

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VARIAN MEDICAL SYSTEMS, INC.,
Petitioner,

v.

WILLIAM BEAUMONT HOSPITAL,
Patent Owner.

Case IPR2016-00171
Patent 7,471,765 B2

Before MICHAEL W. KIM, KALYAN K. DESHPANDE, and
MATTHEW R. CLEMENTS, *Administrative Patent Judges*.

DESHPANDE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Inter Partes Review
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Varian Medical Systems, Inc. (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 14–19 of U.S. Patent No. 7,471,765 B2 (Ex. 1201, “the ’765 patent”). Paper 1 (“Pet.”). William Beaumont Hospital (“Patent Owner”) filed a Preliminary Response. Paper 11 (“Prelim. Resp.”).

Pursuant to 35 U.S.C. § 314, we instituted *inter partes* review of the ’765 patent, on May 5, 2016, under 35 U.S.C. § 103(a), as to claims 14–16 on the basis that these claims would have been obvious over Jaffray 1999 SPIE,¹ Jaffray 1999 JRO,² Adler,³ and Depp;⁴ as to claims 17–19 on the basis that these claims would have been obvious over Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, Depp, and Yan;⁵ as to claims 14–16 on the basis

¹ D.A. Jaffray *et al.*, *Performance of a Volumetric CT Scanner Based Upon a Flat-Panel Imager*, SPIE, 3659:204–14 (Feb. 1999) (Ex. 1205, “Jaffray 1999 SPIE”).

² David A. Jaffray *et al.*, *A Radiographic and Tomographic Imaging System Integrated into a Medical Linear Accelerator for Localization of Bone and Soft-Tissue Targets*, *Int. J. Radiation Oncology Biol. Phys.*, 45:773–89 (Oct. 1999) (Ex. 1206, “Jaffray 1999 JRO”).

³ U.S. Patent No. 5,207,223, issued May 4, 1993 (Ex. 1203).

⁴ U.S. Patent No. 5,427,097, issued June 27, 1995 (Ex. 1204).

⁵ D. Yan *et al.*, *The Use of Adaptive Radiation Therapy to Reduce Setup Error: A Prospective Clinical Study*, *Int’l J. Radiation Oncology Biol. Phys.*, 41:715–20 (1998) (Ex. 1210) (“Yan”).

that these claims would have been obvious over Cho,⁶ Antonuk,⁷ Jaffray 1997,⁸ Adler, and Depp; and as to claims 17–19 on the basis that these claims would have been obvious over Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan. Paper 14 (“Dec.”).

Patent Owner filed a Response (Paper 26, “PO Resp.”), and Petitioner filed a Reply (Paper 52, “Pet. Reply”). A consolidated oral hearing was held on January 31, 2017, and the hearing transcript has been entered in the record. Paper 77, (“Tr. 1”); Paper 78 (“Tr. 2”). Patent Owner also filed a Motion to Exclude (Paper 60, “PO Mot.”), to which Petitioner filed an Opposition (Paper 66, “Pet. Opp.”) and Patent Owner filed a Reply (Paper 70, “PO Reply”).

After the oral hearing, we authorized additional briefing on the proper claim construction of the phrase “wherein said computer receives said image of said object and based on said image sends a signal to said radiation source that controls said path of said radiation source,” as recited by independent claim 1 of the ’502 patent, and as similarly recited by independent claims 14 and 17. Paper 76. Patent Owner filed a Response (Paper 79) and Petitioner filed a Response (Paper 80).

⁶ P.S. Cho et al., *Cone-beam CT for radiotherapy applications*, Phys. Med. Biol., 40:1863-83 (1995) (Ex. 1207, “Cho”).

⁷ L.E. Antonuk et al., *Thin-Film, Flat-Panel, Composite Imagers for Projection and Tomographic Imaging*, IEEE Transactions on Medical Imaging, 13:482-90 (1994) (Ex. 1208, “Antonuk”).

⁸ D.A. Jaffray et al., *Exploring “Target Of The Day” Strategies for A Medical Linear Accelerator With Conebeam-CT Scanning Capability*, Proceedings of the 12th International Conference on the Use of Computers in Radiation Therapy, Medical Physics Publishing, pp. 172-75 (1997) (Ex. 1209, “Jaffray 1997”).

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. Pursuant to our jurisdiction under 35 U.S.C. § 6, we conclude, for the reasons discussed below, Petitioner has not shown by a preponderance of the evidence that claims 14–19 of the ’765 patent are unpatentable under 35 U.S.C. § 103(a).

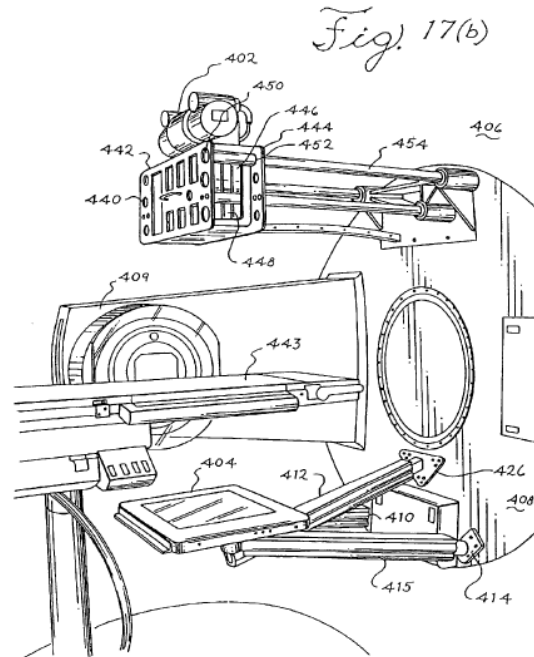
B. Related Proceedings

The parties indicate that the ’765 patent is involved in the following district court case: *Elekta Ltd. and William Beaumont Hosp. v. Varian Med. Sys., Inc.*, Case No. 2:15-cv-12169-AC-MKM (E.D. Mich.). Pet. 1; Paper 4, 2. Petitioner and Patent Owner identify further the following *inter partes* reviews that also involve the ’765 patent: IPR2016-00169 and IPR2016-00170. Pet. 1; Paper 4, 2. Patent Owner identifies further the following *inter partes* reviews directed to U.S. Patent 6,842,502 B2 (“the ’502 patent”), which the ’765 patent claims priority to: IPR2016-00160, IPR2016-00162, IPR2016-00163, and IPR2016-00166. Paper 4, 2. Patent Owner identifies further the following *inter partes* reviews directed to U.S. Patent 7,826,592 B2, which claims priority to the ’765 patent: IPR2016-00187. *Id.*

C. The ’765 Patent

The ’765 patent discloses that it is directed to a cone-beam computed tomography system that employs an amorphous silicon flat-panel imager for use in radiotherapy applications where images of a patient are acquired with the patient in a treatment position on a treatment table. Ex. 1201, 1:16–21. Figure 17(b) (below) depicts a diagrammatic view of one orientation of an

exemplary wall-mounted cone beam computerized tomography system employing a flat-panel imager. *Id.* at 6:48–52.



Specifically, Figure 17(b) above shows wall-mounted cone beam computerized tomography system 400 including an x-ray source, such as x-ray tube 402, and flat-panel imager 404 mounted on gantry 406. *Id.* at 19:41–43. X-ray tube 402 generates beam of x-rays 407 in a form of a cone or pyramid. *Id.* at 19:43–56. Flat-panel imager 404 employs amorphous silicon detectors. *Id.* at 19:46–47.

D. Illustrative Claim

Petitioner challenges claims 14–19 of the '765 patent. Pet. 19–60. Claims 14 and 17 are the only independent claims at issue, and are reproduced below:

14. A method of treating an object with radiation, comprising:
 - positioning said object on a support table;
 - generating three-dimensional information concerning said object by:

passing multiple x-ray beams in a cone beam form through said object from different angles;

creating a two-dimensional projection image of said object based on each of said multiple x-ray beams passing through said object by using a flat-panel imager to detect portions of said multiple x-ray beams passing through said object;

generating an image containing three-dimensional information concerning said object, wherein said three-dimensional information concerning said object is based on a plurality of two-dimensional projection images; and

controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information substantially at a time when said detecting portions of said multiple x-ray beams passing through said object is performed.

Ex. 1201, 29:19–41.

17. A method of planning a treatment of an object with radiation, comprising:

positioning said object on a support table;

generating three-dimensional information concerning said object by:

passing multiple x-ray beams in a cone beam form from an x-ray source through said object from different angles;

acquiring a two-dimensional projection image of said

object based on each of said multiple x-ray beams passing through said object by using a flat-panel imager to detect portions of said multiple x-ray beams passing through said object;

generating an image containing three-dimensional information concerning said object based on said acquired two-dimensional projection image and other two-dimensional projection images acquired by said flat panel imager; and

modifying a radiation therapy treatment plan based on said three-dimensional information substantially at a time when said detecting portions of said multiple x-ray beams passing through said object is performed.

Id. at 29:47–67.

E. Instituted Ground of Unpatentability

We instituted *inter partes* review of claims 14–19 of the '765 patent under the following grounds:

Reference(s)	Basis	Challenged Claims
Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, and Depp	§ 103(a)	14–16
Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, Depp, and Yan	§ 103(a)	17–19
Cho, Antonuk, Jaffray 1997, Adler, and Depp	§ 103(a)	14–16
Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan	§ 103(a)	17–19

Dec. 35–36.

II. ANALYSIS

A. Claim Construction

We interpret claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard as the claim construction standard to be applied in an *inter partes* review proceeding). Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech.*

Inc., 504 F.3d 1249, 1257 (Fed. Cir. 2007). *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

Patent Owner offers constructions for the limitation of “an image containing three-dimensional information concerning said object . . . based on a plurality of two-dimensional projection images.” PO Resp. 9–12. In addition, after oral argument, we authorized briefing on the construction of ““wherein said computer receives said image of said object and based on said image sends a signal to said radiation source that controls said path of said radiation source,” as recited by independent claim 1 of the ’502 patent, and as similarly recited by independent claims 1, 7, 20, and 26. Paper 76. Both parties submitted briefing. Papers 79, 80.

For purposes of this Decision, we determine that it is necessary to construe only (1) “substantially at a time;” (2) the claim phrase containing “three-dimensional information;” and (3) “controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information.”

1. “*substantially at a time*”

In our Decision on Institution, we construed “substantially at a time” to mean “substantially at the same time,” where the “receiving” of the x-rays is substantially at the same time of the “controlling” of the radiation path. Dec. 7–10. Subsequent to our initial construction, neither Petitioner nor Patent Owner provides any more argument or evidence to disturb our construction of this term. Accordingly, after considering our initial

construction anew, we construe “substantially at a time” to mean “substantially at the same time,” where the “receiving” of the x-rays is substantially at the same time of the “controlling” of the radiation path.

2. *“an image containing three-dimensional information concerning said object . . . based on a plurality of two-dimensional projection images”*

Independent claim 14 recites “an image containing three-dimensional information concerning said object . . . based on a plurality of two-dimensional projection images.” Independent claim 17 recites substantially similar limitations. Petitioner asserts that “three-dimensional information” should be construed as “information concerning three dimensions of an object (such as length, width, and depth).” Pet. 15–16 (citing Ex. 1201, 3:41–44; Ex. 1202 ¶ 39); Pet. Reply 1–2 (citing Exs. 1500 ¶¶ 13–25;⁹ 1502, 78:22–80:16, 83:14–87:11, 135:10–136:11).¹⁰ Patent Owner asserts that the aforementioned claim limitation, in its entirety, should be construed as “a volumetric image of an object generated by reconstructing 2-D projection images.” PO Resp. 9–12 (citing Ex. 1201, 1:40–50, 2:44–56, 3:41–56, 5:5–9, 16:24–28, 16:39–42; Ex. 2080 ¶¶ 87–92). We agree with Petitioner.

We begin first with the claim language, and note that “three-dimensional information” appears facially to be co-extensive with any information relevant to three-dimensions. We discern that “length, width,

⁹ In evaluating the assertions set forth in the Declaration of James Balter, Ph.D. in Support of Petitioner’s Reply (Ex. 1500), we considered Patent Owner’s Motion for Observations on the Cross-Examination of Dr. James Balter (Paper 59) and Petitioner’s Response to Patent Owner’s Motion for Observations on Cross-Examination (Paper 67).

¹⁰ In the Decision on Institution, we preliminarily agreed with Petitioner’s proposed construction of “three-dimensional information.” Dec. 10–11.

and depth” are just such information. We have considered Patent Owner’s above-cited portions of the ’765 patent, but are unpersuaded that those portions narrow “three-dimensional information” with sufficient “reasonable clarity, deliberateness, and precision” such that one of ordinary skill would have understood “three-dimensional information” as co-extensive with Patent Owner’s proffered construction. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). For example, column 2, lines 44–56 certainly disclose that “volume” is desirable, but does not provide any equivalence between “three-dimensional information” and “volume.” Indeed, column 2, lines 55–56 disclose “provide information regarding the location of soft-tissue target volumes,” indicating that “information” is a subset of “volume.” In another example, column 3, lines 41–56, mentions “three-dimensional (3-D) images,” which we agree would appear to require “volumetric data;” however, the claim limitation at issue is the broader term “three-dimensional information.” In a further example, column 9, line 54–64, clearly refers to “volumetric data,” but does not indicate its relation to “three-dimensional information.” In yet another example, column 16, lines 23–25 and 38–42, do not recite “three-dimensional information,” instead disclosing “3-D structure” and “3-D nature” in relation generally to “volumetric data,” but, again, not in a manner sufficient to indicate a particular relationship.

Finally, in regards to assertions set forth in the Declaration of Dr. Hashemi, we discern some merit in his assertion that when reading the claim limitation “three-dimensional information” in conjunction with another claim limitation “cone-beam computed tomography,” “a CBCT image is a volumetric image that provides the location, shape, and spatial orientation of the target volume in all directions, not just its length, width,

and depth.” Ex. 2080 ¶ 88. Furthermore, the claim limitation does not preclude an image having *more* information than “three-dimensional information concerning said object” (such as length, width, and depth), “based on a plurality of two-dimensional projection images.” Under Patent Owner’s construction, however, the image would be *required* to have such information. We are unpersuaded that such information is required under a proper construction of “three-dimensional information” for the reasons set forth *supra*.

We construe “three-dimensional information” as “information concerning three dimensions of an object (such as length, width, and depth).”

3. “*controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information*”

Independent claim 14 recites “controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information.”

Independent claim 17 recites substantially similar limitations.¹¹

¹¹ Patent Owner asserts that the limitation “wherein said computer receives said three-dimensional information and based on said three dimensional information received controls a path of said beam of radiation through said object” (hereinafter “controls a path”) is unique to independent claim 1, and “is not found in any other claims in this proceeding.” Paper 79, 1 n.1. We do not agree with Patent Owner. Independent claim 14 recites “controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information,” and independent claim 17 recites “modifying a radiation therapy treatment plan based on said three-dimensional information substantially at a time when said detecting portions of said

Petitioner asserts that “[a person of ordinary skill in the art] would understand this claim language to encompass both a computer system operated by a user and a system that autonomously carries out the recited control function.” Paper 80, 1.¹² Patent Owner agrees that “based on the intrinsic evidence and basic principles of claim construction, the relevant limitation of claim 1 of the ’765 patent should be construed to encompass a computer configured to permit human operation to perform the recited control function.” Paper 79, 5.¹³

Both parties agree that this construction is supported by both the intrinsic evidence and the extrinsic evidence. Paper 80, 1–5 (citing

multiple x-ray beams passing through said object is performed.” As neither party has explained, and we are unable to discern independently, any substantive differences between the aforementioned limitations, we determine that all of these limitations are substantially similar to the “controls a path” limitation of independent claim 1. Dependent claims 14–16 and 18–19 incorporate these limitations from independent claims 14 and 17 respectively. Accordingly, we determine that all of the challenged claims in this proceeding, claims 14–19, recite substantially similar limitations to the “controls a path” limitation of independent claim 1.

¹² Petitioner asserts this position with respect to independent claim 1. Paper 80, 1. For the reasons discussed above, we understand Petitioner’s position to be applicable to independent claims 14 and 17 because independent claims 14 and 17 recite substantially similar limitations for the reasons discussed above.

¹³ Patent Owner asserts this position with respect to independent claim 1. Paper 79, 5. For the reasons discussed above, we understand Petitioner’s position to be applicable to independent claims 14 and 17 because independent claims 14 and 17 recite substantially similar limitations for the reasons discussed above.

Ex. 1201, Abstract, 4:56–61, claims 1, 7, 13, 20, 26, 31);¹⁴ Paper 79, 1–5 (citing Ex. 1201, 26:12–27, claim 1; Ex. 1216, 125–126; Paper 77, 31:1–33:13; Paper 78, 44:22–45:13; Ex. 2084, WBH_Elekta_02055, WBH_Elekta_02089, WBH_Elekta_02142).

We agree. We, therefore, construe “controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information” to encompass a person or user operating the computer to perform the recited control functions. As discussed above, independent claim 17 recites similar limitations, and, therefore, we interpret these limitations to similarly encompass a person or user operating the computer to perform the recited control functions.

B. Level of Ordinary Skill in the Art

“Section 103(a) forbids issuance of a patent when ‘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).

Dr. Balter, Petitioner’s expert, proffers that a hypothetical person of ordinary skill in the art, with respect to and at the time of the ’765 Patent, would have the following qualifications: “a medical physicist with a Ph.D.

¹⁴ Petitioner further cites to papers and exhibits filed in IPR2016-00169. *Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 68 (citing IPR2016-00169: Ex. 1500 ¶¶ 36–38; Ex. 1502, 120:14–121:11; Ex. 2080 ¶¶ 61–65, 108, 109, 126–130).

(or similar advanced degree) in physics, medical physics, or a related field, and two or more years of experience in radiation oncology physics and image processing/computer programming related to radiation oncology applications.” Ex. 1202 ¶ 13. Dr. Hashemi, Patent Owner’s expert, essentially agrees, with the only major differences to the above being that an M.S. is acceptable in lieu of a Ph.D., and that three years of experience is preferred. Ex. 2080 ¶ 17. Nominally, we accept Petitioner’s proffered level of ordinary skill in the art based on Dr. Balter more complete explanation. We note, however, that neither party has explained substantively any significance that the difference in the proffered levels of ordinary skill in the art would have in the obviousness analysis. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“[T]he level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention.”); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991) (“The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.”). To that end, we note that the prior art itself often reflects an appropriate skill level. *See Okajima*, 261 F.3d at 1355.

B. Whether Jaffray 1999 SPIE and Jaffray 1999 JRO are Prior Art to Claims 14–19

1. Principles of Law

Petitioner has the burden of persuasion to prove unpatentability by a preponderance of the evidence. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1379 (Fed. Cir. 2015). Petitioner also has the initial burden of production to show that a reference is prior art to certain claims under a relevant section of 35 U.S.C. § 102. *Id.* Once Petitioner has

met that initial burden, the burden of production shifts to Patent Owner to argue or produce evidence that the asserted reference is not prior art to certain claims, for example, because those claims are entitled to the benefit of priority of an earlier-filed application. *Id.* at 1380. Once Patent Owner has met that burden of production, the burden is on Petitioner to show that the claims at issue are not entitled to the benefit of priority of the earlier filed application. *Id.*

Section 102(a) recites “[a] person shall be entitled to a patent unless . . . (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.” “[O]ne’s own work is not prior art under [§] 102(a) even though it has been disclosed to the public in a manner or form which otherwise would fall under [§] 102(a).” *In re Katz*, 687 F.2d 450, 454 (Fed. Cir. 1982). Generally, “[a] patent is ‘to another’ when the ‘inventive entities’ are different.” *In re Fong*, 378 F.2d 977, 980 (CCPA 1967); *see also In re Land*, 368 F.2d 866, 877 (CCPA 1966) (“There appears to be no dispute as to the law that A is not ‘another’ as to A, B is not ‘another’ as to B, or even that A & B are not ‘another’ as to A & B. But that is not this case, which involves . . . , the question whether either A or B is ‘another’ as to A & B as joint inventors under section 102(e).”).

What we have in this case is ambiguity created by the printed publication. The article does not tell us anything specific about inventorship, and appellant is only one of three authors who are reporting on scientific work in which they have all been engaged in some capacity at the Harvard Medical School. It was incumbent, therefore, on appellant to provide a satisfactory

showing which would lead to a reasonable conclusion that he is the sole inventor.

In re Katz, 687 F.2d at 455 (footnote omitted).

2. *Whether Jaffray 1999 SPIE and Jaffray 1999 JRO are Prior Art under 35 U.S.C. § 102(b) and 35 U.S.C. § 102(a)*

Petitioner asserts that (1) claims 14–19 are not entitled to the benefit of priority of the February 18, 2000 filing date of provisional application no. 60/183,590 (“the ’590 Application”), and, thus, Jaffray 1999 SPIE and Jaffray 1999 JRO are prior art under 35 U.S.C. § 102(b)¹⁵ (Pet. 16–20; Pet. Reply 3–5); and (2) even if the claims are entitled to the benefit of the February 18, 2000, filing date of the ’590 Application, Jaffray 1999 SPIE and Jaffray 1999 JRO are still prior art under 35 U.S.C. § 102(a) (Pet. 16–20; Pet. Reply 6–10).

Patent Owner asserts that (1) the challenged claims are entitled to the benefit of priority of the February 18, 2000, filing date of the ’590 Application, and, thus, Jaffray 1999 SPIE and Jaffray 1999 JRO are not prior art under 35 U.S.C. § 102(b) (PO Resp. 14–19); and (2) Jaffray 1999 SPIE and Jaffray 1999 JRO are not prior art under 35 U.S.C. § 102(a), because the portions of Jaffray 1999 SPIE and Jaffray 1999 JRO upon which Petitioner relies is the work of the named inventors of the ’502 Patent, not of the coauthors not named as inventors (*id.* at 19–23).

Petitioner presents substantially the same arguments and evidence here as those asserted in IPR2016-00169. *Compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 1 (“169 Pet.”), 24–29

¹⁵ All references to 35 U.S.C. §§ 102, 103 herein will be pre-AIA.

with Pet. 16–20; *compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 51 (“169 Pet. Reply”), 6–24 with Pet. Reply 3–10. Patent Owner also presents substantially the same arguments and evidence here as those asserted in IPR2016-00169. *Compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 11 (“169 Prelim. Resp.”), 19–37 with Prelim. Resp. 23–35; *compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 25 (“169 PO Resp.”), 20–45 with PO Resp. 3–10.¹⁶

As discussed above, independent claims 14 and 17 recite substantially the same subject matter as independent claims 1, 7, 20, and 26. Neither party has explained, and we are unable to discern independently, any substantive differences between the aforementioned claims. That is, neither party has presented additional or unique arguments, evidence, or rationale towards independent claims 14 and 17 than those that were presented in IPR2016-00169 concerning independent claims 1, 7, 20, and 26.

In light of Petitioner’s and Patent Owner’s arguments and supporting evidence, we determine that Petitioner has not shown sufficiently, on this record, that both Jaffray 1999 SPIE and Jaffray 1999 JRO are prior art to independent claims 14 and 17, and the challenged claims that depend therefrom, under 35 U.S.C. § 102(b) for the same reasons we set forth in our

¹⁶ We recognize that the arguments and evidence argued by both Petitioner and Patent Owner in IPR2016-00169 are not identical to the arguments and evidence advanced here. Although the arguments and evidence set forth here have been reduced from those set forth in IPR2016-00169, presumptively in order to comply with word count limits, we understand the general thrust of the arguments and evidence in this proceeding and IPR2016-00169 to be the same.

analysis of claims 1–13 and 20–31 of the '765 patent in IPR2016-00169. *Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 79, 13–21. We also determine that Petitioner has not met its burden of showing sufficiently that both Jaffray 1999 SPIE and Jaffray 1999 JRO are prior art to independent claims 14 and 17, and the challenged claims that depend therefrom, under 35 U.S.C. § 102(a) for the same reasons we set forth in our analysis of claims 1–13 and 20–31 of the '765 patent in IPR2016-00169. *Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00169, Paper 79, 21–32.

C. Claims 14–19 as Unpatentable over the Cited Prior Art

Petitioner asserts that a combination of Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, and Depp renders obvious claims 14–16. Pet. 25–41. Petitioner asserts that a combination of Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, Depp, and Yan renders obvious claims 17–19. Pet. 41–50. Petitioner relies solely upon Jaffray 1999 SPIE and Jaffray 1999 JRO for several limitations of independent claims 14 and 17.

For example, independent claim 14 recites “generating three-dimensional information concerning said object” by “passing multiple x-ray beams in a cone beam form through said object from different angles” and “creating a two-dimensional projection image of said object based on each of said multiple x-ray beams passing through said object by using a flat-panel imager to detect portions of said multiple x-ray beams passing through said object.” Petitioner relies solely on Jaffray 1999 SPIE and Jaffray 1999 JRO to meet these claim limitations. *See* Pet. 27–28 (citing Ex. 1205, 17, 25; Ex. 1206, 9, 15; Ex. 1202 ¶¶ 66–67). Independent claim 17 recites similar limitations, and Petitioner again relies solely on Jaffray 1999 SPIE

and Jaffray 1999 JRO to disclose this limitations. As discussed above, however, we not persuaded that Jaffray 1999 SPIE and Jaffray 1999 JRO are prior art to claims 14–19. Moreover, Petitioner does not contend that Adler or Depp teach these limitations.

As a result, we are not persuaded that Petitioner has met its burden of showing, by a preponderance of the evidence, that claims 14–16 are obvious over a combination of Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, and Depp, and claims 17–19 are obvious over a combination of Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, and Yan.

D. Claims 14–16 as Unpatentable over Cho, Antonuk, Jaffray 1997, Adler, and Depp; Claims 16–17 as Unpatentable over Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan

Petitioner asserts that a combination of Cho, Antonuk, Jaffray 1997, Adler, and Depp renders obvious claims 14–16. Pet. 50–58. Petitioner asserts that a combination of Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan renders obvious claims 17–19. Pet. 59–60. Patent Owner disagrees. PO Resp. 23–61. Petitioner replies. Pet. Reply 10–25. Claims 14 and 17 are the independent claims for these grounds.

In our Decision on Institution, we concluded that the arguments and evidence advanced by Petitioner demonstrated a reasonable likelihood that claims 14–16 were unpatentable as obvious based on Cho, Antonuk, Jaffray 1997, Adler, and Depp, and claims 17–19 were unpatentable as obvious based on Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan. Dec. 35–36.

We must now determine whether Petitioner has established by a preponderance of the evidence that the specified claims are unpatentable over the cited prior art. 35 U.S.C. § 316(e). We previously instructed Patent Owner that “any arguments for patentability not raised in the [Patent Owner

Response] will be deemed waived.” Paper 15, 3; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”). Additionally, the Board’s Trial Practice Guide states that the Patent Owner Response “should identify all the involved claims that are believed to be patentable and state the basis for that belief.” Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012).

In connection with the arguments and evidence advanced by Petitioner to support its positions that Patent Owner chose not to address in its Patent Owner Response, the record now contains persuasive, unrebutted arguments and evidence presented by Petitioner regarding the manner in which the asserted prior art teaches corresponding elements of the claims against which that prior art is asserted. Based on the preponderance of the evidence before us, we conclude that the prior art identified by Petitioner describes all other limitations of the reviewed claims, except for those that Patent Owner contested in the Patent Owner Response, which we address below.

1. *Cho (Ex. 1207)*

Cho describes a cone-beam CT system for radiotherapy applications, and algorithm used therein to permit an increased reconstruction volume to be imaged using a detector of a given size. Ex. 1207, Abstract. The system described in Cho is a digital spot imager (*id.* at 6), but Cho also describes the use of a flat panel detector for real-time diagnostic X-ray imaging. Ex. 1207, 24 (citing Antonuk). Cho describes generating a 3-D image “by rotating the gantry over 360° at approximately 1° increments.” Ex. 1207, 9, 15–17.

2. *Antonuk (Ex. 1208)*

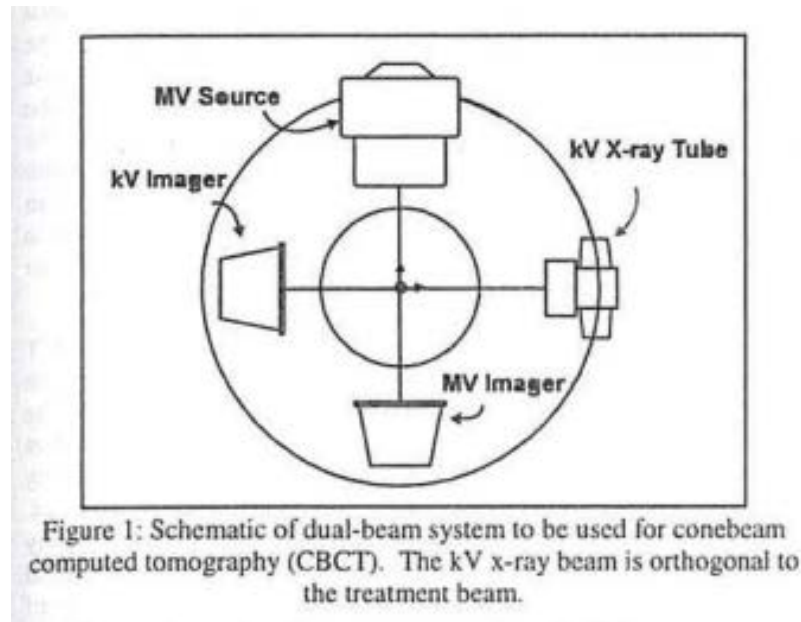
Antonuk describes “Thin-Film, Flat-Panel, Composite Imagers for Projection and Tomographic Imaging.” Ex. 1208, Title. Specifically, Antonuk describes how “[t]he recent development of large-area, flat-panel a-Si:H imaging arrays is generally expected to lead to real-time diagnostic and megavoltage x-ray projection imagers with film-cassette-like profiles.” Ex. 1208, Abstract. According to Antonuk, “[t]he construction, operation, and properties of the arrays have been extensively reported.” Ex. 1208, 3. “It is widely perceived that part of the solution is to obtain imaging information with the portal beam immediately prior to and/or during the treatment.” Ex. 1208, 5. “Toward this aim of patient verification, a variety of real-time megavoltage imaging devices, including our a-Si:H imager, have been developed over the last decade.” Ex. 1208, 5. “This composite imager would be positioned behind the patient in the middle of the megavoltage radiation field during imaging.” Ex. 1208, 6, Fig. 5. In an alternative configuration, “[s]everal a-Si:H x-ray detectors rotate with an x-ray tube collecting conebeam projection data inside the bore of a PET machine.” Ex. 1208, 8.

3. *Jaffray 1997 (Ex. 1209)*

Jaffray 1997 describes “a conebeam-computed tomography (CB-CT) scanner for installation on our medical linear accelerator.” Ex. 1209, 4.¹⁷ A

¹⁷ Many Exhibits, such as Exhibit 1209, include two page numbers: the original page number from the source material itself, and the page numbers added by the parties. For consistency, we use the page numbers added by the parties.

schematic of the dual-beam imaging system is shown in Figure 1 of Jaffray 1997, which is reproduced below.



Ex. 1209, 5. As shown in Figure 1, “[t]wo fluoroscopic imaging systems are attached to a Philips SL-20 medical linear accelerator; one detects the megavoltage image, the other a kV image produced with a kV beam projected at 90° to the treatment beam axis.” Ex. 1209, 4. Jaffray 1997 states that the “gantry is rotated continuously” in order to generate a “conebeam imaging sequence consist[ing] of ~100 exposures over 194° of rotation.” Ex. 1209, 5.

4. *Adler (Ex. 1203)*

Adler teaches an apparatus and method for extending a surgical instrumentality to a target region in a patient, for example, for performing stereotaxic surgery using an x-ray linear accelerator. Ex. 1203, 1:6–10. Specifically, Adler teaches that a 3-dimensional mapping of a mapping region of at least a portion of a living organism is prepared. Ex. 1203, 3:64–68. First and second diagnostic beams are then passed through the mapping

region, and are used to produce respective first and second images of respective first and second projections within the mapping region. Ex. 1203, 4:5–10. Adler then teaches that the 3-dimensional mapping and the first and second images are compared to derive therefrom data representative of a real-time location of a target portion of the mapping region. Ex. 1203, 4:41–46. Adler teaches further “adjusting the relative position of the beaming apparatus 20 and the patient 14 as needed in response to data which is representative of the real time location of the target region 18.” Ex. 1203, 7:37–40.

5. *Depp (Ex. 1204)*

Depp teaches an apparatus for and method of carrying out stereotaxic radiosurgery and/or radiotherapy on a particular target region within a patient utilizing previously obtained reference data indicating the position of the target region with respect to its surrounding area, which also contains certain nearby reference points. Ex. 1204, 1:6–12. Depp further teaches the following:

The apparatus also utilizes a pair of diagnostic beams of radiation or target locating beams, as they will be referred to in this discussion. These beams are passed through the surrounding area containing the target region and reference points and, after passing through the surrounding area, contain data indicating the positions of the reference points within the surrounding area. This position data is collected by cooperating detectors, as described previously, and delivered to the multiprocessor computer where the latter compares it with previously obtained reference data for determining the position of the target region with respect to each of the reference points during each such comparison. The radiosurgical beam is accurately directed into the target region in substantially real time based on this information.

Ex. 1204, 11:46–61.

6. *Yan (Ex. 1210)*

Yan discloses its purpose as the following:

Adaptive Radiation Therapy (ART) is a feedback treatment process that optimizes a patient's treatment according to the patient specific information measured during the course of treatment. Utilizing an electronic portal imaging device (EPID) and a computer-controlled multileaf collimator (MLC), the ART process is currently being implemented in our clinic to improve the treatment accuracy by compensating for the treatment setup error.

Ex. 1210, 7 (emphasis omitted). Yan discloses treating patients using conventional external beam therapy, which was planned using either a two-dimensional (2D) or a three-dimensional (3D) planning system. *Id.* at 8. Daily portal images were taken and used to identify errors in the treatment plan. *Id.* at 9. Yan discloses further using a closed-loop treatment process to apply patient specific information measured during a treatment course to reevaluate and reoptimize the treatment plan. *Id.* at 11. According to Yan, an optimal way to implement this feedback process integrates new technologies such as a 3D treatment planning system, an on-line imaging device, and MLC through an information and control network. *Id.*

7. *Petitioner's Initial Positions*

Petitioner asserts that a combination of Cho, Antonuk, Jaffray 1997, Adler, and Depp renders obvious claims 14–16. Pet. 50–58. For example, claim 14 recites “method of treating an object with radiation.” Petitioner argues that Adler and Depp disclose methods for radiotherapy that is configured for selectively irradiating a target within a patient. Pet. 25–27¹⁸

¹⁸ Even though the main portion of this ground of unpatentability is discussed at pages 50–59 of the Petition, the Petition refers, on page 50, to the arguments set forth on pages 25–27 of the Petition, as to how Adler and

(citing Ex. 1203, Abstract, 3:62–68; Ex. 1204, Abstract, 1:6–12, 1:18–26; Ex. 1202 ¶¶ 61–62). Petitioner alternatively argues that Adler and Depp disclose a radiation beam that is contained in a mechanism having six degrees of movement. *Id.* (citing Ex. 1203, Fig. 3; Ex. 1204, Fig. 3).

Claim 14 further recites “positioning said object on a support table.” Petitioner argues that Adler and Depp disclose an operating table or patient table. *Id.* at 27 (citing Ex. 1203, 7:37–52; Ex. 1204, 5:10–25).

Claim 14 also recites “generating three-dimensional information concerning said object” by “passing multiple x-ray beams in a cone beam form through said object from different angles.” Petitioner argues that Cho discloses a cone-beam CT system for radiotherapy that generates a 3-D image by rotating the gantry over 360° at approximately 1° increments. Pet. 51 (citing Ex. 1207, 5, 15). Petitioner further argues that Jaffray 1997 discloses a cone beam CT apparatus that uses a linear accelerator that obtains 3-D information from a plurality of 2-D projection images by rotating the gantry around a patient. *Id.* at 51–52 (citing Ex. 1208, 4–5). Petitioner further argues, applying the testimony of Dr. Balter, that Antonuk discloses an x-ray source that emits beams in a cone-beam geometry. *Id.* at 52 (citing Ex. 1208, Fig. 5; Ex. 1202 ¶ 104).

Claim 14 additionally recites:

creating a two-dimensional projection image of said object based on each of said multiple x-ray beams passing through said

Depp meet these claim limitations, as presented in the challenged ground of claims 14–16 as unpatentable over Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, and Depp. Pet. 50–58. Accordingly, we discuss these arguments advanced by Petitioner here.

object by using a flat-panel imager to detect portions of said multiple x-ray beams passing through said object.

Petitioner argues that Cho discloses an amorphous silicon flat panel imager (“FPI”) that detects cone-beam x-ray projection images, and that Cho specifically refers to Antonuk for its FPI. *Id.* at 52–53 (citing Ex. 1207, 24). Petitioner then argues that Antonuk discloses flat panel imagers as diagnostic x-ray detectors mounted on a linear accelerator for imaging during radiotherapy. *Id.* at 53 (citing Ex. 1208, 3). Petitioner argues, as explained by Dr. Balter, that the FPI devices, such as those in Cho and Antonuk, detect multiple x-ray beams that pass through an object being imaged, and the FPI receives a plurality of 2-D x-rays. *Id.* at 53–54 (citing Ex. 1202 ¶ 106).

Claim 14 also recites:

generating an image containing three-dimensional information concerning said object, wherein said three-dimensional information concerning said object is based on a plurality of two-dimensional projection images.

Petitioner argues that Cho discloses a cone-beam CT system for radiotherapy that generates a 3-D image by rotating the gantry over 360° at approximately 1° increments. *Id.* at 54 (citing Ex. 1207, 15, 22). Petitioner further argues that Cho discloses generating 3-D images based on 2-D CBCT scans using a modified Feldkamp algorithm. *Id.* (citing Ex. 1207, 15–17). Petitioner argues that Adler/Depp disclose obtaining two x-ray images at a known angle relative to one another, and, therefore, provide three-dimensional information about the imaged object. *Id.* at 30 (citing 1203, 7:6–12, 7:17–23; Ex. 1202 ¶ 71).

Claim 14 further recites:

controlling a path of a radiation beam through said object by controlling a relative position between said radiation beam and said object based on said three-dimensional information substantially at a time when said detecting portions of said multiple x-ray beams passing through said object is performed.

Petitioner argues that Adler discloses a computer, coupled to the x-ray system, that receives three dimensional information, as discussed above, and adjusts the position of the radiation beam in response to the real-time three dimensional location information of the target. *Id.* at 30–34 (citing Ex. 1203, 7:6–12, 7:37–40). Petitioner argues that the radiation source is adjusted in the gantry, or by moving the patient table. *Id.* at 31–32 (citing Ex. 1203, 7:42–58). Petitioner further argues that Depp discloses the use of diagnostic beams that pass through target region and surrounding area, and then contain data indicating the position of the target. *Id.* at 32–33 (citing Ex. 1204, 11:46–61). According to Petitioner, the substantially real time position data of Depp is used to direct the radiosurgical beam to the target region. *Id.* (citing Ex. 1204, 11:46–61).

For a rationale to modify Cho, Antonuk, Jaffray 1997, Adler, and Depp in view of each other, Petitioner sets forth such a rationale on pages 56–58 of the Petition. Petitioner performs a similar analysis for dependent claims 15 and 16. *Id.* at 55–56.

With respect to independent claim 17, Petitioner relies on its analysis of independent claim 14, as set forth *supra*, for the bulk of its analysis of independent claim 17 (*id.* at 59), and then identifies the only substantive between independent claim 14 and independent claim 17 as the recitation of the following limitation in independent claim 17: “modifying a radiation therapy treatment plan based on said three-dimensional information

substantially at a time when said detecting portions of said multiple x-ray beams passing through said object is performed.” Petitioner cites Yan for disclosing a closed-loop treatment process used to apply patient specific information measured during the treatment course to reevaluate and to reoptimize the treatment plan. *Id.* at 41–42 (citing Ex. 1210, 11).¹⁹ Petitioner argues that this disclosure is consistent with the ’765 patent specification that discloses the recalculation of a treatment plan. *Id.* at 42 (citing Ex. 1201, 25:30–31, 26:37–42; Ex. 1202 ¶ 90). Petitioner performs a similar analysis for dependent claims 18 and 19. *Id.* at 43, 59. For a rationale to modify Cho, Antonuk, Jaffray 1997, Adler, and Depp in view of each other, Petitioner relies on the same rationale to combine as asserted with respect to claims 14–16, and relies on the rationale to combine Yan with the other prior art for the same reasons discussed with respect to the Jaffray 1999 references and Adler/Depp. *Id.* at 60.

8. *Patent Owner’s Assertions Concerning the References*

Patent Owner raises the arguments that (1) Petition does not account sufficiently for “the element of controlling the relative position of the radiation source and tumor based on the three-dimensional information contained in the claimed image,” and “[n]one of these references . . . either alone or in combination, shows the actual use of an FPI in the context of CBCT in the treatment room;” (2) one of ordinary skill would not have modified the radiation therapy systems of Adler/Depp to include the

¹⁹ On page 59 of the Petition, Petitioner references how, earlier in the Petition, the Petition sets forth how Yan meets the claim limitations as presented in the challenged ground of claims 17–19 as unpatentable over Jaffray 1999 SPIE, Jaffray 1999 JRO, Adler, Depp, and Yan. Pet. 41–44. Accordingly, we discuss these arguments advanced by Petitioner here.

CBCT/FPI system of Cho/Antonuk/Jaffray 1997, because both timing and dosage considerations teach away from the proposed combination; and (3) one of ordinary skill would not have modified the radiation therapy systems of Adler/Depp to include the CBCT/FPI system of Cho/Antonuk/Jaffray 1997, because one of ordinary skill would not have had a reasonable expectation of success with respect to the modification. PO Resp. 26–55.

Patent Owner asserts substantially the same aforementioned three arguments and supporting evidence in IPR2016-00170. *Compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00170, Paper 26 (“170 PO Resp.”), 22–53 *with* PO Resp. 26–55. Petitioner responds with substantially the same arguments and evidence as that set forth in IPR2016-00170. *Compare Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00170, Paper 42 (“170 Pet. Reply”), 5–15 *with* Pet. Reply 10–18.²⁰

As discussed above, independent claims 14 and 17 recite substantially the same subject matter as independent claims 1, 7, 20, and 26. As neither party has explained, and we are unable to discern independently, any substantive differences between the aforementioned claims. That is, neither party has presented additional or unique arguments, evidence, or rationale towards independent claims 14 and 17 than those that were presented in IPR2016-00170 towards independent claims 1, 7, 20, and 26.

²⁰ We recognize that the arguments and evidence argued by both Petitioner and Patent Owner in IPR2016-00170 are not identical to the arguments and evidence advanced here. Although the arguments and evidence set forth here have been reduced from those set forth in IPR2016-00170, presumptively in order to comply with word count limits, we understand the general thrust of the arguments and evidence in this proceeding and IPR2016-00170 to be the same.

In light of Petitioner's and Patent Owner's arguments and supporting evidence, we are not persuaded by the aforementioned three arguments advanced by Patent Owner for the same reasons we set forth in IPR2016-00170 with respect to independent claims 1, 7, 20, and 26. *See Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00170, Paper 69, 20–33.

9. *Motivation to combine Adler, Depp, and Yan*

Patent Owner argues that a person with ordinary skill in the art would not have combined Yan with Adler/Depp, with respect to claims 17–19, because Yan is incompatible with the Adler/Depp methods. PO Resp. 55–56 (citing Ex. 2080 ¶¶ 239-251, 260-273). Patent Owner specifically argues

Yan discloses obtaining images over several treatment fractions to determine the statistical error in daily patient setup positions. (*Id.* ¶¶ 261-265). This statistical determination and modification of the treatment plan are performed off-line after the patient has gone home, not substantially at the time of the imaging. (*Id.* ¶¶ 271-272). Once that statistical error is determined, Yan teaches that imaging at the setup of each treatment fraction can be discontinued. (*Id.* ¶¶ 264-265). The Petition provides no evidence suggesting that the modification of the treatment plan based on the statistical analysis disclosed in Yan could be incorporated into the Adler/Depp methods. (*Id.* ¶¶ 267-272).

Id. at 56.

We are not persuaded by Patent Owner's argument. Petitioner relies on Yan to disclose reevaluating and reoptimizing a radiation treatment plan. Pet. 42 (citing Ex. 2010, 11). Petitioner relies on Adler/Depp to meet the claim limitation of "substantially at a time." *Id.* at 33–34, 55. Patent Owner's arguments are unpersuasive because they are directed to each individual reference's failure to disclose the claim limitations, rather than to the combination of prior art disclosures. *See In re Merck & Co. Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Although we recognize that the

modifying of the radiation therapy treatment plan cannot simply be divorced from the modification occurring “substantially at a time,” Patent Owner’s argument does not rebut sufficiently Petitioner’s argument that a person with ordinary skill in the art would have combined Yan’s modification of the treatment plan such that it occurs “substantially at a time,” as the systems of Adler/Depp. As argued by Petitioner, a person with ordinary skill in the art would have been motivated in order to improving the accuracy and efficacy of radiotherapy through image-guided means. Pet. 44. Furthermore, Patent Owner’s argument does not set forth persuasive evidence why a person of ordinary skill in the art, reading Yan in combination with Adler/Depp, would not have known to modify a treatment plan “substantially at a time” of receiving 3-D images in order to improve accuracy and efficacy, as asserted by Petitioner, and would have had to perform the modification of the treatment plan off-line. As such, we are persuaded by Petitioner that a person of ordinary skill in the art would have combined Yan with Adler/Depp.

10. Evidence of Secondary Considerations

As discussed above, Petitioner sets forth arguments and supporting evidence that Cho, Antonuk, Jaffray 1997, Adler, and Depp disclose each of the limitations of claims 14–16, and Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan disclose each of the limitations of claims 17–19. Pet. 50–60. Petitioner further argues a person with ordinary skill in the art would have had a reason to combine the cited references. *Id.* at 55–56, 60. We find that Petitioner has identified sufficient evidence that each limitation of claims 14–19 is disclosed in the cited prior art, and that the rationale to combine the

references were well known to one of ordinary skill in the art, at the time of the invention.

Patent Owner asserts that even if all of the other factors weigh in favor of the obviousness of certain claims, those factors are outweighed by Patent Owner's proffered evidence concerning objective indicia of non-obviousness, i.e., secondary considerations. PO Resp. 56–61. Petitioner disagrees. Pet. Reply 18–25.

Patent Owner presents substantially the same arguments and supporting evidence to demonstrate objective indicia of non-obviousness, i.e., secondary considerations, in this proceeding as those presented in IPR2016-00170. *Compare* 170 PO Resp. 54–62 *with* PO Resp. 56–61. Petitioner responds with substantially the same arguments and supporting evidence as that set forth in IPR2016-00170. *Compare* 170 Pet. Reply 15–24 *with* Pet. Reply 18–25.²¹

As discussed above, independent claims 14 and 17 recite substantially the same subject matter as independent claims 1, 7, 20, and 26. As neither party has explained, and we are unable to discern independently, any substantive differences between the aforementioned claims. That is, neither party has presented additional or unique arguments, evidence, or rationale

²¹ We recognize that the arguments and evidence argued by both Petitioner and Patent Owner in IPR2016-00170 are not identical to the arguments and evidence advanced here. Although the arguments and evidence set forth here have been reduced from those set forth in IPR2016-00170, presumptively in order to comply with word count limits, we understand the general thrust of the arguments and evidence in this proceeding and IPR2016-00170 to be the same.

towards independent claims 14 and 17 than those that were presented in IPR2016-00170 towards independent claims 1, 7, 20, and 26.

In light of Patent Owner's arguments and Petitioner's reply, we determine that Patent Owner has proffered (1) very strong evidence of industry praise, (2) very strong evidence of long-felt need, (3) moderately strong evidence of commercial success, and (4) moderately strong evidence of copying of the invention set forth in independent claims 14 and 17 for the same reasons we set forth in IPR2016-00170. *See Varian Med. Sys., Inc. v. William Beaumont Hosp.*, IPR2016-00170, Paper 69, 33–69. Claims 15–16 and 18–19 ultimately depend from independent claims 14 and 17, and we determine that a similar weighing for each of claims 15–16 and 18–19 results in the same conclusion.

Accordingly, for these reasons, we determine that Petitioner has not met its burden of showing that claims 14–19 are obvious.

11. Conclusion

For the foregoing reasons, we are unpersuaded that Petitioner has shown, by a preponderance of the evidence, that claims 14–16 are obvious in view of the combination of Cho, Antonuk, Jaffray 1997, Adler, and Depp and that claims 17–19 are obvious in view of the combination of Cho, Antonuk, Jaffray 1997, Adler, Depp, and Yan.

E. Patent Owner's Motion to Exclude

Patent Owner requests that “Exhibits 1218–1231, 1233, 1236, 1238 (‘Exhibits’) and Paragraphs 123–150 of Exhibit 1202 (‘Balter Testimony’) be excluded and expunged from the record” because they are “irrelevant to the ground on which this proceeding was instituted” and “the exhibits have not been cited by either Party.” PO Mot. 1. Petitioner responds that the

aforementioned Exhibits were cited, albeit in a cursory manner, at page 4 of the Petition (Pet. Opp. 1), and that the Board has, effectively, already excluded the referenced Exhibits and testimony as follows:

This interpretation is also consistent with the Board's determination in its Institution Decision that the exhibits in question should not be relied upon to "fill in' any 'gap' in the Petition." (See Paper 14 at 34–35.) Thus, in this case Patent Owner already obtained adequate relief for its concerns regarding the supposedly "extraneous" Exhibits and Balter Testimony by virtue of the Institution Decision. As Patent Owner acknowledged in its motion, Petitioner complied with the Board's directive did not rely on this evidence in its Reply papers. (See Paper 60 at 2.)

Pet. Opp. 2. Patent Owner replies that retaining the Exhibits and testimony leaves open the possibility that Petitioner may attempt to rely on them during appeal. PO Reply 2–3.

Patent Owner's Motion is *denied*. Petitioner does refer to the referenced Exhibits, however briefly, in the Petition, and so retaining the papers would assist the public in better understanding, however minimally, the record. Furthermore, this Decision does not rely on portions of those Exhibits or testimony, and we determine expressly that it is improper for Petitioner to rely on those Exhibits and testimony, because, other than the cursory mention, their relevance was not explained adequately with respect to any ground of unpatentability in the Petition. Additionally, that Petitioner may use such Exhibits and testimony on appeal is speculative. Furthermore, we are unpersuaded that there is sufficient prejudice to Patent Owner in denying their request, as we are unclear how any of those Exhibits is relevant to our determination that neither Jaffray 1999 SPIE nor Jaffray 1999

JRO are prior art under either § 102(a) or § 102(b). Accordingly, Patent Owner's Motion to Exclude is *denied*.

F. Petitioner's Allegedly Improper New Arguments and Evidence in Reply

We have considered Patent Owner's listing (Paper 61) and Petitioner's responsive listing (Paper 69) on this issue. Patent Owner's assertions are moot, because, even considering those portions of the Reply and Dr. Balter's Supplemental Declaration, Petitioner has still not met its burden.

G. Papers Under Seal

This Final Written Decision discusses or cites information in papers that are subject to a Protective Order. For those papers, the Parties should follow the guidance related to 37 C.F.R. § 42.56. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,761 (Aug. 14, 2012).

III. CONCLUSION

Petitioner has not shown, by a preponderance of the evidence, that claims 14–19 are unpatentable. Patent Owner's Motion to Exclude is *denied*.

IV. ORDER

After due consideration of the record before us, and for the foregoing reasons, it is:

ORDERED claims 14–19 of the '765 patent are not held unpatentable; and

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*; and

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FURTHER ORDERED that because this is a final written decision, 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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