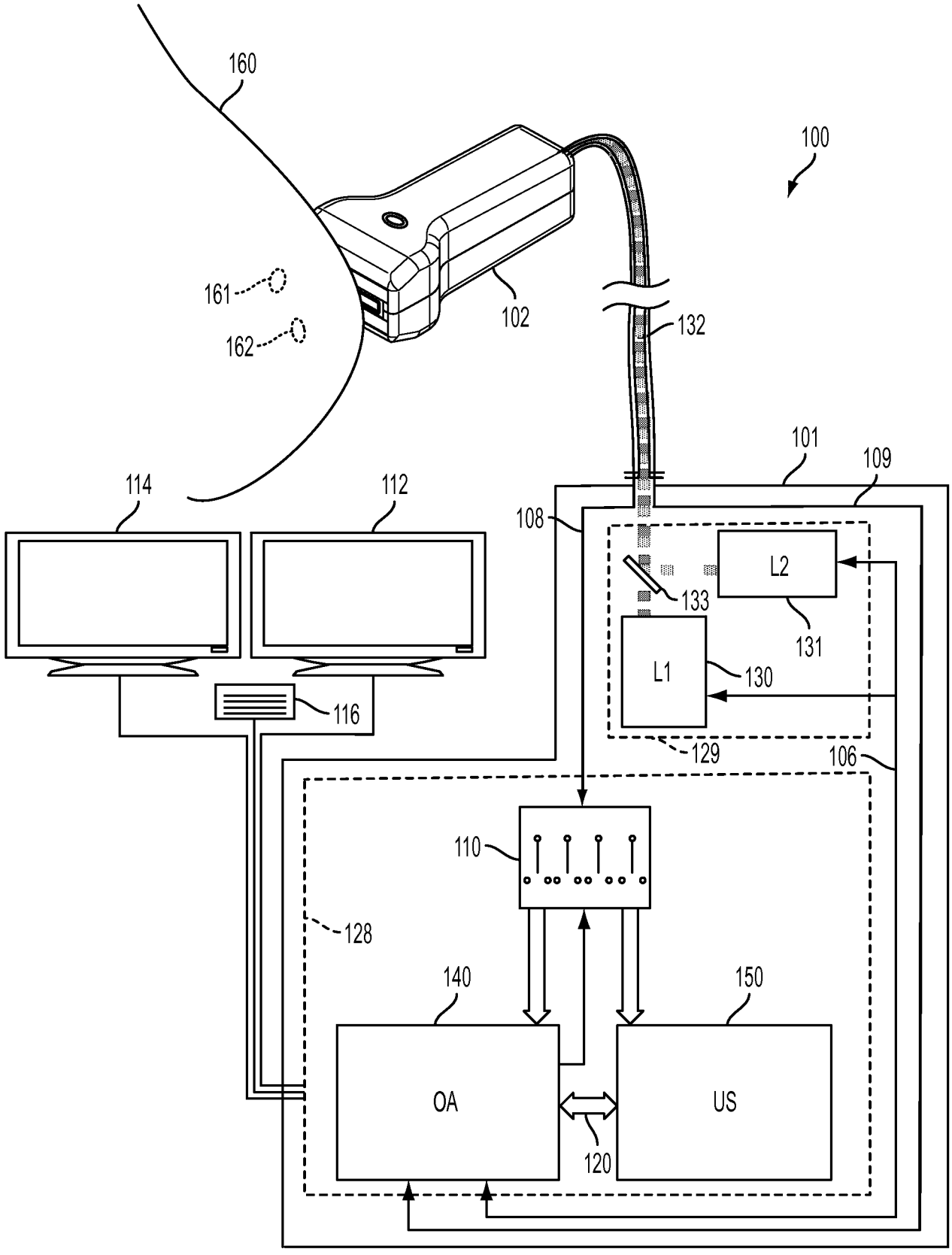

160
100
161
162
102
132
101
109
114
112
108
L2
133
131
L1
130
116
129
106
110
128
140
150
OA
US
120

FIG. 1

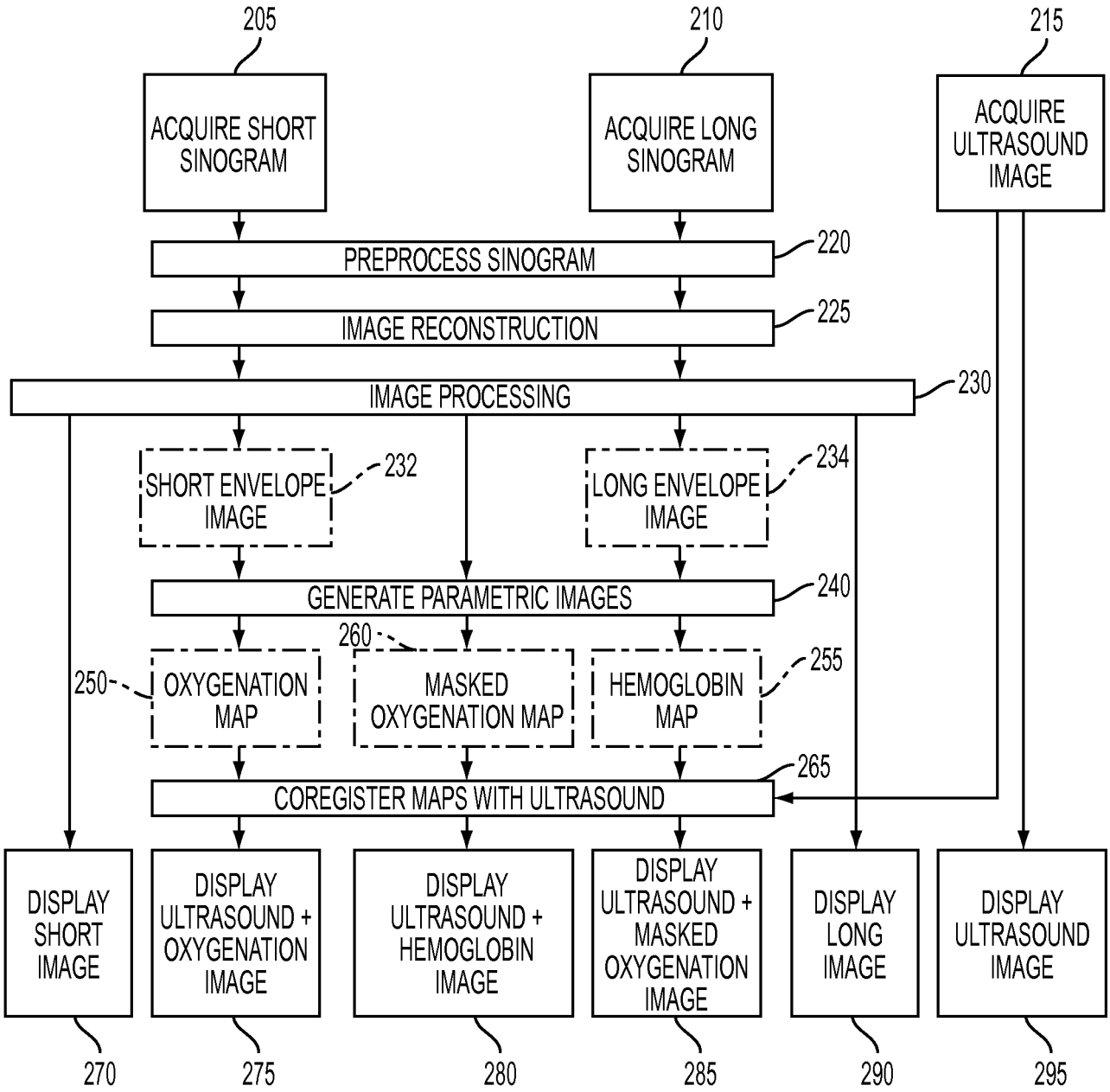

205
210
215
ACQUIRE SHORT SINOGRAM
ACQUIRE LONG SINOGRAM
ACQUIRE ULTRASOUND IMAGE
PREPROCESS SINOGRAM
220
IMAGE RECONSTRUCTION
225
IMAGE PROCESSING
230
SHORT ENVELOPE IMAGE
232
LONG ENVELOPE IMAGE
234
GENERATE PARAMETRIC IMAGES
240
260
250
OXYGENATION MAP
MASKED OXYGENATION MAP
HEMOGLOBIN MAP
255
265
COREGISTER MAPS WITH ULTRASOUND
DISPLAY SHORT IMAGE
DISPLAY ULTRASOUND + OXYGENATION IMAGE
DISPLAY ULTRASOUND + HEMOGLOBIN IMAGE
DISPLAY ULTRASOUND + MASKED OXYGENATION IMAGE
DISPLAY LONG IMAGE
DISPLAY ULTRASOUND IMAGE
270
275
280
285
290
295

FIG. 2

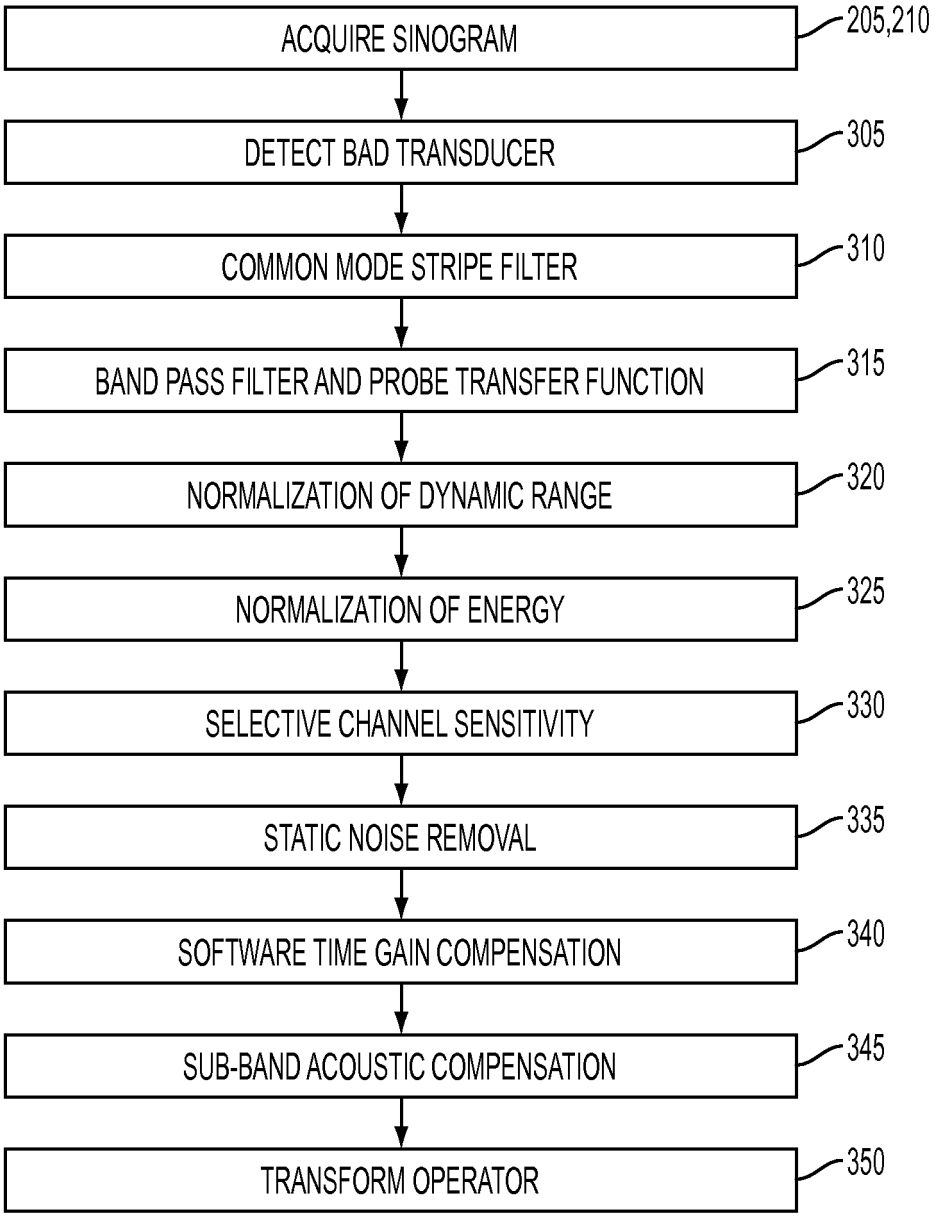

ACQUIRE SINOGRAM
205,210
DETECT BAD TRANSDUCER
305
COMMON MODE STRIPE FILTER
310
BAND PASS FILTER AND PROBE TRANSFER FUNCTION
315
NORMALIZATION OF DYNAMIC RANGE
320
NORMALIZATION OF ENERGY
325
SELECTIVE CHANNEL SENSITIVITY
330
STATIC NOISE REMOVAL
335
SOFTWARE TIME GAIN COMPENSATION
340
SUB-BAND ACOUSTIC COMPENSATION
345
TRANSFORM OPERATOR
350

FIG. 3

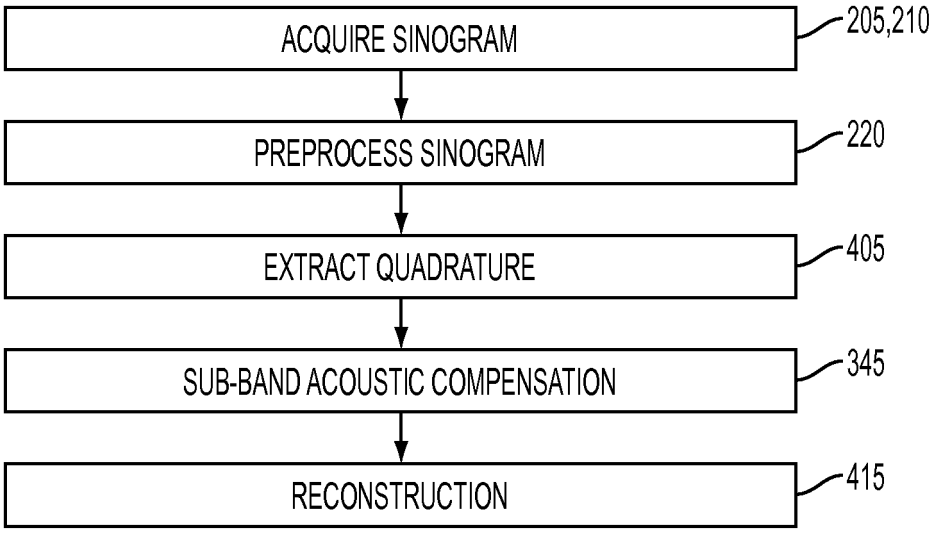

ACQUIRE SINOGRAM
205,210
PREPROCESS SINOGRAM
220
EXTRACT QUADRATURE
405
SUB-BAND ACOUSTIC COMPENSATION
345
RECONSTRUCTION
415

FIG. 4

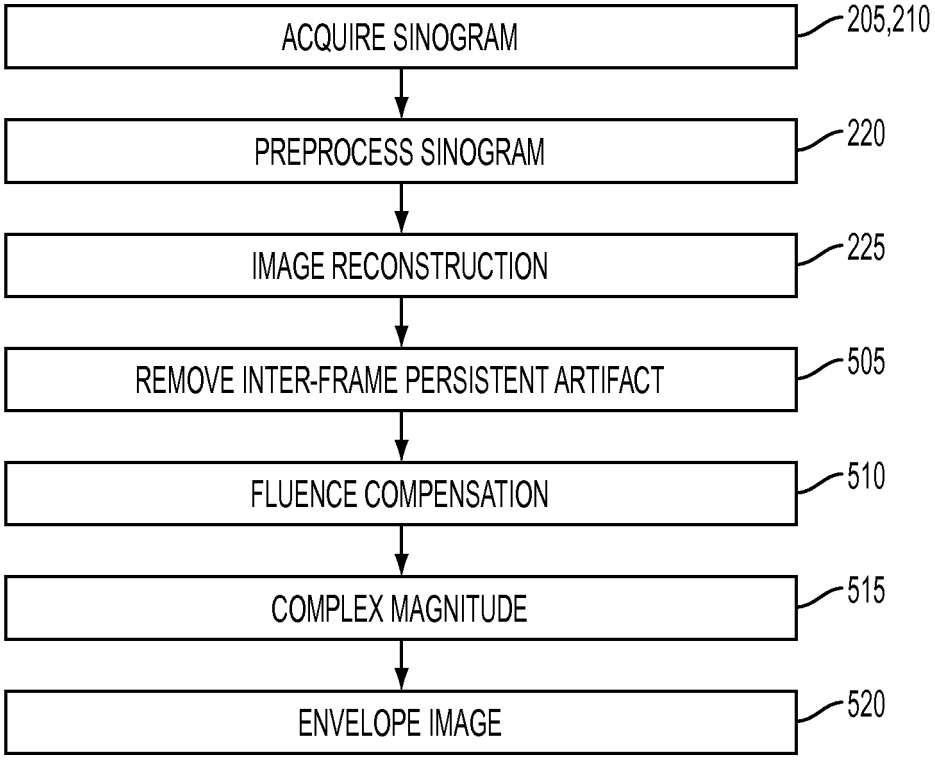

ACQUIRE SINOGRAM
205,210
PREPROCESS SINOGRAM
220
IMAGE RECONSTRUCTION
225
REMOVE INTER-FRAME PERSISTENT ARTIFACT
505
FLUENCE COMPENSATION
510
COMPLEX MAGNITUDE
515
ENVELOPE IMAGE
520

FIG. 5

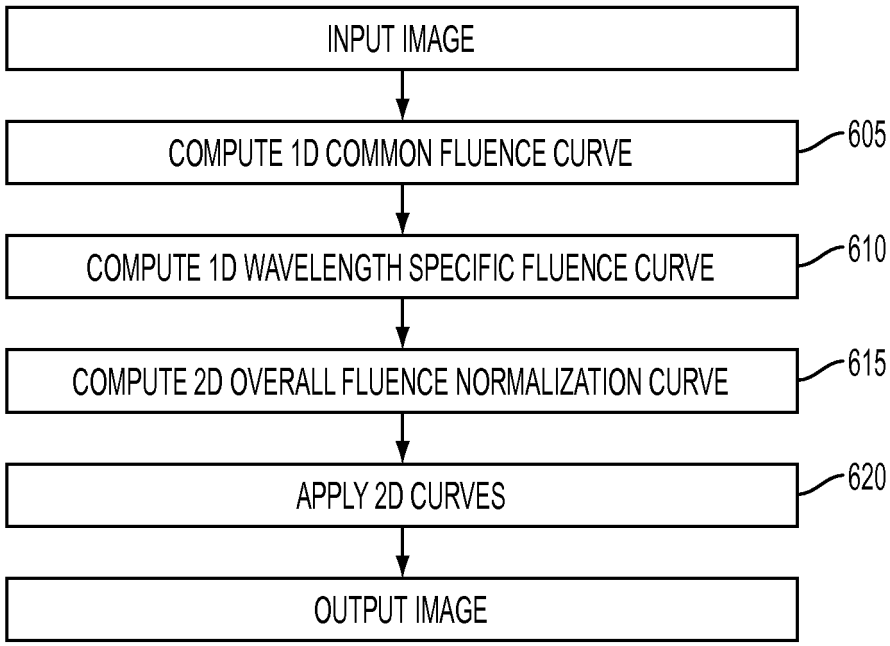

INPUT IMAGE
COMPUTE 1D COMMON FLUENCE CURVE
605
COMPUTE 1D WAVELENGTH SPECIFIC FLUENCE CURVE
610
COMPUTE 2D OVERALL FLUENCE NORMALIZATION CURVE
615
APPLY 2D CURVES
620
OUTPUT IMAGE

FIG. 6

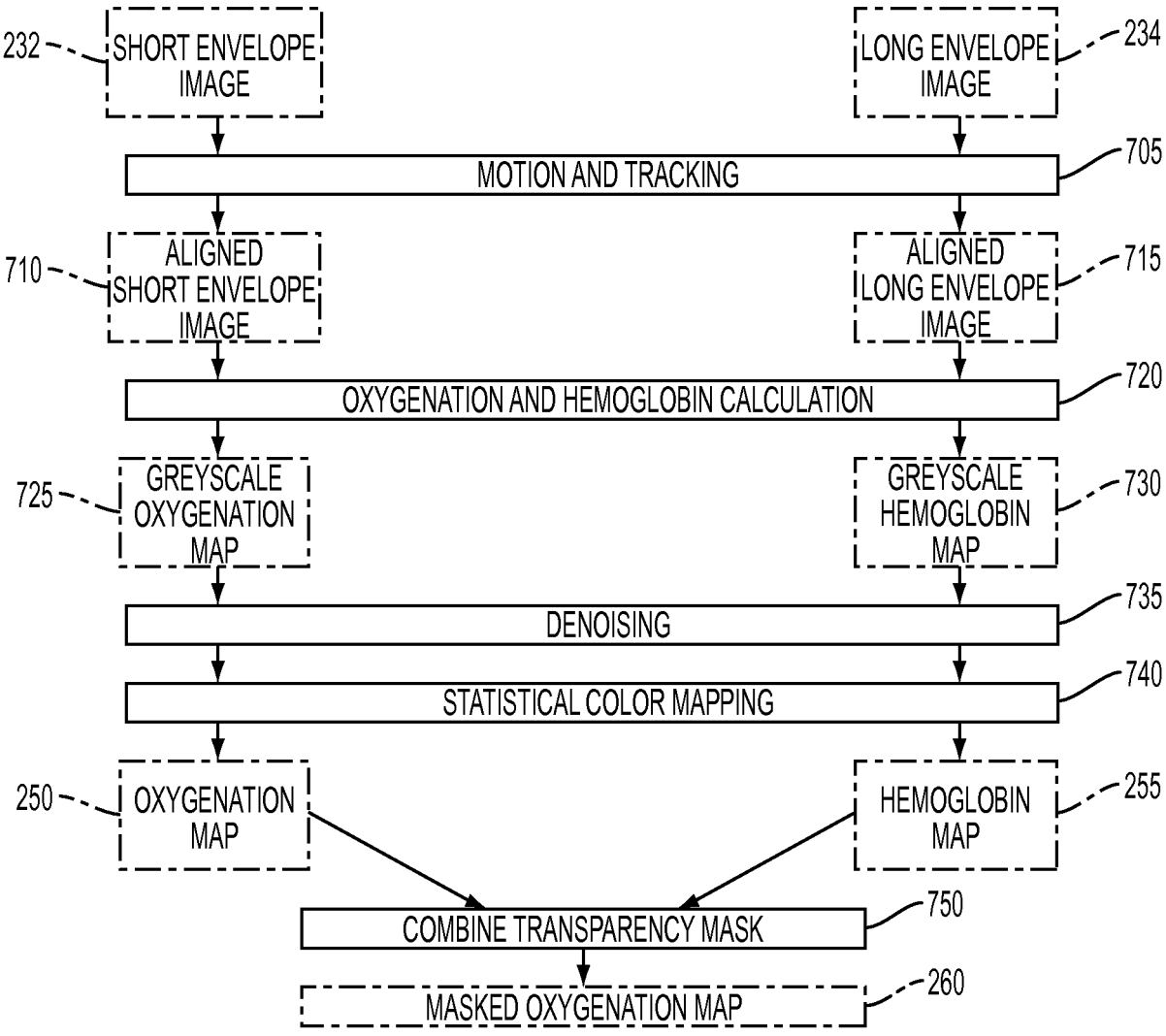

232
SHORT ENVELOPE IMAGE
234
LONG ENVELOPE IMAGE
705
MOTION AND TRACKING
710
ALIGNED SHORT ENVELOPE IMAGE
715
ALIGNED LONG ENVELOPE IMAGE
720
OXYGENATION AND HEMOGLOBIN CALCULATION
725
GREYSCALE OXYGENATION MAP
730
GREYSCALE HEMOGLOBIN MAP
735
DENOISING
740
STATISTICAL COLOR MAPPING
250
OXYGENATION MAP
255
HEMOGLOBIN MAP
750
COMBINE TRANSPARENCY MASK
260
MASKED OXYGENATION MAP

FIG. 7

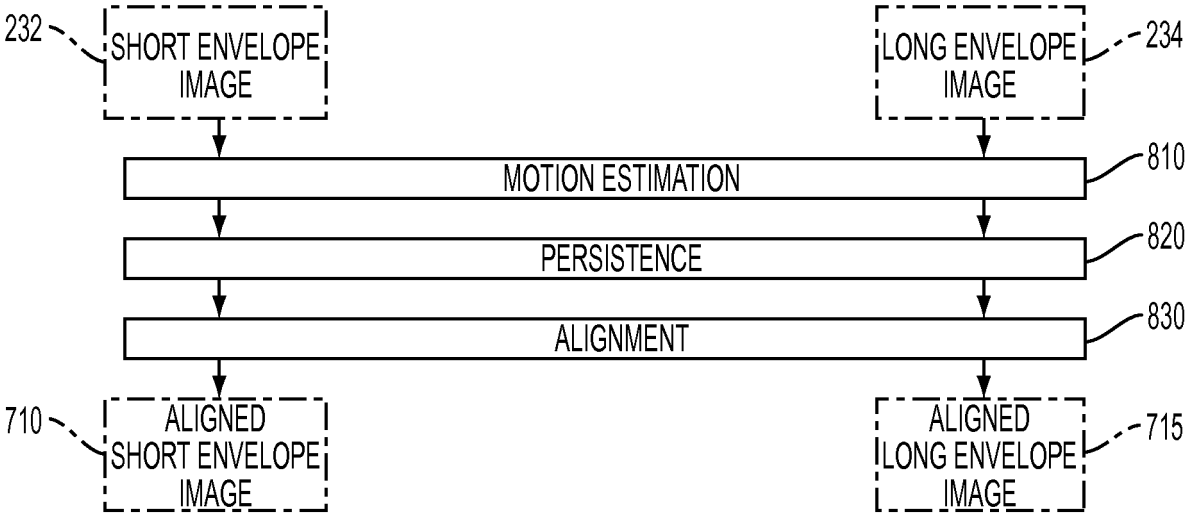

232
SHORT ENVELOPE IMAGE
LONG ENVELOPE IMAGE
234
MOTION ESTIMATION
810
PERSISTENCE
820
ALIGNMENT
830
710
ALIGNED SHORT ENVELOPE IMAGE
ALIGNED LONG ENVELOPE IMAGE
715

FIG. 8

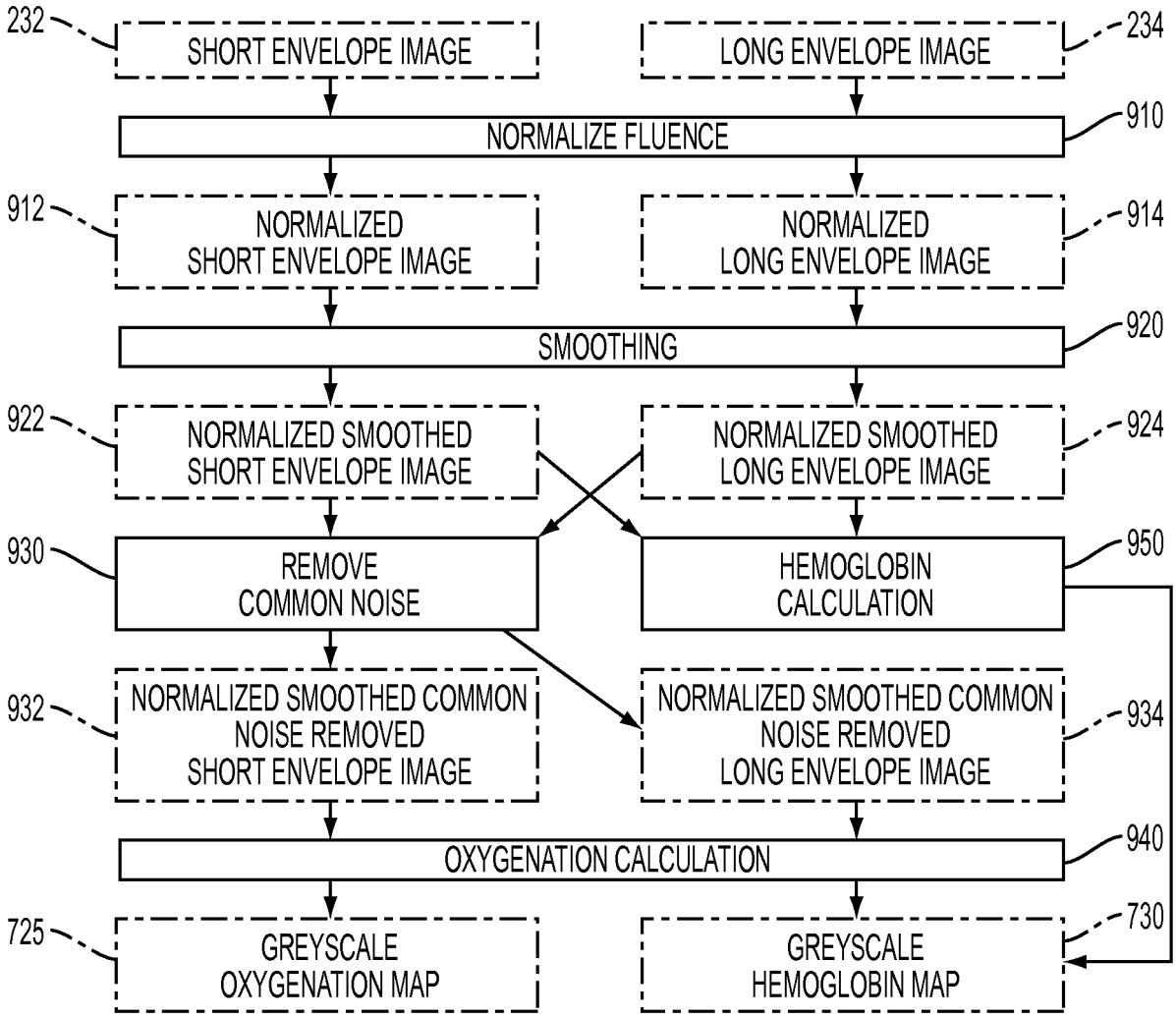

232
SHORT ENVELOPE IMAGE
234
LONG ENVELOPE IMAGE
NORMALIZE FLUENCE
910
912
NORMALIZED SHORT ENVELOPE IMAGE
914
NORMALIZED LONG ENVELOPE IMAGE
SMOOTHING
920
922
NORMALIZED SMOOTHED SHORT ENVELOPE IMAGE
924
NORMALIZED SMOOTHED LONG ENVELOPE IMAGE
930
REMOVE COMMON NOISE
950
HEMOGLOBIN CALCULATION
932
NORMALIZED SMOOTHED COMMON NOISE REMOVED SHORT ENVELOPE IMAGE
934
NORMALIZED SMOOTHED COMMON NOISE REMOVED LONG ENVELOPE IMAGE
OXYGENATION CALCULATION
940
725
GREYSCALE OXYGENATION MAP
730
GREYSCALE HEMOGLOBIN MAP

FIG. 9

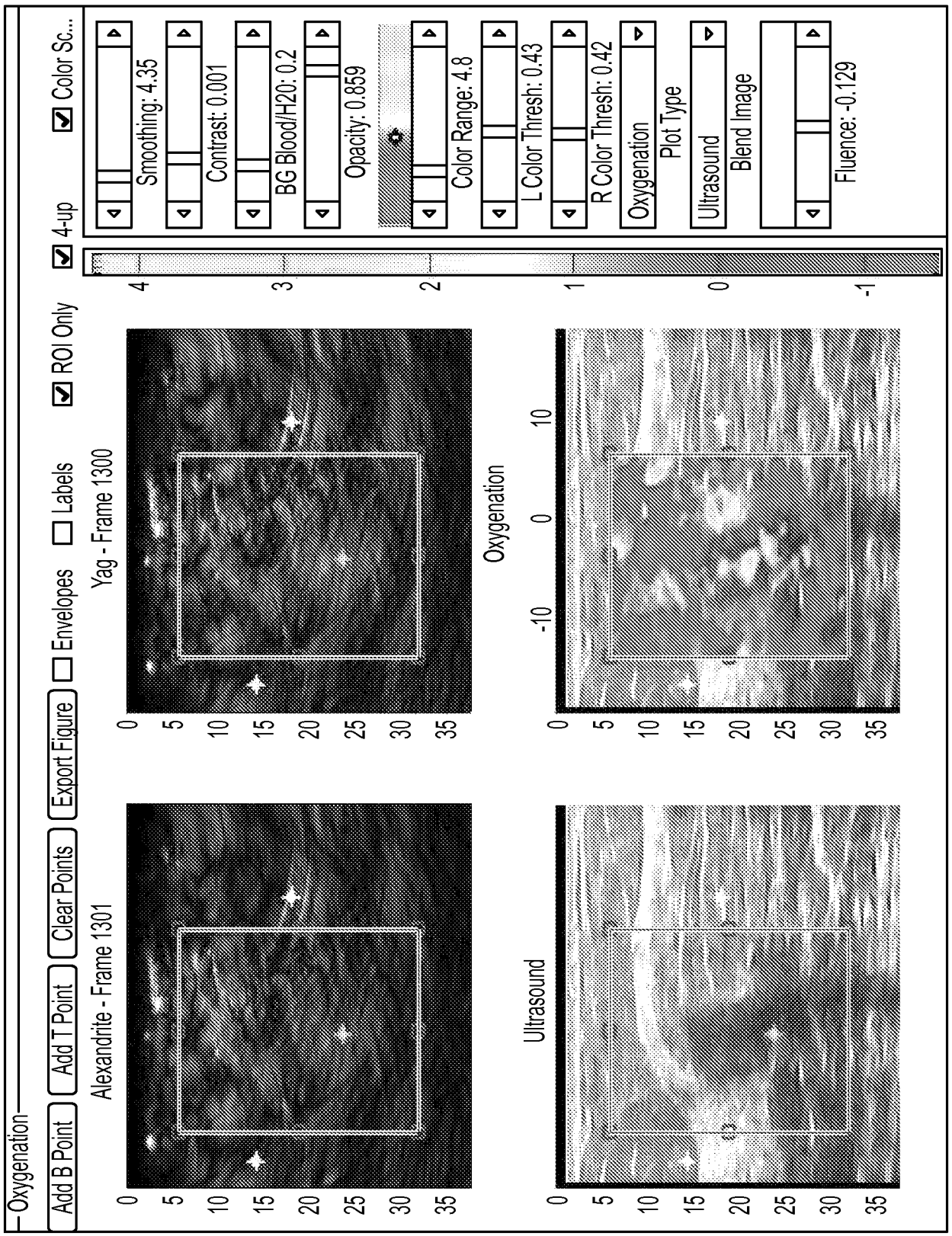

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Oxygenation
Ultrasound
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.859
Color Range: 4.8
L Color Thresh: 0.43
R Color Thresh: 0.42
Oxygenation
Plot Type
Ultrasound
Blend Image
Fluence: -0.129

FIG. 10

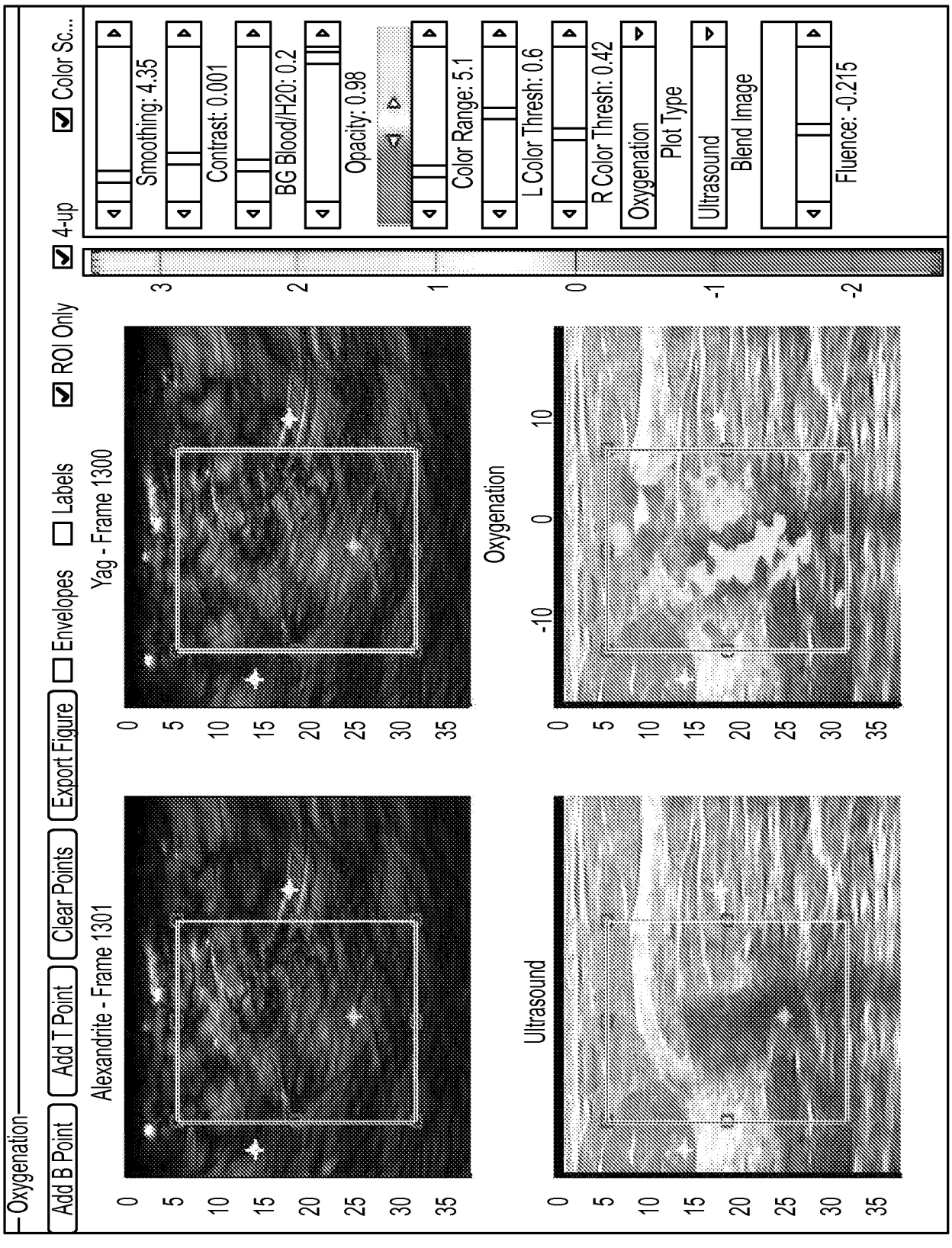

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Oxygenation
Ultrasound
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.98
Color Range: 5.1
L Color Thresh: 0.6
R Color Thresh: 0.42
Oxygenation
Plot Type
Ultrasound
Blend Image
Fluence: -0.215

FIG. 11

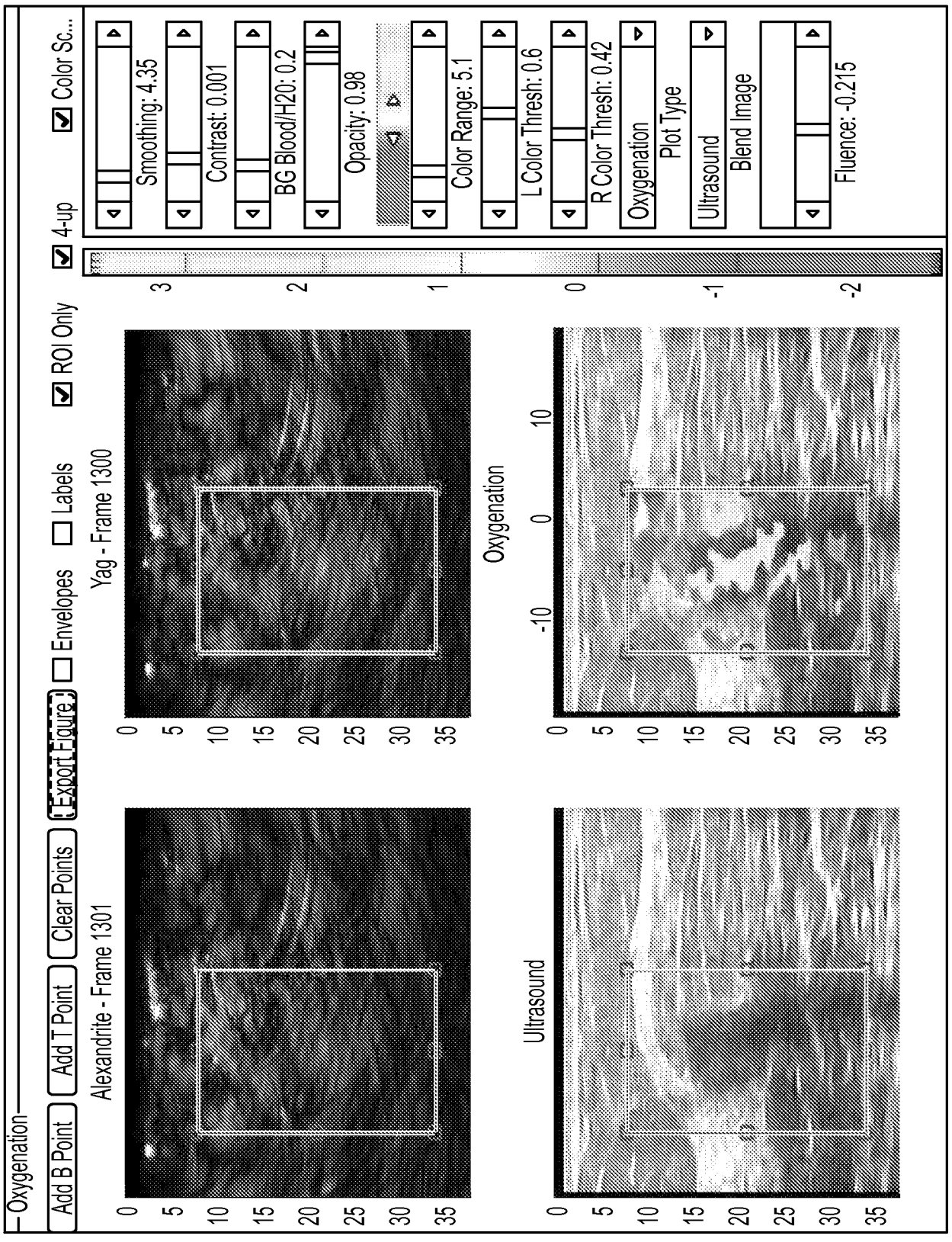

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Oxygenation
Ultrasound
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.98
Color Range: 5.1
L Color Thresh: 0.6
R Color Thresh: 0.42
Oxygenation
Plot Type
Ultrasound
Blend Image
Fluence: -0.215

FIG. 12

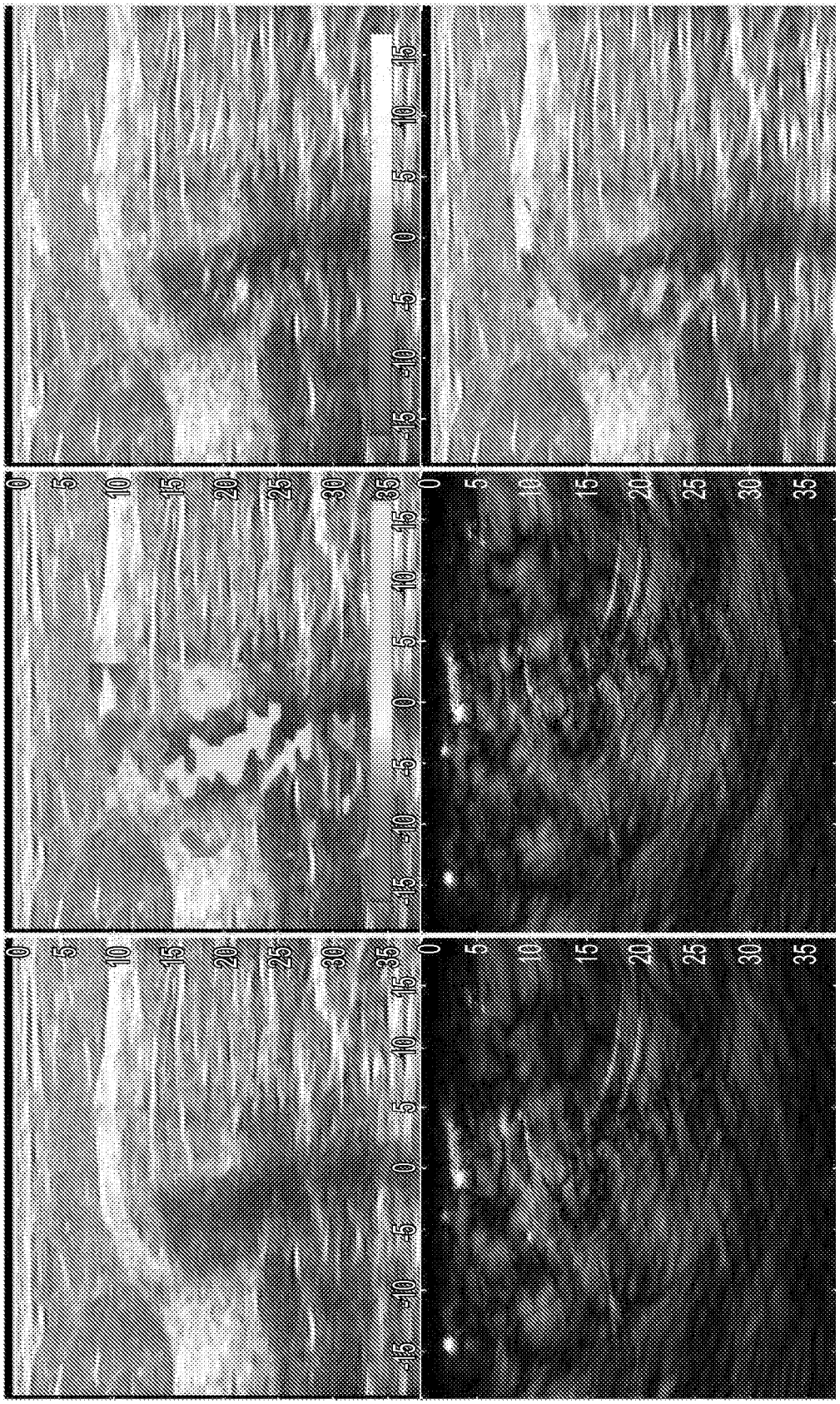


FIG. 13

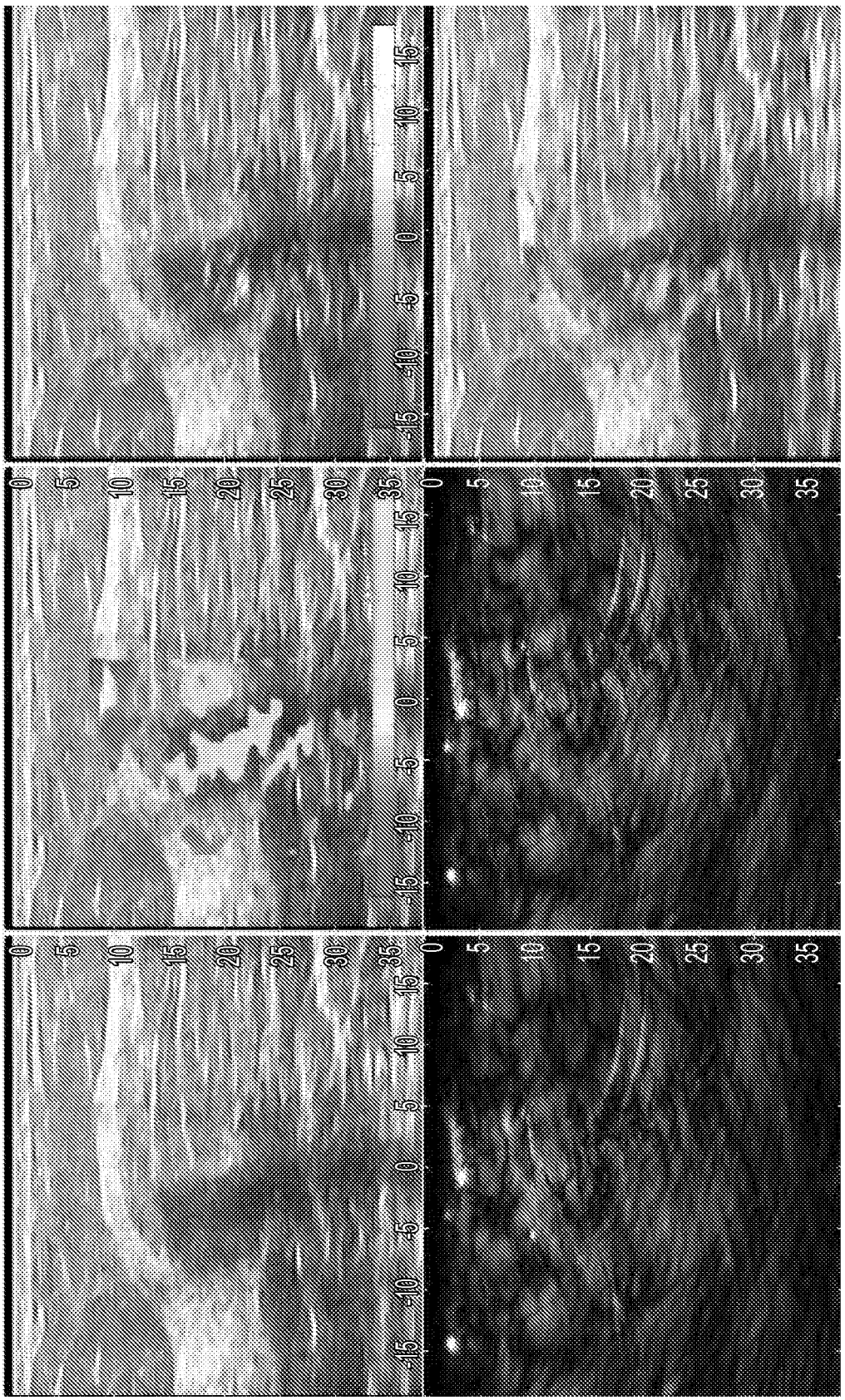


FIG. 14

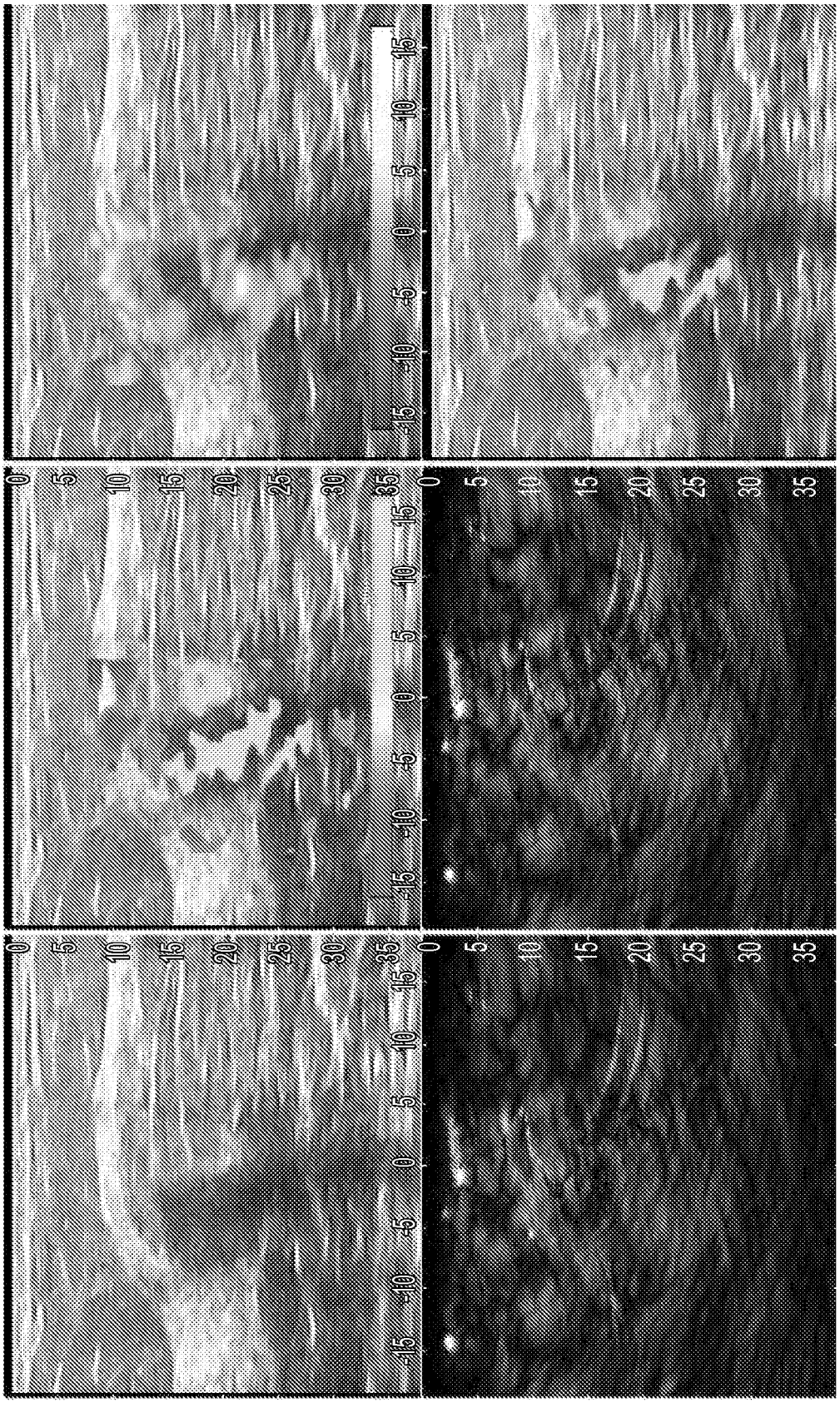


FIG. 15

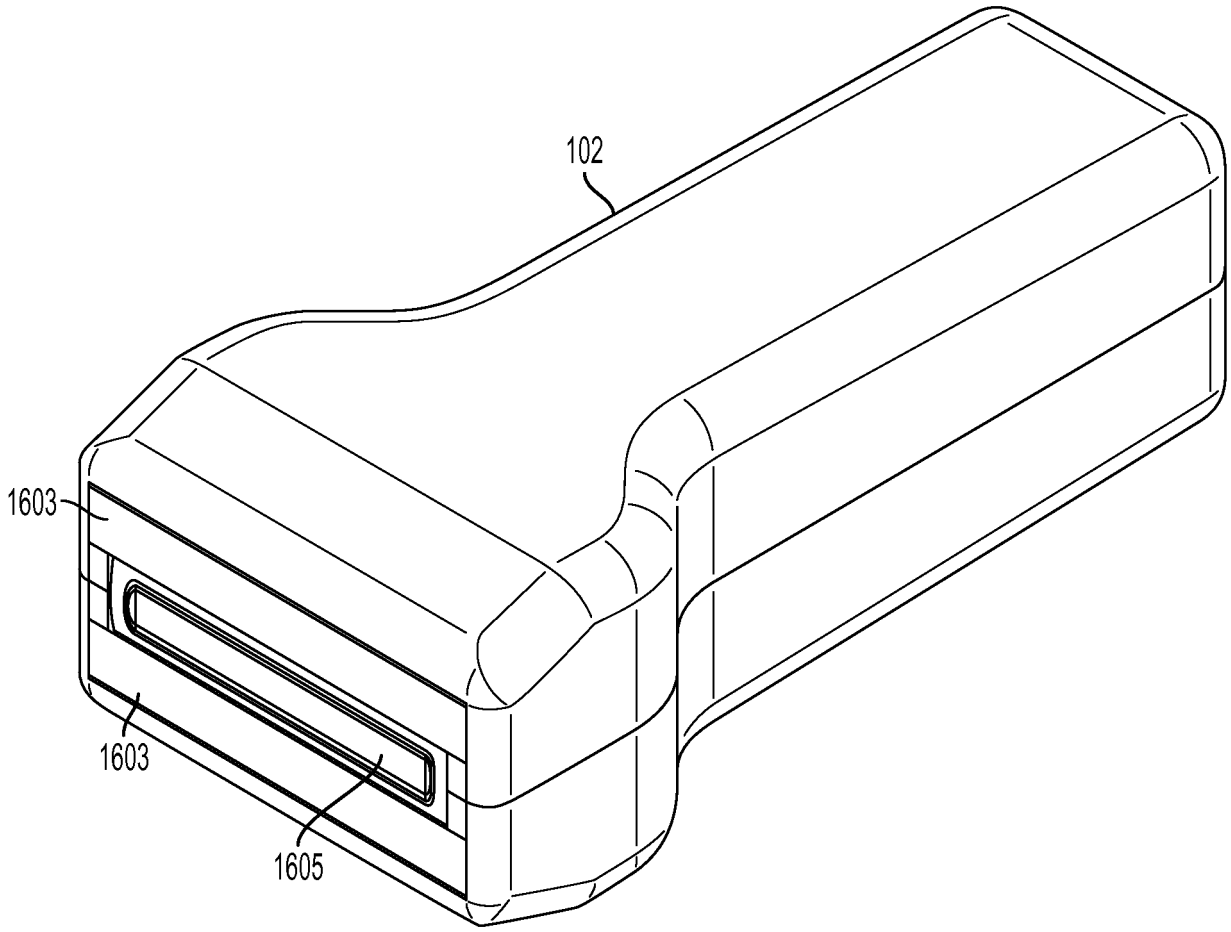


FIG. 16

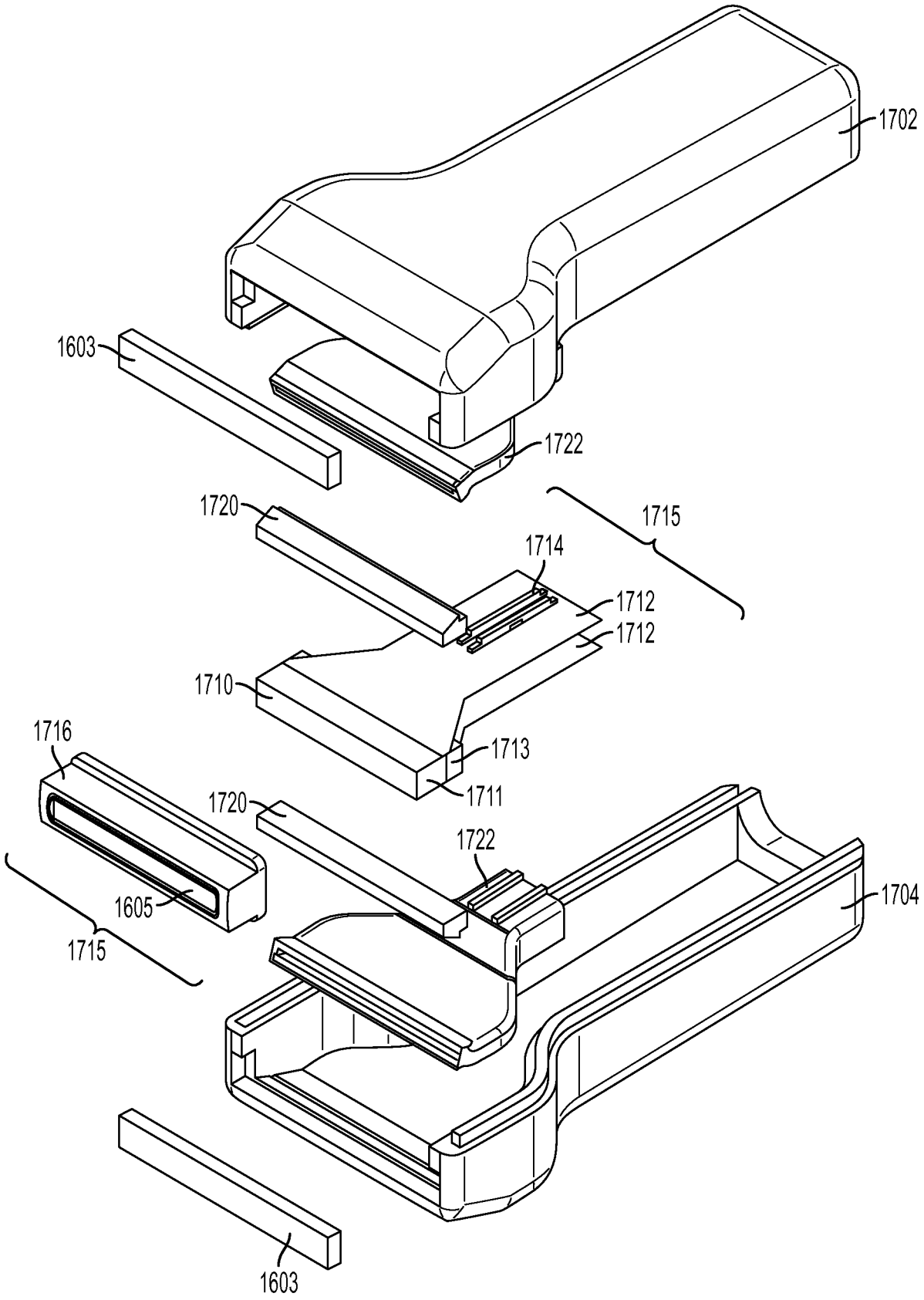

1702
1603
1722
1720
1715
1714
1712
1712
1710
1716
1713
1711
1720
1722
1704
1605
1715
1603

FIG. 17

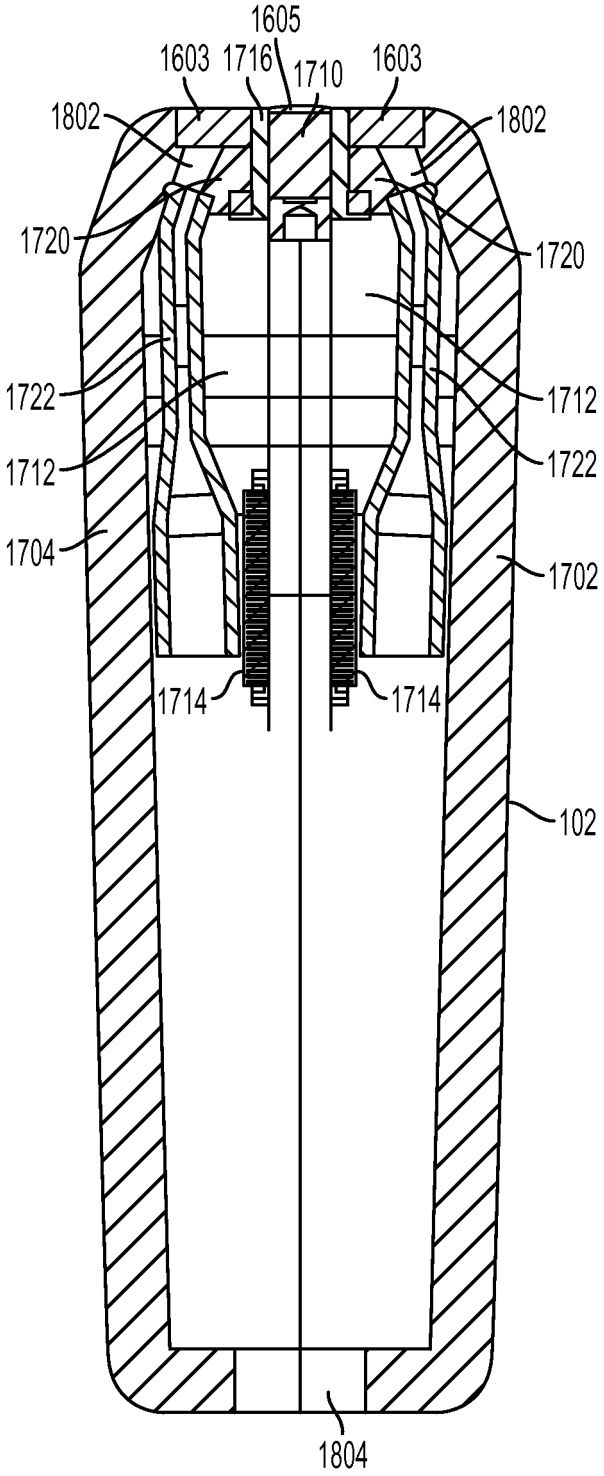

1605
1603
1716
1710
1603
1802
1802
1720
1720
1722
1712
1712
1722
1704
1702
1714
1714
102
1804

FIG. 18

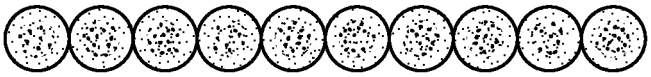


FIG. 19A

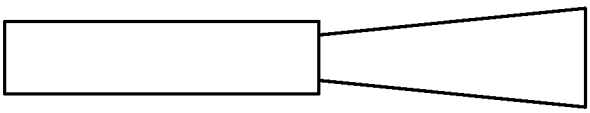


FIG. 19B



FIG. 20A

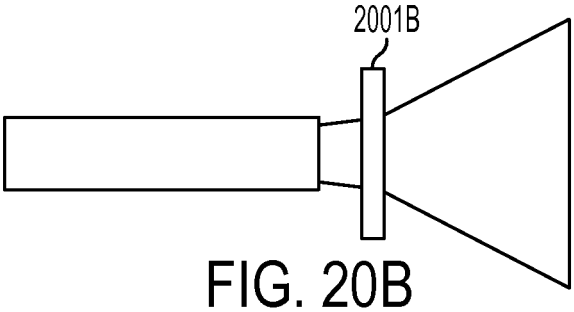


FIG. 20B

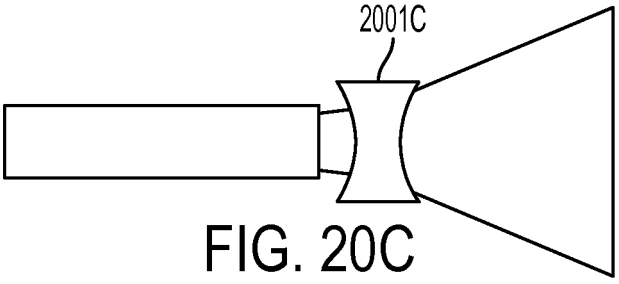


FIG. 20C

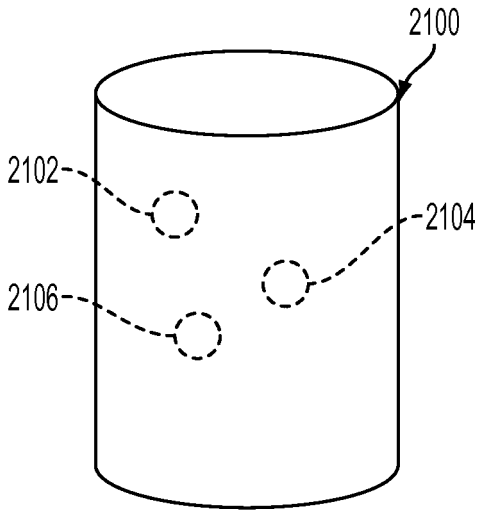


FIG. 21

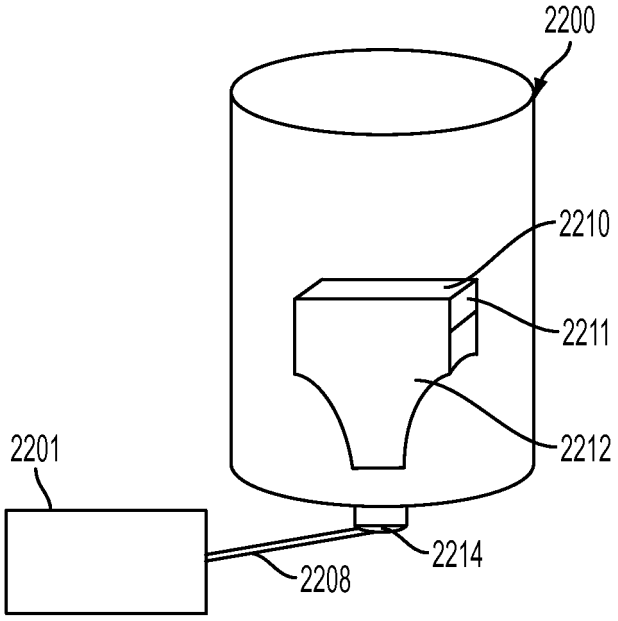


FIG. 22

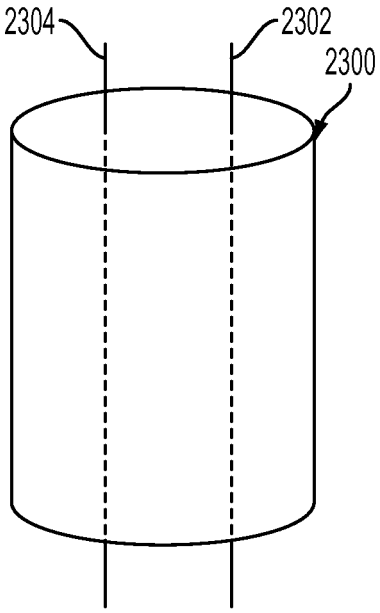


FIG. 23

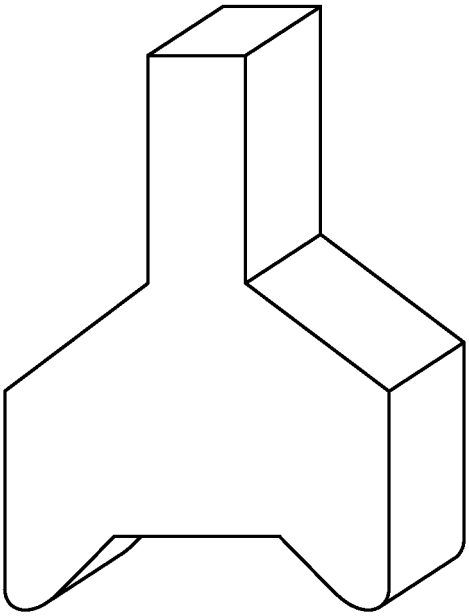


FIG. 24A

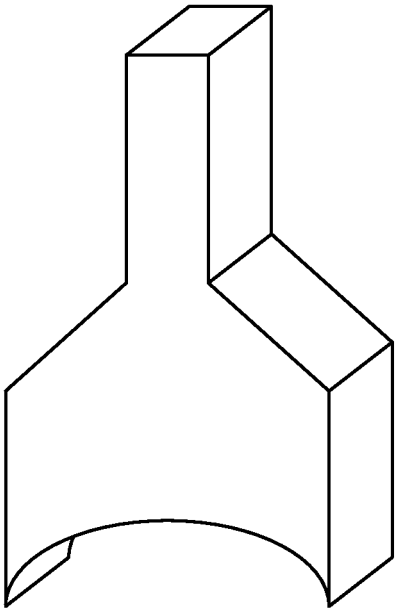


FIG. 24B

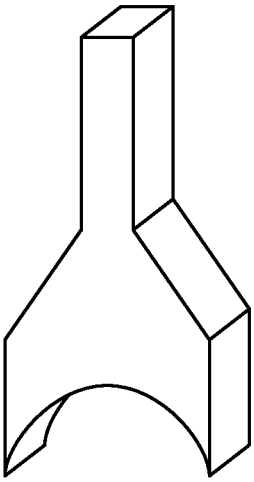


FIG. 24C

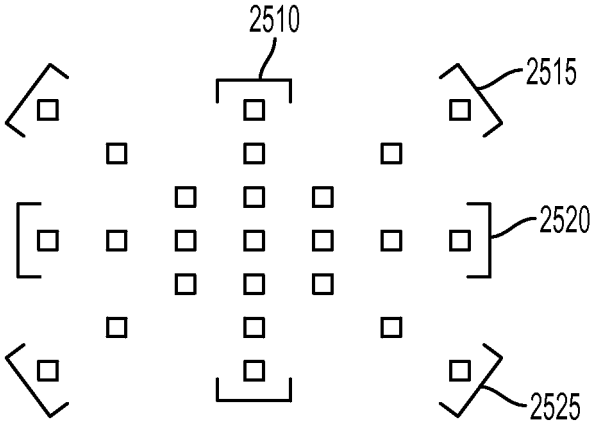


FIG. 25A

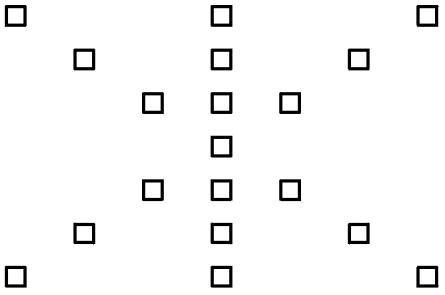


FIG. 25B

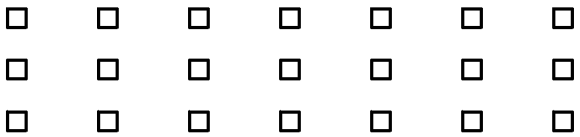


FIG. 25C

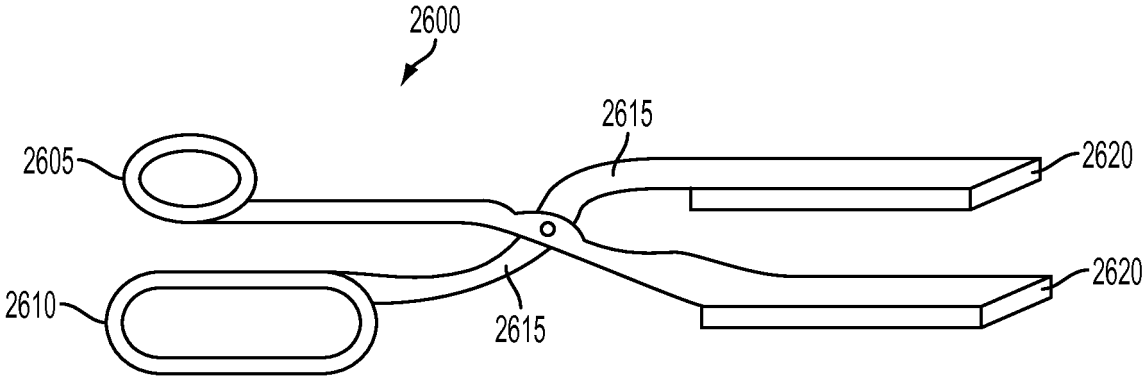

2600
2615
2605
2620
2620
2610
2615

FIG. 26

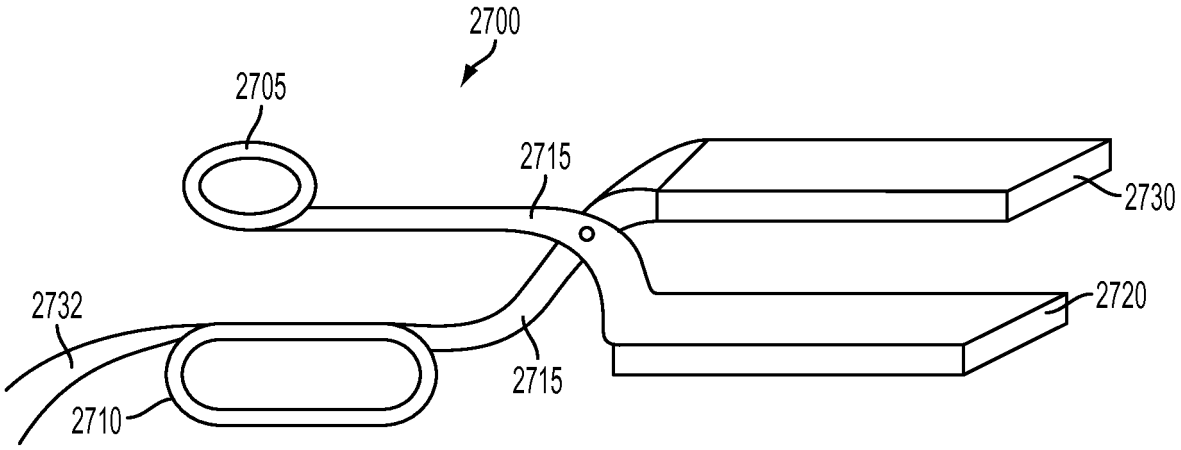

2700
2705
2715
2730
2732
2720
2715
2710

FIG. 27

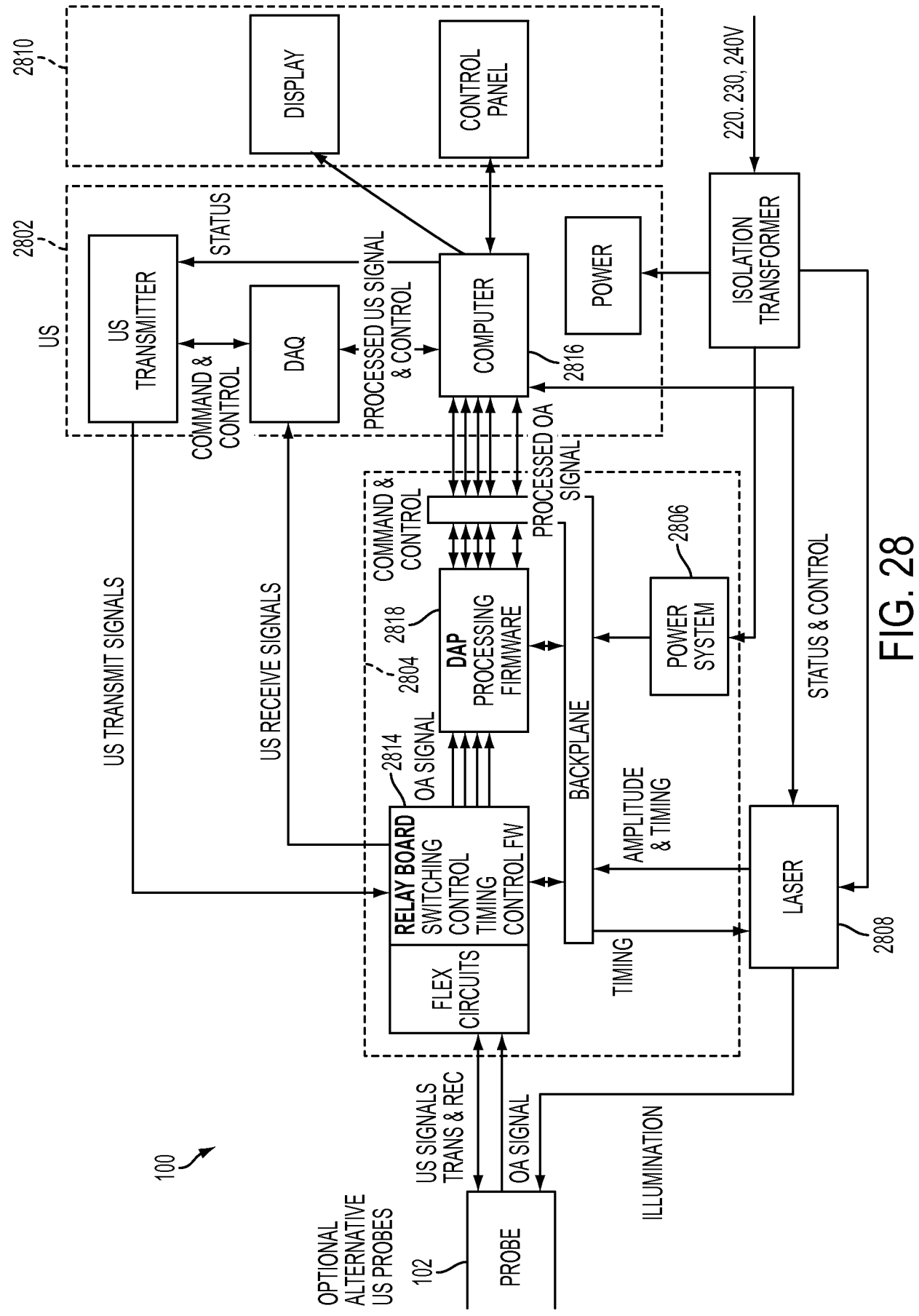

2810
DISPLAY
CONTROL PANEL
220. 230, 240V
2802
US
STATUS
US TRANSMITTER
DAQ
PROCESSED US SIGNAL & CONTROL
COMPUTER
POWER
ISOLATION TRANSFORMER
COMMAND & CONTROL
2816
PROCESSED OA SIGNAL
COMMAND & CONTROL
2806
US TRANSMIT SIGNALS
US RECEIVE SIGNALS
2818
2804
DAP PROCESSING FIRMWARE
POWER SYSTEM
STATUS & CONTROL
2814
OA SIGNAL
BACKPLANE
AMPLITUDE & TIMING
RELAY BOARD SWITCHING CONTROL TIMING CONTROL FW
FLEX CIRCUITS
TIMING
LASER
2808
100
US SIGNALS TRANS & REC
OA SIGNAL
ILLUMINATION
OPTIONAL ALTERNATIVE US PROBES
102
PROBE

FIG. 28

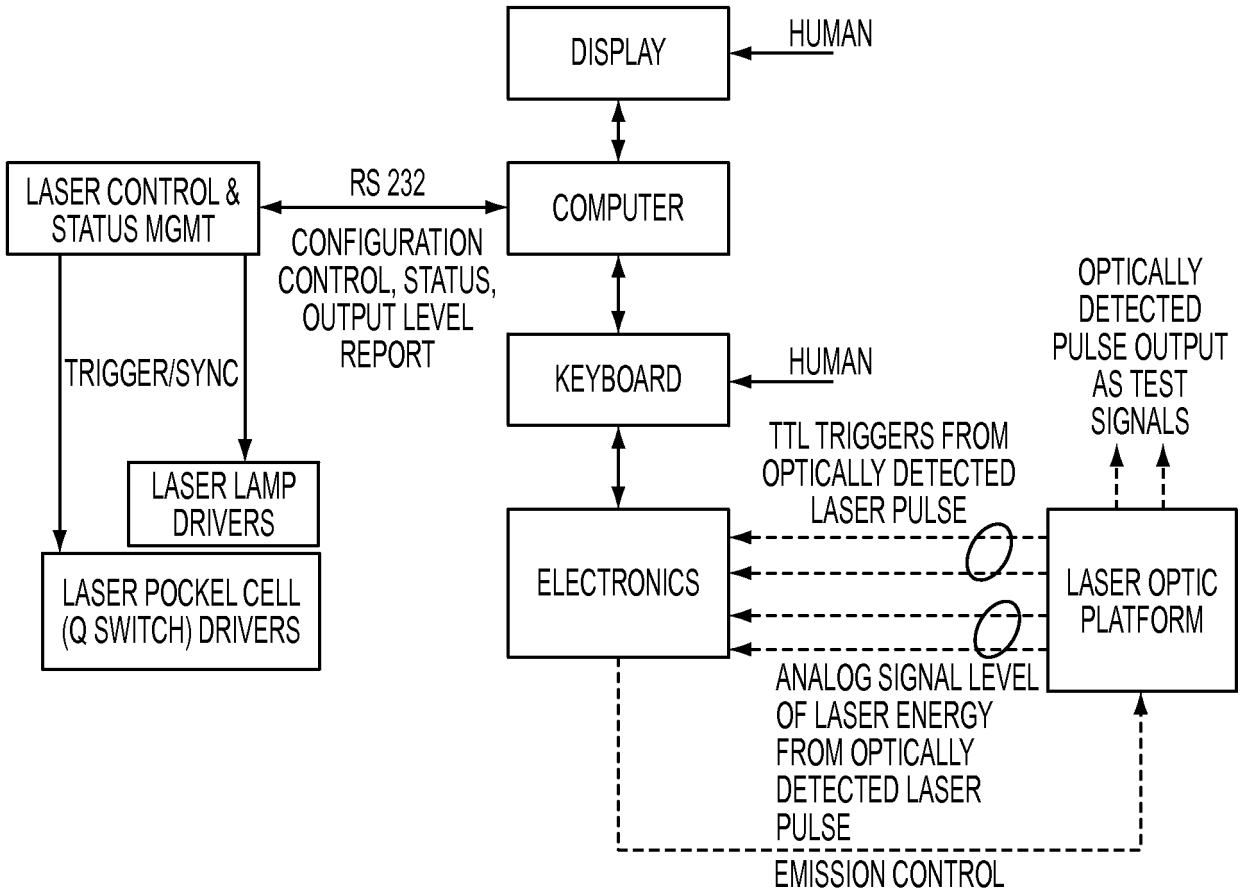

DISPLAY
HUMAN
LASER CONTROL & STATUS MGMT
RS 232
CONFIGURATION CONTROL, STATUS, OUTPUT LEVEL REPORT
COMPUTER
TRIGGER/SYNC
KEYBOARD
HUMAN
OPTICALLY DETECTED PULSE OUTPUT AS TEST SIGNALS
TTL TRIGGERS FROM OPTICALLY DETECTED LASER PULSE
LASER LAMP DRIVERS
LASER POCKEL CELL (Q SWITCH) DRIVERS
ELECTRONICS
LASER OPTIC PLATFORM
ANALOG SIGNAL LEVEL OF LASER ENERGY FROM OPTICALLY DETECTED LASER PULSE
EMISSION CONTROL

FIG. 29

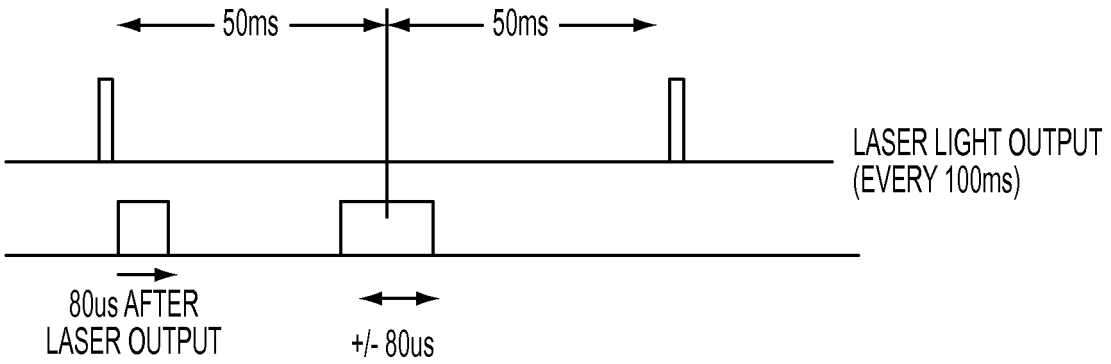

50ms
50ms
LASER LIGHT OUTPUT (EVERY 100ms)
80us AFTER LASER OUTPUT
+/- 80us

FIG. 30

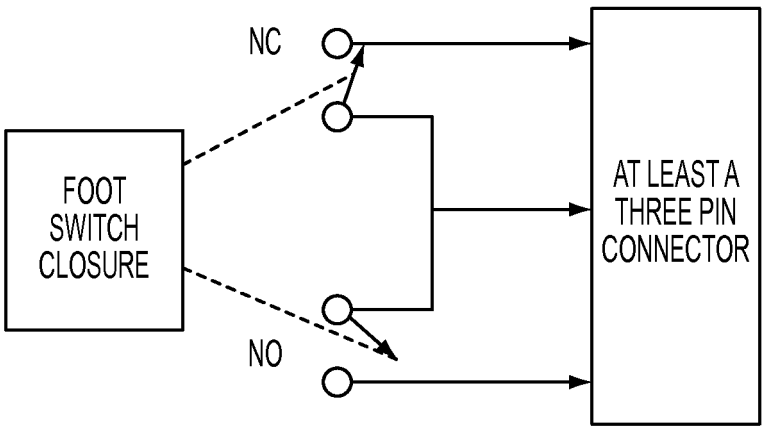


FIG. 31

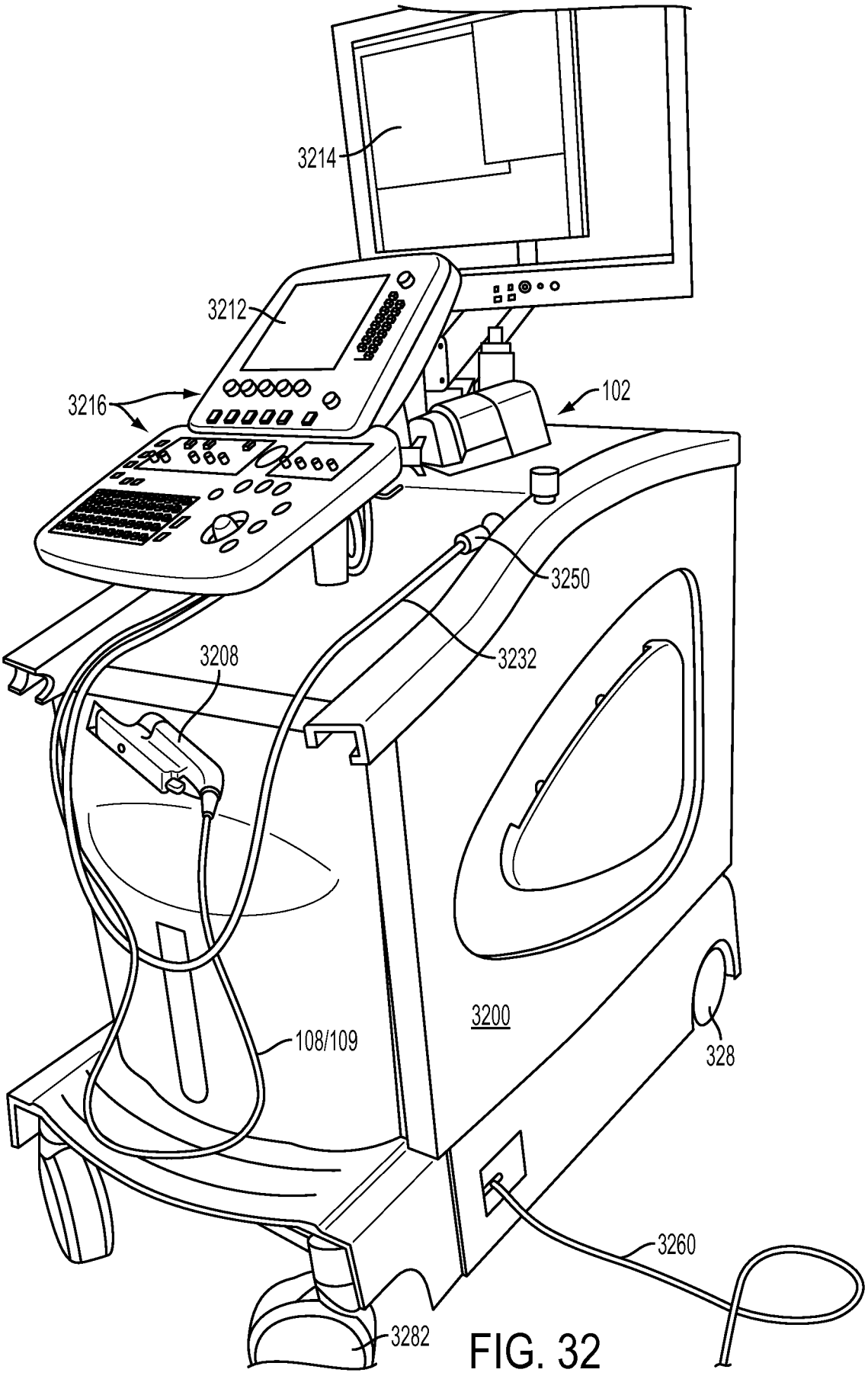


FIG. 32

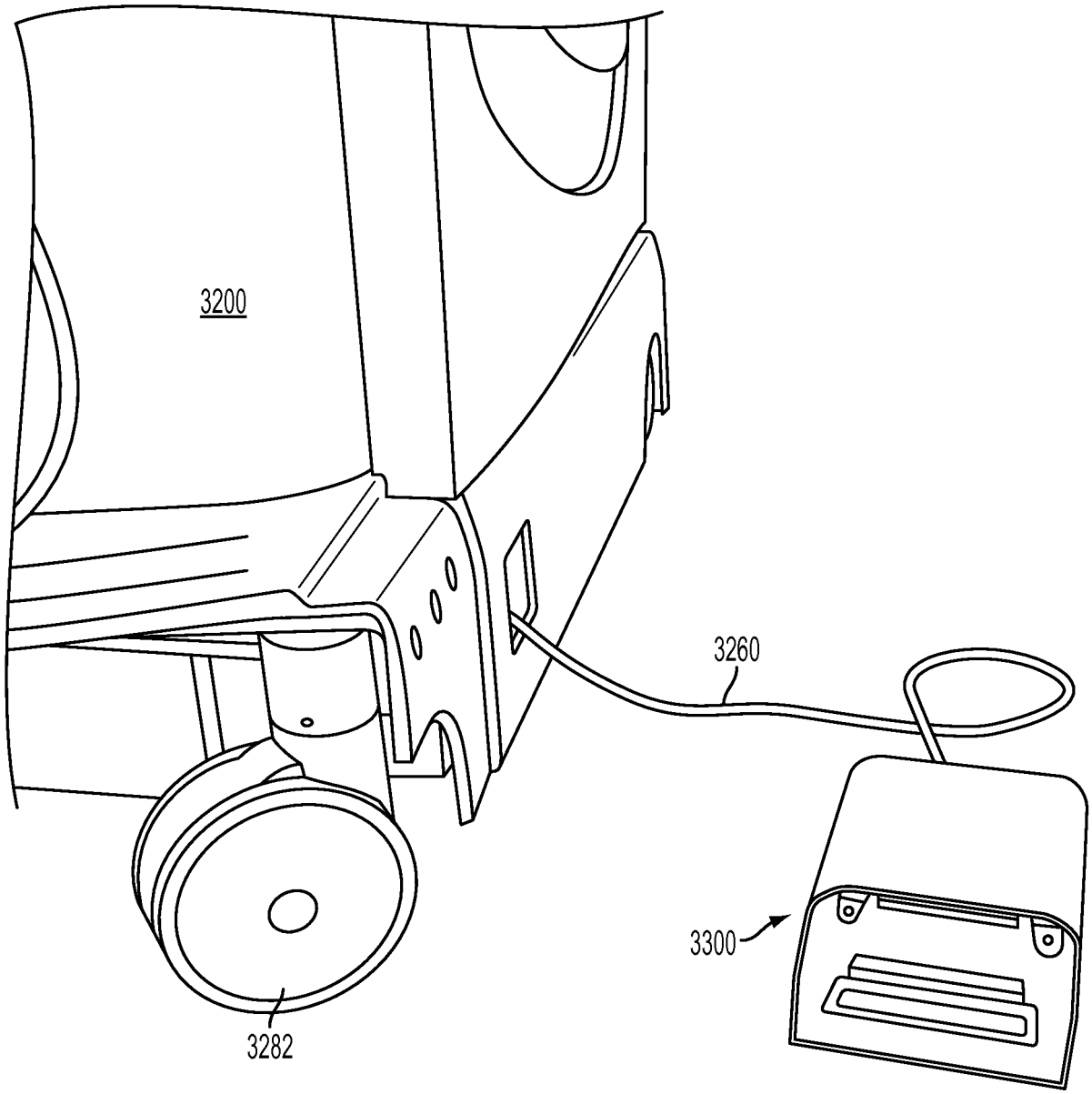


FIG. 33

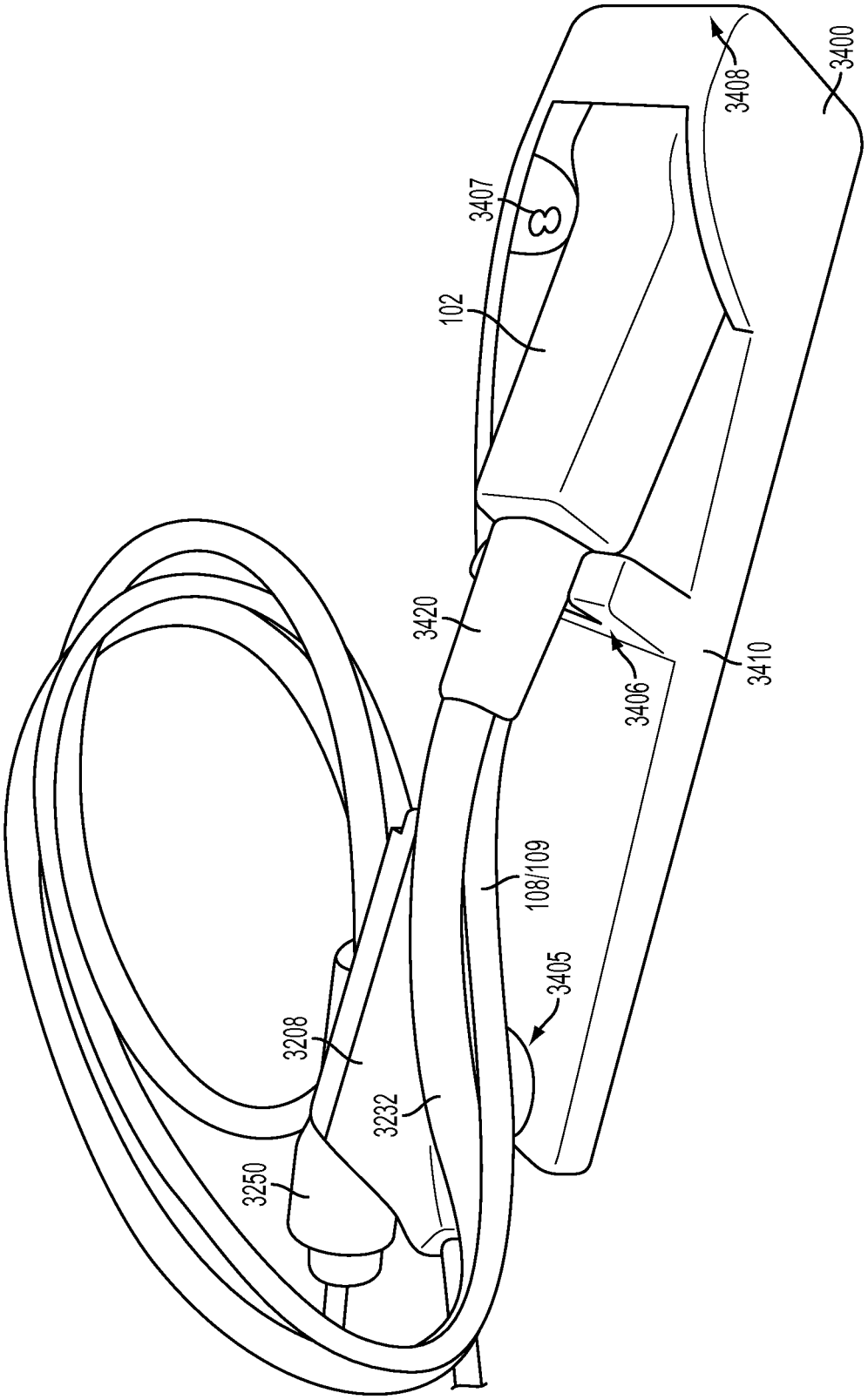


FIG. 34

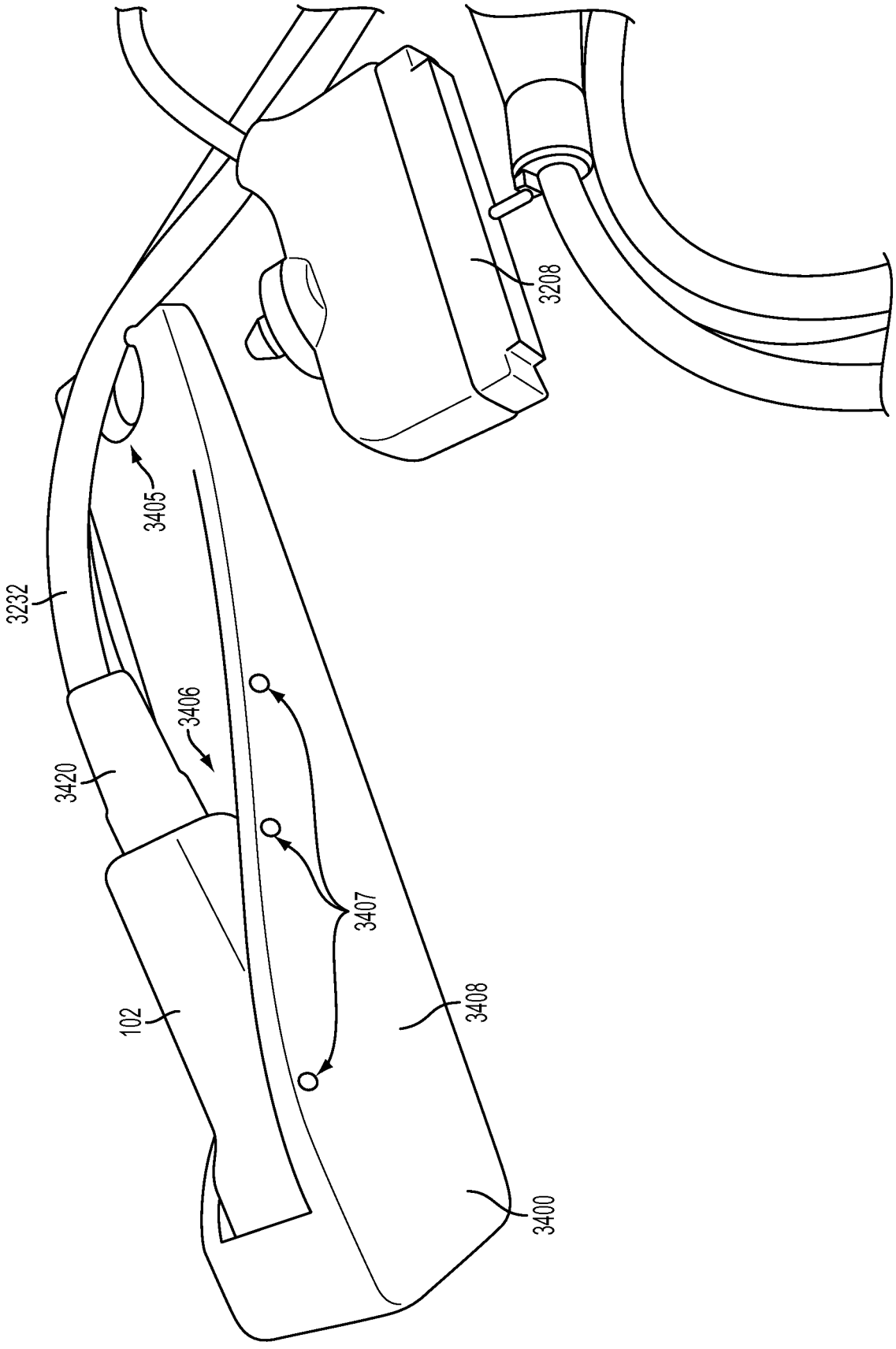


FIG. 35

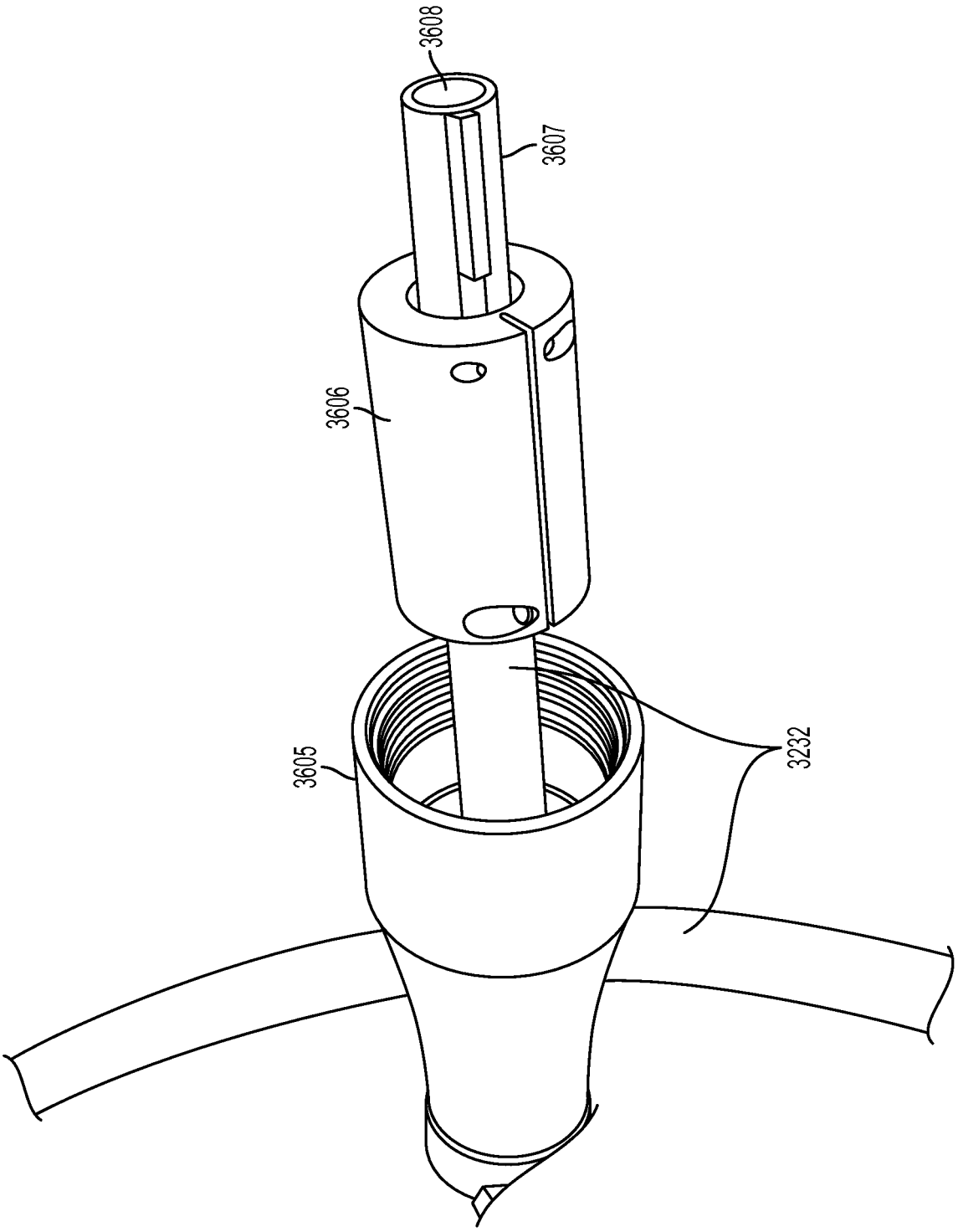


FIG. 36

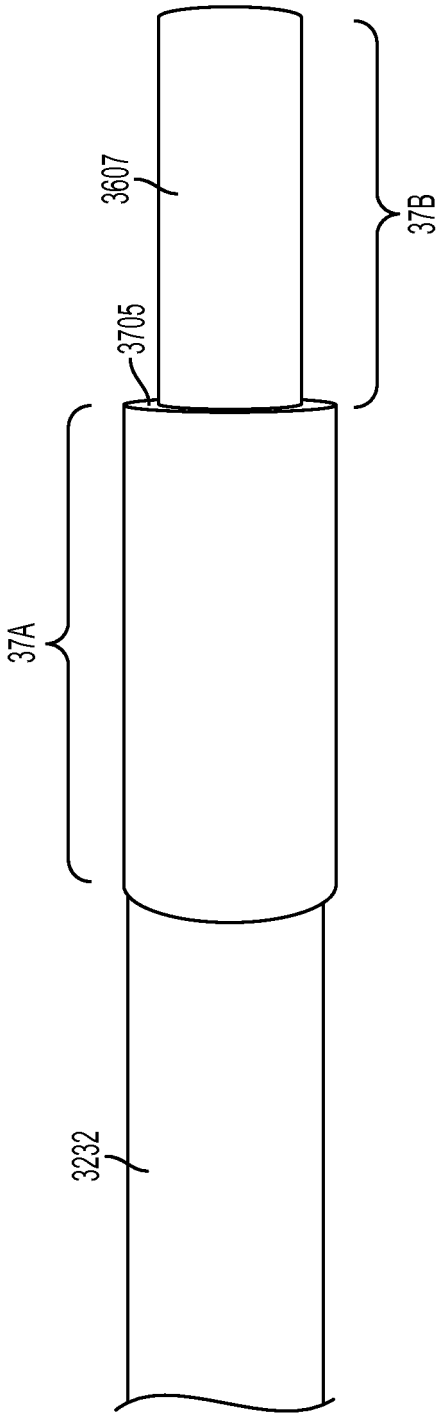


FIG. 37

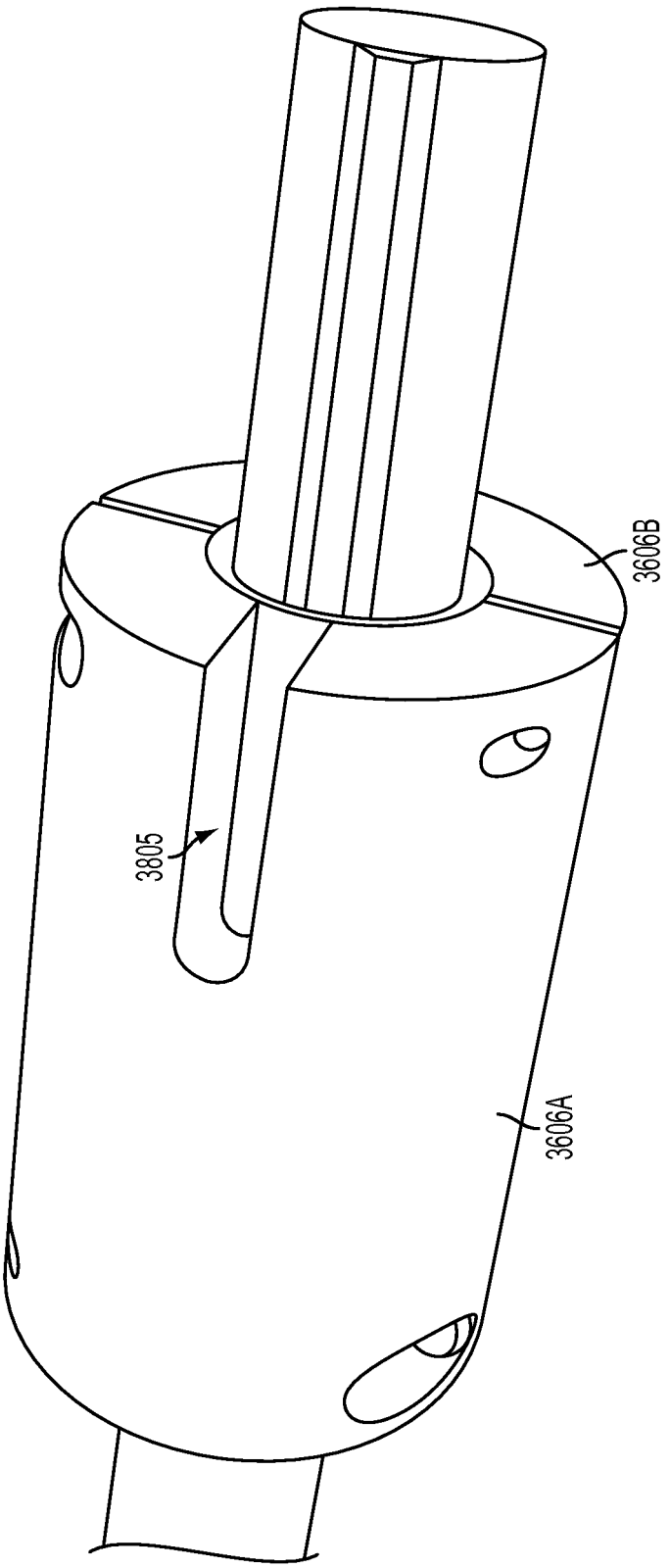


FIG. 38

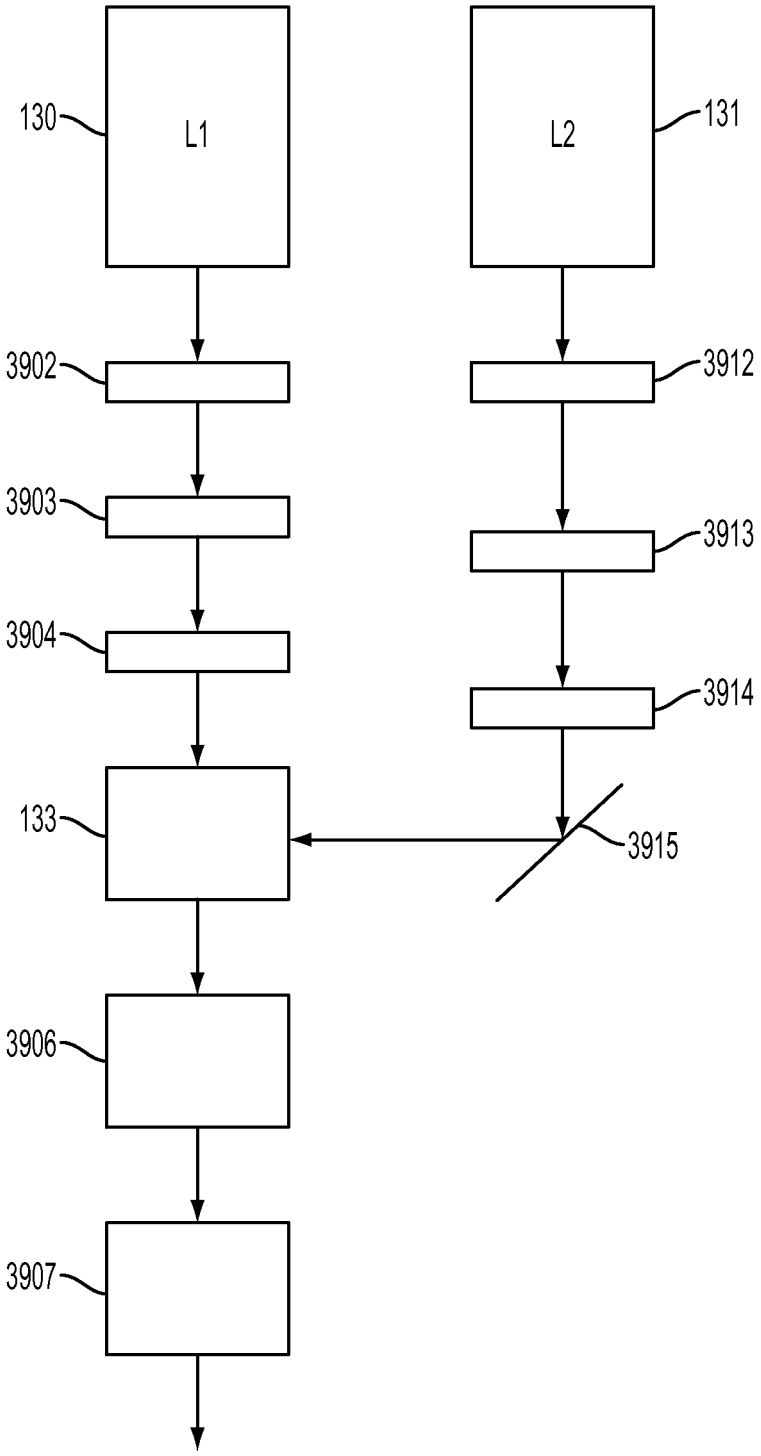


FIG. 39

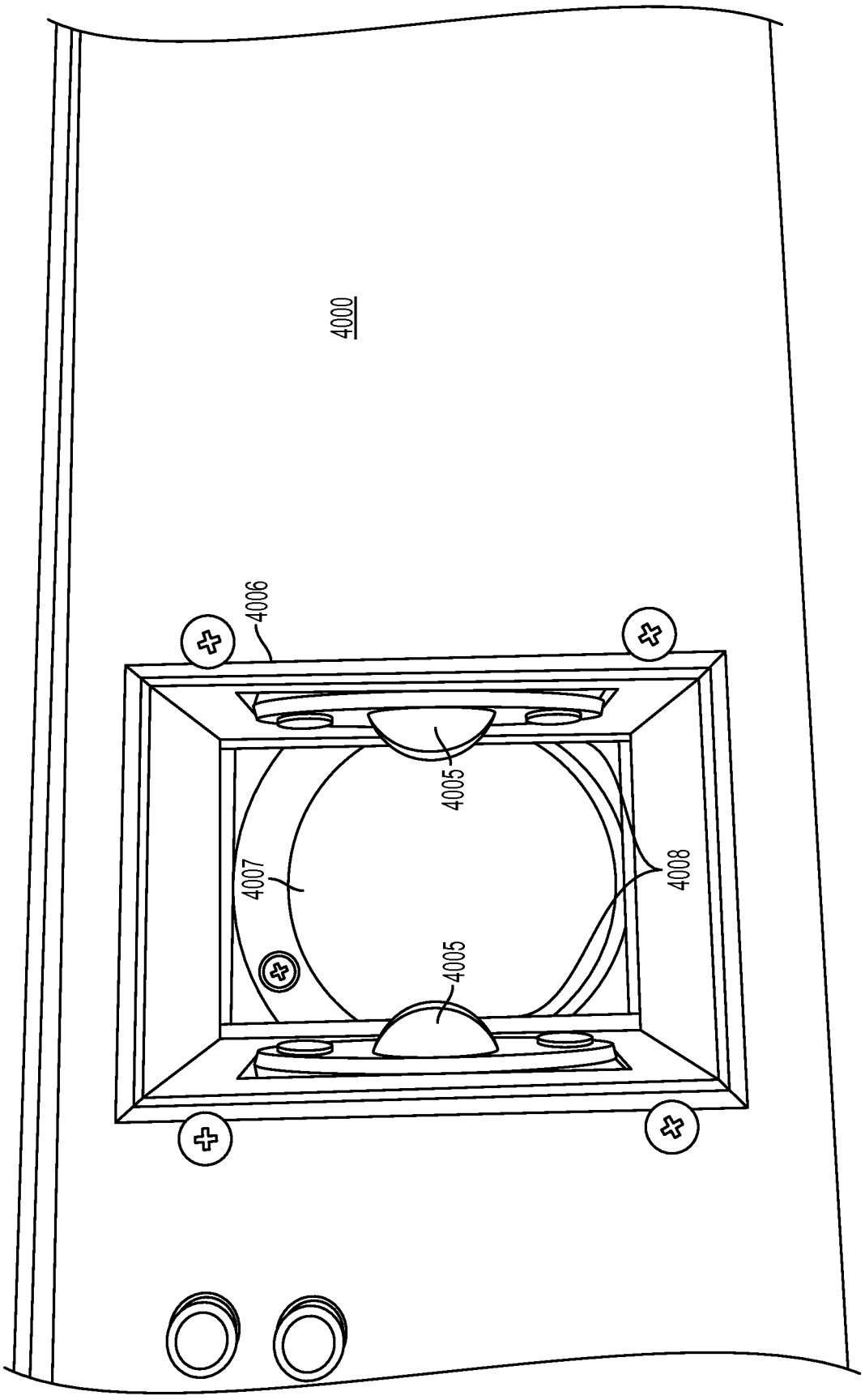


FIG. 40

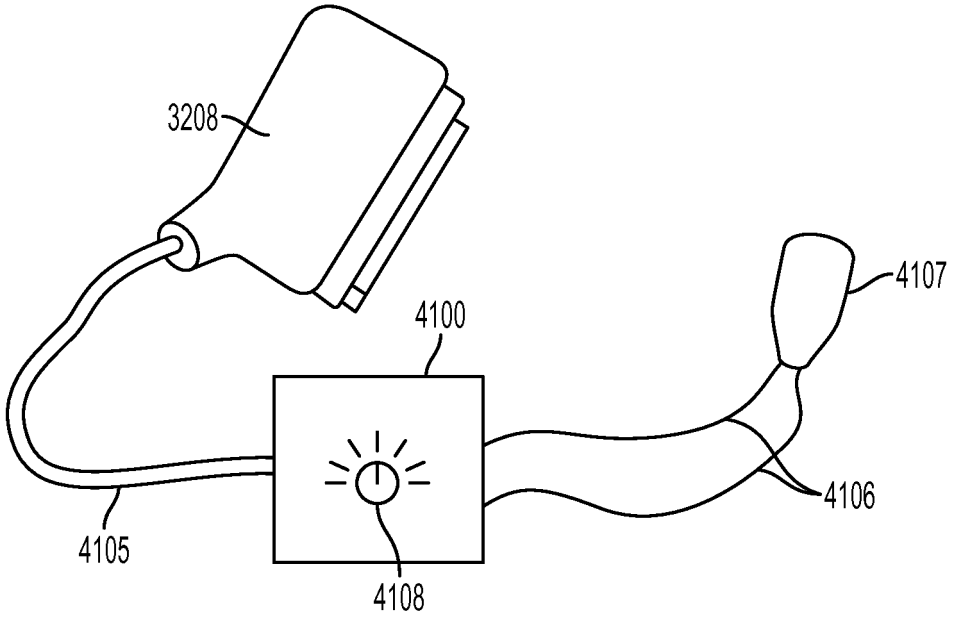


FIG. 41