SheppardMullin

GCE's Hearing Demonstratives

GCE Gas Control Equipment Inc. v. Vbox, Inc.
IPR2023-00326
Patent No. 11,389,614 B2
March 20, 2024

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Ex. 1079 - DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The ’614 Patent – Background

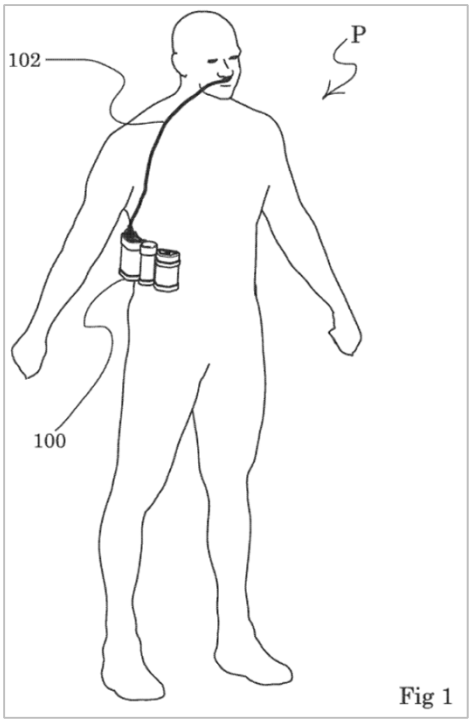


Fig 1

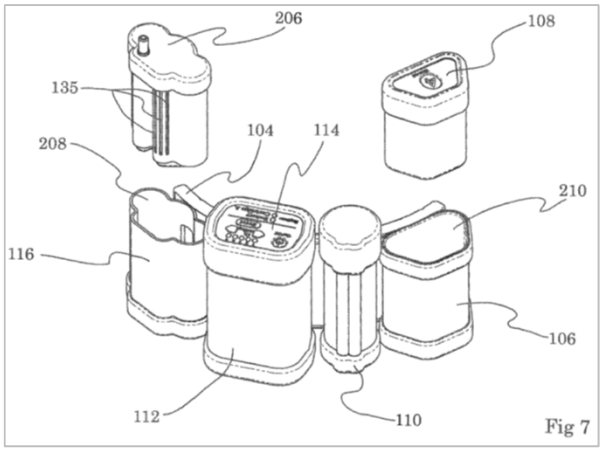


Fig 7

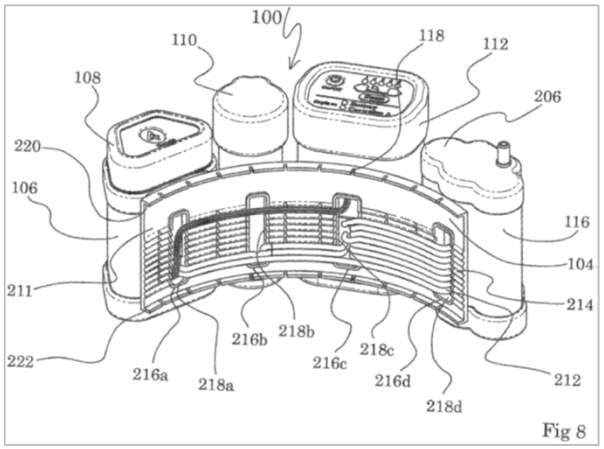


Fig 8

The field of this invention relates to oxygen concentrators. In particular, the invention relates to wearable oxygen concentration systems utilizing vacuum swing adsorption for creating an oxygen stream for ambulatory respiratory patients.

FIG. **2** is a perspective view of oxygen concentrator **100**. Oxygen concentrator **100** is comprised of belt **104**, power module **106** containing power pack **108**, reservoir module **110**, control module **112** containing user interface **114**, and separation cartridge module **116**. Oxygen concentrator **100** is a portable oxygen separator used to provide an oxygen rich gas stream to patient P. Belt **104** connects and carries the modules **106**, **110**, **112**, and **116** of oxygen concentrator **100**.

110 ,**112**, and **116**, is connected to belt **104**. In one embodiment, sockets **218***a*-**218***d* are constructed to allow each individual module **106**, **110**, **112**, and **116**, to snap onto belt **104** or attach in a similar quick connect fashion. Utility tubes

Ex. 1079 - DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ex. 1001 (’614 Patent), 1: 17-21, 3:60-67, 13:34-37, FIGS. 1, 7, 8; Pet., pp. 4-6; Ex. 1003 (1st Knaebel Dec., ¶¶65-75

The Petition

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

2. The portable oxygen concentrator as recited in claim **1**, wherein:
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.

Grounds	Claims	Statutory Basis	Prior Art
1	1-5, 7-16	§103	*Deane* in view of *Dubois* and *Berntson*
2	2, 3, 15	§103	*Deane* in view of *Dubois*, *Berntson*, and *Hill '719*
3	6	§103	*Deane* in view of *Dubois*, *Berntson*, and *Basset*
4	1-5, 7-16	§103	*Deane*
5	2, 3, 15	§103	*Deane in view of Hill '719*
6	6	§103	*Deane in view of Basset*

Ex. 1001 ('614 Patent), 26:14-37; Pet., pp. 13-14

Claim Elements In Dispute

1. A portable oxygen concentrator, comprising:

[1b(i)] a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet oriented in a second direction opposite the first direction, an outlet oriented in the second direction, and a bed of adsorbent material configured to preferentially adsorb nitrogen;

wherein a first line extending parallel to the first and second directions passes through the outlet,

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

[1e] wherein the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed.

2. The portable oxygen concentrator as recited in claim 1, wherein:

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.

- *Deane* (or *Deane* / *Berntson*) teaches [1b(i)]
  - [1b(i)] requires only "movement relative to" for the cartridge and receptacle
  - *Deane's* disassembly is not limited to that argued by PO
  - *Deane* teaches the same cartridge/receptacle as claimed

    Pet. Reply, pp. 15-26; Ex. 1078 (2nd Knaebel Dec.), ¶¶117-170; Pet., pp. 32-43, Ex. 1003 (1st Knaebel Dec., ¶¶313-335
- *Deane* teaches [1e] (and [12g], [13n]/[13q])
  - *Deane's* FIGS. 6/7 (and supporting specification description) teachings of this element are clear
  - PO and Dr. Talu misread FIGS. 6/7

    Pet. Reply, pp. 26-30; Ex. 1078 (2nd Knaebel Dec.), ¶¶171-191; Pet., pp. 48-51, Ex. 1003 (1st Knaebel Dec., ¶¶348-354
- *Deane* / art knowledge or *Deane* / *Hill '719* teaches claim 2 (and 15)
  - The prior art teachings of spring arrangement as claimed cannot be overcome by Dr. Talu's *ipse dixit*

    Pet. Reply, pp. 30-31; Ex. 1078 (2nd Knaebel Dec.), ¶¶192-201, 220-226; Pet., pp. 51-53, Ex. 1003 (1st Knaebel Dec., ¶¶355-359

Topics Presented

- Element [1b(i)]
  - Scope of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane / Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

Scope of Element [1b(i)]

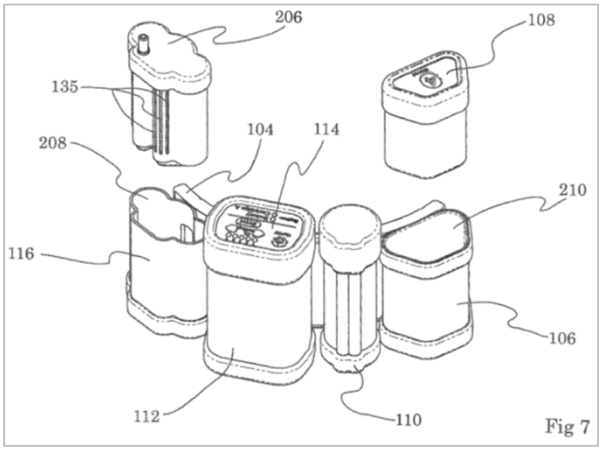


Fig 7

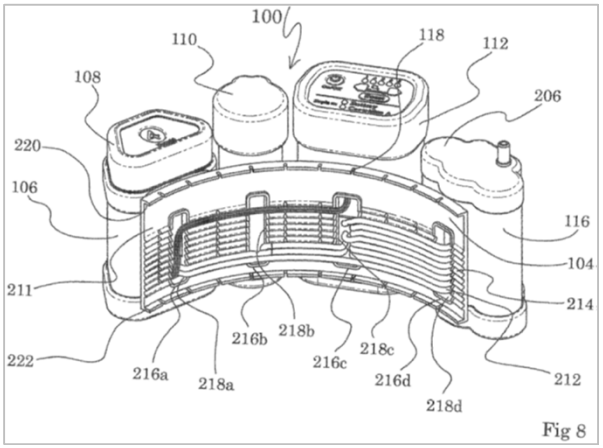


Fig 8

Ex. 1001 ('614 Patent), FIGS. 7, 8

a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

Pet. Reply, p. 5

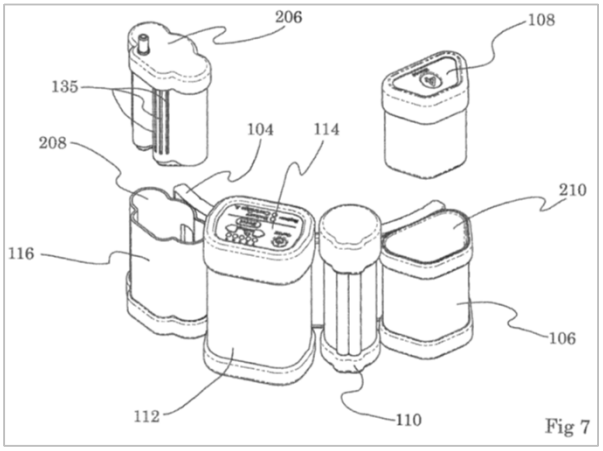
- "Separation cartridge"
  - Invention is a multi-bed housing

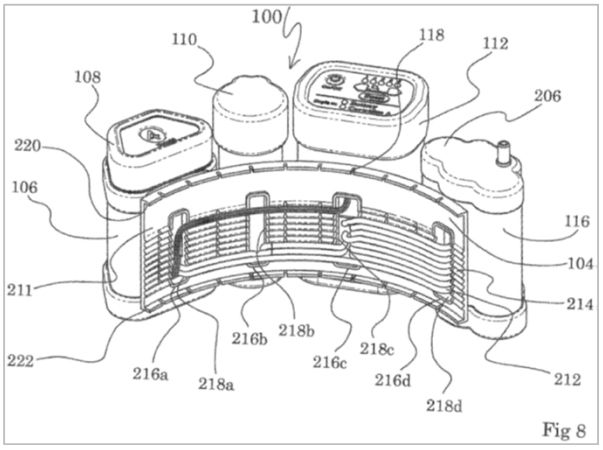
    Pet. Reply, pp. 6-7; Ex. 1078 (2nd Knaebel Dec.), ¶¶37-62; Pet., pp. 21-23, Ex. 1003 (1st Knaebel Dec., ¶¶232-258

- "Selectively removable"
  - Specifies separation cartridge can be chosen for separation/withdrawal
  - No requirement of removability from the POC, just from the receptacle
  - "Removable" is broad; no requirement as to ease of disassembly

    Pet. Reply, pp. 9-11; Ex. 1078 (2nd Knaebel Dec.), ¶¶80-98; Pet., pp. 24-26, Ex. 1003 (1st Knaebel Dec., ¶¶270-284

Scope of Element [1b(i)]





Ex. 1001 ('614 Patent), FIGS. 7, 8

a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

Pet. Reply, p. 5

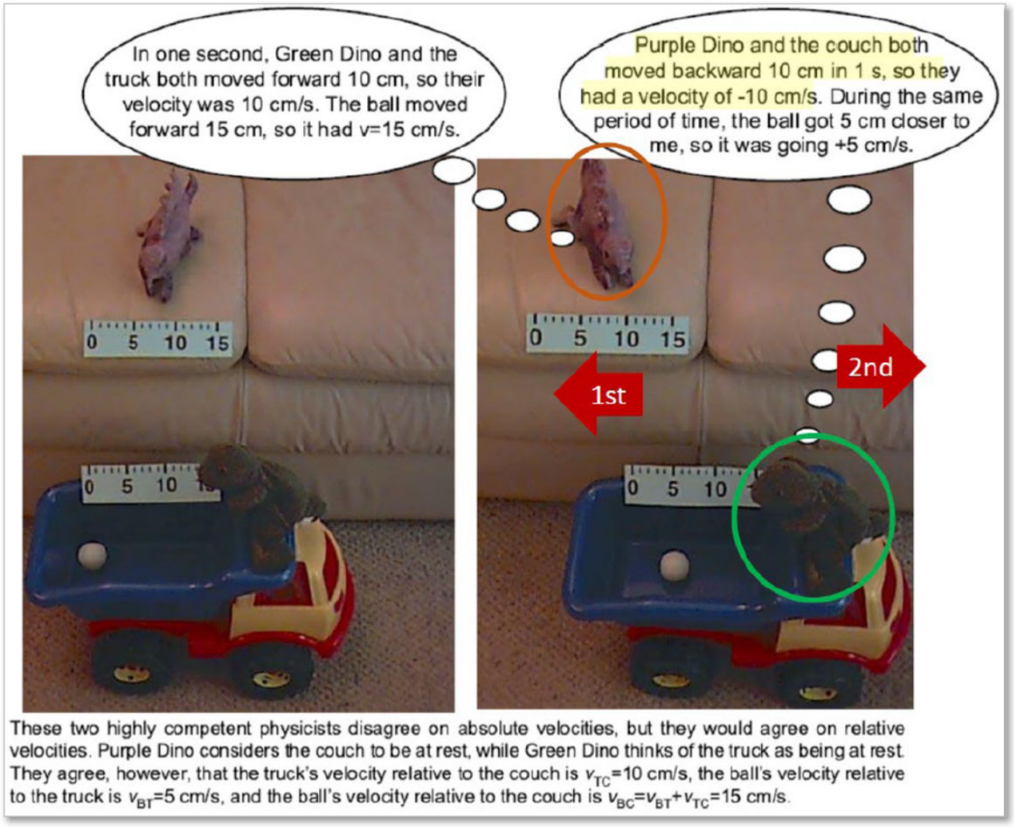
- "Receptacle"
  - A **structure** that releasably receives / at least partially contains separation cartridge
  - Only partial containment required, as shown in exemplary embodiment
  - No requirement the receptacle be fixed/mounted within a housing
  - No requirement the receptacle be directly accessible from outside a POC

  Pet. Reply, pp. 7-9; Ex. 1078 (2nd Knaebel Dec.), ¶¶63-79; Pet., pp. 23-24, Ex. 1003 (1st Knaebel Dec., ¶¶259-269

- "By movement relative to the receptacle in a first direction"
  - Not a method claim nor limitation
  - Requires only the capability of movement; actual movement not required
    - *INVT SPE LLC v. ITC*, 46 F.4th 1361, 1372 (Fed. Cir. 2022)
  - Only "movement relative to" is required

  Pet. Reply, pp. 11-15; Ex. 1078 (2nd Knaebel Dec.), ¶¶99-115; Pet., p. 21; Ex. 1003 (1st Knaebel Dec., ¶231

“By Movement Relative To …”

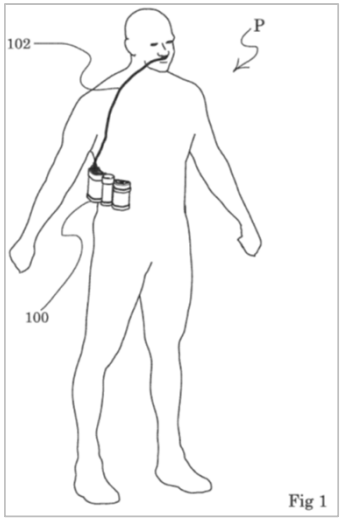


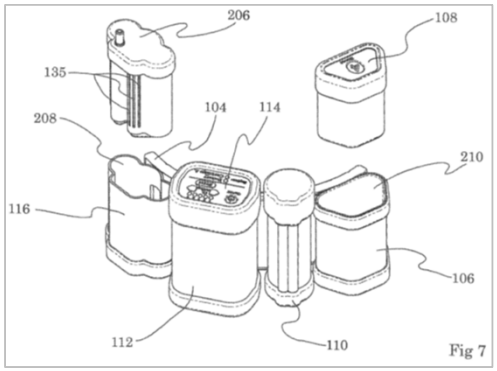
EX1078 (2nd Knaebel Dec.), ¶104

104. Relative movement is a commonly-used concept in physics and engineering that specifies movement relative to a particular ***frame of reference***. In the context of two objects, a first object may move “relative to” a second object’s frame of reference (*i.e.*, from the second object’s perspective) by, *e.g.*, moving the first object away from the second, moving the second away from the first, or moving both the first and second objects away from each other. A good

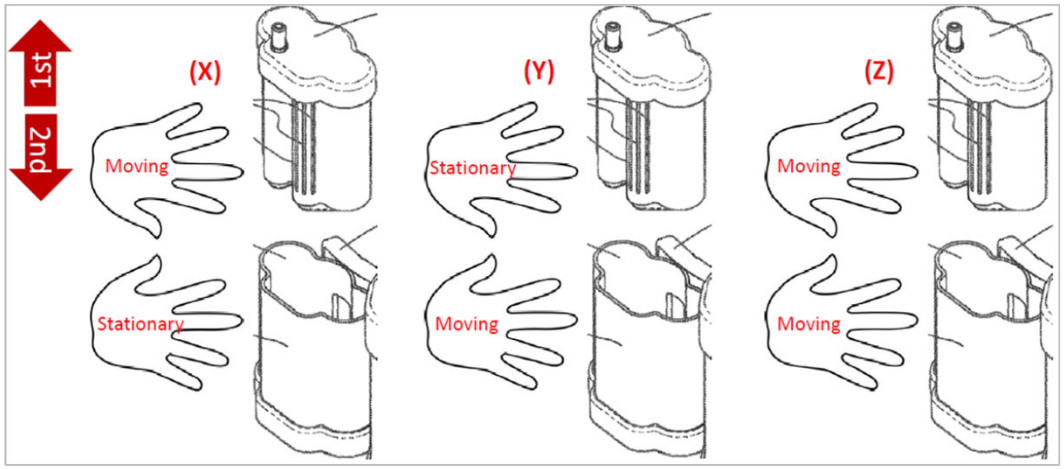
Ex. 1078 (2nd Knaebel Dec.), ¶104

“By Movement Relative To …” Covers All Removal Methodologies in the ’614 Patent





Ex. 1001 (’614 Patent), FIGS. 1, 7



Pet. Reply, p. 14

- ’614 Patent does not specifically describe how the cartridge and receptacle are separated
- Based on the ’614 disclosure, there are several ways to remove the cartridge from the receptacle
- A POSITA would have understood “by movement relative to” provides broad coverage for all contemplated methods and covers at least “X,” “Y,” and “Z”

Pet. Reply, pp. 13-14; Ex. 1078 (2nd Knaebel Dec.), ¶¶108-110

"By Movement Relative To …" Must Mean Something

a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

≠

a separation cartridge selectively removable from a receptacle ~~by movement relative to the receptacle~~ in a first direction, the separation cartridge comprising an inlet

See Becton, Dickinson & Co. v. Tyco Healthcare Grp., 616 F.3d 1249, 1257 (Fed. Cir. 2010)

PO's Arguments About [1b(i)]'s Scope Are Wrong

Assertion

> Regardless, in response to Petitioner's belated "relative movement" argument, Patent Owner can only reiterate so many times that the claims do not recite "relative movement." The removal direction limitations specify that the separation cartridge itself must be the structure that is able to be removed from the receptacle by "movement relative to" the receptacle. The phrase "movement relative to" must be considered in the context of the claim language as a whole, the specification, and the file history. Petitioner's interpretation of "movement relative to" as mere "relative movement" does not meet this standard.

PO Sur-Reply, p. 5

Response

- PO offers no analysis of the intrinsic record

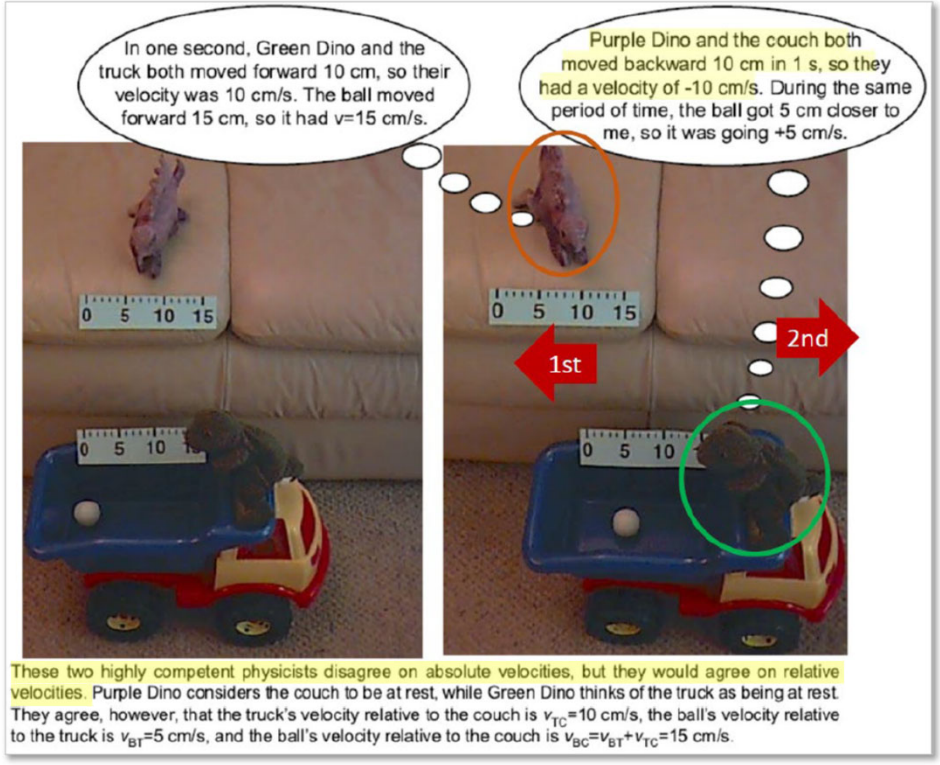
PO's Arguments About [1b(i)]'s Scope Are Wrong

Assertion

In arguing that the claims cover mere "relative movement," Petitioners are ignoring the frame of reference for the movement of the cartridge that is specified in the claims. As explained by Dr. Talu, "the frame of reference is the receptacle." *See* Ex. 1074 at page 22 (native cite 82:13-19). Dr. Knaebel also admitted that "if one places the frame of reference on the receptacle, then the cartridge moves away from it." *See* Ex. 2009 at pages 114:14-116:2. Since the claims do place the frame of reference on the receptacle (to use Dr. Knaebel's words), there is no meaningful dispute here that Petitioner's theory is incorrect.

PO Sur-Reply, p. 5

Response



Ex. 1078 (2nd Knaebel Dec.), ¶104

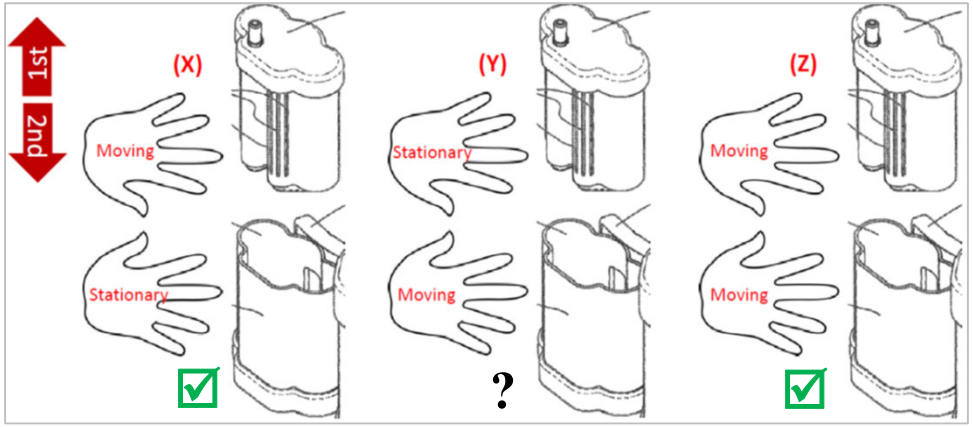
PO's Arguments About [1b(i)]'s Scope Are Wrong

Assertion

Petitioner identifies three possible techniques for removing a cartridge from a receptacle. *See* Reply at page 17. The claims expressly rule out Petitioner's example (Y), because in that example the cartridge is stationary. The claims expressly require the cartridge to be removable by being moved relative to the receptacle. The claims encompass Petitioner's examples (X) and (Z) because in those examples the cartridge is removable by moving relative to the receptacle. However, *Deane* does not disclose or suggest examples (X) or (Z).

PO Sur-Reply, p. 5

Response

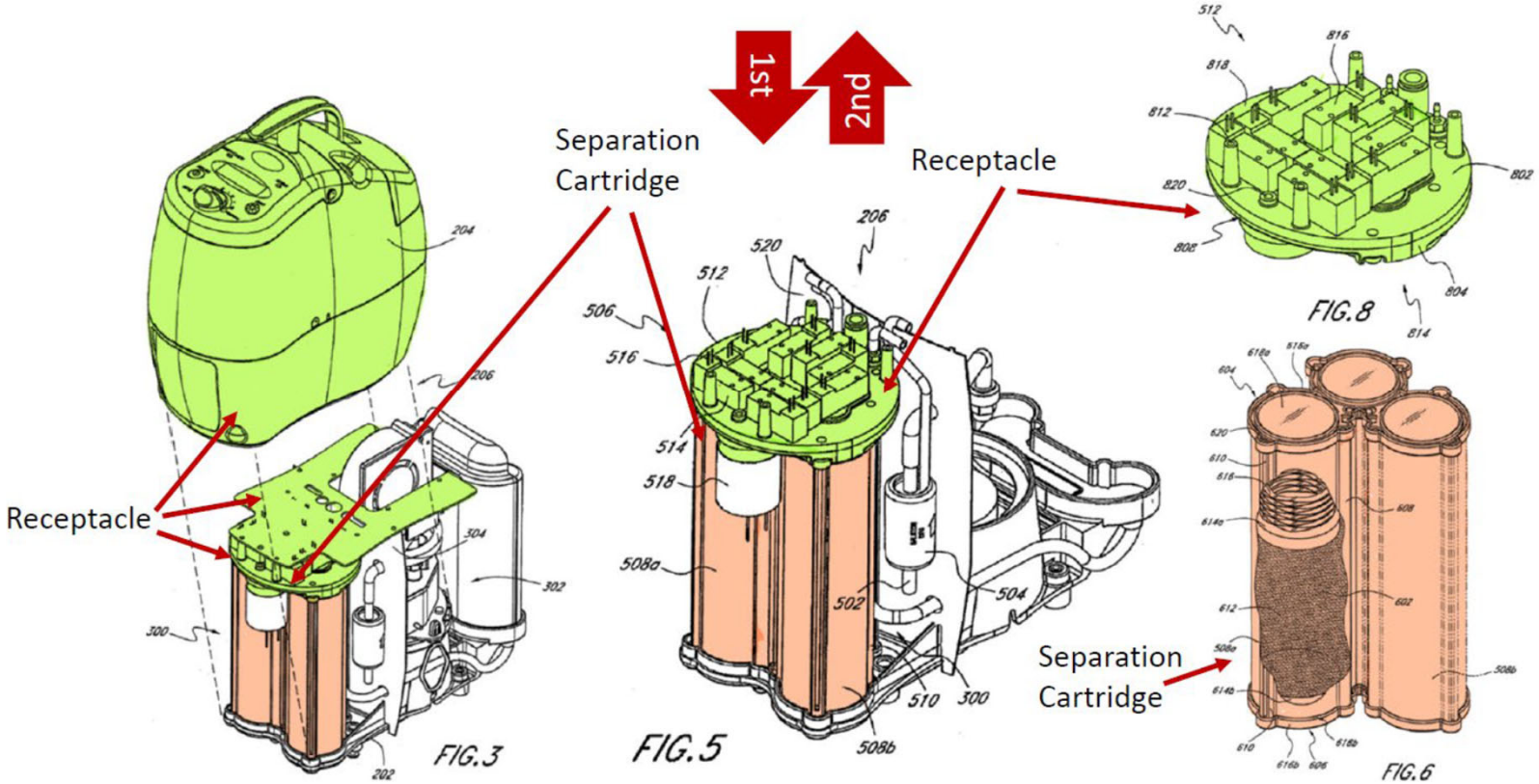


Pet. Reply, p. 14

Topics Presented

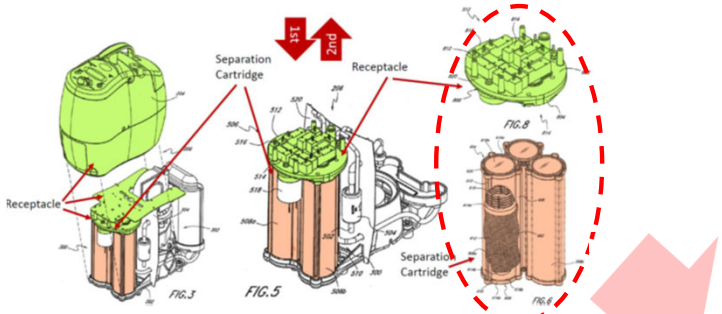
- Element [1b(i)]
  - Scope Of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane / Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

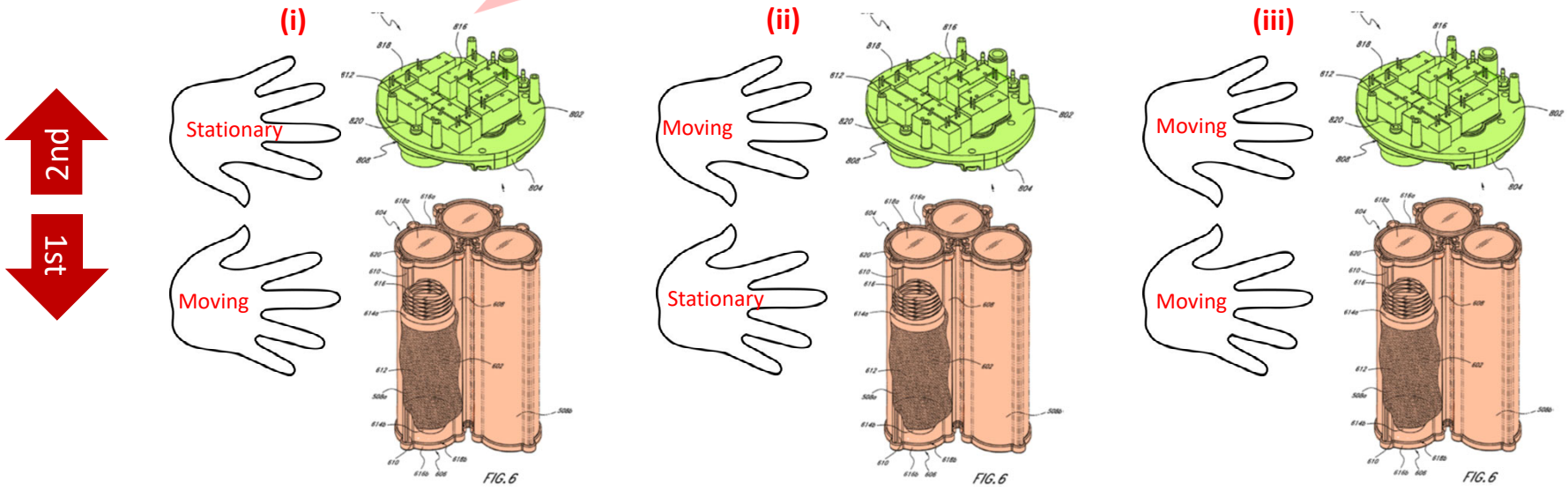
Deane's Disassembly



Pet., p. 36; Ex. 1003 (1st Knaebel Dec.), ¶319; Pet. Reply, p. 2; Ex. 1078 (2nd Knaebel Dec.), ¶121

Deane's Disassembly





Pet. Reply, pp. 16-17; Ex. 1078 (2nd Knaebel Dec.), ¶17

Deane's Disassembly Teachings

[0032] **FIG. 1** schematically illustrates a portable gas fractionalization system **100** of one preferred embodiment of the present invention. As shown in **FIG. 1**, the system **100** generally comprises an intake **102** through which ambient air is drawn into the system, a filter **104** for removing particulate from the intake air, a compressor assembly **106** for pressurizing the intake air to provide a feed gas, a pressure swing adsorption (PSA) unit **108** which receives and processes the feed gas to produce a product gas having a higher oxygen content than the ambient air, and a gas delivery system **110** for delivering the product gas to a patient.

[0036] As shown in **FIG. 1**, the PSA unit **108** of a preferred embodiment includes two adsorbent beds **118***a*, **118***b*, each containing an adsorbent material that is selective toward nitrogen, and a plurality of valves **120***a-j* connected thereto for directing gas in and out of the beds **118***a*, **118***b*. As will be described in greater detail below, the valves **120***a-j* preferably operate in accordance with a novel PSA cycle which comprises a six step/two bed process that includes a pressure equalization step in which a portion of the effluent product gas from one bed is diverted to pressurize another bed in order to improve product recovery and reduce power consumption. One preferred embodiment of the PSA cycle comprises the following steps:

[0057] **FIG. 2** illustrates a gas fractionalization apparatus **200** of the preferred embodiment, which is shown in the form of a portable oxygen concentrator. As illustrated in **FIG. 2**, the apparatus **200** generally comprises a chassis **202** (see also **FIG. 3**) and a shell **204** that together form a housing **206** in which various components are mounted. The chassis **202** is removably attached to a base **208** of the

[0058] As shown in **FIG. 3**, the components in the housing **206** are structurally supported by the chassis **202** and the chassis **202** is removably attached to the shell **204**. As such, the components can be assembled outside the confines of the shell **204**. Also, the shell can be conveniently removed to provide access for testing, repair, or maintenance of the components. Additionally, the housing **206** is preferably separated into two compartments **300**, **302** by a partition

[0060] Preferably, at least some of the above-described structures of the chassis **202** are integrally formed via an injection molding process so as to ensure dimensional accuracy and reduce assembly time. These pre-formed structures in the chassis advantageously facilitate assembly of the components and help stabilize the components once they are assembled in the housing. In one embodiment, the chassis

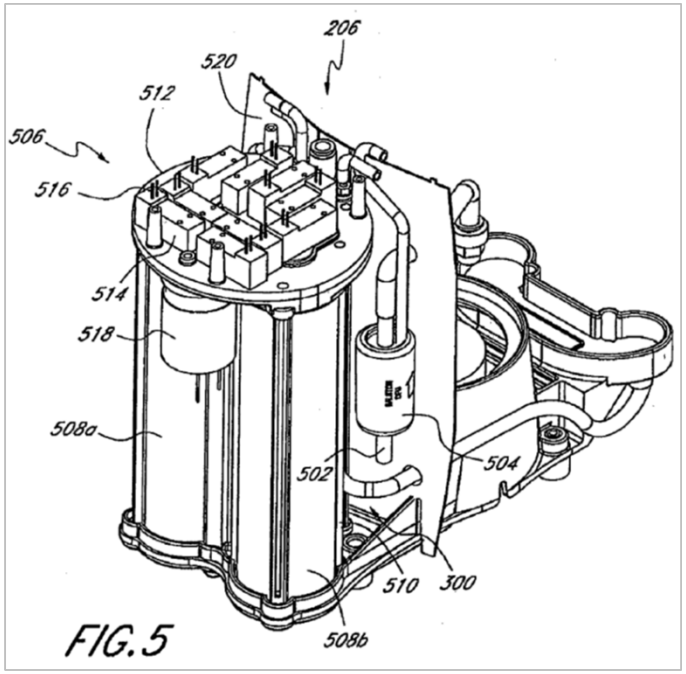


FIG. 5

Ex. 1004 (Deane), ¶¶[0032], [0036], [0057]-[0060], FIG. 5; Pet., pp. 14, 32-33; Ex. 1003 (1st Knaebel Dec., ¶¶201-208, 313-335

Deane's Disassembly Teachings

[0062] As **FIG. 5** further shows, the PSA unit **506** generally includes a pair of adsorbent bed columns **508***a*, **508***b*, a product gas storage column **510**, and an integrated manifold **512** for controlling fluid flow to and from the columns **508***a-b*, **510**. Each adsorbent bed column **508***a-b* comprises an elongated housing containing a nitrogen-selective adsorbent material such as zeolite. The adsorbent bed columns **508***a-b* are adapted to remove nitrogen from intake air in a known manner in accordance with a PSA cycle so as to produce an oxygen rich product gas. The product gas storage column **510** comprises an elongated housing adapted to receive and store the oxygen rich product gas. In one embodiment, the product gas storage column **510** also contains an adsorbent material capable of holding a higher molar density of the product gas than an equivalent gas filled chamber at equal pressure. As shown in **FIG. 5**, all three columns **508***a-b*, **510** are mounted side by side in the housing **206**. Preferably, the columns **508***a-b*, **510** have substantially the same length so that the integrated manifold **512** can be mounted horizontally on the upper end of the columns **508***a-b*, **510**.

[0063] As will be described in greater detail below, the integrated manifold **512** contains a plurality of integrated flow passages formed in a single plane that permit fluid to flow to and from the columns **508***a-b*, **510**. The integrated manifold **512** also has a plurality of solenoid valves **514** positioned in a single plane that control the flow of the fluid to and from the columns **508***a-b*, **510** during a PSA cycle. As shown in **FIG. 5**, the integrated manifold **512** is mounted on the upper end of the columns **508***a-b*, **510** in a manner such that the integrated flow passages in the manifold are in fluid communication with openings in the upper end of each column. While the manifold **512** is positioned on only the

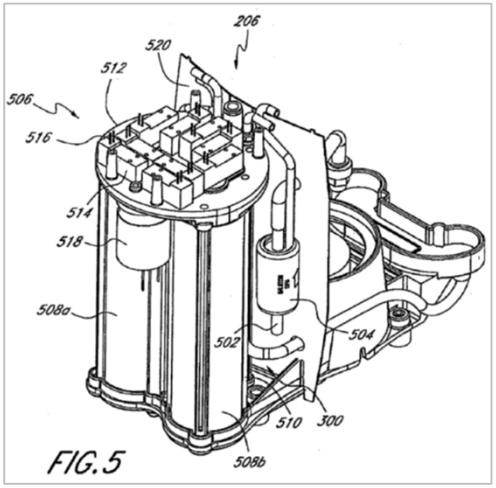
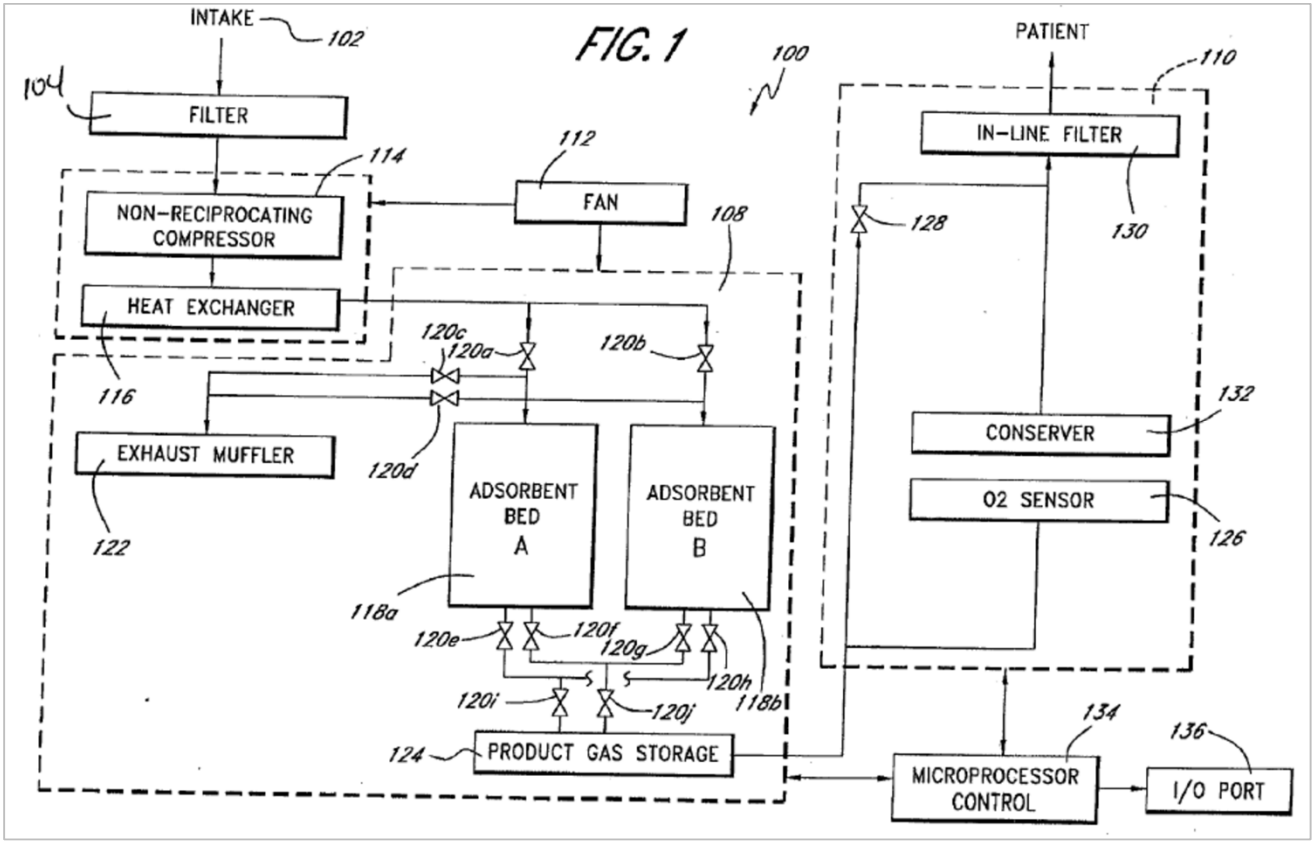


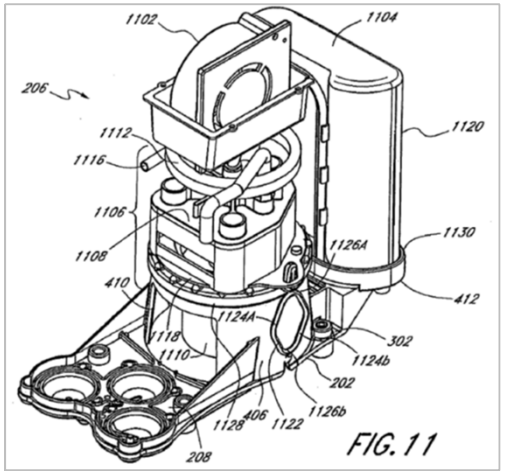
FIG. 5

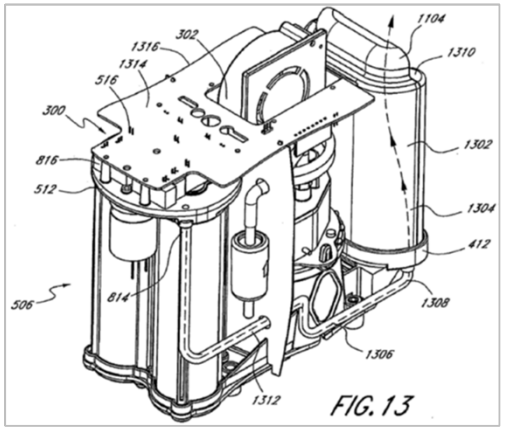
[0065] Advantageously, the PSA unit **506** has many novel features which, individually and in combination, contribute to a lighter, more compact and reliable apparatus. As shown in **FIG. 5**, the PSA unit **506** is mounted in the first compartment **300** which is thermally isolated from other heat generating components in the housing **206**. Thermal isolation of the PSA unit **506** substantially prevents heat degradation of the valves **514** and other components in the unit. The PSA unit **506** is also configured with integrated gas flow passages so as to substantially eliminate the use of flexible tubing, which in turn reduces the number of potential leak points. Moreover, the PSA unit **506** is designed to operate with a single, generally planar integrated manifold mounted horizontally on one end of the columns. The single manifold design reduces the amount of space the PSA unit occupies inside the housing and also reduces potential leak points. Additionally, the PSA unit **506** is configured to directly connect to a circuit board without additional wires, which further conserves space and simplifies assembly.

Ex. 1004 (Deane), ¶¶[0062]-[0063], [0065], FIG. 5; Pet., pp. 14, 32-33;
Ex. 1003 (1st Knaebel Dec., ¶¶201-208, 313-335

Deane's Disassembly Teachings





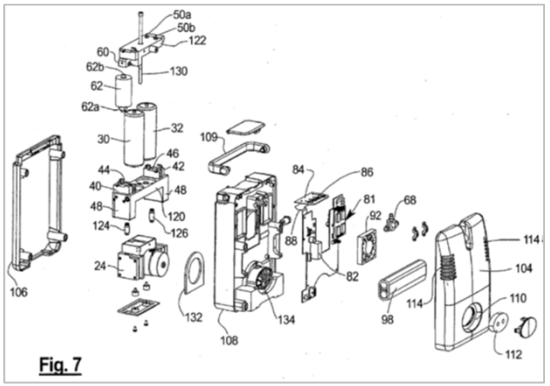


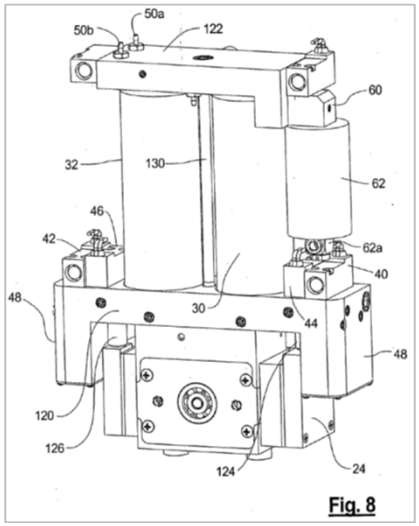
Ex. 1004 (Deane), FIGS. 1, 11, 13; Pet., pp. 14, 32-33;
Ex. 1003 (1st Knaebel Dec., ¶¶201-208, 313-335

Known to Remove PSA-Type Units

- Removable units like *Deane's* PSA unit were well known by 2004-2005

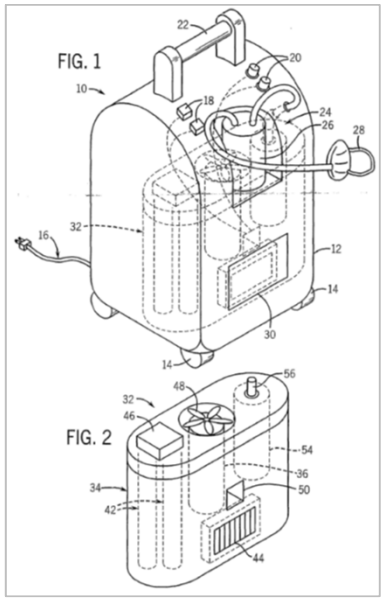
McCombs '957





[0030] The two beds **30**, **32**, the two manifolds **120**, **122** and compressor **24** are then held together as a compact unit, as shown, by a single elongated bolt **130** passing through manifolds **120**, **122**, between beds **30**, **32** and threaded to compressor **24**. The unit as assembled is then attached to central chassis **108** by suitable shock absorbing means. As thus constructed, it is apparent that the mechanical components of apparatus **20** can now be readily assembled in production and readily accessed for servicing.

Berntson



Ex. 1010 (McCombs '957), FIGS. 7, 8; Ex. 1006 (Berntson), FIGS. 1, 2; Ex. 1078 (2nd Knaebel Dec.), ¶25

Dr. Knaebel Addresses Knowledge in the Art

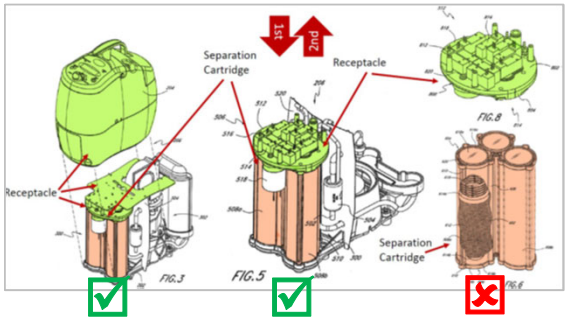
50. *McCombs '957* teaches, as discussed above, that its beds 30, 32, manifolds 120, 122, and compressor 24 are "held together as a compact unit" that can "be readily assembled in production and readily accessed for servicing." EX1010 (*McCombs '957*) at ¶[0028]. A POSITA would have recognized that this bed, manifold, and compressor unit was a removable module or cartridge that would be removable from *McCombs '957's* POC for servicing the compressor or valves and/or replacing the beds 30, 32 as their zeolite reached the end of its life.

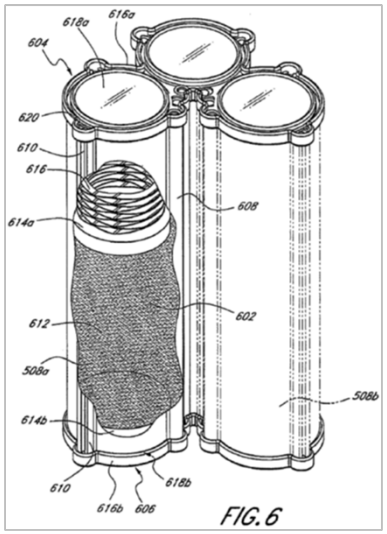
297. Beyond the specific motivations to combine *Deane* (and *Dubois*) with *Berntson* provided by the references themselves, further support for such motivation can be found in a POSITA's general knowledge at the time, such as described by the references identified in §I.G, including *McCombs '957's* "compact unit" that is "readily accessed for servicing," *Dechene's* modular oxygen concentrator design with bed assembly E that is removable from housing A such that it is "serviceable and repairable in the field by an untrained operator or technician" (EX1021 (*Dechene*), 1:31-34), *Cole's* removable adsorber cartridge (sieve unit 30) that seeks to reduce assembly errors (EX1020 (*Cole*), 1:48-53), and *Hechinger's* "removable cartridge for the adsorbent bed of a swing-type adsorber system" where "the cartridge and the adsorbent material can be removed and installed as a unit" in order to reduce the required time for replacing the components (EX1048 (*Hechinger*), Abstract). Each of these references and the others discussed above in §I.G would have informed a POSITA's general understanding as of 2004-2005 that it was desirable for adsorbent-containing units in oxygen concentrators to be easily removable/accessible from the concentrators for maintenance purposes and for ease of assembly/disassembly.

334. Lastly, selectively removable components, including batteries and separation cartridges, were generally known by POSITAs by 2004-2005 (*see, e.g.*, §I.G). Thus, to the extent Patent Owner argues *Deane* (and/or *Berntson*) is somehow deficient as to teaching this element of [1b], it would have been obvious to a POSITA based on the POSITA's general knowledge to configure *Deane's* adsorbent housing 602 / adsorbent bed columns 508a, 508b to utilize such teachings to improve the speed of replacement of the adsorbent material 612 in adsorbent housing 602 / adsorbent bed columns 508a, 508b.

Ex. 1003 (1st Knaebel Dec.), ¶¶50, 297, 334; Pet., pp. 27-29, 42, 46-47

PO's Arguments About *Deane* Are Wrong





- ☑ The Parties agree on the first two disassembly steps
- ☒ PO argues manifold 512 would be removed from housing 602 while on chassis 202 (*i.e.*, that PSA unit 108/506 would not be first removed)
- PO argues PSA unit 108/506 would not be removed from chassis 202 before disassembling housing 602 and manifold 512 because:
  - Spring 616 would pop manifold 512 off the top of housing 602 if it is not restrained
  - Adsorbent would fall out of the bottom of housing 602 if it is removed from chassis 202
- Mere *ipse dixit*
- *Deane's* FIG. 6 of a self-contained cartridge directly refutes PO's argument
- *Deane* satisfies the structural requirements of the claims

Ex. 1004 (Deane), FIG. 6; Pet. Reply, pp. 2, 4-5; Ex. 1078 (2nd Knaebel Dec., ¶¶31-33

Dr. Talu's Concessions

Does Figure 6 of Deane show a housing 602 that is not mounted to either manifold 512 or chassis 202?

MR. ATALLAH: Objection. Asked and answered.

A. Figure 6 is a detailed drawing, so it only tries to illustrate how the housing looks like and the main parts of that housing, so it could be connected to the manifold or it may not be. It's just the drawing of the part.

Ex. 1074 (Talu Dep. Tr.), p. 132:13-22

Q. Okay. So is it fair to say you don't know for sure whether the adsorbent would fall out the bottom or not?

MR. ATALLAH: Objection. Misstates.

A. It may or may not fall out, as stated in my declaration.

Ex. 1074 (Talu Dep. Tr.), p. 136:1-6

Dr. Talu's Concessions

14 Q. Based on paragraph 58, would you agree that Dean's
15 components are removable from its chassis?
16 A. After they are disassembled. Obviously they are
17 removable. As such, the components can be assembled
18 outside. If they're assembled, they need to be
19 disassembled to be removed.
20 Q. Okay, let's look at paragraph 62. Please read that
21 and let me know when you're done.
22 A. Is it okay if I look at the figures also?

1 Q. Of course. Look at whatever you need.
2 A. I was referring to the figures. Yes, please go
3 ahead.
4 Q. In the first sentence, it says that "PSA Unit 506
5 generally includes a pair of adsorbent bed columns, a
6 product gas storage column, and a integrated manifold
7 512."
8 Do you see that?
9 A. Yes, I do.
10 Q. Is -- would you consider a PSA Unit 506 to be a
11 component of Deane?
12 A. Yes, this is part of the Deane.

Ex. 1074 (Talu Dep. Tr.), pp. 99:14-100:12

17 So you read Deane as teaching that there
18 could be threaded fasteners that connect the manifold
19 to the housing and different fasteners that contain --
20 that connect the housing to the chassis?
21 A. I do not recall particularly Deane teaching on two
22 sets of fasteners, but it could be either way. It

1 could be a single fastener running all the way from
2 manifold down to the chassis or it could be fasteners
3 at the manifold and another set of fasteners at the
4 chassis end.

Ex. 1074 (Talu Dep. Tr.), pp. 129:17-130:20

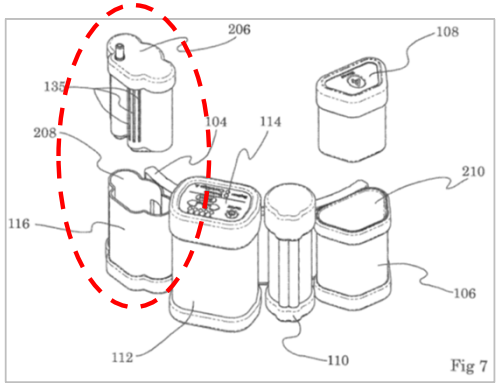
Topics Presented

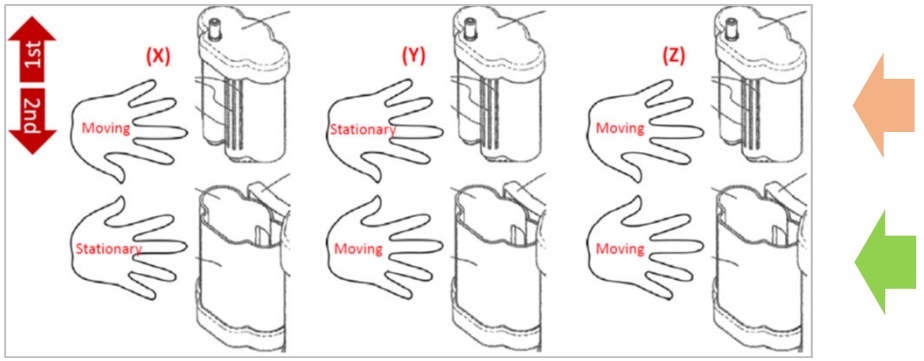
- Element [1b(i)]
  - Scope Of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane* / *Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

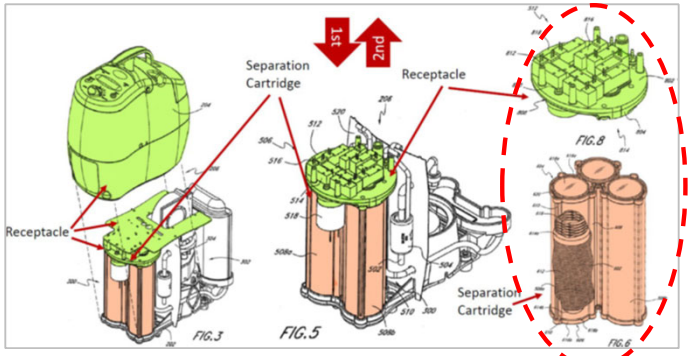
[1b(i)], Properly Construed, is Taught By *Deane*

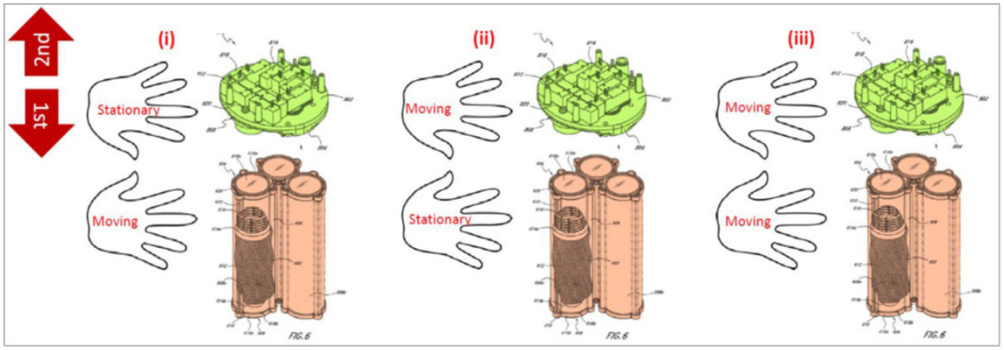
a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

Pet. Reply, p. 5









Ex. 1001 ('614 Patent), FIG. 7; Ex. 1078 (2nd Knaebel Dec.), ¶¶109, 121, 126; Pet., pp. 32-43, Ex. 1003 (1st Knaebel Dec., ¶¶313-335

[1b(i)] – Petitioner's Reading Tracks Prior Examiners' Application of *Deane*

- '669 Patent Examiner Vasat found *Deane* teaches Claim 38, including [1b(i)], in prosecution

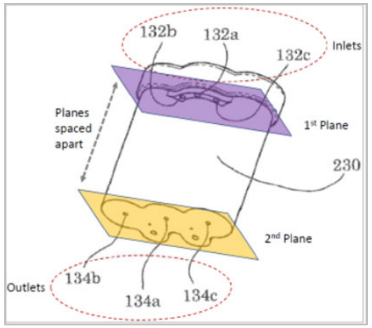
Pet., pp. 7-13

38. (New) A portable oxygen concentrator, comprising:

a receptacle;

a cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction, the cartridge comprising:

Ex. 1052 (*'669 Patent FH*), 149-53



Claim 38, line 20, replace "." with --; wherein:

a first plane extends through the first and third ports,

the first plane is substantially perpendicular to the first and second axes,

a second plane extends through the second and fourth ports,

the second plane is substantially perpendicular to the first and second axes,

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

Ex. 1052 (*'669 Patent FH*), 15

The following is an examiner's statement of reasons for allowance: Applicant cancelled claims 1-23, rendering the rejection of those claims moot. Applicant filed new claims 24-42 on 1/20/2020. Applicant approved amending independent claims 24 and 38 to include the substance of claim 20. The closest prior art to new claims 24-42 is considered to be prior art to Deane (US 20050072426). Deane is considered to disclose an oxygen concentrator cartridge, best shown in Figure 6, having a first port corresponding to the filter portion 618a (par. 67) disposed along the first axis defined by the bed of adsorbent material 612 (par. 66) and a second port the upper port of feed tube 608 (par. 68) that lies in the same plane as filter portion 618a and spaced apart from the first port (fig. 6). The amendment defines over Deane because Deane requires the aforementioned first and second ports to be located in a single plane with the manifold to reduce the number of tubing connections and potential leak points in the unit (par. 64). Modifying Deane to read on independent claims 24 and 38, as currently amended, would improperly change Deane's principle of operation. Accordingly, independent claims 24 and 38 and the claims depending therefrom are considered to define over the prior art.

Ex. 1052 (*'669 Patent FH*), 16

The ’614 and ’669 Patent Claims Are Similar

193. The only apparent differences in these claims is that: (i) the January 20, 2020 versions of the ’669 patent’s claims (*e.g.*, claim 38 above) expressly recite that its cartridge includes ***two*** adsorbent beds (in accordance with the exemplary embodiments of the ’669 and ’614 patents’ specification), while claim 1 of the ’614 Patent appears to have been drafted in an attempt to more broadly cover a cartridge with at least one adsorbent bed (which is not shown in either the ’669 or ’614 patents’ specifications); and (ii) the ’614 Patent’s claim 1 specifies which fluid flows contact adsorbent material. The former is not a substantive difference for patentability, in my understanding, as at least one includes two, and the latter is clearly taught by *Deane ’426* (EX1047) (and *Deane* (EX1004)). *See* FIGS. 7A of each and §VI.A.2[1c]-[1e].

Ex. 1003 (1st Knaebel Dec.), ¶193

[1b(i)] – Petitioner's Reading Tracks Prior Examiners' Application of *Deane*

- Two other Examiners agreed *Deane* teaches a removeable cartridge

> **As to claim 1**, Deane (in figures 1-18B) discloses a removable gas separation cartridge for use in an oxygen concentrator which separates oxygen from ambient air by using a vacuum

Ex. 1075, 107

> a VSA gas separation system in communication with the gas input system to receive the ambient air **(see col. 11 lines 55-60)**, the gas separation system comprising a cartridge **118a and 118b** containing an adsorbent material for producing oxygen **(see col. 4 lines 4-15)**;

Ex. 1050, 59

Pet. Reply, pp. 4, 19, Ex. 1078 (2nd Knaebel Dec.), ¶¶55-56, 93, 144; Ex. 1003 (1st Knaebel Dec., ¶115

[1b(i)] – Petitioner's Reading Tracks PO's Infringement Contentions

a separation cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction,	 *Fig. 9*  A separation cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction A first direction *Fig. 10* [Ex. A; *see also* Ex. D]. GCE further indirectly infringes by instructing and teaching customers/end users to use and/or make a separation cartridge selectively removable from the receptacle by movement relative to the receptacle in a first direction. [Exs. A-E]. Customers/end users directly infringe by following these instructions and teachings.	Literally infringed.

141. *Third*, PO's '628 patent *Infringement Contentions* (EX1076) in the district court matter asserts that patent's removable cartridge limitation covers a cartridge removable ***after*** some disassembly, thus confirming Petitioner's position. EX1076, 5 (showing removal of cover and installation/use of removal tool before cartridge removal); EX1078, ¶142.

Pet. Reply, p. 19

Ex. 1076 , 5

The ’614 Patent’s Claims Are Broader than the ‘628 Patent’s

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

Ex. 1054 (*’628 Patent*), Claim 1

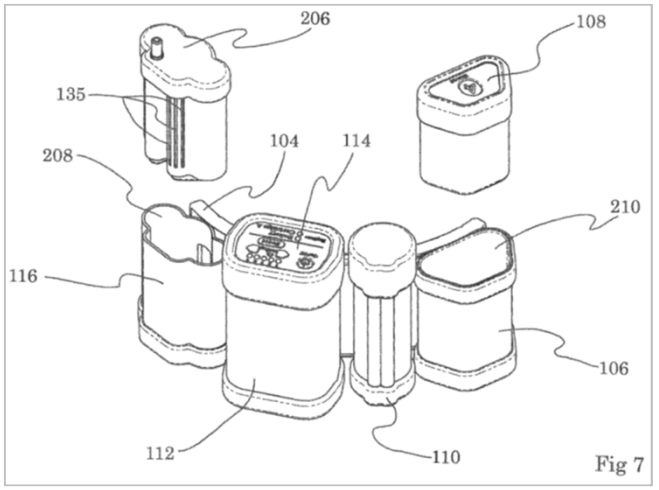
≠

1. A portable oxygen concentrator, comprising:
a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

Ex. 1001 (*’614 Patent*), Claim 1

[1b(i)] Is Broader Than the Element at Issue in the ’628 Patent IPR: PO argues the Board should come to the same conclusion regarding [1b(i)] that it did in denying institution in the related ’628 patent IPR (IPR2023-00527, Paper 9). POR, 34-35. But [1b(i)] recites a broader removability concept than the ’628 patent’s claims (*i.e.*, removability from a receptacle defined by a cartridge module). EX1078, ¶145. The receptacle here is disembodied in the POC and thus broader in scope. *Id.*

Pet. Reply, pp. 19-20

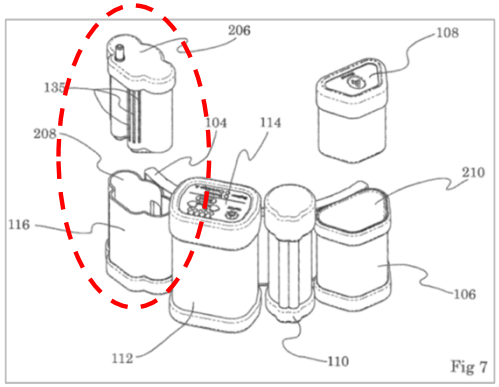


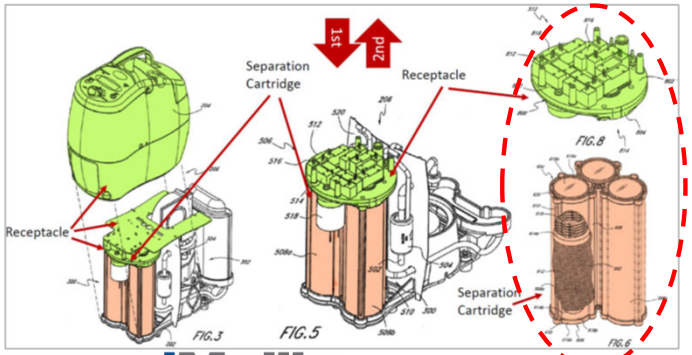
Ex. 1001 (*’614 Patent*), FIG. 7

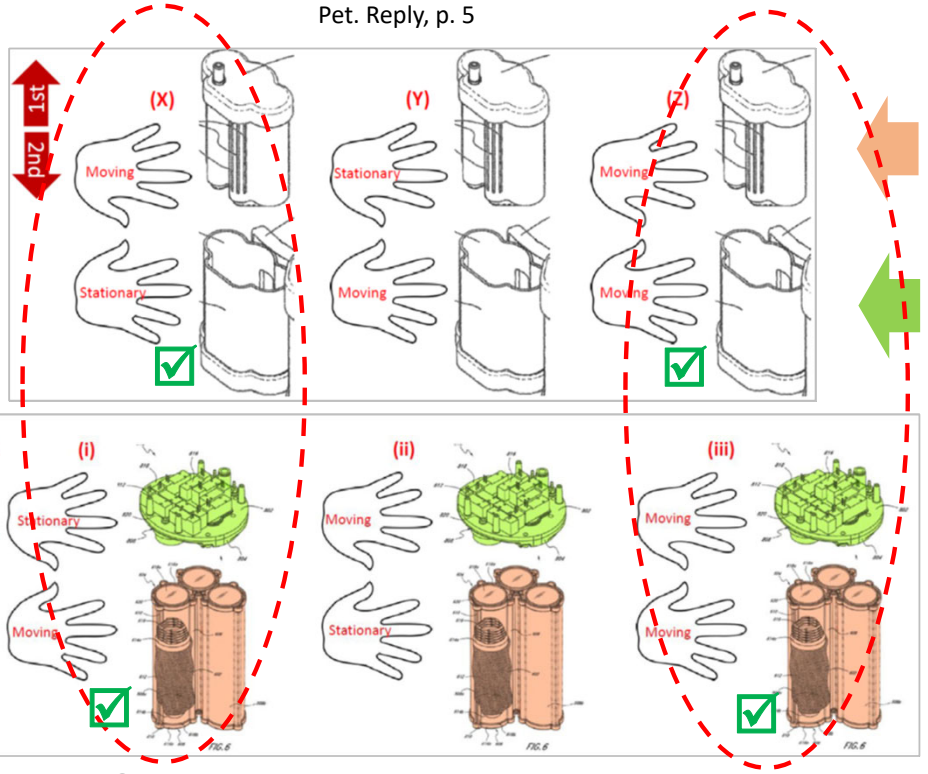
[1b(i)] is Also Taught By *Deane* Using PO's Construction Excluding Stationary Cartridges

a separation cartridge selectively removable from a receptacle by movement relative to the receptacle in a first direction, the separation cartridge comprising an inlet

Pet. Reply, p. 5







Ex. 1079 - DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Ex. 1001 ('614 Patent), FIG. 7; Ex. 1078 (2nd Knaebel Dec.), ¶¶109, 121, 126

[1b(i)], Properly Construed, is Also Taught By *Deane* Under PO's Disassembly Theory

is not Patent Owner's burden to do so, Patent Owner has provided a reasoned explanation, based on the disclosure of *Deane* and supported by Dr. Talu, that one would likely detach *Deane's* alleged receptacle by moving it while the alleged cartridge is stationary, contrary to what is claimed. *See* Patent Owner Response at

PO Sur-Reply, p. 6

the chassis and manifold. Ex. 1004 at ¶ [0067]. Therefore, these screws would need to be removed. Only then could the manifold 512 be removed from the housing 602 or the adsorbent columns 508a, 508b.

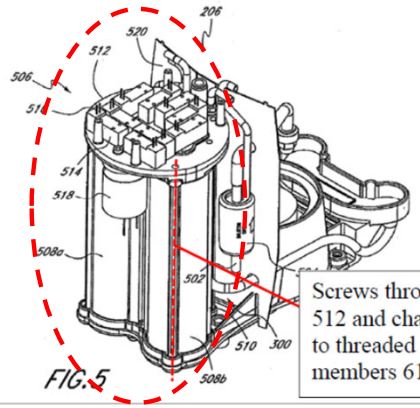


FIG. 5

Screws through the manifold 512 and chassis 202 attach to threaded mounting members 610.

Ex. 2001 (Talu Dec.), ¶127

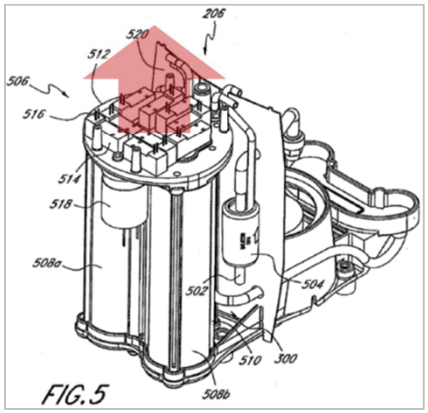


FIG. 5

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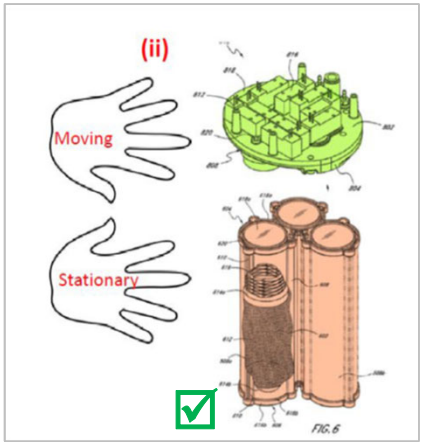


FIG. 6

[1b(i)] is Obvious

There are two issues for the Board to decide regarding PO's [1b(i)] patentability arguments. *First*, is PO's narrow interpretation of [1b(i)] that ignores its plain meaning and "movement relative to" language correct? *Second*, is Petitioner's reading of *Deane* impossible, as PO alleges? Because *Deane's* disassembly, properly understood, would teach [1b(i)] even under PO's narrow construction, and PO's theory of *Deane's* disassembly would teach [1b(i)] under Petitioner's (proper) construction, the Board must agree with PO on ***both*** issues to uphold claims 1-11. For the reasons below, the Board should reject PO's arguments.

Pet. Reply, p. 1

PO's Patentability Arguments Are Wrong

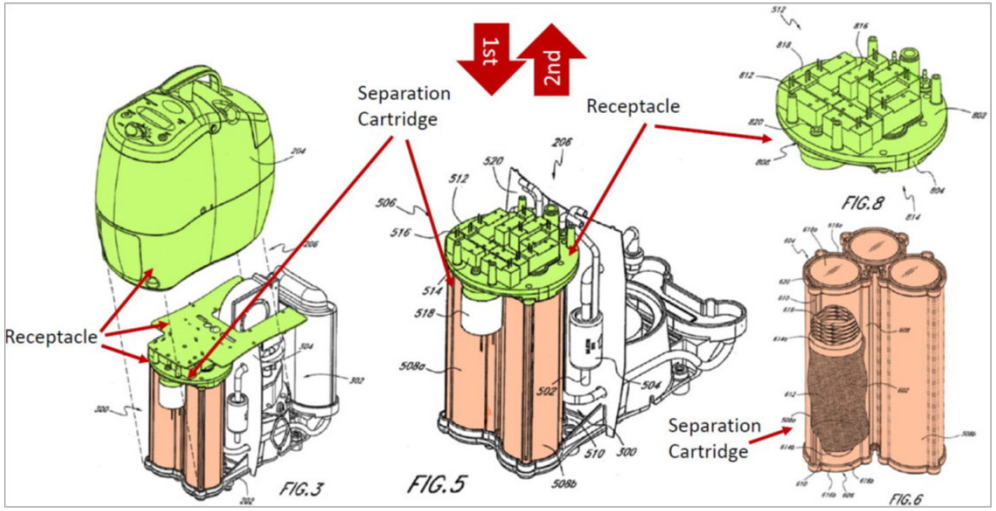
Assertion

Now, in order to try to avoid the clear teachings of *Deane* and the issue with the chassis, Petitioner argues on Reply that the alleged manifold and alleged cartridge can be removed from the chassis, and then, at that point, the alleged cartridge can be removed from the alleged manifold to meet the removal direction limitations. *See* Reply at pages 15-18. This "disassembly" argument was not presented in the Petition or in Dr. Knaebel's original Declaration. At best, Dr. Knaebel described the manner in which certain of *Deane's* components are assembled—not disassembled. *See* Ex. 1003 at ¶ 355. Dr. Knaebel's discussion of how certain components are allegedly assembled (importantly, not disassembled) falls short of teaching the precisely-claimed removal direction limitations.

PO Sur-Reply, p. 7

Response

- Disassembly shown in Petition and 1st Knaebel Declaration



Pet., p. 36; Ex. 1003 (1st Knaebel Dec.), ¶319

PO's Patentability Arguments Are Wrong

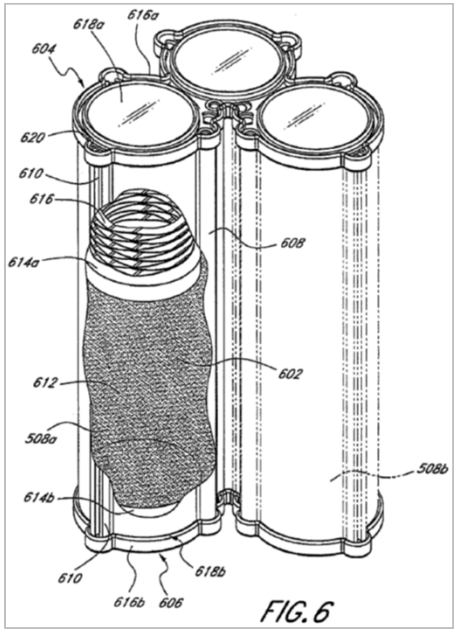
Assertion

Regardless, *Deane* does not teach any specific technique for detaching its housing from its manifold after those components are removed from the chassis. As one potential issue, it is not clear how or if *Deane's* housing/manifold assembly could be supported in a way that would allow the housing to be removed from the manifold according to the removal direction limitations. As noted by Dr. Talu, the springs within *Deane's* housing would bias the manifold upward, away from the housing, making it such that removing the housing by moving it away from the manifold would either be difficult or impossible. *See* Patent Owner Response at page 42 *citing* Ex. 2001 at ¶ 129. Further, *Deane* appears to teach that long screws attach the housing to the chassis and also affix the two separable plates of the manifold together and to the housing. *See* Patent Owner Response at pages 41-43. So, if the housing/manifold were removed from the chassis together, then the two unsecured plates of the manifold would be loosely sitting on top of the housing. *Id.* All of this

PO Sur-Reply, p. 8

Response

- *Deane's* housing is self-contained as seen in FIG. 6

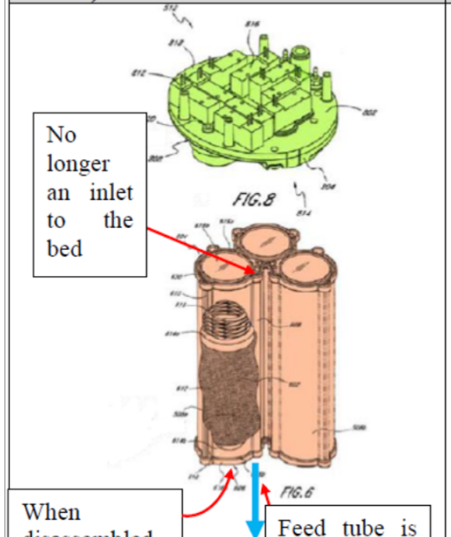
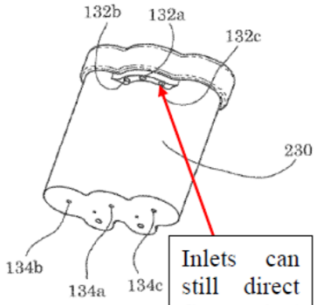


Ex. 1004 (Deane), FIG. 6

Pet. Reply, p. 4, Ex. 1078 (2nd Knaebel Dec.), ¶¶31-33, 198

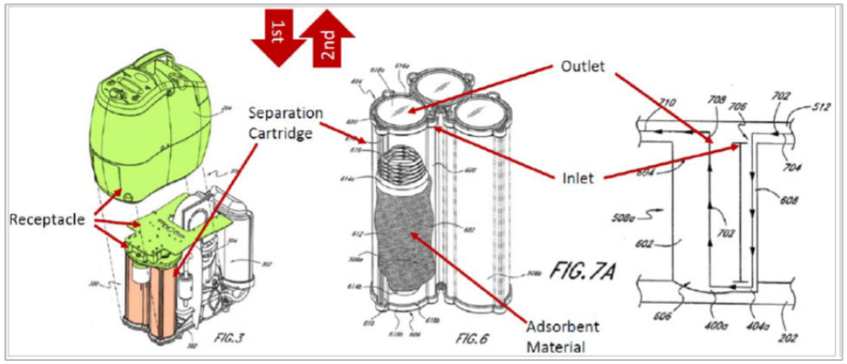
PO's Patentability Arguments Are Wrong

Assertion

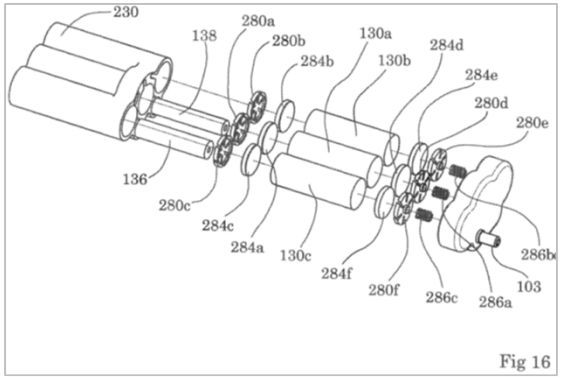
Deane, disassembled (*see* Reply at page 2, with annotations added by Patent Owner)	'614 Patent, when removed from receptacle (*see* '614 Patent at Figure 15)
	

PO Sur-Reply, p. 10

Response



Pet., p. 33; Ex. 1003 (1st Knaebel Dec.), ¶315



Ex. 1001 ('614 Patent), FIG. 16

PO's Patentability Arguments Are Wrong

Assertion

> Petitioner also argues the removal direction limitations would have been obvious in light of an "art-recognized methodology." *See* Reply at page 4. This is another new theory of obviousness that was not in the Petition, nor is it fully developed in the Reply. *See* MPEP § 2144 ("Simply stating the principle (e.g., 'art recognized equivalent,' 'structural similarity') without providing an explanation of its applicability to the facts of the case at hand is generally not sufficient to establish a prima facie case of obviousness."); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369-70 (Fed. Cir. 2016) (petition asserted that a single reference disclosed a limitation and then improperly argued in its reply that there was a motivation to combine references to arrive at that limitation.).

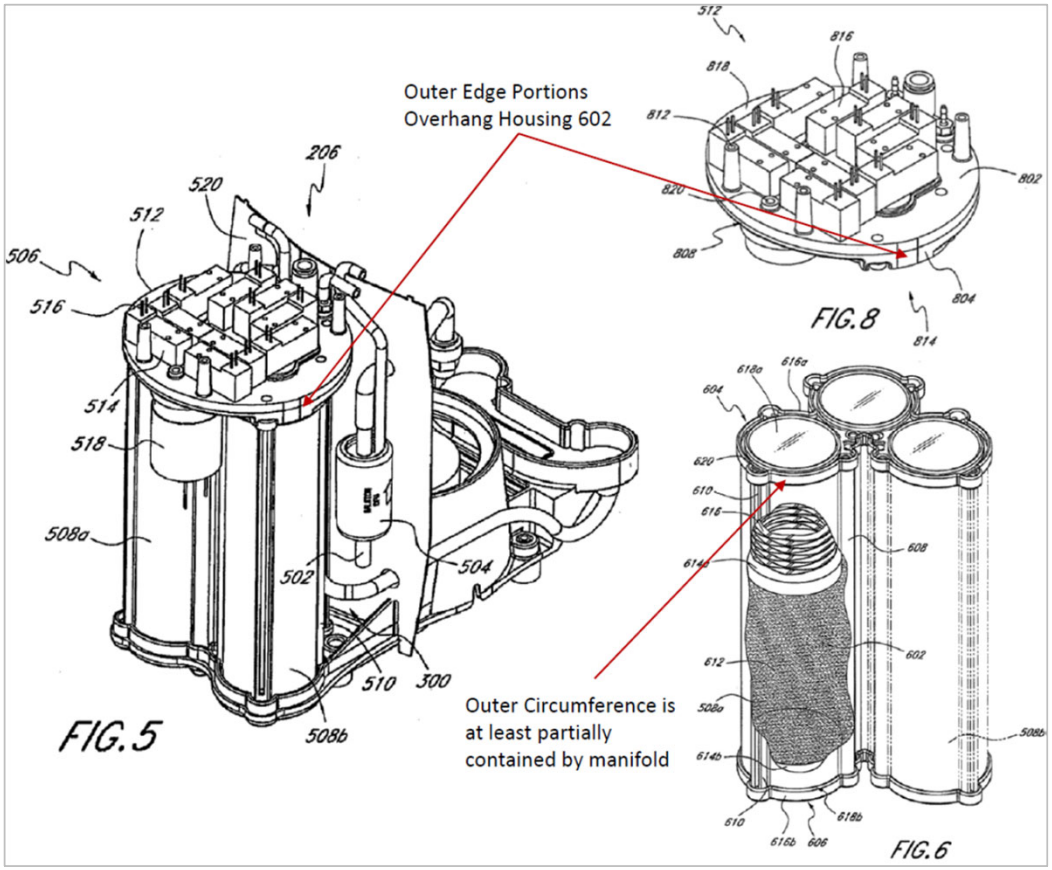
PO Sur-Reply, p. 11

Response

- State of the art discussed by Dr. Knaebel in detail in his original Declaration

Ex. 1003 (1st Knaebel Dec.), ¶¶50, 297, 334

[1b(i)] – *Deane's* Manifold 512 Teaches a Receptacle

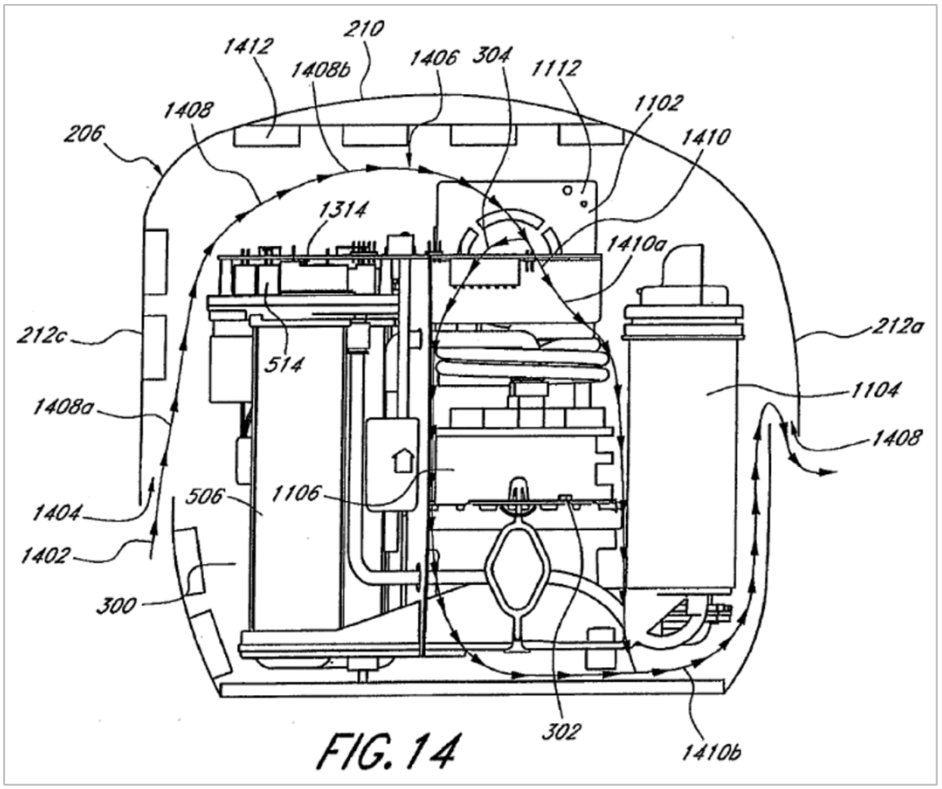


- A "receptacle" need only "at least partially contain" a cartridge
- Geometry of manifold 512 / housing 602 connection shown in *Deane's* FIGS. 5/6 teaches such partial containment
- Manifold 512's outer edge portions overhang and surround housing 602's outer circumference and therefore manifold 512 "at least partially contains" housing 602

> 72. Partial containment also reflects the normal use of "receptacle" outside the '614 patent. Returning to the electrical wall receptacle example, only the blades of the male plug are "contained" within the receptacle structure, while the remaining portions of the plug remain outside the receptacle.

Pet. Reply, pp. 7-9, 21-22, Ex. 1078 (2nd Knaebel Dec.), ¶¶63-72, 148-155; Pet., pp. 35-39; Ex. 1003 (1st Knaebel Dec., ¶¶318-324

[1b(i)] – Other Receptacle Configurations Are Obvious



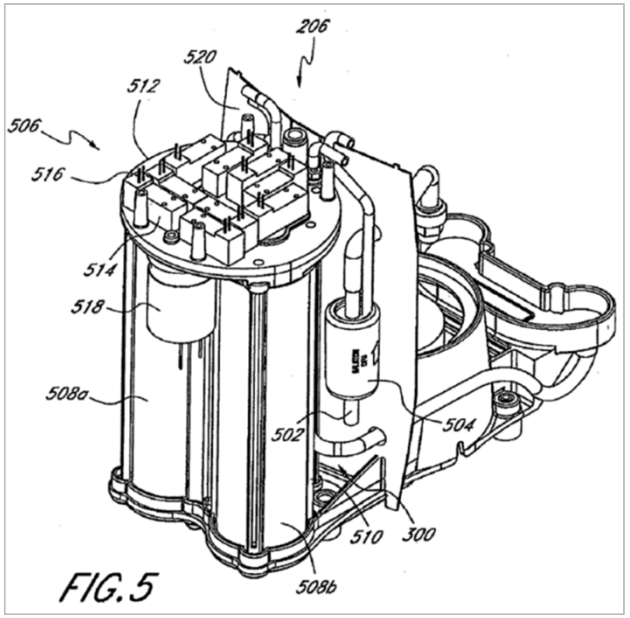
Ex. 1004 (Deane), FIG. 14

- It would have been obvious to utilize a combination of manifold 512 and shell 204 (and any intervening parts like circuit board 1314) to form a "receptacle"
- A POSITA would have simply provided mounting hardware for PSA unit 108/506 on shell 204 and reversed the direction of the fasteners connecting PSA unit 108/506 to chassis 202 to provide an assembly of shell 204 and PSA unit 108/506 that would be installed/removed from chassis 202
- Obvious design choice, particularly given the well-known desire to modularize assemblies.
- Would still provide the capability for housing 602 to be removable from manifold 512

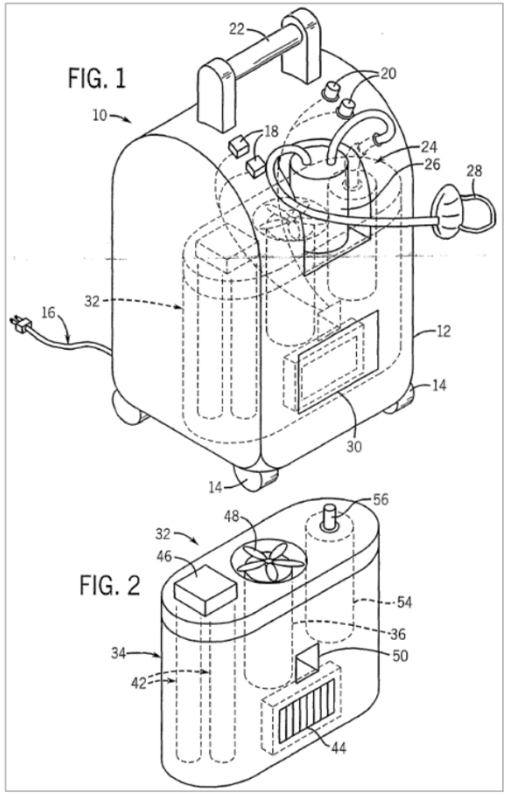
Pet. Reply, pp. 22-23, Ex. 1078 (2nd Knaebel Dec.), ¶¶156-161;
Pet., pp. 35-39; Ex. 1003 (1st Knaebel Dec., ¶¶318-324

[1b(i)] Is Also Taught By *Deane* / *Berntson*

- *Berntson* teaches a self-contained cartridge
- *Berntson* teaches structure around cartridge
- *Berntson* teaches PSA removability



Ex. 1004 (Deane), FIG. 5



Ex. 1006 (Berntson), FIGS. 1, 2

Pet. Reply, pp. 24-26 , Ex. 1078 (2nd Knaebel Dec.), ¶¶162-170

Topics Presented

- Element [1b(i)]
  - Scope of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane / Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

[1e] is Obvious

wherein the separation cartridge is configured such that, when fluid flows through the separation cartridge, fluid flowing along the first line contacts the adsorbent material of the bed and fluid flowing along the second line does not contact the adsorbent material of the bed.

Ex. 1001 ('614 Patent), 26:14-37

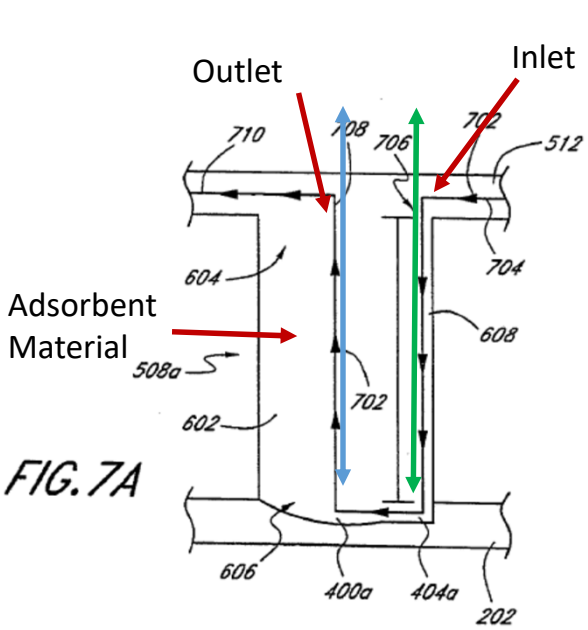


FIG. 7A

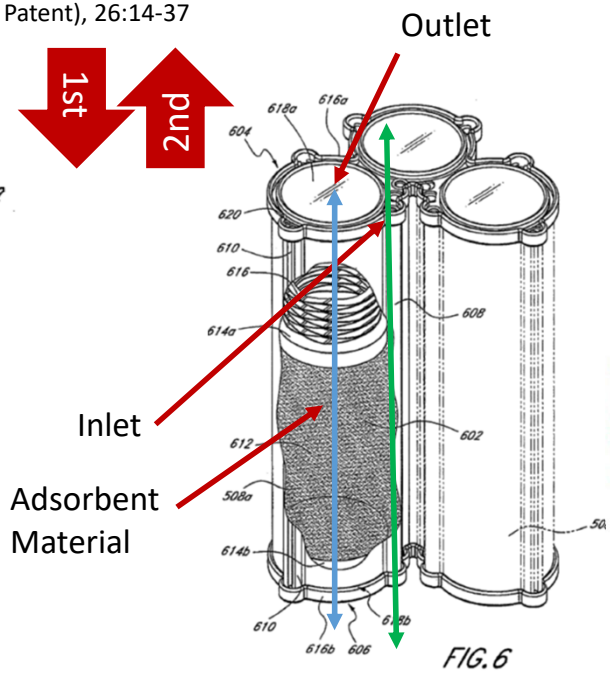


FIG. 6

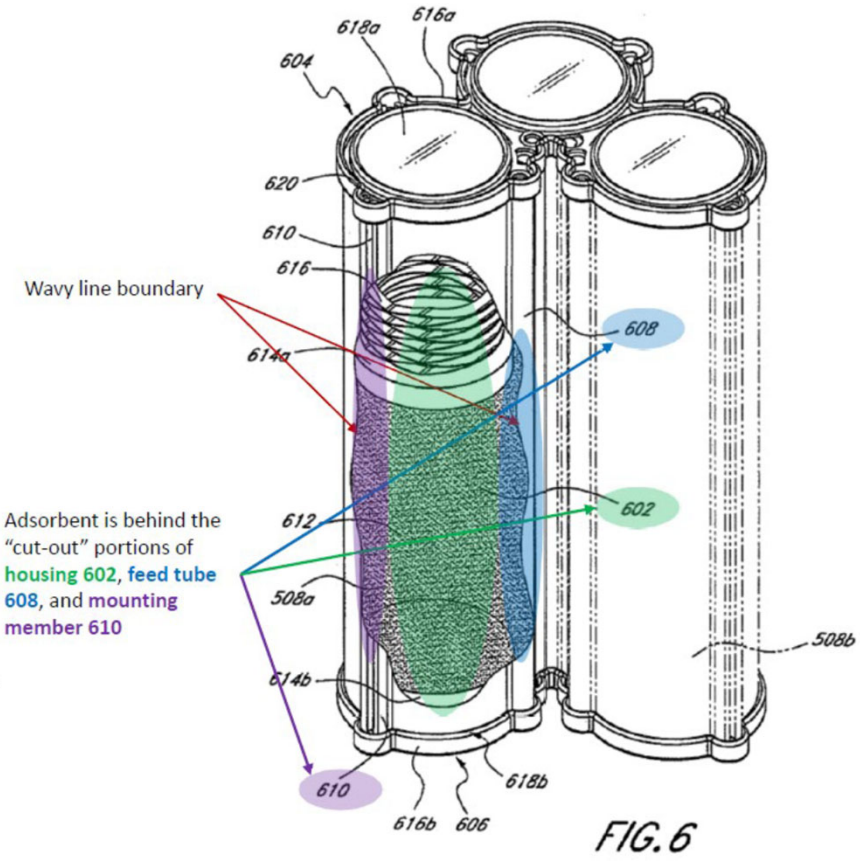


FIG. 6

Ex. 1003 (1st Knaebel Dec.), ¶360, Ex. 1078 (2nd Knaebel Dec.), ¶¶172, 176; Pet., pp. 48-51; Ex. 1003 (1st Knaebel Dec., ¶¶348-354

Dr. Talu's Concessions

Q. I just want to make sure I understand your opinion on this paragraph. Is it your opinion -- is it your opinion that Deane teaches adsorbent in both the column 508a and the feed tube 608?

A. Deane does not teach specifically that there is adsorbent in the feed tube, but also it does not specifically state that there is not adsorbent in the feed tube, and this figure is taken from the petition. And if I look at the figure, I see that the line going through what's called the feed tube does cross the adsorbent material, so it is somewhat ambiguous what is happening with the feed tube.

Ex. 1074 (Talu Dep. Tr.), p. 136:11-22

Q. So is it your opinion that Figure 6 of Deane illustrates adsorbent in the feed tube?

A. Looking at Figure 6, I cannot state either way if

138

there is or there is not, the way it's drawn.

Ex. 1074 (Talu Dep. Tr.), pp. 137:20-138:1

Topics Presented

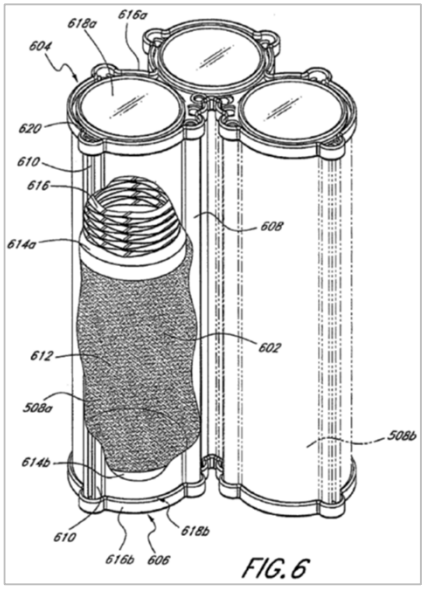
- Element [1b(i)]
  - Scope of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane/Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

Claim 2 is Obvious

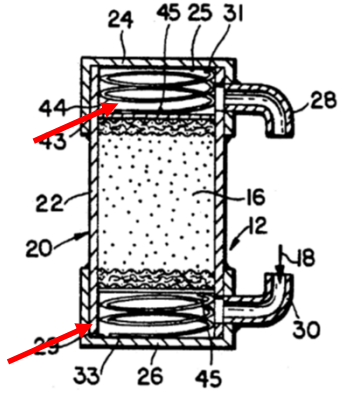
> **2**. The portable oxygen concentrator as recited in claim **1**, wherein:
>
> the outlet is arranged adjacent a first end of the bed, and adjacent a second end of the bed opposite the first end, the separation cartridge includes a spring configured to hold the bed in place.

Ex. 1001 ('614 Patent), 26:14-37

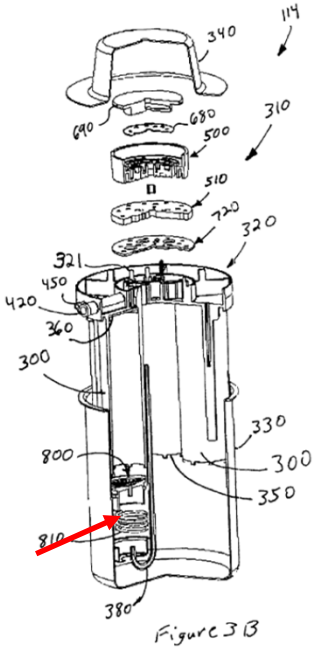
- Grounds 1/4: *Deane* + Art Knowledge
- Grounds 2/5: *Deane* + *Hill 719*



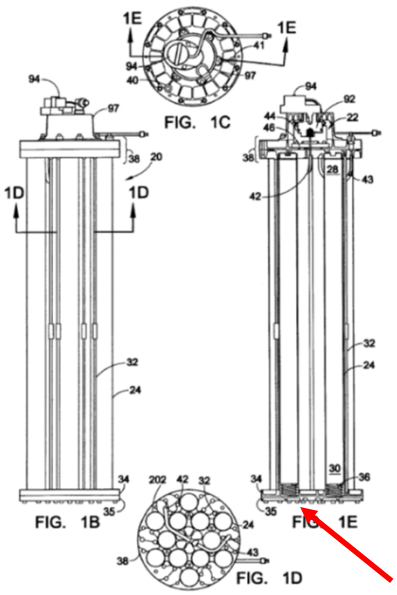
+



Bassine



Appel 928



Hill 719

Pet. Reply, pp. 30-31; Ex. 1078 (2nd Knaebel Dec.), ¶¶192-201, 220-226; Pet., pp. 51-53; Ex. 1003 (1st Knaebel Dec., ¶¶355-359; Ex. 1004 (Deane), FIG. 6; Ex. 1026 (Bassine). FIG. 6; Ex. 1015 (Appel '928), FIG. 3B; Ex. 1008 (Hill '719), FIG. 1E;

Topics Presented

- Element [1b(i)]
  - Scope of [1b(i)]
  - *Deane's* Disassembly Teachings
  - *Deane's* or *Deane / Berntson's* Teachings
- Elements [1e] (and [12g], [13n]/[13q])
- Claims 2/15
- Claim Constructions

Construction of "Separation Cartridge"

Petitioner's Construction	PO's Construction
"a housing[/container[3]] that holds multiple adsorbent columns for gas separation and provides separate inlet and outlet ports for each adsorbent column"	"a cartridge configured to separate gas"

Pet. Reply, p. 6

Construction of “Separation Cartridge”

235. “Separation cartridge” does not have a specific meaning in the art.

Ex. 1003 (1st Knaebel Dec.), ¶235

Q. Have you ever used the term "separation cartridge" before?

MR. ATALLAH: Objection. Vague.

A. Separation cartridge was not in the common language in the art, in the skilled art back in 2005, but with the introduction of separation cartridges actually in the marketplace, it -- now somebody skilled in the art will understand clearly what it means.

So at the time of '614 or the time relevant to this IPR, it was not in the language.

Ex. 1074 (Talu Dep. Tr.), p. 94:4-13

Construction of “Separation Cartridge”

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of a patient carrying the oxygen concentrator of the present invention.

FIG. **7** is an exploded view of the oxygen concentrator in which the power pack and the adsorbent cartridge have been removed.

FIG. **15** is a perspective view of the cartridge contained within a cartridge module.

FIG. **16** is an exploded view of columns and filters within the cartridge.

The current invention relates to separation of gases using vacuum swing adsorption. Specifically, disclosed is an oxygen concentrator for a patient who requires a source of oxygen. The present invention is further explained with reference to the drawn figures in which like structures are referred to by like numerals throughout the several views.

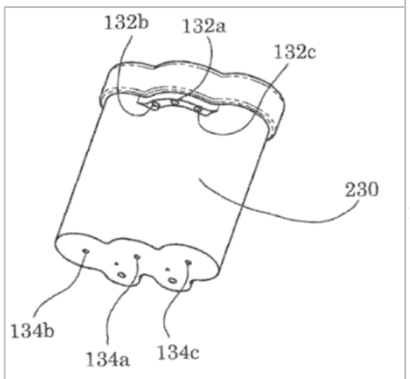


Fig 15

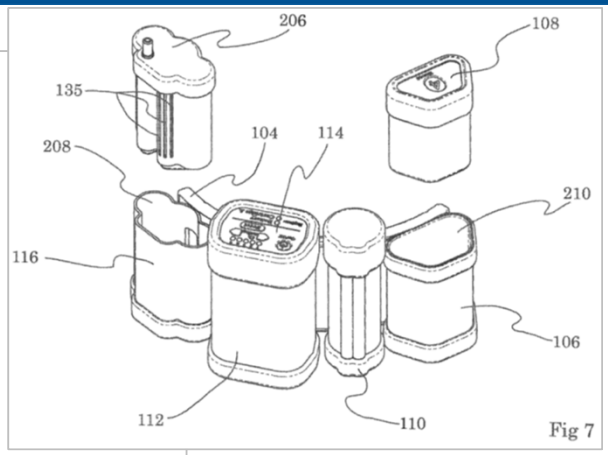


Fig 7

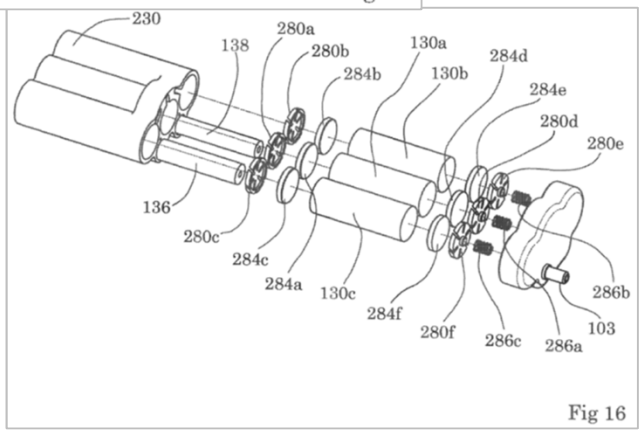


Fig 16

Ex. 1001 (’614 Patent), 2:60-63, 3:6-8, 3:26-29, 3:38-43, FIGS. 7, 15, 16; Pet., p. 22; Ex. 1003 (1st Knaebel Dec., ¶¶239-243

Construction of "Separation Cartridge"

The industry has developed a set of recommendations for systems targeted to provide portable oxygen for ambulatory patients. The Fifth Oxygen Consensus Conference set forth the following standards for long-term oxygen therapy ambulatory equipment: 1) equipment must weigh less than 10 lbs., 2) equipment must provide the equivalent of 2 liter/min of continuous flow O_2, and 3) the flow rate must be maintained for four hours or more. Thus, ambulatory equipment, or personal oxygen systems (POS), are to be inconspicuous to the public as well as unrestricting to the patient. Cylinders and other liquid oxygen systems tend to be bulky, which interferes with normal daily activities. Similarly, cylinders and liquid oxygen systems are difficult to conceal from public view. Ideally, a POS is small, lightweight, quiet, and flexible which allows the device to be concealed from the public. The present invention, whereby oxygen rich gas is provided to a patient from a wearable oxygen concentrator, meets and exceeds these standards.

or wearing it as an ambulatory device. The device of the present invention with the described components weighs less than three pounds (1.36 kg). The compact size (less than about 61 cu. in. (1000 cc)) allows for easy portability.

Construction of “Separation Cartridge”

Vacuum Swing Adsorption (VSA) Process-Overview

Oxygen concentrator **100** operates using a vacuum swing adsorption process, which involves a series of cycles that include a feed step or phase, an evacuation step or phase, and a repressurization step or phase. Each of these three phases takes place in one of the three columns **130***a*-**130***c* at any given time. Each column **130***a*-**130***c* is in a different phase. For purposes of explanation, the VSA process will be described in reference to A column **130**", which is representative of each of the three columns **130***a*-**130***c*.

The Feed Phase—Breakthrough Detection

During the feed phase of the separation cycle, the position of the MTZ within adsorbent column **130** is monitored,

* * *

drawn in column **130** during the evacuation phase. Just prior to column **130** reaching about 1 atm, the repressurization phase ends and the feed phase of the cycle begins again.

This constitutes the general principles of vacuum swing adsorption (VSA) for gas separation. All phases can be accomplished with a single column, or with a plurality of columns. If a plurality of columns are used, it is preferable to have a multiple of three (illustrated as **130***a*-**130***c* in FIG. **5**) that are sequenced out of phase for the different cycle phases in order to maintain constant product flow.

Construction of “Separation Cartridge”

19 Q. Do you know of any commercialized portable oxygen
20 concentrators that used a single column?
21 MR. ATALLAH: Objection. Form.
22 Go ahead.

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1 **A. Not that I know of. There are a few patents out**
2 **there and it's been covered in scientific**
3 **literatures.**
4 **BY MR. CREMEN:**
5 Q. Do you have any knowledge as to why a manufacturer
6 would not offer a portable oxygen concentrator using a
7 single column design?
8 **A. I can't really speak to other people's minds, but my**
9 **suspicion is because of the inefficiency, which makes**
10 **the battery larger, which makes the -- harder for the**
11 **patient to carry it.**

Ex. 1074 (Talu Dep. Tr.), pp. 57:19-58:11

11 Q. I guess my question was, if you wanted to use a single
12 column design in the embodiment shown in Figure 2, are
13 there particular aspects of the design that you would
14 have to change?
15 MR. ATALLAH: Objection. Form.
16 Foundation. Mischaracterizes.
17 Go ahead.
18 **A. Well, two of them are obvious from our discussion**
19 **over the last five minutes. One is, the tank needs**
20 **to be larger to perform or to provide the same amount**
21 **of oxygen. And the battery needs to be larger**
22 **because the efficiency will be lower.**

1 **That implies the compressor has to be**
2 **larger or the vacuum pump in this case has to be**
3 **larger. As I said, it's all tradeoffs among many**
4 **different parts.**

Ex. 1074 (Talu Dep. Tr.), pp. 62:11-63:4

Construction of “Separation Cartridge”

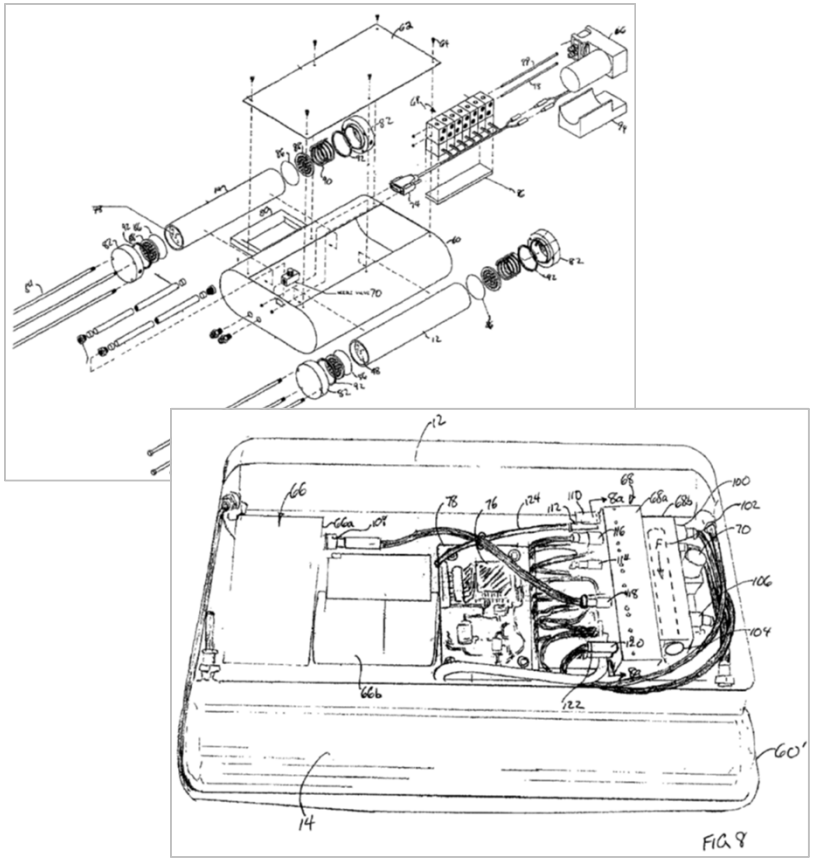
Claims 1, 4, and 5 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Warren (US 20020033095) in view of Bassine (US 5275642).

Regarding claim 1, Warren discloses a gas separation cartridge 12 for use in an oxygen concentrator which separates oxygen from ambient air by using an adsorption

Ex. 1052 (*’669 Patent FH*), 297

First, there is no reason to modify Warren’s inlet and outlet such that they face in a common direction. Second, even if one modified Warren’s inlet and outlet such that they faced a common direction, there is no indication that the modified inlet/outlet would face the bottom of Warren’s separation cartridge, as claimed. Again, the Examiner does not identify a separation cartridge in Warren, and there is no way to tell from Warren’s Figures 7 and 8 what is the bottom (or top or sides, for that matter). Regardless, there is certainly no reason, other than hindsight, to orient Warren’s inlet/outlet such they face the bottom of a separation cartridge. Accordingly,

Ex. 1052 (*’669 Patent FH*), 271



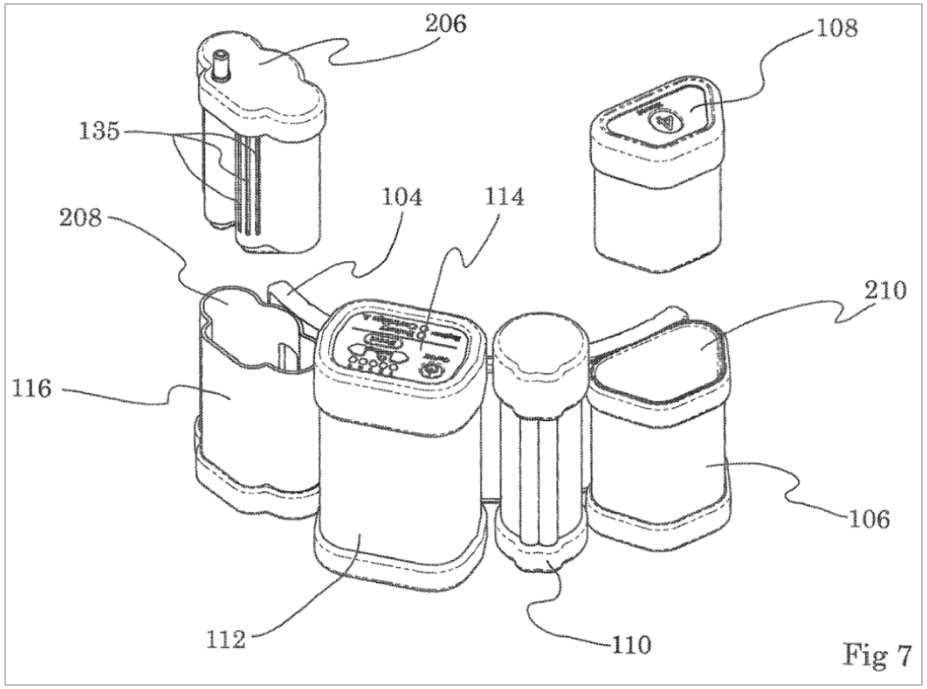
Ex. 1012 (Warren ’095), FIGS. 7, 8

Pet., pp. 22-23; Ex. 1003 (1st Knaebel Dec., ¶¶253-254

Construction of “Receptacle”

Petitioner’s Construction	PO’s Construction
“a structure that releasably interfaces with the inlet(s) and outlet(s) of the separation cartridge and at least partially contains the separation cartridge.” -OR- “a structure configured to releasably receive and at least partially contain the separation cartridge” (EX1073, 29)	“a space configured to receive and contain something”

Pet. Reply, p. 7



Ex. 1001 (’614 Patent), FIG. 7

Pet., pp. 23-24; Ex. 1003 (1st Knaebel Dec., ¶¶259-269

Construction of “Receptacle”

Q. Okay, let's go look back at the claim language limitation we were looking at in column -- in Claim 1. Does the claim require any structure for the receptacle?

A. No. It's just a receptacle. It doesn't specify any structure.

Q. Does the claim require the receptacle to be arranged anywhere in particular in the portable oxygen concentrator?

MR. ATALLAH: Objection. Vague.

A. It does not specify where it should be.

BY MR. CREMEN:

Q. Does the claim require the receptacle to be accessible from outside the personal oxygen concentrator?

80

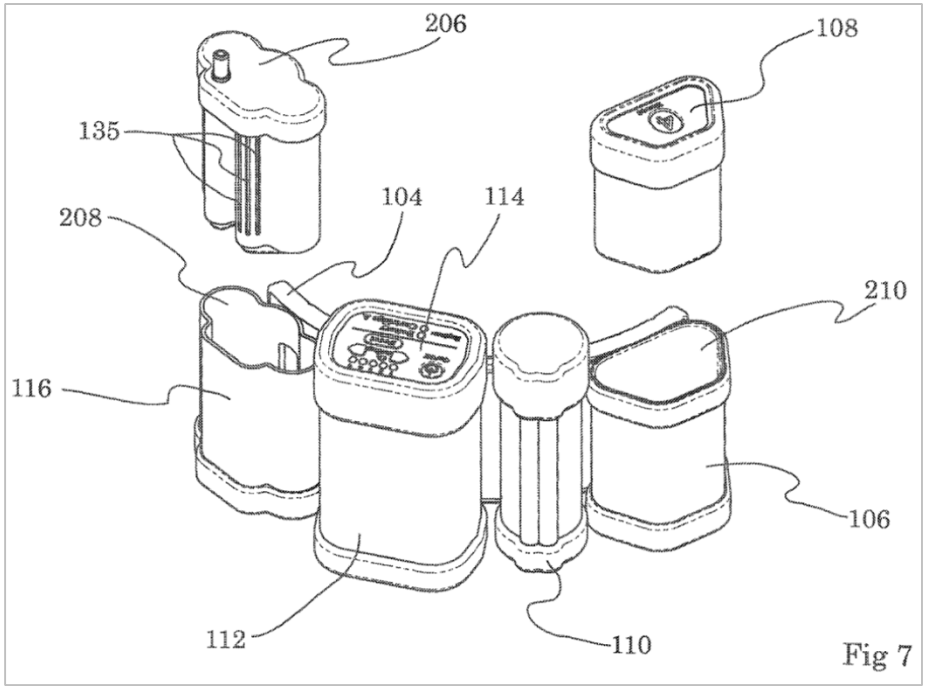
A. It does not say that.

Ex. 1074 (Talu Dep. Tr.), pp. 79:9-80:1

Construction of “Selectively Removable [From A Receptacle]”

Petitioner’s Construction	PO’s Construction
“withdrawable or separable as a whole from a receptacle” -OR- “can be individually chosen to be withdrawn” (compromise construction from district court matter; EX1073, 31)	“can be chosen to be removed”

Pet. Reply, p. 9



Ex. 1001 (’614 Patent), FIG. 7

Pet., pp. 24-26; Ex. 1003 (1st Knaebel Dec., ¶¶270-284

Construction of “Selectively Removable [From A Receptacle]”

21 Q. Is there a difference in your mind between something
22 that is easily removable as opposed to just something

1 that's removable?
2 **A. There is a difference. Everything in these devices**
3 **are removable. They are assembled by trained people**
4 **in particular fashion, so everything in them is**
5 **removable. So easily removable is quite different**
6 **than removable in my opinion.**

Ex. 1074 (Talu Dep. Tr.), pp. 68:21-69:6

14 Q. Does the phrase, "a separation cartridge selectively
15 removable from a receptacle by movement relative to
16 the receptacle in a first direction" require the
17 cartridge to move or just have the capability of
18 moving?
19 **A. "Removable" means, as I understand it, it has the**
20 **capability of being removed.**

Ex. 1074 (Talu Dep. Tr.), p. 83:14-20

Claim Appendix

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

2. The portable oxygen concentrator as recited in claim **1**, wherein:
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.

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

13. A portable oxygen concentrator, comprising:
a first bed of adsorbent material configured to preferentially adsorb nitrogen;
a first inlet oriented in a direction, wherein the first inlet is configured to direct a flow of ambient air to the first bed;
a first outlet oriented in the direction, wherein the first outlet is configured to expel product gas flowing downstream of the first bed;
a second bed of adsorbent material configured to preferentially adsorb nitrogen;
a second inlet oriented in the direction, wherein the second inlet is configured to direct a flow of ambient air to the second bed;
a second outlet oriented in the direction, wherein the second outlet is configured to expel product gas flowing downstream of the second bed;
a power pack removable from the portable oxygen concentrator;
a pump electrically coupled to the power pack, the pump operable to cause a flow of fluid to move relative to the first and second beds of adsorbent material;
a user interface configured to allow a patient to adjust and monitor operation of the portable oxygen concentrator;
a carrying device for transporting the portable oxygen concentrator;
wherein a first line extending parallel to the direction passes through the first outlet,
wherein a second line spaced-apart from the first line and extending parallel to the first line passes through the first inlet,
wherein the portable oxygen concentrator is configured such that, during use, fluid flowing along the first line contacts the adsorbent material of the first bed and fluid flowing along the second line does not contact the adsorbent material of the first bed,
wherein a third line extending parallel to the direction passes through the second outlet,
wherein a fourth line spaced-apart from the third line and extending parallel to the third line passes through the second inlet, and
wherein the portable oxygen concentrator is configured such that, during use, fluid flowing along the third line contacts the adsorbent material of the second bed and fluid flowing along the fourth line does not contact the adsorbent material of the second bed.

15. The portable oxygen concentrator as recited in claim **14**, wherein:
the first outlet is arranged adjacent a first end of the first bed,
a first spring is arranged adjacent a second end of the first bed opposite the first end,
the first spring is configured to hold the first bed in place,
the second outlet is arranged adjacent a first end of the second bed,
a second spring is arranged adjacent a second end of the second bed opposite the first end, and
the second spring is configured to hold the second bed in place.