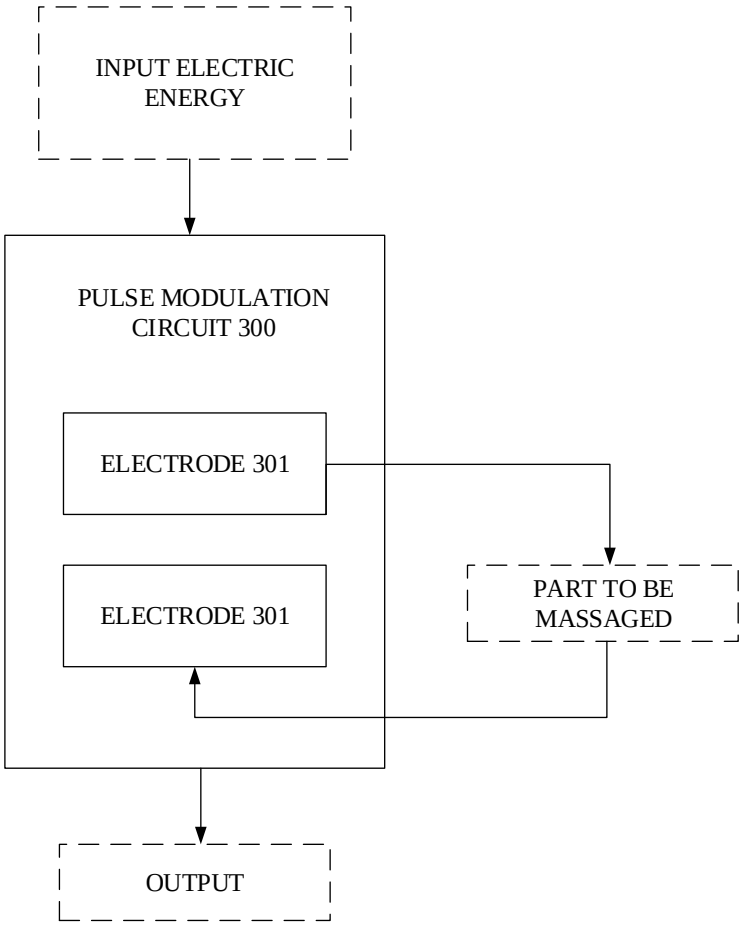

INPUT ELECTRIC ENERGY
PULSE MODULATION CIRCUIT 300
ELECTRODE 301
ELECTRODE 301
PART TO BE MASSAGED
OUTPUT

FIG. 1

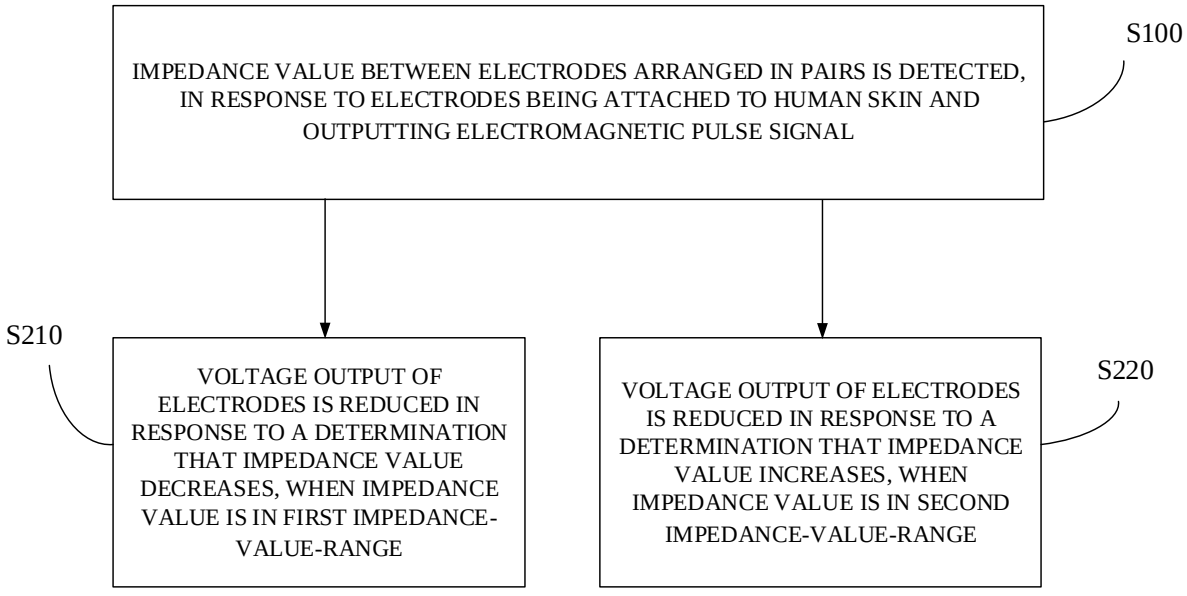

IMPEDANCE VALUE BETWEEN ELECTRODES ARRANGED IN PAIRS IS DETECTED, IN RESPONSE TO ELECTRODES BEING ATTACHED TO HUMAN SKIN AND OUTPUTTING ELECTROMAGNETIC PULSE SIGNAL
S100
S210
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE DECREASES, WHEN IMPEDANCE VALUE IS IN FIRST IMPEDANCE-VALUE-RANGE
S220
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE INCREASES, WHEN IMPEDANCE VALUE IS IN SECOND IMPEDANCE-VALUE-RANGE

FIG. 2

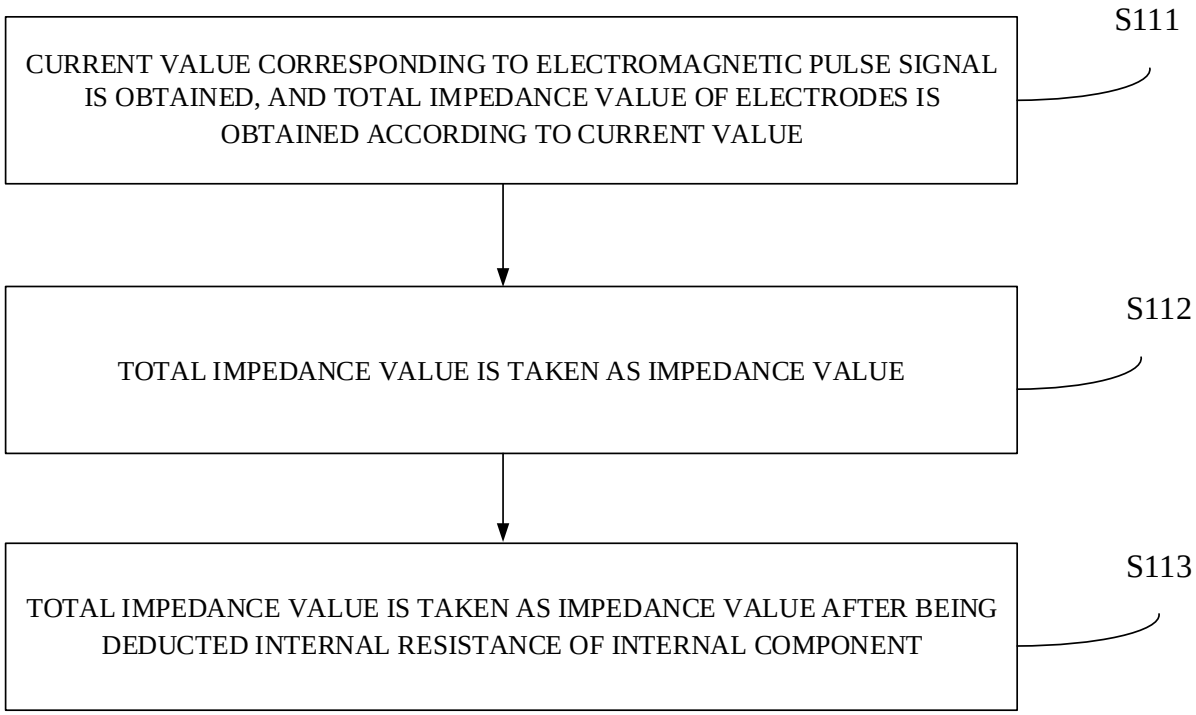

S111
CURRENT VALUE CORRESPONDING TO ELECTROMAGNETIC PULSE SIGNAL IS OBTAINED, AND TOTAL IMPEDANCE VALUE OF ELECTRODES IS OBTAINED ACCORDING TO CURRENT VALUE
S112
TOTAL IMPEDANCE VALUE IS TAKEN AS IMPEDANCE VALUE
S113
TOTAL IMPEDANCE VALUE IS TAKEN AS IMPEDANCE VALUE AFTER BEING DEDUCTED INTERNAL RESISTANCE OF INTERNAL COMPONENT

FIG. 3

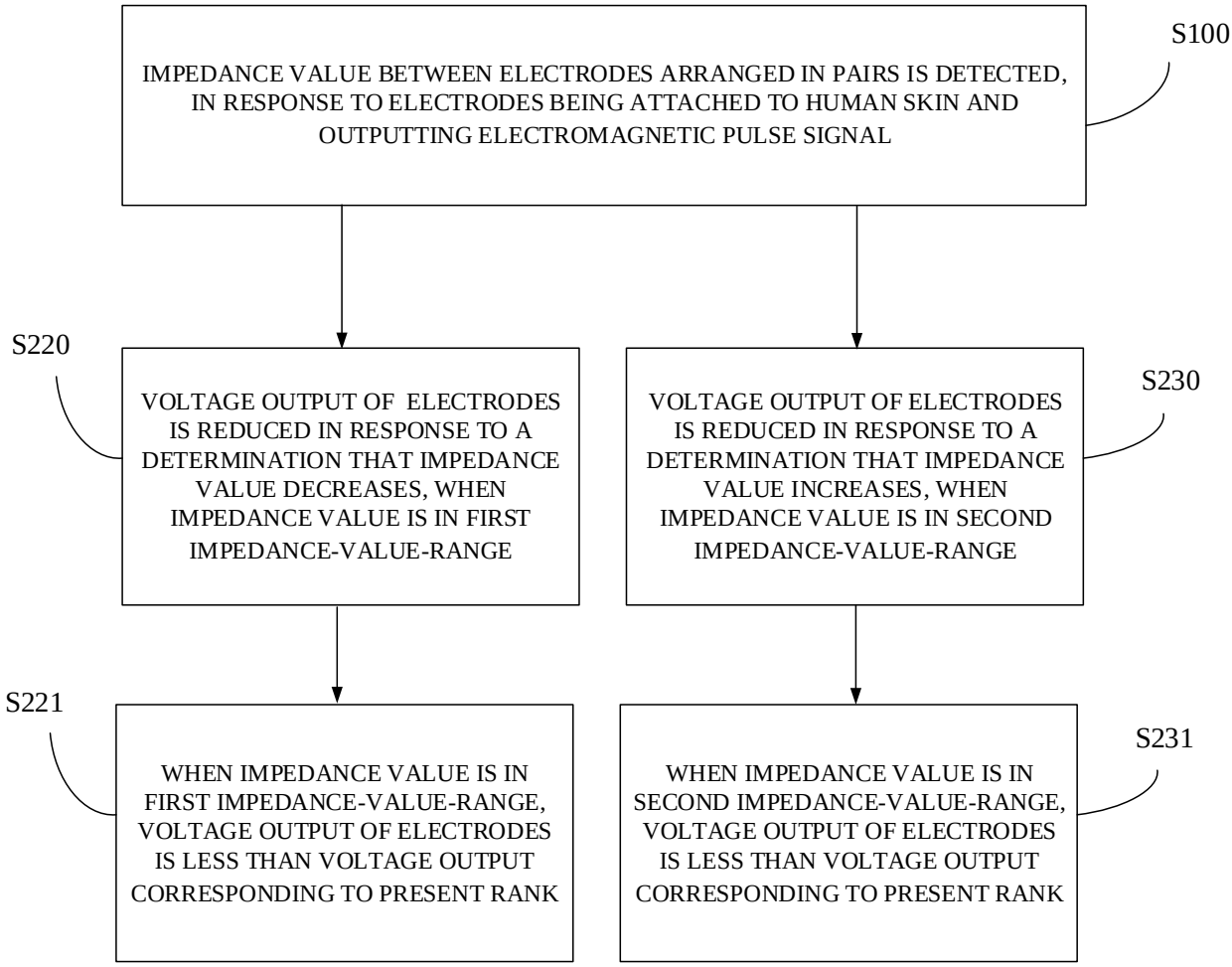

S100
IMPEDANCE VALUE BETWEEN ELECTRODES ARRANGED IN PAIRS IS DETECTED, IN RESPONSE TO ELECTRODES BEING ATTACHED TO HUMAN SKIN AND OUTPUTTING ELECTROMAGNETIC PULSE SIGNAL
S220
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE DECREASES, WHEN IMPEDANCE VALUE IS IN FIRST IMPEDANCE-VALUE-RANGE
S230
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE INCREASES, WHEN IMPEDANCE VALUE IS IN SECOND IMPEDANCE-VALUE-RANGE
S221
WHEN IMPEDANCE VALUE IS IN FIRST IMPEDANCE-VALUE-RANGE, VOLTAGE OUTPUT OF ELECTRODES IS LESS THAN VOLTAGE OUTPUT CORRESPONDING TO PRESENT RANK
S231
WHEN IMPEDANCE VALUE IS IN SECOND IMPEDANCE-VALUE-RANGE, VOLTAGE OUTPUT OF ELECTRODES IS LESS THAN VOLTAGE OUTPUT CORRESPONDING TO PRESENT RANK

FIG. 4

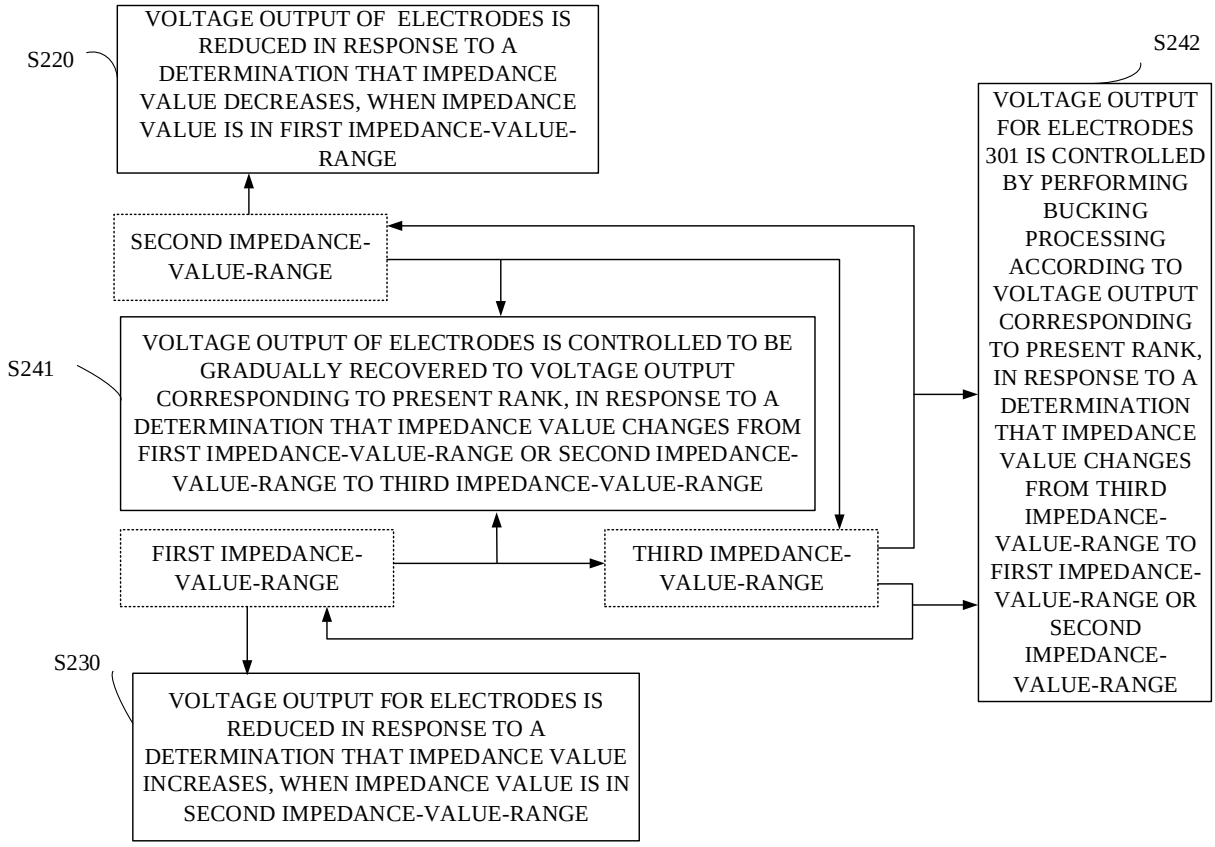

S220
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE DECREASES, WHEN IMPEDANCE VALUE IS IN FIRST IMPEDANCE-VALUE-RANGE
SECOND IMPEDANCE-VALUE-RANGE
S241
VOLTAGE OUTPUT OF ELECTRODES IS CONTROLLED TO BE GRADUALLY RECOVERED TO VOLTAGE OUTPUT CORRESPONDING TO PRESENT RANK, IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE CHANGES FROM FIRST IMPEDANCE-VALUE-RANGE OR SECOND IMPEDANCE-VALUE-RANGE TO THIRD IMPEDANCE-VALUE-RANGE
FIRST IMPEDANCE-VALUE-RANGE
THIRD IMPEDANCE-VALUE-RANGE
S230
VOLTAGE OUTPUT FOR ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE INCREASES, WHEN IMPEDANCE VALUE IS IN SECOND IMPEDANCE-VALUE-RANGE
S242
VOLTAGE OUTPUT FOR ELECTRODES 301 IS CONTROLLED BY PERFORMING BUCKING PROCESSING ACCORDING TO VOLTAGE OUTPUT CORRESPONDING TO PRESENT RANK, IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE CHANGES FROM THIRD IMPEDANCE-VALUE-RANGE TO FIRST IMPEDANCE-VALUE-RANGE OR SECOND IMPEDANCE-VALUE-RANGE

FIG. 5

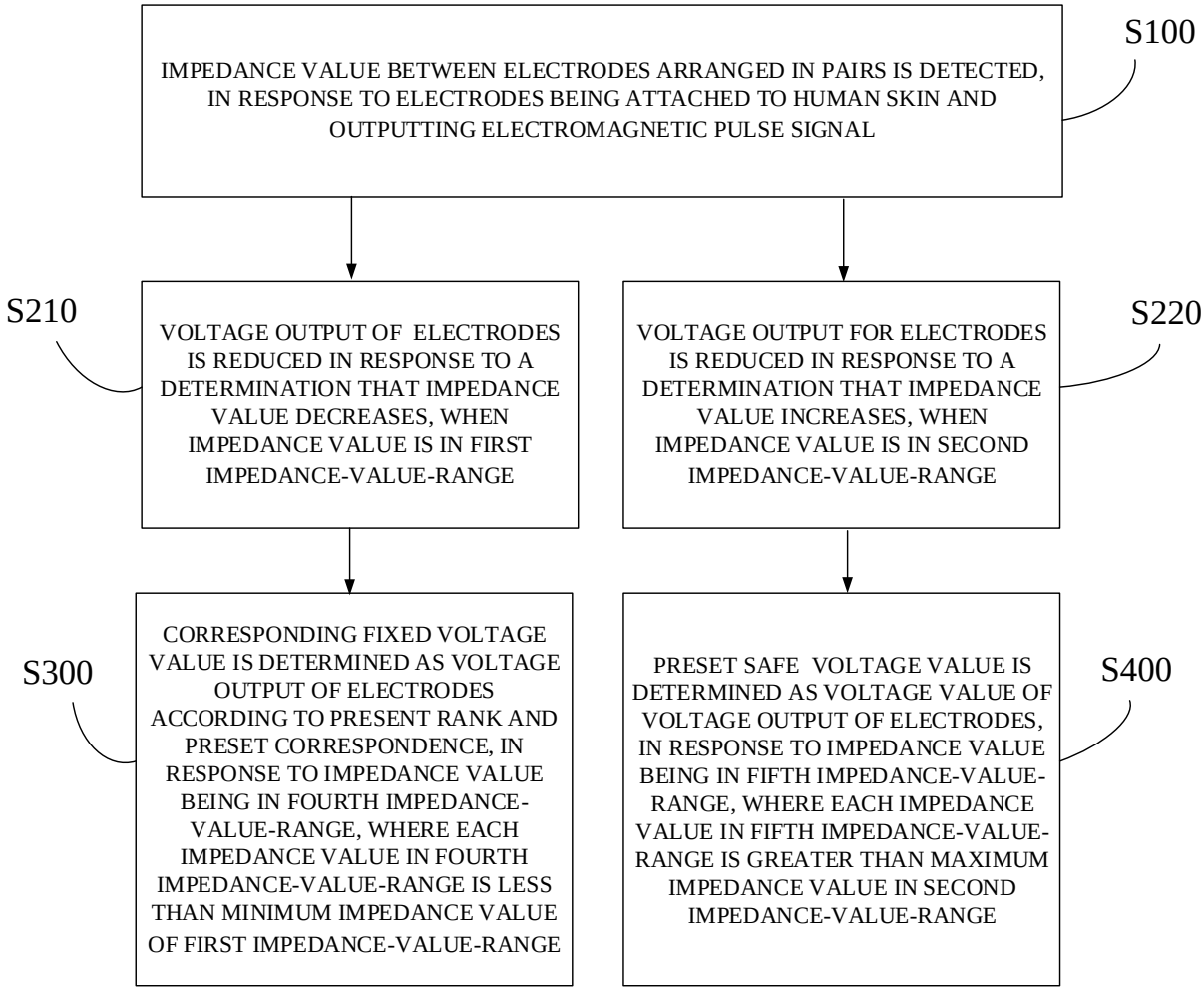

IMPEDANCE VALUE BETWEEN ELECTRODES ARRANGED IN PAIRS IS DETECTED, IN RESPONSE TO ELECTRODES BEING ATTACHED TO HUMAN SKIN AND OUTPUTTING ELECTROMAGNETIC PULSE SIGNAL
S100
S210
VOLTAGE OUTPUT OF ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE DECREASES, WHEN IMPEDANCE VALUE IS IN FIRST IMPEDANCE-VALUE-RANGE
S220
VOLTAGE OUTPUT FOR ELECTRODES IS REDUCED IN RESPONSE TO A DETERMINATION THAT IMPEDANCE VALUE INCREASES, WHEN IMPEDANCE VALUE IS IN SECOND IMPEDANCE-VALUE-RANGE
S300
CORRESPONDING FIXED VOLTAGE VALUE IS DETERMINED AS VOLTAGE OUTPUT OF ELECTRODES ACCORDING TO PRESENT RANK AND PRESET CORRESPONDENCE, IN RESPONSE TO IMPEDANCE VALUE BEING IN FOURTH IMPEDANCE-VALUE-RANGE, WHERE EACH IMPEDANCE VALUE IN FOURTH IMPEDANCE-VALUE-RANGE IS LESS THAN MINIMUM IMPEDANCE VALUE OF FIRST IMPEDANCE-VALUE-RANGE
S400
PRESET SAFE VOLTAGE VALUE IS DETERMINED AS VOLTAGE VALUE OF VOLTAGE OUTPUT OF ELECTRODES, IN RESPONSE TO IMPEDANCE VALUE BEING IN FIFTH IMPEDANCE-VALUE-RANGE, WHERE EACH IMPEDANCE VALUE IN FIFTH IMPEDANCE-VALUE-RANGE IS GREATER THAN MAXIMUM IMPEDANCE VALUE IN SECOND IMPEDANCE-VALUE-RANGE

FIG. 6

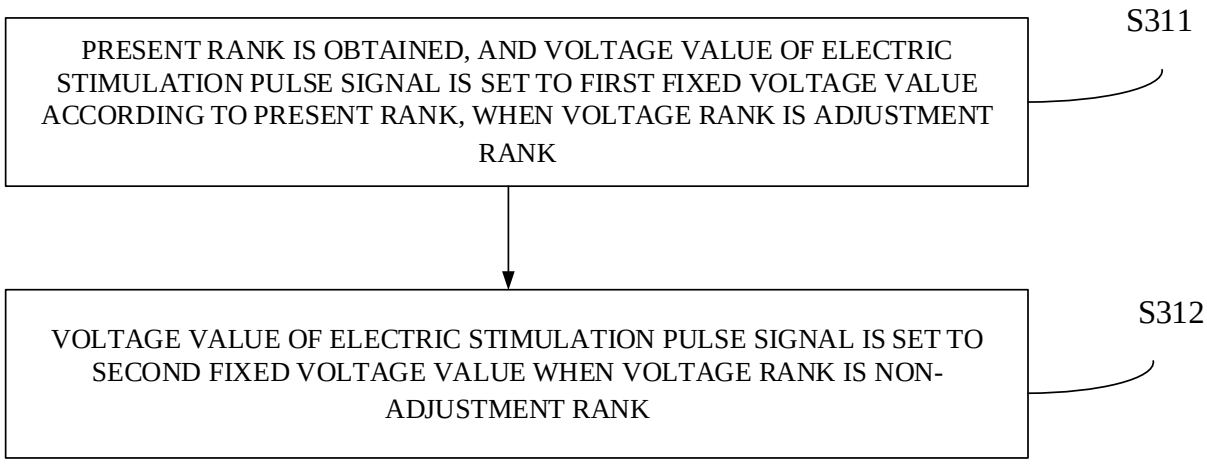

PRESENT RANK IS OBTAINED, AND VOLTAGE VALUE OF ELECTRIC STIMULATION PULSE SIGNAL IS SET TO FIRST FIXED VOLTAGE VALUE ACCORDING TO PRESENT RANK, WHEN VOLTAGE RANK IS ADJUSTMENT RANK
S311
VOLTAGE VALUE OF ELECTRIC STIMULATION PULSE SIGNAL IS SET TO SECOND FIXED VOLTAGE VALUE WHEN VOLTAGE RANK IS NON-ADJUSTMENT RANK
S312

FIG. 7

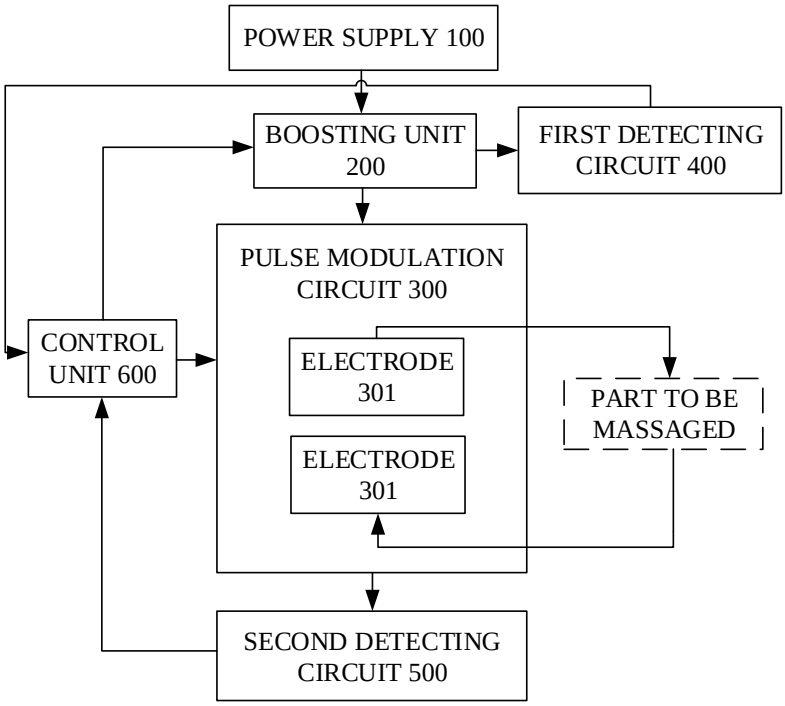

POWER SUPPLY 100
BOOSTING UNIT 200
FIRST DETECTING CIRCUIT 400
PULSE MODULATION CIRCUIT 300
CONTROL UNIT 600
ELECTRODE 301
ELECTRODE 301
PART TO BE MASSAGED
SECOND DETECTING CIRCUIT 500

FIG. 8

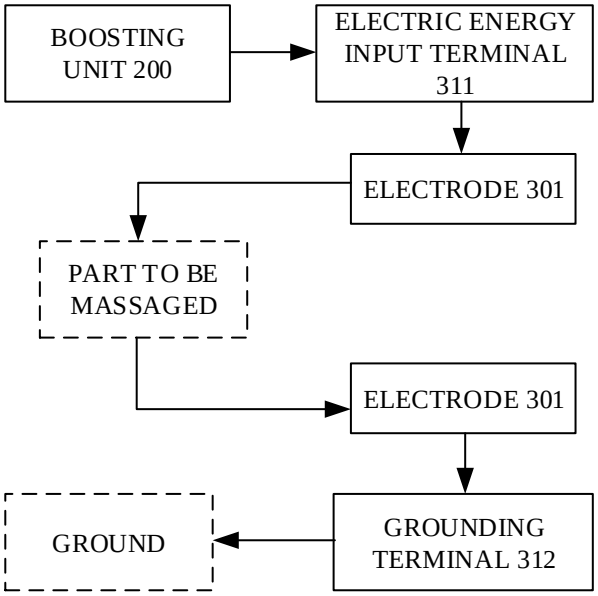

BOOSTING UNIT 200
ELECTRIC ENERGY INPUT TERMINAL 311
ELECTRODE 301
PART TO BE MASSAGED
ELECTRODE 301
GROUND
GROUNDING TERMINAL 312

FIG. 9

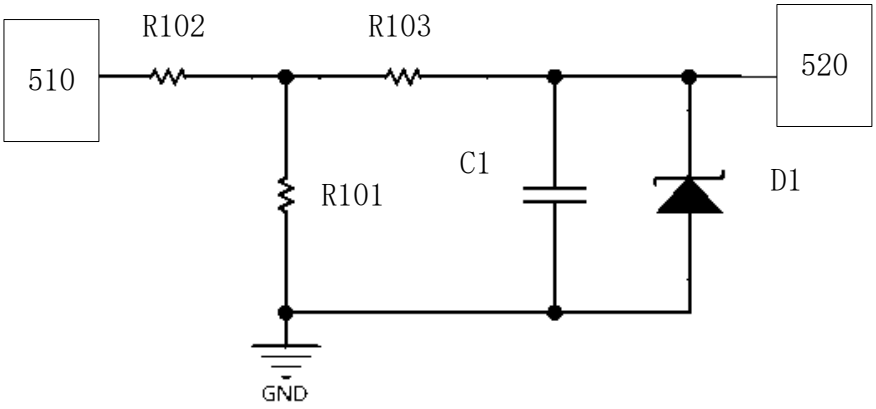


FIG. 10

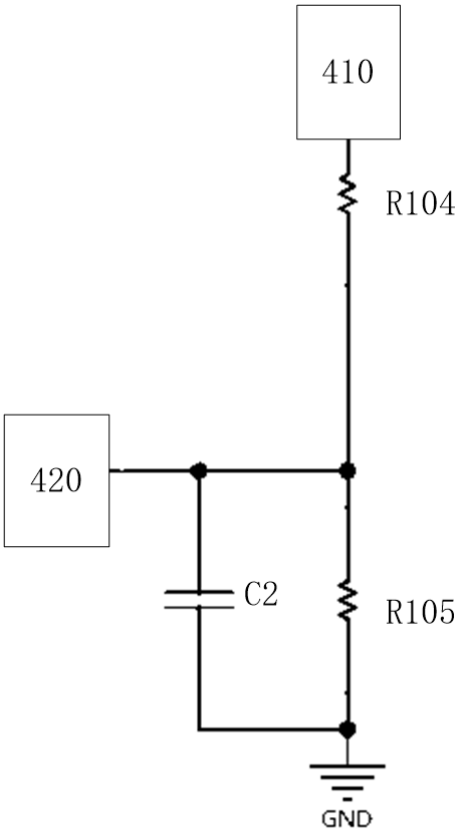


FIG. 11

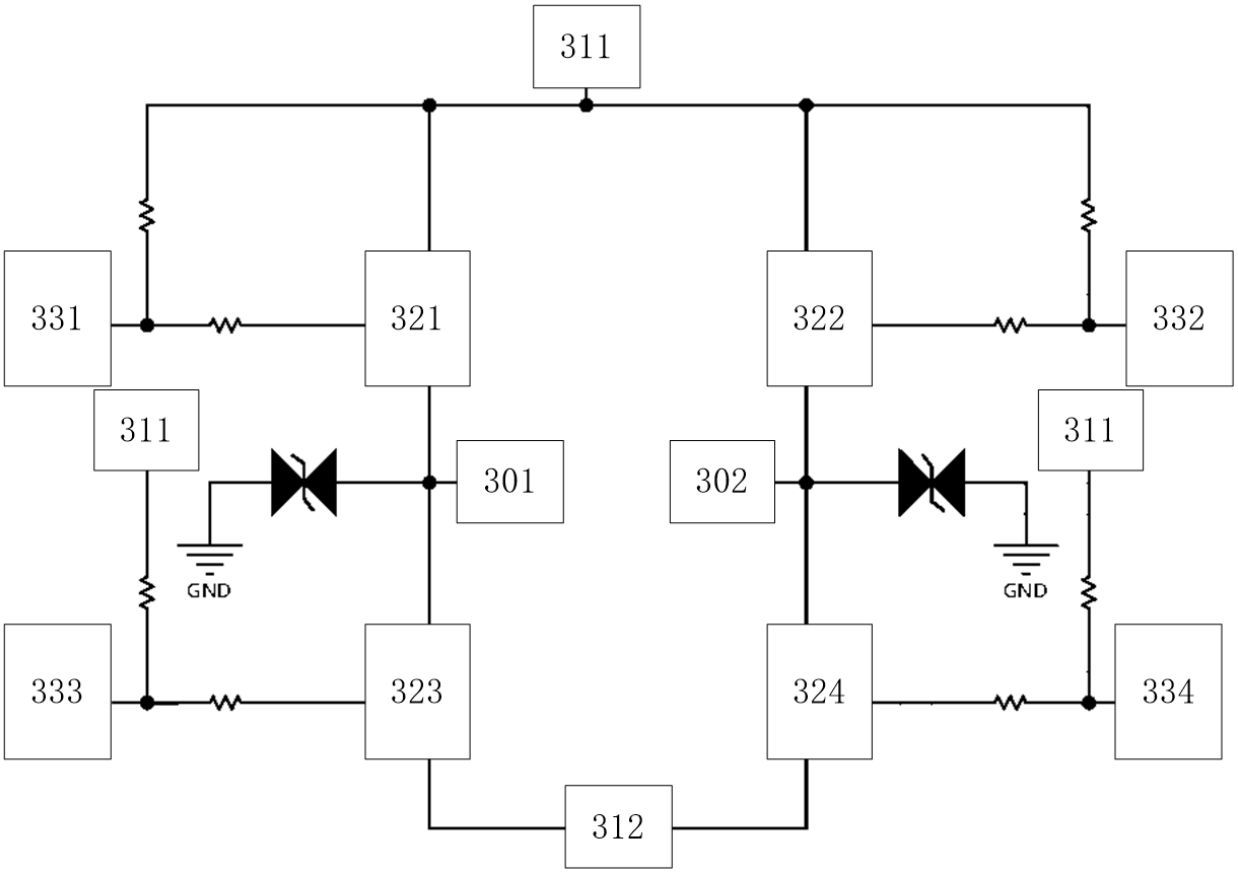


FIG. 12

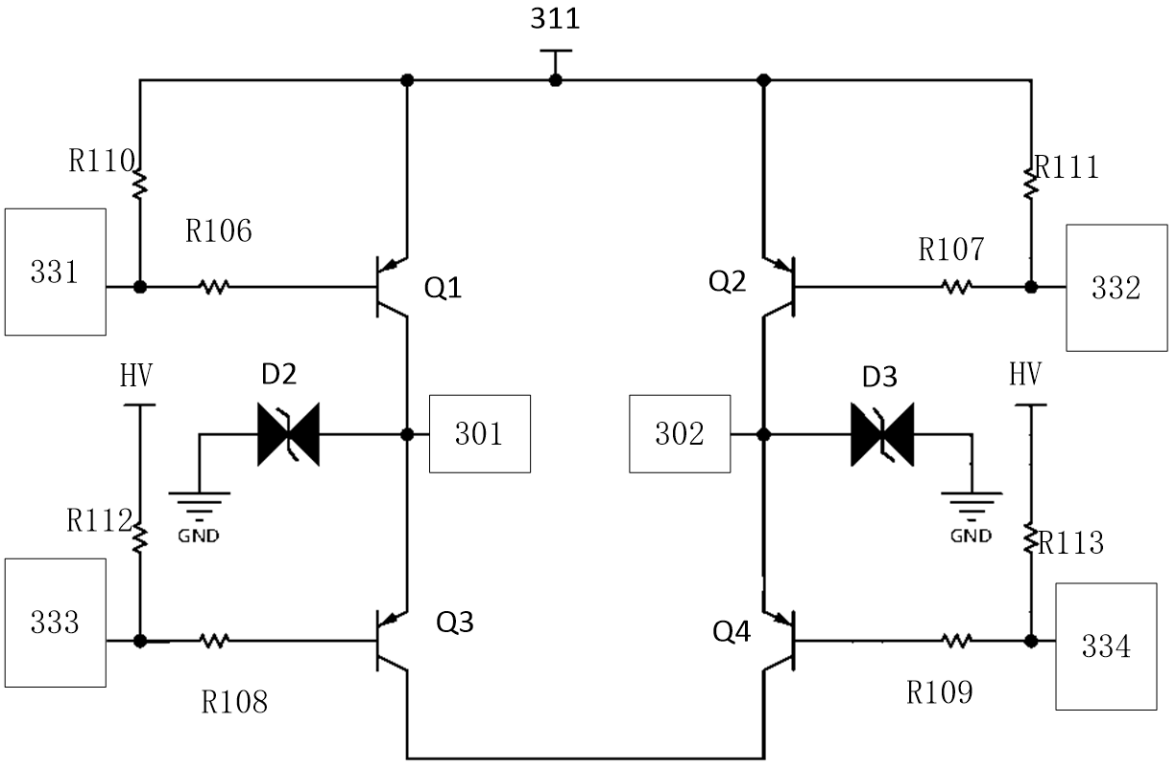

311
R110
R106
331
Q1
Q2
R111
R107
332
HV
D2
301
302
D3
HV
R112
GND
GND
R113
333
Q3
Q4
334
R108
R109

FIG. 13

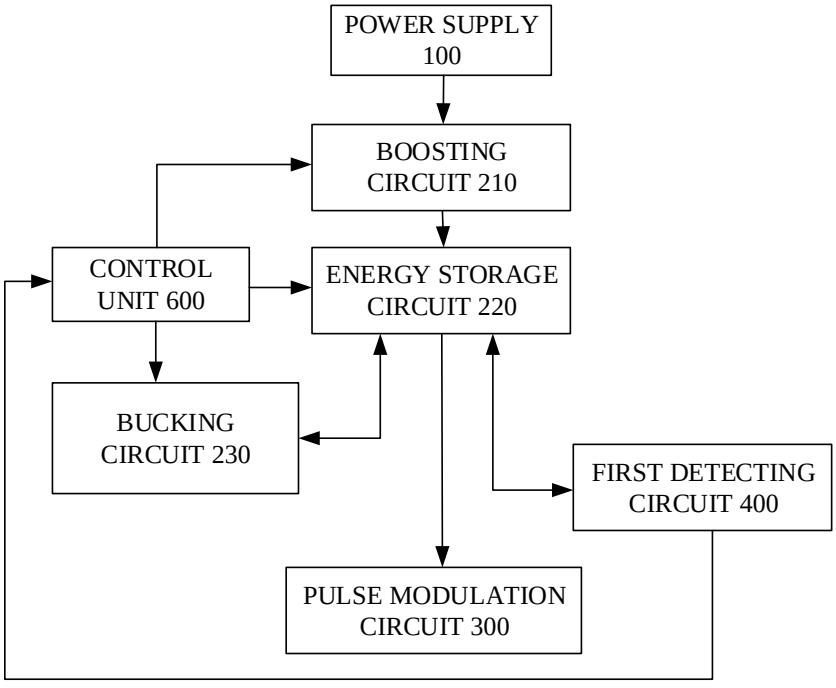

POWER SUPPLY 100
BOOSTING CIRCUIT 210
CONTROL UNIT 600
ENERGY STORAGE CIRCUIT 220
BUCKING CIRCUIT 230
FIRST DETECTING CIRCUIT 400
PULSE MODULATION CIRCUIT 300

FIG. 14

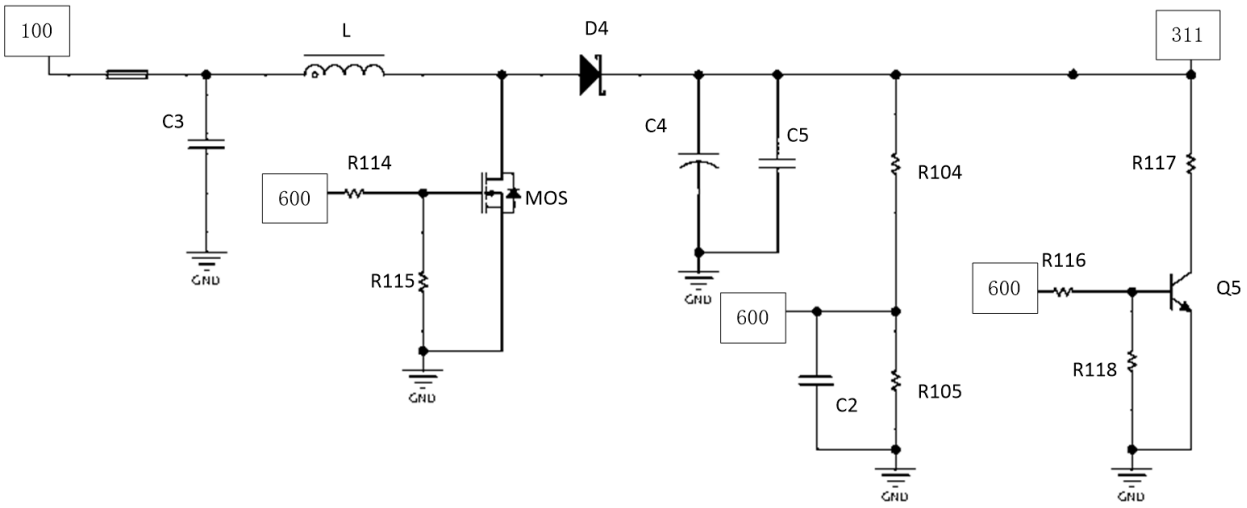

100
L
D4
311
C3
C4
C5
R104
R117
R114
600
MOS
R115
R116
600
Q5
600
R118
C2
R105
GND

FIG. 15