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.
11/226,877	09/14/2005	Konstantinos Spartiotis	3523-1005	6015

466 7590 03/12/2013
YOUNG & THOMPSON
209 Madison Street
Suite 500
Alexandria, VA 22314

EXAMINER
LEE, SHUN K

ART UNIT	PAPER NUMBER
2884	

NOTIFICATION DATE	DELIVERY MODE
03/12/2013	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):

DocketingDept@young-thompson.com
yandtpair@firsttofile.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KONSTANTINOS SPARTIOTIS and
TUOMAS PANTSAR

Appeal 2010-010755
Application 11/226,877
Technology Center 2800

Before JOSEPH L. DIXON, ST. JOHN COURTENAY III, and
CARLA M. KRIVAK, *Administrative Patent Judges*.

DIXON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-30, 33-40, and 42-44. Claims 31, 32 and 41 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

INVENTION

Appellants' claimed invention is generally related to the field of semiconductor imaging systems for imaging x-ray and gamma ray radiant energy. More specifically, the invention is directed to a high frame rate, high energy charge-integrating imaging devices utilizing Cd-Te or Cd-Zn-Te based detector substrates in combination with CMOS readout substrates. Additionally, the invention is directed to a process for calibrating such high energy radiation imaging systems. (Spec. 1).

Independent claims 1 and 21, reproduced below, are representative of the subject matter on appeal.

1. An x-ray imaging device (28), comprising:

a camera radiation detector substrate comprised of an array of pixels,

each pixel collecting electrical charges generated responsive to absorption of radiation energy,

the collected electrical charges defining an uncorrected image pixel value of the corresponding pixel;

an output for producing multiple different image frames (44), each frame comprising an array (45) of the uncorrected image pixel values from the detector substrate;

a correction part (20, 49, 22, 24) for individually applying an individualized, pixel-specific calibration correction

function to each of the uncorrected image pixel values of the output, including offset correction, for correcting the uncorrected image pixel values from each frame of the different image frames to provide a normalized image data to a display for presenting an x-ray image,

the calibration correction function being specific to each of the uncorrected image pixel values of the output of each frame; and

a processor (24) for calculating the individualized specific correction function for each of the uncorrected image pixel values of each frame, the specific calibration correction for each image pixel value (47) of said normalized image data being derived from a plurality of corrected individual single frame image pixel values (36) of said multiple different frames corrected by said specific correction functions.

21. An x-ray imaging device (28), comprising:

an output providing an array of pixels values for producing multiple different individual image frames (44),

each said pixel value generated responsive to absorption of impinging high energy x-ray gamma ray radiation and having a first bit depth,

each individual frame of said multiple individual frames comprising the array (45) of the pixel values with the first bit depth, and

a processor (24) for calculating final image pixel values (47) of a second bit depth from the pixel values of the first bit depth of the different individual frames,

wherein the second bit depth of the final image pixel values (47) is greater than the first bit depth of the pixel values from the individual frames to provide

relatively increased resolution of the image data for presenting an x-ray image from the x-ray imaging device.

REFERENCES

Gordon	US 4,135,247	Jan. 16, 1979
Conrads	US 6,246,746 B1	Jun. 12, 2001
Berliner	US 6,278,765 B1	Aug. 21, 2001
Endo	US Pat. App. No. 2003/0038242 A1	Feb. 27, 2003
Dagan	US Pat. App. No. 2004/0094720 A1	May 20, 2004
Rosner	US Pat. App. No. 2004/0101091 A1	May 27, 2004

REJECTIONS

Claims 33 and 34 stand rejected claim under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

Claims 1-14, 16-18, and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan and Gordon.

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan, Gordon, and Endo.

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan, Gordon, and Conrads.

Claims 21-30, 33, 34, and 36-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan and Berliner.

Claim 35 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan, Berliner, and Endo.

Claims 39 and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan, Berliner, and Conrads.

Claims 43 and 44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dagan, Gordon, and Rosner.

ANALYSIS

35 U.S.C. § 112, SECOND PARAGRAPH

The Examiner maintains that claims 33 and 34 are directly or indirectly dependent on a canceled base claim. Thus, we find one of skill in the art would be unable to determine the metes and bounds of the claims as the skilled artisan would not have been reasonably apprised of claim scope and would not be clear what other limitations might apply to the claims.

Therefore, the claim is incomplete and fails to particularly point out and distinctly claim the subject matter which Appellant regards as the invention (MPEP § 608.01(n)). (Ans. 3). Appellants do not address this ground of rejection in the Appeal Brief. (App. Br. 13-14). Therefore, we *pro forma* affirm the rejection.

"Any arguments or authorities not included in the brief or a reply brief filed pursuant to [37 C.F.R.] § 41.41 will be refused consideration by the Board, unless good cause is shown." 37 C.F.R. § 41.37(c)(1)(vii). Accordingly, our affirmance is based only on the arguments made in the briefs. Any arguments or authorities omitted therefrom are neither before us nor at issue but are considered waived. *Cf. In re Watts*, 354 F.3d 1362, 1367 (Fed. Cir. 2004) ("[I]t is important that the applicant challenging a decision not be permitted to raise arguments on appeal that were not presented to the Board.")

35 U.S.C. § 103(a)

Claim 1-20 and 42-44

With respect to claims 1-20 and 42-44, the Examiner applies various rejections based upon the combination of Dagan and Gordon and further in view of Endo, Conrads, or Rosner.

With respect to independent claim 1, which is illustrative for the above group, Appellants contend:

> What the prior art does not teach is the recited correction part i) individually applying an individualized, pixel-specific calibration correction function to each of the uncorrected image pixel values of the output, including offset correction, for correcting the uncorrected image pixel values from each frame of the different image frames to provide a normalized image data to a display for presenting an x-ray image, ii) the calibration correction function being specific to each of the uncorrected image pixel values of the output of each frame, and iii) the specific calibration correction for each image pixel value of said normalized image data being derived from a plurality of corrected individual single frame image pixel values of said multiple different frames corrected by said specific correction functions.

(App. Br. 15-16).

The Examiner's general proposition is that the Dagan reference expressly teaches that "other methods of calibration are also possible" and "one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified calibration method of Dagan *et al.* as any one of the known conventional calibration methods that would not require further description." (Ans. 23). The Examiner maintains that the Gordon reference teaches a method of calibration which should account for differences in sensitivity among individual detectors of a detector array.

(Ans. 23). The Examiner further relies upon the proposition that the known conventional calibration method of Gordon is a mere substitution of one element for another known element in the field and therefore the combination would yield predictable results. (*Id.*).

Appellants contend that:

> What Dagan discloses is a pre-operational calibration that is an average charge/photon for specific calibration geometry. In Dagan, this relationship is generated from a prior calibration based on a statistical analysis of charge/photon over an expected range of photon energies, which relationship is stored in a processor prior to beginning the capturing step, and relates the number of charges generated per incident photon and is typically a look-up table or a function.
>
> Dagan Figure 7A shows that in step 204, charge is collected on each pixel, in step 206 the charge is read out pixel-by-pixel, and in step 208 the number of photons is determined (pixel-by-pixel) presumably based on the charge/photon calibration. From this charge readout, Dagan develops a correction relationship that provides the same correction factor to each pixel, e.g., by look-up table. The calibration correction function is not specific to each uncorrected image pixel value. The look-up table/relationship is a generalized correction that is applied to each and every pixel. The same correction relationship (function) is applied to each pixel. In Dagan, there is no calibration function individualized and specific to each pixel.
>
> Thus, the Examiner's factual finding is incorrect in that Dagan does not disclose that "the calibration correction function being specific to each of the uncorrected image pixel values of the output of each frame".

(App. Br. 18-20). We agree with Appellants and note that paragraph [0108] of the Dagan reference states "the calibration is carried out prior to the application of the system. This calibration is effected in a manner very

similar to the statistical analysis discussed above which was based on Eq. 1. Other methods of calibration are also possible." From our review of the cited portions of the Dagan reference and the lengthy discussion and tables in the Examiner's Answer, we find that the Examiner's line of reasoning is based upon a flawed piecemeal analysis of the claim language.

As discussed above, the Dagan reference clearly states that the calibration is preformed prior to application of the system, but the language of independent claim 1 requires that the "calibration correction function being specific to each of the uncorrected image pixel values of the output of each frame" and "the specific calibration correction for each image pixel value (47) of said normalized image data being derived from a plurality of corrected individual single frame image pixel values (36) of said multiple different frames corrected by said specific correction functions." We find the teachings and suggestions of the Dagan reference do not support the Examiner's findings. Additionally, the Examiner's identification of the unspecified calibration method of the Dagan reference (Ans. 23) and reliance upon the calibration method of the Gordon reference does not remedy the above-noted deficiency.

Appellants further contend that "in both Dagan and Gordon the calibration functions are based on tests done prior to any processing. In both Dagan and Gordon the calibration functions are not derived from plural corrected individual single frame image pixel values of multiple different frames corrected by the specific correction functions." (App. Br. 23-24, emphasis omitted). We agree with Appellants that the Gordon reference discloses "[t]he offset correction data table and the calibration correction data table are determined by the tomographic system prior to performing a

tomographic scan of a body to be examined." (Col. 14, ll. 34-37). Again, the Examiner's reliance upon a calibration function determined prior to application of the system falls short of teaching and fairly suggesting the invention as recited in independent claim 1. Furthermore, while we agree with the Examiner's identification of the substitution as predictable, the relied upon combination falls short of teaching and fairly suggesting the invention as recited in independent claim 1. Therefore, we cannot sustain the rejection of independent claim 1 based upon the combination of the Dagan reference and the Gordon reference. Since each of the dependent claims 2-14, 16-18, and 42 contain the same limitations, we do not sustain the obviousness rejection thereof.

Since each of the dependent claims 15, 19, 20, 43, and 44 contain the same limitations as independent claim 1 and the Examiner has not identified how the additional prior art references (Endo, Conrads, Rosner) remedy the noted deficiency, we cannot sustain the obviousness rejections of claims 15, 19, 20, 43, and 44.

Claims 21-30 and 33-40

With respect to independent claim 21, Appellants argue the rejection of claims 21-30, 33, 34, and 36-38, as a single group. (App. Br. 36-41). We select independent claim 21 as the representative claim for the group and address Appellants' arguments thereto.

The Examiner relies upon the Dagan reference and the Berliner reference in the obviousness rejection. We note that independent claim 21 is of a different scope than independent claim 1. The Examiner further explains the teachings and suggestions of the Berliner reference regarding "bit depth." (Ans. 34-36). The Examiner explains that the processing in the

Berliner reference identifies greater bit depth than the initial pixel level/bit depth.

Appellants contend that there is a fundamental problem with the Examiner's rejection. (App. Br. 38). Appellants contend that the Berliner reference is very confusing and the Examiner has not carefully sorted out what is actually disclosed. (App. Br. 38). Appellants essentially repeat the Examiner's analysis and maintain that in the Berliner reference the final pixel value is the same bit depth as the initial pixel level. (App. Br. 39).

We disagree with Appellants' contention and find that the Examiner has provided an analysis to show that pixel depth is greater during the processing relative to the initial processing. While Appellants contend that the ultimate output pixel level is the same, Appellants' claimed invention does not specifically claim how the processing is done to distinguish the claimed invention. Nor does the language of independent claim 21 recite what the claimed "final image pixel values (47) of a second bit depth from the pixel values of the first bit depth of the different individual frames" must be. The mere label "final pixel values" does not have to be an output of the device and may be a final value of some portion of the data processing. Therefore, Appellants' argument does not show error in the Examiner's showing of obviousness of representative independent claim 21.

Additionally, Appellants have not identified any express definitions with which to distinguish the claimed invention. Appellants merely identify a general benefit discussed at page 8 of the Specification, but we find no such limitations recited in the device of independent claim 21 to distinguish the processor of the claim over the processor of the combination of the Dagan reference and the Berliner reference. Therefore, we sustain the

rejection of representative independent claim 21, and claims 22-30, 33, 34, and 36-38 grouped therewith.

With respect to the rejections of claims 35, 39, and, 40, Appellants rely on the arguments advanced with respect to independent claim 21. (App. Br. 40-41). Therefore, we group these claims as falling with representative claim 21.

CONCLUSION

The Examiner did not err in rejecting claims 33 and 34 under 35 U.S.C. § 112, second paragraph.

The Examiner erred in rejecting claims 1-20 and 42-44 under 35 U.S.C. § 103(a).

The Examiner did not err in rejecting claims 21-30 and 33-40 under 35 U.S.C. § 103(a).

DECISION

The Examiner's decision rejecting claims 33 and 34 under 35 U.S.C. § 112, second paragraph is affirmed. The Examiner's decision rejecting claims 1-20 and 42-44 under 35 U.S.C. § 103(a) is reversed. The Examiner's decision rejecting claims 21-30 and 33-40 under 35 U.S.C. § 103(a) is affirmed.

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)(iv).

AFFIRMED-IN-PART

Vsh