UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/427,018	03/22/2012	James Mark Long	2012P04699US	7153

28524 7590 02/14/2018

SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
3501 Quadrangle Blvd Ste 230
Orlando, FL 32817

EXAMINER
IGYARTO, CAROLYN

ART UNIT	PAPER NUMBER
2884	

NOTIFICATION DATE	DELIVERY MODE
02/14/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdadmin.us@siemens.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JAMES MARK LONG

Appeal 2017-002521
Application 13/427,018
Technology Center 2800

Before CATHERINE Q. TIMM, CHRISTOPHER C. KENNEDY, and JANE E. INGLESE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

---

[1] In explaining our Decision, we cite to the Specification dated March 22, 2012 (Spec.), the Final Office Action dated June 22, 2015 (Final), the After-Final Amendment dated August 24, 2015 (After-Final Amdt.), the Advisory Action dated September 11, 2015 (Advisory Act.), the claims appendix within the Response to Notification of Non-Compliant Appeal Brief dated April 15, 2016 (Claims Appendix), the Appeal Brief dated January 4, 2016 (Appeal Br.), the Examiner's Answer dated October 3, 2016 (Ans.), and the Reply Brief dated December 5, 2016 (Reply Br.).

STATEMENT OF CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to reject claims 3, 4, 6–9, 20–22, 24, and 25.[3] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

The claims on appeal are directed to a nuclear medical imaging system (*see, e.g.*, Claims Appendix, claim 3), a method of encoding scintillation events detected by a radiation detector (*see, e.g.*, Claims Appendix, claim 20), and a non-transitory computer readable storage medium (*see, e.g.*, Claims Appendix, claim 25).

The Examiner maintains the following rejections (Ans. 2):

A. The rejection of claims 3, 4, and 6–9 under 35 U.S.C. §112 ¶ 2 as indefinite;

---

[2] Appellant identifies the real party in interest as Siemens Medical Solutions USA, Inc. Appeal Br. 1.

[3] Claim 26 is pending, but its status is unclear. During prosecution, claim 26 was variously treated as either withdrawn from consideration as being directed to a non-elected invention, as subject to a rejection on the merits for lack of written descriptive support along with claim 25, or as no longer subject to a rejection for lack of written description based on persuasive arguments overcoming the rejection (*see, e.g.*, Final, office action summary ¶¶ 5, 7 and detailed action 3, 5; Advisory Act. ¶¶ 5, 15). In the Answer, the Examiner repeats the rejection of claim 25 under 35 U.S.C. § 112 ¶ 1 without listing claim 26 as rejected (Ans. 2), but then reproduces the rejection including claim 26 (Ans. 5). Appellant lists claim 26 as withdrawn from further consideration subject to restriction. Appeal Br. 2. A petition requesting reconsideration of the restriction requirement was denied. Decision on Petition dated November 24, 2015. Thus, we treat the claim as withdrawn.

B. The rejection of claims 3, 4, 6–8, 20, 21, and 24 under 35 U.S.C. § 103(a) as obvious over Cho[4] in view of Daghighian;[5]

C. The rejection of claims 3, 9, 20, 22, and 24 under 35 U.S.C. § 103(a) as obvious over Rousso[6] in view of Daghighian;

D. The rejection of claim 25 under 35 U.S.C. § 112 ¶ 1 as lacking written descriptive support;

E. The rejection of claim 25 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Rousso.

OPINION

A. The rejection of claims 3, 4, and 6–9 under 35 U.S.C. §112 ¶ 2 as indefinite

The Examiner maintains the rejection of claims 3, 4, and 6–9 as indefinite under 35 U.S.C. § 112 ¶ 2. Ans. 2.

In the Final Office Action, the Examiner states that "[t]he claims are replete with errors" and provides examples of language in claim 3 the Examiner determined to be unclear, inexact, or verbose. Final 6.

In response to the Examiner's rejection, Appellant amended claim 3 to remove the specifically exemplified issues of indefiniteness raised by the Examiner. After-Final Amdt. 2. The amendment was entered. Advisory Act. ¶ 7. In the Advisory Action, the Examiner states that "[t]he amendment has corrected the examples of issues regarding 35 USC 112, second

---

[4] Cho et al., US 4,980,552, issued Dec. 25, 1990.
[5] Daghighian, US 7,750,311 B2, issued July 6, 2010.
[6] Rousso et al., US 2009/0152471 A1, published June 18, 2009.

paragraph." Advisory Act. continuation of ¶ 5. However, in the Answer, the Examiner maintains the rejection. Ans. 2. According to the Examiner, although the After-Final Amendment corrected some of the indefiniteness issues, the claims remain replete with errors and Appellant was advised to carefully revise the claims to correct the numerous errors, not merely the examples provided. Ans. 4.

The Examiner must provide notice of the grounds of rejection stating the reasons for the rejection together with information as may be useful to the applicant in judging the propriety of continuing prosecution of the application. 35 U.S.C. § 132 (2010). Because the Examiner has not specifically pointed out what language in the claims remains indefinite and what the Examiner determines is indefinite is not readily apparent on the face of the claims, we conclude that Appellant was not given adequate notice of the rejection. Thus, we do not sustain the rejection as to claims 3, 4, and 6–9.[7]

B. The rejection of claims 3, 4, 6–8, 20, 21, and 24 under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian

The Examiner rejects claims 3, 4, 6–8, 20, 21, and 24 under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian. We discuss claims 3 and 20 separately. No other claims are argued separately by Appellant. Appeal Br. 6–8.

Claim 3

Claim 3, with emphasis on the limitation at issue, reads as follows:

---

[7] We note claim 6 depends from claim 1, a canceled claim, and, thus, is improperly dependent under 35 U.S.C. § 112 ¶ 4.

> 3. A nuclear medical imaging system, comprising:
>
> a plurality of *stationary detector units* configured to encircle a patient to be imaged, said plurality of stationary detector units being responsive to radiation photons emitted by a radiopharmaceutically doped organ tissue mass of the patient to output a signal indicative of a radiation photon event[];
>
> a plurality of angular orientation-sensing accelerometers each mounted on a respective stationary detector unit, each of said plurality of angular orientation-sensing accelerometers being configured to provide an angular position of the respective detector unit on which it is mounted, wherein a radiation photon event signal outputted by a stationary detector unit is tagged with a respective angular position provided by a respective angular orientation-sensing accelerometer; and
>
> an image processor configured to receive radiation photon event signals tagged with angular position information and to use said tagged signals to reconstruct an image of the doped organ tissue mass.

Claims Appendix (emphasis added).

Claim 3 requires "a plurality of stationary detector units." Claims Appendix. The issue with regard to claim 3 is: Has Appellant identified a reversible error in the Examiner's finding that Cho describes a nuclear medical imaging system including detector units that are stationary?

Appellant has identified such an error.

The Examiner acknowledges that Cho teaches rotating the detectors. Final 8. As shown by arrow 300 in Cho's Figure 3, Cho's ring array of detectors (DET 1-23) rotate around a central image volume 302. Cho col. 9, ll. 8–11. This rotation is either continuous or incremental. Cho col. 9, ll. 46–50.

It is the Examiner's position that claim 3 does not require the detector units to be prevented from ever rotating or moving and Cho's detectors can be stationary. Ans. 4. In essence, the Examiner determines that Cho's incrementally moved detectors are stationary detectors within the meaning of claim 3.

Appellant contends the Examiner has misconstrued the claimed subject matter: Stationary detectors, as that phrase is used in the claims, does not encompass incrementally moved detectors, but is limited to immobile detectors not intended to move. Appeal Br. 6–7. Appellant cites portions of the Specification supporting Appellant's interpretation of the claim language. *Id.*, citing Spec. ¶¶ 4–6.

The portions of the Specification cited by Appellant distinguish detectors that remain stationary from those that rotate intermittently. Spec. ¶¶ 4–6. The Specification uses the terms "immobile," "stationary and not intended to move," "remain stationary," "immobile/stationary," and "stationary" to mean the same thing, i.e., structures that do not rotate, but remain immobile. Spec. ¶¶ 3–6, 34. Thus, as used in the Specification, "stationary detector units" means detector units that have no apparatus associated with them that serves to move any of the detector units intentionally.

This interpretation is further supported by the purpose of the accelerometers described in the Specification. The accelerometers determine the angular orientation and location of the detectors when the entire scanner is moved to another location, e.g., such as when moving the entire scanner to another room or building, or when individual detectors are replaced. Spec. ¶ 6. This use is different from using accelerometers to

determine the angular orientation and location of the detectors as they rotate around a patient during the scan. The difference in use is further evidence that stationary detectors are different structurally from incrementally rotating detectors. Stationary detector units have no parts that allow the detector units to move intentionally.

Appellant has identified a reversible error in the Examiner's rejection of claim 3. We do not sustain the rejection of claim 3, or the rejection of claims 4 and 6–8, that depend from claim 3, under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian.

Claim 20

Claim 20 is directed a method and does not require stationary detector units. Claim 20 reads:

> 20. A method of encoding scintillation events detected by a radiation detector, comprising:
>
> providing an angular orientation value from an angular orientation sensing accelerometer associated with said radiation detector;
>
> associating said angular orientation value with information concerning a detected scintillation event from said radiation detector; and
>
> transmitting said associated information to a processor configured to reconstruct a radiation image from said associated information.

Claims Appendix.

Appellant contends "none of the prior art references relied on in the rejection discloses tagging location information from the angular orientation sensing accelerometers to radiation or scintillation event information and sending it to the imaging system for image reconstruction" and

"[c]onsequently, no modification of Cho with Daghighian could result in the subject matter of claim 20." Appeal Br. 8.

Claim 20 recites "associating said angular orientation value with information concerning a detected scintillation event" and "transmitting said associated information to a processor."

The "associating" is described in the Specification as tagging:

> Position information (i.e., at least "X-axis" and "Y-axis" data (and optionally "Z-axis" data (e.g., Z-axis data can be used when the accelerometers 208 are mounted on the detectors 204 to provide the location of a ring))) is compared with data stored in memory (e.g., a look-up table). By comparing the acquired position information with the data stored in memory the angle of inclination of the DEA units 202 are determined. Thus, by measuring the angle of inclination of the DEA unit 202, the location of the DEA unit 202 can be determined, and *that location information can be tagged to each event detected by the detector unit*, for which the information concerning the detector unit is sent to the imaging system processing computer (not illustrated).

Spec. ¶ 35 (emphasis added). Claim 20 requires tagging or associating a location value (angular orientation value) with information concerning a detected scintillation event.

The Examiner finds that Cho teaches the required associating of the angular orientation value with information concerning a detected scintillation event. Final 11; Ans. 5, citing Cho claim 30.

Cho's claim 30 seeks to exclude others from making and using a method with steps including acquiring coincidence position emission data (emission data is information concerning a detected scintillation event) at each of plural rotational positions of the ring array (angular orientation values) and rebinning the data at each of the positions into sets of

substantially equally spaced substantially parallel rays of PET projection image data. Cho describes this rebinning as involving the use of pre-assigned lookup tables. Cho col. 12, ll. 16–18. As shown in Figures 15A and 15B, gantry positions are associated with emission data from specific detectors. Although Cho does not disclose using an accelerometer as the angular orientation sensor, the Examiner relies on Daghighian to support the finding of a reason to use an accelerometer in Cho's apparatus and Appellant does not dispute this finding.

Appellant does not address the Examiner's specific findings and, thus, has not identified a reversible error in the Examiner's rejection of claim 20. Appellant does not separately argue the rejection of claims 21 and 24. We sustain the rejection of claims 20, 21, and 24 under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian.

C. The rejection of claims 3, 9, 20, 22, and 24 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian

The Examiner rejects claims 3, 9, 20, 22, and 24 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian. We discuss claims 3 and 20 separately. No other claims are argued separately by Appellant.

Claim 3

The issue is analogous to that of the rejection of claim 3 over Cho in view of Daghighian: Has Appellant identified a reversible error in the Examiner's finding that Rousso describes a nuclear medical imaging system including detector units that are stationary?

Appellant has identified such an error and, again, the error is in the Examiner's interpretation of "a plurality of *stationary* detector units" as

recited in claim 3. Claim 3 (emphasis added). As we determined above, the Specification uses the terms "immobile," "stationary and not intended to move," "remain stationary," "immobile/stationary," and "stationary" to mean the same thing, i.e., structures that remain immobile during use and are not intended to be moved. Spec. ¶¶ 3–6, 34. The stationary detector units do not move at any time during the use of the machine; the purpose of the angular orientation-sensing motion providers is not to sense orientation during movement, but only to provide orientation information when the entirety of the machine is relocated, for instance, to another room, or a detector unit is replaced, for instance, when one becomes defective. The detector units remain stationary, immobile, and not intended to move.

Rousso, as correctly found by the Examiner, teaches a stationary dynamic SPECT camera that contains detector units. Rousso ¶¶ 189–208. But even though the camera is described as stationary, the detecting units 12 are moved by assembly motion provider 40 prior to the acquisition of radioactive-emission data. Rousso ¶¶ 196–200. The Examiner has not established that Rousso's detector units 12 lack structures that allow the units to be moved intentionally. Thus, the Examiner has not established that Rousso's detector units 12 are "stationary detector units" within the meaning of that phrase as it is used by Appellant in claim 3.

We do not sustain the rejection of claims 3 and 9 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian.

Claim 20

Again, claim 20 does not require stationary detector units. Appellant argues that "none of the prior art references relied on in the rejection discloses tagging location information from the angular orientation sensing

accelerometers to radiation or scintillation event information and sending it to the imaging system for image reconstruction," and "[c]onsequently, no modification of Rousso with Daghighian could result in the subject matter of claim 20." Appeal Br. 9–10. But Appellant does not address the specific findings of the Examiner pointing to Rousso's disclosure in paragraphs 21–24 as teaching associating angular orientation values and transmitting them, or the Examiner's findings and conclusion with regard to the obviousness of using an accelerator in Rousso's method to provide the angular orientation values. Appellant has not identified a reversible error in the Examiner's rejection of claim 20.

We sustain the rejection of claims 20, 22, and 24 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian.

D. The rejection of claim 25 under 35 U.S.C. § 112 ¶ 1 as lacking written descriptive support

The Examiner rejects claim 25 under 35 U.S.C. § 112 ¶ 1 as lacking written descriptive support.

Claim 25 is directed to a software program stored on a storage medium. The instructions of the program cause a computer processor to perform actions. Specifically, the instructions cause the processor to receive information signals from the detectors and reconstruct an image using the signals. According to claim 25, each of the plurality of information signals includes (1) a detected scintillation event from a detector and (2) an angular orientation value from the accelerometer associated with that detector. Claim 25 reads:

> 25. A non-transitory computer readable storage medium having stored thereon computer executable instructions that when executed cause at least one processor to:
>
> receive a plurality of information signals from a radiation detector unit, each of said plurality of information signals including a detected scintillation event from a radiation detector of said radiation detector unit and an angular orientation value from an angular orientation sensing accelerometer associated with said radiation detector; and
>
> reconstruct a radiation image using said plurality of information signals.

Claim Appendix.

The Examiner finds that the written description provides support for compiling detected events from detector units 12 along with associated detector orientations, but there is no original support for each of said plurality of information *signals* received from a *single* radiation detector unit including *both* a detected scintillation event from a radiation detector of said radiation detector unit and an angular orientation value from an angular orientation sensing accelerometer associated with the particular detector. Ans. 3. In other words, there is no support for the data to be received together in each *signal*. *Id.*

Appellant identifies program memory 506 as the non-transitory computer readable storage medium of claim 25. Appeal Br. 4. According to Appellant, the program on memory 506 includes instructions that cause the receiving of the recited plurality of information signals described in paragraphs 24–26 of the Specification. Appeal Br. 4–5.

Specification paragraphs 24 and 25 describe the structure of a PET detector system 10 with a ring of detector units 12 encircling a patient bed

14, the detector units 12 each including a direct-encoding, DC accelerometer 18 (DEA). Spec. ¶¶ 24–25.

Specification paragraphs 25 and 26 further disclose how each detector unit 12 is tagged with its orientation around the circle. Spec. ¶¶ 25–26. For example, the top detector unit (defined as the 0 detector in Fig. 1) has a detector orientation of 180° (facing straight down). Thus, any detected event that occurs at the topmost detector unit 0 is tagged with an orientation of 180°. This tagging associates *detector units* with their orientation. This portion of the Specification does not describe any *signal* or the informational contents of any signal.

Paragraph 26 further describes a pairing of event and orientation information, but it does not state that the paired information is in a *single signal*. According to this paragraph, the detected events from all detector units 12 can be compiled along with the associated detector orientations, and by pairing essentially simultaneous events that have associated orientations that are 180° apart from each other, one can generate lines of responses that are used to generate an image. Spec. ¶ 26, as informed by Spec. ¶¶ 2, 9, 38.

Moreover, the written description describes the program memory 506, which Appellant identifies as the non-transitory computer readable medium recited in claim 25, not as receiving combined orientation/detecting signals, but as simply determining location/orientation information. Spec. ¶ 55. According to paragraph 55, software routine 506 is stored in memory 504. *Id.* The general-purpose computer 500 housing a processor 510 and memory 504 is suitable for performing the method 400 of Figure 4. *Id.* The method of Figure 4 is a method of determining the location of DEA units 202 by receiving position information from accelerometers, comparing the position

information to predefined location parameters stored in memory, and using the comparison to determine the location of the DEA units. There is no specific disclosure of a processor receiving a plurality of information signals, each of which contain a detected scintillation event as well as an angular orientation value. There is only a disclosure of receiving angular orientation values.

Appellant has not identified a reversible error in the Examiner's finding that claim 25 lacks written descriptive support. We sustain the rejection of claim 25 under 35 U.S.C. § 112 ¶ 1.

E. The rejection of claim 25 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Rousso

The Examiner rejects claim 25 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Rousso. Final 15–16. According to the Examiner, Rousso teaches or suggests instructions that cause the processor to receive a plurality of information signals each including a detected scintillation event and an angular orientation value as required by claim 25. *Id.*, citing Rousso ¶¶ 99, 202.

Although Rousso teaches using position sensors to determine the angular orientation of each detecting unit 12, Rousso ¶ 99, the Examiner has not established that Rousso teaches or suggests that the information signals include a detected scintillation event as well as an angular orientation value. Neither paragraph cited by the Examiner describes such a combining of information in a signal. Accordingly, we do not sustain the Examiner's rejection of claim 25 as anticipated by or obvious over Rousso.

CONCLUSION

We do not sustain the rejection of claims 3, 4, and 6–9 under 35 U.S.C. § 112 ¶ 2 as indefinite.

We do not sustain the rejection of claims 3, 4, and 6–8 under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian.

We sustain the rejection of claims 20, 21, and 24 under 35 U.S.C. § 103(a) as obvious over Cho in view of Daghighian

We do not sustain the rejection of claims 3 and 9 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian.

We sustain the rejection of claims 20, 22, and 24 under 35 U.S.C. § 103(a) as obvious over Rousso in view of Daghighian.

We sustain the rejection of claim 25 under 35 U.S.C. § 112 ¶ 1 as lacking written descriptive support.

We do not sustain the rejection of claim 25 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Rousso.

DECISION

The Examiner's decision is affirmed-in-part.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED-IN-PART