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(71) Applicant *(for all designated States except US)*: **EXXONMOBIL UPSTREAM RESEARCH COMPANY** [US/US]; CORP-URC-SW-359, P.O. Box 2189, Houston, TX 77252-2189 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **JING, Charlie** [US/US]; 4227 Cedar Ridge Tr., Houston, TX 77059 (US). **CARAZZONE, Jim J.** [US/US]; 4153 Marquette, Houston, TX 77005 (US). **RUMPFHUBER, Eva-Maria** [AT/US]; 201 S. Heights Blvd. #1134, Houston, TX 77007 (US). **SALTZER, Rebecca L.** [US/US]; 5811 Charlotte St., Houston, TX 77005 (US). **DICKENS, Thomas, A.** [US/US]; 9239 Buffalo Speedway, Houston, TX 77025 (US). **MULLUR, Anoop, A.** [IN/US]; 3121 Buffalo Speedway #8312, Houston, TX 77098 (US).

(74) Agents: **PLUMMER, J. Paul** et al.; Exxonmobil Upstream Research Company, CORP-URC-SW-359, P.O. Box 2189, Houston, TX 77252-2189 (US).

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(54) Title: HYDROCARBON DETECTION WITH PASSIVE SEISMIC DATA

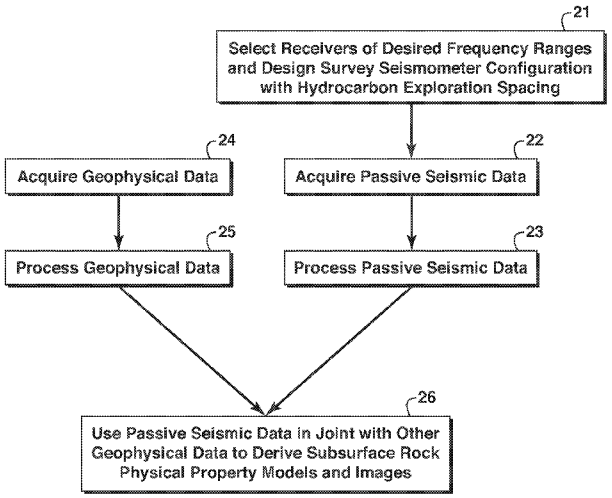


FIG. 2

(57) Abstract: Method for using seismic data from earthquakes to address the low frequency lacuna problem in traditional hydrocarbon exploration methods. Seismometers with frequency response down to about 1 Hz are placed over a target subsurface region in an array with spacing suitable for hydrocarbon exploration (21). Data are collected over a long (weeks or months) time period (22). Segments of the data (44) are identified with known events from earthquake catalogs (43). Those data segments are analyzed using techniques such as traveltime delay measurements (307) or receiver function calculations (46) and then are combined with one or more other types of geophysical data acquired from the target region, using joint inversion (308-310) in some embodiments of the method, to infer physical features of the subsurface indicative of hydrocarbon potential or lack thereof (26).

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