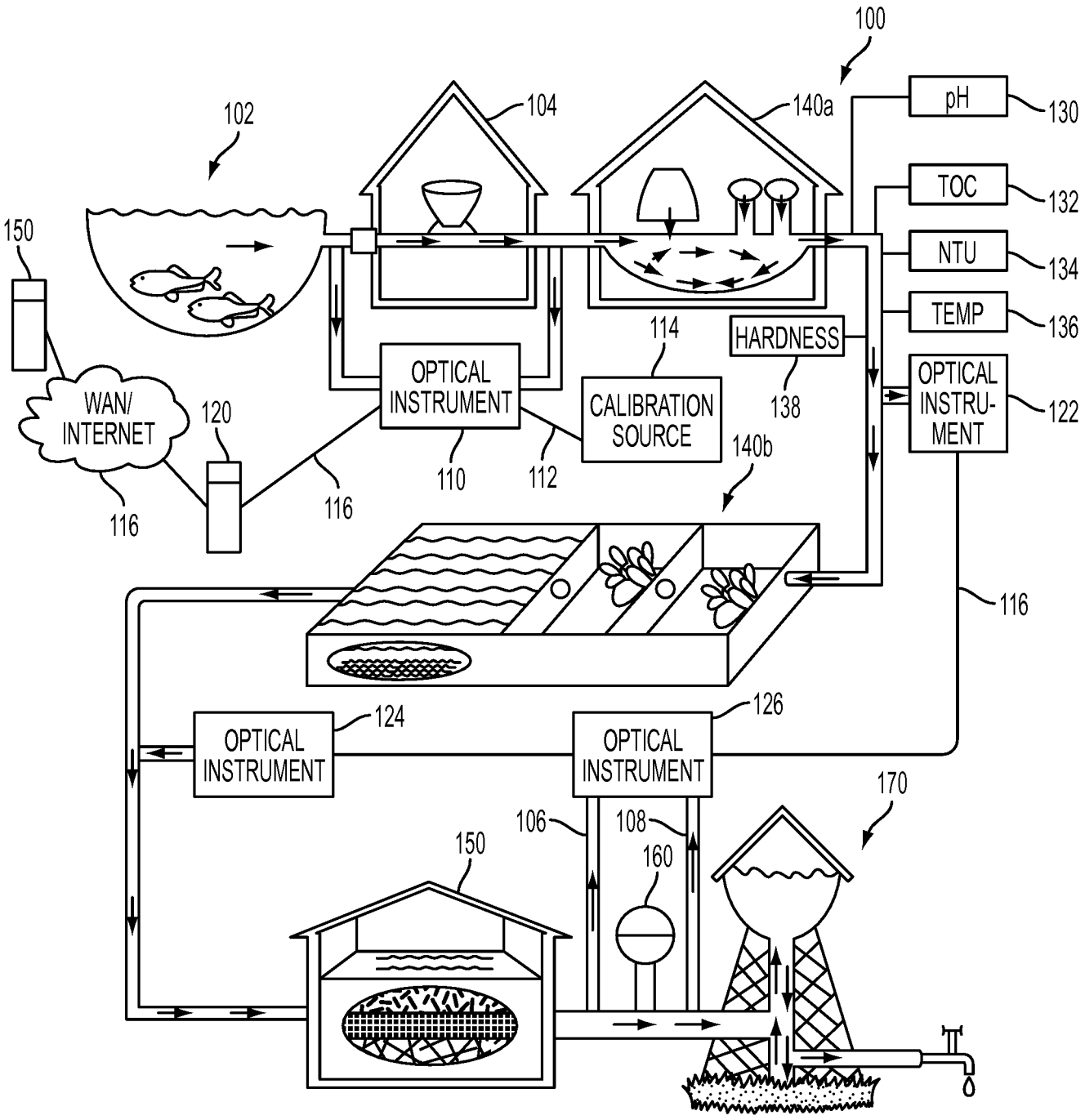

100
102
104
140a
pH
130
TOC
132
NTU
134
TEMP
136
150
114
HARDNESS
138
OPTICAL INSTRUMENT
CALIBRATION SOURCE
OPTICAL INSTRU-MENT
122
WAN/ INTERNET
120
110
112
140b
116
116
116
OPTICAL INSTRUMENT
124
OPTICAL INSTRUMENT
126
170
106
108
150
160

FIG. 1

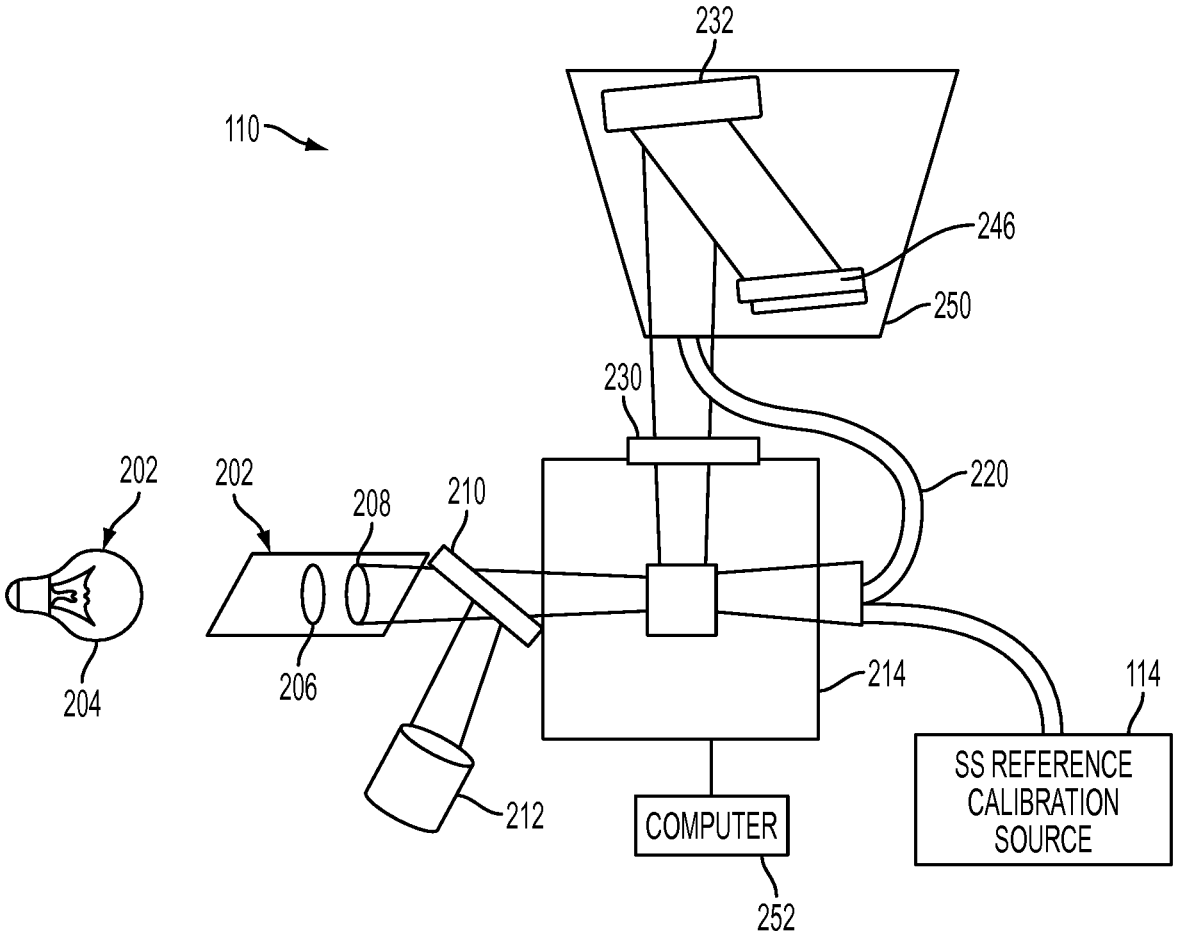

232
110
246
250
230
220
202
202
208
210
204
206
214
114
212
COMPUTER
SS REFERENCE CALIBRATION SOURCE
252

FIG. 2

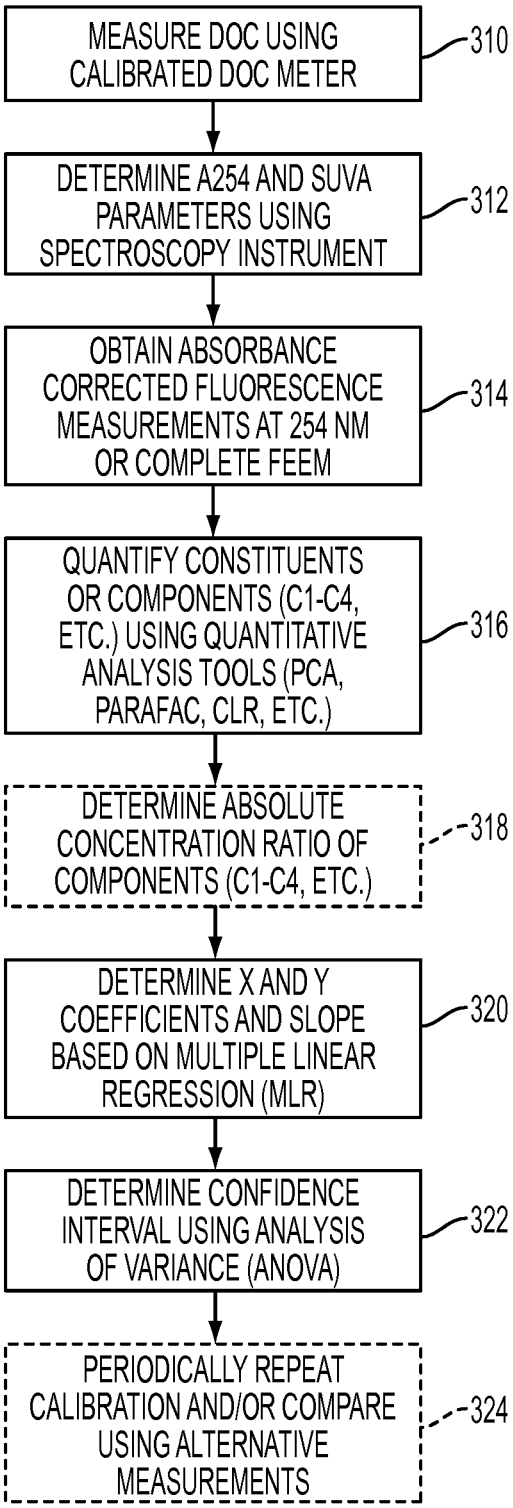

MEASURE DOC USING CALIBRATED DOC METER
310
DETERMINE A254 AND SUVA PARAMETERS USING SPECTROSCOPY INSTRUMENT
312
OBTAIN ABSORBANCE CORRECTED FLUORESCENCE MEASUREMENTS AT 254 NM OR COMPLETE FEEM
314
QUANTIFY CONSTITUENTS OR COMPONENTS (C1-C4, ETC.) USING QUANTITATIVE ANALYSIS TOOLS (PCA, PARAFAC, CLR, ETC.)
316
DETERMINE ABSOLUTE CONCENTRATION RATIO OF COMPONENTS (C1-C4, ETC.)
318
DETERMINE X AND Y COEFFICIENTS AND SLOPE BASED ON MULTIPLE LINEAR REGRESSION (MLR)
320
DETERMINE CONFIDENCE INTERVAL USING ANALYSIS OF VARIANCE (ANOVA)
322
PERIODICALLY REPEAT CALIBRATION AND/OR COMPARE USING ALTERNATIVE MEASUREMENTS
324

FIG. 3A

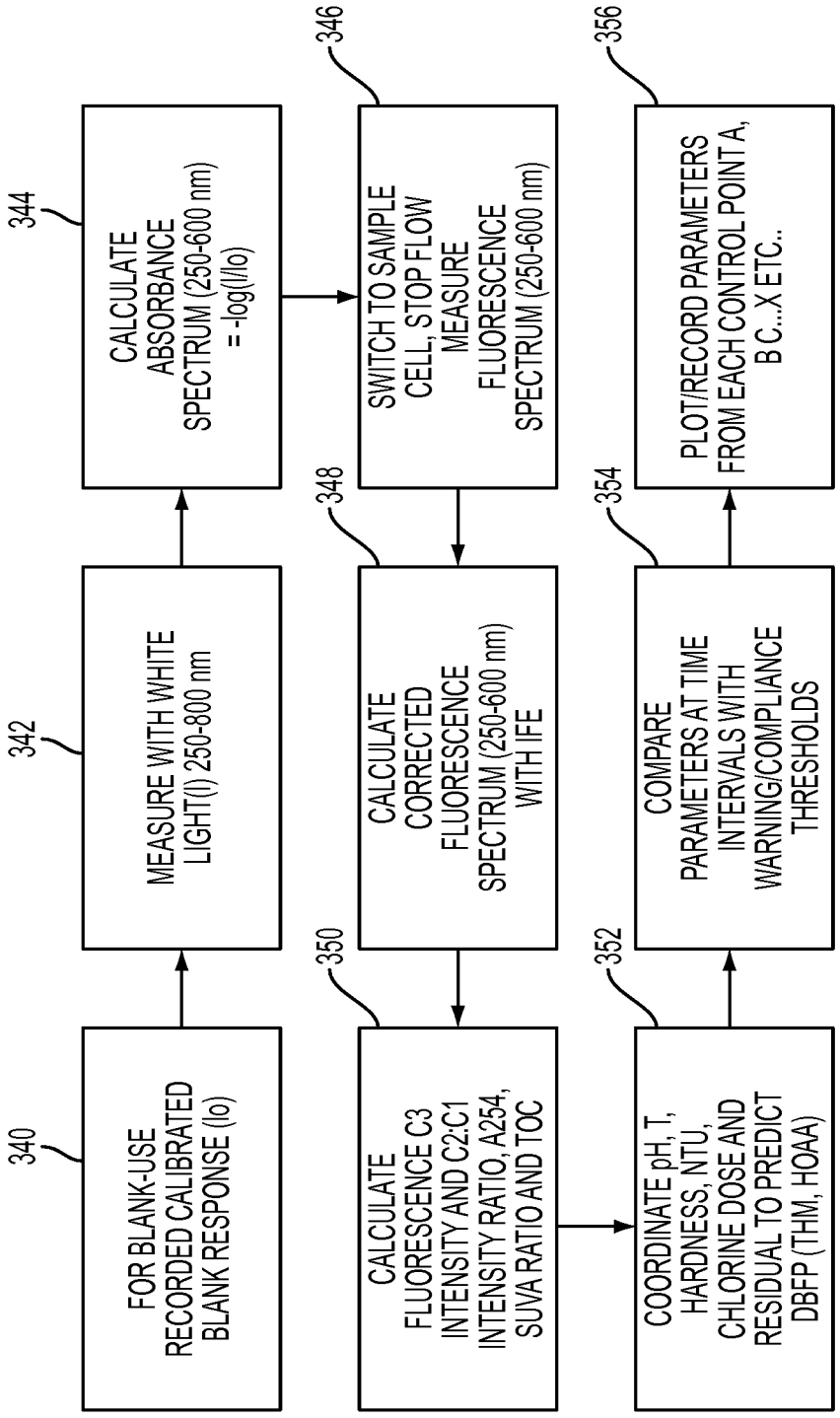

340
FOR BLANK-USE RECORDED CALIBRATED BLANK RESPONSE (Io)
342
MEASURE WITH WHITE LIGHT(I) 250-800 nm
344
CALCULATE ABSORBANCE SPECTRUM (250-600 nm) = -log(I/Io)
346
SWITCH TO SAMPLE CELL, STOP FLOW MEASURE FLUORESCENCE SPECTRUM (250-600 nm)
348
CALCULATE CORRECTED FLUORESCENCE SPECTRUM (250-600 nm) WITH IFE
350
CALCULATE FLUORESCENCE C3 INTENSITY AND C2:C1 INTENSITY RATIO, A254, SUVA RATIO AND TOC
352
COORDINATE pH, T, HARDNESS, NTU, CHLORINE DOSE AND RESIDUAL TO PREDICT DBFP (THM, HOAA)
354
COMPARE PARAMETERS AT TIME INTERVALS WITH WARNING/COMPLIANCE THRESHOLDS
356
PLOT/RECORD PARAMETERS FROM EACH CONTROL POINT A, B C...X ETC..

FIG. 3B

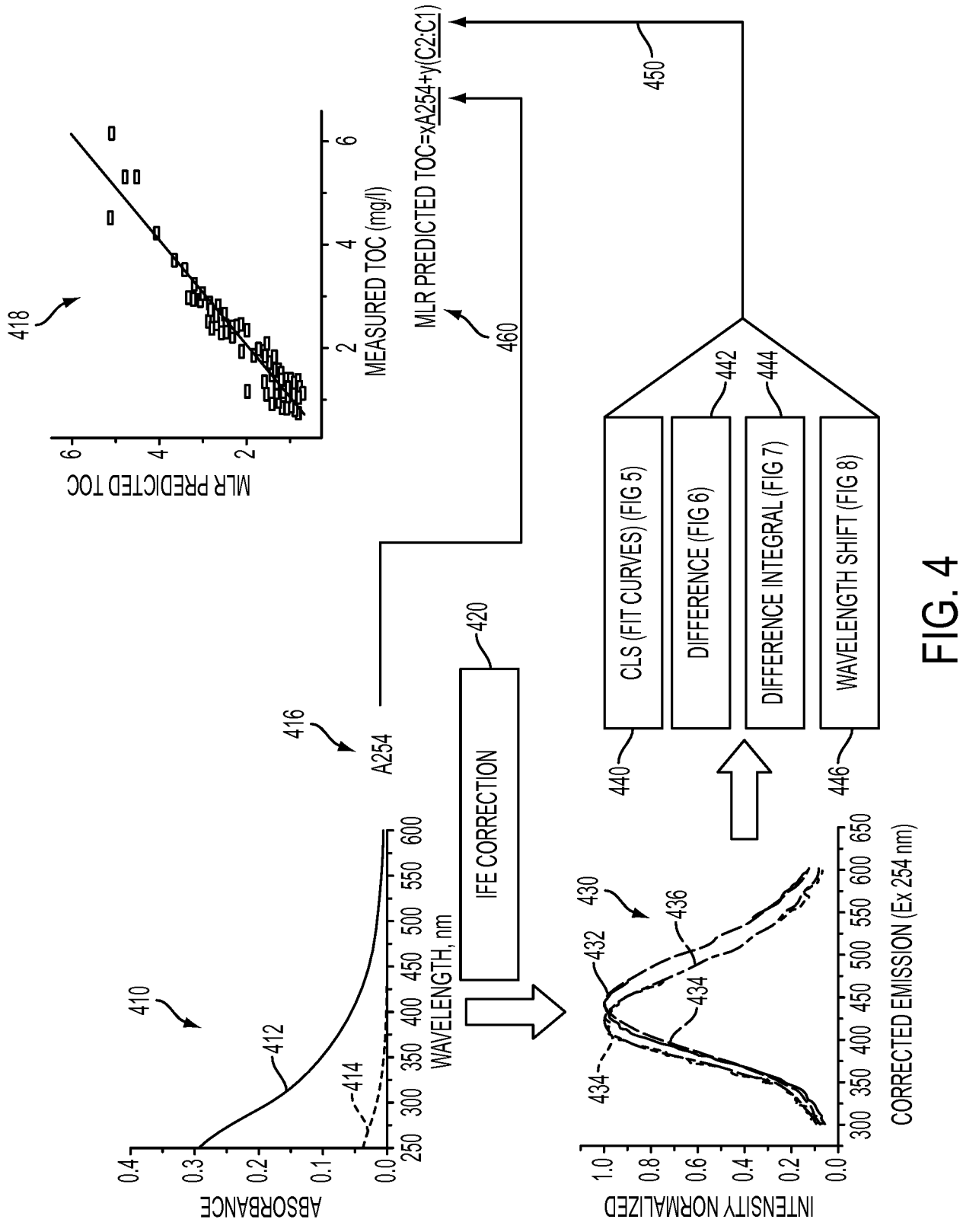

418
MLR PREDICTED TOC
MEASURED TOC (mg/l)
MLR PREDICTED TOC=xA254+y(C2:C1)
460
450
410
412
414
ABSORBANCE
WAVELENGTH, nm
416
A254
420
IFE CORRECTION
430
432
434
436
INTENSITY NORMALIZED
CORRECTED EMISSION (Ex 254 nm)
CLS (FIT CURVES) (FIG 5)
DIFFERENCE (FIG 6)
DIFFERENCE INTEGRAL (FIG 7)
WAVELENGTH SHIFT (FIG 8)
440
442
444
446

FIG. 4

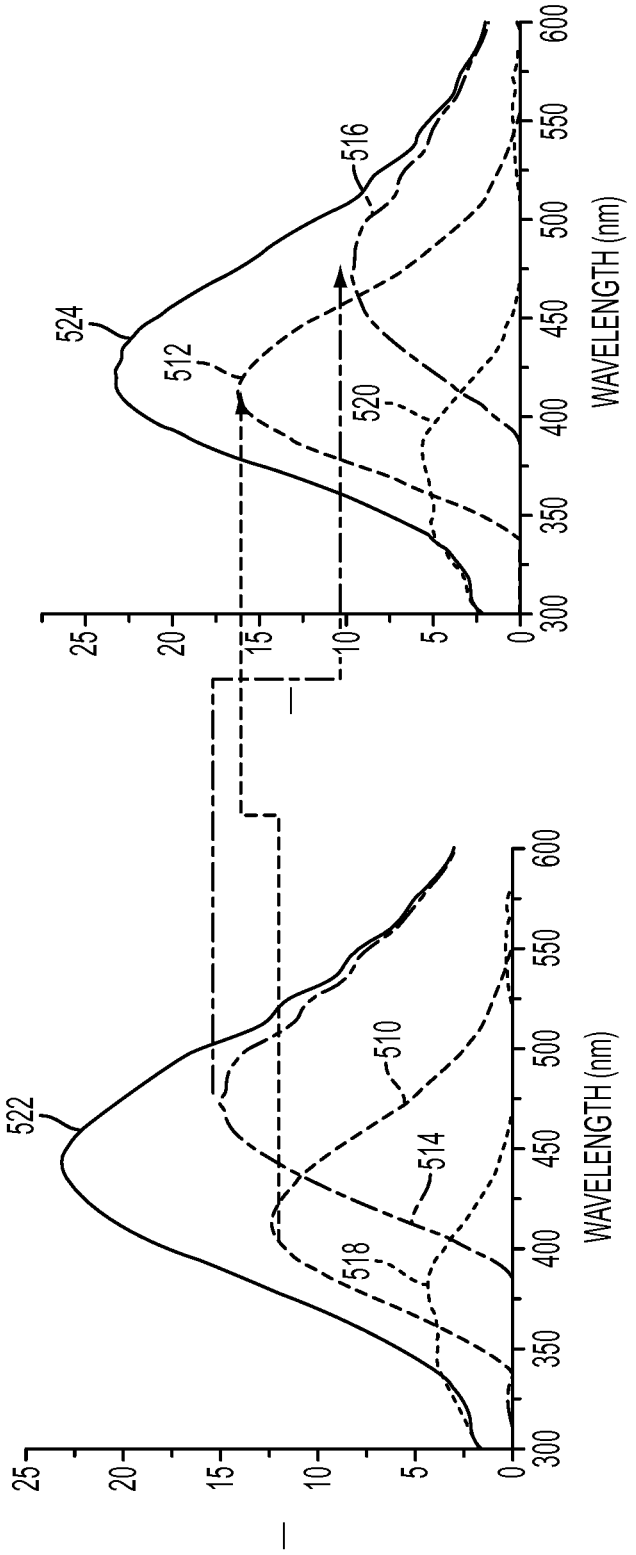

I
25
20
15
10
5
0
300
350
400
450
500
550
600
WAVELENGTH (nm)
522
510
514
518
524
512
520
516

FIG. 5

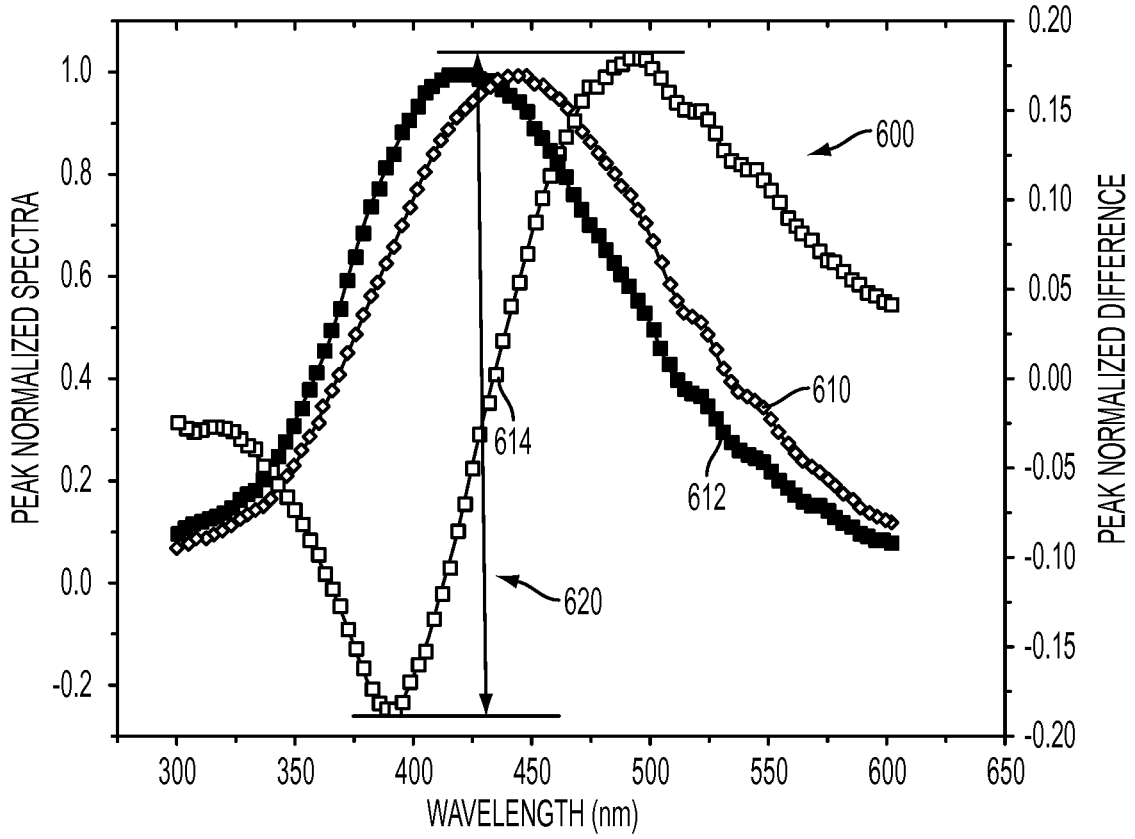

PEAK NORMALIZED SPECTRA
PEAK NORMALIZED DIFFERENCE
WAVELENGTH (nm)
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
300
350
400
450
500
550
600
650
600
610
612
614
620

FIG. 6

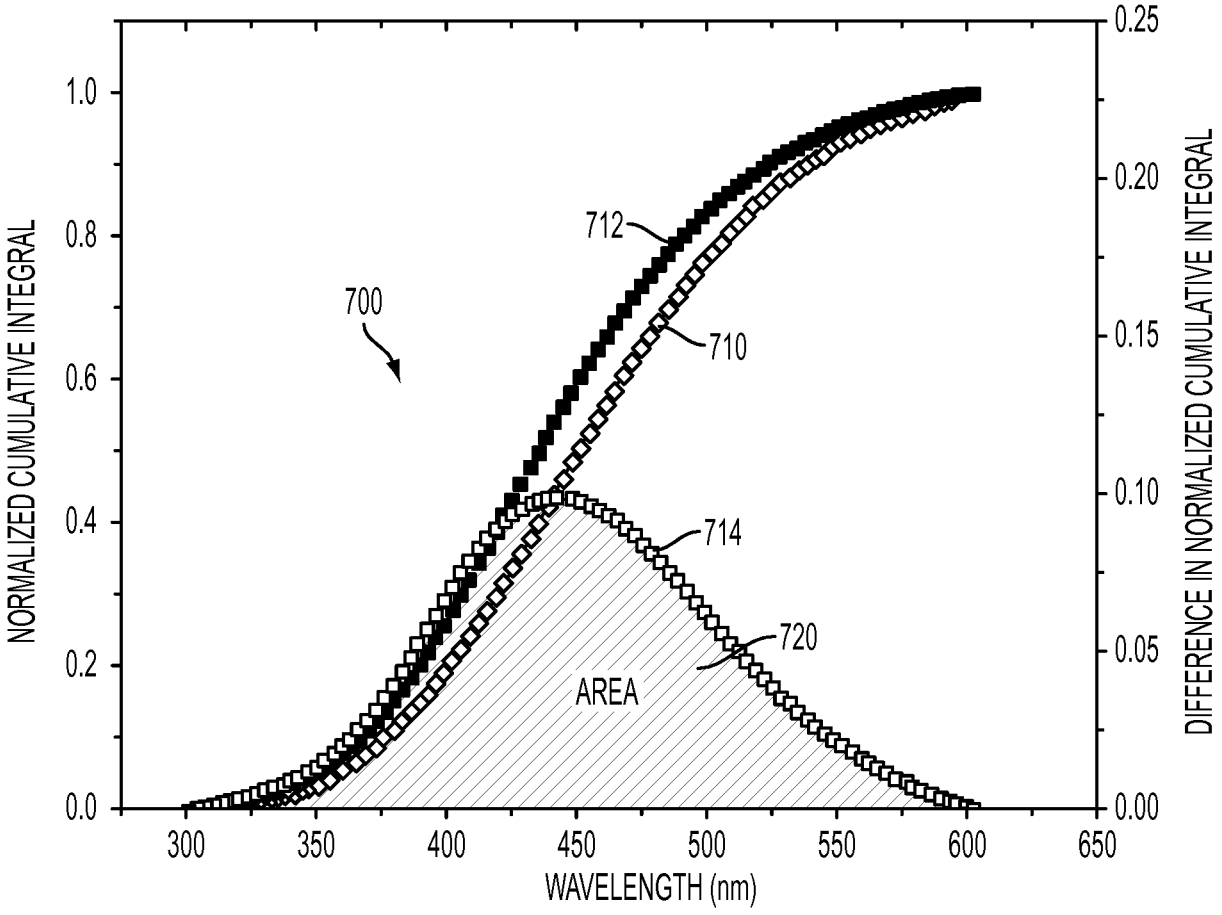

NORMALIZED CUMULATIVE INTEGRAL
DIFFERENCE IN NORMALIZED CUMULATIVE INTEGRAL
WAVELENGTH (nm)
0.0
0.2
0.4
0.6
0.8
1.0
0.00
0.05
0.10
0.15
0.20
0.25
300
350
400
450
500
550
600
650
700
710
712
714
720
AREA

FIG. 7

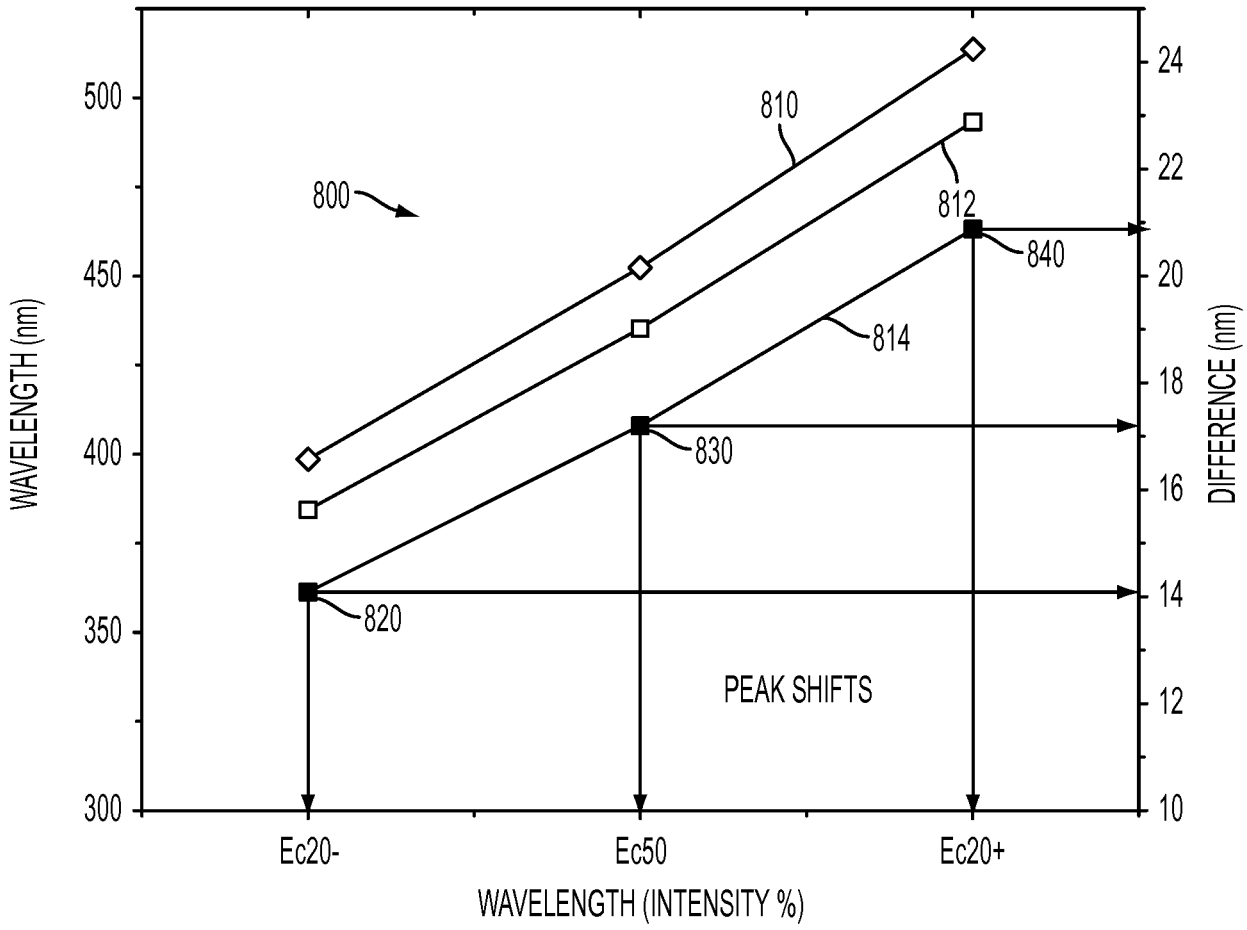

WAVELENGTH (nm)
500
450
400
350
300
DIFFERENCE (nm)
24
22
20
18
16
14
12
10
800
810
812
814
820
830
840
PEAK SHIFTS
Ec20-
Ec50
Ec20+
WAVELENGTH (INTENSITY %)

FIG. 8

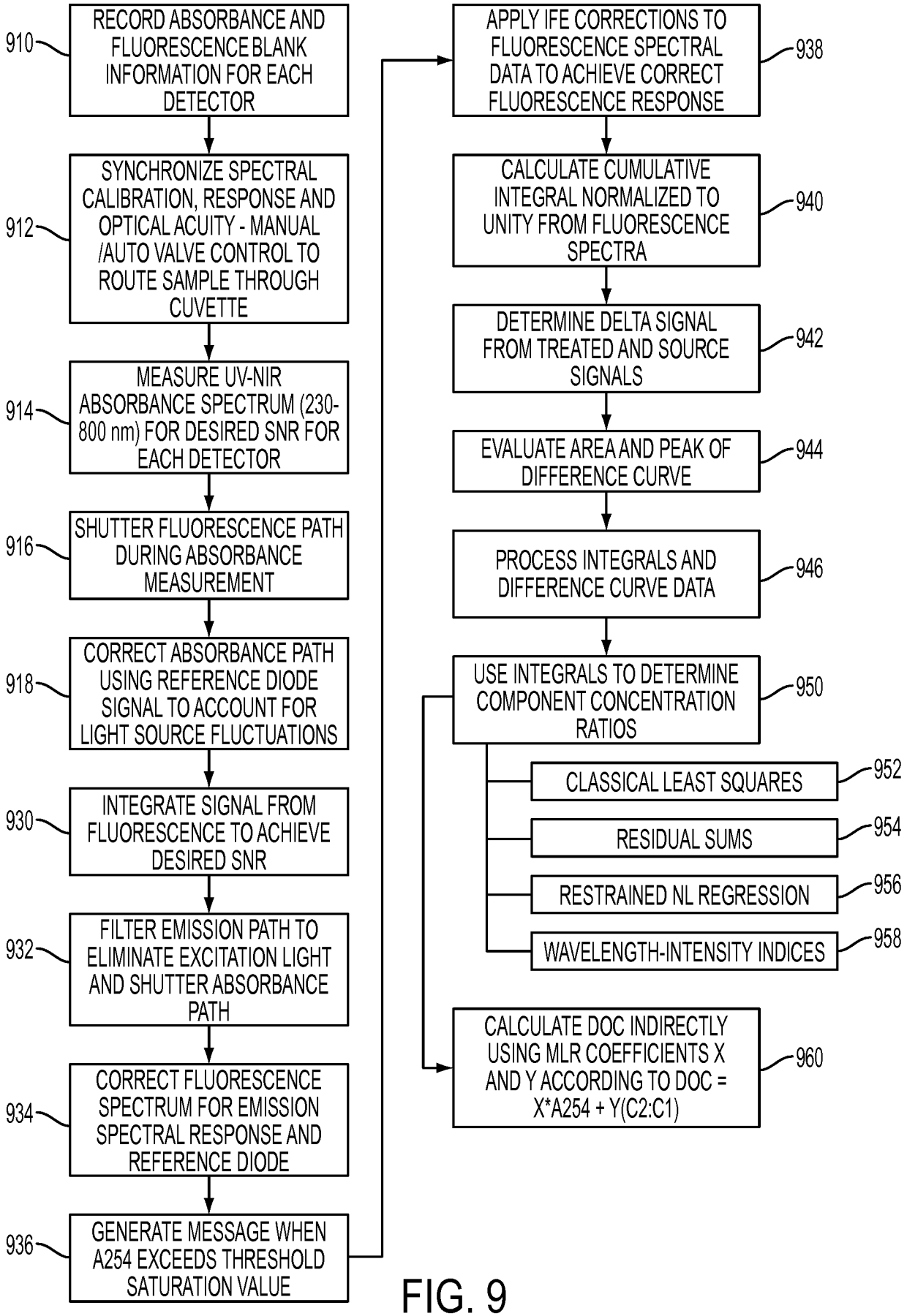

910
RECORD ABSORBANCE AND FLUORESCENCE BLANK INFORMATION FOR EACH DETECTOR
912
SYNCHRONIZE SPECTRAL CALIBRATION, RESPONSE AND OPTICAL ACUITY - MANUAL /AUTO VALVE CONTROL TO ROUTE SAMPLE THROUGH CUVETTE
914
MEASURE UV-NIR ABSORBANCE SPECTRUM (230-800 nm) FOR DESIRED SNR FOR EACH DETECTOR
916
SHUTTER FLUORESCENCE PATH DURING ABSORBANCE MEASUREMENT
918
CORRECT ABSORBANCE PATH USING REFERENCE DIODE SIGNAL TO ACCOUNT FOR LIGHT SOURCE FLUCTUATIONS
930
INTEGRATE SIGNAL FROM FLUORESCENCE TO ACHIEVE DESIRED SNR
932
FILTER EMISSION PATH TO ELIMINATE EXCITATION LIGHT AND SHUTTER ABSORBANCE PATH
934
CORRECT FLUORESCENCE SPECTRUM FOR EMISSION SPECTRAL RESPONSE AND REFERENCE DIODE
936
GENERATE MESSAGE WHEN A254 EXCEEDS THRESHOLD SATURATION VALUE
938
APPLY IFE CORRECTIONS TO FLUORESCENCE SPECTRAL DATA TO ACHIEVE CORRECT FLUORESCENCE RESPONSE
940
CALCULATE CUMULATIVE INTEGRAL NORMALIZED TO UNITY FROM FLUORESCENCE SPECTRA
942
DETERMINE DELTA SIGNAL FROM TREATED AND SOURCE SIGNALS
944
EVALUATE AREA AND PEAK OF DIFFERENCE CURVE
946
PROCESS INTEGRALS AND DIFFERENCE CURVE DATA
950
USE INTEGRALS TO DETERMINE COMPONENT CONCENTRATION RATIOS
952
CLASSICAL LEAST SQUARES
954
RESIDUAL SUMS
956
RESTRAINED NL REGRESSION
958
WAVELENGTH-INTENSITY INDICES
960
CALCULATE DOC INDIRECTLY USING MLR COEFFICIENTS X AND Y ACCORDING TO DOC = X*A254 + Y(C2:C1)

FIG. 9