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(71) Applicant: UNIVERSITY OF WYOMING [US/US];
1000 E. University Avenue, LARAMIE, Wyoming 82071 (US).

(72) Inventors: ALLOUSH, Rami; 1000 E. University Avenue, Laramie, Wyoming 82071 (US). PIRI, Mohammad; 1000 E. University Avenue, Laramie, Wyoming 82071 (US). W. LOWRY, Evan; 1000 E. University Avenue, Laramie, Wyoming 82071 (US).

(74) Agent: TUETING, Brooks D. et al.; Patterson & Sheridan, L.L.P., 24 Greenway Plaza, Suite 1600, Houston, Texas 77046 (US).

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(54) Title: AUTOMATED APPARATUS FOR CHARACTERIZATION OF FLUID-SOLID SYSTEMS

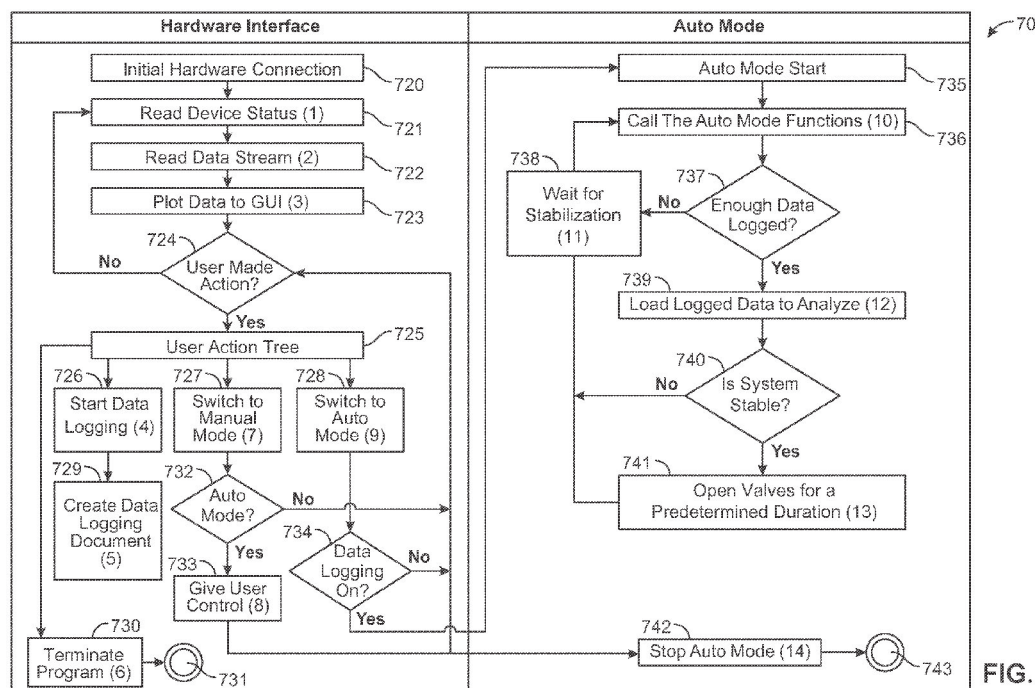


FIG. 7

(57) Abstract: Embodiments of the present disclosure generally relate to apparatus, systems, and methods for characterizing fluid-solid systems. In an embodiment, a method includes placing a porous rock sample in a core holder, contacting the porous rock sample with a fluid to create a fluid-solid system inside the core holder, automatically adjusting a temperature and/or pressure of the fluid-solid system to a preselected value via a processor and at least one automated valve, monitoring the fluid-solid system for equilibrium, recording a value for temperature, pressure, and/or mass of the fluid-solid system, performing an action based on the recorded data, and repeating the adjusting, monitoring, recording, and performing operations to produce a thermodynamic data characteristic of the fluid-solid system. In one example, the performing operation includes analyzing a pressure signal for stationarity by performing an Augmented Dickey-Fuller (ADF) test and/or a Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test.

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