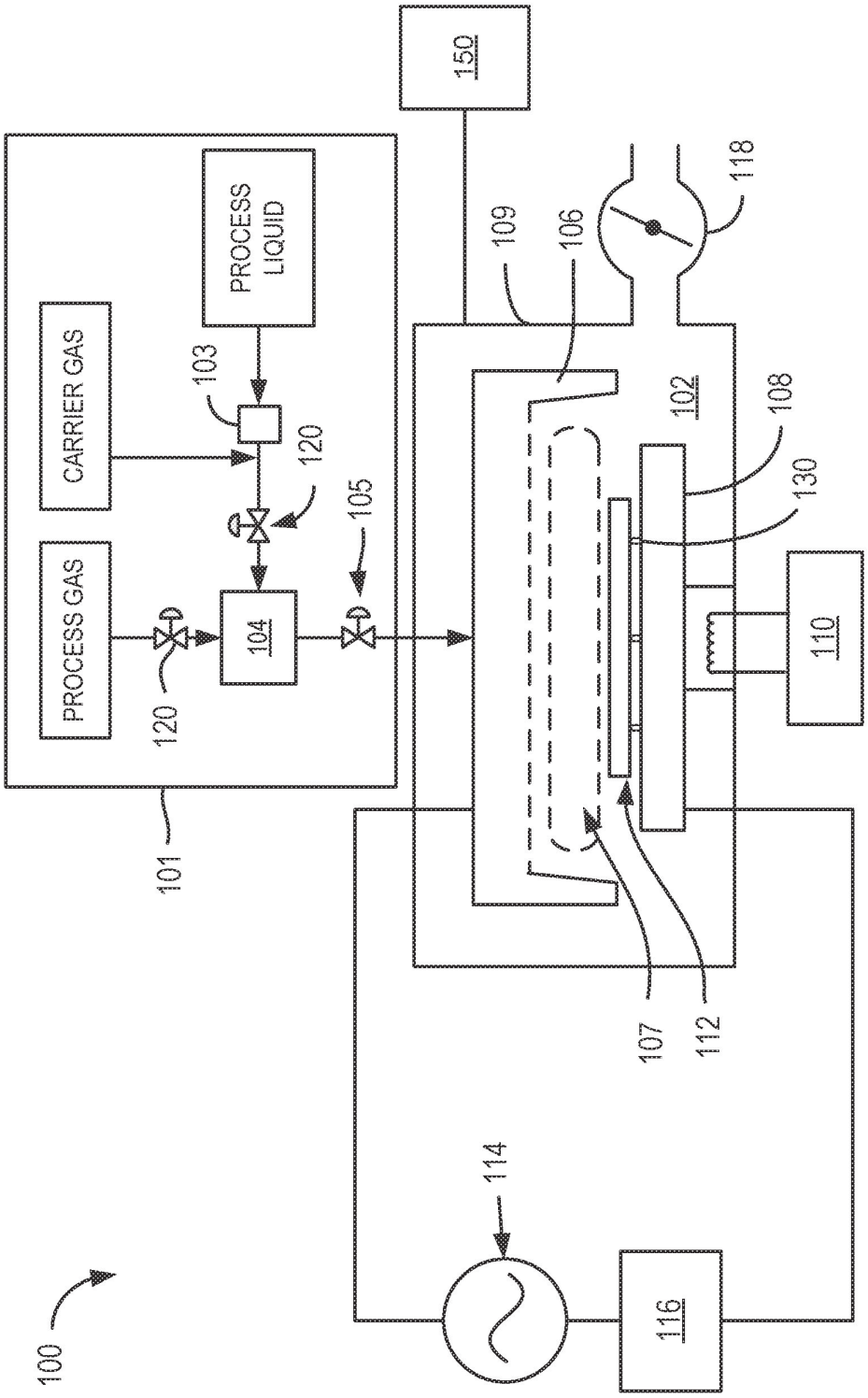
150
PROCESS LIQUID
CARRIER GAS
PROCESS GAS
103
120
105
104
120
101
109
106
118
102
108
130
110
107
112
114
116
100

FIG. 1

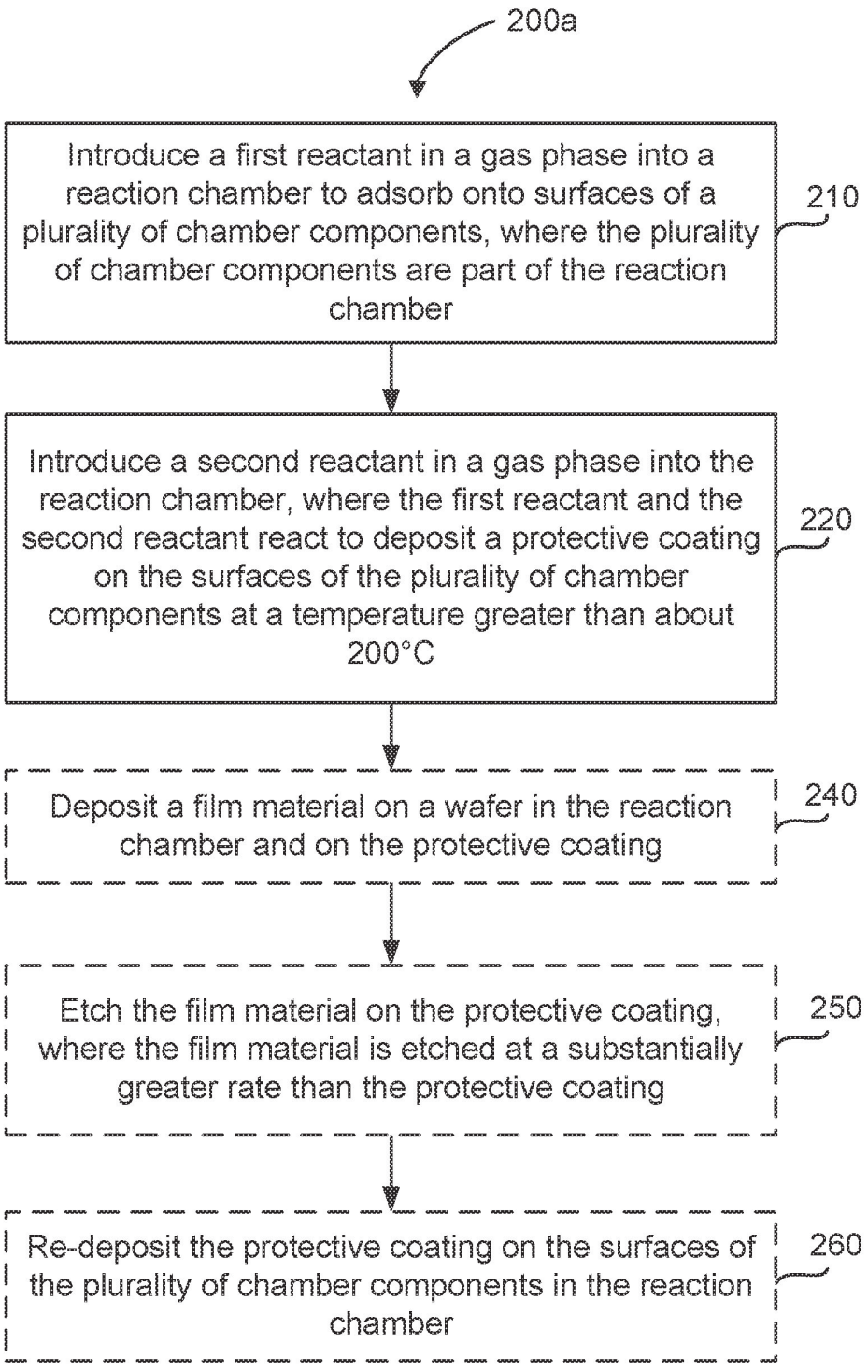
200a
Introduce a first reactant in a gas phase into a reaction chamber to adsorb onto surfaces of a plurality of chamber components, where the plurality of chamber components are part of the reaction chamber
210
Introduce a second reactant in a gas phase into the reaction chamber, where the first reactant and the second reactant react to deposit a protective coating on the surfaces of the plurality of chamber components at a temperature greater than about 200°C
220
Deposit a film material on a wafer in the reaction chamber and on the protective coating
240
Etch the film material on the protective coating, where the film material is etched at a substantially greater rate than the protective coating
250
Re-deposit the protective coating on the surfaces of the plurality of chamber components in the reaction chamber
260

FIG. 2A

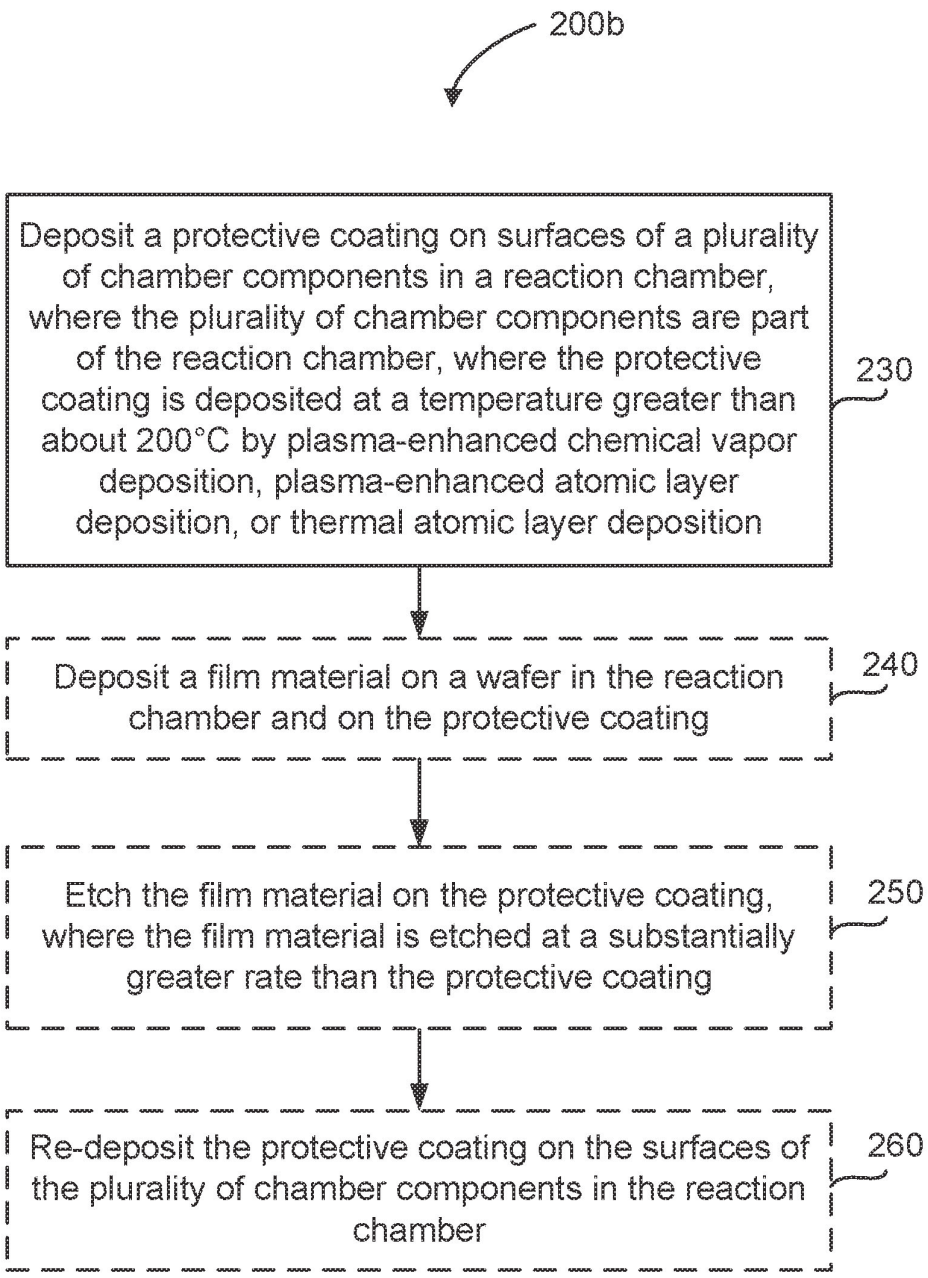
200b
Deposit a protective coating on surfaces of a plurality of chamber components in a reaction chamber, where the plurality of chamber components are part of the reaction chamber, where the protective coating is deposited at a temperature greater than about 200°C by plasma-enhanced chemical vapor deposition, plasma-enhanced atomic layer deposition, or thermal atomic layer deposition
230
Deposit a film material on a wafer in the reaction chamber and on the protective coating
240
Etch the film material on the protective coating, where the film material is etched at a substantially greater rate than the protective coating
250
Re-deposit the protective coating on the surfaces of the plurality of chamber components in the reaction chamber
260

FIG. 2B

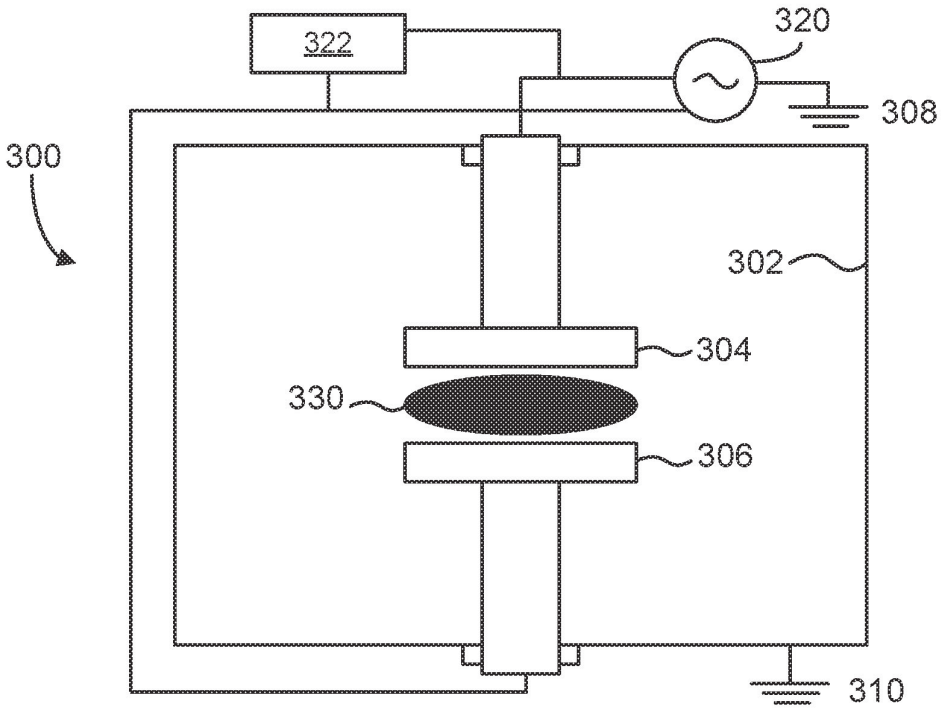
322
320
308
300
302
304
330
306
310

FIG. 3A

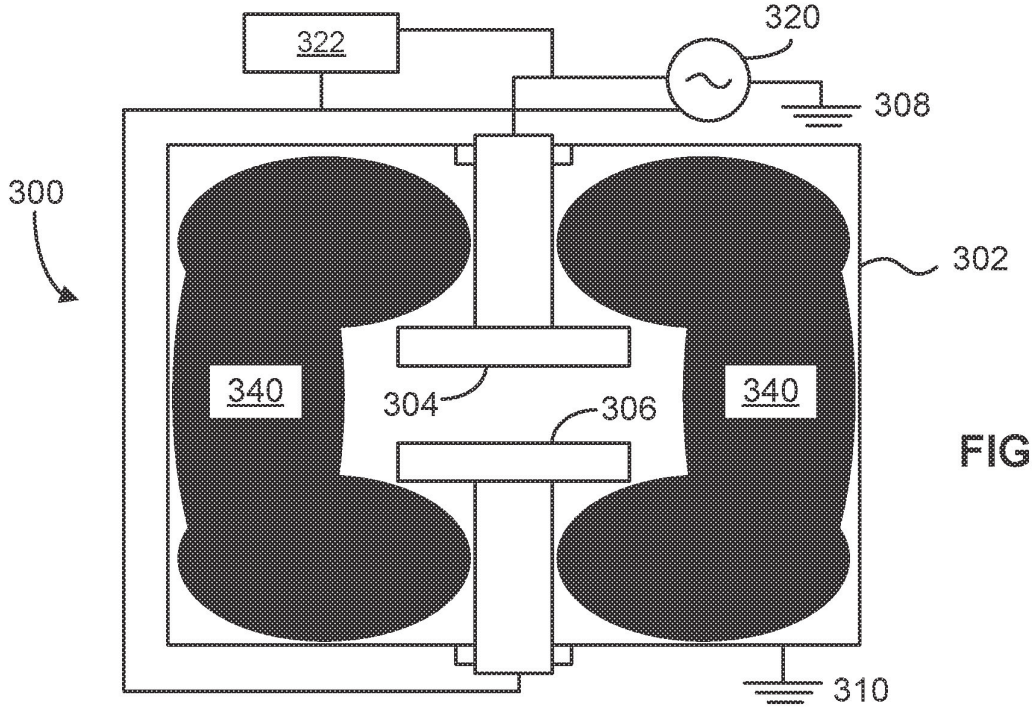
322
320
308
300
302
340
304
306
340
310

FIG. 3B

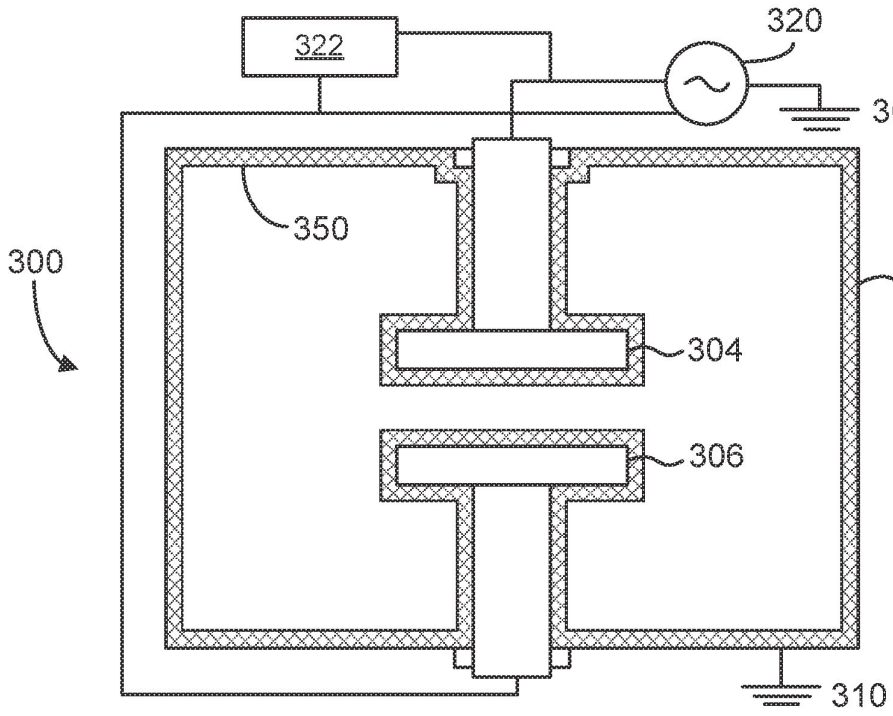

FIG. 3C

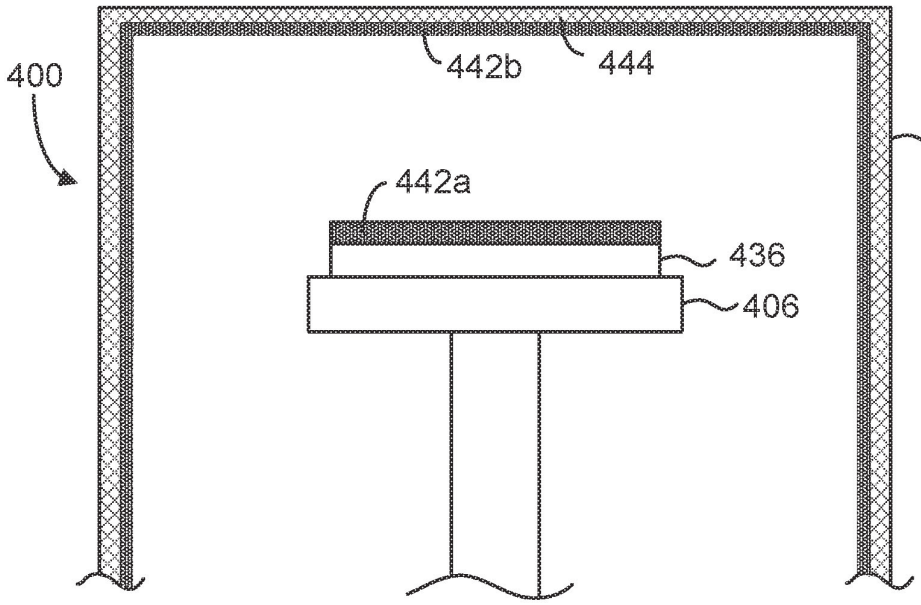

FIG. 4A

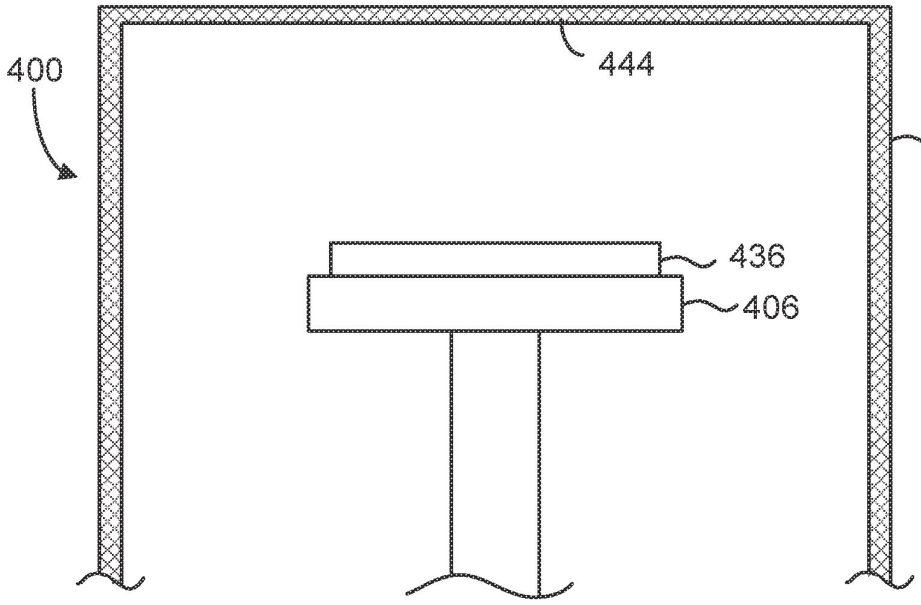

FIG. 4B