

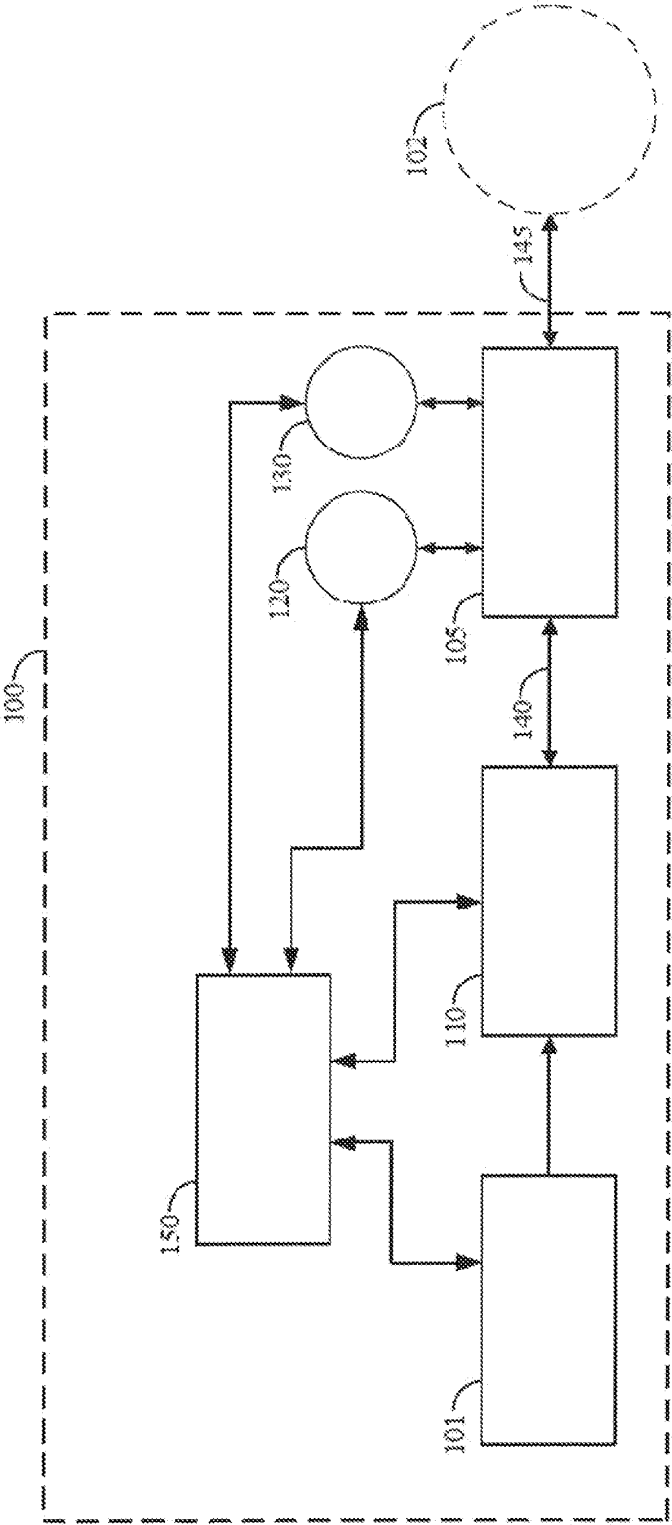
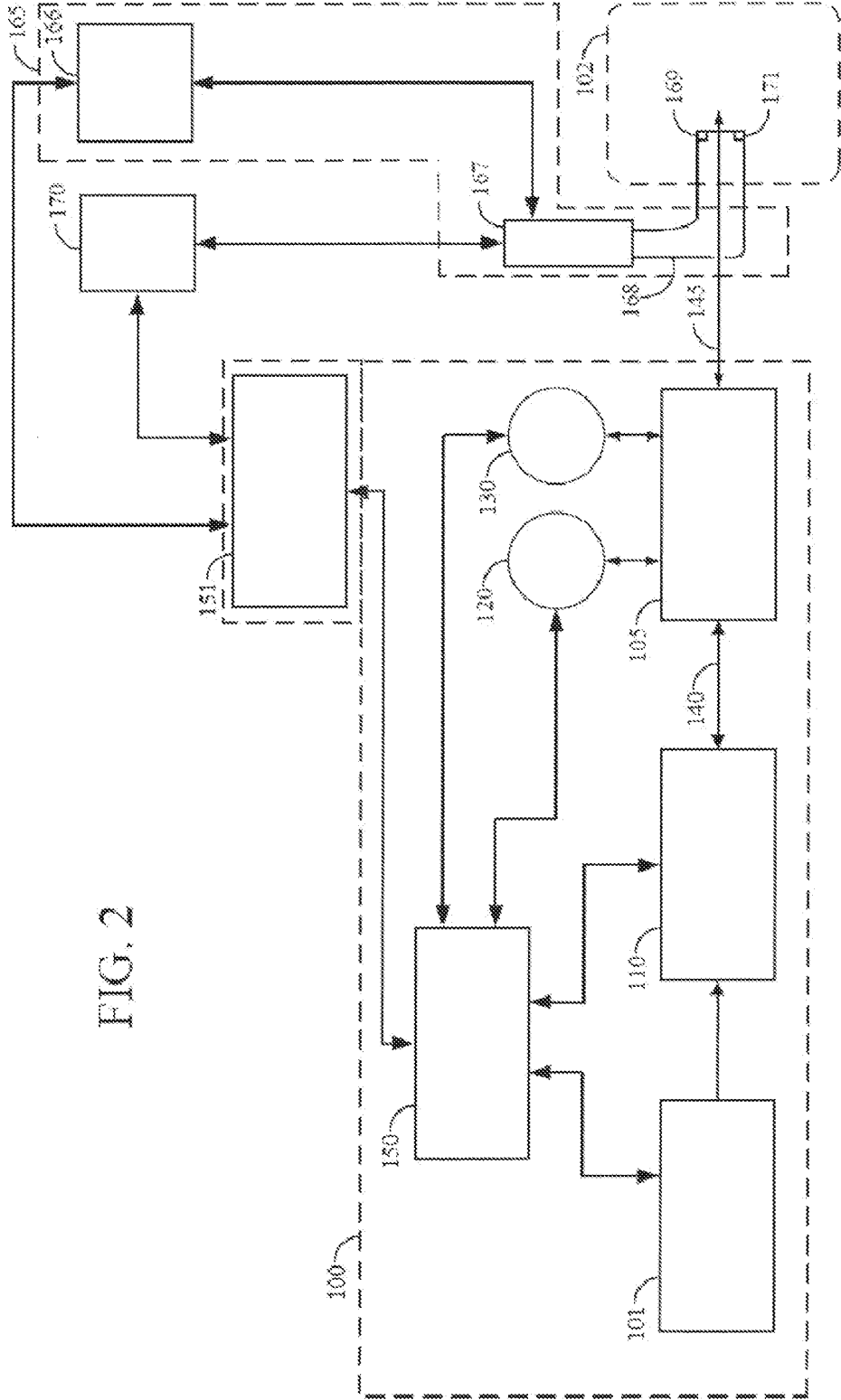


FIG. 1

FIG. 2



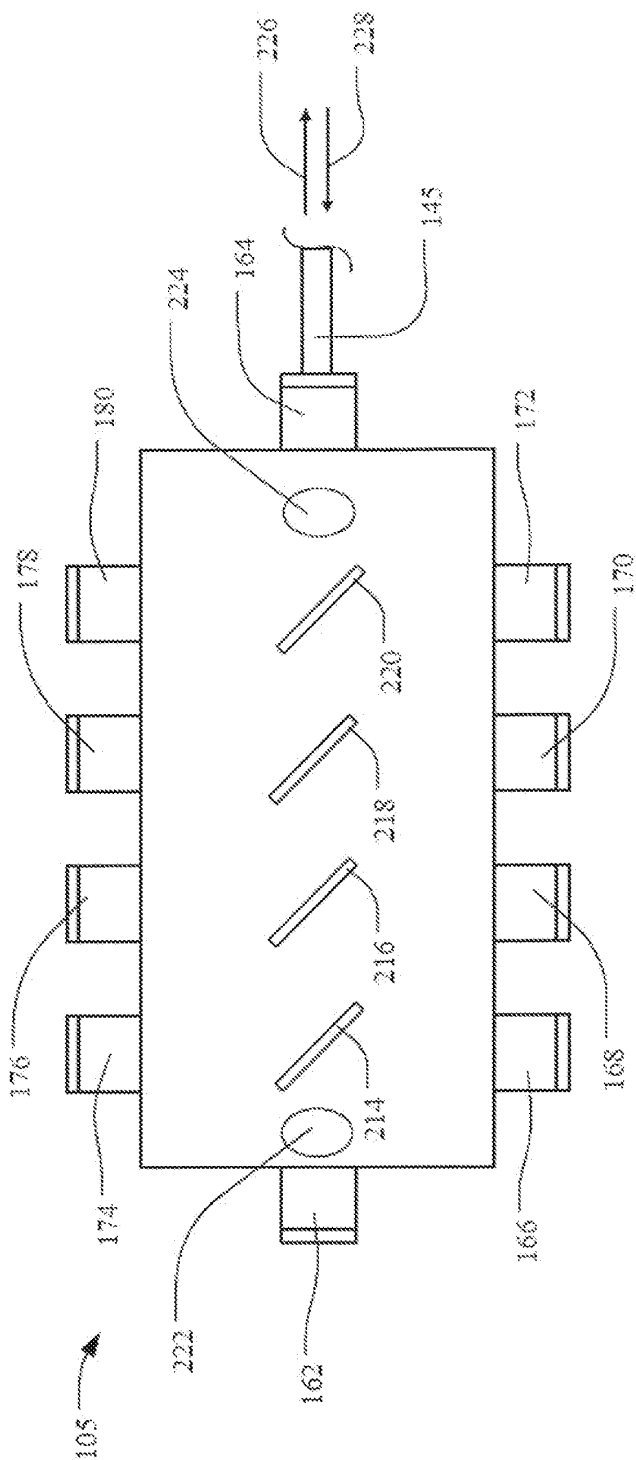


FIG. 3

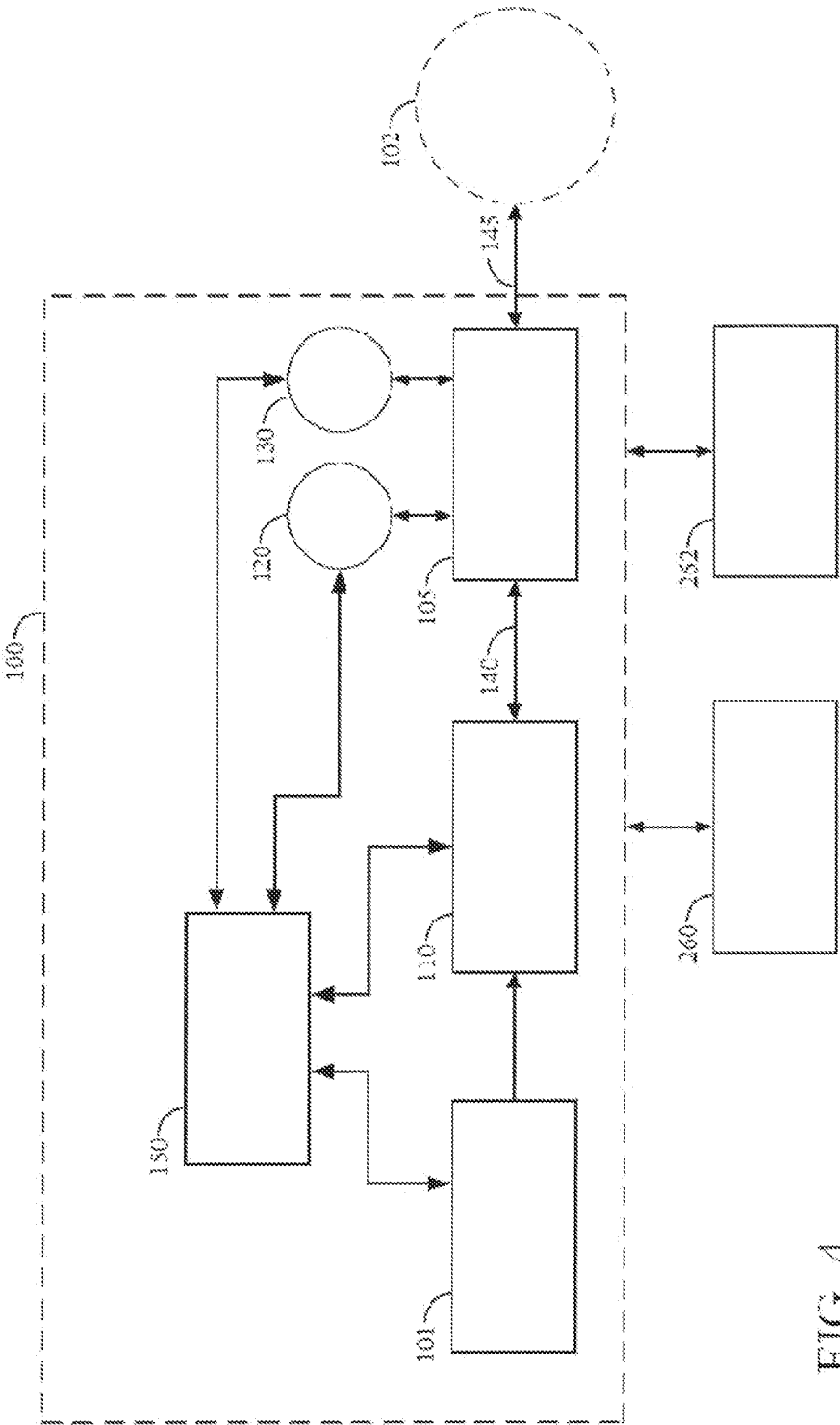


FIG. 4

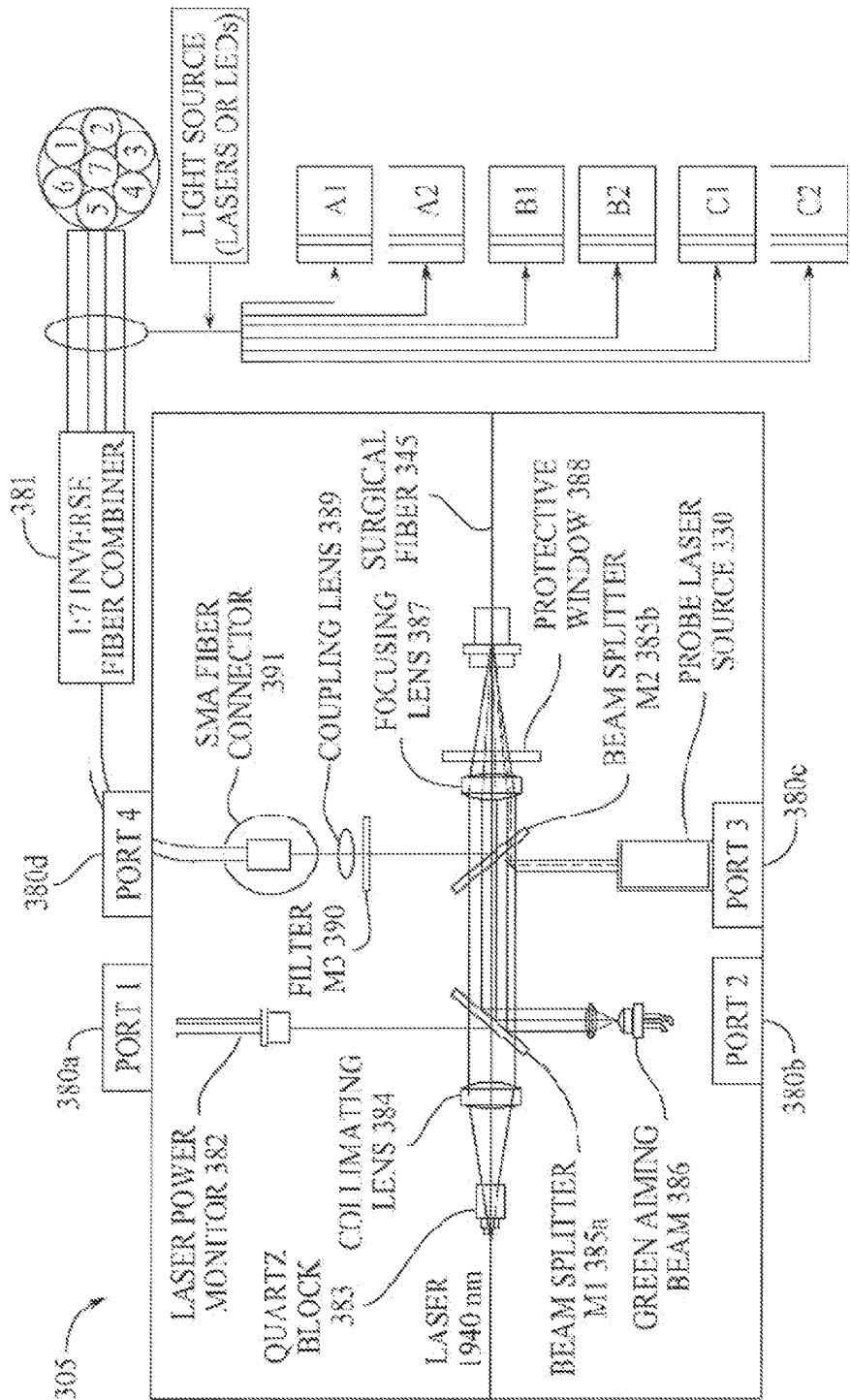


FIG. 5

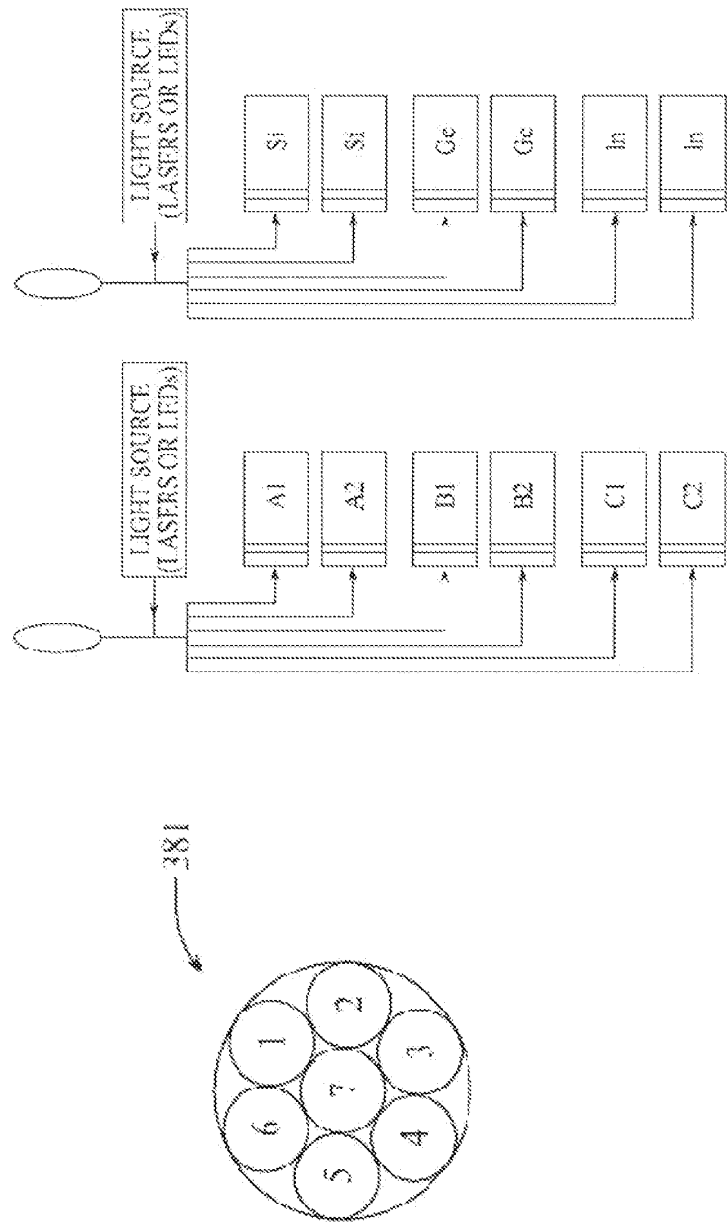
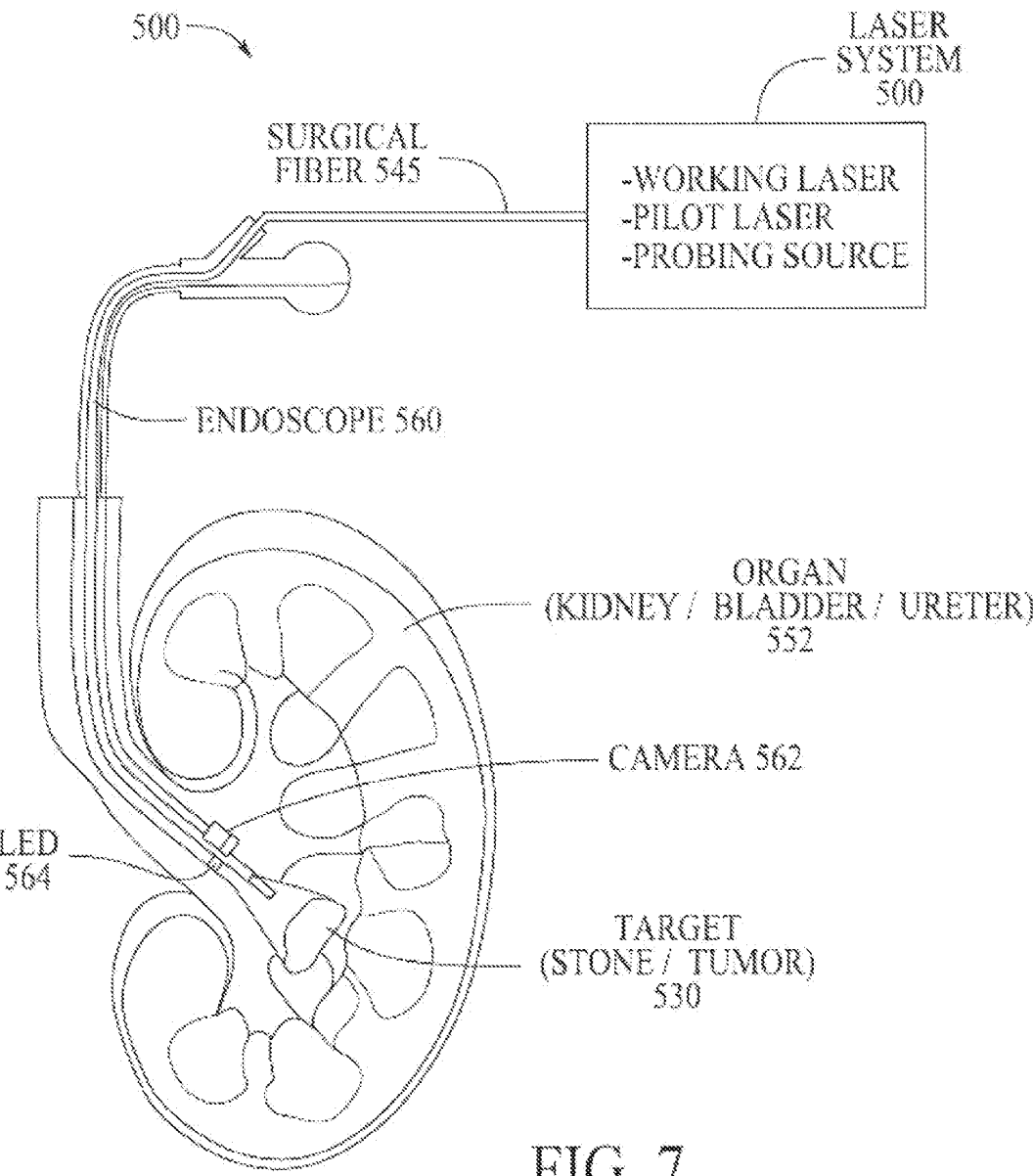


FIG. 6



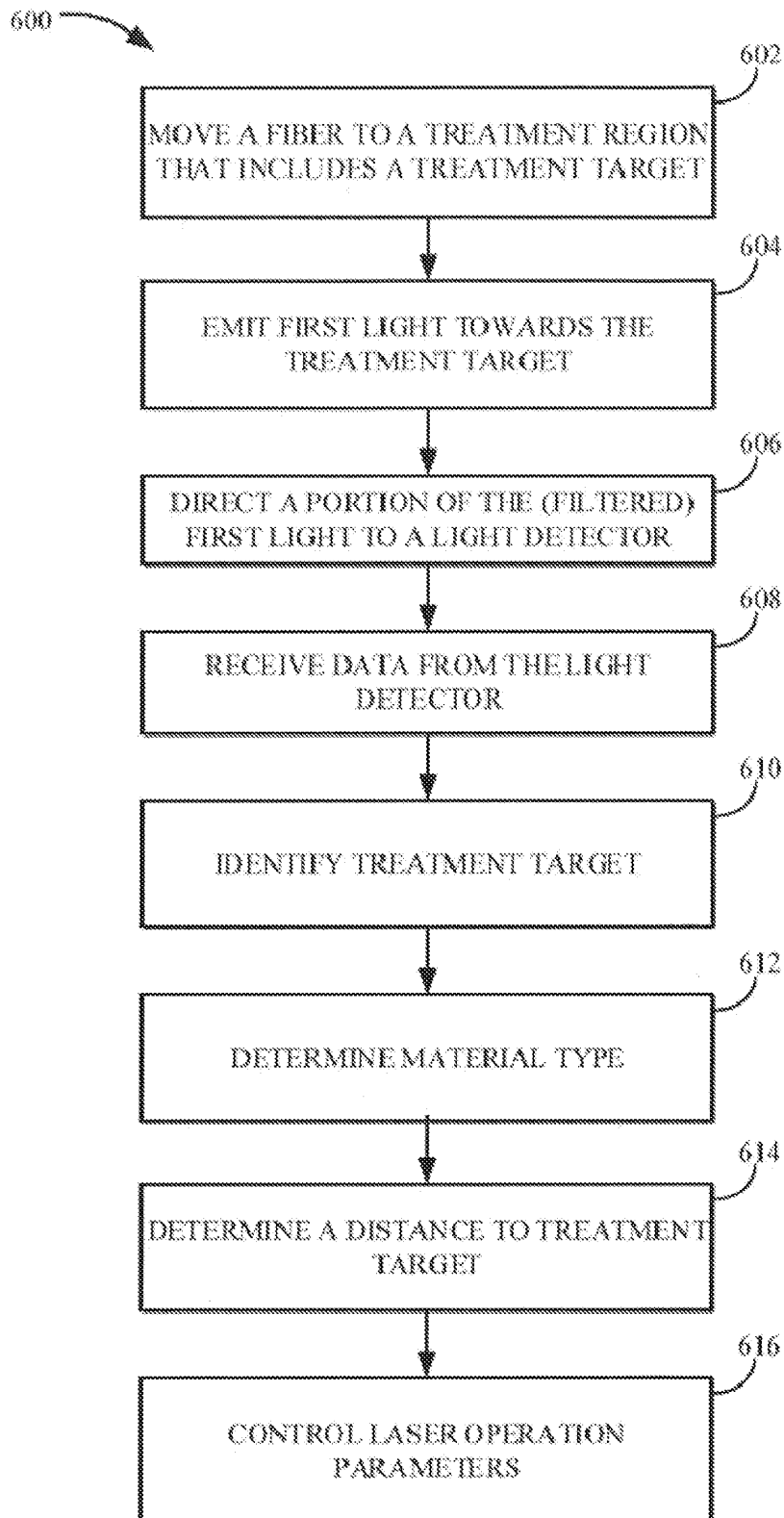


FIG. 8A

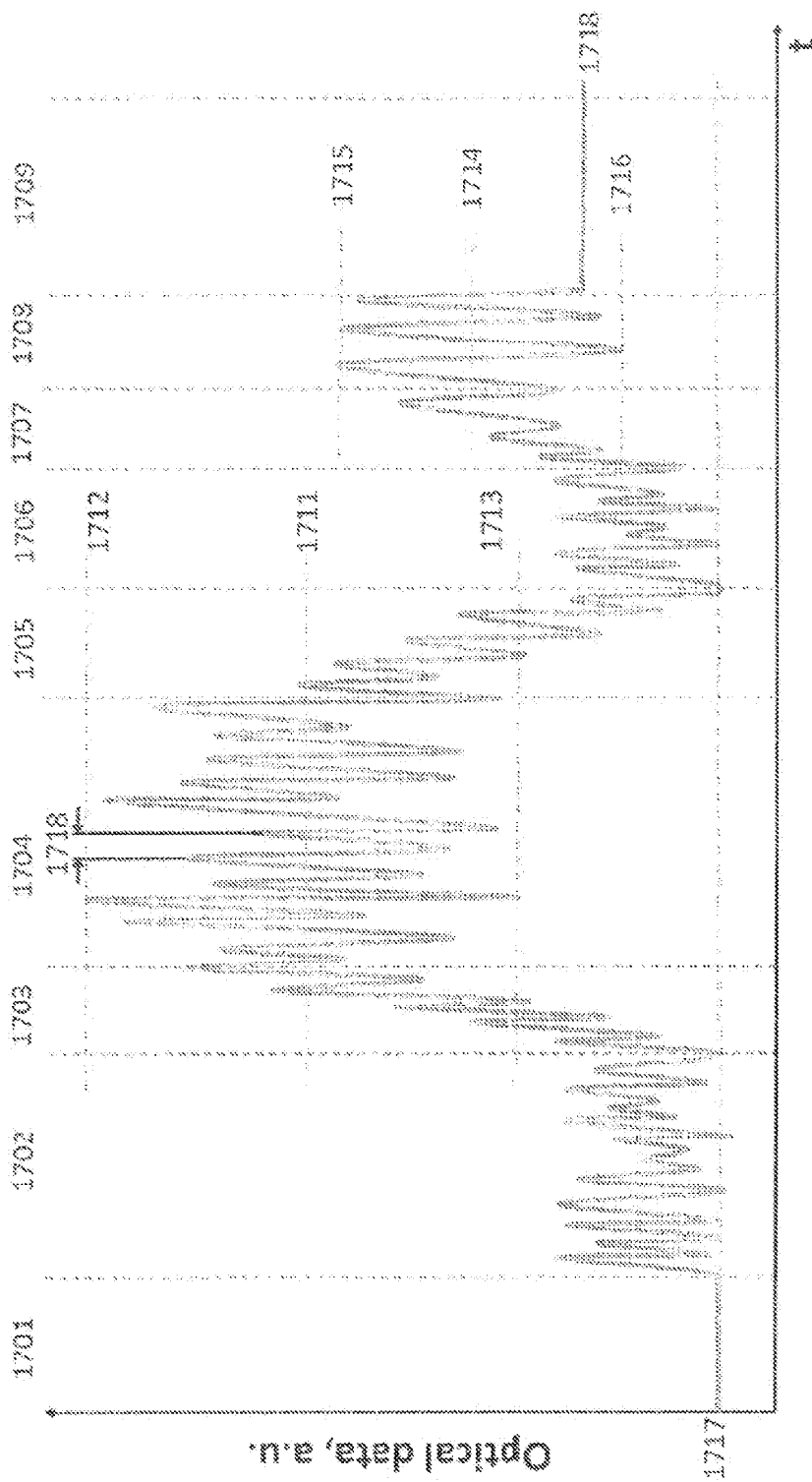


FIG. 8B

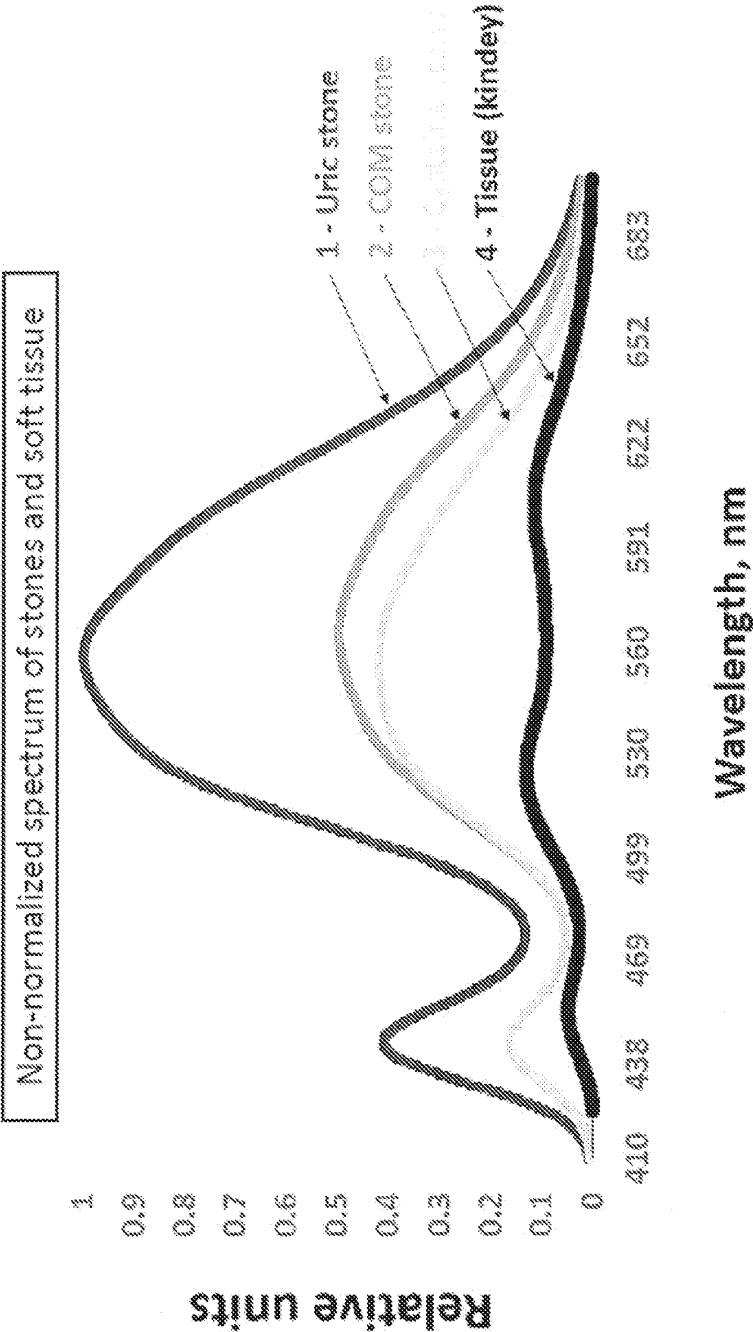


FIG. 9

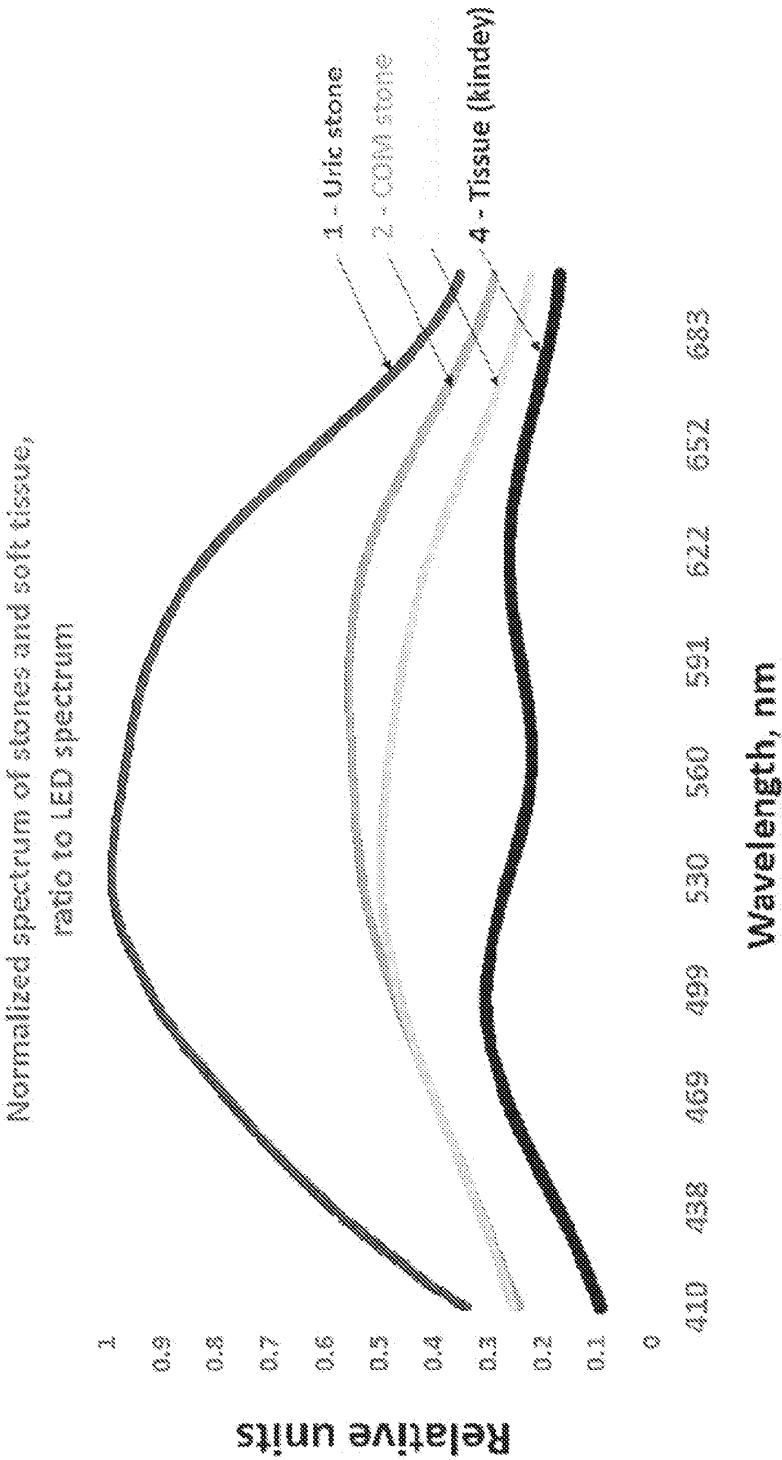


FIG. 10

Full integral of back reflection signal of endoscopic LED signals from stones and soft tissue in different spectral ranges.

Area of integration	Integral signal for different tissue type in different spectral range, a.u and same signal normalized to signal in same ranges from soft tissue									
	Uric stone		COM stone		Cysteine stone		Tissue (kidney)			
	Abs. value	Normalized value (ratio to tissue)	Abs. value	Normalized value (ratio to tissue)	Abs. value	Normalized value (ratio to tissue)	Abs. value	Normalized value (ratio to tissue)		
Whole range	410-700 nm	220	3.28	130	1.94	114	1.7	67	1	
	410-460 nm	27.5	3.4	15.4	1.9	15.6	1.93	8.1	1	
Wide range	510-620 nm	104.2	3.83	59.6	2.19	52.1	1.92	27.2	1	
	410-430 nm	8.6	3.74	5.3	2.3	5.5	2.39	2.3	1	
Preferable range	550-590 nm	38.3	4.26	22	2.44	19.1	2.12	9	1	

FIG. 11

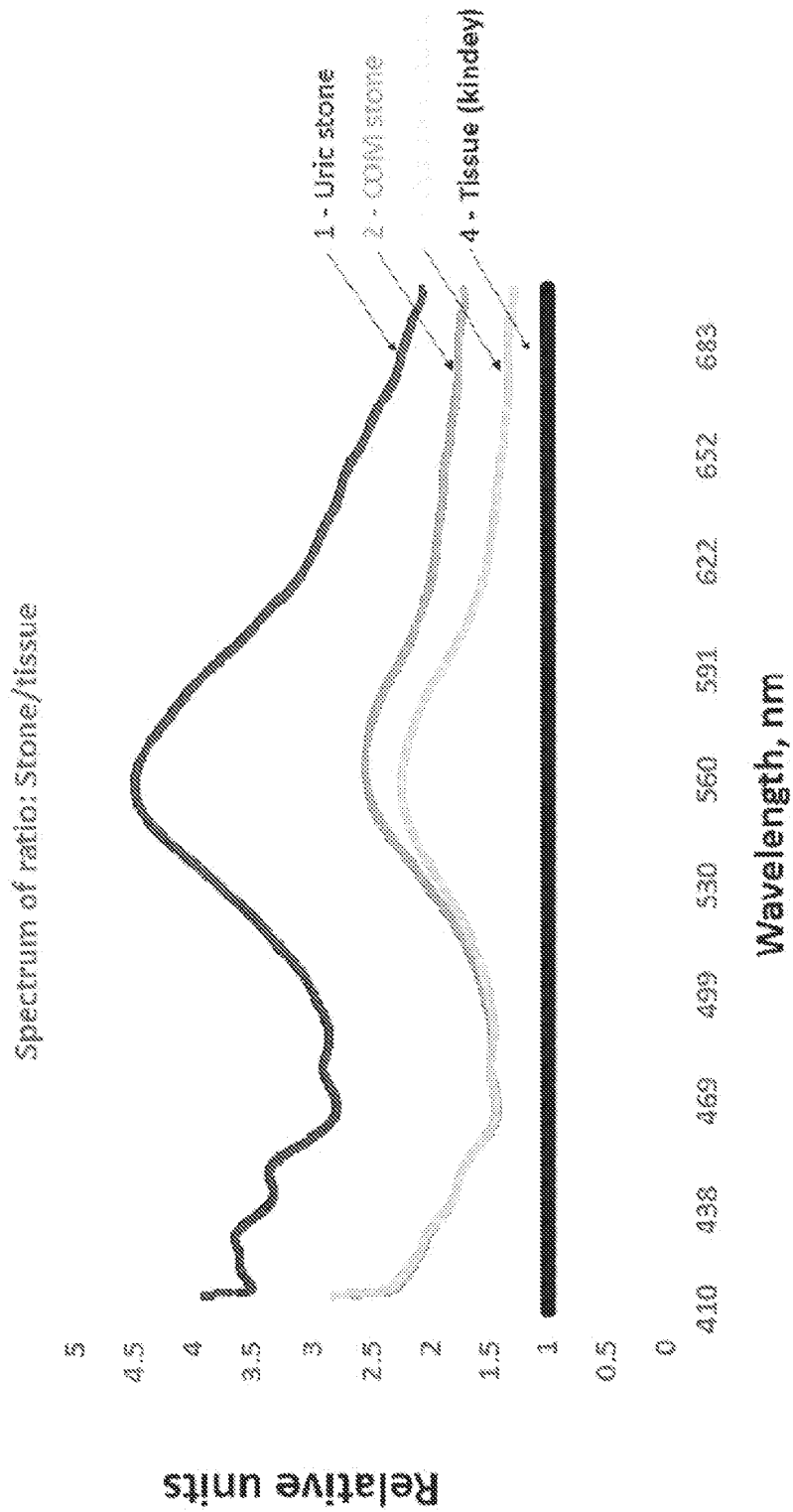


FIG. 12

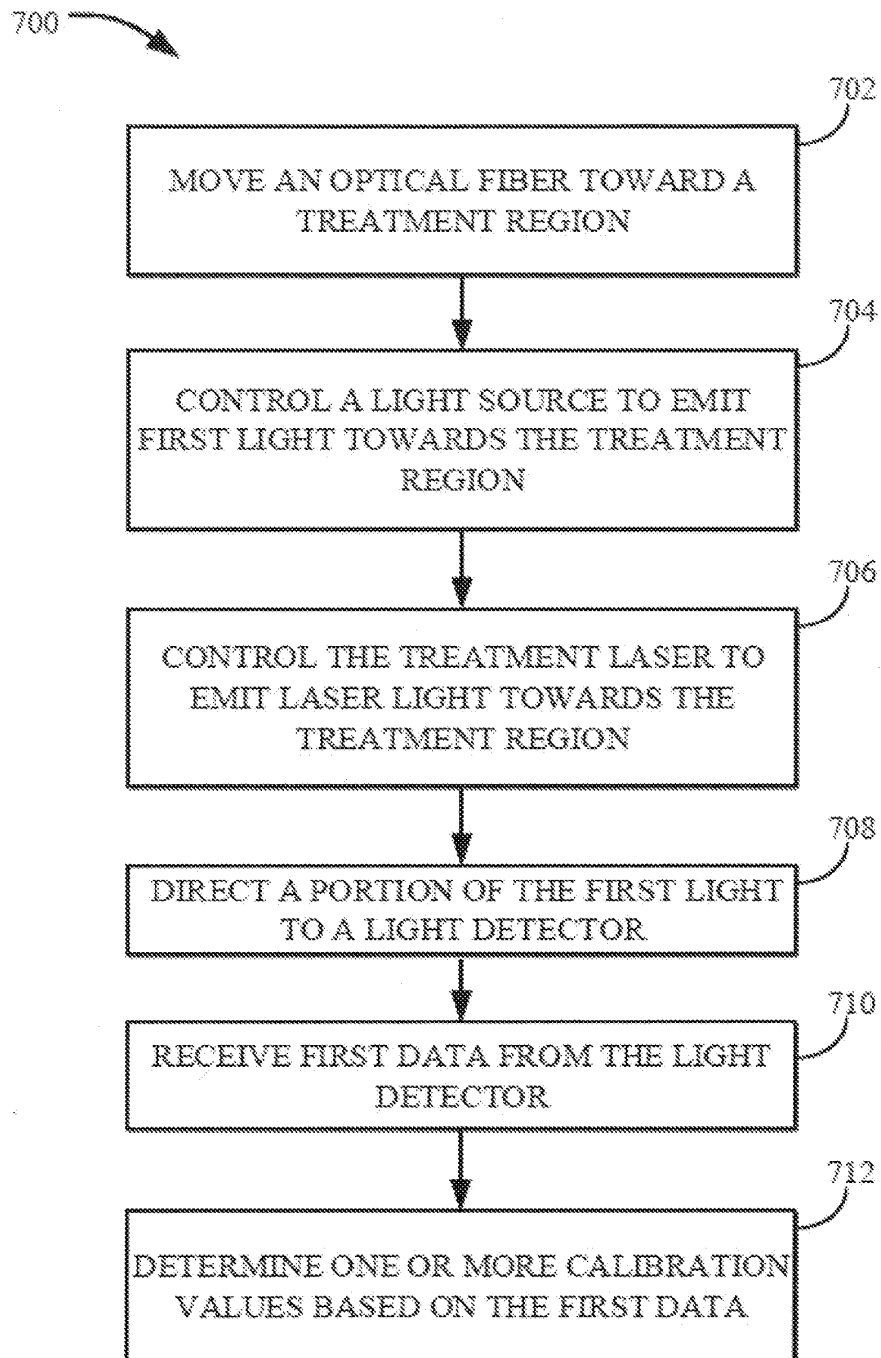


FIG. 13

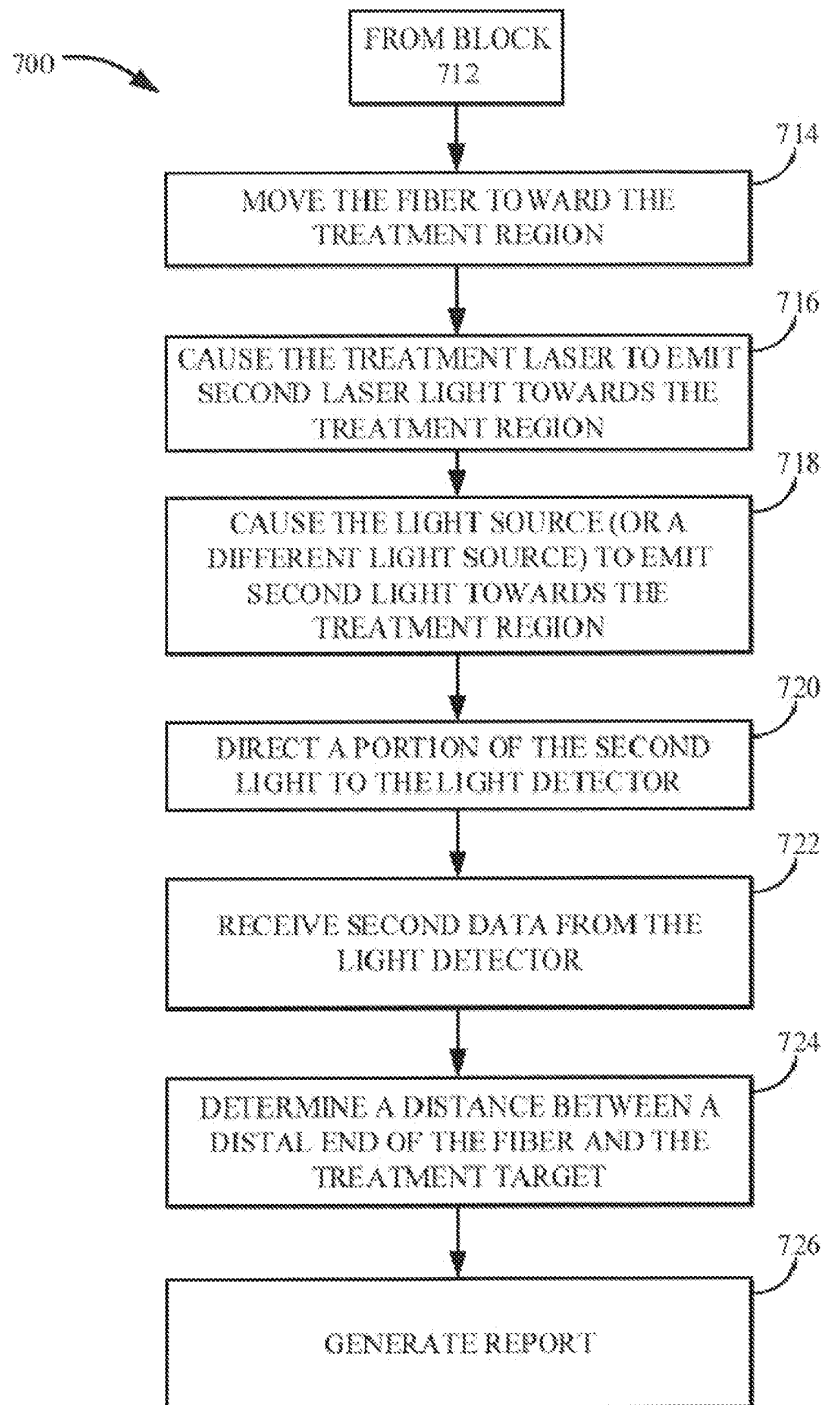
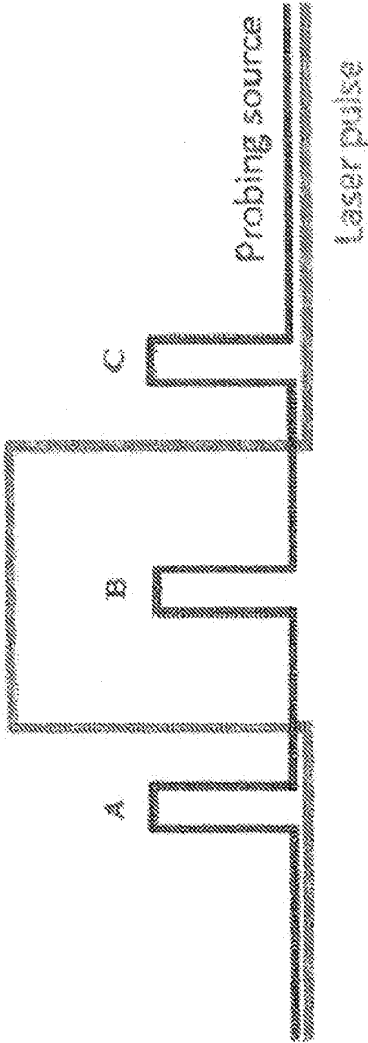


FIG. 14

Graph of laser pulses with pulsed probing source



Graph of laser pulses with continuous wave probing source

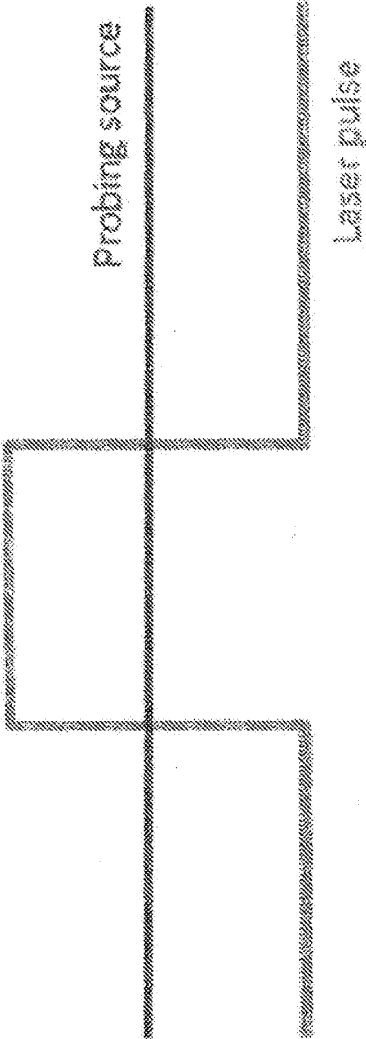


FIG. 15

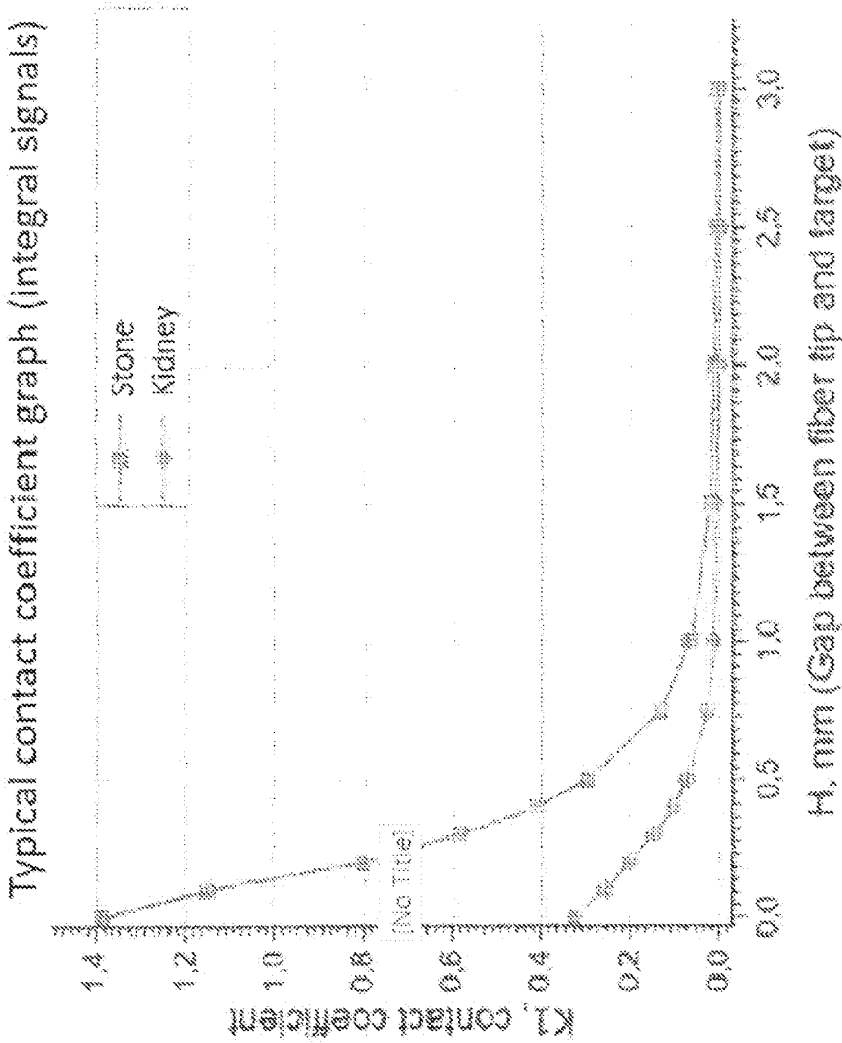


FIG. 16

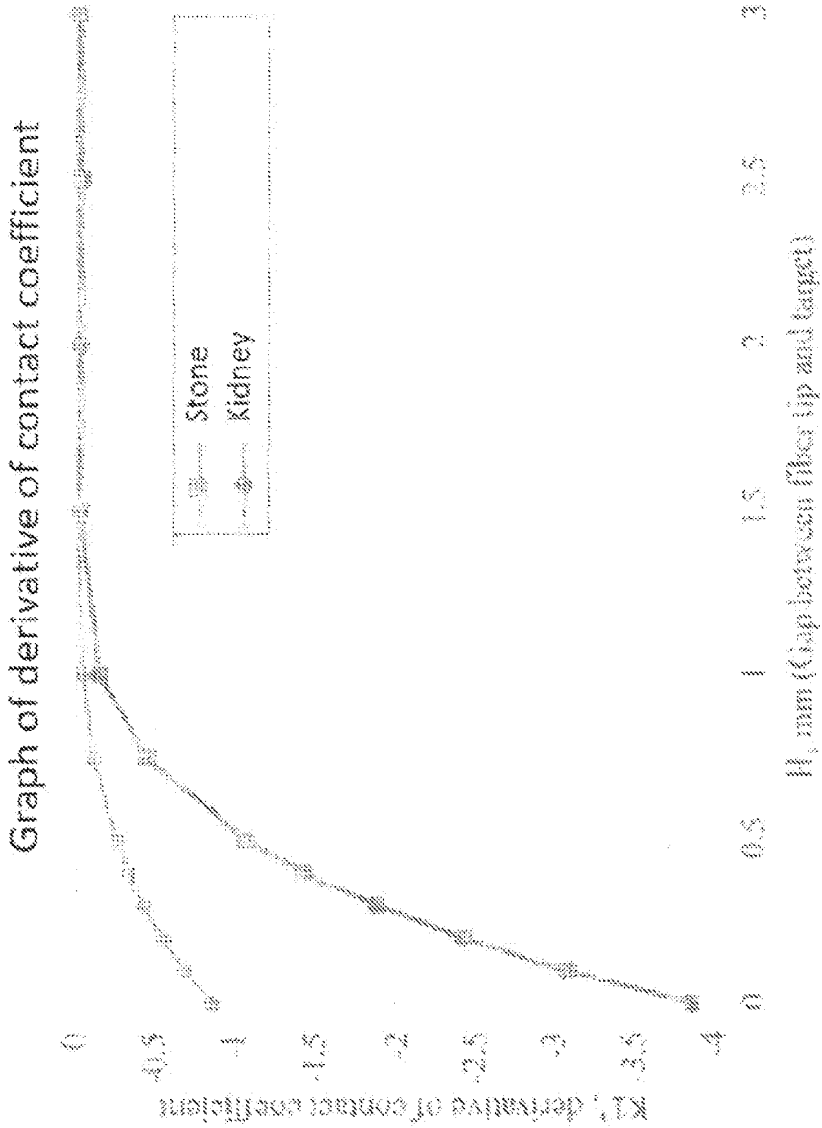


FIG. 17

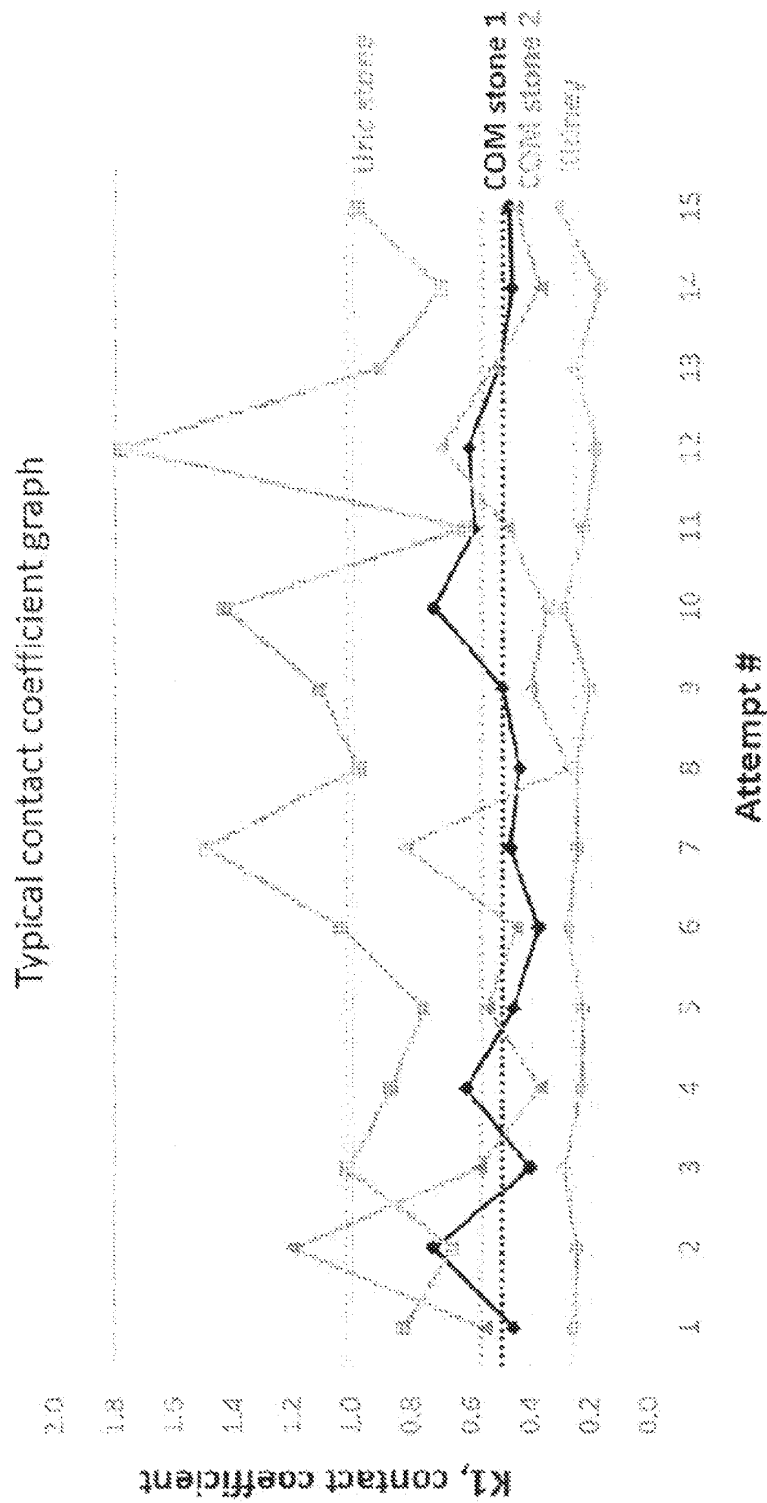


FIG. 18

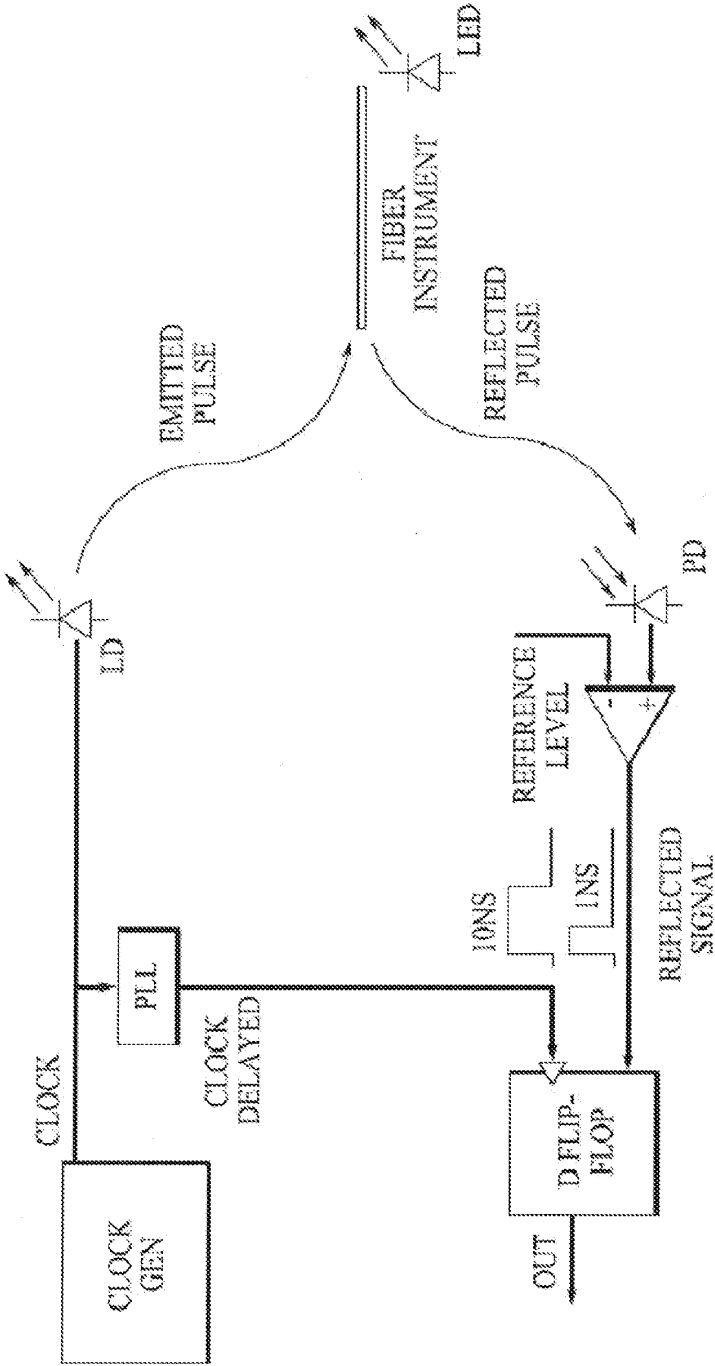


FIG. 19

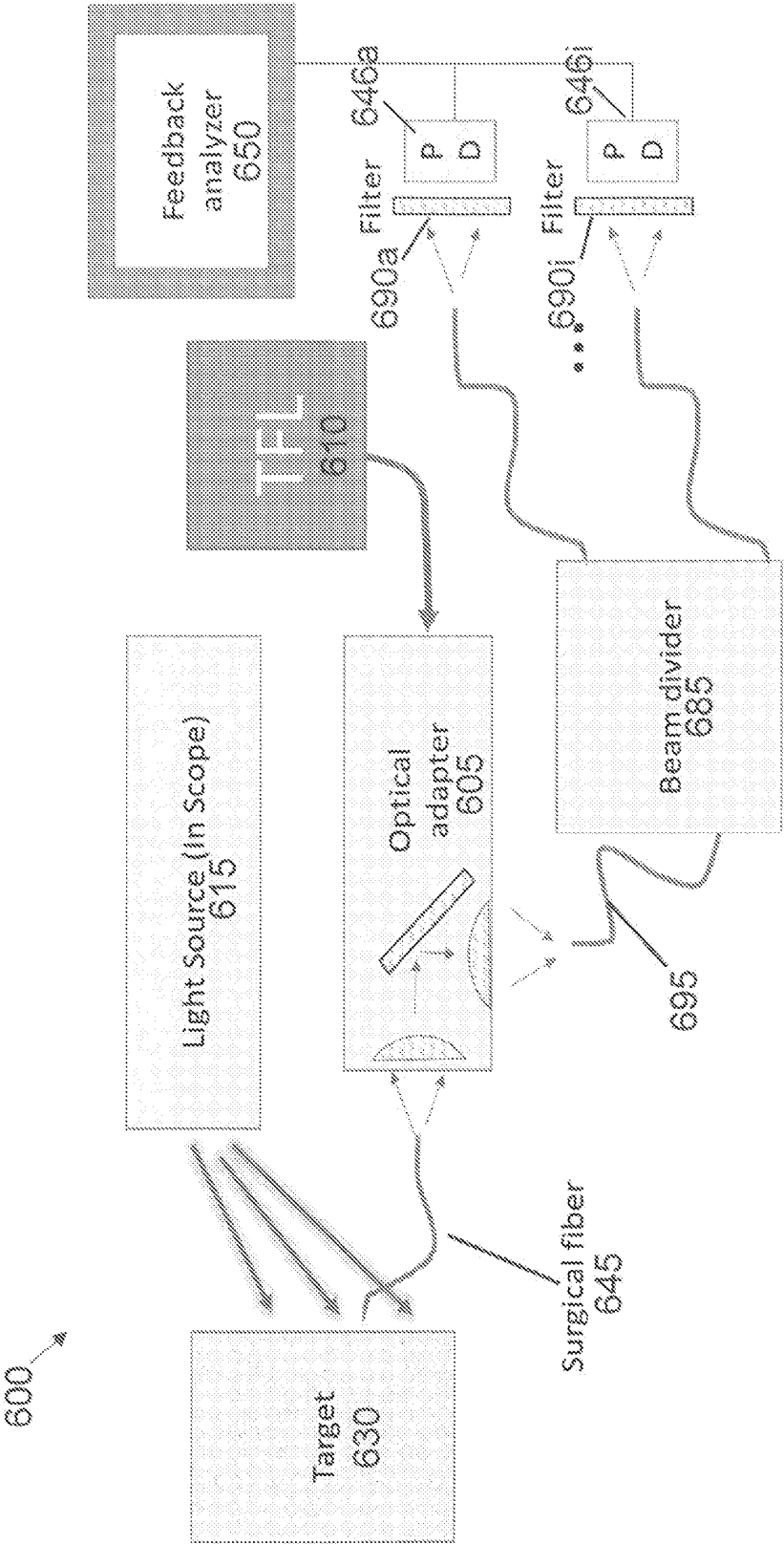


FIG. 20

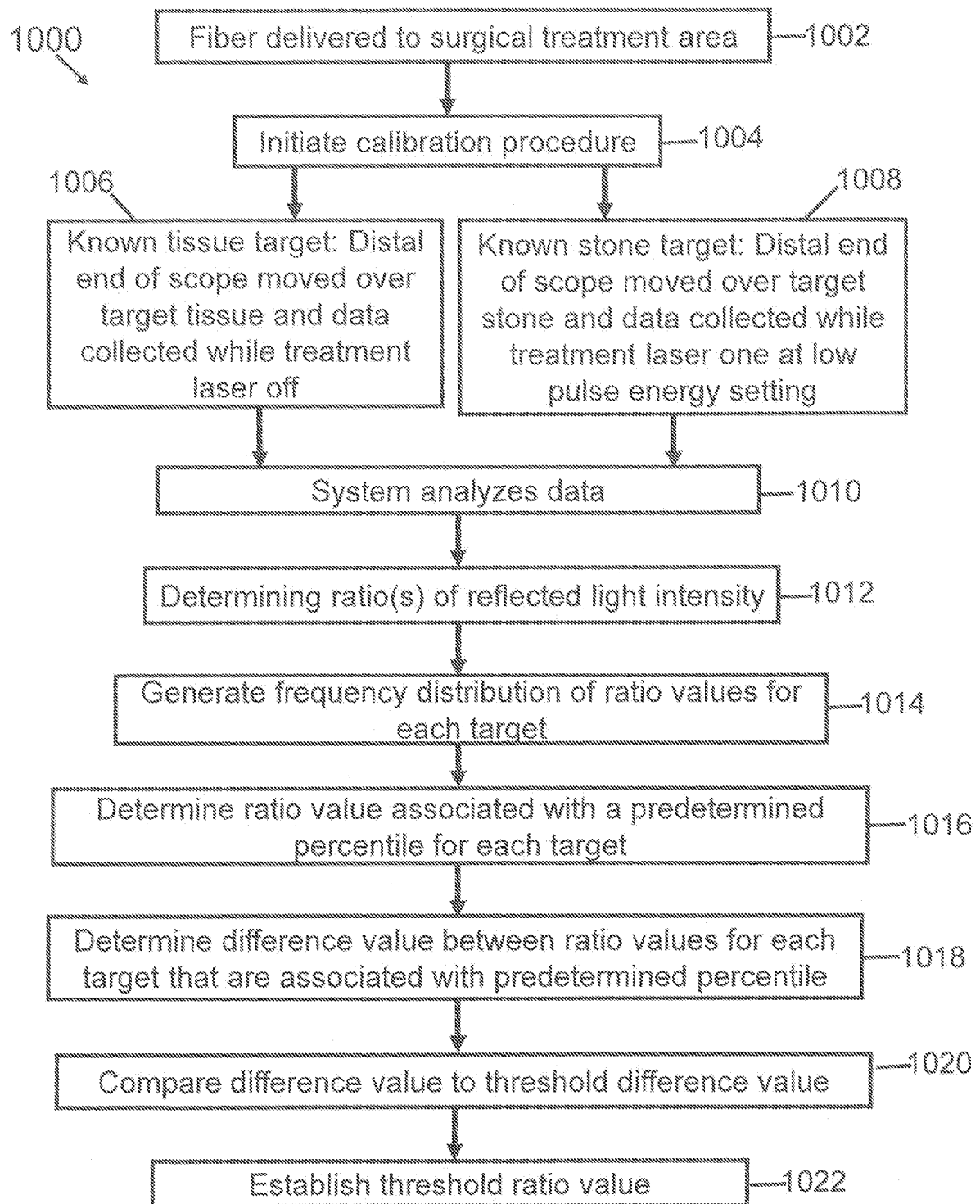


FIG. 21a

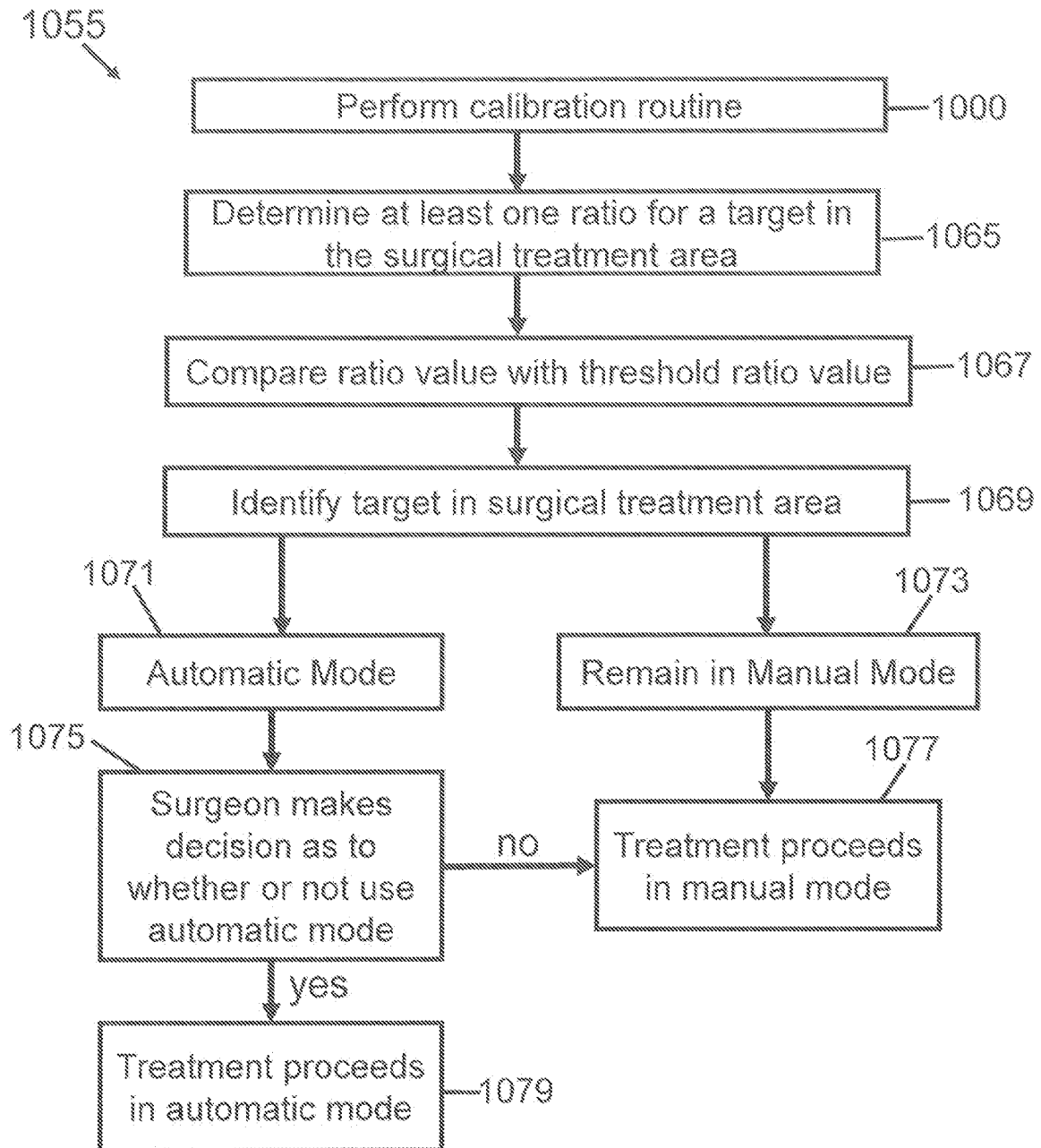


FIG. 21b

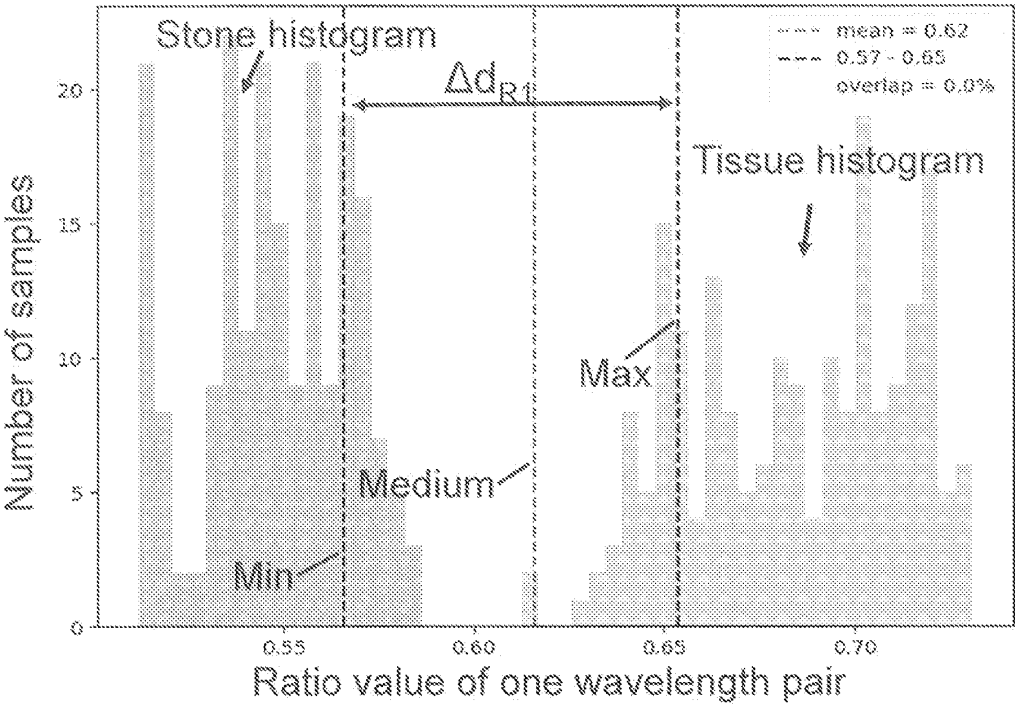


FIG. 22a

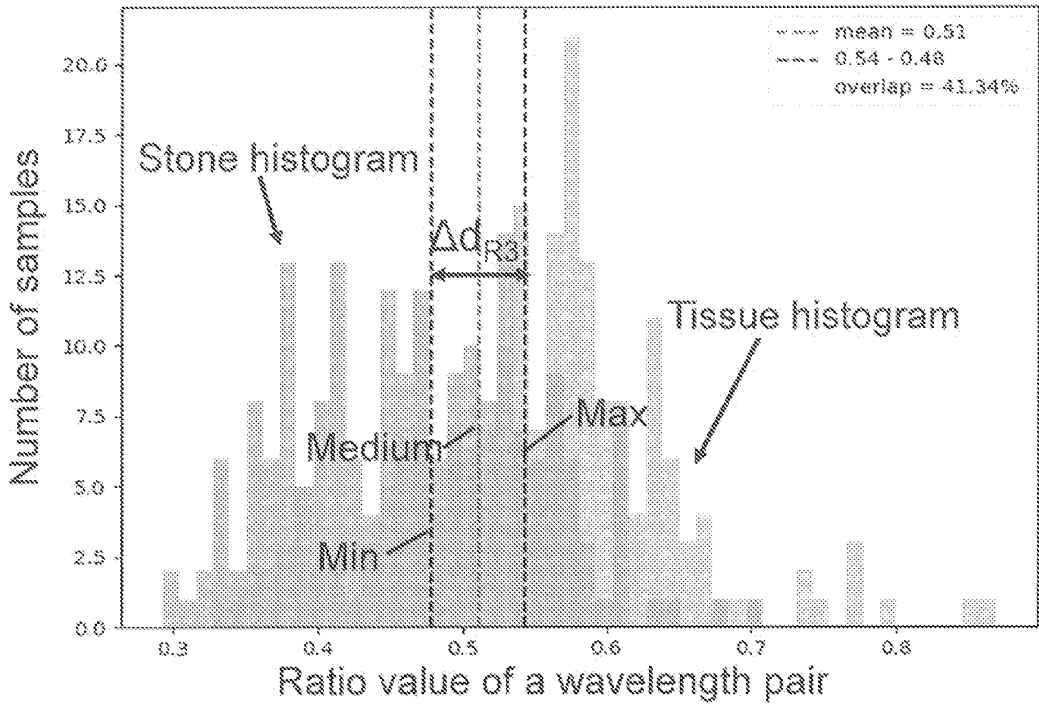


FIG. 22b

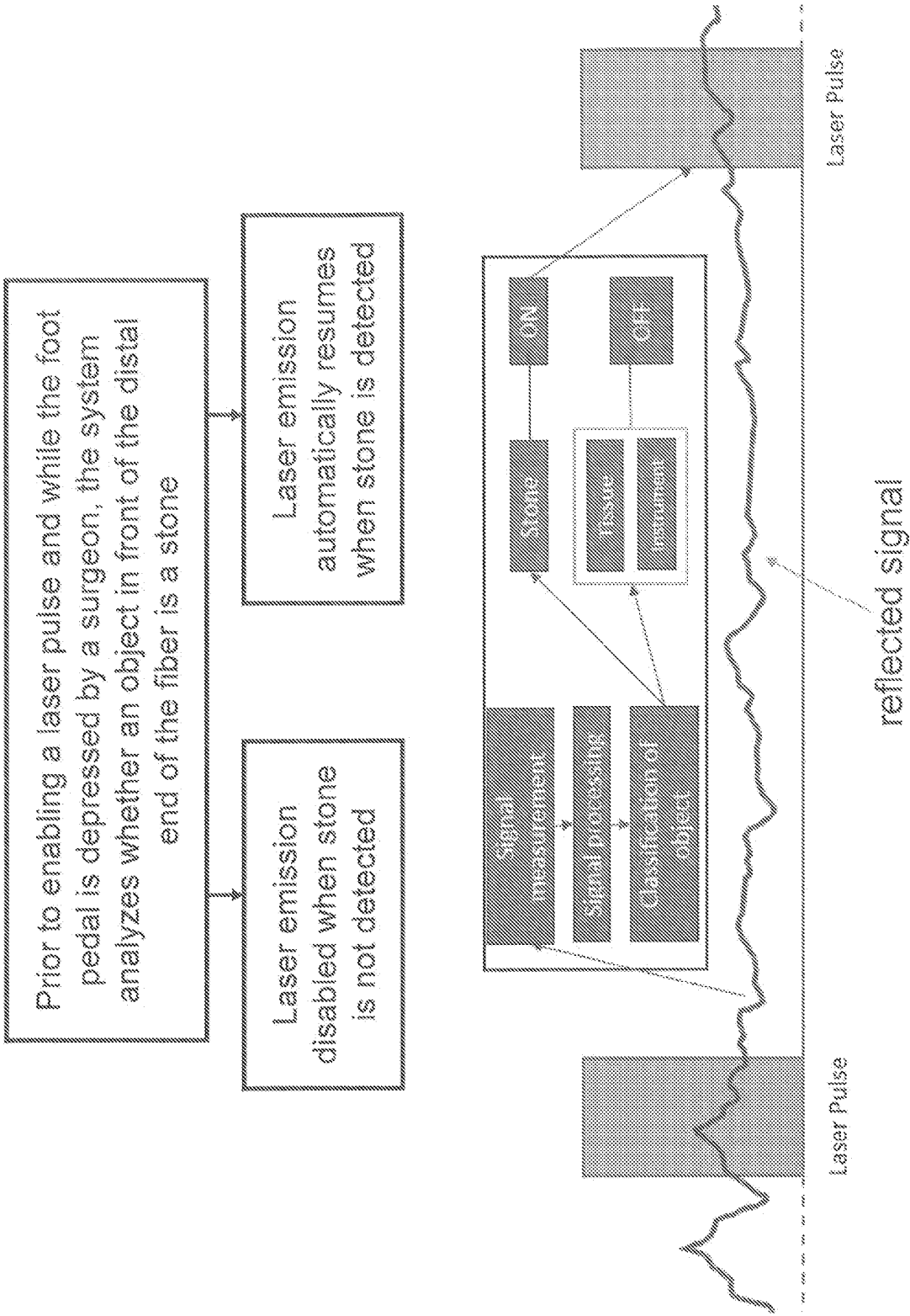


FIG. 23

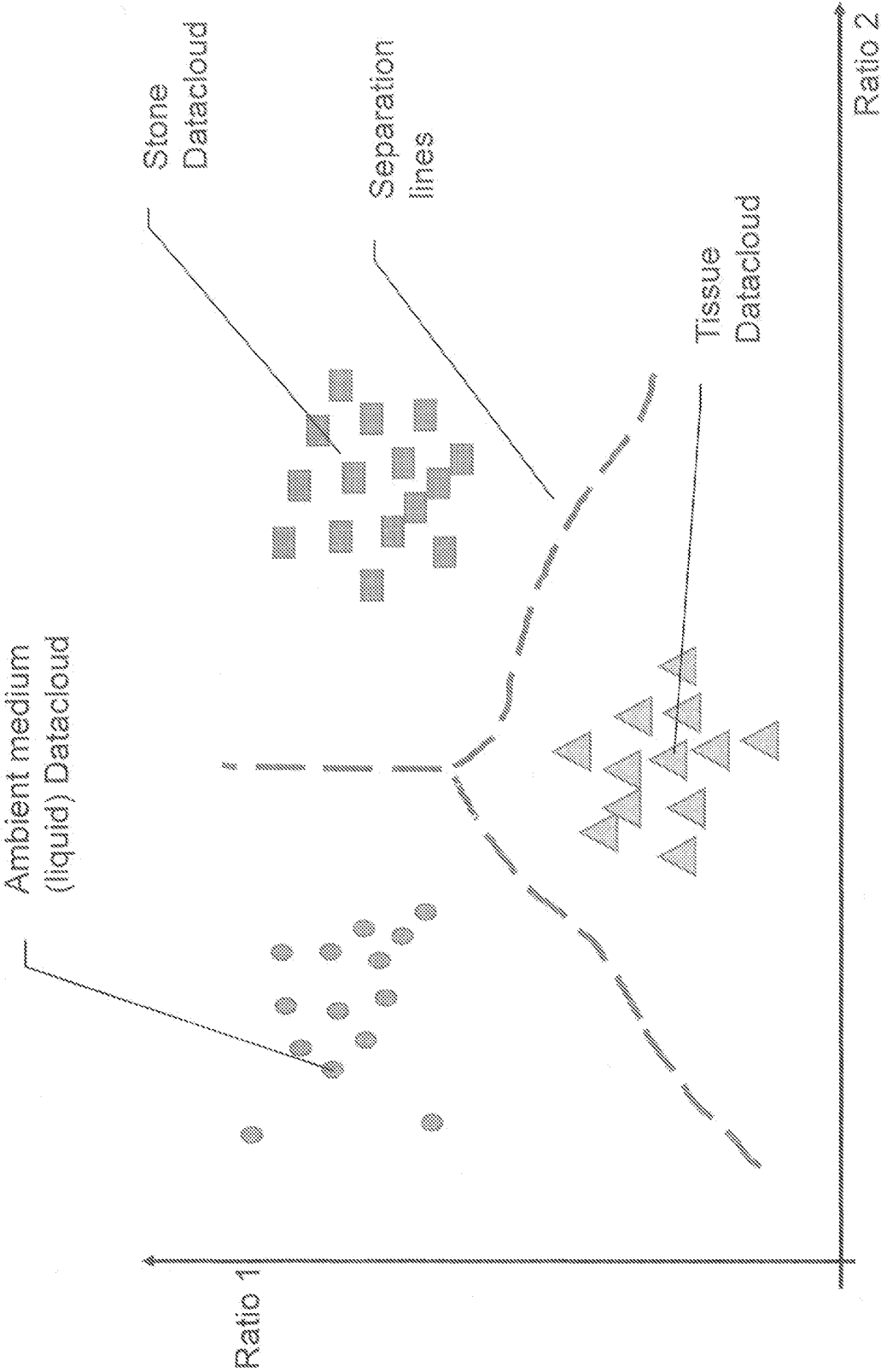


FIG.24

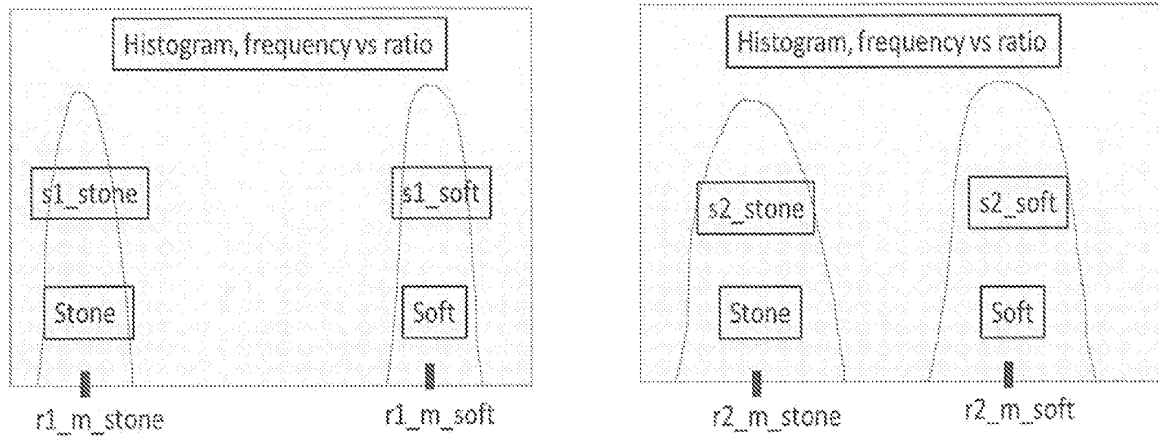


FIG. 25

- $r1_m_soft$: mean ratio, soft, $r1_m_stone$: mean ratio, stone, similar for $r2$.
- $s1_soft$: s.d., soft, $s1_stone$: s.d., stone, similar for $s2$.
- $es1 = (r1_m_soft - r1_m_stone) / ((s1_soft * s1_stone)^{0.5})$
- $es2 = (r2_m_soft - r2_m_stone) / ((s2_soft * s2_stone)^{0.5})$
- Use $\alpha 1$ and $\alpha 2$ as weighting factors, defined as: $\alpha 1 = es1$; $\alpha 2 = es2$
- Larger the α , larger is the separation
- Weighted r (new) = $(\alpha 1 * r1 + \alpha 2 * r2) / (\alpha 1 + \alpha 2)$
- If $\alpha 1 \gg \alpha 2$, weighted $r = r1$, as expected.
- Build a histogram of frequency vs weighted r . Use separation factor based on weighted r .

FIG. 26

Case#	Stone Sense On/Off	Stone volume, cm ³	Density, HU	Laser mode				Total laser procedure time, min	Total procedure time, min	Footswitch on time, sec	Laser emission time, sec	Actual Duty cycle	Number of off/on pressing the footswitch
				Peak power, W	Average Power, W	Pulse energy, J	Frequency, Hz						
1	On	0.92	1290	500	30	1	30	5	10	103	70	0.66	4
2	Off	0.9	1196	500	30	1	30	8.5	13	104	104	1.00	36
3	On	0.28	1500	500	30	1	30	3	20	53	17	0.92	3
4	Off	0.3	1445	500	30	1	30	10	85	474	474	1.00	130
5	On	0.26	1600	500	30	1	30	7	15	104	40	0.22	5
6	On	0.11	1357	500	30	1	30	4	15	44	13	0.3	3

FIG. 27

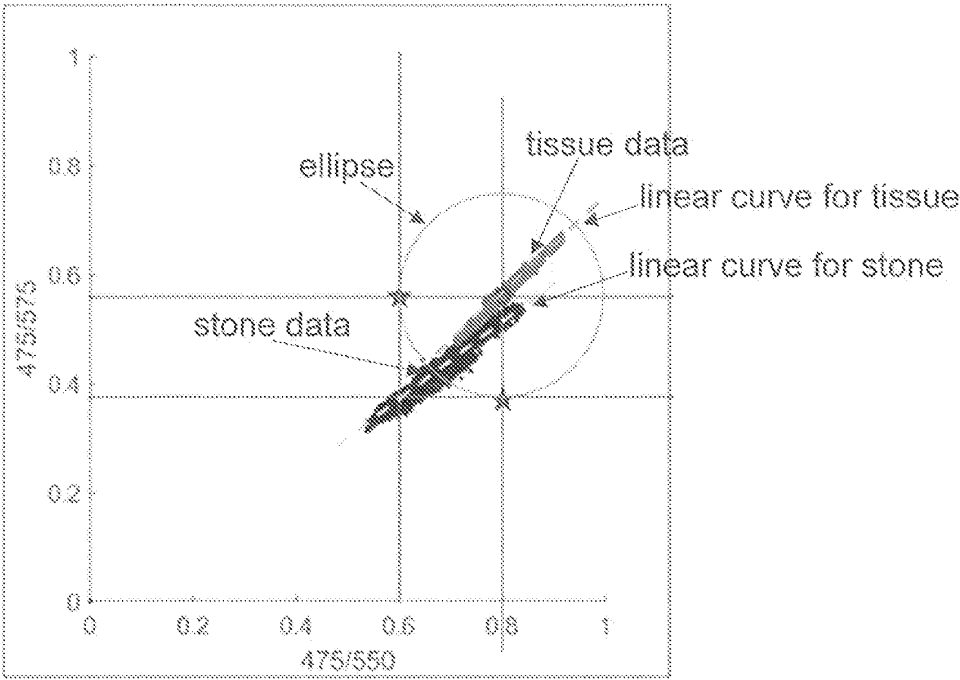


FIG. 28a

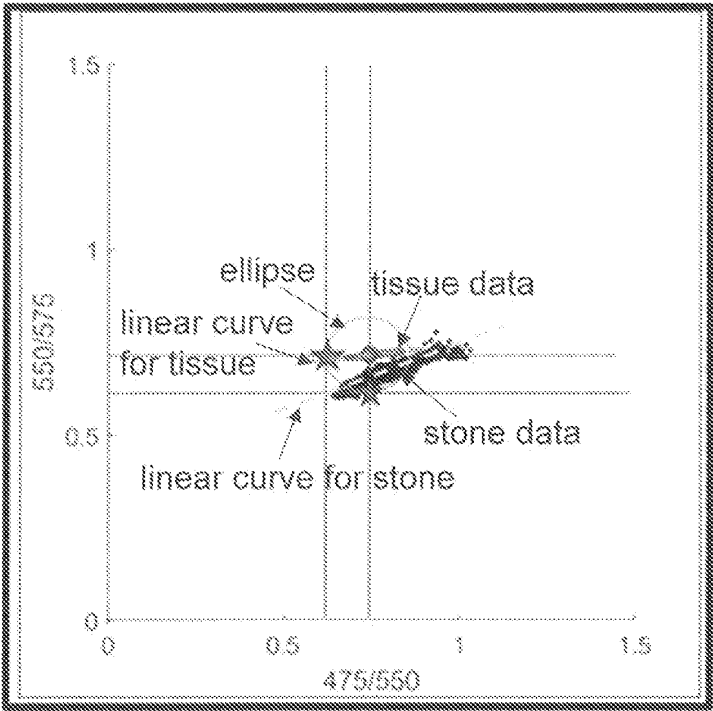


FIG. 28b

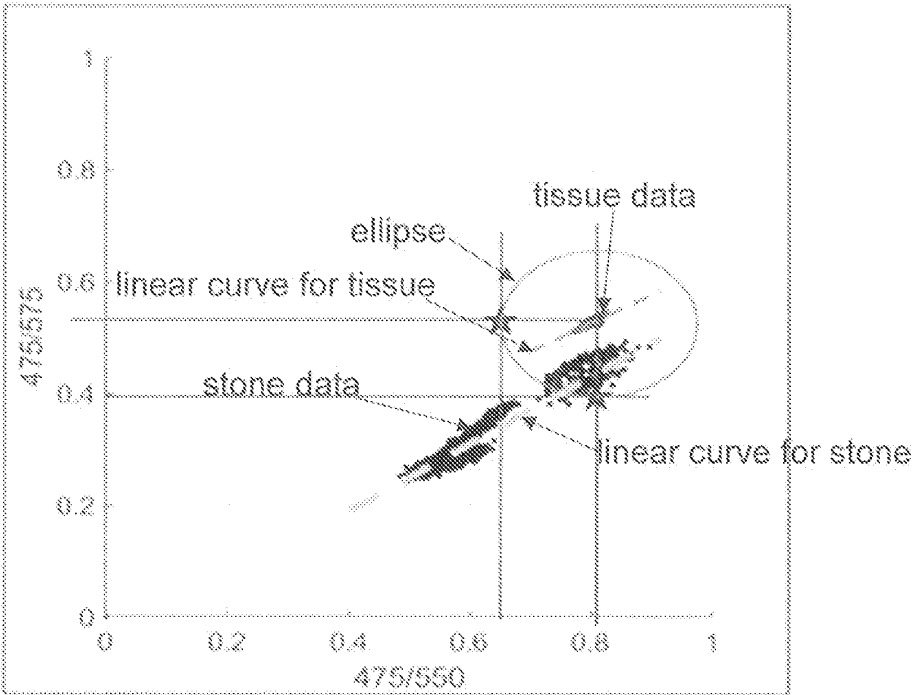


FIG. 29a

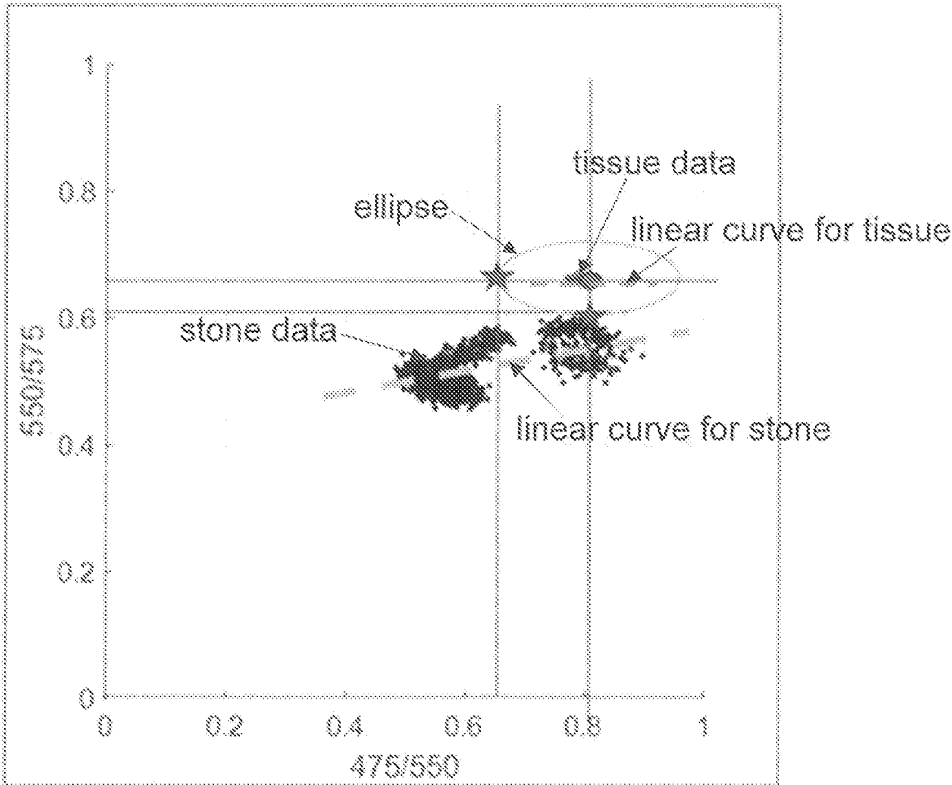


FIG. 29b