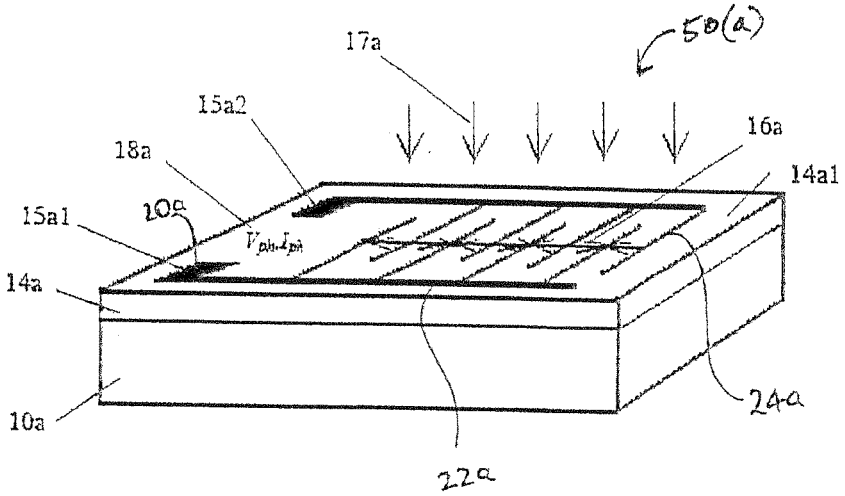


Figure 1(a)

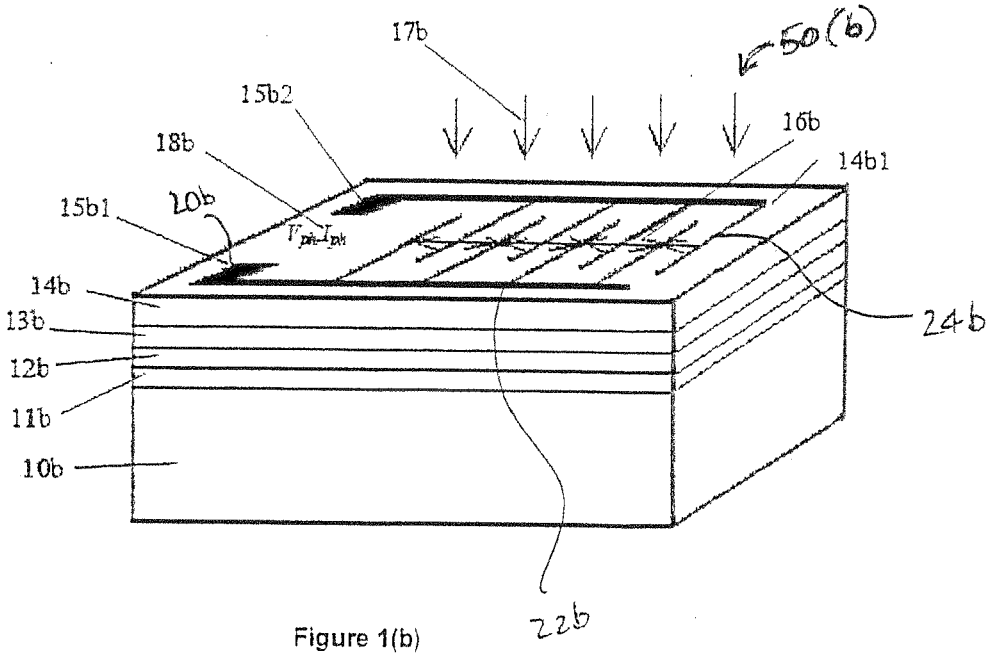


Figure 1(b)

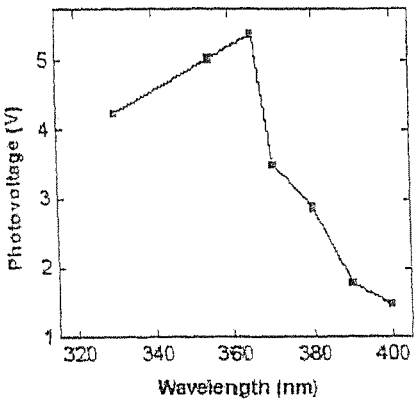


Figure 2

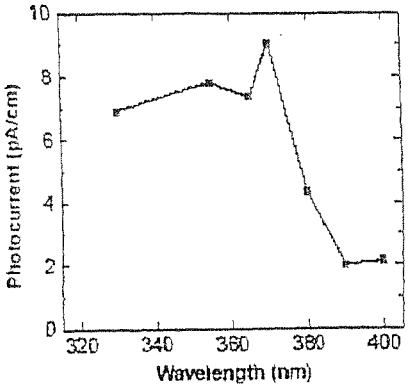


Figure 3

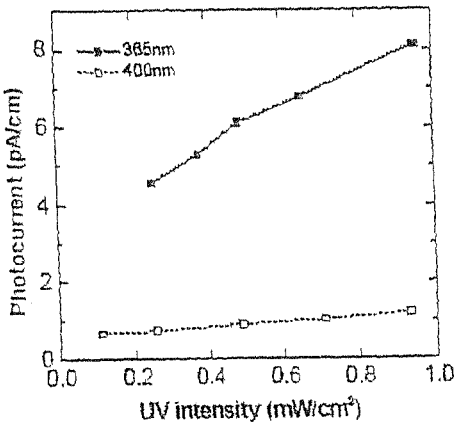


Figure 4

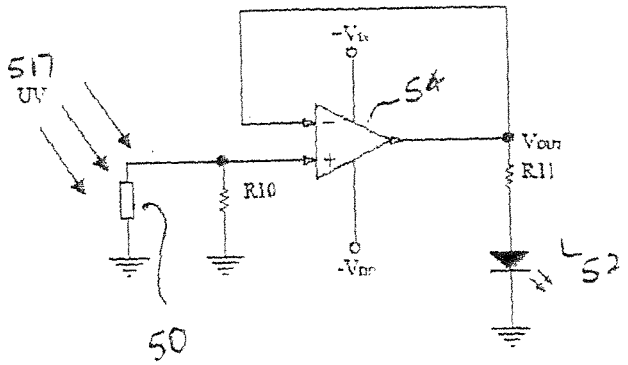


Figure 5

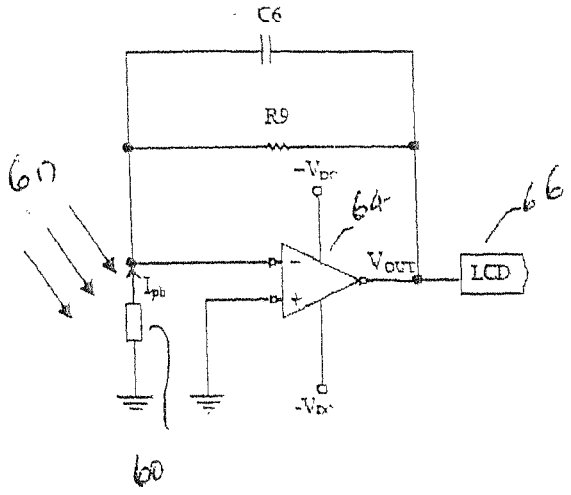


Figure 6

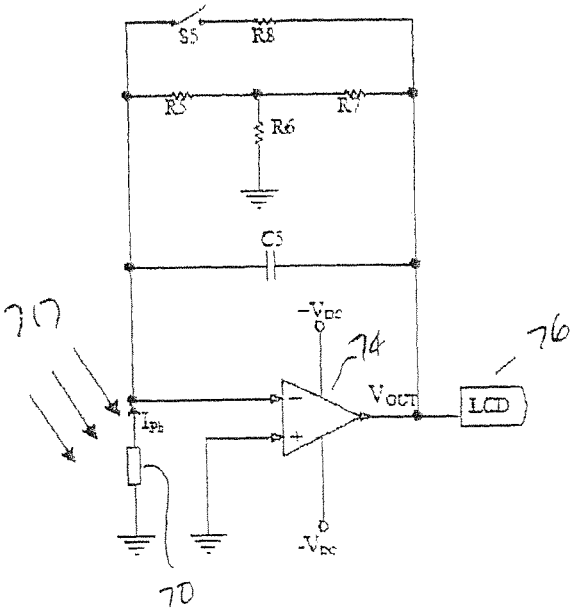


Figure 7

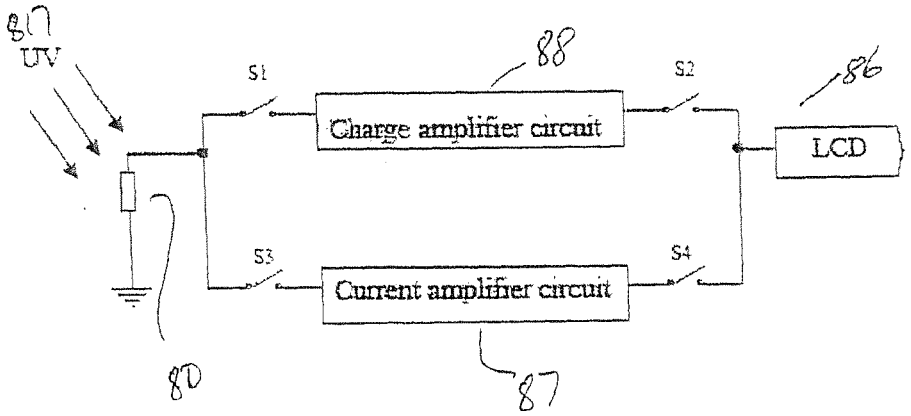

UV
S1
Charge amplifier circuit
S2
LCD
S3
Current amplifier circuit
S4

Figure 8

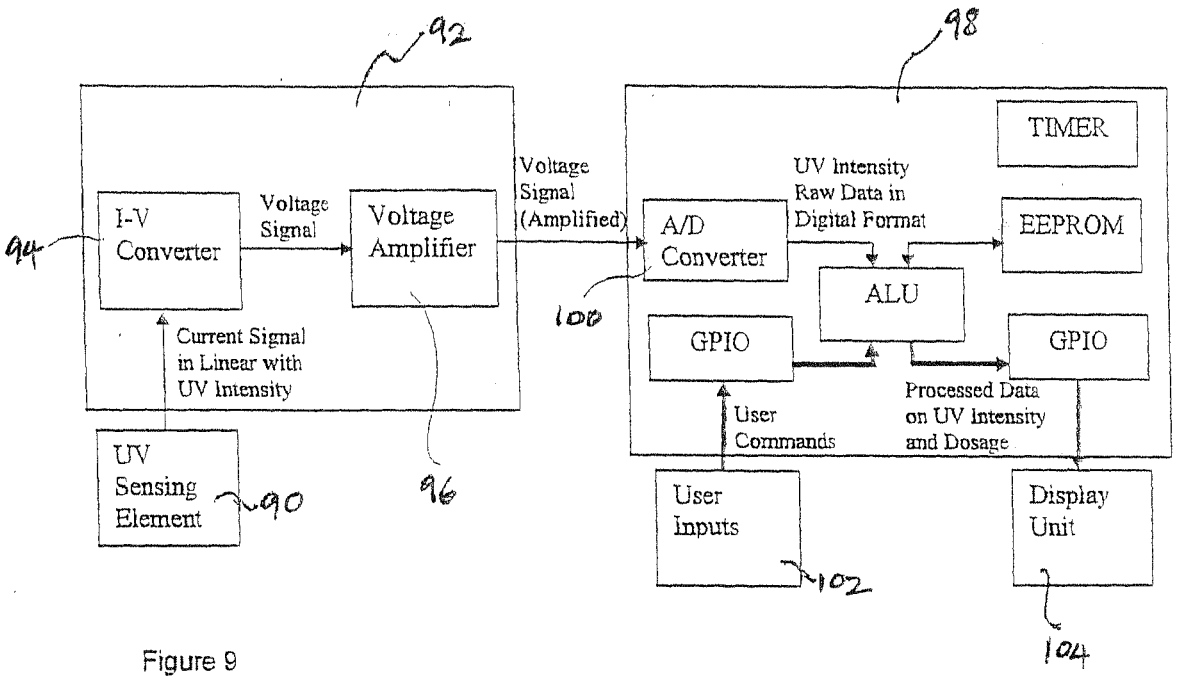


Figure 9

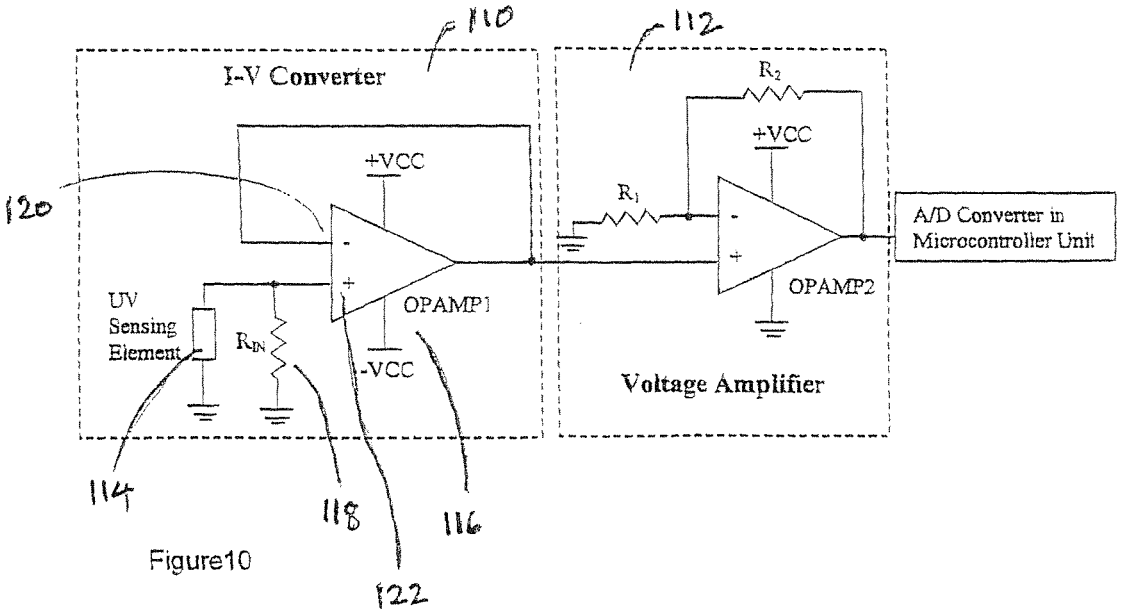


Figure10

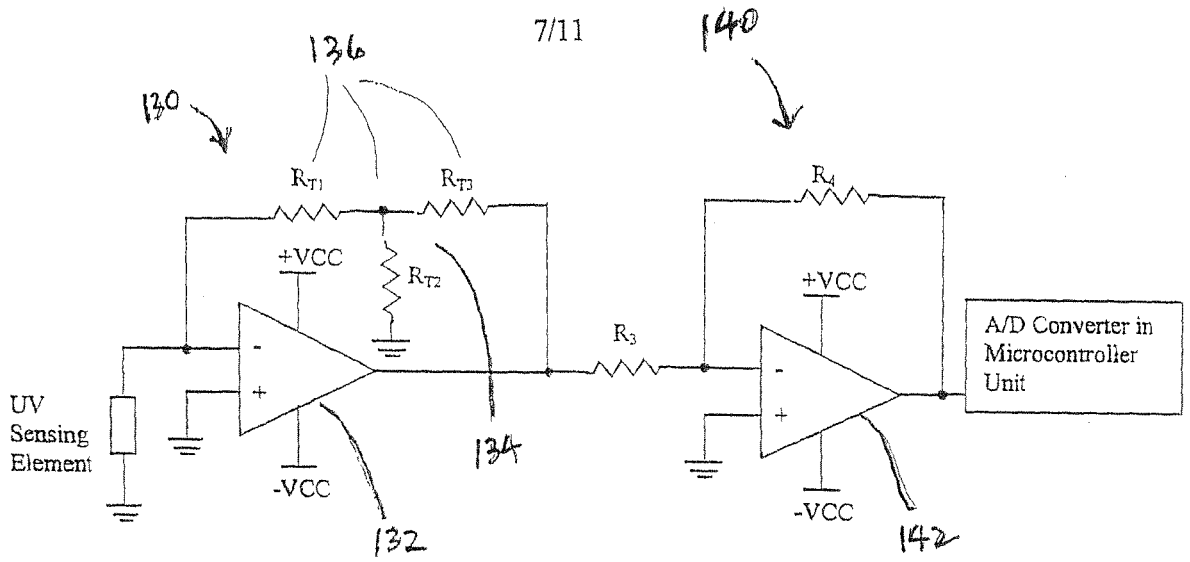


Figure 11

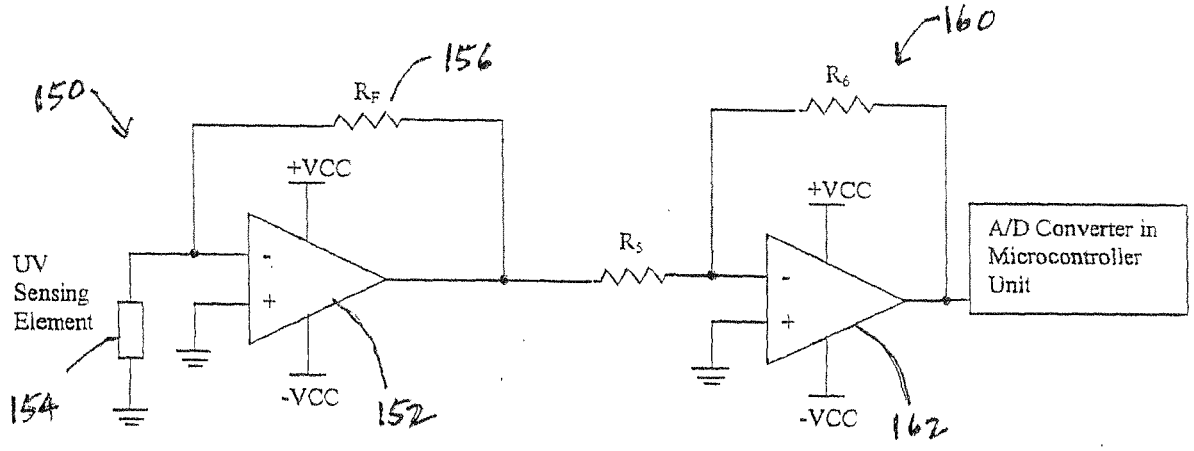


Figure 12

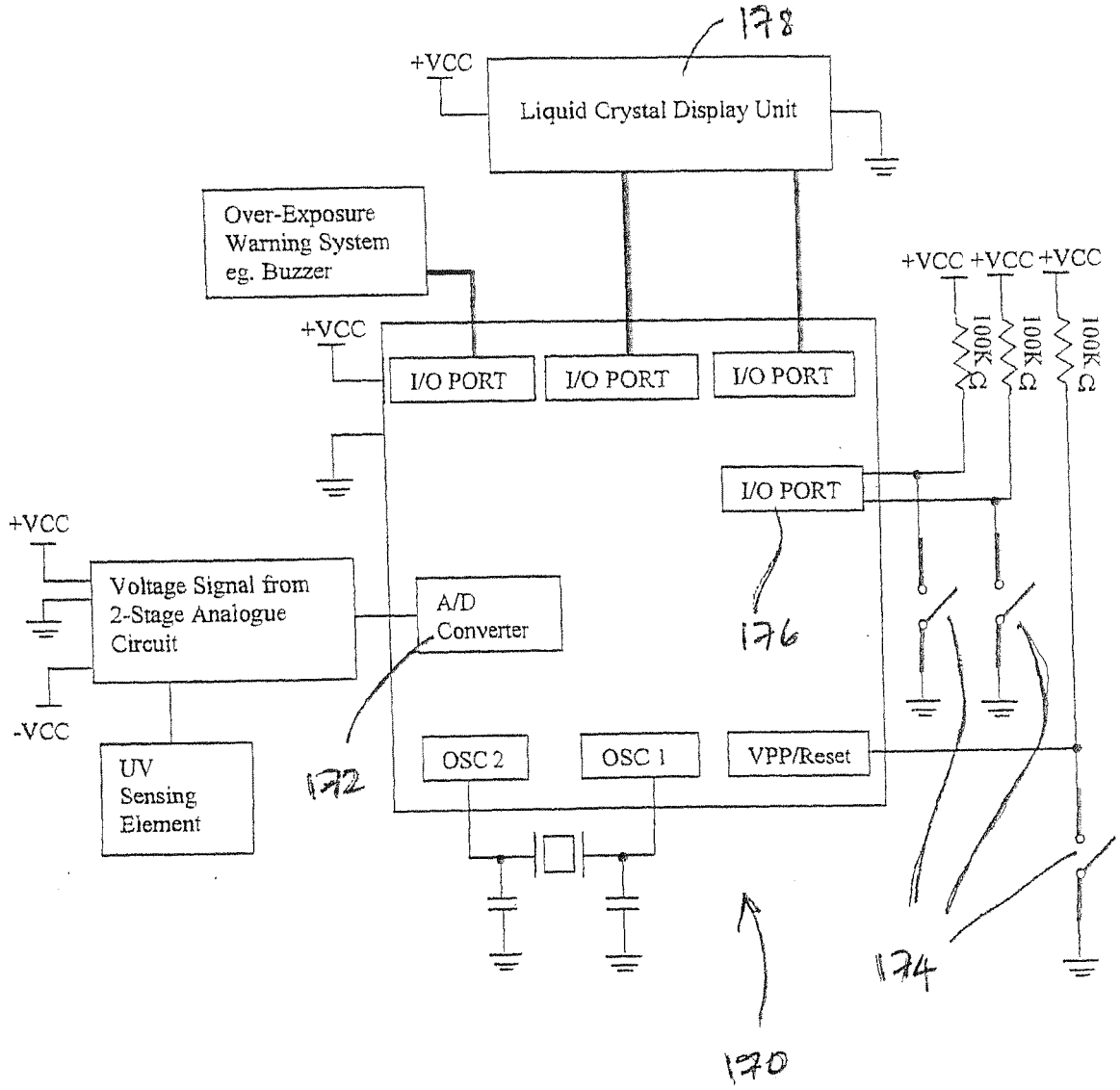

178
+VCC
Liquid Crystal Display Unit
Over-Exposure Warning System eg. Buzzer
+VCC
I/O PORT
I/O PORT
I/O PORT
+VCC +VCC +VCC
100K Ω
100K Ω
100K Ω
I/O PORT
+VCC
Voltage Signal from 2-Stage Analogue Circuit
A/D Converter
176
-VCC
UV Sensing Element
172
OSC 2
OSC 1
VPP/Reset
174
170

Figure 13

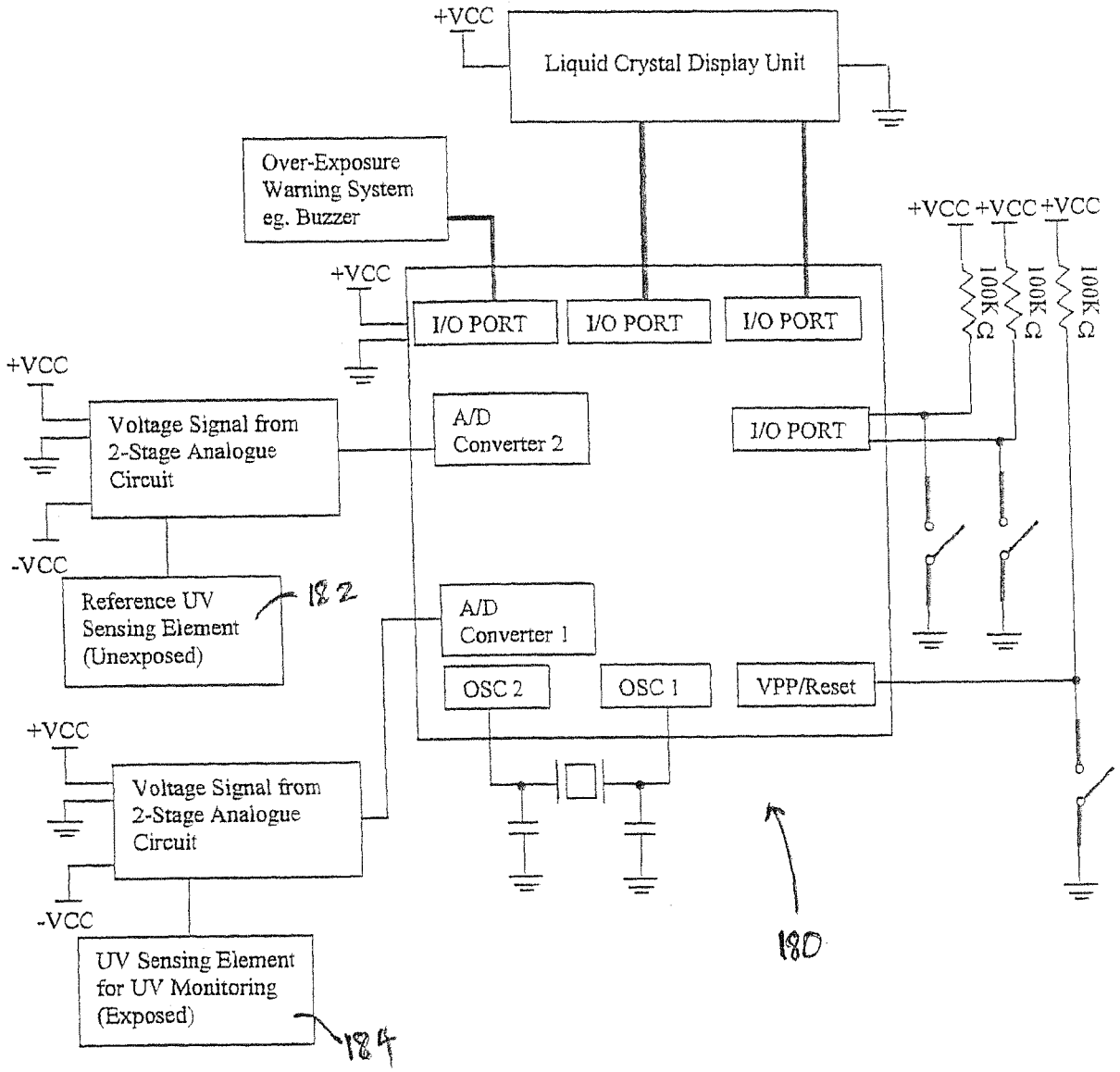

+VCC
Liquid Crystal Display Unit
Over-Exposure Warning System eg. Buzzer
+VCC
+VCC +VCC +VCC
100K Ω
100K Ω
100K Ω
I/O PORT
I/O PORT
I/O PORT
+VCC
Voltage Signal from 2-Stage Analogue Circuit
A/D Converter 2
I/O PORT
-VCC
Reference UV Sensing Element (Unexposed)
182
A/D Converter 1
OSC 2
OSC 1
VPP/Reset
+VCC
Voltage Signal from 2-Stage Analogue Circuit
-VCC
UV Sensing Element for UV Monitoring (Exposed)
184
180

Figure 14

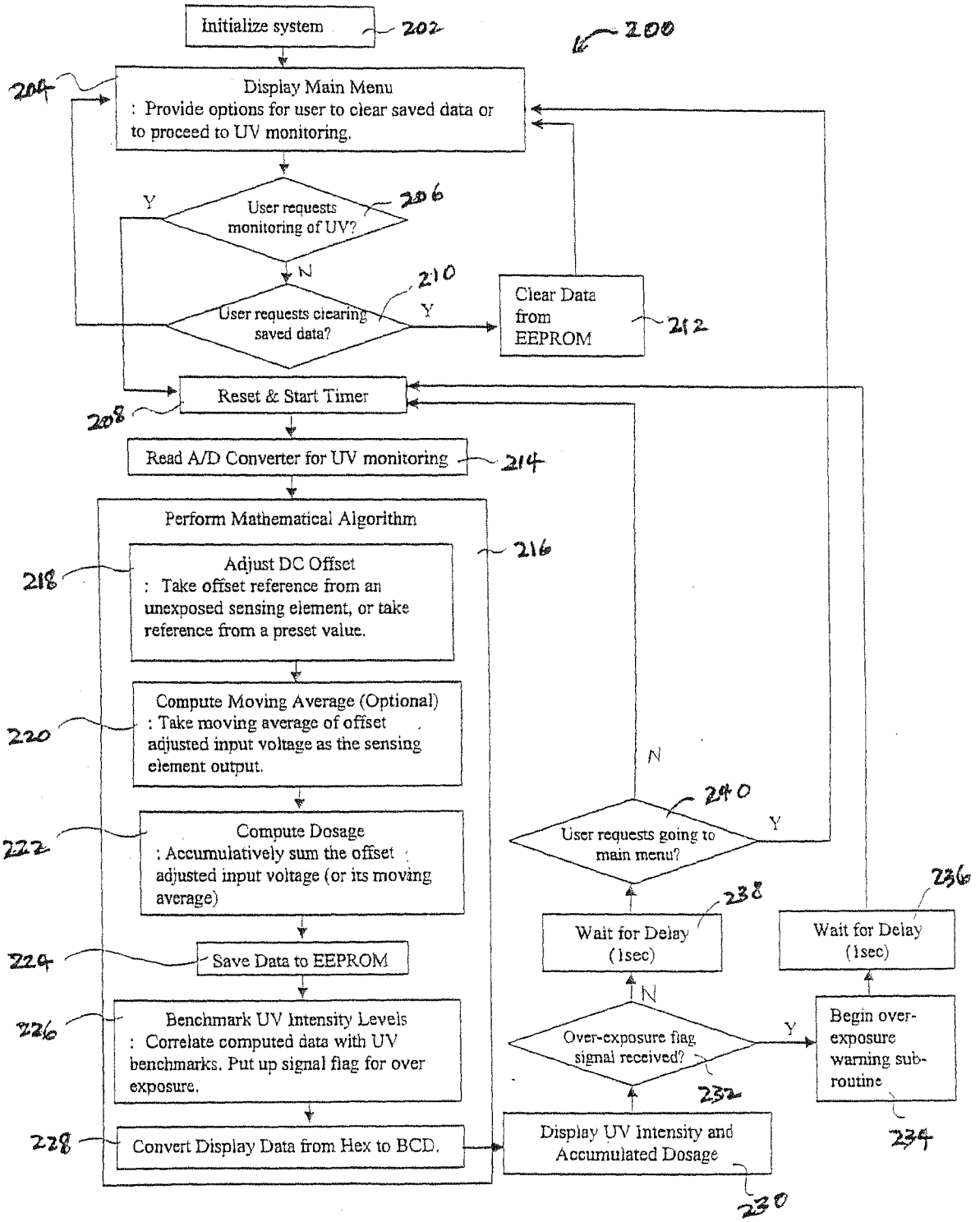

Initialize system
202
200
Display Main Menu
: Provide options for user to clear saved data or to proceed to UV monitoring.
204
User requests monitoring of UV?
206
Y
N
User requests clearing saved data?
210
Y
Clear Data from EEPROM
212
Reset & Start Timer
208
Read A/D Converter for UV monitoring
214
Perform Mathematical Algorithm
216
Adjust DC Offset
: Take offset reference from an unexposed sensing element, or take reference from a preset value.
218
Compute Moving Average (Optional)
: Take moving average of offset adjusted input voltage as the sensing element output.
220
Compute Dosage
: Accumulatively sum the offset adjusted input voltage (or its moving average)
222
Save Data to EEPROM
224
Benchmark UV Intensity Levels
: Correlate computed data with UV benchmarks. Put up signal flag for over exposure.
226
Convert Display Data from Hex to BCD.
228
Display UV Intensity and Accumulated Dosage
230
Over-exposure flag signal received?
232
N
Y
Begin over-exposure warning sub-routine
234
Wait for Delay (1sec)
236
Wait for Delay (1sec)
238
User requests going to main menu?
240
N
Y

Figure 15

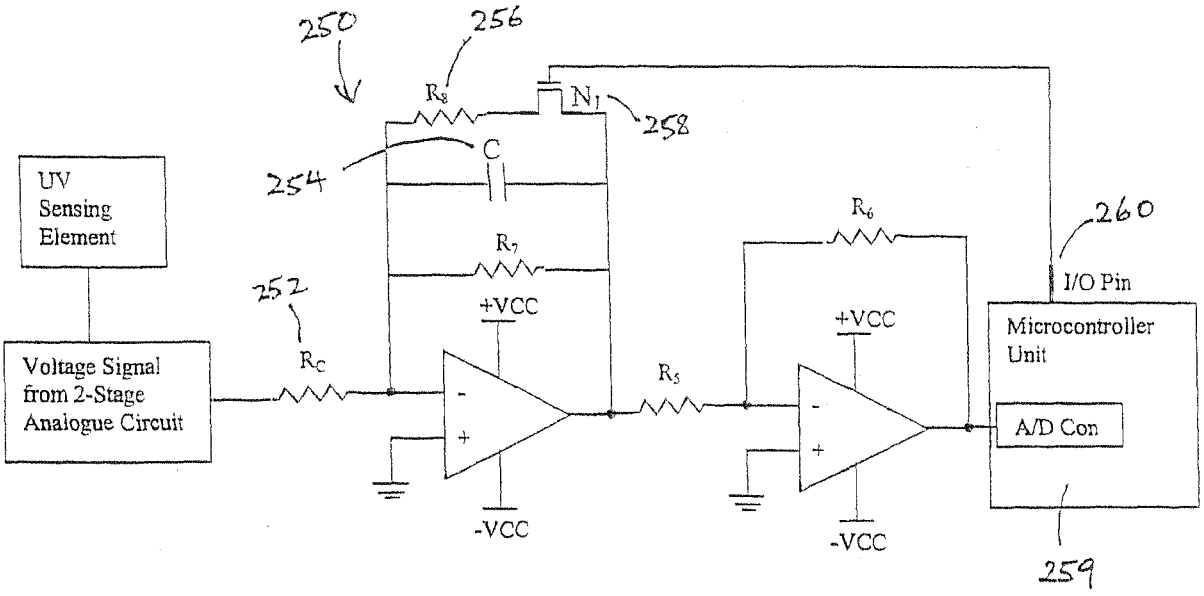


Figure 16

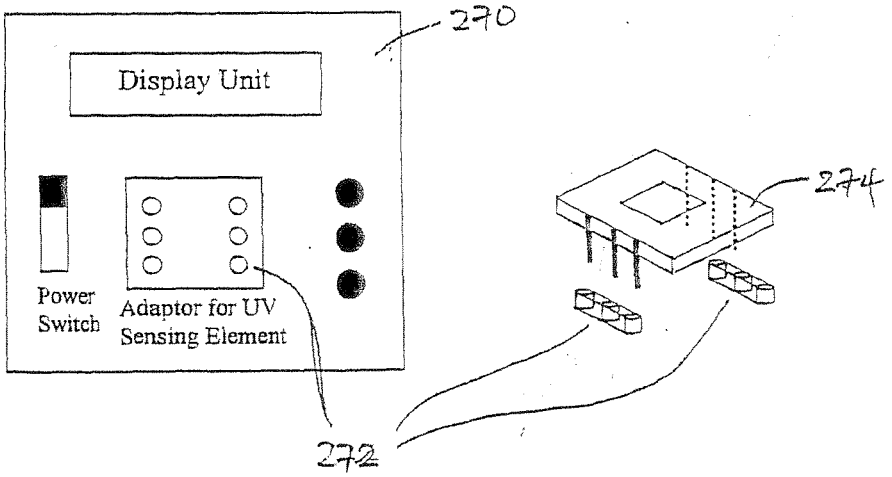


Figure 17