US008186880B1

(12) **United States Patent**
Arnold

(10) **Patent No.: US 8,186,880 B1**
(45) **Date of Patent: May 29, 2012**

(54) **EXTENDED AND FIXED INTABLE SIMULTANEOUSLY IMAGED CALIBRATION AND CORRECTION METHODS AND REFERENCES FOR 3-D IMAGING DEVICES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/626,610**

(22) Filed: **Nov. 25, 2009**

Related U.S. Application Data

(60) Provisional application No. 61/118,438, filed on Nov. 27, 2008.

(51) **Int. Cl.**
G01D 18/00 (2006.01)

(52) **U.S. Cl.** **378/207**; 378/18

(58) **Field of Classification Search** 378/18, 378/207

See application file for complete search history.

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(57) **ABSTRACT**

Calibration and reference samples with reduced cross-sectional areas encased within imaging tables or couch pads have low attenuation properties and provide patient comfort. The samples are stable and provide reproducible images without artifacts. The torso-length samples avoid positioning errors and misalignment. Sample density or mass calibration materials include calcium compounds representative of bone and calcifications, iodine compounds for contrast angiography, gadolinium compounds for MRI, and fat and tissue equivalent materials. Density corrections for variable patient scatter and imperfect image reconstructions improve quantitative measurement. Automated computer methods detect the samples and record readings on all images over the extent of the scans without operator interaction. Spatial references function as location references and enable spatial correction of device imperfections such as point spread function (PSF) or motion for improved images. Comparative analysis of backward and forward projections corrects images based on simultaneous imaging of the references of known properties.

15 Claims, 17 Drawing Sheets