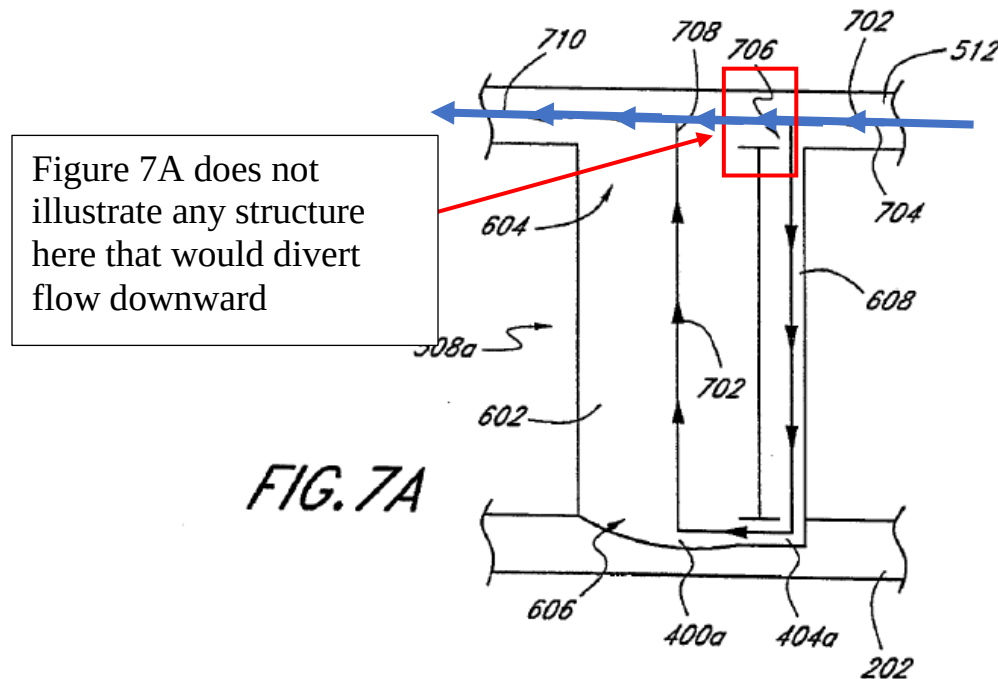


Similarly, another reference cited by Petitioner, *Dee '318* (Ex. 1037), also teaches that using multiple adsorbent beds in series can result in higher oxygen product purity. Ex. 1037 at 4:48-50. Indeed, in his deposition Dr. Knaebel admitted that such pre-beds were known prior to the priority date of *Deane*. See Ex. 2003 at 67:12-68:13. These teachings support a reason why *Deane* shows adsorbent in the identified feed tube 608.

b. Other portions of Deane are consistent with contact

The highly schematic drawing in *Deane*'s Figure 7A does not help Petitioner. Adsorbent material is not even shown in Figure 7A, nor is the reference number 612 corresponding to adsorbent material included in the figure. See Ex. 1004 at Fig. 7A. As such, Figure 7A does not establish that feed tube 608 lacks adsorbent. Dr. Knaebel admitted that Figure 7A is "only schematic, to show how the fluid generally flows." Ex. 2003 at 43:7-8.

There are other reasons to question any alleged teachings of Figure 7A. As shown below, there is no structure at the top of the manifold 512 in Figure 7A which would explain why fluid is diverted downward into feed tube 608. Ex. 2001 at ¶ 146. Taking the structural showing of Figure 7A as gospel, one would expect gas to flow straight through the manifold without ever entering the adsorbent bed columns 508a, 508b (illustrated with a blue line below). Thus, one would not look to Figure 7A as allegedly showing any structural details or arrangement of components.



Outside of the drawings, the Petition does not cite to anything in *Deane's* written description to teach the non-contact limitations. See Petition at pages 48-50. *Deane* never states there is no adsorbent material in the feed tube 608. See, e.g., Ex. 1004. Dr. Knaebel has admitted to this. See Ex. 2003 at 51:17-22 (Q: “[T]he disclosure doesn’t say [] that it’s not there. And it doesn’t say that it’s there, correct? Explicitly either way in the written disclosure?” A: “I agree.”).

For the first time in its Reply to Patent Owner’s Preliminary Response, Petitioner contended that the fact that *Deane* refers to its fluid as “feed gas” after it passes through the feed tube 608, means that the gas has yet to pass through any adsorbent. See Paper 7 at page 2. Yet, Petitioner’s assertion is unsupported and belied by the very reference it relies upon—*Deane*.

Petitioner has set forth no evidence to support its contention that “feed gas” is commonly understood to refer to gas that has not passed through adsorbent. *See id.* And, surprisingly, two references attributable to Petitioner’s own declarant, Dr. Knaebel, contradict such a suggestion. First, the book co-authored by Dr. Knaebel discussed above uses the term “feed gas” to refer to fluid that is fed to both the pre-bed and the main bed. *See* Ex. 1068 at page 127-129. Second, *Deane* incorporates by reference into its disclosure a patent of Dr. Knaebel—U.S. Patent No. 5,226,933 (Ex. 2005, “the ’933 Patent”). *See* Ex. 1004 at ¶ [0035]. The ’933 Patent states, quite clearly, that “[t]he feed gas may comprise air, or in the alternative, the predominantly oxygen/argon product remaining after nitrogen has been separated out.” *Id.* Dr. Knaebel also confirmed in his deposition that this usage of the term “feed gas” is proper. *See* Ex. 2003 at 64:7-9 (Q: “So you [] could refer to gas that has nitrogen removed as feed gas, correct?” A: “Yes.”). Accordingly, referring to the fluid flow as “feed gas” after it contacts the adsorbent in feed tube 608 is entirely consistent with usage of that term in the field. Dr. Talu confirms “feed gas” could refer to gas that has passed through an adsorbent bed. Ex. 2001 at ¶ 149.

Further, Petitioner also argues for the first time in its Reply that *Deane* lacks separately illustrated restraining disks for its feed tube 608, which, according to Petitioner, suggests that there is no adsorbent material in the feed tube 608. Paper 7 at page 2. This argument is undercut by the fact that adsorbent beds do not require

retaining disks to hold them in place. Ex. 2001 at ¶ 150. Further, the retaining disks 614a, 614b in Figure 6 do not appear to be sized appropriately to trap adsorbent in the adsorbent housing 602. *See* Ex. 1004 at Fig. 6. For instance, disk 614a appears to have too large of a diameter, whereas disk 614b appears to have too small of a diameter. *Id.* Clearly, not much thought was put into the illustration of restraining structures in Figure 6 of *Deane*. And certainly, *Deane* does not disclose anything that would preclude an internal restraining structure for the adsorbent in the feed tube 608.

In sum, there is simply nothing in *Deane* which contradicts the clear showing of Figure 6 of adsorbent extending into the feed tube 608.

c. Petitioner's position is inconsistent

It is telling that Petitioner has been inconsistent in asserting when the drawings of *Deane* can and cannot be relied upon as accurate.

For example, Petitioner relies on the veracity of Figure 6 to allegedly show that the manifold 512 at least partially containing adsorbent columns 508a, 508b, and also to allegedly teach that the adsorbent columns 508a, 508b are separable from the manifold 512 in an axial, rather than lateral direction. *See* Petition at pages 32 and 42-43. And yet, when confronted with the clear showing of adsorbent extending into the feed tube 608 in Figure 6, Petitioner attempts to distance themselves from the accuracy of the drawing. In Petitioner's Reply, Petitioner qualifies Figure 6 as

providing a “cut-out” view and noted “the limitations of representing a 3D structure in 2D.” Paper 7 at pages 2-3. Likewise, in Dr. Knaebel’s deposition he described Figure 6 as “an artist’s rendition of the physical device” and stated that “the drawing could be improved, or the text could be supplemented to clarify that there’s no adsorbent in that down tube.” Ex. 2003 at 46:5-6 and 57:15-24. The fact is, Petitioner is stuck with the un-improved and un-clarified version of *Deane* that it chose for this IPR.

Petitioner’s flip-flopping is understandable, as Petitioner is stuck between a rock and a hard place. Either Figure 6 is accurate and shows contact contrary to the claims, or Figure 6 is inaccurate, and therefore cannot fairly be relied upon alone to teach the removal direction limitation and other necessary elements of the claims.

In summary, *Deane*’s Fig. 6 shows contact with adsorbent where Petitioner alleges there is none, *Deane*’s detailed description is silent on the issue, and the prior art cited by Petitioner, including a prior publication by Petitioner’s own declarant, demonstrates a known reason that green-line-contact with adsorbent would make sense and be beneficial. Thus, the Petition has failed to establish that the non-contact limitations are either explicitly or inherently taught by *Deane* and failed to establish a *prima facie* case of obviousness for all of the challenged claims.

7. Ground 1 Fails As To Dependent Claims 2 and 15 - Not obvious to rearrange *Deane's* spring

Dependent claim 2 recites “the outlet is arranged adjacent a first end of the bed, and adjacent a second end of the bed opposite the first end, the separation cartridge includes a spring configured to hold the bed in place.” Claim 15 recites a similar combination.

Contrary to the claims, *Deane* includes a spring 616 on a top end of its bed, rather on the bottom. See Fig. 6. In attempting to address this deficiency in *Deane*, Petitioner argues that one would either (1) move *Deane's* spring 616 to the opposite end, or (2) keep *Deane's* spring 616 in place and add a spring at the bottom of *Deane's* adsorbent bed 508a. Petition at pages 51-53. This appears to be the exact kind of improper hindsight Dr. Knaebel testified he was applying in providing his opinions.

As a practical matter, Petitioner's first proposal would not work when packaging adsorbent material into the adsorbent bed 508a. Ex. 2001 at ¶¶ 163, 164. Taking Figure 6 of *Deane* at face value, it is clear that the adsorbent column is loaded from the top. When the column 508a is nearly full of adsorbent material 612, the retaining disk 614a and spring 616 are placed atop of the adsorbent material. *Id.* The gasket 616a and manifold 512 would then be secured over the top of the spring 616 to compress the spring down and secure the adsorbent material 612. *Id.* So, if the top

spring 616 were moved to the bottom, it would be difficult, if not impossible to load the column 508a with beads of adsorbent material such that those beads would be under compression. *Id.* Even if the bottom spring 616 could still somehow be compressed during packaging, it would be providing a bias on the adsorbent beads in the upward direction which would cause beads to spill over the top of the adsorbent housing 602 when attempting to load and then seal the column 508a. *Id.*

With regards to Petitioner's two spring proposal, adding a second spring to the bottom of the adsorbent column 508a would add unnecessary complexity and provide no additional benefit to the already-included top spring 616. Ex. 2001 at ¶ 165. Further, an additional spring would risk uneven compression on the adsorbent bed, add to cost, and may require more maintenance and calibration, all without a tangible benefit. *Id.* Therefore, one would not add a second spring near the bottom of *Deane's* adsorbent columns.

The only reason Petitioner makes these assertions is because Petitioner is motivated by hindsight to assert that the claims are obvious. Petitioner's rationale should be rejected.

B. Grounds 2-6 are deficient for the same reasons as Ground 1

Ground 2 relates to dependent claims 2, 3, and 15. Petitioner applies *Deane*, *Dubois*, *Berntson*, and *Hill '719* (Ex. 1008) to the claims in Ground 2. Ground 3 relates to dependent claims 6. Petitioner applies *Deane*, *Dubois*, *Berntson*, and

Basset (Ex. 1007) in Ground 3. Petitioner does not rely on *Hill* or *Basset* in an attempt to cure any of the above-noted deficiencies in the proposed grounds of rejection of the independent claims relating to the removal direction limitation, the non-contact limitations, or the receptacle. Therefore, the Petition fails on Grounds 2 and 3 for these same reasons as Ground 1, above. Grounds 4-6 repeat the allegations of Grounds 1-3, but eliminate the teachings of *Dubois* and *Berntson*. Petition at page 72. Grounds 4-6 fail for the same reasons as Grounds 1-3.

Grounds 2 and 5 fail relative to claims 2, 3, and 15 as well. In Grounds 2 and 5, Petitioner argues as an alternative that it would have been obvious to modify *Deane* in view of *Hill* to provide *Deane* with the spring of claims 2, 3, and 15. However, Dr. Talu explains that it is standard practice to provide a spring on the same side of column where the adsorbent material is loaded. Ex. 2001 at ¶ 169. That is all *Hill* is teaching. While *Hill* appears to pack its column from the bottom, it is more generally teaching one to arrange a spring on the same side of the column as the side where the adsorbent is loaded into the column. *Id.* When applied to *Deane*, *Hill* would teach no change to *Deane*. Dr. Talu explains that one would not pack *Deane*'s columns 508a, 508b from the bottom, because the bottom is blocked by the chassis 202. *Id.*

Hill does not teach one to use a spring at the bottom of *Deane*'s column, either alone or together with *Deane*'s existing top spring.

VI. LICENSING

Secondary considerations are anything but “secondary.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012).

Licensing is a relevant secondary consideration.

Inogen has taken a license from 3B (an exclusive licensee of Patent Owner) for Inogen’s POC products regarding patent families including U.S. Patent Nos. 10,357,628 and 7,604,005 (which includes the ’614 Patent).

While the terms of the license are confidential, the license permits the parties to publicly disclose its existence by making the above statement.

Dr. Knaebel testified that he believes Inogen to be a market leader in the portable oxygen concentrator space, and that he believed Inogen would not have taken a license to a patent it believed to be invalid. Ex. 2003 at 22:4-23:8.

Dr. Talu testifies that Inogen has a good reputation in the industry and their taking of a license speaks to the inventiveness of the ’614 Patent. Ex. 2001 at ¶¶ 170, 171.

The licensing activity further suggests the claims are non-obvious.

VII. NOT CONSTITUTIONAL

A. IPRs Violate Due Process Rights

When a petition for an IPR is filed, the petitioner must pay a fee of \$19,000. If the IPR is instituted, the petitioner must pay a second fee of \$22,500. Since 2021, these post-institution fees have amounted to more than \$20 million per year, and represent about 24% of the Board's total budget and about 40% of the Board's AIA trial proceedings budget.³ There is thus an incentive for the Board to favor institution. This is especially problematic because Board leadership holds dual executive (financial) and judicial functions. That is, the same people making decisions about the merits of an IPR also participate in making financial decisions about the operation of the Board. *See, e.g., Mobility Workx, LLC v. Unified Patents, LLC*, 15 F.4th 1146, 1154 (Fed. Cir. 2021).

This is a source of impermissible structural bias within the Board and violates litigants' due process rights. *See, e.g., Ward v. Vill. of Monroeville*, 409 U.S. 57, 60 (1972).

³ See USPTO Aggregate Revenue Tables, available at <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>

A recent report by the Government Accountability Office⁴ has revealed that the management practices of the USPTO and Board affects the independence of the Board judges. 67 percent of judges “reported feeling pressure to change or modify an aspect of their decision in an AIA proceeding” based on internal review procedures, including with respect to institution decisions. Exhibit 2006 at 2, 35, 59. 21 percent of judges indicated they were pressured to change or modify the overall outcome of a proceeding as a result of these internal review procedures. *Id.* at 63. 15 percent of judges indicated that in their opinion, the Board management’s influence on the outcome of a proceeding has been inappropriate all of the time. *Id.* at 68. This information, viewed in light of the structural issues discussed above, underscores due process deficiencies in the IPR procedure.

B. The Institution Procedure Violates the Appointments Clause

The authorizing statutes for IPRs granted the Director authority to institute an IPR. 35 U.S.C. § 314. However, shortly after enactment of those statutes the authority to institute an IPR was delegated to the Board. *Changes to Implement Inter Partes Review Proceedings, Post-Grant Review Proceedings, and Transitional*

⁴ Available at <https://www.gao.gov/assets/gao-23-105336.pdf> and attached hereto as Ex. 2004.

Program for Covered Business Method Patents, 77 Fed. Reg. 48612, 48647 (Aug. 14, 2012).

This delegation is in conflict with a recent Supreme Court decision. In *United States v. Arthrex*, the Supreme Court confirmed that final decisions made on behalf of the USPTO in an IPR must be made by a principal officer, one who is appointed by the President with the advice and consent of the Senate. *United States v. Arthrex, Inc.*, 141 S. Ct. 1970, 1985 (2021). At issue in *Arthrex* was a Final Written Decision issued at completion of an IPR, but the same principle stands for institution decisions, which are also final and nonappealable. See 35 U.S.C. § 314(d); *Cuozzo v. Speed Techs, LLC*, 579 U.S. 261, 266 (2016). Board judges are not principle officers and therefore they cannot act alone on behalf of the USPTO by rendering final institution decisions. *Arthrex*, 141 S. Ct. at 1985. This problem has been highlighted by Judge Newman of the United States Court of Appeal for the Federal Circuit, and is ripe for review. See *Mobility Workx*, 15 F.4th at 1161 (Newman, P., dissenting).

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(b)(1), the undersigned hereby certifies that the foregoing document contains 13,636 words, excluding a table of contents, a table of authorities, mandatory notices under 37 C.F.R. § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing, as measured by the word-processing system used to prepare this paper.

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CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing document was served electronically via email in its entirety on the following:

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Petitioner has consented to electronic service.

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