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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PASCAL DESAUTE, IRÈNE DORION, and NICOLAS DUMAY

Appeal 2019-001184
Application 14/362,687
Technology Center 2800

Before LINDA M. GAUDETTE, N. WHITNEY WILSON, and CHRISTOPHER C. KENNEDY, *Administrative Patent Judges.*

GAUDETTE, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

The Appellant[2] appeals under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1–10.[3]

We REVERSE.

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[1] This Decision includes citations to the following documents: amended Specification filed February 27, 2017 ("Spec."); Final Office Action dated November 16, 2017 ("Final"); Appeal Brief filed June 5, 2018 ("Appeal Br."); and Examiner's Answer dated September 20, 2018 ("Ans.").

[2] We use the word "Appellant" to refer to the "Applicant" as defined in 37 C.F.R. § 1.42(a). The Appellant, also identified as the real party in interest, is Smiths Heimann SAS. *See* Appeal Br. 3.

[3] We have jurisdiction under 35 U.S.C. § 6(b).

CLAIMED SUBJECT MATTER

The claims are directed to equipment and a method for the radiography of a load. Title of the Invention. The equipment and method may be used, for example, in airports to inspect passengers' luggage or to monitor the content of containers or truck trailers. *Id.* at 1:20–22. Figure 1, reproduced below, illustrates the inventive radiography equipment. *Id.* at 6:2.

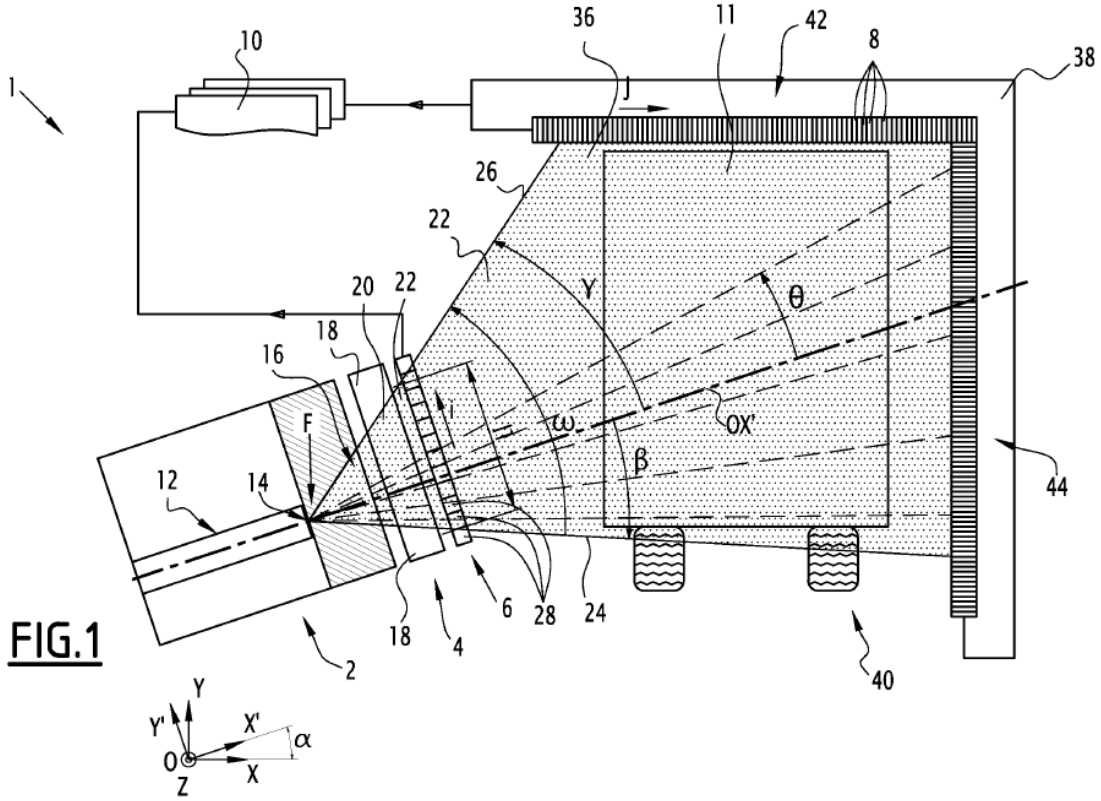

FIG.1

Figure 1, above, illustrates a side and sectional view of radiography equipment 1. Spec. 5:21–22. Radiography equipment 1, designed for the radiography of load 11, includes x-ray source 2, collimator 4, reference block 6, receiving sensors 8, and control and signal processing device 10. *Id.* at 6:5–6. X-ray source 2 comprises a device for producing and accelerating electron beam 12, and target 14 for the electron beam so as to generate

divergent x-ray pulse 16 from focal point F. *Id.* at 6:8–10. Collimator 4 generates incident x-ray beam 22 that irradiates entire load 11. *Id.* at 6:34–35, 7:10–11. Reference block 6, comprising a plurality of intermediate x-ray sensors 28, is inserted between collimator 4 and load 11 so as to be passed through by at least part of incident beam 22. *Id.* at 7:12–13, 18. Each intermediate sensor 28 is capable of being irradiated by an individual angular sector of incident beam 22 and of creating a reference signal that is representative of the intensity of incident beam 22 in the individual angular sector in question. *Id.* at 8:20–22. Each receiving sensor 8 is capable of receiving an individual angular sector of beam 22 after it has successively passed through reference block 6 followed by intermediate space 36, optionally occupied by load 11. *Id.* at 9:18–20.

Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. Equipment for the radiography of a load, the equipment and the load being designed to move relative to one another during the detection, the radiography equipment comprising:
>
> a source for emitting pulses of divergent X-rays;
>
> a collimator for the source for delimiting an incident X-ray beam designed to irradiate a section of the load, the successive X-ray pulses being capable of irradiating successive sections of the load; and
>
> sensors for receiving X-rays situated in the extension of the incident beam to receive the X-rays after they have passed through the load and generate raw image signals designed to be converted into a radiographic image portion corresponding to said section;
>
> wherein it further includes a reference block including intermediate X-ray sensors which are to be located each, at least partially, in the incident beam, between the source and the load,

> the intermediate sensors being designed to be irradiated by at least two separate angular sectors of the incident beam and to provide independent reference signals corresponding to each angular sector to be used in the conversion of the raw image signals into a portion of the radiographic image.

Appeal Br. 15 (Claims Appendix).

REJECTION

Claims 1–10 are rejected under 35 U.S.C. § 102(b) as anticipated by Uyama (US 4,907,157, issued March 6, 1990). Final Act. 2.

APPLIED PRIOR ART

Uyama "relates to a tomographic apparatus suitable for nondestructively inspecting industrial manufactures or the materials thereof, and particularly to a CT apparatus provided with independent movable radiation generating/sensing systems." Uyama 1:8–12. Uyama Figure 1 is reproduced below.

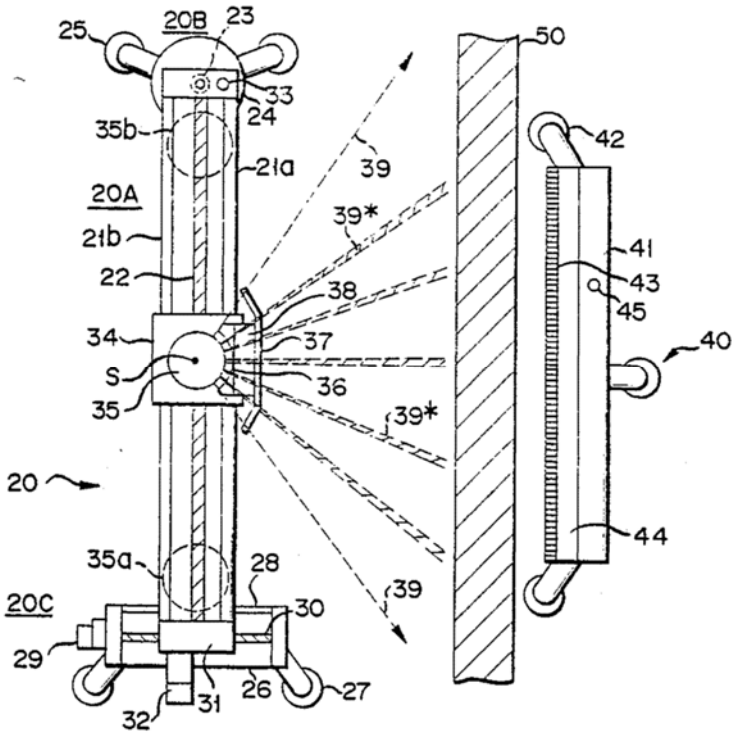

Figure 1, above, illustrates an upper-side view of the mechanical part of Uyama's tomographic apparatus. Uyama 3:40–41. Radiation generator system 20 faces radiation sensor system 40 and object 50 is located therebetween. *Id.* at 3:42–45. "[S]canner frame 34 is movably mounted on guide rails 21*a* and 21*b*[, and] . . . is provided with a radiation generator 35 which may be formed of an X-ray tube or the like." *Id.* at 4:16–19. "Radiation controller 53 governs the operation of radiation generator 35 so that generator 35 provides the X-ray radiations continuously or intermittently." *Id.* at 5:4–6. Collimator plate 37 is positioned in front of radiation generator 35's radiating outlet, and reference detector 36, which measures radiation intensity, is positioned therebetween. *Id.* at 4:23–25. "When plural pencil beams 39* are utilized to obtain a CT image of object 50, driver 38 lifts collimator plate 37 up so that plate 37 is inserted in the radiation path of fan beams 39 generated from radiation generator 35." *Id.* at 4:28–32. "When the fan beam radiation is used for the inspection, driver 38 lowers collimator plate 37 so that plate 37 is removed from the radiation path." *Id.* at 4:32–34. "Radiation sensor 43 is formed of a plurality of sensor elements, each of which electrically converts the intensity of sensed radiation into radiation absorption data." *Id.* at 4:41–44.

OPINION

The Appellant argues that the Examiner reversibly erred in finding that Uyama discloses a reference block including intermediate X-ray sensors that are located in the incident X-ray beam, as required by each of independent claims 1 and 8. *See* Appeal Br. 10–12. The Appellant acknowledges that in column 4, lines 23–25, Uyama discloses that "the reference block is located in front of the source," but contends that Uyama

"does not disclose intermediate X-ray sensors which are to be located each, at least partially, in the incident beam[, because] '[i]n front' does not imply that the sensors are in the incident beam." Appeal Br. 11. The Appellant argues that, contary to the Examiner's contention, Uyama suggests that "reference block 36 is located close to the beam, but beside and not in the path of the incident beam." *Id.* at 12 (arguing that Uyama's description in column 8, lines 65–68, of a sensor element whose location is closest to the beam path "would not make sense if the reference block was located at least partially in the beam").

The Examiner contends that the Appellant's argument is not persuasive because it is not commensurate in scope with the claim language. Ans. 2–3. The Examiner asserts that the language of claims 1 and 8 "suggests that the X-ray beam from the source creates a beam that is incident *on the collimator*, which delimits the beam incident on the collimator from the source, and wherein the collimator then passes the delimited beam on to the load." *Id.* The Examiner argues that Uyama's reference sensors 36 are in the path of "the 'incident beam' *to the collimator*." *Id.* at 3 (emphasis added).

The respective positions of the Appellant and the Examiner raise an issue as to the scope and meaning of the claim term "incident X-ray beam" (claims 1, 8). Specifically, the Examiner contends that the broadest reasonable interpretation of the term "incident X-ray beam," as used in claims 1 and 8, encompasses a beam exiting the source and incident on the collimator. The Appellant contends that the term "incident X-ray beam" should be interpreted as the beam created by the collimator and incident on the load.

Claim 8 recites "a) emitting a pulse of divergent X-rays from a source, . . . b) from the X-ray pulse, *forming an incident X-ray beam using a collimator*," and "a step d) in which a measurement is done of the X-ray doses received by at least two intermediate sensors of a reference block situated in the incident beam so as to be passed through by at least two separate angular sectors of the incident beam delimited in step b)." Appeal Br. 16–17 (Claims Appendix). It is clear from the phrase "forming an incident X-ray beam *using a collimator*" (claim 8 (emphasis added)) that the reference block must be situated in the path of a beam *created by the collimator*. Therefore, we agree with the Appellant that the broadest reasonable interpretation of the term "incident X-ray beam," as used in claim 8, is the beam created by the collimator and incident on the load.

Claim 1 recites "a collimator for the source [of divergent X-rays] for delimiting an incident X-ray beam designed to irradiate a section of the load" and "a reference block including intermediate X-ray sensors which are to be located each, at least partially, in the incident beam between the source and the load, the intermediate sensors being designed to be irradiated by at least two separate angular sectors of the incident beam." *See* claim 1 *supra* pp. 3–4. We determine the meaning of "incident X-ray beam," as used in claim 1,—e.g., "an incident X-ray beam designed to irradiate a section of the load"—is not clear from the claim language itself. Therefore, we turn to the written description to ascertain the broadest reasonable interpretation.

> With reference to Figure 1, the Specification discloses that
>
> collimator 4 extends at the output of the x-ray source 2 substantially in direction OY'. It includes a wall 18 substantially opaque to X-rays delimiting a slot 20 oriented in plane XOY in direction OY'. Thus, *the collimator 4 is capable of generating*

> *an incident x-ray beam 22* essentially comprised in plane XOY, which is a median plane for the incident beam.

Spec. 6:32–35 (emphasis added). In discussing the Figure 2 embodiment, the Specification refers to "the opening angle ω of the *beam 22 created by the collimator*." *Id.* at 7:35 (emphasis added). In describing an implementation of the inventive equipment and method, the Specification discloses that "*collimator 4 forms an incident beam 22* that irradiates successive sections of the load 11 carried by the vehicle 40." *Id.* at 10:32–33 (emphasis added). "Upon each x-ray pulse 16, an *incident beam 22* with angular expanse ω *is created at the output of the collimator 4* at the slot 20." *Id.* at 11:1–2 (emphasis added).

We determine from the above-quoted language in the written description, as well as the entire Specification disclosure which contains no description of the incident beam as the beam emanating from the source, that one of ordinary skill in the art at the time of the invention would have understood that the recitation of an "incident X-ray beam" in claim 1 refers to the beam created by the collimator that is incident on the load.

The Examiner has not identified a teaching in Uyama of a reference block located at least partially in the beam created by the collimator as required by independent claims 1 and 8. *But see* Uyama 4:23–25 (describing reference detector 36 as positioned between collimator plate 37 and radiation generator 35). Therefore, we do not sustain the rejection of claims 1–10 under 35 U.S.C. § 102(b).

CONCLUSION

Claims Rejected	35 U.S.C. §	Reference/Basis	Affirmed	Reversed
1–10	102(b)	Uyama		1–10

REVERSED