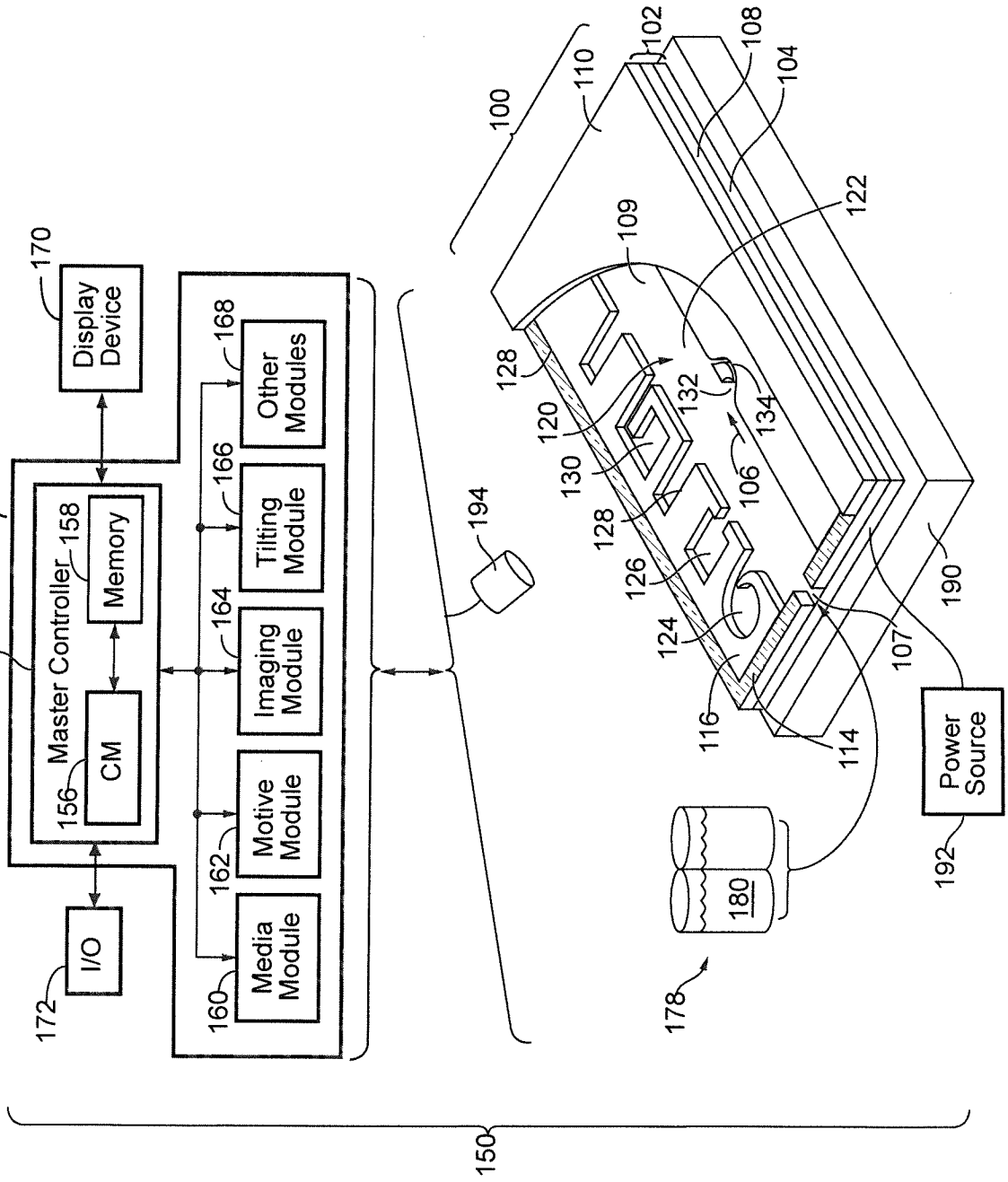
150
152
154
Master Controller
156
CM
158
Memory
160
Media Module
162
Motive Module
164
Imaging Module
166
Tilting Module
168
Other Modules
170
Display Device
172
I/O
100
102
104
106
107
108
109
110
114
116
120
122
124
126
128
130
132
134
178
180
190
192
Power Source
194

FIG. 1A

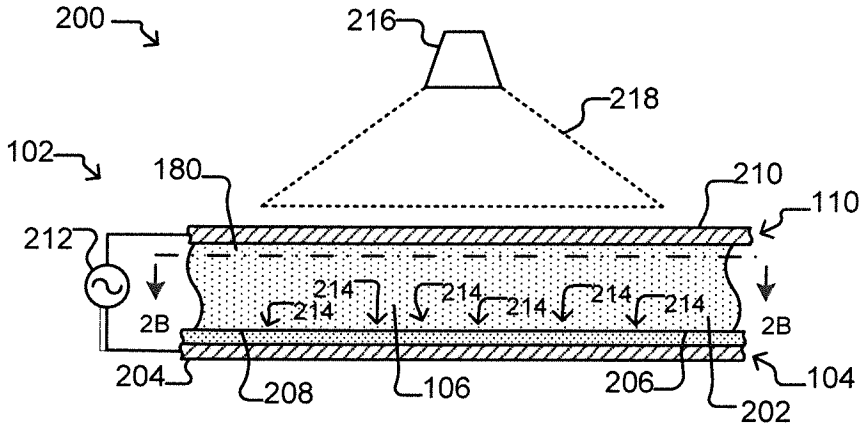
200
216
218
102
180
210
110
212
214
214
214
214
214
214
2B
2B
204
208
106
206
202
104

FIG. 1B

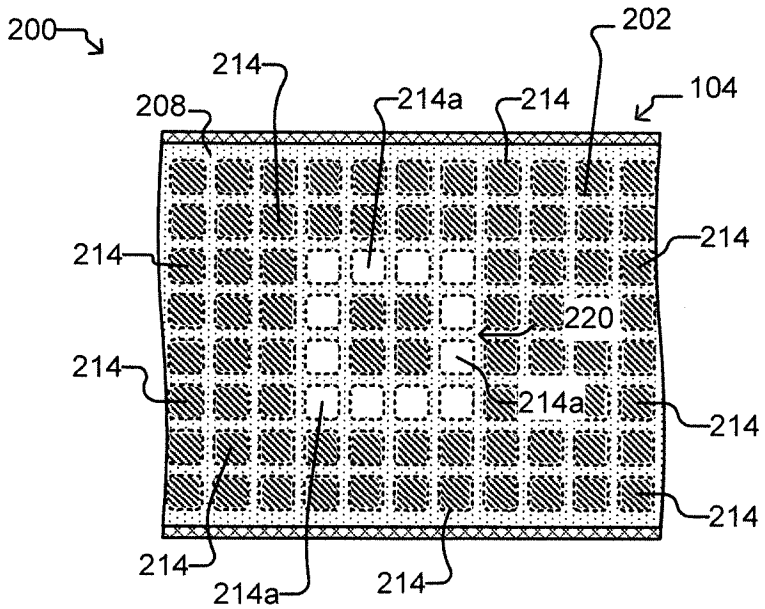
200
202
214
208
214a
214
104
214
214
220
214
214a
214
214
214
214a
214

FIG. 1C

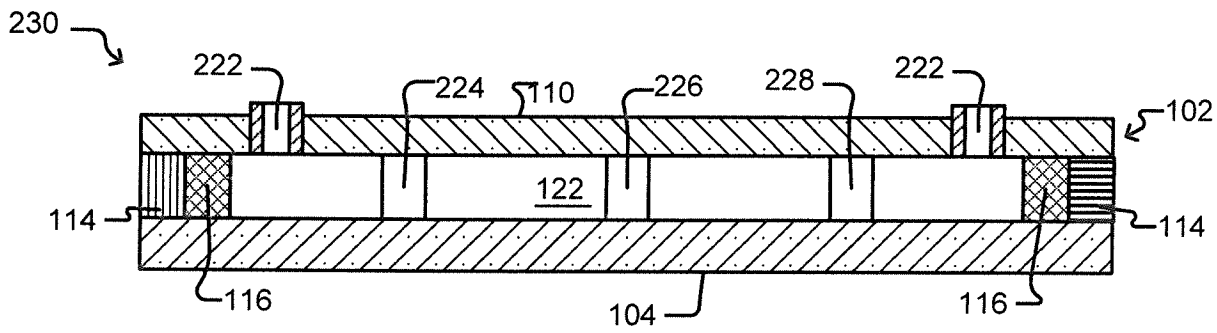
230
222
224
110
226
228
222
102
122
114
114
116
104
116

FIG. 2A

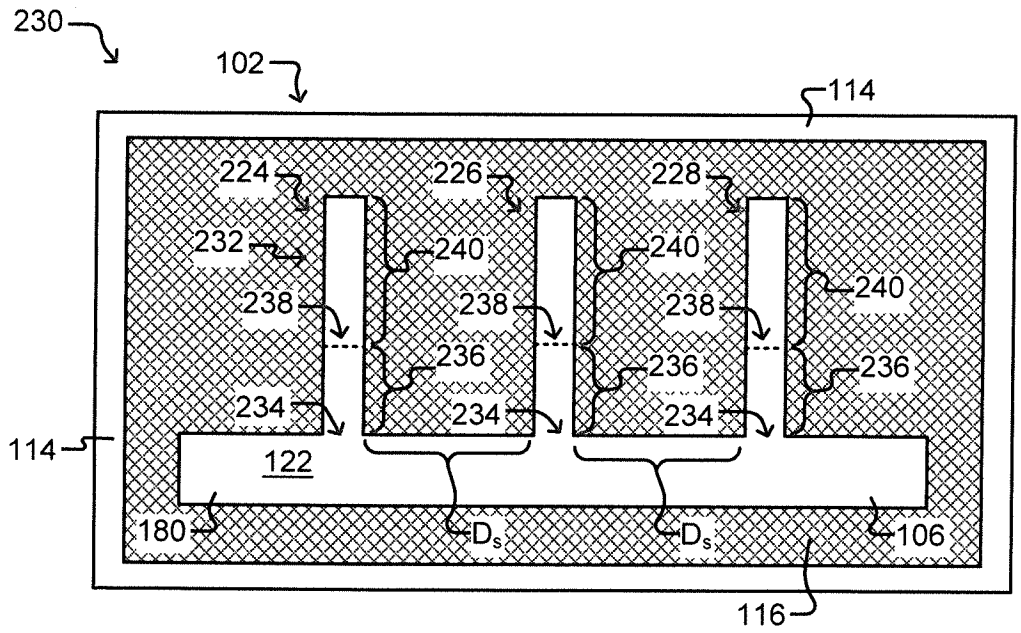
230
102
114
224
226
228
232
240
240
240
238
238
238
236
236
236
234
234
234
114
122
180
D_s
D_s
106
116

FIG. 2B

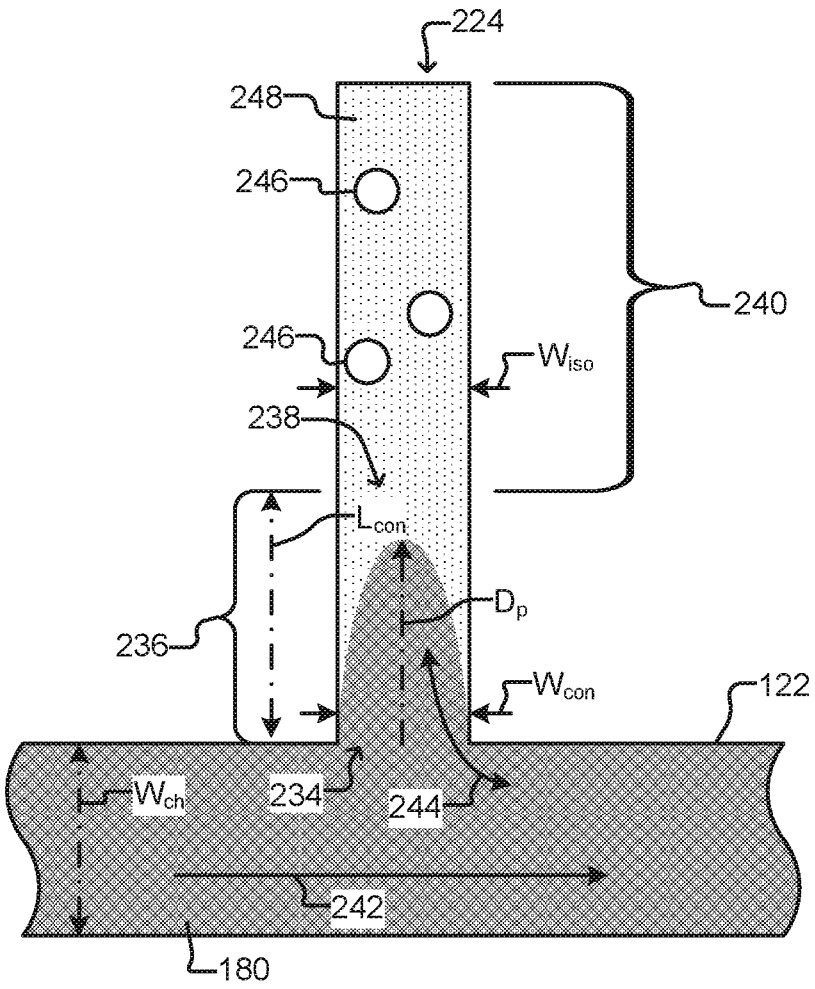
224
248
246
246
238
240
W_{iso}
L_{con}
236
D_p
W_{con}
122
W_{ch}
234
244
242
180

FIG. 2C

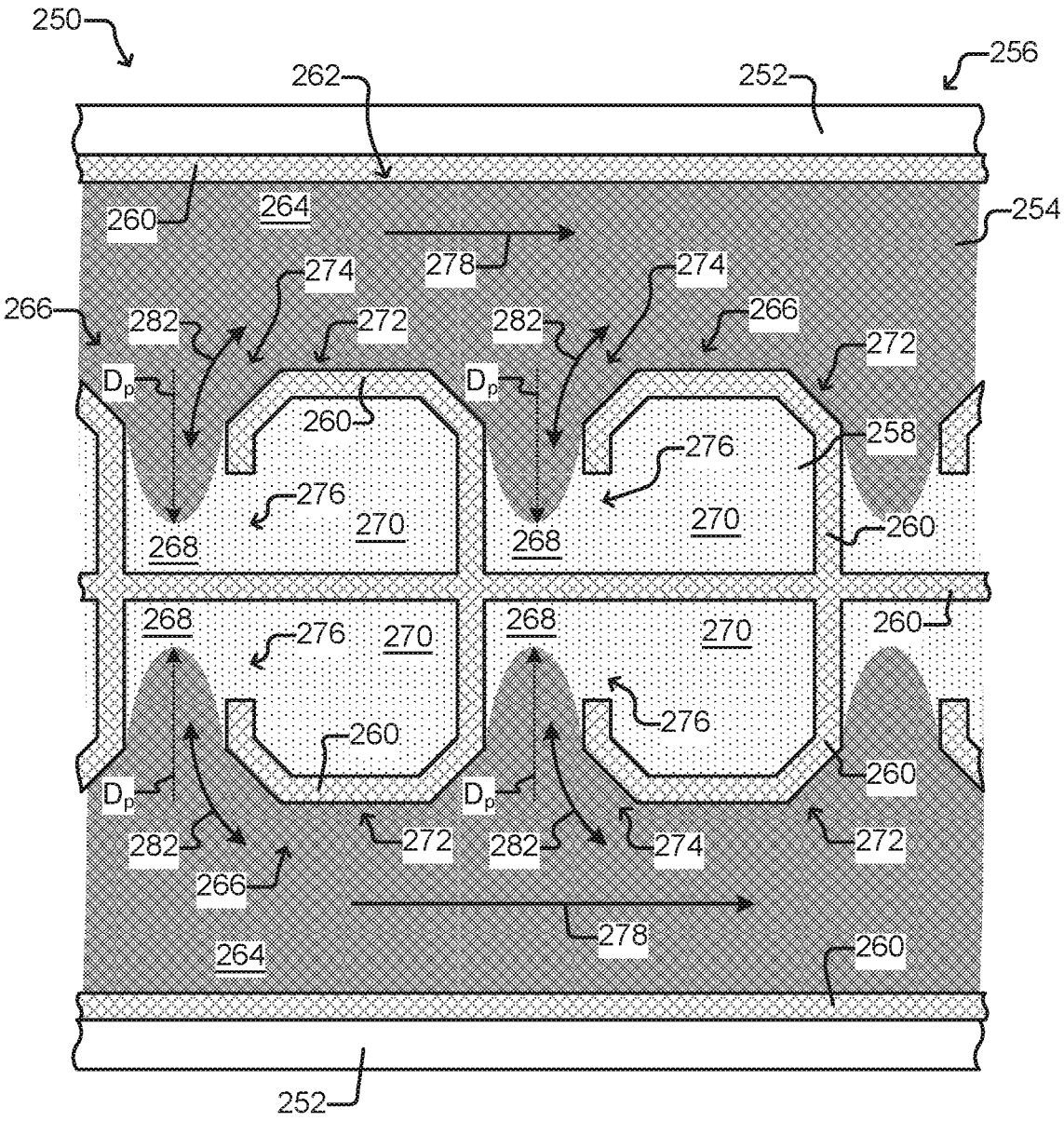
250
256
262
252
260
264
254
278
274
274
266
282
272
282
266
272
D_p
D_p
260
276
258
276
270
270
268
268
260
268
276
270
268
270
260
276
260
260
D_p
D_p
282
272
282
274
272
266
278
260
264
252

FIG. 2D

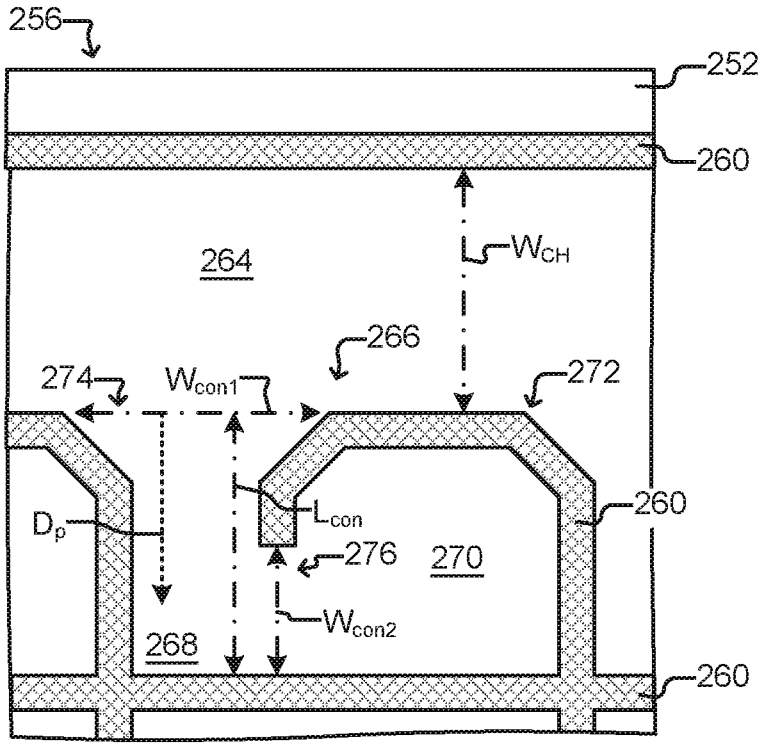
256
252
260
264
W_{CH}
266
274
W_{con1}
272
260
L_{con}
D_p
276
270
W_{con2}
268
260

FIG.2E

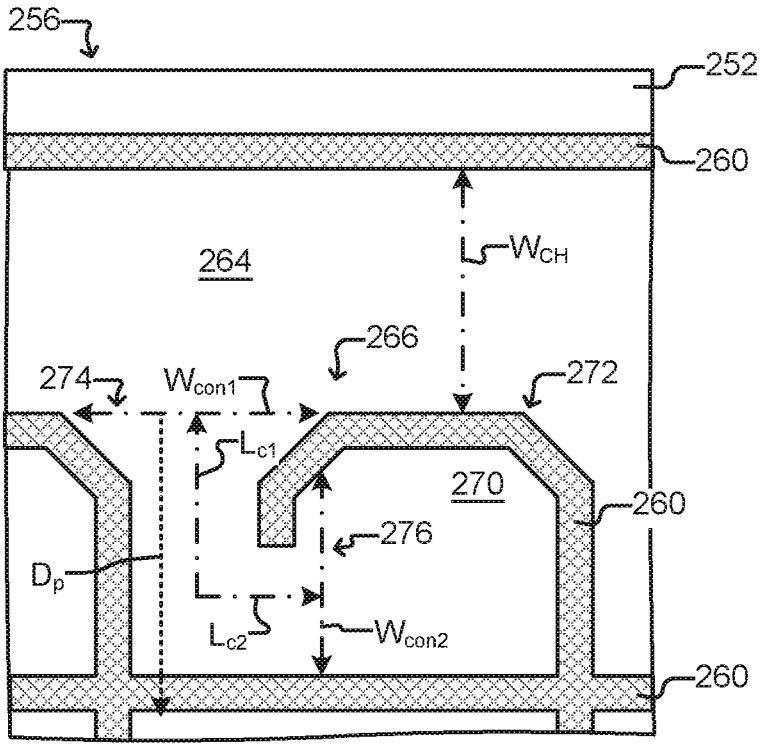
256
252
260
264
W_{CH}
266
274
W_{con1}
272
L_{c1}
270
260
276
D_p
L_{c2}
W_{con2}
260

FIG. 2F

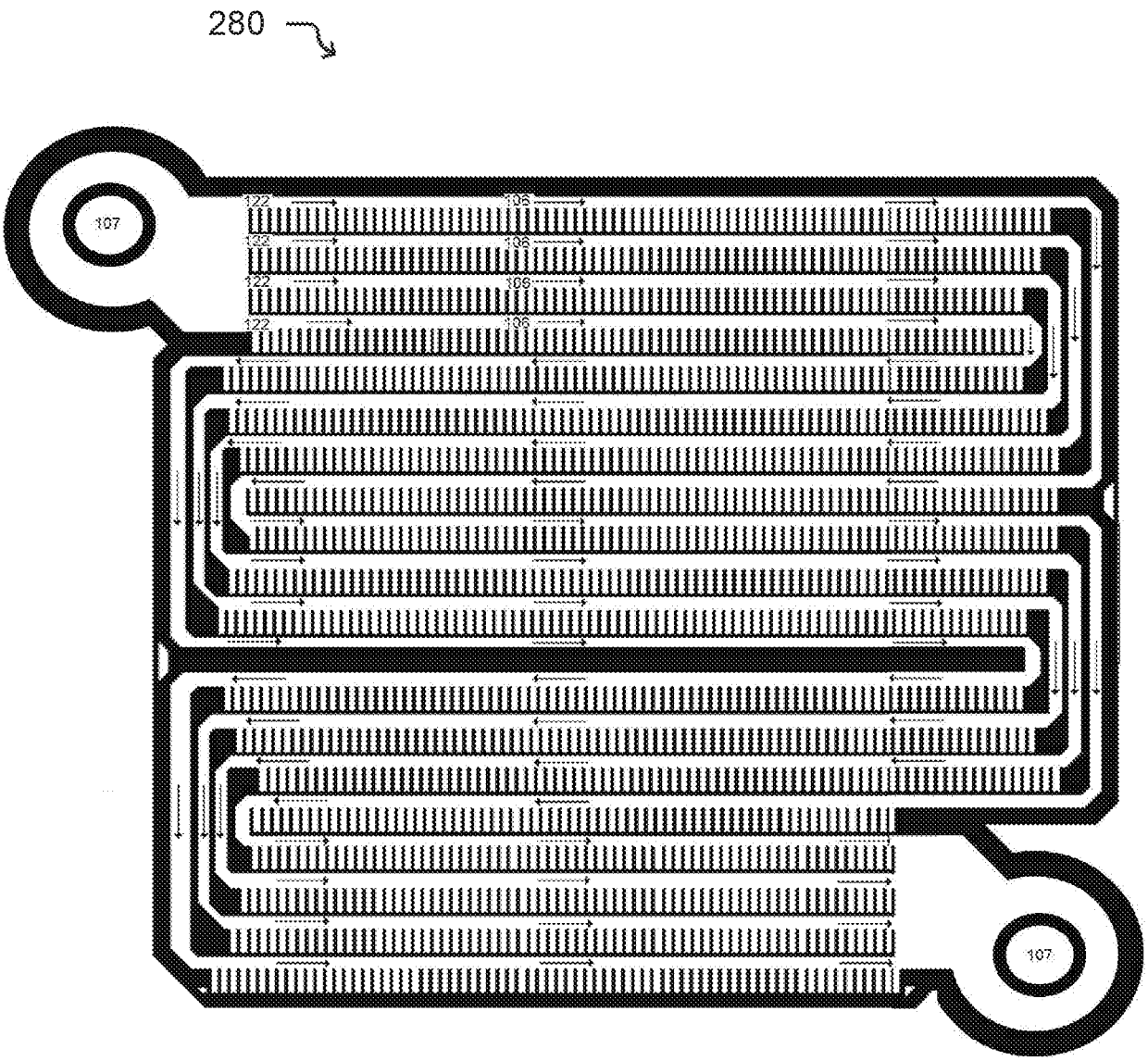

FIG. 2G

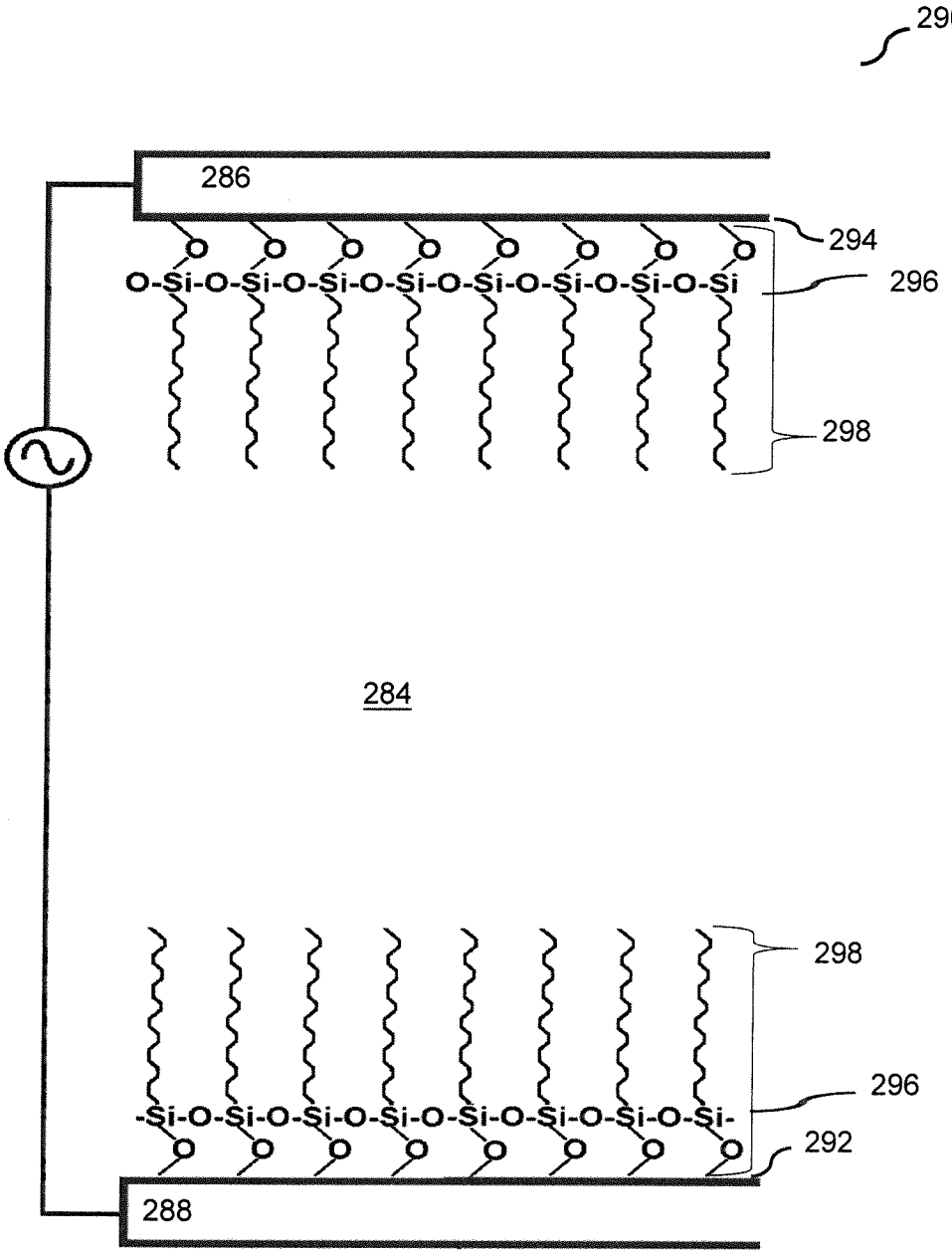
290
286
294
O-Si-O-Si-O-Si-O-Si-O-Si-O-Si-O-Si-O-Si
296
298
284
298
296
-Si-O-Si-O-Si-O-Si-O-Si-O-Si-O-Si-O-Si-
292
288

FIG. 2H

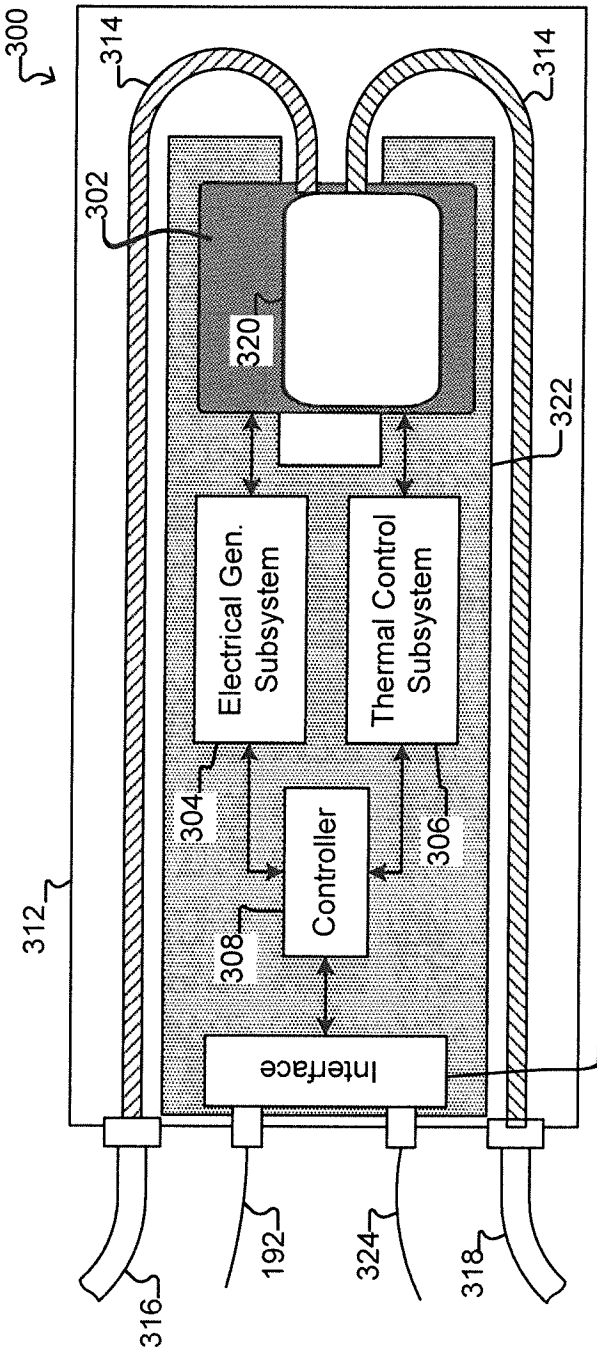
300
314
314
302
320
322
Electrical Gen. Subsystem
Thermal Control Subsystem
304
306
Controller
308
312
310
Interface
316
192
324
318

FIG. 3A

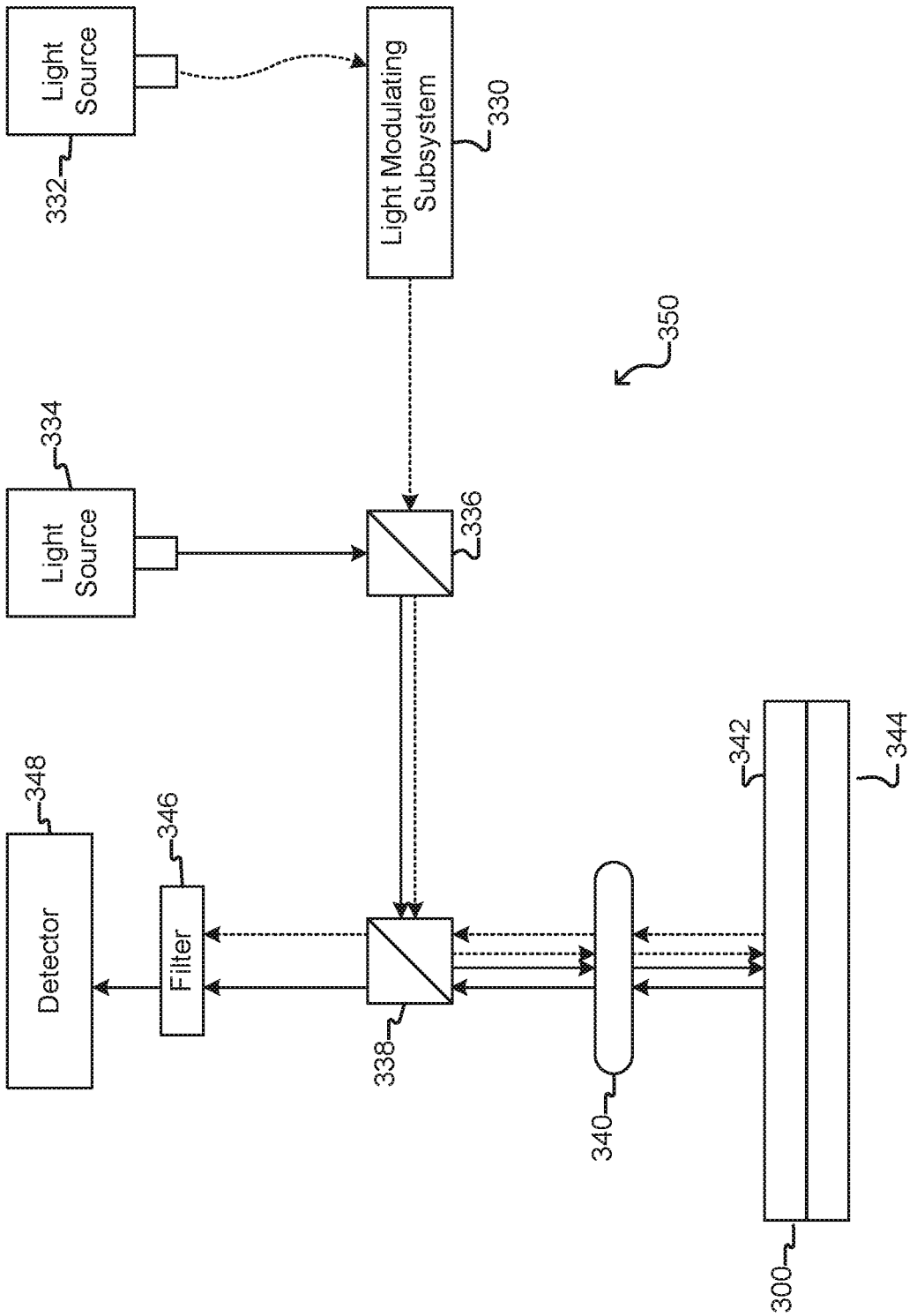
Light Source
332
Light Modulating Subsystem
330
350
Light Source
334
336
Detector
348
Filter
346
338
340
342
344
300

FIG. 3B

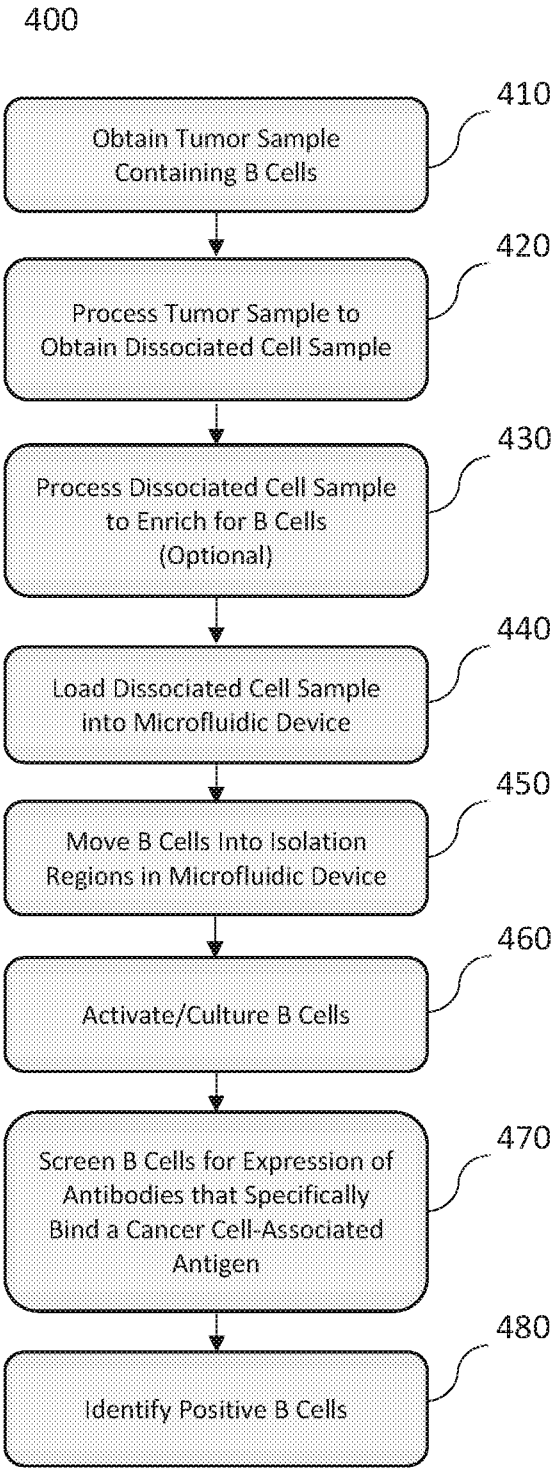
400
Obtain Tumor Sample Containing B Cells
410
Process Tumor Sample to Obtain Dissociated Cell Sample
420
Process Dissociated Cell Sample to Enrich for B Cells (Optional)
430
Load Dissociated Cell Sample into Microfluidic Device
440
Move B Cells Into Isolation Regions in Microfluidic Device
450
Activate/Culture B Cells
460
Screen B Cells for Expression of Antibodies that Specifically Bind a Cancer Cell-Associated Antigen
470
Identify Positive B Cells
480

FIG. 4

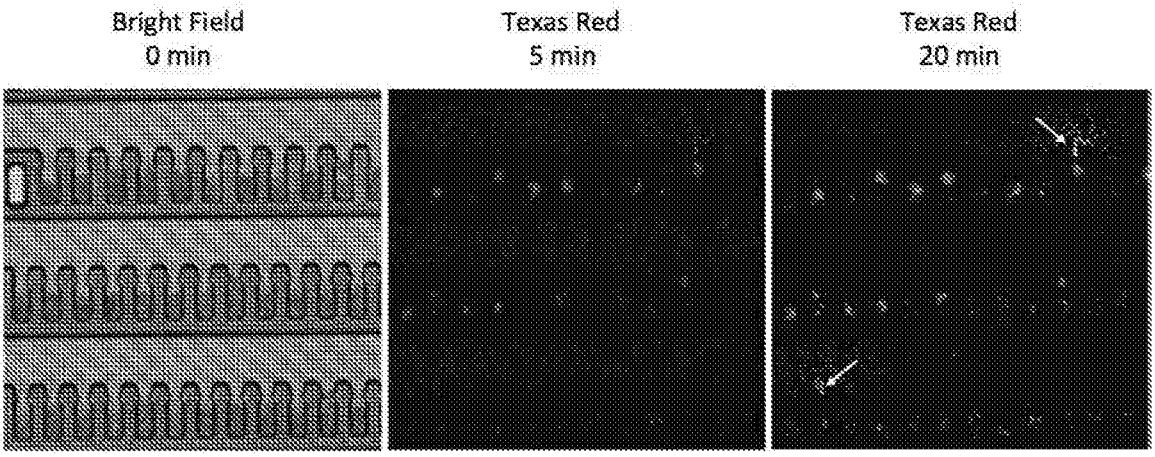

FIG. 5A FIG. 5B FIG. 5C

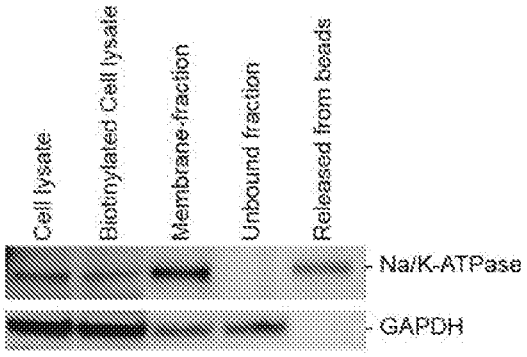

Figure 6

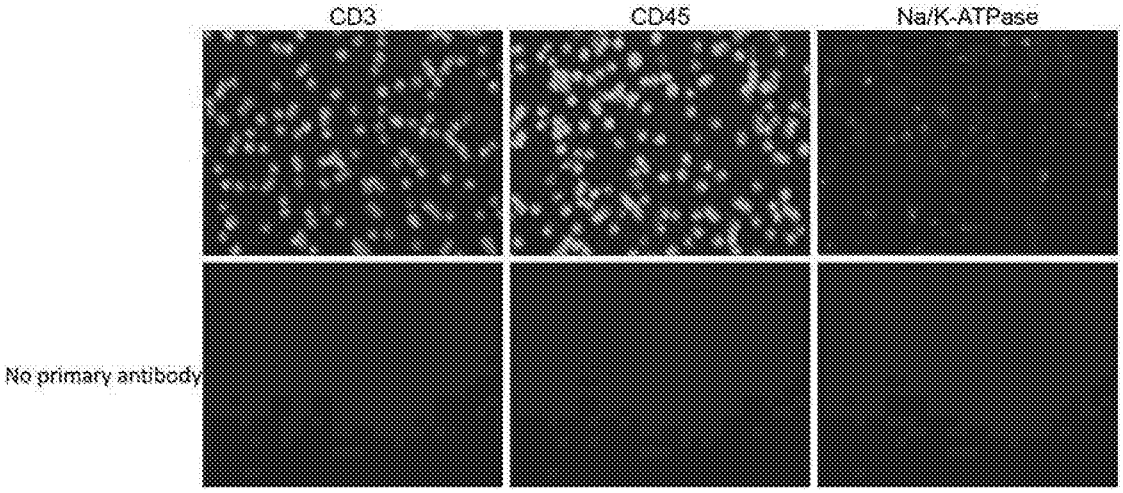

Figure 7

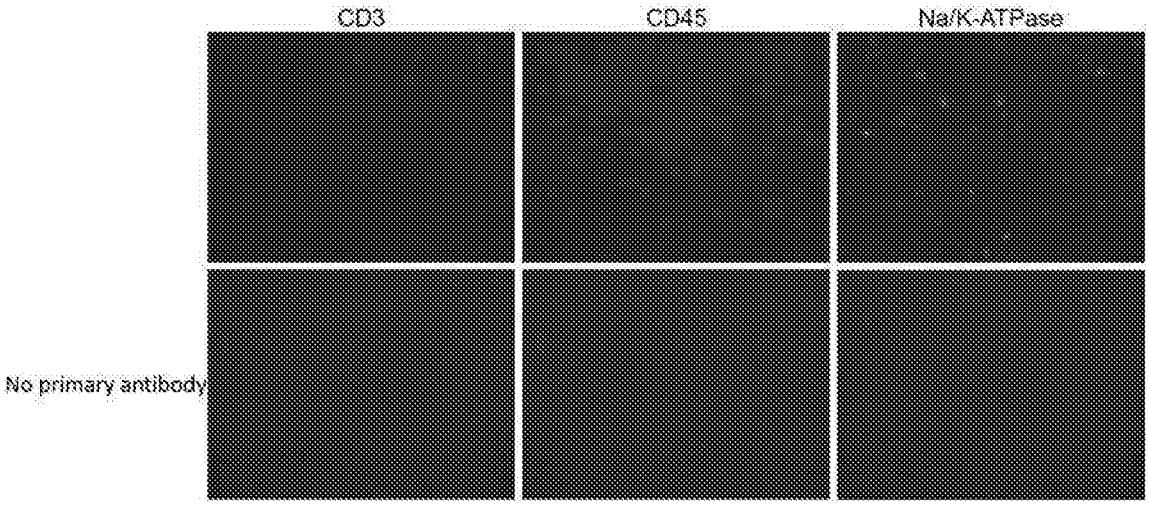

Figure 8