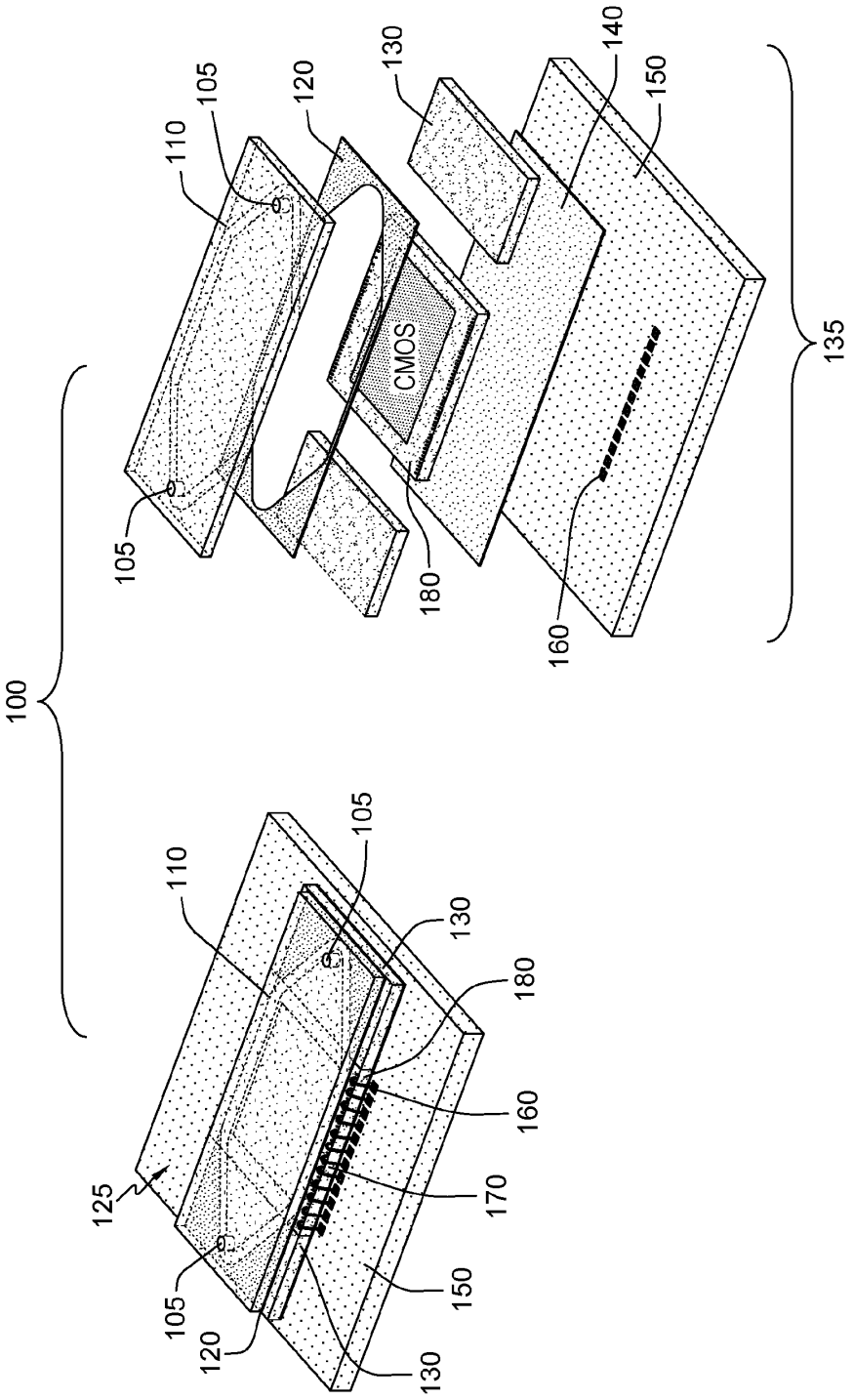

100
105
110
120
130
140
150
CMOS
135
105
180
160
105
110
130
180
160
125
170
105
120
150
130

FIG. 1

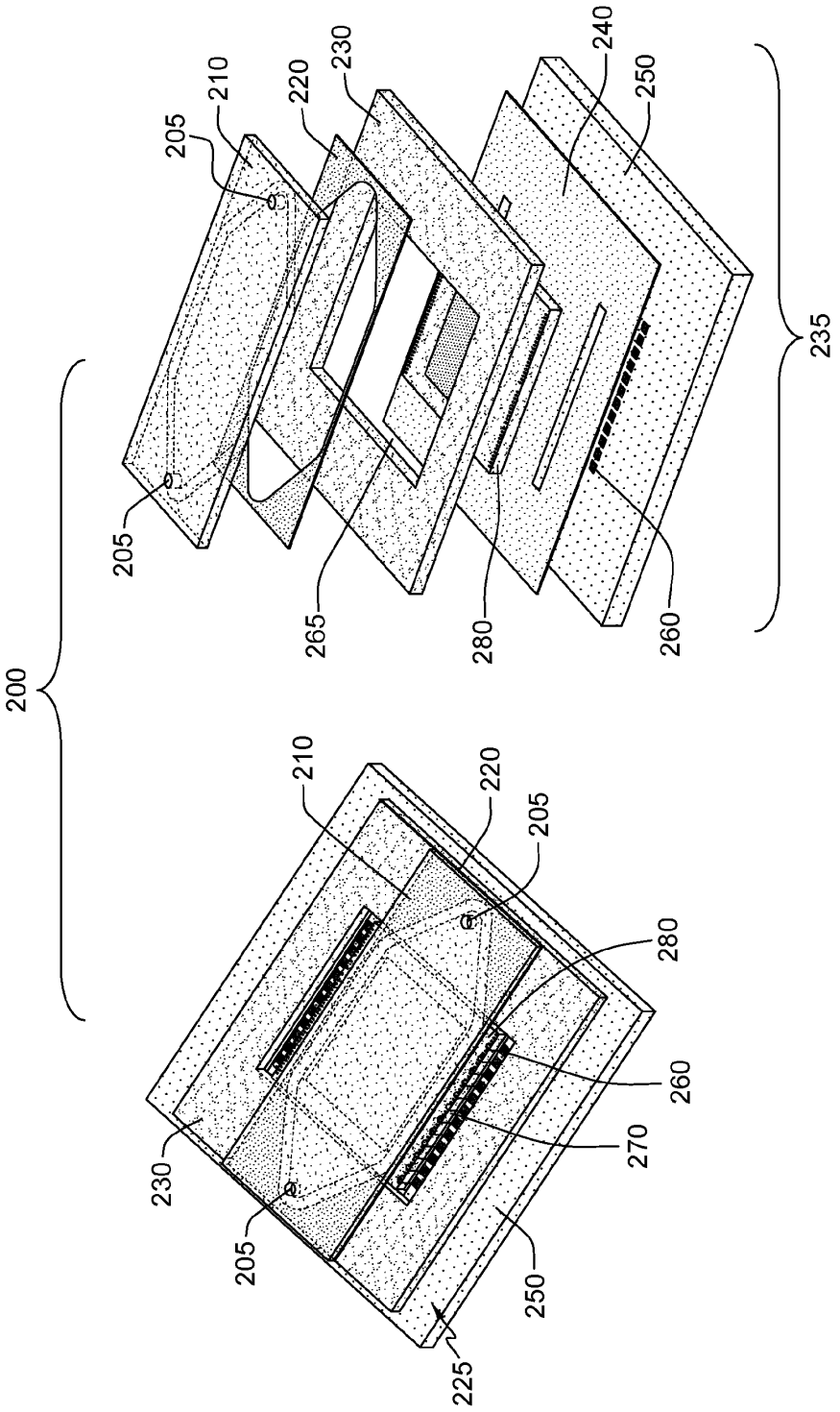

200
205
210
220
230
240
250
235
205
265
280
260
210
220
205
280
260
270
230
205
250
225

FIG. 2

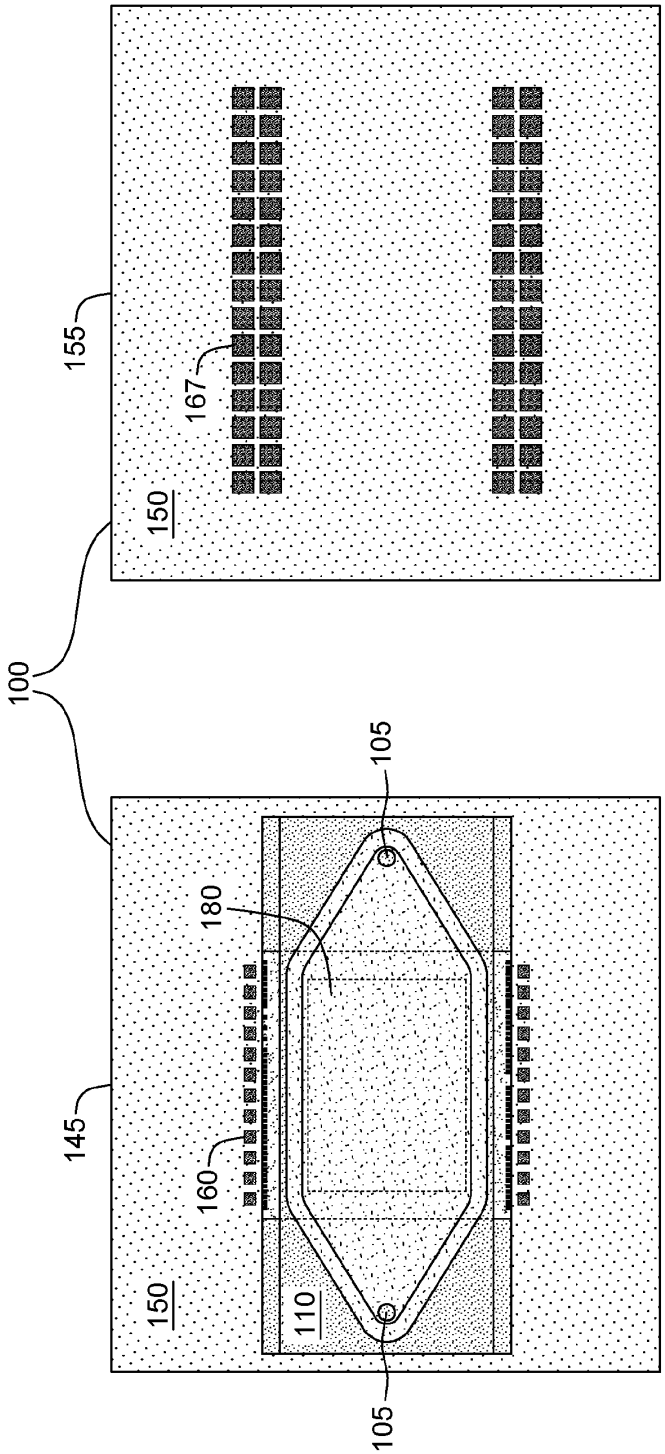


FIG. 3

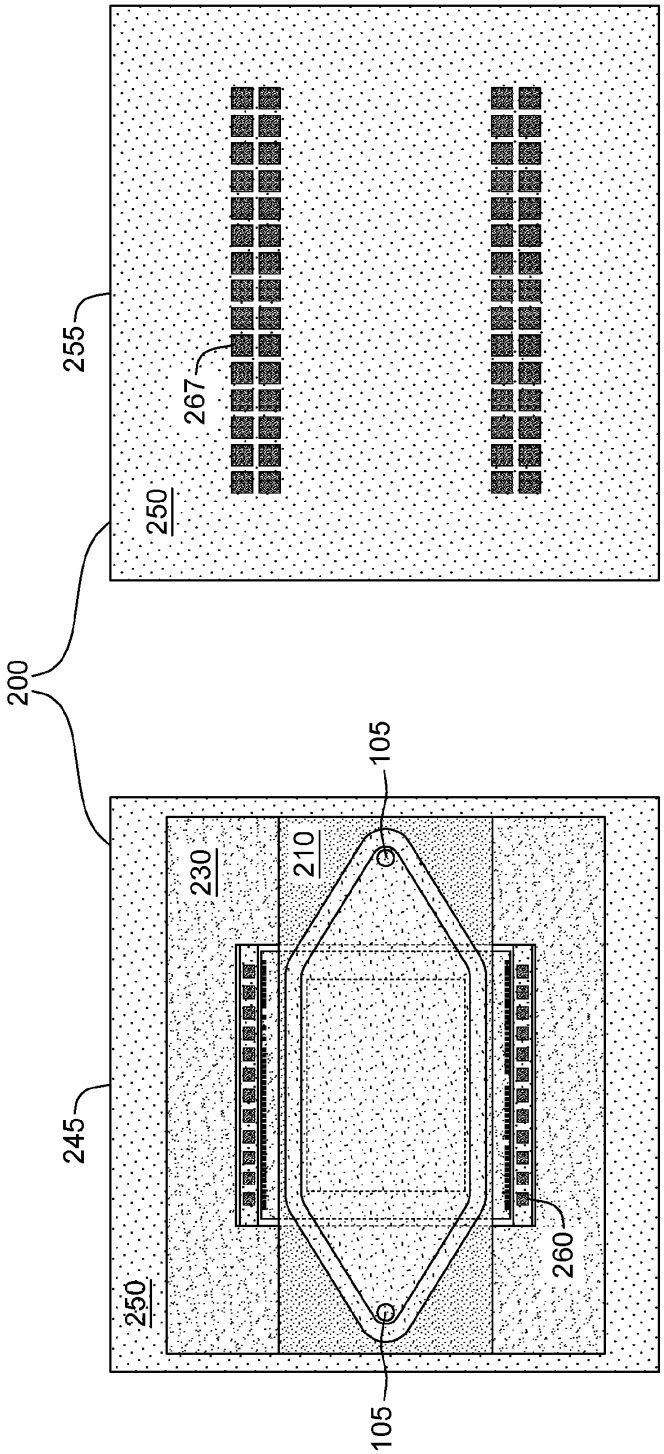


FIG. 4

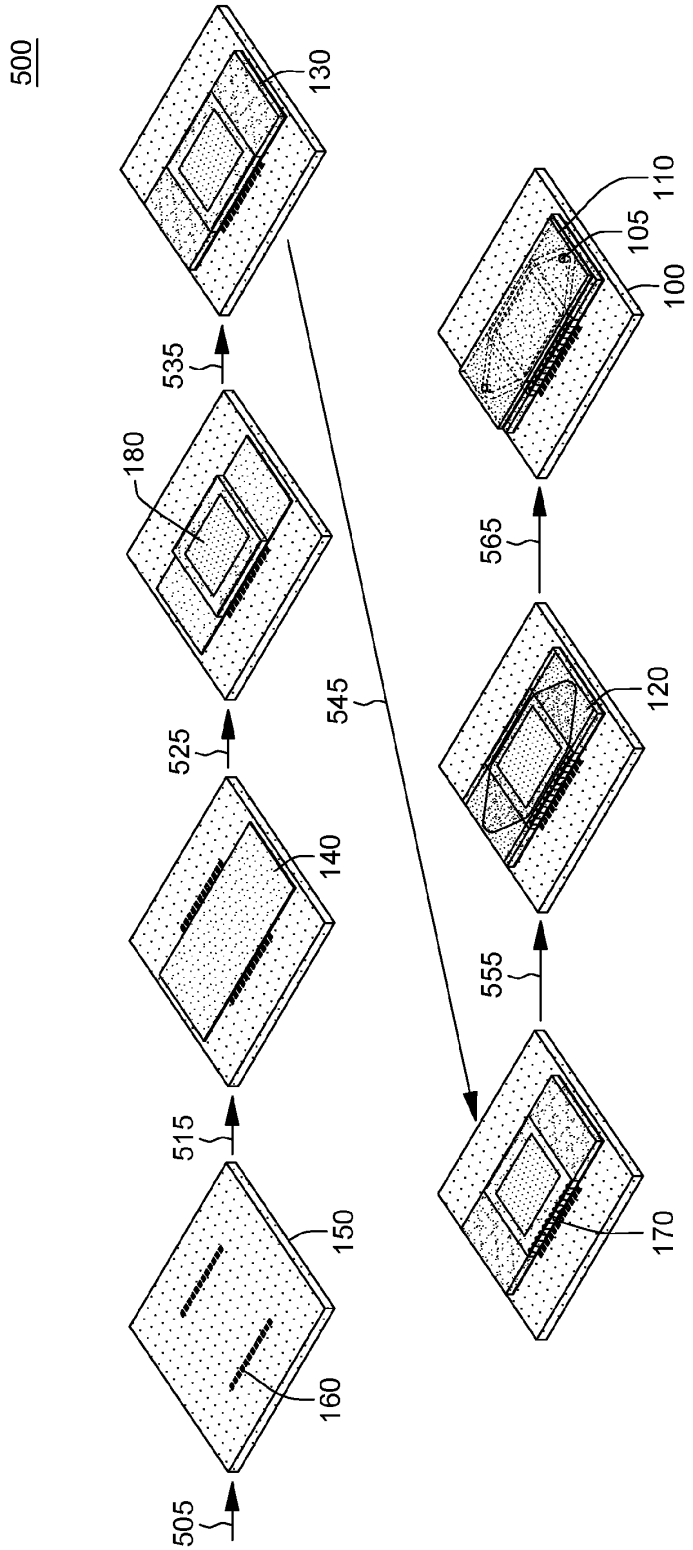

500
130
535
180
525
140
515
150
160
505
545
110
105
100
565
120
555
170

FIG. 5

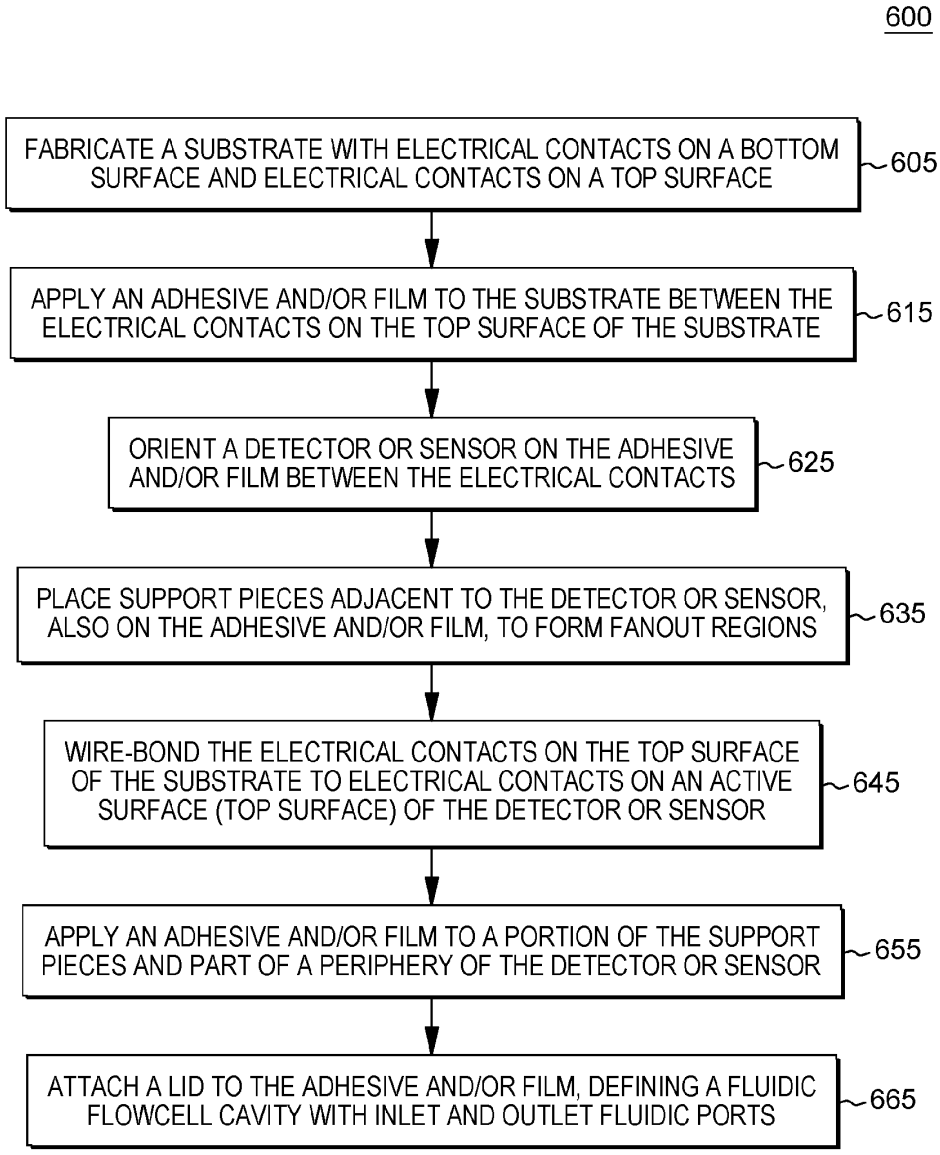

600
FABRICATE A SUBSTRATE WITH ELECTRICAL CONTACTS ON A BOTTOM SURFACE AND ELECTRICAL CONTACTS ON A TOP SURFACE
605
APPLY AN ADHESIVE AND/OR FILM TO THE SUBSTRATE BETWEEN THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE
615
ORIENT A DETECTOR OR SENSOR ON THE ADHESIVE AND/OR FILM BETWEEN THE ELECTRICAL CONTACTS
625
PLACE SUPPORT PIECES ADJACENT TO THE DETECTOR OR SENSOR, ALSO ON THE ADHESIVE AND/OR FILM, TO FORM FANOUT REGIONS
635
WIRE-BOND THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE TO ELECTRICAL CONTACTS ON AN ACTIVE SURFACE (TOP SURFACE) OF THE DETECTOR OR SENSOR
645
APPLY AN ADHESIVE AND/OR FILM TO A PORTION OF THE SUPPORT PIECES AND PART OF A PERIPHERY OF THE DETECTOR OR SENSOR
655
ATTACH A LID TO THE ADHESIVE AND/OR FILM, DEFINING A FLUIDIC FLOWCELL CAVITY WITH INLET AND OUTLET FLUIDIC PORTS
665

FIG. 6

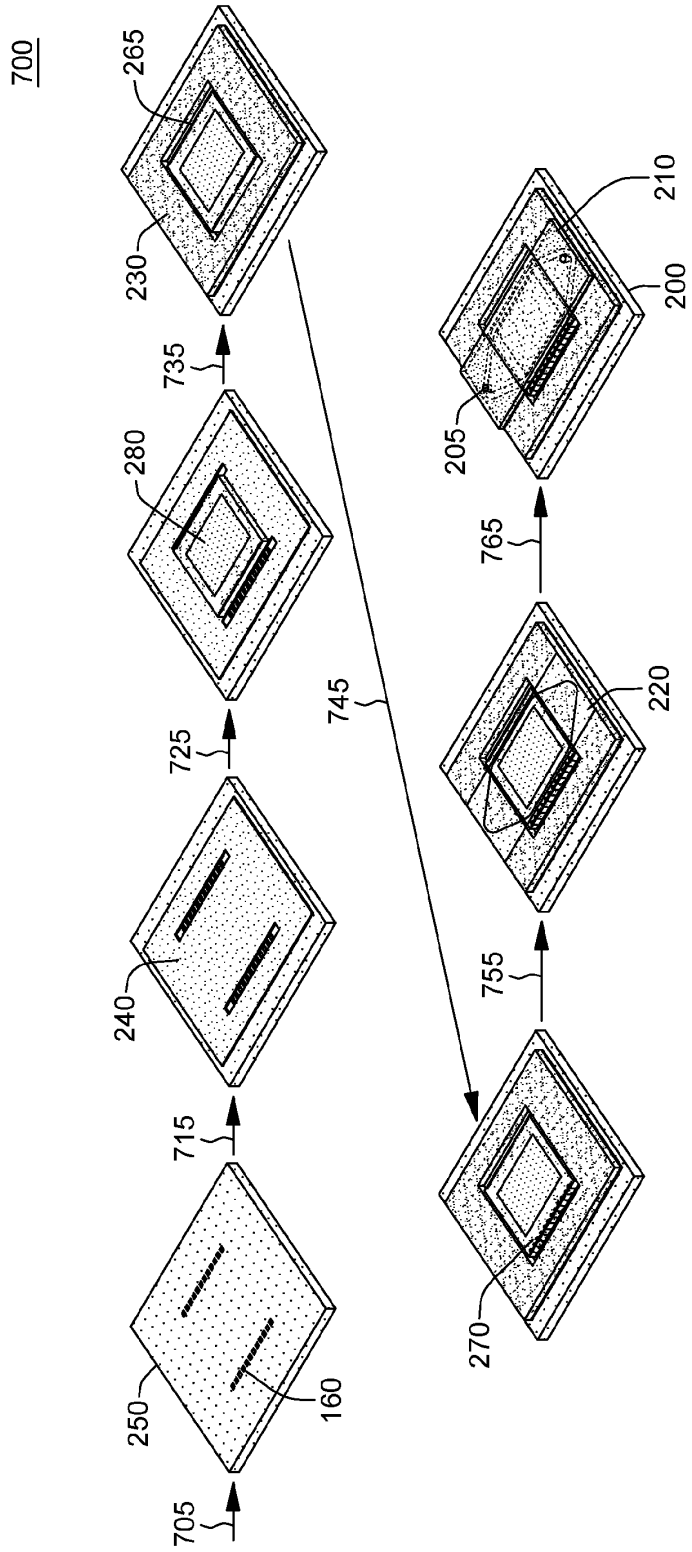

700
265
230
735
280
725
240
715
250
160
705
745
210
200
205
765
220
755
270

FIG. 7

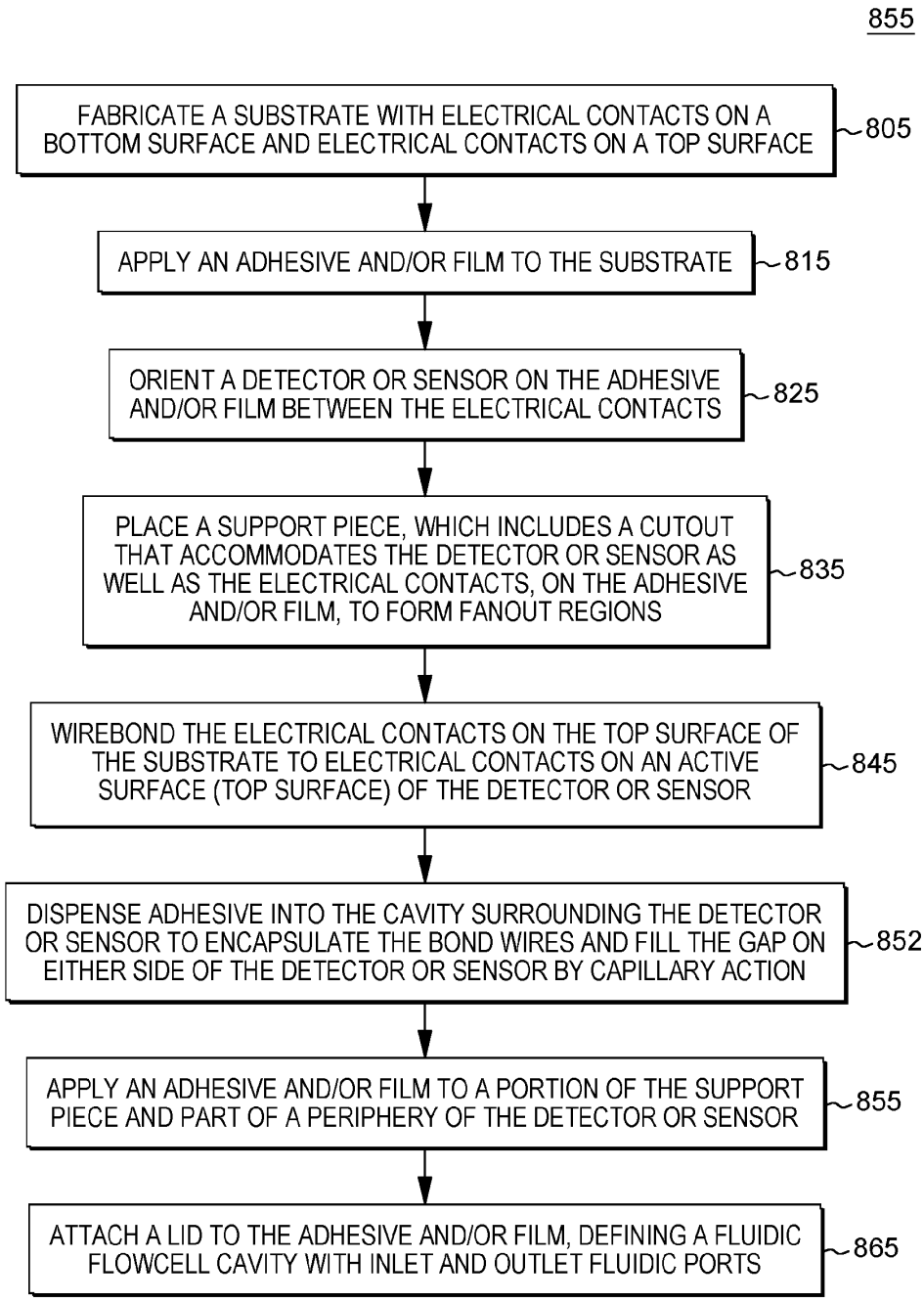

855
FABRICATE A SUBSTRATE WITH ELECTRICAL CONTACTS ON A BOTTOM SURFACE AND ELECTRICAL CONTACTS ON A TOP SURFACE
805
APPLY AN ADHESIVE AND/OR FILM TO THE SUBSTRATE
815
ORIENT A DETECTOR OR SENSOR ON THE ADHESIVE AND/OR FILM BETWEEN THE ELECTRICAL CONTACTS
825
PLACE A SUPPORT PIECE, WHICH INCLUDES A CUTOUT THAT ACCOMMODATES THE DETECTOR OR SENSOR AS WELL AS THE ELECTRICAL CONTACTS, ON THE ADHESIVE AND/OR FILM, TO FORM FANOUT REGIONS
835
WIREBOND THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE TO ELECTRICAL CONTACTS ON AN ACTIVE SURFACE (TOP SURFACE) OF THE DETECTOR OR SENSOR
845
DISPENSE ADHESIVE INTO THE CAVITY SURROUNDING THE DETECTOR OR SENSOR TO ENCAPSULATE THE BOND WIRES AND FILL THE GAP ON EITHER SIDE OF THE DETECTOR OR SENSOR BY CAPILLARY ACTION
852
APPLY AN ADHESIVE AND/OR FILM TO A PORTION OF THE SUPPORT PIECE AND PART OF A PERIPHERY OF THE DETECTOR OR SENSOR
855
ATTACH A LID TO THE ADHESIVE AND/OR FILM, DEFINING A FLUIDIC FLOWCELL CAVITY WITH INLET AND OUTLET FLUIDIC PORTS
865

FIG. 8

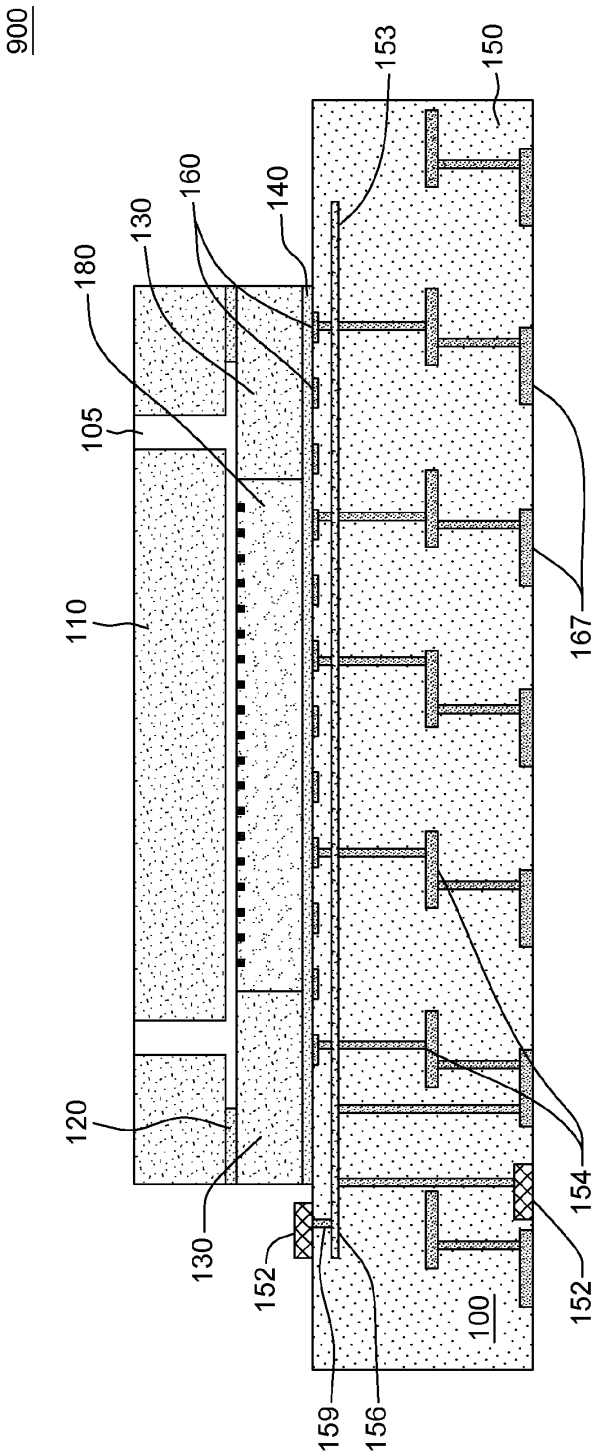

900
153
150
160
140
130
180
105
110
167
120
154
130
152
152
100
159
156

FIG. 9

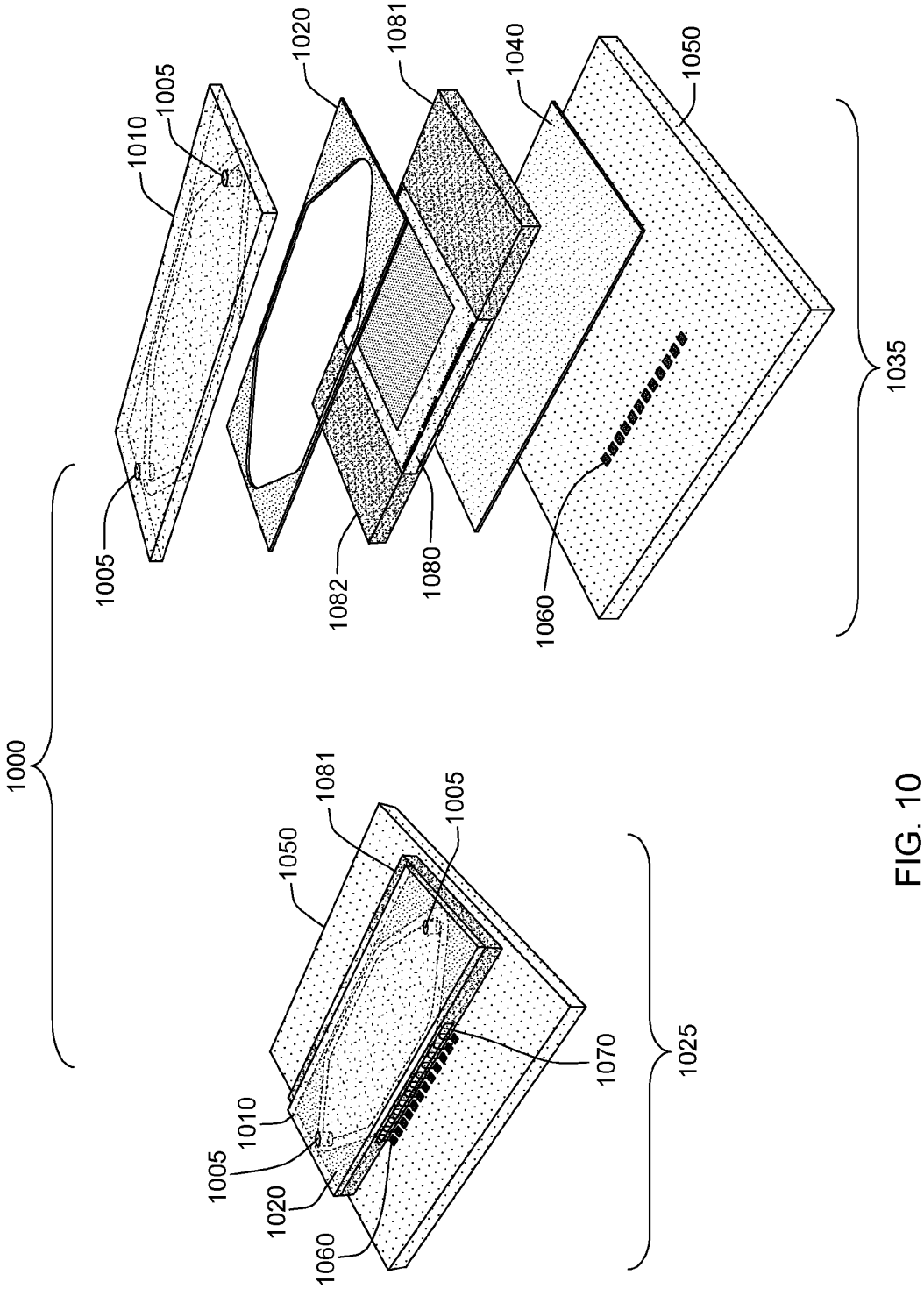

1000
1005
1010
1005
1020
1081
1040
1050
1035
1005
1082
1080
1060
1081
1005
1050
1070
1025
1010
1005
1020
1060

FIG. 10

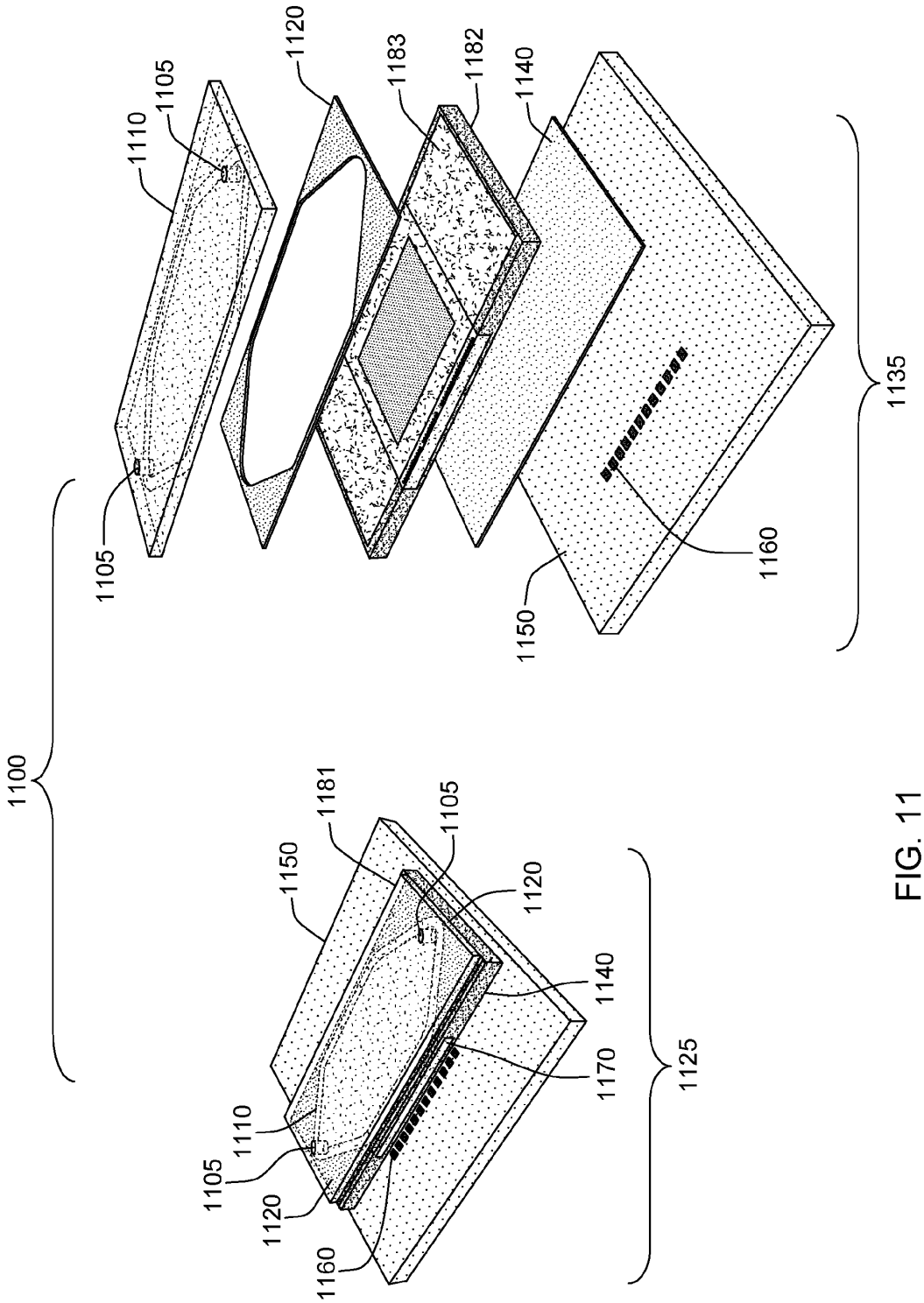

1100
1105
1110
1120
1183
1182
1140
1135
1160
1150
1181
1105
1150
1120
1140
1170
1125
1110
1105
1120
1160

FIG. 11

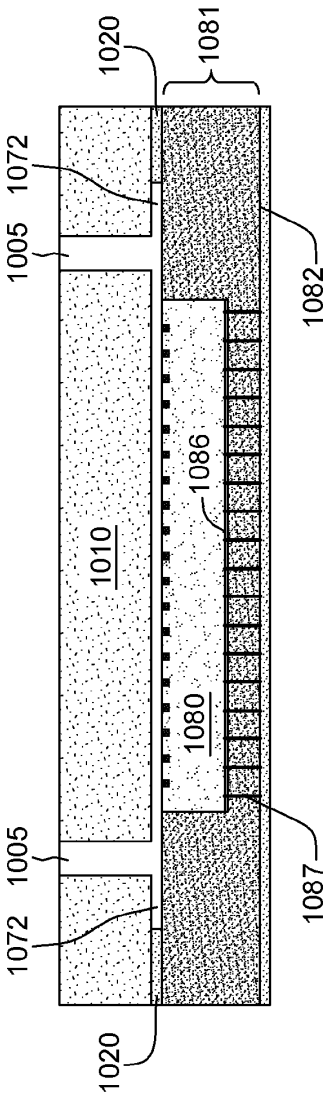

1020
1081
1072
1005
1082
1086
1010
1080
1005
1087
1072
1020

FIG. 12

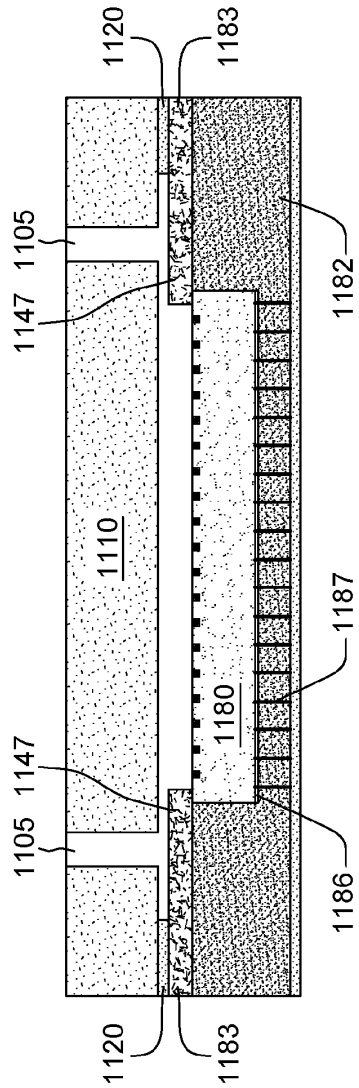

1120
1183
1105
1147
1182
1110
1187
1180
1147
1105
1186
1120
1183

FIG. 13

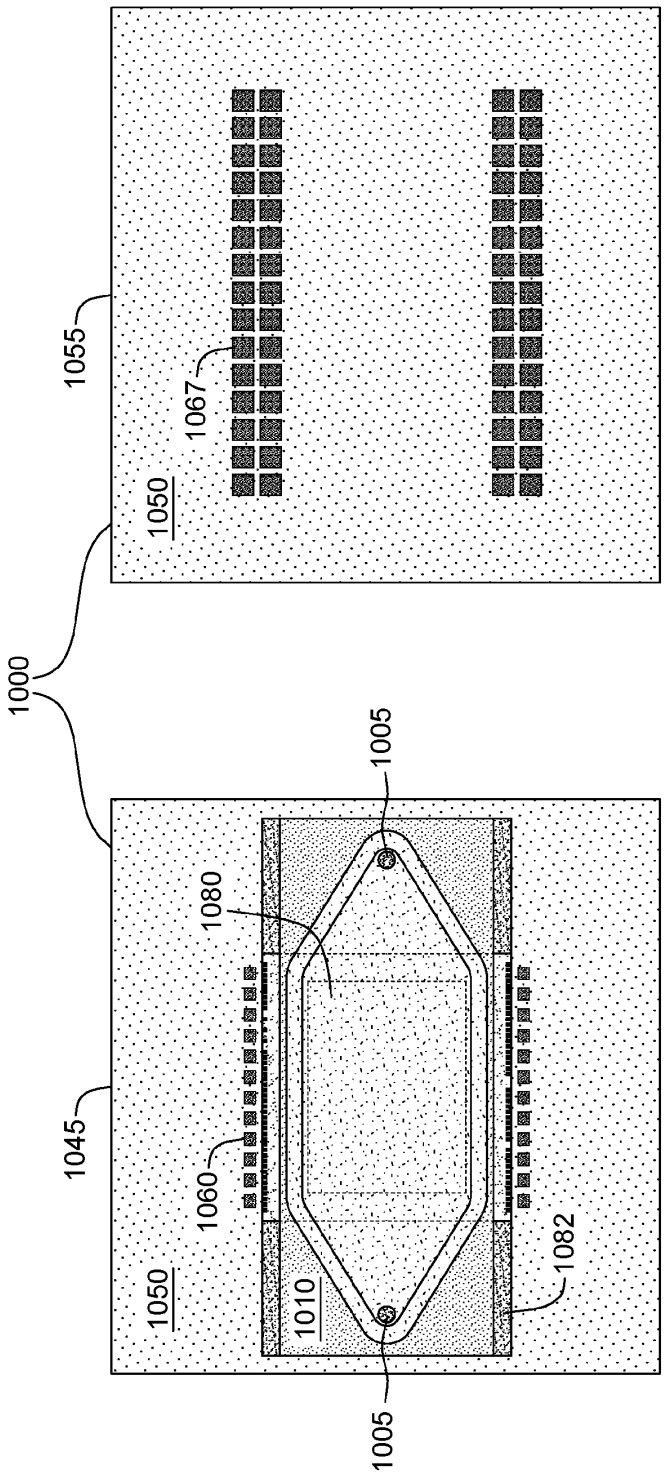


FIG. 14

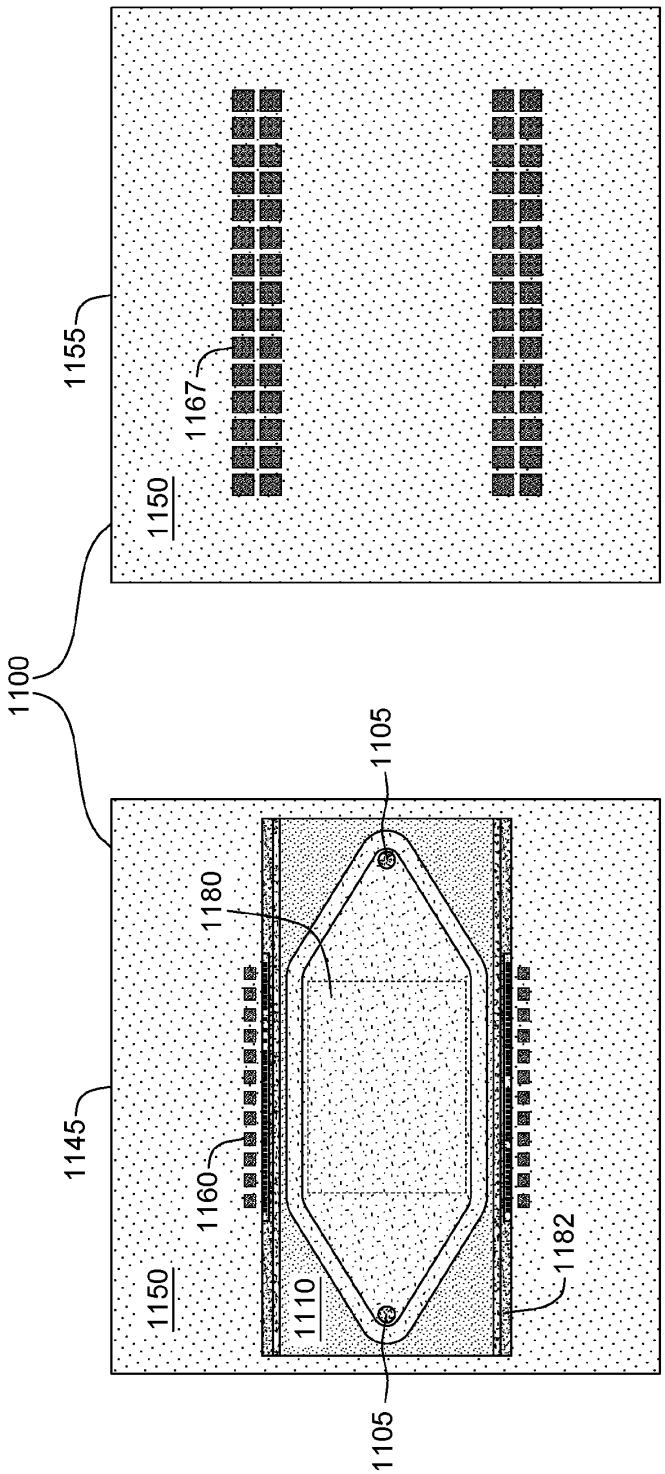


FIG. 15

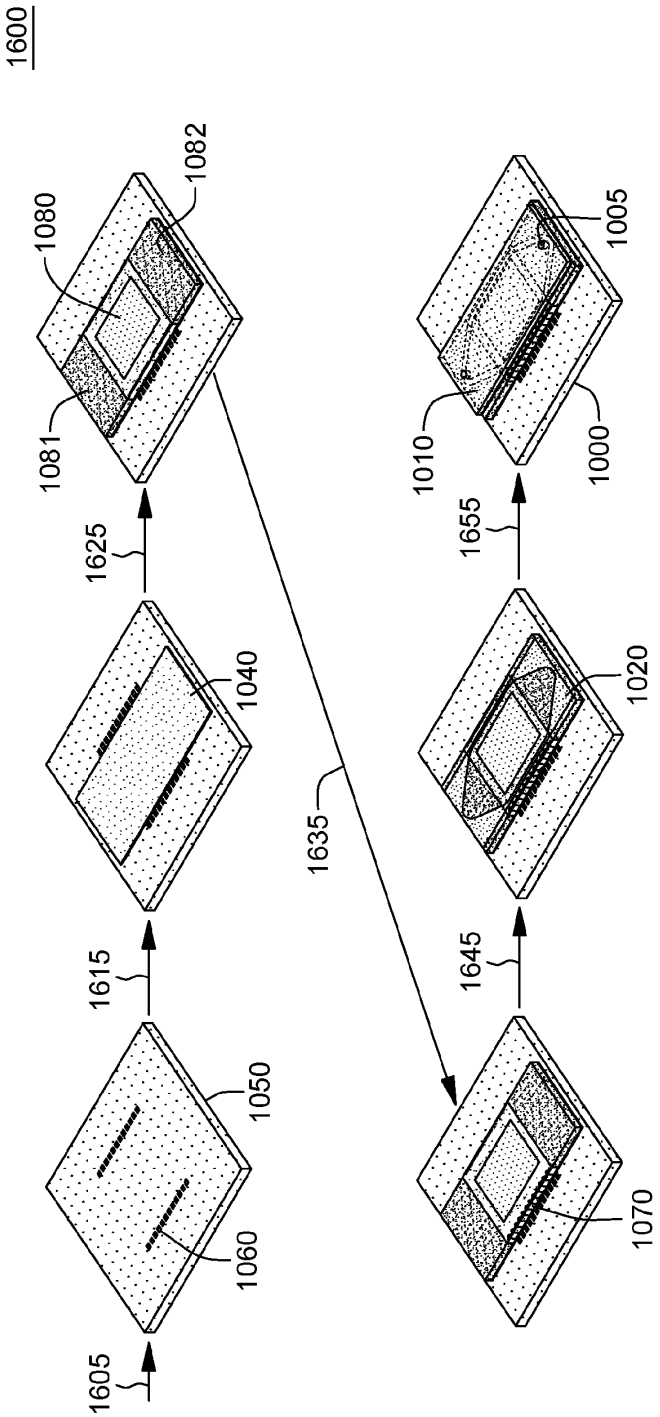

1600
1605
1615
1625
1635
1645
1655
1050
1060
1040
1080
1081
1082
1070
1020
1010
1000
1005

FIG. 16

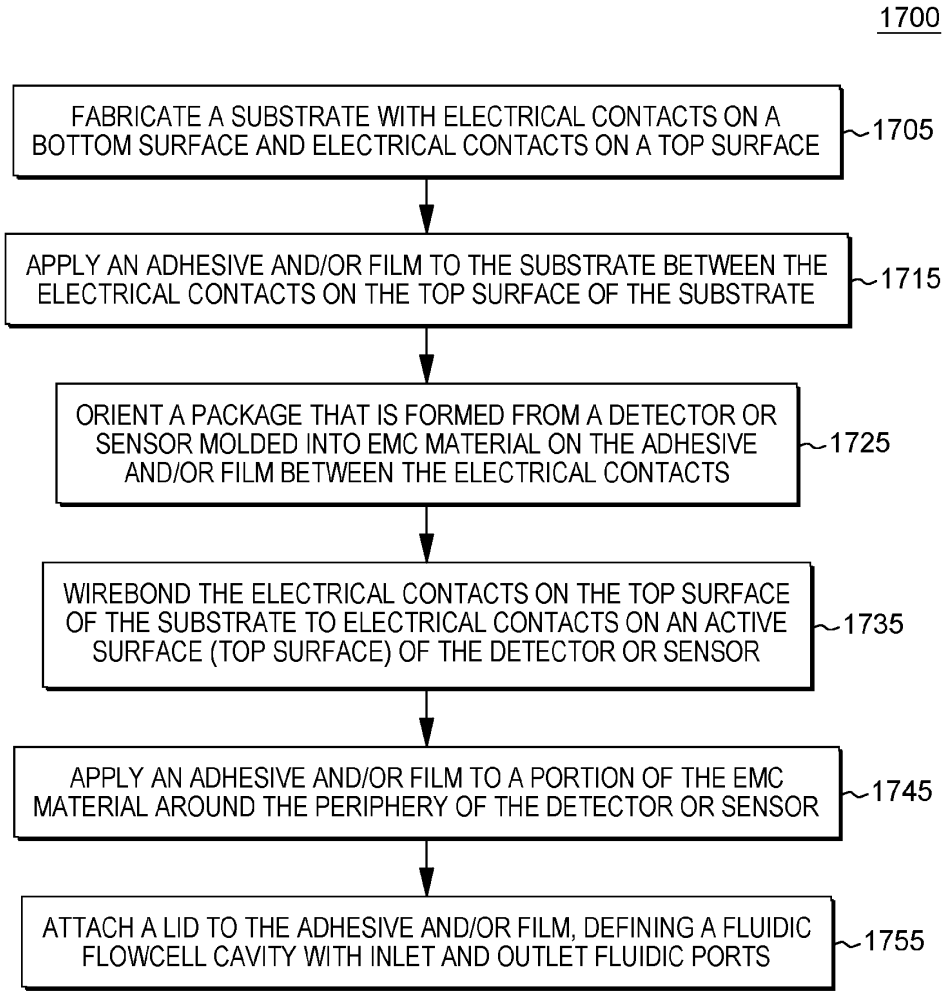

1700
FABRICATE A SUBSTRATE WITH ELECTRICAL CONTACTS ON A BOTTOM SURFACE AND ELECTRICAL CONTACTS ON A TOP SURFACE
1705
APPLY AN ADHESIVE AND/OR FILM TO THE SUBSTRATE BETWEEN THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE
1715
ORIENT A PACKAGE THAT IS FORMED FROM A DETECTOR OR SENSOR MOLDED INTO EMC MATERIAL ON THE ADHESIVE AND/OR FILM BETWEEN THE ELECTRICAL CONTACTS
1725
WIREBOND THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE TO ELECTRICAL CONTACTS ON AN ACTIVE SURFACE (TOP SURFACE) OF THE DETECTOR OR SENSOR
1735
APPLY AN ADHESIVE AND/OR FILM TO A PORTION OF THE EMC MATERIAL AROUND THE PERIPHERY OF THE DETECTOR OR SENSOR
1745
ATTACH A LID TO THE ADHESIVE AND/OR FILM, DEFINING A FLUIDIC FLOWCELL CAVITY WITH INLET AND OUTLET FLUIDIC PORTS
1755

FIG. 17

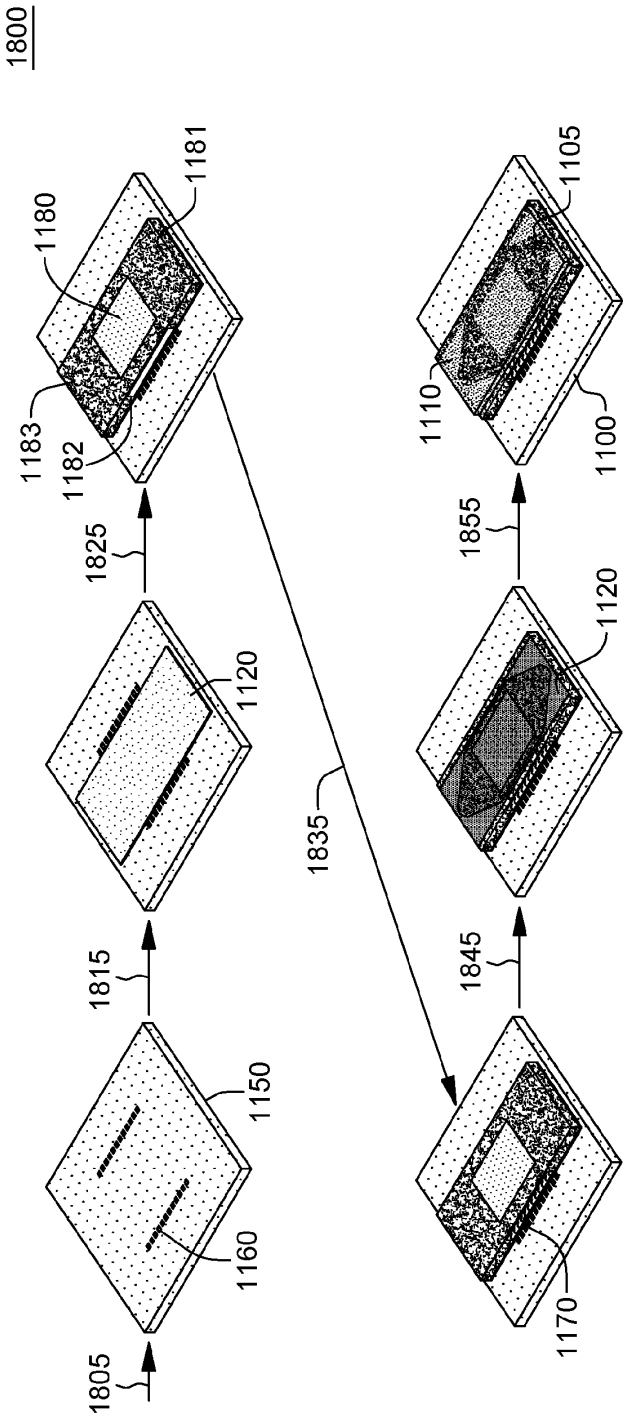

1800
1805
1815
1825
1835
1845
1855
1160
1150
1120
1180
1181
1183
1182
1170
1110
1105
1100
1120

FIG. 18

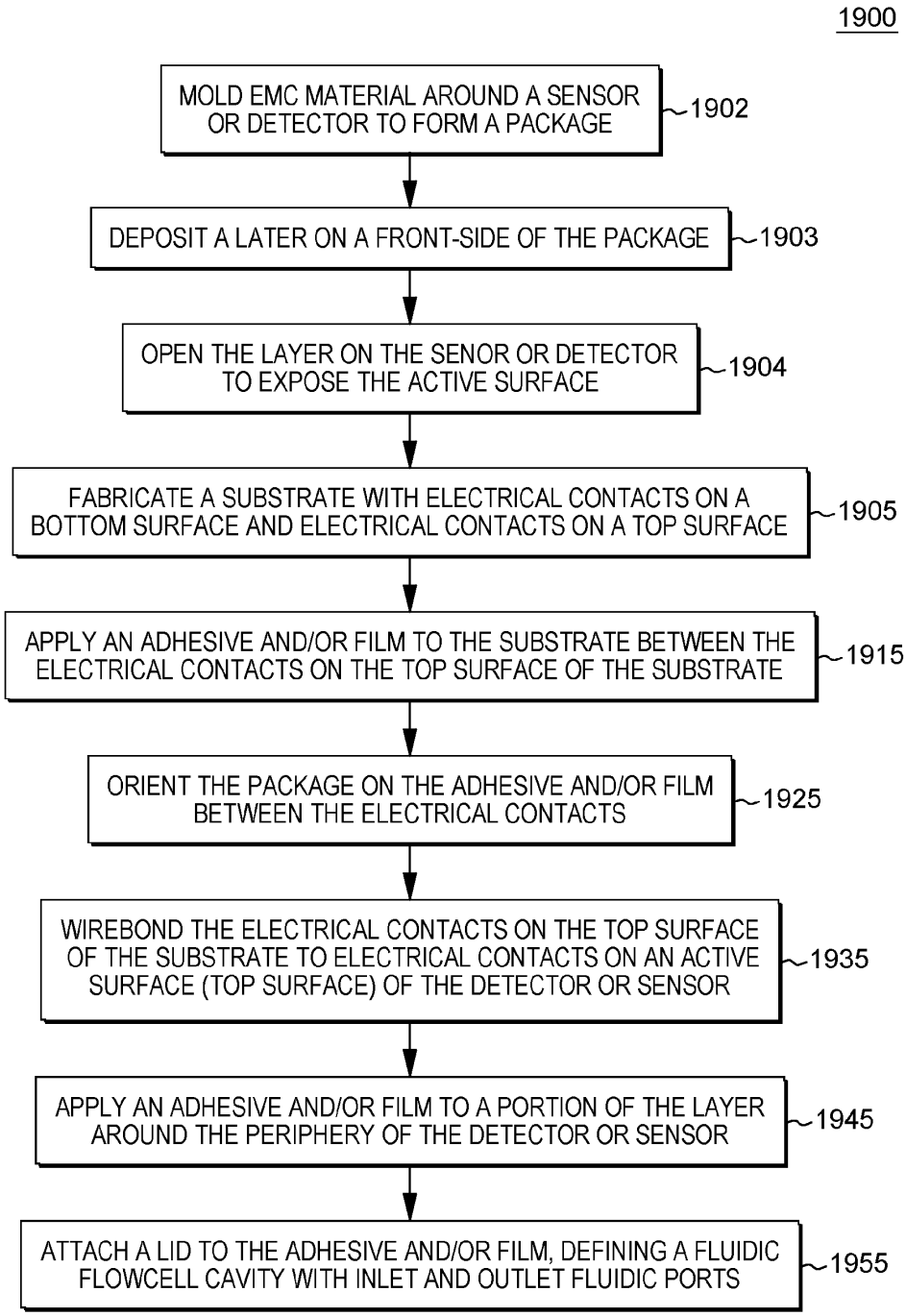

1900
MOLD EMC MATERIAL AROUND A SENSOR OR DETECTOR TO FORM A PACKAGE
1902
DEPOSIT A LATER ON A FRONT-SIDE OF THE PACKAGE
1903
OPEN THE LAYER ON THE SENOR OR DETECTOR TO EXPOSE THE ACTIVE SURFACE
1904
FABRICATE A SUBSTRATE WITH ELECTRICAL CONTACTS ON A BOTTOM SURFACE AND ELECTRICAL CONTACTS ON A TOP SURFACE
1905
APPLY AN ADHESIVE AND/OR FILM TO THE SUBSTRATE BETWEEN THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE
1915
ORIENT THE PACKAGE ON THE ADHESIVE AND/OR FILM BETWEEN THE ELECTRICAL CONTACTS
1925
WIREBOND THE ELECTRICAL CONTACTS ON THE TOP SURFACE OF THE SUBSTRATE TO ELECTRICAL CONTACTS ON AN ACTIVE SURFACE (TOP SURFACE) OF THE DETECTOR OR SENSOR
1935
APPLY AN ADHESIVE AND/OR FILM TO A PORTION OF THE LAYER AROUND THE PERIPHERY OF THE DETECTOR OR SENSOR
1945
ATTACH A LID TO THE ADHESIVE AND/OR FILM, DEFINING A FLUIDIC FLOWCELL CAVITY WITH INLET AND OUTLET FLUIDIC PORTS
1955

FIG. 19

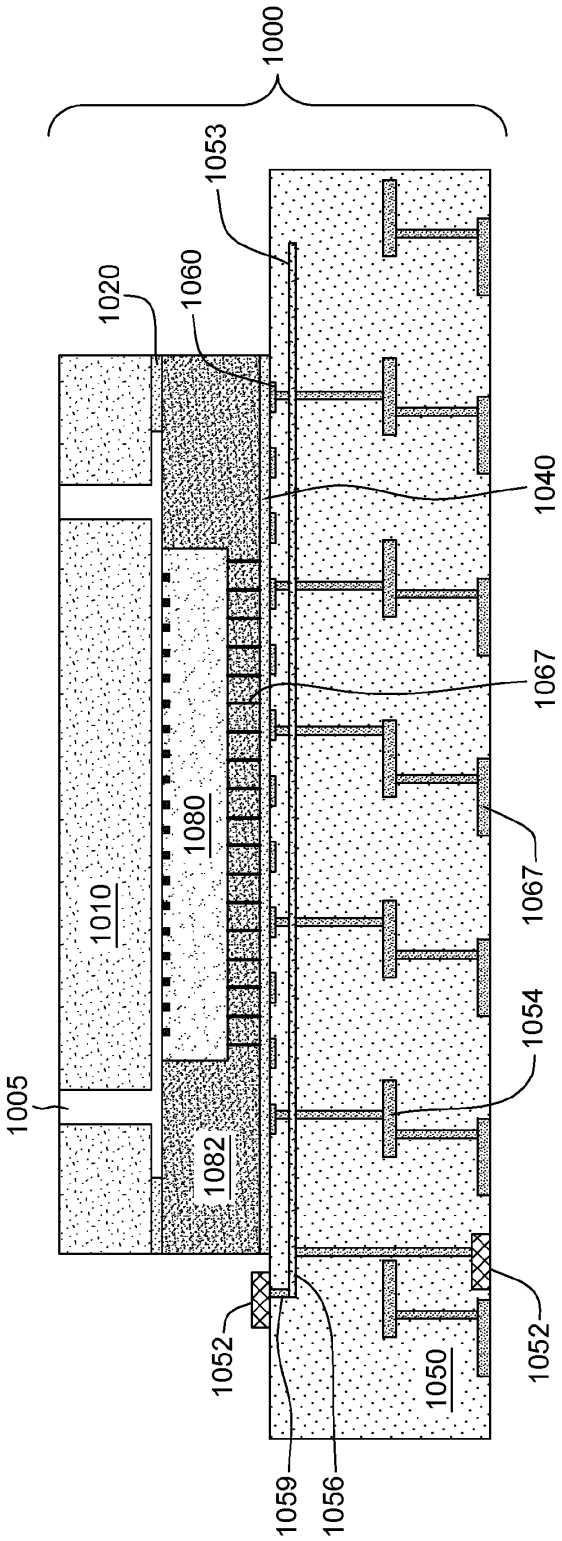

2000
1000
1053
1020
1060
1040
1067
1080
1010
1067
1054
1005
1082
1052
1052
1050
1059
1056

FIG. 20

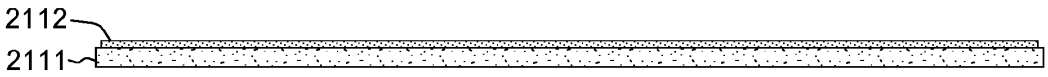


FIG. 21

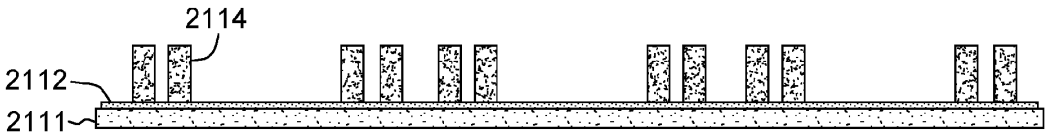


FIG. 22



FIG. 23

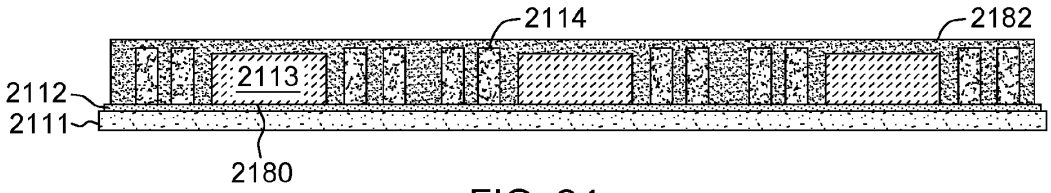


FIG. 24

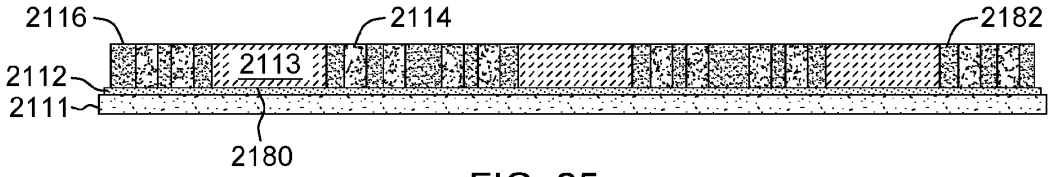


FIG. 25

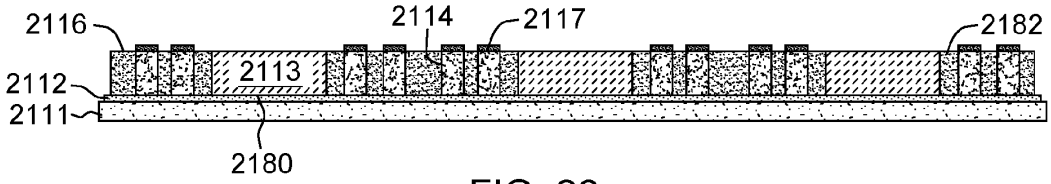


FIG. 26

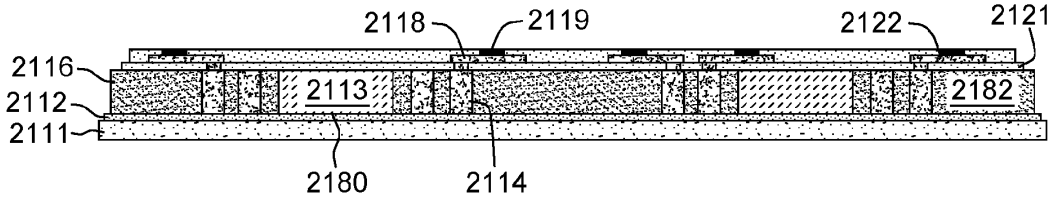


FIG. 27

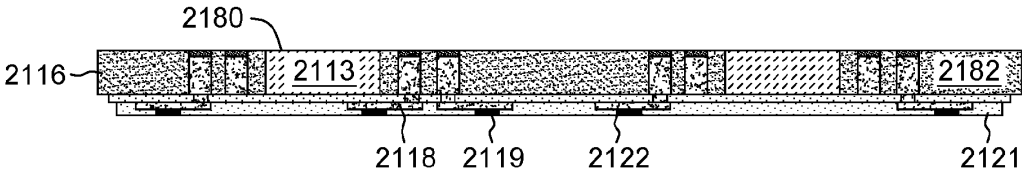


FIG. 28

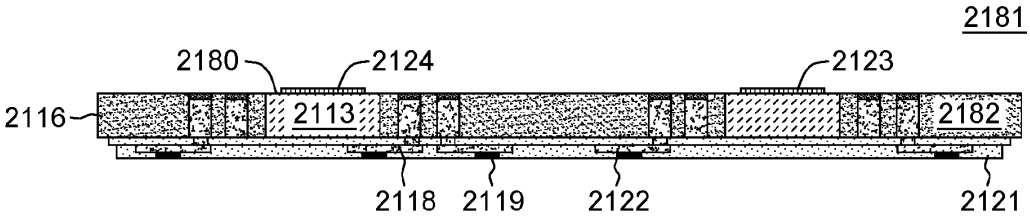


FIG. 29

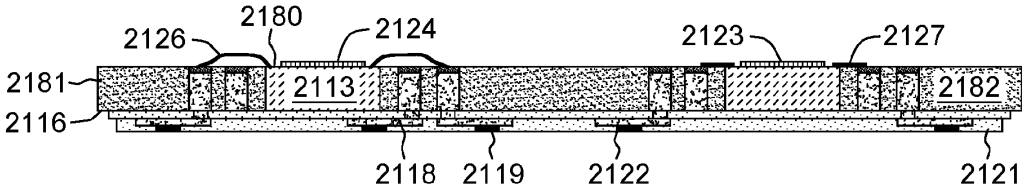


FIG. 30

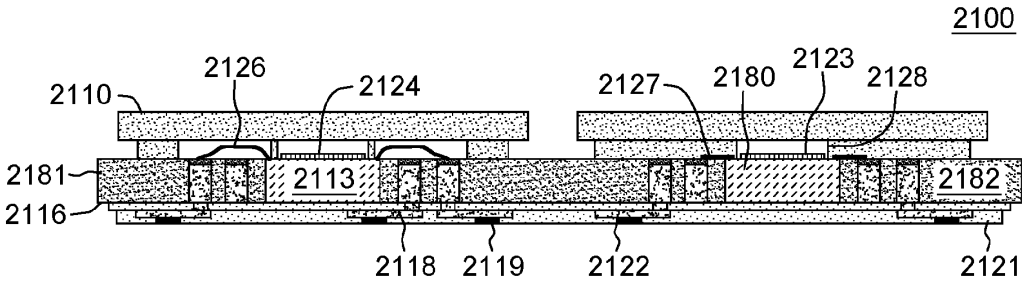


FIG. 31

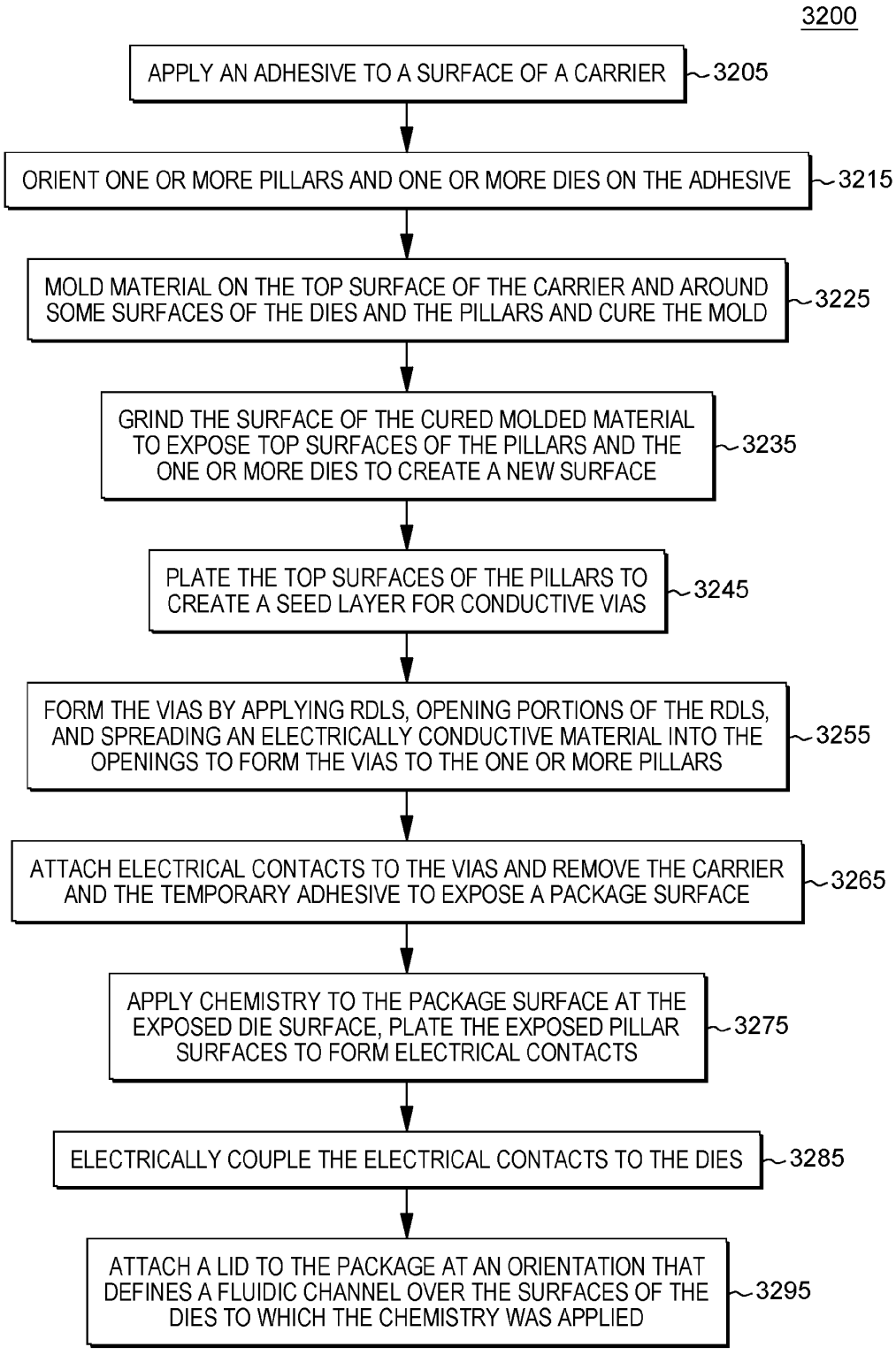

3200
APPLY AN ADHESIVE TO A SURFACE OF A CARRIER
3205
ORIENT ONE OR MORE PILLARS AND ONE OR MORE DIES ON THE ADHESIVE
3215
MOLD MATERIAL ON THE TOP SURFACE OF THE CARRIER AND AROUND SOME SURFACES OF THE DIES AND THE PILLARS AND CURE THE MOLD
3225
GRIND THE SURFACE OF THE CURED MOLDED MATERIAL TO EXPOSE TOP SURFACES OF THE PILLARS AND THE ONE OR MORE DIES TO CREATE A NEW SURFACE
3235
PLATE THE TOP SURFACES OF THE PILLARS TO CREATE A SEED LAYER FOR CONDUCTIVE VIAS
3245
FORM THE VIAS BY APPLYING RDLS, OPENING PORTIONS OF THE RDLS, AND SPREADING AN ELECTRICALLY CONDUCTIVE MATERIAL INTO THE OPENINGS TO FORM THE VIAS TO THE ONE OR MORE PILLARS
3255
ATTACH ELECTRICAL CONTACTS TO THE VIAS AND REMOVE THE CARRIER AND THE TEMPORARY ADHESIVE TO EXPOSE A PACKAGE SURFACE
3265
APPLY CHEMISTRY TO THE PACKAGE SURFACE AT THE EXPOSED DIE SURFACE, PLATE THE EXPOSED PILLAR SURFACES TO FORM ELECTRICAL CONTACTS
3275
ELECTRICALLY COUPLE THE ELECTRICAL CONTACTS TO THE DIES
3285
ATTACH A LID TO THE PACKAGE AT AN ORIENTATION THAT DEFINES A FLUIDIC CHANNEL OVER THE SURFACES OF THE DIES TO WHICH THE CHEMISTRY WAS APPLIED
3295

FIG. 32