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.

Case No. PGR2025-00040
Patent 12,249,437

PATENT OWNER'S RESPONSE PURSUANT TO 37 C.F.R. § 42.220

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AdvanCell Pty Ltd. ("Petitioner") filed a petition for post grant review of various claims of U.S. Patent No. 12,249,437 (the "'437 patent", EX1001). Sciencons, AS and ARTBIO, Inc. ("Patent Owner" or "PO") hereby requests that the Board now issue a final written decision confirming that claims 1-9, 11-33, and 35-38 are not unpatentable.

I. INTRODUCTION

Petitioner fails to meet its burden to show the unpatentability of any challenged claim.

Claim 1 recites, *inter alia*, "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal." Petitioner alleges ambiguity based on arguing three possibilities as to what "gas tight seal" refers to. Pet., 5. While the petition's proffered "three possible constructions" are themselves erroneous and unclear, the Board instituted trial to address whether "with a gas tight seal" modifies: (1) a volume, (2) a collector surface, or (3) the precursor isotope source is configured to be fluidly coupled. DI, 12-13. As recognized by the Board in the institution decision and addressed further below, under a plain reading of the claims "gas tight seal" modifies the "collector surface." If the claims and prior art are to be further evaluated, they should be evaluated under that understanding. Doing so effectively eliminates from consideration Grounds 1, 2, 6, 7 and 11. None of these grounds are

based on a reading of the claims where “gas tight seal” modifies the “collector surface.”

To be clear, however, none of Petitioner’s proffered “three possible constructions” actually advanced in the petition is correct, as discussed below. Petitioner is, of course, the master of its petition case and that case should be evaluated as presented. *SAS Inst., Inc. v. Iancu,* 584 U.S. 357, 367 (2018) (“[T]he petitioner’s contentions, not the Director's discretion, define the scope of the litigation all the way from institution through to conclusion.”). If Petitioner here is held to their burden, any ground based on any of the “three possible constructions” from the petition should be rejected as improperly based on nonsensical and erroneous constructions. Indeed, each of Petitioner’s proffered “three possible constructions” are grounded in legal error, unnecessarily deviate from the plain language of the claims and inject unnecessary confusion. Those constructions and the grounds on which they depend (i.e., all grounds of challenge) should be rejected as such.

Regarding the prior art, the petition advances two anticipation grounds (grounds 1 and 3) based on the Hassfjell-Hoff and Norman references, yet it fails to show that either reference discloses each and every element of the independent claims. Among other deficiencies, the petition fails to show that either Hassfjell-Hoff or Norman discloses the limitations of the independent claims regarding a

precursor isotope source "fluidly coupled to a volume including a collector surface with a gas tight seal" as recited in independent claim 1. The petition also fails to show prior art teaching of the similar limitation in claim 16, as the petition fails to identify a gas-tight seal used to provide the recited fluid coupling.

Petitioner also advances three obviousness grounds (Grounds 2, 4, 5) addressing the independent claims, but each falls short of the mark. Two of its grounds are single-reference obviousness arguments that fail to remedy the key deficiencies of the anticipation grounds. The remaining ground proposes modifying Hassfjell-Hoff in view of Norman, yet it proposes a modification (1) not disclosed by the prior art and (2) based on a rationale that is illogical and negated by Hassfjell-Hoff itself. The petition also advances five different obviousness grounds addressing the dependent claims, but none of these grounds remedies the petition's deficiencies regarding the independent claims.

Petitioner's last ground, ground 11, is likewise deficient and does not merit institution. Ground 11 raises a challenge under §112, arguing that claim 1 and its dependent claims are indefinite. However, this challenge is premised on Petitioner's unsupported and incoherent claim construction. Ground 11 adds nothing to the defective claim construction arguments advanced by Petitioner and should thus be rejected for similar reasons.

Accordingly, Patent Owner respectfully submits that the Board should issue a final written decision upholding the patentability of each challenged claim.

II. SUMMARY OF '437 PATENT

The '437 patent discloses methods and systems for producing highly purified radioisotopes, such as ^{212}Pb. As the '437 patent explains, such isotopes have important medical applications. *See* EX1001, 7:22-25 (use in radiopharmaceuticals), 9:58-67 (use in cancer therapy). For example, the 10.6-hour half-life of ^{212}Pb makes it a useful radioisotope for anti-cancer treatment, as it can act rapidly on its target, delivering a large dose of radiation, but it will also decay quickly enough such that it substantially stops acting as a radioactive source in the body shortly after treatment. EX1001, 1:62-2:3. However, the short half-life also impedes centralized production, storage, and distribution (since the isotope will decay during storage and shipment), raising the need for methods of production that may be performed easily in the location where the radioisotopes are needed, such as a hospital. EX1001, 1:62-2:3, 5:67-6:13; EX2002, ¶¶23-24.

The '437 patent provides solutions to these problems, disclosing devices and methods allowing the on-location generation of radioisotopes like ^{212}Pb safely, efficiently, and in high purity. EX1001, Abstract. For example, Fig. 4 (below) depicts a device configured to generate radioisotopes and deposit them on the interior surface of a collector vial.

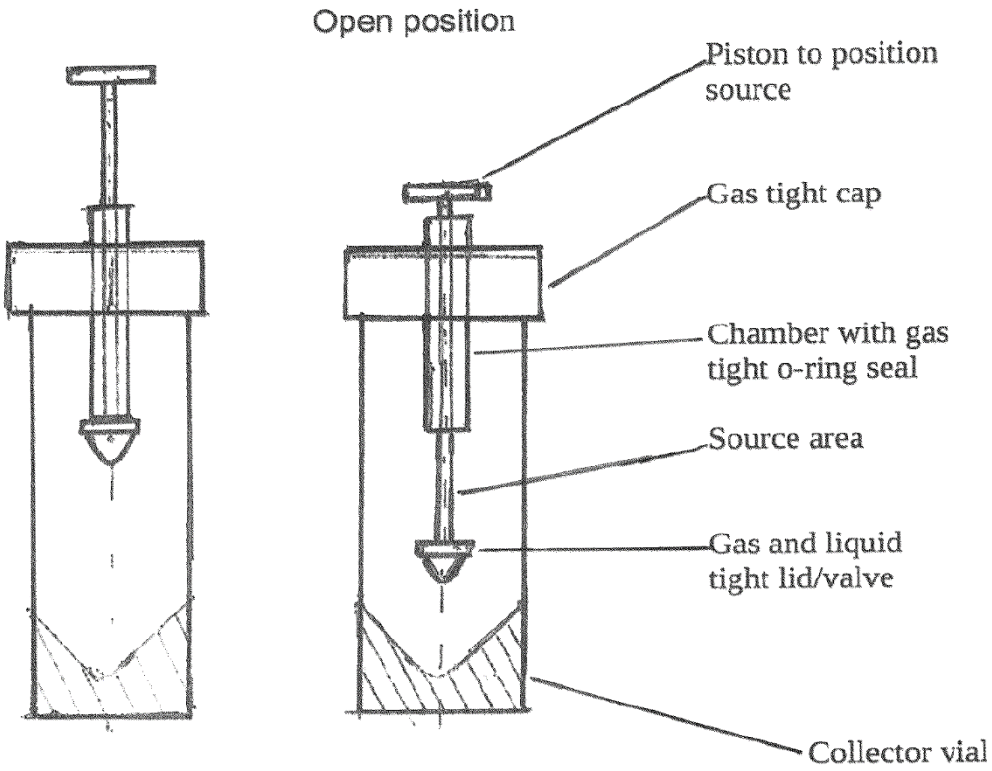


Fig. 4A

Fig. 4B

EX1001, Fig. 4; *see also id.* 14:37-43, 18:19-35. The collector vial (container) is connected to a cap, and together, they define a gas-tight volume in which a rod or piston, with a radioisotope source disposed thereon, is movably located. EX1001, 14:37-43, 18:19-35, 13:63-14:24, Figs. 2, 4. The rod moves between an open or closed position by moving it up or down. *Id.* In the open position, a decay product of the radioisotope source (e.g., ^{220}Rn) emanates throughout the collector vial container, the decay product (e.g., ^{220}Rn gas) further decays (e.g., into ^{216}Po and ^{212}Pb), and the emanation process completes by depositing these decay products on

the container's interior surface. *See* EX1001; *see also id.*, 2:27-47, 13:63-14:24; EX2002, ¶25.

In this open configuration, the volume has a gas tight seal, indicated in Fig. 4, formed at the interface between the collector surface and the cap. *See* EX1001, Fig. 4 (indicating open position with "Gas tight cap"). Thus, when in the open position, the device uses a gas-tight seal to provide fluid coupling within the volume between the precursor isotope source and the collector surface, while also confining the ^{220}Rn gas emanated from the precursor isotope source to the volume (since the seal of the volume remains gas-tight when providing the fluid coupling). The device disclosed in the specification allows for efficient, safe production of ^{212}Pb. EX1001, 1:20-27; EX2002, ¶26.

These features are reflected in the claims of the '437 patent. Applying the element numbering from the petition, claim 1 recites:

[1pre] A radioisotope generator comprising:

[1a] a solid precursor isotope source configured to emanate one or more gaseous progeny isotopes,

[1b] the solid precursor isotope source comprising a precursor isotope; and

[1c] wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal, and

[1d] wherein the solid precursor isotope source and the collector surface are configured such that the one or more gaseous progeny isotopes deposit one or more solid progeny isotopes on the collector surface.

Independent claim 16 recites similar limitations directed to a method of generating a progeny radioisotope. EX2002, ¶27.

III. CLAIM CONSTRUCTION

In a post grant review, a claim is given its ordinary and customary meaning. 37 C.F.R. §42.200(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). Petitioner in a PGR bears the unshifting burden of explaining how the challenged claims are to be construed and how the construed claims are unpatentable. 37 C.F.R. §§42.204(b)(3)-(4). Here, Petitioner has not met that burden. As discussed further below, the petition's constructions should be rejected. Those constructions are unsubstantiated, nonsensical, and confusing, and they repeatedly deviate from the plain language of the claims. Not only do the proposed constructions lack factual or legal underpinnings, but they also violate the requirement under 35 U.S.C. §322(a)(3) that the petition challenge be plead with a requisite degree of clarity and particularity. Certain constructions upon which the petition challenge critically relies are discussed below. EX2002, ¶31; *see also id.*, ¶¶28-30 (applying Petitioner's definition of level of skill).

A. "fluidly coupled"

The petition proposed rewriting the term "fluidly coupled" to "selectively fluidly coupled." Specifically, the petition proposes construing the term "fluidly coupled" to mean "capable of being connected or linked together using a gas." Pet., 4. Petitioner argues "fluidly coupled" means "selectively fluidly couple[d]." Pet., 19. Petitioner, however, must "construe the claim as written" rather than how it wishes it was written. *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004); *see also Stumbo v. Eastman Outdoors, Inc.*, 508 F.3d 1358, 1362 (Fed. Cir. 2007) (construction that would render a phrase "superfluous" is "a methodology of claim construction that this court has denounced"); *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950-51 (Fed. Cir. 2006) (refusing to construe claim terms in a way that made other claim limitations meaningless).

In the institution decision, the Board correctly concluded that the term "fluidly coupled" does not mean "*capable* of being connected or linked together using a gas," but rather requires that two structures that are fluidly coupled have gas flow therebetween. DI, 11-12. The institution decision notes that claim 1 recites a solid precursor isotope source configured to be fluidly coupled to a volume including a collector surface with a gas tight seal. DI, 12. In other words, this limitation requires that the radioisotope generator must have a configuration in which the precursor isotope source is fluidly coupled to a volume *including a*

collector surface with a gas tight seal. 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. EX2002, ¶¶32-35.

B. "gas tight seal"

While Petitioner did not propose any construction of the term "gas tight seal," in discussing claim 16, the institution decision stated that at "this stage of the proceeding, we understand that a gas tight valve is a gas tight seal regardless of whether the valve is closed (preventing gas flow) or open (allowing gas flow) position." DI, 12. The Board reasoned that Fig. 4 depicts a "Gas and liquid tight lid/valve" in the open position as well as the closed position. *Id.*; EX2002, ¶36.

However, the portion of the specification describing Fig. 4 clarifies that this preliminary understanding is not correct. In describing Figs. 2 and 4, the specification states the following:

> The rod in FIG. 2 (piston in FIGS. 4A-4B) slides in a tube with o rings or similar at the top to secure gas tight seal. The valve at the bottom of the rod is gas and liquid tight in the closed position for the unit.

EX1001, 18:19-24. This language clarifies that the valve is gas and liquid tight *in the closed position*, not the open position. Notably, the valve is not labeled as a *gas-tight seal* in Fig. 4B, but instead a gas- and liquid-tight *valve*—that is, a valve that is gas and liquid tight *when closed*. By contrast, Fig. 4B labels the chamber as

having a gas tight o-ring seal, which the specification clarifies is at the top of the tube "to secure gas tight seal." *Id.*; EX2002, ¶40; *see id.*, ¶¶38-39 (caps of Figs. 3A and 5A provide gas tight seals, but none is present for open containers in Figs. 3B and 5B).

When confronted with this language in cross-examination, Dr. Mirzadeh did not dispute that the specification's description of the valve as only being gas and liquid tight in the closed position applied to Fig. 4. *See* EX2004, 98:1-99:25. He further testified that Fig. 4's collector surface extends into the cap and is "most likely threaded into the cap." EX2004, 101:6-10. Indeed, while Dr. Mirzadeh repeatedly asserted that Fig. 4 depicted a gas tight *valve* even in the open position, when asked to "explain all the ways Figure 4 has a gas tight *seal*," he responded "Figure 4 has a gas tight seal when the cap is closed and basically that is it," and while it has a "gas tight valve," he did not respond that it was a gas tight seal when open. EX2004, 101:23-102:3. This is because it is not. The only gas tight seals in the open configuration of Fig. 4 are those in the cap, a seal formed on the collector surface and a seal formed by o-rings near the top of the central chamber. EX2002, ¶40; *see also id.*, ¶¶48-49.

Accordingly, the claim recites "gas tight seal"—it does not recite "valve." The claim term "gas tight seal" should be construed to refer to a seal that is gas tight, not a structure that is not gas tight, such as an open valve. EX2002, ¶37.

C. "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal"

Petitioner alleges ambiguity based on arguing three possibilities as to what "gas tight seal" refers to. Pet., 5. While the petition's proffered "three possible constructions" are themselves erroneous and unclear, the Board instituted trial to address whether "with a gas tight seal" modifies: (1) a volume, (2) a collector surface, or (3) the precursor isotope source is configured to be fluidly coupled. DI, 12-13. As recognized by the Board in the institution decision and addressed further below, under a plain reading of the claims "gas tight seal" modifies the "collector surface." The claims and prior art should be evaluated under that understanding.[1] As discussed above, doing so effectively eliminates from consideration Grounds 1, 2, 6, 7 and 11. None of these grounds are based on a plain reading of the claims where "gas tight seal" modifies the "collector surface."

Of course, none of Petitoner's proffered "three possible constructions" actually advanced in the petition is correct, as discussed below. Those

[1] As discussed, the petition challenge can and should be rejected for being premised on the erroneous "three possible constructions," none of which are correct. Patent Owner does not concede otherwise. Petitioner should not be relieved of their burden of presenting its case in the petition.

constructions and the grounds on which they depend (i.e., all grounds of challenge) should be rejected. EX2002, ¶¶42-43.

1. Petitioner's first construction is unsupported

Petitioner proposes its "first construction" as follows: "The entire volume has a gas tight seal (with the precursor isotope source inside the volume)." Pet., 5. On the same page Petitioner argues that, under this construction, "a POSITA would have understood the gas-tight seal of this limitation to include a gas-tight seal that *selectively* fluidly couples the precursor isotope source to a volume, as shown in Figure 4."[2] *Id.* In the shown annotated version of Figure 4, the petition marks (without explanation) with a red box the "Gas and liquid tight lid/valve" that is actuated to contact the "Chamber with gas tight o-ring seal." There is no coherent construction proposed here, and the argument should be rejected as unsubstantiated, confusing, and improperly inserting additional and different language not recited. EX2002, ¶45.

For example, the petition introduces the new term "the entire volume." No explanation is provided and is unclear how "the entire volume" distinguishes from "the volume" also mentioned in its construction or what is claimed. Petitioner also introduces new terminology arguing a gas-tight seal that "selectively fluidly

[2] Emphases added unless otherwise indicated.

couples." Similar to the discussion above, the claim recites the term "fluidly coupled"—the term "selectively" is not recited in the claim.

The petition's citation to an annotated version of Figure 4 with virtually no discussion only adds confusion. *See* Pet., 5-6. Petitioner identifies the "lid/valve" that is brought in contact with the illustrated "chamber" (Pet., 5 arguing "selectively fluidly couples the precursor isotope source to a volume"), but ignores both the container volume and the "gas tight cap." *See* EX1001, Fig. 4 (Patent Owner annotated below). Unlike the "lid/valve," the gas-tight cap provides a gas tight seal for the container volume while the precursor surface is fluidly coupled to the collector surface.

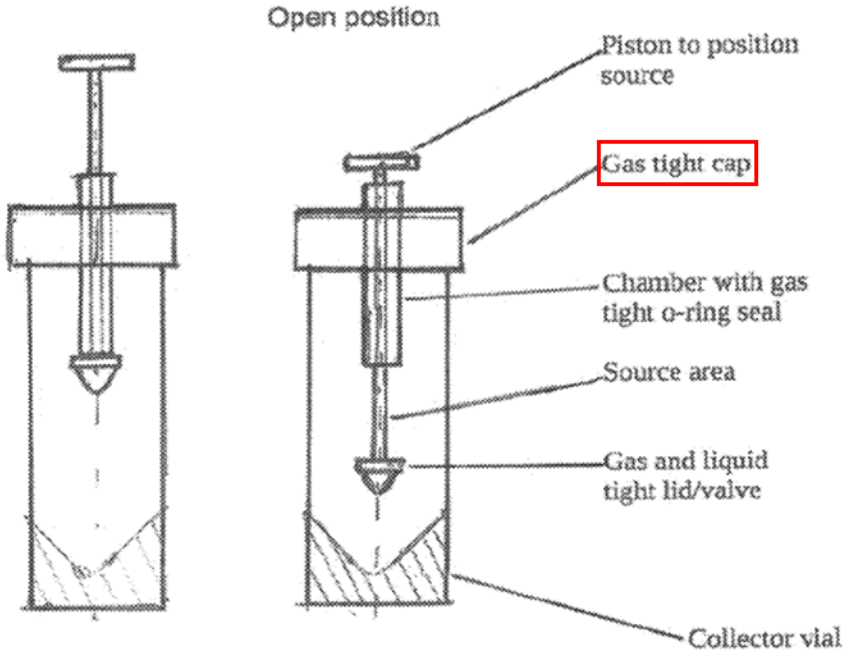


Fig. 4A

Fig. 4B

Ultimately, it is indeterminable what Petitioner considers "the entire volume," "the volume" or the claimed volume—or why the injection of different terminology is appropriate. Pet., 5. Moreover, argument regarding a gas tight seal that "*selectively* fluidly couples" is another unsubstantiated departure from the claim language. *Id.* The petition's discussion of the grounds only adds further confusion and lack of clarity. In ground 1, for example, the petition injects additional new terminology in arguing "selectively fluidly couple *or isolate*," and specifically cites to Hassfjell-Hoff's "lower chamber (i.e., the claimed volume)." Pet., 19-20. For ground 3, the petition conflates together its "First and Second Constructions" without explanation and points specifically to "the second chamber 12 (a volume)," which is a subcomponent of Norman's generator. Pet., 51.

Accordingly, Petitioner's "first construction" is unsubstantiated and improperly burdens both the Board and Patent Owner with confusion and lack of particularity.

2. Petitioner's second construction is unsupported

Petitioner provides contradicting statements for its "second construction." First, the petition states the construction as follows: "Just the collector surface, *not the entire volume*, has a gas tight seal (when the precursor isotope source is inside the collector)." Pet., 5. On the next page, the petition inconsistently states that "under the second possible construction, this limitation should be construed to

require that the precursor isotope source is fluidly coupled to *a fully enclosed volume* that has a gas-tight seal." Pet., 6. Thus, according to Petitioner, the second construction requires that (1) the collector surface has a gas tight seal; (2) the entire volume *does not have* a gas tight seal; and (3) the fully enclosed volume *has* a gas tight seal. The petition does not address these seeming inconsistencies or explain how these requirements are simultaneously possible.

Moreover, the petition introduces multiple new, distinct terms without explanation: "the entire volume," "a fully enclosed volume," and "the collector." It is unclear what these different volumes are or how they relate either to each other or the "volume" recited in the claims. Additionally, the petition provides no reason why a negative limitation (the requirement that *the entire volume* does not have a gas-tight seal) should be read into the claims. Yet when asked about this negative limitation in cross examination, Dr. Mirzadeh repeatedly insisted that it was an essential aspect of his construction. *See* EX2004, 78:2-11, 87:22-88:23, 93:21-25. Thus, the petition fails to coherently present its second construction, let alone justify its adoption. Petitioner's second construction should thus be rejected. EX2002, ¶44.

3. Petitioner's third construction is unsupported

Petitioner's third construction reads as follows: "The system is configured to selectively couple, using a gas tight seal, a volume with the solid precursor isotope

source and a volume with a collector surface." Pet., 5. This construction introduces multiple new terms and concepts, yet the petition provides no justification whatsoever for its third construction.

Nor could it, as this third construction is divorced from the language of the claims. The third construction introduces the term "selectively couple," found nowhere in the claim. The construction deletes the claim term "fluidly," presumably expanding the scope of coupling. The third construction also expressly introduces *two* volumes despite the claim reciting one. The petition does not explain which of its two volumes is the volume recited in the claims, nor does Petitioner explain why a POSITA would interpret the claim language to require multiple different volumes. In sum, the petition provides no reason for the third construction, ignores the plain language of the claims, and introduces multiple elements not found in the claims. Rather than illuminating the meaning of the words in the claim, the construction presents more incoherent argument that injects confusion where none is warranted. The "third construction" should be rejected. EX2002, ¶45.

4. Properly construed, "gas tight seal" modifies "collector surface"

While it is not Patent Owner's burden to construe claim terms in the first instance, the plain meaning of the claim language indicates that the term "with a

gas tight seal" refers to the term it immediately follows in the claim: "a collector surface." In other words, the language requires that there be a gas tight seal on the collector surface. EX2002, ¶46.

This conclusion is supported by the "'rule of the last antecedent,' according to which a limiting clause or phrase … should ordinarily be read as modifying only the noun or phrase that it immediately follows." *Barnhart v. Thomas*, 540 U.S. 20, 26 (2003); *see, e.g., Davita Inc. v. Va. Mason Mem'l Hosp.*, 981 F.3d 679, 690 n.3 (9th Cir. 2020) (applying rule of last antecedent as "strongly suggesting" that a prepositional phrase refers to the words it comes immediately after); *Days Inn Worldwide, Inc. v. Shri Ganesai Ltd. Liab. Co.*, 791 F. Supp. 3d 540, 550 (D.N.J. 2025) (observing that "modifiers are usually taken to modify nearby words, not distant ones," including in the case of "prepositional phrases"). This rule applies unless "overcome by other indicia of meaning" contrary to the interpretation provided by the rule. *Barnhart*, 540 U.S. at 26.

The claim element reads as follows: "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal." The term "with a gas tight seal" appears immediately after "collector surface," making "collector surface" the last antecedent. The other terms identified in the institution decision—"volume" or "source is configured to be fluidly coupled" (DI, 12-13)—are more remote, and thus not appropriate referents.

EX2002, ¶47. Nor does the context in which this limitation appears contradict this interpretation—it is consistent with both the remaining claim language and examples in the specification for the collector surface to have a gas tight seal. *Id.*

In the institution decision, the Board agreed that this interpretation was the natural way to read the claim language noting that the claim "could be read to mean that only the collector surface has a gas tight seal as the 'collector surface' immediately precedes 'with a gas tight seal.'" DI, 19. The Board also agreed that this construction reads on the embodiments shown in Figs. 3A-B and 5A-B. *Id.* Nor are these the only embodiments in the specification matching this construction: the embodiments shown in Figs. 2A-B and 4A-B also have a gas tight seal on the collector surface. EX2002, ¶¶48-50.

The petition had argued for a construction that imposed two requirements: (1) the collector must have a gas tight seal, and (2) the volume of the generator must not have a gas-tight seal. *See* Pet., 5. Dr. Mirzadeh admitted in cross-examination Fig. 4 *does* have a seal on the collector surface where it meets the gas tight cap, and maintained that he excluded Fig. 4 from his construction because of the requirement he inserted that the volume must not contain a gas tight seal. *See* EX2004, 100:22-102:1. Indeed, as noted above, Dr. Mirzadeh emphatically and repeatedly insisted that the petition's second possible construction includes this negative limitation. *See* EX2004, 78:2-11, 87:22-88:23, 93:21-25. Thus, Dr.

Mirzadeh admitted that his construction read out a disclosed embodiment by including a limitation excluding the generator's volume from containing a seal. Without that negative limitation, found nowhere in the claim language, Petitioner has provided no basis to avoid the plain reading of the claim 1, which requires "a collector surface with a gas tight seal."

While the institution also addressed the two other constructions based on its understanding of Petitioner's arguments, the only reason identified for using those constructions was that the Board viewed them as also reading on some embodiments shown in the figures. *See* ID, 19-23. However, in claim construction, "the claims are 'of primary importance,'" and courts must "avoid the danger of reading limitations from the specification into the claim." *Phillips*, 415 F.3d at 1312, 1323 (quoting *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876)). To avoid doing so, rather than identifying what different embodiments might read on different constructions, a court's focus must be on "understanding how a person of ordinary skill in the art would understand the claim terms." *Id.* at 1323.

Even if there exist hypothetical constructions that read on some embodiments, that (e.g., when considered in a vacuum) is not a sufficient basis to alter the claim language. Petitioner bears the burden of construing the claim, yet it offers no evidence of the plain meaning a POSITA would ascribe to the claim language. And even if reading on embodiments shown in figures controlled claim

interpretation—which it does not—the correct construction (modifying "collector surface") reads on each embodiment shown in the figures. Even Petitioner admits that the "collector surface" construction reads on Figs. 3 and 5, and as noted above, Dr. Mirzadeh conceded that Fig. 4 also has collector surface with a gas tight seal. Pet., 6-8; EX2004, 101:6-102:1; *see also id.*, 90:1-16; *cf. id.*, 78:25-79:12 ("Q. The cap forms a gas tight seal. Is that correct? A. Yeah."). Put another way, because the "collector surface" construction is in accord with the rules of grammar and the plain and ordinary meaning a POSITA would apply, and because it is not inconsistent with the specification, the specification provides no reason to depart from that construction.

While the institution decision preliminarily adopted all three constructions (DI, 23), the Board correctly observed when discussing Ground 11 that "we have concerns as to whether it is appropriate to construe claim element [1.C] as having multiple constructions." DI, 43. The three constructions preliminarily adopted by the Board for purposes of resolution during the trial stage are mutually inconsistent: each requires different configurations, such that one construction could be satisfied without satisfying another. There is no indication in the claim language that this claim element was intended to capture a group of alternative configurations (e.g., requiring that any one of several different elements have a gas tight seal).

Because the plain rules of grammar identify the "collector surface" construction as correct, and no evidence of a POSITA's understanding dictates otherwise, element [1.C]'s gas-tight seal limitation should be interpreted to require the collector surface have a gas tight seal.

IV. THE PETITION FAILS TO ESTABLISH IT IS MORE LIKELY THAN NOT THAT ANY CHALLENGED CLAIM IS UNPATENTABLE

A. Ground 1 Fails to Demonstrate Hassfjell-Hoff Anticipates Claims 1, 3-4, 7-9, 11-12, 14-19, 22-26, 28-29, 31-32, 35-36, and 38

As an initial matter, there is no argument in the petition that Hassfjell-Hoff anticipates the claims under any construction where "the gas tight seal" modifies "the collector surface," including Petitioner's "second possible construction." As such, should the Board adopt the correct reading of the claims where "the gas tight seal" modifies "the collector surface," ground 1 can be rejected on the basis there is no argument advanced in the petition for anticipation under this reading.

As discussed above, each of Petitioner's "three possible constructions" are unsubstantiated and plainly erroneous and should be rejected accordingly. Any challenge based on such an erroneous construction, too, should be correspondingly rejected at least for being incurably based on a faulty premise. No alternate theory is advanced in the petition. And neither the Board nor Patent Owner should be burdened with proposing alternate theories or constructions—or otherwise playing archeologist with the record—on Petitioner's behalf. *See SAS*, 584 U.S. at 367

("[T]he petitioner's contentions, not the Director's discretion, define the scope of the litigation all the way from institution through to conclusion."); *Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1372 (Fed. Cir. 2023) ("[T]he Board should not be forced to 'play arch[a]eologist with the record.'" (second alteration in original) (quoting *Gen. Access Sols., Ltd. v. Sprint Spectrum L.P.*, 811 F. App'x 654, 657 (Fed. Cir. 2020))).

Regardless, even if Petitioner's failure to properly construe the claims is excused, Hassfjell-Hoff fails to anticipate the claims as properly construed, as discussed in further detail below.

1. Hassfjell-Hoff has not been shown to teach "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal" [Element 1c]

As discussed above in §III.C, this limitation requires that there be a gas-tight seal on collector surface. This corresponds to Petitioner's second construction (without the negative limitation Petitioner added). However, Petitioner did not even assert that Hassfjell-Hoff anticipates any claims under the second construction. *See* Pet., 19-22. Indeed, as discussed below, Hassfjell-Hoff fails to teach element 1c, as it lacks a collector surface with a gas tight seal. EX2002, ¶¶51-54.

Hassfjell-Hoff's generator is depicted in Fig. 2, shown below:

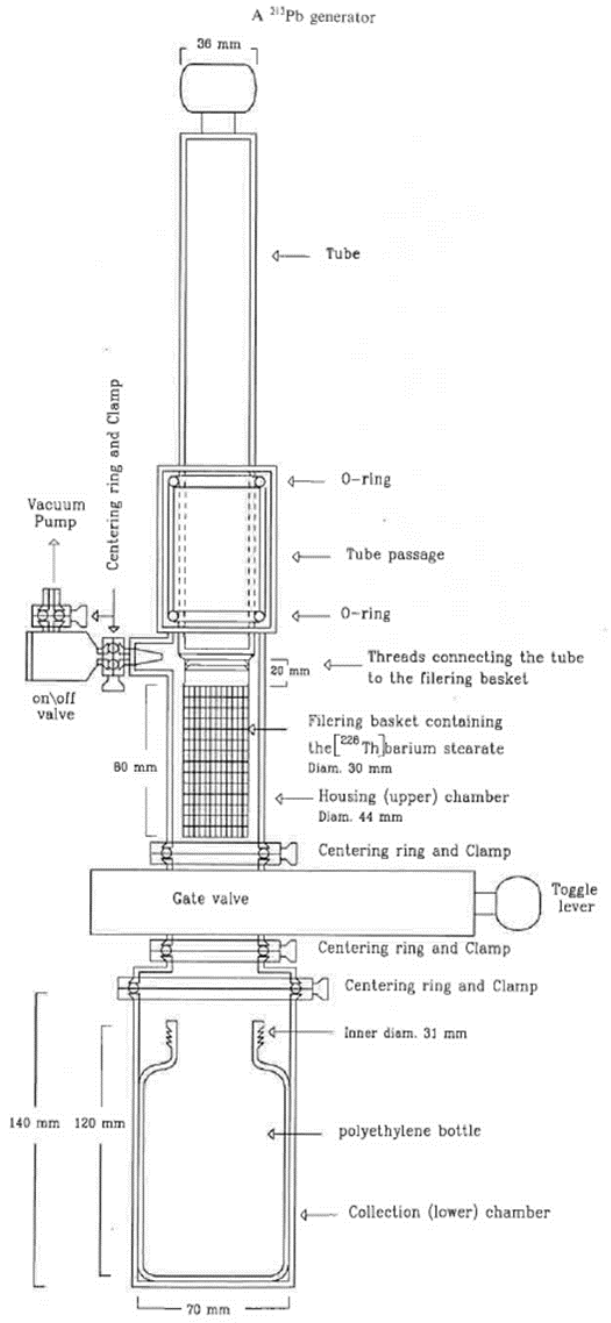


Fig. 2. The design of the generator showing functional details and operating mechanism.

EX1003, Fig. 2. The petition identifies the collector surface as the polyethylene bottle shown in the lower chamber of Fig. 2. Pet., 20, 22-23; *see also* EX2004, 89:21-25 (“the collection surface only refers to the surface that you can recover the Lead-212”); EX2002, ¶55.

Contrary to the requirements of limitation 1c, Hassfjell-Hoff's polyethylene bottle does not have a gas tight seal. Indeed, nowhere does Hassfjell-Hoff disclose a gas tight seal being formed on the surface of the polyethylene bottle. EX2002, ¶¶55, 58-59; *see generally* EX1003. And the petition does not assert that such a gas-tight seal is formed in Hassfjell-Hoff—indeed, in ground 5, the petition characterizes forming a gas-tight seal on the polyethylene bottle as a modification of Hassfjell-Hoff. *See* Pet., 67 ("A POSITA would have found it obvious to configure the surface at the top of the inner neck of the polyethylene bottle to mate with the chamfered end of the tube to enhance the integrity with a gas-tight seal between the end of the tube and the bottle."); EX1002, ¶177 ("Specifically, a POSITA would modify Hassfjell-Hoff such that its tube forms a gas-tight seal with the polyethylene bottle when the filering basket is lowered into the interior of the polyethylene bottle.").

Because the petition fails to show that Hassfjell-Hoff discloses a collector surface with a gas tight seal, Hassfjell-Hoff has not been shown to anticipate claim 1.

2. The Petition fails to show that Hassfjell-Hoff teaches "fluidly coupling a volume including a collector surface to the solid precursor isotope source using a gas tight seal" [Element 16c]

Petitioner devotes just two paragraphs to limitation 16c. In the first paragraph, Petitioner asserts that Hassfjell-Hoff anticipates limitation 16c because

it anticipates claim 1c. Pet., 35. As discussed above, Hassfjell-Hoff has not been shown to anticipate claim 1c, as Petitioner never applied a correct construction to that limitation. Because Petitioner's arguments for claim 1c apply only to incorrect constructions (that is, the first or third constructions), Petitioner fails to show that claim 1c is anticipated. *See also* Pet., 5-8 (not asserting that any of the constructions for claim 1 apply to or even relate to claim 16). Accordingly, Petitioner's argument for claim 16c also fails for relying on an invalid argument regarding claim 1c. EX2002, ¶56.

In the second paragraph, Petitioner asserts that "the gate valve is a gas tight seal that is selectively fluidly coupling the solid precursor isotope source to the volume that includes a collector surface." Pet., 35. Petitioner goes on to say that when the "gate valve is closed, the solid precursor isotope source is not fluidly coupled," and when the "gate valve is open, the solid precursor isotope source is fluidly coupled." *Id.*; EX2002, ¶57.

This argument also fails to show that Hassfjell-Hoff anticipates claim 16c. As Petitioner admits, there is no fluid coupling when Hassfjell-Hoff's gate valve is closed, yet when the gate valve is opened it does not provide a gas tight seal, since gas flows through it. EX2002, ¶58. An open valve like Hassfjell-Hoff's gate valve does not have a gas tight seal. Since the gate valve of Hassfjell-Hoff lacks a gas tight seal when fluid coupling is present, Hassfjell-Hoff fails to disclose "<u>fluidly</u>

coupling a volume including a collector surface to the solid precursor isotope source using a gas tight seal" as recited in limitation 16c. EX2002, ¶58.

Accordingly, Petitioner fails to show that Hassfjell-Hoff anticipates claim 16.

As the petition fails to show that Hassfjell-Hoff teaches each and every limitations of claims 1 or 16, Petitioner has not met its burden to show that Hassfjell-Hoff anticipates any of claims 1, 3-4, 7-9, 11-12, 14-19, 22-26, 28-29, 31-32, 35-36, and 38. EX2002, ¶60.

B. Ground 2 Fails to Remedy the Deficiencies of Ground 1

Ground 2 argues that in the event the "gate valve does not form a gas-tight seal, it would have been obvious to implement Hassfjell-Hoff's gate-valve as establishing a gas-tight seal between the upper and lower collection chambers." Pet., 45. Ground 2 otherwise relies on the same argument from ground 1.

As with ground 1, there is no argument in the petition that Hassfjell-Hoff anticipates the claims under any construction where "the gas tight seal" modifies "the collector surface," including Petitioner's "second possible construction." As such, should the Board adopt the correct reading of the claims where "the gas tight seal" modifies "the collector surface," ground 2 can be rejected on the basis that there is no argument advanced in the petition for anticipation under this reading.

Even if Petitioner's additional argument in ground 2 is considered it still does not cure the deficiencies of ground 1 that are relied upon and addressed above. Only the "first" and "third" constructions are advanced, which are flawed as discussed, with no alternate theory presented. Indeed, Petitioner does not and cannot show anticipation by Hassfjell-Hoff under the correct construction for claim 1, and Petitioner's arguments regarding claim 16 fail for the reasons discussed above for ground 1. Regardless of whether the gate valve is gas tight when in a closed position, it is not gas tight in an open position, which is the only time there is fluid coupling between a precursor isotope source and a volume including a collector surface. Accordingly, ground 2 fails to show the obviousness of any claim for similar reasons to those discussed above for ground 1. EX2002, ¶¶52, 60.

C. Ground 3 Fails to Show Norman Anticipates Claims 1, 3, 5-7, 15-16, 18, 20-22, 29-33, and 35-37

Norman has not been shown to anticipate or render obvious claims 1, 3, 5-7, 15-16, 18, 20-22, 29-33, and 35-37 at least because it has not been shown to teach limitations 1c and 16c of the independent claims. EX2002, ¶¶61-62.

As a threshold matter, the petition improperly relies on what the petition admits are two separate embodiments in Norman: the generators depicted in Figs. 1 and 2. Pet., 51-54; *see* EX1007, 2:40-45 ("FIG. 1 is sectional view of a diffusion generator…. FIG. 2 is a sectional view of an alternate embodiment of the generator…."); Pet., 49 ("Figures 1 and 2 are each an 'alternate embodiment of the

generator" (quoting EX1007, 2:40-45, 7:65-8:1)); *see also id.*, 65 (discussing "the Figure 2 embodiment" as distinct from that shown in Fig. 1); EX2002, ¶63.

It is well-established that anticipation is not established by picking and choosing different elements of different embodiments, even if those different embodiments are found in the same reference. To anticipate a claim, a reference "must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim.'" *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Thus, anticipation cannot be shown by pointing to a reference that merely "includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention." *Id.*, 1371. By proposing such a combination of distinct embodiments, Petitioner advances an improper anticipation ground.

In addition to this deficiency, when addressing claim element "[1c]," the petition incorrectly asserts that it teaches "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface **using a gas tight seal**." Pet., 51; *see id.*, 52 (quoting same language). This is not what element 1c recites. Instead, element 1c recites "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface **with a gas tight seal**." EX1001, claim 1. Because Petitioner does not

compare the language actually found in the claims to the teachings of Norman, it fails to show that limitation 1c is taught by Norman. EX2002, ¶62.

Regardless, even applying the teachings of Norman cited by Petitioner, and presuming the different embodiments of Norman would be combined, Norman has not been shown to disclose limitation 1c. Limitation 1c requires that the collection surface have a gas tight seal. Petitioner identifies the collector surface as "the sides of the collecting chamber 12" in Fig. 1 of Norman, or alternatively a porous medium on that surface. Pet., 53; *see* EX1007, Fig. 1, 3:4-20. These elements are shown in Figs. 1 and 2, reproduced below with Petitioner's mark-up:

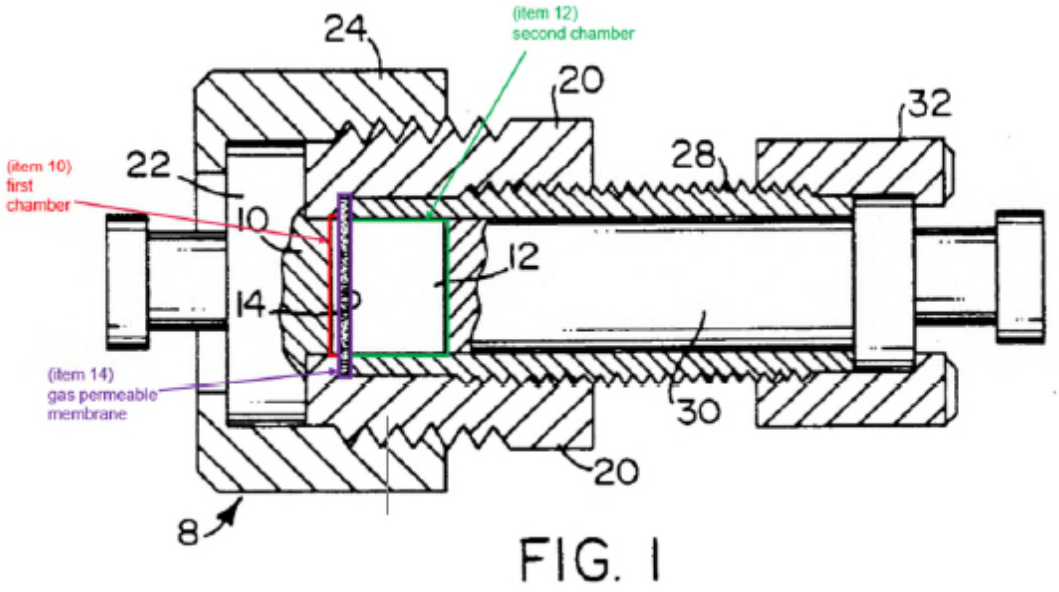
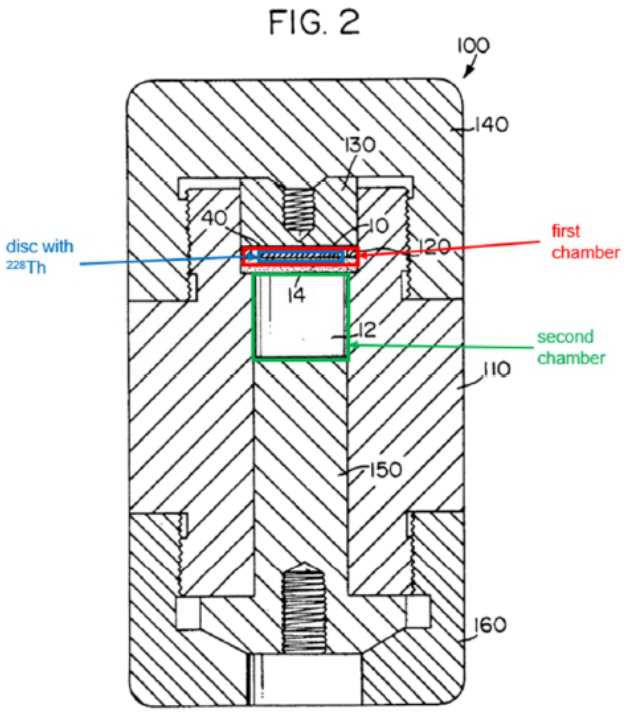


FIG. 1



Pet., 50, 53 (marking up EX1007, Figs. 1-2). The collection surface identified by Petitioner is thus the surface of the chamber marked in green in the figures above. EX2002, ¶63.

At institution, the Board correctly questioned whether Norman disclosed a collector surface with a gas tight seal, noting that the Board did "not understand the Petition to provide sufficient evidence and argument explaining how just Norman's second chamber 12 has a gas tight seal." DI, 39.

Indeed, Petitioner never identifies a gas-tight seal on a collector surface in Norman's generators. Norman's "receiving chamber 12" (the "second chamber" labeled above) has an opening on one end, where it attaches to a "gas permeable membrane" (labeled in purple in Fig. 1 and also shown as element 14 in fig. 2).

EX1007, 6:12-16, Figs. 1-2. This gas permeable membrane is interposed between the parental chamber 10 and receiving chamber 12, allowing gas to flow between them. *Id.* A gas-permeable membrane is not a gas tight seal; indeed, the fact that it is gas permeable means specifically that it is not gas tight. EX2002, ¶64.

Petitioner points to nothing constituting a gas-tight seal on the collector surface. Indeed, Petitioner's argument is addressed to language not in the claims, so despite asserting that Norman meets Petitioner's "second construction," the petition makes no showing whatsoever to support its assertion. Accordingly, Norman has not been shown to teach limitation 1c. EX2002, ¶¶62-64.

With regard to the remaining independent claim (claim 16), Petitioner relies exclusively on its reasoning for claim 1 for the limitations regarding a gas-tight seal. *See* Pet., 60. As explained above, Norman has not been shown to teach limitation 1c as properly construed. Because Petitioner's arguments for claim 1c apply only to incorrect constructions, Petitioner fails to show that claim 1c is anticipated. *See also* Pet., 5-8 (not asserting that any of the constructions for claim 1 apply to or even relate to claim 16). Petitioner thus fails to show that Norman discloses "fluidly coupling a volume including a collector surface to the solid precursor isotope source using a gas tight seal" as recited in claim 16 for similar reasons to those discussed above for claim 1. EX2002, ¶65.

However, even considering Petitioner's misplaced arguments for claim 1 as applied to claim 16, Petitioner still fails to show that limitation 16c is satisfied. Petitioner identifies the "volume" recited in the claims as "second chamber 12" (Pet., 51), yet this volume does not use a gas tight seal—it uses a gas-permeable membrane. EX2002, ¶66.

Petitioner also asserts that "escape of radon from the generator is prevented" when discussing Fig. 2, citing to various uses of the word "seal" in Norman. Pet., 53-54 (citing EX1007, 7:65-8:24). But the cited portion of Norman does not describe providing a gas-tight seal to the volume, on the collector surface, or even used to provide fluid coupling. Pet., 53-54; *see* EX1007, 7:65-8:24 (discussing use of "seal ring" and "seal cap" to provide spacing of chambers and diffusion membrane, not a gas-tight seal). Given Norman's failure to teach limitation 1c, Petitioner fails to explain how this disclosure in Norman would have been understood to provide "fluidly coupling a volume including a collector surface to the solid precursor isotope source using a gas tight seal" as recited in claim 16c.

Petitioner also identifies an alternative embodiment in Norman that involves a stopcock inserted between the first and second chambers as allegedly teaching a gas tight seal. Pet. 54; *see* EX1007, 8:33-41. However, similar to the gate valve of Hassfjell-Hoff, this stopcock does not fluidly couple the precursor isotope source to the collector surface using a gas tight seal—as Petitioner admits, when the

"stopcock is closed, the solid precursor isotope source is not fluidly coupled," whereas "the gaseous ^{220}Rn diffuses from parental chamber 10 into the collection chamber 12" only when it is opened (and thus does not use a gas tight seal). Pet., 54; EX1002, ¶133. Thus, in addition to failing to teach limitation 1c, these teachings of Norman have also not been shown to teach or suggest limitation 16c. EX2002, ¶67.

Accordingly, the petition has not shown that Norman anticipates any of claims 1, 3, 5-7, 15-16, 18, 20-22, 29-33, and 35-37. EX2002, ¶68.

D. Ground 4 Fails to Remedy the Deficiencies of Ground 3

Ground 4 asserts obviousness over Norman, alleging that it would have been obvious to combine the different embodiments of Figs. 1 and 2 to use Fig. 1's purported gas-tight seal in the embodiment of Fig. 2. Pet., 65-66 ("It would have been obvious to a POSITA to utilize the teaching of Norman regarding having a gas tight seal for Figure 1 in the Figure 2 embodiment."). This argument fails for several reasons.

First, the argument is conclusory and insufficiently explained. Petitioner argues the two different embodiments "are fully compatible with each other" and could be combined with "minimal effort." Pet., 65-66. But there is virtually no explanation why this is so or any explanation how the two different embodiments would be combined. For example, in Ground 3 Petitioner cites to the "plungers 22

and 30" and "end caps 24 and 32" of Norman Fig. 1. Pet., 53. Here, Petitioner offers no explanation whatsoever as to why such plungers and end caps would be combined into the embodiment of Norman Fig. 2, how this would be accomplished, or what effort would be required. Such conclusory argument is insufficient to establish obviousness.

Additionally, even if this combination is considered it does nothing to remedy the deficiencies of ground 3 as discussed above. Accordingly, ground 4 fails to show the obviousness of any claim for similar reasons to those discussed above for ground 3. EX2002, ¶68.

E. Ground 5 Fails

Ground 5 asserts that claims 1, 3-9, 11-12, 14-26, and 28-33, and 35-38 were obvious over Hassfjell-Hoff in view of Norman. With regard to the independent claims, Petitioner proposes to "combine Hassfjell-Hoff and Norman to implement the Hassfjell-Hoff system with Norman's gas tight seal on the collection chamber." Pet., 68; *see id.*, 70-71. Specifically, to address claim element 1c, the petition proposes "to implement Hassfjell-Hoff such that there is a gas-tight seal around the collection container during collection as disclosed by Norman." Pet., 67; *see also id.*, 68 ("to configure the Hassfjell-Hoff system to form a gas-tight seal between the tube and the polyethylene bottle."). For ground 5, Petitioner argues only that its

"second construction" is satisfied. Pet., 67 ("second 1c construction"), 68 ("limitation 1c second construction").

As discussed below, ground 5 fails for various reasons, as Petitioner has neither identified teachings in the prior art of the modification proposed in the petition nor shown that a POSITA would have had reason to make the petition's modification. EX2002, ¶¶69-70.

1. Petitioner Fails to Ground Its Combination in the Prior Art

Petitioner proposes modifying Hassfjell-Hoff's device "to establish a gas-tight seal between the bottom end Hassfjell-Hoff's tube and the neck of the polyethylene bottle when the filering basket is lowered into the interior of the polyethylene bottle." Pet., 67. To arrive at this newly created structure, Petitioner points "specifically" to a completely unrelated structure in Norman. Pet., 68 ("plungers 22 and 30 are inserted and secured with end caps 24 and 32" (quoting EX1007, 7:22-25)); *see* EX1007, Fig. 1 (shown below with Petitioner's annotations).

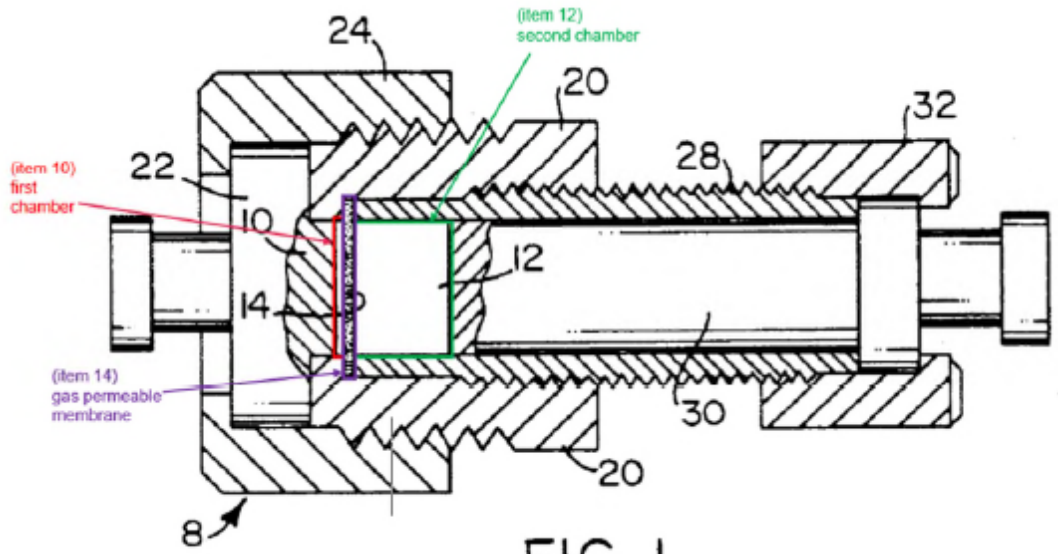
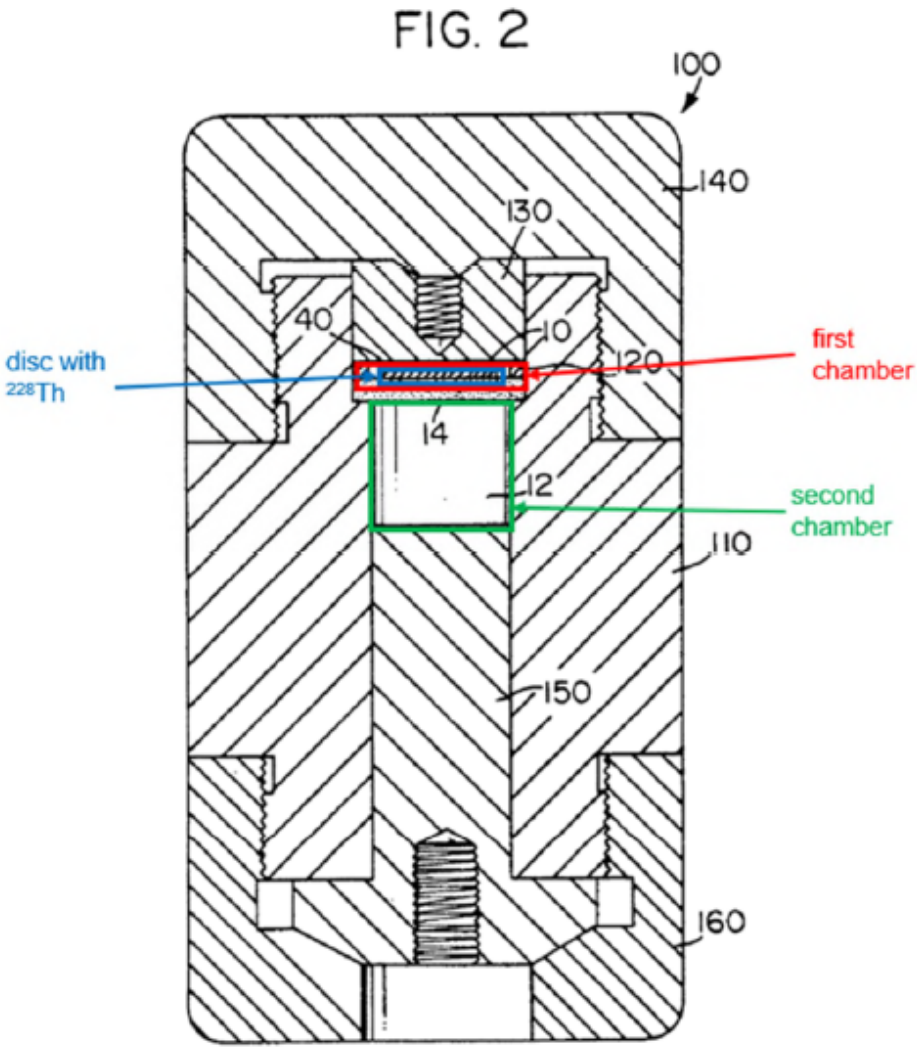


FIG. 1

The 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." Only impermissible hindsight draws together these two different and unrelated structures in Petitioner's argument. *See, e.g.*, *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) ("A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."); *K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014) ("[T]he Board was correct to require record evidence to support an assertion that the structural features of [the claims] were known prior art elements."); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall

victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."); EX2002, ¶¶71-72.

Petitioner also mischaracterizes Norman in asserting that "Norman discloses using a gas tight seal on the collection chamber," citing to column 7, lines 22-25 of Norman. *Id.* The collection chamber of Norman (which Petitioner maps to the "volume" in ground 3), is "collection chamber 12" (referred to interchangeably as "receiving chamber 12"), shown below marked in green by Petitioner:



EX1007, Fig. 2 (annotated), 8:2-16; Pet., 50. Collection chamber 12 has no gas-tight seal: as explained above in ground 3, Norman's collection chamber as shown above has a *gas-permeable* membrane at its top, not a seal. *See* EX1007, Fig. 2, 8:2-16 ("The gas permeable membrane 14 … separate[es] the cylindrical chamber into a parental chamber 10 and a receiving chamber 12.… so as to provide collection chamber 12 between the diffusion membrane 14 and the inner end of plunger 150."); EX2002, ¶71.

Petitioner's citation to Norman does not say what Petitioner wants it to say. The cited part of Norman states "If the receiving chamber is also closed … the escape of radon **from the generator** is prevented." EX1007, 68. This does not describe any seal for the volume of the collection chamber 12. Norman merely says that radon does not escape from its generator. Norman never says that its collection chamber (or anything else) has a gas-tight seal. It could not, since gas freely flows out of the collection chamber 12 through the gas-permeable membrane 14 and into parental chamber 10. EX2002, ¶71.

While Petitioner also cites to U.S. Patent No. 9,281,089 (EX1017) as allegedly teaching "ways to create a gas-tight seal on the collection chamber" (Pet., 68-69 (citing EX1017, Cover, Figs. 3-9)), this assertion finds no support in the cited patent. In fact, as Mr. Conroy explains, the figures from EX1017 do not show a gas tight seal resembling the type of seal proposed by Petitioner. EX2002, ¶73.

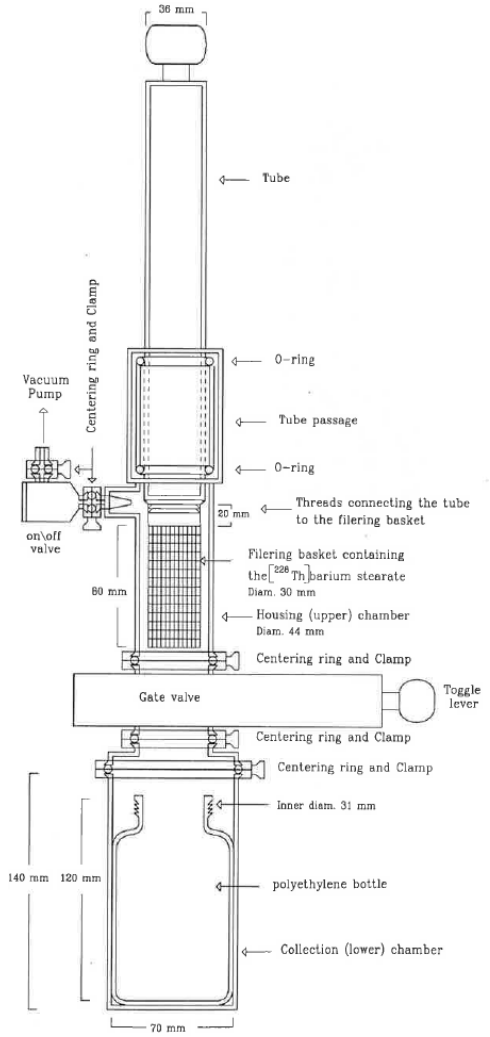
Indeed, the examples in that patent do not show such a gas-tight seal. Rather, they discuss containers to prevent escape of line-of-sight radiation like gamma rays, not emanation of radioactive gas (which is not line-of-sight). EX2002, ¶73; *see* EX1017, 3:28-39.

Accordingly, Petitioner's obviousness case fails as it is not grounded in the teachings of the prior art.

2. Petitioner Fails to Show Motivation for Its Combination

Even putting aside the petition's mischaracterization of the prior art and the illogical path from plungers/caps to a seal formed by a "chamfered end of the tube," the petition fails to establish such a newly created structure would be necessary or desirable in the context of Hassfjell-Hoff. Petitioner asserts that modifying Hassfjell-Hoff's polyethylene bottle to have it form a gas-tight seal with Hassfjell-Hoff's tube would be desirable to a POSITA because the resulting seal "would reduce the possibility of outside contamination or allowing radioactivity to escape the container." Pet., 68. To remedy this alleged concern, Petitioner proposes modifying Hassfjell-Hoff's bottle and tube to mate and form a gas tight seal so as to prevent radon gas (^{220}Rn) from flowing into the areas outside of the bottle's interior.

Hassfjell-Hoff expressly indicates contamination is not a concern in its device and the proposed modification, in any event, would not eliminate exposure that already occurs outside the polyethylene bottle. Petitioner's proposal is to have Hassfjell-Hoff's tube form a seal when it contacts the polyethylene bottle, but this would not prevent radon gas from filling the part of Hassfjell-Hoff's collection chamber outside of the bottle. This is readily apparent looking at Hassfjell-Hoff's Figure 2. EX1003, Fig. 2; EX2002, ¶74.



The process of bringing the filering basket into the lower chamber begins with the basket in the upper chamber with the gate valve closed, as shown. *See* EX1007, 7-8. At that point, ^{220}Rn fills the upper chamber. *See* EX2004, 29:14-30:6. When the gate valve is opened, ^{220}Rn freely emanates throughout the upper and lower chambers before the tube is lowered down. *See id.*; EX2002, ¶58.

Petitioner's proposal would not prevent radon gas from emanating to the outside of the polyethylene bottle. Instead, the proposed combination would involve the following sequence of steps: (1) opening the gate valve; (2) lowering

the tube into the lower compartment until the filering basket enters the polyethylene bottle; (3) contacting the top of the polyethylene bottle with the bottom of the tube, which Petitioner proposes modifying to form a gas tight seal; (4) letting radon continue emanating into the bottle; (5) breaking the seal as the tube begins withdrawing; (6) lifting the tube until the filering basket is in the upper compartment; and (7) closing the gate valve. EX2002, ¶75.

From step 1 to step 3, and from step 5 to step 7, the [^{228}Th]barium stearate in the filering basket will be exposed to the entire generator interior, including the part of the lower compartment outside of the polyethylene bottle. *Id.* This exposure will cause ^{220}Rn gas to flow to all of these areas, with the result that radioactive material (^{220}Rn and its decay products such as ^{212}Pb) will reach these volumes and coat their surfaces. *Id.*

Thus, Petitioner's proposed modification would not "reduce the possibility of outside contamination or allowing radioactivity to escape the container" (Pet., 68); instead, radioactive ^{220}Rn would freely fill the lower chamber and deposit ^{212}Pb on the bottle's surface. *Id.*

Furthermore, Petitioner's proposed rationale is contrary to Hassfjell-Hoff's own teachings. Petitioner asserts that a POSITA would be motivated to make the petition's modification to prevent contamination of the area outside of the bottle (e.g., on the bottle's outer surface). *See* Pet., 68. Hassfjell-Hoff disagrees, teaching

that there are no contamination concerns. It addresses concerns of contamination, explaining that "[n]o contamination from ^{228}Th or ^{224}Ra outside the filter membrane packets has been detected." EX1007, 7. Moreover, Hassfjell-Hoff also teaches that "99% of the ^{212}Pb can be washed of the walls of the bottle" using a simple saline solution. *Id.* In other words, contrary to Petitioner's proposed reasons for modifying Hassfjell-Hoff, the reference itself teaches that contamination is of no concern. In contrast, the proposed modification would add greater complexity and cost to Hassfjell-Hoff's device. The petition fails to address disclosure in Hassfjell-Hoff undermining the reasoning behind its proposed modification, or explain why a POSITA would opt for greater complexity and points of failure to accommodate an issue the authors themselves say is not a concern. EX2002, ¶76.

Thus, Petitioner fails to advance a sufficient motivation for its proposed modification of Hassfjell-Hoff. For at least the foregoing reasons, Petitioner fails to meet its burden to show that any of claims 1, 3-9, 11-12, 14-26, and 28-33, 35-38 were obvious over Hassfjell-Hoff and Norman. EX2002, ¶77.

F. Grounds 6-10 Fail to Remedy Hassfjell-Hoff's and Norman's Deficiencies

Each of grounds 6-10 asserts obviousness of different sets of dependent claims, with each ground relying on the petition's prior mapping in one of grounds 1-5. *See* Pet., 73-80 (relying in grounds 6-7 on ground 1 for independent claim elements), 80-91 (relying in ground 8 on ground 3 for independent claim

elements), 92-93 (further relying in ground 9 on ground 8's mapping), 93-95 (relying in ground 10 on ground 5's mapping).

As an initial matter, grounds 6 and 7 rely on the ground 1 arguments based on Hassfjell-Hoff for the independent claims, and there is no argument in the petition that Hassfjell-Hoff anticipates the claims under any construction where "the gas tight seal" modifies "the collector surface," including Petitioner's "second possible construction." As such, should the Board adopt the correct reading of the claims where "the gas tight seal" modifies "the collector surface," grounds 6 and 7 can be rejected on the basis there is no argument advanced in the petition for anticipation under this reading.

Indeed, none of grounds 6-10 addresses any independent claim element, and thus none of grounds 6-10 remedy the deficiencies of Hassfjell-Hoff and Norman discussed above for grounds 1-5. Accordingly, Accordingly, the petition fails to meet its burden with regard to any claim challenged in grounds 6-10 for similar reasons to those described above for grounds 1-5. *Supra* §§IV.A-E; EX2002, ¶78.

G. Ground 11 Fails to Demonstrate Unpatentability Under §112

The petition argues that claim 1 and its dependent claims are unpatentable as indefinite under 35 U.S.C. §112 because the term "wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal" (limitation 1c) allegedly "has three equally possible

meanings." Pet., 95-96. The petition does not elaborate on these meanings beyond citing back to its claim construction section. *See id.*

However, as explained above in §III, Petitioner fails to justify any of its proposed constructions are indeed plausible in the first place. None are substantiated, or even particularly coherently reasoned—sometimes with no reasoning at all presented. Moreover, Petitioner contradicts itself in its own characterization of those constructions, and provides no basis to conclude that a POSITA would be unable to understand the plain and ordinary meaning of the claims. EX2002, ¶¶79-80.

The argument in ground 11 provides no further elaboration on the petition's reasoning. Nor does Petitioner's declarant provide any supplementary explanation, as his testimony matches the petition's arguments verbatim. *See* EX1002, ¶¶36-39, 289-90. Because Petitioner fails to justify or even coherently describe its proposed constructions, and because Petitioner also fails show that a POSITA would not have been able to understand the claims under their plain and ordinary meaning, Petitioner fails to meet its burden to show that claim 1 or its dependent claims are indefinite under 35 U.S.C. §112(b).

Indeed, contrary to Petitioner's assertion in ground 11, a POSITA would not be "unable to determine the scope" of limitation 1c. Pet., 95. Rather, as explained in §III.C, a POSA would have been able to understand from the plain language of

the claims, read in light of the specification, that the term "with a gas tight seal" in limitation 1c characterizes the collector surface, not the other, more distant antecedents in limitation 1c. EX2002, ¶80; *see id.*, ¶¶42-50. Accordingly, Petitioner has not shown claim 1 or its dependent claims to be indefinite.

Accordingly, Petitioner fails to satisfy its burden in its §112 challenges to claims 1-9, 11-15 and 35-38. EX2002, ¶81.

V. PETITIONER'S EXPERT TESTIMONY DESERVES NO WEIGHT

The petition materials include declarations by two declarants, Per Hoff (EX1019) and Saed Mirzadeh (EX1002). These declarations fail to provide the meaningful analysis and explanation necessary to entitle them to weight. *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."); *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) (lack of factual support can render expert testimony "of little probative value in a validity determination"); *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15-16 (precedential) (testimony merely repeating petition arguments without providing additional "supporting evidence or technical reasoning" is "conclusory and unsupported … and is entitled to little weight").

The declaration of Dr. Hoff, for example, is entirely conclusory. A representative page of his declaration is reproduced below, showing the entirety of his analysis of independent claim 1 in ground 1.

A. Claim 1

A radioisotope generator comprising:
a solid precursor isotope source configured to emanate one or more gaseous progeny isotopes,
the solid precursor isotope source comprising a precursor isotope; and
wherein the solid precursor isotope source is configured to be fluidly coupled to a volume including a collector surface with a gas tight seal, and
wherein the solid precursor isotope source and the collector surface are configured such that the one or more gaseous progeny isotopes deposit one or more solid progeny isotopes on the collector surface.

38. In my opinion, Hassfjell-Hoff discloses this claim.

As illustrated, Dr. Hoff merely repeats the text of the claim and then asserts that Hassfjell-Hoff discloses it. This is the epitome of conclusory testimony and entitled to no weight.

The declaration of Saed Mirzadeh provides scant improvement. The Mirzadeh declaration copies the petition's attorney arguments verbatim (or nearly verbatim) without providing independent analysis. *Compare, e.g.*, Pet., 68-69, *with* EX1002, ¶178 (word-for-word identical except for the insertion of "in my opinion"). Accordingly, as Dr. Mirzadeh merely copies the petition arguments

without providing any new factual support or technical analysis, his declaration is also entitled to little or no weight. *See Xerox*, Paper 9 at 15-16.

Moreover, where he claims to have written portions of his declaration himself, Dr. Mirzadeh's analysis is sorely lacking. For example, Dr. Mirzadeh claims that he came up with the three "possible" constructions for limitation 1c himself (EX2004, 73:9-24), yet both the constructions and the subsequent discussion is self-contradictory and not tied to the understanding of a POSITA or the language of the claims. *See* EX1002, ¶¶36-39; *supra* §III.C.

VI. CONCLUSION

Accordingly, for at least the reasons set forth above, the Board should find that Petitioner has failed to show the unpatentability of any of claims 1-9, 11-33, and 35-38.

Respectfully submitted,

Date: February 04, 2026

/ Michael T. Rosato /
Michael T. Rosato, Lead Counsel
Reg. No. 52,182

CERTIFICATE OF COMPLIANCE

Pursuant to §42.24(d), the undersigned certifies that this paper contains no more than 18,700 words, not including the portions of the paper exempted by §42.24(b). According to the word-processing system used to prepare this paper, the paper contains 9578 words.

Respectfully submitted,

Date: February 04, 2026

/ Michael T. Rosato /
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VII. EXHIBIT LIST

EXHIBIT NO.	DESCRIPTION
2001	Disclaimer of Claims 10 and 34 in U.S. Patent No. 12,249,437
2002	Declaration of Charles Conroy
2003	Curriculum vitae of Charles Conroy
2004	Mirzadeh Deposition Transcript
2005	Mirzadeh Deposition Errata

CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Response Pursuant to 37 C.F.R. § **42.220** and accompanying Exhibits 2002-2005 were served on this 4th day of February, 2026, on the Petitioners at the following electronic service addresses:

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