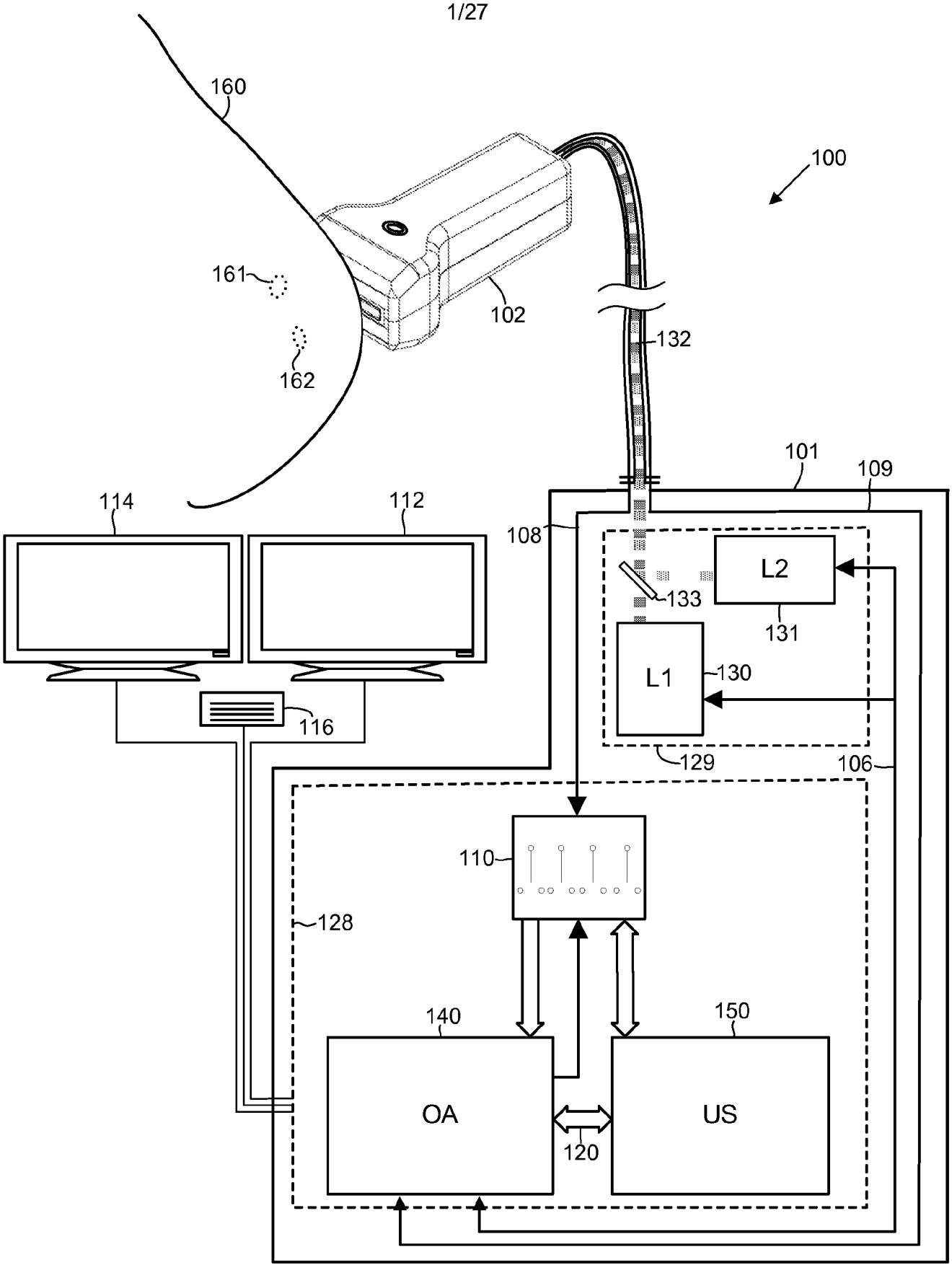

160
100
161
102
132
162
101
109
114
112
108
L2
133
131
L1
130
116
129
106
110
128
140
150
OA
US
120

FIG. 1

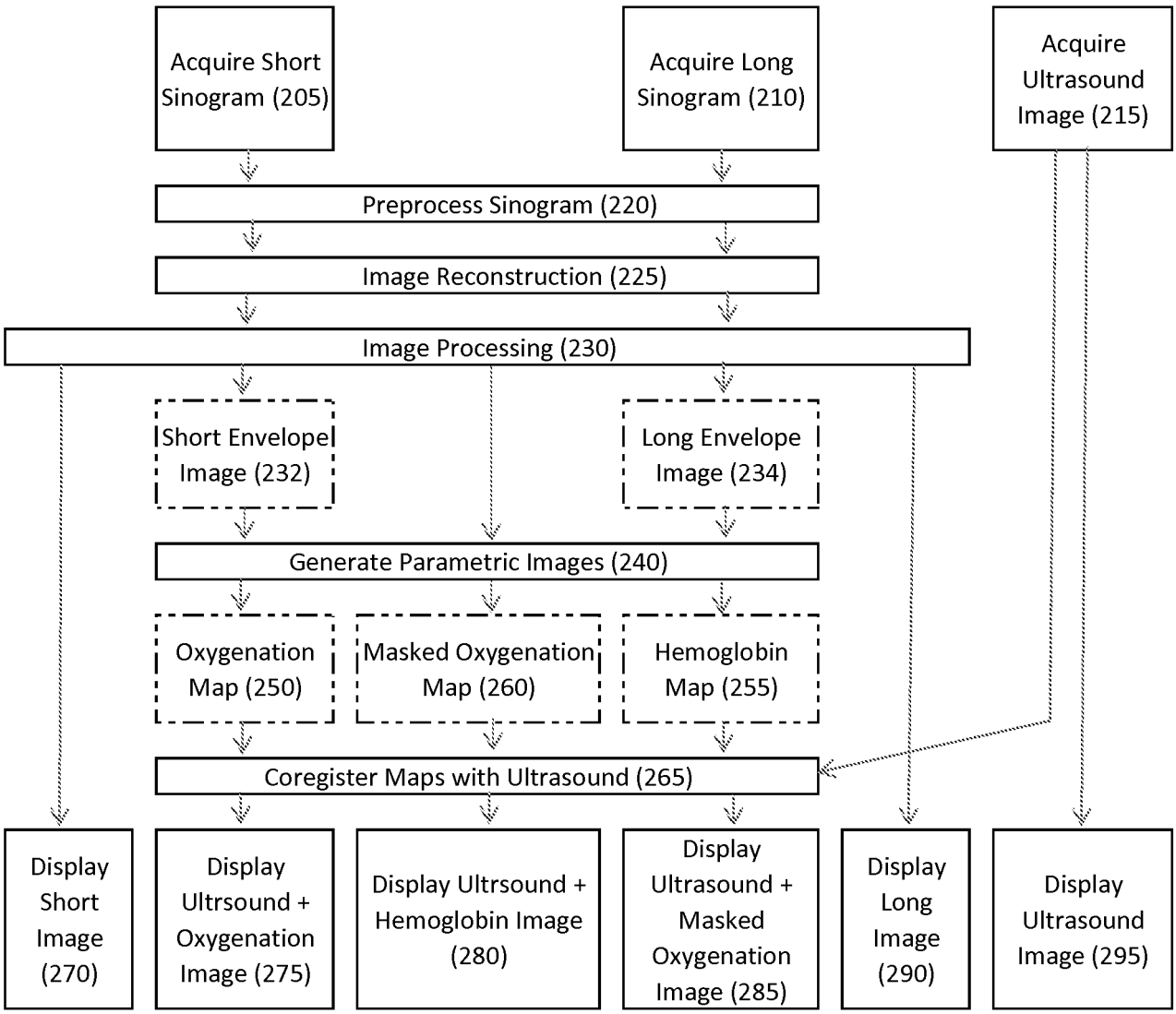

Acquire Short Sinogram (205)
Acquire Long Sinogram (210)
Acquire Ultrasound Image (215)
Preprocess Sinogram (220)
Image Reconstruction (225)
Image Processing (230)
Short Envelope Image (232)
Long Envelope Image (234)
Generate Parametric Images (240)
Oxygenation Map (250)
Masked Oxygenation Map (260)
Hemoglobin Map (255)
Coregister Maps with Ultrasound (265)
Display Short Image (270)
Display Ultrsound + Oxygenation Image (275)
Display Ultrsound + Hemoglobin Image (280)
Display Ultrasound + Masked Oxygenation Image (285)
Display Long Image (290)
Display Ultrasound Image (295)

FIG. 2

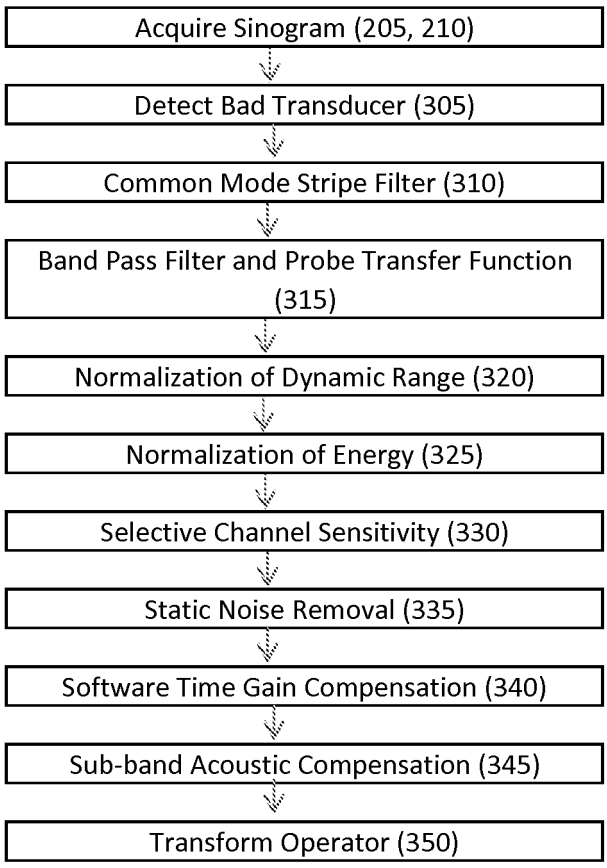

Acquire Sinogram (205, 210)
Detect Bad Transducer (305)
Common Mode Stripe Filter (310)
Band Pass Filter and Probe Transfer Function (315)
Normalization of Dynamic Range (320)
Normalization of Energy (325)
Selective Channel Sensitivity (330)
Static Noise Removal (335)
Software Time Gain Compensation (340)
Sub-band Acoustic Compensation (345)
Transform Operator (350)

FIG. 3

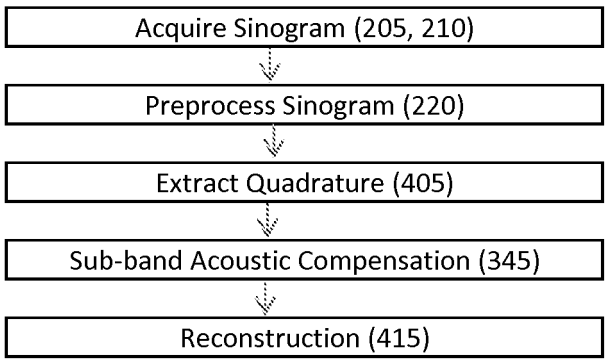

Acquire Sinogram (205, 210)
Preprocess Sinogram (220)
Extract Quadrature (405)
Sub-band Acoustic Compensation (345)
Reconstruction (415)

FIG. 4

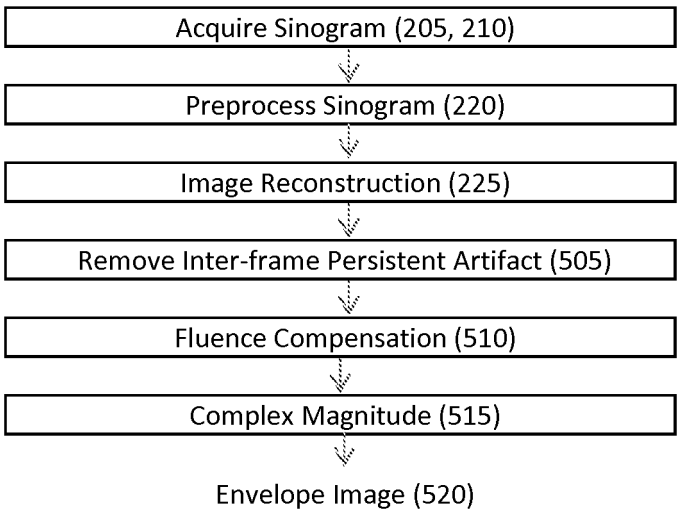

Acquire Sinogram (205, 210)
Preprocess Sinogram (220)
Image Reconstruction (225)
Remove Inter-frame Persistent Artifact (505)
Fluence Compensation (510)
Complex Magnitude (515)
Envelope Image (520)

FIG. 5

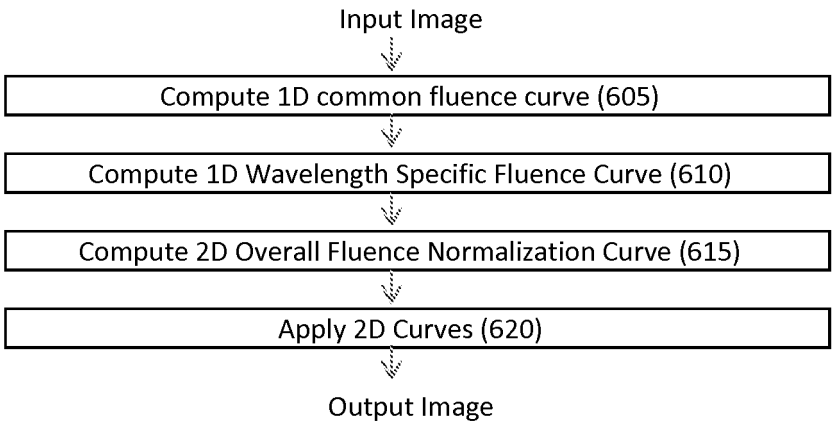

Input Image
Compute 1D common fluence curve (605)
Compute 1D Wavelength Specific Fluence Curve (610)
Compute 2D Overall Fluence Normalization Curve (615)
Apply 2D Curves (620)
Output Image

FIG. 6

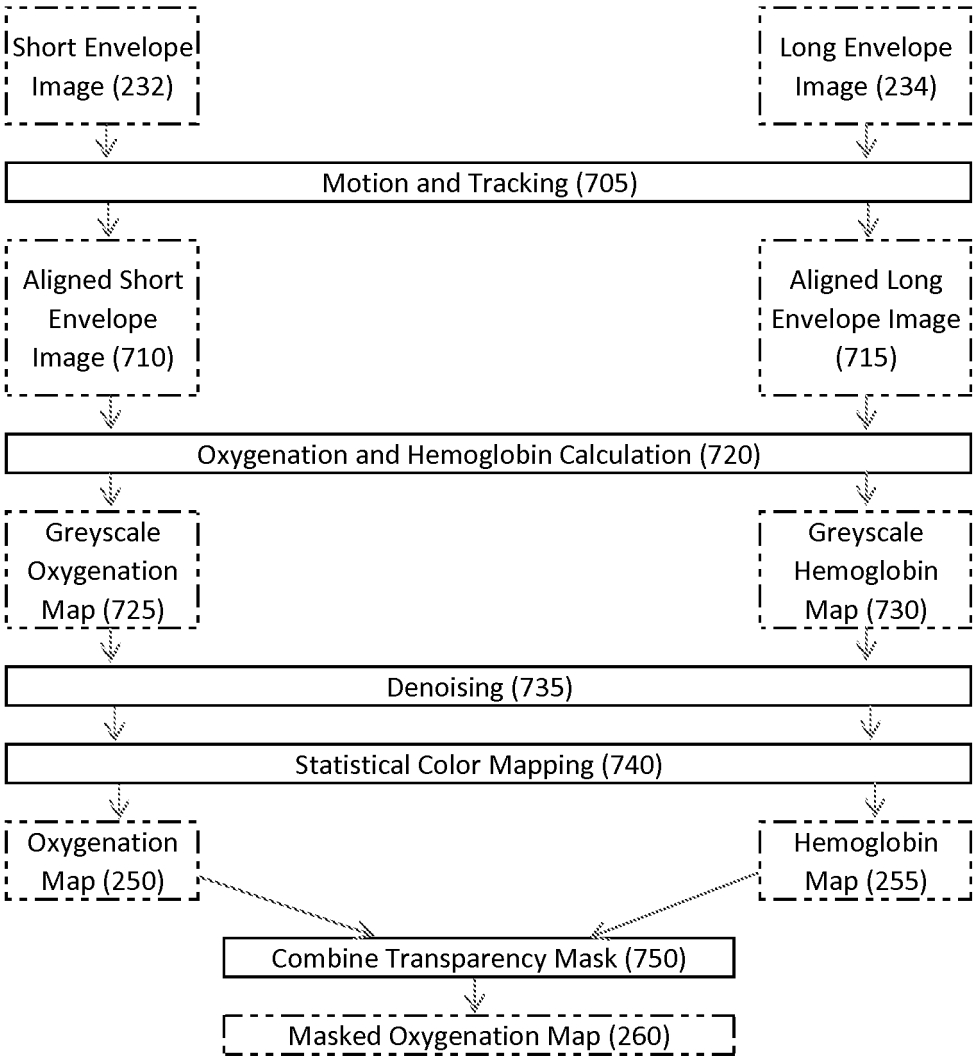

Short Envelope Image (232)
Long Envelope Image (234)
Motion and Tracking (705)
Aligned Short Envelope Image (710)
Aligned Long Envelope Image (715)
Oxygenation and Hemoglobin Calculation (720)
Greyscale Oxygenation Map (725)
Greyscale Hemoglobin Map (730)
Denoising (735)
Statistical Color Mapping (740)
Oxygenation Map (250)
Hemoglobin Map (255)
Combine Transparency Mask (750)
Masked Oxygenation Map (260)

FIG. 7

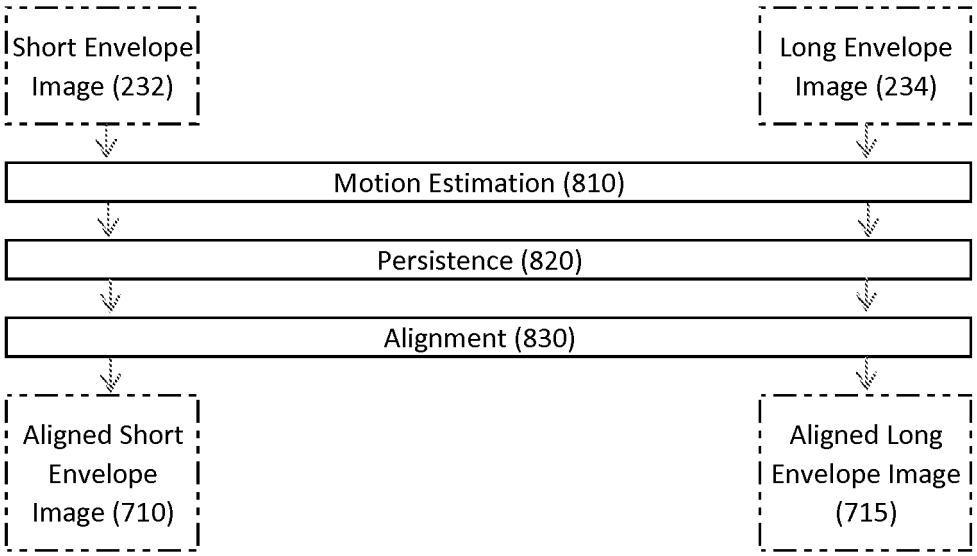

Short Envelope Image (232)
Long Envelope Image (234)
Motion Estimation (810)
Persistence (820)
Alignment (830)
Aligned Short Envelope Image (710)
Aligned Long Envelope Image (715)

FIG. 8

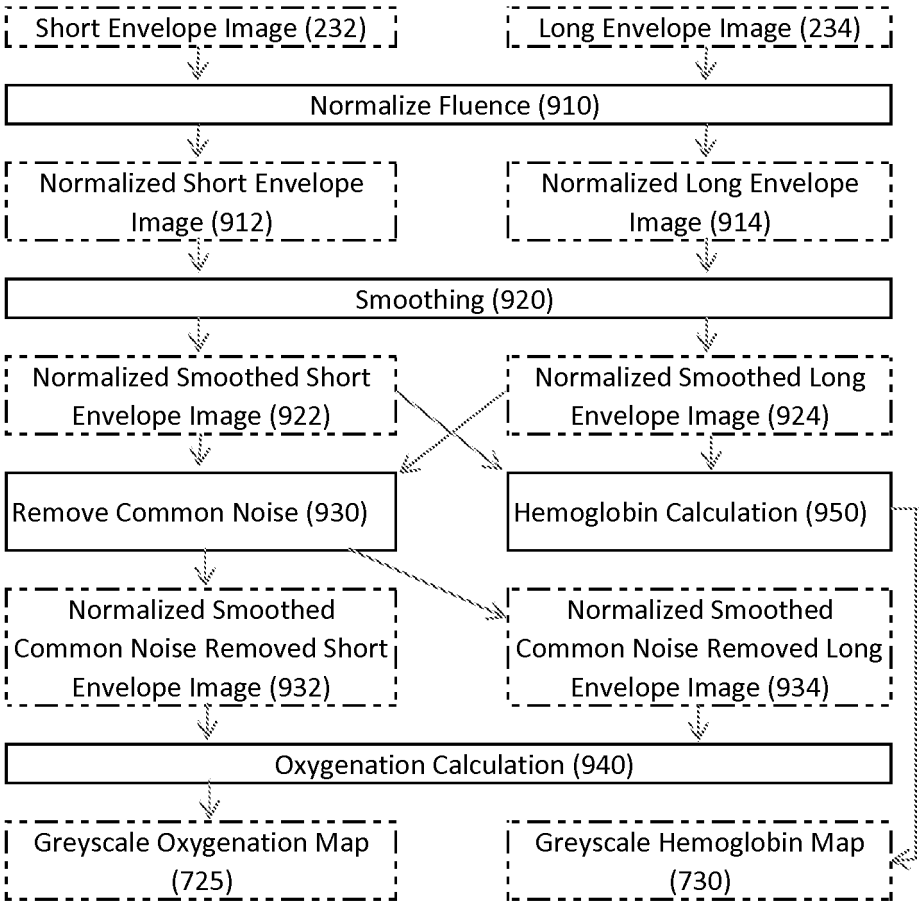

Short Envelope Image (232)
Long Envelope Image (234)
Normalize Fluence (910)
Normalized Short Envelope Image (912)
Normalized Long Envelope Image (914)
Smoothing (920)
Normalized Smoothed Short Envelope Image (922)
Normalized Smoothed Long Envelope Image (924)
Remove Common Noise (930)
Hemoglobin Calculation (950)
Normalized Smoothed Common Noise Removed Short Envelope Image (932)
Normalized Smoothed Common Noise Removed Long Envelope Image (934)
Oxygenation Calculation (940)
Greyscale Oxygenation Map (725)
Greyscale Hemoglobin Map (730)

FIG. 9

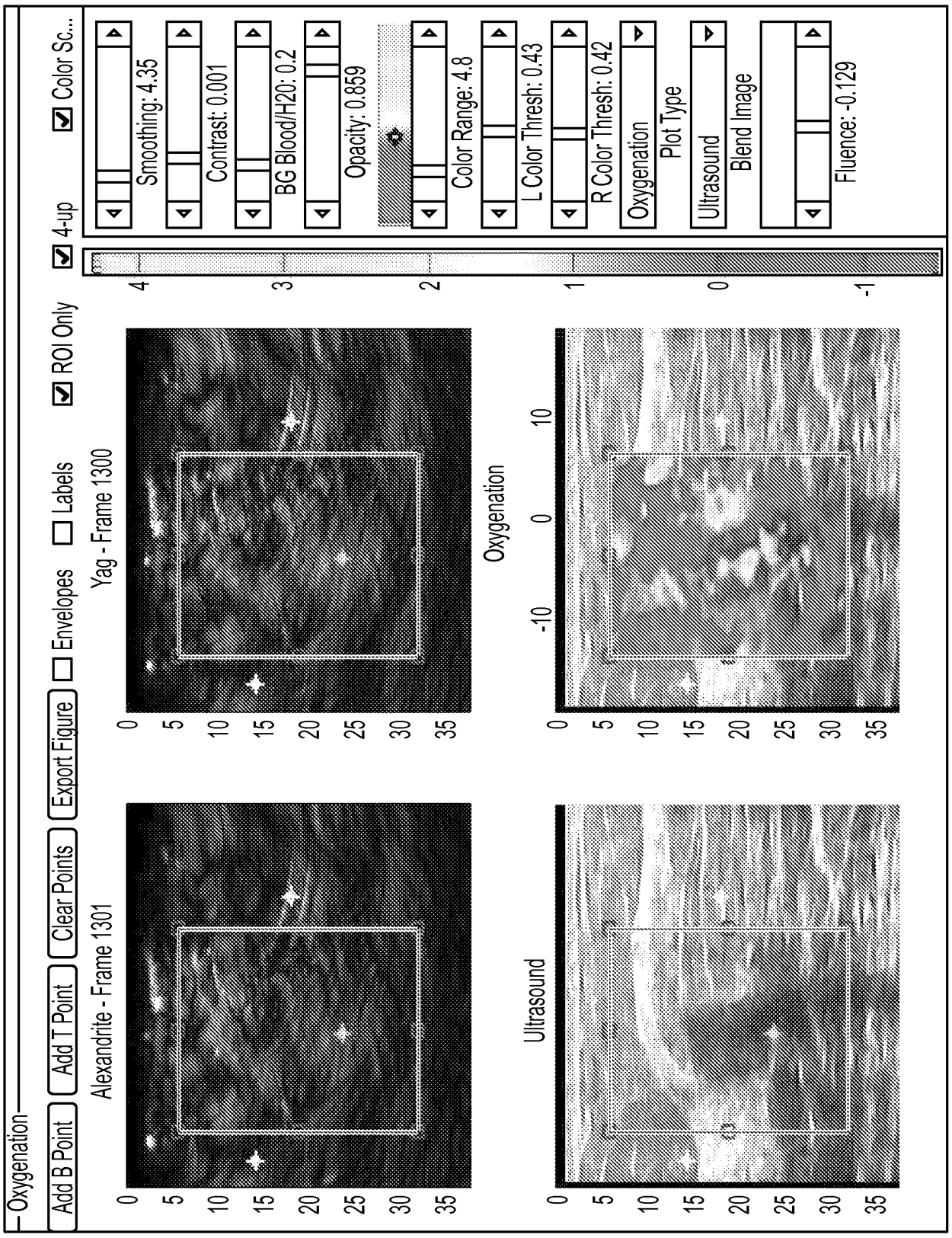

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Oxygenation
Ultrasound
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.859
Color Range: 4.8
L Color Thresh: 0.43
R Color Thresh: 0.42
Oxygenation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

FIG. 10

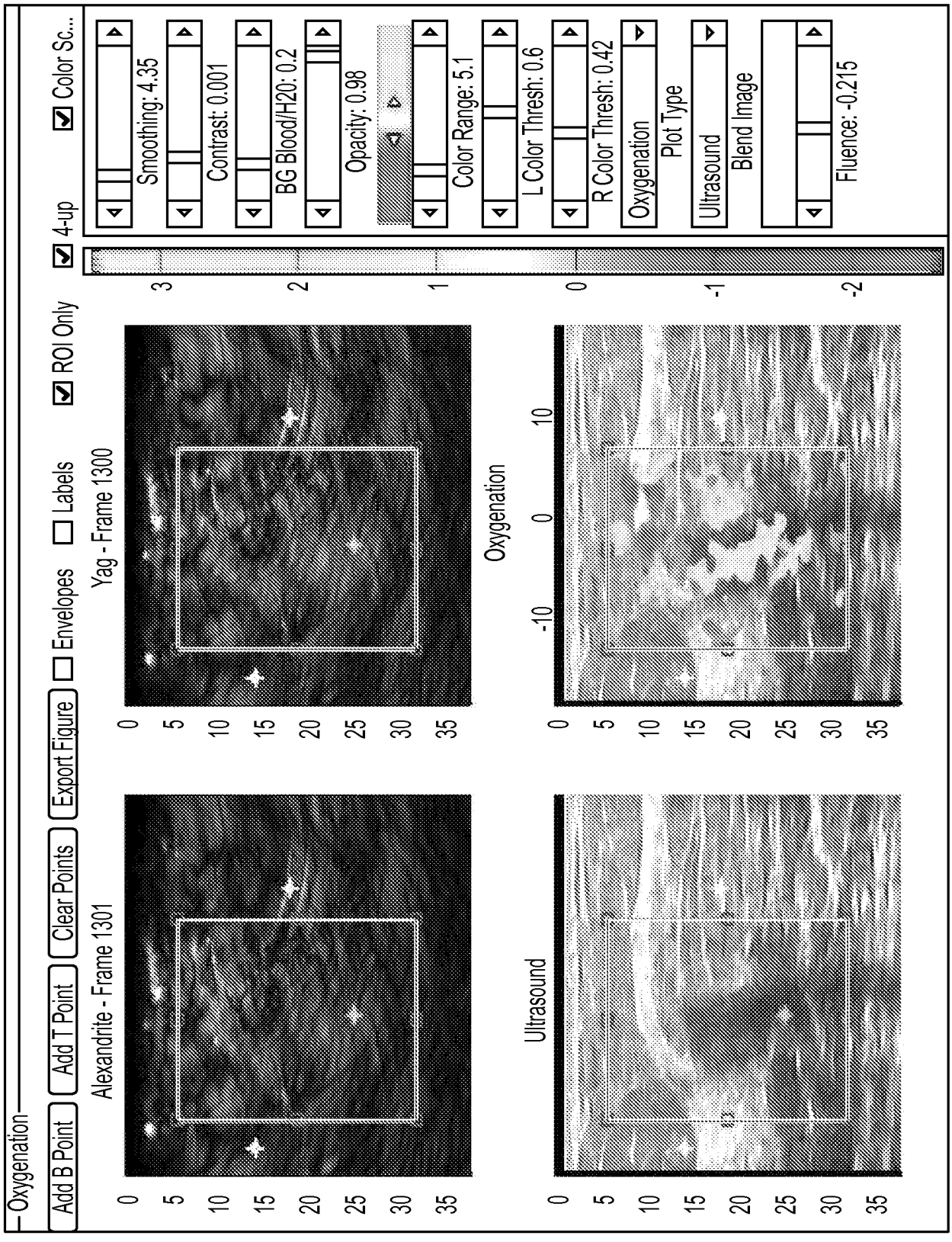

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Ultrasound
Oxygenation
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.98
Color Range: 5.1
L Color Thresh: 0.6
R Color Thresh: 0.42
Oxygenation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

FIG. 11

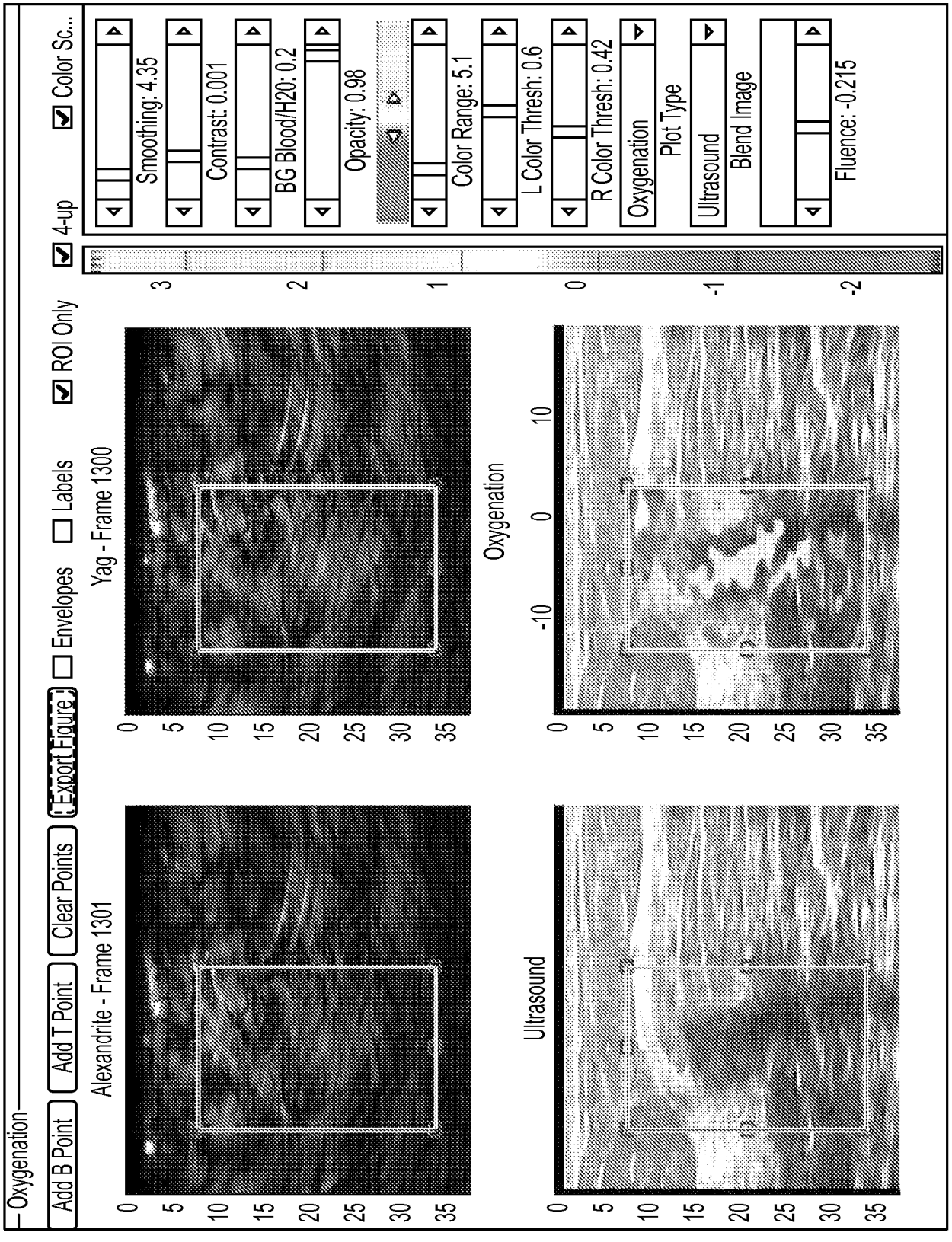

Oxygenation
Add B Point
Add T Point
Clear Points
Export Figure
Envelopes
Labels
ROI Only
4-up
Color Sc...
Alexandrite - Frame 1301
Yag - Frame 1300
Ultrasound
Oxygenation
Smoothing: 4.35
Contrast: 0.001
BG Blood/H20: 0.2
Opacity: 0.98
Color Range: 5.1
L Color Thresh: 0.6
R Color Thresh: 0.42
Oxygenation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

FIG. 12

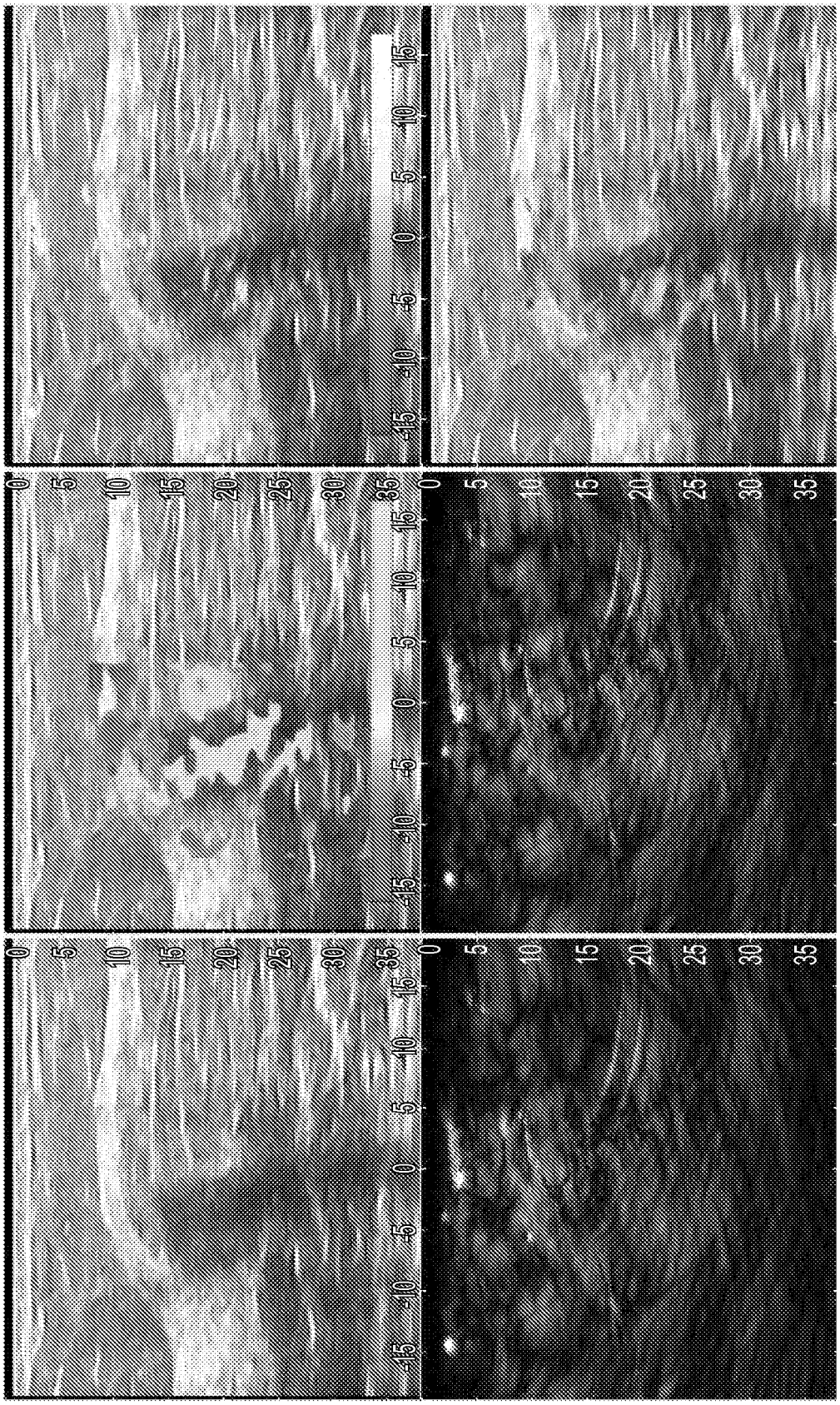


FIG. 13

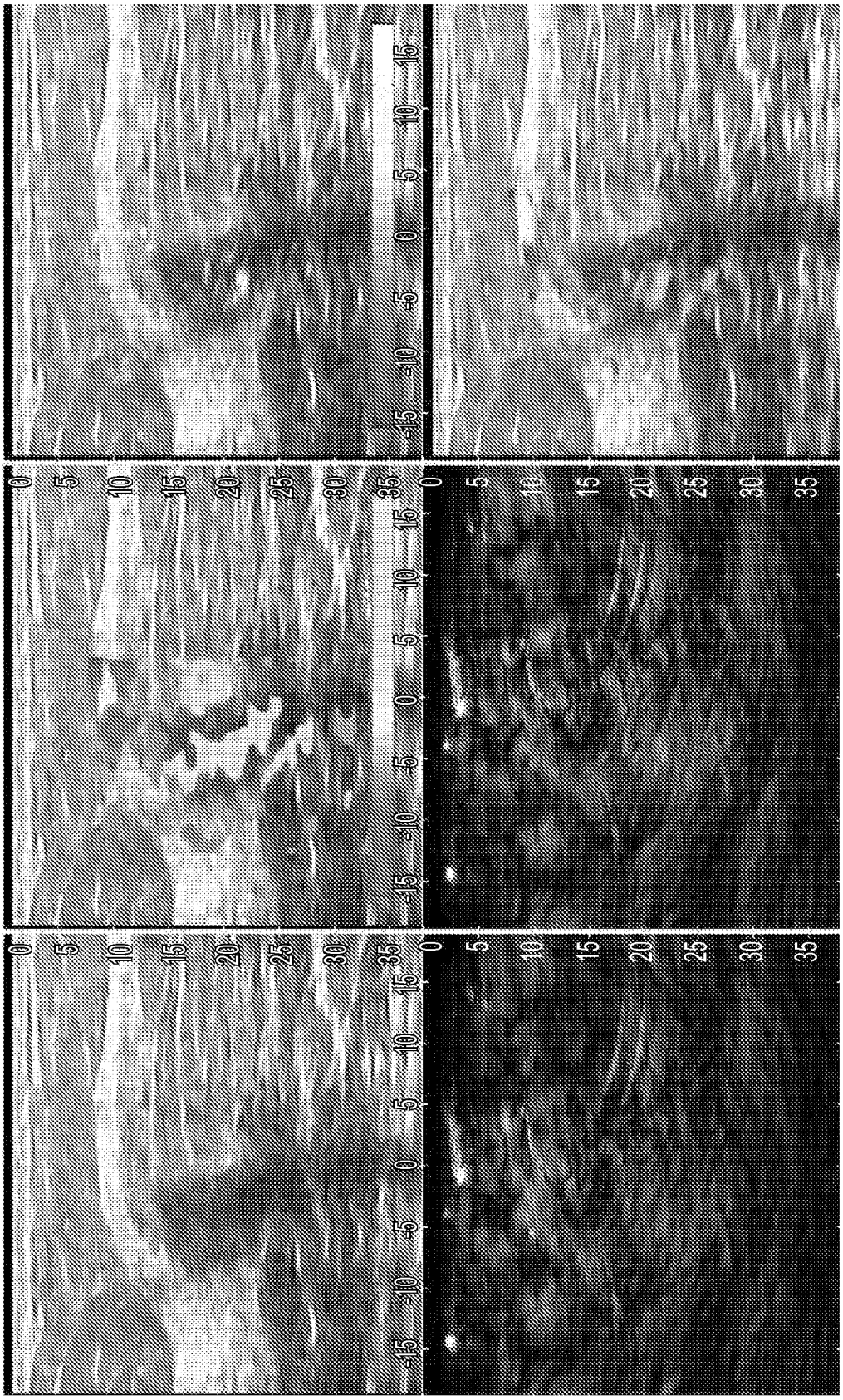


FIG. 14

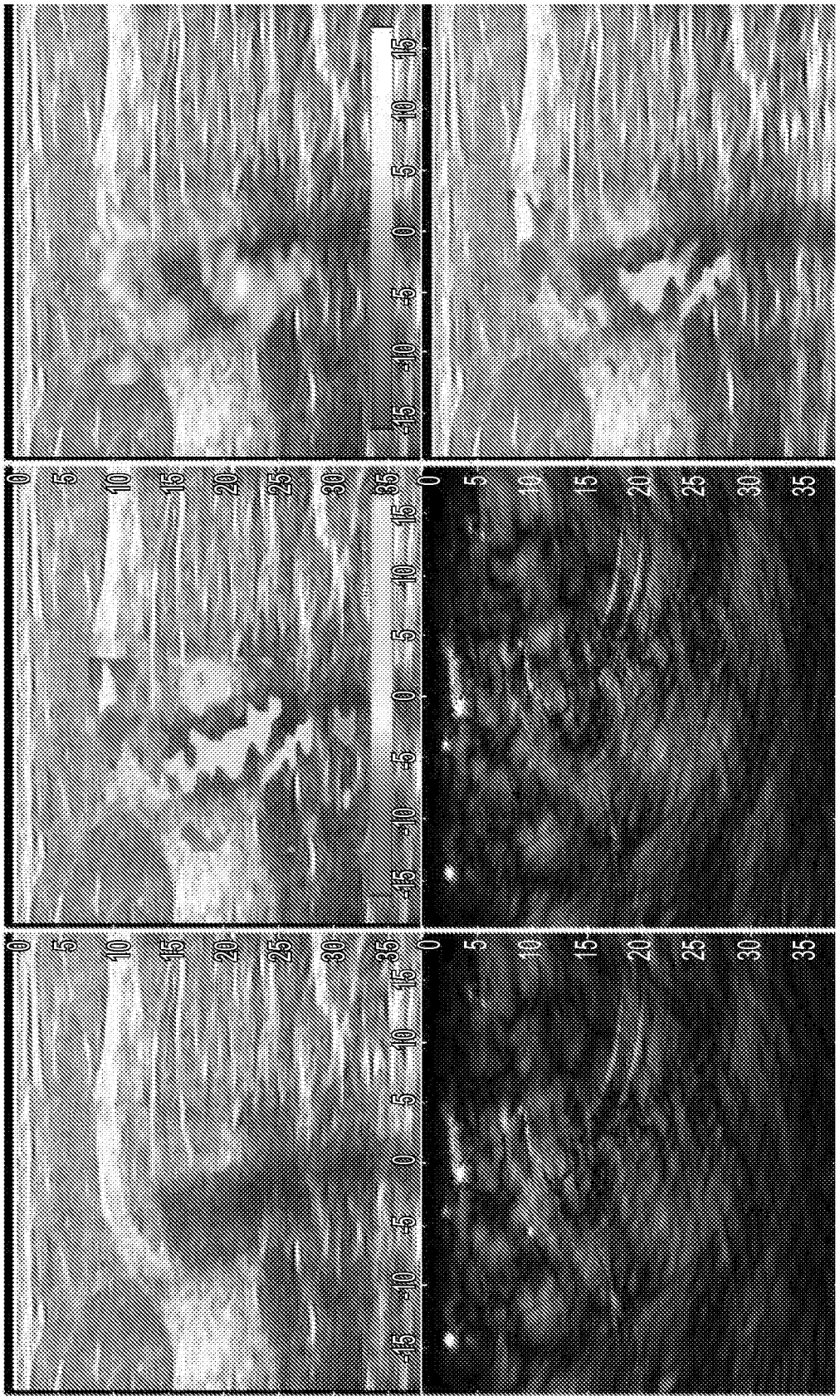


FIG. 15

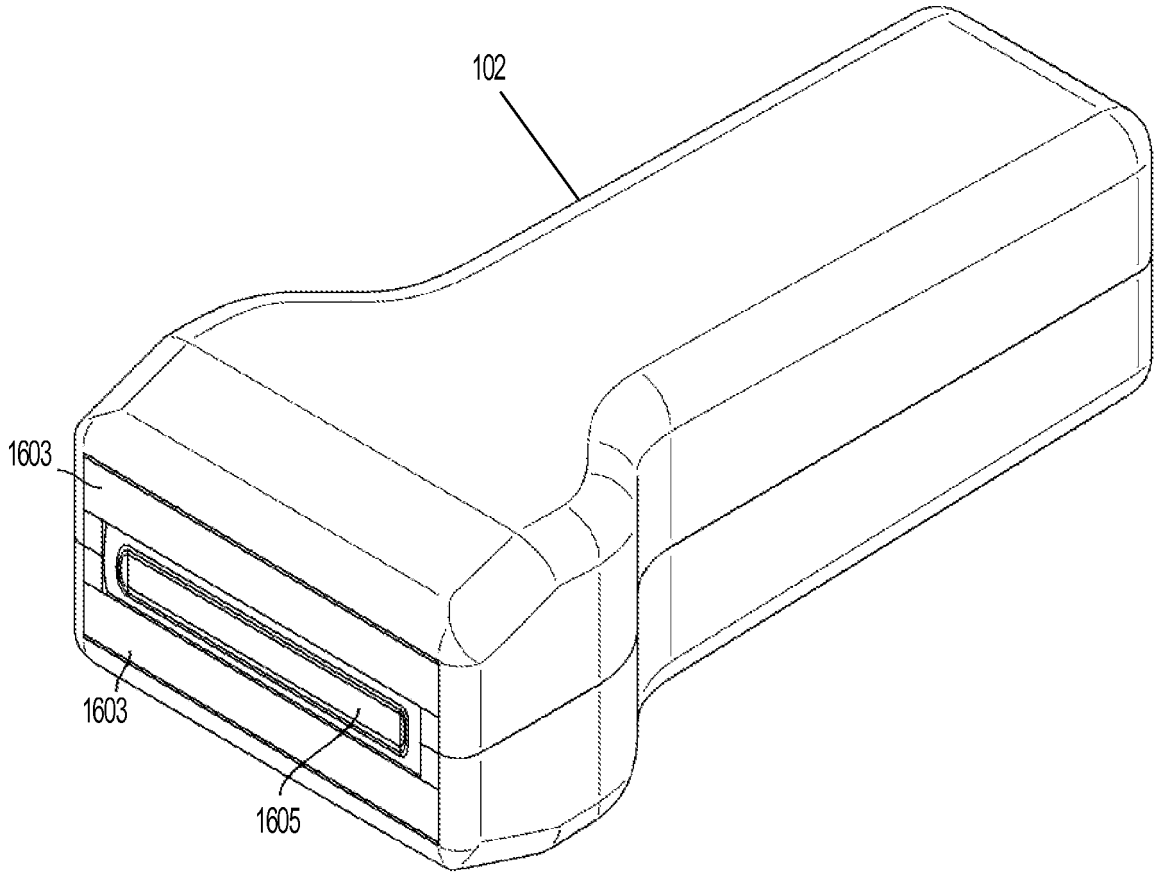


FIG. 16

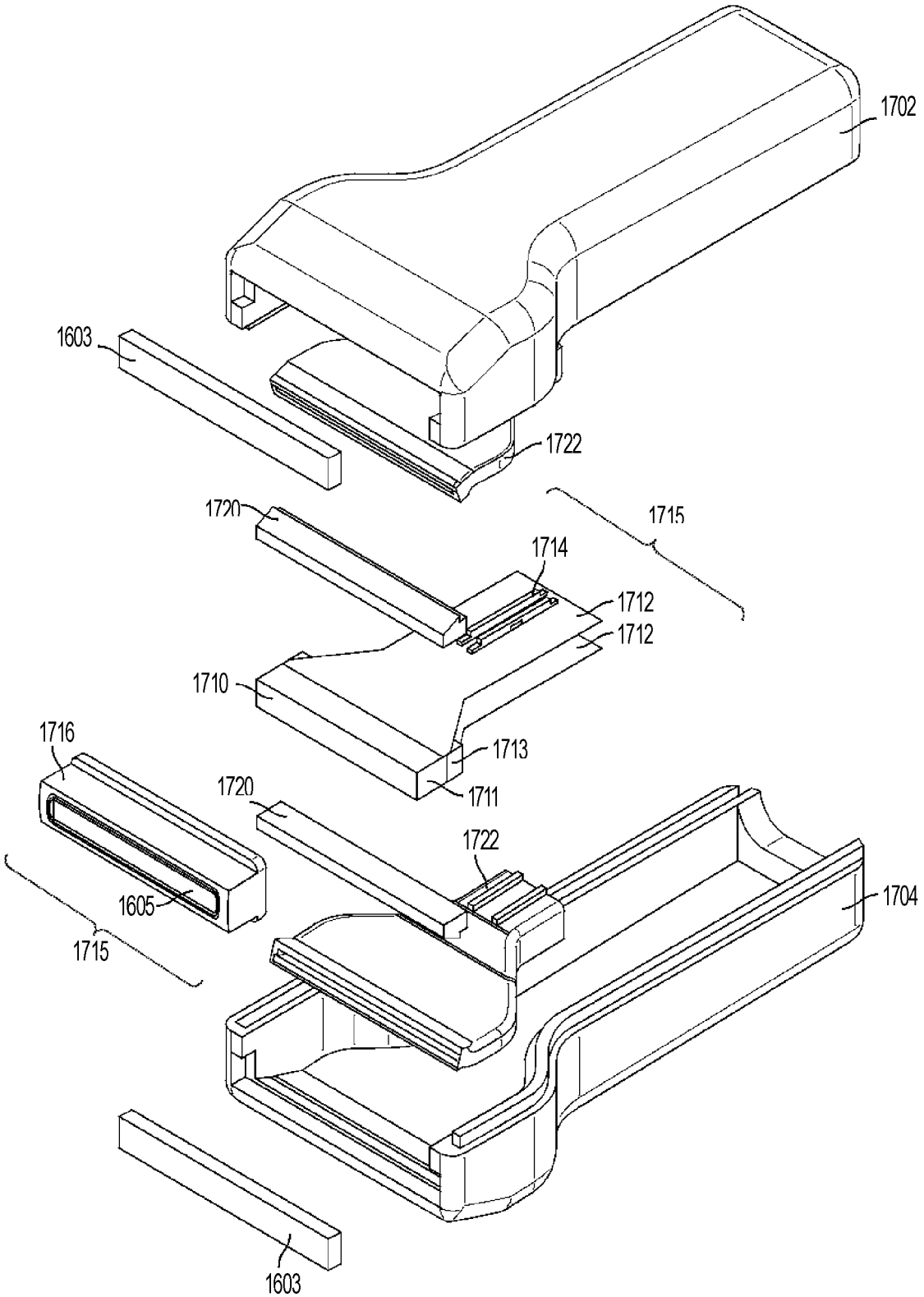

1702
1603
1722
1720
1715
1714
1712
1712
1710
1716
1713
1720
1711
1722
1704
1605
1715
1603

FIG. 17

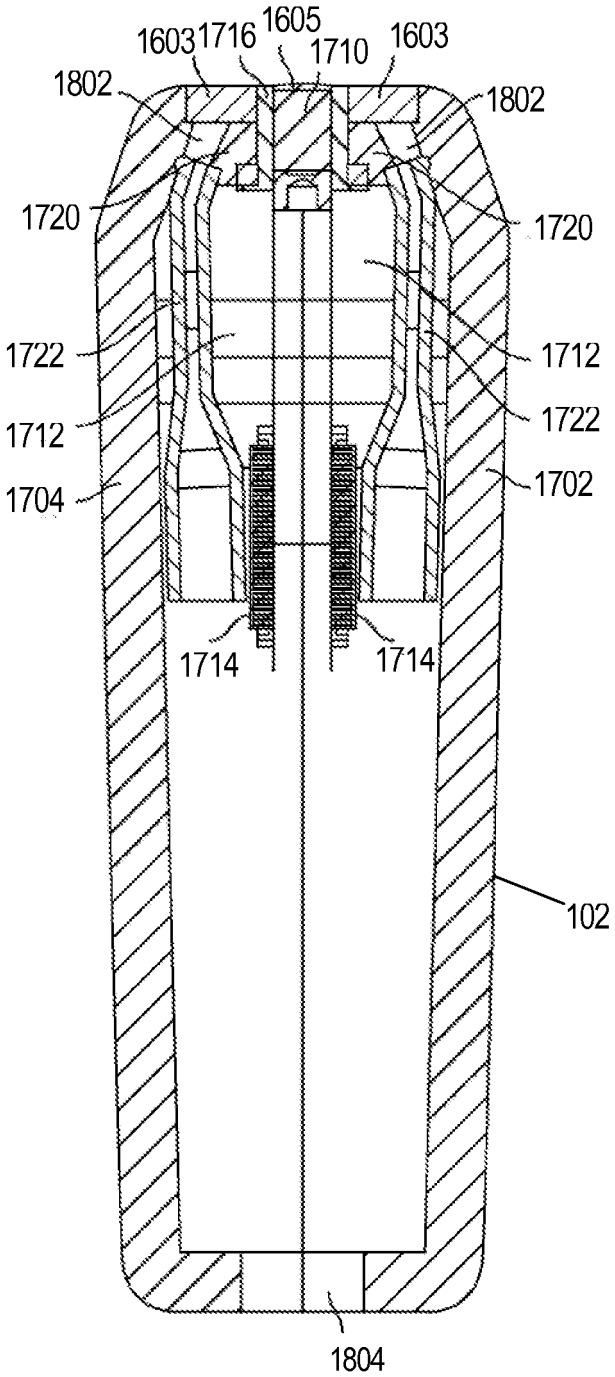

1603
1716
1605
1710
1603
1802
1802
1720
1720
1722
1712
1712
1722
1704
1702
1714
1714
102
1804

FIG. 18



FIG. 19A

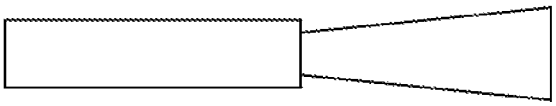


FIG. 19B

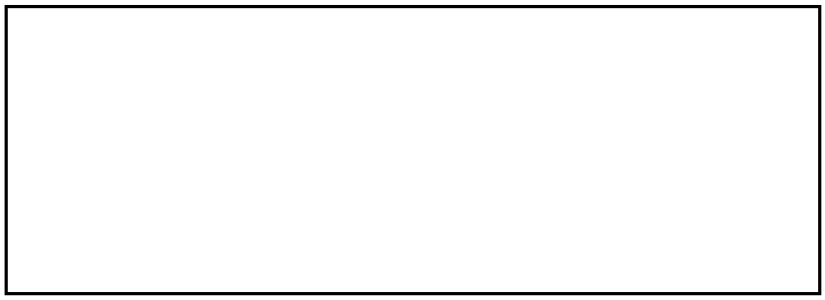


FIG. 20A

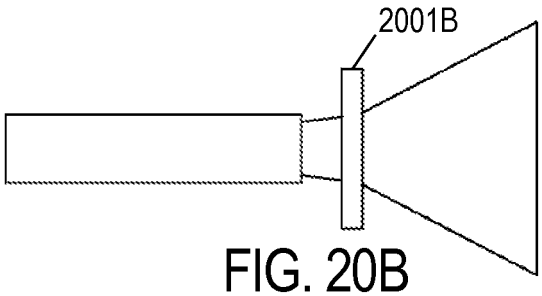


FIG. 20B

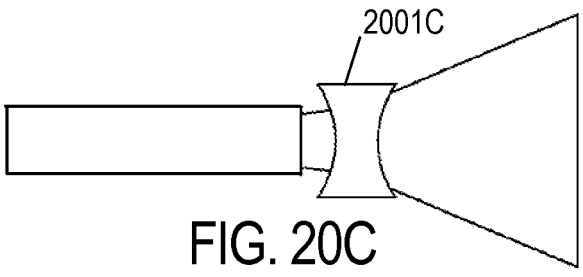


FIG. 20C

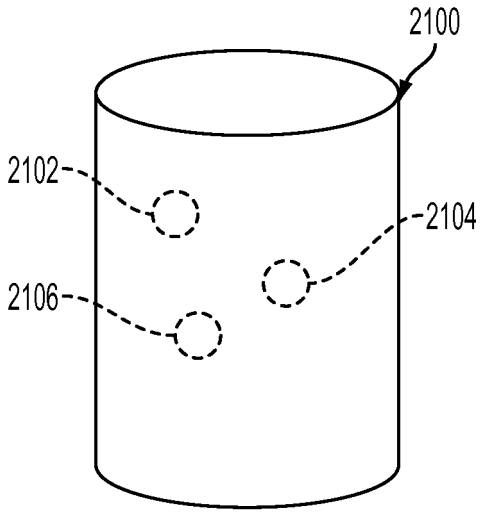


FIG. 21

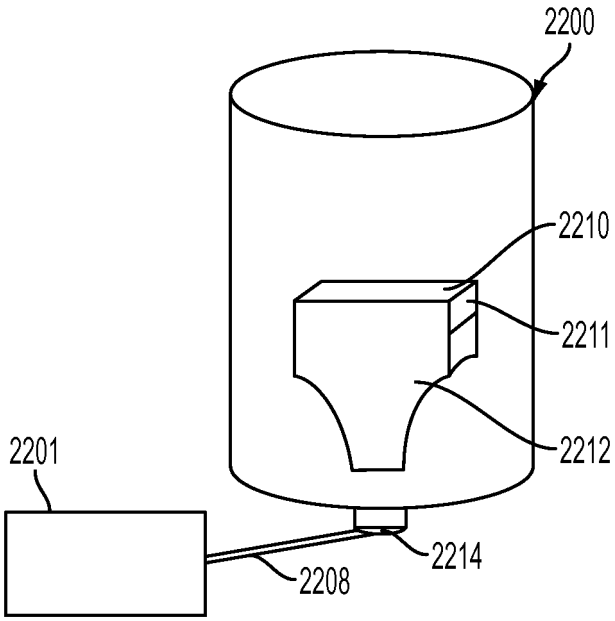


FIG. 22

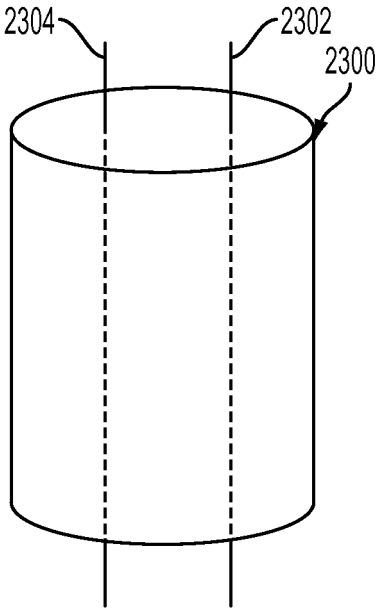


FIG. 23

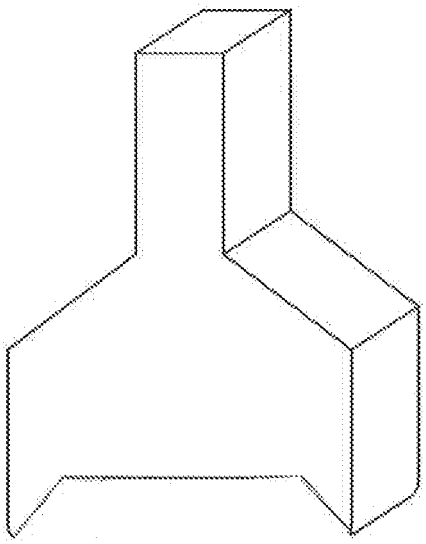


FIG. 24A

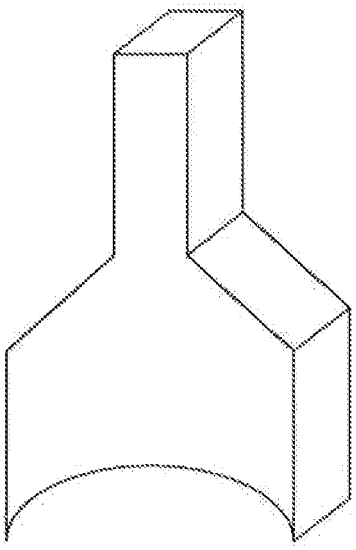


FIG. 24B

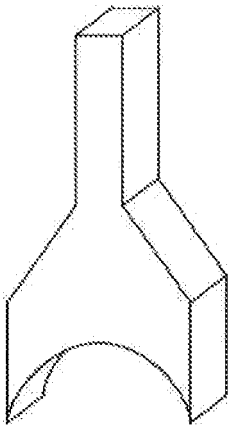


FIG. 24C

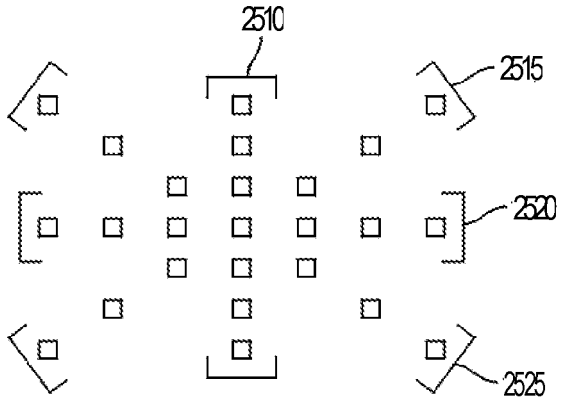


FIG. 25A

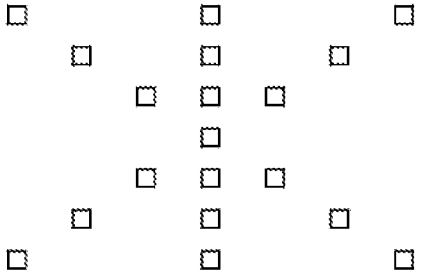


FIG. 25B



FIG. 25C

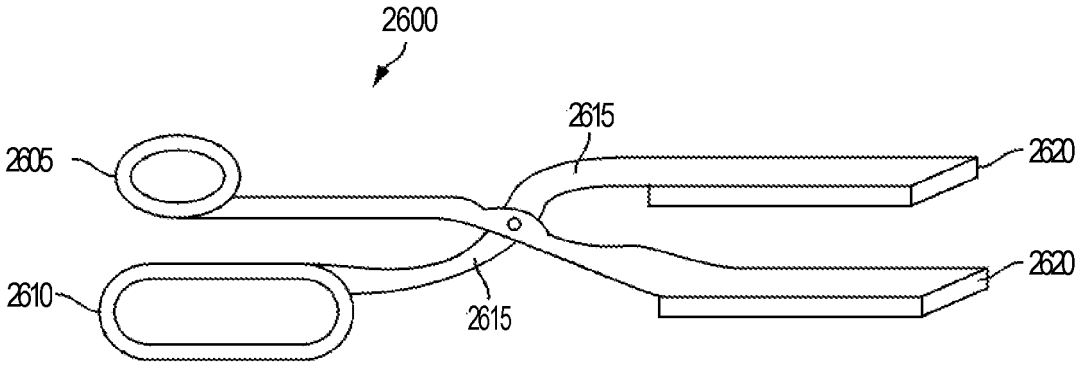

2600
2615
2605
2620
2620
2610
2615

FIG. 26

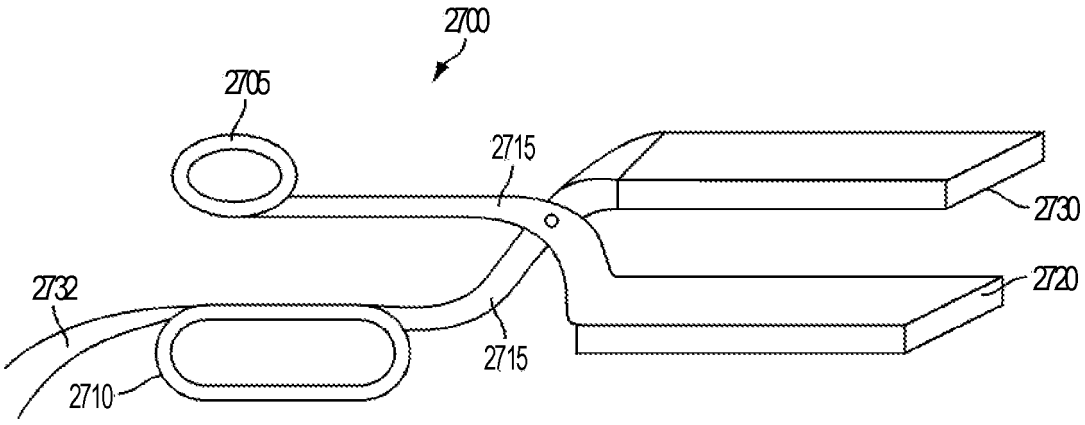

2700
2705
2715
2730
2720
2732
2715
2710

FIG. 27

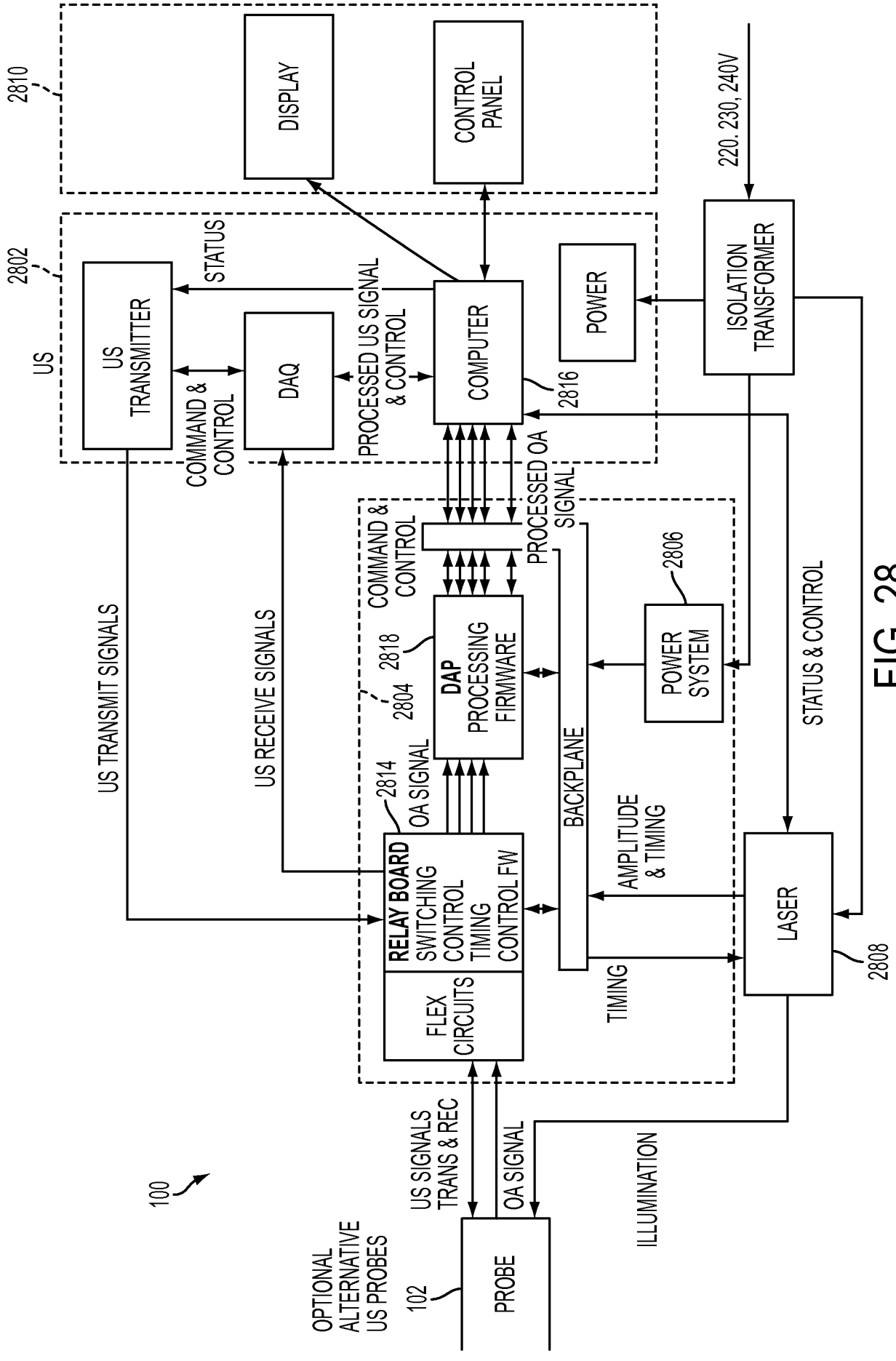

2810
DISPLAY
CONTROL PANEL
220. 230, 240V
2802
US
STATUS
US TRANSMITTER
DAQ
PROCESSED US SIGNAL & CONTROL
COMPUTER
POWER
ISOLATION TRANSFORMER
2816
COMMAND & CONTROL
PROCESSED OA SIGNAL
COMMAND & CONTROL
2806
2818
DAP PROCESSING FIRMWARE
2804
POWER SYSTEM
US TRANSMIT SIGNALS
US RECEIVE SIGNALS
2814
OA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

FIG. 28

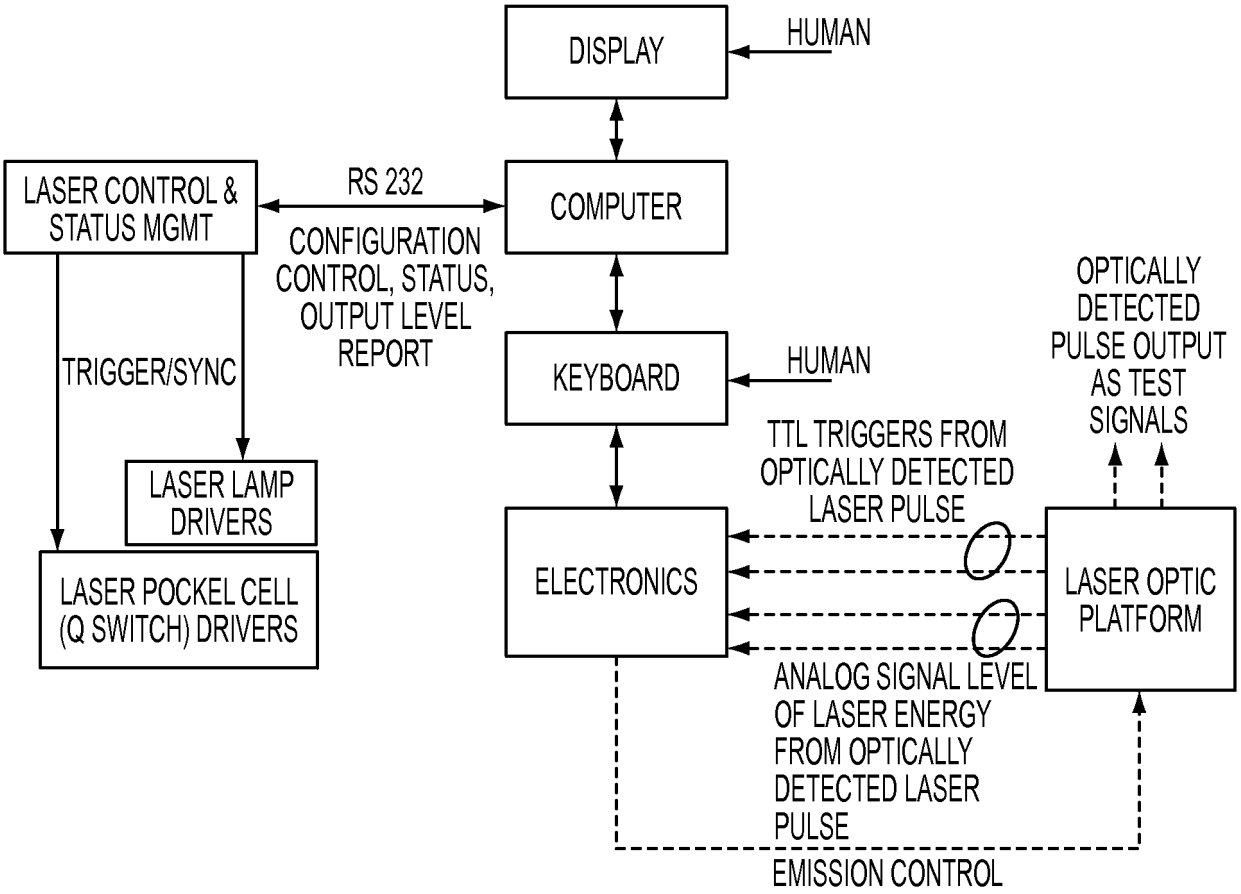

DISPLAY
HUMAN
LASER CONTROL & STATUS MGMT
RS 232
CONFIGURATION CONTROL, STATUS, OUTPUT LEVEL REPORT
COMPUTER
TRIGGER/SYNC
KEYBOARD
HUMAN
OPTICALLY DETECTED PULSE OUTPUT AS TEST SIGNALS
TTL TRIGGERS FROM OPTICALLY DETECTED LASER PULSE
LASER LAMP DRIVERS
LASER POCKEL CELL (Q SWITCH) DRIVERS
ELECTRONICS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

FIG. 29

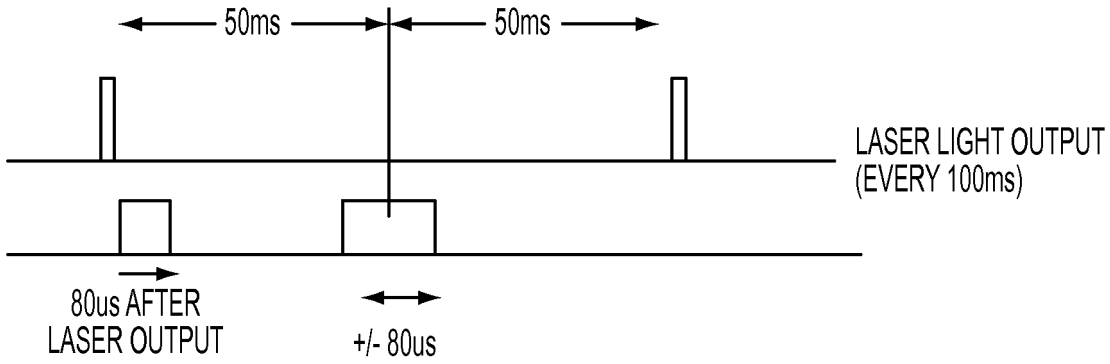

50ms
50ms
LASER LIGHT OUTPUT (EVERY 100ms)
80us AFTER LASER OUTPUT
+/- 80us

FIG. 30

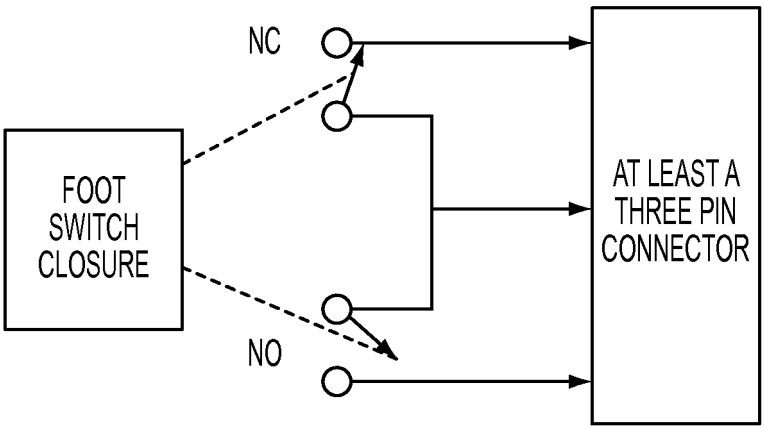


FIG. 31

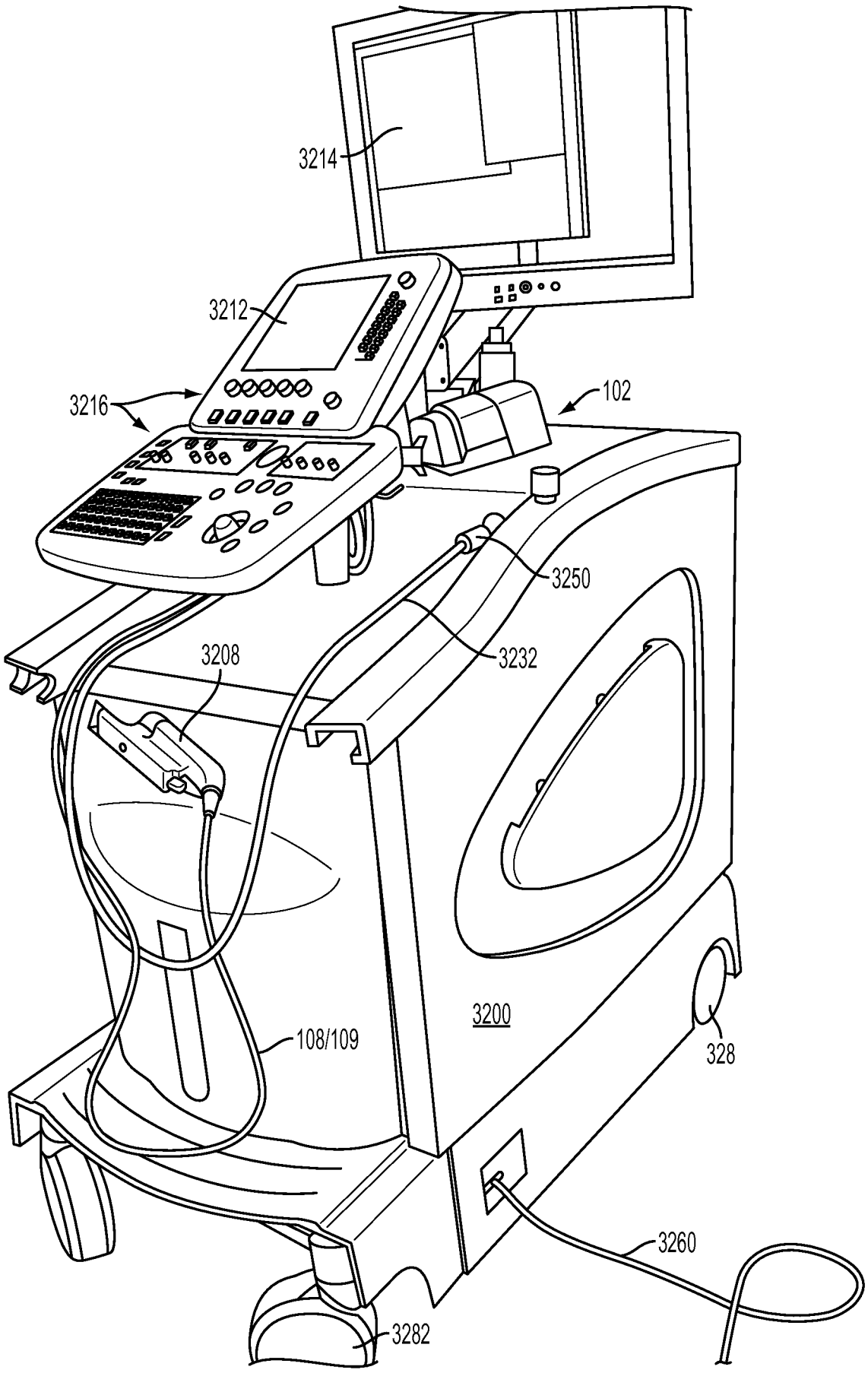


FIG. 32

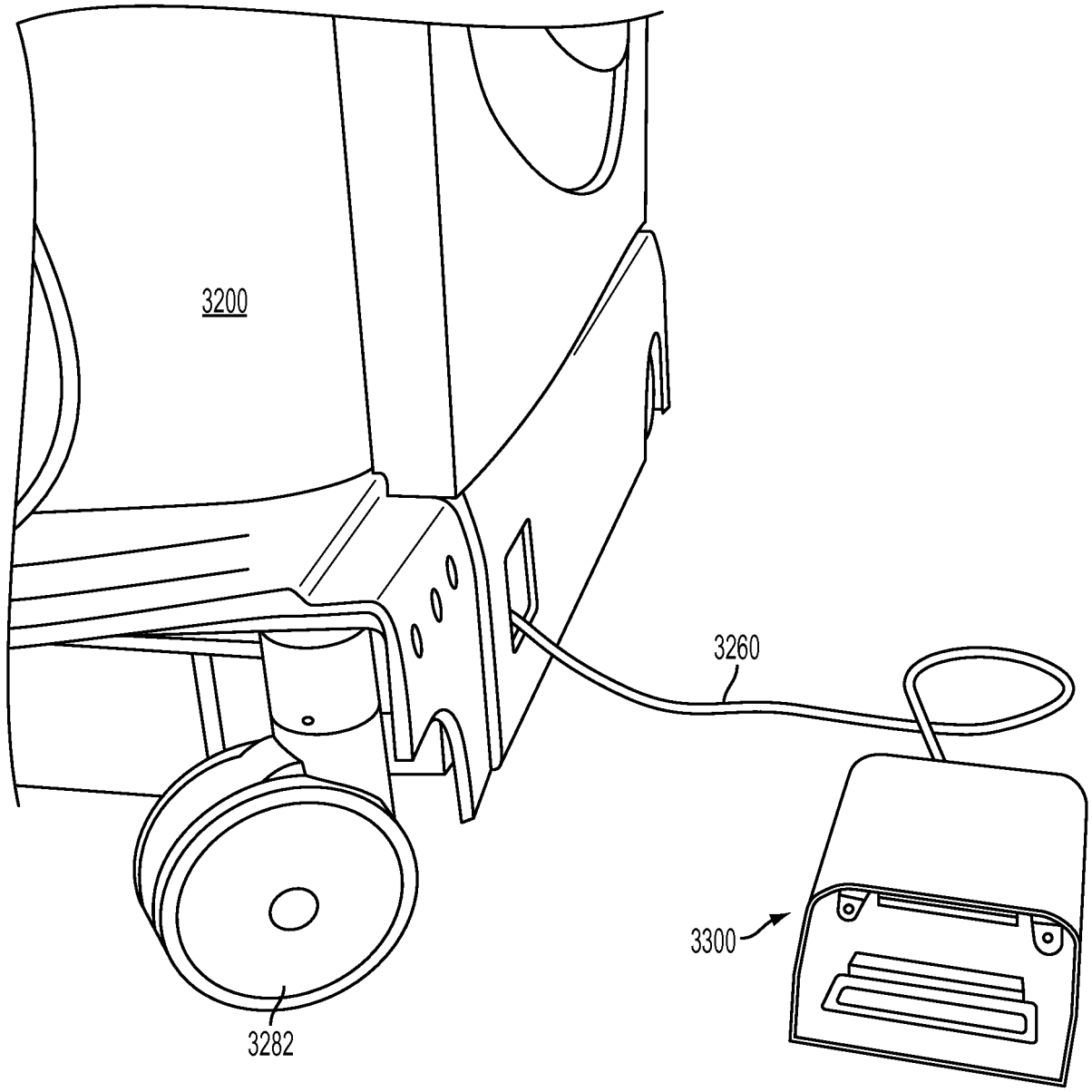


FIG. 33

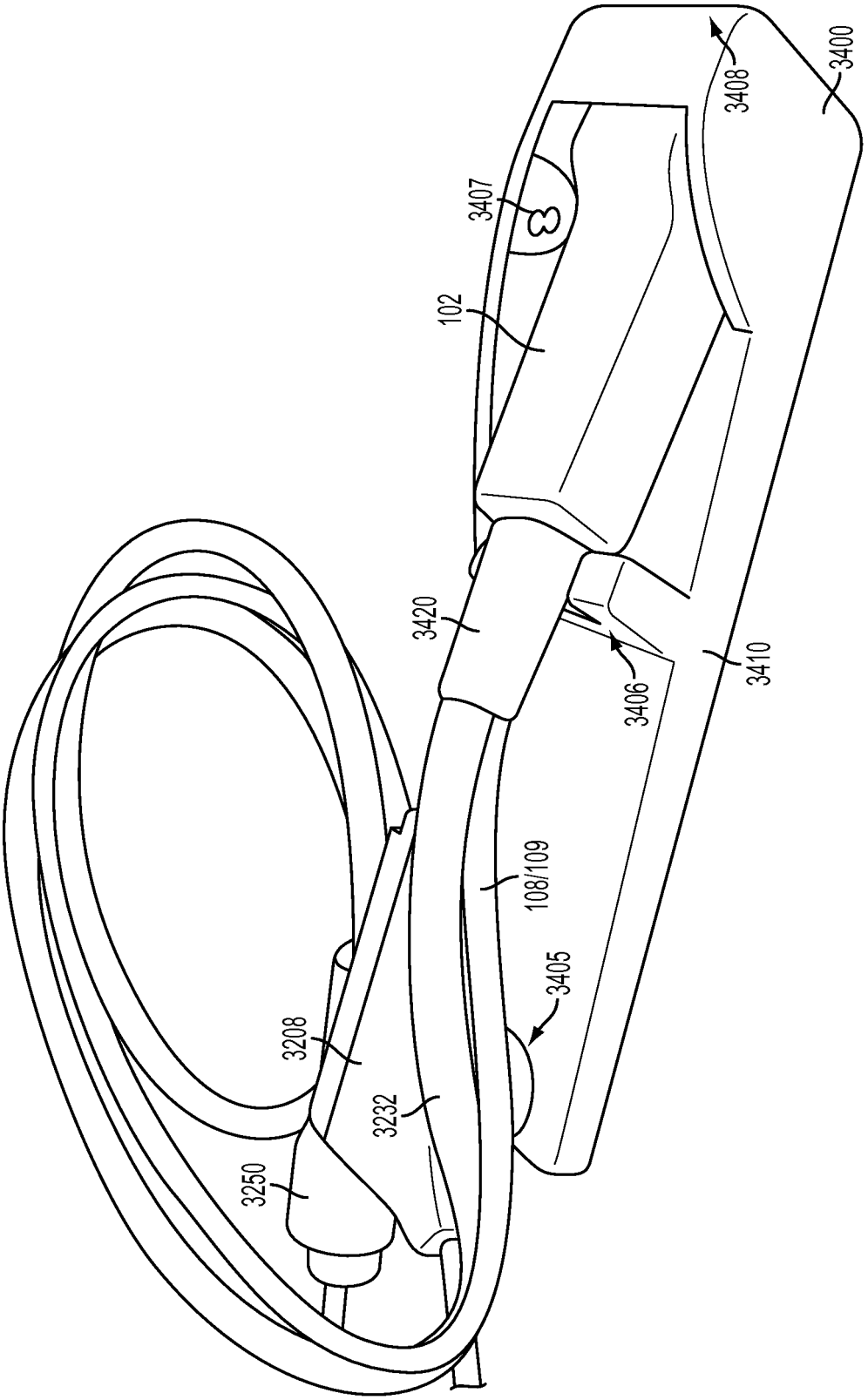


FIG. 34

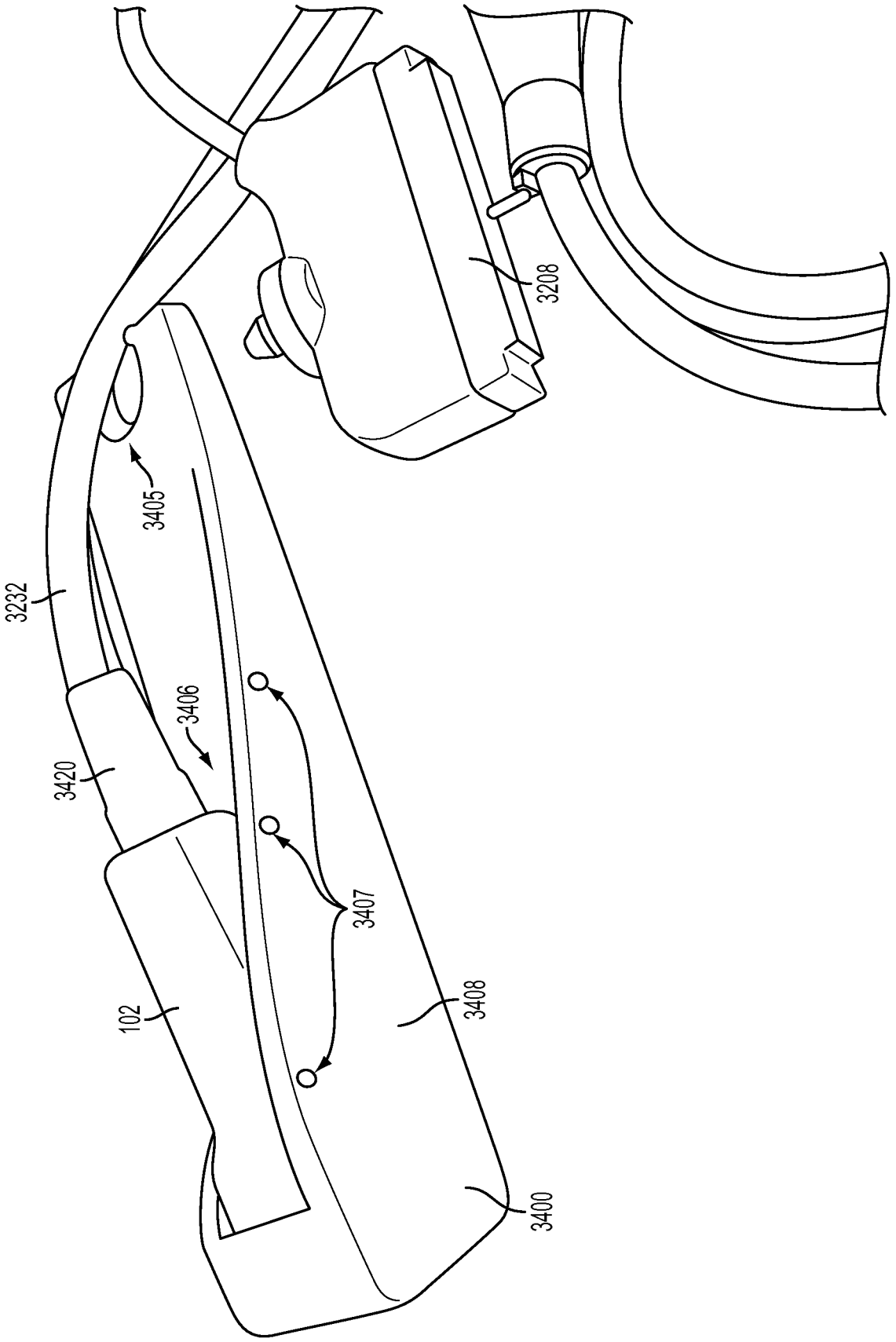


FIG. 35

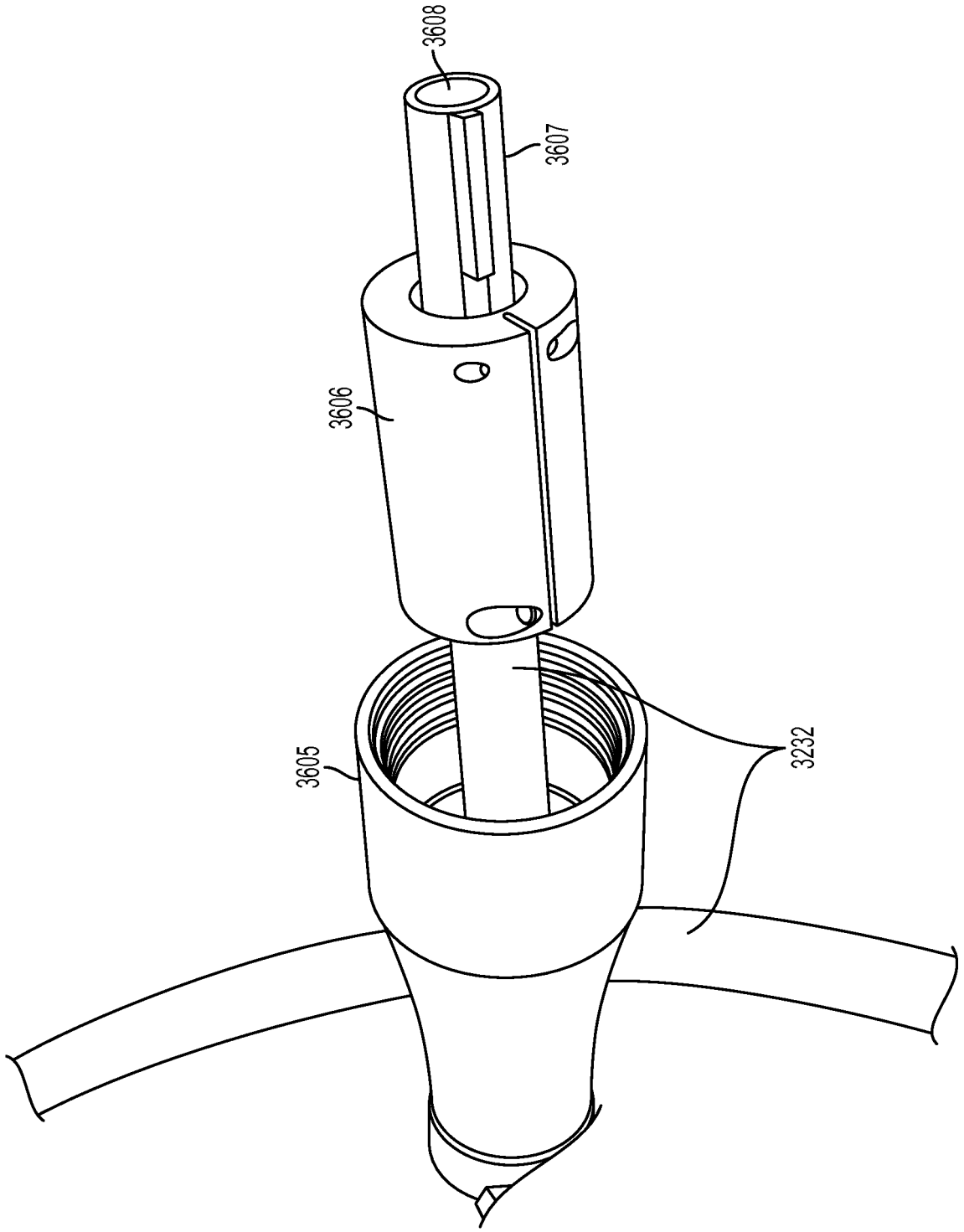


FIG. 36

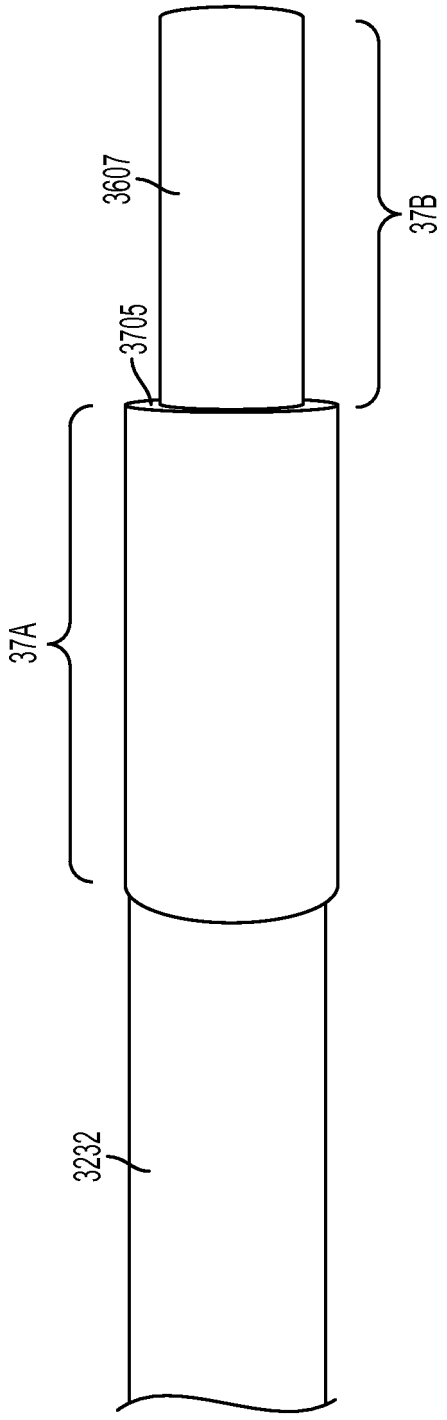


FIG. 37

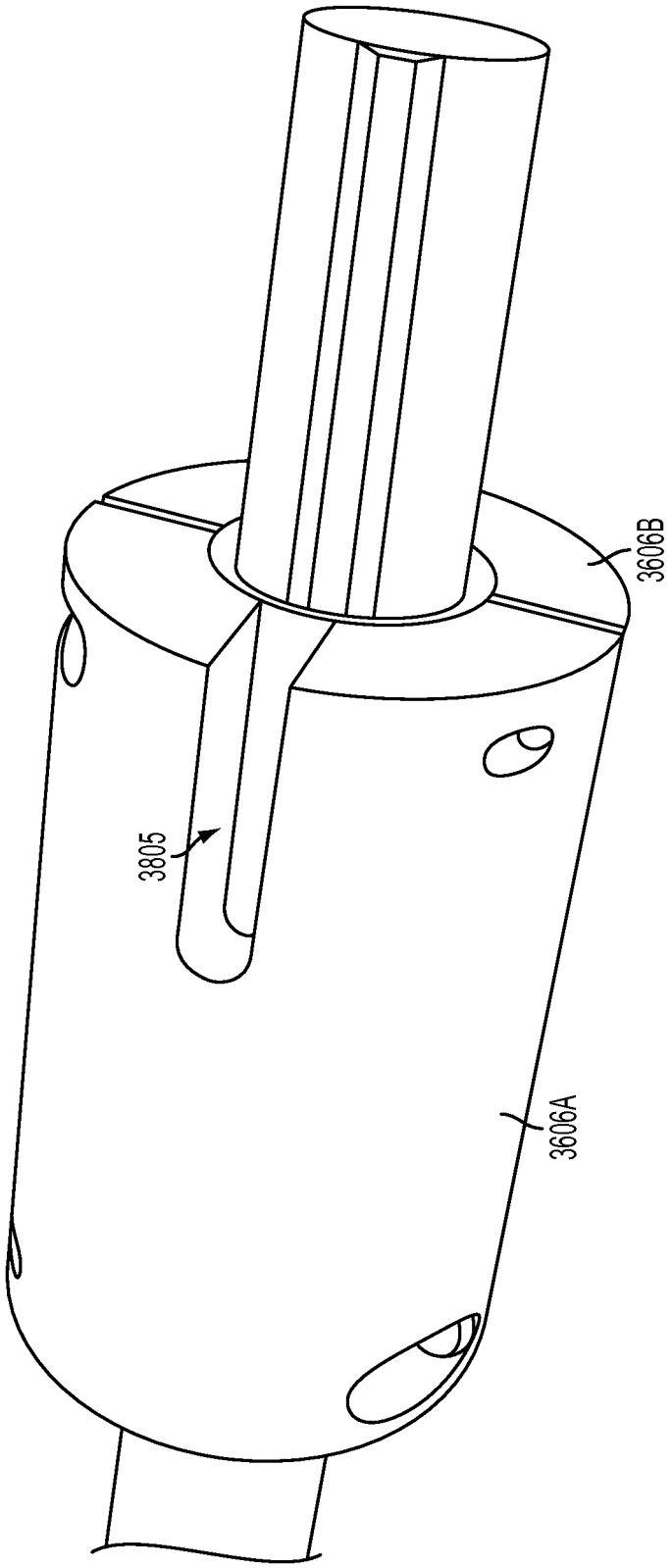


FIG. 38

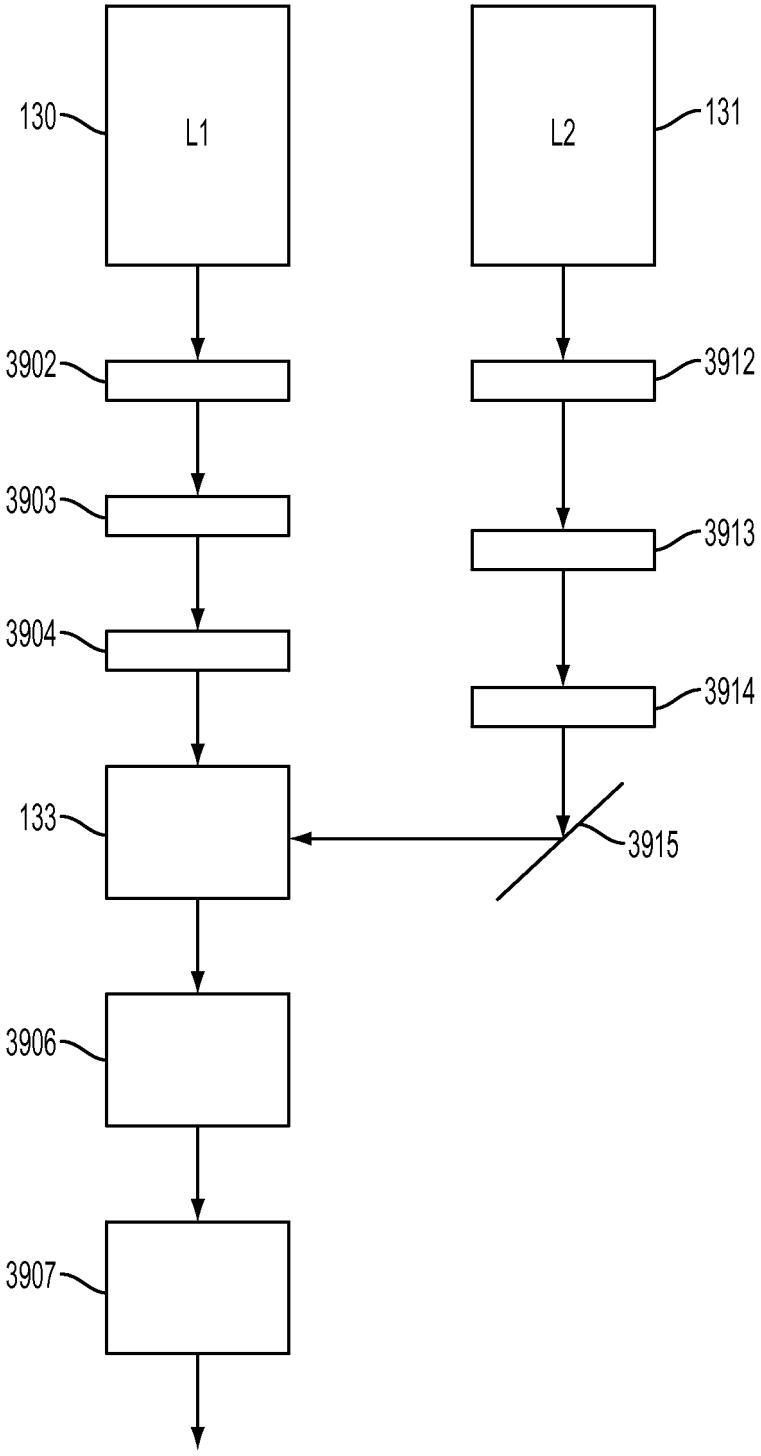


FIG. 39

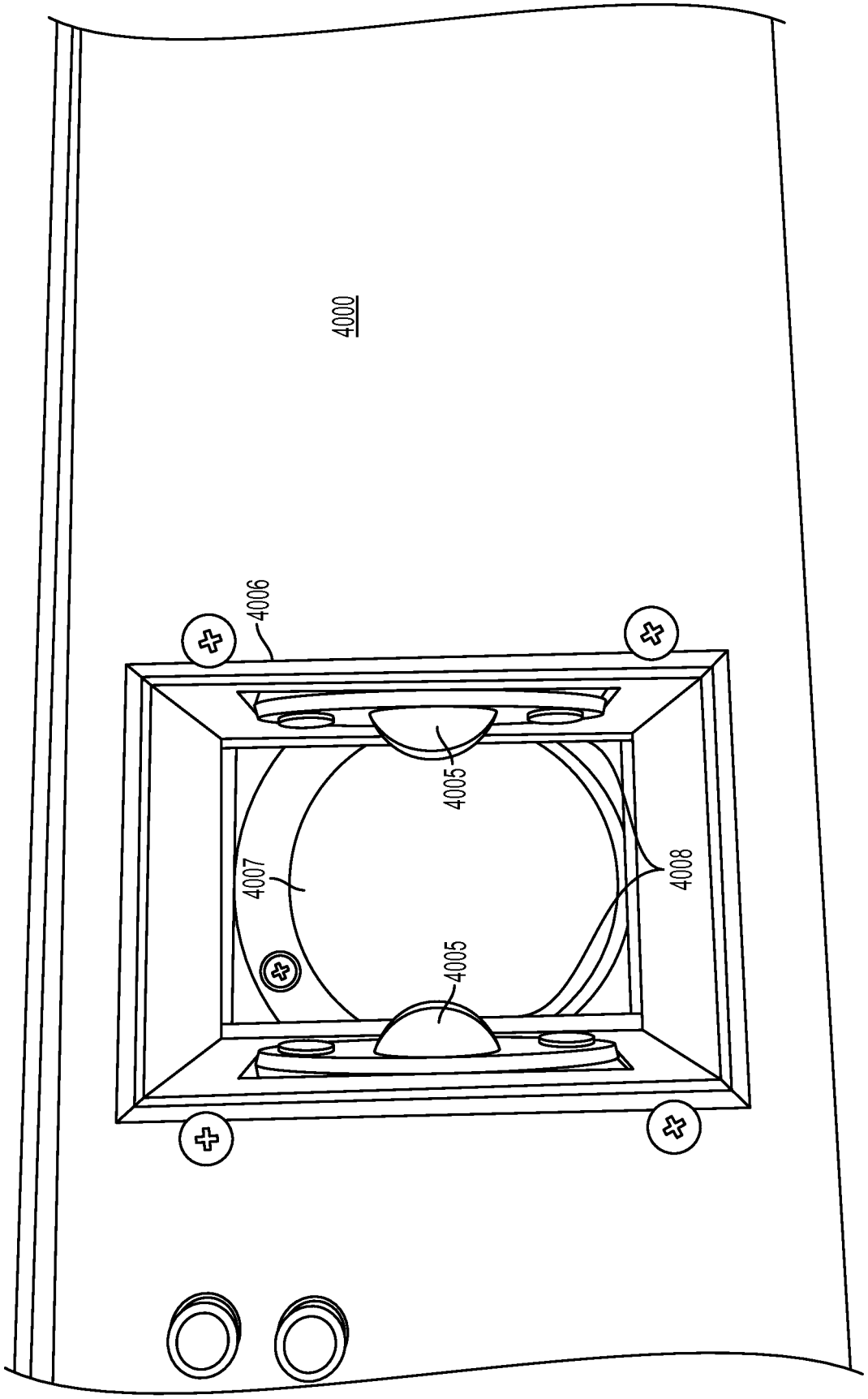


FIG. 40

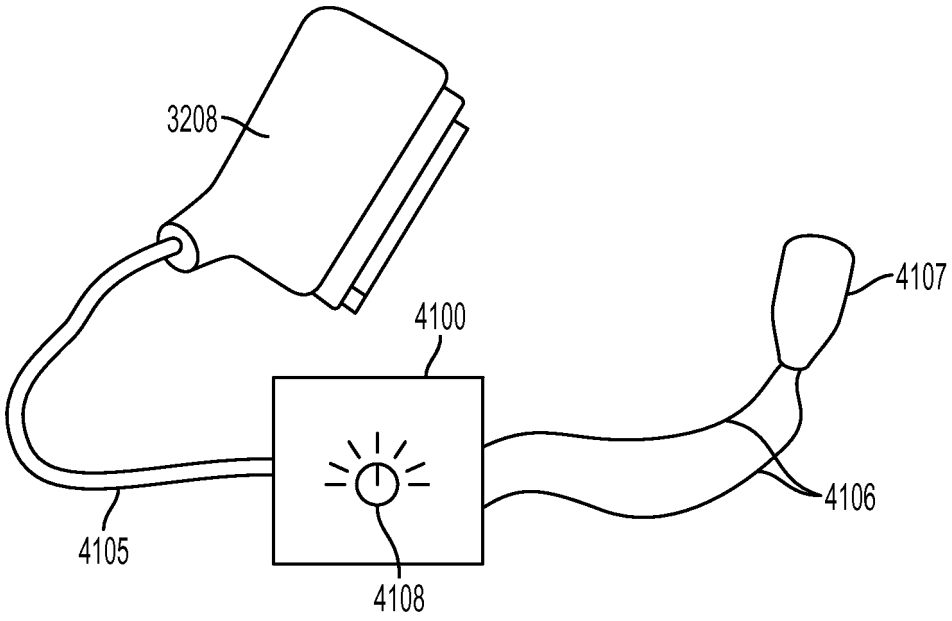


FIG. 41