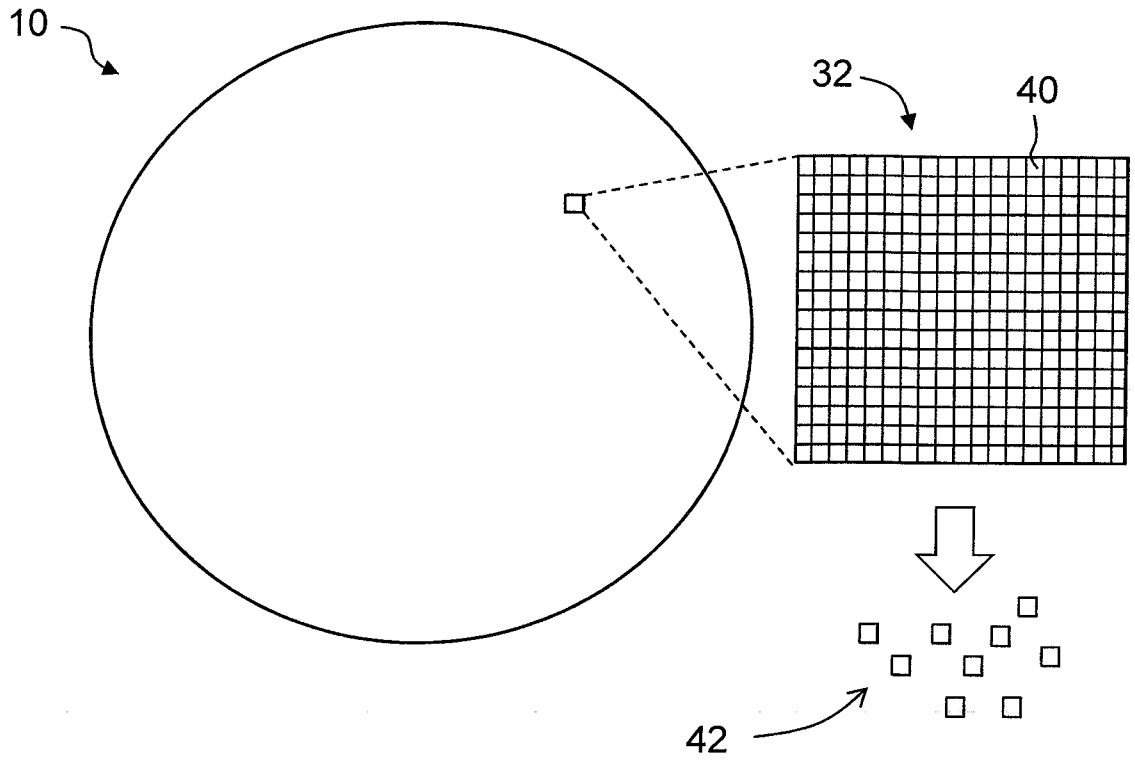


FIG. 1

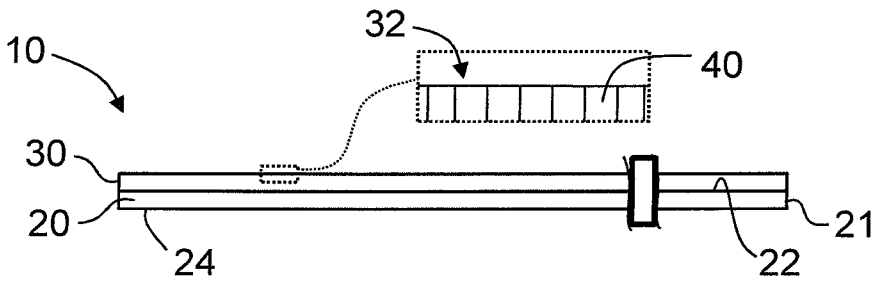


FIG. 2

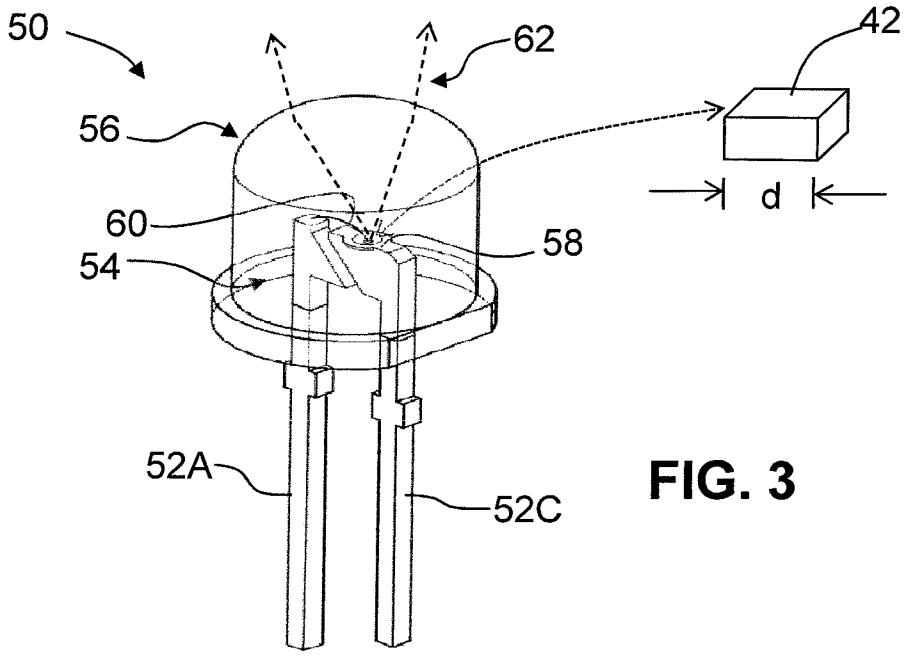


FIG. 3

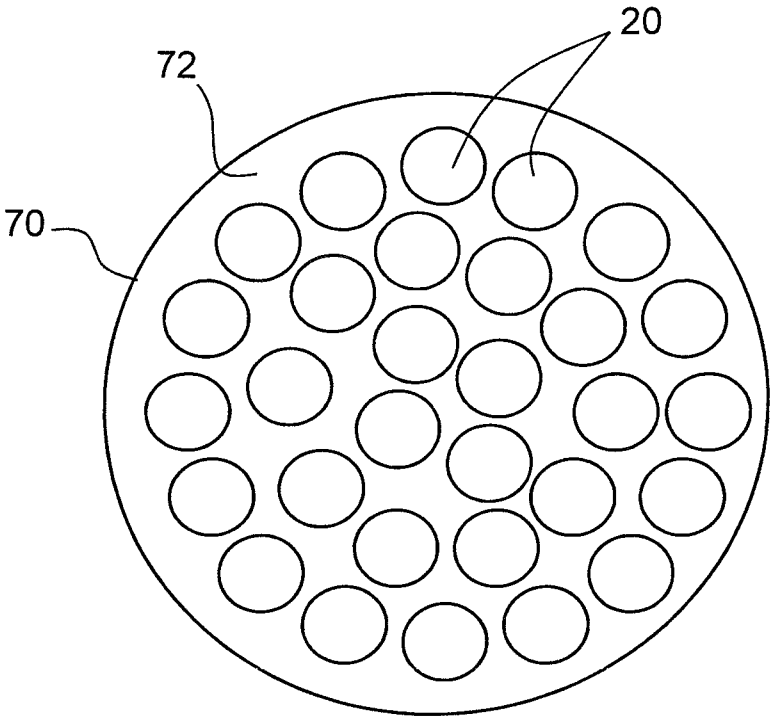


FIG. 4

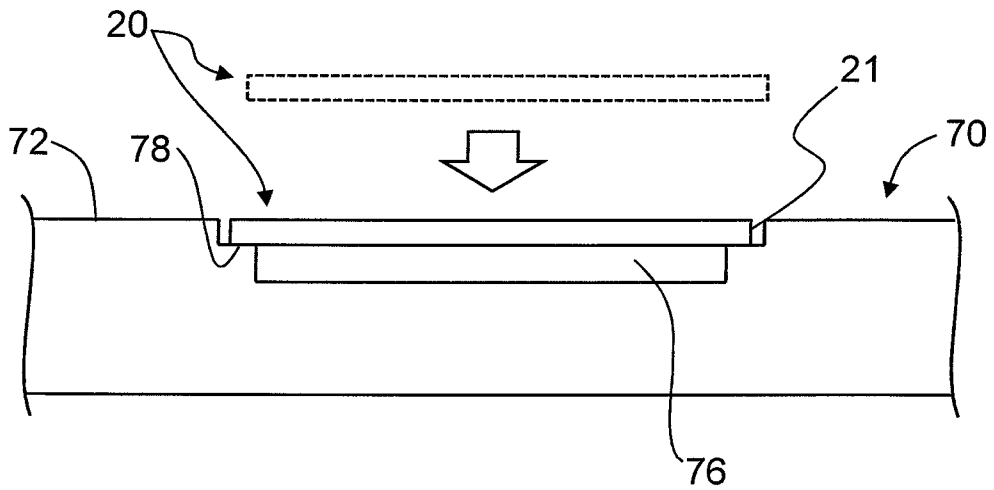


FIG. 5

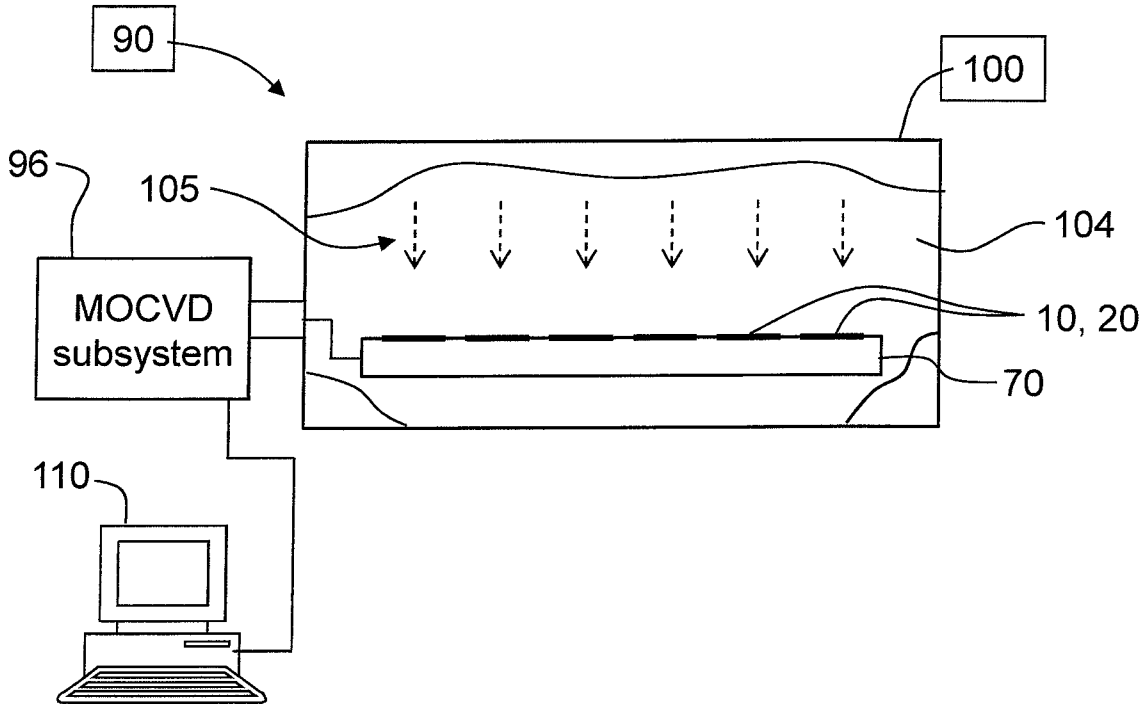


FIG. 6

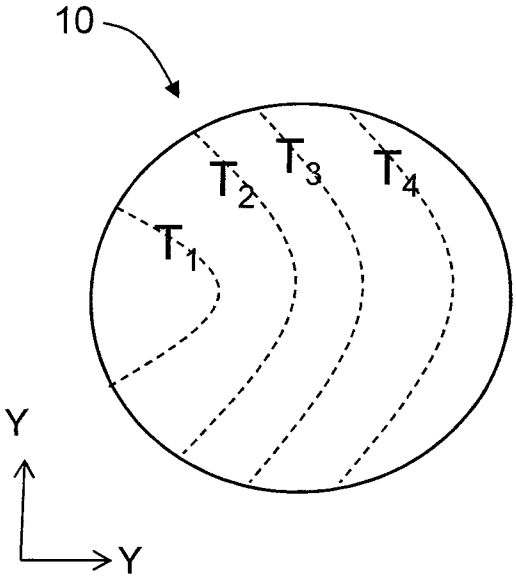


FIG. 7A

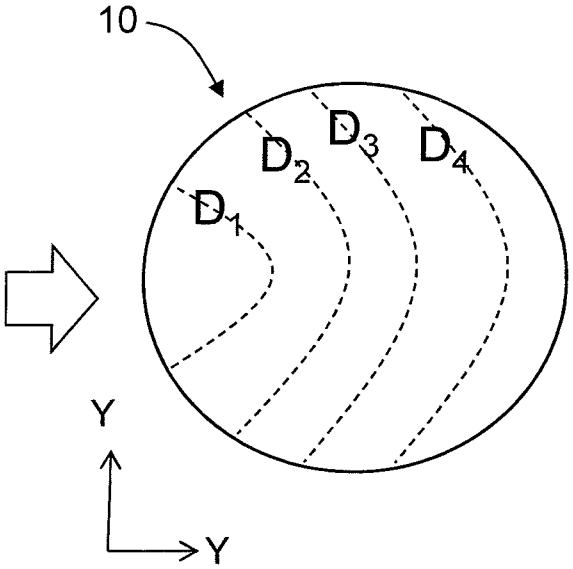


FIG. 7B

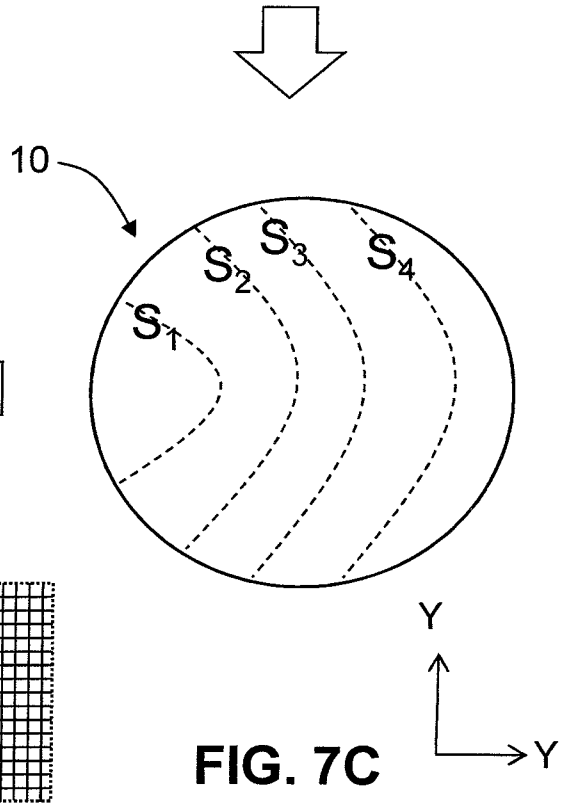


FIG. 7C

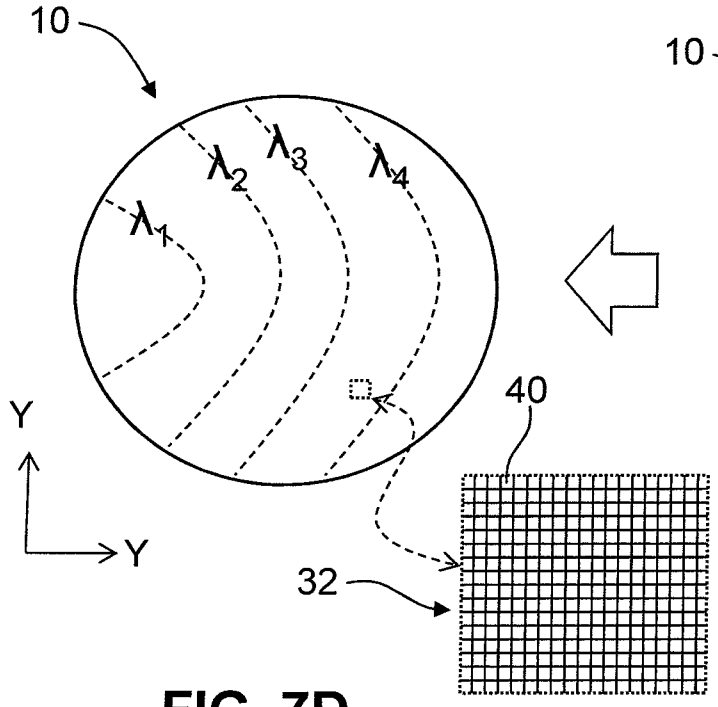


FIG. 7D

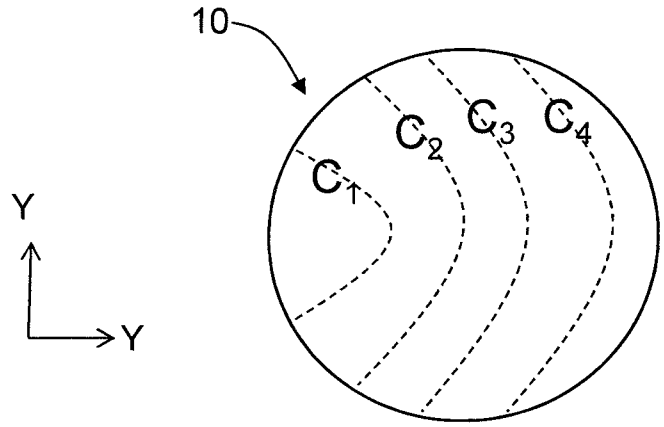


FIG. 8A

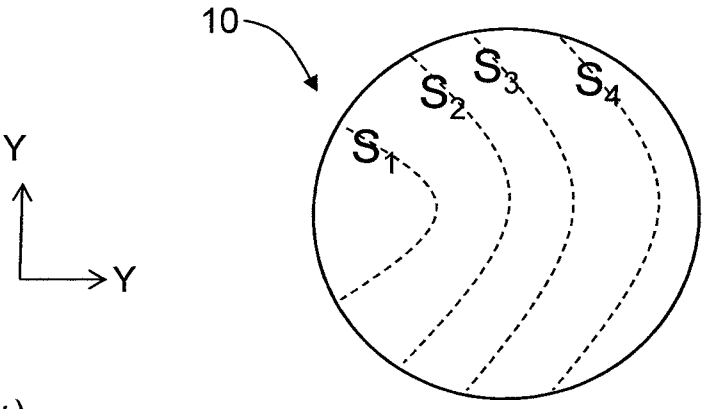


FIG. 8B

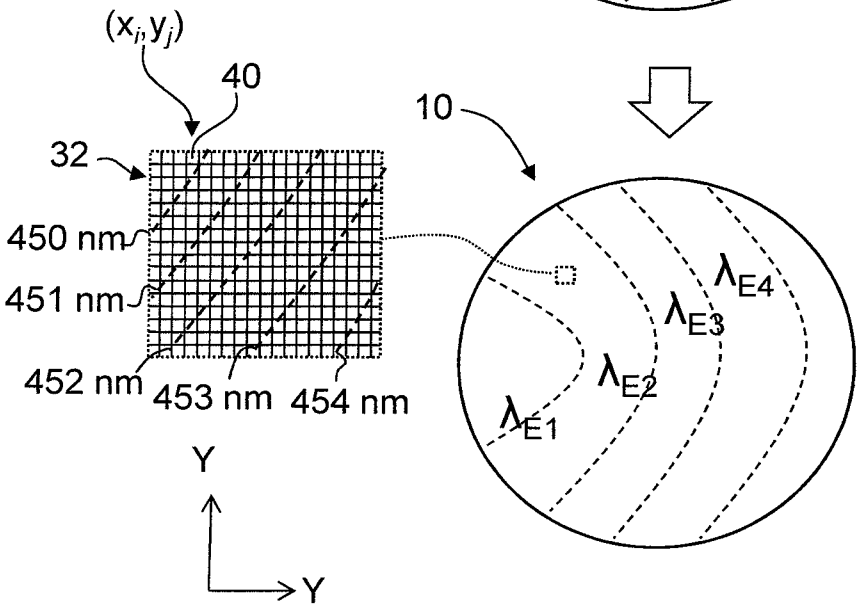


FIG. 8C

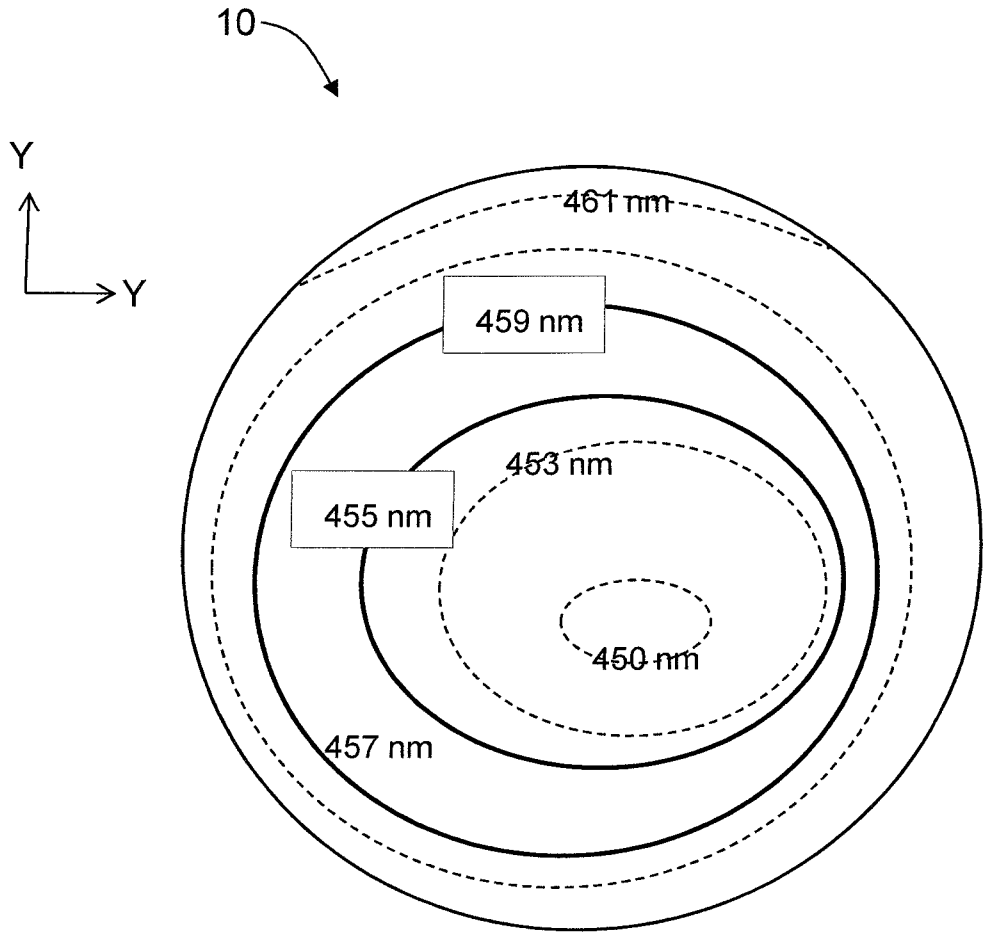


FIG. 8D

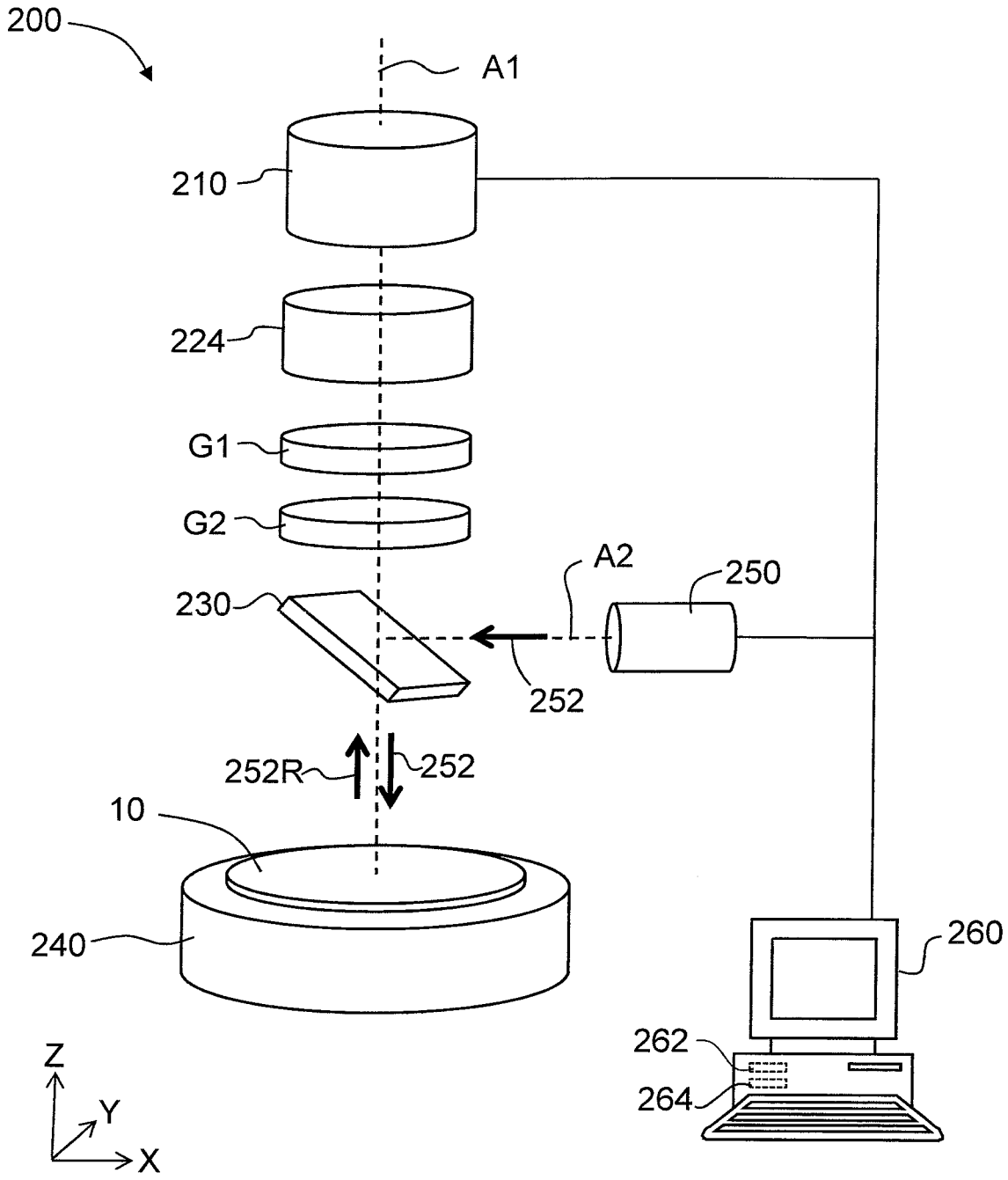

200
A1
210
224
G1
G2
A2
250
230
252
252R
252
10
240
260
262
264
Z
Y
X

FIG. 9

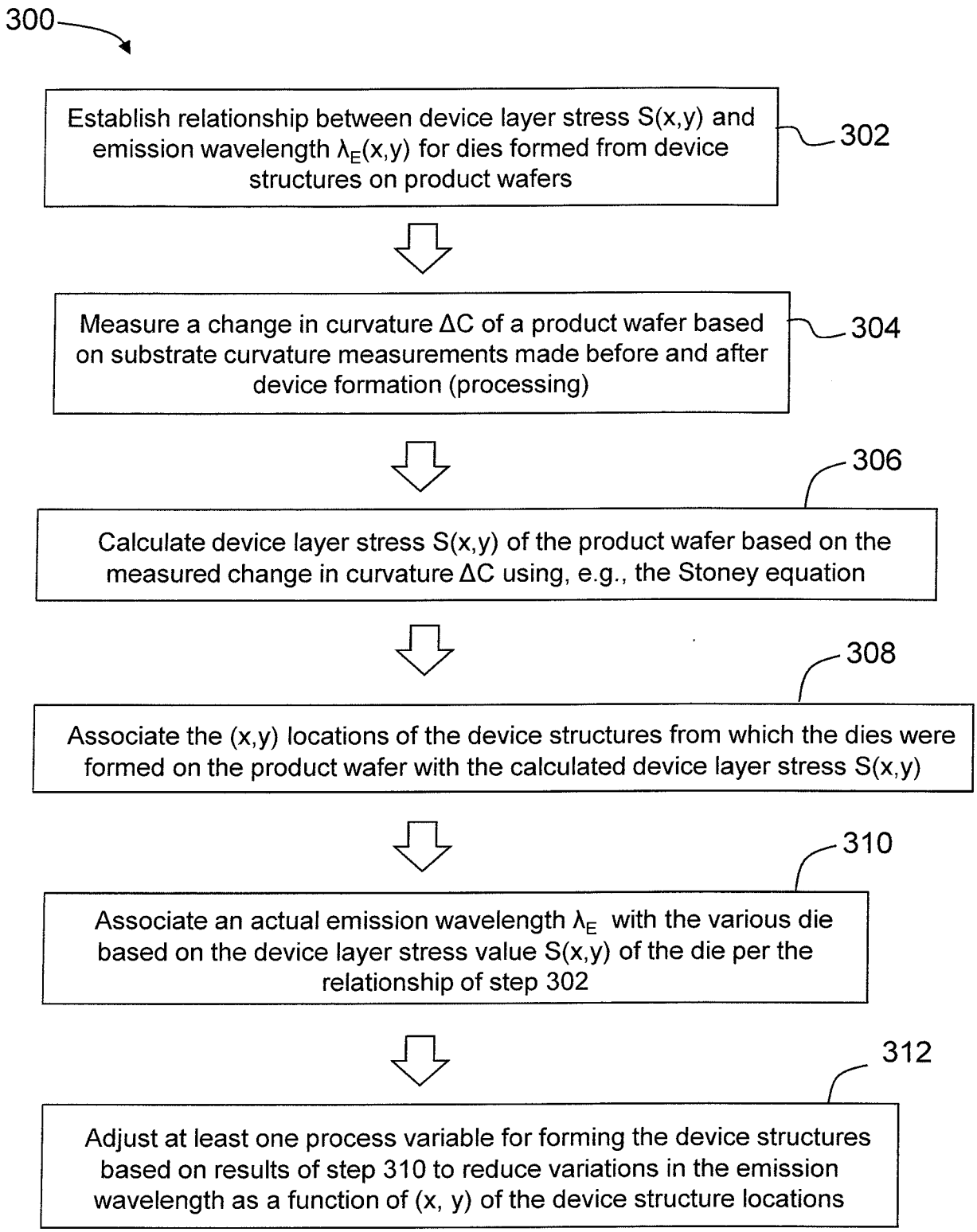

300
Establish relationship between device layer stress S(x,y) and emission wavelength λ_E(x,y) for dies formed from device structures on product wafers
302
Measure a change in curvature ΔC of a product wafer based on substrate curvature measurements made before and after device formation (processing)
304
306
Calculate device layer stress S(x,y) of the product wafer based on the measured change in curvature ΔC using, e.g., the Stoney equation
308
Associate the (x,y) locations of the device structures from which the dies were formed on the product wafer with the calculated device layer stress S(x,y)
310
Associate an actual emission wavelength λ_E with the various die based on the device layer stress value S(x,y) of the die per the relationship of step 302
312
Adjust at least one process variable for forming the device structures based on results of step 310 to reduce variations in the emission wavelength as a function of (x, y) of the device structure locations

FIG. 10