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(54) **SYSTEM AND METHOD FOR CALIBRATION OF CT SCANNERS AND DISPLAY OF IMAGES IN DENSITY UNITS WITHOUT THE USE OF WATER PHANTOMS**

(76) Inventor: **Ben A. Arnold**, Columbia, KY (US)

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USPC **378/207**

(58) **Field of Classification Search**
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See application file for complete search history.

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Primary Examiner — Courtney Thomas
(74) *Attorney, Agent, or Firm* — Jerry Turner Sewell

(57) **ABSTRACT**

A system and method enable calibration of CT scanners without using water phantoms. Tissue densities are expressed in either the Hounsfield Scale units (HU) referenced back to water or the proposed Gram Scale units (GU) with voxel intensities expressed in true density units. The fully automatic software-only method requires no interactions with the images. Routine calibration of CT scanners with water phantoms can be eliminated. The method further provides accurate calibrations that are patient, scanner, and scan specific and are repeatable over long time durations. The calibrations are based on the uniquely defined intensity of voxels with equal contributions of two tissues types. This calibration point is immune to the many variables found in ROI histogram measurements of mean, mode, SD or other measures of voxel intensities. The disclosed CT scanner system provides consistent CT image voxel intensities of the various tissues across a great variety of patients.

29 Claims, 10 Drawing Sheets