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- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

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- (54) **Title:** METHOD AND APPARATUS FOR SEISMIC DATA INVERSION

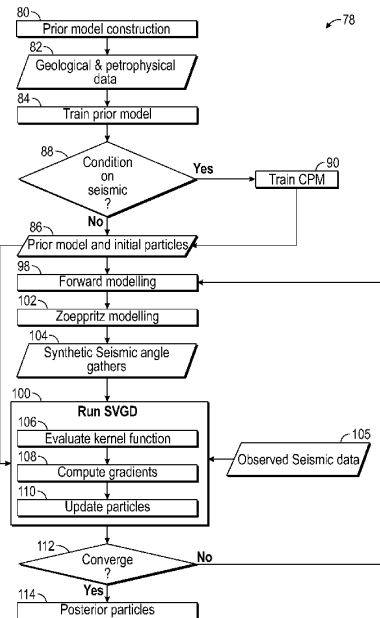


FIG. 5

(57) **Abstract:** Techniques to allow for increases in the accuracy of the determination of properties of a formation (e.g., a formation's fluid content, porosity, density, etc.) or seismic velocity, shear wave information, etc. The techniques include generating initial input data comprising based at least in part on initial seismic data, modeling the initial input data to generate synthetic seismic data based on different combinations of the initial input data, iteratively updating a value of each particle of a set of particles utilizing the synthetic seismic data to generate a final set of particles and outputting the final set of particles as a target distribution.

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