

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUBILANT DRAXIMAGE INC.,
Petitioner,

v.

BRACCO DIAGNOSTICS INC.,
Patent Owner.

IPR2018-01448
Patent 9,299,468 B2

Before HYUN J. JUNG, GEORGE R. HOSKINS, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

JUNG, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a

preponderance of the evidence that claims 1, 2, 4–20, and 24–28 of U.S. Patent No. 9,299,468 B2 are unpatentable.

A. Background and Summary

Jubilant DraxImage Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of an *inter partes* review of claims 1, 2, 4–20, and 24–28 of U.S. Patent No. 9,299,468 B2 (Ex. 1001, “the ’468 patent”). Bracco Diagnostics Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6. Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of the ’468 patent. Paper 7 (“Dec. to Inst.”). In particular, we instituted review of claims 1, 2, 4–20, and 24–28 on all presented challenges. Dec. to Inst. 2, 16, 22.

After institution, Patent Owner filed a Response (Paper 13, “PO Resp.”), to which Petitioner filed a Reply (Paper 14, “Pet. Reply”). We authorized via email (1) Patent Owner to file a paper identifying arguments in Petitioner’s Reply that Patent Owner believed exceeded proper scope and (2) Petitioner to file a paper to identify where the contention Petitioner was responding to can be found. Patent Owner filed its authorized paper (Paper 15), and Petitioner filed its authorized response (Paper 16). Patent Owner thereafter filed a Sur-Reply (Paper 17, “PO Sur-Reply”).

An oral hearing in this proceeding was held on October 29, 2019; a transcript of the hearing is included in the record (Paper 26, “Tr.”).

B. Real Parties in Interest

Petitioner states that the “real parties-in-interest for this Petition are Jubilant DraxImage Inc., Jubilant Pharma Limited, and Jubilant Life Science Limited.” Pet. 2. Patent Owner states that “Bracco Diagnostics Inc. (‘Bracco’) is the real party-in-interest.” Paper 4, 2.

C. Related Matters

The parties indicate that the '468 patent has been asserted in *Bracco Diagnostics Inc. v. Jubilant DraxImage Inc.*, Case No. 3:18-cv-04422 (D.N.J.). Pet. 2; Paper 4, 2; PO Resp. 5; Ex. 1002 (complaint for patent infringement involving the '468 patent and others). The parties also indicate that the district court litigation is stayed pending resolution of Investigation No. 337-TA-1110 by the U.S. International Trade Commission ("ITC" or "Commission"). Pet. 2 (citing Exs. 1002–1004); PO Resp. 5 (citing Exs. 1002–1004); Ex. 1004 (order from civil action no. 3:18-cv-4422 granting joint motion to stay pending resolution of ITC Investigation No. 337-TA-1110).

In the ITC investigation filed March 27, 2018, Bracco Diagnostics, Inc. contends that Jubilant DraxImage Inc., Jubilant Pharma Limited, and Jubilant Life Sciences violate Section 337 of the Tariff Act of 1930 by importing strontium-rubidium infusion systems and components that infringe one of U.S. Patent Nos. 9,814,826; 9,750,869; and 9,750,870. Ex. 1003, 1, 14. The '468 patent is not part of the ITC investigation, but Patent Owner indicates that the investigation "involv[es] related patents." PO Resp. 5 (citing Exs. 1002–1004). Patent Owner also states that "an ITC evidentiary hearing was held April 11–17 relative to the related patents, and many of the same factual issues disputed there are also in dispute here." *Id.*

Patent Owner subsequently filed a "Notice of Commission Determination to Review in Part a Final Initial Determination Finding No Section 337 Violation." Paper 21; Ex. 2018 (notice from Investigation No. 337-TA-1110 issued Sept. 30, 2019). The notice states that a Final Initial Determination ("FID") was issued on August 1, 2019, "the FID finds . . . all

asserted claims are infringed but invalid as obvious over the prior art,” and the “Commission has determined to review the FID in part.” Ex. 2018, 2.

Petitioner filed a “Notice of Commission Final Determination of No Violation of Section 337; Termination of the Investigation.” Paper 27, 1; Ex. 1047. According to Petitioner, “Ex. 1047 indicates that the Commission determined to affirm with modification and to supplement the prior Final Initial Determination’s findings with respect to the invalidity of the patent claims asserted in the 1110 Investigation.” Paper 27, 1 (citing Ex. 1047, 2); Ex. 1047, 2 (stating that “the Commission has determined to affirm with modification and to supplement the FID’s findings with respect to the invalidity of the asserted patent claims”).

Petitioner also filed a public version of a Commission Opinion for Investigation No. 337-TA-1110. Paper 28; Ex. 1048. Petitioner states that the “Commission Opinion addresses several issues that are relevant to the present *inter partes* review.” Paper 28, 1. According to Petitioner, “the Commission considered teachings of the Klein and Tate references against claim elements that require an eluate reservoir, a shielded well, and a dose calibrator to be located ‘on-board a cart’” and held that “Klein, alone or in combination with Tate, teaches or discloses such subject matter.” *Id.* (citing Ex. 1048, 13–19). Petitioner also states that “the Commission considered teachings of the Klein reference against claim elements that require a computer not to allow a patient infusion when a strontium breakthrough test result is greater than or equal to an allowed limit” and held that “Klein teaches or discloses such subject matter.” *Id.* (citing Ex. 1048, 24–26). Patent Owner has filed an appeal of the Commission Opinion. Ex. 2019.

The '468 patent is also challenged in IPR2018-01450, and a related patent that claims priority to common applications is challenged in IPR2018-01449. Pet. 2; Paper 4, 2; PO Resp. 5.

D. The '468 Patent

The '468 patent issued March 29, 2016, from an application filed August 8, 2014, which is a continuation of an application filed June 11, 2009, which, in turn, is a continuation of four applications filed June 11, 2008. Ex. 1001, codes (22), (45), (63), 1:8–21; *see also* Pet. 9 (asserting that the “priority date for the '468 Patent is June 11, 2009” because the applications filed on June 11, 2008 fail to “provide written description support for ‘a dose calibrator carried by [a] movable cart’ as required by claims 1 and 24”).

The '468 patent relates to “systems that generate and infuse radiopharmaceuticals.” Ex. 1001, 1:25–26. Figure 1D of the '468 patent is reproduced below.

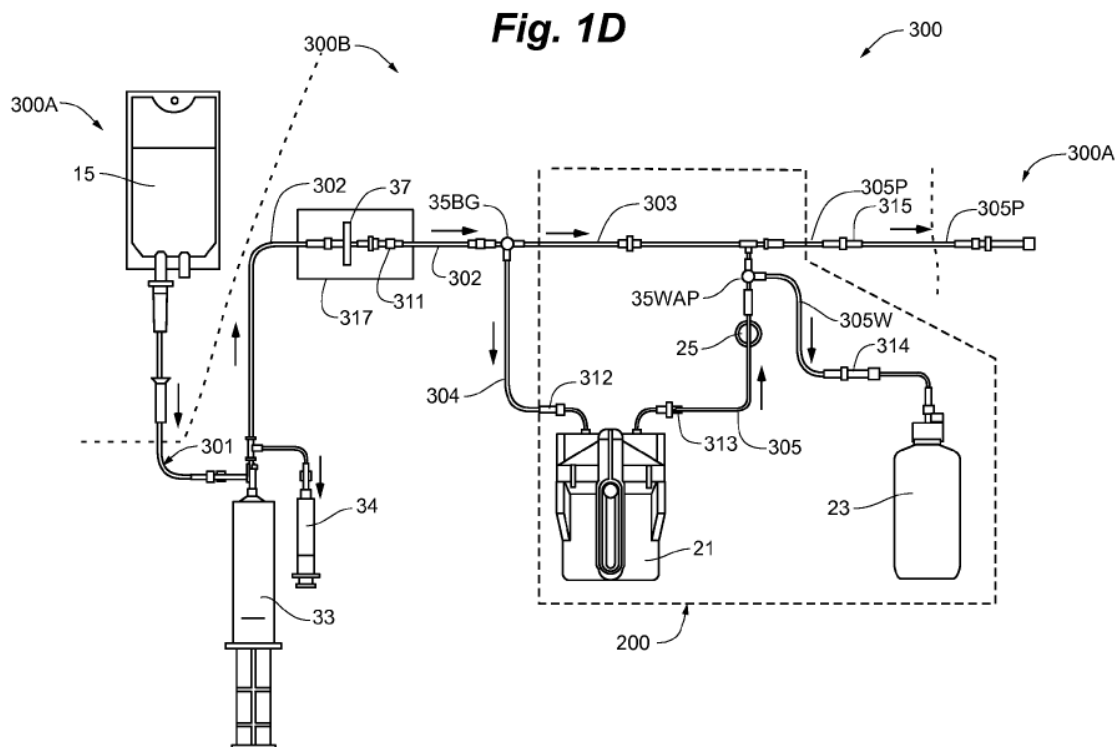


Figure 1D is “a schematic of an infusion circuit.” *Id.* at 2:10–11. Infusion system 10 can be mobile and may incorporate infusion circuit 300, a part of which is contained within shielding assembly 200. *Id.* at 3:52–54, 4:53–61, Fig. 1A. Infusion circuit 300 includes eluant reservoir 15 that contains saline as the eluant, syringe pump 33 that pumps eluant from reservoir 15, radioisotope generator 21 through which eluant is pumped to create a radioactive eluant, and activity detector 25 that measures the activity of the eluant from generator 21. *Id.* at 4:65–67, 5:2–3, 5:6–7, 5:10–11. Activity detector 25 also provides feedback for directing the eluant via divergence valve 35WP to either waste bottle 23 or patient line 305p. *Id.* at 5:10–14. Divergence valve 35BG directs eluant either to tubing line 304 to generator 21 or to by-pass tubing line 303 and patient line 305p. *Id.* at 5:41–45.

“[A]ccording to alternate embodiments, system 10 includes an ‘on board’ dose calibrator for quality control tests, and circuit 300 is expanded to include elements for an automated collection of eluate samples for activity measurements, via the on board dose calibrator,” such as “downstream of divergence valve 35WP and in communication with tubing line 305P.” *Id.* at 8:4–12; *see also id.* at 18:56–60 (stating “some alternate embodiments . . . include an on board dose calibrator so that the entire sequence of sample collection and calculation steps . . . for the quality control procedures, may be automated”).

Also, in some embodiments, “computer 17 is coupled to a controller of system 10” and “monitor 172 of computer 17 not only displays indications of system operation for a user of system 10, but also serves as a device for user input (e.g. touch screen input).” *Id.* at 3:28–33. “According to some embodiments, system 10 will not allow an infusion if the results

exceed the acceptable limits, and may present a screen explaining that the results are outside the acceptable limits.” *Id.* at 17:64–67.

E. Illustrative Claim

The ’468 patent has 29 claims, of which Petitioner challenges claims 1, 2, 4–20, and 24–28. Of those, claims 1 and 24 are independent. Claim 1 is reproduced below.

1. A mobile radioisotope generator system comprising:

a movable platform carrying an infusion tubing circuit, an activity detector, a dose calibrator, a computer, and a shielding assembly containing a strontium/rubidium radioisotope generator configured to generate a radioactive eluate via elution of an eluant,

the infusion tubing circuit including a tubing line connected between the strontium/rubidium radioisotope generator and the dose calibrator and configured to supply a portion of radioactive eluate to the dose calibrator,

the activity detector being positioned downstream of the strontium/rubidium radioisotope generator and configured to measure an activity of the radioactive eluate flowing through the infusion tubing circuit, and

the computer being electronically coupled to the dose calibrator and configured to execute automated quality control testing using the dose calibrator,

wherein the computer is configured to determine an activity of strontium-82 and an activity of strontium-85 in the portion of radioactive eluate through automated quality control testing using the dose calibrator,

the computer is configured to control the mobile radioisotope generator system to deliver a dose of radioactive eluate to a patient during a patient infusion procedure, and

the computer is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit.

Ex. 1001, 23:60–24:21.

F. Prior Art and Asserted Grounds

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

U.S. Patent Application Publication No. US 2004/0260143 A1, published December 23, 2004 (Ex. 1024, “Reilly”);

U.S. Patent Application Publication No. US 2008/0177126 A1, published July 24, 2008 (Ex. 1025, “Tate”);

U.S. Patent Application Publication No. US 2008/0242915 A1, published October 2, 2008 (Ex. 1023, “Jackson”);

U.S. Patent Application Publication No. US 2011/0178359 A1, published July 21, 2011 (Ex. 1022, “Hirschman”);

Ran Klein, *Precise ⁸²Rb Infusion System for Cardiac Perfusion Measurement Using 3D Positron Emission Tomography* (2006) (Ex. 1014, “Klein”); and

Bracco Diagnostics Inc., *CardioGen-82 Infusion System User’s Guide*, (rev. 07, 2004) (Ex. 1021, “Bracco Manual”).

Patent Owner states that “Klein, Reilly, and Tate all appear to be pre-AIA §102 prior art as of June 11, 2008.” PO Resp. 8.

The Petition is supported by a Declaration of Robert T. Stone, Ph.D. Ex. 1015. Petitioner also filed a Declaration of Venkatesh L. Murthy, M.D., Ph.D. Ex. 1017. Patent Owner filed a Declaration of Norbert J. Pelc, Sc.D. (Ex. 2003) and deposition transcripts for Dr. Stone and Dr. Murthy (Exs. 2010, 2016).

Petitioner asserts that claims 1, 2, 4–20, and 24–28 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 4, 6, 7, 9–17, 19, 24, 25, 28	103(a) ¹	Klein, Reilly, Tate
8	103(a)	Klein, Reilly, Tate, the Bracco Manual
18, 20, 27	103(a)	Klein, Reilly, Tate, Hirschman
5, 26	103(a)	Klein, Reilly, Tate, Hirschman, Jackson

Pet. 25–87.

II. ANALYSIS

A. *Legal Standards*

To prevail in its challenges, Petitioner must prove unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art;

¹ The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (Sept. 16, 2011), took effect on March 16, 2013. The application from which the ’468 patent issued was filed in August 2014, but asserts continuation priority to several applications filed before March 2013. Because there is no argument in the record to suggest the AIA version of Title 35 applies to the ’468 patent, our citations to Title 35 are to the pre-AIA version.

(2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

As discussed below, the parties’ disputes are related to the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and claims 1, 2, and 24. The parties do not present any objective evidence of nonobviousness.

After reviewing the complete record, we conclude that Petitioner has shown by a preponderance of the evidence that the asserted references teach or suggest each limitation of claims 1, 2, 4–20, and 24–28; that a person of ordinary skill in the art would have had a reason to modify or combine the asserted references; and that a person of ordinary skill in the art would have had a reasonable expectation of success in modifying or combining the asserted references.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art would have a

graduate’s degree with some emphasis in equipment design, automation, or controls, such as electrical engineering, systems engineering, mechanical engineering, or a related field, or an undergraduate degree in such fields with two to three years’ work experience in radioactive protection systems or in medical device product, automation, or instrumentation design and development, including work with prototypes and finished commercial products.

Pet. 10 (citing Ex. 1015 ¶¶ 32–42). Petitioner also contends that “[s]uch a person would have had a basic understanding, through education or experience, of general design control principles and processes and practices for partial or full automation of existing processes or test procedures.” *Id.*

(citing Ex. 1015 ¶¶ 32–42). Petitioner further argues that Patent Owner’s proposed level of ordinary skill in the related ITC case is flawed because the claims challenged in this proceeding additionally recite a computer that automates procedures previously manually performed by medical personnel and “[m]edical personnel like those suggested by the Patent Owner lack the education and experience to develop the hardware and software controls for such computer-controlled systems or to design radiation shielding.” *Id.* at 10–11 (citing Ex. 1015 ¶¶ 32–42; Ex. 1021; Ex. 1039).

Patent Owner asserts that a person of ordinary skill in the art “would generally have a graduate degree in medicine and/or in a medical related science, including physics, chemistry, biology, physiology, and/or biophysics, and would generally have at least some clinical, research and/or design experience with respect to PET imaging and/or PET imaging systems.” PO Resp. 6–7 (citing Ex. 2003 ¶ 27). Patent Owner also asserts that “[a]n individual with an undergraduate degree along with significant experience could also be sufficiently skilled,” “the amount of experience following an undergraduate degree would depend on the level of formal education and amount of experience working with radiopharmaceuticals,” and “such a person may be working as part of a team.” *Id.* at 7–8 (citing Ex. 2003 ¶¶ 27–29).

Patent Owner argues that Petitioner’s proposed level of ordinary skill is improper because it “does not actually require familiarity with elution of radioactive isotopes, PET imaging, or even systems employing any form of radioactive substance.” *Id.* at 7. Patent Owner also argues that Petitioner is “attempt[ing] to open the door to considering any instrumentation design or medical device design background, while ignoring that one of ordinary skill in the art would be particularly hesitant to make any changes to a system

involving radioactive materials when that system has serious design concerns specifically associated with radioactivity.” *Id.* Patent Owner further states that “the parties disagree regarding the [person of ordinary skill in the art] definition, both here and in the ITC.” *Id.* at 6 (citing Pet. 10–11). Patent Owner contends that “Petitioner has failed to show that the Challenged Claims are invalid under either party’s proposed level of skill.” *Id.* at 8. Petitioner replies that “[a]lthough the parties define [person of ordinary skill in the art] differently, neither party argues that the differences between them are material to the outcome of this IPR.” Pet. Reply 1–2.

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation and internal quotation marks omitted).

Klein addresses the development of a system for eluting a constant rate of activity. *See* Ex. 1014, 1 (“The goal of this project is to develop a system that is capable of eluting ^{82}Rb at a constant rate of activity from a $^{82}\text{Sr}/^{82}\text{Rb}$ generator for use in a clinical and experimental setting.”). Reilly similarly states a “desir[e] to develop devices, systems and methods through which toxic or hazardous pharmaceuticals (for example, radiopharmaceuticals) can be administered in controlled manner to enhance their effectiveness and patient safety, while reducing exposure of administering personnel to such hazardous pharmaceuticals.” Ex. 1024 ¶ 16.

Tate likewise states that “[i]t has long been recognized as very desirable to develop devices, systems, components and methods for calculating and delivering accurate and effective doses of

radiopharmaceuticals to patients, while reducing the exposure of administering or other medical personnel to such hazardous pharmaceuticals.” Ex. 1025 ¶ 11. Jackson similarly describes “a need to improve the quality control of the administration of radiopharmaceuticals to patients” and “a need to reduce the exposure of people, such as PET technicians, to radioactivity during the manual steps of administering a radiopharmaceutical to patients.” Ex. 1023 ¶ 11. According to Hirschman, “a need exists for integrated systems and methods capable of the generation, preparation, and administration of pharmaceutical substances . . . such as radioactive pharmaceutical substances.” Ex. 1022 ¶ 18.

Based on the full record before us, because the asserted references describe the problems and solutions of accurately delivering radiopharmaceuticals, reducing radiation exposure to operators, and integrating systems related to radiopharmaceuticals, we find that Petitioner’s proposed level of ordinary skill in the art, which includes understanding of equipment control, “radioactive protection systems,” and equipment design, is more consistent with the prior art of record than Patent Owner’s proposal. Pet. 10 (citing Ex. 1015 ¶¶ 32–42). We, therefore, apply Petitioner’s proposed level of skill to our analysis.

We also determine that the parties’ competing proposals regarding the level of ordinary skill agree in certain aspects. For example, both parties propose at least a graduate degree, albeit in different concentrations of study. See Pet. 10 (“graduate’s degree with some emphasis in equipment design, automation, or controls, . . . or a related field”); PO Resp. 6–7 (“a graduate degree in medicine and/or in a medical related science”). Both parties also alternatively propose that the ordinarily skilled artisan would have had “an undergraduate degree in such fields with two to three years’ work experience

in radioactive protection systems or in medical device product, automation, or instrumentation design and development, including work with prototypes and finished commercial products” (Pet. 10) or “an undergraduate degree along with significant experience,” “the amount of experience following an undergraduate degree would depend on the level of formal education and amount of experience working with radiopharmaceuticals” (PO Resp. 7–8).

We further determine that Petitioner’s proposed ordinarily skilled artisan with “an undergraduate degree in [equipment design, automation, or controls, or a related field] with two to three years’ work experience . . . in medical device product, automation, or instrumentation design and development” (see Pet. 10) would overlap, at least in part, Patent Owner’s proposal of a person having “a graduate degree in medicine and/or in a medical related science” and “at least some . . . design experience with respect to . . . PET imaging systems” (see PO Resp. 6–7). We, thus, determine that any differences between the parties’ proposed level of skill would not affect our analysis below. *See also* Pet. Reply 1–2 (“Although the parties define [person of ordinary skill in the art] differently, neither party argues that the differences between them are material to the outcome of this IPR.”).

C. Claim Construction

In the present *inter partes* review, claim terms in the ’468 patent, which is unexpired, are interpreted according to their broadest reasonable construction in light of the Specification of the ’468 patent. 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131,

2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).²

Petitioner states that “[a]ll claim terms have been assigned their ordinary and customary meaning in this analysis.” Pet. 12. “Patent Owner believes that no specific constructions are required at this time” (PO Resp. 6), and Petitioner replies that “[t]here are no claim construction issues in dispute” (Pet. Reply 1). *See also* Tr. 8:14–19 (Petitioner’s counsel agreeing that no claim term in this proceeding needs express interpretation).

We agree with the parties that no express interpretation is required for any claim term. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (construing explicitly only those claim terms in controversy and only to the extent necessary to resolve the controversy); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

D. Scope and Content of the Prior Art

Petitioner contends that June 2008 is “the earliest date to which the ’468 Patent claims priority” but that the “proper priority date for the ’468

² On October 11, 2018, the Office revised its rules to harmonize the Board’s claim construction standard with that used in civil actions under 35 U.S.C. § 282(b) in federal district court. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018). This rule change does not apply here. *See* Paper 3, 1 (according filing date of August 22, 2018 to the Petition); PO Resp. 6 (stating that the “present IPR was filed before the new IPR rules regarding claim construction were implemented”); *see also* Pet. 12 n.1 (arguing that “[i]f the Patent Office were to adopt the same claim construction standard as used in district court proceedings, the analysis would remain the same”).

Patent is June 11, 2009” because the written description support for “a dose calibrator carried by [a] movable cart” first appeared in an application filed on June 11, 2009. Pet. 1, 9 (citing Ex. 1010, 1196).

Patent Owner disagrees but states that “it is immaterial to this IPR whether June 11, 2008 or June 11, 2009 is the correct priority date as the cited art of Klein, Reilly, and Tate all appear to be pre-AIA §102 prior art as of June 11, 2008.” PO Resp. 8 (citing Pet. 9). Thus, because there is no priority dispute that would determine whether any of the references involved here are early enough to be prior art, there is nothing for us to decide in this regard.

Patent Owner also disputes that the Bracco Manual is a printed publication (*id.* at 58), which we address below in connection with the parties’ arguments regarding claim 8, against which Petitioner asserts the Bracco Manual along with other references.

1. *Klein (Ex. 1014)*

Klein is a student thesis that “describes the development of a Rubidium-82 (^{82}Rb) infusion system for use in positron emission tomography (PET)” and “is based on a $^{82}\text{Sr}/^{82}\text{Rb}$ generator which produces ^{82}Rb activity continuously.” Ex. 1014, 1³; *see also id.* at 8 (“ ^{82}Rb can be supplied using a $^{82}\text{Sr}/^{82}\text{Rb}$ generator.”)

“The goal of this project is to develop a system that is capable of eluting ^{82}Rb at a constant rate of activity from a $^{82}\text{Sr}/^{82}\text{Rb}$ generator for use in a clinical and experimental setting.” *Id.* at 1. Klein “introduces the

³ Our citations to Klein are to the page numbers found in the bottom center of each page.

second generation ^{82}Rb elution system (RbES).” *Id.* Figures 2-2, 2-3, and 2-4 of Klein are reproduced below. *Id.* at 19.

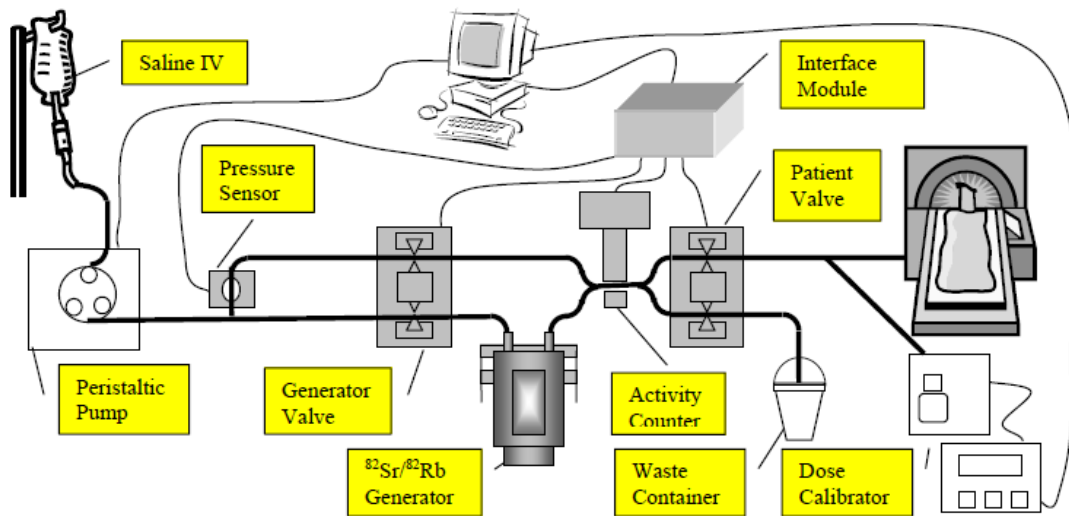


Figure 2-2 – Hardware component diagram of the RbES prototype [18] was not altered.

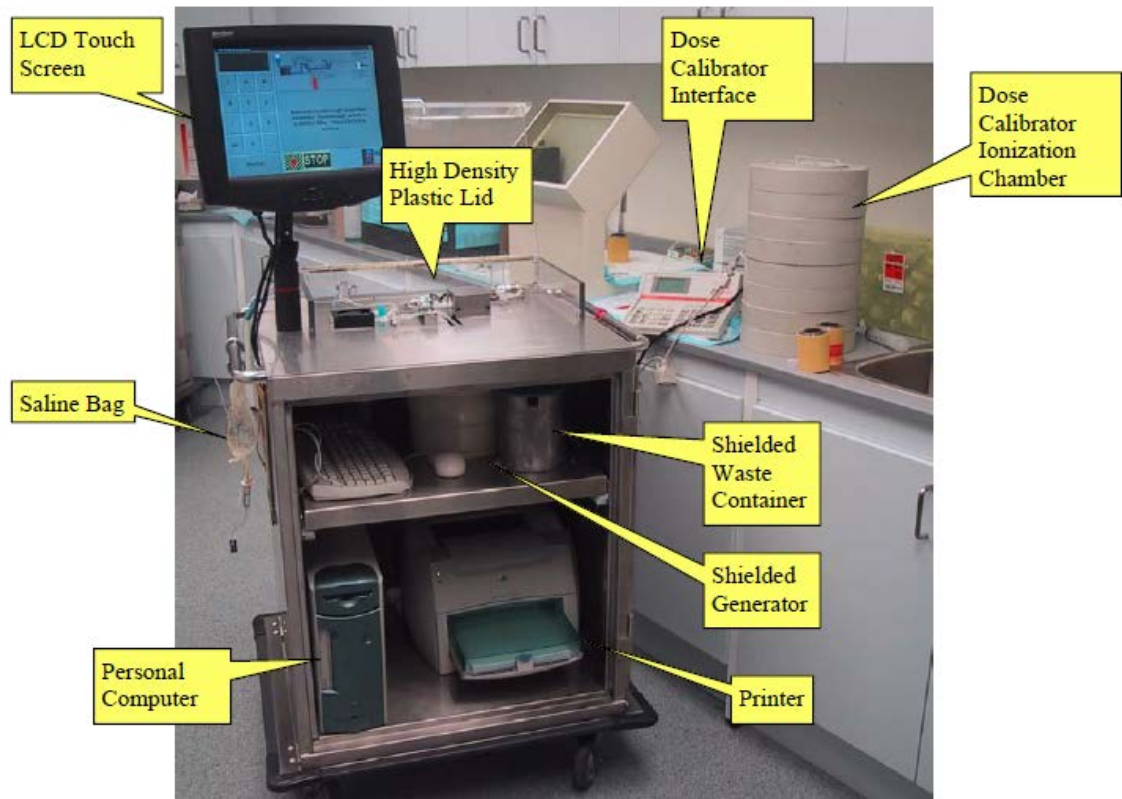


Figure 2-3 - Photograph of the assembled ^{82}Rb elution system and its components.

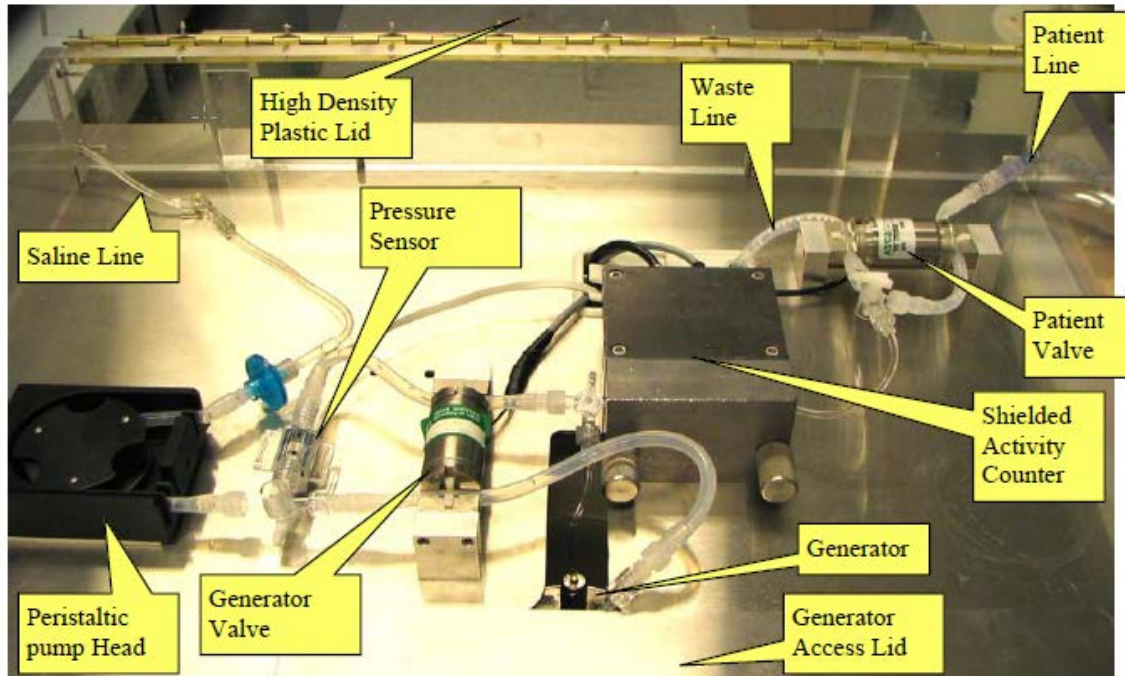


Figure 2-4 - Photograph of top cover of the ^{82}Rb elution system.

Figure 2-2 is a hardware component diagram of an RbES prototype. Ex. 1014, 19. Figure 2-3 is a “[p]hotograph of the assembled ^{82}Rb elution system and its components,” and Figure 2-4 is a “[p]hotograph of top cover of the ^{82}Rb elution system.” *Id.* at 24.

Klein includes a personal computer that interfaces with sensors and actuators to allow flow of saline through a $^{82}\text{Sr}/^{82}\text{Rb}$ generator or a bypass line to the patient, dose calibrator, or waste container. *Id.* at 19. Klein states that “using a PC to control the system” allows for a “wide range of applications and devices that are readily supported” including “off-the-shelf user interface devices, as well as machine interfaces and data acquisition devices” *Id.* at 20.

“All the components are assembled in a stainless steel cart.” *Id.* at 23. The “generator was placed in the cart and surrounded by lead rings to provide maximum radiation shielding” from which “ ^{82}Rb is eluted in the form of $^{82}\text{RbCl}$ (eluate).” *Id.* at 8, 23; *see also id.* at 34 (stating that the

“waste container is located on the top shelf inside the cart and is contained within lead shielding to minimize exposure to the operator”).

“All the saline lines were mounted on a modified top cover” (*id.* at 23), and “[a]lthough the generator and waste container are shielded by lead, the saline lines are a source of radiation during elutions” (*id.* at 36).

Klein also includes flow control valves, an activity counter, pumps, and a pressure sensor. *Id.* at 21–23. Klein states that “real-time software controls the pumps and valves” to “affect the flow of saline through the generator or its bypass line to the patient, dose calibrator, or waste container.” *Id.* at 19. The system acquires data from the activity counter and dose calibrator. *Id.* The “activity counter was included in the design to allow data collection and monitoring of the elution of activity” so as to “develop[] a controller capable of directing saline through the generator or its bypass line by actuating the generator valve in order to achieve a constant rate of activity using feedback from the activity counter.” *Id.* at 71.

According to Klein, the “system is required to operate in a clinical setting and therefore must be reliable, easy to operate, and above all, safe.” *Id.* at 26. Klein also states that “⁸²Sr and ⁸⁵Sr ‘breakthrough’ can result if the generator is used indefinitely” and “[i]n high quantities these compounds may have ill effects on health.” *Id.* at 9. Klein describes that if there is an indication of excessive strontium breakthrough, then “elution to patients should be avoided.” *Id.* at 10; *see also id.* at 33 (stating that the “amount of Sr breakthrough activity must be strictly limited to the Health Canada guidelines”).

The dose calibrator “is utilized in the system for both calibration and testing” and “is used to detect the breakthrough activity as part of the calibration test through measurement of ⁸²Rb activity.” *Id.* at 19, 23, 50.

Klein's system is calibrated "by monitoring an external dose calibrator during the calibration run" (*id.* at 17) and "[w]ait[s] for decay to read breakthrough from dose calibrator" (*id.* at 64). The "dose calibrator is used to detect the breakthrough activity . . . through measurement of ^{82}Rb activity" and the "breakthrough of each isotope, $A_{82\text{Sr}}/A_{82\text{Rb}}$ and $A_{85\text{Sr}}/A_{82\text{Rb}}$, is calculated as a relative activity ratio of Sr activity to ^{82}Rb activity delivered." *Id.* at 50–51.

Klein also describes a daily protocol "intended for routine system maintenance, system diagnostics, and clinical preparation of the system," which includes a calibration run. *Id.* at 17–18. Klein states that "[o]nly after a calibration run with low Sr breakthrough has been successfully completed can patient elutions be carried out," and "[o]nce the daily protocol has been completed successfully, patient elutions are enabled until the end of the day." *Id.* at 18; *see also id.* at 33 (stating that the "issue is addressed by daily breakthrough tests as part of the daily protocol ensured by the system"), 43 (stating that "certain maintenance measures must be carried out as dictated by the daily protocol" and "Sr breakthrough must be measured and a complete system test must follow"), 50–52 (describing breakthrough measurement), 122 (stating "[d]aily calibration samples are used to test for the breakthrough of Sr activity; if significant Sr activity is detected, the generator cannot be used on humans"). Klein also states that the " ^{82}Rb infusion system software must ensure that the protocol is followed (i.e. that each run is enabled only after the prerequisites have been completed successfully)." *Id.* at 44.

2. *Reilly (Ex. 1024)*

Reilly relates to “delivery and injection methods, systems and components thereof for use with radiopharmaceutical substances.” Ex. 1024

¶ 2. Figure 3 of Reilly is reproduced below.

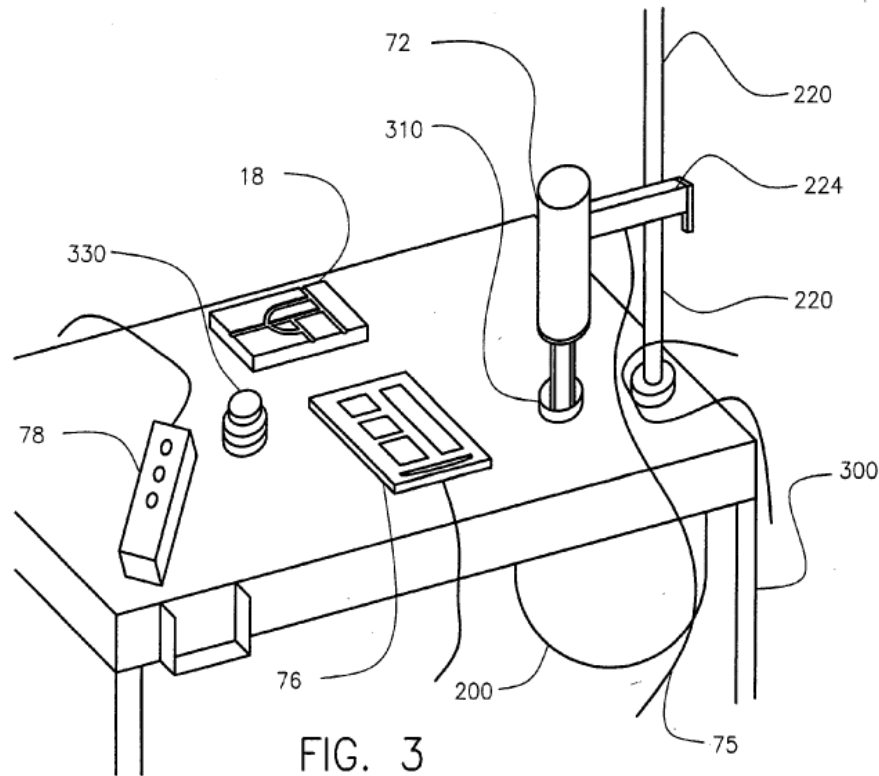


Figure 3 is a perspective view of Reilly’s system. *Id.* ¶ 41. System 10 is positioned upon cabinet stand 300. *Id.* ¶ 66. It includes dose calibrating unit 200 that shields administering personnel from radiation, and system 10 delivers a known volume of a radiopharmaceutical with a known radiation level measured by dose calibrating unit 200 for imaging. *Id.* ¶ 64.

Reilly also describes earlier patents that disclose strontium-rubidium infusion systems and dosimetry systems for use with those infusion systems. *Id.* ¶ 14. According to Reilly, known infusion systems include a generator of strontium-rubidium radiopharmaceutical in fluid connection with a

syringe, and saline is pumped through the generator to a patient via a dosimetry probe or to waste collection. *Id.*

3. *Tate (Ex. 1025)*

Tate “relates to methods, systems and components thereof for delivering pharmaceutical substances to patients for imaging procedures.”

Ex. 1025 ¶ 2. Figure 1E of Tate is reproduced below.

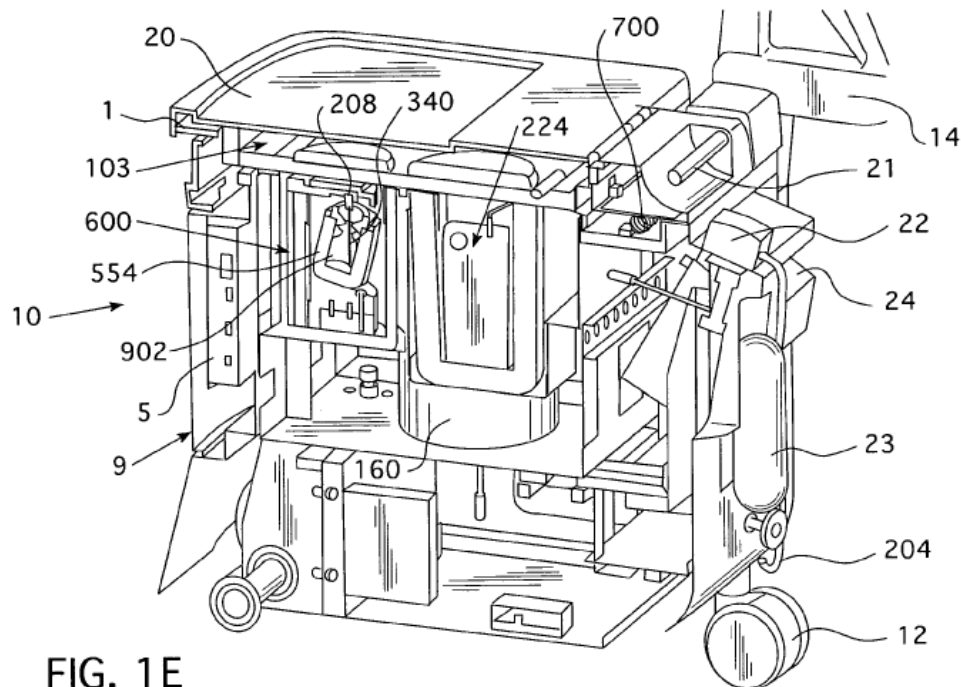


Figure 1E shows a cross-sectional view of a fluid delivery system. *Id.* ¶¶ 32, 36. Preferably, fluid delivery system 10 is a cart-like apparatus 9 and includes system controller 5 (preferably a single-board computer) that communicates with graphical user interface 15 (shown in Figure 1A), pumps, dose calibrator or ionization chamber 160, and other components. *Id.* ¶¶ 70, 84.

Fluid delivery system 10 also includes lid or cover 20, which preferably includes radioactive shielding to minimize radiation exposure from a radiopharmaceutical. *Id.* ¶¶ 72, 73; *see also id.* ¶¶ 9, 10, 87

(describing that long-term radiation exposure can pose a health risk, shielding personnel from a radiation source minimizes radiation exposure, and recessed portions are preferably encased with suitable radioactive shielding to minimize exposure). Also, radiopharmaceutical vial or container 902 is in vial shield or FIG 554. *Id.* ¶ 79.

4. *The Bracco Manual (Ex. 1021)*

The Bracco Manual is a user's guide for the Rb-82 Infusion System manufactured by Bracco Diagnostics Inc. Ex. 1021, cover. The cover indicates that the Rb-82 Infusion System was manufactured by RbM Services, LLC for Bracco Diagnostics Inc. *Id.*

"The Rb-82 Infusion System is a complete system for the generation and delivery of Rb-82 from a CardioGen®-82 generator (Sr-82/Rb-82 generator) to a patient for cardiovascular nuclear medicine procedures," and the Rb-82 is "eluted in sterile normal saline for direct injection into a patient." *Id.* at 1.

The Bracco Manual's system "is a mobile, self-contained cart complete with a shield for a CardioGen®-82 generator, a waste bottle shield, a saline syringe pump, sterile tubing and valve components, a positron detector, and all of the support electronics necessary to administer controlled levels of Rb-82 activity to a patient." *Id.* Figure 2.2 of the Bracco Manual is reproduced below.

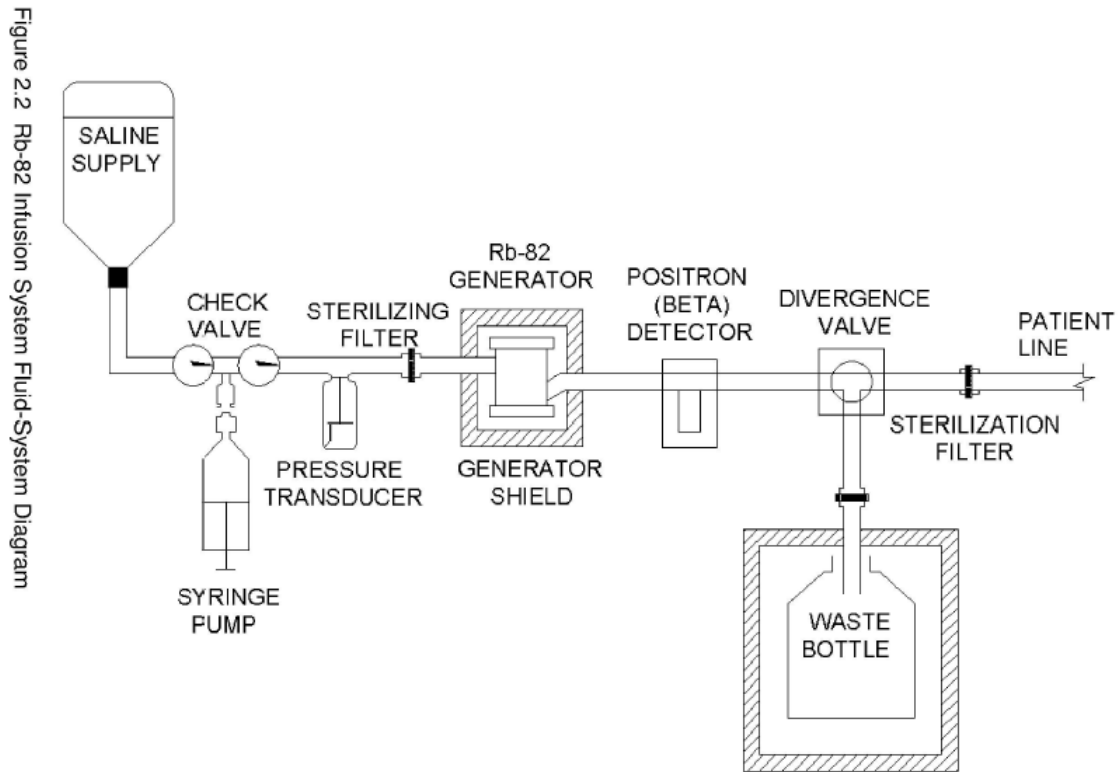


Figure 2.2 is a “Rb-82 Infusion System Fluid-System Diagram.” Ex. 1021, 3. The Bracco Manual cautions that patient administration should be performed only after completing daily calibration and breakthrough procedures. *Id.* at 31; *see also id.* at 34–35 (providing “Sr-82/85 Breakthrough Worksheet”), 37 (providing “Rb-82 Infusion System Calibration Log Sheet”). It also states that “[a]t the end of an infusion operation, a complete report of the Rb-82 infusion is printed on the system printer and this same data is echoed out the RS-232C serial data port.” *Id.* at 17.

5. *Hirschman (Ex. 1022)*

Hirschman relates to “methods and systems and associated components for the generation, preparation, transportation, and administration of fluid radiopharmaceutical substances to human . . . subjects.” Ex. 1022 ¶ 3. Hirschman describes known infusion systems that

include a generator of a strontium-rubidium radiopharmaceutical for use in diagnostic imaging procedures. *Id.* ¶¶ 9, 10. One embodiment relates to an integrated radiopharmaceutical patient treatment system that includes a radiopharmaceutical fluid delivery system for infusing such a fluid into a patient and an integrated system controller operably associated with parts of the integrated radiopharmaceutical patient treatment system to control and coordinate their operations. *Id.* ¶ 22. Figure 3 of Hirschman is reproduced below.

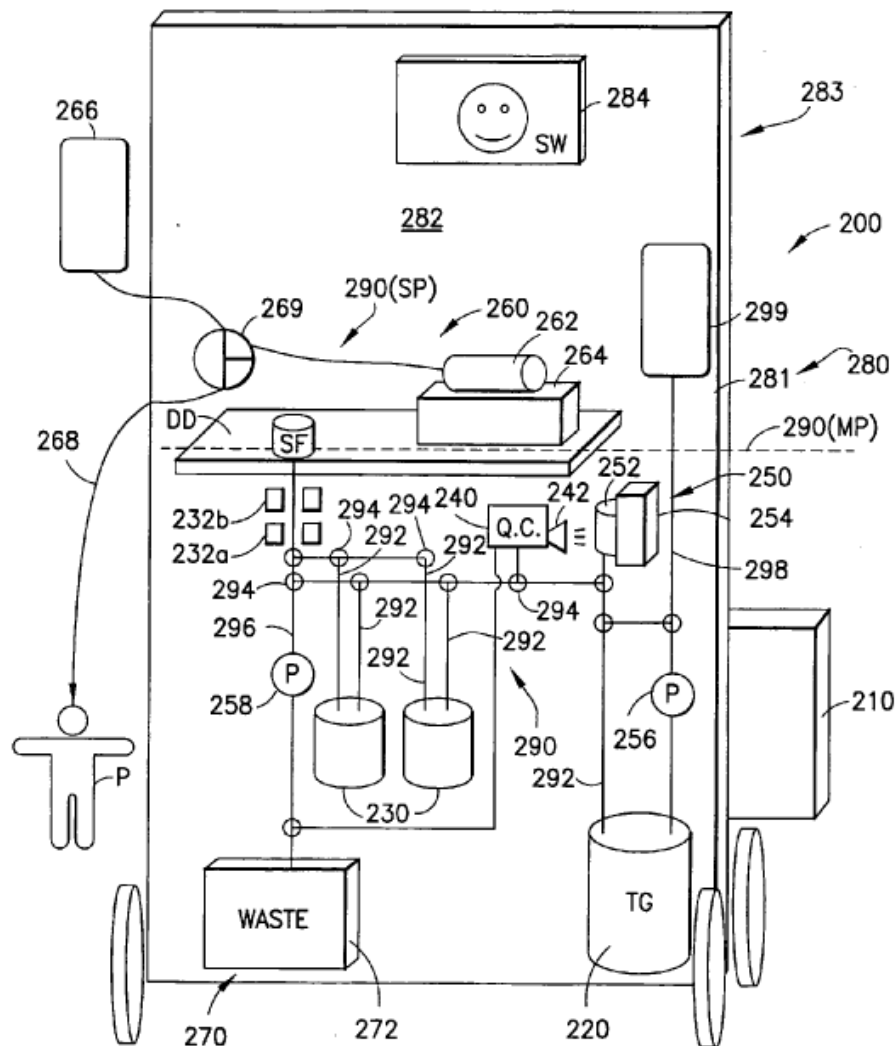


FIG.3

Figure 3 is a schematic representation of a radiopharmaceutical system that creates a radionuclide and processes it into a radiopharmaceutical that is delivered to a patient. Ex. 1022 ¶ 39. Portable or mobile system 220 includes control computer 210, radionuclide generation module 220, patient administration/injection module or delivery area 260, and other subsystems or modules. *Id.* ¶¶ 121, 122, 126, 130.

Control computer 210 includes graphic user interface 212 (shown in Figures 4A–4B) and a label printer (not shown), RFID reading/writing subsystem (not shown), and a memory stick, such as a USB memory drive. *Id.* ¶¶ 123, 124, 142. For embodiments in which “information is written as a bar code, stored on an RFID tag, written to a USB memory stick, or otherwise encoded and associated with a radiopharmaceutical container, patient injection module 260 . . . is designed to read the encoded information.” *Id.* ¶ 153.

Control computer 210 can also communicate with an information system to populate automatically and update “patient information, expected patient injection times, and radiopharmaceutical production schedules.” *Id.* ¶ 125. Hirschman states that “automatic population of patient information, expected patient injection times, and radiopharmaceutical production schedules” is “used to update the information in the HIS system” and “creates workflow efficiencies as well as eliminates steps which could otherwise lead to data entry errors” *Id.* Fluid delivery system control 1036 includes communications interface 1040 so that “communications connection may be made to an HIS (Hospital Information System)”) and “procedure results and notes” are “communicated to physicians, patient records, and other appropriate systems.” *Id.* ¶ 187.

6. *Jackson (Ex. 1023)*

Jackson “relates generally to positron emission tomography.” Ex. 1023 ¶ 2. It states that, “[i]n conventional positron emission tomography control systems, an individual dose of a premeasured radiotracer is administered to an individual patient.” *Id.* ¶ 3. An example of Jackson’s apparatus “includes a control system that is operably coupled to the local area network, to receive status information from, and send commands to, any one of the devices in the system” and an injector system for a radiopharmaceutical. *Id.* ¶¶ 16, 17, 22, Fig. 4. Jackson indicates that, in addition to cyclotron 101, radioisotopes can be produced by a radioisotope generator and states that “[r]ubidium-82 is produced by a radioisotope generator.” *Id.* ¶ 34.

System 100 can include quality control unit 110 that “monitors the amount of radioactivity and other measures of quality” *Id.* ¶ 36; *see also id.* ¶¶ 36–38 (describing the functions and components of quality control unit 110). System 100 can also include control system 146 that “is operable to receive status information from and send commands to,” for example, quality control device 110, injector systems 122, 124, and computers 142, 144. *Id.* ¶ 48. According to Jackson, “a computer program in the control system 146 stores production and dosing data” and “system 100 provides for a more centralized storage of records in the preparation, delivery, monitoring and injection of radiotracers to patients, which reduces disjoint[ed] management and control of those functions that conventional systems exhibit.” *Id.* ¶ 50. Also, “computer 1202 can operate in a networked environment using logical connections to one or more remote computers” that can be a local-area network or wide-area network and “such

networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet.” *Id.* ¶ 135.

E. Challenge Based on Klein, Reilly, and Tate

1. Claim 1

Petitioner argues that Klein teaches all limitations except a dose calibrator being on a movable platform, as required by independent claim 1 and its dependent claim 9, with citations to Klein and Petitioner’s declarant testimony. Pet. 26, 30–43, 62–70. For the dose calibrator on a movable platform, Petitioner relies on Reilly and Tate with citations to those references and support from Petitioner’s declarant testimony. *Id.* at 34–35, 52–53. Patent Owner responds that one of ordinary skill in the art would not have modified Klein in view of Reilly and Tate. PO Resp. 1–4, 11–47. Patent Owner also responds that Klein fails to teach a computer that prevents infusion, if test results exceed an allowable limit, as required by dependent claim 2 and independent claim 24. *Id.* at 4, 48–57.

a) “A mobile radioisotope generator system”

Petitioner argues that Klein teaches a “mobile radioisotope generator system.” Pet. 30 (citing Ex. 1014, 1, 24; Ex. 1015 ¶¶ 300–303). Petitioner also relies on a “[p]hotograph of the assembled ⁸²Rb elution system and its components,” reproduced below. Ex. 1014, 24 (Fig. 2-3).

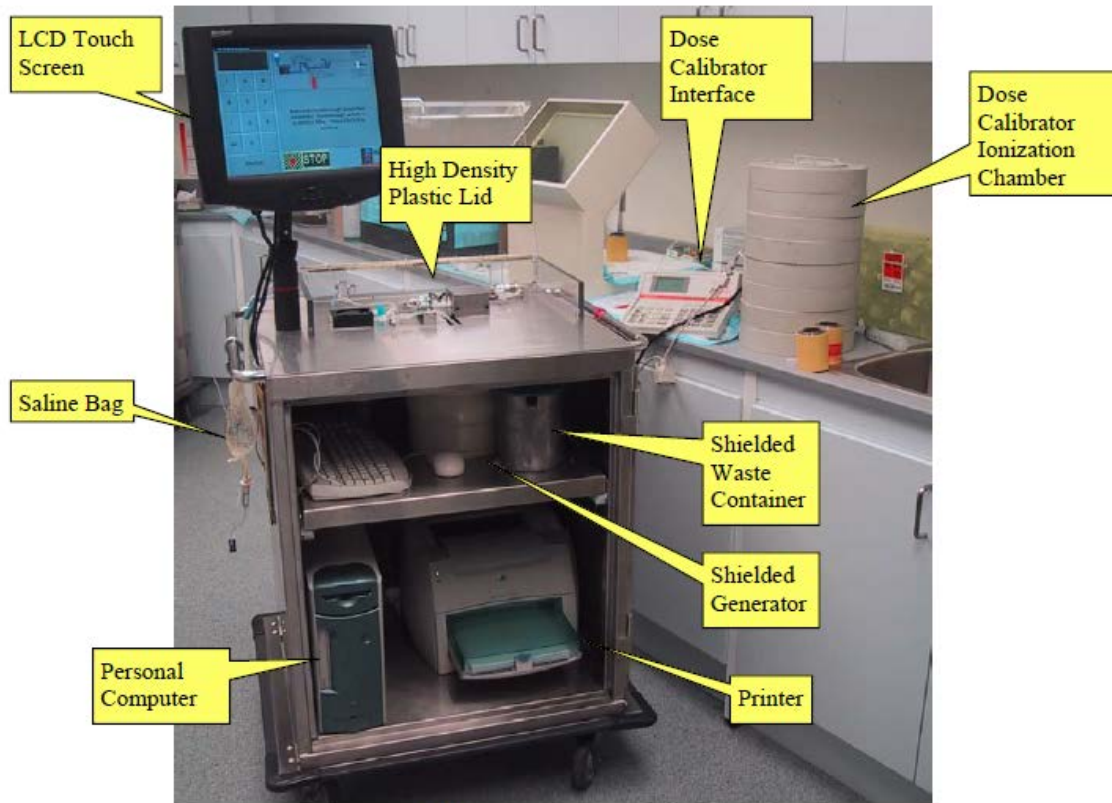


Figure 2-3 - Photograph of the assembled ^{82}Rb elution system and its components.

We find that Klein shows a “Shielded Generator” on a cart. Ex. 1014, 24 (Fig. 2-3); *see also* PO Resp. 41 (“Klein and Tate disclose moveable carts.”); Ex. 1014, 23 (“All the components are assembled in a stainless steel cart shown in Figure 2-3.”). We also find that a relied-upon portion of Klein states that it “describes the development of a Rubidium-82 (^{82}Rb) infusion system . . . based on a $^{82}\text{Sr}/^{82}\text{Rb}$ generator, which produces ^{82}Rb activity continuously.” Ex. 1014, 1. We further credit Petitioner’s declarant testimony regarding a “mobile radioisotope generator system” because Klein supports that testimony. Ex. 1015 ¶¶ 300–303 (citing Ex. 1014, 1, 23, 24 (Fig. 2-3)). Patent Owner does not provide a response specifically for a “mobile radioisotope generator system.” *See* PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches a shielded $^{82}\text{Sr}/^{82}\text{Rb}$ generator on a stainless steel cart, Petitioner persuades us by a

preponderance of the evidence that Klein teaches a “mobile radioisotope generator system.”

- b) *“a movable platform carrying an infusion tubing circuit, an activity detector, a dose calibrator, a computer, and a shielding assembly containing a strontium/rubidium radioisotope generator configured to generate a radioactive eluate via elution of an eluant”*

Petitioner argues that Klein teaches “a movable platform carrying an infusion tubing circuit an activity detector, a dose calibrator, a computer, and a shielding assembly containing a strontium/rubidium radioisotope generator configured to generate a radioactive eluate via elution of an eluant.” Pet. 31–34 (citing Ex. 1014, 19, 23, 24, 39, 50; Ex. 1015 ¶¶ 304–334), 36–38 (citing Ex. 1014, 19, 23, 24, 25; Ex. 1015 ¶¶ 331, 333). Petitioner also argues that Reilly and Tate each teach a dose calibrator integrated into a cart. *Id.* at 34–35 (citing Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶¶ 70, 79, 87, Fig. 1C).

We find that the relied-upon portions of Klein teach that “[a]ll the components are assembled in a stainless steel cart shown in Figure 2-3” (Ex. 1014, 23), “[a]ll the saline lines were mounted on a modified top cover” (*id.* at 23), “[t]he system acquires data from a[n] . . . activity counter” (*id.* at 19), “[t]he system acquires data from a . . . dose calibrator” that “is used to detect the breakthrough activity as part of the calibration test through measurement of ^{82}Rb activity” (*id.* at 19, 50), “the LCD touch screen was mounted on an adjustable support arm” with a “PC . . . mounted on the lower tray” (*id.* at 23, 25), a “generator was placed in the cart and surrounded by lead rings to provide maximum radiation shielding” (*id.* at 23), “ ^{82}Rb is eluted in the form of $^{82}\text{RbCl}$ (eluate)” from the generator (*id.* at 8), and “the generator and waste container are shielded by lead” (*id.* at 36).

We also find that Figures 2-3 and 2-4 of Klein show, at least, a “Saline Line” (Fig. 2-4), “Shielded Activity Counter” (Fig. 2-4), “Personal Computer” (Fig. 2-3), “Shielded Waste Container” (Fig. 2-3), and “Shielded Generator” (Fig. 2-3) on its stainless steel cart. Ex. 1014, 24. Figure 2-3 also shows a “Dose Calibrator Ionization Chamber,” but it is not on the cart. *Id.* We further find that Klein shows in its Figure 2-2 lines between components, such as “Saline IV,” “Activity Counter,” “Dose Calibrator,” and a “ $^{82}\text{Sr}/^{82}\text{Rb}$ Generator.” *Id.* at 19. We further credit the Petitioner’s declarant testimony regarding the movable platform of claim 1 because Klein supports that testimony. Ex. 1015 ¶¶ 304–318 (citing Ex. 1014, 19, 23, 24, 36, 39, 50).

Petitioner, thus, persuades us by a preponderance of the evidence that Klein teaches “a movable platform carrying an infusion tubing circuit, an activity detector, . . . , a computer, and a shielding assembly containing a strontium/rubidium radioisotope generator configured to generate a radioactive eluate via elution of an eluant.” Ex. 1001, 23:61–65. Although Klein teaches a dose calibrator, Klein’s movable platform does not carry the dose calibrator. *See also* Pet. 33 (stating that “Klein’s dose calibrator is located apart from the cart”); PO Resp. 17 (stating that “prior to the effective date of the ’468 patent, a [person of ordinary skill in the art] knew that Sr82/Rb82 systems included (a) an on-board Sr82/Rb82 generator, (b) an on-board activity detector, and (c) an off-board dose calibrator”); Ex. 2003 ¶¶ 50–55.

Turning to Tate and Reilly, we find that the relied-upon portions of Tate and Reilly teach a dose calibrator. Ex. 1024 ¶ 64 (describing “dose calibrating unit 200 such as the Capintec CRC-15PET dose calibrator . . . which measures the total radiation of the volume of radiopharmaceutical

enclosed within the pressurizing chamber”); Ex. 1025 ¶¶ 79 (“As shown in FIG. 1C, the second trough 113 also . . . leads to a second well 121 that accommodates a dose calibrator or ionization chamber 160 for the fluid delivery system 10.”), 87 (“[T]he recessed portions shown and described with respect to FIG. 1C are preferably encased throughout with suitable radioactive shielding to further minimize exposure to an operator.”), Fig. 1C. We further credit Petitioner’s declarant testimony regarding the dose calibrators of Reilly and Tate because these references support the testimony. Ex. 1015 ¶¶ 321–323 (citing Ex. 1024 ¶ 64; Ex. 1025 ¶¶ 70, 79, Fig. 1C).

Patent Owner responds that Reilly does not teach a moveable cart and one of ordinary skill in the art would not have understood Reilly to be teaching a cart. PO Resp. 41–42 (citing Ex. 1024 ¶ 66; Ex. 2003 ¶¶ 72–74). Patent Owner also argues that Petitioner’s declarant agreed that Reilly does not teach a cart. *Id.* at 42 (citing Ex. 2010, 43:22–51:1); *see also* Tr. 29:4–9 (Petitioner’s counsel agreeing that Reilly does not teach a cart). We agree with Patent Owner that Reilly does not teach placing a dose calibrator on a moveable cart. Ex. 1024 ¶ 66 (describing “system 10 is positioned upon a cabinet stand 300”), Fig. 3 (showing system 10 on cabinet stand 300).

We, however, find that the relied-upon portions of Tate teach a movable platform carrying a dose calibrator and its shielding. Ex. 1025. Fig. 1A ¶¶ 70 (“The fluid delivery [system] 10 is preferably a cart-like apparatus 9 having wheels 13 and/or casters 12 for allowing the system to be moveable.”), 79 (“As shown in FIG. 1C, the second trough 113 also leads . . . to a second well 121 that accommodates a dose calibrator or ionization chamber 160 for the fluid delivery system 10.”), 87 (“[T]he recessed portions shown and described with respect to FIG. 1C are preferably encased

throughout with suitable radioactive shielding to further minimize exposure to an operator.”), Fig. 1C (showing cart-like apparatus 9 with casters 12 and second well 121 accommodating dose calibrator 160). We further credit Petitioner’s declarant testimony regarding the dose calibrator of Tate being on a cart because Tate supports the testimony. Ex. 1015 ¶¶ 322–324 (citing Ex. 1025 ¶¶ 70, 79, 87, Fig. 1C).

Based on the full record before us, Petitioner persuades us by a preponderance of the evidence that Tate teaches “a movable platform carrying . . . a dose calibrator.” Ex. 1001, 23:61–62. Also, as discussed above, Petitioner persuades us by a preponderance of the evidence that Klein teaches “a movable platform carrying an infusion tubing circuit, an activity detector, . . . , a computer, and a shielding assembly containing a strontium/rubidium radioisotope generator configured to generate a radioactive eluate via elution of an eluant.” *Id.* at 23:61–65.

(1) Reason for Modifying Klein in view of Reilly and Tate

(a) Applicability of Reilly and Tate

Petitioner argues that “Klein, Reilly, and Tate are directed to similar subject matter,” their systems include similar components, and these references describe computers controlling infusion systems and the need to minimize radiation exposure. Pet. 27–28 (citing Ex. 1014, 1, 7–9, 17, 23, 25; Ex. 1015 ¶¶ 292–294; Ex. 1024 ¶¶ 4–6, 9–11, 14, 17, 19, 21, 23, 31, 49, 55, 61, 66; Ex. 1025 ¶¶ 2, 7, 9–10, 70, 73, 79, 81, 84, 87, 89, 90, 96, 161, 276; Ex. 1032; Ex. 1033; Ex. 1034, 664–710). Petitioner also argues that one of ordinary skill in the art would have considered the “inter-related teachings” of Klein, Reilly, and Tate “when selecting design features for a rubidium-82 infusion system” and such consideration would have been routine for an ordinarily skilled artisan “developing human use medical

devices for radiopharmaceuticals at the time under the applicable regulatory frameworks.” *Id.* (citing *KSR*, 550 U.S. at 418; Ex. 1015 ¶ 294; Ex. 1028; Ex. 1029; Ex. 1030; Ex. 1032; Ex. 1033).

Patent Owner responds that there is no motivation to move Klein’s dose calibrator onto Klein’s moveable cart because neither Reilly nor Tate are applicable to Klein. PO Resp. 11–12 (citing Pet. 26; Ex. 2010, 42:18–43:6), 37. Patent Owner argues that Reilly and Tate both describe 18-fluorodeoxyglucose (“FDG”) infusion systems and thus, one of ordinary skill in the art would not apply their “dose calibrator teachings” to Klein’s ⁸²Sr/⁸²Rb elution-infusion system. *Id.* at 11–12, 18–25.

Patent Owner contends that Klein describes using ⁸²Rb that has a 76-second half-life, a locally generated radiopharmaceutical, an activity counter for ensuring that the correct amount of radioactivity is administered, and a dose calibrator that tests for breakthrough and therefore, must be extremely sensitive. *Id.* at 12–14 (citing Ex. 1014, 7–10, 18, 19, 23, 32, 43, 45–52; Ex. 1018, 1:20–2:52; Ex. 2003 ¶¶ 39–49), 26–27 (citing Pet. 12–13; Ex. 1014, 18, 32–33, 43, 45–52; Ex. 2003 ¶¶ 46–48, 78).

FDG infusion, according to Patent Owner, uses ¹⁸F that has a 1.8-hour half-life, does not require local generation or an on-board generator, does not need breakthrough testing, and uses a different mode of administration than rubidium infusion. *Id.* at 18–19 (citing Ex. 1014, 6; Ex. 1024 ¶¶ 4, 5, 64; Ex. 1025 ¶¶ 4, 7, 13, 79, 89; Ex. 2003 ¶¶ 57–58). Patent Owner also argues that, in FDG infusion, dose calibrators are “used to measure the amount of FDG being administered to the patient,” not breakthrough testing or calibration as in Klein, and thus, are more like Klein’s activity detector than Klein’s dose calibrator. *Id.* at 19 (citing Ex. 2003 ¶ 59); *see also id.* at 32 (arguing that background radiation is not an issue for FDG systems) (citing

Ex. 2007, 815:22–817:7; Ex. 2010, 110:5–21). Patent Owner, thus, argues that one of ordinary skill in the art would have considered FDG infusions systems to be disparate from $^{82}\text{Sr}/^{82}\text{Rb}$ elution-infusion systems. *Id.* at 20 (citing Ex. 2003 ¶ 60).

Patent Owner further argues that Reilly and Tate do not need an onboard generator. *Id.* at 20 (citing Pet. 12; Ex. 1014, 8; Ex. 1024 ¶¶ 22, 24, 50, 60, 66, 72, Figs. 1a–4c, 5a–5d; Ex. 1025 ¶¶ 4, 7, 8, 10, 79, 89, 91; Ex. 2003 ¶¶ 57–58, 62, 63; Ex. 2004, 202:8–15; Ex. 2010, 60:6–14, 73:21–74:22), 21 (citing Ex. 2003 ¶¶ 61–64, 67–68). Patent Owner contends that using FDG procedures for ^{82}Rb would result in ^{82}Rb decaying away before being used for imaging. *Id.* at 20–21 (citing Ex. 2003 ¶ 68).

Patent Owner also contends that Reilly and Tate do not describe application to ^{82}Rb infusion systems. *Id.* at 21–22 (citing Pet. 27; Ex. 1015 ¶ 293; Ex. 1024 ¶ 14; Ex. 1025 ¶¶ 7, 276; Ex. 2004, 202:8–15; Ex. 2010, 60:6–14, 64:25–67:4, 93:7–94:5, 108:21–109:9). Patent Owner asserts that one of ordinary skill in the art would not have considered Tate to be in the same field of endeavor as $^{82}\text{Sr}/^{82}\text{Rb}$ elution-infusion systems and would not have been motivated to apply Tate to such systems. *Id.* at 22–25 (citing Ex. 2003 ¶¶ 12–16, 67, 70–71; Ex. 2012, 958:17–973:3, 976:24–977:4, 1000:24–1001:6, 1003:5–18). Patent Owner presents the same argument for Reilly. *Id.* at 25 (citing Ex. 2003 ¶¶ 68–71).

Patent Owner further contends that Klein’s dose calibrator is used for detecting strontium breakthrough, but Reilly and Tate use their dose calibrators for preparing a dose from a pre-prepared vial. *Id.* at 38–39 (citing Pet. 27–29; Ex. 1024 ¶ 64; Ex. 1025 ¶¶ 79, 87). Patent Owner, thus, argues that, because of their different purposes, Klein’s dose calibrator is used once per day, and Reilly’s and Tate’s dose calibrators are used with

each patient, like Klein’s activity detector. *Id.* at 39 (citing Ex. 2003 ¶ 70). Patent Owner also argues that one of ordinary skill in the art would have known of the different purposes, would have considered the teachings of Reilly and Tate inapplicable to Klein, and, therefore, would not have been motivated to combine their teachings. *Id.* at 40–41 (citing Ex. 2003 ¶¶ 70–71).

Petitioner replies that one of ordinary skill in the art would have recognized that the teachings of Reilly and Tate apply to Klein’s PET system. Pet. Reply 13. Petitioner also replies that Patent Owner attacks the references individually and that the differences between rubidium and FDG systems are immaterial. *Id.* at 14–15.

Patent Owner replies that it considers the references for all they teach and that Petitioner “blindly applies” background statements without considering the references as a whole. PO Sur-Reply 10–11, 16–17. Patent Owner also replies that both parties’ declarants agreed that Klein’s system is different from the system of Tate and Reilly. *Id.* at 17 (citing Ex. 2003 ¶¶ 36–74; Ex. 2004, 202:7–205:14, Ex. 2007, 815:22–818:4; Ex. 2010, 58:3–61:9, 86:1–90:25, 135:11–137:7). Patent Owner further replies that “Klein’s system is fundamentally different than that of Tate and Reilly’s.” *Id.* at 18 (citing Ex. 2003 ¶¶ 36–74).

We find that Klein states that it “describes the development of a Rubidium-82 (⁸²Rb) infusion system for use in positron emission tomography (PET).” Ex. 1014, 1. We also find that Reilly “relates . . . especially to delivery and injection methods, systems and components thereof for use with radiopharmaceutical substances” and “[e]xamples of use of a radiopharmaceutical include positron emission tomography (PET).” Ex. 1024 ¶¶ 2, 4. We additionally find that Tate “relates to methods,

systems and components thereof . . . for delivering radiopharmaceuticals to patients for positron emission tomography (PET).” Ex. 1025 ¶ 2. We further credit Petitioner’s declarant testimony that Klein, Reilly, and Tate are directed to similar subject matter because the references themselves support that testimony. Ex. 1015 ¶ 292.

Because Klein, Reilly, and Tate relate to radiopharmaceuticals that can be used in PET imaging, Petitioner persuades us by a preponderance of the evidence that these references (1) are in the same field of endeavor as the ’468 patent, and (2) would have been reasonably pertinent to a problem related to the ’468 patent and would have logically commended themselves in considering the problem.

The ’468 patent states that “there is a need for new system configurations that facilitate more efficient set up, maintenance and operation” (Ex. 1001, 1:56–58), which is a need that Klein, Reilly, and Tate also address. *See* Ex. 1014, 1 (“The system is aimed at administering the activity to patients in a precise and controlled manner.”); Ex. 1024 ¶ 35 (“In general, the present invention provides for administration or delivery of a toxic or hazardous pharmaceuticals (for example, radiopharmaceuticals) in controlled manner to enhance the effectiveness of the pharmaceutical”); Ex. 1025 ¶ 12 (“The present invention broadly contemplates and provides devices, systems, components and methods for accurately calculating or delivering effective doses of pharmaceuticals to patients.”).

While Petitioner presents arguments and evidence that one of ordinary skill in the art would have considered Klein, Reilly, and Tate to teach similar subject matter and, therefore, would have considered applying relevant teachings from one reference to another (Pet. 27–28), Patent Owner’s arguments and evidence primarily rely on one of ordinary skill in the art

being unable to account for different radioisotopes being used in each reference. The full record, however, does not indicate that it was beyond ordinary skill to apply teachings from PET imaging systems using ^{18}F to PET imaging systems using ^{82}Rb while considering and compensating for their differences. *See, e.g.*, Ex. 1025 ¶ 7 (“To minimize the radiation dose to patients, radiopharmaceuticals containing radioisotopes, such as Flourine-18, . . . Rubidium-82, . . . and [others], having relatively short half-lives are typically used for PET and SPECT imaging procedures and other radio-therapies.”). Under either party’s proposed level of ordinary skill in the art, which both include a graduate degree, we see no reason a person of this ordinary skill level would have been dissuaded from considering applying teachings for imaging systems using ^{18}F to imaging systems using ^{82}Rb . Petitioner’s reasoning “takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made.” *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971).

For the reasons above, Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have looked to Reilly and Tate, and thus, Reilly and Tate would have been applicable to the ’468 patent’s field of endeavor and problems addressed, and to Klein. *See* Pet. 27–28.

(b) Motivation for Moving the Dose Calibrator

Petitioner contends with support from its declarant that relocating a dose calibrator or shielded well to a cart would have been obvious in view of Reilly and Tate and that one of ordinary skill in the art would have been motivated to combine Klein, Reilly, and Tate for several reasons. Pet. 26, 27 (citing Ex. 1015 ¶ 291). Relying on declarant testimony, Petitioner contends that, because Klein is a prototype device, it was ready for

improvement and that one of ordinary skill in the art would have been motivated to combine Klein with Reilly and Tate so as to include “beneficial design choices that increase user convenience,” such as “a self-contained medical device . . . in building a commercialized product.” *Id.* at 28–29 (citing Ex. 1015 ¶ 295). Petitioner also contends that moving Klein’s dose calibrator and its shielding in view of Tate would have been an obvious alternative. *Id.* at 29 (citing *KSR*, 550 U.S. at 416). Petitioner argues that one of ordinary skill in the art would have had a reasonable expectation of success in combining Klein, Reilly, and Tate in this fashion. *Id.* (citing Ex. 1013, 23; Ex. 1015 ¶ 297; Ex. 1024 ¶ 64).

Patent Owner responds that there is no motivation to move Klein’s dose calibrator onto Klein’s moveable cart because of measurement accuracy and patient safety concerns. PO Resp. 25–37. Patent Owner contends that Klein’s dose calibrator is heavily shielded and is identified as a Capintec CRC-15. *Id.* at 14–16 (citing Ex. 1014, 23, Fig. 2-3; Ex. 2003 ¶¶ 52–56), 27–28 (citing Pet. 17, 29; Ex. 1014, 23, 52; Ex. 2014, 1-3; Ex. 2015, 1-3). Patent Owner further contends that, according to the Capintec CRC-15 manual, it is “essential to avoid mechanical shock or vibration of any kind” and that the Capintec CRC-15 requires shielding and a location with low background radiation. *Id.* at 16 (citing Ex. 2003 ¶ 51; Ex. 2014, 1-3, 2-1, 2-3; Ex. 2015, 1-3, 2-1, 2-3).

Thus, according to Patent Owner, one of ordinary skill in the art would have known that Klein’s dose calibrator should be protected from “mechanical shock or vibration of any kind” and shielded to minimize exposure to radiation from the sample in the dose calibrator, and to minimize the effect of background radiation on measurements in the dose calibrator. *Id.* at 17 (citing Ex. 2003 ¶¶ 50–56). Patent Owner, thus, argues that one of

ordinary skill in the art would have found it “unacceptable to move Klein’s dose calibrator onto Klein’s movable cart” because it “would expose the dose calibrator to mechanical shock and/or vibrations, thereby causing erroneous potential erroneous calculations relative to the calibration constant and/or the breakthrough testing” and “potentially expose the patient to harmful radiation.” *Id.* at 28 (citing Ex. 2003 ¶ 78).

Petitioner replies that the reasoning of *Anderson’s-Black Rock v. Pavement Co.*, 396 U.S. 57, 62 (1969), applies here because moving Klein’s dose calibrator to Klein’s cart represents “the combination of old elements” that “adds nothing to the nature or quality of the dose calibrator disclosed by Klein.” Pet. Reply 12. Petitioner also replies that “Klein ascribes no significance to the model of the dose calibrator” and Tate teaches another model that is “suitable for mobile environments.” *Id.* at 15–16 (citing Ex. 1014, 23; Ex. 1025 ¶ 115). Petitioner further replies that Klein does not teach that the CRC-15 is wholly immovable. *Id.* at 16–17 (citing PO Resp. 28; Ex. 1014, 23; Ex. 2011 ¶ 348; Ex. 2014, 1-3, 2-1, 2-3; Ex. 2015, 1-3, 2-1, 2-3; Ex. 1028; Ex. 1029; Ex. 1030).

Patent Owner replies that Klein describes its model as the “gold standard” and Klein stresses the quality of a dose calibrator. PO Sur-Reply 12 (citing Pet. Reply 15–16; Ex. 1014, 23, 52). Patent Owner also replies that *Anderson* is distinguishable because “moving Klein’s dose calibrator onto Klein’s cart causes significant issues with measurement accuracy and, accordingly, jeopardizes patient safety.” *Id.* at 17–18 (citing Pet. Reply 12).

Based on the full record, Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have moved Klein’s dose calibrator and shielding onto Klein’s cart because it would

result in “beneficial design choices that increase user convenience,” such as “a self-contained medical device.” Pet. 28–29 (citing Ex. 1015 ¶ 295).

Also, as discussed above, we find that the relied-upon portions of Tate teach a movable platform carrying a dose calibrator and its shielding. Ex. 1025 ¶¶ 70 (stating that the “fluid delivery [system] 10 is preferably a cart-like apparatus 9”), 79 (stating the Fig. 1C shows “second recess or trough 113 [also] . . . [leads] to a second well 121 that accommodates a dose calibrator or ionization chamber 160 for the fluid delivery system 10”), 87 (stating that the “recessed portions shown and described with respect to FIG. 1C are preferably encased throughout with suitable radioactive shielding”), Fig. 1C. Even if the dose calibrator 160 of Tate does not perform the exact same function as Klein’s dose calibrator, as argued by Patent Owner, we find that Tate suggests and would motivate moving Klein’s dose calibrator and shielding onto its cart. Tate further provides evidence that moving a dose calibrator or similar device was within the level of ordinary skill in the art. We also agree with Petitioner that the Capintec CRC-15 manual does not indicate that such a dose calibrator should never be moved, but must be moved with care. See Ex. 2014, 1-3; Ex. 2015, 1-3 (both stating “[c]are must be exercised when moving the instrument or when maintenance is performed”). See, *Syntex (U.S.A) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005) (“A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination”).

In addition to persuading us that one of ordinary skill would have made the proposed modification to increase user convenience, we also agree with Petitioner that moving Klein’s dose calibrator onto its cart would have been obvious because the “combination of familiar elements according to

known methods is likely obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. Klein, Reilly, and Tate teach familiar elements, such as dose calibrators, shielding, and a cart; and Tate teaches or suggests moving the dose calibrator and shielding to the cart. Reilly teaches that dose calibration unit 200, which can be a Capintec CRC-15, can be placed in close proximity to passage 320 for pharmaceutical source 40, a potential source of radiation. Ex. 1024 ¶¶ 64, 66, Fig. 4C; *see also* Ex. 1014, 24 (Fig. 2-3 showing Klein’s dose calibrator close to sources of radiation on the top cover of Klein’s cart). Tate also indicates that the combination would yield predictable results, such as the dose calibrator measuring activity. Ex. 1025 ¶¶ 79, 84. For the same reasons, Petitioner persuades us that one of ordinary skill in the art would have had a reasonable expectation of success in combining Klein, Reilly, and Tate in the fashion claimed. *See* Pet. 29 (citing Ex. 1015 ¶ 297).

Patent Owner also responds that moving Klein’s dose calibrator to Klein’s cart would potentially expose the calibrator to “additional high and/or variable sources of radiation,” such as the generator and eluate waste reservoir. PO Resp. 29–31 (citing Ex. 1014, 23, 34; Ex. 2003 ¶¶ 52–56, 79–81; Ex. 2014, 2-1, 2-3; Ex. 2015, 2-1, 2-3). According to Patent Owner, one of ordinary skill in the art would have found it unacceptable to place Klein’s dose calibrator near these sources of high and/or variable radiation. *Id.* at 31–32 (citing Ex. 2003 ¶ 81; Ex. 2010, 116:3–20; Ex. 2012, 968:16–969:3, 972:22–973:3, 978:20–979:13). Patent Owner, thus, argues that one of ordinary skill in the art would not have been motivated to move Klein’s dose calibrator onto its cart. *Id.* at 32 (citing Ex. 2003 ¶¶ 52–56, 75–81).

Petitioner replies that Patent Owner’s argument based on high or variable radiation is unsupported speculation because Patent Owner’s

declarant provides a subjective assessment without quantitative analysis. Pet. Reply 17 (citing PO Resp. 30). Petitioner also replies that Klein, Reilly, and Tate each teach shielded dose calibrators but do not discuss “unmanageable background radiation.” *Id.* at 18–19 (citing Ex. 1014, 6–7, 23–25, 34, 45–52, Fig. 2-3; Ex. 1024 ¶¶ 26, 31, 55, Fig. 1A; Ex. 1025 ¶¶ 73–81, Fig. 1C).

Patent Owner replies that both parties’ declarants agreed that background radiation is a serious concern for ^{82}Rb systems like Klein’s, but not the system of Reilly or Tate. PO Sur-Reply 12–13 (citing Pet. Reply 17–19; Ex. 2003 ¶¶ 79–81; Ex. 2007, 816:25–817:7, 836:22–837:2). Patent Owner also argues that Petitioner conflates motivation to combine with expectation of success. *Id.* at 13–14 (citing Pet. Reply 19). Patent Owner contends that arguments regarding sufficient skill to implement the combination does not show a reason to combine the references. *Id.* at 14.

As discussed above, Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have combined the references to increase user convenience and that the proposed combination combines known elements by known methods to yield predictable results. Also, Petitioner proposes moving Klein’s dose calibrator with its shielding, not merely the dose calibrator. We agree with Petitioner that the references teach shielded dose calibrators and do not indicate that placing such shielded dose calibrators near other sources of radiation presents a problem or a problem that one of ordinary skill in the art could not have overcome.

Patent Owner further responds that Klein’s system has a “mature hardware layout” that ensures electrical safety and is crucial for implementing an easy to control system. PO Resp. 33–35 (citing Ex. 1014, 16, 28, 36, 39, 104, 127–132, Fig. 2-3; Ex. 2003 ¶¶ 82–86). Patent Owner

argues that moving Klein's dose calibrator onto its cart would require a system redesign to reconfigure Klein's mature hardware layout. *Id.* at 36 (citing Ex. 1014, Fig. 2-3; Ex. 2012, 978:8–16, 988:1–8). Patent Owner, thus, argues that there is no motivation to disturb Klein's proven layout. *Id.* at 36–37 (citing Ex. 2003 ¶¶ 87–89).

Petitioner replies that redesigning Klein so that a dose calibrator is on its cart does not negate obviousness and placing a dose calibrator onto Klein's cart does not change its operation or interfere with its layout. Pet. Reply 20–21 (citing PO Resp. 34–37; Ex. 1014, 39–41; Ex. 2006, 652:18–657:3). Petitioner also replies that Klein does not teach that its layout is critical or that placing another component on the cart would have been beyond ordinary level of skill. *Id.* at 21 (citing Ex. 1014, Fig. 2-3).

Patent Owner replies that Petitioner does not show a motivation to combine the references, contradicts itself in its reply arguments, and does not present a proposed redesign. PO Sur-Reply 15 (citing Pet. 28; Pet. Reply 20, 22 n.3). Patent Owner also argues that Petitioner's declarant submitted a proposed redesign at the ITC, which he conceded would not work. *Id.* (citing Ex. 2007, 825:11–17). Patent Owner further argues that Klein describes proposed improvements to its system, which do not include moving the dose calibrator, and that Petitioner's reasons to combine are hindsight-driven or unfounded. *Id.* at 15–16 (citing PO Resp. 25–33, 35; Pet. Reply 21, 22; Ex. 1014, 127–132).

Patent Owner further responds that Petitioner's "self-contained" argument is belied by Tate which, according to Patent Owner, provides no motivation for a self-contained system. PO Resp. 43–44 (citing Pet. 28–29; Ex. 1015 ¶ 293; Ex. 2007, 815:22–23; Ex. 2010, 135:11–137:7). Patent

Owner also contends that there was no market drive or motivation to a self-contained system or to move Klein's dose calibrator to its cart. *Id.* at 44–45.

Patent Owner additionally argues that Klein's system was not a prototype. PO Resp. 45 (citing Pet. 28; Ex. 1014, 2, 130, Fig. 2-2). Patent Owner contends that one of ordinary skill in the art would not have been motivated to improve Klein by moving its dose calibrator “due to measurement accuracy, safety, size and weight, and redesign challenges, among others.” *Id.* at 46 (citing Ex. 2003 ¶¶ 89–91). Patent Owner asserts that Klein sets forth potential improvements. *Id.* at 46 (citing Ex. 1014, 127–132). Patent Owner, thus, contends that, absent hindsight, one of ordinary skill in the art would not have been motivated to move Klein's dose calibrator onto its cart, instead of focusing on the improvements listed by Klein. *Id.* at 46–47 (citing Ex. 2003 ¶¶ 89–91). Petitioner replies that it provided several reasons for placing a dose calibrator on a movable cart and those reasons are consistent with *KSR*. Pet. Reply 21–23 (citing *KSR*, 550 U.S. at 419; Pet. 27–29).

The full record does not indicate that it would have been beyond ordinary level of skill in the art to move a dose calibrator and its shielding onto a cart so that Klein's layout is maintained. *See also* Tr. 85:20–86:2 (Patent Owner's counsel agreeing that a larger cart could be used to accommodate the dose calibrator but arguing that the dose calibrator would not be moved because of sensitivity concerns); Ex. 1014, 24 (Fig. 2-3 showing that Klein's dose calibrator is not so large that it could not be accommodated on a larger cart). Because Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have combined the references to increase user convenience and that the proposed combination combines known elements by known methods to

yield predictable results, we do not agree that Petitioner's reasons for combining the references are driven by hindsight or unfounded.

As discussed above, we find support for Petitioner's reason to combine in Tate, and thus, we do not need to find further that market forces would have also motivated Petitioner's proposed combination. Likewise, because a preponderance of the evidence supports Petitioner's other reasons for combining, Petitioner does not need to find additional support in Klein. Nor do we agree that one of ordinary skill in the art, aware of all prior art, would have focused only on the improvements described in Klein and not other improvements taught or suggested by the prior art.

For the reasons above, Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine Klein, Reilly, and Tate.

- c) *“the infusion tubing circuit including a tubing line connected between the strontium/rubidium radioisotope generator and the dose calibrator and configured to supply a portion of radioactive eluate to the dose calibrator”*

Petitioner argues that Klein teaches “the infusion tubing circuit including a tubing line connected between the strontium/rubidium radioisotope generator and the dose calibrator and configured to supply a portion of radioactive eluate to the dose calibrator.” Pet. 38–39 (citing Ex. 1014, 19, 23; Ex. 1015 ¶¶ 335–340).

We find that the relied-upon portions of Klein show a line between “⁸²Sr/⁸²Rb Generator” and “Dose Calibrator” and teach software controlling pumps and valves to “affect the flow of saline through the generator or its bypass line to the patient, dose calibrator, or waste container.” Ex. 1014, 19, Fig. 2-2. We also find that Klein teaches that the “dose calibrator is utilized in the system for both calibration and testing” and that a “Calibration Run”

comprises “flushing of the generator . . . into the dose calibrator.” *Id.* at 23, 43.

We further credit Petitioner’s declarant testimony regarding “the infusion tubing circuit including a tubing line connected between the strontium/rubidium radioisotope generator and the dose calibrator and configured to supply a portion of radioactive eluate to the dose calibrator” because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 335–340 (citing Ex. 1014, 19, 23, 43). Patent Owner does not provide a response specifically for this limitation. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches saline flowing into the dose calibrator and flushing the generator into the dose calibrator, Petitioner persuades us by a preponderance of the evidence that Klein teaches “the infusion tubing circuit including a tubing line connected between the strontium/rubidium radioisotope generator and the dose calibrator and configured to supply a portion of radioactive eluate to the dose calibrator.”

d) *“the activity detector being positioned downstream of the strontium/rubidium radioisotope generator and configured to measure an activity of the radioactive eluate flowing through the infusion tubing circuit”*

Petitioner argues that Klein teaches “the activity detector being positioned downstream of the strontium/rubidium radioisotope generator and configured to measure an activity of the radioactive eluate flowing through the infusion tubing circuit.” Pet. 39–40 (citing Ex. 1014, 19, 24, 30, 41; Ex. 1015 ¶¶ 341–345).

We find that the relied-upon portions of Klein show a line between “⁸²Sr/⁸²Rb Generator” and “Activity Counter” and teach that the “system acquires data from a[n] . . . activity counter,” and that the activity counter “measure[s] activity in the line.” Ex. 1014, 19 (Fig. 2-2), 24 (Fig. 2-4), 30,

41 (Fig. 3-3). We also credit Petitioner’s declarant testimony regarding “the activity detector being positioned downstream of the strontium/rubidium radioisotope generator and configured to measure an activity of the radioactive eluate flowing through the infusion tubing circuit” because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 341–345 (citing Ex. 1014, 19, 24, 30, 41). Patent Owner does not provide a response specifically for this limitation. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches an activity counter downstream of its generator and the activity counter measures activity in the line, Petitioner persuades us by a preponderance of the evidence that Klein teaches “the activity detector being positioned downstream of the strontium/rubidium radioisotope generator and configured to measure an activity of the radioactive eluate flowing through the infusion tubing circuit.”

e) *“the computer being electronically coupled to the dose calibrator and configured to execute automated quality control testing using the dose calibrator”*

Petitioner argues that Klein teaches “the computer being electronically coupled to the dose calibrator and configured to execute automated quality control testing using the dose calibrator.” Pet. 41 (citing Ex. 1014, 19, 23, 50; Ex. 1015 ¶¶ 346–351).

We find that the relied-upon portions of Klein show a connection between a computer and a “Dose Calibrator.” Ex. 1014, 19 (Fig. 2-2). We also find that the relied-upon portions of Klein teach a system “based around a PC which interfaces with the various sensors and actuators” and “acquires data from a . . . dose calibrator” and that the “dose calibrator is utilized in the system for both calibration and testing” and “to detect the breakthrough

activity as part of the calibration test through measurement of ^{82}Rb activity.”
Id. at 19, 23, 50.

We further credit Petitioner’s declarant testimony regarding “the computer being electronically coupled to the dose calibrator and configured to execute automated quality control testing using the dose calibrator” because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 346–351 (citing Ex. 1014, 19, 23, 50). Patent Owner does not provide a response specifically for this limitation. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches a PC interfacing with a dose calibrator that is used to detect breakthrough activity during a calibration test, Petitioner persuades us by a preponderance of the evidence that Klein teaches “the computer being electronically coupled to the dose calibrator and configured to execute automated quality control testing using the dose calibrator.”

f) *“wherein the computer is configured to determine an activity of strontium-82 and an activity of strontium-85 in the portion of radioactive eluate through automated quality control testing using the dose calibrator”*

Petitioner argues that Klein teaches “wherein the computer is configured to determine an activity of strontium-82 and an activity of strontium-85 in the portion of radioactive eluate through automated quality control testing using the dose calibrator.” Pet. 41–42 (citing Ex. 1014, 50–51; Ex. 1015 ¶¶ 352–356).

We find that the relied-upon portions of Klein teach that the “dose calibrator is used to detect the breakthrough activity as part of the calibration test through measurement of ^{82}Rb activity,” the “Sr solution that is loaded onto the generator column is composed of mostly ^{82}Sr , but also contains a large amount of ^{85}Sr ,” and the “breakthrough of each isotope, $A_{82\text{Sr}}/A_{82\text{Rb}}$ and

$A_{85\text{Sr}}/A_{82\text{Rb}}$, is calculated as a relative activity ratio of Sr activity to ^{82}Rb activity delivered.” Ex. 1014, 50–51. As discussed above, we find that Klein’s computer is coupled to its dose calibrator and configured to detect breakthrough during a calibration test.

We further credit Petitioner’s declarant testimony regarding “wherein the computer is configured to determine an activity of strontium-82 and an activity of strontium-85 in the portion of radioactive eluate through automated quality control testing using the dose calibrator” because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 352–356 (citing Ex. 1014, 50–51). Patent Owner does not provide a response specifically for this limitation. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches calculating ^{82}Sr and ^{85}Sr activities relative to ^{82}Rb activity during breakthrough testing and that Klein’s computer is coupled to its dose calibrator and configured to detect breakthrough during a calibration test, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the computer is configured to determine an activity of strontium-82 and an activity of strontium-85 in the portion of radioactive eluate through automated quality control testing using the dose calibrator.”

g) *“the computer is configured to control the mobile radioisotope generator system to deliver a dose of radioactive eluate to a patient during a patient infusion procedure”*

Petitioner argues that Klein teaches that “the computer is configured to control the mobile radioisotope generator system to deliver a dose of radioactive eluate to a patient during a patient infusion procedure.” Pet. 42–43 (citing Ex. 1014, 19; Ex. 1015 ¶¶ 357–360).

We find that the relied-upon portions of Klein teach a system “based around a PC which interfaces with the various sensors and actuators” and “controls the pumps and valves” via “real-time software” to “affect the flow of saline through the generator or its bypass line to the patient.” Ex. 1014, 19. We also find that Figure 2-2 of Klein shows a computer connected to a “Peristaltic Pump” and an “Interface Module” that connects with a “Patient Valve.” *Id.*

We further credit Petitioner’s declarant testimony regarding “the computer is configured to control the mobile radioisotope generator system to deliver a dose of radioactive eluate to a patient during a patient infusion procedure” because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 357–360 (citing Ex. 1014, 19). Patent Owner does not provide a response specifically for this limitation. *See* PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches a PC interfacing with sensors and actuators and controlling pumps and valves to cause saline to flow through the generator to the patient, Petitioner persuades us by a preponderance of the evidence that Klein teaches “the computer is configured to control the mobile radioisotope generator system to deliver a dose of radioactive eluate to a patient during a patient infusion procedure.”

h) “the computer is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit”

Petitioner argues that Klein teaches that “the computer is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit.” Pet. 43 (citing Ex. 1014, 18, 33, 122; Ex. 1015 ¶¶ 361–371).

We find that the relied-upon portions of Klein teach that (1) “[o]nce the daily protocol has been completed successfully, patient elutions are enabled until the end of the day” (Ex. 1014, 18); (2) the “amount of Sr breakthrough activity must be strictly limited to the Health Canada guidelines” (*id.* at 33); (3) “[t]his issue is addressed by daily breakthrough tests as part of the daily protocol ensured by the system” (*id.*); (4) the “⁸²Rb infusion system software must ensure that the protocol is followed (i.e. that each run is enabled only after the prerequisites have been completed successfully)” (*id.* at 44); and (5) “[d]aily calibration samples are used to test for the breakthrough of Sr activity; if significant Sr activity is detected, the generator cannot be used on humans” (*id.* at 122). We also credit the testimony of Petitioner’s declarant regarding this particular limitation of claim 1 because record evidence supports the testimony. Ex. 1015 ¶ 370. Patent Owner does not provide a response specifically for this limitation but responds based on this limitation combined with the further limitation of claim 2. *See* PO Resp. 1–4, 11–58.

Based on the full record before us, because Klein teaches enabling infusions only after daily protocols are completed successfully, the daily protocols include breakthrough tests to detect Sr activity that would exceed Health Canada guidelines, and the generator cannot be used if significant Sr activity is detected, Petitioner persuades us by a preponderance of the evidence that Klein teaches a “computer [that] is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit.” *See also* PO Resp. 13 (stating that “Klein tests the generator for breakthrough on a daily basis using an off-board ‘dose calibrator’ and as part of his ‘daily protocol’”); Tr. 64:12–17 (Patent

Owner's counsel agreeing that Klein's computer prevents an infusion if the dose calibrator does not provide a reading).

2. *Claim 2*

Claim 2 depends from claim 1 and recites "wherein the automated quality control testing comprises breakthrough testing." Ex. 1001, 24:22–23.

a) *Parties' Positions*

Petitioner argues that Klein teaches the limitation of claim 2. Pet. 44 (citing Ex. 1014, 122; Ex. 1015 ¶¶ 372–377). Patent Owner responds that Klein does not teach a computer that prevents patient infusions if a strontium breakthrough test result exceeds an allowable limit as required by claim 2 and independent claim 24. PO Resp. 11, 48–49, 52–57. Claims 2 and 24 require that the quality control testing include breakthrough testing or determining activities of strontium-82 and strontium-85. Ex. 1001, 24:22–23, 26:44–50.

Patent Owner notes that Petitioner's arguments and evidence that Klein teaches a computer that prevents infusion if breakthrough test results exceed an allowable limit are the same in this proceeding and the related proceedings, IPR2018-01449 and IPR2018-01450. PO Resp. 49–51. Patent Owner also contends that paragraph 252 of Petitioner's declarant testimony is representative of Petitioner's position. *Id.* at 52 (quoting Ex. 1015 ¶ 252).

According to Patent Owner, Petitioner implicitly acknowledges that Klein does not expressly state that a computer prevents infusions if breakthrough test results exceed an allowable limit, and the relied-upon portions of Klein fail to disclose expressly such a computer. *Id.* at 53. Also, according to Patent Owner, although Klein resets at midnight and prohibits infusions until a daily protocol is completed, the computer of Klein does not

prevent infusions if breakthrough test results exceed an allowable limit, and the “decision is left to the operator.” *Id.* (citing Ex. 2003 ¶¶ 95–96).

Patent Owner contends that Klein’s computer merely “facilitates testing for strontium breakthrough.” *Id.* (citing Ex. 1014, 53–55). In Patent Owner’s view, Klein describes an experiment for observing excessive breakthrough, and the experiment would have been complicated or impossible if Klein’s computer prevented infusions based on breakthrough testing. *Id.* (citing Ex. 1014, 122; Ex. 2003 ¶ 97). Patent Owner also argues that Klein does not describe its computer preventing or having to override the computer after breakthrough was observed, and thus, one of ordinary skill in the art would have understood that an operator must prevent infusions if breakthrough is detected. *Id.* at 54.

Patent Owner further argues that (1) Klein teaches an operator may manually enter breakthrough activity from a more sensitive instrument, (2) Klein does not state clearly that the system is locked out until breakthrough activity is entered, (3) Klein lists error messages, none of which pertain to locking out based on breakthrough testing, and (4) Klein teaches that automatic testing of activity can fail so that the system could not determine breakthrough and may not be locked out. *Id.* at 54–55 (citing Ex. 1014, 52, 54, 61, Fig. 3-12; Ex. 2003 ¶¶ 98–99). Patent Owner also directs us to its declarant’s testimony in the related ITC proceeding. *Id.* at 55 (citing Ex. 2012, 983:10–984:23). Further, based on Figure 3-15 of Klein, which includes the step “Wait for Breakthrough Reading,” Patent Owner argues that the daily protocol is satisfied if Klein’s system can simply acquire data from the dose calibrator. *Id.* at 56–57 (citing Ex. 1014, Fig. 3-15; Ex. 2003 ¶¶ 100–101; Ex. 2003, 981:22–983:9).

Petitioner replies that Klein teaches a computer that “disables patient elutions each night,” and Patent Owner’s declarant agrees. Pet. Reply 2 (citing Ex. 2012, 981:9–10), 5 (citing Ex. 1014, 18, 19, Fig. 2-1; Ex. 1015 ¶¶ 159–168; Ex. 2012, 981:9–14). Petitioner argues that Klein teaches a computer-controlled infusion system with touchscreens that enable or disable buttons based on Klein’s operational state, thereby locking out elutions. Pet. Reply 4–5 (citing Pet. 42–44; Ex. 1014, 19, 30–31, 53–54, Fig. 3-12(c); Ex. 1015 ¶¶ 144–155, 159–168, 346–377).

Petitioner also argues that Patent Owner’s declarant incorrectly infers that the operator, not Klein’s computer, determines if strontium breakthrough tests results are low enough to resume patient infusions, and that Klein contradicts Patent Owner’s declarant. *Id.* at 5–6 (citing Ex. 2012, 1078:8–1079:12). According to Petitioner, “**the computer** does not re-enable patient infusions unless a calibration run is performed that yields strontium breakthrough values below a predetermined limit.” *Id.* at 6 (citing Ex. 1014, 17, 29, 44). Petitioner contends that one of ordinary skill in the art would have recognized from Klein that Klein’s computer operates as required by claims 2 and 24. *Id.* at 6–7 (citing Ex. 1015 ¶¶ 361–377, 532–541).

Regarding Patent Owner’s arguments that Klein’s breakthrough experiments suggest that its computer does not prevent infusions, Petitioner replies that those experiments were not patient infusion procedures, Klein distinguishes the experiments from patient procedures, Klein never suggests that those experiments involved patient procedures, and Klein prevents patient infusion procedures as required by claims 2 and 24. *Id.* at 7–9 (citing PO Resp. 52, 53; Ex. 1014, 53, 122, Fig. 3-15; Ex. 1015 ¶¶ 159–168).

Petitioner argues that the claims do not require that the computer disable all operation, only patient infusion procedures. *Id.* at 9.

Regarding Patent Owner's argument based on Klein's manual entry of breakthrough results, Petitioner replies that Klein teaches that manual entry is not normally done, manual entry would still be consistent with Klein's computer performing lockout, manual entry of breakthrough measurements would also ensure that the daily protocol is followed, and "automated breakthrough testing suffices in many cases," thus operating as claimed. *Id.* at 9–10 (citing Ex. 1014, 17, 33, 43, 64).

Petitioner also argues that Patent Owner's declarant testimony that a calibration run would be successful even if high strontium breakthrough levels were detected is inconsistent with a plain reading of Klein and not credible. *Id.* at 10 (citing PO Resp. 56–57; Ex. 1014, Fig. 3-15; Ex. 2012, 981:22–983:9). Petitioner further argues that Klein's breakthrough tests are completed successfully "only when test results show low strontium breakthrough." *Id.* at 11 (citing Ex. 1014, 18). Petitioner additionally argues that Klein's software, not the operator, enables patient elution runs because Klein's computer disables elutions each night and re-enables elutions only after breakthrough results meet limits. *Id.* (citing Ex. 1014, 29, 33, 44).

Patent Owner replies that "Petitioner's contention that Klein discloses the prevent limitations relies on selectively excerpting the record and mere attorney argument." PO Sur-Reply 3. Patent Owner also argues that its declarant provided testimony in the ITC proceeding regarding Klein's breakthrough testing and that the "testimony is unchallenged." *Id.* at 3–4 (citing Ex. 2012, 971:4–19, 1078:21–23).

Patent Owner contends that Petitioner relies on “disclosures in Klein relating to whether/when the system is locked out due to expiration of system calibration, not due to breakthrough results exceeding an allowable limit, as required by the claims.” *Id.* at 4–5 (citing Pet. Reply 3–11). According to Patent Owner, Petitioner incorrectly contends that Patent Owner’s declarant agreed that Klein’s system is locked out until breakthrough testing is performed. *Id.* at 5 (citing Pet. Reply 6). Patent Owner argues that its declarant testimony is consistent with the portions of Klein relied upon by Petitioner. *Id.* at 5–6 (citing Pet. Reply 6; Ex. 1014, 17; Ex. 2012, 983:7–9; 982:25–983:6).

Patent Owner also argues that Petitioner misreads Klein’s statement that “[o]nly after a calibration run with low Sr breakthrough has been successfully completed can patient elutions be carried out” and selectively quotes Klein. *Id.* at 6 (citing Pet. Reply 11; Ex. 1014, 18, 44). Patent Owner asserts that none of the relied-upon portions of Klein expressly teach a computer preventing infusion procedures based on breakthrough testing results. *Id.* at 6–7 (citing Ex. 1014, 44; Ex. 2003 ¶ 95). Patent Owner states that “there is no question that Klein requires that the calibration protocol is followed” but “Klein does not disclose that the computer prevents patient infusions if a strontium breakthrough test result exceeds an allowable limit.” *Id.* at 7.

Patent Owner further replies that Petitioner did not depose Patent Owner’s declarant Dr. Pelc and relies on attorney arguments to contend that one of ordinary skill in the art would understand Klein discloses a computer preventing infusion procedures. *Id.* (citing Pet. Reply 6, 7). Patent Owner also argues that Petitioner implicitly admits that Klein does not disclose such a computer because Petitioner relies on declarant testimony. *Id.* (citing Pet.

Reply 7; Ex. 1015 ¶ 252). Patent Owner likens Klein’s disclosures to the Bracco Manual, which does not disclose a computer performing breakthrough testing or preventing patient infusions. *Id.* at 8 (citing Ex. 1021, 31, 34–35). Patent Owner, thus, contends that Klein does not disclose a computer preventing infusions, as contended by Petitioner, but instead “teaches that the decision to perform patient infusions based on a strontium breakthrough test result is left to the operator.” *Id.* (citing Pet. Reply 6; Ex. 2003 ¶¶ 95–96).

Patent Owner also points to Klein’s statement that “[i]f the eluted ⁸²Rb activity is insufficient to accurately measure breakthrough, the automatic measurement is skipped,” and argues that one of ordinary skill in the art would not have understood Klein to be disclosing that its computer prevents patient elutions when skipping automatic measurement, or a requirement for manual entry when the skipping occurs. *Id.* at 8–9 (citing Pet. Reply 9; Ex. 1014, 52; Ex. 2012, 983:10–984:23).

Regarding Petitioner’s argument that “if significant Sr activity is detected, ***the generator cannot be used on humans***,” Patent Owner contends that “Klein does not mention the computer preventing a patient infusion due to such significant Sr activity” and Klein supports the analysis of Patent Owner’s declarant that “the operator, not the computer, makes the decision.” *Id.* at 9 (citing Pet. Reply 9; Ex. 2003 ¶ 97).

b) Whether Klein Teaches a Computer Preventing Infusion if Breakthrough Testing Result Exceeds an Allowable Limit

We find that Petitioner’s relied-upon portion of Klein teaches that “[d]aily calibration samples are used to test for the breakthrough of Sr activity; if significant Sr activity is detected, the generator cannot be used on humans.” Ex. 1014, 122; *see also* Pet. 44 (citing Ex. 1014, 122; Ex. 1015

¶¶ 372–377). We also find that Klein teaches that “Sr breakthrough . . . is tested for on a daily basis as part of the daily protocol.” Ex. 1014, 122.

Further, as discussed above, for claim 1’s recitation that “the computer is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit,” we find that Klein teaches that (1) “[o]nce the daily protocol has been completed successfully, patient elutions are enabled until the end of the day” (Ex. 1014, 18); (2) the “⁸²Rb infusion system software must ensure that the protocol is followed (i.e. that each run is enabled only after the prerequisites have been completed successfully)” (*id.* at 44); and (3) “[d]aily calibration samples are used to test for the breakthrough of Sr activity; if significant Sr activity is detected, the generator cannot be used on humans” (*id.* at 122). *See* Pet. 43 (citing Ex. 1014, 18, 33, 122; Ex. 1015 ¶¶ 361–371).

We, thus, find that, because Klein’s software ensures the daily protocol is followed and patient elutions or runs are “**enabled**” once the daily protocol is completed successfully, one of ordinary skill in the art would have understood that Klein teaches a computer that is configured via software to prevent or not enable patient infusion if the daily protocol is not completed successfully. *See also* Ex. 1014, 17–18 (describing that the “protocol consists of a system flush and a calibration run” and that “[a]lthough the outline remains unchanged, the protocol was slightly modified to remove operator intervention where automation was introduced”).

As for breakthrough testing, Klein expressly teaches that “Sr breakthrough . . . is tested for on a daily basis as part of the daily protocol” (Ex. 1014, 122), the “amount of Sr breakthrough activity must be strictly limited to the Health Canada guidelines” (*id.* at 33), and “[t]his issue is

addressed by daily breakthrough tests as part of the daily protocol ensured by the system” (*id.*). We, thus, find that one of ordinary skill in the art would have understood that Klein teaches breakthrough testing is part of the daily protocol that must be completed successfully to enable patient elutions.

We also find that a relied-upon portion of Klein for claim 2 teaches that “[d]aily calibration samples are used to test for the breakthrough of Sr activity” and “if significant Sr activity is detected, the generator cannot be used on humans.” *Id.* at 122. Thus, Klein expressly teaches that “if a quality control test result exceeds an allowable limit,” in particular if significant Sr activity indicating breakthrough is detected as further required by claim 2, then the generator should not be used and, therefore, a patient infusion procedure will not be enabled.⁴

Based on the full record, because Klein teaches software that ensures the daily protocol, which includes breakthrough testing, is followed and patient elutions are enabled only if the daily protocol is completed successfully, Petitioner persuades us by a preponderance of the evidence that Klein teaches “the computer is further configured to prevent the patient infusion procedure if a quality control test result exceeds an allowable limit,” as recited by claim 1 and “wherein the automated quality control testing comprises breakthrough testing,” as recited by dependent claim 2.⁵

⁴ Although we find that one of ordinary skill in the art would have understood that Klein teaches the limitations of claims 1 and 2, we note that our findings from Klein indicate that it would have also at least suggested the limitations of claims 1 and 2 to one of ordinary skill in the art.

⁵ Although the parties did not present or brief a broader interpretation, these limitations could be interpreted more broadly than implied by the parties’ arguments. For example, the limitation at issue does not exclude any and all operator intervention because a computer can still be configured to prevent a

Turning to Patent Owner's argument that an operator prevents infusions if breakthrough is detected, Petitioner persuades us that Klein's software enables patient infusions if the daily protocol, which includes breakthrough testing, is completed successfully. Also, Klein's teachings of manually entering breakthrough activity from a more sensitive instrument if such activity is not available from the dose calibrator and its description of a breakthrough experiment do not address if operator intervention is required when readings are available from the dose calibrator and when there is no breakthrough experiment.

During oral hearing, Patent Owner's counsel argued that independent claim 21 recites four steps of measuring activity, calculating a strontium activity, comparing a strontium activity to an allowable limit, and preventing infusion if the strontium activity exceeds the limit. Tr. 47:4–48:18, 49:16–20, 73:17–20. Patent Owner's counsel contended that Klein discloses a computer that performs the first step, automatically measuring activity, but not the other three steps. *See, e.g., id.* at 48:6–18, 58:8–16, 59:16–60:5, 60:14–61:17, 70:23–71:3. Petitioner's counsel objected to these arguments because they were not the arguments previously presented. *See id.* at 73:17–20, 95:14–96:3.

We agree with Petitioner that Patent Owner did not assert explicitly in its authorized briefing that independent claim 21 requires four steps, only

procedure even if additional operator action is required. *See* Tr. 19:15–20:16 (Petitioner's counsel answering questions about possible broader interpretation), 48:19–49:15 (Patent Owner's counsel answering questions about possible broader interpretation). For our analysis, because the parties dispute whether Klein's computer, standing alone, prevents a procedure without operator intervention if a strontium activity exceeds an allowable limit, we have applied the parties' implied, narrower interpretation.

one of which is completed automatically. Further, Patent Owner did not explain adequately how its analysis at the hearing ties into claim 2 (or any claim) of the '468 patent at issue here. We view these arguments as beyond the scope of Patent Owner's arguments in its briefing in this case, and thus, determine that these arguments were waived. Even if these arguments could be said to be within the scope of what was previously presented, we determine them to be unpersuasive, because Klein discloses software that ensures the daily protocol, which includes breakthrough testing, is followed and patient elutions are enabled only if the daily protocol is completed successfully. Thus, Petitioner persuades us by a preponderance of the evidence that one of ordinary skill in the art would have understood that Klein discloses a computer measuring activity, calculating a strontium activity, comparing a strontium activity to an allowable limit, and preventing infusion if the strontium activity exceeds the limit.

3. *Claim 4*

Claim 4 depends from claim 1 and recites “wherein the computer is configured to collect and store quality control test parameters and results.” Ex. 1001, 24:30–32. Petitioner argues that Klein teaches these limitations. Pet. 44 (citing Ex. 1014, 17, 31; Ex. 1015 ¶¶ 378–385).

We find that the relied-upon portions of Klein teach that the “⁸²Rb infuser was based on an industrial PC running MS-DOS coupled to a LCD touch-screen” (Ex. 1014, 17), “[t]he software ensured that the daily protocol . . . is followed and generated a recording of each elution” (*id.*), “[d]ata logging for analysis and recording . . . will include a log from the start of the elution until its termination” (*id.* at 31), and “[i]n the case of calibration runs and elution tests, the dose calibrator reading and the serial communication delay must also be logged” (*id.*).

We further credit Petitioner's declarant testimony regarding claim 4 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 378–385 (citing Ex. 1014, 17, 31). Patent Owner does not provide an argument specifically for claim 4. See PO Resp. 1–4, 11–58.

Because Klein teaches that its computer records each elution, logs data, and logs the dose calibrator reading, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the computer is configured to collect and store quality control test parameters and results.”

4. *Claim 6*

Claim 6 depends from claim 1 and recites

wherein the movable platform further carries a waste reservoir and the infusion tubing circuit further includes a waste tubing line and a divergence valve, the waste tubing line being configured to provide fluid communication between the strontium/rubidium radioisotope generator and the waste reservoir via the divergence valve, and

the computer is configured to receive activity measurements from the activity detector, control the divergence valve to direct eluate to the waste reservoir until the activity detector measures a threshold amount of radioactivity in the eluate, and, upon receiving an indication from the activity detector that the eluate has the threshold amount of radioactivity, control the divergence valve to direct eluate to the dose calibrator.

Ex. 1001, 24:36–50. Petitioner argues that Klein teaches these limitations. Pet. 45–47 (citing Ex. 1014, 19, 41, 44–45, 63, Figs. 2-2, 3-3; Ex. 1015 ¶¶ 388–397).

We find that Figure 2-2 of Klein shows a “Waste Container” and a line between “⁸²Sr/⁸²Rb Generator” and “Waste Container” through a “Patient Valve.” Ex. 1014, 19. We also find that Figure 3-3 of Klein shows a line between “Point G Generator Output” and “Waste” through “Point P

Patient Valve.” *Id.* at 41. At pages 44–45, we find that Klein describes a “general set of events” that is “common to most elutions” that includes a “generator flush . . . while the activity counter readings are monitored” and “[i]f a minimum threshold activity is not reached within a given time, the elution sequence is aborted.” According to Klein, in “Waiting for Threshold,” it “[e]lutes from generator to waste until the threshold activity is reached.” *Id.* at 63.

As discussed above for claim 1, we determine that Klein teaches that that “[t]he system acquires data from a . . . dose calibrator” (*id.* at 19), that “[a]ll the components are assembled in a stainless steel cart shown in Figure 2-3” (*id.* at 23), that “[a]ll the saline lines were mounted on a modified top cover” (*id.*), and that the “dose calibrator is used to detect the breakthrough activity as part of the calibration test through measurement of ^{82}Rb activity” (*id.* at 50).

We further credit Petitioner’s declarant testimony regarding claim 6 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 388–397 (citing Ex. 1014, 19, 41, 44–45, 63). Patent Owner does not provide an argument specifically for claim 6. See PO Resp. 1–4, 11–58.

Because Klein teaches a waste container, patient valve, and tubing between the valve, the waste container, and a $^{82}\text{Sr}/^{82}\text{Rb}$ generator on a stainless steel cart and because Klein’s computer acquires data from the dose calibrator for detecting breakthrough activity during which minimum activity must be reached during elution from generator to waste before eluting to a patient, Petitioner persuades us by a preponderance of the evidence that Klein teaches the subject matter of claim 6.

5. Claim 7

Claim 7 depends from claim 6 and recites

wherein the movable platform further carries a pump electronically coupled to the computer and connected to a supply of eluant,

the computer is configured to control the pump to supply the eluant to the strontium/rubidium radioisotope generator and generate the portion of radioactive eluate, and

the computer is configured to execute the automated quality control testing by controlling the pump, the divergence valve, the dose calibrator, and the activity detector.

Ex. 1001, 24:51–61. Petitioner argues that Klein teaches these limitations. Pet. 47–50 (citing Ex. 1014, 18, 19, 50; Ex. 1015 ¶¶ 400–416).

We find that Figure 2-2 of Klein shows a “Peristaltic Pump” coupled to a computer and a “Saline IV.” Ex. 1014, 19. We also find that a relied-upon portion of Klein teaches that its “system is based around a PC which interfaces with the various sensors and actuators” and “the real-time software controls the pumps and valves” to “affect the flow of saline through the generator.” *Id.*; *see also id.* at 23 (stating that “[a]ll the components are assembled in a stainless steel cart shown in Figure 2-3”). Klein describes that patient elutions are done only after a calibration run with low Sr breakthrough has been completed. *See id.* at 18, 23, 42, 50.

We further credit Petitioner’s declarant testimony regarding claim 7 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 400–416 (citing Ex. 1014, 18, 19, 23, 42, 50). Patent Owner does not provide an argument specifically for claim 7. *See* PO Resp. 1–4, 11–58.

Because Klein teaches a cart carrying a peristaltic pump coupled to a PC and a saline IV, and a computer that controls at least the pump to carry out breakthrough testing and elutions, Petitioner persuades us by a preponderance of the evidence that Klein teaches the subject matter of claim 7.

6. *Claim 9*

Claim 9 depends from claim 1 and recites “wherein the dose calibrator is at least one of integrated into the shielding assembly or contained within a well of the shielding assembly.” Ex. 1001, 24:65–67. Petitioner argues that the combination of Klein, Tate, and Reilly teaches these limitations. Pet. 50–53 (citing Ex. 1014, 24; Ex. 1015 ¶¶ 417–429; Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶¶ 79, 87, Fig. 1C).

As discussed above for claim 1, we find that each of Klein, Tate, and Reilly teaches a dose calibrator. Ex. 1014, 24; Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶¶ 79, 87, Fig. 1C. Also, based on our findings from Tate as discussed above, we further find that Tate teaches a dose calibrator encased in radioactive shielding. Ex. 1025 ¶¶ 79 (stating that “first trough 107 leads into a second recess or trough 113” and that “[a]s shown in FIG. 1C, the second trough 113 also . . . [leads] to a second well 121 that accommodates a dose calibrator or ionization chamber 160”), 87 (stating that the “recessed portions shown and described with respect to FIG. 1C are preferably encased throughout with suitable radioactive shielding to further minimize exposure to an operator.”), Fig. 1C (showing dose calibrator 160 within second recess or trough 113).

We additionally credit Petitioner’s declarant testimony regarding claim 9 because the relied-upon portions of Klein, Tate, and Reilly support that testimony. Ex. 1015 ¶¶ 417–423, 426–429 (citing Ex. 1014, 24; Ex. 1025 ¶¶ 79, 87, Fig. 1C). Patent Owner argues that one of ordinary skill in the art would not have moved Klein’s dose calibrator onto Klein’s cart, as required by claim 9, which we addressed above for claim 1. *See* PO Resp. 1–4, 11–58.

Because Klein, Reilly, and Tate each teach a dose calibrator and Tate teaches a dose calibrator integrated into a shielding assembly or contained within a well of a shielding assembly, Petitioner persuades us by a preponderance of the evidence that the cited prior art references teach “wherein the dose calibrator is at least one of integrated into the shielding assembly or contained within a well of the shielding assembly.”

7. *Claim 10*

Claim 10 depends from claim 1 and recites “wherein the computer is configured to execute automated quality control testing by at least receiving activity data from the dose calibrator and calculating at least one of breakthrough test results and calibration coefficient results.” Ex. 1001, 25:1–5. Petitioner argues that Klein teaches these limitations. Pet. 53–54 (citing Ex. 1014, 18, 20; Ex. 1015 ¶¶ 430–438).

We find that the relied-upon portions of Klein teach that “[a]n important advantage of using a PC to control the system is the wide range of applications and devices that are readily supported” including “user interface devices” and “data acquisition devices.” Ex. 1014, 20. We also find that Klein teaches that “[o]nly after a calibration run with low Sr breakthrough has been successfully completed can patient elutions be carried out.” *Id.* at 18. Klein further teaches “Wait[ing] for Breakthrough Reading” that includes “Wait[ing] for decay to read breakthrough from dose calibrator.” *Id.* at 64. As discussed above, Klein receives data from a dose calibrator and the dose calibrator is used for breakthrough testing. *See id.* at 18, 19, 50.

We also credit Petitioner’s declarant testimony regarding claim 10 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 430–438 (citing Ex. 1014, 17–19, 20, 64). Patent Owner does not provide an argument specifically for claim 10. *See* PO Resp. 1–4, 11–58.

Because Klein teaches its computer receives data from a dose calibrator and calculates breakthrough results, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the computer is configured to execute automated quality control testing by at least receiving activity data from the dose calibrator and calculating at least one of breakthrough test results and calibration coefficient results.”

8. *Claim 11*

Claim 11 depends from claim 1 and recites

wherein the computer is configured to execute automated quality control testing by at least receiving a first activity measurement from the dose calibrator at a first time, receiving a second activity measurement from the dose calibrator at a second time later than the first time, and calculating breakthrough test results using the first activity measurement and the second activity measurement.

Ex. 1001, 25:6–12. Petitioner argues that Klein teaches these limitations. Pet. 54–55 (citing Ex. 1014, 19, 50–51; Ex. 1015 ¶¶ 439–446).

We find that the relied-upon portions of Klein teach that ^{82}Rb activity “decays exponentially over time,” “breakthrough of each isotope, $A_{82\text{Sr}}/A_{82\text{Rb}}$ and $A_{85\text{Sr}}/A_{82\text{Rb}}$, is calculated as a relative activity ratio of Sr activity to ^{82}Rb activity delivered,” “dose calibrator is sensitive to the radiation of ^{82}Rb decay which is a consequence of ^{82}Sr decay,” and “ $\hat{A}_{\text{Breakthrough}}$ is the measured breakthrough activity by the dose calibrator after sufficient time has passed for the initial ^{82}Rb activity, $A_{82\text{Rb}}$, to decay.” Ex. 1014, 50–51.

We also credit Petitioner’s declarant testimony regarding claim 11 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 439–446 (citing Ex. 1014, 50–51). Patent Owner does not provide an argument specifically for claim 11. See PO Resp. 1–4, 11–58.

Because Klein teaches measuring $A_{82\text{Rb}}$ and $\hat{A}_{\text{Breakthrough}}$ after sufficient time has passed for $A_{82\text{Rb}}$ to decay, Petitioner persuades us by a preponderance of the evidence that Klein teaches the subject matter of claim 11.

9. *Claim 12*

Claim 12 depends from claim 1 and recites “where the computer is configured to execute automated quality control testing by receiving activity data from the dose calibrator and calculating the ratio of an activity of strontium-82 divided by an activity of rubidium-82 and a ratio of the activity of strontium-85 divided by the activity of rubidium-82.” Ex. 1001, 25:13–18. Petitioner argues that Klein teaches these limitations. Pet. 55–56 (citing Ex. 1014, 19, 50–51; Ex. 1015 ¶¶ 447–454).

We find that the relied-upon portions of Klein teach that “breakthrough of each isotope, $A_{82\text{Sr}}/A_{82\text{Rb}}$ and $A_{85\text{Sr}}/A_{82\text{Rb}}$, is calculated as a relative activity ratio of Sr activity to ^{82}Rb activity delivered” and that the “dose calibrator is sensitive to the radiation of ^{82}Rb decay which is a consequence of ^{82}Sr decay.” Ex. 1014, 50–51; *see also id.* at 19 (stating that “[t]he system acquires data from a[n] . . . activity counter”). We also credit Petitioner’s declarant testimony regarding claim 12 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 447–454 (citing Ex. 1014, 19, 50–51). Patent Owner does not provide an argument specifically for claim 12. *See* PO Resp. 1–4, 11–58.

Because Klein teaches a computer acquiring data from a dose calibrator and calculating $A_{82\text{Sr}}/A_{82\text{Rb}}$ and $A_{85\text{Sr}}/A_{82\text{Rb}}$ from activity measured by the dose calibrator, Petitioner persuades us by a preponderance of the evidence that Klein teaches “where the computer is configured to execute automated quality control testing by receiving activity data from the dose

calibrator and calculating the ratio of an activity of strontium-82 divided by an activity of rubidium-82 and a ratio of the activity of strontium-85 divided by the activity of rubidium-82.”

10. Claim 13

Claim 13 depends from claim 1 and recites “wherein the movable platform further carries a touch screen display and the computer is further configured to indicate via the display if results of the quality control testing are within allowable limits.” Ex. 1001, 25:19–22. Petitioner argues that Klein teaches these limitations. Pet. 57–58 (citing Ex. 1014, 18, 29; Ex. 1015 ¶¶ 455–462).

We find that Figure 2-3 of Klein shows, at least, an “LCD Touch Screen” and “Personal Computer” on a cart. Ex. 1014, 24. As discussed above, we find that Klein teaches that “[a]ll the components are assembled in a stainless steel cart shown in Figure 2-3” (Ex. 1014, 23), where “the LCD touch screen was mounted on an adjustable support arm” with a “PC . . . mounted on the lower tray” (*id.* at 23, 25). We also find that the relied-upon portions of Klein describe enabling patient elutions after a calibration run with low Sr breakthrough. *Id.* at 18, 29. We further find that Klein teaches that the “real-time graphics display must include a system diagram with updated information about the state of the system.” *Id.* at 55; *see also id.* Fig. 3-12 (showing “screenshots of the GUI”).

We also credit Petitioner’s declarant testimony regarding claim 13 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 455–462 (citing Ex. 1014, 18, 24, 29, 55). Patent Owner does not provide an argument specifically for claim 13. *See* PO Resp. 1–4, 11–58.

Because Klein teaches a cart carrying a touch screen and a computer that displays update information about the system and because Klein teaches

enabling elutions after a calibration run with low Sr breakthrough, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the movable platform further carries a touch screen display and the computer is further configured to indicate via the display if results of the quality control testing are within allowable limits.”

11. Claim 14

Claim 14 depends from claim 1 and recites “wherein the dose calibrator comprises a removable sample collection reservoir configured to receive the portion of eluate.” Ex. 1001, 25:23–25. Petitioner argues that Klein teaches this limitation. Pet. 58–59 (citing Ex. 1014, 47, 50, 101; Ex. 1015 ¶¶ 463–470).

We find that Figure 3-7 of Klein shows a “Vial” in a dose calibrator chamber. Ex. 1014, 47. We also find that the relied-upon portions of Klein teach “eluti[ng] to a vial” and “vials must be changed between elutions.” *Id.* at 50, 101. We further credit Petitioner’s declarant testimony regarding claim 14 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 463–470 (citing Ex. 1014, 46, 50, 101). Patent Owner does not provide an argument specifically for claim 14. See PO Resp. 1–4, 11–58.

Because Klein teaches eluting to a removable vial in a dose calibrator, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the dose calibrator comprises a removable sample collection reservoir configured to receive the portion of eluate.”

12. Claim 15

Claim 15 depends from claim 1 and recites “wherein the computer is electronically coupled to the dose calibrator via one of a wired or wireless connection.” Ex. 1001, 25:26–28. Petitioner argues that Klein teaches these limitations. Pet. 59 (citing Ex. 1014, 23; Ex. 1015 ¶¶ 471–477).

We find that the relied-upon portion of Klein teaches that “[c]ommunication between the PC and the dose calibrator is achieved through RS-232 polling by the PC.” Ex. 1014, 23. We also find that Figure 2-2 of Klein shows a connection between a computer and a “Dose Calibrator.” *Id.* at 19. We further credit Petitioner’s declarant testimony regarding claim 15 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 471–477 (citing Ex. 1014, 20, 23). Patent Owner does not provide an argument specifically for claim 15. *See* PO Resp. 1–4, 11–58.

Because Klein teaches that its computer communicates with its dose calibrator through RS-232 polling, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein the computer is electronically coupled to the dose calibrator via one of a wired or wireless connection.”

13. Claim 16

Claim 16 depends from claim 1 and recites “wherein the movable platform rests on wheels configured to roll and swivel.” Ex. 1001, 25:29–30. Petitioner argues that Klein and Tate teach these limitations. Pet. 59–60 (citing Ex. 1014, 24, 36; Ex. 1015 ¶¶ 478–486; Ex. 1025, Fig. 1A).

We find that Figure 2-3 of Klein shows its cart on wheels. Ex. 1014, 24. We also find that Klein teaches that “the cart must be moved around the PET imaging room.” *Id.* at 36. We also find that Figure 1A of Tate shows cart-like apparatus 9 with casters 12. *See also* Ex. 1025 ¶ 70 (stating that “fluid delivery system 10 is preferably a cart-like apparatus 9 having wheels 13 and/or casters 12 for allowing the system to be moveable”).

We also credit Petitioner’s declarant testimony regarding claim 16 because the relied-upon portions of Klein and Tate support that testimony.

Ex. 1015 ¶¶ 478–486 (citing Ex. 1014, 24, 36; Ex. 1025, Fig. 1A). Patent Owner does not provide an argument specifically for claim 16. *See* PO Resp. 1–4, 11–58.

Because Klein teaches a cart with wheels so that it can be moved around an imaging room and Tate teaches cart-like apparatus 9 with casters 12, Petitioner persuades us by a preponderance of the evidence that Klein and Tate each teach “wherein the movable platform rests on wheels configured to roll and swivel.”

14. Claim 17

Claim 17 depends from claim 1 and recites “further comprising an eluant reservoir containing saline as the eluant, the eluant reservoir being connected to the movable platform and positioned outside of the shielding assembly.” Ex. 1001, 25:31–34. Petitioner argues that Klein teaches these limitations. Pet. 60–61 (citing Ex. 1014, 18, 24; Ex. 1015 ¶¶ 487–493).

We find that Figure 2-3 of Klein shows a “Saline Bag” mounted on an outer surface of a cart that contains a “Shielded Waste Container” and “Shielded Generator.” Ex. 1014, 24; *see also id.* at 19 (showing a “Saline IV” that supplies a “Peristaltic Pump” that leads to a generator and a patient valve in Fig. 2-2). We also find that the relied-upon portions of Klein teach that the “daily protocol begins with replacement of the saline supply,” a “flush run is initiated by the operator to flush and prime all lines with 0.9% NaCl saline,” and the “generator is then flushed with 50 ml saline in order to remove air bubbles and any Sr breakthrough from the system.” *Id.* at 18. We further credit Petitioner’s declarant testimony regarding claim 17 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 487–493 (citing Ex. 1014, 18, 19, 24). Patent Owner does not provide an argument specifically for claim 17. *See* PO Resp. 1–4, 11–58.

Because Klein teaches a saline bag, supply, or IV mounted on an outer surface of its cart, Petitioner persuades us by a preponderance of the evidence that Klein teaches “further comprising an eluant reservoir containing saline as the eluant, the eluant reservoir being connected to the movable platform and positioned outside of the shielding assembly.”

15. Claim 19

Claim 19 depends from claim 1 and recites “further comprising a pressure sensor in communication with the computer and configured to measure pressure of the eluate within the infusion tubing circuit.” Ex. 1001, 25:43–46. Petitioner argues that Klein teaches these limitations. Pet. 61–62 (citing Ex. 1014, 19, 33; Ex. 1015 ¶¶ 494–500).

We find that Figure 2-2 of Klein shows a “Pressure Sensor” that is connected to a “Interface Module” that is also connected to a computer. Ex. 1014, 19. We also find that the relied-upon portions of Klein teach that a “flow rate is set by the software and controlled by the autonomous peristaltic pump,” “pressure in the lines must remain within pump manufacturer specifications to ensure that the flow rate is accurate,” a “pressure sensor is used to sense high pressure in the saline lines due to blockage,” and the “pressure sensor is located downstream of the pump head and before the generator valve.” *Id.* at 33. We further credit Petitioner’s declarant testimony regarding claim 19 because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 494–500 (citing Ex. 1014, 19, 33). Patent Owner does not provide an argument specifically for claim 19. See PO Resp. 1–4, 11–58.

Because Klein teaches a pressure sensor connected to a computer, and it is used to sense high pressure in saline lines, Petitioner persuades us by a preponderance of the evidence that Klein teaches “a pressure sensor in

communication with the computer and configured to measure pressure of the eluate within the infusion tubing circuit.”

16. *Claim 24*

a) *“A method”*

Petitioner argues that Klein teaches a method. Pet. 62 (citing Ex. 1014, 1; Ex. 1015 ¶¶ 503–505).

We find that the relied-upon portion of Klein teaches that its “system is aimed at administering the activity to patients in a precise and controlled manner.” Ex. 1014, 1. We also credit Petitioner’s declarant testimony regarding the preamble of claim 24 because the record supports it. Ex. 1015 ¶¶ 503–505 (citing Ex. 1014, 1, 19). Patent Owner does not provide a response regarding the preamble of claim 24. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches administering radioactive eluant, Petitioner persuades us by a preponderance of the evidence that Klein teaches a “method.”

b) *“delivering eluant to a strontium/rubidium radioisotope generator carried by a movable cart and thereby generating radioactive eluate via elution”*

Petitioner argues that Klein teaches the delivering eluant step. Pet. 63–64 (citing Ex. 1014, 8, 19, 23, 24; Ex. 1015 ¶¶ 506–510).

We find that the relied-upon portions of Klein teach that a “generator consists of a tin-oxide (SnO_2) ion-separation column which strongly binds Sr isotopes” and “is flushed with a solution, such as 0.9% NaCl saline” so that “ ^{82}Rb is eluted in the form of $^{82}\text{RbCl}$ (eluate).” Ex. 1014, 8; *see also id.* at 24 (Figure 2-2 showing a peristaltic pump between a saline IV and a $^{82}\text{Sr}/^{82}\text{Rb}$ generator). We also find that Klein teaches that “[a]ll the components are assembled in a stainless steel cart shown in Figure 2-3.” *Id.*

at 23. We further credit the testimony of Petitioner's declarant because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 506–510 (citing Ex. 1014, 8, 19, 23, 24). Patent Owner does not present an argument specifically for this limitation of claim 24. See PO Resp. 1–4, 11–58.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein teaches “delivering eluant to a strontium/rubidium radioisotope generator carried by a movable cart and thereby generating radioactive eluate via elution.”

c) *“measuring, with an activity detector carried by the movable cart, an activity of the eluate within a tubing line of an infusing tubing circuit”*

Petitioner argues that Klein teaches the measuring activity of the eluate step. Pet. 64–65 (citing Ex. 1014, 19, 24, 30; Ex. 1015 ¶¶ 511–515).

We find that the relied-upon portions of Klein teach that the “system is based around a PC which interfaces with the various sensors and actuators” and “acquires data from a[n] . . . activity counter.” Ex. 1014, 19; see also *id.* at 24 (Figure 2-2 showing an activity detector downstream of a $^{82}\text{Sr}/^{82}\text{Rb}$ generator). We also credit the testimony of Petitioner's declarant because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 511–515 (citing Ex. 1014, 19, 24, 30). Patent Owner does not present an argument specifically for this limitation of claim 24. See PO Resp. 1–4, 11–58.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein teaches “measuring, with an activity detector carried by the movable cart, an activity of the eluate within a tubing line of an infusing tubing circuit.”

d) *“delivering a portion of eluate via the tubing line to a dose calibrator carried by the movable cart”*

Petitioner argues that the combination of Klein, Reilly, and Tate teaches the delivering eluate step. Pet. 65–68 (citing Ex. 1014, 19, 23, 24, 50; Ex. 1015 ¶¶ 516–526; Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶ 79, Fig. 1C).

We find that the relied-upon portions of Klein teach that the “system is based around a PC which interfaces with the various sensors and actuators” and “acquires data from a . . . dose calibrator.” Ex. 1014, 19; *see also id.* at 24 (Figure 2-2 showing a dose detector downstream of a $^{82}\text{Sr}/^{82}\text{Rb}$ generator). We also credit the testimony of Petitioner’s declarant because the relied-upon references support that testimony. Ex. 1015 ¶¶ 516–526 (citing Ex. 1014, 19, 23, 24, 43, 50; Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶¶ 79, 87, Fig. 1C).

Patent Owner responds that there is no motivation to move Klein’s dose calibrator onto its cart. PO Resp. 1–4, 11–47. For the reasons discussed above for claim 1, Petitioner persuades us that Reilly and Tate each teach a dose calibrator (Ex. 1024 ¶ 64, Figs. 3, 4C; Ex. 1025 ¶ 79, Fig. 1C) and that one of ordinary skill in the art would have had a reason to move a dose calibrator to the cart of Klein with a reasonable expectation of success.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein teaches “delivering a portion of eluate via the tubing line to a dose calibrator carried by the movable cart.”

- e) *“performing quality control testing on the eluate delivered to the dose calibrator, quality control testing including determining an activity of strontium-82 and an activity of strontium-85 in the eluate”*

Petitioner argues that Klein teaches the performing quality control testing on the eluate step. Pet. 68–69 (citing Ex. 1014, 50–51; Ex. 1015 ¶¶ 527–531).

We find that the relied-upon portions of Klein teach that ^{82}Rb activity “decays exponentially over time,” “breakthrough of each isotope, $A_{82\text{Sr}}/A_{82\text{Rb}}$ and $A_{85\text{Sr}}/A_{82\text{Rb}}$, is calculated as a relative activity ratio of Sr activity to ^{82}Rb activity delivered,” “dose calibrator is sensitive to the radiation of ^{82}Rb decay which is a consequence of Sr decay,” and “ $\hat{A}_{\text{Breakthrough}}$ is the measured breakthrough activity by the dose calibrator after sufficient time has passed for the initial ^{82}Rb activity, $A_{82\text{Rb}}$, to decay.” Ex. 1014, 50–51. We also credit the testimony of Petitioner’s declarant because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 527–531 (citing Ex. 1014, 19, 50–51). Patent Owner does not present an argument specifically for this limitation of claim 24. See PO Resp. 1–4, 11–58.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein teaches “performing quality control testing on the eluate delivered to the dose calibrator, quality control testing including determining an activity of strontium-82 and an activity of strontium-85 in the eluate.”

- f) *“preventing, via a computer carried by the movable cart, a patient injection procedure if a quality control test result exceeds an allowable limit”*

Petitioner argues that Klein teaches the preventing, via a computer, a patient injection procedure step. Pet. 69–70 (citing Ex. 1014, 19, 33, 44, 55, 122; Ex. 1015 ¶¶ 532–541).

We find that the relied-upon portions of Klein teach that (1) the “amount of Sr breakthrough activity must be strictly limited to the Health Canada guidelines” (Ex. 1014, 33); (2) “[t]his issue is addressed by daily breakthrough tests as part of the daily protocol ensured by the system” (*id.*); (3) the “⁸²Rb infusion system software must ensure that the protocol is followed (i.e. that each run is enabled only after the prerequisites have been completed successfully)” (*id.* at 44); and (4) “[d]aily calibration samples are used to test for the breakthrough of Sr activity; if significant Sr activity is detected, the generator cannot be used on humans” (*id.* at 122). We also credit the testimony of Petitioner’s declarant because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 532–541 (citing Ex. 1014, 18, 19, 29, 33, 55, 122, Fig. 2-1).

Patent Owner responds that Klein fails to teach this step of claim 24 for the reasons we summarized above for claim 2. PO Resp. 4, 48–57. Based on the full record, and for the reasons discussed above in the context of our analysis of claim 2, Petitioner persuades us by a preponderance of the evidence that Klein teaches “preventing, via a computer carried by the movable cart, a patient injection procedure if a quality control test result exceeds an allowable limit.”

17. Claim 25

Claim 25 depends from claim 24 and recites “further comprising storing, on the computer carried by the movable cart, quality control testing information.” Ex. 1001, 26:51–53.

Petitioner argues that Klein teaches the limitations of claim 25. Pet. 71 (citing Ex. 1014, 16, 31; Ex. 1015 ¶¶ 542–551).

We find that the relied-upon portion of Klein teaches that “[d]ata logging for analysis and recording . . . will include a log from the start of the elution until its termination,” “[f]or all elutions the elapsed time, activity counts, line pressure, and generator valve open-time must be logged,” and “[i]n the case of calibration runs and elution tests, the dose calibrator reading and the serial communication delay must also be logged.” Ex. 1014, 31. We also credit the testimony of Petitioner’s declarant because the relied-upon portions of Klein support that testimony. Ex. 1015 ¶¶ 542–551 (citing Ex. 1014, 17, 26, 31). Patent Owner does not present an argument specifically for claim 25. See PO Resp. 1–4, 11–58.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein teaches “storing, on the computer carried by the movable cart, quality control testing information.”

18. Claim 28

Claim 28 depends from claim 24 and recites “wherein delivering the portion of eluate via the tubing line to the dose calibrator comprises delivering the portion of eluate to a removable sample collection reservoir.” Ex. 1001, 26:61–64.

Petitioner argues that Klein teaches the limitations of claim 28. Pet. 71–72 (citing Ex. 1014, 46 (Fig. 3-7), 50, 101; Ex. 1015 ¶¶ 552–560).

We find that Figure 3-7 of Klein shows a “Dose calibrator chamber measurement diagram” with a “Patient Line” into a “Vial” within a “Calibrator Chamber.” Ex. 1014, 47. We also find that the relied-upon portions of Klein teach that the “dose calibrator is used to detect the breakthrough activity” (*id.* at 50), “[o]nce elution to a vial is complete, a high proportion of ^{82}Rb isotopes are present” (*id.*), and “[f]inally, vials must be changed between elutions” (*id.* at 101). We further credit Petitioner’s declarant testimony regarding claim 28 because the record supports it. Ex. 1015 ¶¶ 552–560 (citing Ex. 1014, 46, 50, 101). Patent Owner does not provide an argument specifically for claim 28. See PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches eluting to a vial that must be changed between elutions, Petitioner persuades us by a preponderance of the evidence that Klein teaches “wherein delivering the portion of eluate via the tubing line to the dose calibrator comprises delivering the portion of eluate to a removable sample collection reservoir.”

F. Challenge Based on Klein, Reilly, Tate, and the Bracco Manual

1. Claim 8

Claim 8 depends from claim 1 and recites “wherein the movable platform further carries a printer configured to provide a printout of quality control test information.” Ex. 1001, 24:62–64.

Petitioner refers to its arguments that Klein, Reilly, and Tate teach all the limitations of claim 1. Pet. 75. Petitioner also argues that Klein and the Bracco Manual teach the limitations of claim 8. *Id.* at 75–76 (citing Ex. 1014, 24; Ex. 1015 ¶¶ 572–576; Ex. 1021, 17, 37).

Patent Owner argues that the Bracco Manual does not qualify as a printed publication because “the manual was only supplied to customers and all such customers were under an obligation of confidentiality during the

relevant time period.” PO Resp. 58 (citing *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1333–1334 (Fed. Cir. 2009)).

Petitioner replies that the Bracco Manual qualifies as a printed publication because Patent Owner “admits that it distributed the printed manual to an interested segment of the public—users of its commercially-available CardioGen system” and “did so for a product that has been commercially available since 1989, roughly two decades before the earliest priority date claimed by the ’468 patent.” Pet. Reply 25 (citing PO Resp. 9, 58; Ex. 1002 ¶¶ 30–33). Petitioner also argues that “the manual (Ex. 1021) contains no confidentiality markings or other language restricting its use.” *Id.* at 26; see also *id.* at 27 (citing *Nobel Biocare Services AG v. Intradent USA, Inc.*, 903 F.3d 1365, 1377 (Fed. Cir. 2018)). According to Petitioner, Patent Owner does not show *Cordis* applies because there is no showing that confidentiality of the manual was requested and maintained. *Id.* at 26–27 (citing PO Resp. 58). Petitioner further argues that Patent Owner provides no evidence that customers were under an obligation of confidentiality or that the manual was distributed with an expectation that it would be kept confidential and not disseminated, and, thus, “[i]ts contention is mere attorney argument” that “should be disregarded.” *Id.* at 26–27 (citing *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017)).

Patent Owner replies that Petitioner has the burden of showing the Bracco Manual qualifies as prior art by a preponderance of the evidence and that Petitioner has provided no evidence of public accessibility. PO Sur-Reply 18–19, 20. Patent Owner states that “Petitioner did not seek any discovery on this issue from Bracco, did not depose Bracco’s expert, and did not seek to file supplemental information.” *Id.* at 19. Patent Owner argues that “the evidence consists of the Bracco Manual, which lists a 2004 date

and says nothing about public accessibility, and Bracco’s explanation that the document was only disseminated to its customers under an obligation of confidentiality.” *Id.* at 19–20.

Whether a reference qualifies as a “printed publication” is a legal conclusion based on underlying factual findings. *Nobel*, 903 F.3d at 1375 (citing *Jazz Pharm., Inc. v. Amneal Pharm., LLC*, 895 F.3d 1347, 1356 (Fed. Cir. 2018)). The underlying factual findings include whether the reference was publicly accessible. *Id.* (citing *In re NTP, Inc.*, 654 F.3d 1279, 1296 (Fed. Cir. 2011)). The determination of whether a document is a “printed publication” under 35 U.S.C. § 102 “involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public.” *Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1380 (citing *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)).

A “petitioner need not establish that specific persons actually accessed or received a work to show that the work was publicly accessible.” *Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1374 (Fed. Cir. 2019). “In fact, a limited distribution can make a work publicly accessible under certain circumstances.” *Id.* (quoting *GoPro, Inc. v. Contour IP Holding LLC*, 908 F.3d 690, 694 (Fed. Cir. 2018)). “Because there are many ways in which a reference may be disseminated to the interested public, ‘public accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’ bar under 35 U.S.C. § 102(b).” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (quoting *In re Hall*, 781 F.2d, 897, 898–99 (Fed.Cir.1986)). “A given reference is ‘publicly accessible’ upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art

exercising reasonable diligence, can locate it.” *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008).

Although not dispositive, the Bracco Manual has a date of “July 20, 2004” and “Rev 07.” Ex. 1021, i; *see Nobel Biocare*, 903 F.3d at 1377 (“Although the ABT Catalog’s date is not dispositive of the date of public accessibility, its date is relevant evidence that supports the Board’s finding of public accessibility at the March 2003 IDS Conference.”); *see also* PO Sur-Reply 19–20 (arguing that “the evidence consists of the Bracco Manual, which lists a 2004 date and says nothing about public accessibility, and Bracco’s explanation that the document was only disseminated to its customers under an obligation of confidentiality”). Also, because the Bracco Manual calls itself an “Rb-82 Infusion System User’s Guide” (Ex. 1021, i), we determine that it must have been distributed to purchasers of the Rb-82 Infusion System. *See* PO Resp. 58 (stating that “the manual was only supplied to customers and all such customers were under an obligation of confidentiality during the relevant time period”). Klein indicates that either the system described by the Bracco Manual or one like it was known. Ex. 1014, 8 (“Various vendors [Bracco, 2004, formerly Squibb] and research teams have manufactured $^{82}\text{Sr}/^{82}\text{Rb}$ generators that are all similar in design.”).

We further agree with Petitioner that Patent Owner states that “it distributed the printed manual to an interested segment of the public—users of its commercially-available CardioGen system” and “did so for a product that has been commercially available since 1989, roughly two decades before the earliest priority date claimed by the ’468 patent.” Pet. Reply 25 (citing PO Resp. 9, 58; Ex. 1002 ¶¶ 30–33). Moreover, the Bracco Manual has no indications that it was meant to be confidential or its use restricted,

and the record does not indicate that confidentiality was requested or maintained. For the reasons above, Petitioner persuades us by a preponderance of the evidence that the Bracco Manual was publicly accessible in the pertinent time frame.

Turning to the teachings of the asserted references, we find that Figure 2-3 of Klein shows a printer on its moveable cart. Ex. 1014, 24; *see also id.* at 23 (“All the components are assembled in a stainless steel cart shown in Figure 2-3.”), 25 (“The PC, printer, and power isolation transformer were mounted on the lower tray.”). We also find that the relied-upon portion of the Bracco Manual states that “[a]t the end of an infusion operation, a complete report of the Rb-82 infusion is printed on the system printer.” Ex. 1021, 17. We further credit Petitioner’s declarant testimony regarding claim 8 because the record supports it. Ex. 1015 ¶¶ 572–576 (citing Ex. 1014, 24; Ex. 1021, 17). Patent Owner does not provide an argument disputing the teachings of Klein and the Bracco Manual with respect to claim 8. *See* PO Resp. 1–4, 11–58.

Based on the full record, because Klein teaches a cart carrying a printer and the Bracco Manual teaches printing out a complete report at the end of an infusion operation, Petitioner persuades us by a preponderance of the evidence that Klein and the Bracco Manual teach “wherein the movable platform further carries a printer configured to provide a printout of quality control test information.”

2. *Reason to Combine*

Petitioner also contends that one of ordinary skill in the art would have been motivated to combine the teachings of these references to include features such as written records of quality control test information as part of implementing Klein’s device for use in a clinical setting. Pet. 72–74 (citing

Ex. 1014, 8, 41–52; Ex. 1015 ¶¶ 562–565; Ex. 1017 ¶ 33; Ex. 1021, 31–38). Petitioner additionally contends that one of ordinary skill in the art would have had a reasonable expectation of success in combining the teachings of Klein, Reilly, Tate, and the Bracco Manual. *Id.* at 74 (citing Ex. 1015 ¶ 567). Patent Owner does not provide an argument against Petitioner’s reason to combine the asserted references. *See generally* PO Resp.; PO Sur-Reply.

Based on the full record, Petitioner persuades us by a preponderance of the evidence that the Bracco Manual teaches that one of ordinary skill in the art would have known of printers, written records of quality control information, and how to implement such records into infusion systems. Ex. 1021, 31–38. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have been motivated to include printouts of quality control information to implement Klein’s system in a clinical setting and would have had a reasonable expectation of success in combining the asserted references. Pet. 72–74. We also credit Petitioner’s declarant testimony regarding the reason to combine because the record supports it. Ex. 1015 ¶¶ 562–568 (citing Ex. 1014, 8, 41–52; Ex. 1021, 31–38)

G. Challenge Based on Klein, Reilly, Tate, and Hirschman

1. Claim 18

Claim 18 depends from claim 17 and recites

further comprising an encoded information reader configured to read encoded information from at least one of the eluant reservoir, the infusion tubing circuit, and the strontium/rubidium radioisotope generator, and wherein the computer is further configured to receive information read from a label attached to the at least one of the eluant reservoir, the infusion tubing circuit, and the strontium/rubidium radioisotope generator.

Ex. 1001, 25:36–43.

Petitioner refers to its arguments that Klein, Reilly, and Tate teach the limitations of claim 17. Pet. 80. Petitioner relies on Hirschman for teaching the limitations of claim 18. *Id.* at 80 (citing Ex. 1015 ¶¶ 588–591; Ex. 1022 ¶ 153).

As discussed above, based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein, Reilly, and Tate teach the limitations of claim 17, from which claim 18 depends. Pet. 60–61. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine the references with a reasonable expectation of success. *Id.* at 27–30.

We find that the relied-upon portion of Hirschman teaches that “information is written as a bar code, stored on an RFID tag, written to a USB memory stick, or otherwise encoded and associated with a radiopharmaceutical container” and that “patient injection module 260 (and desirably fluid injection system 700) is designed to read the encoded information.” Ex. 1022 ¶ 153. We also credit Petitioner’s declarant testimony regarding claim 18 because the record supports it. Ex. 1015 ¶¶ 588–591 (citing Ex. 1022 ¶¶ 124, 153). Patent Owner does not provide arguments specifically for claim 18. *See generally* PO Resp.; *see also* Pet. Reply 2 (stating that “Bracco makes no challenge specific to Grounds 3 and 4”).

Based on the full record, because Hirschman teaches that its patient injection module 260 can read encoded information associated with a radiopharmaceutical container, Petitioner persuades us by a preponderance of the evidence that Hirschman teaches “an encoded information reader configured to read encoded information from at least one of the eluant

reservoir, the infusion tubing circuit, and the strontium/rubidium radioisotope generator.” Also, based on the full record, because Hirschman teaches that the information can be written as a bar code and associated with a radiopharmaceutical container, Petitioner persuades us by a preponderance of the evidence that Hirschman teaches “wherein the computer is further configured to receive information read from a label attached to the at least one of the eluant reservoir, the infusion tubing circuit, and the strontium/rubidium radioisotope generator.”

2. *Claim 20*

Claim 20 depends from claim 1 and recites “wherein the computer is configured to connect to a removable computer readable storage device and transfer quality control information to the removable computer readable storage device.” Ex. 1001, 25:48–51.

Petitioner refers to its arguments that Klein, Reilly, and Tate teach all the limitations of claim 1. Pet. 81. Petitioner relies on Hirschman for teaching the limitations of claim 20. *Id.* (citing Ex. 1015 ¶¶ 593–599; Ex. 1022 ¶ 153).

As discussed above, based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein, Reilly, and Tate teach the limitations of claim 1, from which claim 20 depends. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine the references with a reasonable expectation of success.

We find that the relied-upon portion of Hirschman teaches that “embodiments discussed in the foregoing wherein information is written as a bar code, stored on an RFID tag, written to a USB memory stick” and “[t]his encoded information retrieval is done for quality control.” Ex. 1022 ¶ 153.

We also credit Petitioner’s declarant testimony regarding claim 20 because the record supports it. Ex. 1015 ¶¶ 593–599 (citing Ex. 1022 ¶ 153). Patent Owner does not provide arguments specifically for claim 20. *See generally* PO Resp.; *see also* Pet. Reply 2 (stating that “Bracco makes no challenge specific to Grounds 3 and 4”).

Based on the full record, because Hirschman teaches writing information to a USB memory stick for quality control, Petitioner persuades us by a preponderance of the evidence that Klein, Reilly, Tate, and Hirschman teach “wherein the computer is configured to connect to a removable computer readable storage device and transfer quality control information to the removable computer readable storage device.”

3. *Claim 27*

Claim 27 depends from claim 25 and recites “further comprising transferring, via the computer carried by the movable cart, quality control information to a removable computer readable storage device.” Ex. 1001, 26:57–60.

Petitioner refers to its arguments that Klein, Reilly, and Tate teach all the limitations of claim 1. Pet. 81. Petitioner relies on Hirschman for teaching the limitations of claim 27. *Id.* (citing Ex. 1015 ¶¶ 601–607; Ex. 1022 ¶ 153).

As discussed above, based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein and Tate teach the limitations of claim 25, from which claim 27 depends. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine the references with a reasonable expectation of success.

We find that the relied-upon portion of Hirschman teaches that “embodiments discussed in the foregoing wherein information is written as a bar code, stored on an RFID tag, written to a USB memory stick” and “[t]his encoded information retrieval is done for quality control.” Ex. 1022 ¶ 153. We also credit Petitioner’s declarant testimony regarding claim 27 because the record supports it. Ex. 1015 ¶¶ 601–607 (citing Ex. 1022 ¶ 153). Patent Owner does not provide arguments specifically for claim 27. *See generally* PO Resp.; *see also* Pet. Reply 2 (stating that “Bracco makes no challenge specific to Grounds 3 and 4”).

Based on the full record, because Hirschman teaches writing information to a USB memory stick for quality control, Petitioner persuades us by a preponderance of the evidence that Klein, Reilly, Tate, and Hirschman teach “transferring, via the computer carried by the movable cart, quality control information to a removable computer readable storage device.”

4. *Reason to Combine*

Petitioner argues that Klein, Reilly, Tate, and Hirschman are directed to similar subject matter. Pet. 77 (citing Ex. 1014, 26; Ex. 1015 ¶ 580; Ex. 1022 ¶¶ 18–20; Ex. 1024 ¶ 17). Petitioner also argues that one of ordinary skill in the art would have been motivated to combine the asserted references because Hirschman provides an explicit motivation, the advantages of encoded data or electronic records were recognized widely, and skilled artisans routinely considered alternatives to paper record keeping. *Id.* at 77–79 (citing Ex. 1014, 29, 31; Ex. 1015 ¶¶ 578, 581–585; Ex. 1021, 23–24, 34–38; Ex. 1022 ¶¶ 83, 124, 142, 238; Ex. 1025 ¶¶ 75, 205, 235, 240–241; Ex. 1035; Ex. 1036; Ex. 1037; Ex. 1038, 5–6, 21). Petitioner additionally contends that one of ordinary skill in the art would

have had a reasonable expectation of success in combining the teachings of Klein, Reilly, Tate, and Hirschman. *Id.* at 79. Patent Owner does not provide arguments as to the motivation to combine issue with respect to Hirschman. *See generally* PO Resp.; *see also* Pet. Reply 2 (stating that “Bracco makes no challenge specific to Grounds 3 and 4”).

Based on the full record, we agree with Petitioner that these references are directed to similar matter. Ex. 1014, 25; Ex. 1022 ¶¶ 18–20; Ex. 1024 ¶¶ 15–17. Petitioner also persuades us by a preponderance of the evidence that Hirschman provides motivation for one of ordinary skill to combine the references. Ex. 1022 ¶¶ 124 (“At various points throughout the creation of radiopharmaceuticals it is anticipated that labels would be printed for containers, including vials, bottles, or syringes”), 142 (“An optional feature is to write the relevant label and/or RFID information onto a ‘memory stick’ such as a USB memory drive.”). Petitioner further persuades us by a preponderance of the evidence that machine-readable information stored on removable computer media was known in the art (Ex. 1022 ¶ 124), and we, therefore, determine that one of ordinary skill in the art would have had a reasonable expectation of success. We additionally credit Petitioner’s declarant testimony regarding the reason to combine because the record supports it. Ex. 1015 ¶¶ 578–585 (citing Ex. 1014, 26, 29, 31; Ex. 1021, 23–24, 34–38; Ex. 1022 ¶¶ 18–20, 83, 124, 142, 238; Ex. 1024 ¶¶ 15–17; Ex. 1025 ¶¶ 75, 205, 235, 240–241).

H. Challenge Based on Klein, Reilly, Tate, Hirschman, and Jackson

1. Claims 5 and 26

Claim 5 depends from claim 1 and recites “wherein the computer is configured to automatically transfer quality control test information to one or more remote computers.” Ex. 1001, 24:33–35. Claim 26 depends from

claim 24 and recites “further comprising transmitting, via the computer carried by the movable cart, quality control information to one or more remote computers.” *Id.* at 26:54–56.

Petitioner argues that Klein, Reilly, Tate, Hirschman, and Jackson teach the limitations of claims 5 and 26. Pet. 85–87 (citing Ex. 1015 ¶¶ 619–624, 628–634; Ex. 1022 ¶¶ 125, 187; Ex. 1023 ¶¶ 48–50, 136, Fig.1).

As discussed above, based on the full record, Petitioner persuades us by a preponderance of the evidence that Klein, Reilly, and Tate teach the limitations of claims 1 and 24, from which claims 5 and 26 depend. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine the references with a reasonable expectation of success.

We also find that the relied-upon portions of Hirschman teach that its “[c]ontrol computer 210 is also optionally configurable to communicate with an imaging suite’s information system, for example, an HIS system . . . to update the information in the HIS system with actual injection times, volumes, and activity levels, along with any observations during the procedure” (Ex. 1022 ¶ 125), its fluid delivery system control 1036 includes communications interface 1040 so that “communications connection may be made to an HIS (Hospital Information System)” (*id.* ¶ 187) and “procedure results and notes” are “communicated to physicians, patient records, and other appropriate systems” (*id.*).

We further find that the relied-upon portions of Jackson teach that its “system 100 includes a control system 146” that “is operable to receive status information from . . . quality control device 110” (Ex. 1023 ¶ 48) and that has a computer program for “stor[ing] production and dosing data” so

that “system 100 provides for a more centralized storage of records in the preparation, delivery, monitoring and injection of radiotracers to patients” (*id.* ¶ 50).

We additionally credit Petitioner’s declarant testimony regarding the limitations of claims 5 and 26 because the record supports it. Ex. 1015 ¶¶ 619–624, 628–634 (citing Ex. 1022 ¶¶ 125, 187, Fig. 2A; Ex. 1023 ¶¶ 48–50, 136). Patent Owner does not provide arguments specifically for claims 5 and 26. *See generally* PO Resp.; *see also* Pet. Reply 2 (stating that “Bracco makes no challenge specific to Grounds 3 and 4”).

Based on the record, Petitioner persuades us by a preponderance of the evidence that Hirschman teaches a computer communicating infusion procedure data to another information system and Jackson teaches receiving and storing information from a quality control device.

2. *Reason to Combine*

Petitioner argues that Klein, Reilly, Tate, Hirschman, and Jackson are directed to similar subject matter. Pet. 82 (citing Ex. 1014, 26; Ex. 1015 ¶ 611; Ex. 1022 ¶¶ 18–20; Ex. 1023 ¶¶ 13, 50; Ex. 1024 ¶ 17). Petitioner also argues that one of ordinary skill in the art would have been motivated to consider alternatives to handwritten records, that Hirschman explicitly provides motivation because it teaches a computer transferring information to remote computers to create workflow efficiencies, and that Jackson teaches that networking environments are common. *Id.* at 82–83 (citing Ex. 1015 ¶ 612; Ex. 1022 ¶ 125; Ex. 1023 ¶¶ 134–136). Petitioner also argues that one of ordinary skill in the art would have been motivated to improve Klein’s record keeping procedures to increase reliability and to reduce the possibility of data loss or falsification. *Id.* at 83–84 (citing Ex. 1015 ¶¶ 613, 614). Petitioner contends that one of ordinary skill in the

art would have had a reasonable expectation of success in combining the asserted references. *Id.* at 84 (citing Ex. 1015 ¶ 615).

Based on the full record, we agree with Petitioner that these references are directed to similar matter. Ex. 1014, 26; Ex. 1022 ¶¶ 18–20; Ex. 1023 ¶¶ 13, 50; Ex. 1024 ¶ 17. Petitioner also persuades us by a preponderance of the evidence that one of ordinary skill in the art would have been motivated to combine the references to increase workplace efficiencies, reduce data loss, and increase reliability based on Hirschman and Jackson. Ex. 1022 ¶ 125 (stating that “automatic population of patient information, expected patient injection times, and radiopharmaceutical production schedules” is “used to update the information in the HIS system” and “creates workflow efficiencies as well as eliminates steps which could otherwise lead to data entry errors”); Ex. 1023 ¶ 135 (stating that “computer 1202 can operate in a networked environment using logical connections to one or more remote computers” that can be a local-area network or wide-area network and “such networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet”). We also determine that, based on Hirschman and Jackson, one of ordinary skill in the art would have had a reasonable expectation of success in making Petitioner’s proposed combination. We additionally credit Petitioner’s declarant testimony regarding the reason to combine because the record supports it. Ex. 1015 ¶¶ 609–615 (citing Ex. 1014, 26; Ex. 1024 ¶ 17; Ex. 1022 ¶¶ 18–20, 125; Ex. 1023 ¶¶ 13, 50, 134–136).

I. Objective Evidence of Nonobviousness

Petitioner states that it is unaware of any objective evidence of nonobviousness regarding the challenged claims. Pet. 29–30, 74, 80, 84; Ex. 1015 ¶¶ 298, 569, 586, 616. Patent Owner does not present any

objective evidence of nonobviousness. *See generally* PO Resp.; PO Sur-Reply.

J. Weighing the Graham Factors

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.”

Arctic Cat Inc. v. Bombardier Recreational Prods. Inc., 876 F.3d 1350, 1361 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

Above, based on full record before us, we provide our factual findings regarding (1) the level of ordinary skill in the art, (2) the scope and content of the prior art, (3) any differences between the claimed subject matter and the prior art, and (4) objective evidence of nonobviousness.

In particular, we find that (1) Petitioner’s proposed level of ordinary skill in the art is consistent with the prior art of record; (2) the asserted references teach all the limitations of claims 1, 2, 4–20, and 24–28; (3) one of ordinary skill in the art would have had a reason to combine Klein with Tate, alone or with at least one of Reilly, the Bracco Manual, Hirschman, or Jackson, with a reasonable expectation of success; and (4) there is no objective evidence of nonobviousness in the record. Weighing these underlying factual determinations, a preponderance of the evidence persuades us that (1) claims 1, 2, 4, 6, 7, 9–17, 19, 24, 25, 28 of the ’468 patent are unpatentable over Klein, Reilly, and Tate; (2) claim 8 is unpatentable over Klein, Reilly, Tate, and the Bracco Manual; (3) claims 18, 20, and 27 are unpatentable over Klein, Reilly, Tate, and Hirschman; and (4) claims 5 and 26 are unpatentable over Klein, Reilly, Tate, Hirschman, and Jackson.

III. CONCLUSION⁶

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 4, 6, 7, 9–17, 19, 24, 25, 28	103(a)	Klein, Reilly, Tate	1, 2, 4, 6, 7, 9–17, 19, 24, 25, 28	
8	103(a)	Klein, Reilly, Tate, the Bracco Manual	8	
18, 20, 27	103(a)	Klein, Reilly, Tate, Hirschman	18, 20, 27	
5, 26	103(a)	Klein, Reilly, Tate, Hirschman, Jackson	5, 26	
Overall Outcome			1, 2, 4–20, 24–28	

⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 2, 4–20, and 24–28 of U.S. Patent No. 9,299,468 B2 have been shown, by a preponderance of the evidence, to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 9,299,468 B2

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