

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ELEKTA, INC.,
Petitioner,

v.

VARIAN MEDICAL SYSTEMS, INC.,
Patent Owner.

Case IPR2016-00317
Patent 7,945,021 B2

Before BRIAN J. McNAMARA, PATRICK M. BOUCHER, and
GARTH D. BAER, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

Elekta, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 2, 9, 11, 13, 16, 54, 55, and 62 (“the challenged claims”) of U.S. Patent No. 7,945,021 B2 (Ex. 1001, “the ’021 patent”). Varian Medical Systems, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 9. Pursuant to 35 U.S.C. § 314(a), we determined the Petition showed a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of claims 2, 9, 11, 13, 16, 54, 55, and 62, and instituted an *inter partes* review of those claims. Paper 12 (“Inst. Dec.”). Patent Owner filed a Patent Owner Response (Paper 18, “PO Resp.”) and Petitioner filed a Reply to Patent Owner’s Response (Paper 25, “Reply”). An oral hearing was held before the Board. Paper 39.

We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. Having considered the record before us, we conclude Petitioner has shown by a preponderance of the evidence that claims 2, 9, 11, 13, 16, 54, 55, and 62 of the ’021 patent are unpatentable. See 35 U.S.C. § 316(e).

I. BACKGROUND

A. RELATED MATTERS

In *Elekta, Inc. v. Varian Medical Systems, Inc.*, IPR2015-01401 (“IPR2015-01401”), we held, in a final written decision (IPR2015-01401, Paper 56, “IPR2015-01401 FWD”), that claims 1, 4, 5, 6, 7, 14, 15, 53, 60, and 61 of the ’021 patent are unpatentable. Patent Owner has appealed that decision. IPR2015-01401, Paper 58.

The parties assert the ’021 patent is also involved in proceedings before the International Trade Commission, and is involved in, or related to

the challenged patent involved in, several other *inter partes* reviews. See Paper 30, 1; Paper 5, 2.

B. THE '021 PATENT

The '021 patent is directed to using an imaging device for radiation therapy. Ex. 1001, 1:8–10. The Specification describes a need for “identifying the precise location of the target volume immediately prior to a dose of therapeutic radiation,” and, to that end, discloses a “cone beam computed tomography radiotherapy simulator and treatment machine.” Ex. 1001, 1:18–20, 46–47.

Figure 3 is reproduced, in part, below:

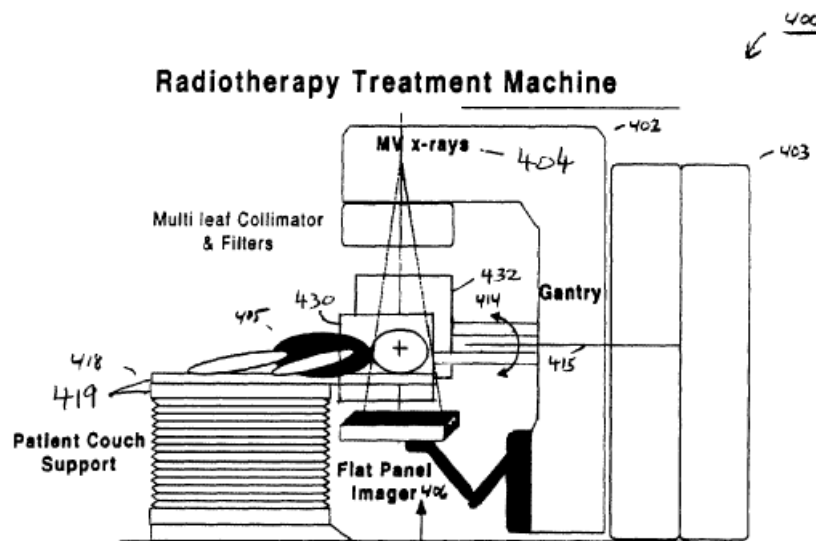


Figure 3 depicts the '021 patent's clinical treatment machine. *Id.* at 5:16–17.

The Specification describes the machine as follows:

The clinical treatment machine 400 includes a rotatable gantry 402 pivotably attached to a drive stand 403. A cone-beam CT radiation source 404 and a flat panel imager 406 oppose each other and are coupled to the rotatable gantry 402. . . . A treatment couch 418 is positioned adjacent to the gantry 402 to place the patient and the target volume within the range of operation for the radiation source 404 and the imager 406.

Id. at 5:18–28. The Specification describes “[the] gantry rotates around the patient while the radiation from the cone-beam CT radiation source impinges the flat-panel imager.” *Id.* at 2:51–56 (reference numerals omitted). “The gantry rotates and collects image data until a computer can calculate a representation of the patient and the target volume.” *Id.* at 2:56–58 (reference numerals omitted). Then, “a treatment plan may be generated from the collected image data . . . to apply a radiation dose to a target volume” while minimizing unwanted radiation to healthy tissue and critical structures. *Id.* at 2:61–67.

C. ILLUSTRATIVE CLAIMS

Independent claims 1, 11, 13, 16, and 53 (reproduced below) are illustrative of the claimed subject matter.

1. An apparatus, comprising:

a radiation treatment system capable of implementing a treatment plan, the system comprising:

a frame;

a rotatable gantry coupled to the frame;

a high-energy radiation source coupled to the rotatable gantry to radiate a patient with therapeutic radiation;

a cone-beam radiation source coupled to the rotatable gantry to radiate the patient;

a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager is operable to capture image projection data of the patient from the cone-beam radiation source to generate cone-beam computed tomography (CT) volumetric image data of the patient; and

a computing unit, coupled to the rotatable gantry via a communications network, to store the image projection data captured by the flat-panel imager.

Ex. 1001, 8:56–9:6.

11. An apparatus, comprising:

a radiation treatment system capable of implementing a treatment plan, the system comprising:

a frame;

a rotatable gantry coupled to the frame;

a high-energy radiation source coupled to the rotatable gantry to radiate a patient with therapeutic radiation;

a cone-beam radiation source coupled to the rotatable gantry to radiate the patient; and

a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager is operable to capture image projection data of the patient from the cone-beam radiation source to generate cone-beam computed tomography (CT) volumetric image data of the patient, wherein the flat-panel imager includes an amorphous silicon sensor array, and wherein the flat-panel imager includes a cesium iodide scintillator for kilovoltage imaging.

Id. at 9:43–60.

13. An apparatus, comprising:

a radiation treatment system capable of implementing a treatment plan, the system comprising:

a frame;

a rotatable gantry coupled to the frame;

a high-energy radiation source coupled to the rotatable gantry to radiate a patient with therapeutic radiation;

a cone-beam radiation source coupled to the rotatable gantry to radiate the patient; and

a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager is operable to capture image projection data of the patient from the cone-beam radiation source to generate cone-beam computed tomography (CT) volumetric image data of the patient, wherein the flat-panel imager is capable of generating image projection data at 15 to 30 frames per second.

Id. at 9:65–10:14.

16. An apparatus, comprising:

a radiation treatment system capable of implementing a treatment plan, the system comprising:

a frame;

a rotatable gantry coupled to the frame;

a high-energy radiation source coupled to the rotatable gantry to radiate a patient with therapeutic radiation;

a cone-beam radiation source coupled to the rotatable gantry to radiate the patient;

a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager is operable to capture image projection data of the patient from the cone-beam radiation source to generate cone-beam computed tomography (CT) volumetric image data of the patient, wherein the a flat-panel imager is a flat-panel KV imager; and

a flat-panel MV portal imager coupled to the rotatable gantry, wherein the MV imager is operable to capture image projection data of the patient produced by the high-energy MV radiation source.

Id. at 10:37–56.

53. An apparatus, comprising:

a clinical radiation treatment system capable of implementing a treatment plan, the system comprising:

a frame;

a rotatable gantry coupled to the frame;

a high-energy radiation source coupled to the rotatable gantry to radiate a patient with therapeutic radiation;

a cone-beam radiation source coupled to the rotatable gantry to radiate the patient; and

a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager captures fluoroscopic or cone-beam CT imaging image projection data of the patient from the cone-

beam radiation source to generate fluoroscopic or cone-beam computed tomography (CT) volumetric image data of the patient.

Id. at 14:22–36.

D. INSTITUTED GROUNDS OF UNPATENTABILITY

We instituted *inter partes* review on the following grounds of unpatentability.

Reference(s)	Basis	Challenged Claims
Jaffray 2001 ¹	§ 102(b)	9, 11, and 62
Jaffray 2000 ² , Jaffray JRO 1999 ³ , and Jaffray SPIE 1999 ⁴	§ 103(a)	2, 9, 11, 13, 16, 54, 55, and 62

Inst. Dec. 20.

II. ESTOPPEL

In IPR2015-01401, we held several claims of the '021 patent that are not at issue in this proceeding unpatentable based on the same prior art references asserted here. In this proceeding, the parties make several patentability arguments that they previously raised in IPR2015-01401, which

¹ D.A. Jaffray et al., *A Volumetric Cone-Beam CT System Based on a 41x41 cm² Flat-Panel Imager*, 4320 MEDICAL IMAGING 800–807 (2001) (Ex. 1003, “Jaffray 2001”).

² Jaffray et al., *Cone-beam Computed Tomography on a Medical Linear Accelerator Using a Flat-Panel Imager*, 558–560 (2000) (Ex. 1005, “Jaffray 2000”).

³ Jaffray et al., *A Radiographic and tomographic imaging system integrated into a medical linear accelerator for localization of bone and soft-tissue targets*, 45 INT. J. RADIATION ONCOLOGY BIOL. PHYS. 773–789 (1999) (Ex. 1007, “Jaffray JRO 1999”).

⁴ Jaffray et al., *Performance of a Volumetric CT Scanner Based Upon a Flat-Panel Imager*, 3659 SPIE 204–214 (1999) (Ex. 1008, “Jaffray SPIE 1999”).

we resolved in Petitioner's favor. At the oral hearing for this proceeding, Petitioner argued that Patent Owner is collaterally estopped from contesting unpatentability based on arguments that were decided in Petitioner's favor in the Final Written Decision in IPR2015-01401. See Ex. 1038, 4–6. We decline to address collateral estoppel both because Petitioner does not identify a statutory or regulatory basis for applying it, and because we need not reach the issue in light of our conclusion, explained below, that a preponderance of evidence establishes that the challenged claims are unpatentable even considering Patent Owner's arguments.

III. ANALYSIS

A. PRINCIPLES OF LAW

Petitioner bears the burden of proving unpatentability of the challenged claims, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish the facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

To anticipate under 35 U.S.C. § 102, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). A patent 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 to a person of ordinary skill in the art at the time the invention was made. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of

the prior art; (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, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. CLAIM CONSTRUCTION

1. Applicable Standard

The Board interprets claims using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b). We presume a claim term carries its “ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question” at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). We construe only those claim terms necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

2. “capable of implementing a treatment plan”

According to Patent Owner, to be “capable of implementing a treatment plan,” a radiation treatment system cannot still be in development, but must be proven ready for real medical use on actual human patients, in accord with industry safety and performance requirements. *See* PO Resp. 5–8, 29–40. In our Final Written Decision in IPR2015-01401, we construed this term based on nearly identical arguments and substantially the same evidence. IPR2015-01401 FWD 7. We declined to read in Patent Owner’s suggested additional limitations because neither the claims nor the specification had sufficient support for doing so. *Id.* Thus, we concluded the broadest reasonable construction of the term requires no more than a

system capable of implementing one or more treatment plans. *Id.* We maintain our position and adopt the same construction in this proceeding for the reasons stated in IPR2015-01401.

3. “communications network”

Patent Owner asserts “[a] communications network is a communication system that facilitates communication between many devices and that uses a networking protocol to selectively route messages to their intended devices.” PO Resp. 12. In Reply, Petitioner proposes a broader construction: “a link between two or more components of the radiation treatment system that allows information to be shared between them.” Reply 5.

In our Final Written Decision in IPR2015-01401, we construed the same term based on nearly identical arguments and substantially the same evidence. IPR2015-01401 FWD 7–8. Specifically, we rejected Patent Owner’s argument that a “communications network” required a networking protocol to selectively route messages because neither the term’s plain language nor the ’021 patent’s specification supported imposing such a requirement. *See id.* For the same reasons explained in IPR2015-01401, we maintain our agreement with Petitioner—under the broadest reasonable construction, a communications network is simply a link between two or more components of the radiation treatment system that allows information to be shared between them.

4. “a high energy radiation source” and “a cone-beam radiation source”

Petitioner asserts we should construe claims reciting “a high energy radiation source” and “a cone-beam radiation source” to cover two separate sources or a single source with both functions. *See* Pet. 7–8 (explaining that

the '021 patent's claims, Specification, and prosecution history support Petitioner's construction). Patent Owner does not address this issue. *See* PO Resp. 3–11. As we did in IPR2015-01401, we agree with Petitioner and construe the claimed “high energy radiation source” and “cone beam radiation source” as encompassing embodiments having the same source with two separate functions, and those with two separate sources. *See* IPR2015-01401 FWD 8–9.

C. ASSERTED PRIOR ART

The four asserted prior-art references at issue in this case are nonpatent articles describing the evolution of a single soft-tissue imaging system (cone-beam computed tomography or CBCT) to be used with a medical linear accelerator for image-guided radiation treatment. *See* Pet. 59 (citing Ex. 1020 ¶ 350); PO Resp. 38.

1. Jaffray 2001 (Ex. 1003)

Jaffray 2001 describes using a flat panel cone beam imaging system on a linear accelerator. Ex. 1003, 800. Jaffray 2001's Figure 4(a) is reproduced below.

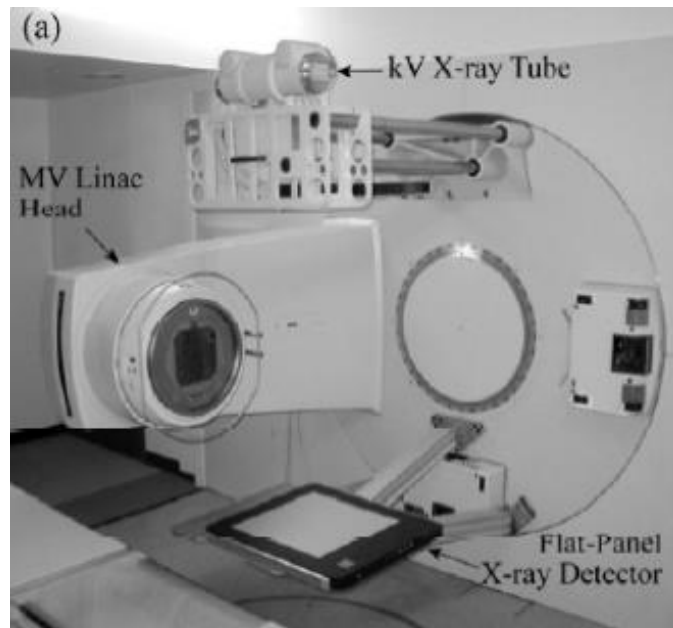


Figure 4(a) depicts a “[f]lat-panel cone-beam CT on a medical linear accelerator.” Ex. 1003, 805. The device includes a rotatable gantry, a megavoltage (MV) radiation source, and a flat panel imager opposite a kilovoltage (kV) X-ray tube. *Id.* at 804, 805.

2. Jaffray 2000 (Ex. 1005)

Jaffray 2000 describes a cone beam flat panel imager on a linear accelerator. Ex. 1005, 558. Jaffray 2000’s Figure 3 is reproduced below.

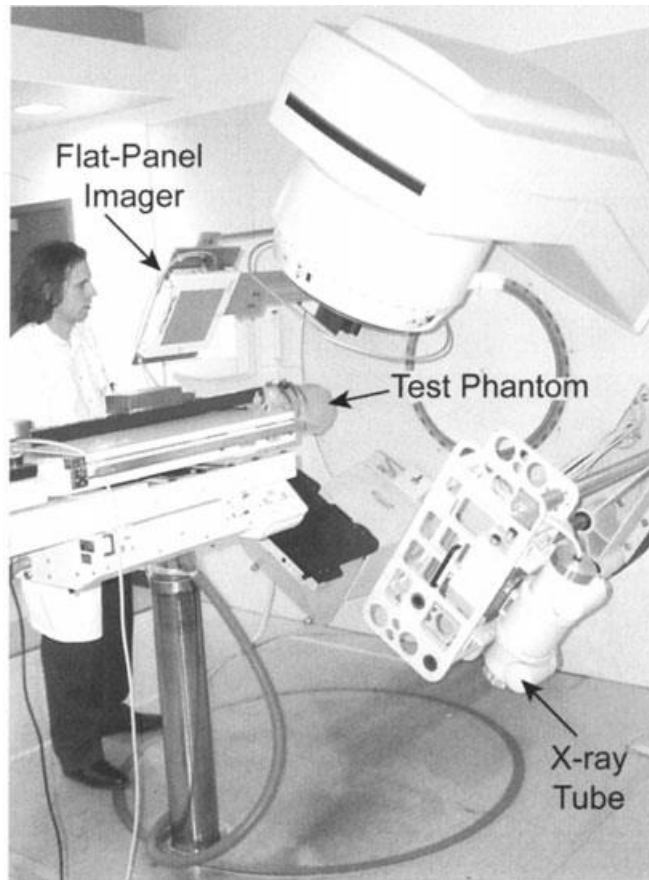


Figure 3 depicts a prototype FPI [flat-panel imager]-based CBCT system on an Elekta SL-20 medical linear accelerator. *Id.* at 559.

3. Jaffray JRO 1999 (Ex. 1007)

Jaffray JRO 1999 discloses a medical linear accelerator with an integrated kV imaging system. Ex. 1007, 773. Jaffray JRO 1999's Figure 1(b) is reproduced below.

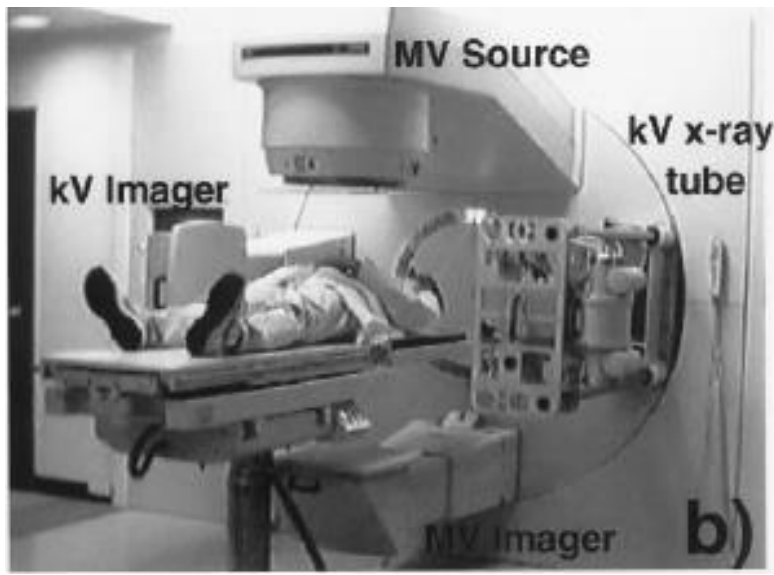


Figure 1(b) depicts a kV x-ray tube and imager integrated into an Elekta SL-20 medical linear accelerator. *Id.* at 775.

4. Jaffray SPIE 1999 (Ex. 1008)

Jaffray SPIE 1999 discloses details of a CBCT flat-panel imaging system, including an “amorphous silicon flat-panel imager (FPI).” See Ex. 1008, 204, 205–08. Jaffray SPIE 1999’s Figure 1(a) is reproduced below.

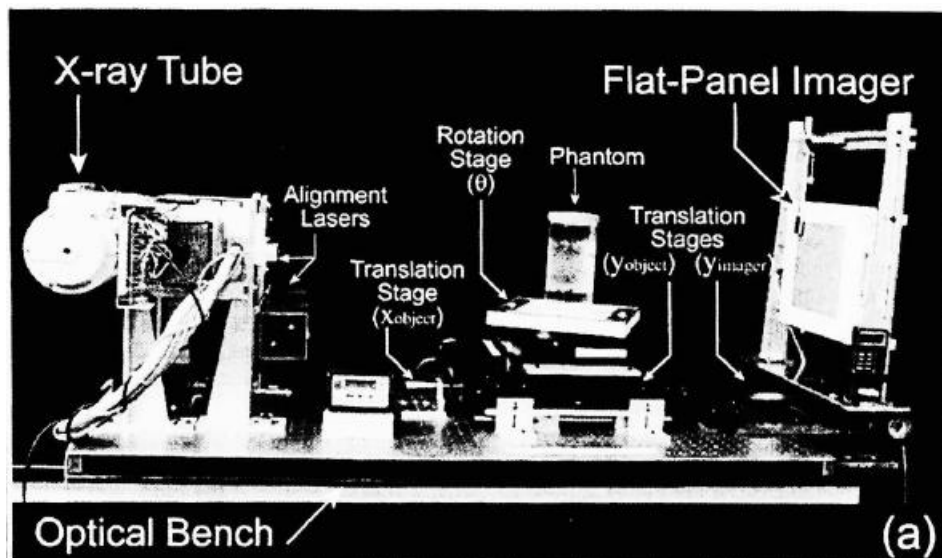


Figure 1(a) depicts a “benchtop experimental apparatus for examining the performance of flat-panel imagers in cone-beam computed tomography.” *Id.* at 206.

D. INSTITUTED GROUNDS OF UNPATENTABILITY

1. Anticipation of Claims 9, 11, and 62 based on Jaffray 2001

Petitioner contends Jaffray 2001 anticipates claims 9, 11, and 62. Pet. 35–43. Based on our review of the arguments and evidence in the Petition, Response, and Reply, we determine Petitioner has demonstrated, by a preponderance of the evidence, that Jaffray 2001 anticipates claims 9, 11, and 62, as explained below.

a. Disputed Limitations

i. Jaffray 2001 Teaches “a radiation treatment system capable of implementing a treatment plan”

All of the challenged claims require a “radiation treatment system capable of implementing a treatment plan.” Petitioner advances substantially the same evidence in this proceeding as it did in IPR2015-01401 to show that Jaffray 2001 teaches the “capable of implementing a treatment plan” limitation. See Pet. 35, 37 (citing Ex. 1003, 800); Reply 6–12 (citing Ex. 1003, 800, 805, Fig. 4(a); Ex. 1020 ¶¶ 259, 266; Ex. 1037 ¶¶ 15–17, 29–48); see also IPR2015-01401 FWD 12–13. Based on that evidence, and for the same reasons explained in IPR2015-01401, we find Jaffray 2001 discloses a system capable of implementing a treatment plan. See IPR2015-01401 FWD 12–13.

Patent Owner contests this element, relying on its claim construction arguments outlined above. Specifically, Patent Owner emphasizes that Jaffray 2001 discloses an intended *future* use of the disclosed system for image-guided radiation therapy, and the Jaffray articles as a group describe a

system that was still in development, but not ready for actual medical use on real human patients. PO Resp. 27–41. Patent Owner made substantively the same arguments in IPR2015-01401. Having declined to adopt Patent Owner’s proffered construction, we find Patent Owner’s arguments unpersuasive for the same reasons given in IPR2015-01401. *See* IPR2015-01401 FWD 7, 12–13.

ii. Jaffray 2001 Teaches “a computing unit, coupled to the rotatable gantry via a communications network”

Claim 1 (and, by dependency, claim 9) requires “a computing unit, coupled to the rotatable gantry via a communications network, to store image projection data from the flat-panel imager.” Petitioner advances substantially the same evidence in this proceeding as it did in IPR2015-01401 to show Jaffray 2001 teaches this limitation. *See* Pet. 36, 39–40 (citing Ex. 1003, 800, 801, 804; Ex. 1020 ¶¶ 277–278); Reply 17–24 (citing Ex. 1037 ¶ 66–85). Patent Owner, as it did in IPR2015-01401, contests this element by relying on its proffered construction for a communications network—i.e., “a communication system that facilitates communication between many devices and that uses a networking protocol to selectively route messages to their intended devices.” *See* PO Resp. 41–45; IPR2015-01401 FWD 14–15. As explained above, we decline to adopt Petitioner’s construction. Based on the evidence provided in the Petition, Response, and Reply, and for the same reasons explained in IPR2015-01401, we find that Jaffray 2001 discloses “a computing unit, coupled to the rotatable gantry via a communications network.” *See* IPR2015-01401 FWD 14–15.

b. Unchallenged Limitations

Petitioner contends Jaffray 2001 discloses the remaining, unchallenged limitations of claims 9, 11, and 62. Pet. 35–43. Patent Owner

does not address the merits of Petitioner's assertions regarding the remaining limitations. See PO Resp. 11–40. We agree with Petitioner's assertions, as outlined below.

i. Claims 9 and 62

Claim 9 depends from independent claim 1 and claim 62 depends from independent claim 53. In IPR2015-01401, we held Petitioner had met its burden to show Jaffray 2001 teaches the underlying unchallenged limitations of independent claims 1 and 53. IPR2015-01401 FWD 13, 16–17, 18–19. Petitioner advances substantially the same evidence in this proceeding as it did in IPR2015-01401 to show Jaffray 2001 teaches the underlying unchallenged limitations of independent claims 1 and 53. See Pet. 37–40, 41–42. For the same reasons explained in IPR2015-01401, we find Petitioner has shown that Jaffray 2001 teaches the unchallenged limitations in independent claims 1 and 53. Petitioner has also shown Jaffray 2001 discloses the additional, unchallenged limitation recited in both dependent claims 9 and 62: “wherein the cone-beam source and high-energy radiation source are different from one another, and the cone-beam source comprises a KV source and wherein the high-energy radiation source comprises a MV source coupled to the rotatable gantry to radiate a patient with therapeutic radiation.” See Pet. 40 (citing Ex. 1003, 801, 804, Fig. 4; Ex. 1020 ¶¶ 281–282), 42–43(citing Ex. 1003, 801, 804, Fig. 4; Ex. 1020 ¶¶ 281, 294).

c. Conclusion

For these reasons, having considered the parties' contentions and supporting evidence, we determine Petitioner has demonstrated, by a

preponderance of the evidence, that claims 9, 11, and 62 are unpatentable under 35 U.S.C. § 102(b) over Jaffray 2001.

2. Obviousness of Claims 2, 9, 11, 13, 16, 54, 55, and 62 based on Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999

Petitioner contends claims 2, 9, 11, 13, 16, 54, 55, and 62 would have been obvious over Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999. Pet. 43–60. Based on our review of the arguments and evidence in the Petition, Response, and Reply, we determine Petitioner has demonstrated, by a preponderance of the evidence, that the subject matter of claims 2, 9, 11, 13, 16, 54, 55, and 62 would have been obvious over Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999, as explained below.

a. Disputed Limitations

i. Jaffray 2000 Teaches “a radiation treatment system capable of implementing a treatment plan”

All of the challenged claims require a “radiation treatment system capable of implementing a treatment plan.” Petitioner advances substantially the same evidence in this proceeding as it did in IPR2015-01401 to show that Jaffray 2000 teaches the “capable of implementing a treatment plan” limitation. See Pet. 48–49 (citing Ex. 1005, 558, 559; Ex. 1020 ¶¶ 259, 306); Reply 14–15 (citing Ex. 1020 ¶¶ 261, 306–307; Ex. 1037 ¶¶ 48, 55–57, 88, 89, 91, 92); see also IPR2015-01401 FWD 23–24. Based on the evidence provided in the Petition, Response, and Reply, and for the same reasons explained in IPR2015-01401, we find that Jaffray 2000 discloses a system capable of implementing a treatment plan. See IPR2015-01401 FWD 23–24.

In contesting this element, Patent Owner raises similar arguments as those related to Jaffray 2001. See PO Resp. 34–35, 47–48. We considered

those arguments in IPR2015-01401 and concluded that they were unpersuasive. IPR2015-01401 FWD 23–24. We conclude that Patent Owner’s arguments in this proceeding are unpersuasive for the same reasons given in IPR2015-01401.

ii. Jaffray SPIE 1999 Teaches “a computing unit, coupled to the rotatable gantry via a communications network”

Claim 1 (and, by dependency, claims 2 and 9) requires “a computing unit, coupled to the rotatable gantry via a communications network.” Petitioner advances substantially the same evidence in this proceeding as it did in IPR2015-01401 to show that Jaffray SPIE 1999 teaches this limitation. See Pet. 45, 50 (citing Ex. 1008, 205; Ex. 1020 ¶ 319); Reply 21–23 (citing Ex. 1037 ¶¶ 95–97); IPR2015-01401 FWD 25. Patent Owner contests this element, again relying on its narrow construction for “communications network” as requiring a networking protocol and message routing. See PO Resp. 51–53. Based on the evidence provided in the Petition, Response and Reply, and for the same reasons explained in IPR2015-01401, we agree with Petitioner that Jaffray SPIE 1999 discloses “a computing unit, coupled to the rotatable gantry via a communications network.” See IPR2015-01401 FWD 25.

b. Unchallenged Limitations

Petitioner contends the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 discloses the remaining, unchallenged limitations in claims 2, 9, 11, 13, 16, 54, 55, and 62. Pet. 43–60. Patent Owner does not address the merits of Petitioner’s assertions regarding the remaining limitations. See PO Resp. 11–40. We agree with Petitioner’s assertions, as outlined below.

i. Claims 2 and 9

Claims 2 and 9 depend from independent claim 1. In IPR2015-01401, we held Petitioner had met its burden to show the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 teaches the underlying unchallenged limitations of independent claim 1. IPR2015-01401 FWD 26–27. Petitioner advances substantially the same evidence in this proceeding. *See* Pet. 48–51. For the same reasons explained in IPR2015-01401, we find Petitioner has shown that the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 teaches the unchallenged limitations of independent claim 1. Petitioner has shown also that Jaffray JRO 1999 discloses the additional limitation recited in dependent claim 2: “wherein the flat-panel imager is capable of fluoroscopic imaging, radiographic imaging, and cone-beam CT imaging.” *See id.* at 46–46, 51 (citing Ex. 1007, 774, 782; Ex. 1020 ¶ 322). In addition, Petitioner has shown the combination of Jaffray 2000 and Jaffray JRO 1999 discloses the additional limitation recited in dependent claim 9 (“wherein the cone-beam source and high-energy radiation source are different from one another, and the cone-beam source comprises a KV source and wherein the high-energy radiation source comprises a MV source coupled to the rotatable gantry to radiate a patient with therapeutic radiation”) because Jaffray 2000 includes separate kV cone beam and MV sources, while Jaffray JRO 1999 refers to the MV source as the treatment beam used to radiate a target volume. *See id.* at 46, 51–52 (citing Ex. 1005, 558, Fig. 3; Ex. 1007, 774; Ex. 1020 ¶¶ 324–325).

ii. Claim 11

Based on the Petition’s incorporation of its claim 1 analysis, we find Petitioner has shown the combination of Jaffray 2000, Jaffray JRO 1999,

and Jaffray SPIE 1999 teaches independent claim 11's frame, rotatable gantry, high-energy radiation source, and cone-beam radiation source, all of which are recited identically in claim 1. *See id.* at 48–50, 52–53. Petitioner has shown also Jaffray 2000 discloses “a flat-panel imager coupled to the rotatable gantry, wherein the flat-panel imager captures fluoroscopic or cone-beam CT imaging image projection data of the patient from the cone-beam radiation source to generate fluoroscopic or cone-beam computed tomography (CT) volumetric image data of the patient,” as claim 11 requires. *See id.* at 50 (citing Ex. 1005, 558, 559, Fig. 3; Ex. 1020 ¶¶ 316–317); *see also id.* at 53. In addition, Petitioner has shown Jaffray 2000 discloses the remaining limitations from independent claim 11: “wherein the flat-panel imager includes an amorphous silicon sensor array, and wherein the flat-panel imager includes a cesium iodide scintillator for kilovoltage imaging.” *See id.* at 46–47, 53 (citing Ex. 1005, 558, 559; Ex. 1020 ¶¶ 328–329).

iii. Claim 13

Based on the Petition's incorporation of its claim 1 analysis, we find Petitioner has shown the combination of Jaffray 2000 and Jaffray JRO 1999 teaches independent claim 13's frame, rotatable gantry, high-energy radiation source, cone-beam radiation source, and flat-panel imager for generating CT volumetric image data of the patient, all of which are recited identically in claim 1. *See id.* at 48–50, 53–54. Petitioner has shown Jaffray SPIE 1999 discloses the remaining limitation from independent claim 13: “wherein the flat-panel imager is capable of generating image projection data at 15 to 30 frames per second.” *See id.* at 47, 55 (citing Ex. 1008, 205; Ex. 1020 ¶ 333).

iv. Claim 16

Based on the Petition's incorporation of its claim 1 analysis, we find Petitioner has shown the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 teaches independent claim 16's frame, rotatable gantry, high-energy radiation source, cone-beam radiation source, and flat-panel imager for generating CT volumetric image data of the patient, all of which are recited identically in claim 1. *See id.* at 48–50, 55–56. In addition, Petitioner has shown the combination of Jaffray 2000 and Jaffray JRO 1999 discloses the remaining limitations of independent claim 16: “wherein the flat-panel imager is a flat- panel KV imager” and “a flat-panel MV portal imager coupled to the rotatable gantry, wherein the MV imager is operable to capture image projection data of the patient produced by the high-energy MV radiation source.” *See id.* at 47, 56 (citing Ex. 1005, 559; Ex. 1007, 773, 782; Ex. 1020 ¶ 337).

v. Claims 54, 55, and 62

Claims 54 and 62 depend from independent claim 53. Claim 55 depends on claim 54. In IPR2015-01401, we held Petitioner had met its burden to show the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 teaches the underlying unchallenged limitations of independent claim 53. IPR2015-01401 FWD 13, 18–19. Petitioner advances substantially the same evidence in this proceeding. Pet. 37–40, 41–42. Thus, we find Petitioner has shown that the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 teaches the underlying unchallenged limitations of independent claim 53 for the same reasons explained in IPR2015-01401. Petitioner has also shown that the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999

discloses the additional limitation recited in dependent claim 54: “wherein the flat-panel imager includes an amorphous silicon sensor array capable of fluoroscopic imaging, radiographic imaging, and cone-beam CT imaging.” *See id.* at 45–47, 51, 53, 57 (citing Ex. 1005, 558; Ex. 1007, 774, 782, 787; Ex. 1008, 205; Ex. 1020 ¶¶ 141–144, 322, 328). In addition, Petitioner has shown that the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 discloses the additional limitation recited in dependent claim 55: “wherein the cone-beam CT radiation source is a kilovoltage radiation source, and the flat-panel imager includes a cesium iodide scintillator for kilovoltage imaging.” *See id.* at 47, 57–58 (citing Ex. 1005, 559; Ex. 1008, 208; Ex. 1020 ¶¶ 329, 347). Petitioner has also shown that the combination of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 discloses the additional limitation recited in dependent claim 62: “wherein the cone-beam source and high-energy radiation source are different from one another, and the cone-beam source comprises a KV source and wherein the high-energy radiation source comprises a MV source coupled to the rotatable gantry to radiate a patient with therapeutic radiation.” *See id.* at 46, 58 (citing Ex. 1005, 558, Fig. 3; Ex. 1007, 774; Ex. 1020 ¶¶ 324–325, 329).

c. Petitioner Provided Sufficient Rationale for Combining Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999

In addition, Petitioner articulates sufficient reasoning with some rational underpinning to support the legal conclusion that its proffered combination would have been obvious to one of ordinary skill in the art. *See KSR*, 550 U.S. at 418. Petitioner explains, with relevant support from its Declarant and the prior art, to the extent Jaffray 2000 does not include, through incorporation by reference, either the flat-panel imaging system described in Jaffray SPIE 1999 or the linear accelerator system described in

Jaffray JRO 1999, it would have been obvious to combine the descriptions of those systems with the system disclosed in Jaffray 2000 because one skilled in the art would understand that the series of Jaffray articles describes the evolution of a single system, and that Jaffray 2000 specifically references both the medical linear accelerator described in Jaffray JRO 1999 and the flat panel imager described in Jaffray SPIE 1999. *See* Pet. 58–60; Ex. 1020 ¶¶ 350–352. Thus, in addition to demonstrating the relevant disclosures in the prior art, Petitioner provides adequate rationale explaining why one skilled in the art would combine the teachings of Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999 in the manner Petitioner advances.

In contesting obviousness based on Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999, Patent Owner asserts we should reject Petitioner’s obviousness challenge because it “proceeds with mere conclusory statements that anything missing from Jaffray 2000 simply would have been obvious.” PO Resp. 56. Patent Owner faults Petitioner for not adequately explaining any differences between the claimed subject matter and the prior art, and for failing to explain why any missing limitations would have been obvious to one skilled in the art. PO Resp. 53–57. We, however, do not view Petitioner’s obviousness challenge as a mere conclusory statement that anything missing from Jaffray 2000 simply would have been obvious. As explained above, Petitioner identified potential differences between Jaffray 2000 and the claimed subject matter (i.e., the claimed details of the flat-panel imaging system described in Jaffray SPIE 1999, and the claimed details of the linear accelerator described in Jaffray JRO 1999) as well as rationale explaining why one skilled in the art would have known to include those elements (i.e., because one skilled in the art would understand the

series of Jaffray articles describes the evolution of a single system and Jaffray 2000 specifically references both the medical linear accelerator described in Jaffray JRO 1999 and the flat panel imager described in Jaffray SPIE 1999).

d. Conclusion

Based on our review of the arguments and evidence in the Petition, Response, and Reply, we determine Petitioner has shown, by a preponderance of the evidence, that claims 2, 9, 11, 13, 16, 54, 55, and 62 are unpatentable under 35 U.S.C. § 103(a) over Jaffray 2000, Jaffray SPIE 1999, and Jaffray JRO 1999.

IV. PETITIONER’S CHALLENGE TO PATENT OWNER’S
DECLARANT

Petitioner argues we should give no weight to Dr. Mutic’s testimony in light of Dr. Mutic’s “long professional history with Patent Owner, which has involved substantial monetary compensation.” Reply 25. According to Petitioner, “Dr. Mutic’s prior, and likely future, compensation from Patent Owner renders his expert testimony biased and questionable.” *Id.* at 26.

We see nothing wrong or unusual with Patent Owner compensating Dr. Mutic for work in this case, or in future ones. In assessing the merits of this case, we have considered the proffered testimony from Dr. Mutic, as well as Petitioner’s Declarant Dr. Hamilton, and accorded weight based on the testimony’s substantive persuasiveness. We see no reason why Dr. Mutic’s past compensation—or his speculative future compensation—makes his testimony unhelpful in understanding the evidence. *See Fed. R. Evid.* 702(a).

V. CONCLUSION

In conclusion, Petitioner has shown by a preponderance of the evidence (1) claims 9, 11, and 62 are unpatentable under 35 U.S.C. § 102(b) over Jaffray 2001; (2) claims 2, 9, 11, 13, 16, 54, 55, and 62 are unpatentable under 35 U.S.C. § 103(a) over Jaffray 2000, Jaffray JRO 1999, and Jaffray SPIE 1999.

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 2, 9, 11, 13, 16, 54, 55, and 62 of the '021 patent are 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.

Case IPR2016-00317

Patent 7,945,021 B2

PETITIONER:

Theresa Gillis

tgillis@mayerbrown.com

Amanda Streff

astreff@mayerbrown.com

PATENT OWNER:

Heidi Keefe

hkeefe@cooley.com

Daniel Knauss

dknauss@cooley.com

Scott Cole

Varian_PTAB_IPR@cooley.com

Reuben Chen

rchen@cooley.com