UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VARIAN MEDICAL SYSTEMS, INC.,
Petitioner,

v.

BEST MEDICAL INTERNATIONAL, INC.,
Patent Owner.

IPR2020-00077
Patent 7,266,175 B1

Before KARL D. EASTHOM, WILLIAM V. SAINDON, and JOHN A. HUDALLA, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

Varian Medical Systems, Inc. ("Petitioner") filed a Petition (Paper 2, "Pet." or "Petition") pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1, 3–5, 8, 9, 13–16, 18, and 19 (the "challenged claims") of U.S. Patent No. 7,266,175 B1 (Ex. 1001, the "'175 patent"). Best Medical Systems, Inc. ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp.").

The Board's authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review requires a demonstration of "a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Upon consideration of the parties' contentions and the evidence of record, we determine that Petitioner does not establish a reasonable likelihood of prevailing in demonstrating the unpatentability of any of the challenged claims. Accordingly, we deny Petitioner's request and do not institute an *inter partes* review of the challenged claims.

II. BACKGROUND

A. Real Parties-in-Interest

Petitioner contends "[i]n addition to Petitioner Varian Medical Systems, Inc., VMS International AG [and its two Dutch parent companies], VMS International Holdings, Inc., VMS Netherlands Holdings, Inc., and VMS Nederland BV are real parties-in-interest." Pet. 1.

B. Related Matters

Patent Owner identifies the following as related matters involving the '175 patent: *Best Medical International, Inc. v. Accuray, Inc. et al.,* No.

2:10-cv-01043 (W.D. Pa.) (dismissed June 26, 2014); *Best Medical International, Inc. v. Elekta Inc. et al.*, No. 1:18-cv-01600-MN (D. Del.) (complaint filed October 16, 2018) (transferred to N.D. Ga.); *Best Medical International, Inc. v. Elekta Inc. et al.* No. 1:19-cv-03409-MLB (N.D. Ga.); *Best Medical International, Inc. v. Varian Medical Systems, Inc. et al.*, No. 1:18-cv-01599 (D. Del.) (complaint filed October 16, 2018). Paper 4, 1–2.

Related PTAB *inter partes* proceedings include the following challenges to the ’175 patent: *Varian Medical Systems, Inc. v. Best Medical International, Inc.,* IPR2020-00053, Paper 2 (PTAB Oct. 17, 2019) (petition challenging claims 13–16, 18, and 19 of the ’175 patent); *Elekta Inc. v. Best Medical International, Inc.,* IPR2020-00073, Paper 2 (PTAB Oct. 18, 2019) (petition challenging claims 1, 8, 10–13, and 17, 19, and 20 of the ’175 patent). *See* Paper 4, 3.

C. The ’175 Patent

The ’175 patent, titled “Planning Method for Radiation Therapy,” involves a “[m]ethod and apparatus for controlling the correlation between the factors of treatment plan efficiency and dosimetric fitness” to optimize a radiotherapy plan. Ex. 1001, code (57).

In the “Background of the Invention” section, the ’175 patent states “[t]raditional inverse intensity modulated radiation therapy (‘IMRT’) planning systems attempt to find radiation intensity maps resulting in the best calculated dose distribution for a specific tumor for a specific patient” using, "typically, a conventional linear accelerator provided with a multileaf, or multiple leaf, collimator ('MLC')." Ex. 1001, 1:13–20.

The '175 patent seeks to provide control of a "tradeoff" between "dosimetric cost" (which measures how close a prescribed dose tracks the delivered dose) and efficiency (measured in the number of MUs or segments):

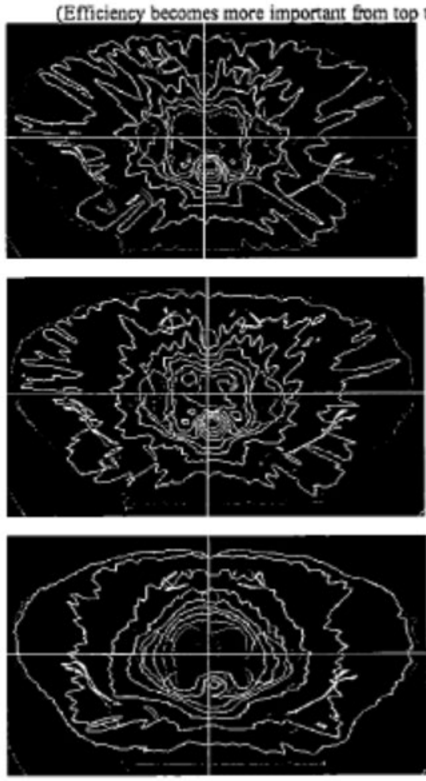
> For many treatment plans, the resultant intensity maps often cannot be efficiently delivered by the radiation therapy treatment equipment . . . . Inefficient intensity maps may require a large number of monitor units ("MU") or a large number of "MLC" segments for delivery. These inefficient treatment plans, or solutions, are undesirable because they might require a large amount of delivery time, radiation beam on time, and/or radiation leakage dose to the patient. It is also undesirable to uniformly preclude the discovery of less efficient treatment plans, which may also be dosimetrically superior plans. Thus, it would be desirable to provide user control of the tradeoff, or correlation, between the factors of treatment plan efficiency and dosimetric fitness to optimize a radiation therapy, or radiotherapy, plan.

Ex. 1001, 1:16–32. The number of "MUs" or "segments" corresponds or relates to the amount of radiation energy output by the treatment machine. *See id.*

During prosecution of the '175 patent, in response to an office action, the patent applicant filed a declaration by Dr. Mark P. Carol shedding light on the background of the invention *See* Ex. 1007, 15 (citing Carol Declaration ¶¶ 6e1–6e2); Ex. 1009 ("Carol Declaration"). For example, Dr. Carol refers to beam segments as "small portions or pieces of a large beam" and relates an increase in monitor units and segments to an increase in inefficiency. *See* Ex. 1009 ¶ 6a1. He also describes a decrease in monitor units or "the use of a smaller number of simpler segments" as "requiring less radiation, and therefore less machine time." *Id.* ¶ 6a4.

Figures 4A–4C of the '175 patent, which follow, illustrate the results of three plan results showing a trade-off between dosimetric cost and monitor units:

(Efficiency becomes more important from top to bottom):



Dosimetric Cost = 0.132
Total Monitor Units = 22365

FIG. 4A.

Dosimetric Cost = 0.149
Total Monitor Units = 15624

FIG. 4B.

Dosimetric Cost = 1.94
Total Monitor Units = 6640

FIG. 4C.

Figures 4A–4C above represent "dose distribution intensity maps for three different radiotherapy plans" with the most efficient plan (lowest number of monitor units) and highest dosimetric cost represented by the radiotherapy plan of Figure 4C. *See* Ex. 1001, 2:3–4.

D. Illustrative Claims

Claims 3–5, 8, and 9 depend from independent claim 1, and claims 14–16 and 18 depend from independent claim 13. For purposes of the decision on institution, independent claim 19 materially tracks independent claims 1 and 13. Independent claims 1 and 13, reproduced below, illustrate the subject matter of the challenged claims:

> 1. A method of determining a radiation beam arrangement, the method comprising the steps of:
>
> receiving prescription parameters for a patient target; and
>
> evaluating a cost function for each of a set of a plurality of candidate intensity maps formed responsive to the prescription parameters to provide control of a trade-off between treatment plan delivery efficiency and dosimetric fitness within an optimizer to optimize a radiation treatment plan within a continuum between substantially optimal dosimetric fitness and enhanced delivery efficiency at an expense of dosimetric fitness, the cost function including a dosimetric cost term representing dosimetric cost and related to dosimetric fitness of the respective candidate intensity map and a delivery cost term representing delivery cost and related to delivery time to deliver radiation according to a beam arrangement represented by the respective candidate intensity map, the evaluation of the delivery cost term for each respective candidate intensity map having linear computational complexity with respect to size of the respective candidate intensity map.

Ex. 1001, 4:34–55.

> 13. A method of providing control of a trade-off between treatment plan delivery efficiency and dosimetric fitness to optimize a radiation treatment plan within a continuum between delivery efficiency and dosimetric fitness, the method comprising the steps of:

> assigning a delivery cost term within an optimizer to each of a plurality of intensity maps representing a potential radiation beam arrangement, the assignment based on complexity of each respective intensity map; and
>
> evaluating an objective cost function for each of the plurality of intensity maps, the objective function including a dosimetric cost term and the delivery cost term, the dosimetric cost term representing dosimetric fitness of the respective intensity map and the delivery cost term representing delivery efficiency.

Id. at 6:5–19.

E. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 3–5, 8, 9, 13–16, 18, and 19 would have been obvious on the following grounds (Pet. 2):

Claims Challenged	35 U.S.C. §	Reference(s)
1, 4, 13, 14[1]	103(a)[2]	Spirou[3]

[1] Petitioner lists claim 18 as rendered obvious by Spirou, but does not provide a specific showing for claim 18. *See, e.g.,* Pet. 16 (listing claim 18: "**Ground 1: Claims 1, 4, 13–14, and 18 Over Spirou"**), 31–32 (addressing claim 14 but not claim 18).

[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103 (effective March 16, 2013). However, because the filing date of the application from which the '175 patent issued antedates March 16, 2013, the pre-AIA version of § 103 applies.

[3] Spirou et al., "Smoothing Intensity-Modulated Beam Profiles to Improve the Efficiency of Delivery," MED. PHYS. V.28, No. 10, 2106–12 (October 2001) (Ex. 1003).

Claims Challenged	35 U.S.C. §	Reference(s)
1, 3–5, 8, 9, 13–16, 18, 19	103(a)	Siebers,[4] Langer[5], Spirou

Petitioner relies on the Declaration of Dr. Timothy Solberg (Ex. 1002). Patent Owner relies on the Declaration of Daniel J. Chase (Ex. 2002).

III. DISCUSSION

A. Principles of Law Relating to Obviousness

The question of obviousness requires resolving 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 skill in the art; and (4) any objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, tribunals "determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006)).

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[4] Siebers et al., "Incorporating Multi-leaf Collimator Leaf Sequencing into Iterative IMRT Optimization," MED. PHYS., V.29, No. 6, 952–59 (June 2002) (Ex. 1006).
[5] Langer et al., "Improved Leaf Sequencing Reduces Segments or Monitor Units Needed to Deliver IMRT Using Multileaf Collimators," MED. PHYS., V.28, No. 12, 2450–58 (December 2001) (Ex. 1004).

B. Level of Ordinary Skill

Petitioner contends

> [a] person of ordinary skill as of July 2003 would be a medical physicist with a Ph.D. (or similar advanced degree) in physics, medical physics, or a related field, and two or more years of experience in radiation oncology physics treatment planning, treatment plan optimization related to radiation oncology applications, and computer programming associated with treatment plan optimization (or equivalent degree or experience).

Pet. 5–6 (citing Ex. 1002 ¶13).

Patent Owner asserts that a person with ordinary skill in the art would have had a master's or doctoral degree in radiation dosimetry, physics, medical physics, or medicine, or equivalent disciplines, and three years of clinical experience in radiation treatment planning. *Id.* at 13–14 (citing Ex. 2002 ¶ 28). Patent Owner also urges a flexible approach that trades some formal education with experience and vice versa. *See id.* at 14 (citing Ex. 2002 ¶¶ 28, 59–60).

The prior art references and the '175 patent reflect a highly skilled and technically proficient audience. *See, e.g.*, *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1556 (Fed. Cir. 1983) ("Patents . . . are written to enable those skilled in the art to practice the invention."). Petitioner's and Patent Owner's proposals similarly suggest a high level of skill in the intersection between mathematical modeling and radiology, with the prior art of record and the '175 patent specification supporting each proposal. We adopt Patent Owner's proposed level of skill.

C. Claim Construction

Under 37 C.F.R. § 42.100(b), claims

> shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

Petitioner construes the term "intensity map" as a "**representation of dose distribution**." Pet. 13. However, Petitioner acknowledges that the term "intensity map" carries a customary meaning in the art that differs from Petitioner's proffered claim construction. *Id.* at 10–11 ("[T]he term '**intensity map**' in intensity modulated radiation therapy ('IMRT') typically refers to the intensity or 'fluence' profile of *a single* radiation beam in a multi-beam arrangement.").

Patent Owner disagrees with Petitioner's proffered claim construction, but agrees with Petitioner that the term "intensity map" carries a customary meaning in the art. *See* Prelim. Resp. 15–18. Patent Owner proposes that we adopt the customary meaning. *See id.*

The parties' arguments here mirror those presented by the same parties in co-pending IPR2020-00053, which also involves challenges to the '175 patent. *Compare id.* at Paper 2 (petition) § 7, *and* Paper 6 (preliminary response) § V, *with* Pet. § 7, *and* Prelim Resp. § V. For the reasons explained in the decision on institution in co-pending IPR2020-00053, we adopt the customary meaning according to the claim construction analyzed therein. *See* IPR2020-00053, Paper 14 (decision denying institution) § III.C (Claim Construction). We incorporate by reference that analysis and the supporting facts. *See id.* Therefore, we construe "intensity map," according to its customary meaning in light of the ’175 patent specification, as “a representation of the variation across a defined area of radiation of a single beam.” *See id.*

We need not resolve the construction other terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Obviousness—Claims 1, 4, 13, and 14

Petitioner asserts that Spirou (Ex. 1003) renders claims 1, 4, 13, and 14 unpatentable for obviousness. Pet. 16–36. Patent Owner disagrees. *See generally* Prelim. Resp.

1. Overview of Spirou

Spirou describes a method for delivering intensity-modulated radiation beams (IMRT) to organs of a patient seeking treatment via targeted radiation therapy. *See* Ex. 1003, 1.[6] Spirou describes two key components of IMRT: “an inverse planning or optimization algorithm to calculate the ‘optimal’ beam profiles and a delivery system to generate them.” *Id.* at 1.

> At the heart of the optimization algorithm is a mathematical objective function, which is an attempt to quantify the clinical objectives and assign a numerical score to each plan. Several groups have proposed different objective functions as well as

[6] We cite the page numbers of Exhibit 1003 added by Petitioner for this proceeding and employ this citation method for most of the Exhibits (with the exception of citing declaration paragraph (¶) numbers).

> procedures to minimize them. Examples of delivery systems include dynamic multileaf collimation (DMLC) step-and-shoot, and physical compensators.

Id. at 1.

Spirou employs an optimization algorithm that includes beam profile smoothness as part of a cost function per the last term in the following Equation (3):

$$F_{\text{obj}} = \sum_{i \,\epsilon\, \text{targets}} w_i \,(d_i - d_p))^2 \; + \; \sum_{j \,\epsilon\, \text{organs}} w_i \,\zeta_i \,(d_i - d_c))^2 +$$

$$\sum_{\text{j} \,\epsilon\, \text{beams}} \text{w}_\text{j} \,(\text{x}_j\text{'} - \text{x}_j))^2$$

"where d_i and w_i are the dose and weight of the ith point, d_p is the prescription dose, d_c is the constraint dose, and ζ_i is a flag indicating whether the constraint is violated." *Id.* at 2. The program sums the first term over the points in the targets and the second term over the points in the critical organs. *Id.* The term x_j', which represents beam profile smoothness, equals the following summation:

$$\sum_{k=-n_L}^{n_R} c_k \cdot x_{j+k}$$

> where x_j is the value of the jth beam element in the original profile, x_j' is the new value after smoothing, c_k is the weighting coefficient of each neighboring beam element, and n_L and n_R are the number of neighbors to the left and to the right to be included in the smoothing, respectively.

Id. at 2. "The n_L and n_R beam elements define the smoothing window." *Id.* "The choice of the coefficients c_k defines the characteristics of the smoothing filter. For example, if all the c_k's are equal, then x_j' is simply the average of the x_j's within the smoothing window." *Id.*

One method of Spirou, Method B, includes the "term within the [algorithm's] objective function that specifies the smoothness of the profiles as an optimization criterion." *Id.* at 1, Abstract. Method B "allows multiple minimum dose, maximum-dose as well as dose-volume constraints to be defined for any structure, each with varying penalty weights." *Id.* "[T]he 'unsmoothness' of the profile negatively affects the cost function, so that its dosimetric effect is incorporated in the optimization process." *Id.*

Smoothing refers to "remov[ing] random (high spatial frequency) fluctuations" in a beam profile while "preserving the essential features of the profile (peaks, valleys, and gradients) that produce the optimum dose distribution." Ex. 1003, 2.

2. Claims 1, 4, 13, and 14

As noted above, Petitioner asserts that Spirou (Ex. 1003) renders claims 1, 4, 13, and 14 obvious. Pet. 16–36.

Claim 1 recites "evaluating a cost function for each of a set of a plurality of candidate intensity maps formed responsive to the prescription parameters." Petitioner reads the recited evaluation of the cost function on Spirou's "dose-volume-based quadratic objective function" used to sum target doses and organ doses within the iterative optimization process of Method B, Equation 2, as reproduced above. *See* Pet. 18–19 (citing Ex. 1003, 2); *supra* Section III.D.1. Petitioner reads the "candidate intensity maps" onto Spirou's "representations of dose distributions" being evaluated at each iteration, with those representations "correspond[ing] to the collection of d_i summed over all targets and organs." *See id.* at 19.

Petitioner explains "the 'dose-volume based quadratic objective function' of Spirou Method B incorporates the . . . two prescription parameters [d_p and d_c] to evaluate how closely the dose distribution at each iteration of the optimization algorithm matches the prescribed dose for the target." *Id.* (citing Ex. 1002 ¶ 83).

Claim 1 also recites the following:

> to provide control of a tradeoff between treatment plan delivery efficiency and dosimetric fitness within an optimizer to optimize a radiation treatment plan within a continuum between substantially optimal dosimetric fitness and enhanced delivery efficiency at an expense of dosimetric fitness, the cost function including a dosimetric cost term representing dosimetric cost and related to dosimetric fitness of the respective candidate intensity map and a delivery cost term representing delivery cost and related to delivery time to deliver radiation according to a beam arrangement represented by the respective candidate intensity map.

Petitioner points to Spirou's Equation (3), annotating it as follows (Pet. 21):

$$F_{\text{obj}} = \boxed{\sum_{i \in \text{targets}} w_i (d_i - d_p)^2 + \sum_{i \in \text{organs}} w_i \zeta_i (d_i - d_c)^2} \\ \boxed{+ \sum_{j \in \text{beams}} w_j (x_j' - x_j)^2,} \qquad (3)$$

Petitioner reads the recited "dosimetric cost term representing dosimetric cost and related to dosimetric fitness of the respective candidate intensity map" onto the summations within the first box above in Equation (3) that specify the squared differences (multiplied by weight w_i) between the dose of the ith point d_i and a) the prescription dose d_p for the targets and b) the constraint dose d_c for the critical organs. *See* Pet. 20–21. Petitioner contends "[t]he term [in the first box] thus evaluates how well the dose distribution generated at each iteration matches the desired dose distribution, d_p." *Id.*

Petitioner reads "a delivery cost term representing delivery cost and related to delivery time to deliver radiation according to a beam arrangement represented by the respective candidate intensity map" onto the term in the second box in Equation (3) above that represents a summation over beams and operates to smooth beam intensities. *See* Pet. 20–22 (citing Ex. 1003, 2; Ex. 1002 ¶¶ 86–87). According to Petitioner, Spirou teaches that the smoothing function operates to decrease beam-on time and delivery cost, and increases delivery efficiency. *Id.* at 22–23.

To support its showing, Petitioner contends Spirou "explains that the smoothing term in Method B is '**related to delivery time to deliver radiation according to a beam arrangement represented by the respective candidate intensity map'**" as set forth in claim 1. Pet. 23. Petitioner supports this contention by quoting Spirou as follows:

> "The beam-on time required for generating an IM beam profile as well as the accuracy of generating it, when factors such as scatter and leaf edge effects are taken into account, depends upon the shape of the profile." . . . . "More highly modulated profiles, with sharp gradients in fluence, are more difficult to generate and usually require a longer beam-on time."

Id. (quoting Ex. 1003, 7; citing Ex. 1002 ¶ 89) (emphasis omitted).

Petitioner also contends "[t]he collection of beam profiles are 'represented by the respective intensity map,' i.e., the corresponding dose distribution at that iteration, because the dose distribution represents the dose collectively created by the combination of the corresponding beam profiles." Pet. 23–24.

Claim 1 also recites "the evaluation of the delivery cost term for each respective candidate intensity map having linear computational complexity with respect to the size of the respective candidate intensity map." Petitioner reiterates that "claimed 'intensity map' corresponds to the **representation of dose distribution** computed at each iteration." Pet. 27–28. Petitioner contends "[t]he 'size of the [] intensity map' corresponds to the number of beam elements *as summed over all beams*, because it is the total number of beam elements that would be required to create the desired dose distribution." *Id.* at 28 (citing Ex. 1003, 3) (emphasis added). Petitioner explains that Spirou's algorithm computes the summation $\sum_{j \in \text{beams}} w_j (x_j' - x_j))^2$ "for each individual beam element of the beam profile." *Id.* Accordingly, as the number of beam elements increases, the "computational complexity of the overall cost term . . . would increase in linear proportion." *Id.* (citing Ex. 1003 ¶ 99). Petitioner notes "Spirou . . . explicitly refers to this [summation over beams] term as a 'linear filter'." *Id.* (quoting Ex. 1003, 2).

Based on the claim construction we adopt above, and contrary to Petitioner's showing, an intensity map as set forth in claim 1 does not read on Spirou's "**representation of dose distribution.**" *See* Pet. 13. Rather, according to Petitioner's showing as discussed above, Spirou's "representation of dose distribution" corresponds to dose contributions from more than one beam at each iteration of Spirou's process instead of radiation from a single beam. *See supra* Section III.C (construing "intensity map" as "a representation of the variation across a defined area of radiation of a single beam."). Independent claim 13 also recites an "intensity map," and

Petitioner relies on the same material showing with respect to claim 13. *See* Pet. 30–31. Claims 4, 14, and 18 depend from claims 1 or 3.

Accordingly, we determine that Petitioner does not establish a reasonable likelihood of prevailing with respect to its obviousness challenges to claims 1, 4, 13, 14, and 18 based on the Spirou.

E. Obviousness—Claims 1, 3–5, 8–9, 13–16, and 18

1. Overview of Siebers

Siebers "propose[s] a simple method to incorporate beam delivery constraints into the IMRT optimization process." Ex, 1006, 2. Figure 2, as annotated by Petitioner, portrays the optimization process:

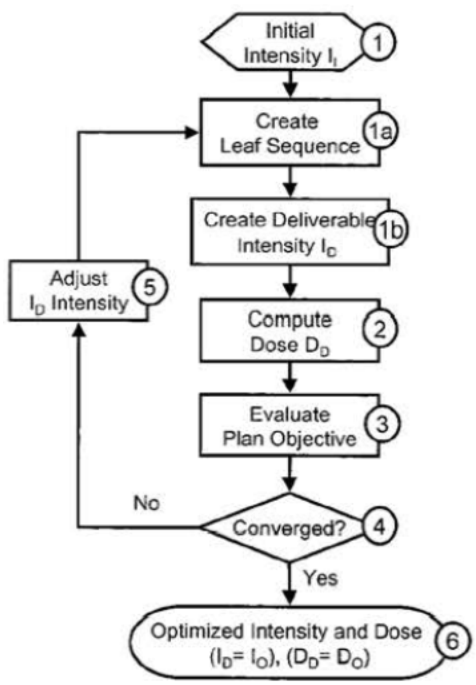

Figure 2 represents a "[f]low diagram for the deliverable-based optimization method" of Siebers. *Id.* 2. "Intensities are converted to MLC leaf sequences and deliverable intensities inside of the iterative IMRT optimization loop. The same leaf sequencer is used as in traditional optimization." *Id.*

Siebers states "because the leaf sequencer smoothes the beam intensity distributions, the deliverable-based optimization method results in more efficient beam delivery requiring fewer monitor units." *Id.* at 7.

Siebers also states "[t]he reduction in MUs is apparently due to the intensity filtering and smoothing present in the leaf sequencing algorithm that is repeatedly applied during deliverable-based optimization." *Id.* at 6.

2. Overview of Langer

Langer discloses minimizing segments and/or monitor units by employing intensity map rules in order to impose restrictions on leaf movement. *See* Ex. 1004, 1–5. Langer's method potentially "minimize[s] a weighted combination of the numbers of monitor units and segments, or minimize the number of segments for different settings of the allowed number of monitor units." *See id.* at 8.

3. Claims 1, 3–5, 8–9, 13–16, 18, and 19

Petitioner contends that the combined teachings of Siebers, Langer, and Spirou render obvious claims 1, 3–5, 8–9, 13–16, 18, and 19. Pet. 36–65. Petitioner does not specify how it reads the claimed "intensity map" recited in each of these claims. *See id.* at 36–65. Even if Petitioner relies upon Spirou to teach the claimed "intensity map" by implication or otherwise, Petitioner does not show sufficiently that the challenged claims would have been obvious for the reasons discussed above.

Accordingly, Petitioner does not establish a reasonable likelihood of prevailing in showing that the teachings of Siebers, Langer, and Spirou render obvious claims 1, 3–5, 8–9, 13–16, 18, and 19. Pet. 36–65.

IV. CONCLUSION

For the reasons discussed above, we determine that Petitioner failed to demonstrate a reasonable likelihood of prevailing in establishing the unpatentability of the challenged claims of the ’175 patent.

V. ORDER

In consideration of the foregoing, we hereby *deny* the Petition.

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