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(54) **AUTOMATIC METHOD AND SYSTEM FOR MEASUREMENTS OF BONE DENSITY AND STRUCTURE OF THE HIP FROM 3-D X-RAY IMAGING DEVICES**

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G06K 9/00 (2006.01)

(52) **U.S. Cl.**
USPC **382/128**

(58) **Field of Classification Search**
None
See application file for complete search history.

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(57) **ABSTRACT**

A method uses a computer and software to measure bone density and structure of the proximal femur of the hip from a volumetric set of images containing pixels representing x-ray attenuation of the subject which are acquired with three-dimensional X-ray imaging devices. The method automatically locates anatomical markers of the hip without operator interaction, automatically positions regions of interest (ROIs) for measurement, automatically determines bone density measures of the ROIs, and automatically reports the results for individual subjects. Bone density measurements of ROIs include the integral bone of the total hip and neck as well as trabecular bone. The method automatically identifies a three-dimensional region-of-interest (ROI) volume which includes the hip, determines a three-dimensional coordinate system referenced to the anatomy of the subject, analyzes the ROI volume to identify voxels in the volume which satisfy defined criteria, and determines a measure of bone structure.

15 Claims, 17 Drawing Sheets

