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(54) Title: STATISTICAL TOMOGRAPHIC RECONSTRUCTION BASED ON MEASUREMENTS OF CHARGED PARTICLES

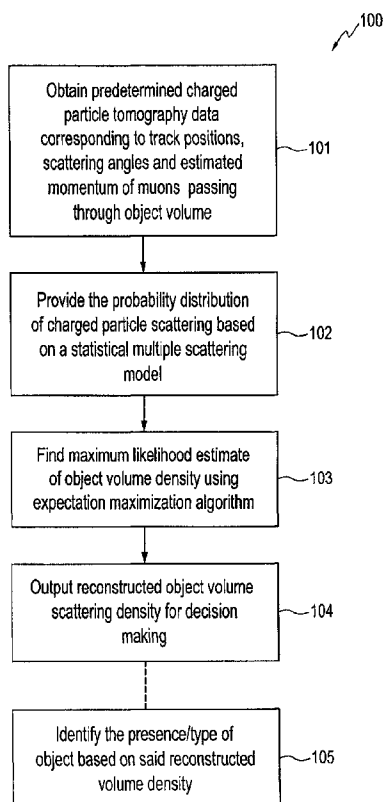


FIG. 15

(57) Abstract: Systems, apparatus, computer program products and methods for charged particle detection including statistical reconstruction of object volume scattering density profiles from charged particle tomographic data to determine the probability distribution of charged particle scattering using a statistical multiple scattering model and determine a substantially maximum likelihood estimate of object volume scattering density using expectation maximization (ML/EM) algorithm to reconstruct the object volume scattering density. The presence of and/or type of object occupying the volume of interest can be identified from the reconstructed volume scattering density profile. The charged particle tomographic data can be cosmic ray muon tomographic data from a muon tracker for scanning packages, containers, vehicles or cargo. Such a method can be implemented using a computer program which is executable on a computer.



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