

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AdvanCell Pty Ltd.
Petitioner

v.

Sciencons AS and ARTBIO, INC.,
Patent Owner

Post Grant Review No.: PGR2025-00040

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

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Exhibit No.	Description
1001	U.S. Patent No. 12,249,437.
1002	Declaration of Saed Mirzadeh.
1003	Hassfjell, Sindre P. and Hoff, Per, “A Generator for Production of ^{212}Pb and ^{212}Bi ”, Appl. Radiat. Inst., vol. 45, no. 10, pp 1021-25 (1994) (“ Hassfjell-Hoff ”).
1004	WorldCat Index for Hassfjell-Hoff .
1005	International Publication Number WO 01/60417.
1006	File History of U.S. Patent No. 12,249,437.
1007	U.S. Patent No. 5,038,046 (“ Norman ”).
1008	International Atomic Energy Agency, “Radiotracer Generators for Industrial Applications”, IAEA Radiation Technology Series No. 5, IAEA, Vienna (2013) (“ IAEA ”).
1009	Westrøm, Sara; Generalov, Roman; Bønsdorff, Sara B.; and Larsen, Roy H., “Preparation of ^{212}Pb -labeled monoclonal antibody using a novel ^{224}Ra -based generator solution”, Nuclear Medicine and Biology, vol. 51, pp 1-9 (August 2017) (“ Westrøm ”).
1010	WorldCat Index for Westrøm .
1011	Hassfjell, Sindre, “A ^{212}Pb generator based on a ^{228}Th source”, Appl. Radiat. Isot., vol. 55, no. 4, pp 433-439 (2001) (“ Hassfjell-2001 ”).
1012	U.S. Patent Application Publication No. 2006/0286130 (“ Bhagwatwar ”).
1013	U.S. Patent No. 2,130,523.
1014	WorldCat Index for IAEA .
1015	U.S. Patent No. 6,592,843.
1016	Xanjiao Xie, “Dissolution, Formation, and Transformation of the Lead Corrosion Product PbO_2 : Rates and Mechanisms of Reactions that Control Lead Release in Drinking Water Distribution Systems”, All Theses and Dissertations (ETDs), 387 (January 2010), available at https://openscholarship.wustl.edu/etd/387 (“ Xie ”).
1017	U.S. Patent No. 9,281,089.
1018	U.S. Patent No. 6,932,111 (“ Ishigaki ”).
1019	Declaration of Per Hoff.
1020	WorldCat Index for Xie .

Exhibit No.	Description
1021	Excerpts of The American Heritage Dictionary of the English Language, 5 th ed. (2016).
1022	Declaration of Jennifer Librach Nall
1023	Conroy Deposition Transcript.
1024	Conroy Deposition Exhibit 6, Excerpt of homedepot.com
1025	Conroy Deposition Exhibit 8, Excerpt of VAT website showing VAT Gate Valve
1026	ARTBIO, “ARTBIO and Nucleus RadioPharma Announce Collaboration to Manufacture GMP-Grade Therapeutic Products Containing Radioisotope Pb-212 to Support Emerging Clinical Trials” (May 7, 2024), https://artbio.com/artbio-nucleus-radiopharma-collaboration-manufacture-gmp-grade-therapeutic-products-radioisotope-pb-212-support-emerging-clinical-trials .
1027	Conroy Exhibit 3: Fraiser Kansteiner, “Nucleus RadioPharma Links Up With ARTBIO to Help Produce Prostate Cancer Candidate for Clinical Trials,” Fierce Pharma (May 7, 2024), https://www.fiercepharma.com/pharma/nuclear-medicine-cdmo-nucleus-links-artbio-help-produce-prostate-cancer-radiotherapy .
1028	Conroy Exhibit 4: ARTBIO, “ARTBIO and Nucleus RadioPharma Announce Collaboration to Manufacture GMP-Grade Therapeutic Products Containing Radioisotope Pb-212 to Support Emerging Clinical Trials” (May 7, 2024), https://artbio.com/artbio-nucleus-radiopharma-collaboration-manufacture-gmp-grade-therapeutic-products-radioisotope-pb-212-support-emerging-clinical-trials .
1029	National Library of Medicine, “Study of Alpha Radioligand Therapy AB001 in Patients With Metastatic Castration Resistant Prostate Cancer (mCRPC) (ARTISAN)” (last updated Apr. 7, 2026), https://clinicaltrials.gov/study/NCT07214961
1030	ARTBIO, “ARTBIO Announces Dosing of Two Cohorts with AB001 in ARTISAN, a Phase 1 Alpha Radioligand Therapy Clinical Trial for Metastatic Castration Resistant Prostate Cancer” (Jan. 12, 2026), https://artbio.com/ARTBIO-Announces-dosing-of-Two-Cohorts-with-AB001

I. INTRODUCTION

Limitation 1c's construction is dispositive for Grounds 1-4. PO first attacks Petitioner's first and third constructions of that limitation, but it merely rehashes its POPR arguments that the Board has already preliminarily rejected in the D.I. If the Board adopts either the Petition's first or third construction, Grounds 1-4 demonstrate unpatentability.

PO then offers an alternative construction of limitation 1c, relying exclusively on the doctrine of the last antecedent. However, that doctrine, which is only a guideline, contradicts the intrinsic evidence and should therefore be rejected. PO's construction also rewrites limitation 1c to require a gas tight seal "on" the collector surface. That rewrite is not supported by the specification and reads out disclosed embodiments. PO's alternative construction should be rejected. If the Board adopts PO's alternative construction or the Petition's second construction, the Petition demonstrates obviousness under Ground 5.

II. CLAIM CONSTRUCTION

A. "fluidly coupled"

"Fluidly coupled" appears in limitation 1c. The parties and Board agree that "two structures that have gas flow therebetween are fluidly coupled to each other." D.I., 11-12; POR, 8.

PO mischaracterizes the Petition as arguing that “fluidly coupled” means “selectively fluidly coupled.” POR, 8 (citing Pet., 19). The Petition so argued for its third construction of limitation 1c, not only for “fluidly coupled.” Pet., 5, 19. *See infra*, §II.B.

B. “configured to be fluidly coupled”

The Board recognized that limitation 1c requires an isotope source that “*is configured to be fluidly coupled*” but does not require one that “*is fluidly coupled*” currently. D.I., 12. PO’s arguments that this limitation requires “a collector surface with a gas tight seal” and that a “generator that only provides the recited fluid coupling without a gas-tight seal, or one that has a gas-tight seal in the absence of fluid coupling, does not suffice” (POR, 9) rest on winning its construction of both “gas tight seal” and limitation 1c. As explained below, neither of those constructions should be adopted. For those same reasons, PO’s construction of this term should be rejected.

The Petition’s third construction including the “selectively” language is consistent with the Board’s construction of “configured to be fluidly coupled” in that it requires a configuration in which the source is fluidly coupled to the volume that includes a collector surface. The Petition’s third construction also reads on all embodiments of the ’437 patent. The third construction reads on Figures 4a and 4b of the ’437 patent as discussed in the D.I. at 21. This third construction reads on

the embodiments of Figures 2-5 because each of them has a configuration where the isotope source is fluidly coupled to a volume that includes a collector surface and a configuration in which the isotope source is not fluidly coupled to the volume. PO's criticism of the "selectively" language in the Petition's third construction of limitation 1c is therefore without merit.

C. "gas tight seal"

The Petition did not provide a separate construction for this term, which is part of limitations 1c and 16c. There are multiple definitions of the word "seal" including (1) "[a] device or material that is used to close off or fasten an opening or connection, especially to prevent the escape of a liquid or gas" and (2) "[a]n airtight closure." EX1021, 3. As explained below, there is no lexicography or disclaimer in the intrinsic evidence that excludes either of these plain and ordinary meanings. Therefore, the plain and ordinary meaning of "seal" *includes* a component that can be used to perform the act of sealing whether or not the component is currently configured to perform that act. See EX1024; EX1023, 149:24-152:21 (Mr. Conroy stating the description of a non-operating seal as a "national multipurpose seal" "seems reasonable"). The Board correctly determined that a gas tight valve qualifies under this plain and ordinary meaning.

PO implies that lexicography in the specification re-defined "seal" to require the component to be performing the act of actually sealing (*i.e.*, the valve must be

in the closed position). POR, 9-10. There is no such definition in the specification and there was no clear and express disavowal. In support of this argument, PO asserts that a passage from the specification defines “seal” limits the term to a seal “in the closed position.” POR, 9 (citing EX1001, 18:19-24). Nothing in this passage is definitional or indicates that “seal” is limited to the act of sealing. In fact, the quoted language indicates that the “gas tight seal” exists in the open position and the sliding rod merely “secure[s]” that pre-existing seal. EX1001, 18:21-23. When operational (“in the closed position”), the valve is *described as* “gas and liquid tight”—but that language does not define “seal.” EX1001, 18:23-24. Moreover, as the D.I. at 12 correctly recognizes, Figure 4B labels a valve in an open position as a “Gas and liquid tight lid/valve.” EX1001, Fig. 4B. The construction of this term should not exclude the gas-tight valve shown in Figure 4. *See Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007) (rejecting proposed claim interpretation that would exclude disclosed examples in the specification). Thus, the intrinsic and extrinsic evidence militates against PO’s request to construe “seal” to be a component that is performing the act of sealing.

PO’s argument that the valve is not labeled as a “seal” in Fig. 4 is specious. POR, 9. In Fig. 4, the o-ring inside the tube is the only element labeled as a gas tight seal. EX1001, 18:19-24, Fig. 4. However, a POSITA would have understood

the patent to disclose three gas tight seals in Figure 4—the cap, the o-ring, and the valve. Indeed, PO itself argues that the cap in Fig. 4 and the caps in Figs. 3 and 5 both provide gas tight seals. POR, 13 (Fig. 4), 10 (Figs. 3 and 5). Regardless, as explained below, both Hassfjell-Hoff and Norman disclose generators with gas-tight seals under PO’s proposed construction.

D. Limitation 1c

1. PO’s Construction of Limitation 1c Should Be Rejected

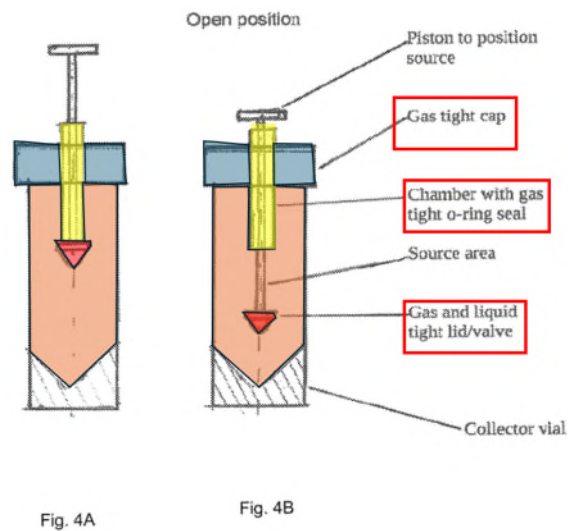
a. “with” does not mean “on”

PO’s construction “requires that there be a gas tight seal **on** the collector surface.” POR, 17 (emphasis added). However, PO does not explain why “with” should be replaced by “on,” and as PO has admitted, claims must be construed as written. *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004); POR, 8. By definition, any portion of a surface that has a seal “on” it is not exposed and therefore is not a collector surface. Thus, PO’s proposed construction is impossible because whatever surface the seal is **on** is not collecting anything.

Crucially, there are no embodiments that include a seal **on** the collector surface, *i.e.*, the inner surfaces on the walls of the collector vials in Figures 2-5 of the ’437 patent. PO argues that Figure 4 has a “seal on the collector surface where it meets the gas-tight cap.” POR, 18. Conspicuously, PO does not attempt to explain how the cap in Figure 4 is or forms a seal “on” the collector **surface**. That

is because, as shown in the drawing and admitted by Mr. Conroy, the cap is not **on** the collector **surface**—the cap is connected to the outside of the top of the vial. EX1023, 212:17-22. As also shown in Figure 4, the lines of the vial stop at the junction with the cap. Thus, the bottom of the cap connects to the outside surface of the top of the vial whereas the top of the cap extends beyond the top of the vial.¹ The diameter of the cap in Figure 4 is also wider than the diameter of the vial, which indicates to a POSITA that the seal between the cap and vial is located on the *outside* of the vial, not the *inside* collector surface.

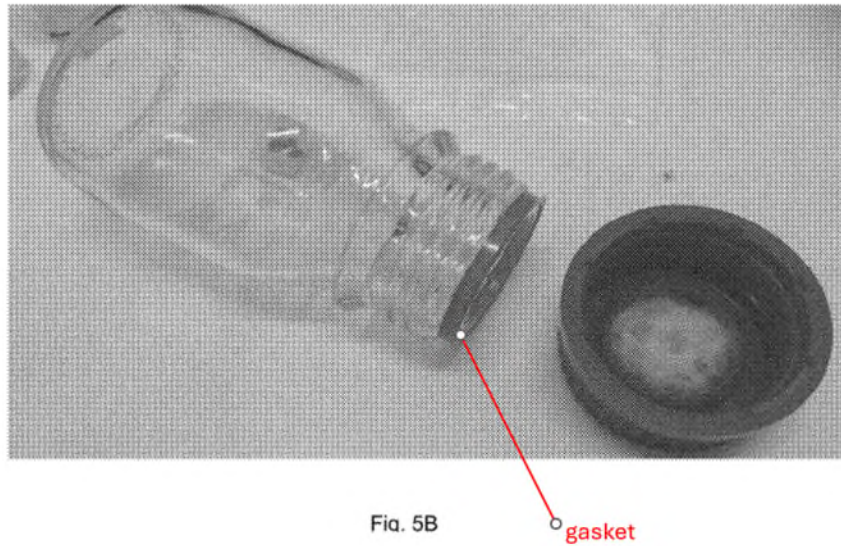
¹ The POR states that Dr. Mirzadeh admitted that Figure 4 has a seal on the collector surface where it meets the gas-tight cap. POR, 18. This mischaracterizes his testimony that the collector surface “just stops right at the cap and maybe a little bit is not shown but most likely it is threaded into the cap.” EX2004, 101:6-10. Dr. Mirzadeh’s testimony is consistent with Figure 4, which shows that the vial just stops at the cap. The fact that a POSITA would have understood that a **little bit** of the vial would be threaded into the cap is consistent with the multiple horizontal lines drawn at the junction between the cap and the top of the vial, and the fact that the cap is wider than the collector vial is consistent with the cap that contacts and mates with the *outside* surface (which is not a collector surface) of the collector vial. See EX1001, Fig. 4.



EX1001, Fig. 4 (annotated).

Fundamentally, there is no disavowal or lexicography that compels a construction of “with” in a way that excludes any of the three seals (o-rings, cap, and valve) in Figure 4 from satisfying limitation 1c. Because all 3 seals are configured to be used for sealing a volume including a collector surface, they are all a seal under the term’s plain meaning.

None of the other ’437 patent embodiments disclose a seal formed “on the collector surface.” As Dr. Mirzadeh testified, in Figure 5B there is a gasket (i.e., a seal) between the top of the bottle and the cap. EX2004, 106:7-107:16.



EX1001, Fig. 5B. Again, a seal on the top of the bottle is not a seal “on” the collector surface as required by PO’s flawed construction. While it is not clear whether the Fig. 3 embodiment also includes a gasket between the top of the bottle and the cap or the cap directly contacts the top of the bottle, the top of the bottle again is not the collector surface. Finally, nothing in Figure 2 indicates that there is any seal on the collector surface of container A.

b. Doctrine of Last Antecedent Is Not Applicable

PO argues that the doctrine of the last antecedent necessitates a construction that “with a gas tight seal” modifies “collector surface.” POR, 17. However, PO admits that this doctrine is not absolute. *Id.* Notably, this doctrine does not apply when “there are good indications that a contrary interpretation is the better one” (*Netflix, Inc. v. DivX, LLC*, 166 F.4th 1341, 1347 (Fed. Cir. 2026)), or where it

creates an absurd or otherwise conflicting result (*Demko v. United States*, 216 F.3d 1049, 1053 (Fed. Cir. 2000)).

Here, PO's proposed application of the last antecedent doctrine must be rejected because there are strong indications that a contrary interpretation is better and because its application leads to a non-sensical and conflicting result. Claim 16 is a method claim that corresponds to apparatus claim 1 and includes limitation 16c that is similar to 1c: "fluidly coupling a volume including a collector surface to the solid precursor isotope source **using** a gas tight seal." Under the doctrine of last antecedent, claim 16 would be construed as meaning the source is "using a gas tight seal." Much like the famous Groucho Marx joke "I shot an elephant in my pajamas, how he got in my pajamas I don't know," this result is non-sensical. EX1023, 204:18-207:13. The only rational way to read limitation 16c is that "using a gas tight seal" specifies how the volume (which includes the collector surface) and the isotope source are fluidly coupled. *Accord* D.I., 12 ("the fluidly coupling step requires use of a gas tight seal."). The doctrine of last antecedent is therefore not applicable to claim 16. It stands to reason that the doctrine is also not applicable to limitation 1c and that limitation 1c should similarly be understood to mean that "with a gas tight seal" indicates how the isotope source and the volume including a collector surface are fluidly coupled. Doing so avoids an inconsistent result. *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 365 F.3d 1299, 1303

(Fed. Cir. 2004) (it is often appropriate to construe method and apparatus claims “together”).

2. Petition’s First and Third Constructions Are Supported

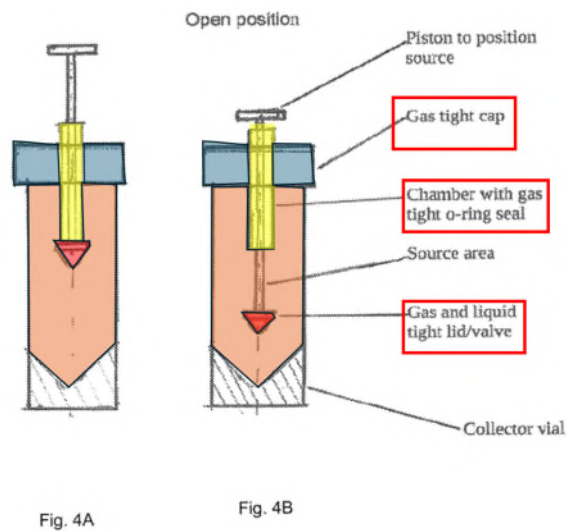
The POR also argues that the Petition’s first and third constructions are not supported by the specification. POR, 12-14, 15-16. However, these arguments in the POR are identical to the arguments in the POPR and preliminarily rejected in the Institution Decision. POPR, 8-11, 12-13; D.I. 13-14, 17-21. Because PO’s alternative construction is wrong for the reasons discussed above, and because PO has merely repeated its flawed POPR arguments against the Petition’s first and third constructions, PO has failed to establish that either the first or third constructions is unsupported.

It should also be noted that the Petition’s first and third constructions are in accord with the understanding above that “with a gas tight seal” specifies how the volume and the isotope source are fluidly coupled. As recognized by the Board, the first construction requires that (i) the isotope source must be configured to be fluidly coupled to a volume that has a collector surface, (ii) the volume must have both a collector surface and a gas tight seal, but there is no requirement that the

collector surface have a gas-tight seal. D.I., 19-20.² Thus, under the first construction, the volume (that includes a collector surface) is coupled to isotope source “with a gas tight seal,” which is analogous to limitation 16c’s recitation of “using a gas tight seal.” The Petition’s third construction is likewise consistent with this understanding, and both the first and third constructions read on all disclosed embodiments of the ’437 patent.

The argument in the POR that there is a gas tight seal between the cap and the collector surface in Fig. 4 establishes that the first construction reads on Figure 4. POR, 13, 18-20. When the valve in Figure 4 is open, the seal created by the cap allows air flow through the entire volume of the device (collectively, the blue, yellow, and beige volumes):

² The D.I. mistakenly states that the first construction also requires the collector surface to have a gas tight seal, but this was a readily recognizable mistake because that requirement is a feature of the second construction which the Board distinguished from the first construction on that basis. D.I., 19.



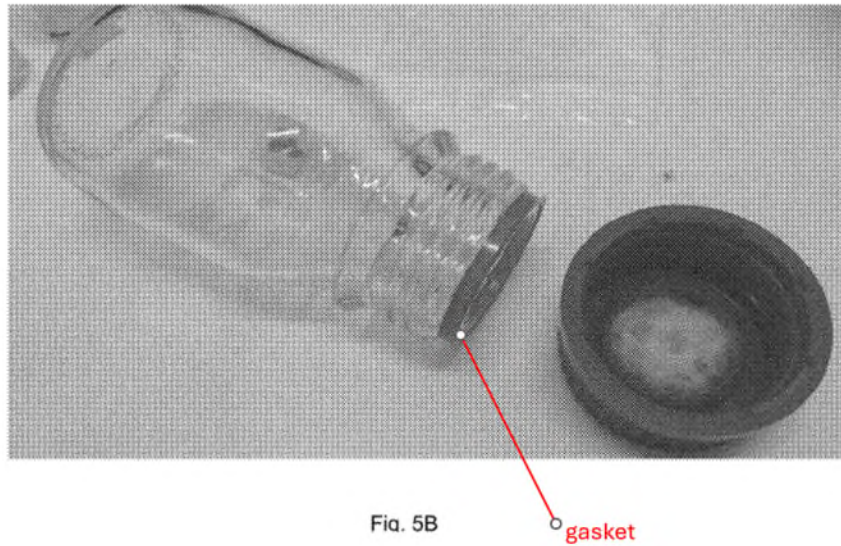
EX1001, Fig. 4. The gas-tight sealing that occurs with the cap (only in combination with the o-rings) is one that prevents exchange of air between the entire volume of the device in Figure 4 and the outside environment. POR, 10. As such, though PO purports to disagree with the Petition’s first construction (POR, 12-14)—PO’s identification of the cap in Figure 4 (POR, 13 (“the gas-tight cap provides a gas tight seal”)) actually supports the Petition’s first construction requiring a gas-tight seal on the entire volume of the device.

3. Petition’s Second Construction Should Not Be Adopted

Petitioner agrees with PO that the second construction, which limits the sealed volume to a volume defined by the collector surface, should not be adopted in view of analysis and evidence adduced after institution of this IPR. First, that construction is premised on “with a gas tight seal” being understood to modify “collector surface,” which conflicts with claim 16 as discussed above.

Second, under a construction where “with a gas tight seal” modifies “a collector surface,” the collector surface defines the volume. Paper 8, 5. This construction renders parts of claim 8 superfluous. Claim 8 recites “wherein the collector surface is an interior surface of a container, and wherein the volume is an internal volume of the container.” If limitation 1c were construed as meaning that “with a gas tight seal” modifies “a collector surface” such that the collector surface with the gas tight seal defines the volume (Petition’s second construction), then “wherein the volume is an internal volume of the container” in claim 8 would be superfluous.

Third, it has now become clear that the second construction with its requirement that the volume be limited to the collector surface is not supported by any disclosed embodiments. POR, 14-15. At his deposition, Dr. Mirzadeh clarified that Figures 3 and 5 have additional volume inside their caps that is included in the sealed volume (*i.e.*, collector vial volume plus cap volume). EX2004, 106:7-107:16.



EX1001, Fig. 5B. As shown in Figure 5B, there is some volume that exists above the glass container where the gasket extends past the glass and also there is volume inside the cap that is above the glass container. This construction does not read on Fig. 4 because the seal created by Fig. 4's cap allows air flow through the entire volume of the device including the blue, yellow, and beige volumes in the annotated version of Fig. 4 discussed above.

Although it has become clear that the second construction should not be adopted, that conclusion has nothing to do with PO's mischaracterization of the Petition's second construction as requiring that the generator's entire volume not also have a gas tight seal. POR, 14-15. There is no such requirement in the Petition's second construction as Dr. Mirzadeh's deposition testimony made clear. EX2004, 93:14-25; 95:15-97:24.

III. ALL CHALLENGED CLAIMS ARE UNPATENTABLE

PO argues that it should prevail in this PGR because each of the Petition's "three possible constructions" for limitation 1c are incorrect. POR, 1-2. This argument fails for two reasons. First, the Petition's first and third constructions are correct as discussed above and the Petition establishes unpatentability under both constructions. Second, even if Petitioner's constructions were incorrect (they are not), Petitioners are afforded the opportunity to show invalidity in response to new claim constructions by either the Board or PO. *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1383 (Fed. Cir. 2023); *Apple Inc. v. Omni Medsci, Inc.*, 2024 WL 3084509, *5 (Fed. Cir. June 21, 2024). As demonstrated below, all challenged claims are unpatentable under any construction contemplated in these proceedings.

A. PO Does Not Dispute Unpatentability Under Petition's Constructions for Grounds 1-4

The POR only addresses patentability for Grounds 1-4 under its own constructions of limitation 1c and "gas tight seal," which is part of limitations 1c and 16c, and does not dispute that Grounds 1-4 establish unpatentability for all the challenged claims under the Petition's first and third constructions for limitation 1c³ and the Petition's evidence for "gas tight seal." PO has therefore waived any

³ "Fluidly coupled" is not disputed as discussed above, and "configured to be fluidly coupled" and "gas tight seal" are both part of limitation 1c.

arguments under those constructions. Paper 11, 10 (arguments not raised in POR may be deemed waived). For all the reasons explained in the Petition, and as the D.I. correctly preliminarily determined, all claims challenged in Grounds 1-4 should be found unpatentable if the Petition's first and/or third constructions of limitation 1c are adopted.

B. Grounds 1 and 3 Establish Unpatentability Under Petitioner's First and Third Constructions for Limitation 1c and PO's Construction of "Gas Tight Seal"

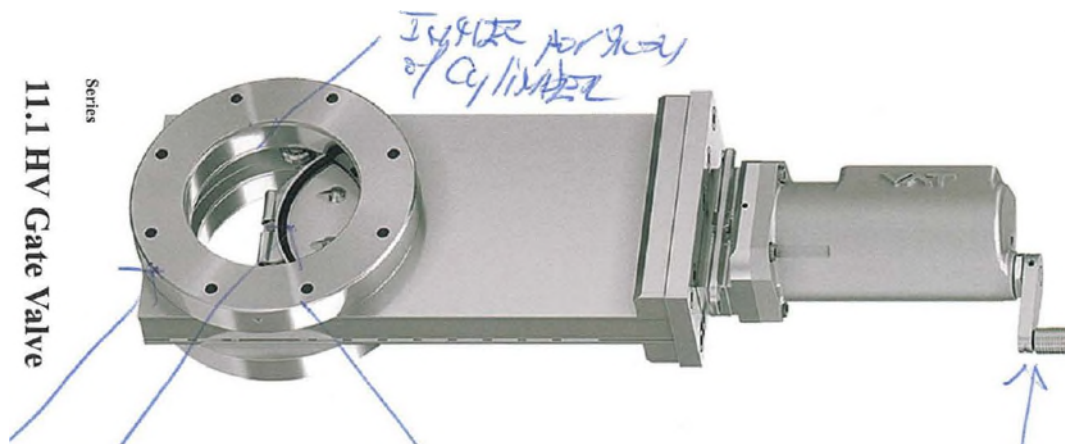
PO only challenges the evidence in the Petition regarding limitations 1c and 16c and makes no arguments regarding any of the other claim limitations or any of the other challenged claims.

1. Grounds 1 and 3 Demonstrate Disclosure of Limitation 1c

a. Ground 1

Hassfjell-Hoff anticipates under Petitioner's first and third constructions of limitation 1c and PO's construction of "gas tight seal." PO overlooks that when the gate valve of Hassfjell-Hoff is open and fluidly coupling the source to the volume, it is one of the gas tight seals that (like the o-rings and centering clamps) seal the internal volume from the environment. Pet., 20-21 ("In use, the solid precursor isotope source is initially positioned in the upper chamber, and the gate valve is then opened. In this position, the upper and lower volumes are enclosed in a gas-tight seal...."); EX1019, ¶37 ("the Hassfjell-Hoff system was designed with gas-

tight seals (*e.g.*, the o-rings and the gate valve) such that there was no leakage detected.”); EX2004, 47:18-48:10 (“that gate valve stops release of the Radon to the environment....the Radon cannot escape to the environment, go outside the system.”), 60:9-19 (“Q....So even if the gate valve is open, you wouldn’t expect radioactivity leaking outside of the system. A. System, Yes.”), 64:15-65:1, 65:9-12, 70:24-1, 83:18-22; EX1003, 6-7 (“Despite the relatively strong ^{228}Th source, no detectable leakage of any kind of radioactivity out of the generator has been observed.”); EX1023, 165:2-168:15, 174:22-178:25, 182:13-189:1 (Mr. Conroy acknowledging that the “interior portion of [the] cylinder” of the gate valve defines part of the generator’s sealed volume); see EX1025, 4.



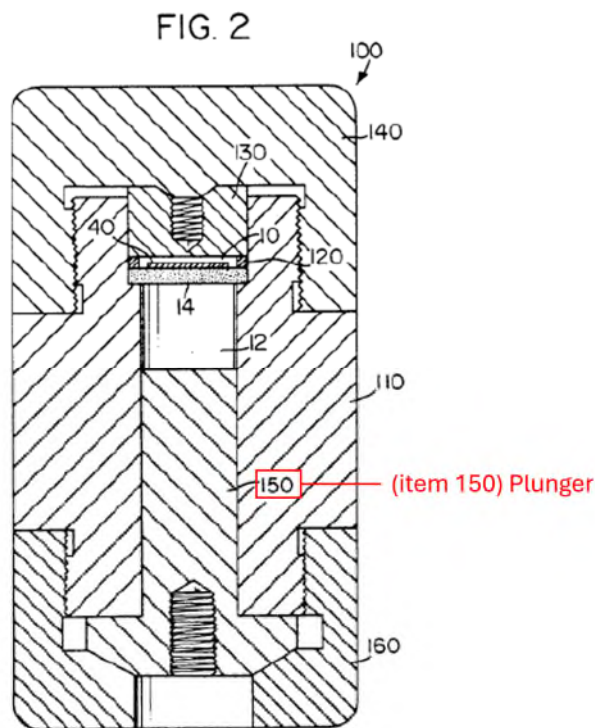
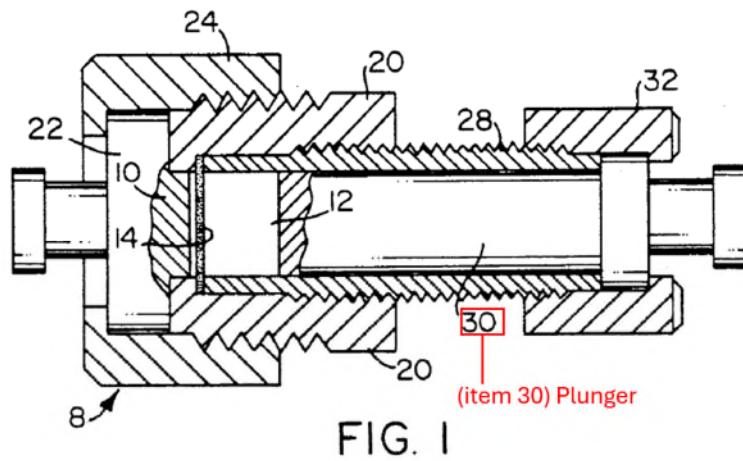
EX1025, 4 (excerpted).

Thus, Hassfjell-Hoff includes seals that are used to create a gas tight seal between the interior of the device and the outside environment. Because Hassfjell-Hoff discloses that its device has gas tight seals when the source is fluidly coupled

to the collector surface, Hassfjell-Hoff anticipates under PO's construction of "gas tight seal."

b. Ground 3

Norman also anticipates under Petitioner's first and third constructions of limitation 1c and PO's construction of "gas tight seal." PO argues that the Petition fails because it "never identifies a gas-tight seal on a collector surface in Norman's generators"—PO's newly proffered construction. POR, 30. Yet, the Petition did assert that the chambers in both embodiments are gas tight with respect to the outside environment. Pet., 52-53 ("If the receiving chamber is also closed, i.e., both plungers 22 and 30 are inserted and secured with end caps 24 and 32, the escape of radon from the generator is prevented." (quoting EX1007, 7:22-25)), 54 (discussing various "seal" elements in figure 2 including seal ring 120, seal 130 and seal cap 140) (citing EX1007, 7:65-8:24)). And plunger 30 is part of the collector surface (item 12) and one of the gas-tight seals in Norman Figure 1, and plunger 150 is the same for Norman Figure 2:



EX1007, Figs. 1-2. Thus, even under PO's construction that requires the seal to be "on" the collector surface, the Petition shows that Norman's embodiments anticipate because the plunger is both a seal and part of the surface.

PO mischaracterizes the Petition as asserting anticipation by combining two embodiments of Norman. POR, 27-28. In fact, the Petition shows that each of the two embodiments of Norman (i.e., Fig. 1 and Fig. 2) anticipate claim 1, and PO fails to show any element of claim 1 that is not anticipated by either embodiment.

The POR at 28 notes that the Petition replaces the word “with” with the word “using” in the analysis. However, this typographical mistake has no impact on the substantive analysis in the Petition.

2. Grounds 1 and 3 Demonstrate Disclosure of Limitation 16c

a. Ground 1

While neither party construes limitation 16c as a whole, the POR proposes one for “gas tight seal,” which is part of that limitation. The Petition establishes unpatentability under that construction.

PO first argues that Hassfjell-Hoff does not disclose limitation 16c based on its arguments regarding limitation 1c. POR, 25-27. However, none of PO’s arguments that “with” means “on” are relevant to the “using” requirement of limitation 16c, and PO’s last antecedent argument undermines its arguments for limitation 16c.

PO next argues that the Hassfjell-Hoff gate valve is open when there is fluid coupling so the Petition fails to show fluid coupling using a gas tight seal. POR, 25. Yet, this is the same configuration as Figure 4, where the valve at the bottom of

the rod is **used** to fluidly couple **only** when that seal is open. But even under PO's construction, the Hassfjell-Hoff device's volume (which includes a collector surface) is coupled to the source using a gas tight seal with o-rings, centering clamps, and a gate valve in the open position. *See supra* §III.B.1.a. PO cannot explain why this evidence does not satisfy limitation 16c.

b. Ground 3

First, PO rehashes its incorrect arguments regarding limitation 1c. *See* §III.B.2.a. Then, PO argues that Norman's seals are not used to fluidly couple. POR, 31-33. Not so. Norman's plunger, a part of the collector surface, is a seal that is fluidly coupled to the source when the plunger is sealing. *See supra* §III.B.2.a. And, Norman's "stopcock" is also a seal that fluidly couples when it is open. Pet., 54-55. PO's Ground 3 arguments regarding limitation 16c also fail.

C. PO Fails to Distinguish Any Elements in Ground 2

PO argues that the gate valve is not gas tight when it is in the open position. POR, 27. But PO does not dispute that the gate valve is gas tight against the outside environment while open, which is the obviousness argument in this ground. Instead, PO repeats its argument that the gate valve is not sealing "with" the collector surface. POR, 26-27. Figure 4 shows the opposite. In the open position, the gate valve creates a seal with the device's entire volume (plus the collector surface) on one side of the seal and the outside environment on the other.

D. PO Fails to Distinguish Any Elements in Ground 4

The Petition shows that a POSITA would have found it obvious and therefore been motivated to implement Norman's Figure 1 as a gas-tight device because Norman's Figure 2 is a gas-tight device. Pet. 65-66. PO does not dispute Dr. Mirzadeh's testimony that a POSITA would have been motivated to implement Figure 2 as a gas-tight device. EX1002, ¶¶177-180.

E. Ground 5 Establishes Unpatentability Under PO's Constructions and Petitioner's Second Construction of Limitation 1c⁴

A POSITA would have been motivated to implement Hassfjell-Hoff such that the chamfered end of the tube forms a gas-tight seal with the neck of the polyethylene bottle when the isotope source is lowered and positioned inside the polyethylene bottle so that the progeny isotopes are collected on the inside of the bottle, i.e., the collector surface. Pet. 67-69. Specifically, Hassfjell-Hoff's tube is similar to the plunger 30 in Norman Figure 1 and plunger 150 in Figure 2. Because Norman's plungers 30/150 form gas-tight seals with the other sides of second chamber 12, a POSITA would have been motivated to implement Hassfjell-Hoff with a gas tight seal between the chamfered lower end of its tube and polyethylene bottle's neck to reduce the amount of ²¹²Pb that collects outside the collector

⁴ Ground 5 also establishes unpatentability under Petitioner's first and third constructions.

surface (i.e., the outside of the polyethylene bottle and interior surfaces of the generator below the gate valve). Pet., 67-69; EX1002, ¶¶84, 177.

PO's contrary arguments fail. In Section IV.E.1, PO argues that "[t]he petition provides no explanation as to why or how Norman's plunger/end cap assembly would logically lead to a seal formed between a polyethylene bottle and a 'chamfered end of the tube.'" POR, 36. But obviousness does not require bodily incorporation. *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference."). Only combination of the references' teachings is necessary. *Id.* And the Petition does not rely on Norman for any structural detail such as a chamfered edge; that is disclosed in Hassfjell-Hoff and common in the art. If PO is arguing that the Petition fails to explain why the connection between the chamfered end of the tube and bottle's neck would be gas-tight, the Petition explains that it is to *reduce* (not eliminate) contamination on the outside of the bottle, particularly the neck area. Pet., 68; *see also infra* at 24-25 (additional discussion concerning the reduction of contamination). Finally, PO includes a partial citation to page 68 of the Petition to argue that Norman only prevents the escape of radon from the generator. POR, 38. But the citation to Norman refers to seals by both plungers at the bottom and top of Norman's generator, and both seals

help prevent the escape of radon from the generator. Pet., 68 (“If the receiving chamber is also closed, **i.e., both plungers 22 and 30 are inserted and secured with end caps 24 and 32**, the escape of radon from the generator is prevented.” (quoting EX1007, 7:22-25) (emphasis added)). Forming a seal between the chamfered end of Hassfjell-Hoff’s tube and the polyethylene bottle would prevent the escape of radon from the polyethylene bottle in the same way.

In Section IV.E.2, PO argues that creating the gas-tight seal between the chamfered edge of Hassfjell-Hoff’s tube and polyethylene bottle “would not prevent radon gas from emanating to the outside of the polyethylene bottle” because the outside of the bottle would be exposed to the source during the time periods (1) in which the gate valve was opened prior to lowering the tube to create the seal, and (2) when the tube was raised prior to closing the gate valve. POR, 40-41. This argument fails because the motivation for the modification was **to reduce** contamination of the outside of the bottle, not to eliminate it entirely. Pet., 68 (sealing the container would “**reduce** the possibility of outside contamination or allowing radioactivity to escape the container” (emphasis added)). The two periods identified by PO are much shorter than when the tube would be sealed to the polyethylene bottle in operation of the generator, so the amount of particles on the outside of the bottle would be greatly reduced. Additionally, having a gas-tight seal on the collection chamber during generation would be useful to increase the

recoverable yield inside the bottle and reduce the amount lost and unrecoverable. PO's argument that washing the bottle can remove the particles does not account for the worker having to remove the bottle from the generator before washing, and the significant reduction in harmful exposure through allowing less contamination on the outside of the bottle. EX1023, 86:1-13, 94:10-13.

As shown above and in the Petition, a POSITA would have been motivated to modify Hassfjell-Hoff to create a gas tight seal between the chamfered end of the tube and neck of the polyethylene bottle. It is undisputed that this is a "gas tight seal" that is "on the collector surface" under PO's constructions, and that this arrangement satisfies Petitioner's second construction of limitation 1c and satisfies limitation 16c. Accordingly, all challenged claims for Ground 5 should be found unpatentable.

F. PO Fails to Distinguish Any Elements in Grounds 6-10

PO makes no arguments that any of the claims addressed in Grounds 6-10 have not been shown unpatentable if the Board finds claims 1 and 16 unpatentable.

G. Ground 11 Shows that Claim 1 is Indefinite

As explained in the Petition and above in Section II.C, a POSITA would not know how to construe limitation 1c. PO's own proffered construction, that "with" should be construed to mean "on" excludes all preferred embodiments. PO's inability to propose a construction that reads on any preferred embodiment is

telling and demonstrates that limitation 1c is not susceptible to a reasonably certain construction. Because a POSITA would be unable to determine the scope of claim 1 with reasonable certainty, claim 1 and dependent claims 2-15 and 35-38 are indefinite.

IV. EXPERTS

A. Petitioner's Experts

PO's complaints concerning Petitioner's experts are without merit.

1. Per Hoff

Per Hoff provided a detailed declaration that explained exactly how the device in his article actually worked at the time. EX1019, ¶¶31-37. PO does not dispute his statements regarding how the device worked or that he is a POSITA.

2. Dr. Mirzadeh

PO's attorney argument that Dr. Mirzadeh copied the Petition is directly contradicted by Dr. Mirzadeh's sworn testimony that he drafted his declaration (except for the legal standards). EX2004, 12:14-13:7, 73:18-75:20. And, as acknowledged by PO's expert, there are differences in the way Dr. Mirzadeh organized and argued grounds compared to the Petition. EX2002, ¶52 ("I further understand that what Dr. Mirzadeh calls 'ground 1' corresponds to two grounds (ground 1, covering anticipation, and ground 2, covering obviousness) in the

petition”), ¶59 fn.1 (“Dr. Mirzadeh covers separately in the section he labels as ground 3”). Finally, PO does not dispute that Dr. Mirzadeh is a POSITA.

B. PO’s Expert Declaration Deserves No Weight

PO relies upon the declaration of Mr. Charles Conroy, but he is not a POSITA under Petitioner’s definition which neither PO nor Mr. Conroy dispute. *See generally* POR; EX2002, ¶30; EX1023, 60:2-8. Mr. Conroy has an MBA and a degree in Pharmacy, with experience in using radioisotope generators (although never emanation-based generators which are at issue here (EX1023, 85:22-24)) and *marketing* and *business administration* of radioisotope generator companies. EX2002, ¶2, ¶4. Neither of his degrees is, or is equivalent to, a degree listed in the Petition’s POSITA definition. Mr. Conroy’s experience *using* other types of radioisotope generators is insufficient to qualify him as an expert here, and he has not explained how or why *marketing* or *business administration* at a company that sells radioisotope generator is **relevant** to qualifying as a POSITA. In the same way that using a Keurig does not make one an expert on coffee brewing machines, Mr. Conroy’s experience using isotope generators cannot confer POSITA eligibility here. The declaration of Mr. Conroy is entitled to no weight.

Furthermore, Mr. Conroy has a financial stake related to ARTBIO because Nucleus RadioPharma (*see* EX1023, 51:3-17, 221:20-222:22 (showing Mr. Conroy’s interest)) is manufacturing ARTBIO’s “patented” technology for clinical

trials. *See Parrot S.A. v. QFO Labs, Inc.*, IPR2018-01690, Paper 40 at 63-64 (PTAB Feb. 20, 2020); EX1026 (“manufacture ARTBIO’s” technology); EX1027 (ARTBIO was Nucleus’s first commercial partnership); EX1028 (same); EX1029 (describing clinical trials); EX1030 (same); EX1023, 59:5-11. Mr. Conroy was “thrilled to unite” with ARTBIO in a “strategic partnership.” EX1026. Because Mr. Conroy is a biased and interested witness, the Board should give his declaration little weight.

V. CONCLUSION

The Board should find all Challenged Claims unpatentable.

Date: April 29, 2026

Respectfully submitted,

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the applicable word count for the foregoing Reply to Patent Owner's Response totals approximately 5,594 as calculated by Microsoft Word, exclusive of the table of contents, mandatory notices under § 42.8, certificates of service, word count, claim listing, and exhibits which is less than the 5,600 allowed under 37 CFR § 42.24.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the parties have agreed that filing with the Board through the P-TACTS system constitutes electronic service and that such service as made on Patent Owner's counsel on April 29, 2026.

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