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(71) Applicant: LANDMARK GRAPHICS CORPORATION [US/US]; 2107 City West Boulevard, Building 2, Houston, Texas 77042 (US).

(72) Inventors: SMITH, Trace Boone; 111 Briaroak Court, Lafayette, Louisiana 70503 (US). RAMSAY, Travis St. George; 6122 Wickshire Drive, Rosenberg, Texas 77471 (US).

(74) Agents: RAJ, Vinu et al.; Haynes and Boone, LLP, 2323 Victory Avenue, Suite 700, Dallas, TX 75219 (US).

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(54) Title: PSEUDO PHASE PRODUCTION SIMULATION: A SIGNAL PROCESSING APPROACH TO ASSESS QUASI-MULTIPHASE FLOW PRODUCTION VIA SUCCESSIVE ANALOGOUS STEP-FUNCTION RELATIVE PERMEABILITY CONTROLLED MODELS IN RESERVOIR FLOW SIMULATION IN ORDER TO RANK MULTIPLE PETRO-PHYSICAL REALIZATIONS

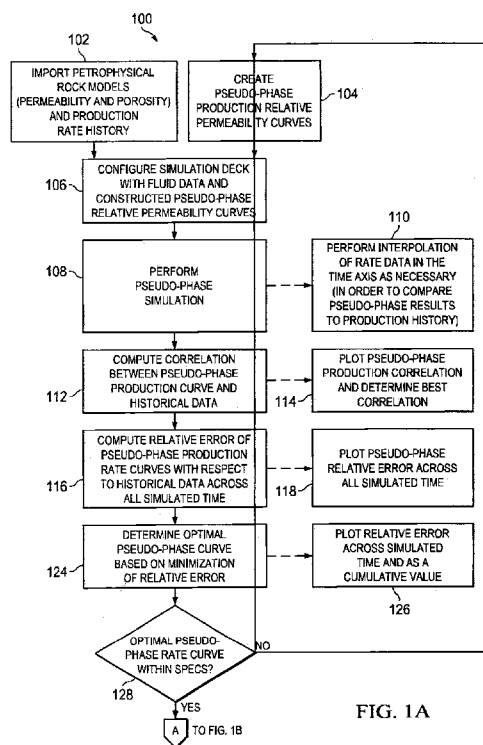


FIG. 1A

(57) Abstract: The disclosed embodiments include a method, apparatus, and computer program product for approximating multiphase flow reservoir production simulation for ranking multiple petro-physical realizations. One embodiment is a system that includes at least one processor and memory coupled to the at least one processor, the memory storing instructions that when executed by the at least one processor performs operations that includes generating a set of pseudo-phase production relative permeability curves; receiving production rate history data; receiving minimal simulation configuration parameters; performing flow simulation using the set of pseudo-phase production relative permeability curves for a set of petro-physical realizations; determining an optimal matching pseudo-phase production simulation result that best matches the production rate history data; and determining a ranking for the petro-physical realizations within the set of petro-physical realizations based on an area between a composite rate curve for a petro-physical realization and a historical rate curve.