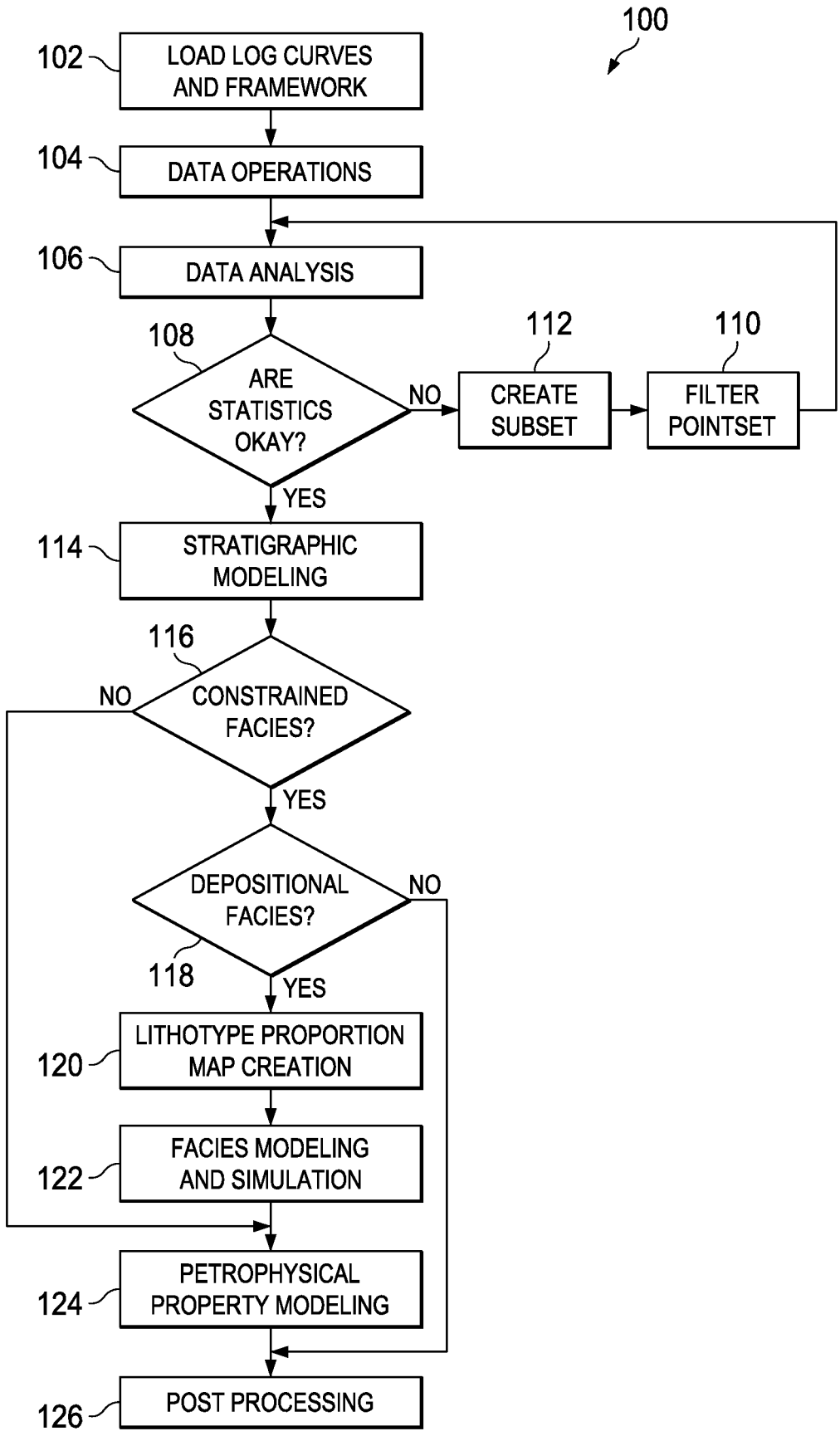

100
102
LOAD LOG CURVES AND FRAMEWORK
104
DATA OPERATIONS
106
DATA ANALYSIS
108
ARE STATISTICS OKAY?
NO
112
CREATE SUBSET
110
FILTER POINTSET
YES
114
STRATIGRAPHIC MODELING
116
CONSTRAINED FACIES?
NO
YES
DEPOSITIONAL FACIES?
NO
118
YES
120
LITHOTYPE PROPORTION MAP CREATION
122
FACIES MODELING AND SIMULATION
124
PETROPHYSICAL PROPERTY MODELING
126
POST PROCESSING

FIG. 1

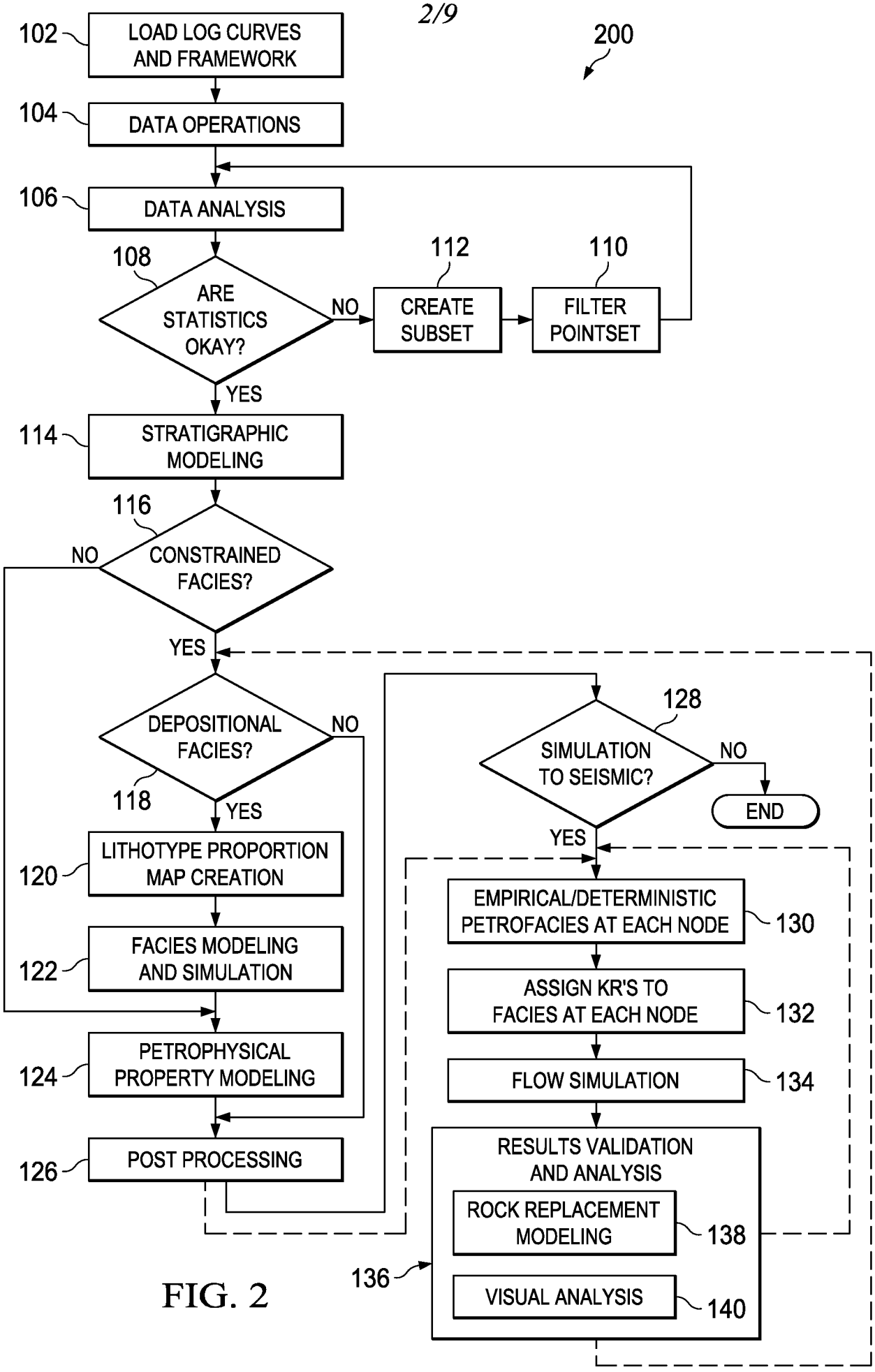

200
102
LOAD LOG CURVES AND FRAMEWORK
104
DATA OPERATIONS
106
DATA ANALYSIS
108
ARE STATISTICS OKAY?
NO
112
CREATE SUBSET
110
FILTER POINTSET
YES
114
STRATIGRAPHIC MODELING
116
CONSTRAINED FACIES?
NO
YES
DEPOSITIONAL FACIES?
NO
118
YES
120
LITHOTYPE PROPORTION MAP CREATION
122
FACIES MODELING AND SIMULATION
124
PETROPHYSICAL PROPERTY MODELING
126
POST PROCESSING
128
SIMULATION TO SEISMIC?
NO
END
YES
EMPIRICAL/DETERMINISTIC PETROFACIES AT EACH NODE
130
ASSIGN KR'S TO FACIES AT EACH NODE
132
FLOW SIMULATION
134
RESULTS VALIDATION AND ANALYSIS
ROCK REPLACEMENT MODELING
138
136
VISUAL ANALYSIS
140

FIG. 2

FIG. 3

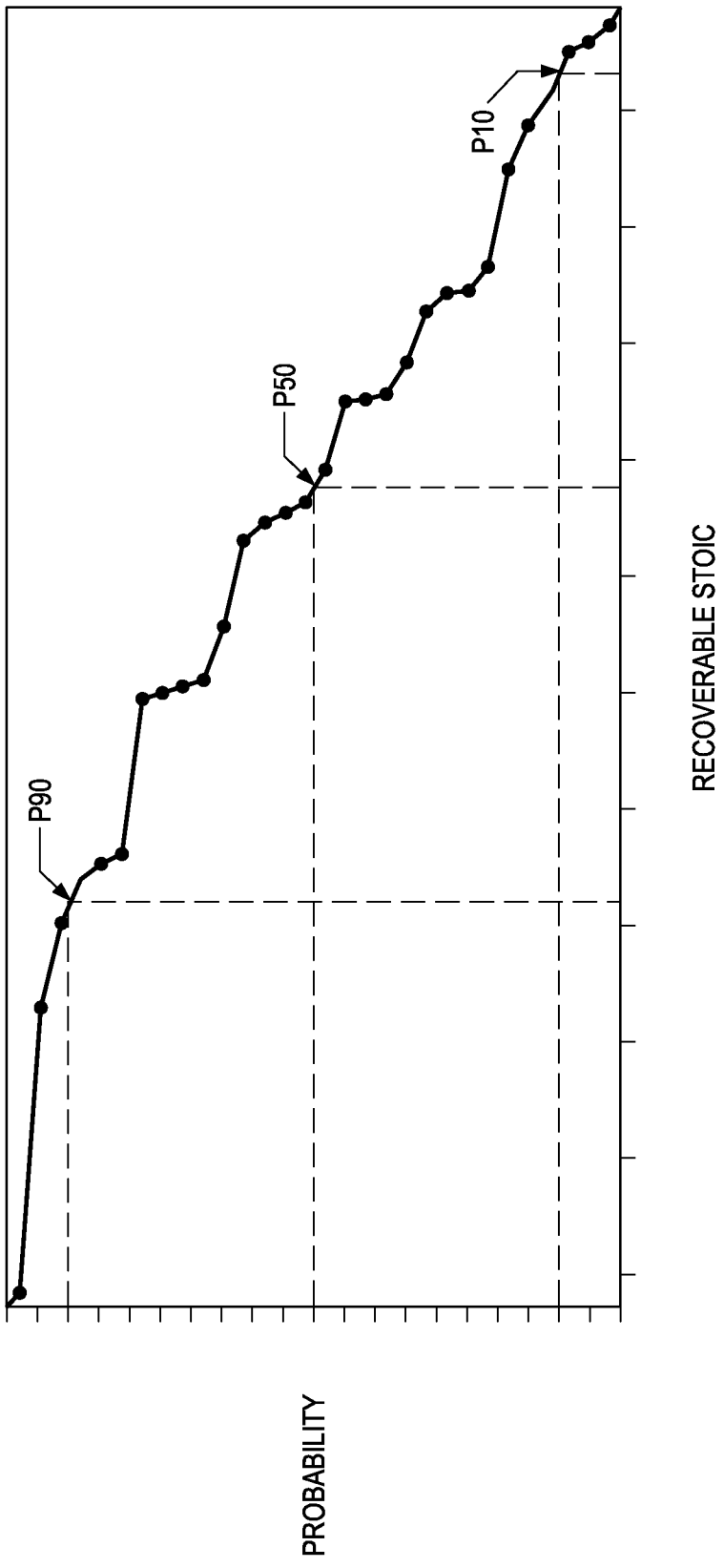
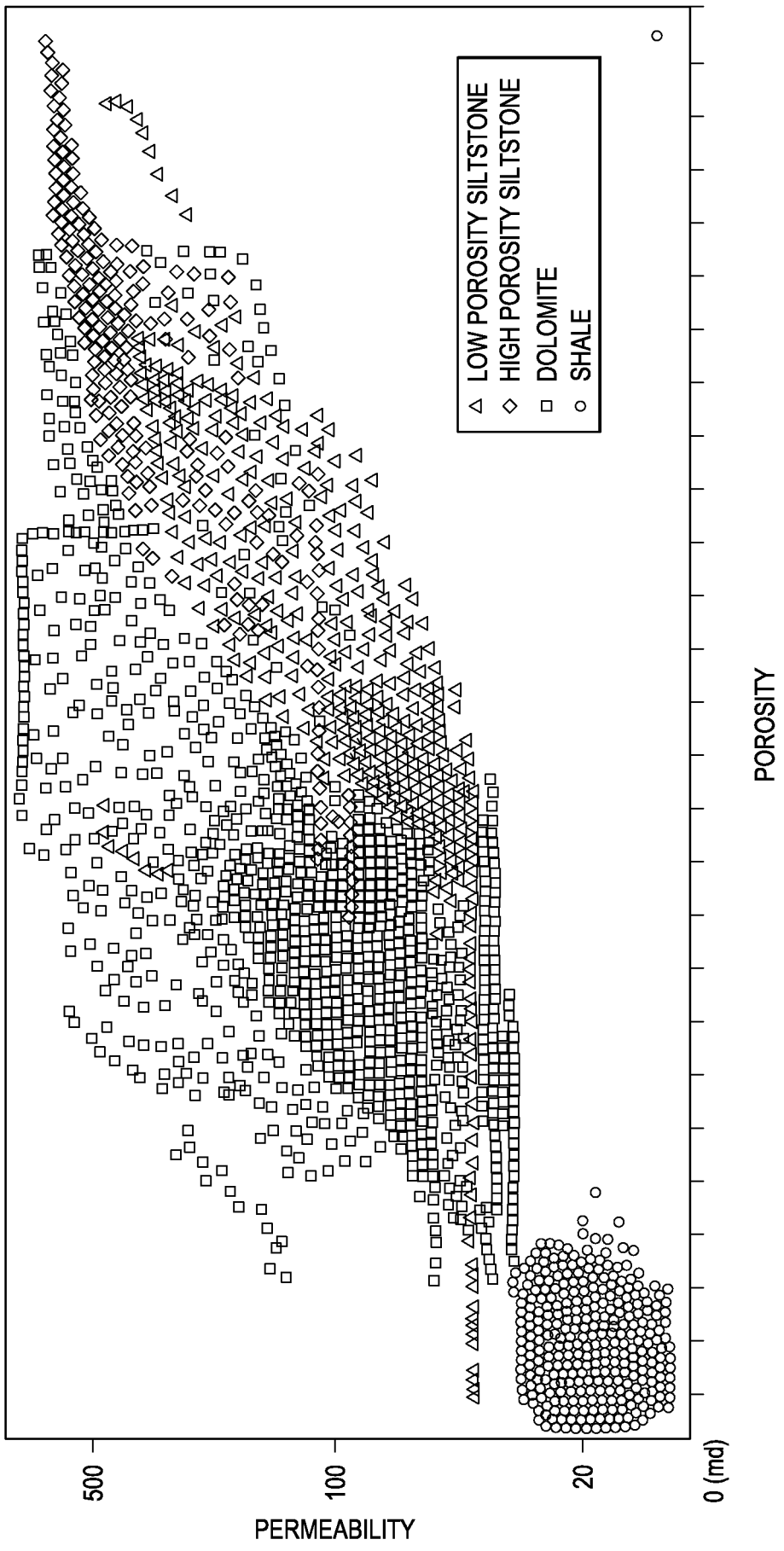


FIG. 4


LOW POROSITY SILTSTONE
HIGH POROSITY SILTSTONE
DOLOMITE
SHALE
500
100
20
0 (md)
PERMEABILITY
POROSITY

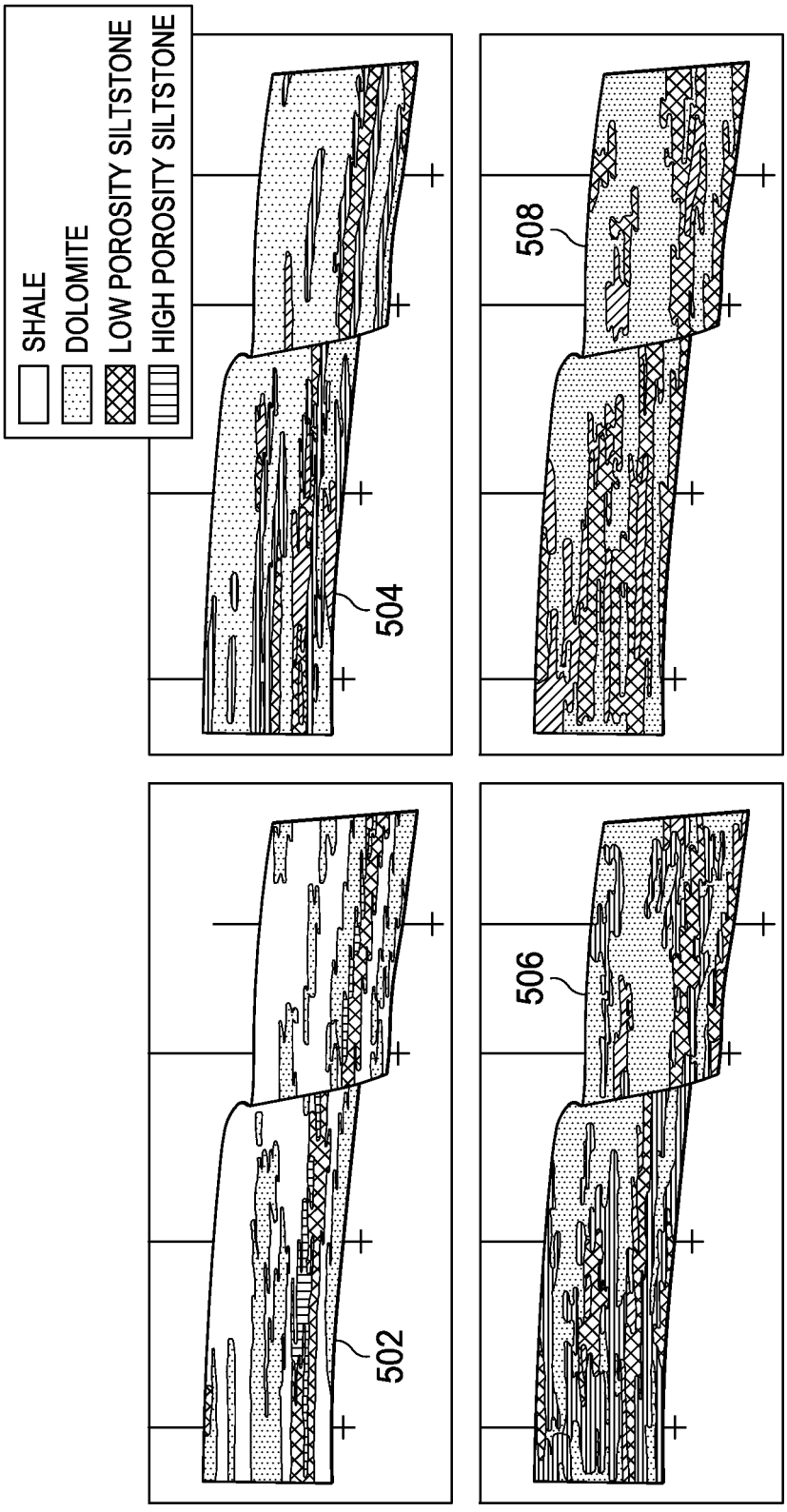
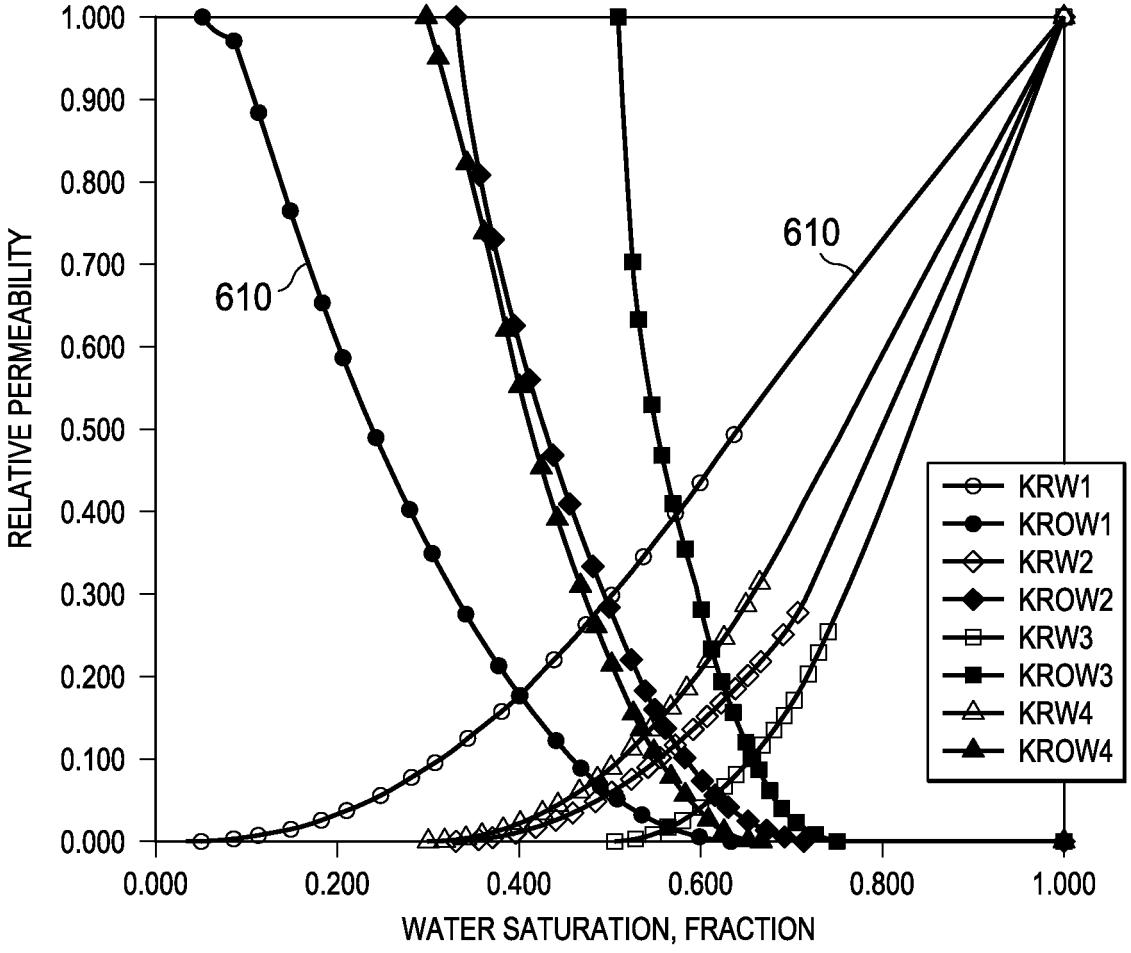

SHALE
DOLOMITE
LOW POROSITY SILTSTONE
HIGH POROSITY SILTSTONE
504
508
502
506

FIG. 5

FIG. 6


1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
RELATIVE PERMEABILITY
0.000
0.200
0.400
0.600
0.800
1.000
WATER SATURATION, FRACTION
610
610
KRW1
KROW1
KRW2
KROW2
KRW3
KROW3
KRW4
KROW4

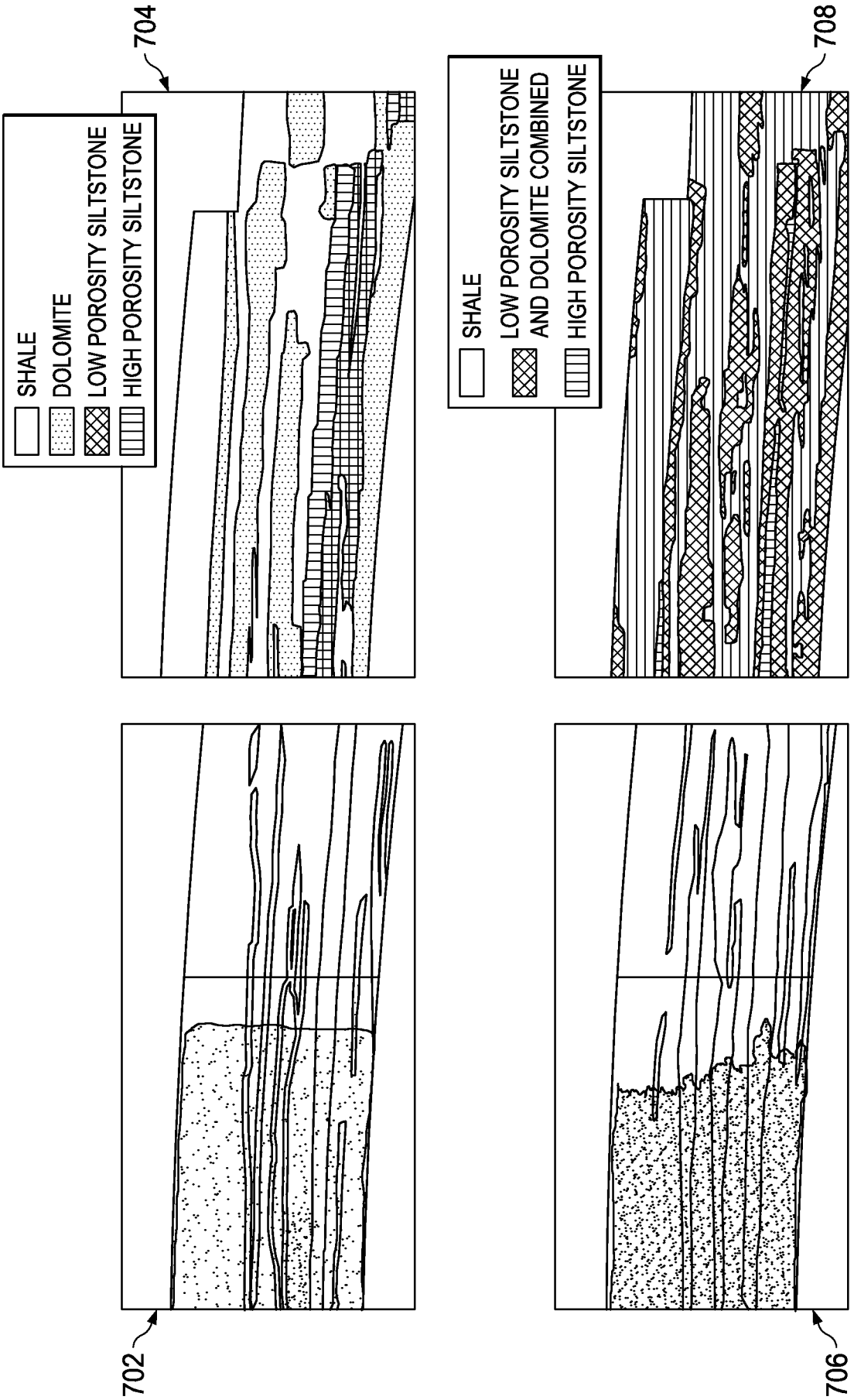

704
SHALE
DOLOMITE
LOW POROSITY SILTSTONE
HIGH POROSITY SILTSTONE
708
SHALE
LOW POROSITY SILTSTONE AND DOLOMITE COMBINED
HIGH POROSITY SILTSTONE
702
706

FIG. 7

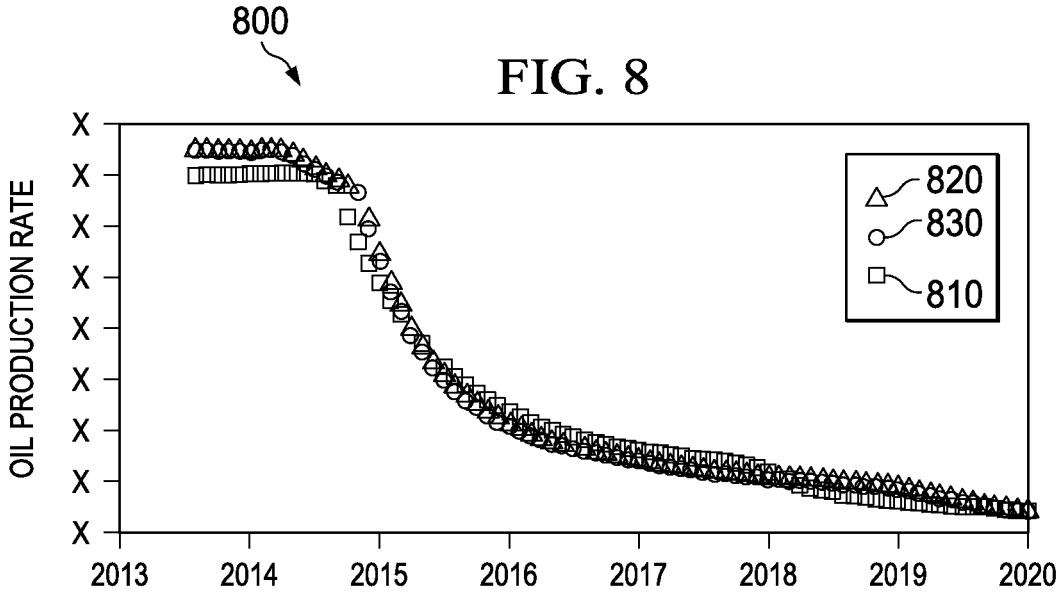

800
OIL PRODUCTION RATE
X
X
X
X
X
X
X
X
2013
2014
2015
2016
2017
2018
2019
2020
820
830
810

FIG. 8

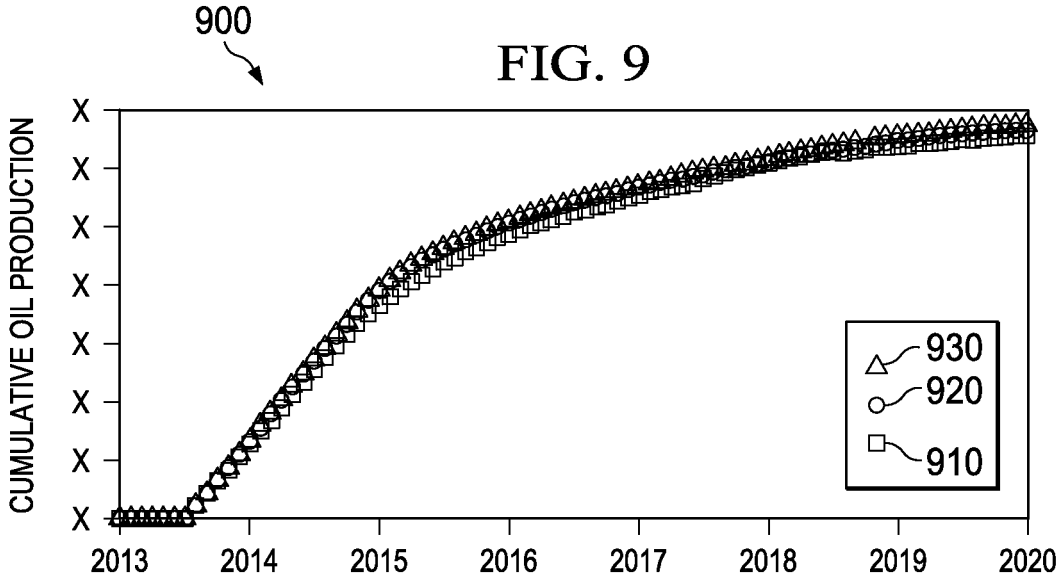

900
CUMULATIVE OIL PRODUCTION
X
X
X
X
X
X
X
X
2013
2014
2015
2016
2017
2018
2019
2020
930
920
910

FIG. 9

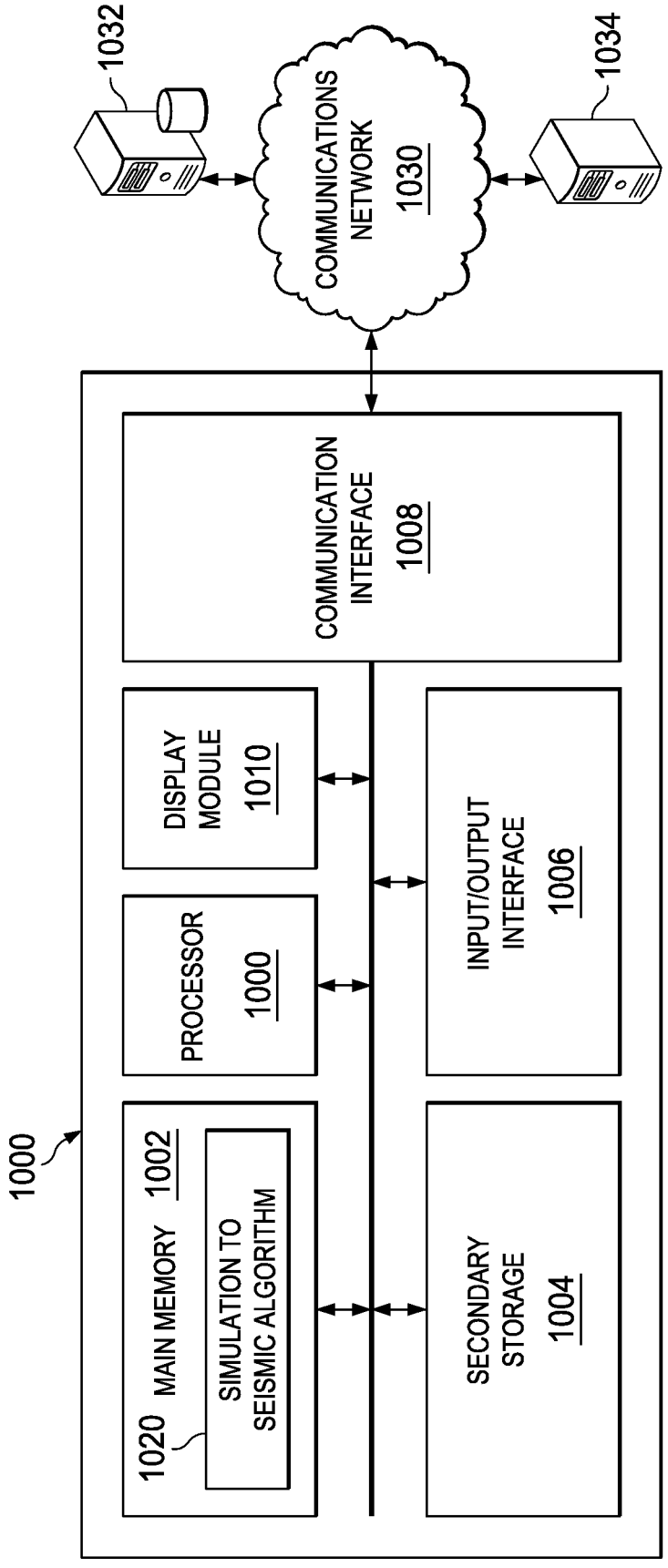

1032
1034
COMMUNICATIONS NETWORK 1030
COMMUNICATION INTERFACE 1008
DISPLAY MODULE 1010
PROCESSOR 1000
INPUT/OUTPUT INTERFACE 1006
1000
MAIN MEMORY 1002
SIMULATION TO SEISMIC ALGORITHM
1020
SECONDARY STORAGE 1004

FIG. 10