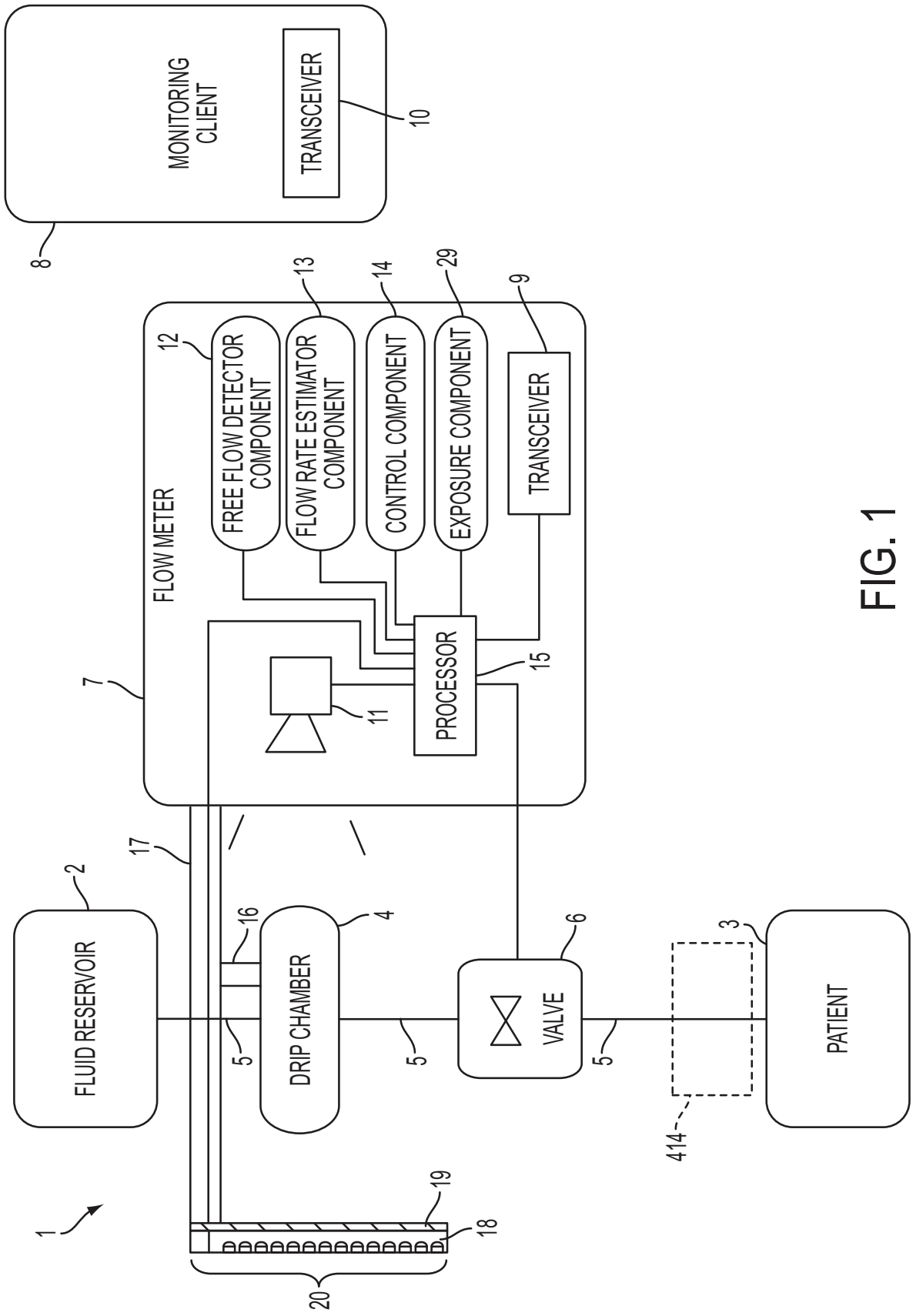

MONITORING CLIENT
TRANSCEIVER
10
8
FLOW METER
12
FREE FLOW DETECTOR COMPONENT
13
FLOW RATE ESTIMATOR COMPONENT
14
CONTROL COMPONENT
29
EXPOSURE COMPONENT
9
TRANSCEIVER
7
11
PROCESSOR
15
17
2
FLUID RESERVOIR
16
4
DRIP CHAMBER
5
5
6
VALVE
5
3
PATIENT
414
1
19
18
20

FIG. 1

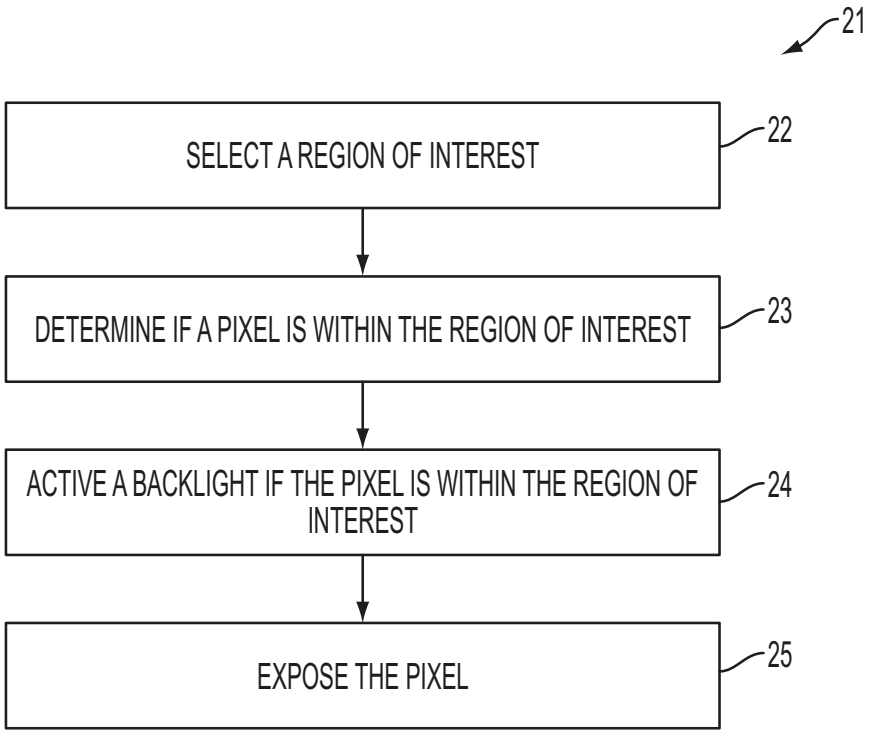

21
SELECT A REGION OF INTEREST
22
DETERMINE IF A PIXEL IS WITHIN THE REGION OF INTEREST
23
ACTIVE A BACKLIGHT IF THE PIXEL IS WITHIN THE REGION OF INTEREST
24
EXPOSE THE PIXEL
25

FIG. 2

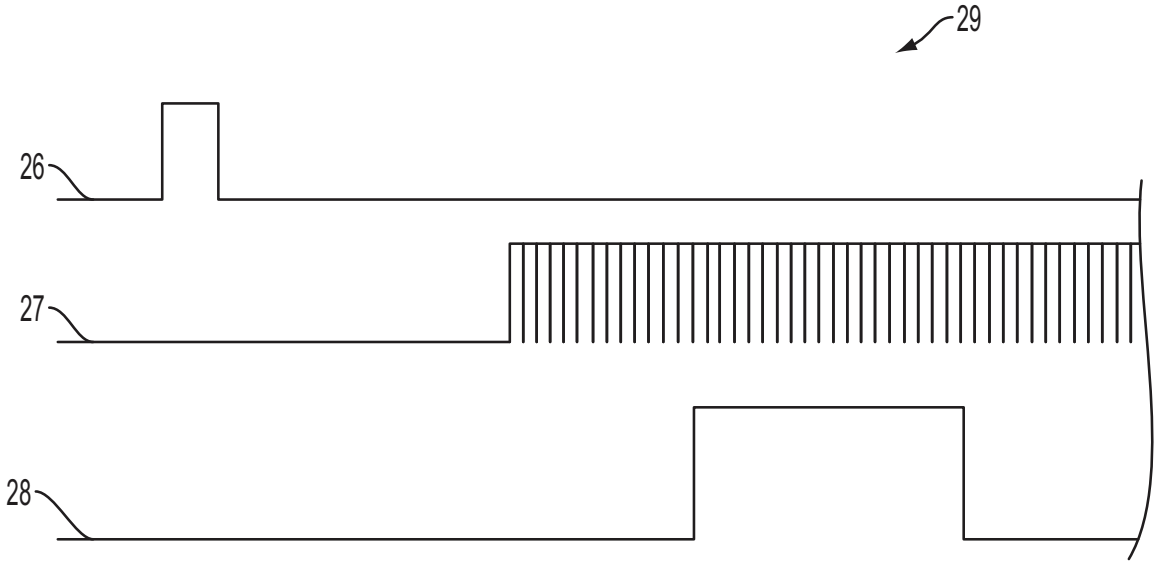


FIG. 3

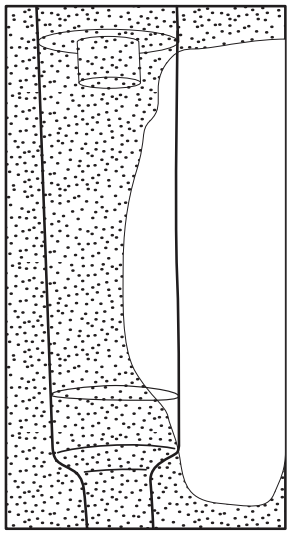


FIG. 4A

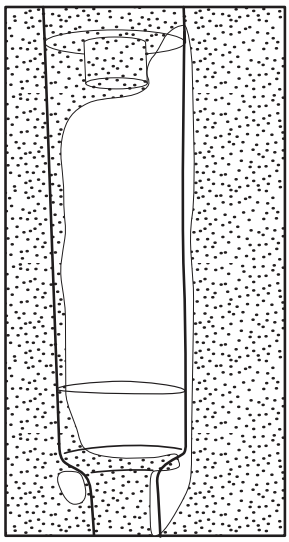


FIG. 4B

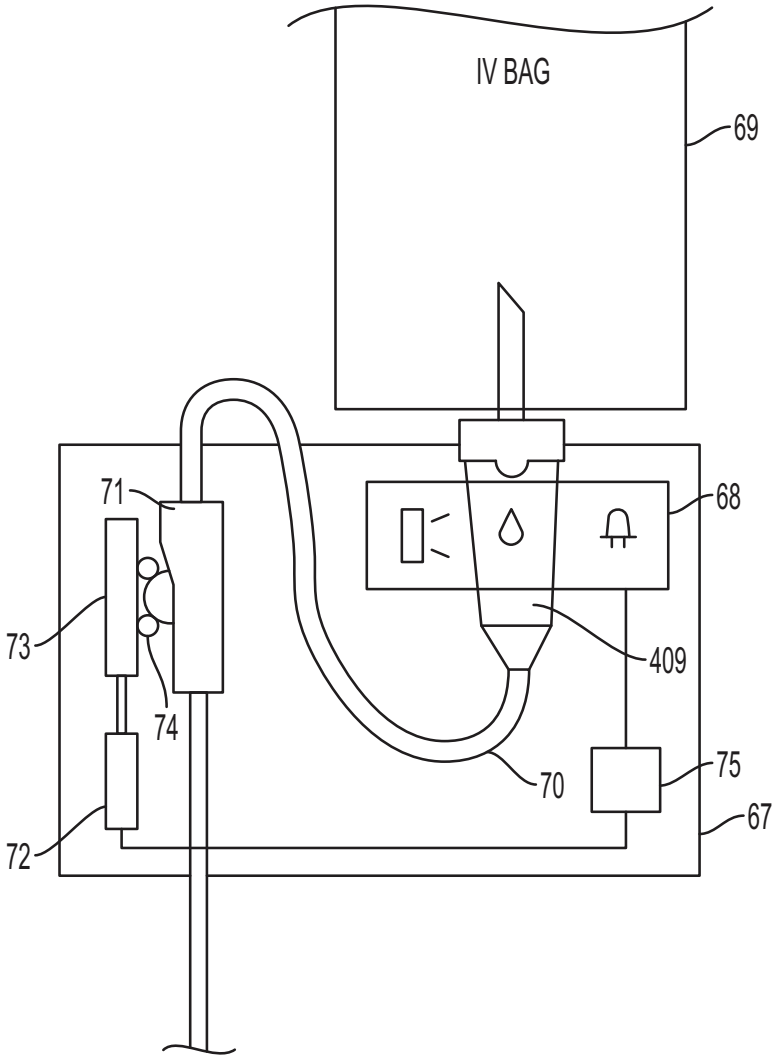


FIG. 5

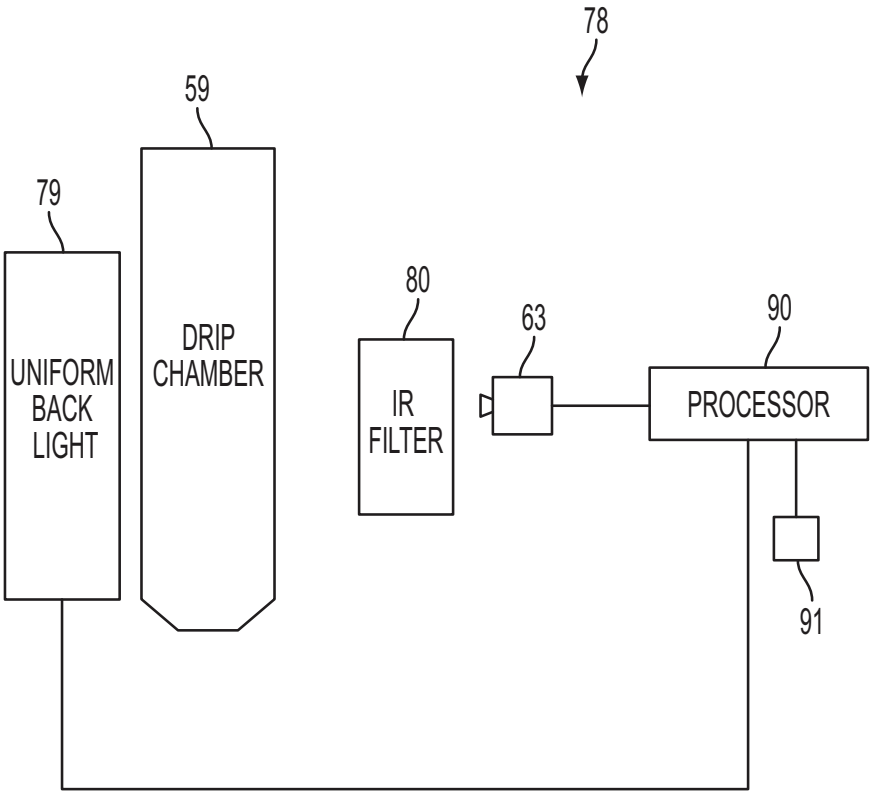

78
59
79
UNIFORM BACK LIGHT
DRIP CHAMBER
80
IR FILTER
63
90
PROCESSOR
91

FIG. 6

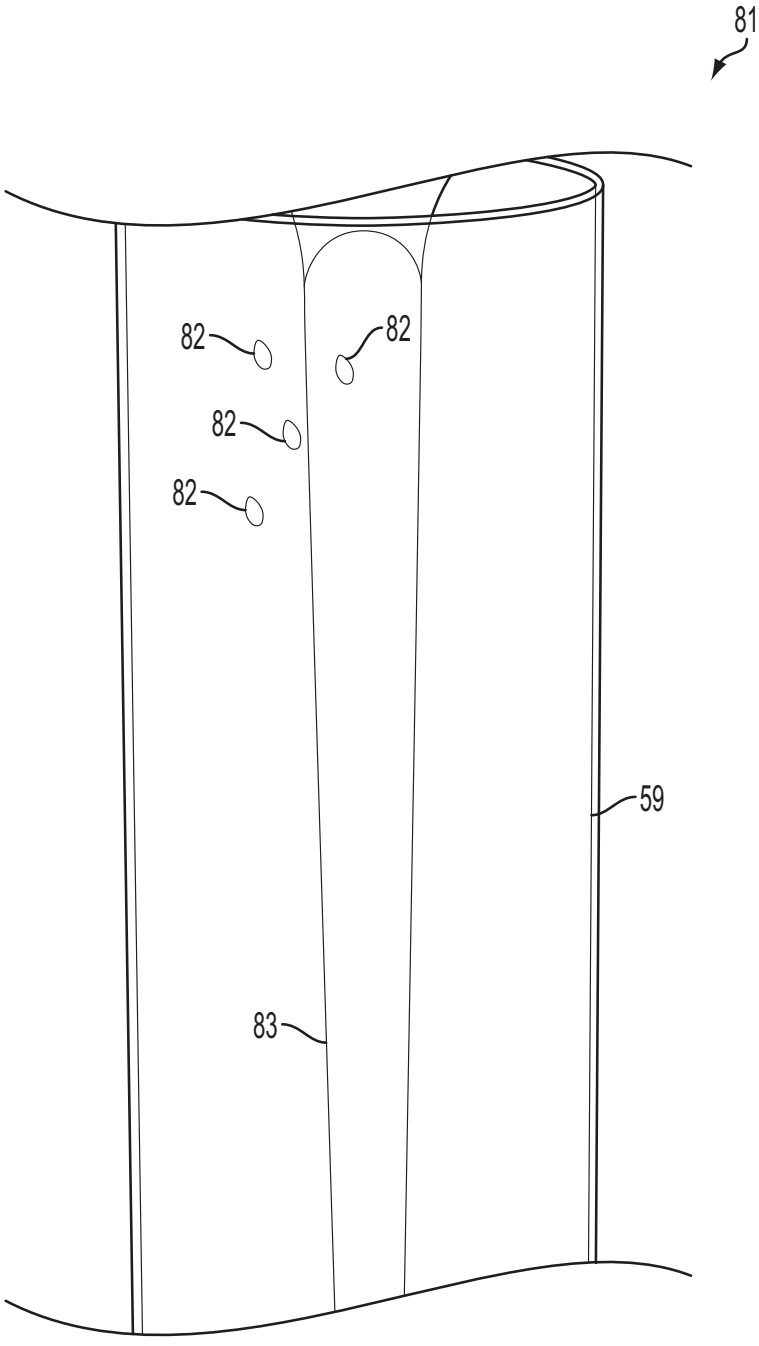


FIG. 7

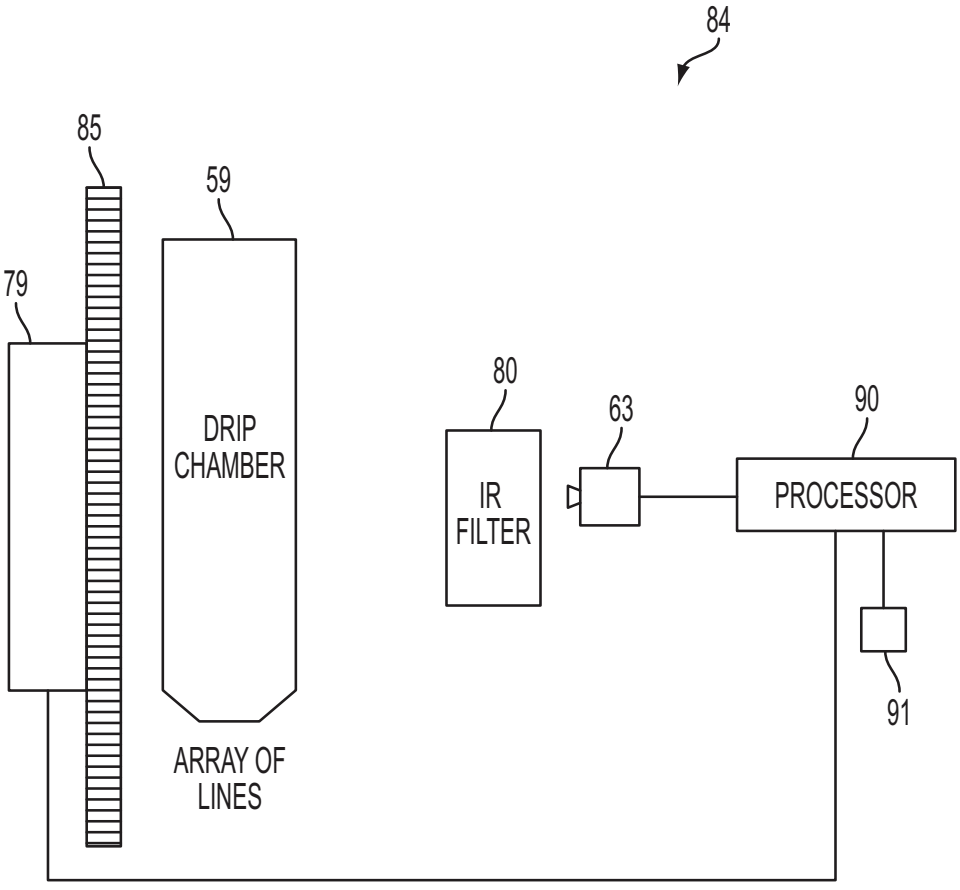

84
85
59
79
DRIP
CHAMBER
80
63
90
IR
FILTER
PROCESSOR
91
ARRAY OF
LINES

FIG. 8

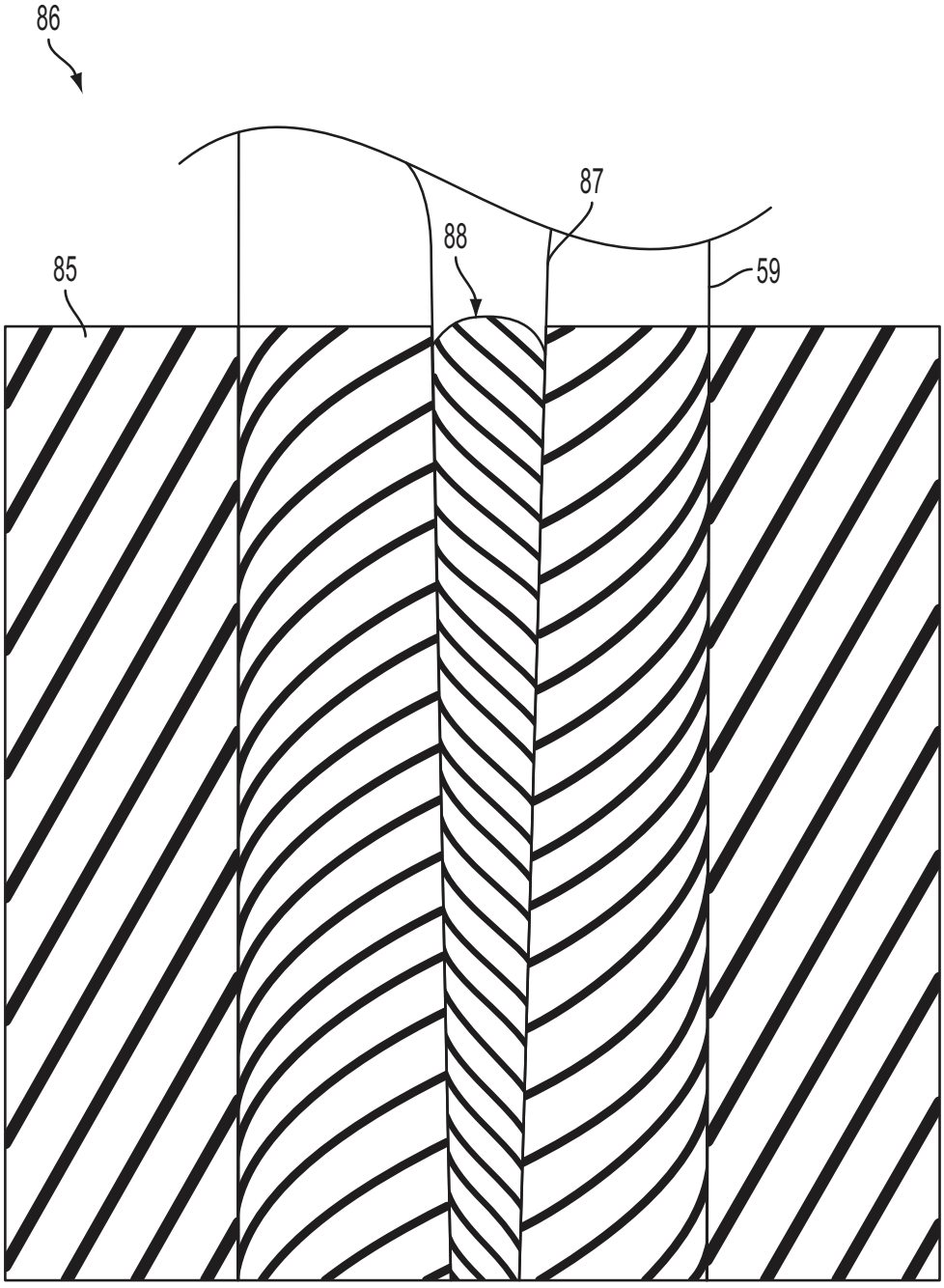


FIG. 9



TYPICAL BACKGROUND IMAGE

FIG. 10

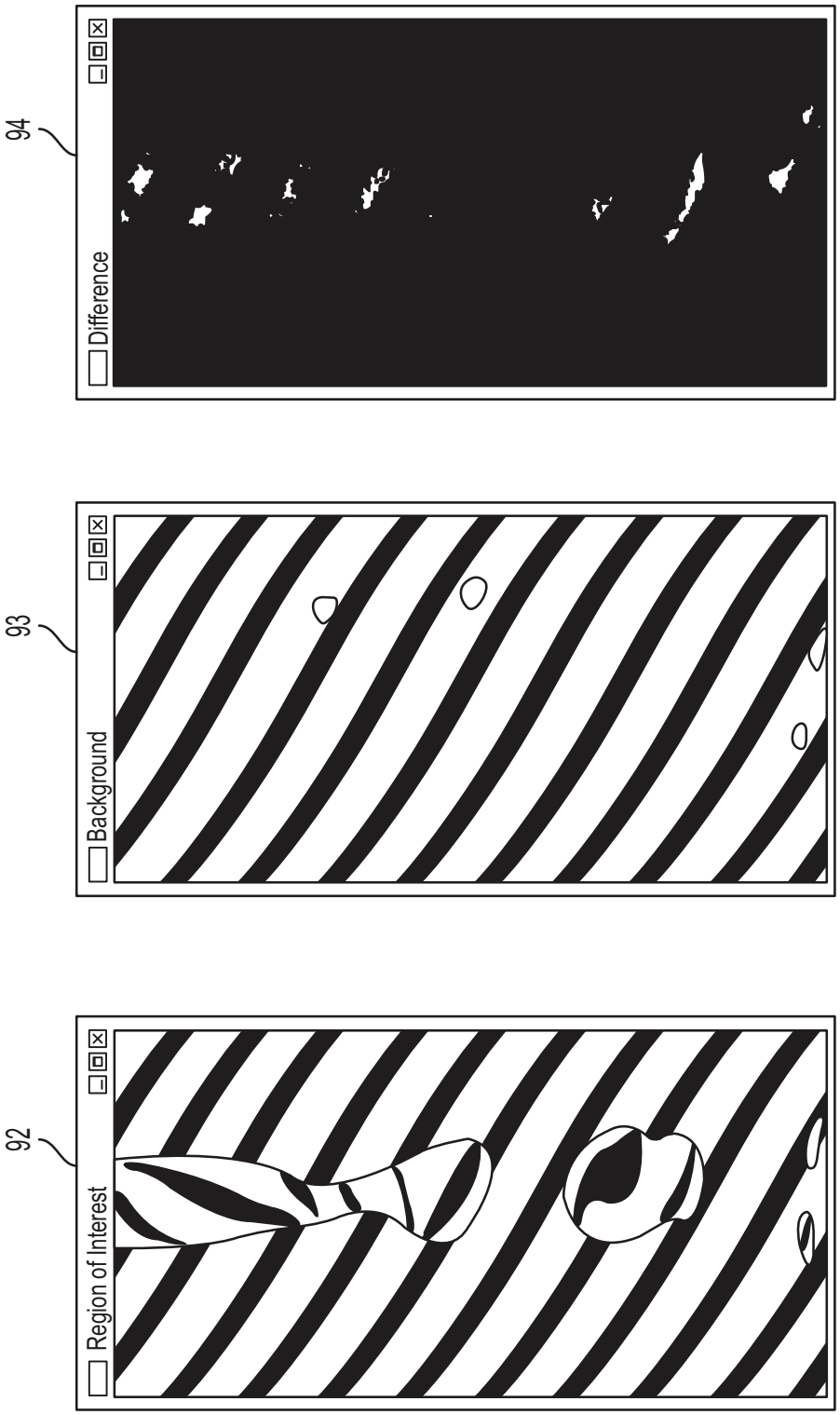


FIG. 11

FIG. 12

FIG. 13

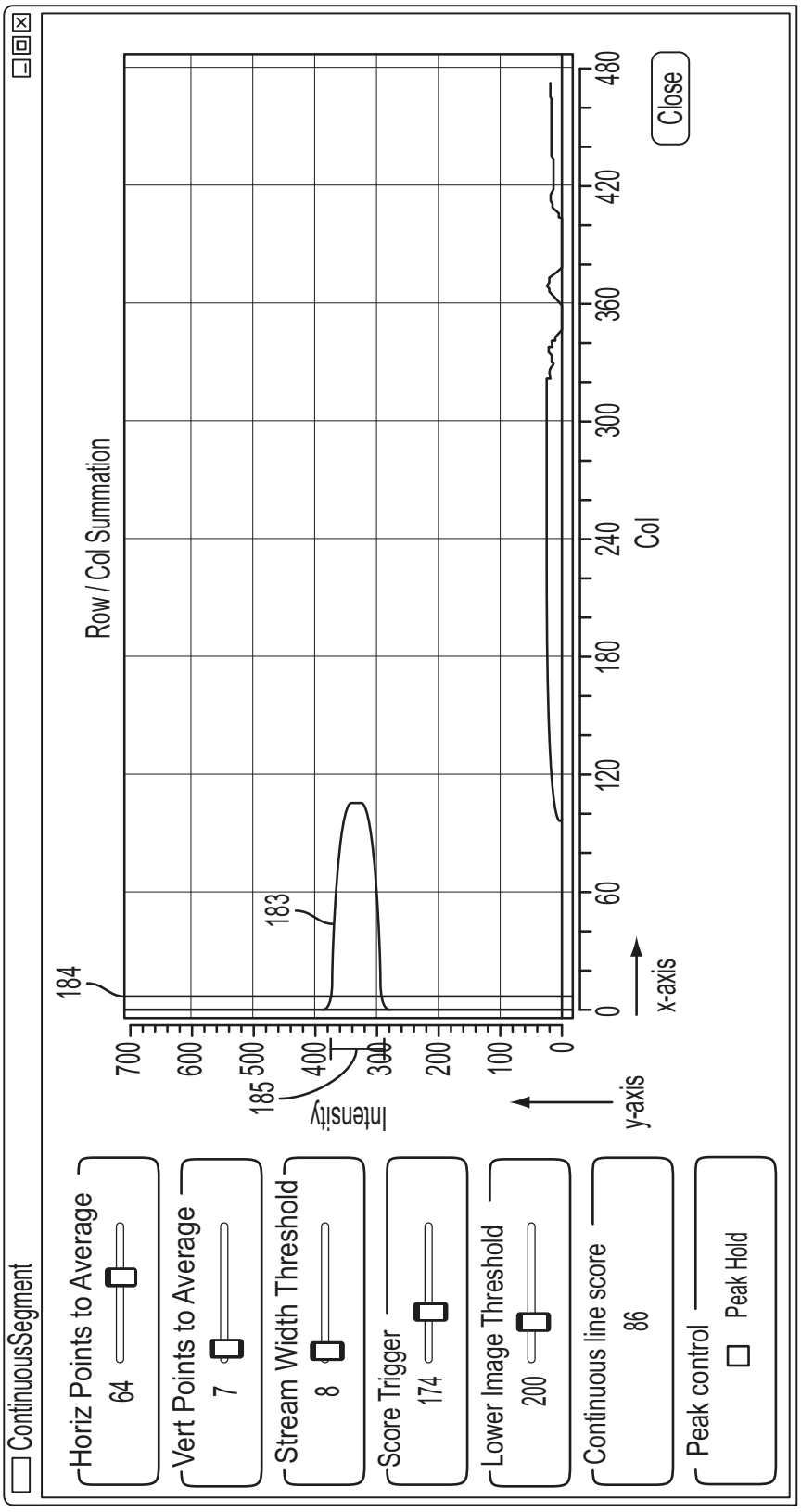

ContinuousSegment
Horiz Points to Average
64
Vert Points to Average
7
Stream Width Threshold
8
Score Trigger
174
Lower Image Threshold
200
Continuous line score
86
Peak control
Peak Hold
Row / Col Summation
184
183
185
Intensity
700
600
500
400
300
200
100
0
y-axis
0
60
120
180
240
300
360
420
480
Col
x-axis
Close

FIG. 14



FIG. 17



FIG. 16

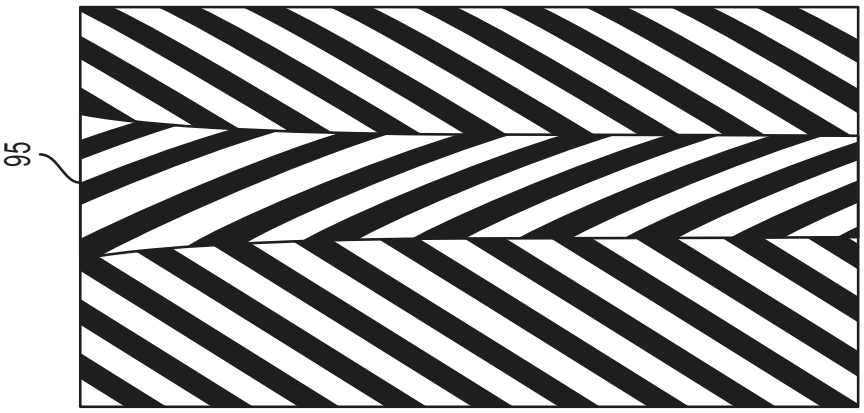


FIG. 15

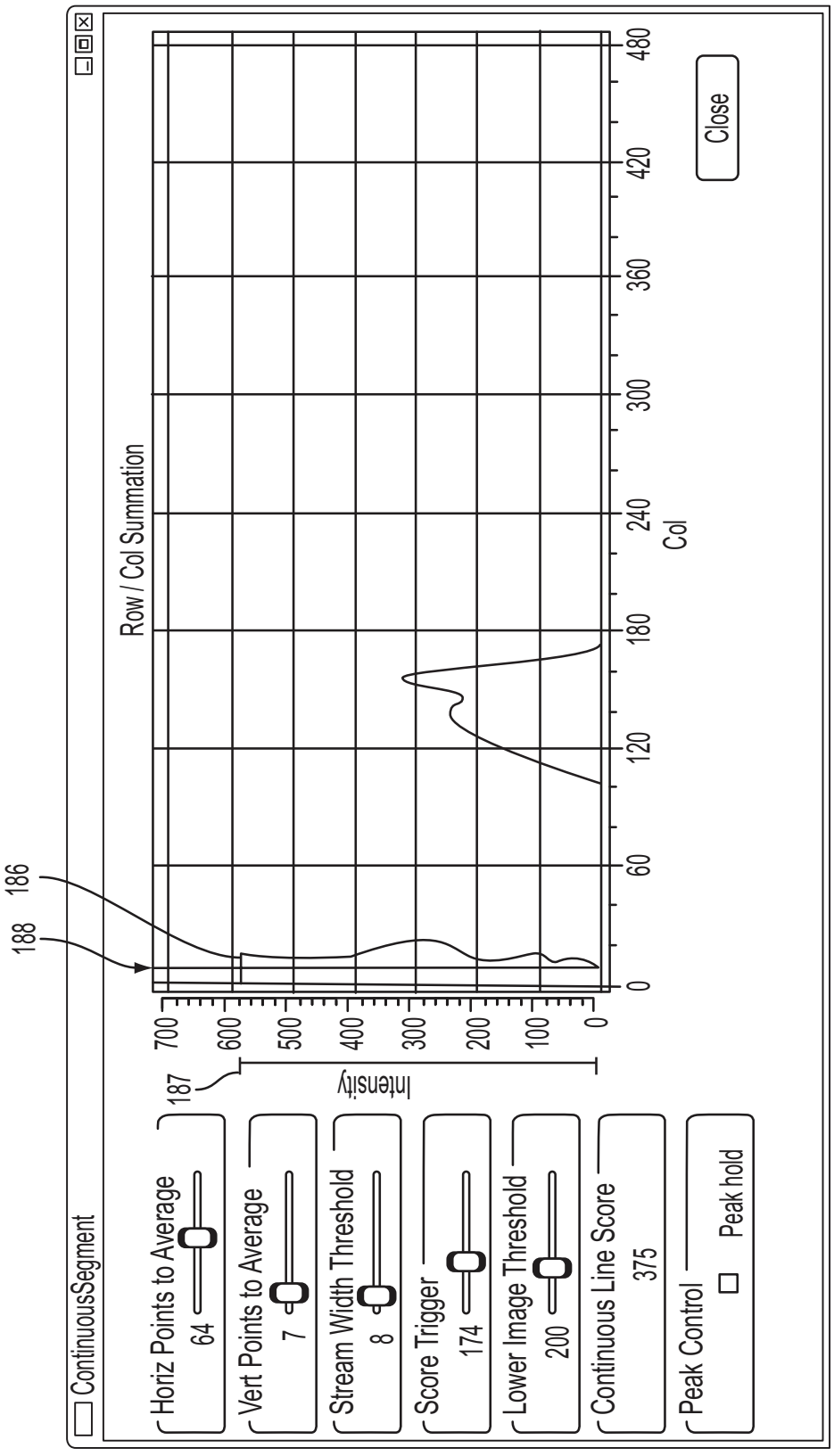

ContinuousSegment
Row / Col Summation
Intensity
Col
0
60
120
180
240
300
360
420
480
700
600
500
400
300
200
100
0
186
188
187
Horiz Points to Average
64
Vert Points to Average
7
Stream Width Threshold
8
Score Trigger
174
Lower Image Threshold
200
Continuous Line Score
375
Peak Control
Peak hold
Close

FIG. 18

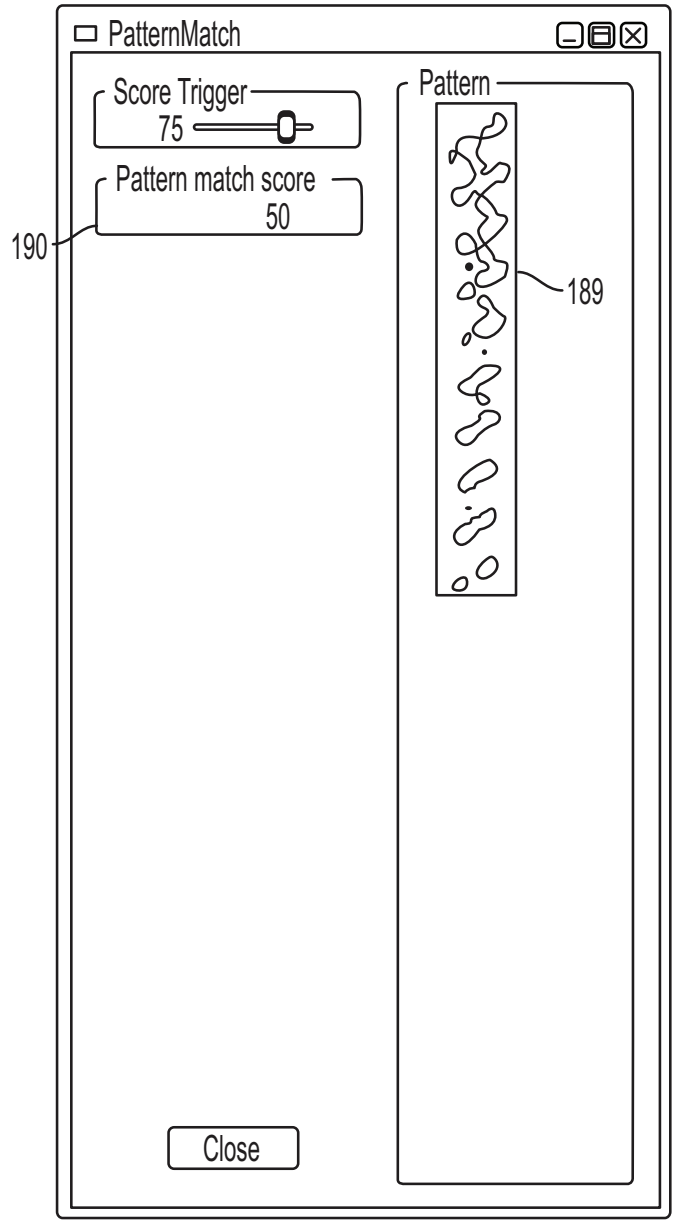

PatternMatch
Score Trigger
75
Pattern match score
50
190
Pattern
189
Close

FIG. 19

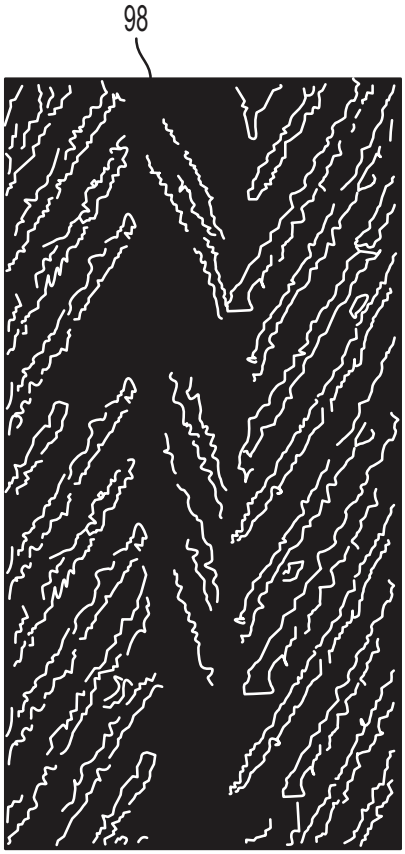


FIG. 20



FIG. 21

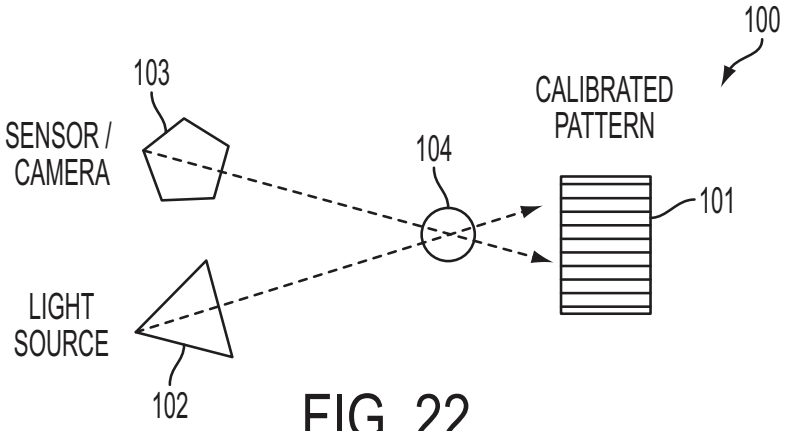


FIG. 22

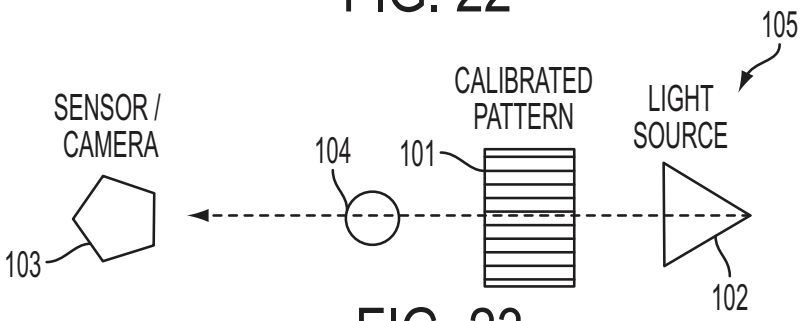


FIG. 23



FIG. 24

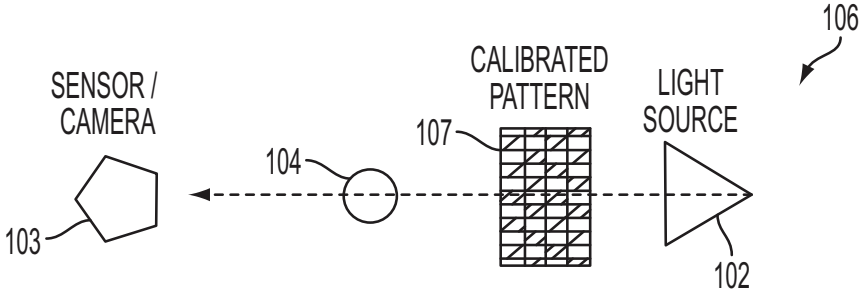


FIG. 25



FIG. 26

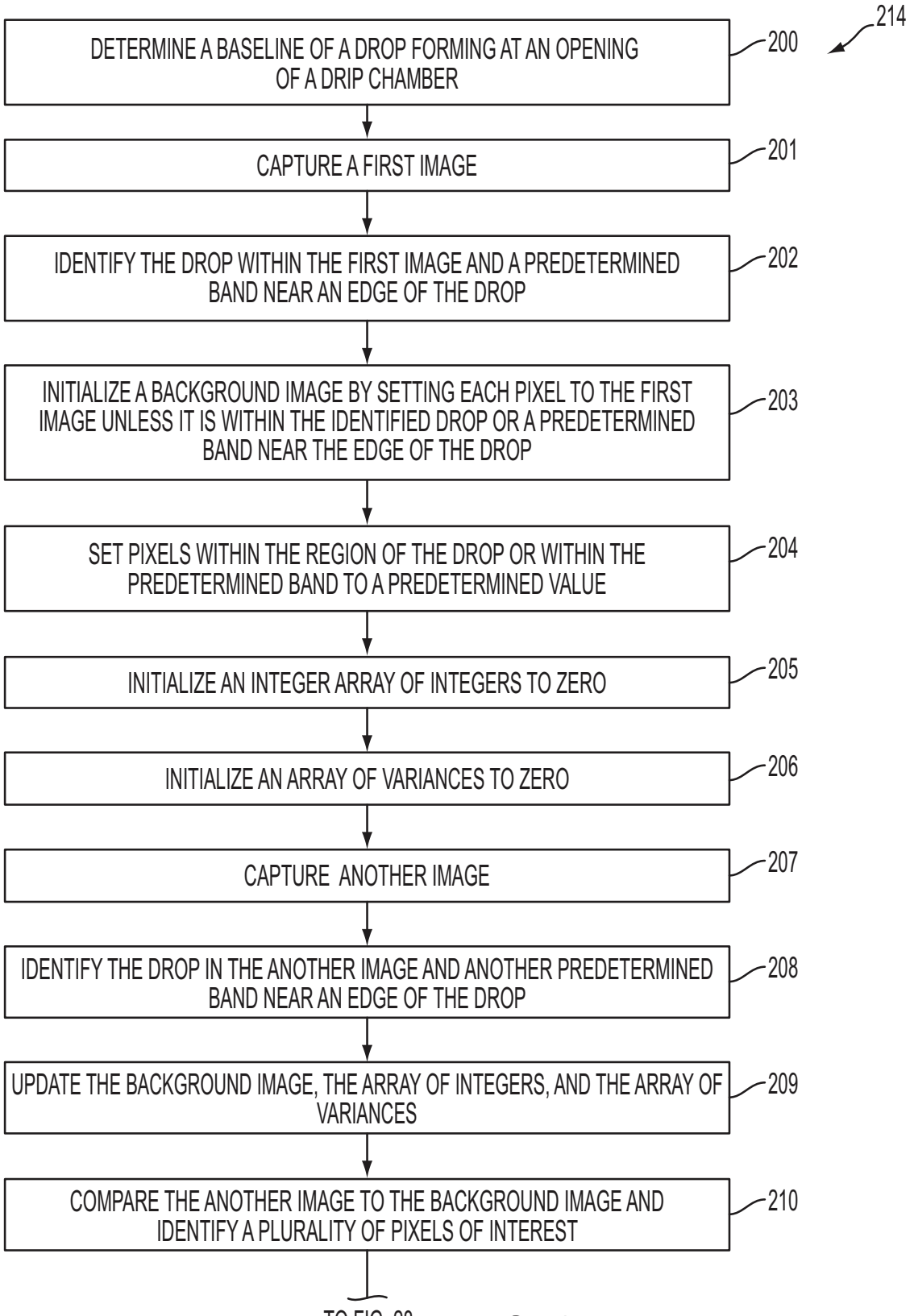

214
DETERMINE A BASELINE OF A DROP FORMING AT AN OPENING OF A DRIP CHAMBER
200
CAPTURE A FIRST IMAGE
201
IDENTIFY THE DROP WITHIN THE FIRST IMAGE AND A PREDETERMINED BAND NEAR AN EDGE OF THE DROP
202
INITIALIZE A BACKGROUND IMAGE BY SETTING EACH PIXEL TO THE FIRST IMAGE UNLESS IT IS WITHIN THE IDENTIFIED DROP OR A PREDETERMINED BAND NEAR THE EDGE OF THE DROP
203
SET PIXELS WITHIN THE REGION OF THE DROP OR WITHIN THE PREDETERMINED BAND TO A PREDETERMINED VALUE
204
INITIALIZE AN INTEGER ARRAY OF INTEGERS TO ZERO
205
INITIALIZE AN ARRAY OF VARIANCES TO ZERO
206
CAPTURE ANOTHER IMAGE
207
IDENTIFY THE DROP IN THE ANOTHER IMAGE AND ANOTHER PREDETERMINED BAND NEAR AN EDGE OF THE DROP
208
UPDATE THE BACKGROUND IMAGE, THE ARRAY OF INTEGERS, AND THE ARRAY OF VARIANCES
209
COMPARE THE ANOTHER IMAGE TO THE BACKGROUND IMAGE AND IDENTIFY A PLURALITY OF PIXELS OF INTEREST
210
TO FIG. 28

FIG. 27

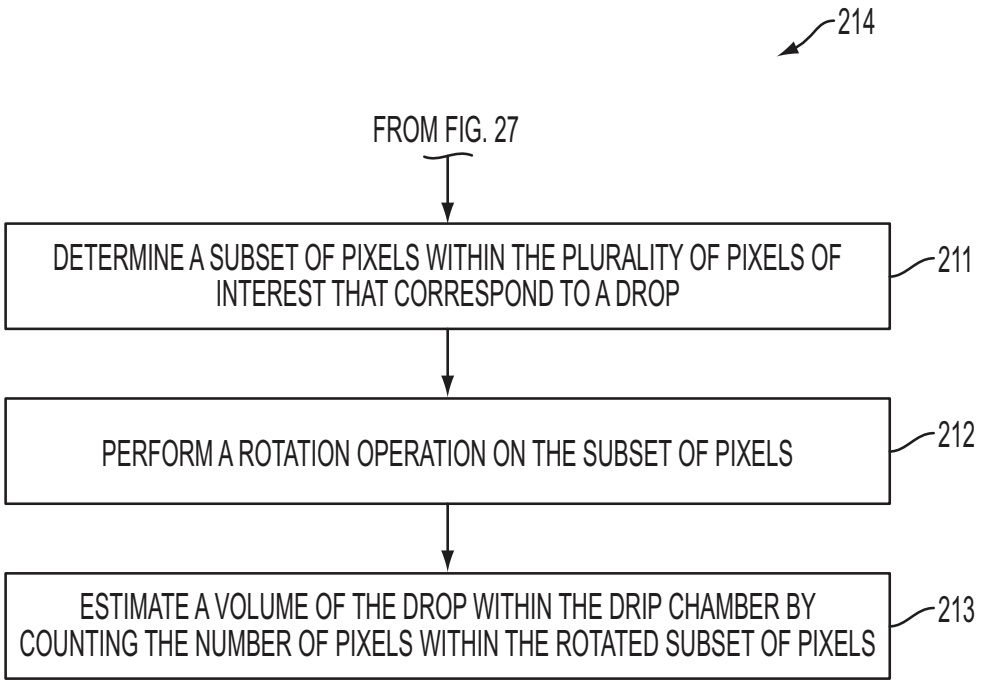

214
FROM FIG. 27
DETERMINE A SUBSET OF PIXELS WITHIN THE PLURALITY OF PIXELS OF INTEREST THAT CORRESPOND TO A DROP
211
PERFORM A ROTATION OPERATION ON THE SUBSET OF PIXELS
212
ESTIMATE A VOLUME OF THE DROP WITHIN THE DRIP CHAMBER BY COUNTING THE NUMBER OF PIXELS WITHIN THE ROTATED SUBSET OF PIXELS
213

FIG. 28

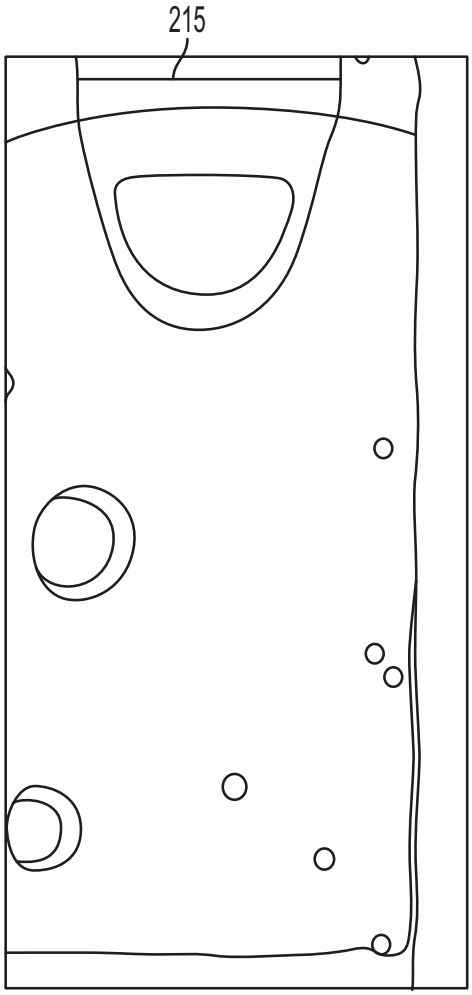


FIG. 29

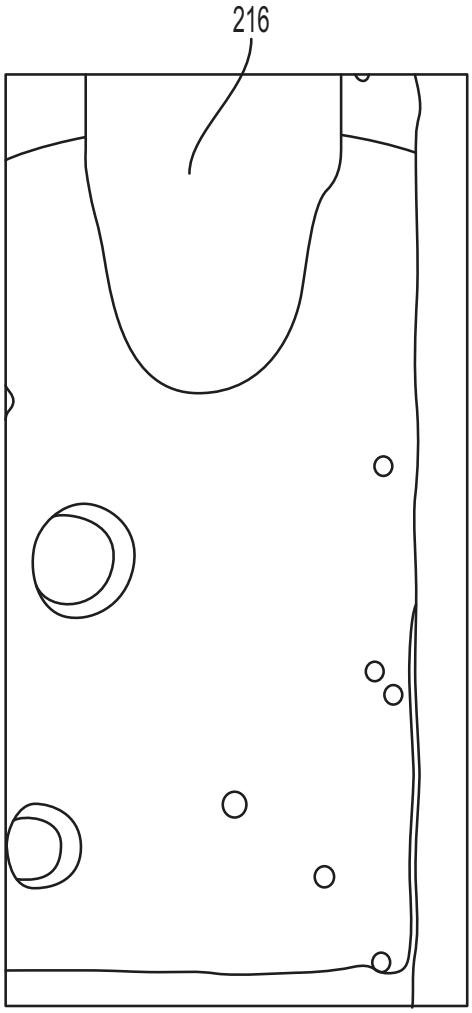


FIG. 30

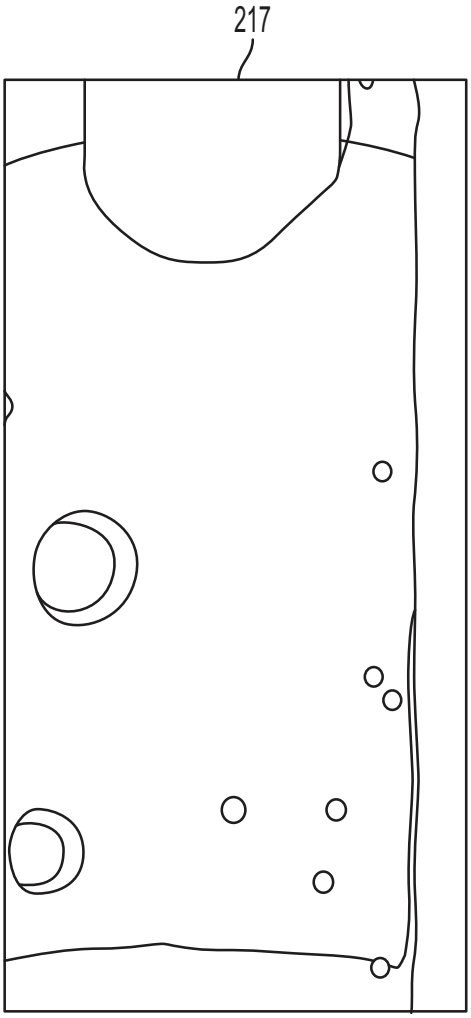


FIG. 31

1. IF THE INPUT PIXEL IS TO THE LEFT OR RIGHT OF THE BASELINE (GREEN LINE) IN THE IMAGE, THEN ITS OUTPUT VALUE IS SET TO ZERO.

2. IF THE INPUT PIXEL'S BACKGROUND COUNT ARRAY INDICATES THAT FEWER THAN A PRE-DETERMINED NUMBER OF IMAGES (E.G., 100) HAVE BEEN USED TO MAKE THIS PIXEL'S BACKGROUND VALUE, THEN

    a. IF THE INPUT PIXEL'S INTENSITY IS LESS THAN THE THRESHOLD INTENSITY (E.G., 140 IN AN RANGE OF 0 - 255), THEN SET THE PIXEL'S OUTPUT VALUE TO NOT - ZERO (255).

    b. IF THE INPUT PIXEL'S INTENSITY IS GREATER THAN OR EQUAL TO THE THRESHOLD INTENSITY, THEN SET THE PIXEL'S OUTPUT VALUE TO ZERO.

3. IF THE INPUT PIXEL'S BACKGROUND COUNT ARRAY IS GREATER THAN THE PRE-DETERMINED NUMBER OF IMAGES , THEN:

    a. IF THE SQUARE OF THE DIFFERENCE BETWEEN THE INPUT PIXEL INTENSITY AND THE BACKGROUND PIXEL INTENSITY IS GREATER THAN THE PIXEL'S ESTIMATE OF BACKGROUND VARIANCE TIMES A

    CONSTANT γ^2 , THEN SET THE PIXEL'S OUTPUT VALUE TO NOT-ZERO (255). *(THIS EFFECTIVELY SAYS IF THE CURRENT PIXEL VALUE IS MORE THAN γ , THEN THE PIXEL IS DISTINCT.)*

    b. IF THE SQUARE OF THE DIFFERENCE BETWEEN THE INPUT PIXEL INTENSITY AND THE BACKGROUND PIXEL INTENSITY IS LESS THAN OR EQUAL TO THE PIXEL'S ESTIMATE OF BACKGROUND VARIANCE TIMES

    A CONSTANT γ^2, THEN SET THE PIXEL'S OUTPUT VALUE TO ZERO.

FIG. 32

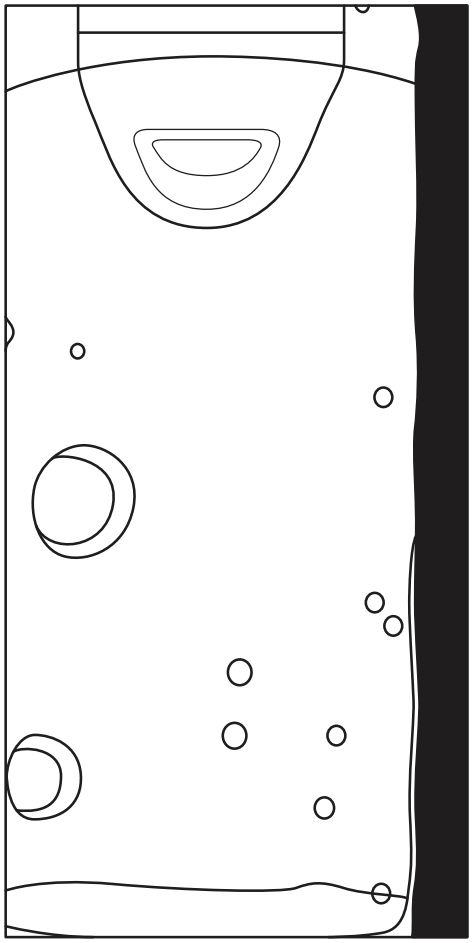


FIG. 33

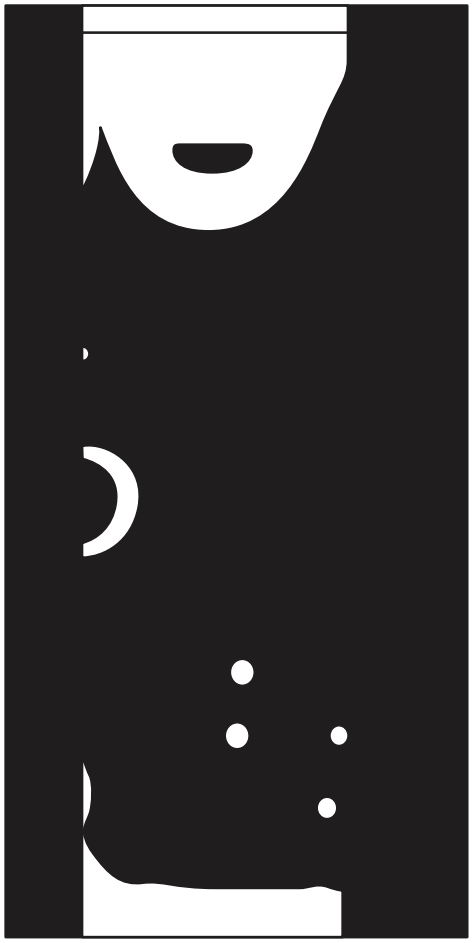


FIG. 34

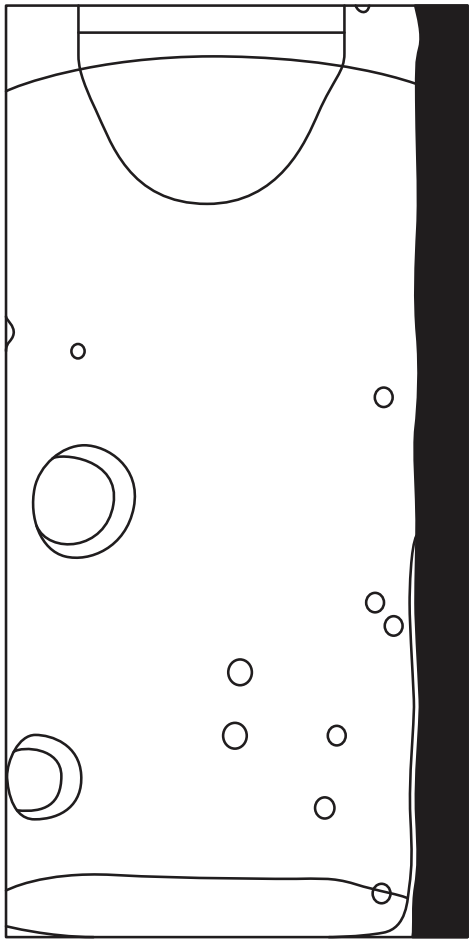


FIG. 35



FIG. 36

1. PUSH THE LOCATION OF THE FIRST PIXEL ONTO A STACK

2. WHILE THE STACK IS NOT EMPTY:

    a. POP THE NEXT LOCATION (i,j) OFF OF THE STACK

    b. MAKE THE OUTPUT PIXEL VALUE AT (i,j) WHITE

    c. EXAMINE THE EIGHT PIXELS ADJACENT TO (i,j) :

        i. IF THE ADJACENT INPUT PIXEL (ι,φ) IS WHITE, BUT THE OUTPUT PIXEL (ι,φ) IS BLACK ADD THE LOCATION (ι,φ) TO THE STACK

    d. RETURN TO 2

FIG. 37

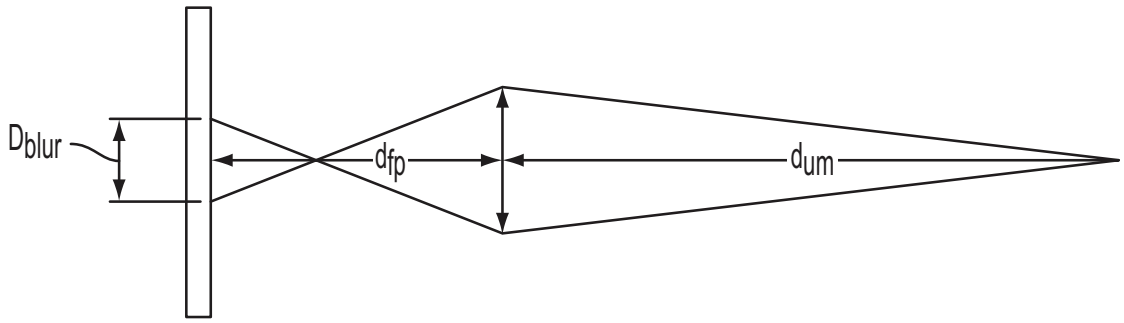


FIG. 38

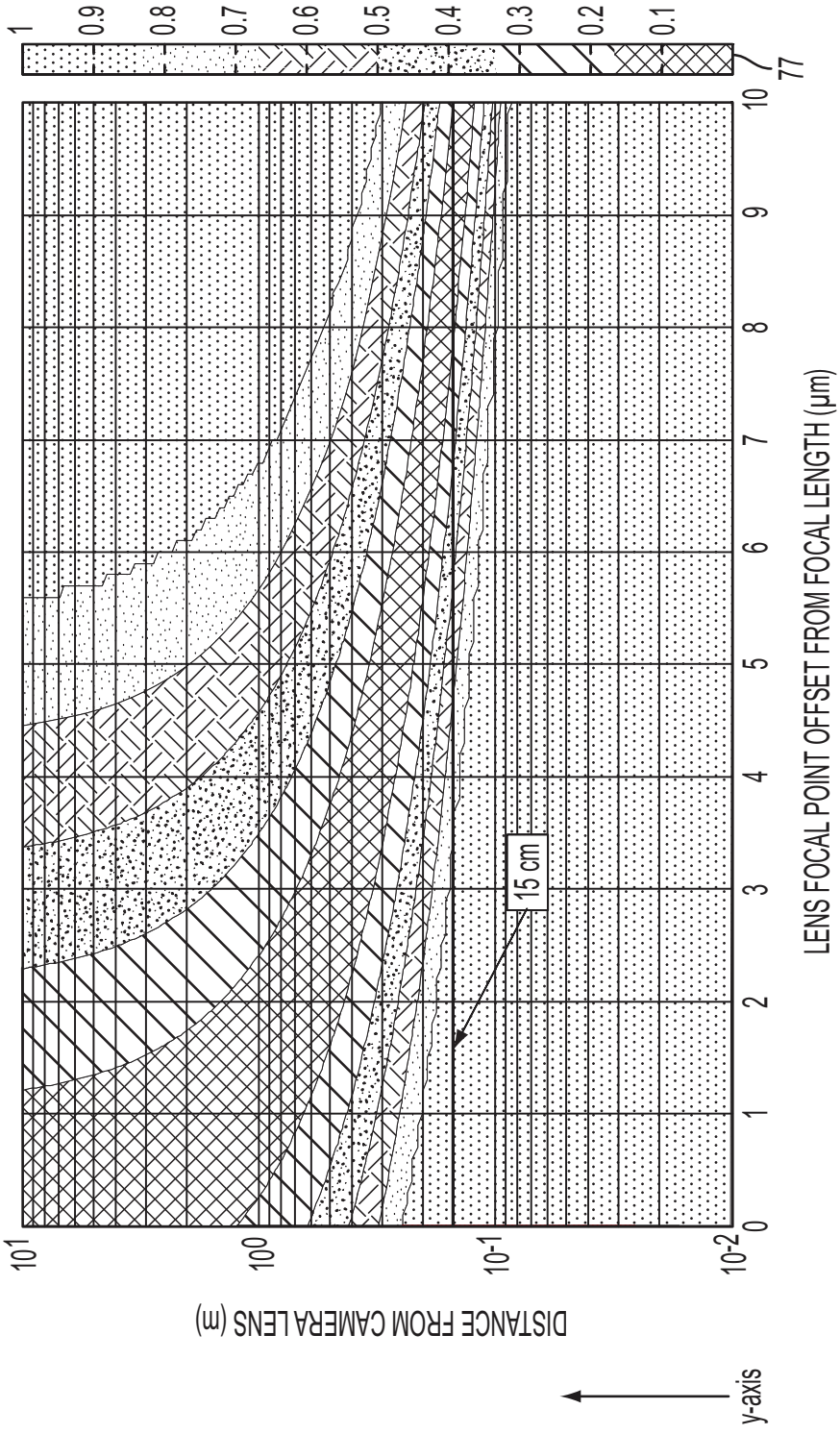

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
77
10
9
8
7
6
5
4
3
2
1
0
10^{1}
10^{0}
10^{-1}
10^{-2}
15 cm
LENS FOCAL POINT OFFSET FROM FOCAL LENGTH (μm)
DISTANCE FROM CAMERA LENS (m)
x-axis
y-axis

FIG. 39

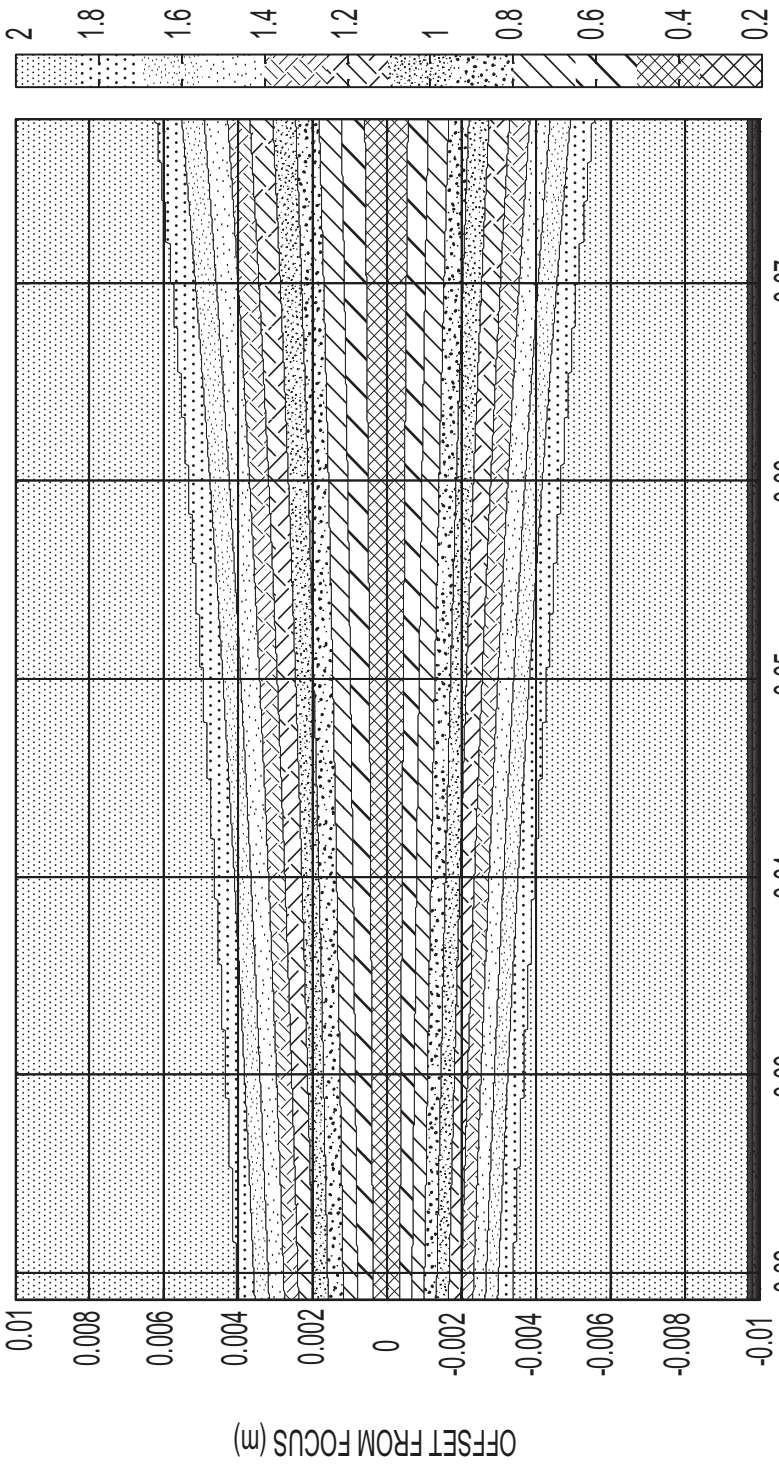

2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0.01
0.008
0.006
0.004
0.002
0
-0.002
-0.004
-0.006
-0.008
-0.01
0.02
0.03
0.04
0.05
0.06
0.07
OFFSET FROM FOCUS (m)
CAMERA TO FOCUS DISTANCE (m)
BLUR CIRCLE DIVIDED BY PIXEL SIZE FOR A 20mm FOCAL LENGTH LENS

FIG. 40

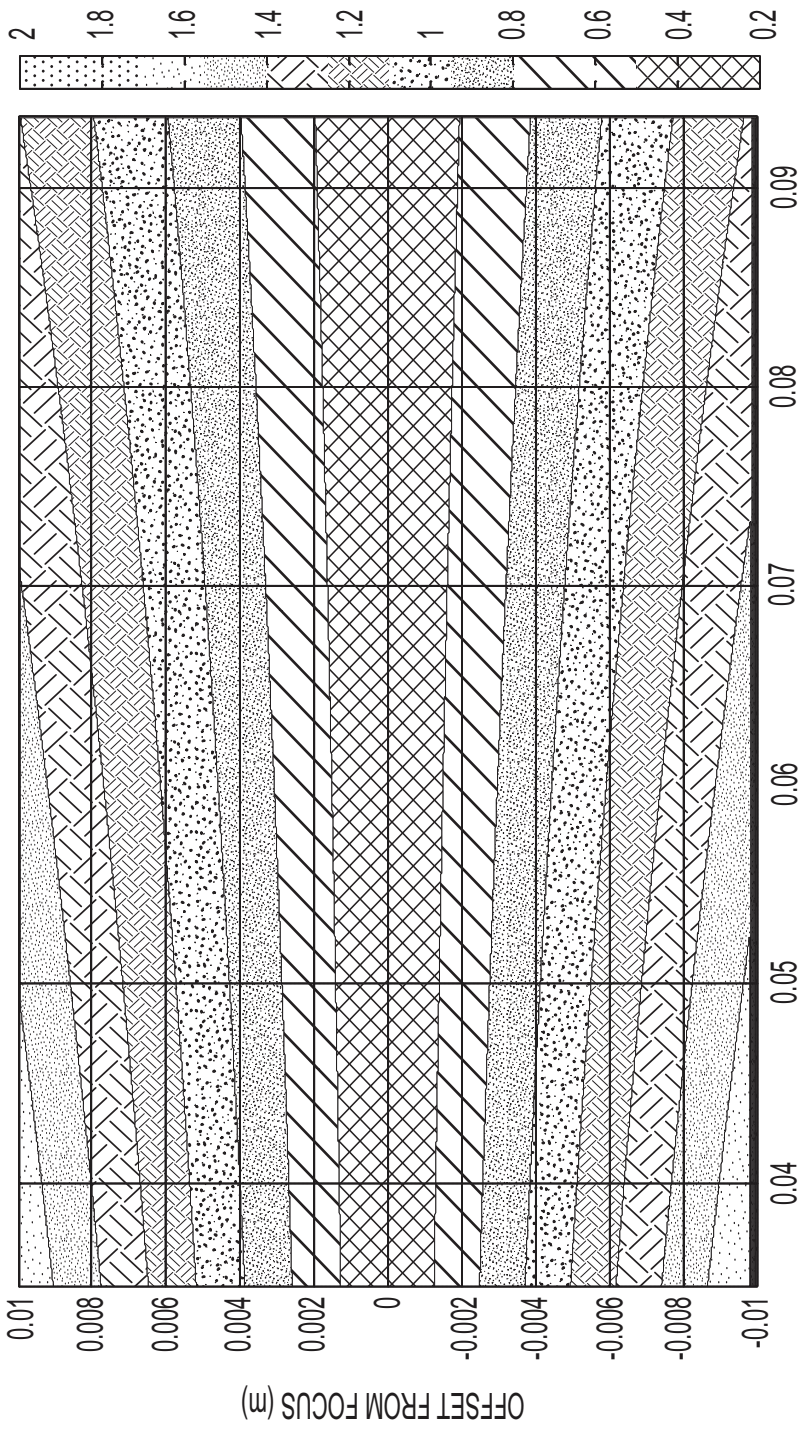

2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0.01
0.008
0.006
0.004
0.002
0
-0.002
-0.004
-0.006
-0.008
-0.01
0.04
0.05
0.06
0.07
0.08
0.09
OFFSET FROM FOCUS (m)
CAMERA TO FOCUS DISTANCE (m)
BLUR CIRCLE DIVIDED BY PIXEL SIZE FOR A 40mm FOCAL LENGTH LENS

FIG. 41

LENS FOCAL LENGTH	LENS SEPARATION FROM THE CAMERA	FOCUS SEPARATION FROM THE CAMERA	FIELD OF VIEW	DEPTH OF FIELD (D_{BLUR}/D_{PIXEL})=1	DEPTH OF FIELD (D_{BLUR}/D_{PIXEL})=2
20mm	0mm	18.6mm	±9.7mm	±2mm	±4mm
20mm	60mm	78.2mm	±12.3mm	±3mm	±6mm
40mm	0mm	34.8mm	±18.2mm	±5mm	≥10mm
40mm	60mm	93.5mm	±22.6mm	±10mm	≥10mm
60mm	0mm	48.9mm	±25.6mm	≥10mm	≥10mm
60mm	60mm	106.4mm	±31.4mm	≥10mm	≥10mm

FIG. 42

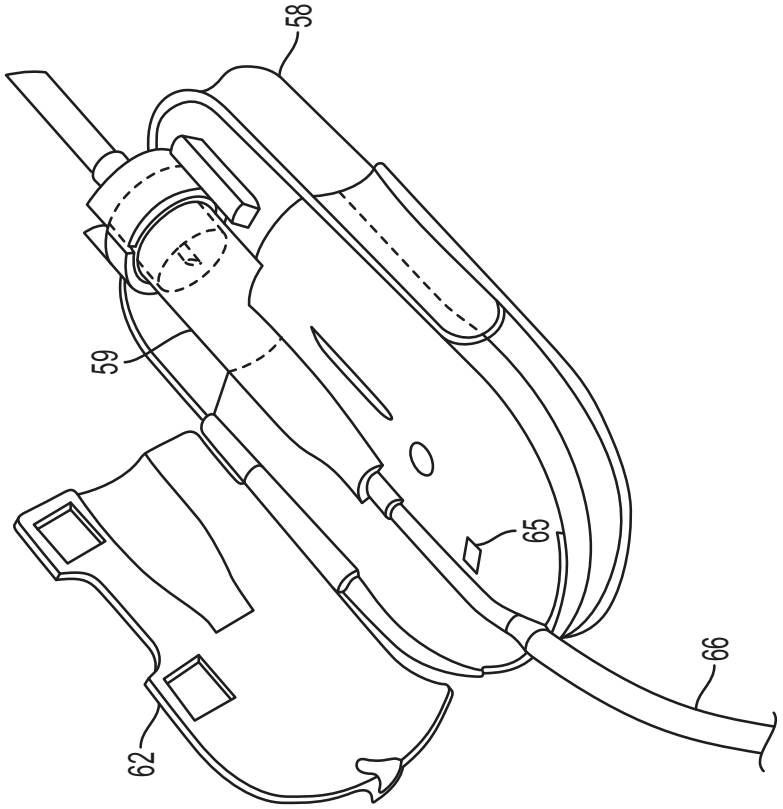


FIG. 44

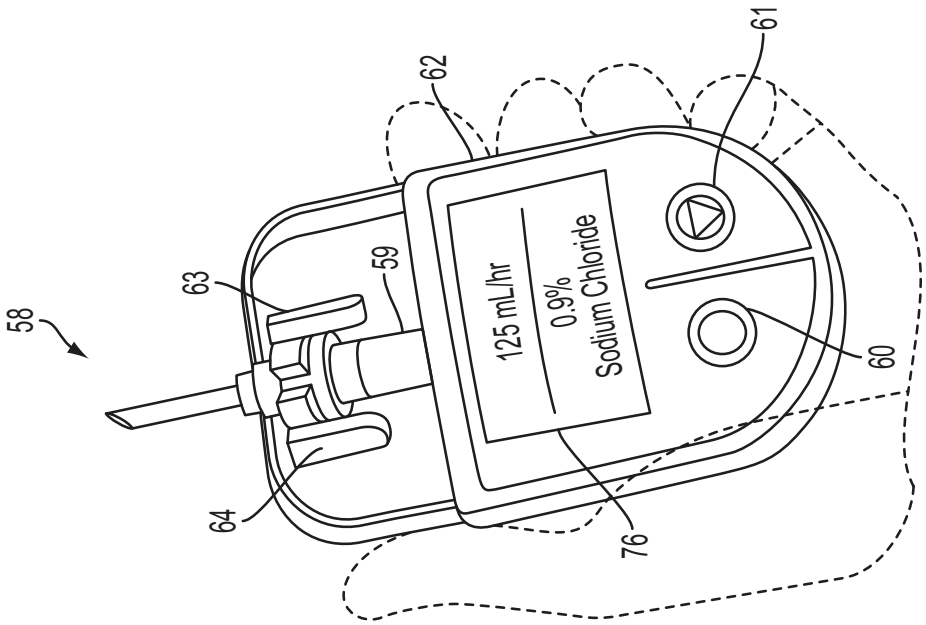


FIG. 43

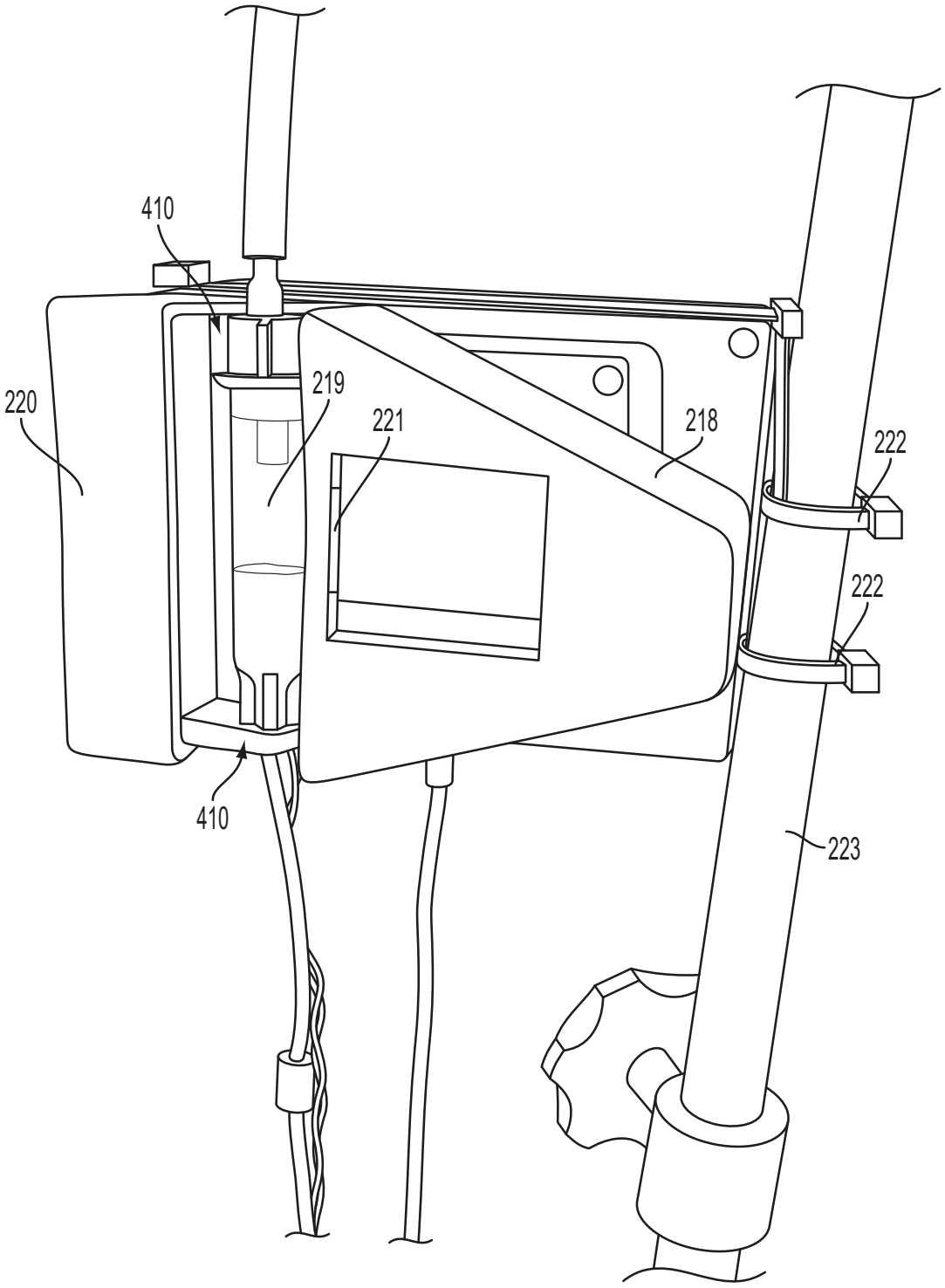


FIG. 45

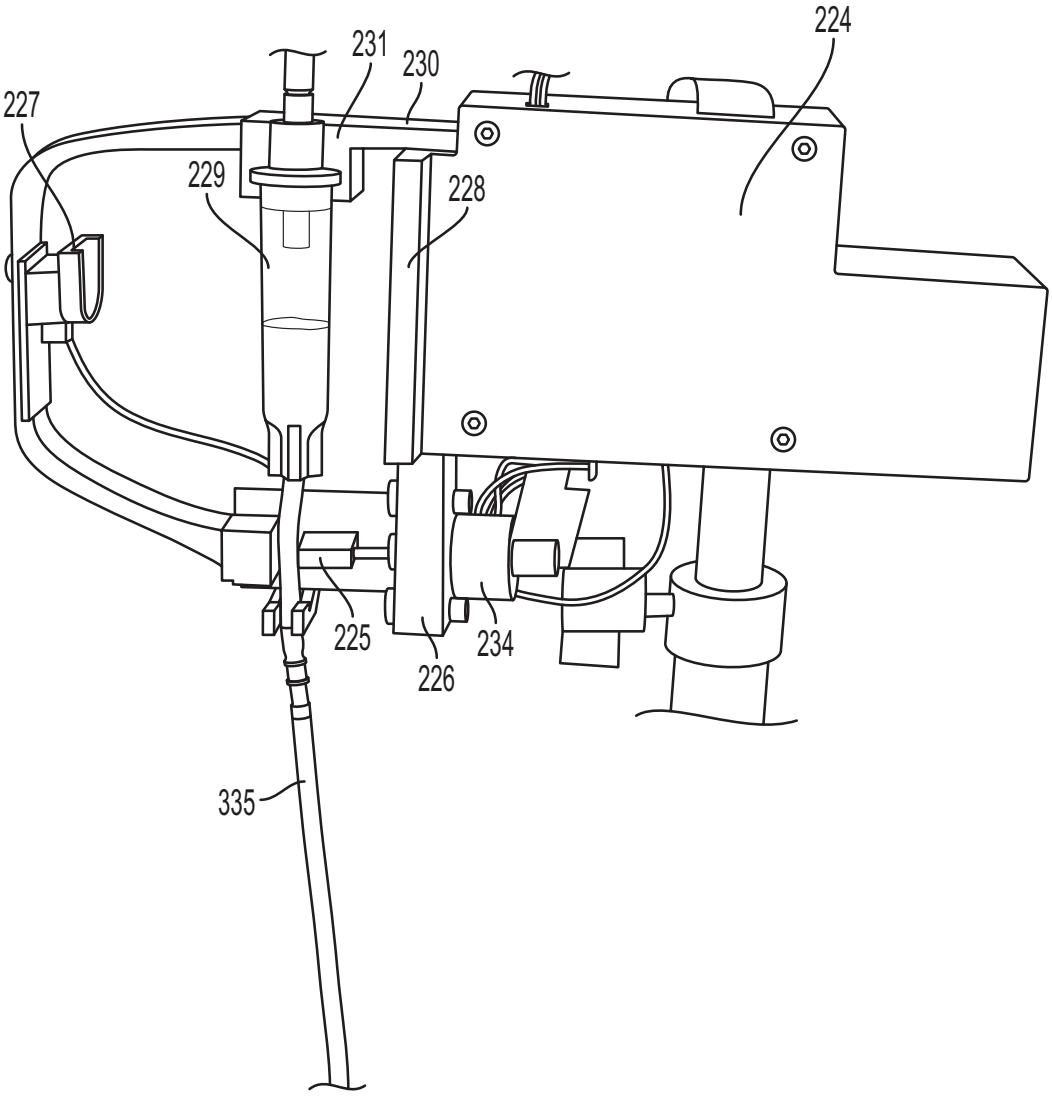


FIG. 46

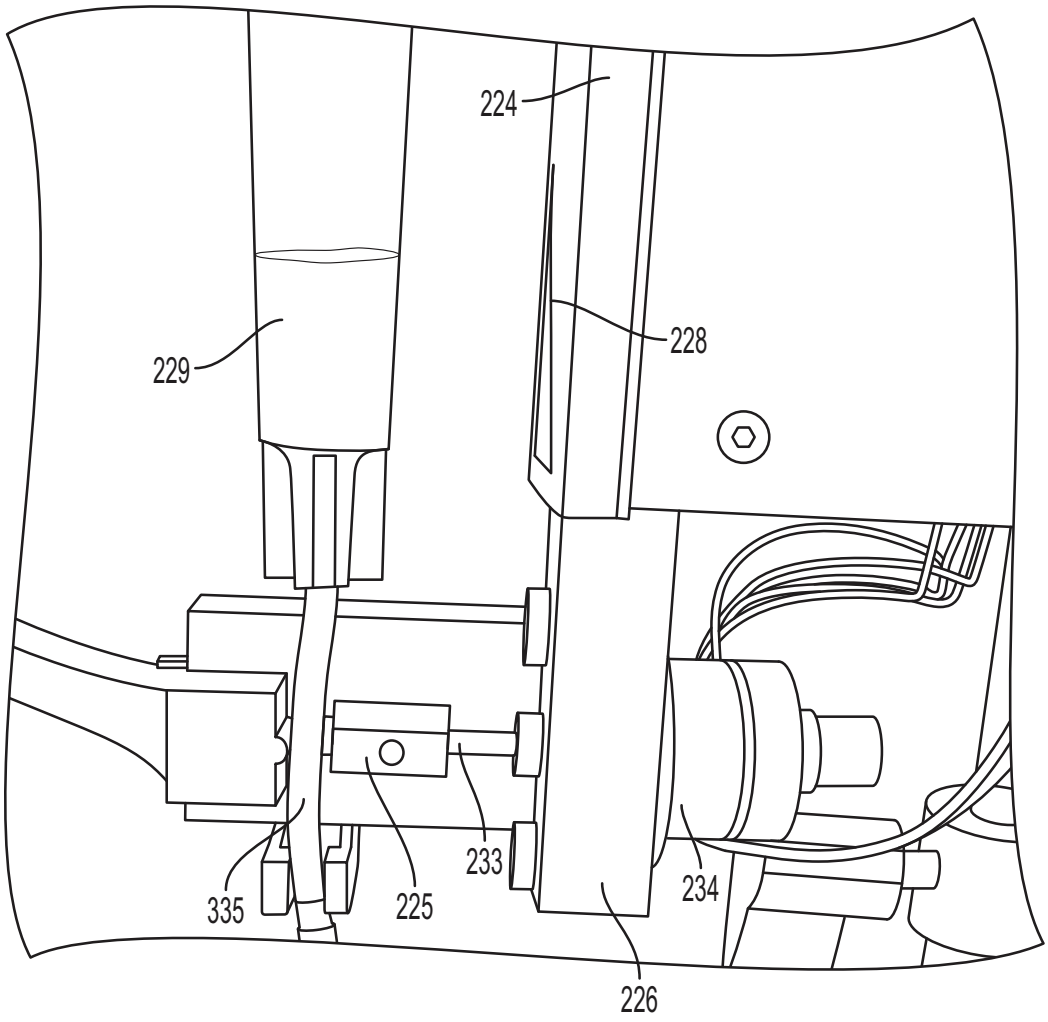


FIG. 47

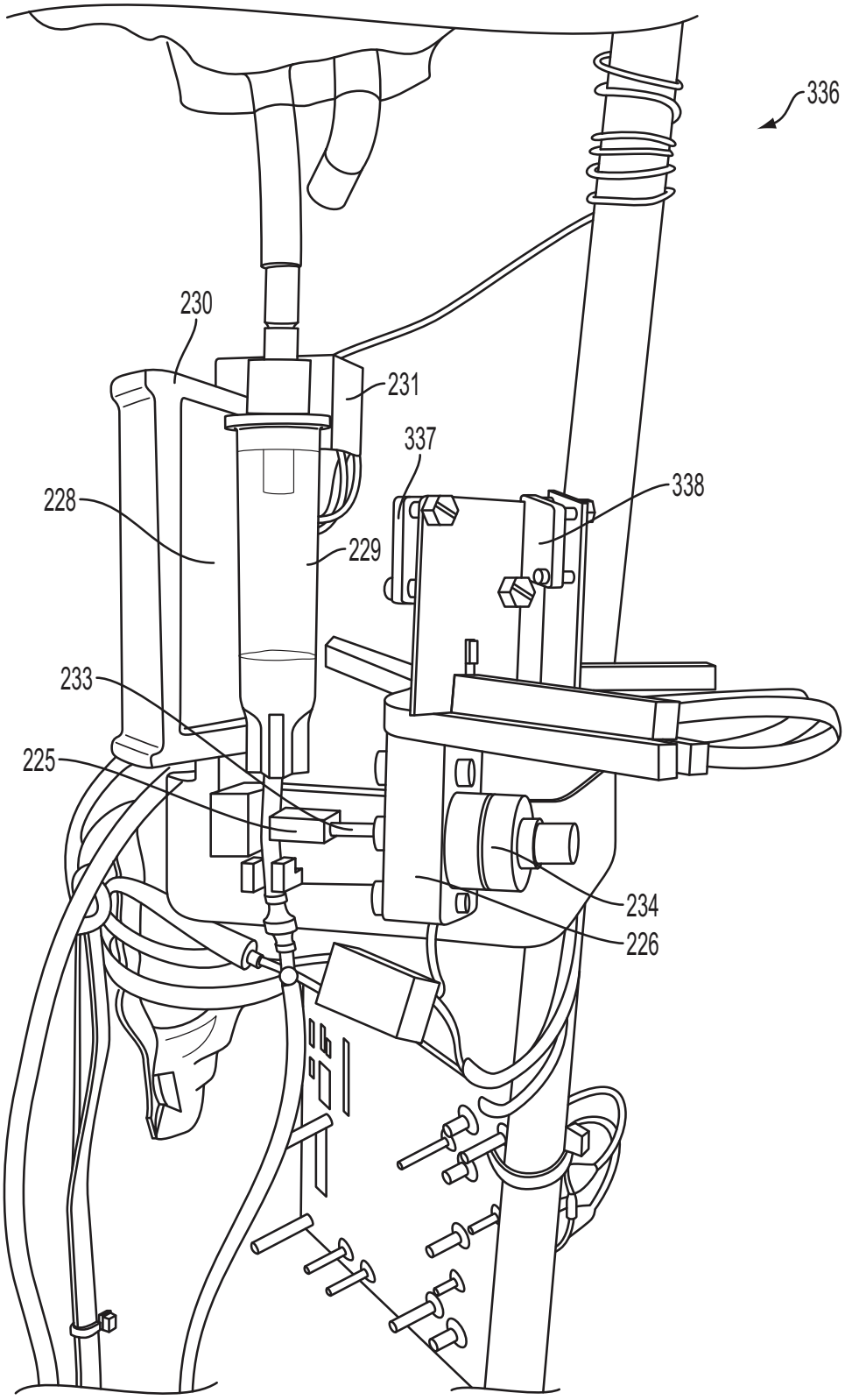


FIG. 48

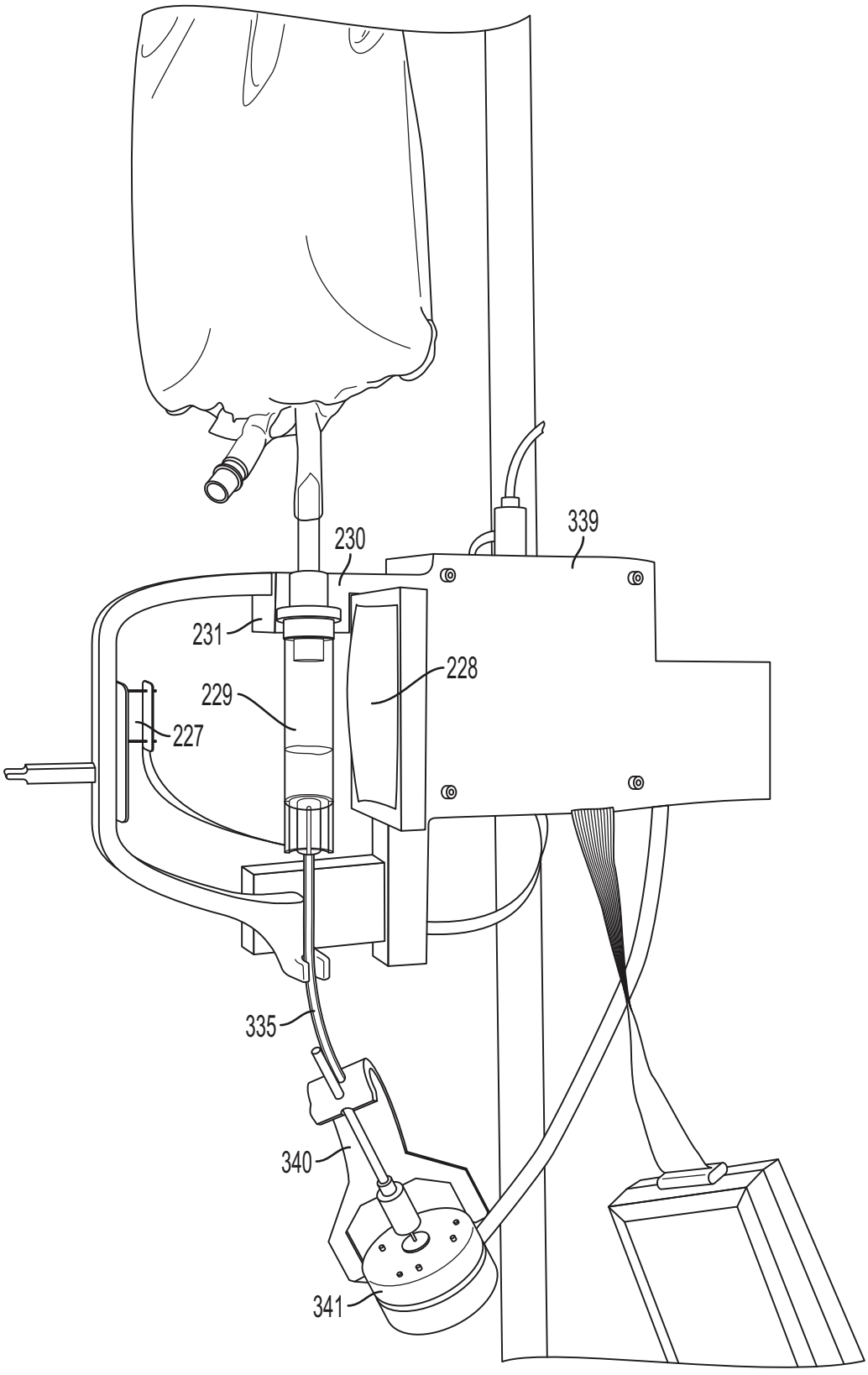


FIG. 49

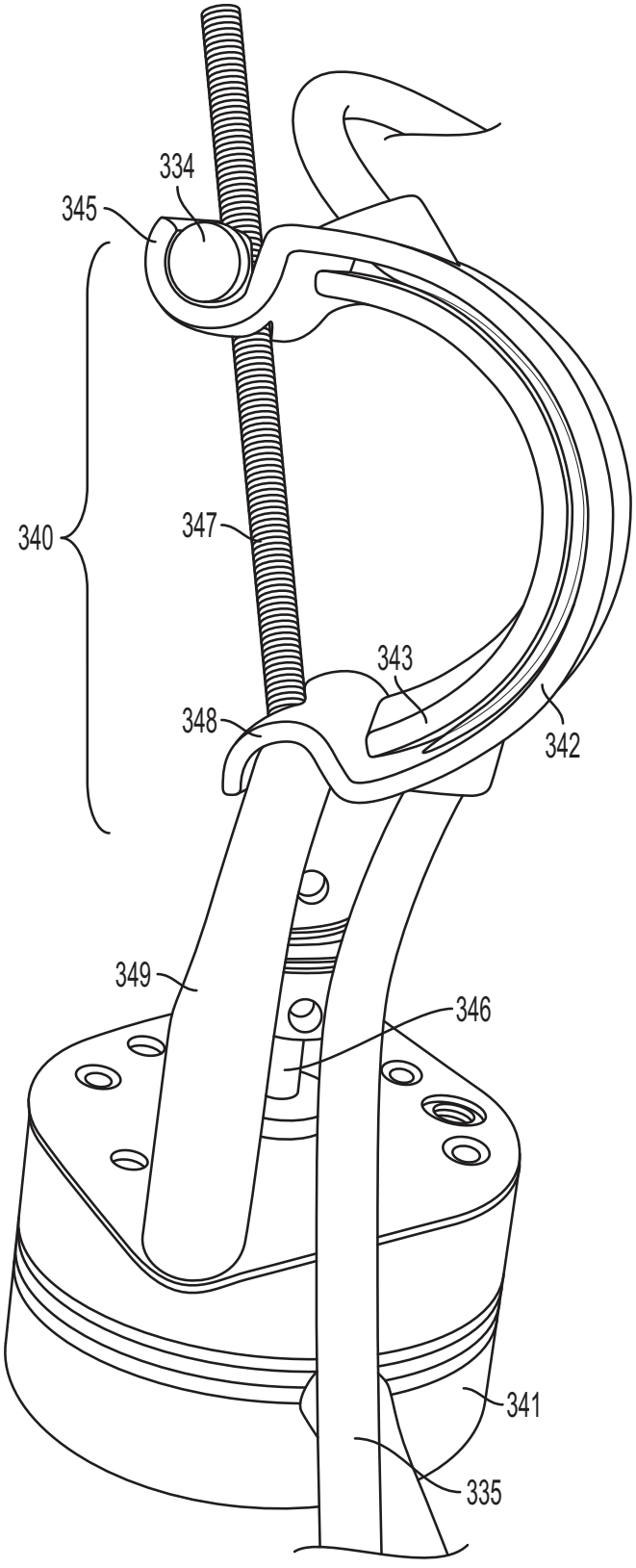


FIG. 50A

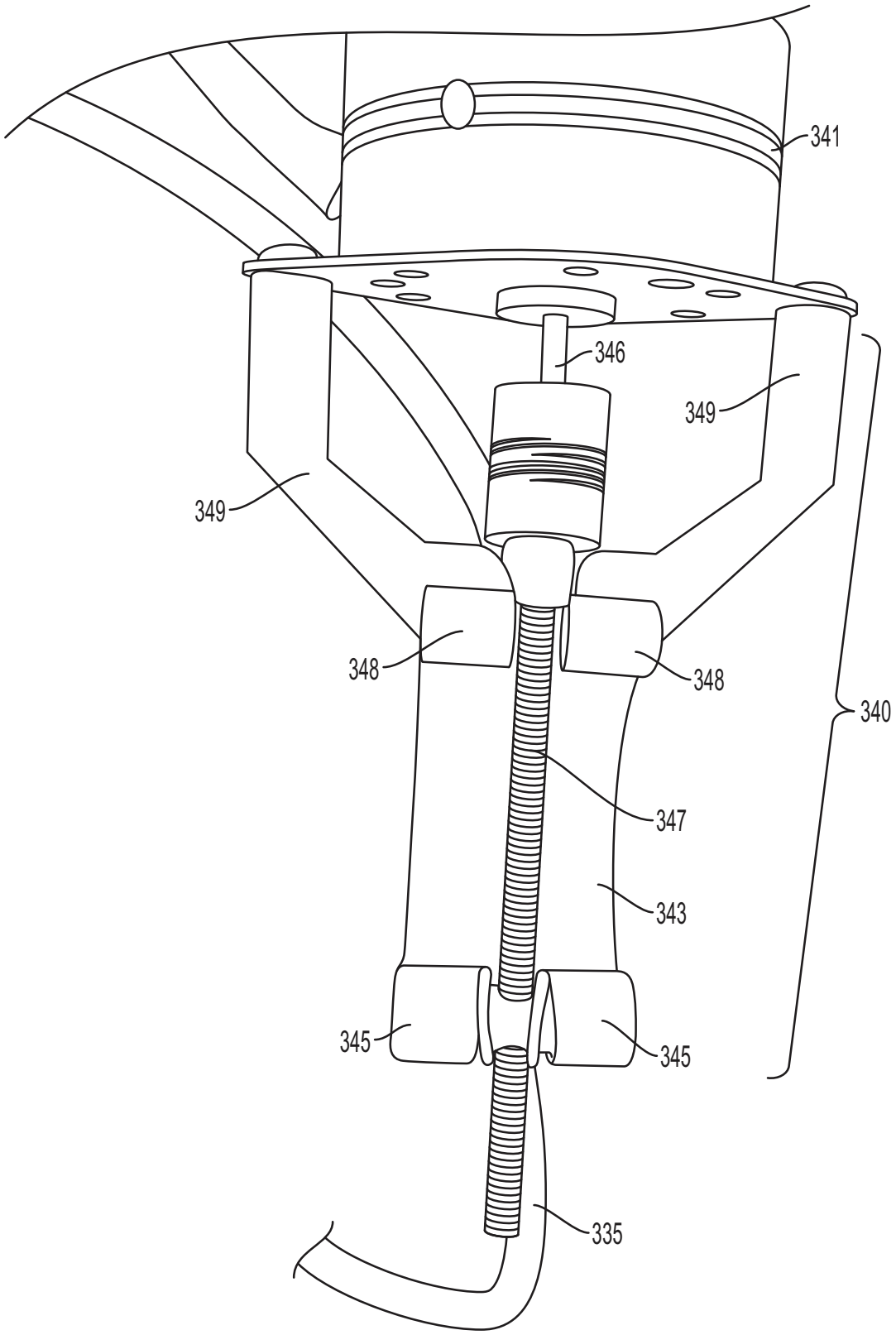


FIG. 50B

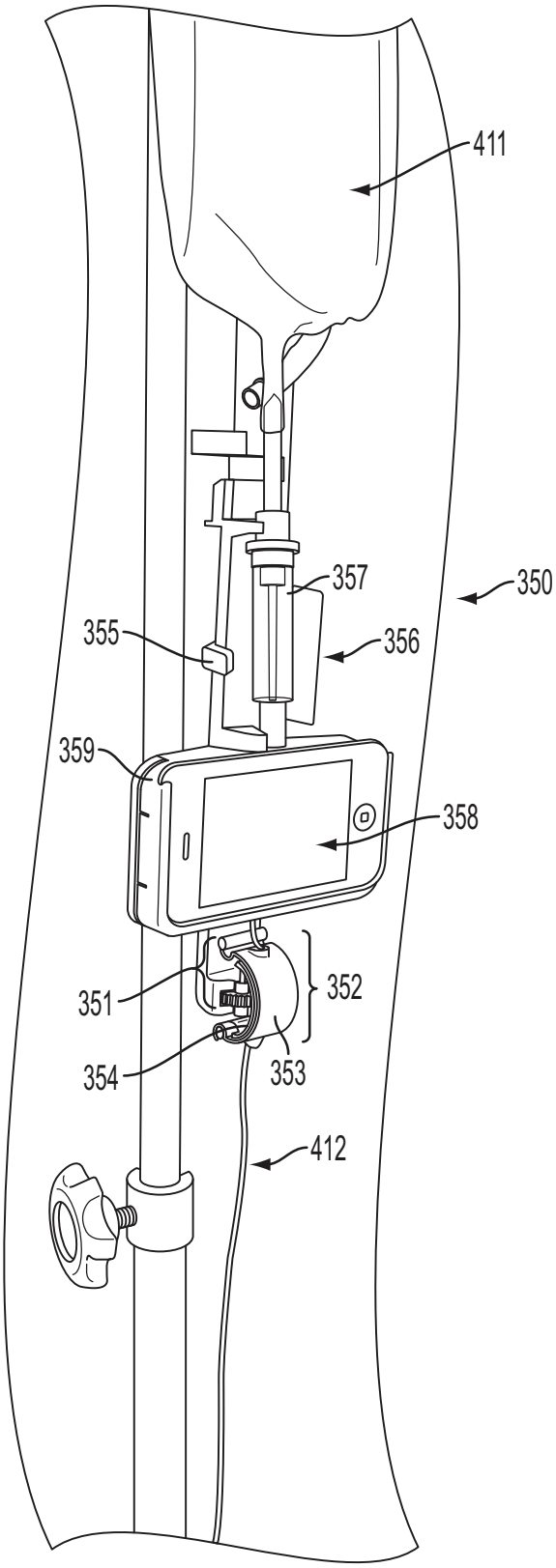


FIG. 51A

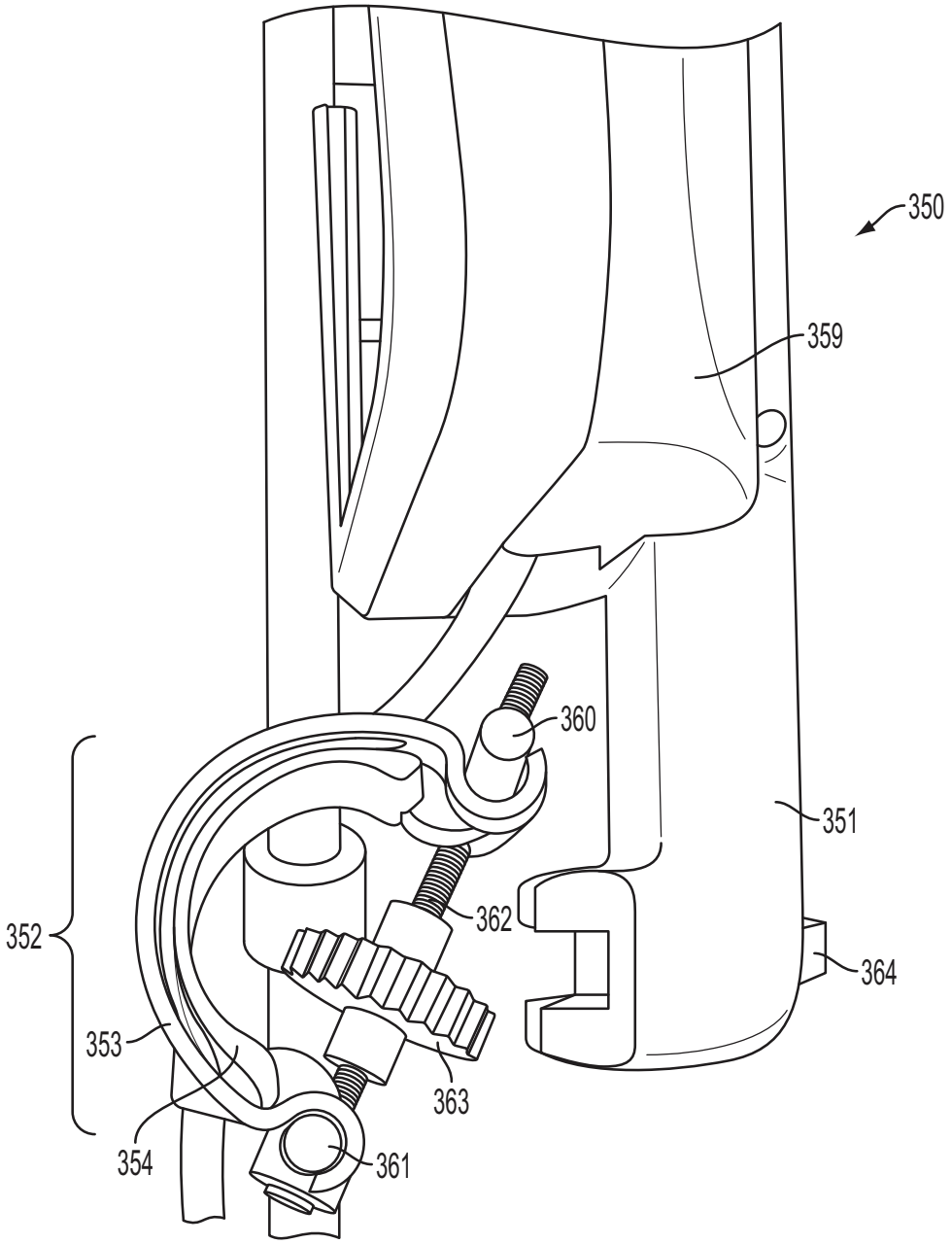


FIG. 51B

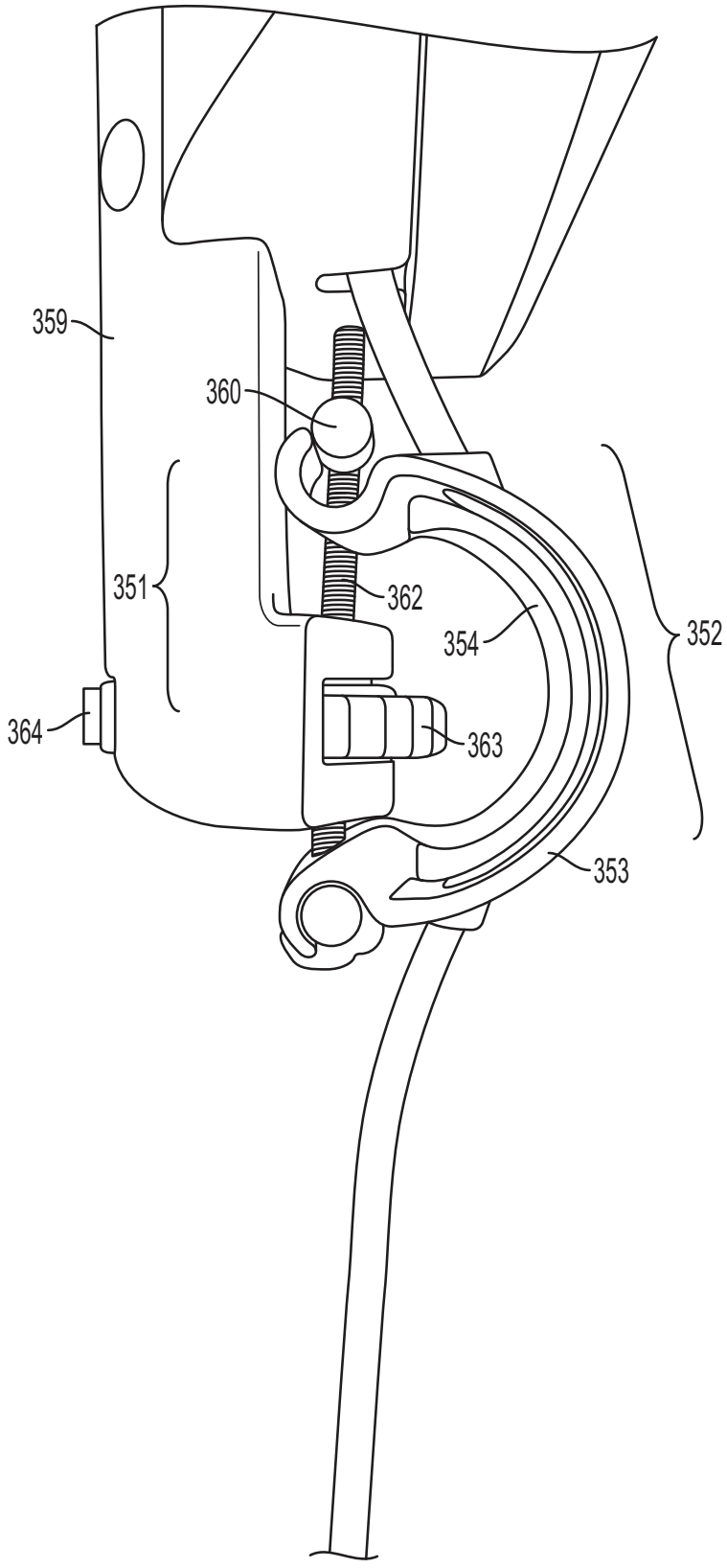


FIG. 51C

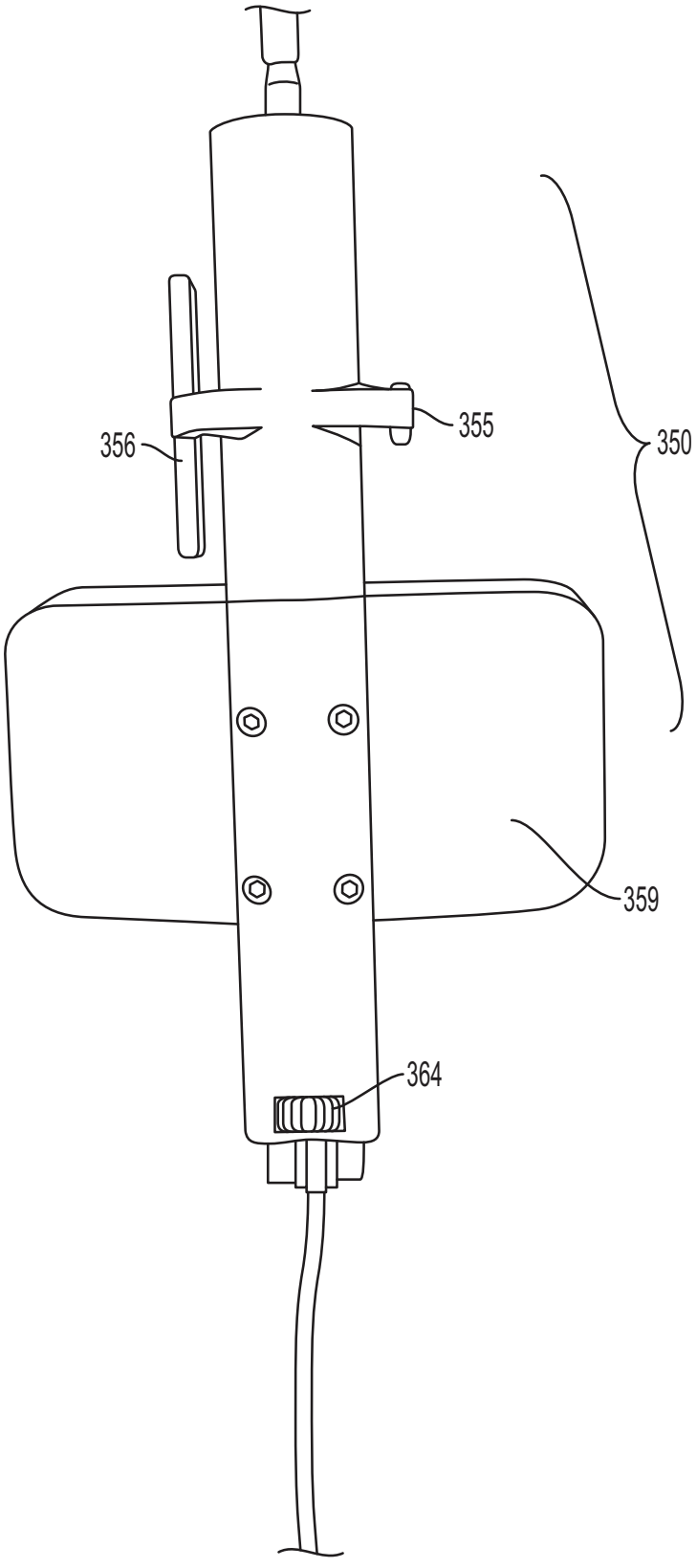


FIG. 51D

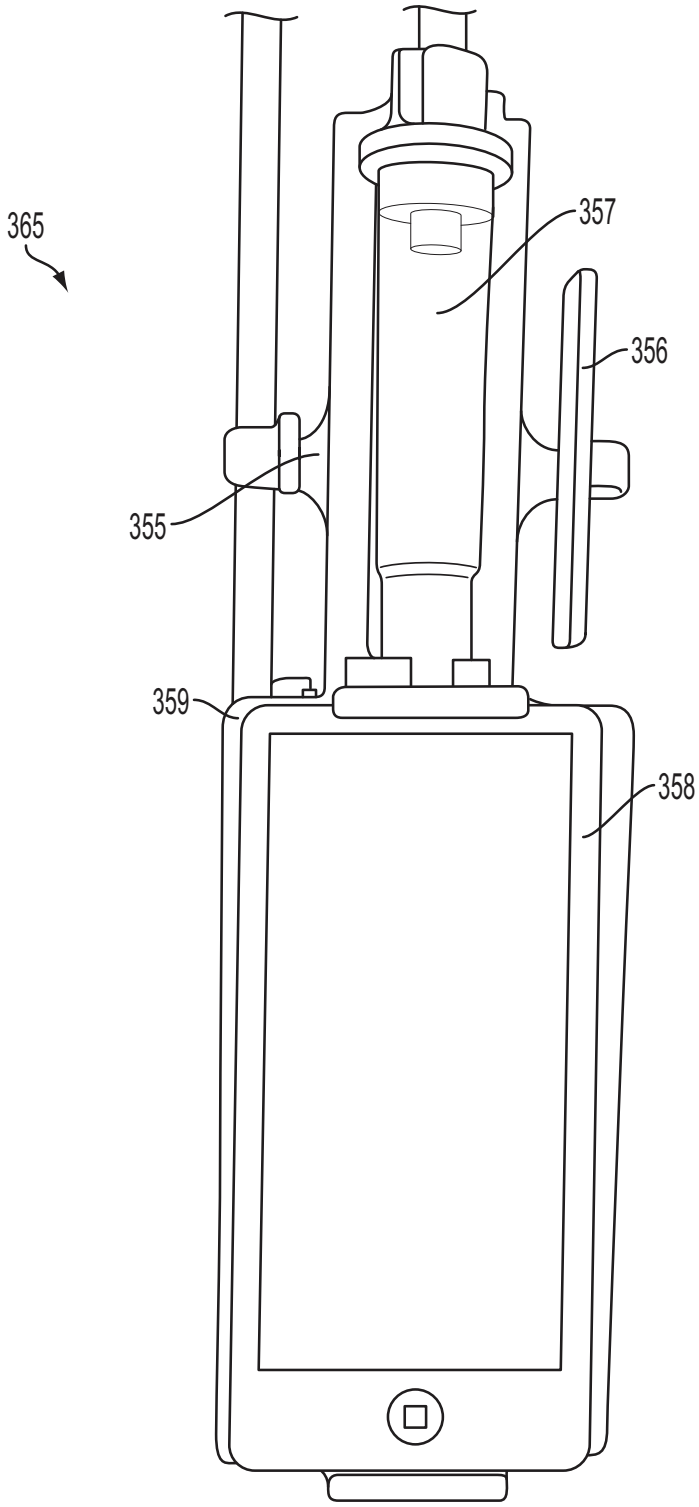


FIG. 52A

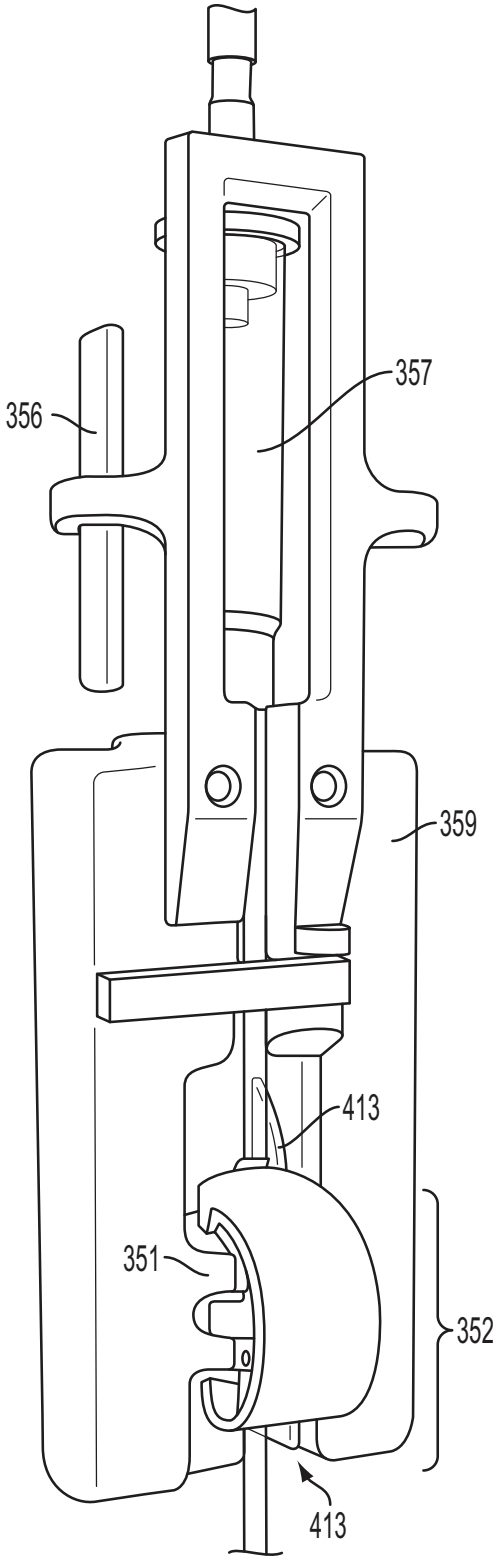


FIG. 52B

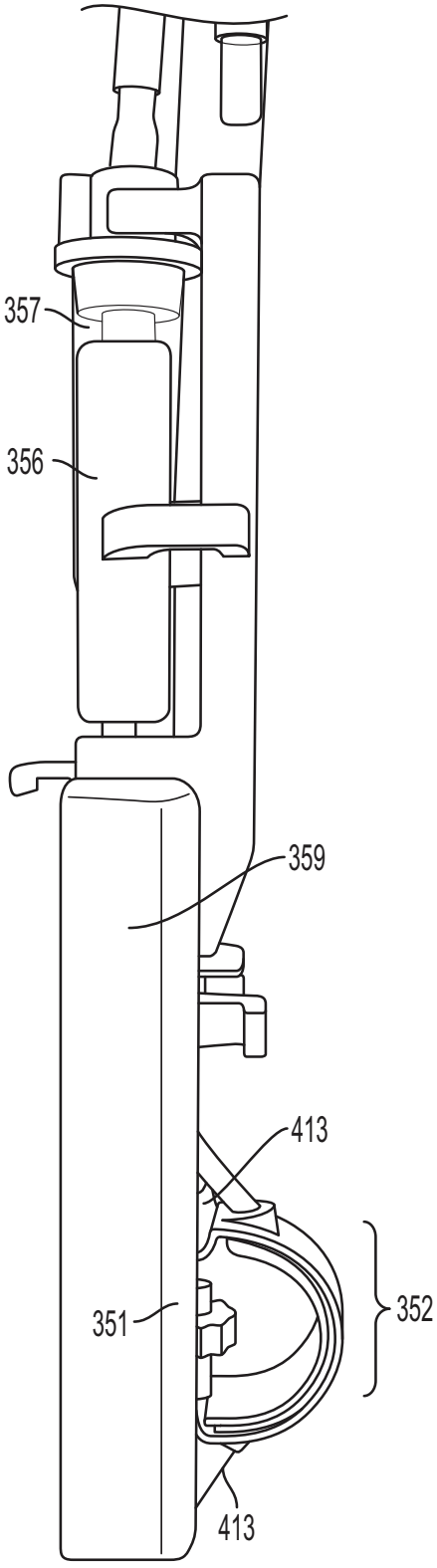


FIG. 52C

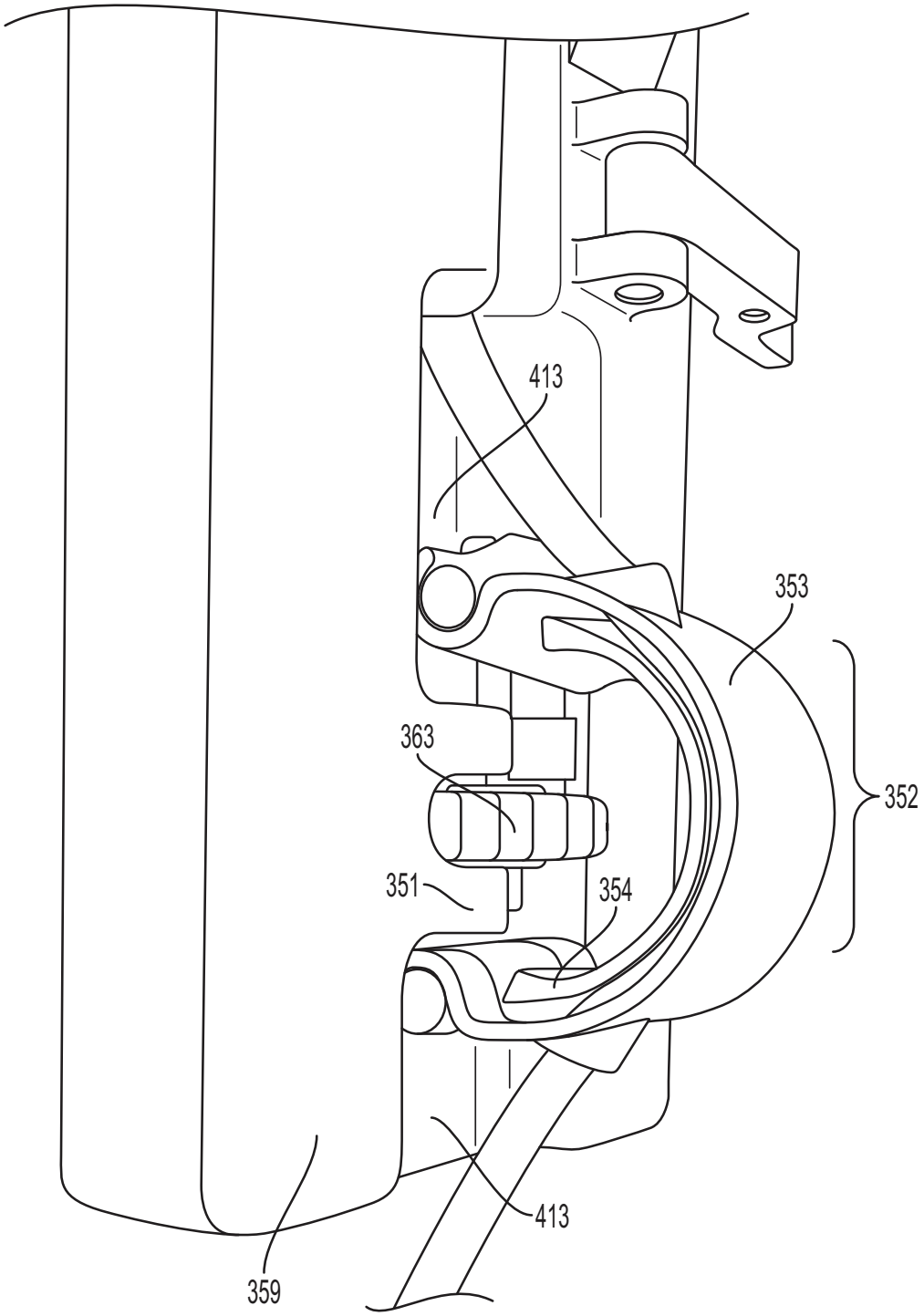


FIG. 52D

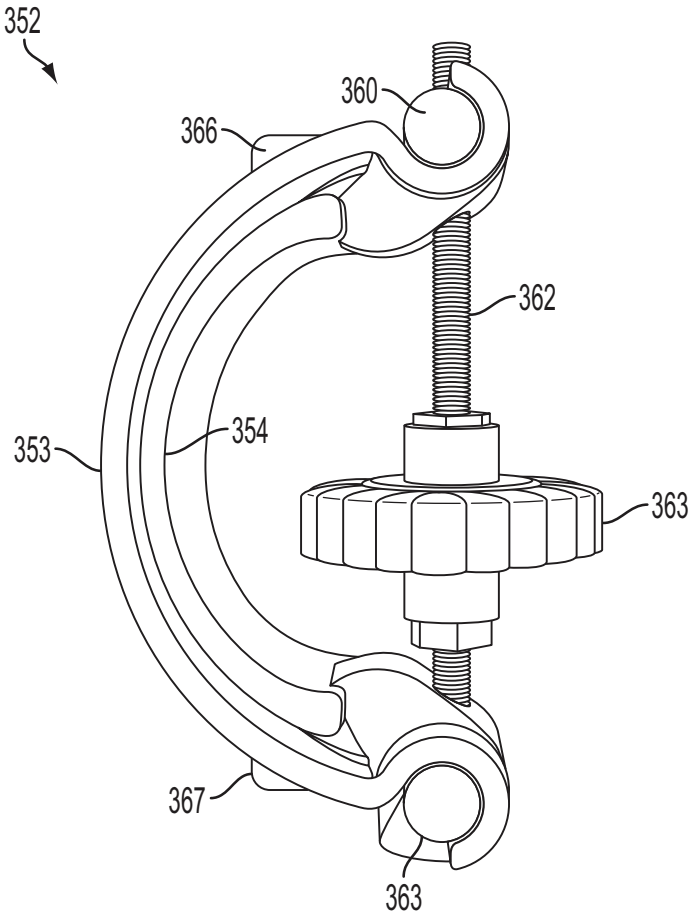


FIG. 53A

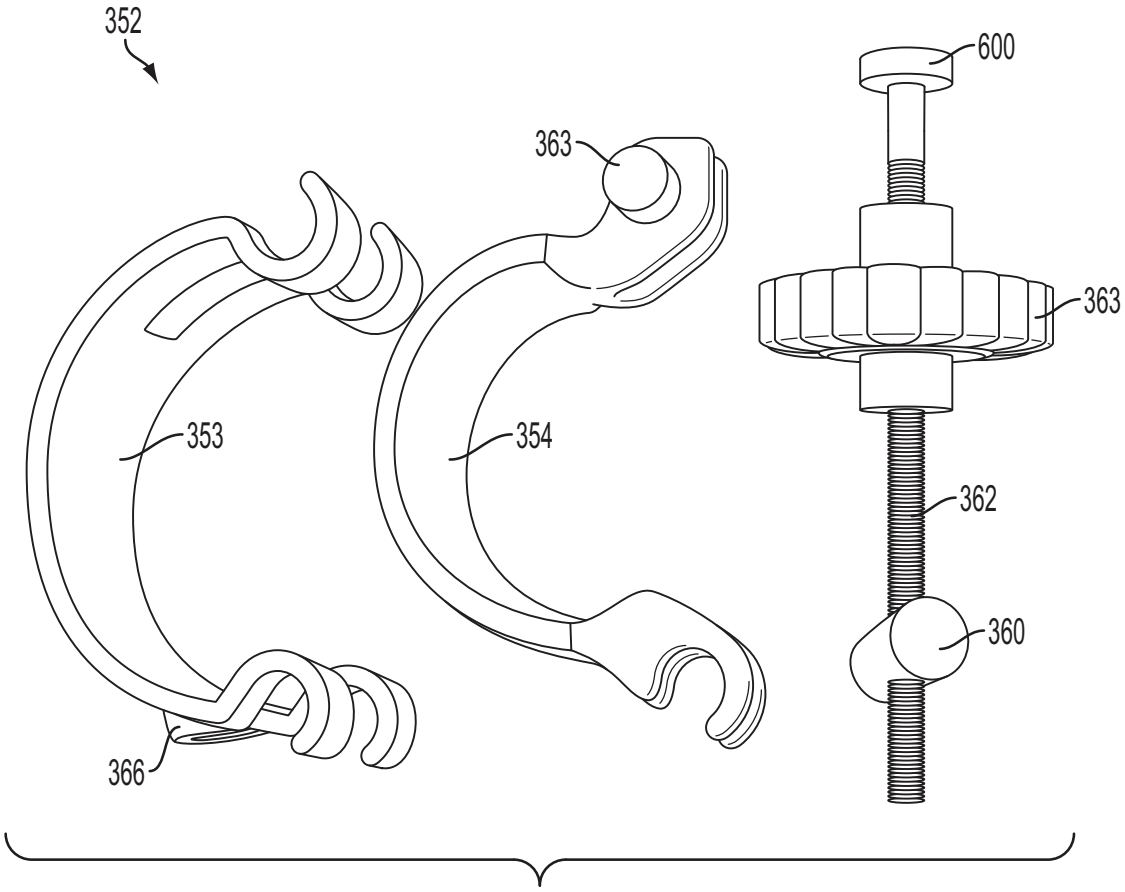


FIG. 53B

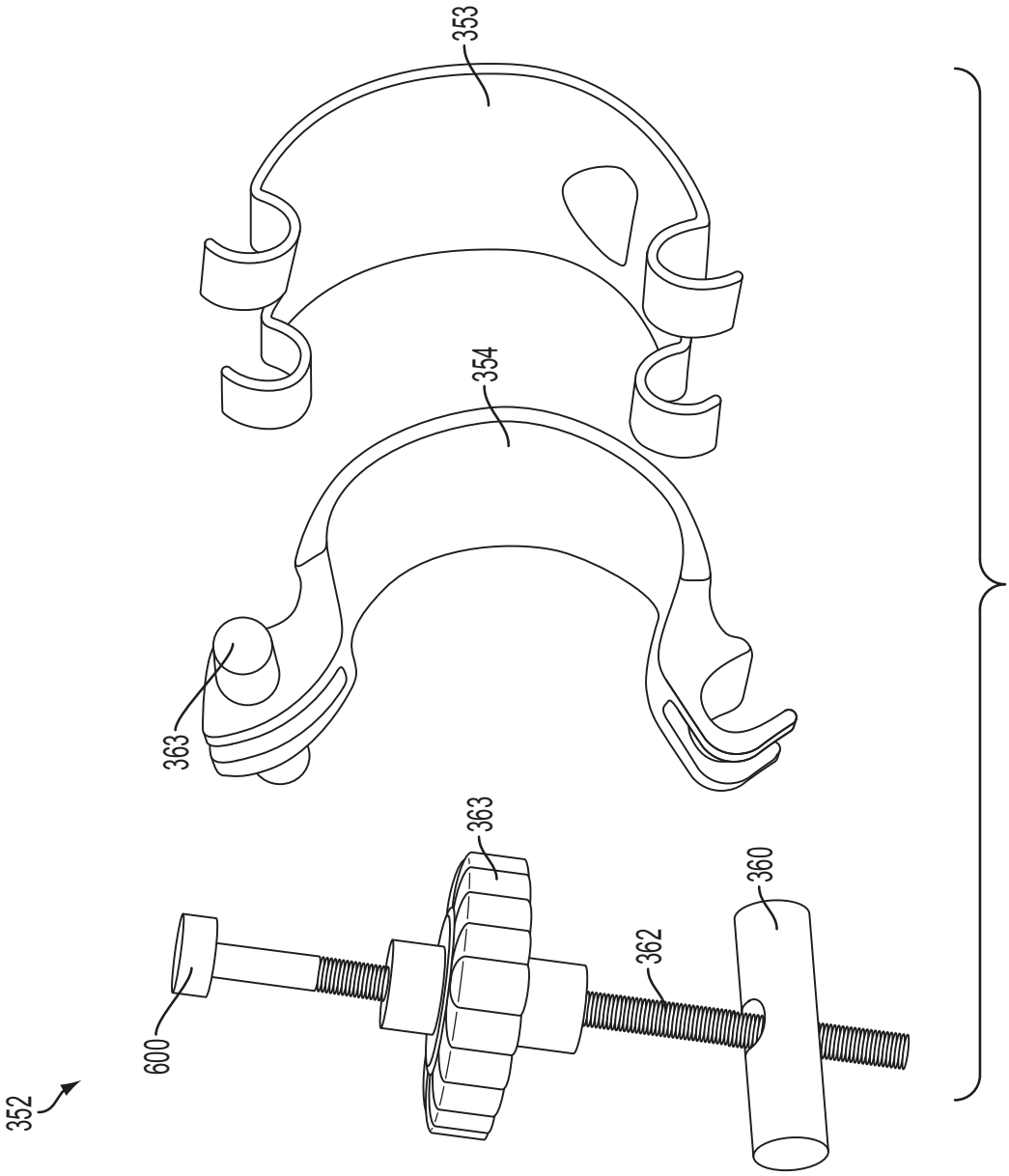


FIG. 53C

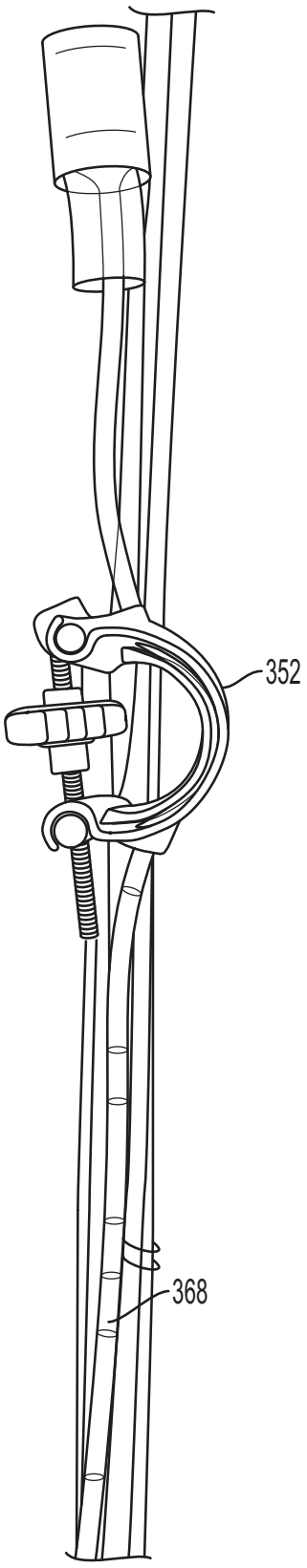


FIG. 54

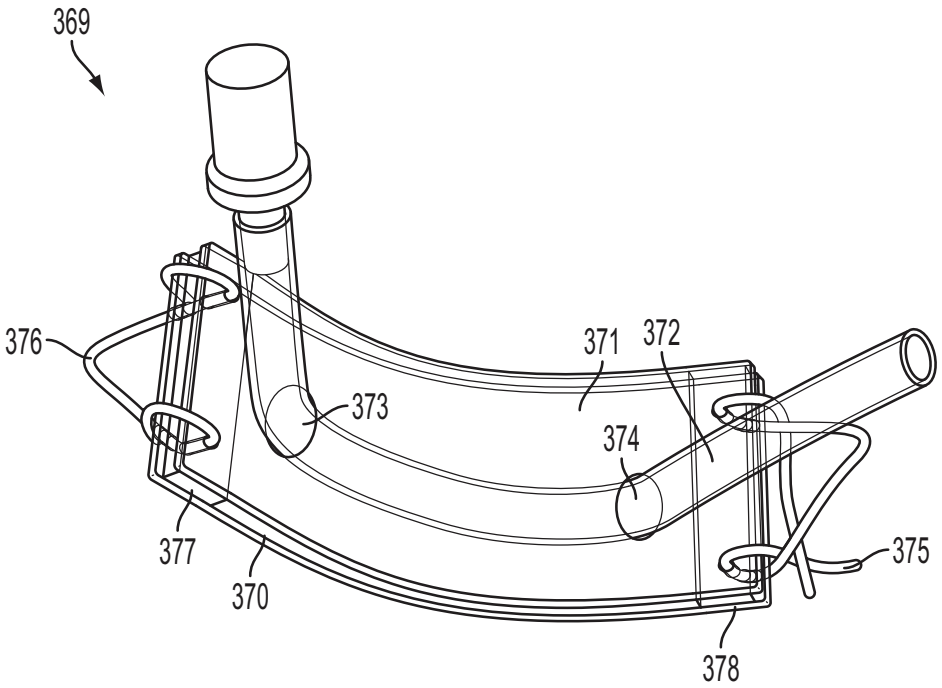


FIG. 55

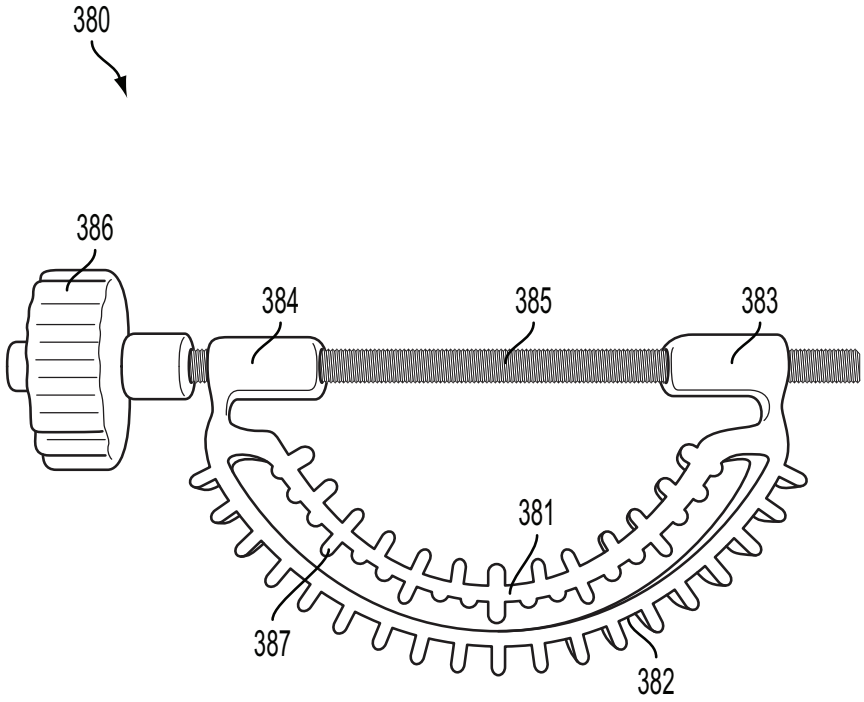


FIG. 56A

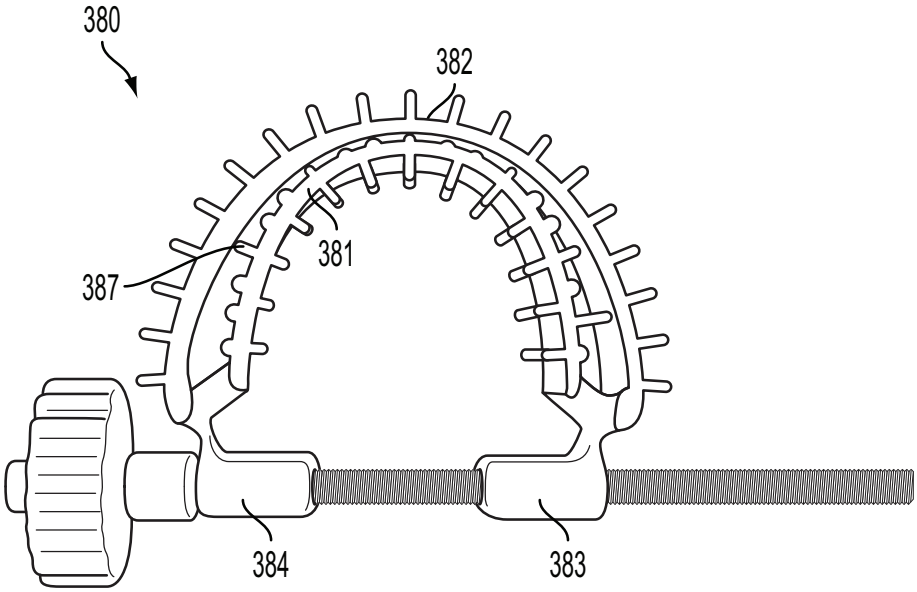


FIG. 56B

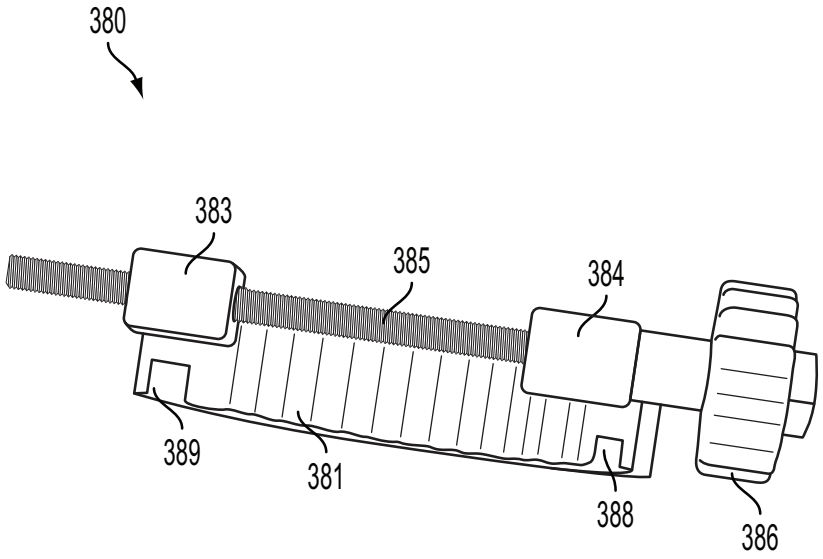


FIG. 56C

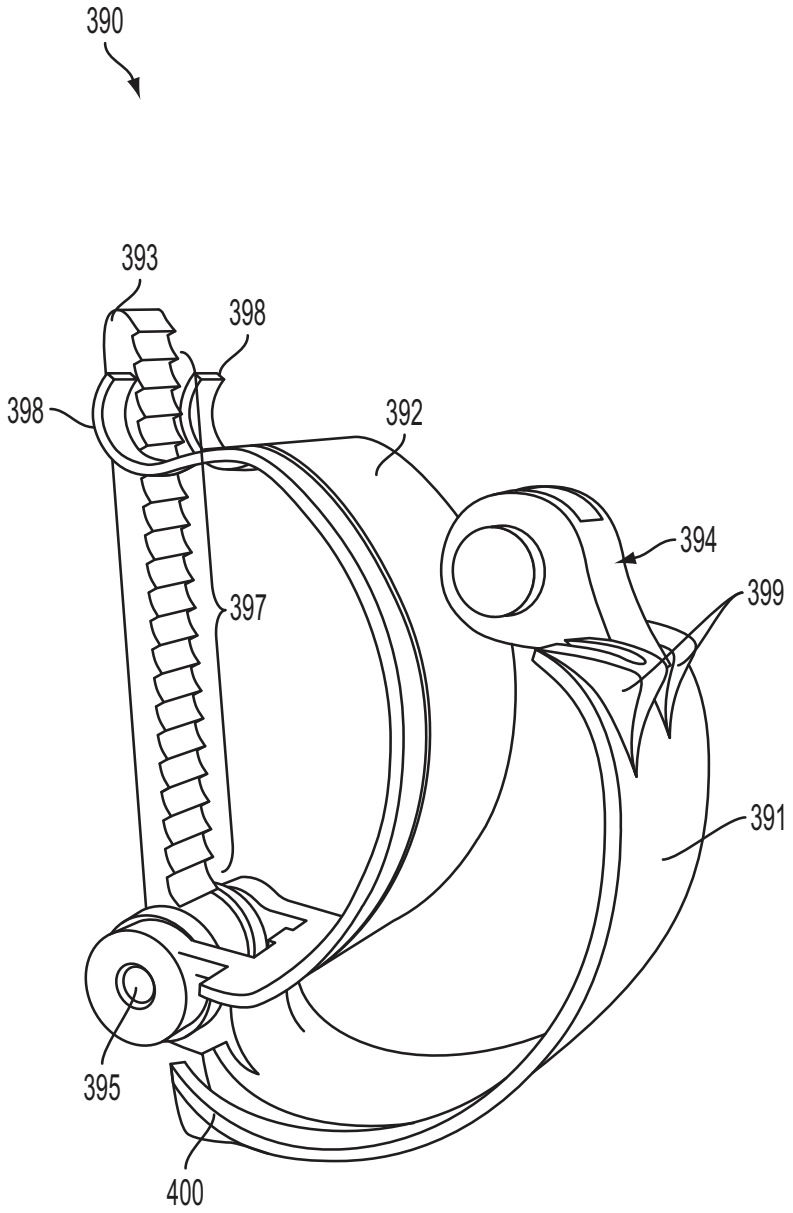


FIG. 57A

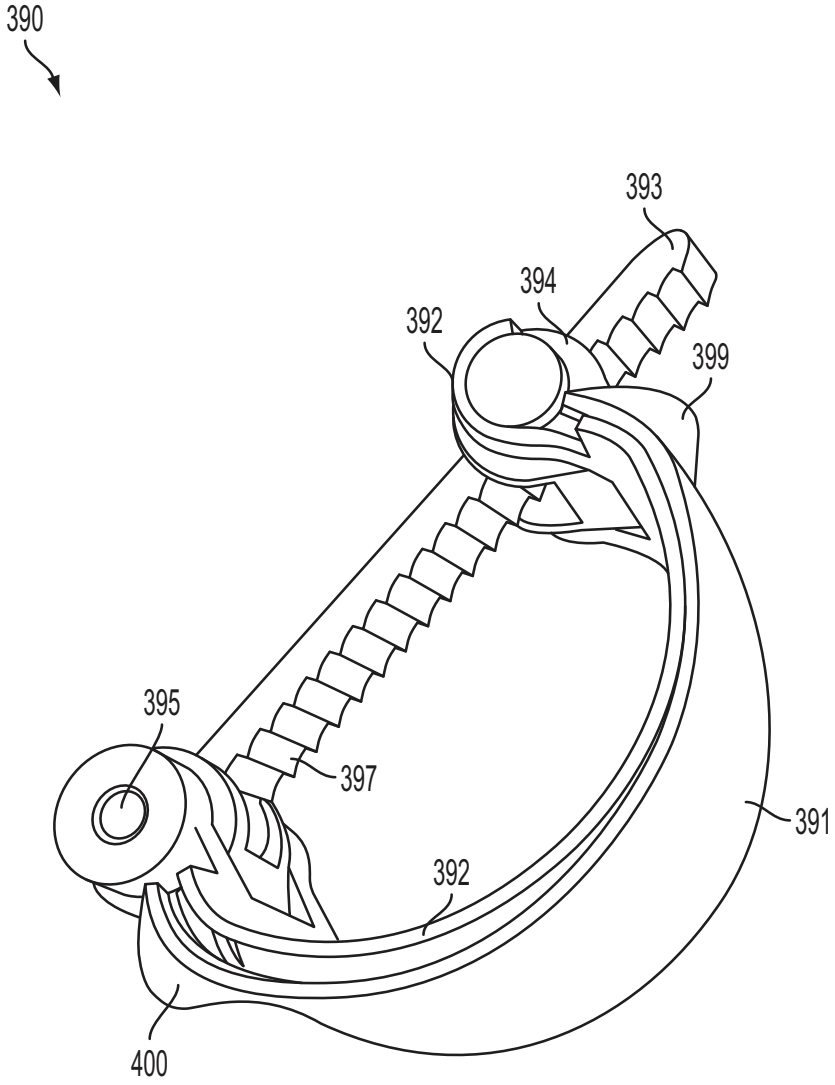


FIG. 57B

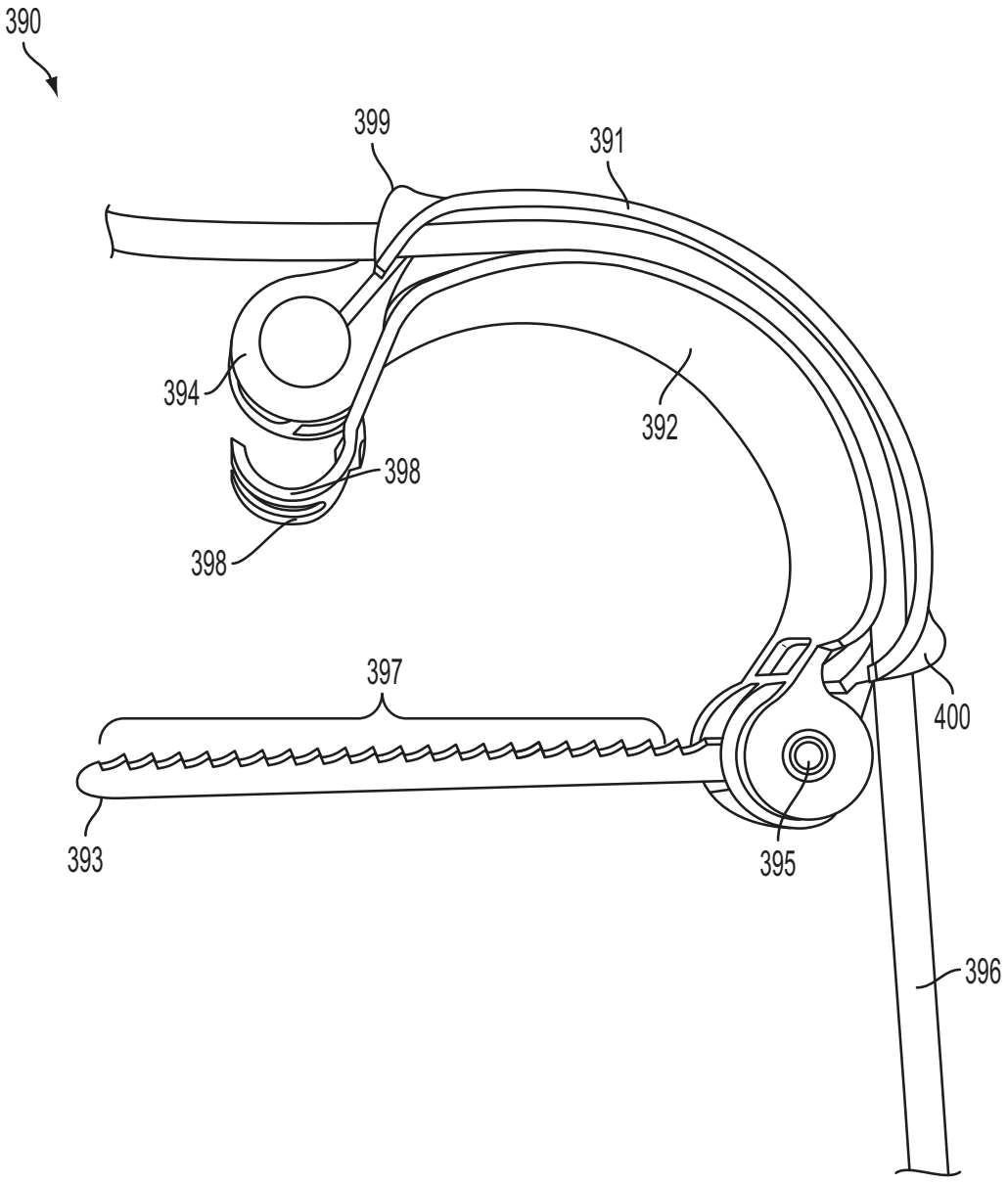


FIG. 57C

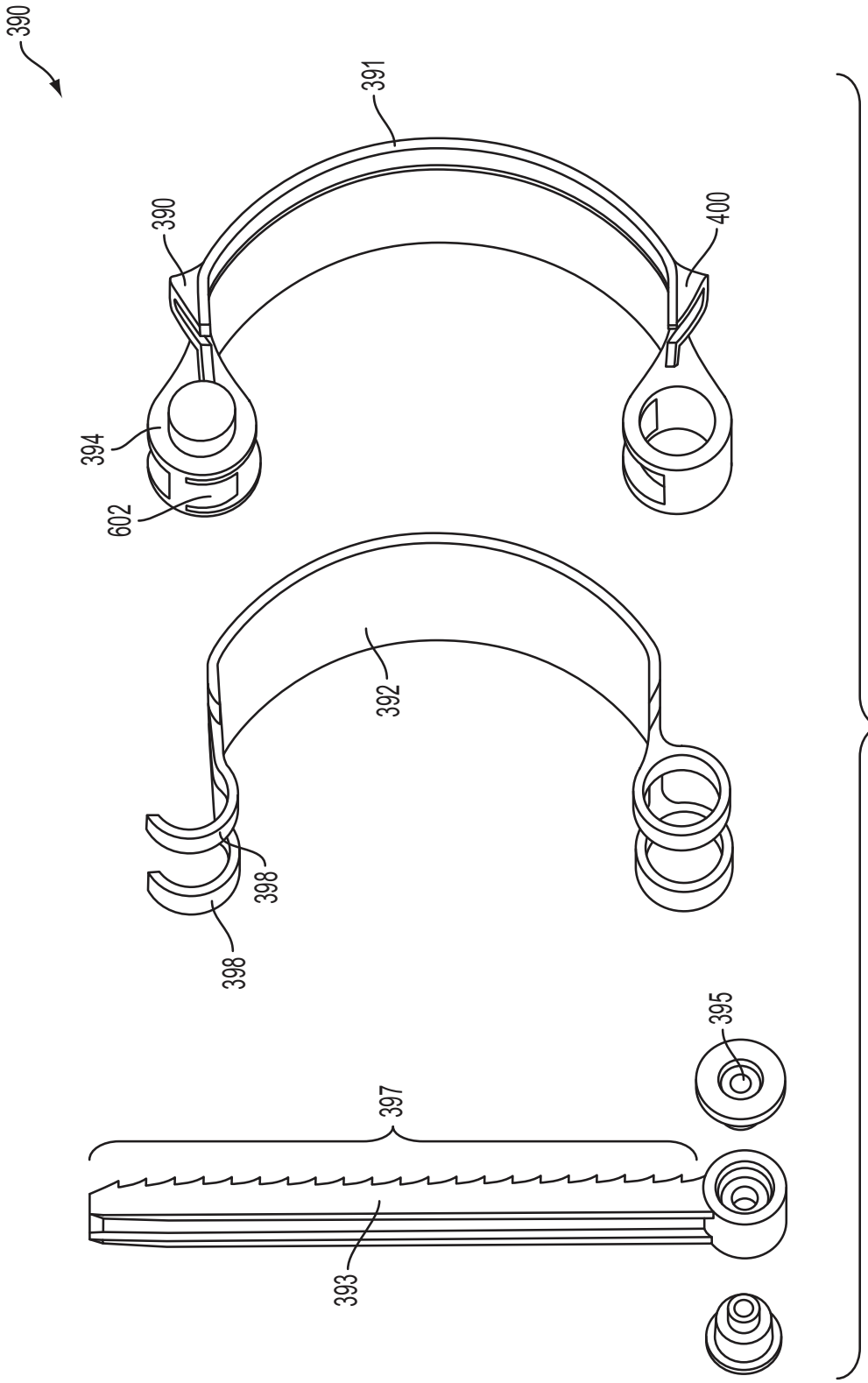


FIG. 57D

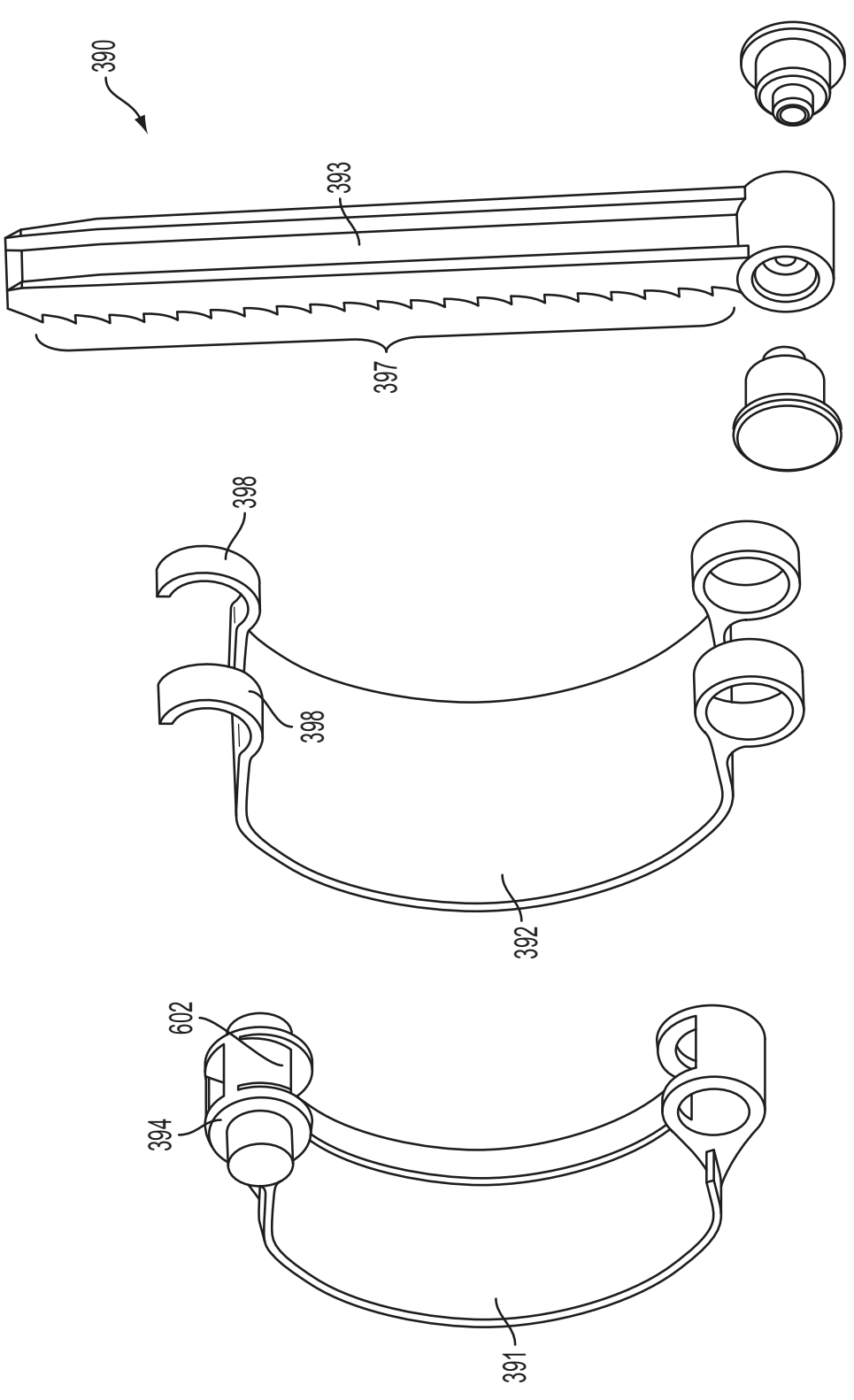


FIG. 57E

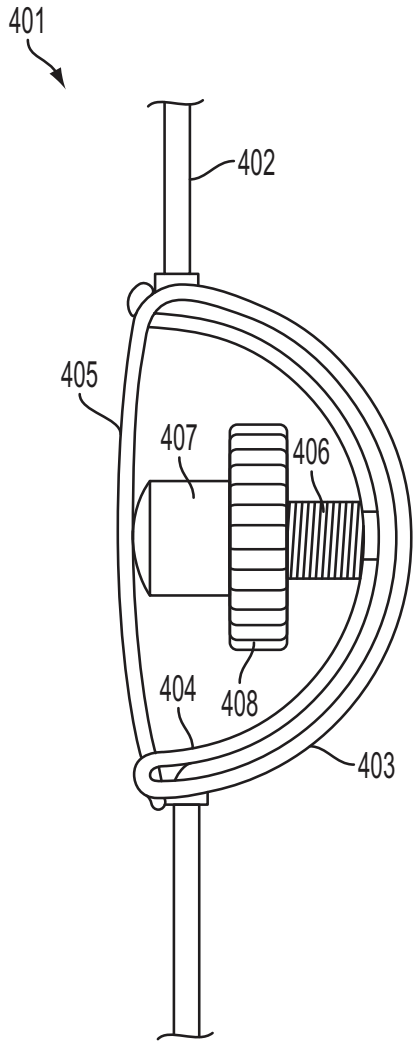


FIG. 58A

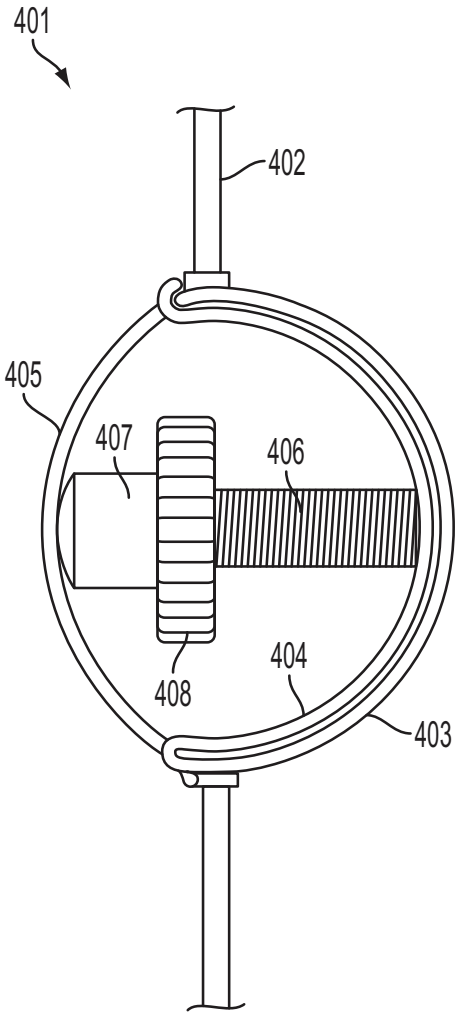


FIG. 58B

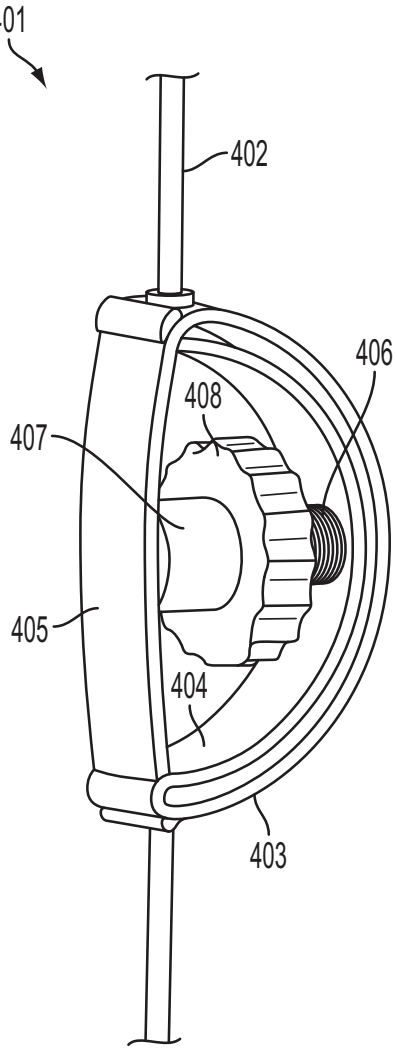


FIG. 58C

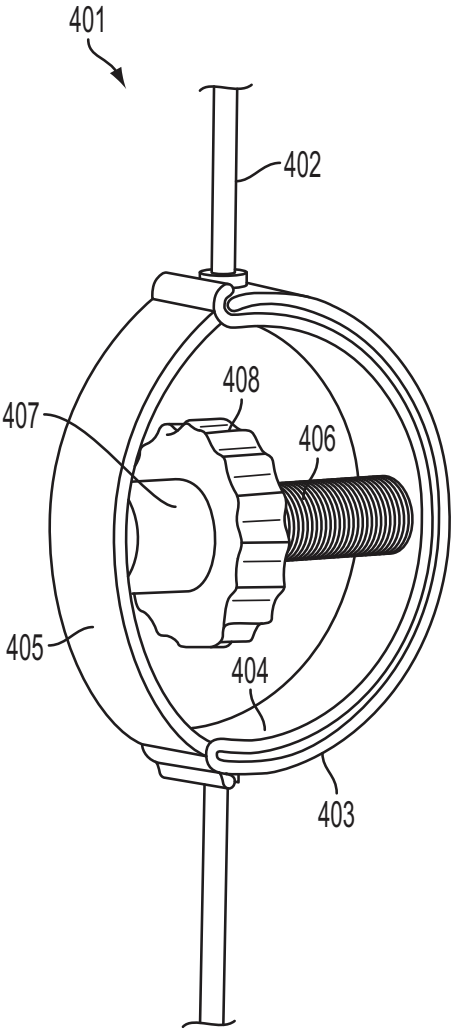


FIG. 58D

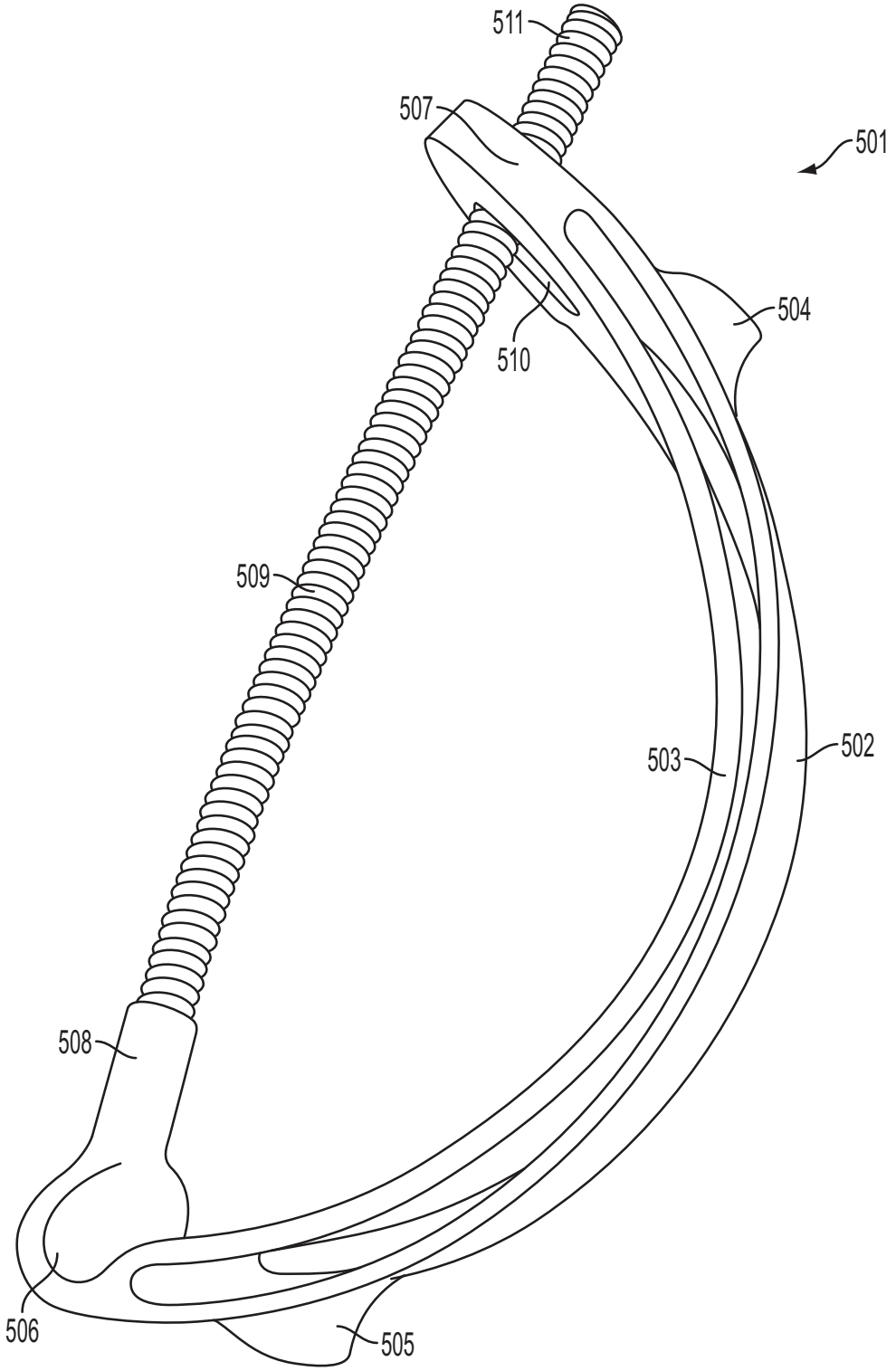


FIG. 59A

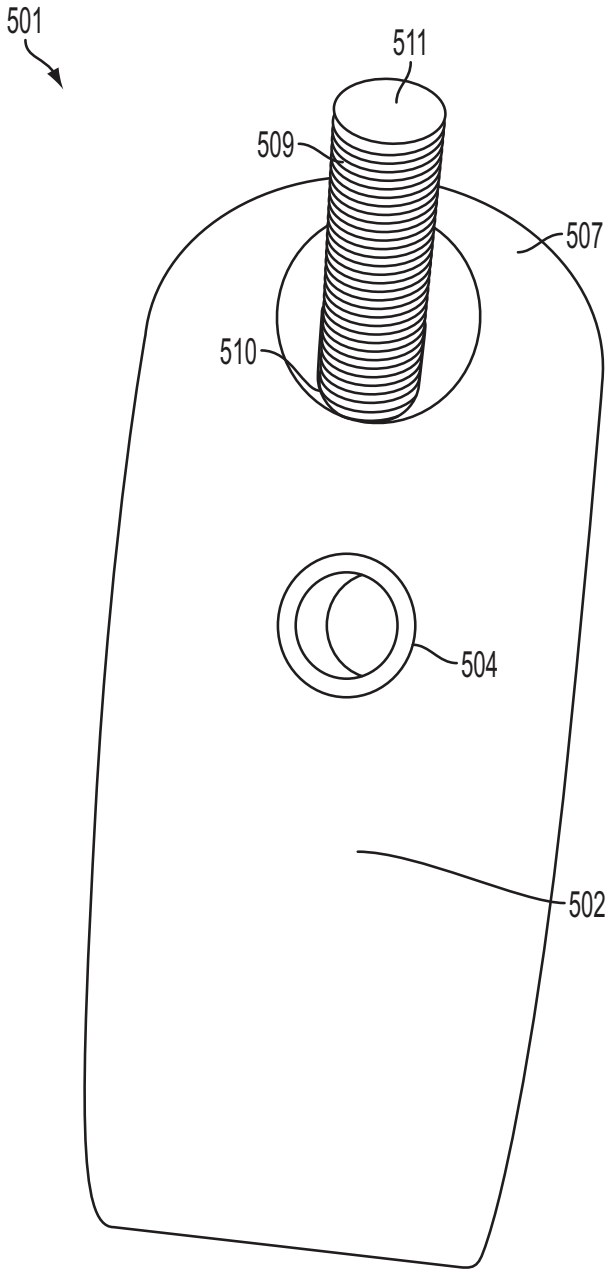


FIG. 59B

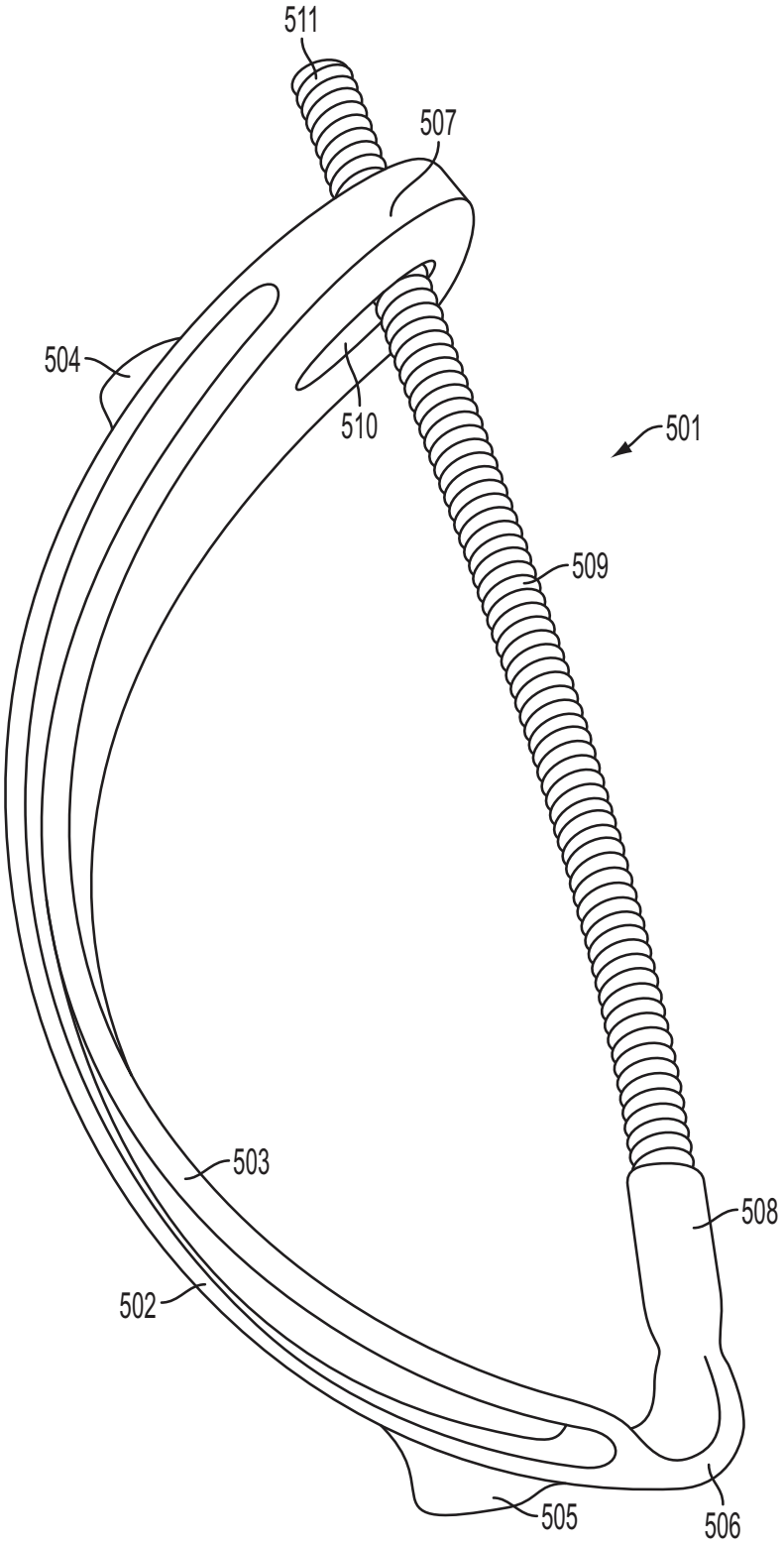


FIG. 59C

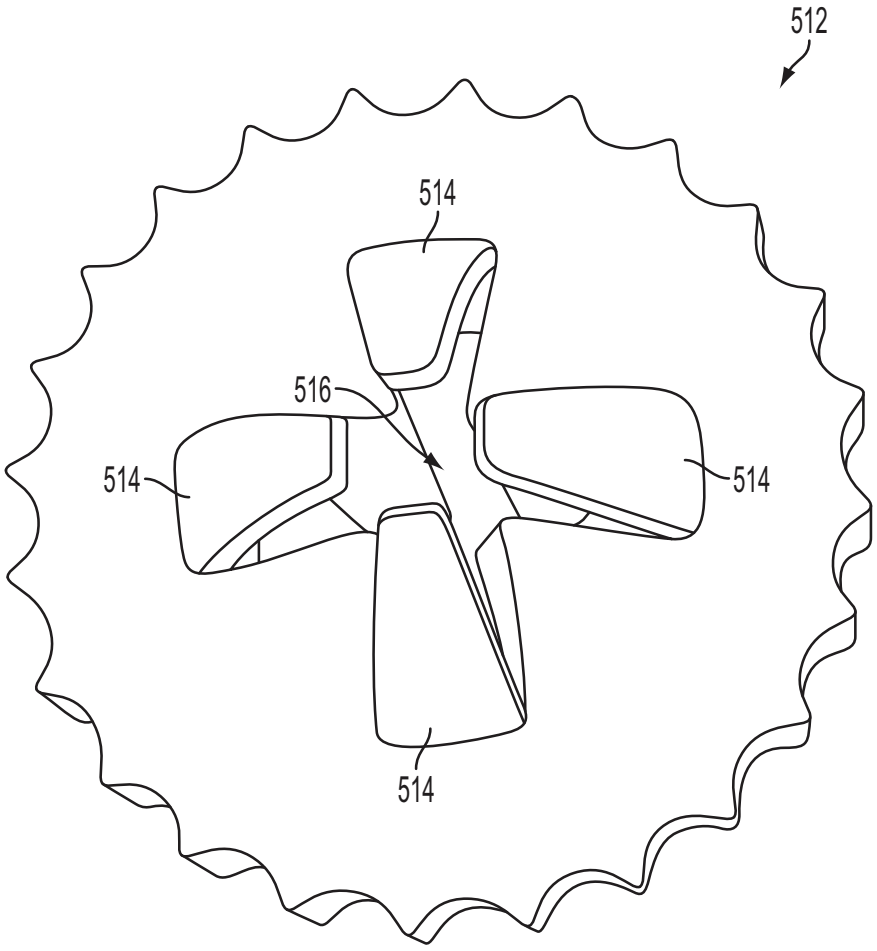


FIG. 59D

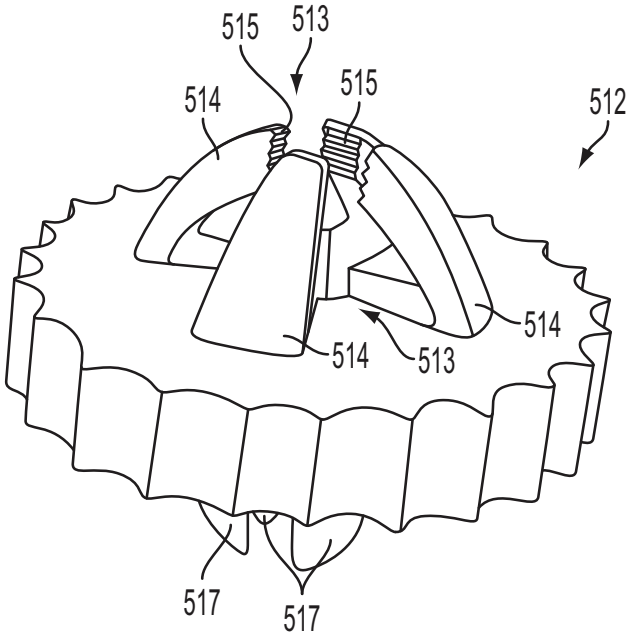


FIG. 59E

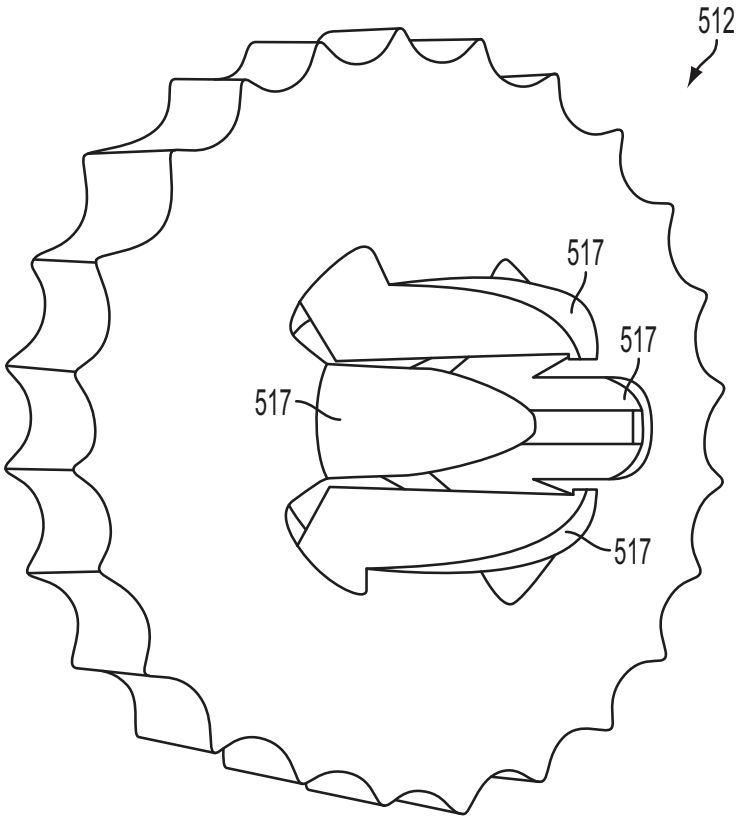


FIG. 59F

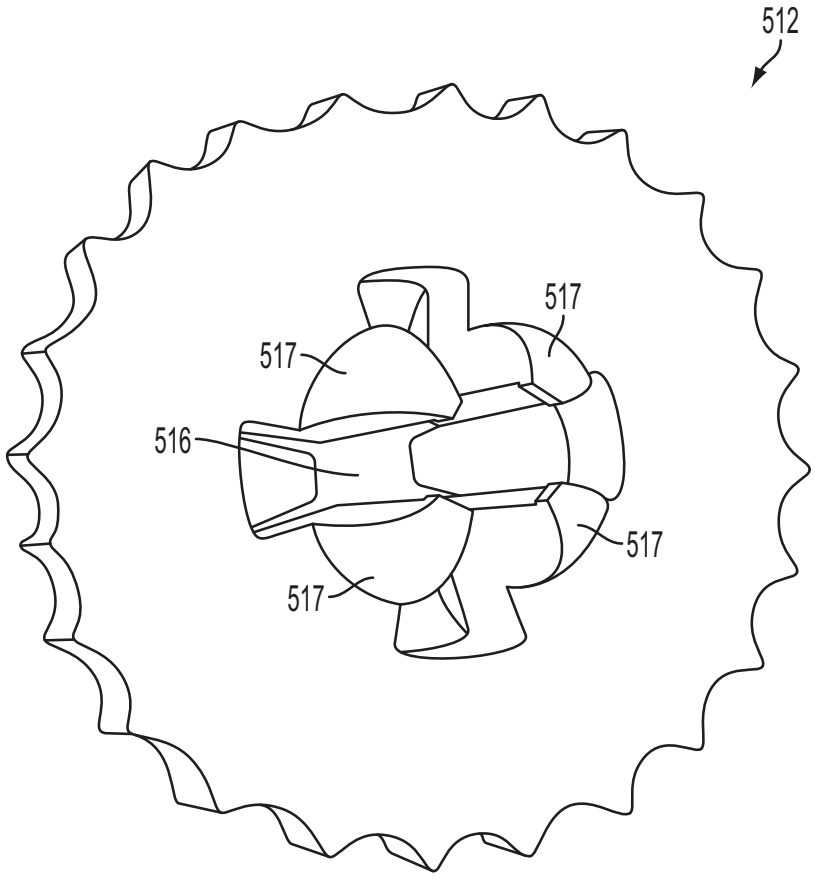


FIG. 59G

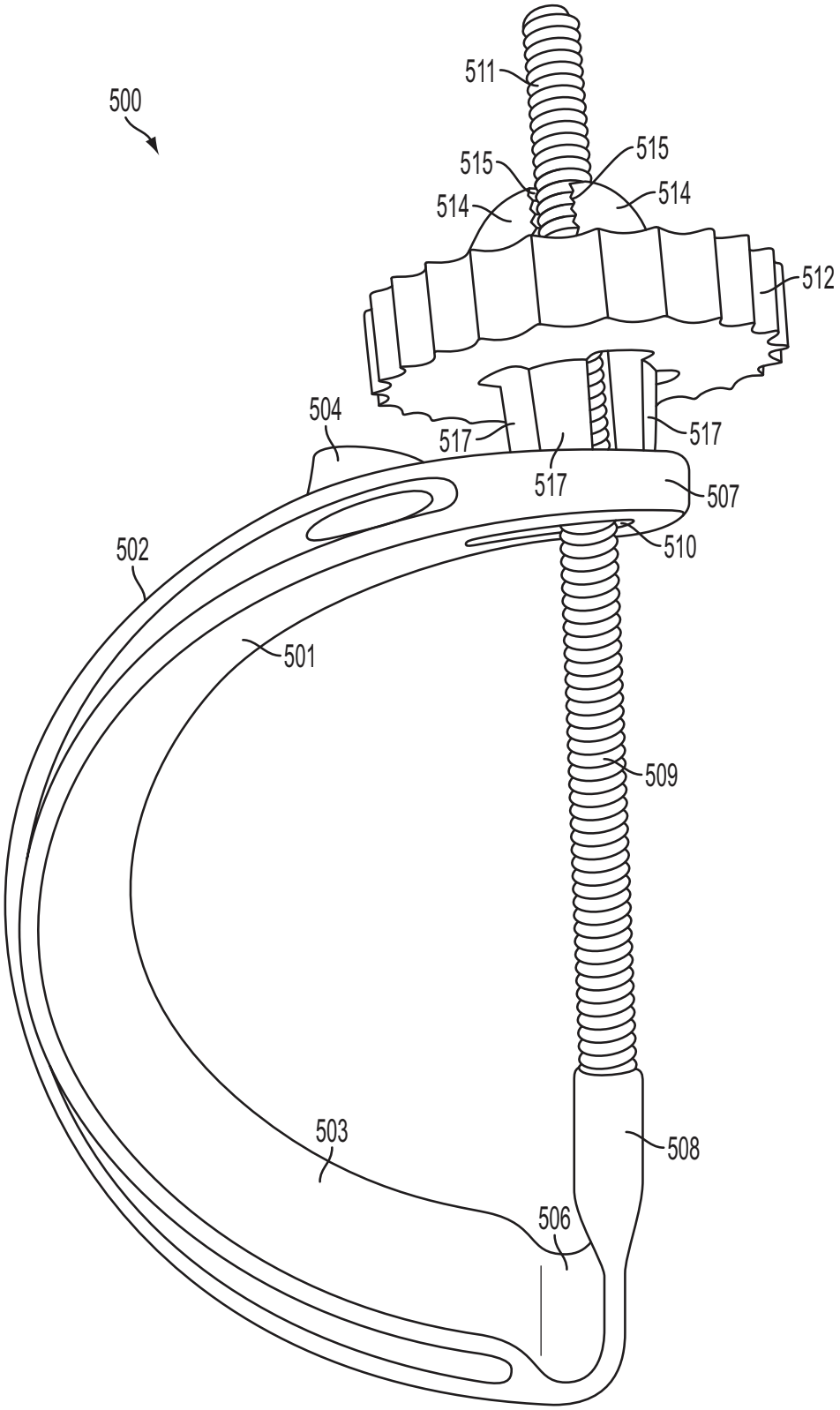

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FIG. 59H

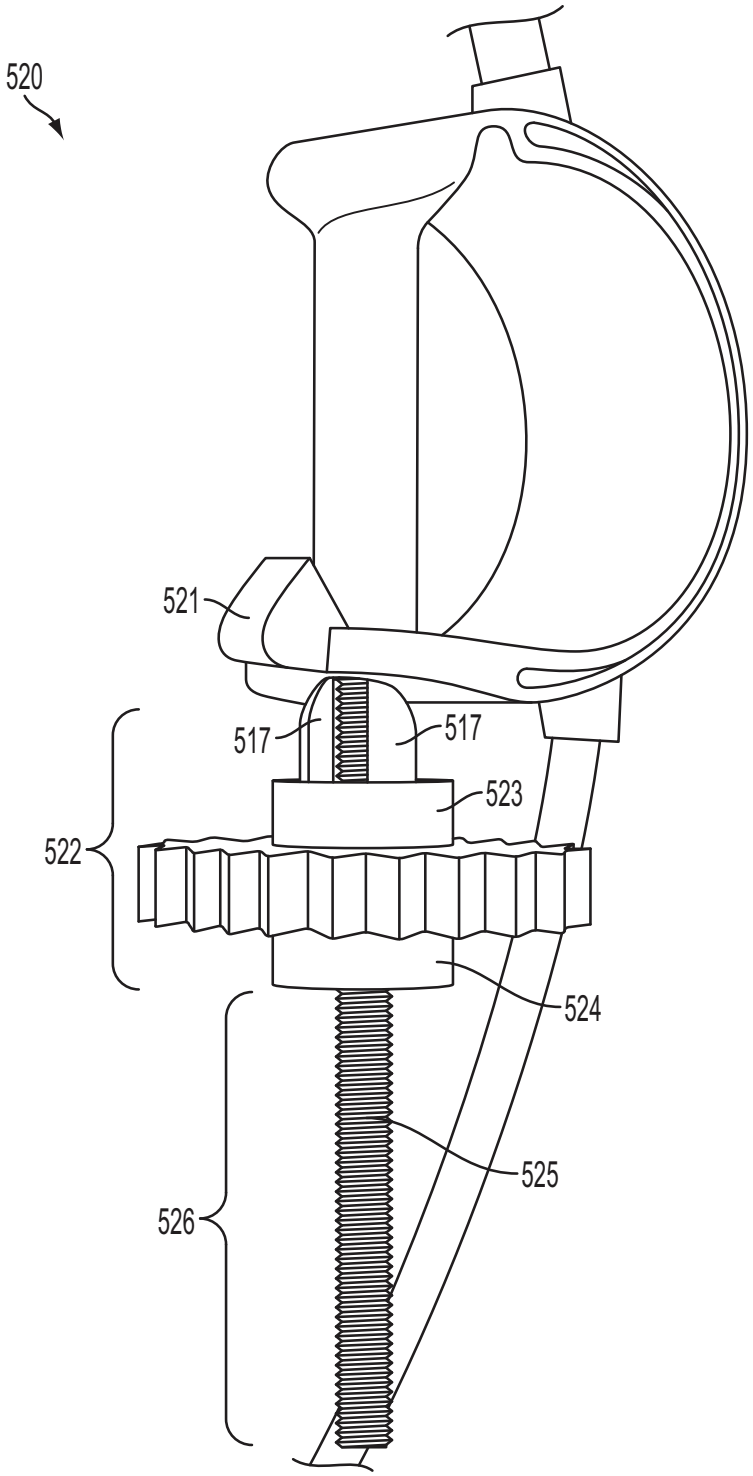


FIG. 60

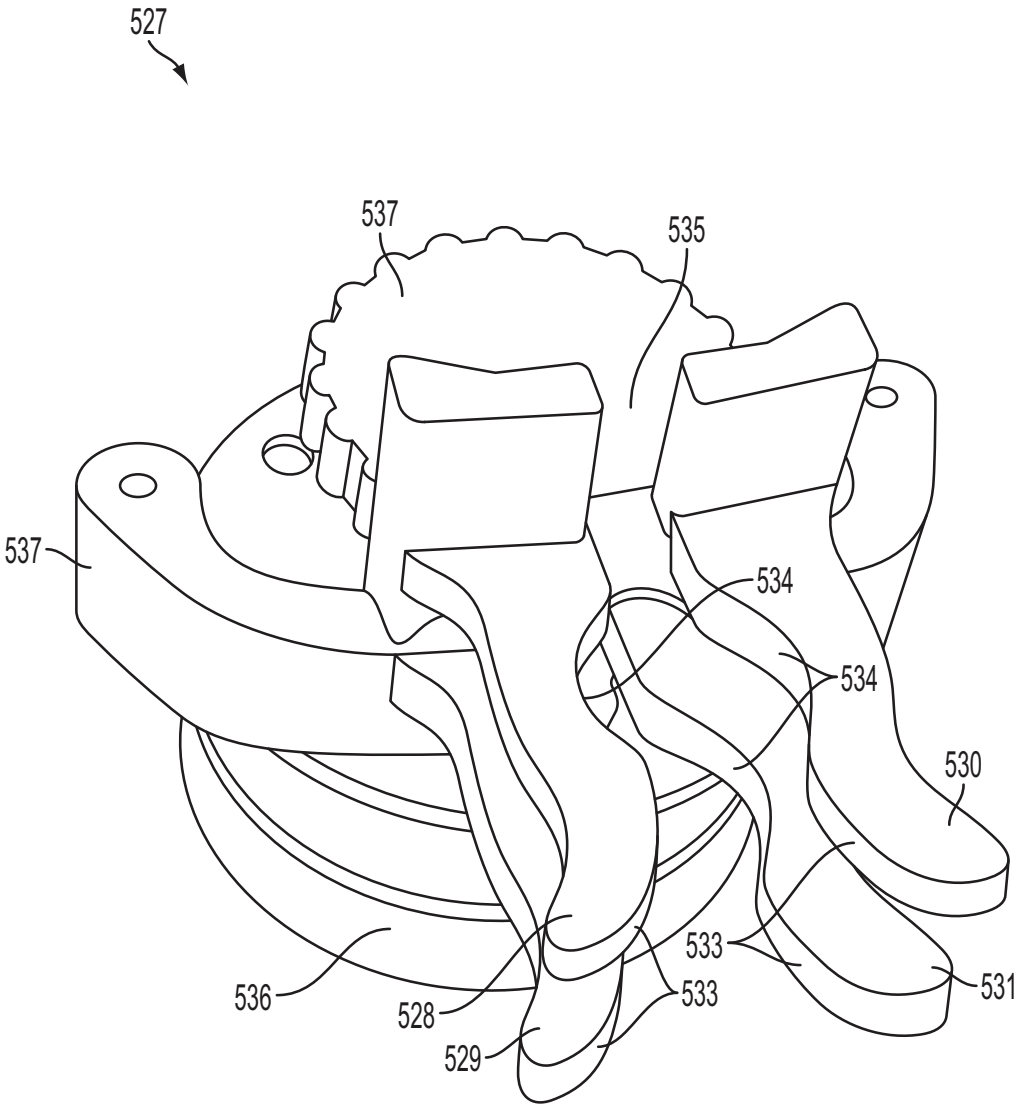


FIG. 61

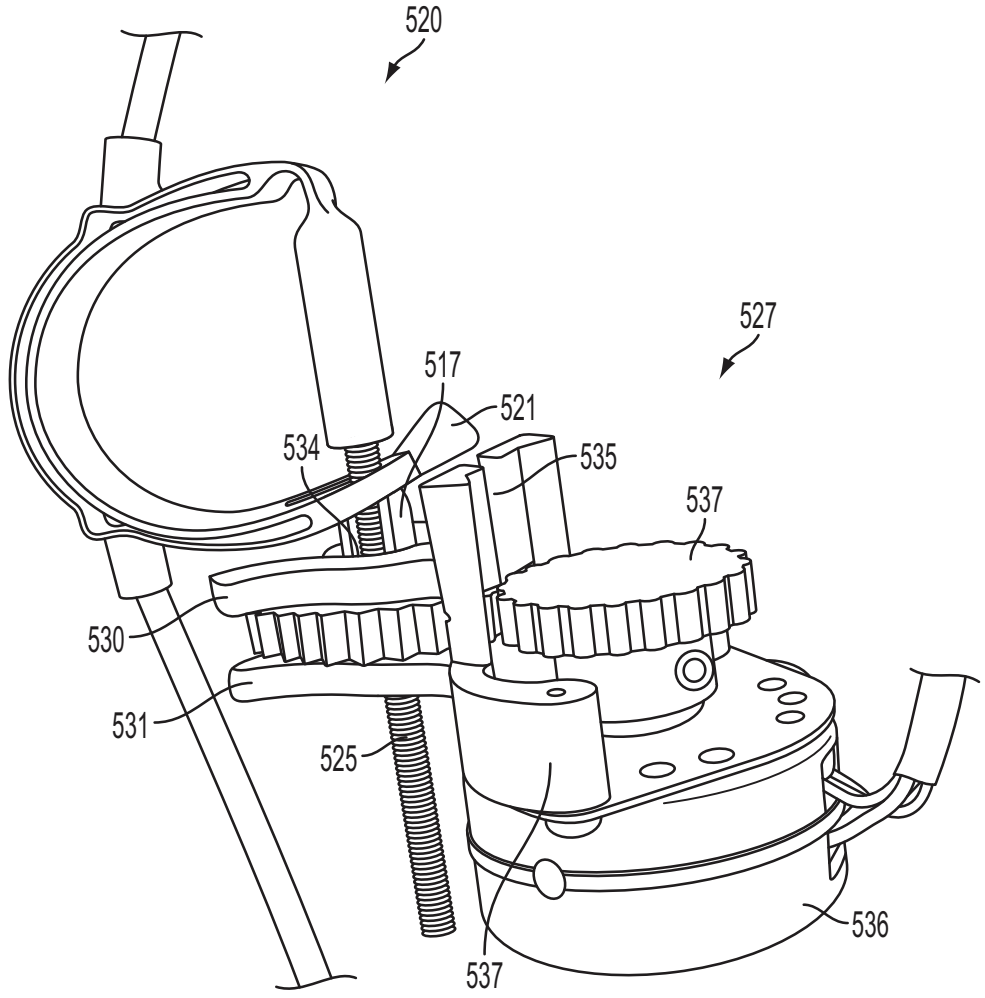


FIG. 62

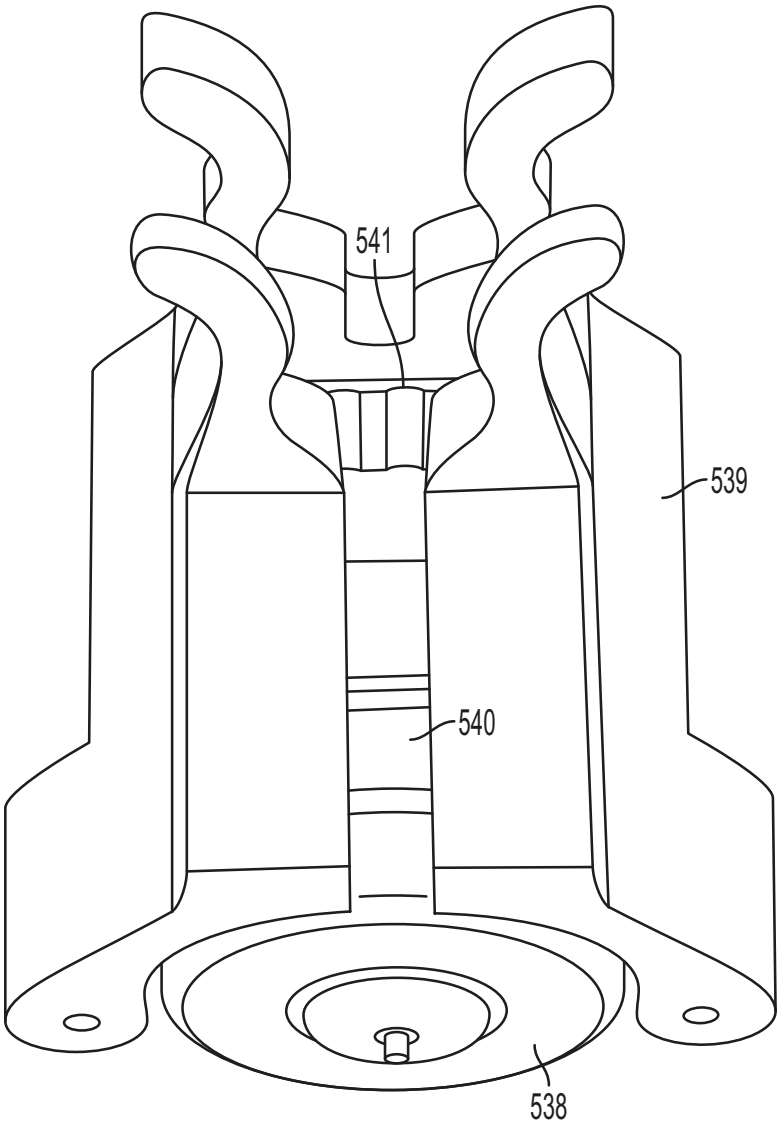


FIG. 63

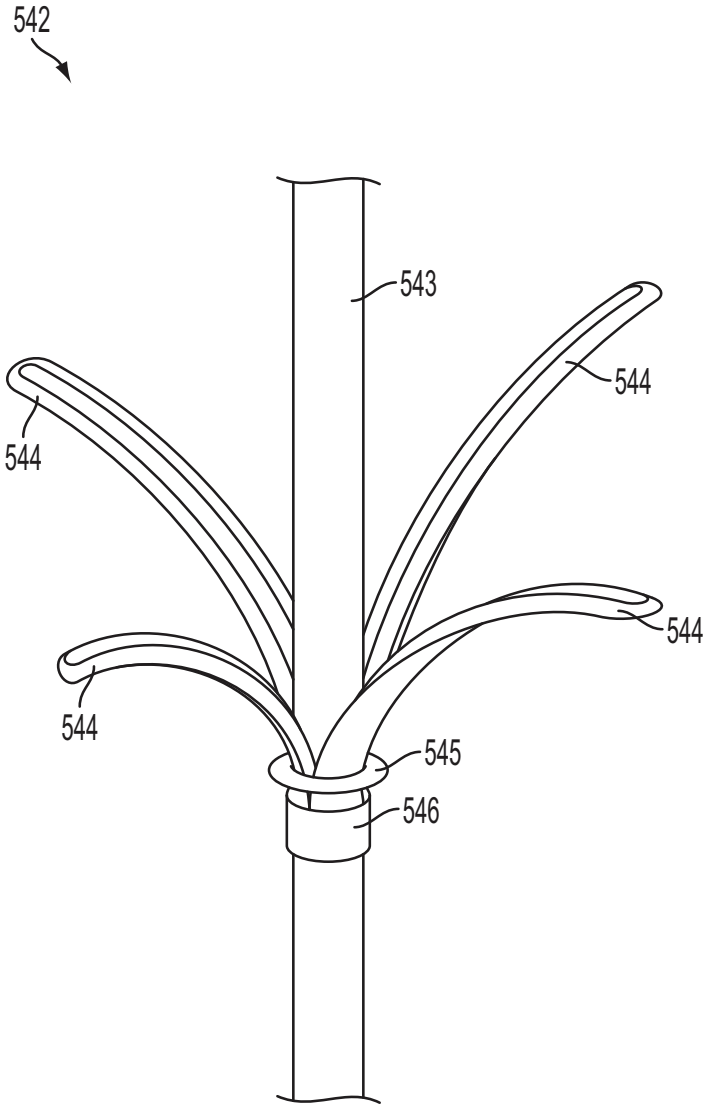


FIG. 64A

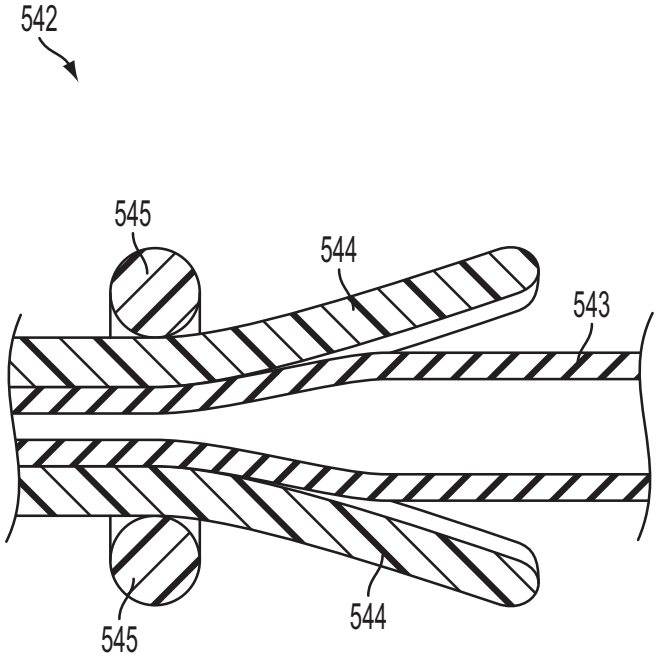


FIG. 64B

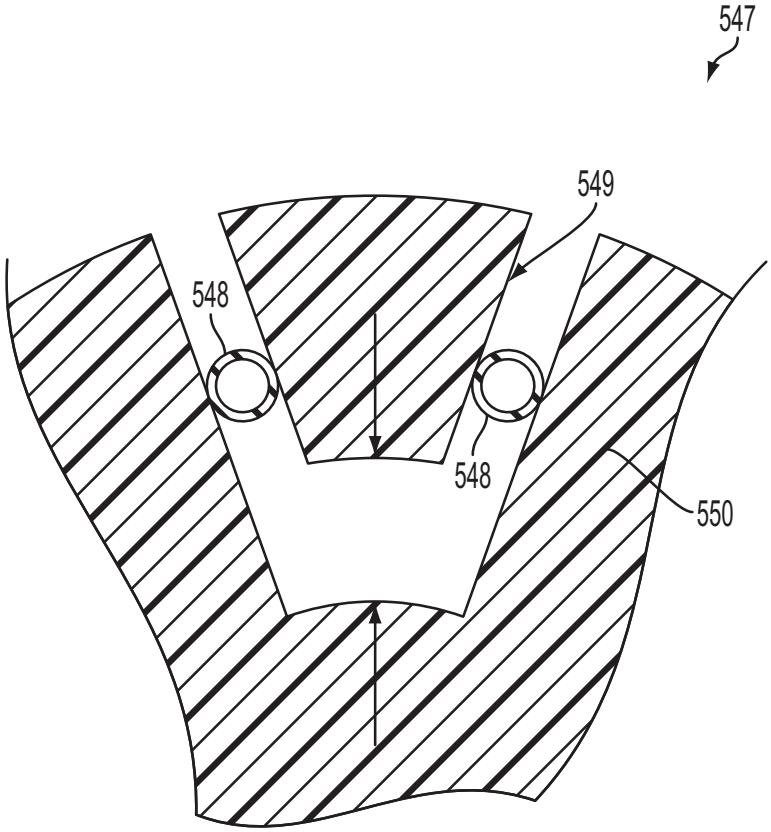


FIG. 65

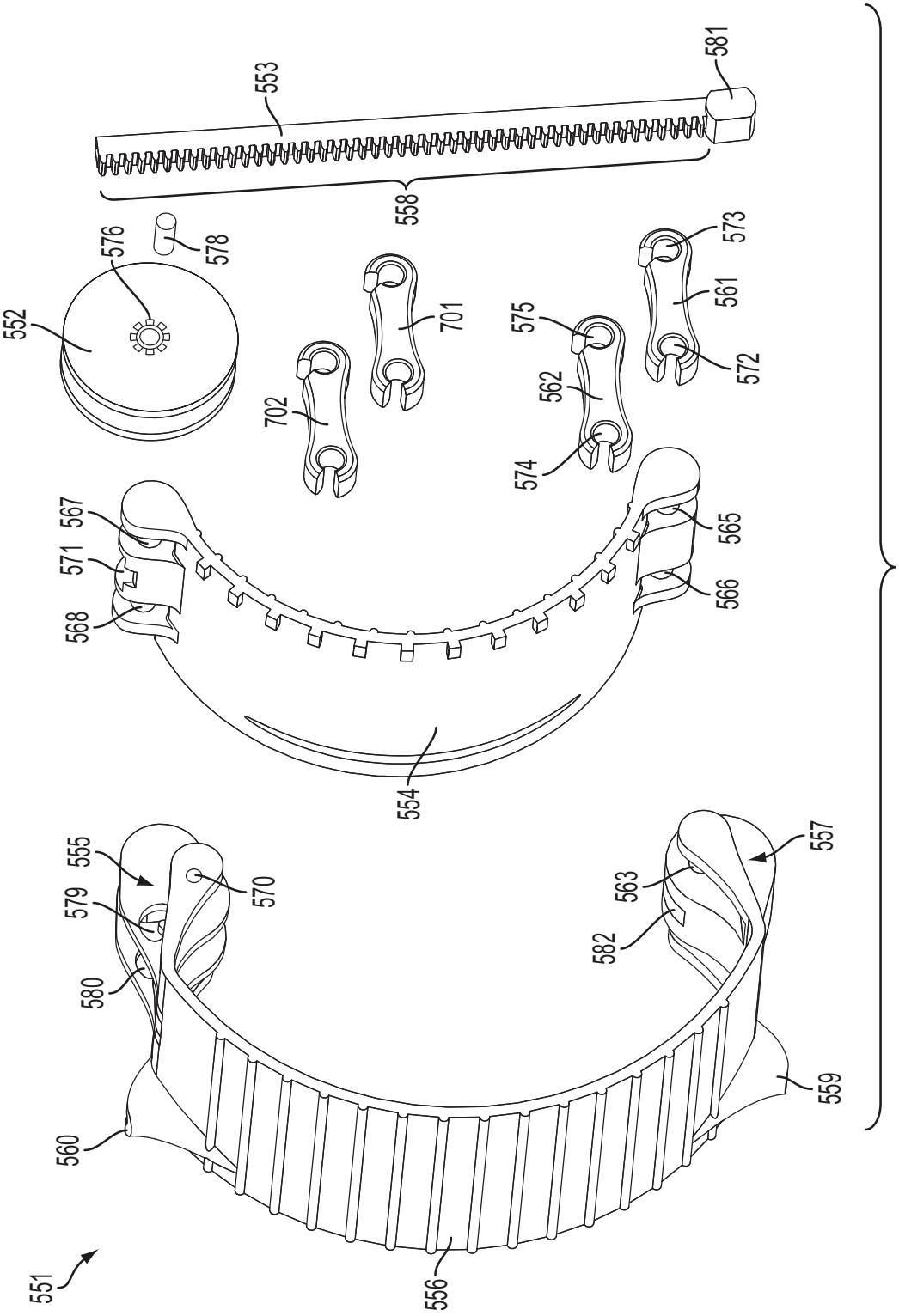

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FIG. 66A

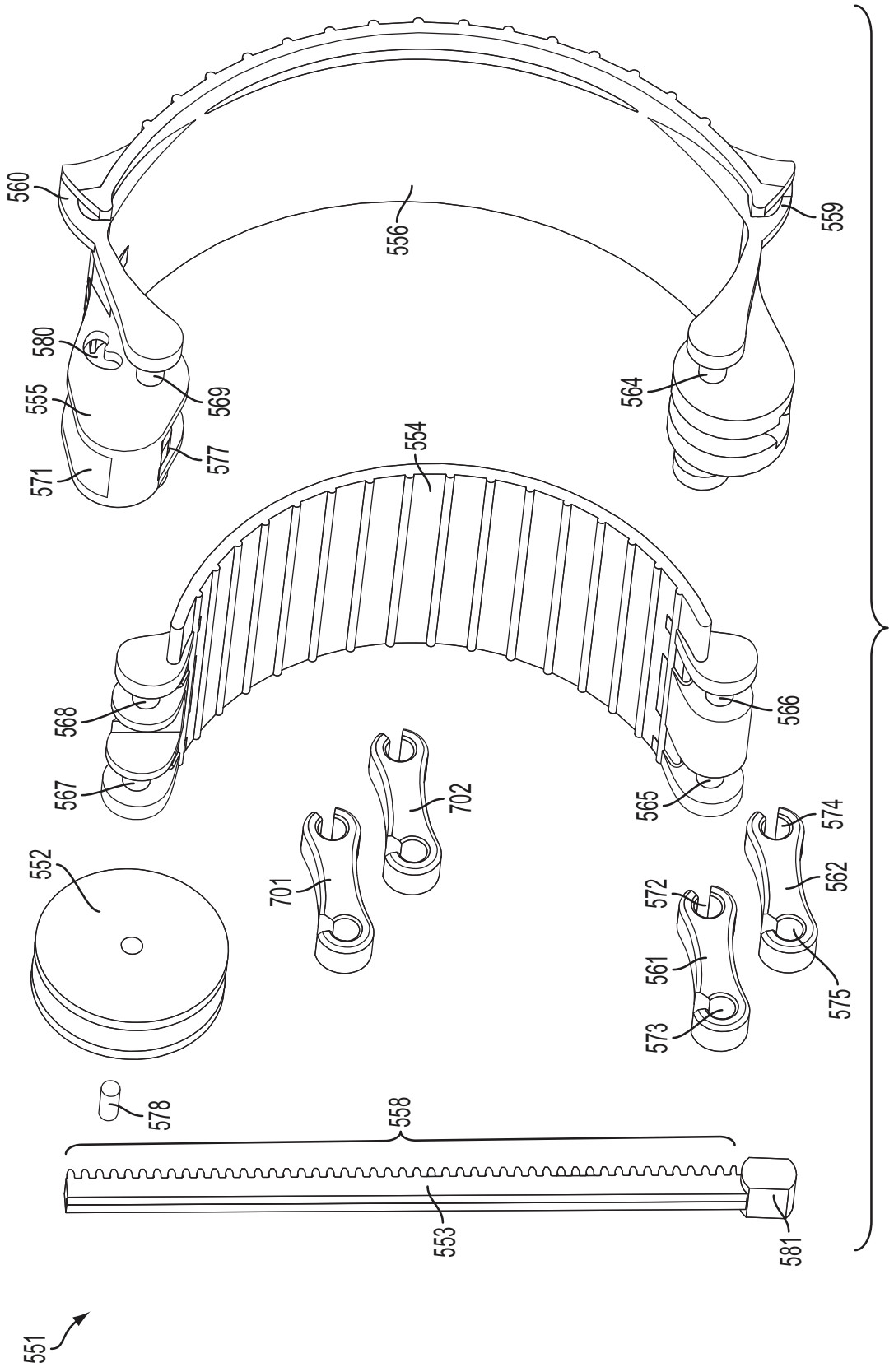

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FIG. 66B

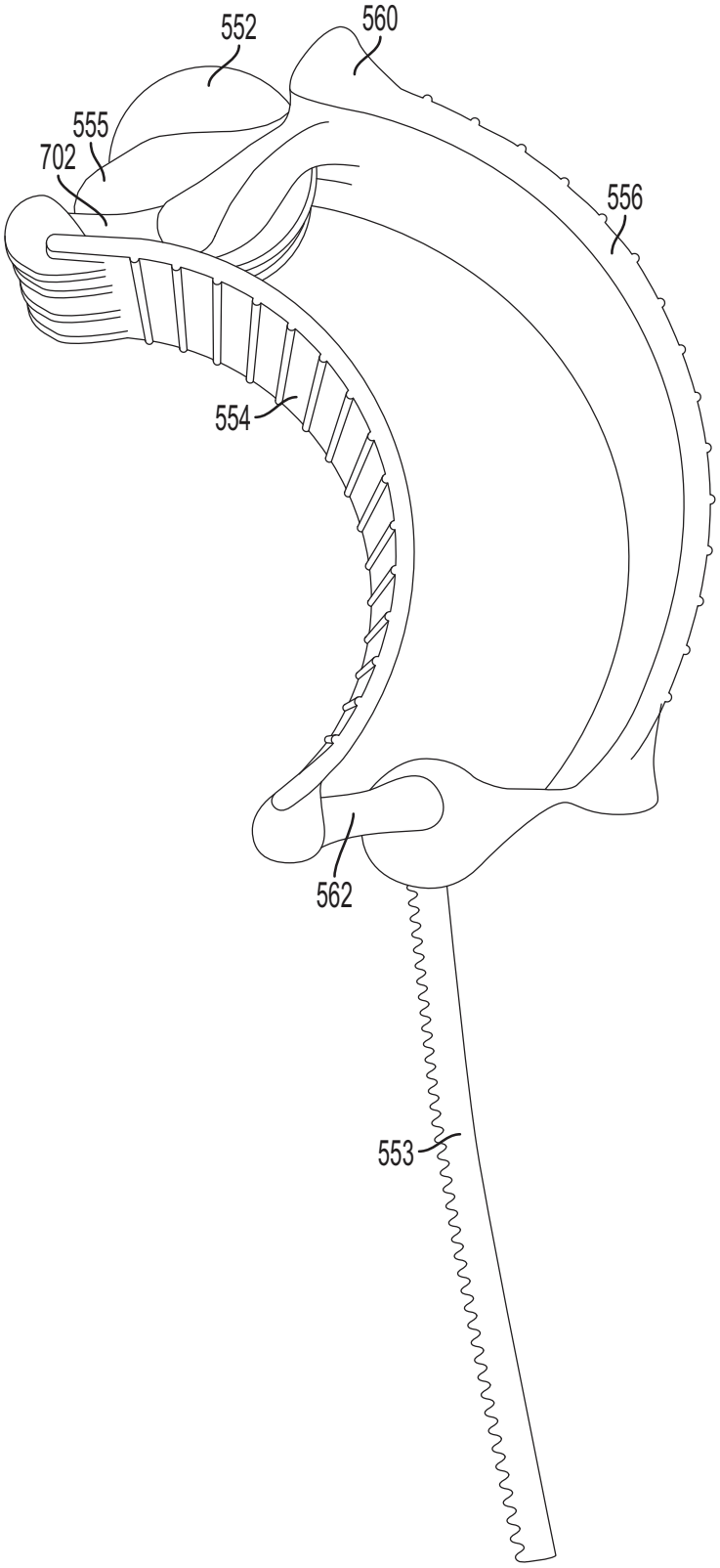


FIG. 66C

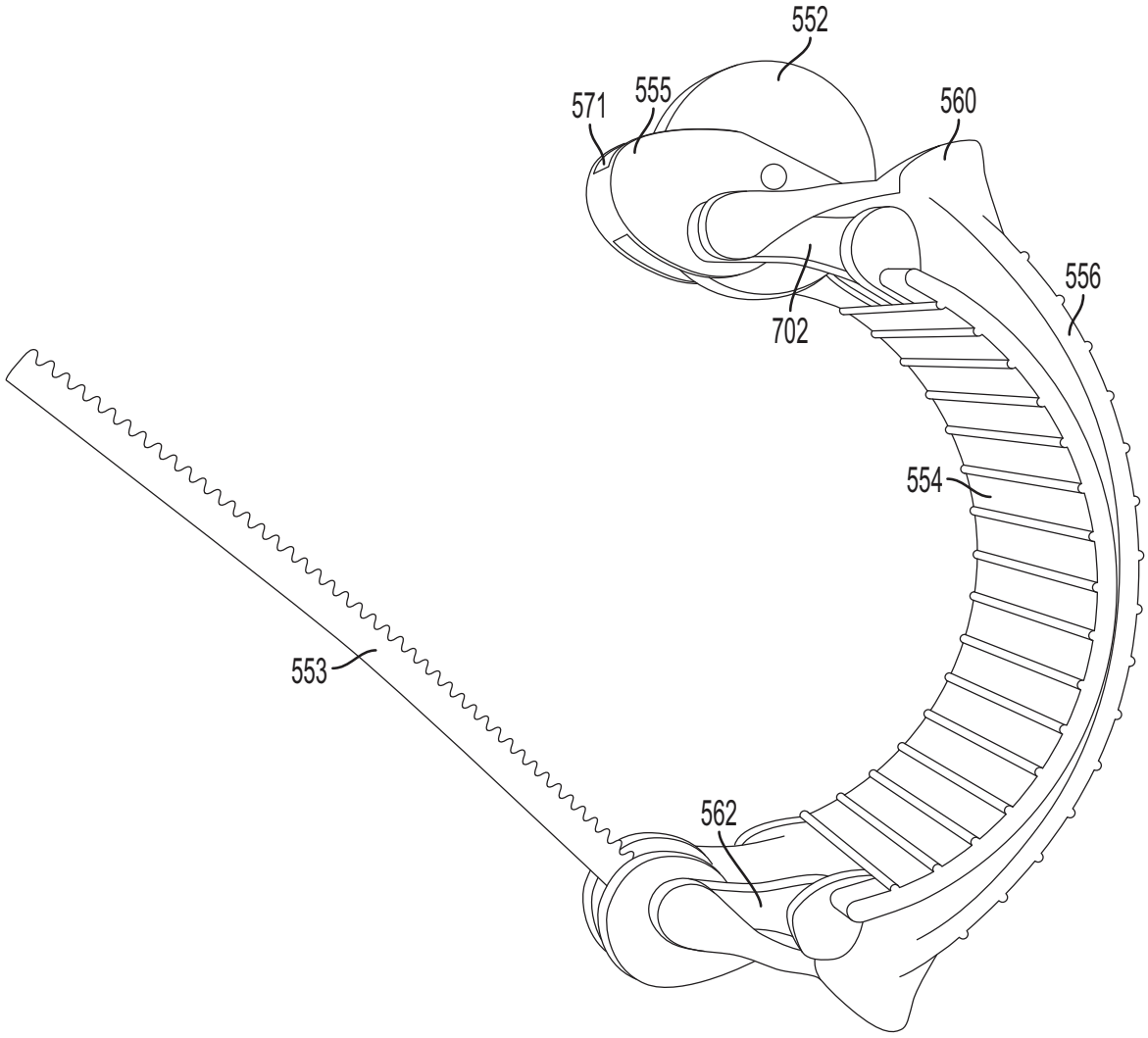


FIG. 66D

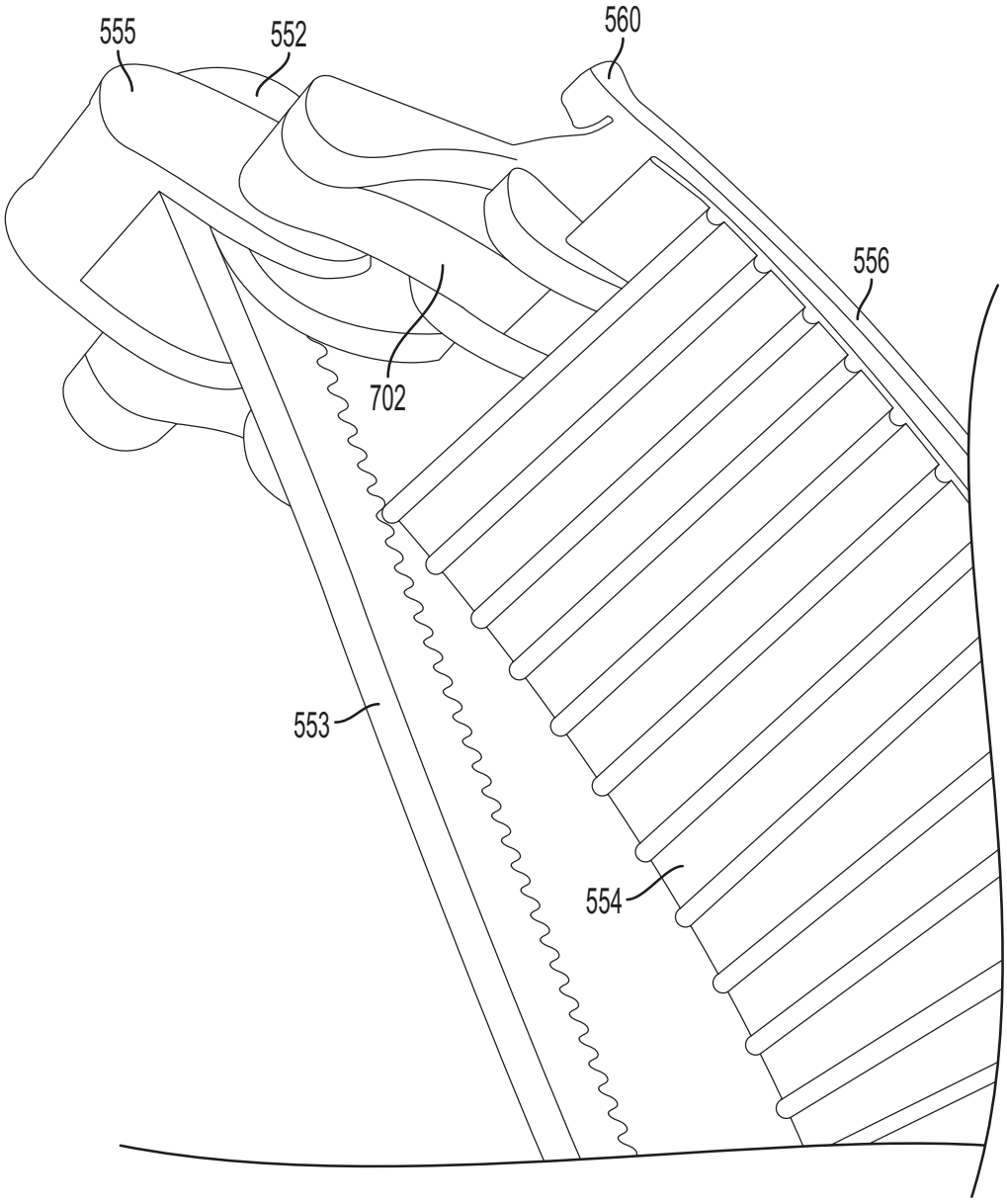


FIG. 66E

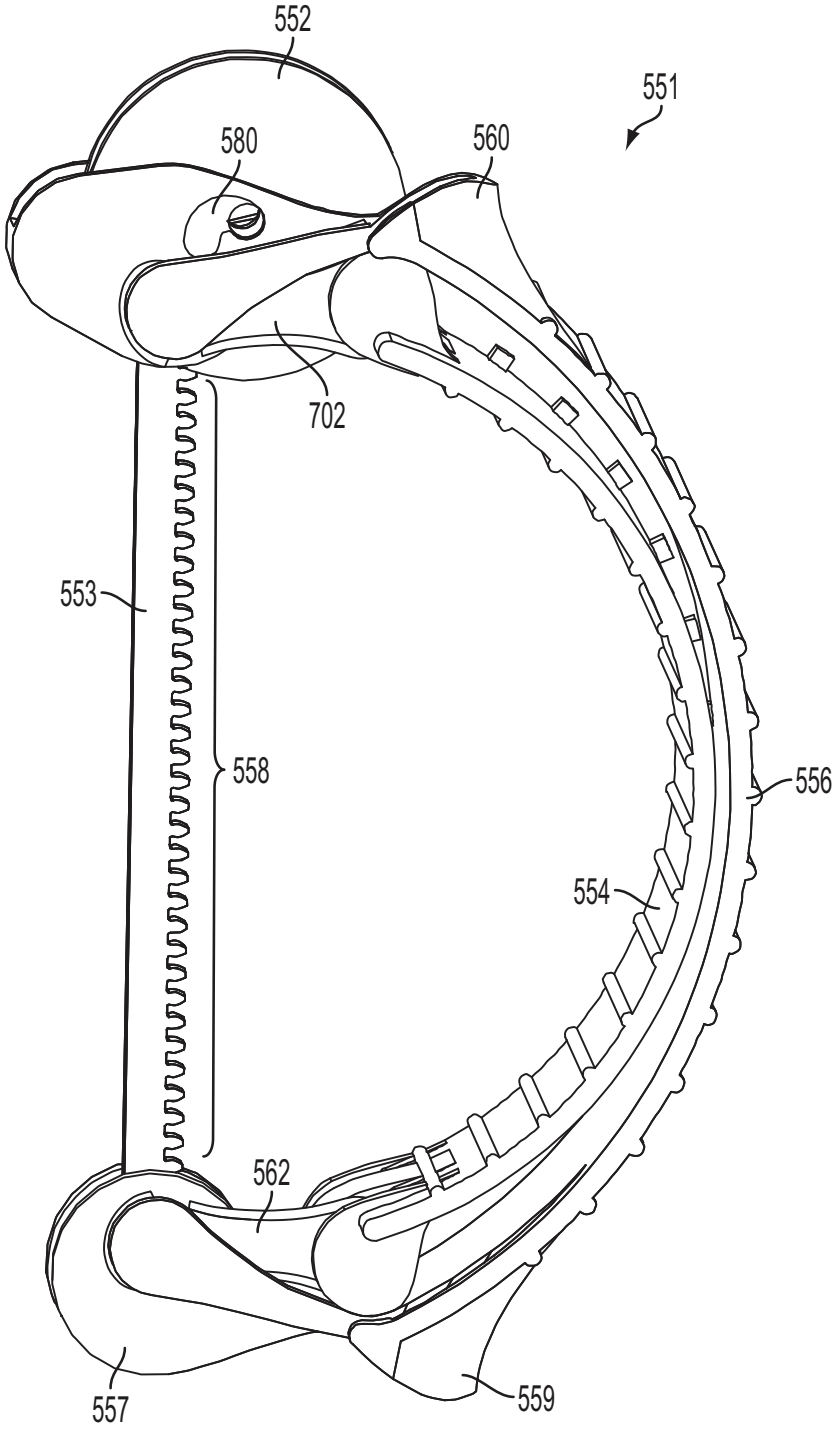


FIG. 66F

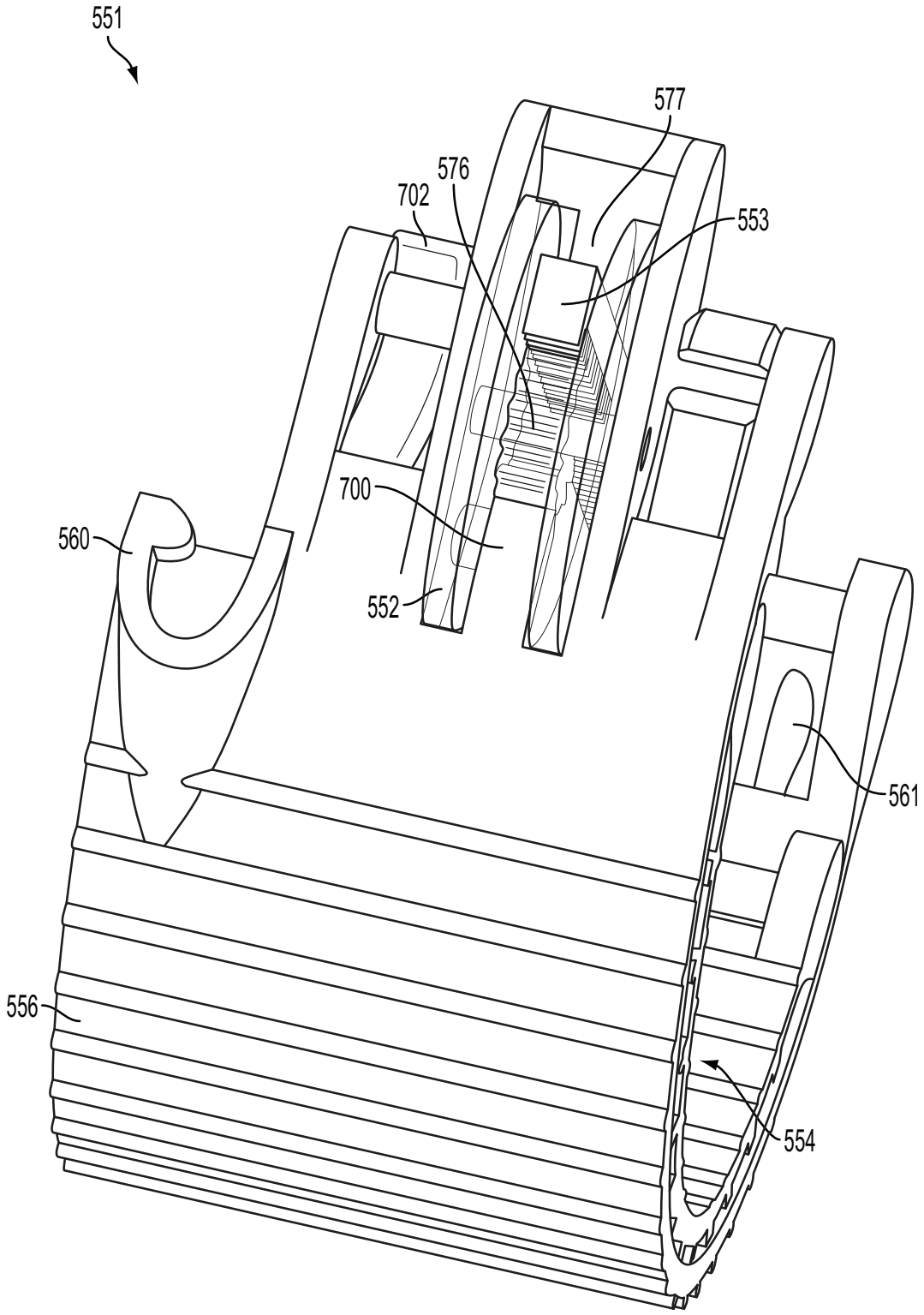


FIG. 66G

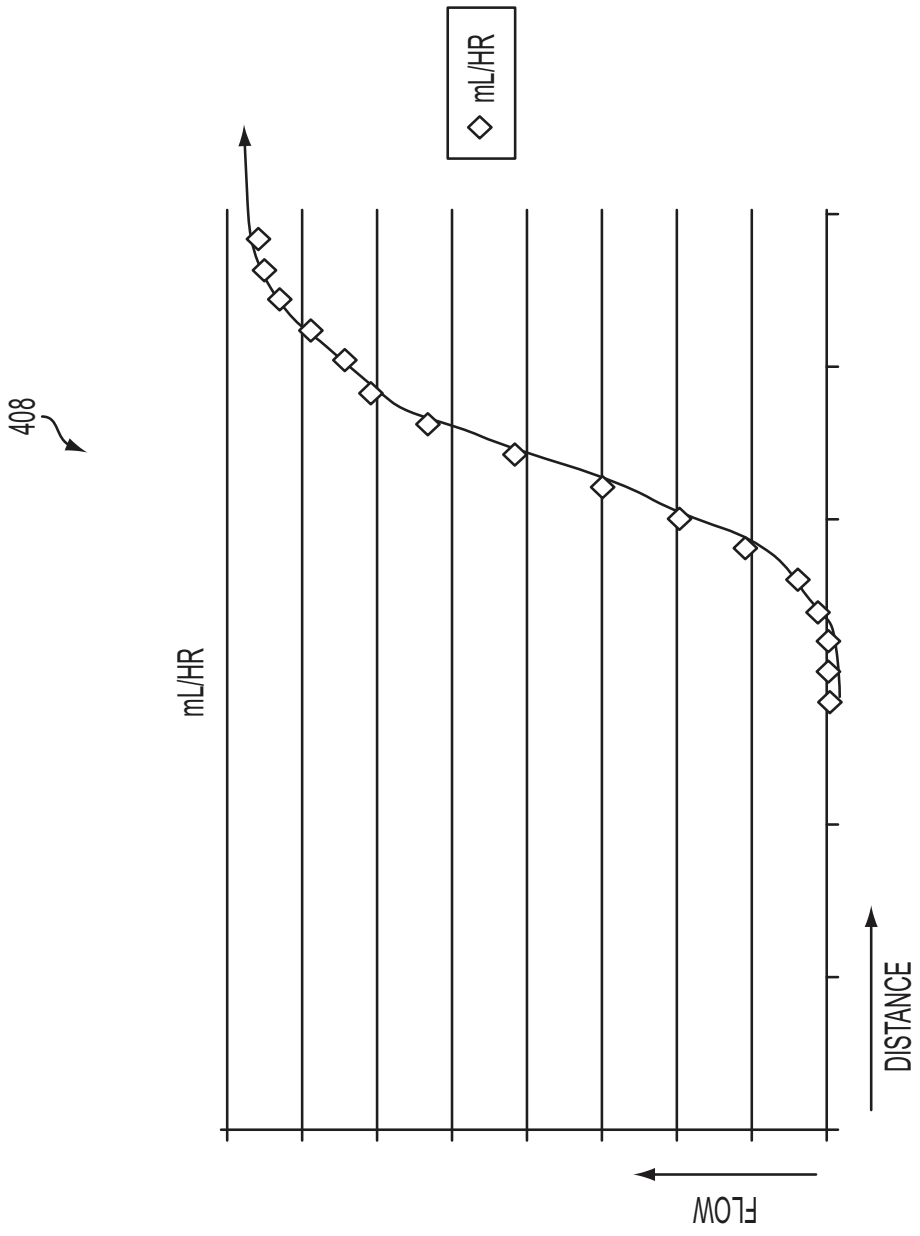


FIG. 67

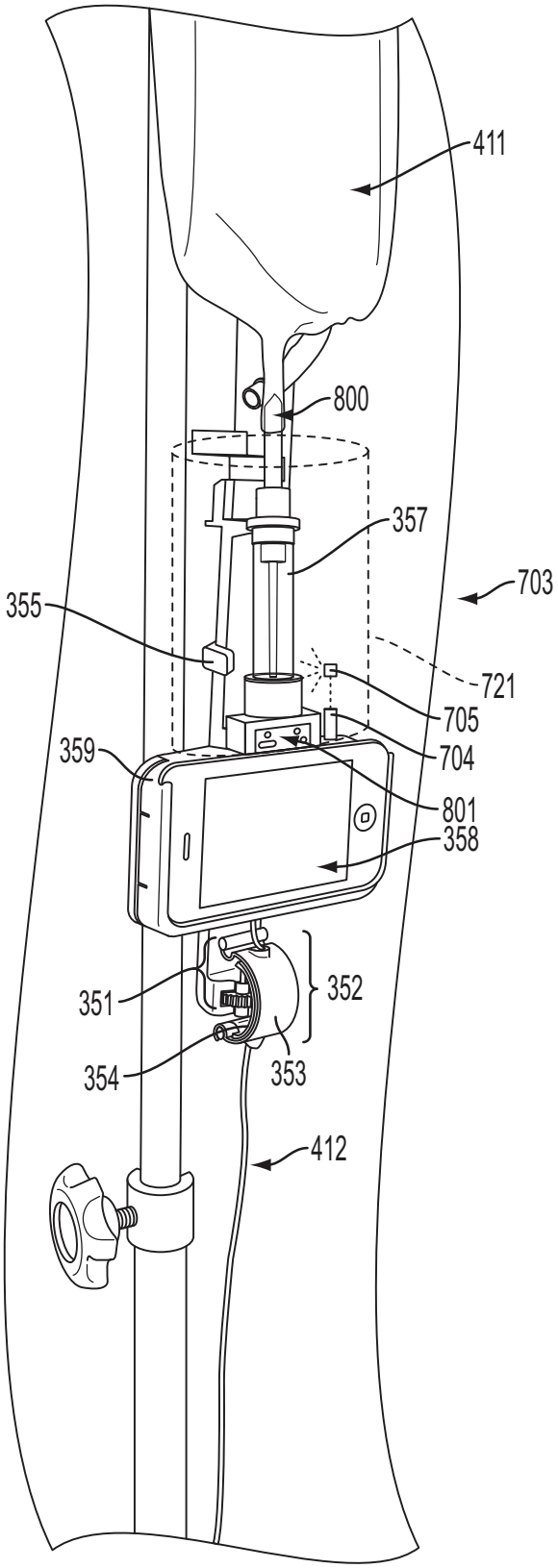


FIG. 68A

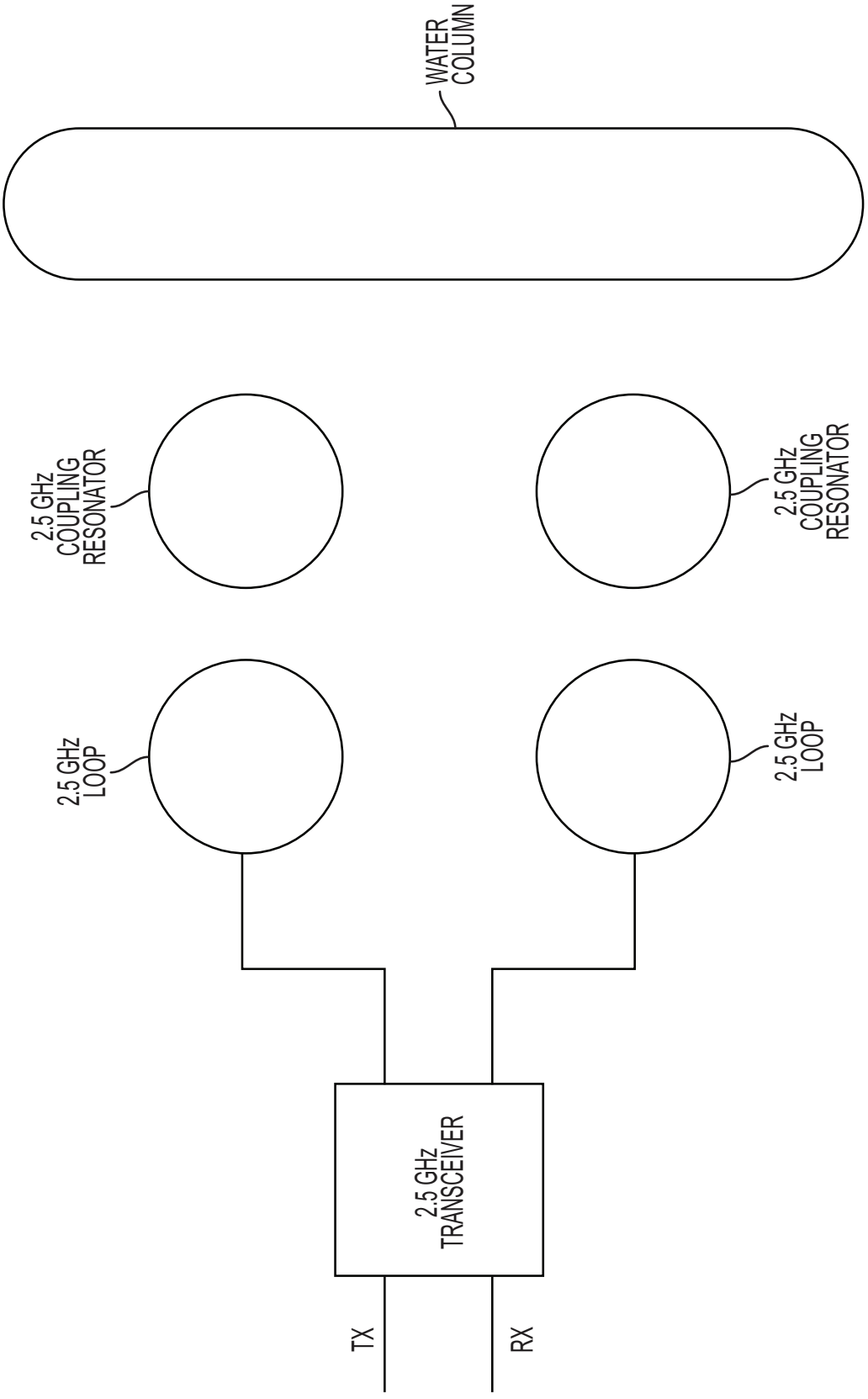

WATER COLUMN
2.5 GHz COUPLING RESONATOR
2.5 GHz COUPLING RESONATOR
2.5 GHz LOOP
2.5 GHz LOOP
2.5 GHz TRANSCEIVER
TX
RX

FIG. 68B

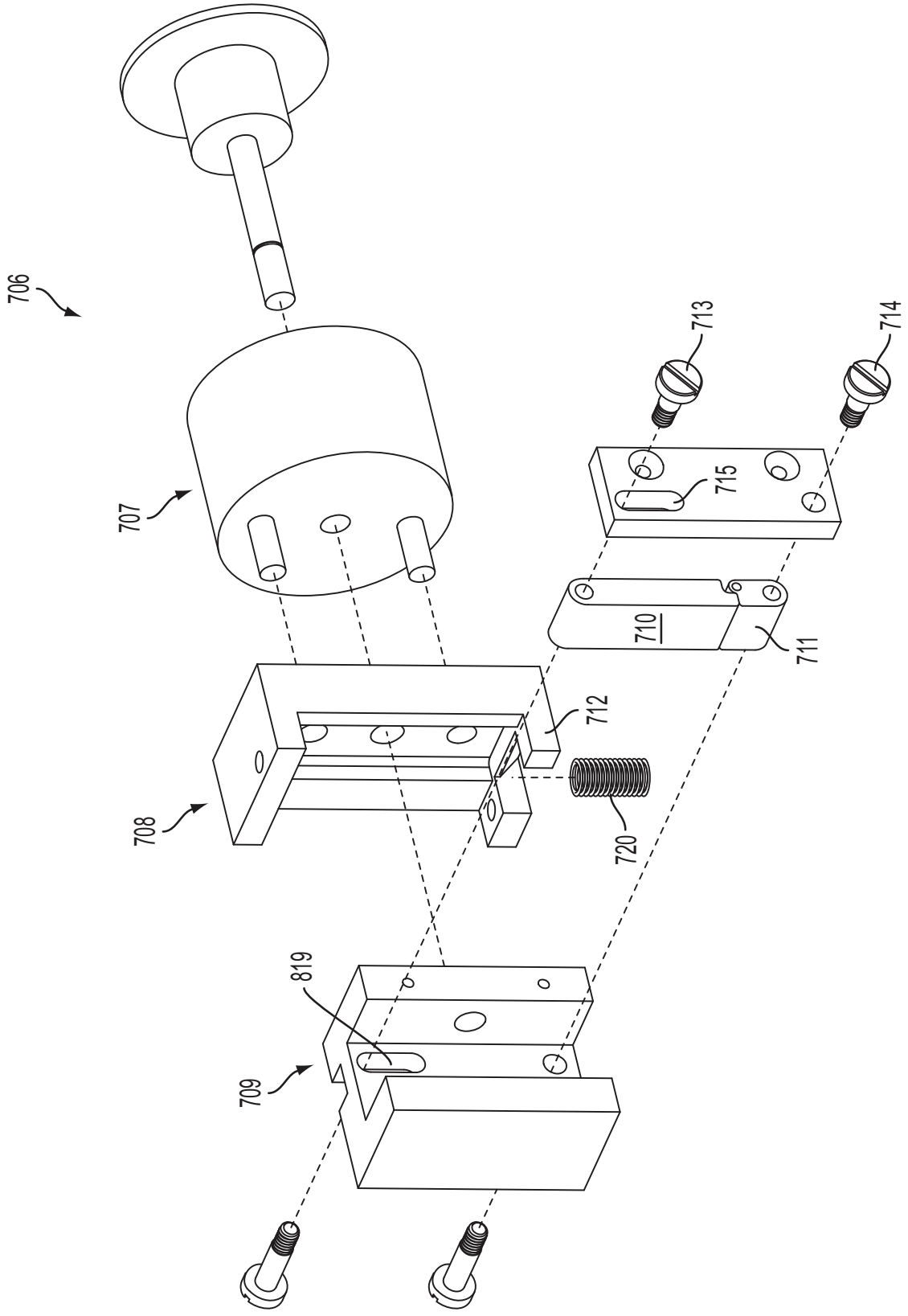


FIG. 69A

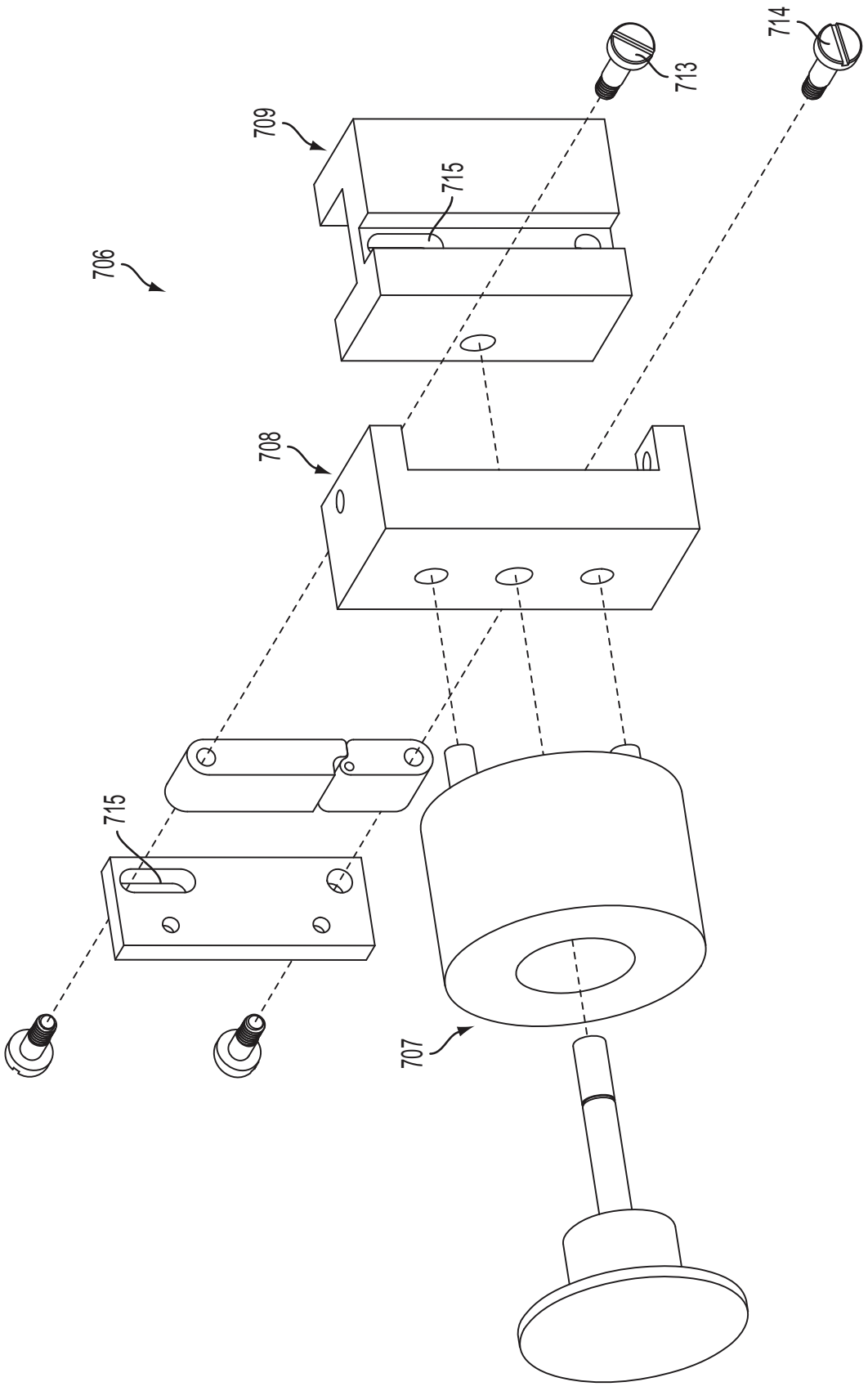


FIG. 69B

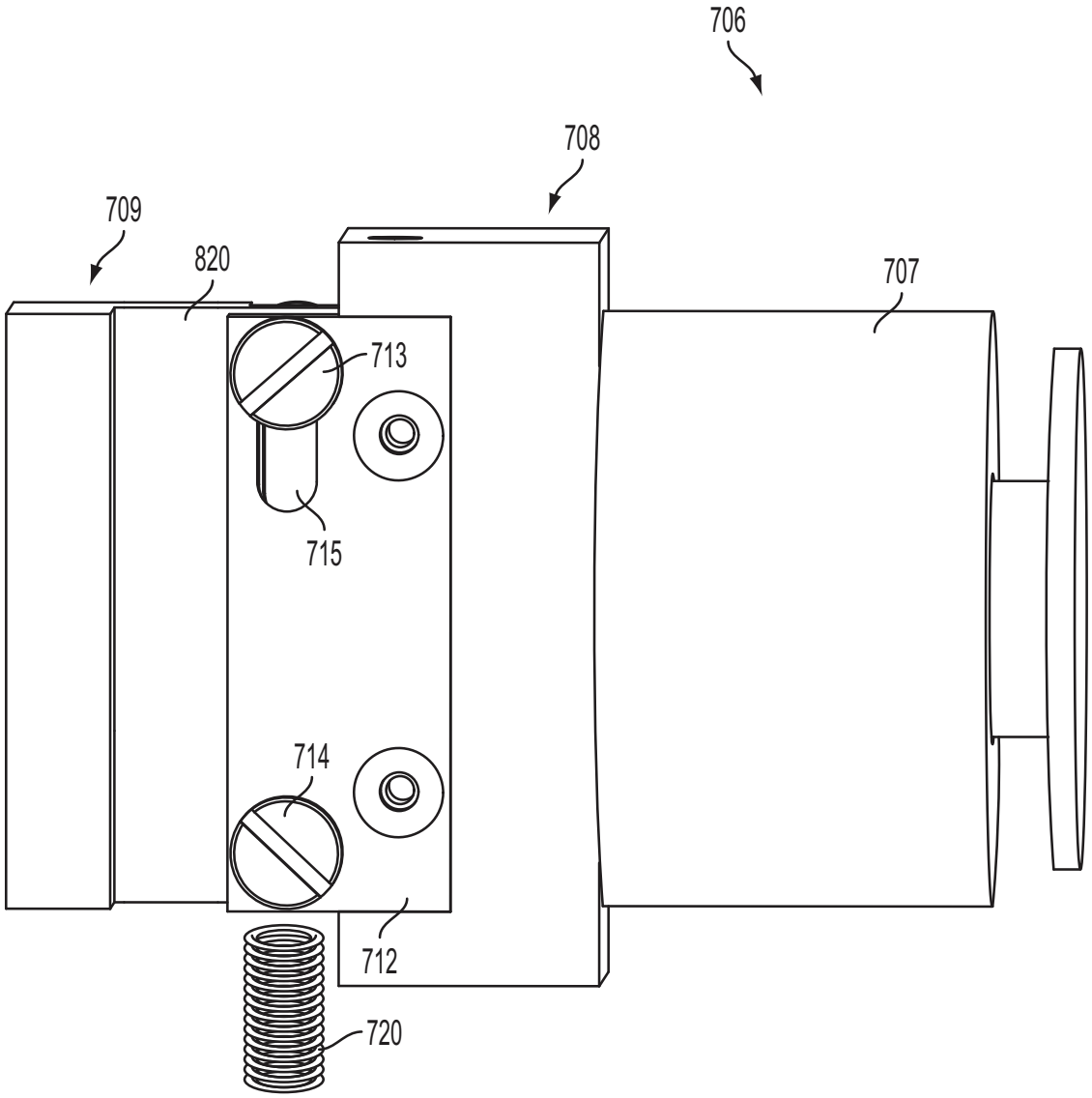


FIG. 69C

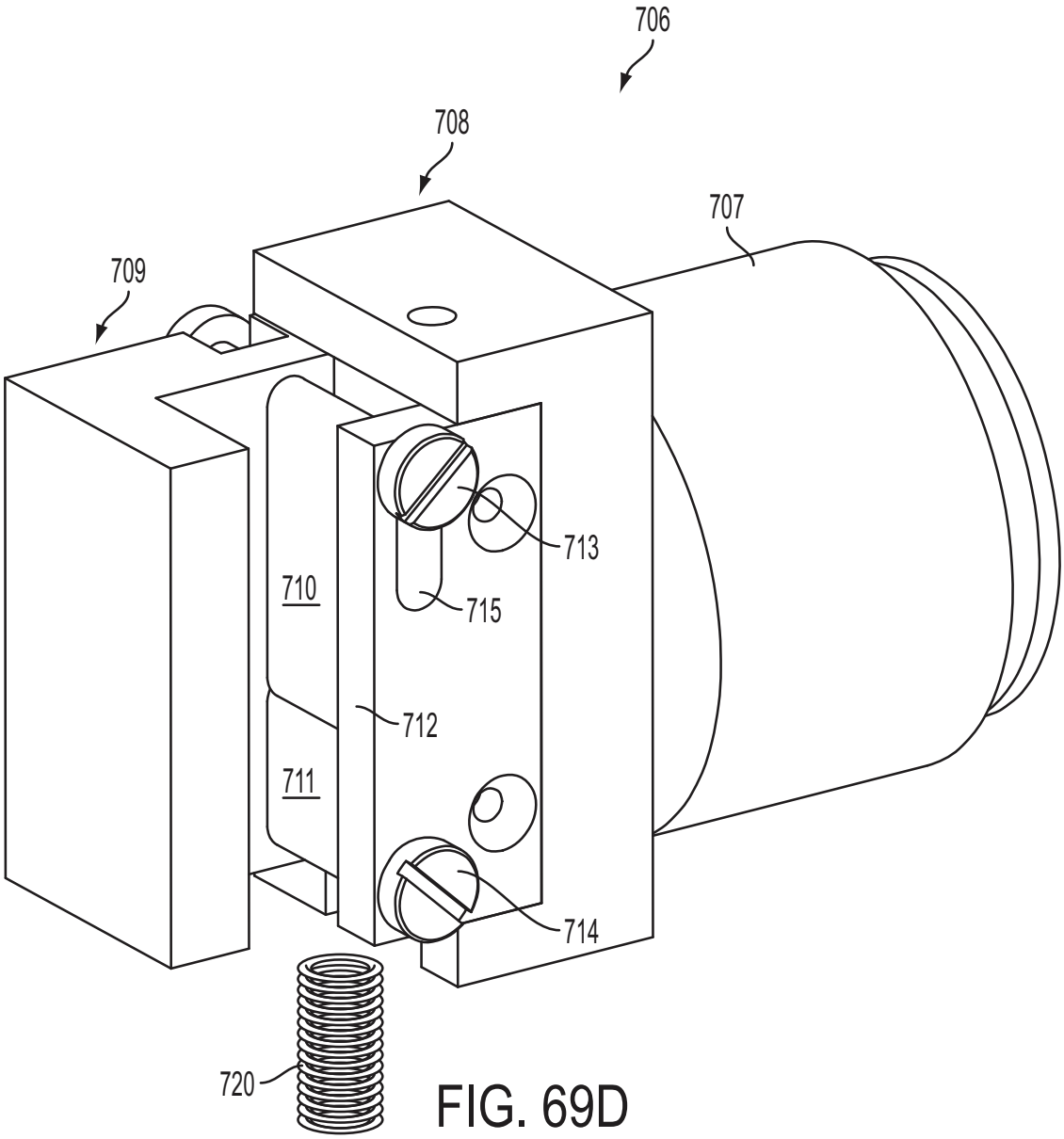


FIG. 69D

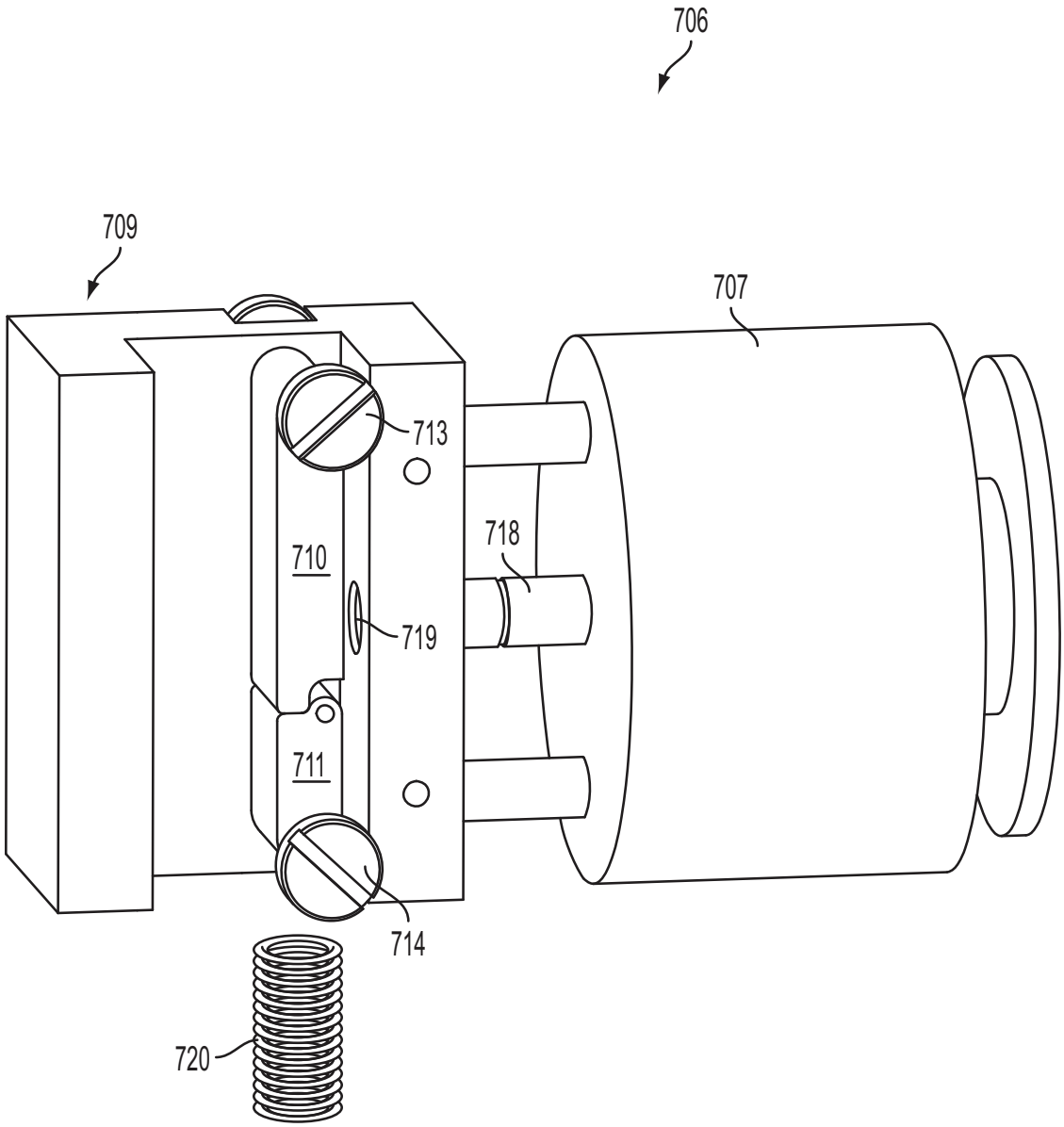


FIG. 69E

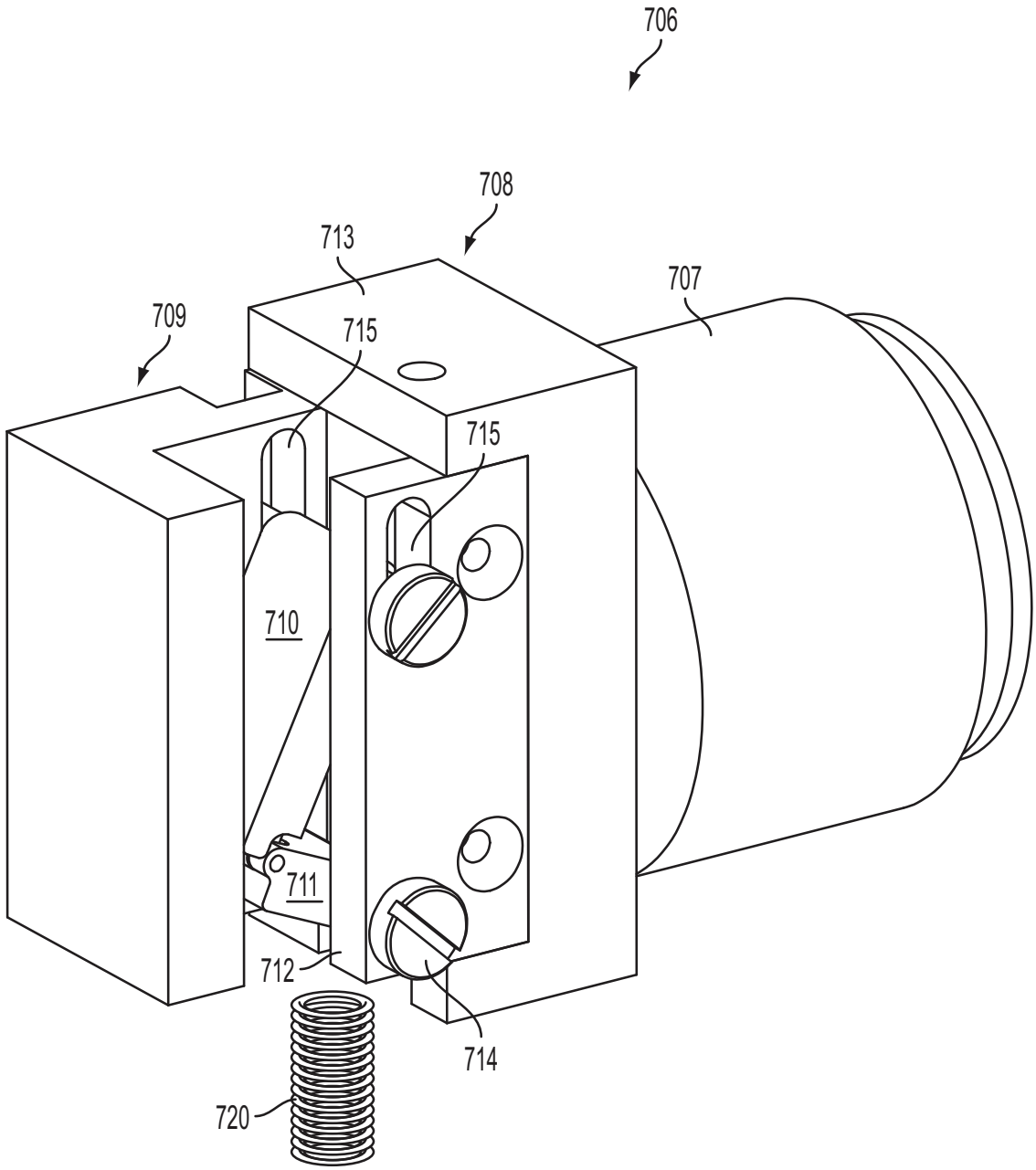


FIG. 69F

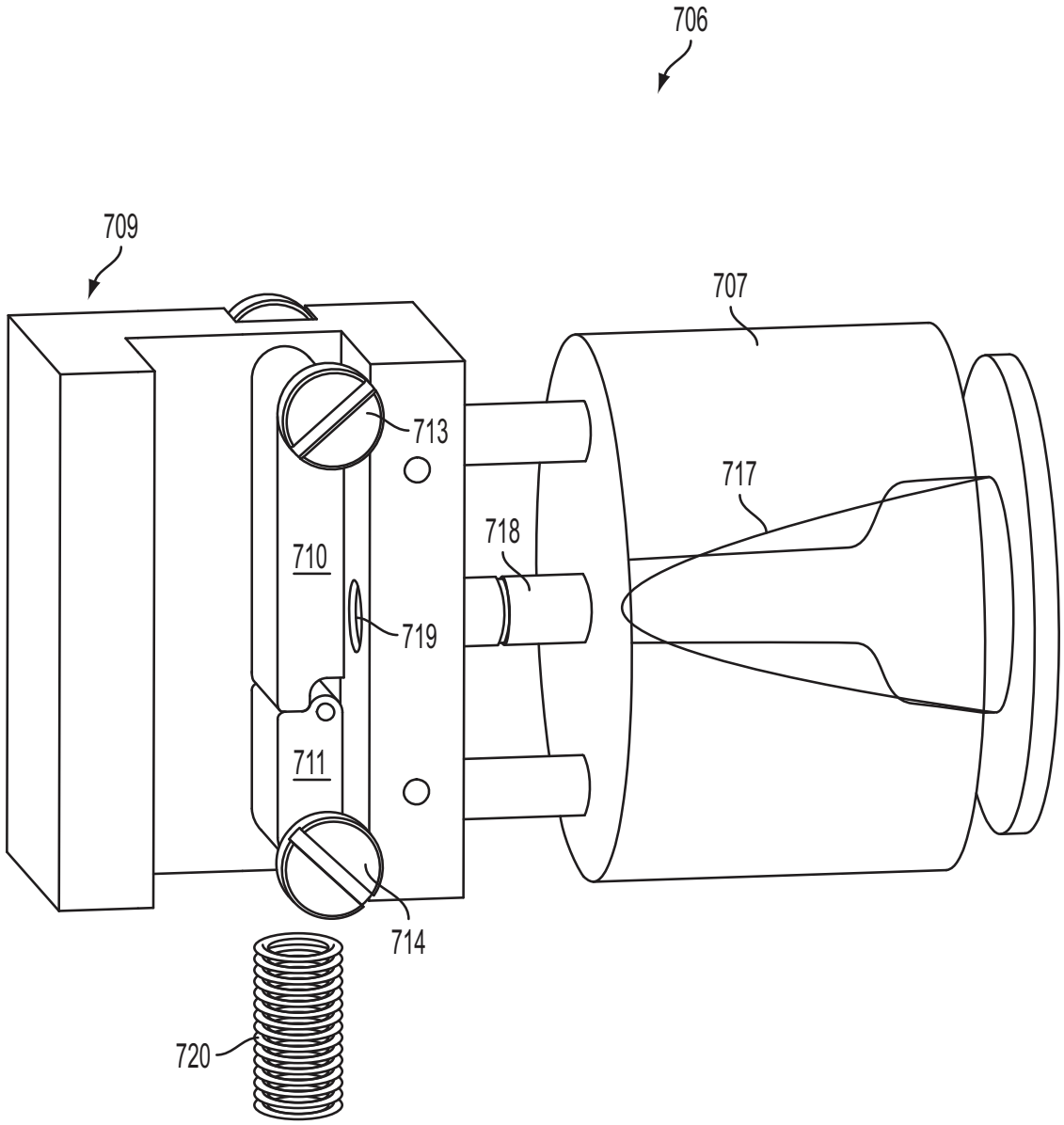


FIG. 69G

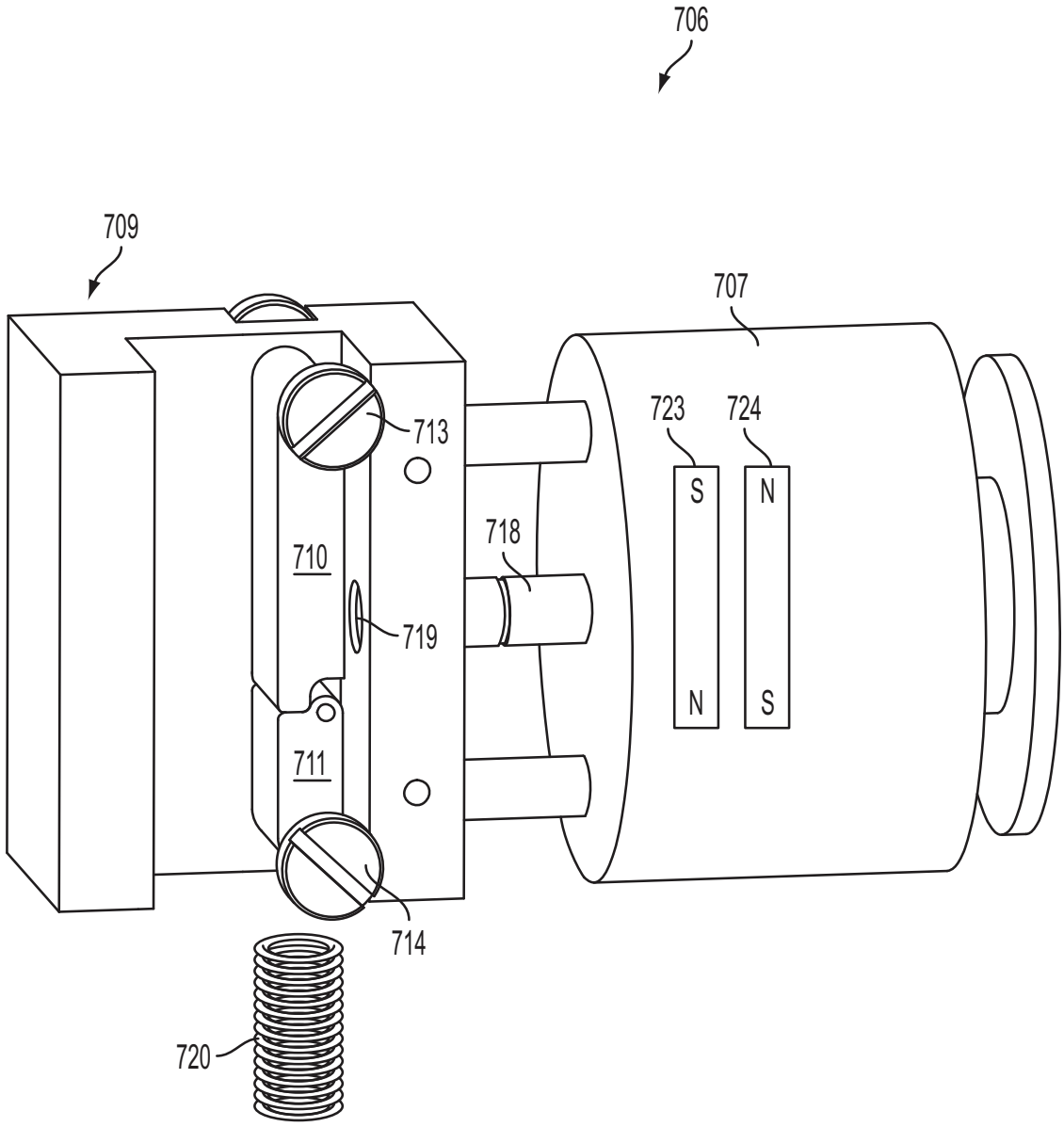


FIG. 69H

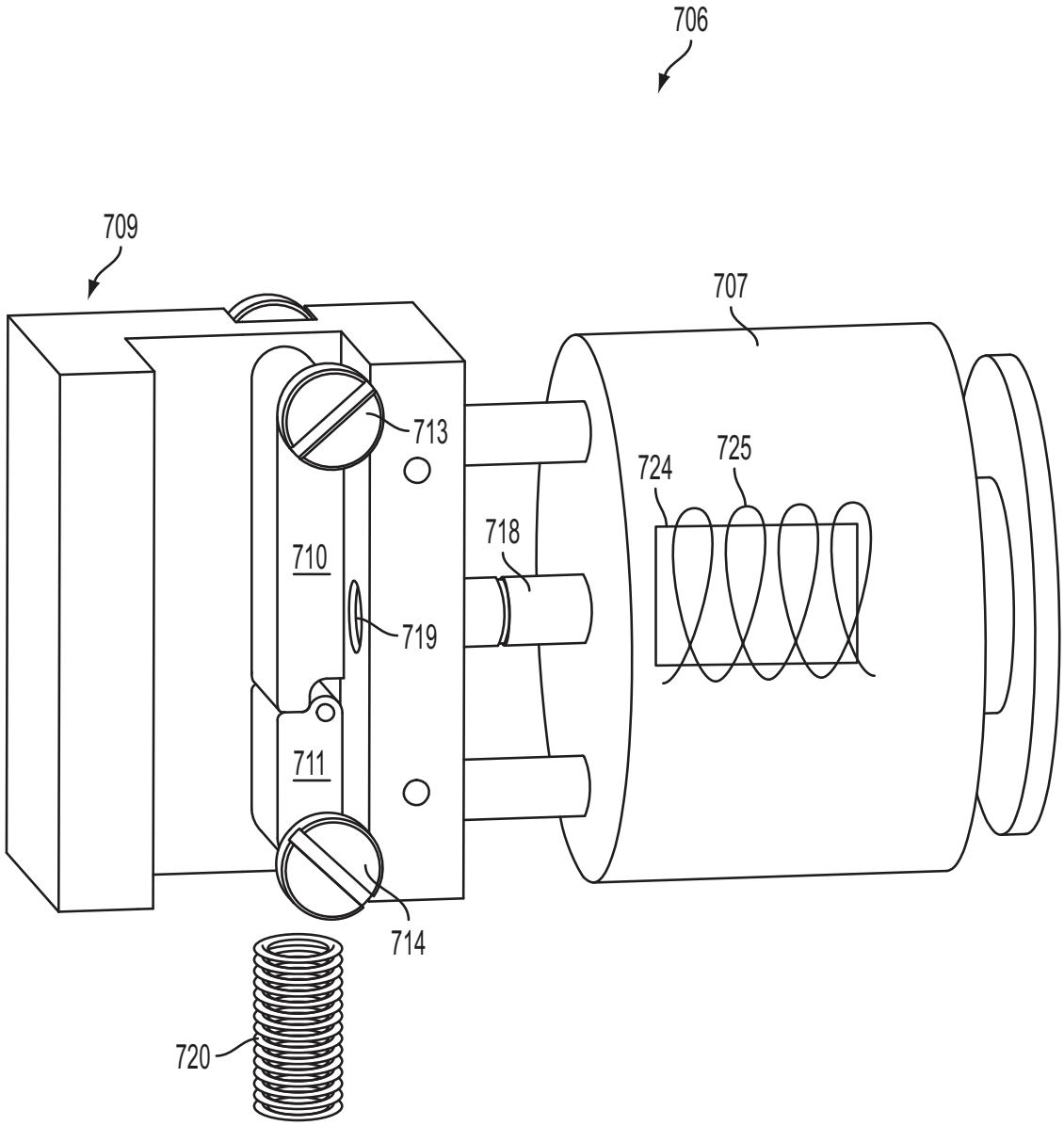


FIG. 69I

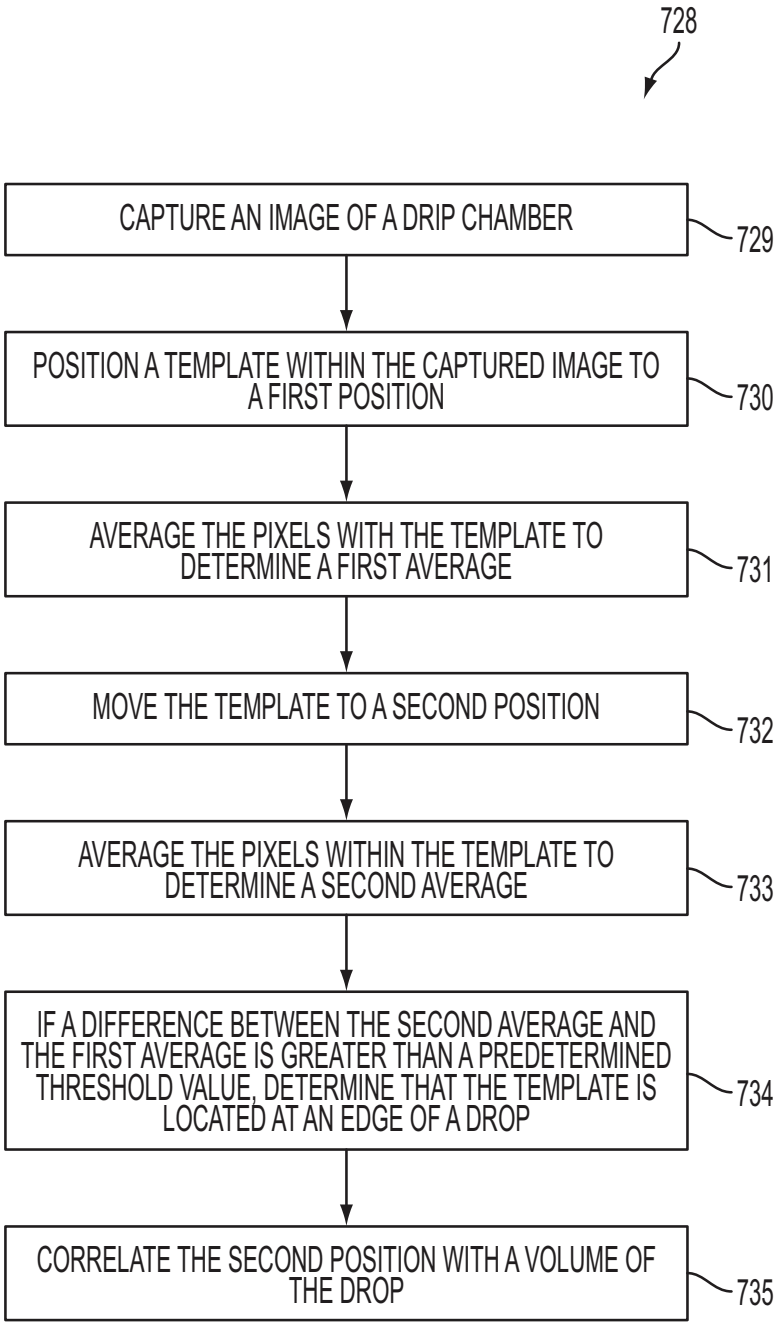

728
CAPTURE AN IMAGE OF A DRIP CHAMBER
729
POSITION A TEMPLATE WITHIN THE CAPTURED IMAGE TO A FIRST POSITION
730
AVERAGE THE PIXELS WITH THE TEMPLATE TO DETERMINE A FIRST AVERAGE
731
MOVE THE TEMPLATE TO A SECOND POSITION
732
AVERAGE THE PIXELS WITHIN THE TEMPLATE TO DETERMINE A SECOND AVERAGE
733
IF A DIFFERENCE BETWEEN THE SECOND AVERAGE AND THE FIRST AVERAGE IS GREATER THAN A PREDETERMINED THRESHOLD VALUE, DETERMINE THAT THE TEMPLATE IS LOCATED AT AN EDGE OF A DROP
734
CORRELATE THE SECOND POSITION WITH A VOLUME OF THE DROP
735

FIG. 70

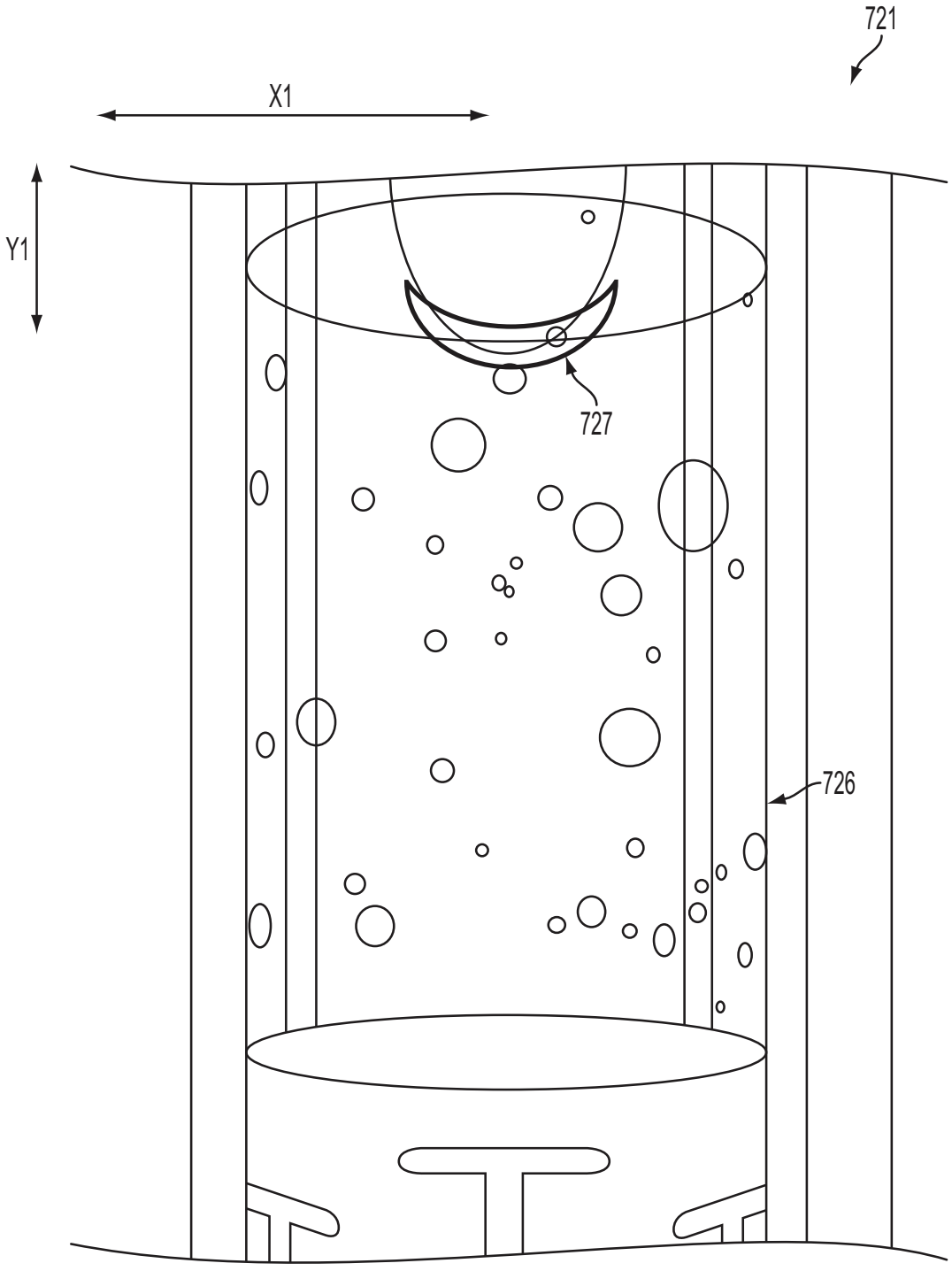


FIG. 71A

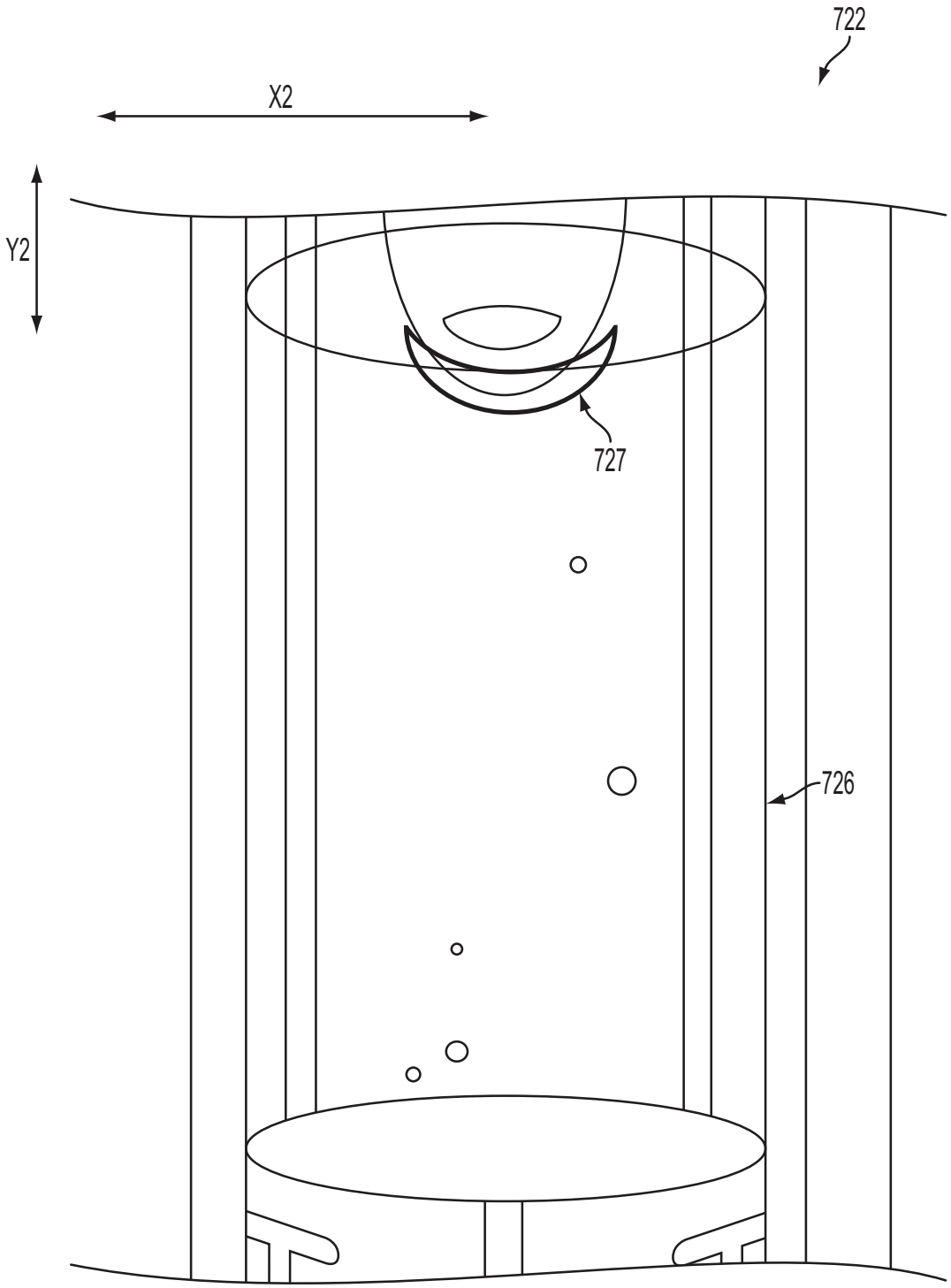


FIG. 71B

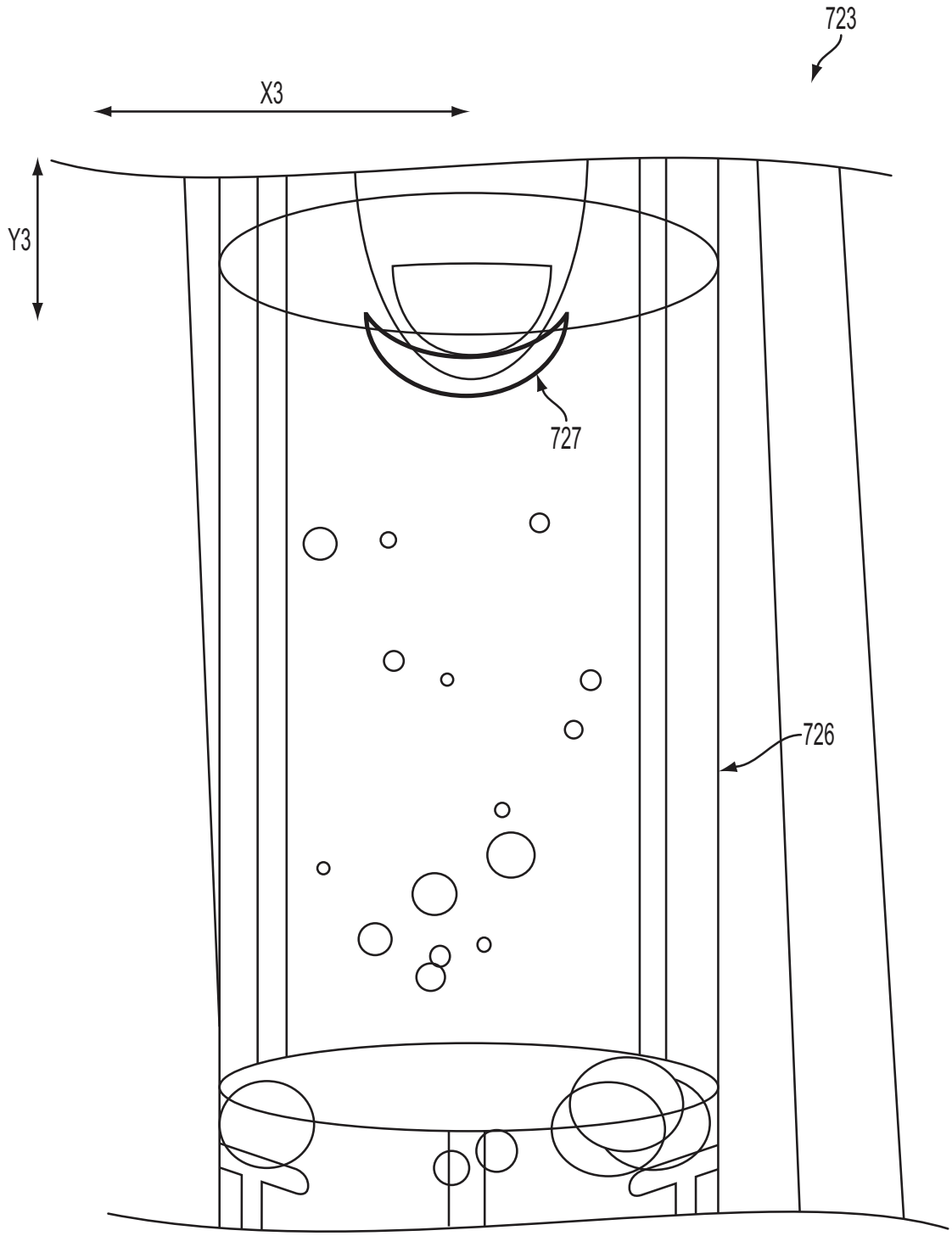


FIG. 71C

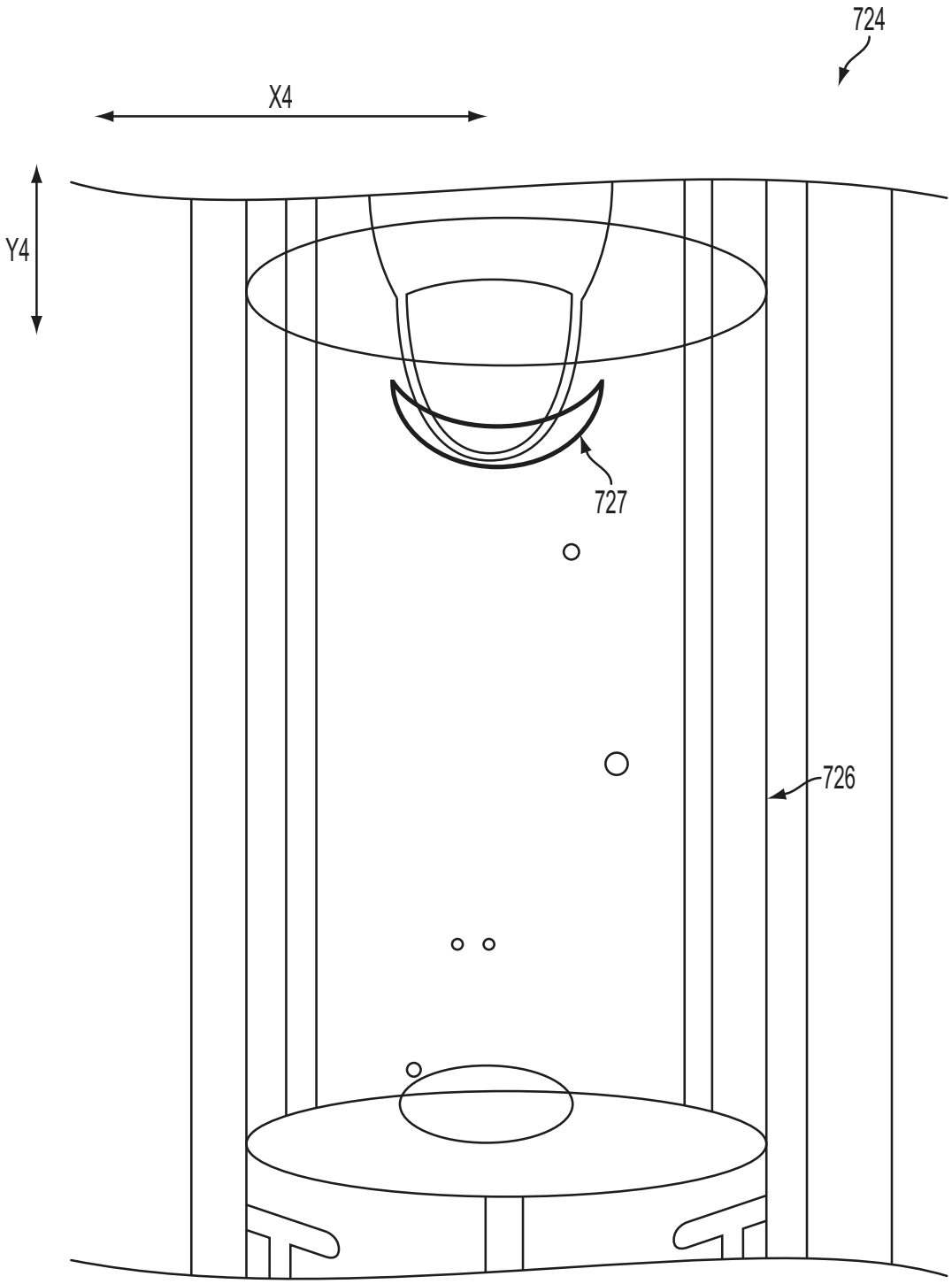


FIG. 71D

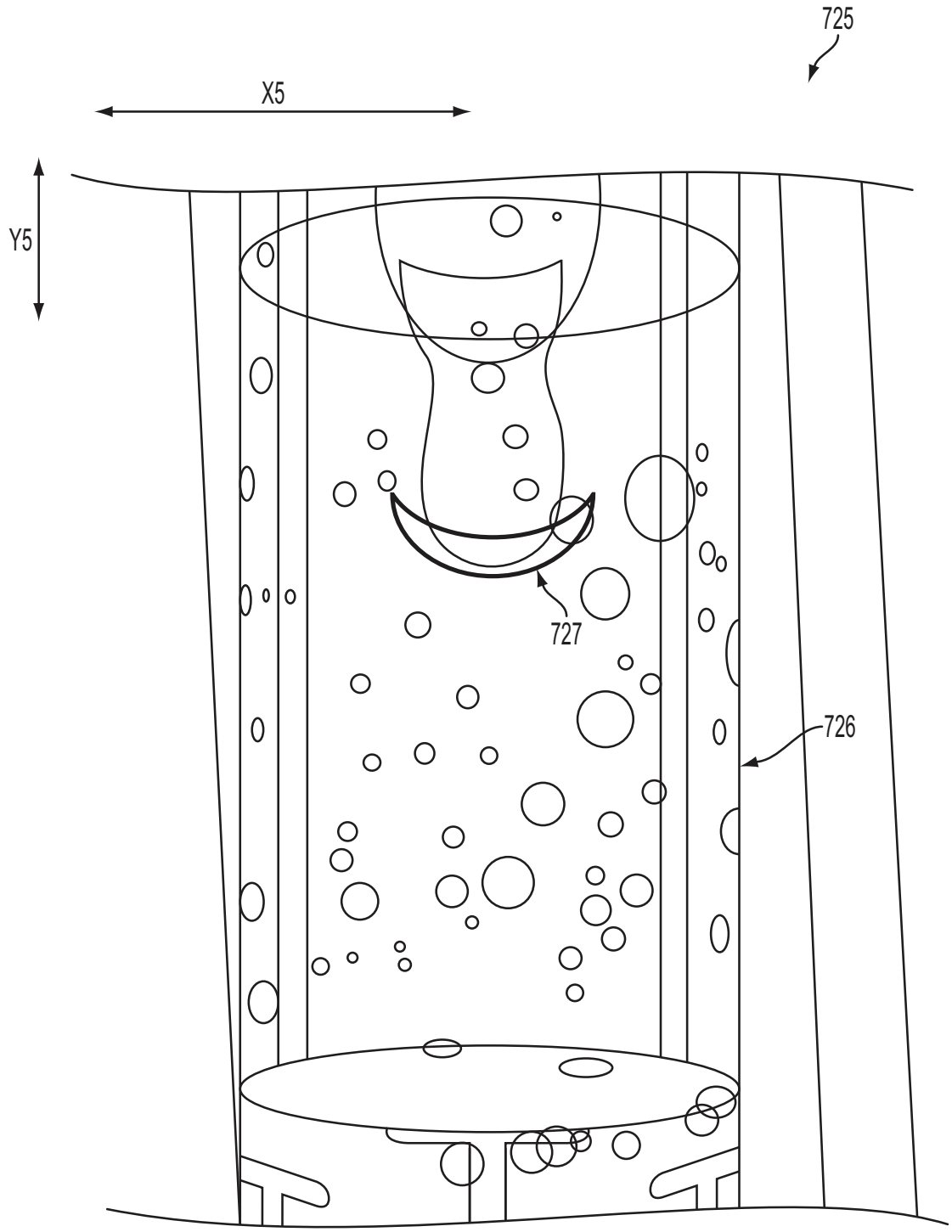


FIG. 71E

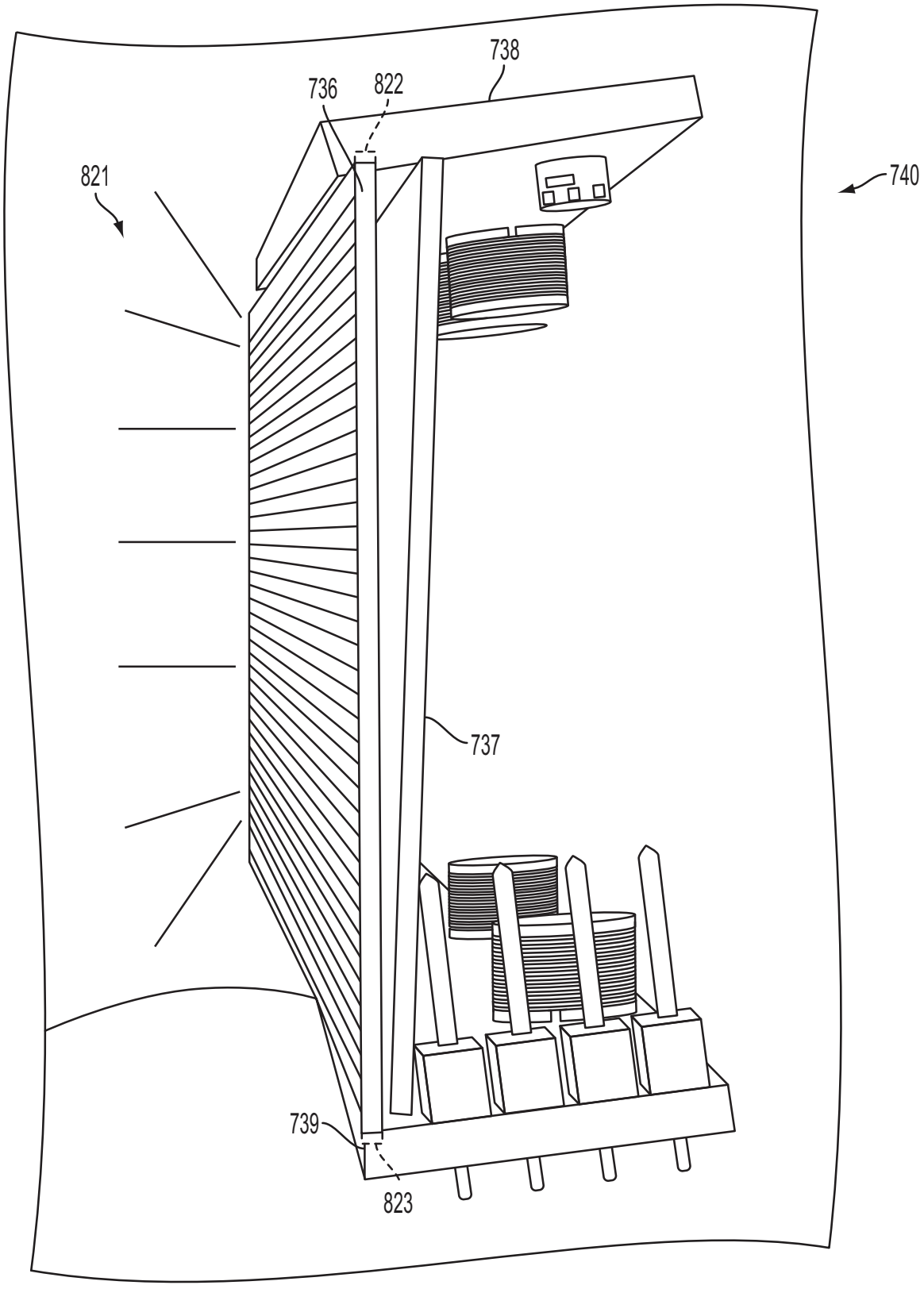


FIG. 72

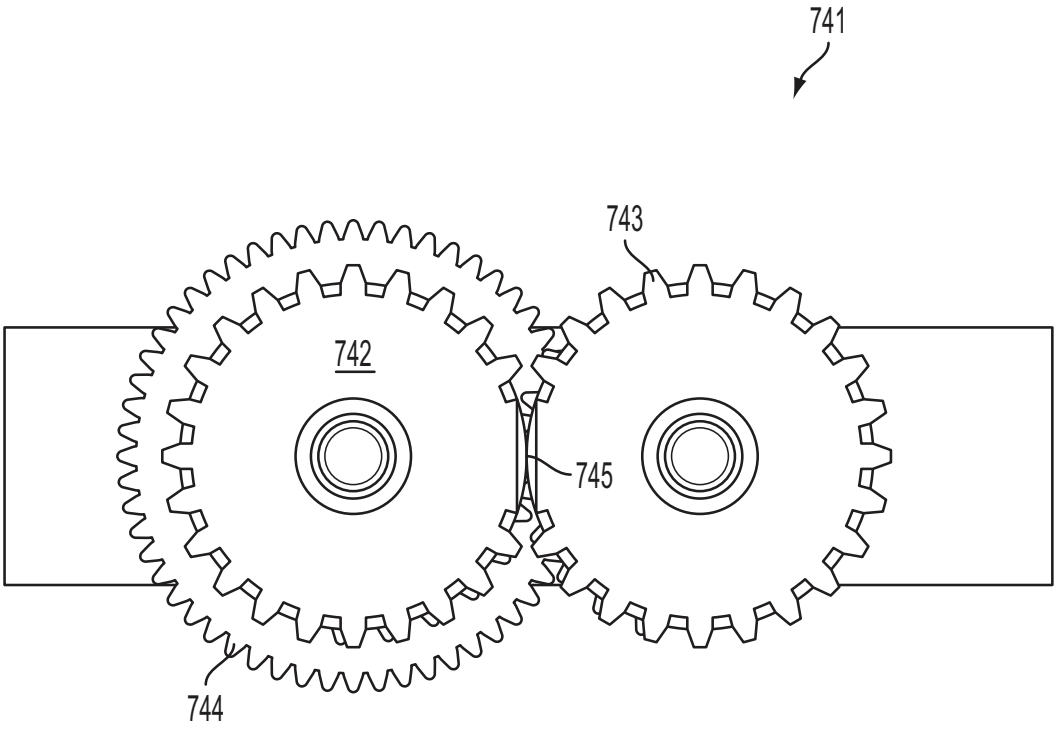


FIG. 73A

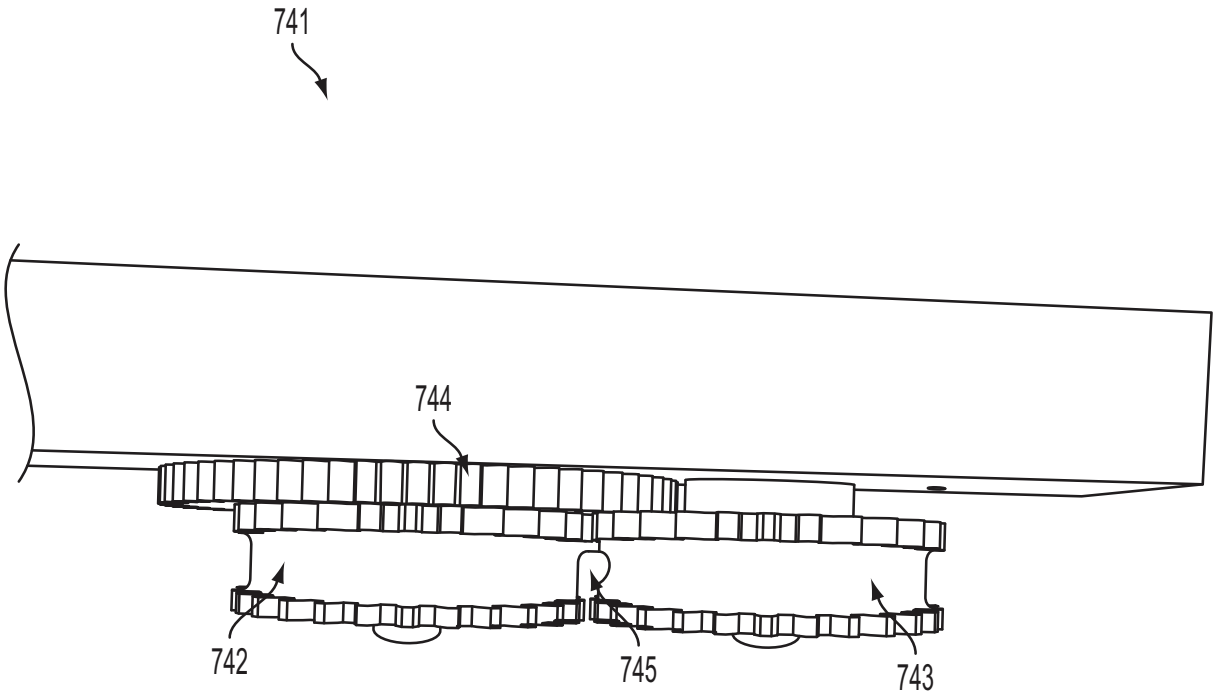


FIG. 73B

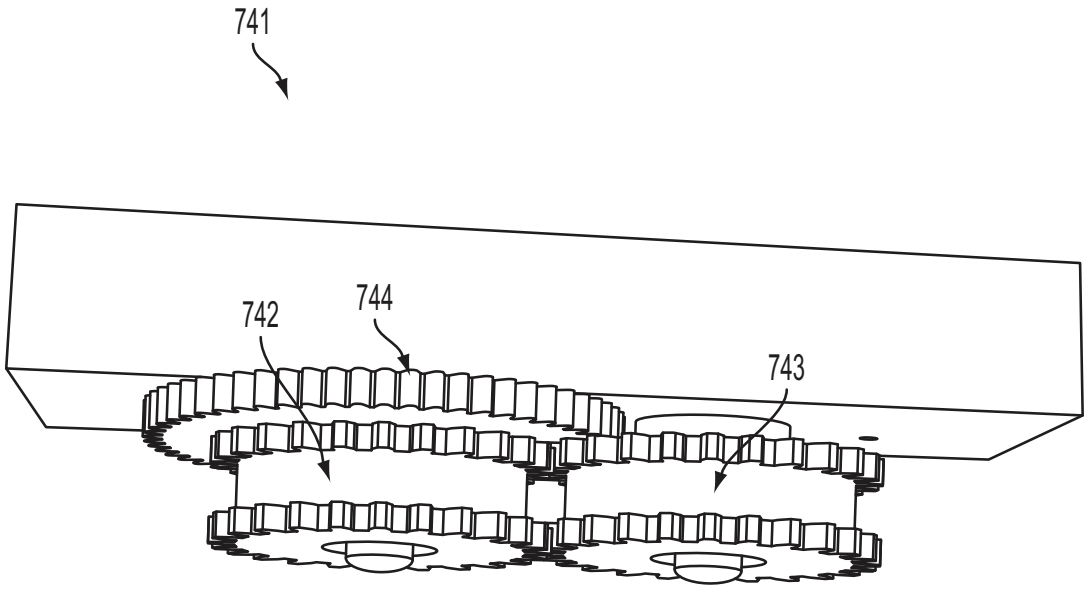


FIG. 73C

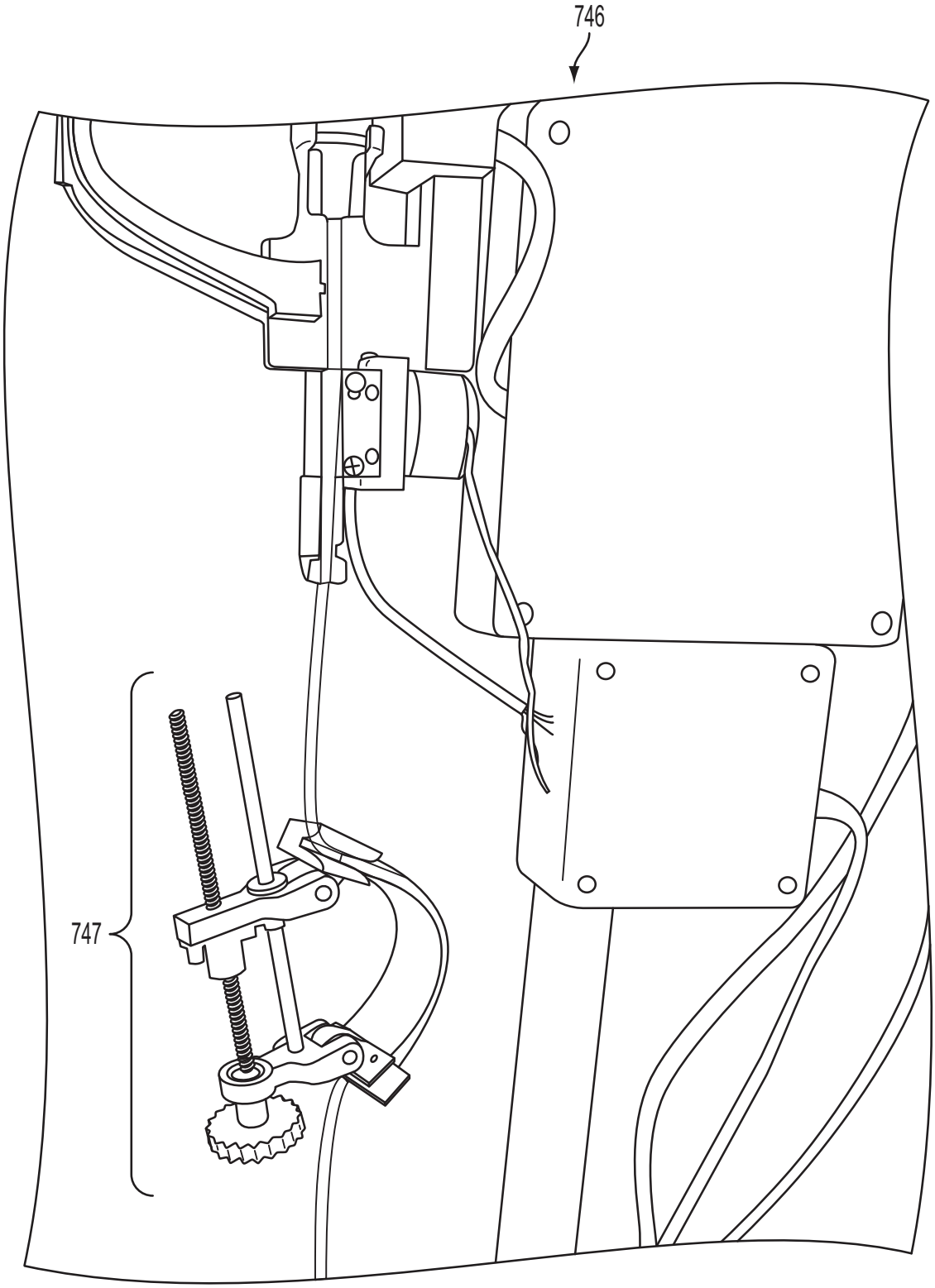


FIG. 74

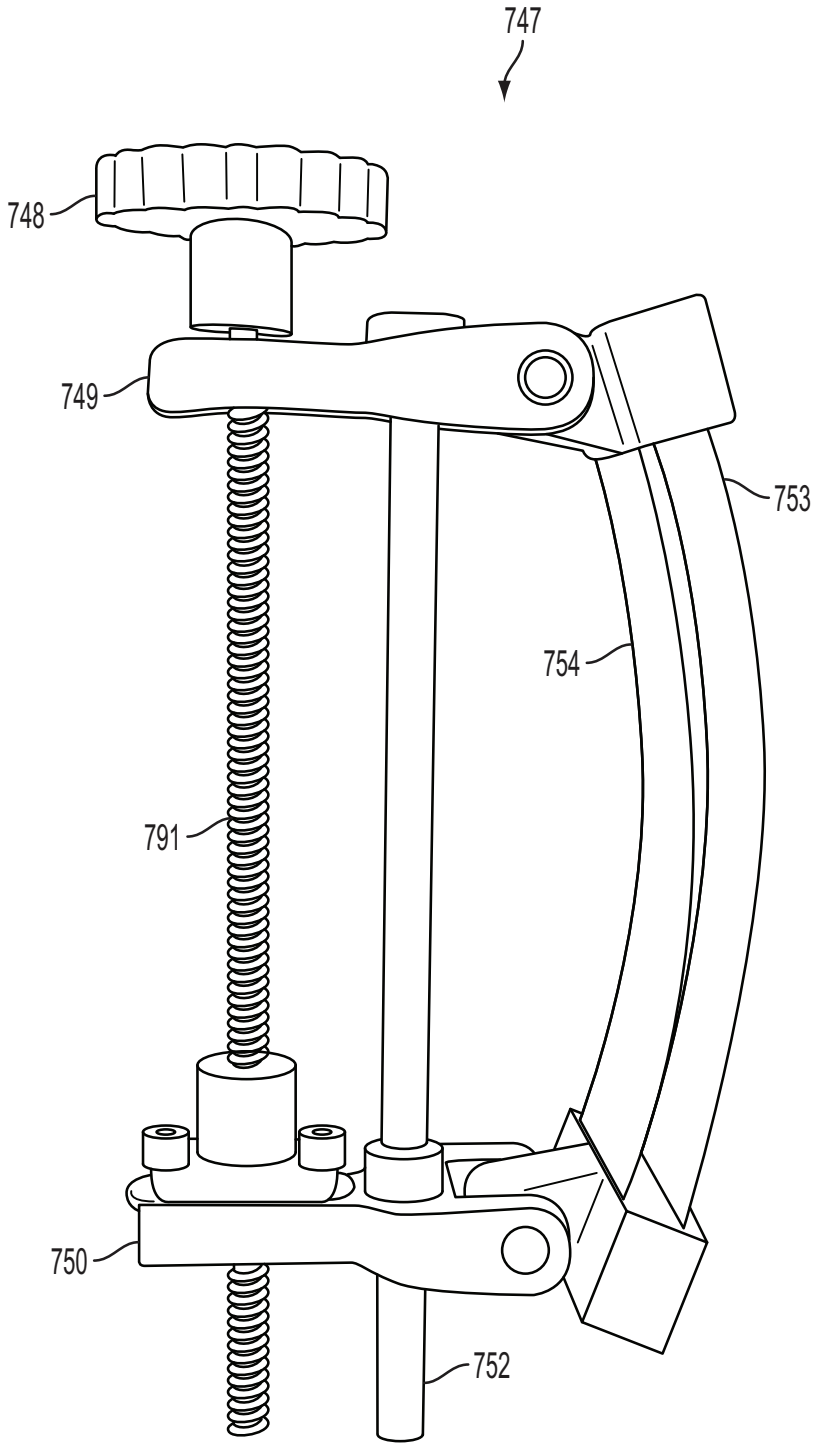


FIG. 75

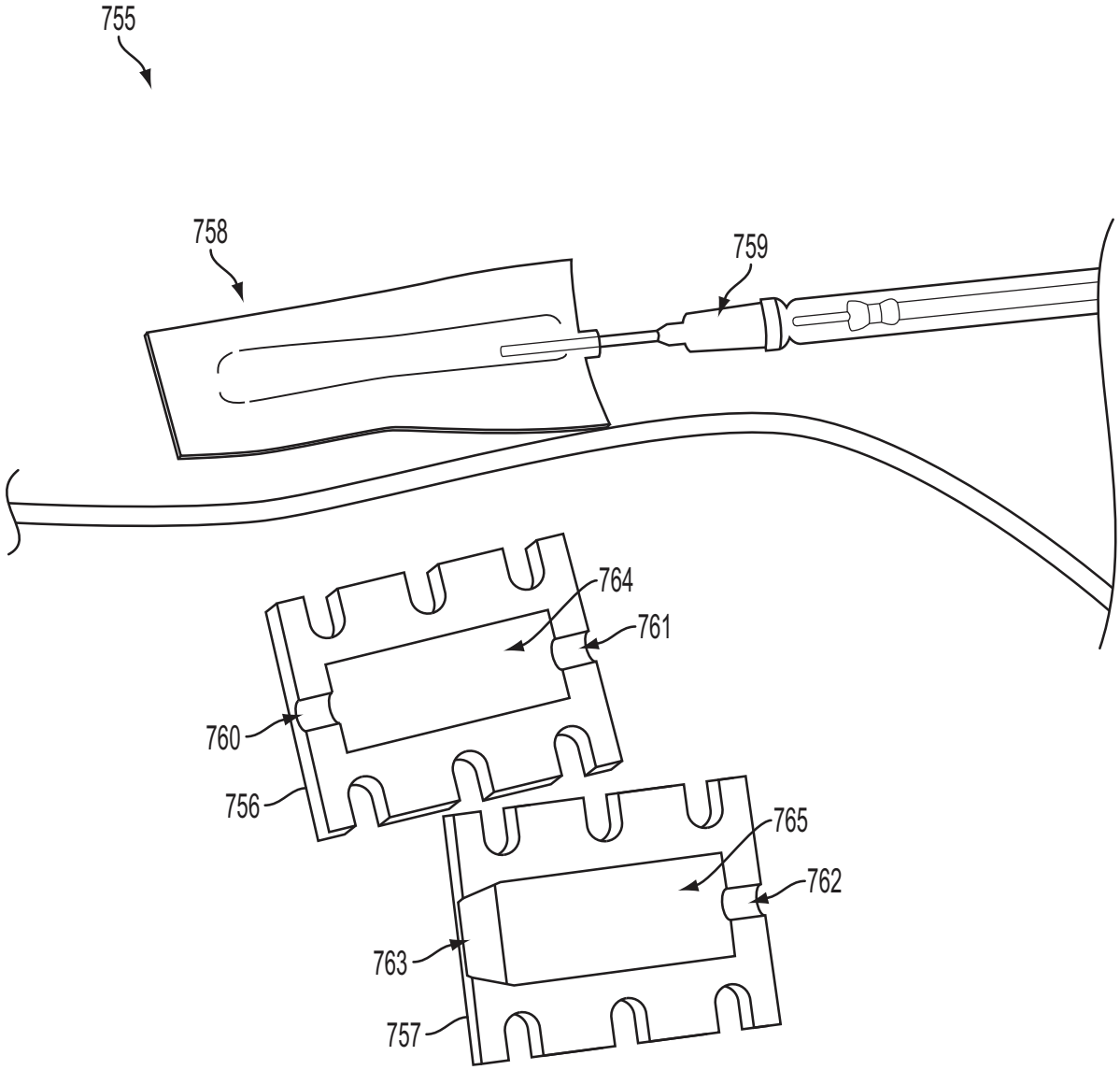


FIG. 76A

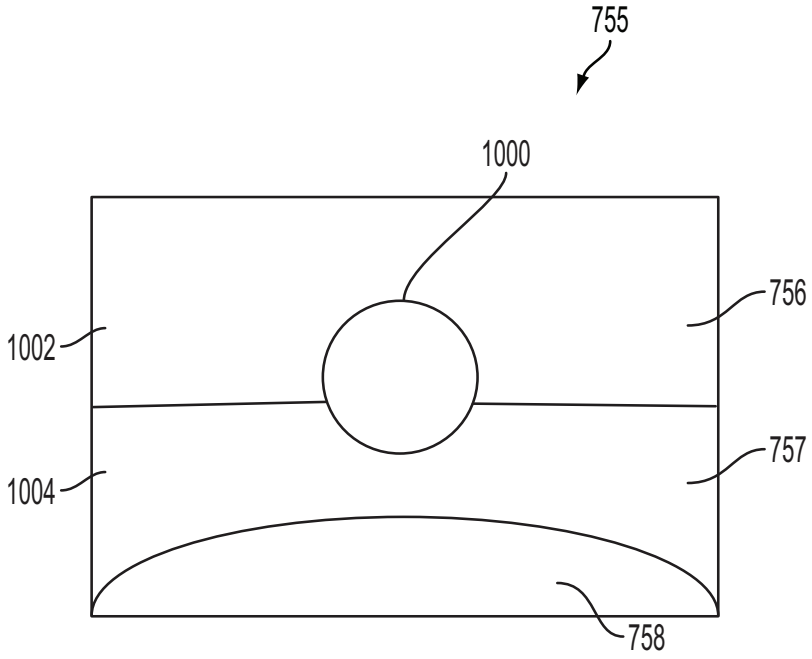


FIG. 76B

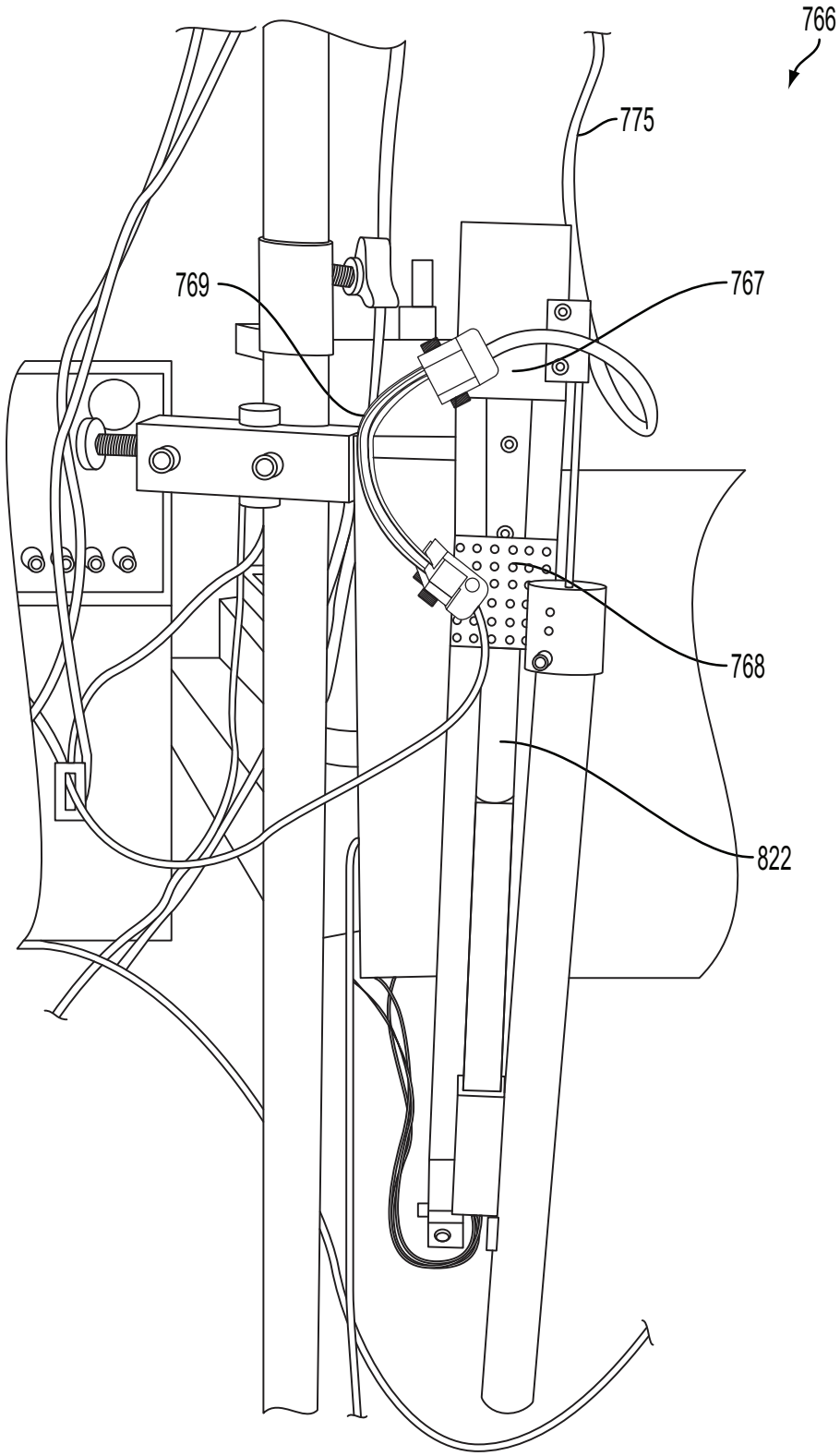


FIG. 77

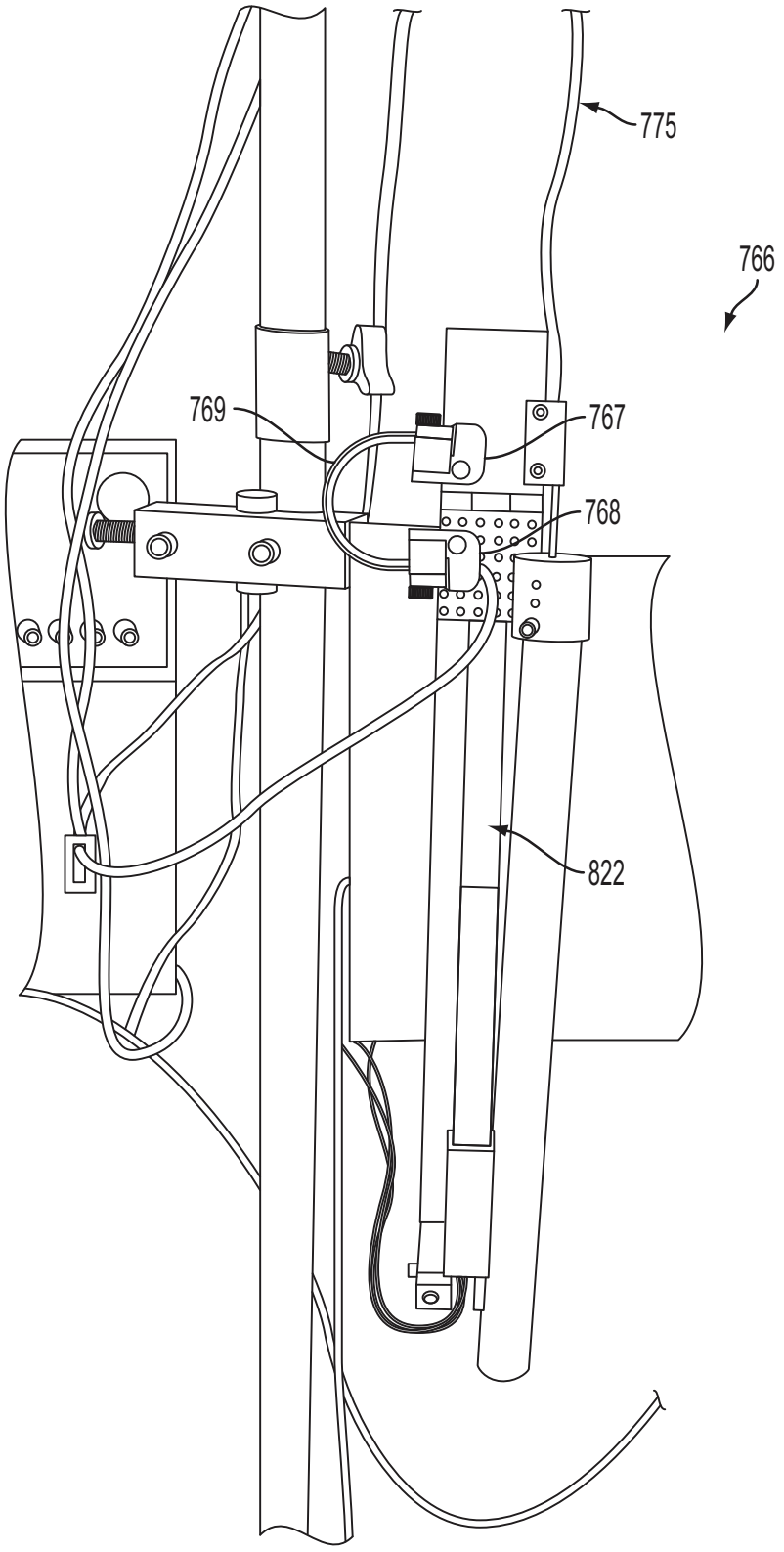


FIG. 78

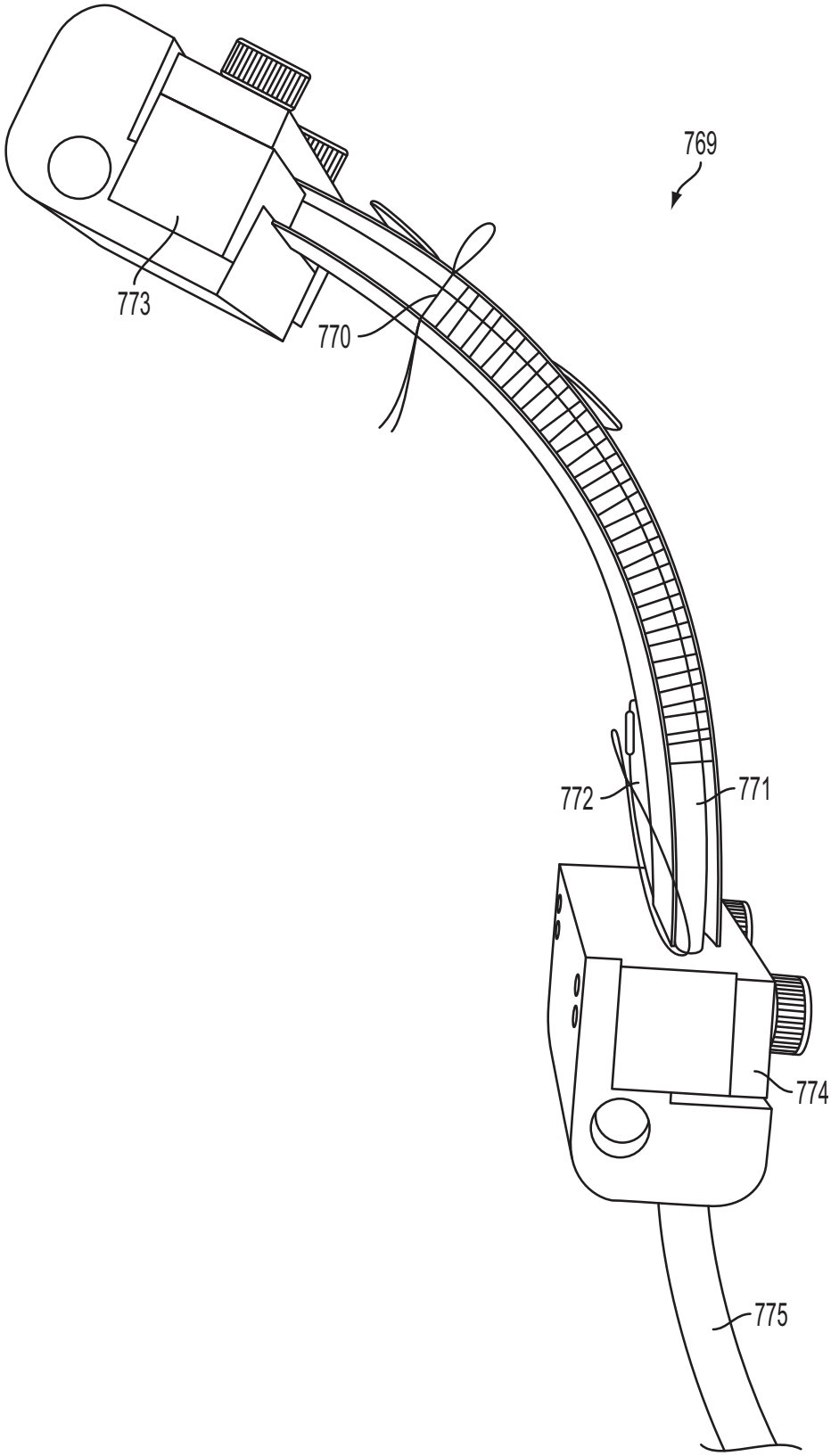


FIG. 79

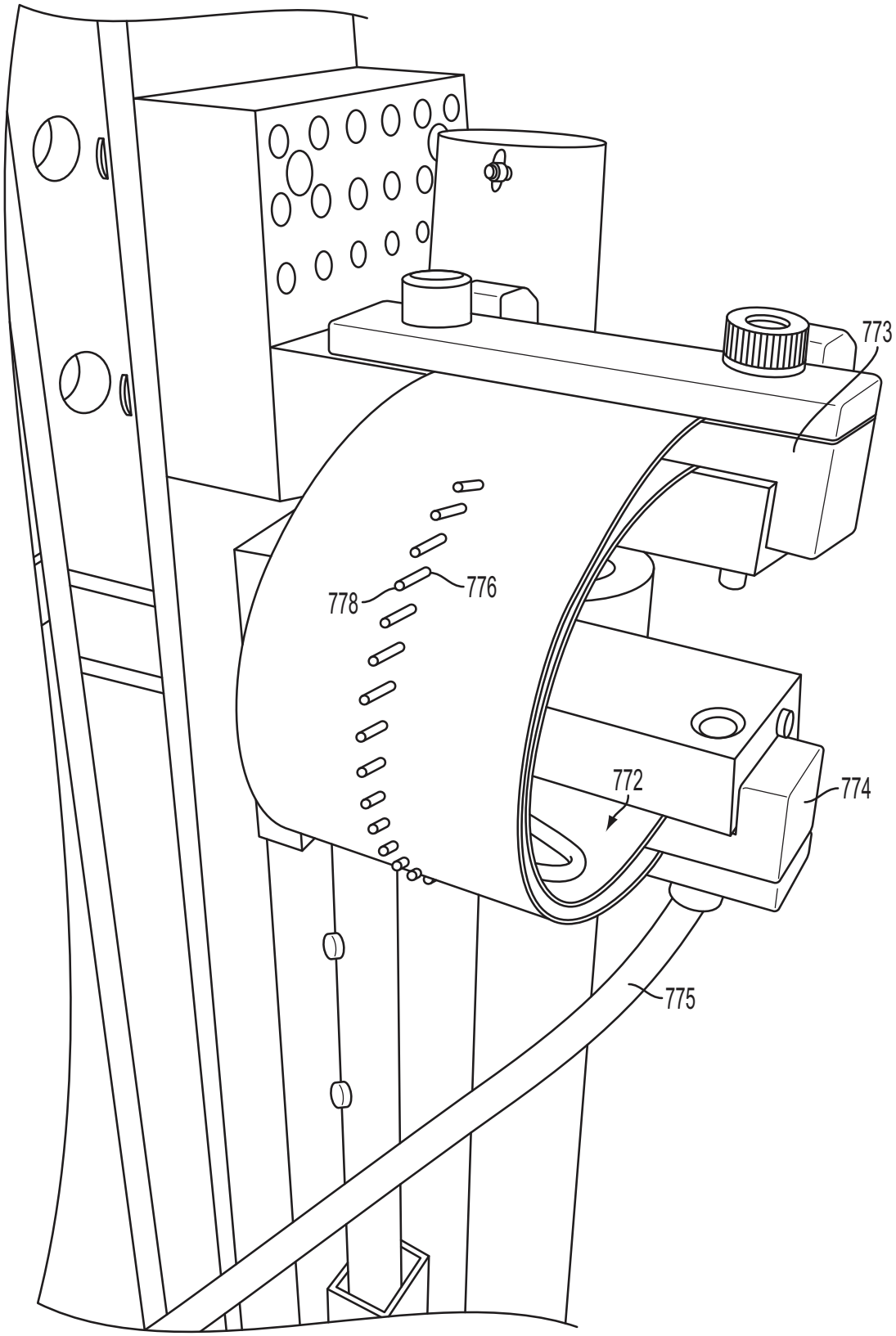


FIG. 80

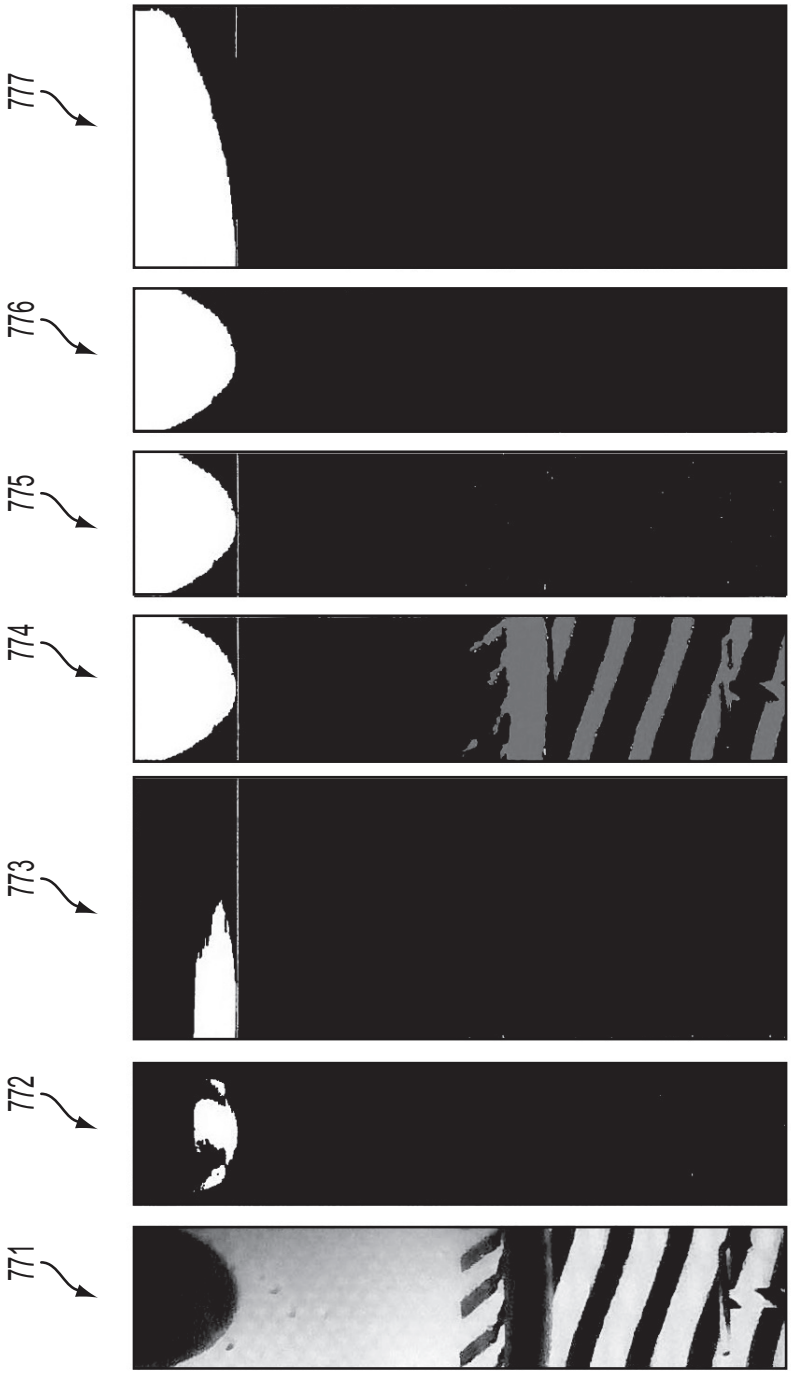


FIG. 81

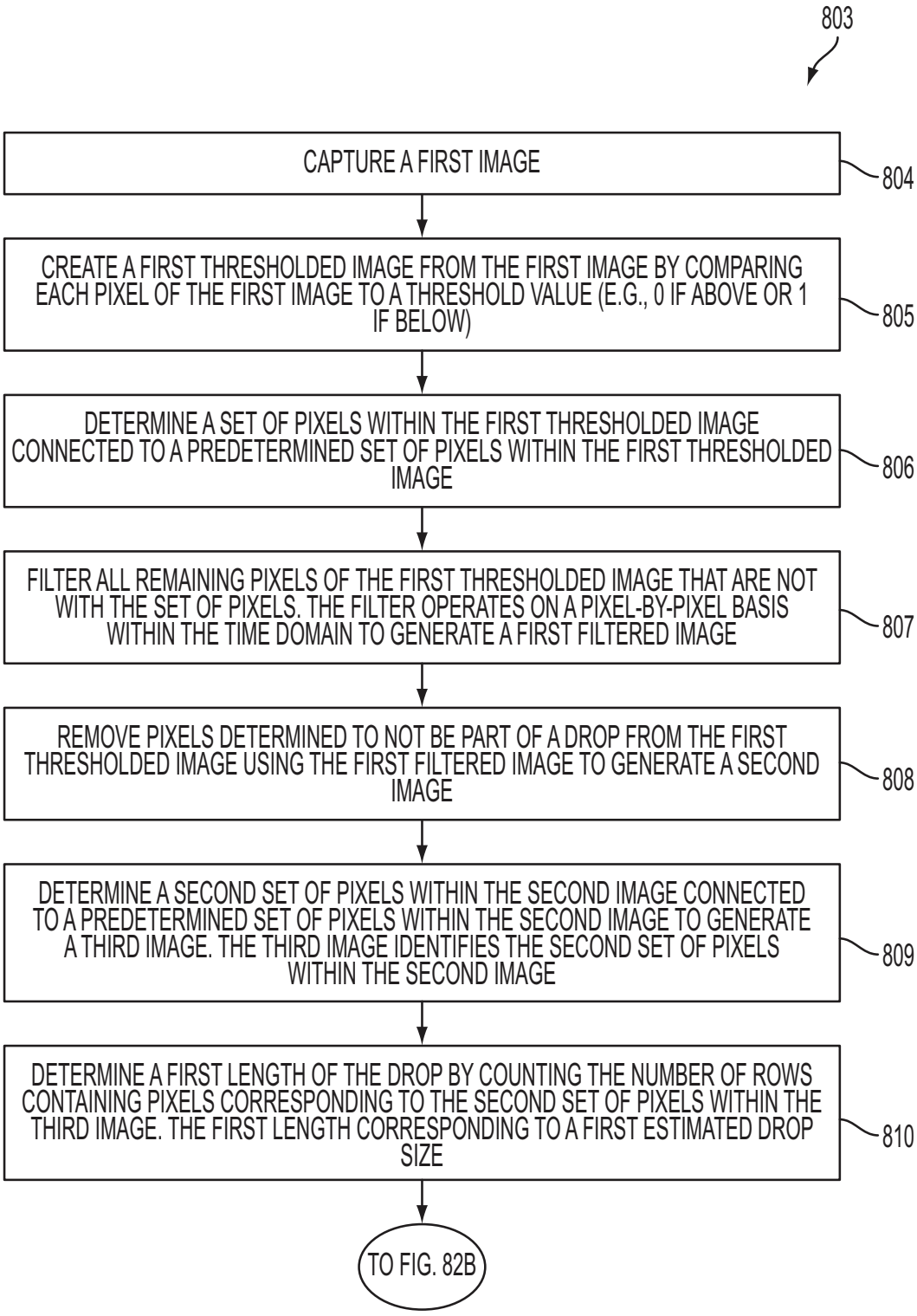

803
CAPTURE A FIRST IMAGE
804
CREATE A FIRST THRESHOLDED IMAGE FROM THE FIRST IMAGE BY COMPARING EACH PIXEL OF THE FIRST IMAGE TO A THRESHOLD VALUE (E.G., 0 IF ABOVE OR 1 IF BELOW)
805
DETERMINE A SET OF PIXELS WITHIN THE FIRST THRESHOLDED IMAGE CONNECTED TO A PREDETERMINED SET OF PIXELS WITHIN THE FIRST THRESHOLDED IMAGE
806
FILTER ALL REMAINING PIXELS OF THE FIRST THRESHOLDED IMAGE THAT ARE NOT WITH THE SET OF PIXELS. THE FILTER OPERATES ON A PIXEL-BY-PIXEL BASIS WITHIN THE TIME DOMAIN TO GENERATE A FIRST FILTERED IMAGE
807
REMOVE PIXELS DETERMINED TO NOT BE PART OF A DROP FROM THE FIRST THRESHOLDED IMAGE USING THE FIRST FILTERED IMAGE TO GENERATE A SECOND IMAGE
808
DETERMINE A SECOND SET OF PIXELS WITHIN THE SECOND IMAGE CONNECTED TO A PREDETERMINED SET OF PIXELS WITHIN THE SECOND IMAGE TO GENERATE A THIRD IMAGE. THE THIRD IMAGE IDENTIFIES THE SECOND SET OF PIXELS WITHIN THE SECOND IMAGE
809
DETERMINE A FIRST LENGTH OF THE DROP BY COUNTING THE NUMBER OF ROWS CONTAINING PIXELS CORRESPONDING TO THE SECOND SET OF PIXELS WITHIN THE THIRD IMAGE. THE FIRST LENGTH CORRESPONDING TO A FIRST ESTIMATED DROP SIZE
810
TO FIG. 82B

FIG. 82A

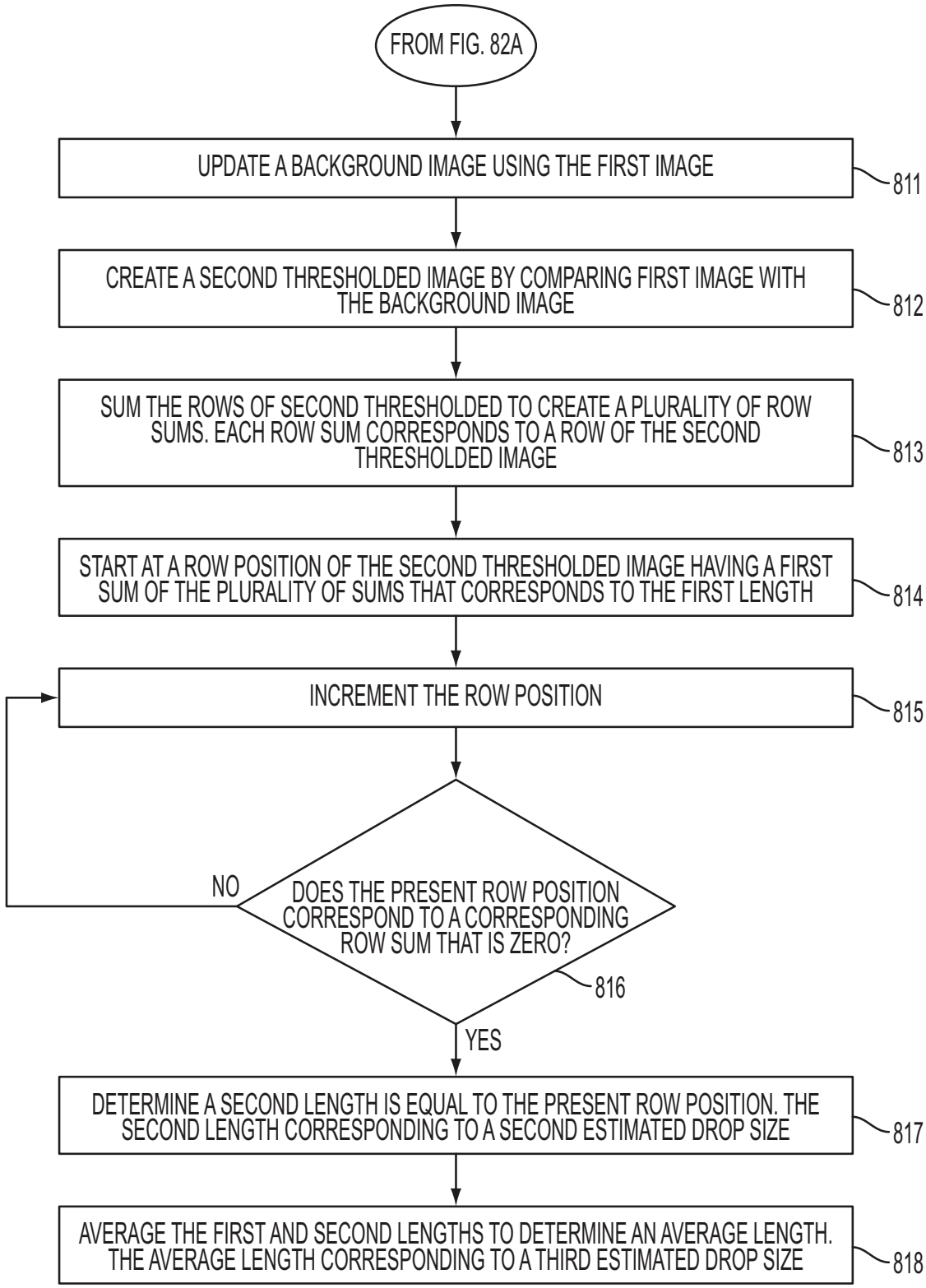

FROM FIG. 82A
UPDATE A BACKGROUND IMAGE USING THE FIRST IMAGE
811
CREATE A SECOND THRESHOLDED IMAGE BY COMPARING FIRST IMAGE WITH THE BACKGROUND IMAGE
812
SUM THE ROWS OF SECOND THRESHOLDED TO CREATE A PLURALITY OF ROW SUMS. EACH ROW SUM CORRESPONDS TO A ROW OF THE SECOND THRESHOLDED IMAGE
813
START AT A ROW POSITION OF THE SECOND THRESHOLDED IMAGE HAVING A FIRST SUM OF THE PLURALITY OF SUMS THAT CORRESPONDS TO THE FIRST LENGTH
814
INCREMENT THE ROW POSITION
815
DOES THE PRESENT ROW POSITION CORRESPOND TO A CORRESPONDING ROW SUM THAT IS ZERO?
816
NO
YES
DETERMINE A SECOND LENGTH IS EQUAL TO THE PRESENT ROW POSITION. THE SECOND LENGTH CORRESPONDING TO A SECOND ESTIMATED DROP SIZE
817
AVERAGE THE FIRST AND SECOND LENGTHS TO DETERMINE AN AVERAGE LENGTH. THE AVERAGE LENGTH CORRESPONDING TO A THIRD ESTIMATED DROP SIZE
818

FIG. 82B

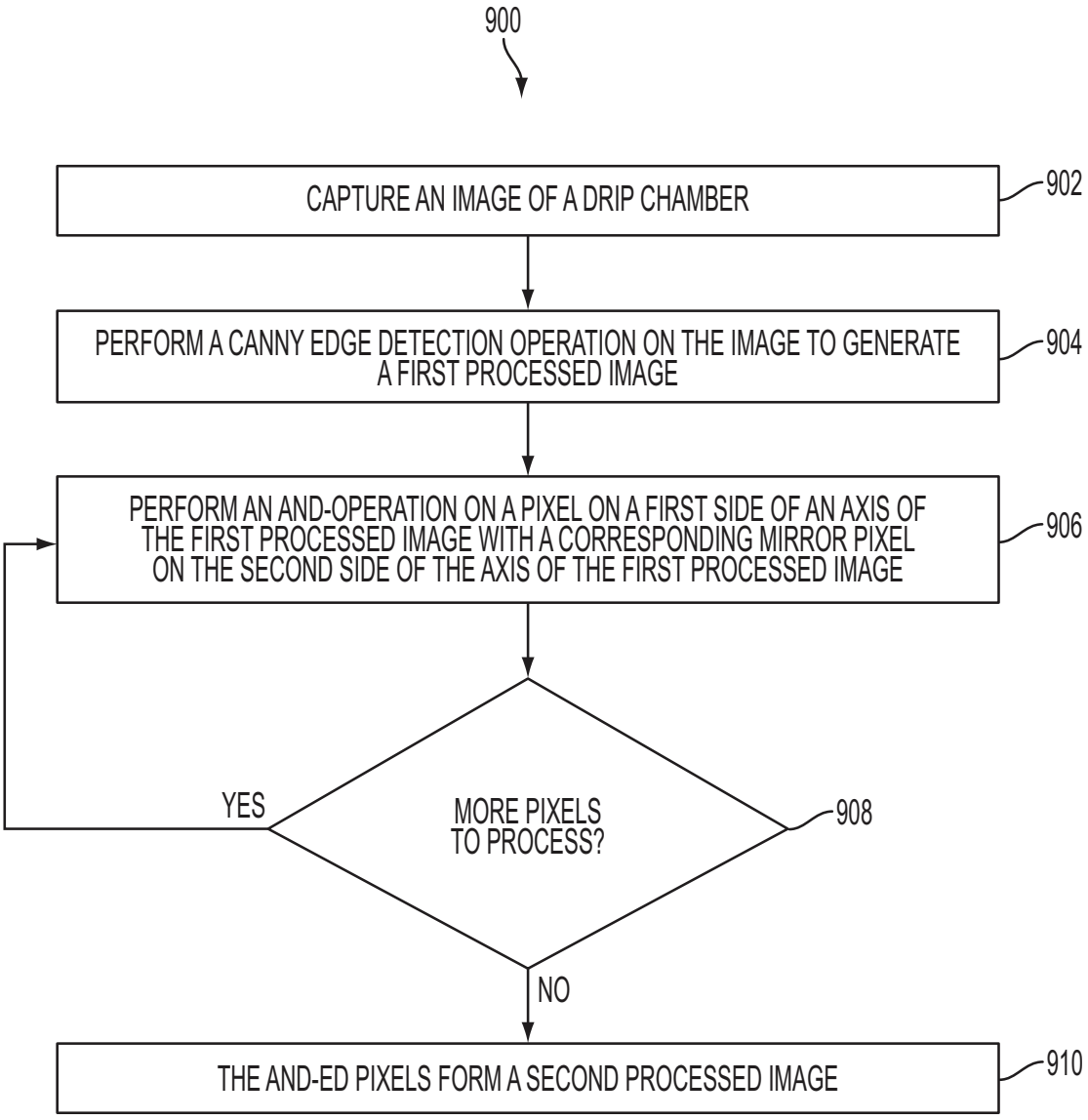

900
CAPTURE AN IMAGE OF A DRIP CHAMBER
902
PERFORM A CANNY EDGE DETECTION OPERATION ON THE IMAGE TO GENERATE A FIRST PROCESSED IMAGE
904
PERFORM AN AND-OPERATION ON A PIXEL ON A FIRST SIDE OF AN AXIS OF THE FIRST PROCESSED IMAGE WITH A CORRESPONDING MIRROR PIXEL ON THE SECOND SIDE OF THE AXIS OF THE FIRST PROCESSED IMAGE
906
MORE PIXELS TO PROCESS?
908
YES
NO
THE AND-ED PIXELS FORM A SECOND PROCESSED IMAGE
910

FIG. 83

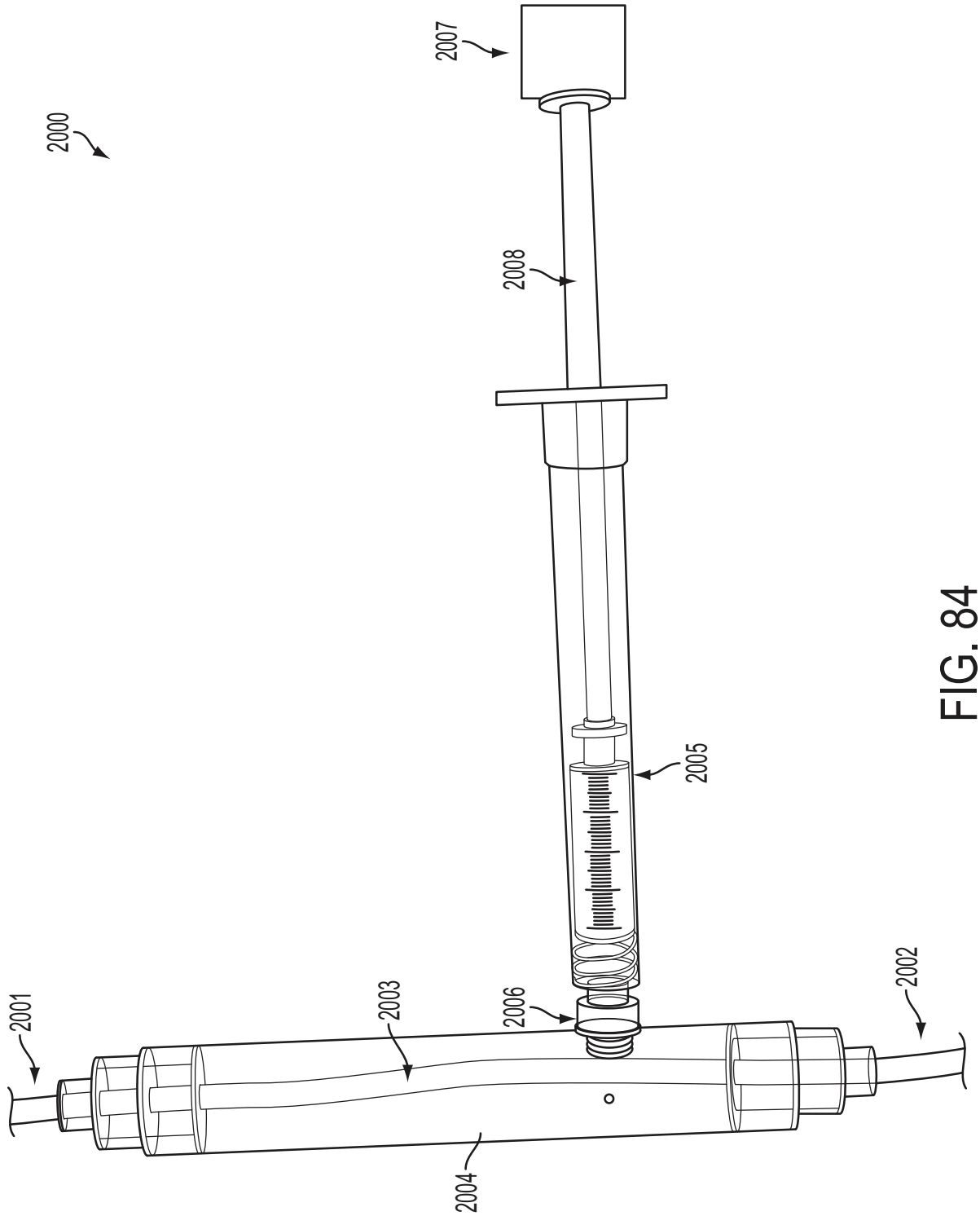


FIG. 84

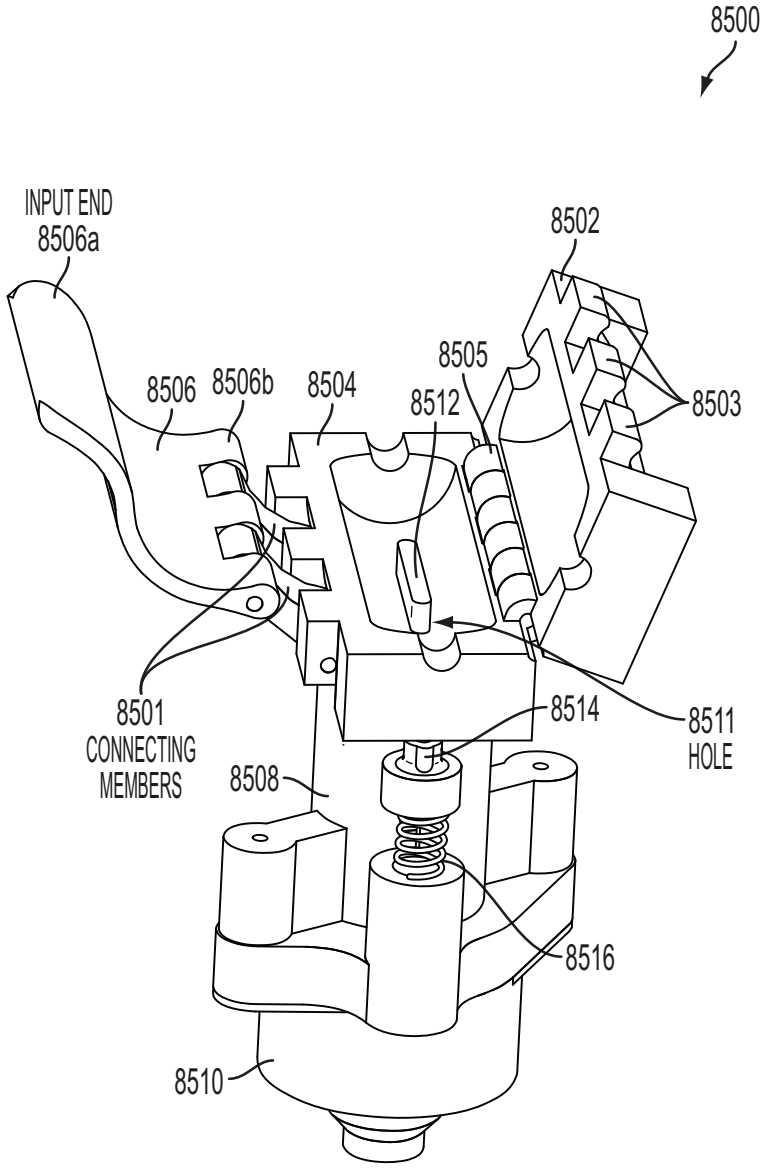

8500
INPUT END
8506a
8502
8506
8506b
8504
8505
8512
8503
8501
CONNECTING
MEMBERS
8514
8511
HOLE
8508
8516
8510

FIG. 85A

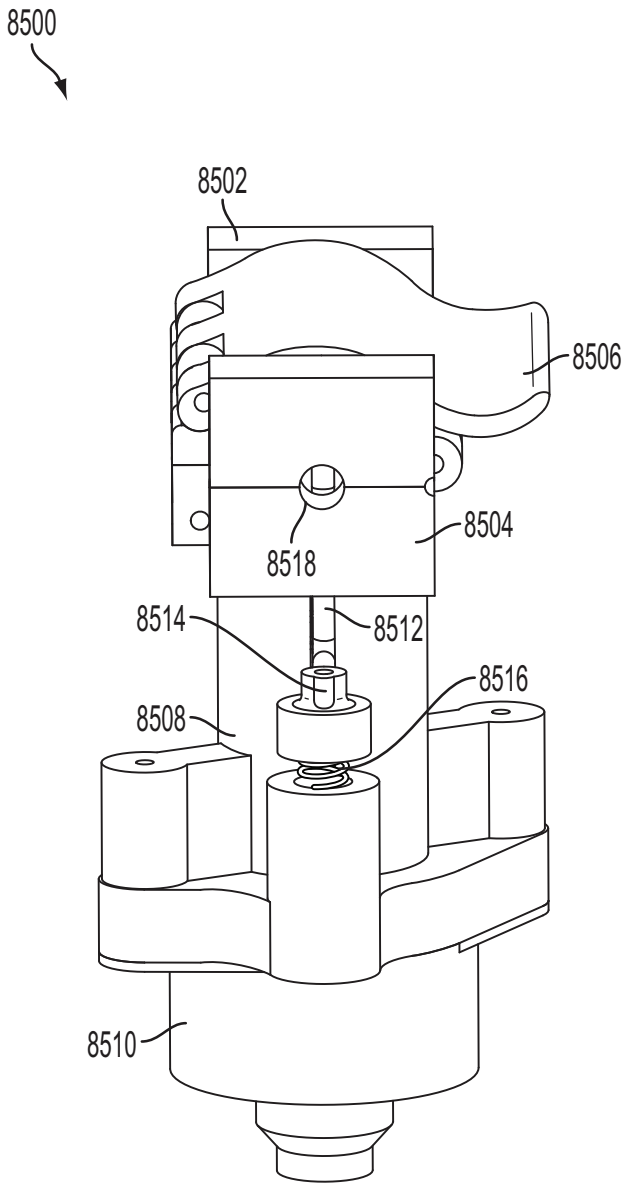


FIG. 85B

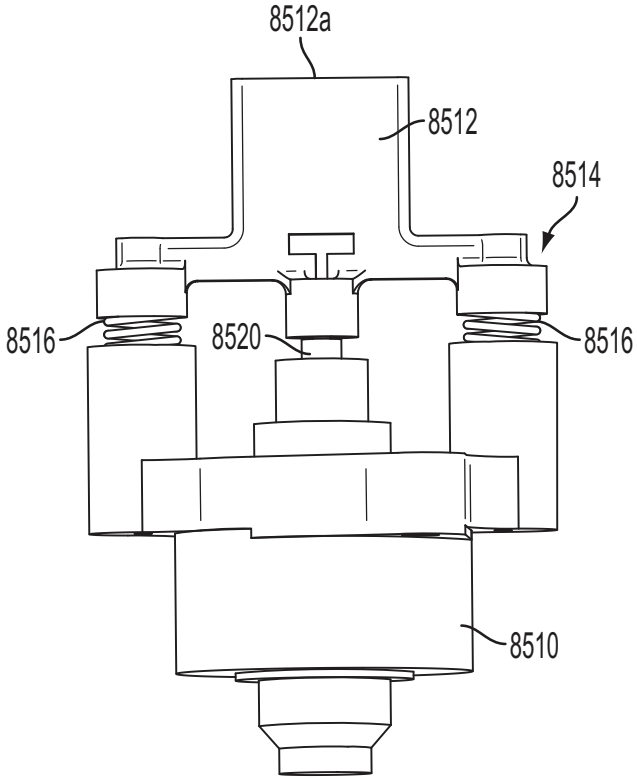


FIG. 85C

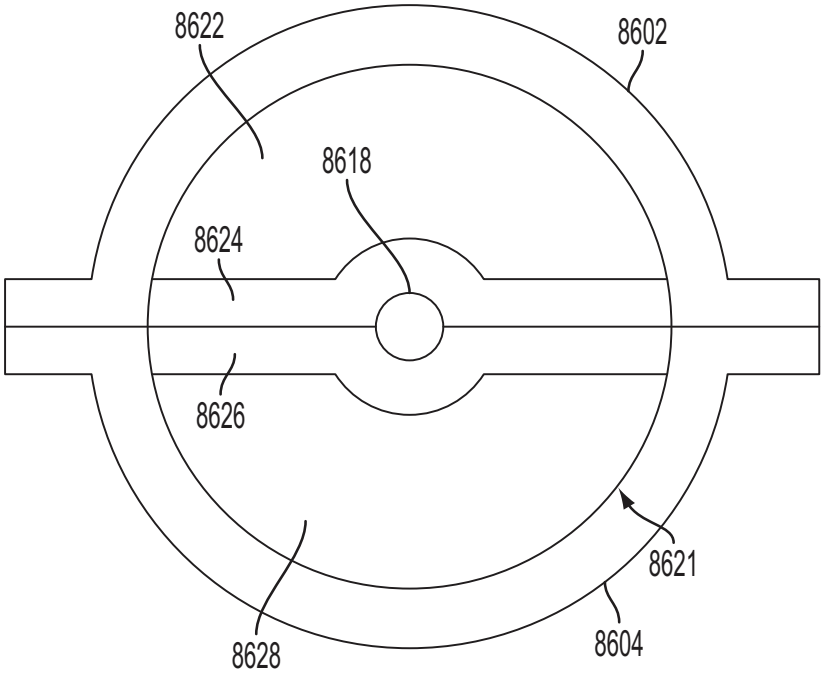


FIG. 86

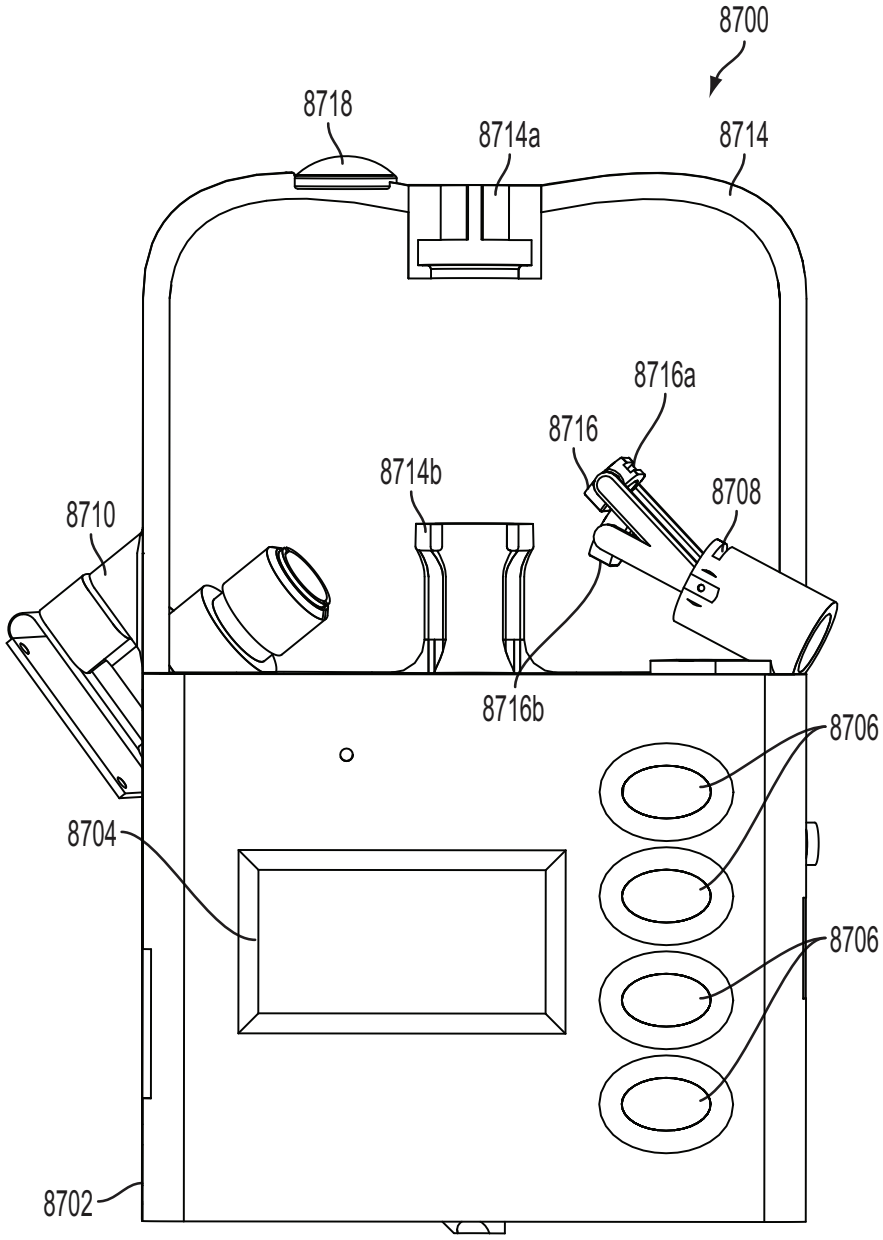

8700
8718
8714a
8714
8716a
8716
8714b
8708
8710
8716b
8706
8704
8706
8702

FIG. 87A

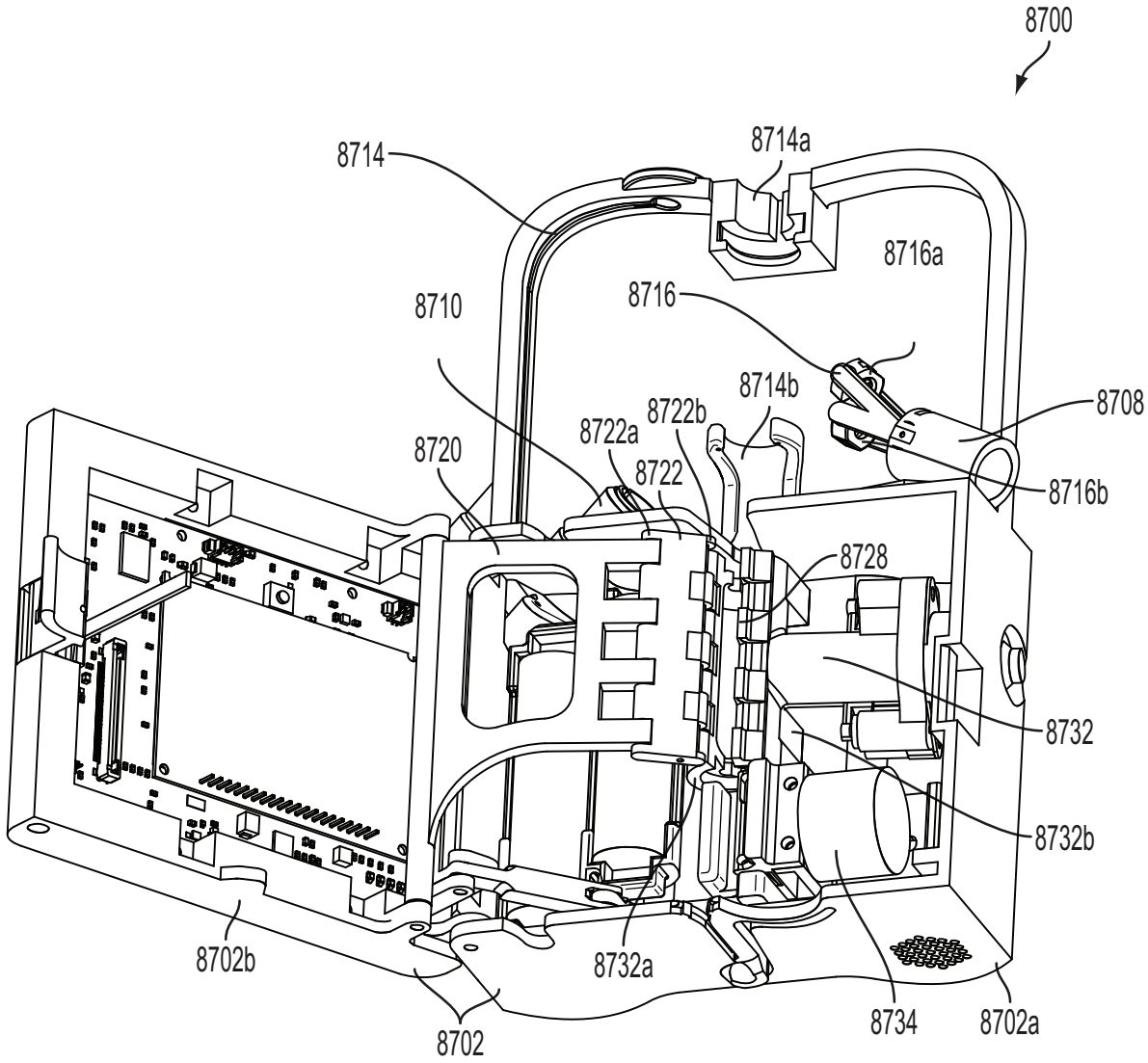

8700
8714
8714a
8716a
8710
8716
8714b
8708
8722b
8722a
8720
8722
8716b
8728
8732
8732b
8702b
8732a
8734
8702a
8702

FIG. 87B

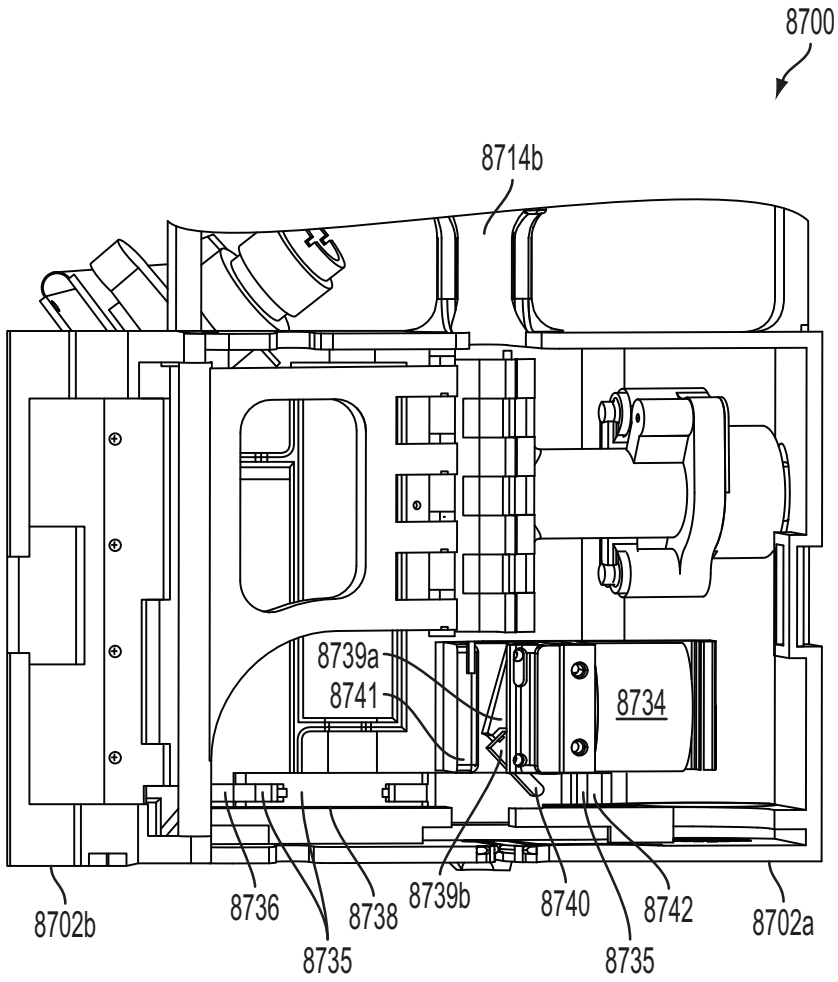

8700
8714b
8739a
8741
8734
8702b
8736
8735
8738
8739b
8740
8735
8742
8702a

FIG. 87C

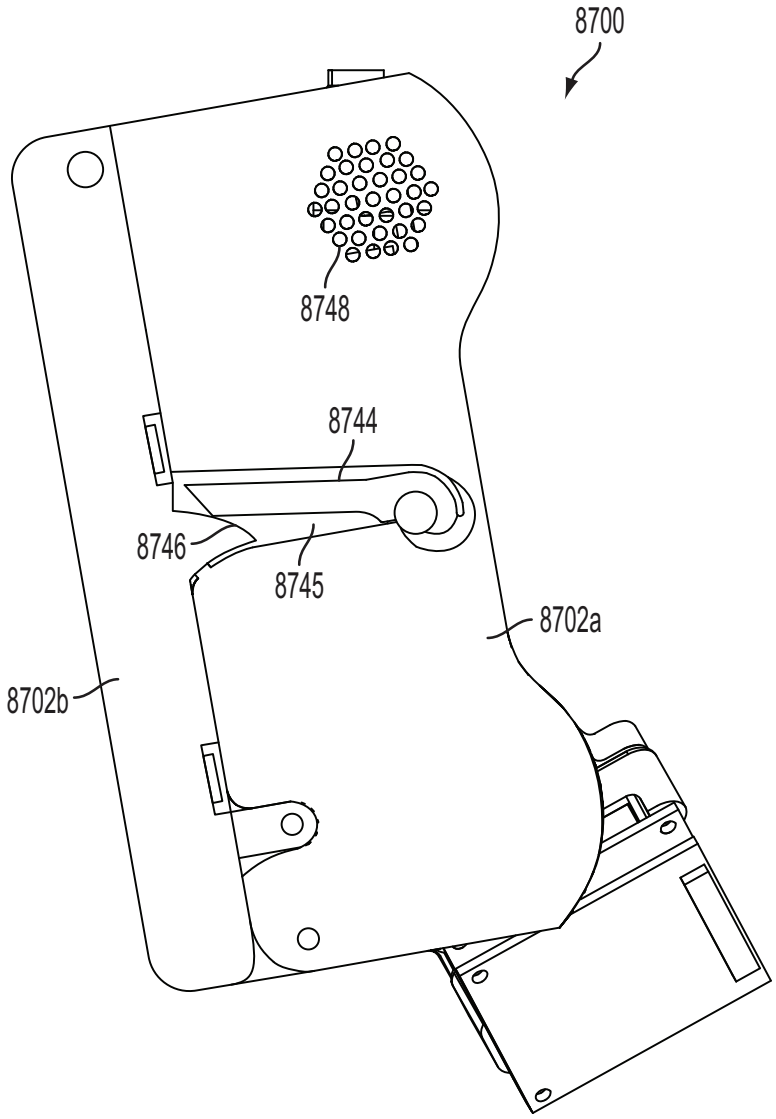


FIG. 87D

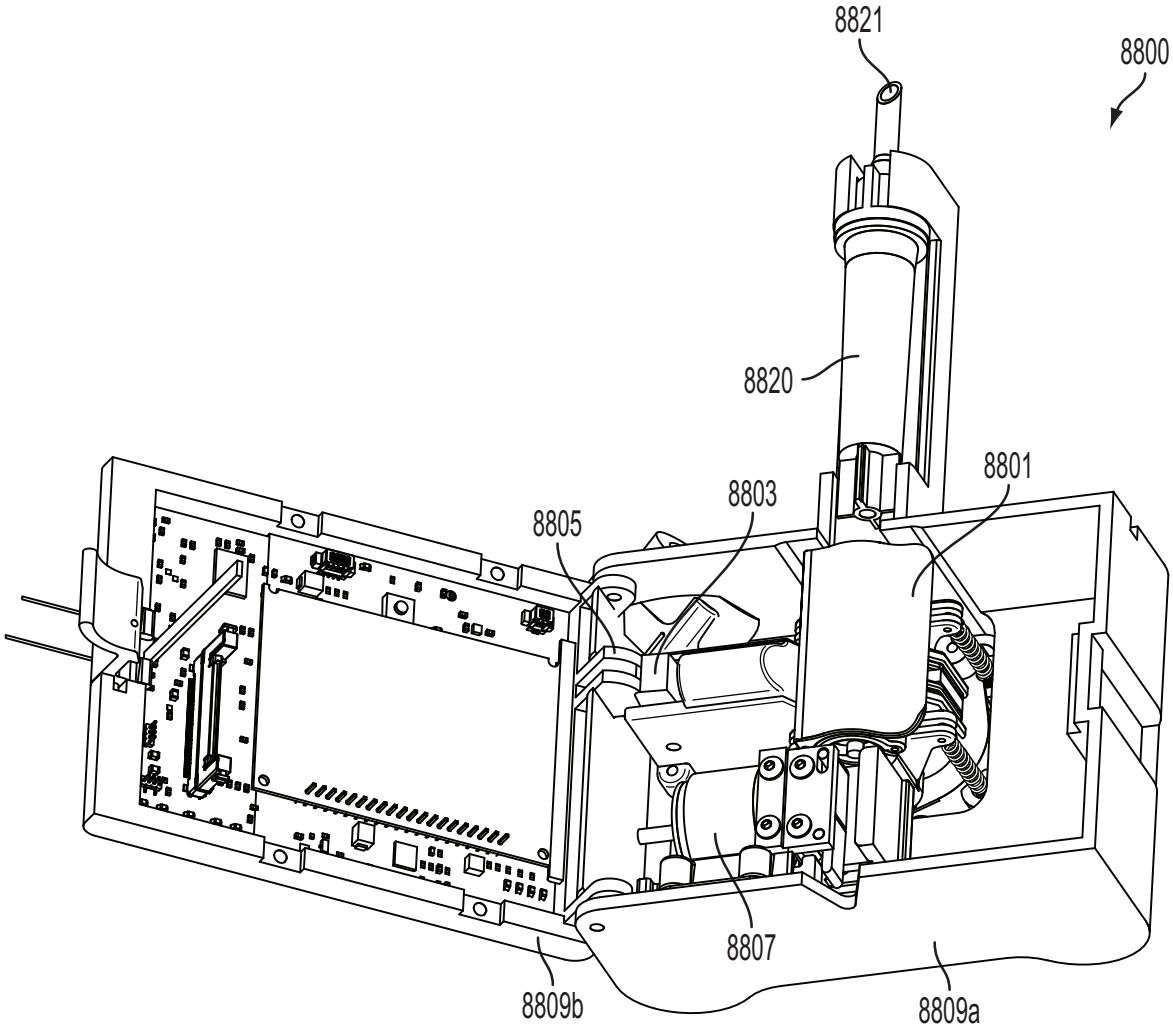


FIG. 88A

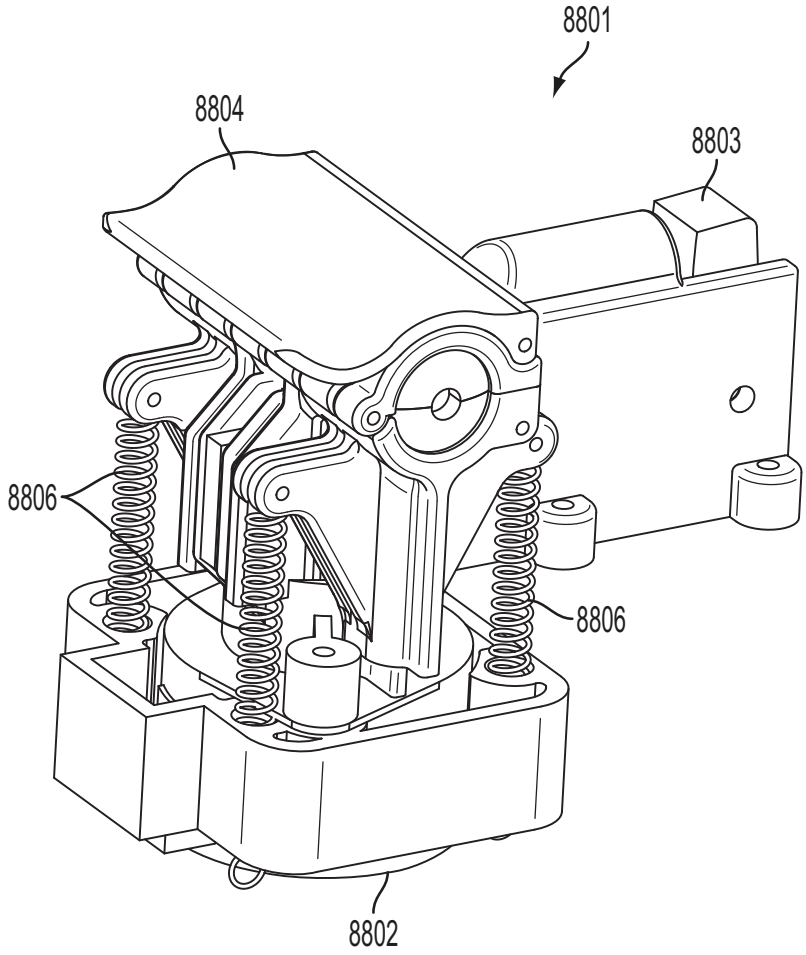


FIG. 88B

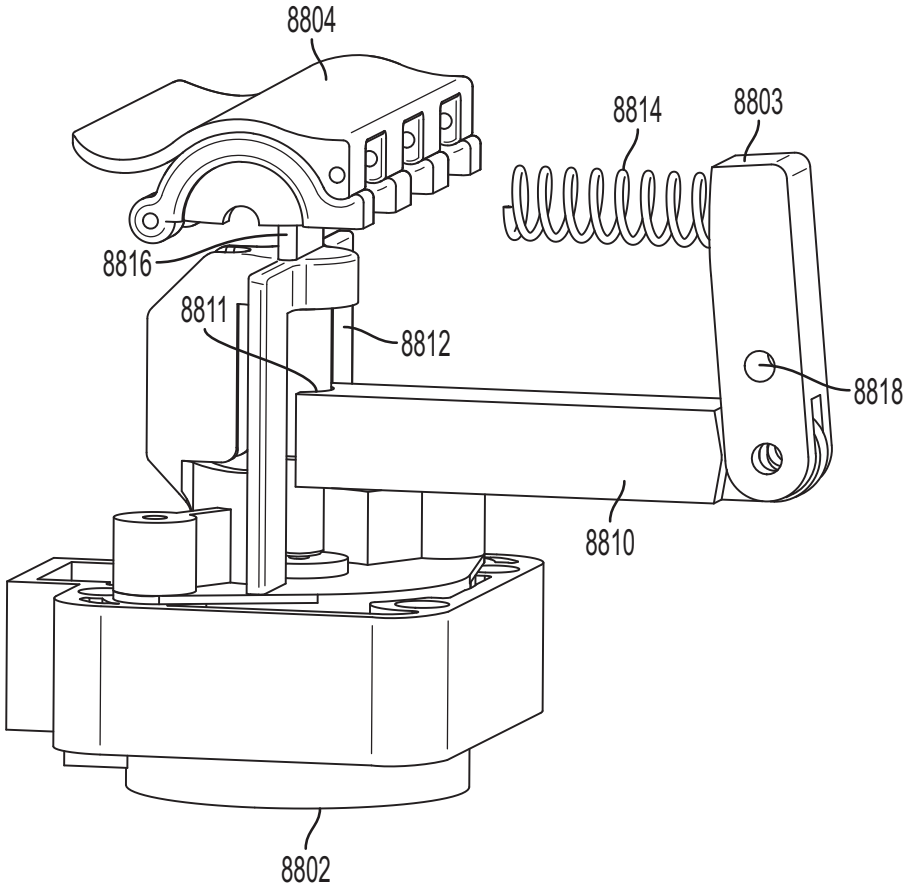


FIG. 88C

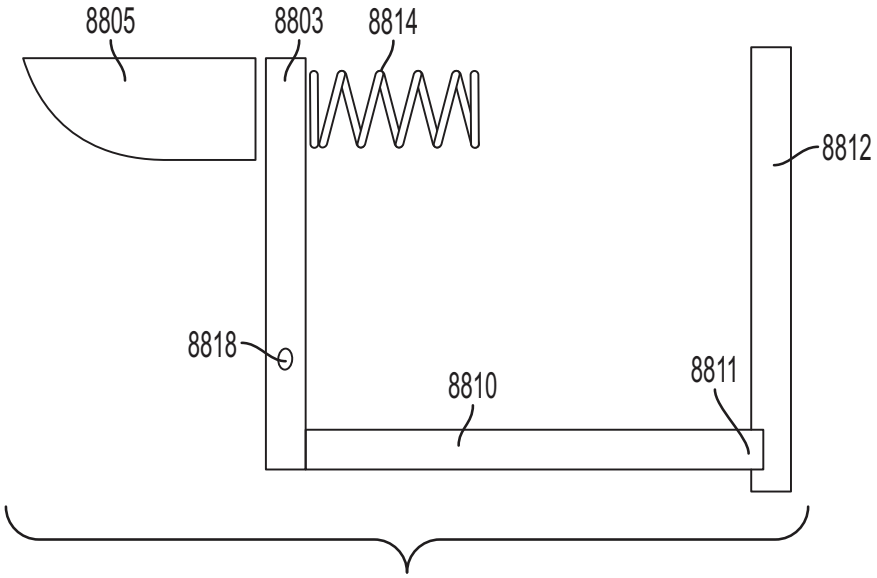


FIG. 88D

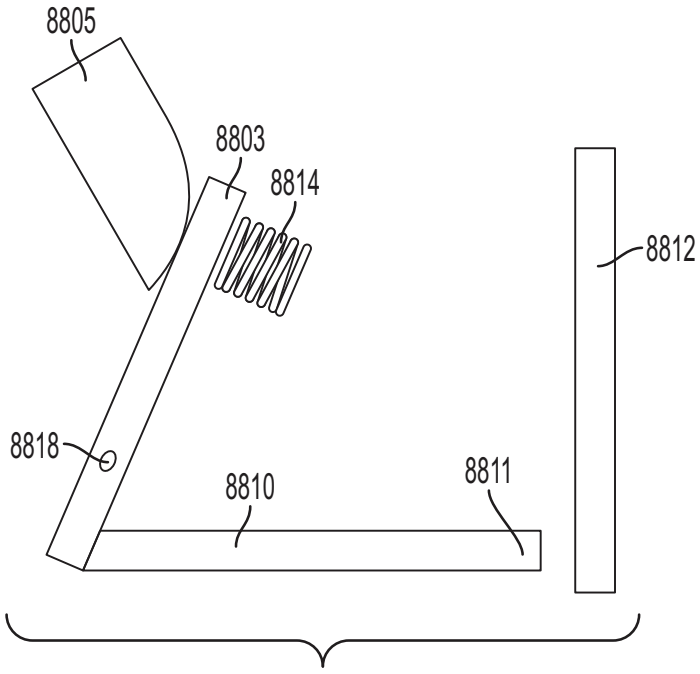


FIG. 88E

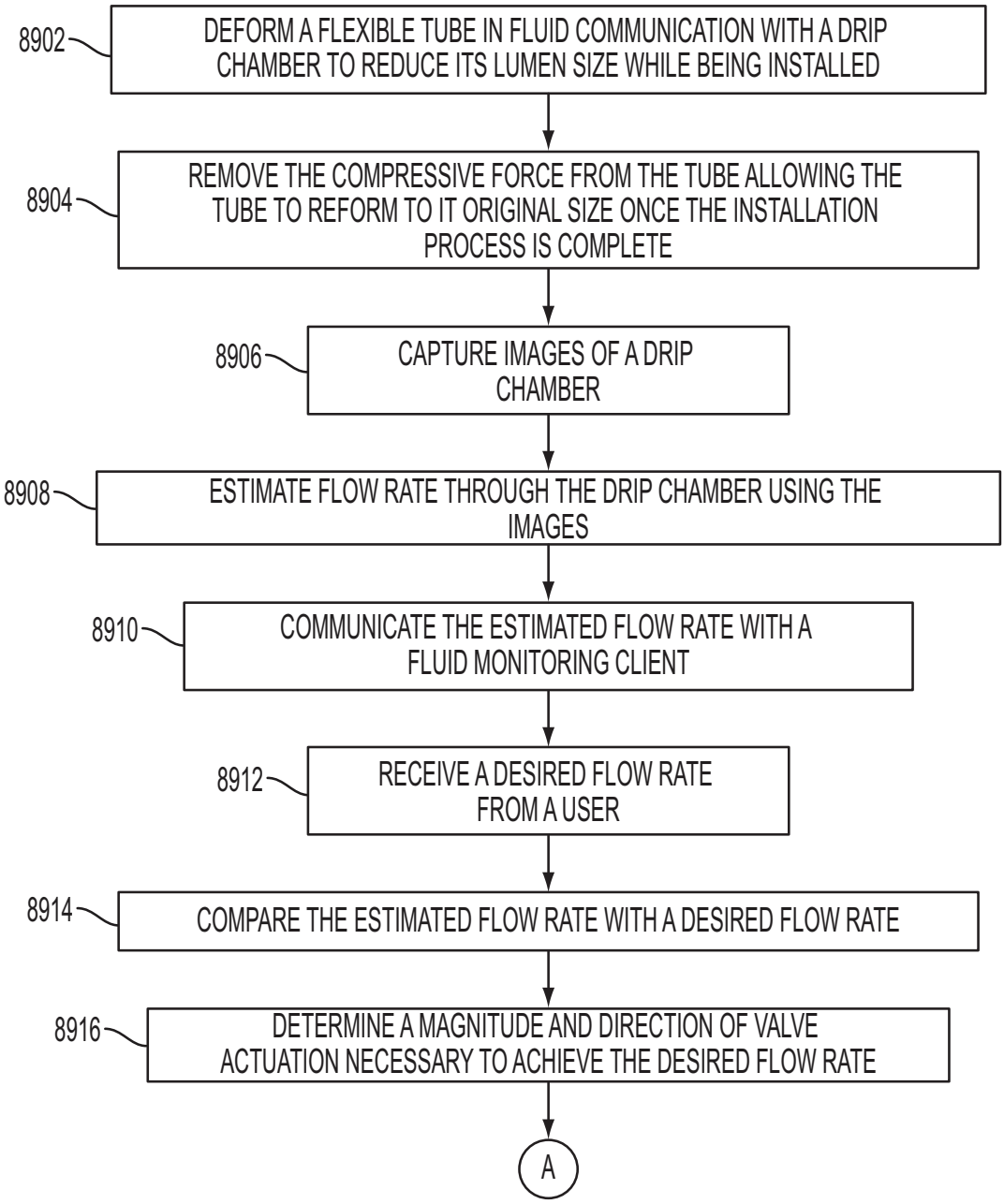

8902
DEFORM A FLEXIBLE TUBE IN FLUID COMMUNICATION WITH A DRIP CHAMBER TO REDUCE ITS LUMEN SIZE WHILE BEING INSTALLED
8904
REMOVE THE COMPRESSIVE FORCE FROM THE TUBE ALLOWING THE TUBE TO REFORM TO IT ORIGINAL SIZE ONCE THE INSTALLATION PROCESS IS COMPLETE
8906
CAPTURE IMAGES OF A DRIP CHAMBER
8908
ESTIMATE FLOW RATE THROUGH THE DRIP CHAMBER USING THE IMAGES
8910
COMMUNICATE THE ESTIMATED FLOW RATE WITH A FLUID MONITORING CLIENT
8912
RECEIVE A DESIRED FLOW RATE FROM A USER
8914
COMPARE THE ESTIMATED FLOW RATE WITH A DESIRED FLOW RATE
8916
DETERMINE A MAGNITUDE AND DIRECTION OF VALVE ACTUATION NECESSARY TO ACHIEVE THE DESIRED FLOW RATE
A

FIG. 89A

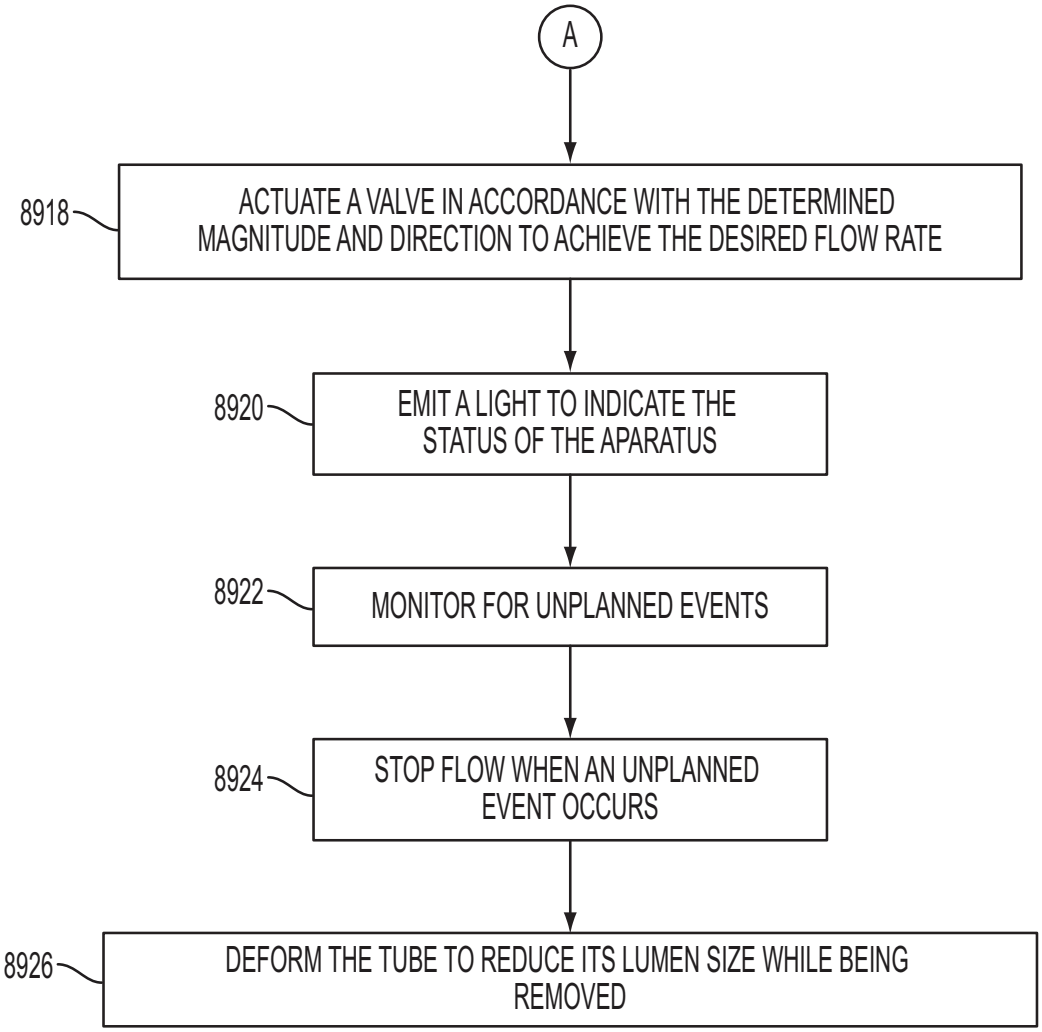

A
8918
ACTUATE A VALVE IN ACCORDANCE WITH THE DETERMINED MAGNITUDE AND DIRECTION TO ACHIEVE THE DESIRED FLOW RATE
8920
EMIT A LIGHT TO INDICATE THE STATUS OF THE APARATUS
8922
MONITOR FOR UNPLANNED EVENTS
8924
STOP FLOW WHEN AN UNPLANNED EVENT OCCURS
8926
DEFORM THE TUBE TO REDUCE ITS LUMEN SIZE WHILE BEING REMOVED

FIG. 89B

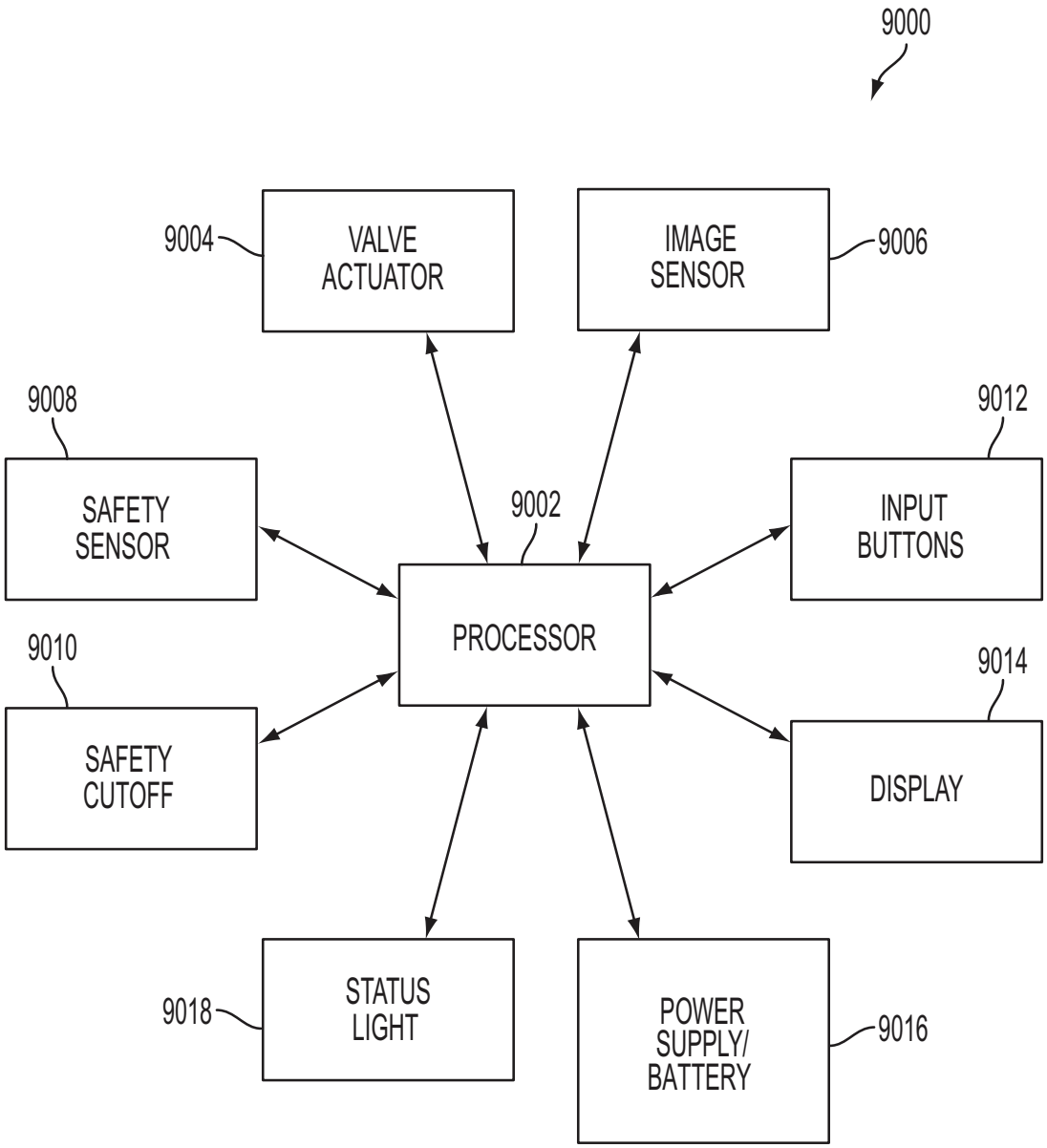

9000
9004
VALVE ACTUATOR
IMAGE SENSOR
9006
9008
SAFETY SENSOR
9002
PROCESSOR
9012
INPUT BUTTONS
9010
SAFETY CUTOFF
9014
DISPLAY
9018
STATUS LIGHT
POWER SUPPLY/ BATTERY
9016

FIG. 90

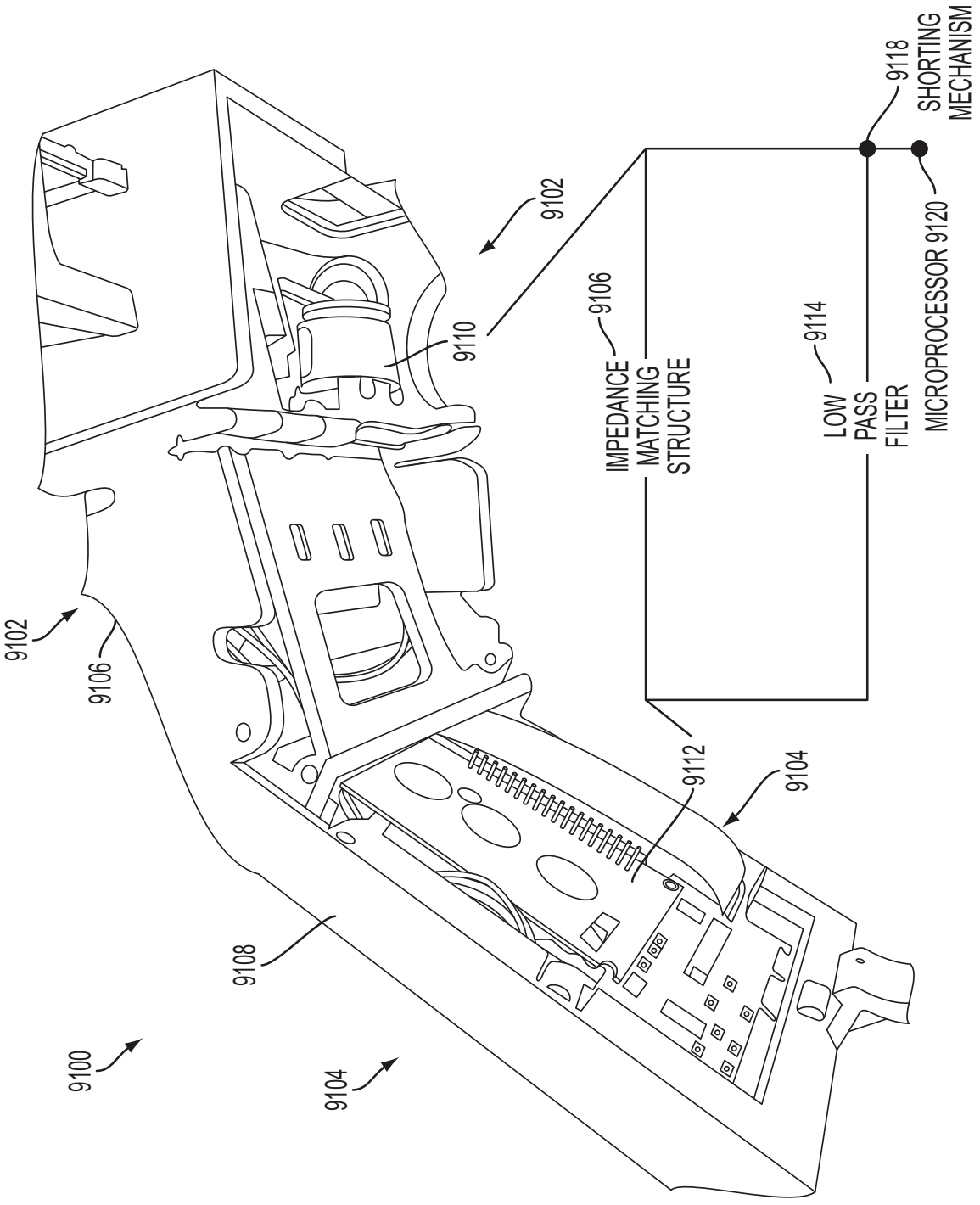

9100
9102
9104
9106
9108
9110
9112
9114
9118
SHORTING MECHANISM
9120
MICROPROCESSOR
LOW PASS FILTER
IMPEDANCE MATCHING STRUCTURE

FIG. 91

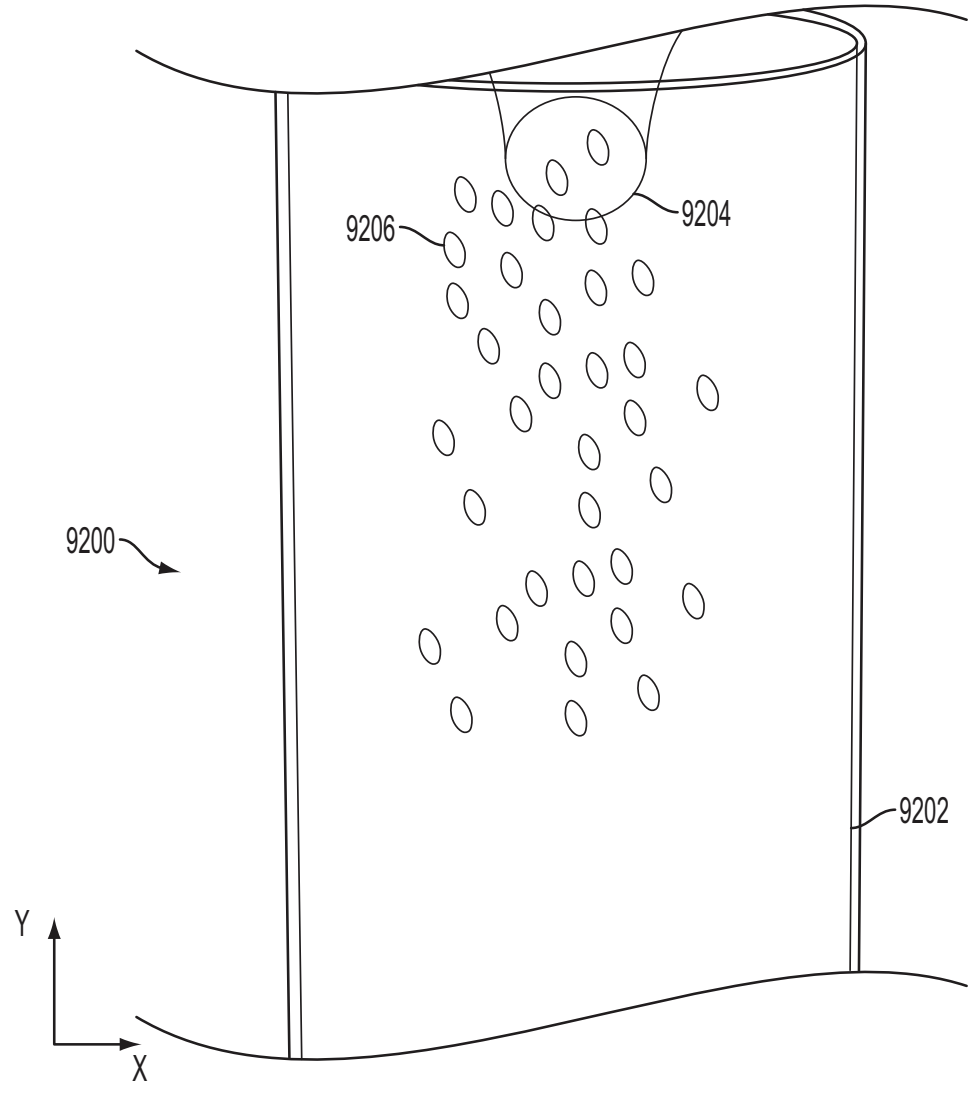


FIG. 92

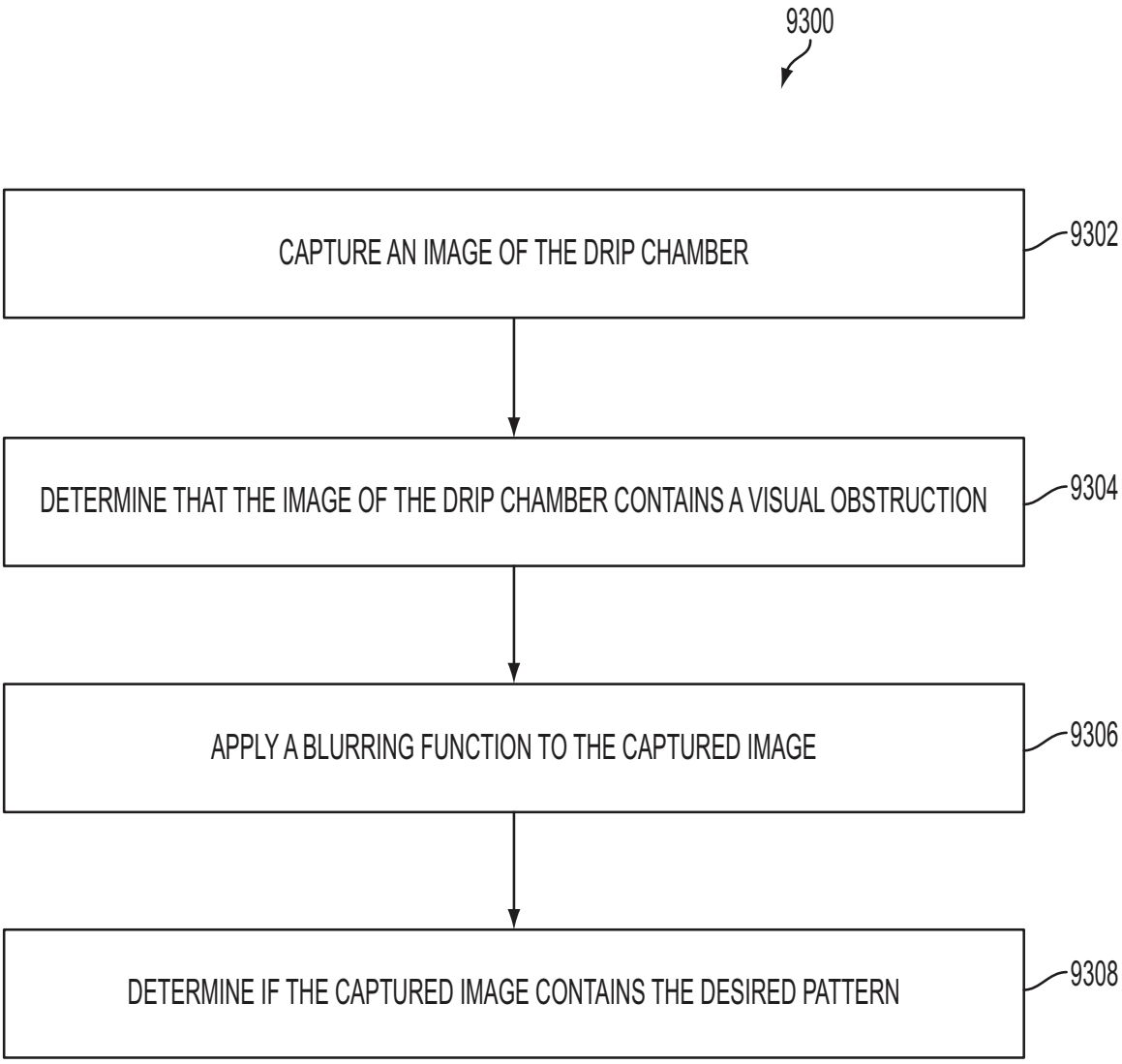

9300
CAPTURE AN IMAGE OF THE DRIP CHAMBER
9302
DETERMINE THAT THE IMAGE OF THE DRIP CHAMBER CONTAINS A VISUAL OBSTRUCTION
9304
APPLY A BLURRING FUNCTION TO THE CAPTURED IMAGE
9306
DETERMINE IF THE CAPTURED IMAGE CONTAINS THE DESIRED PATTERN
9308

FIG. 93

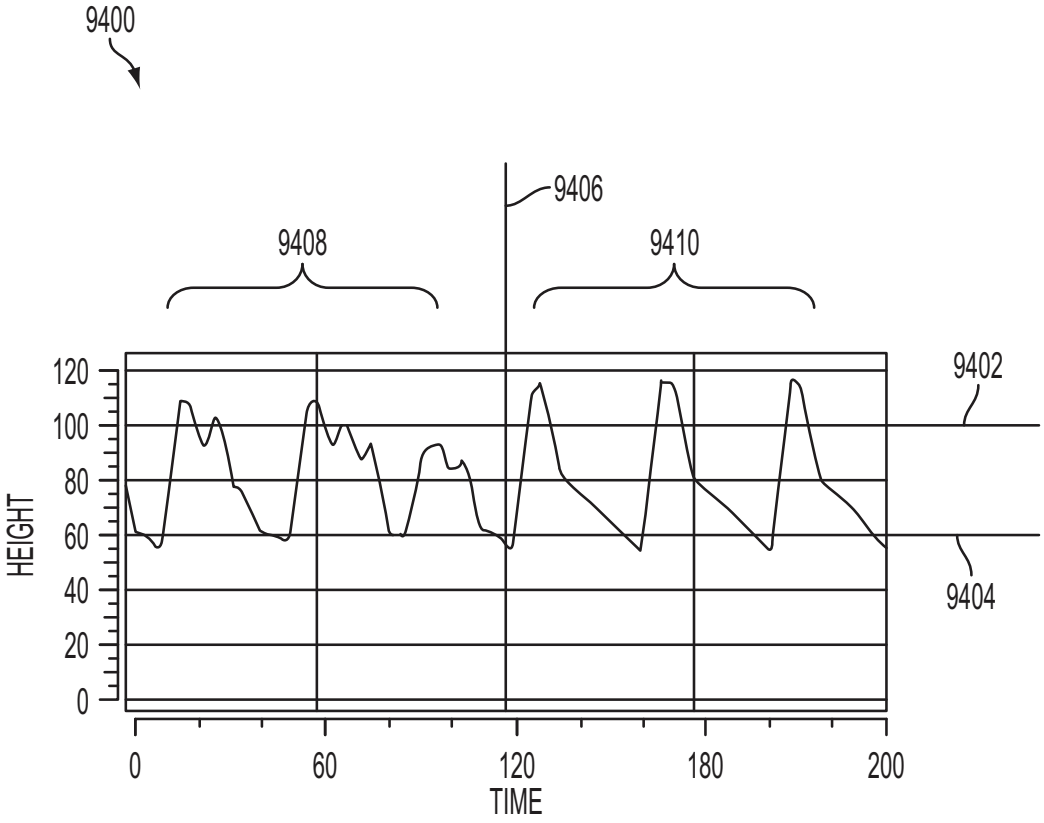

9400
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FIG. 94

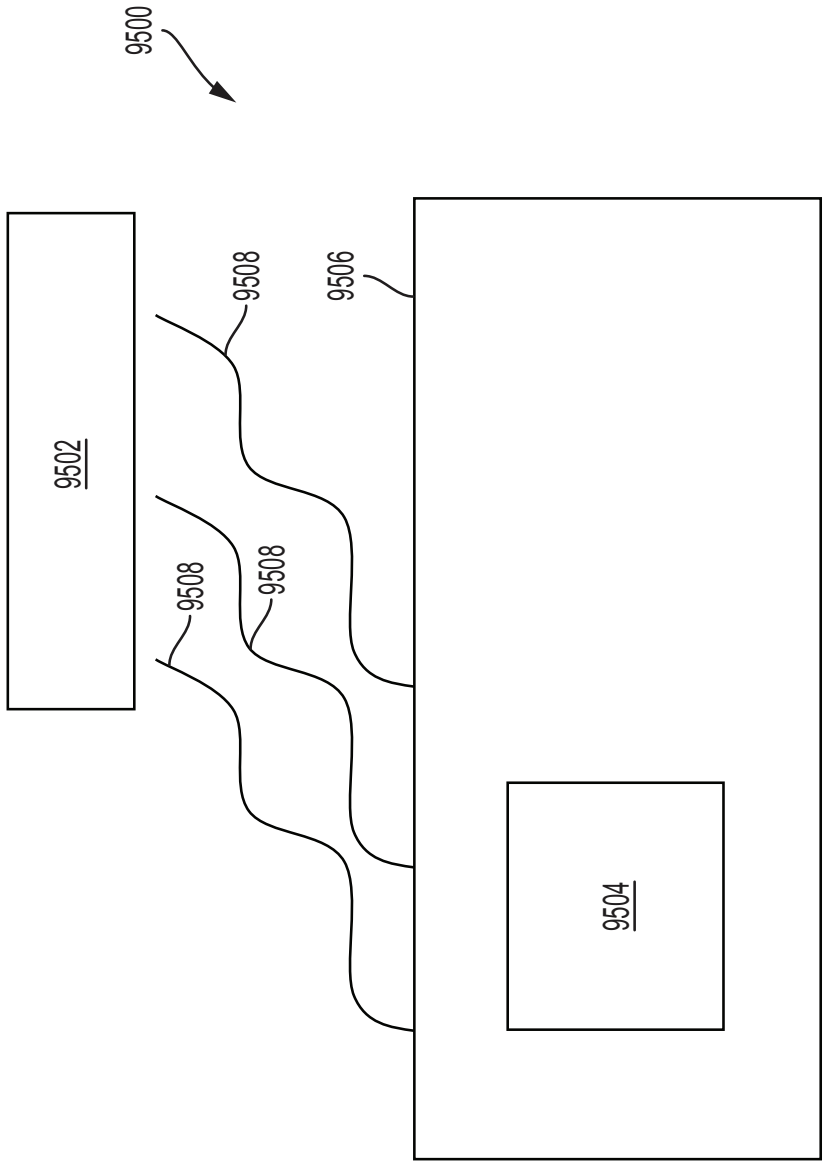


FIG. 95

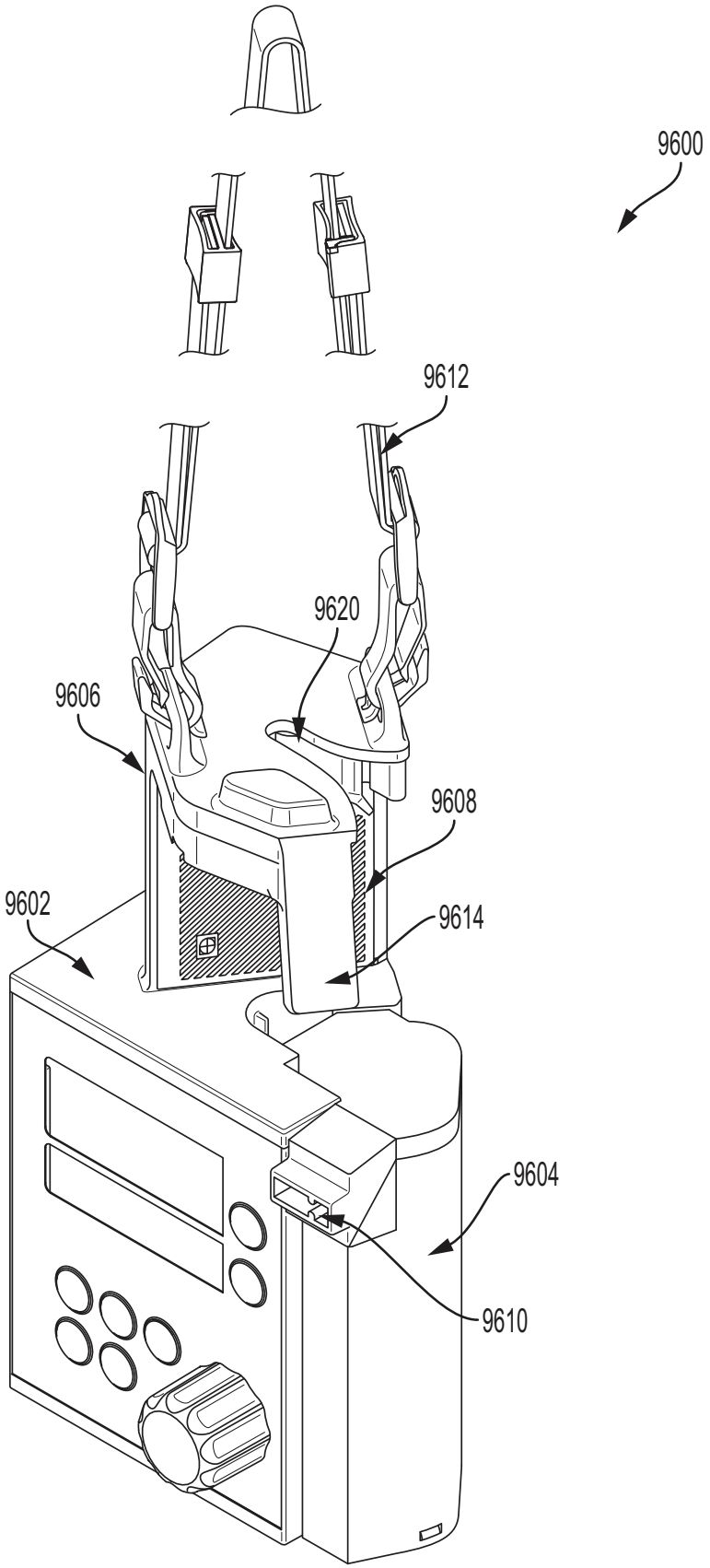


FIG. 96A

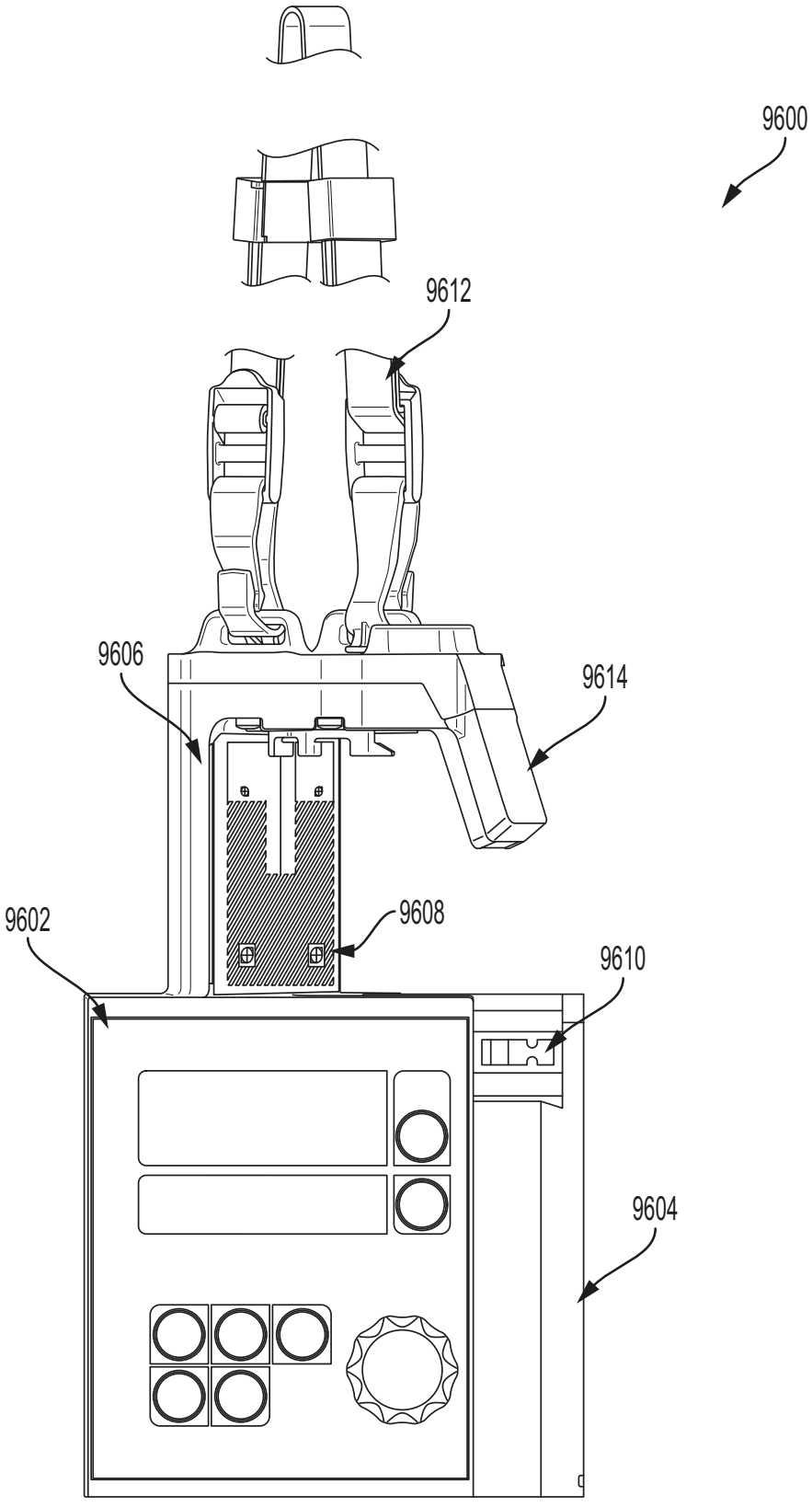


FIG. 96B

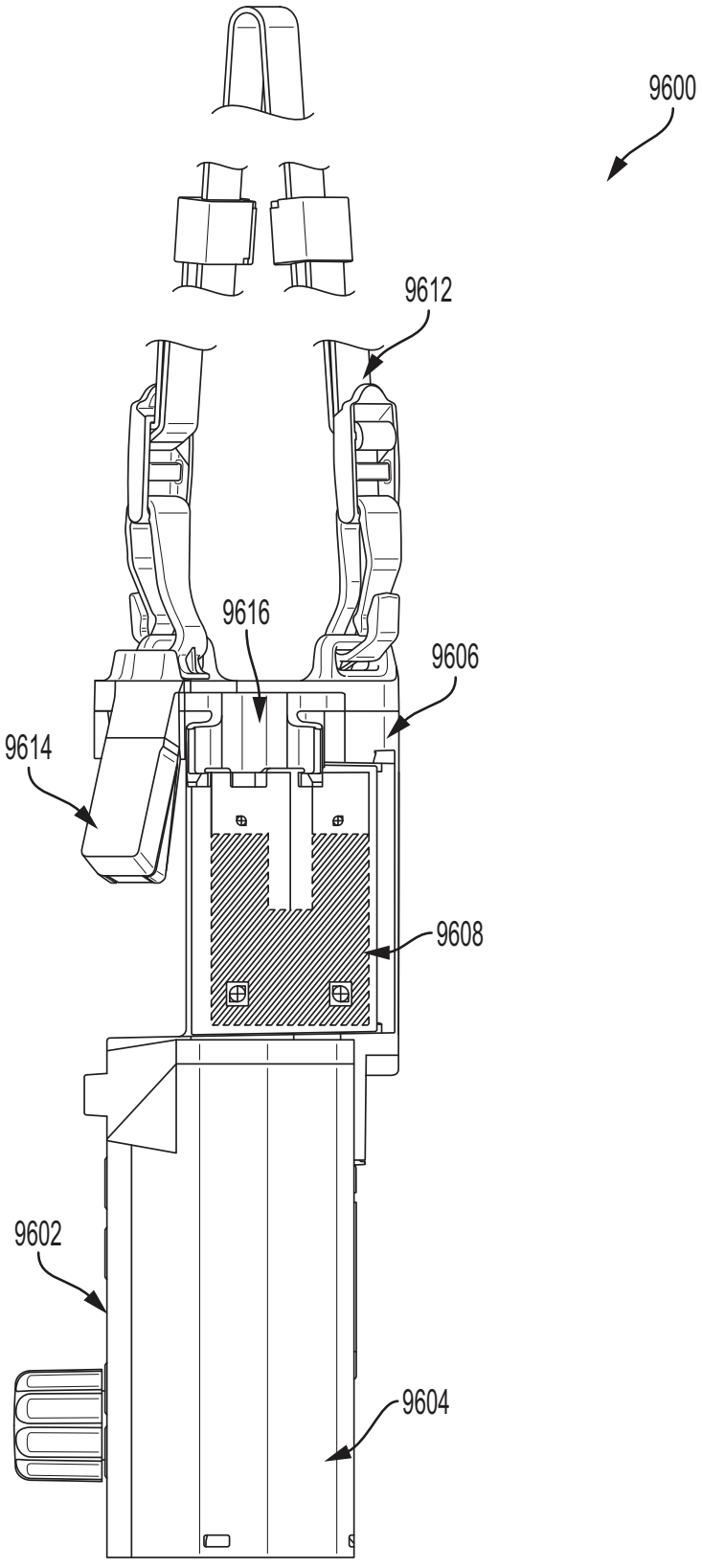


FIG. 96C

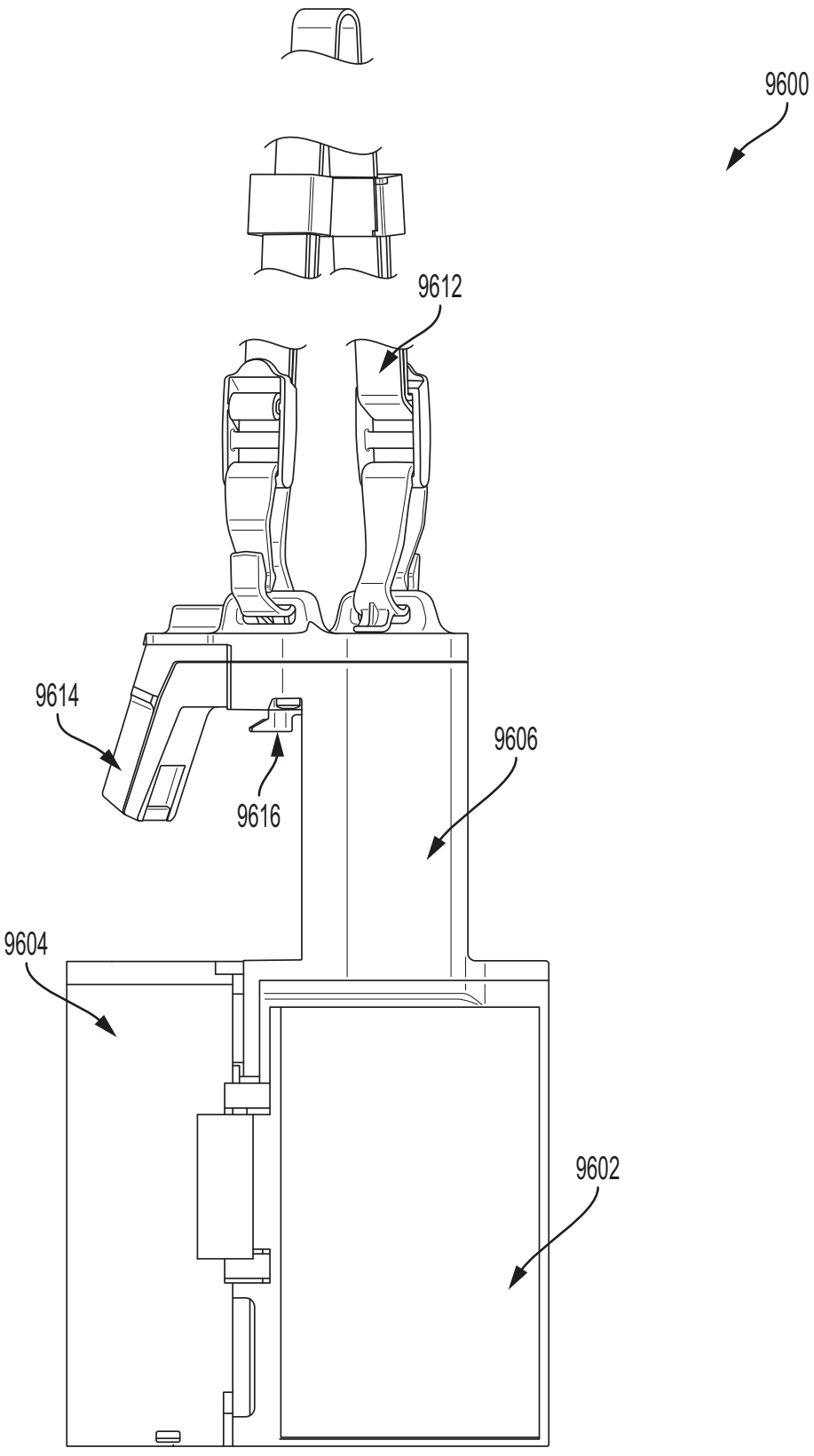


FIG. 96D

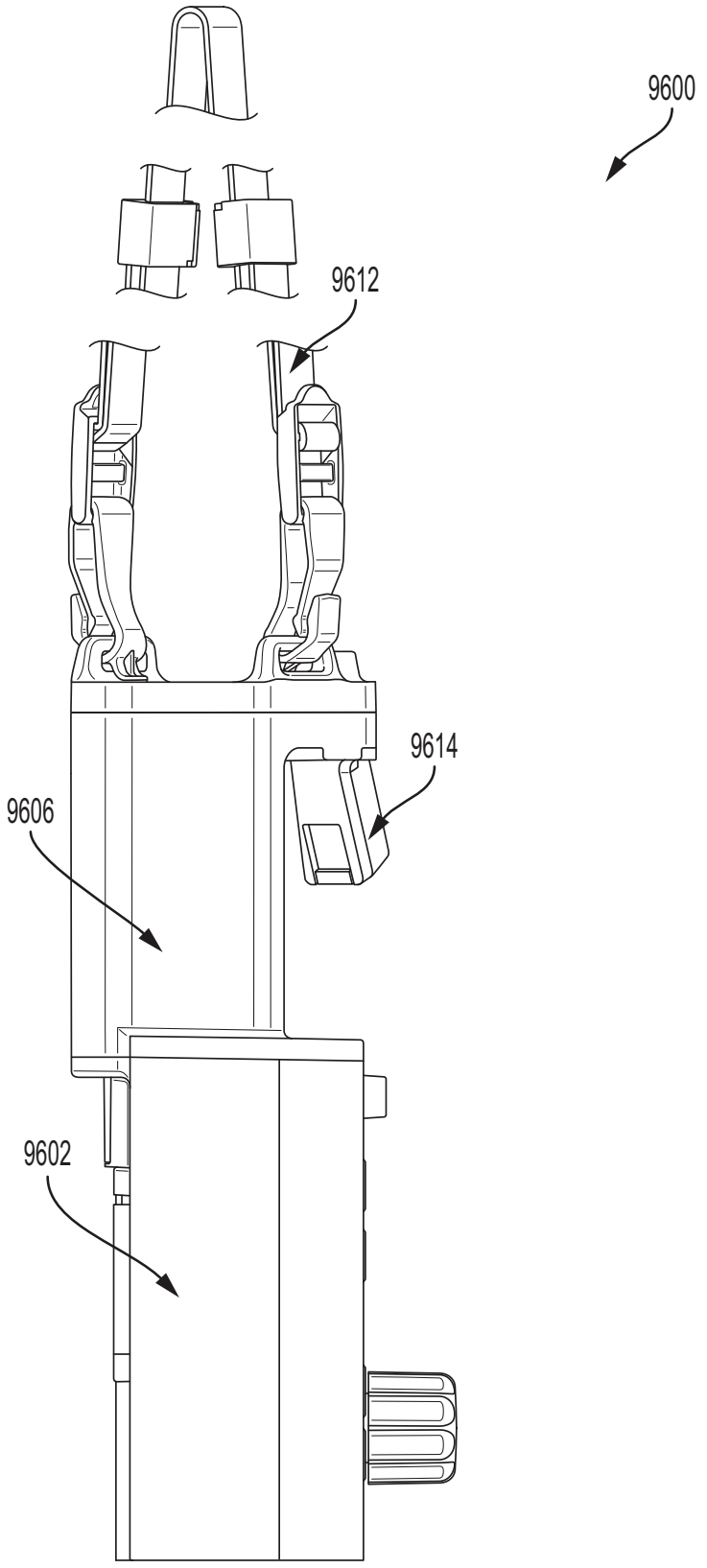


FIG. 96E

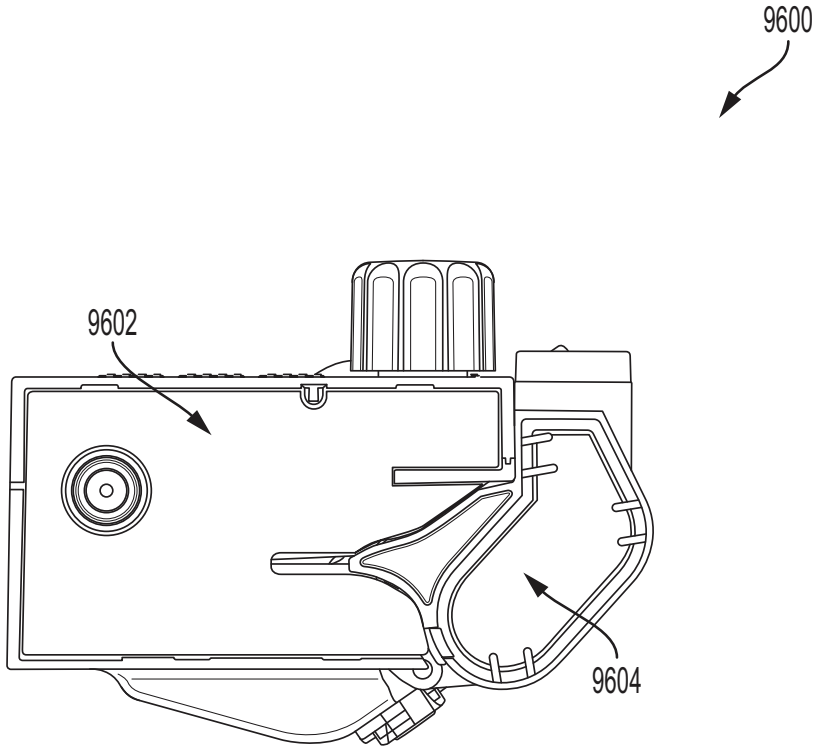


FIG. 96F

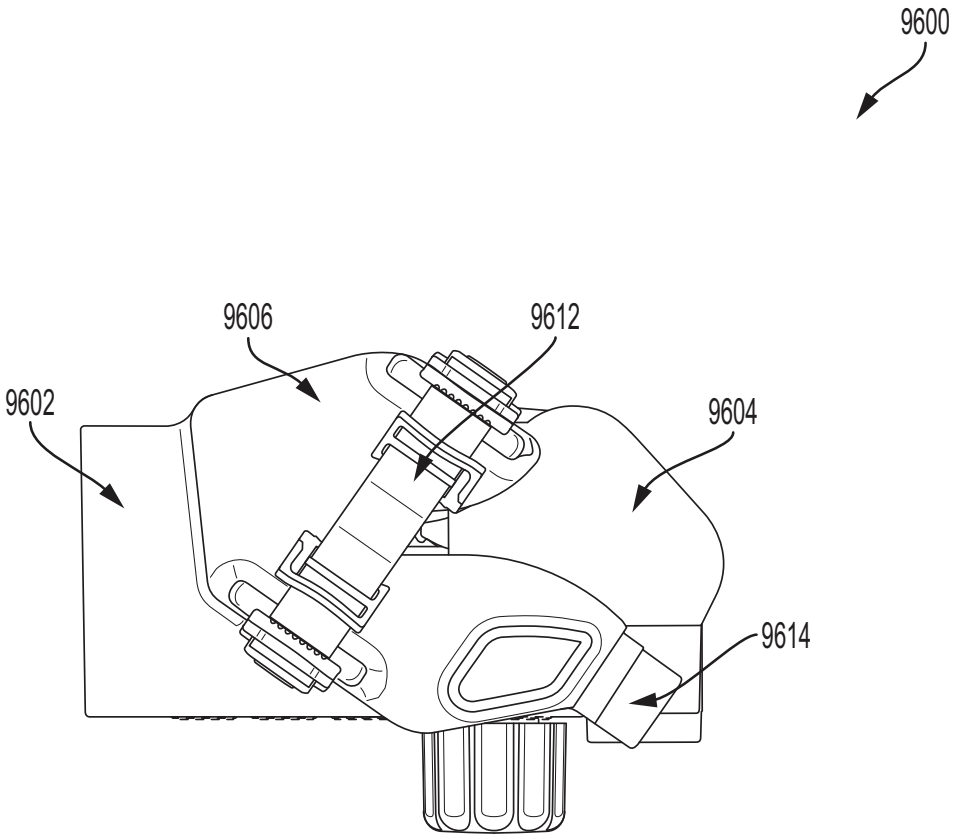


FIG. 96G

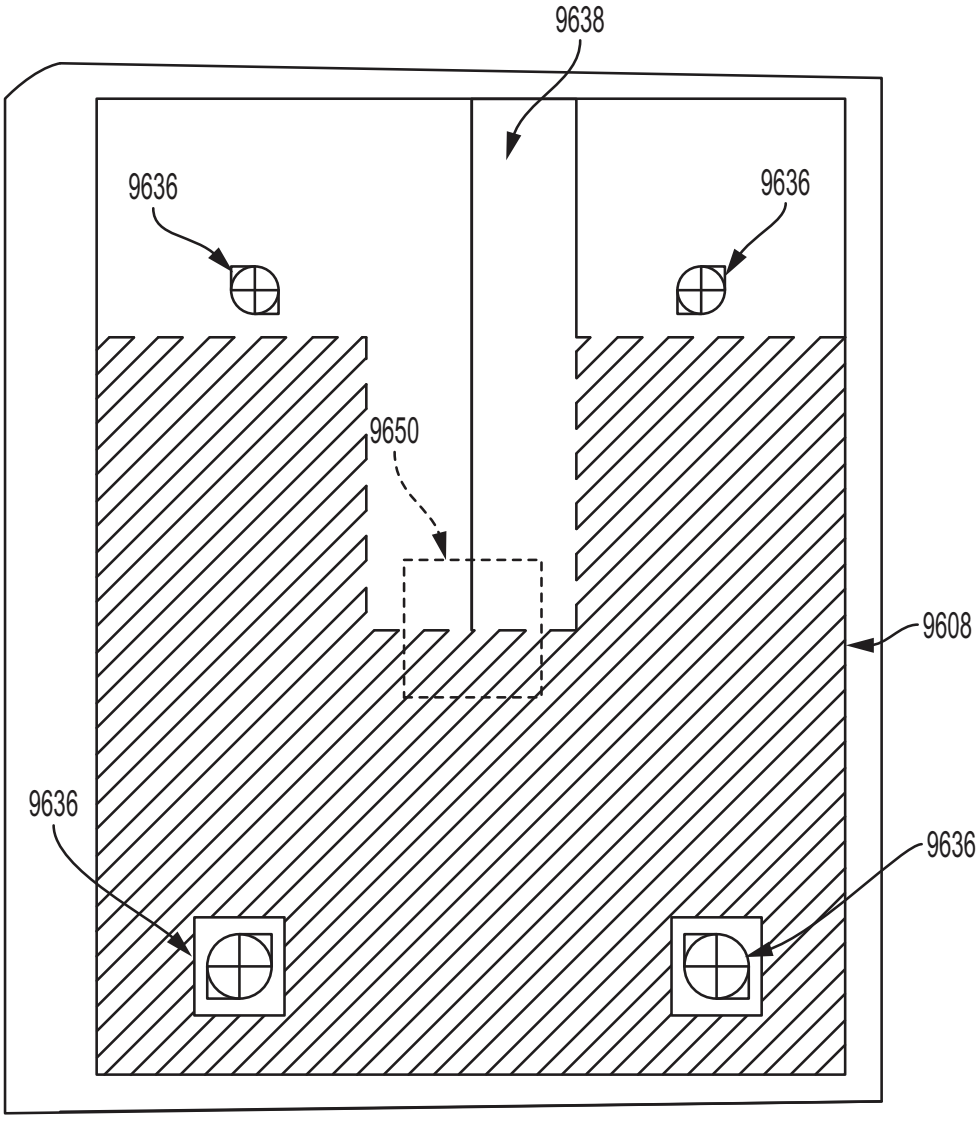


FIG. 96H

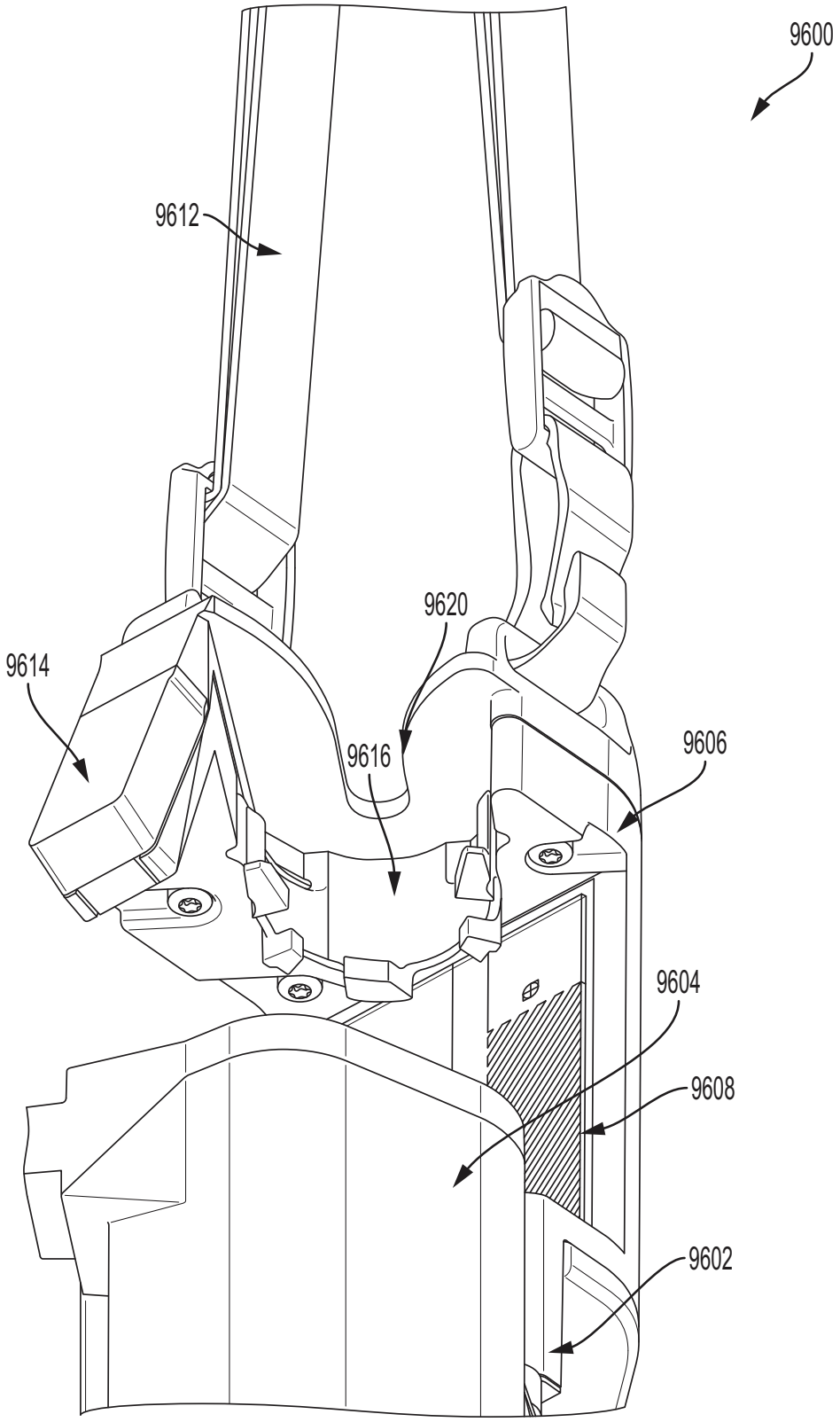


FIG. 96I

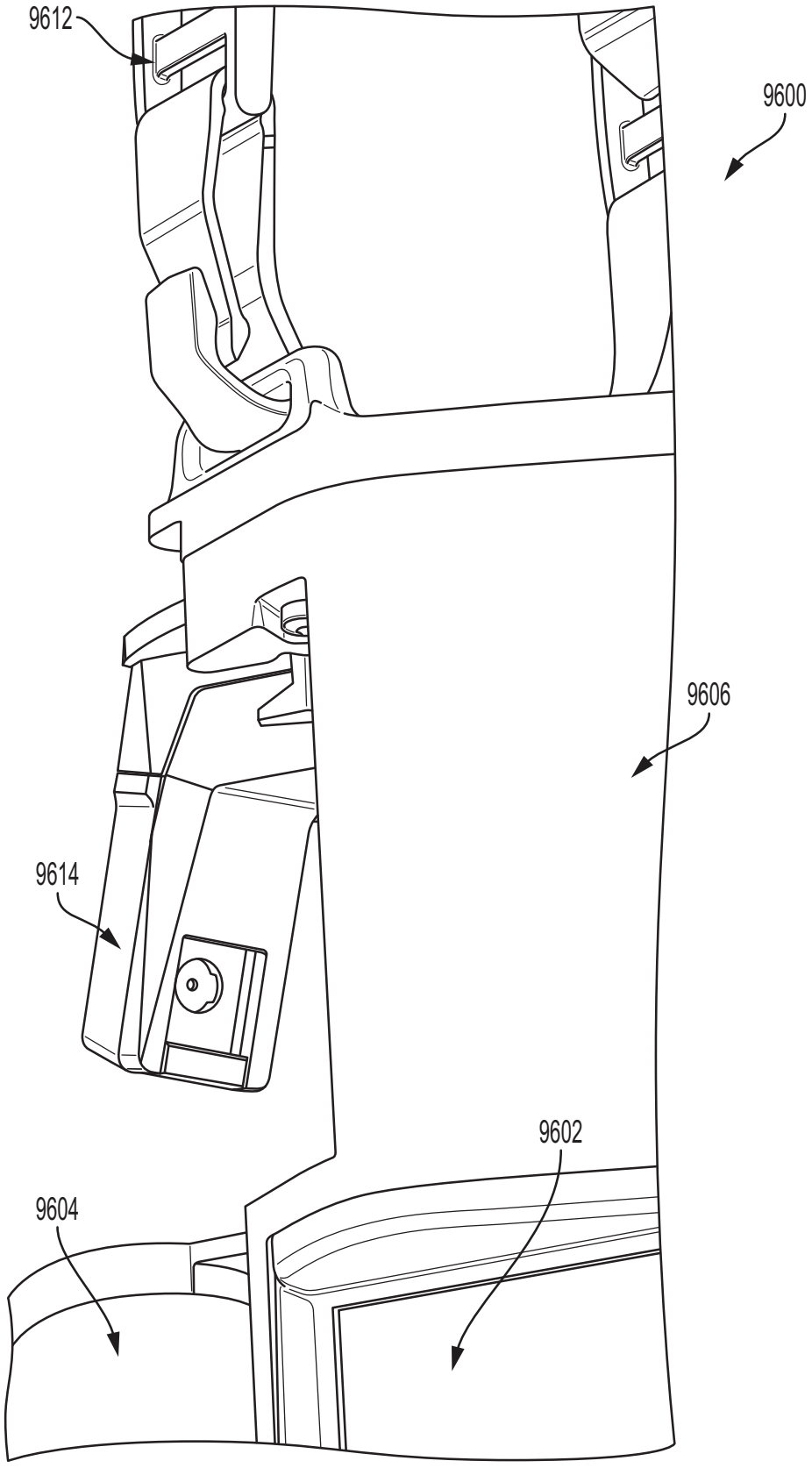


FIG. 96J

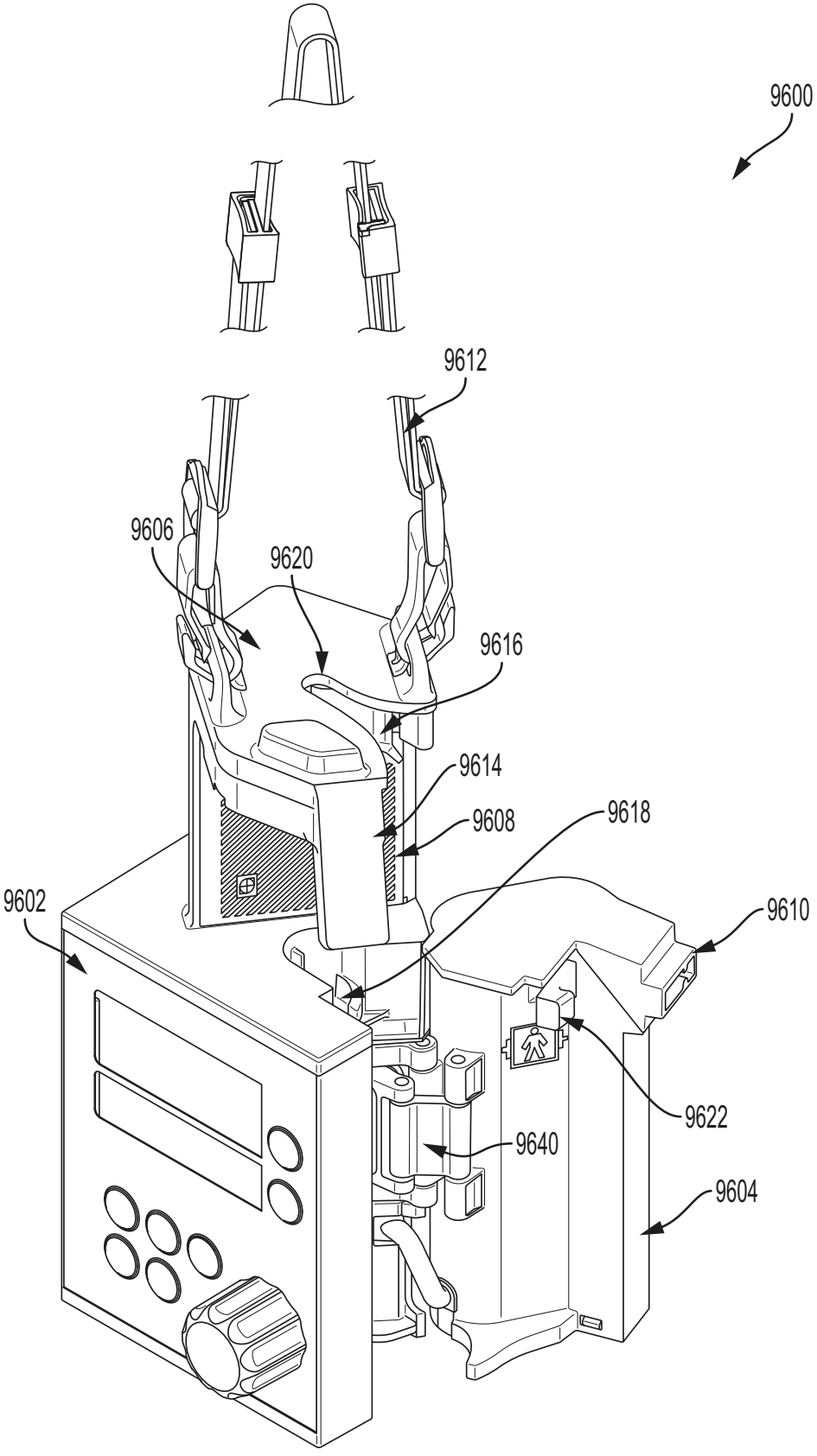

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FIG. 96K

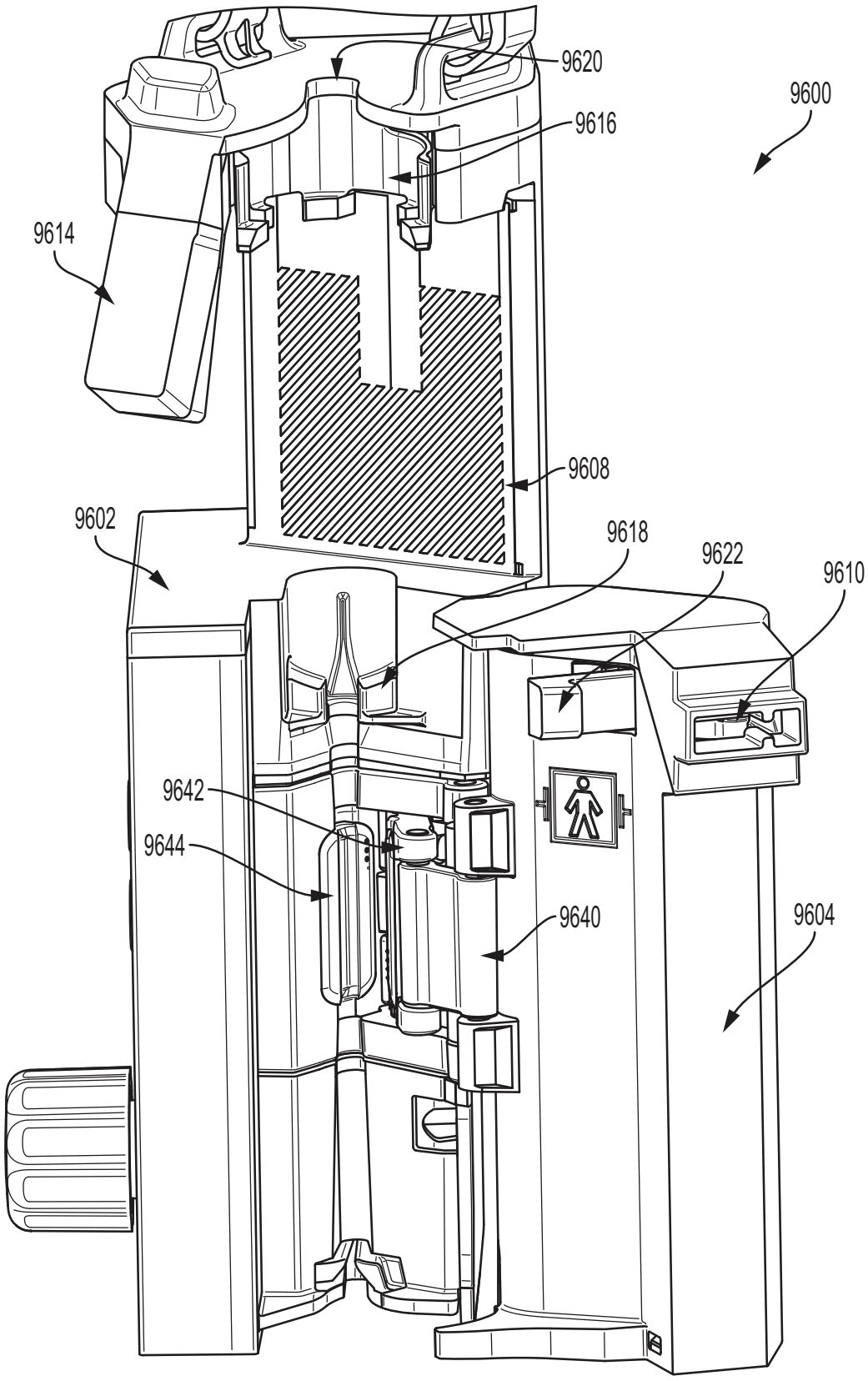

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FIG. 96L

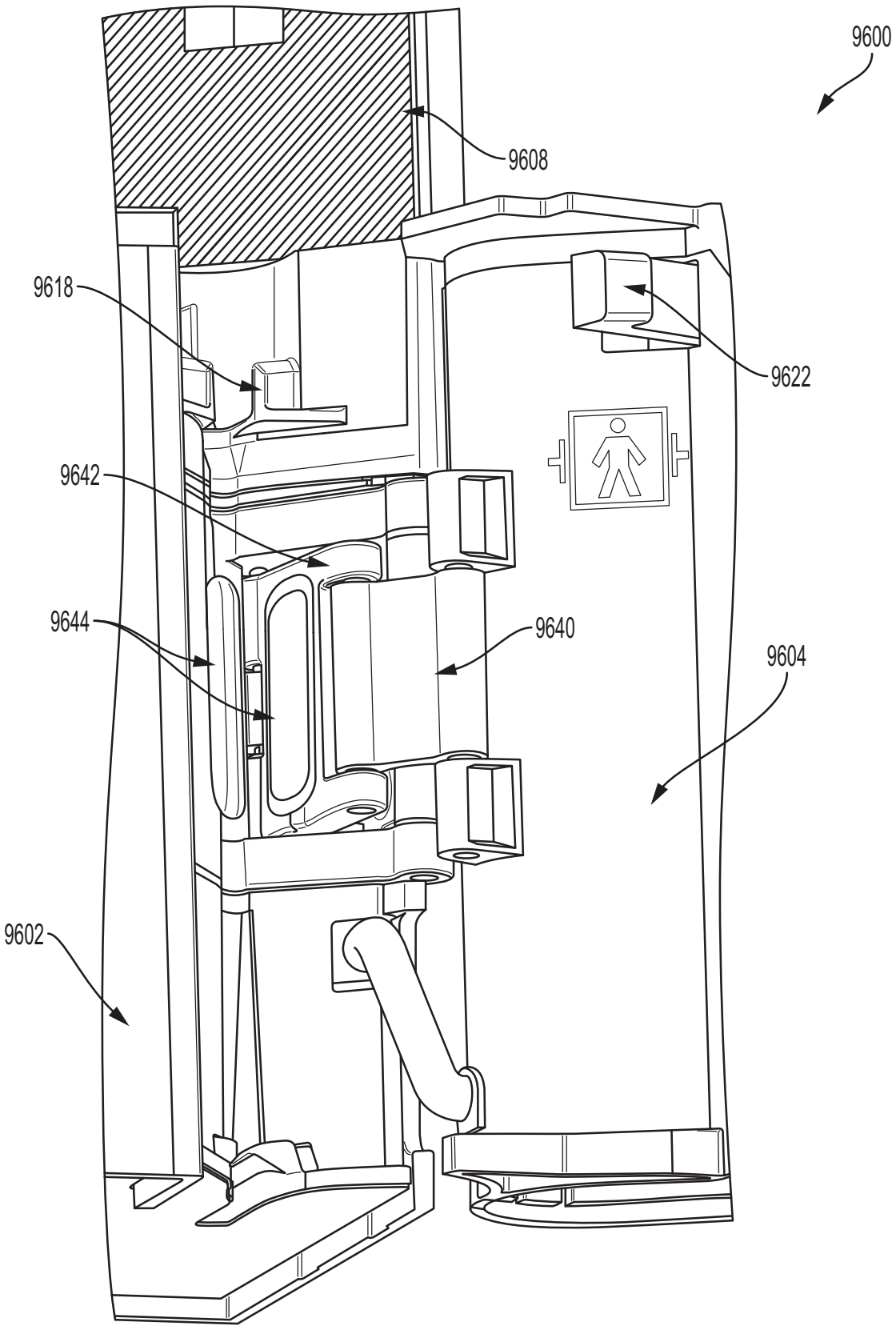


FIG. 96M

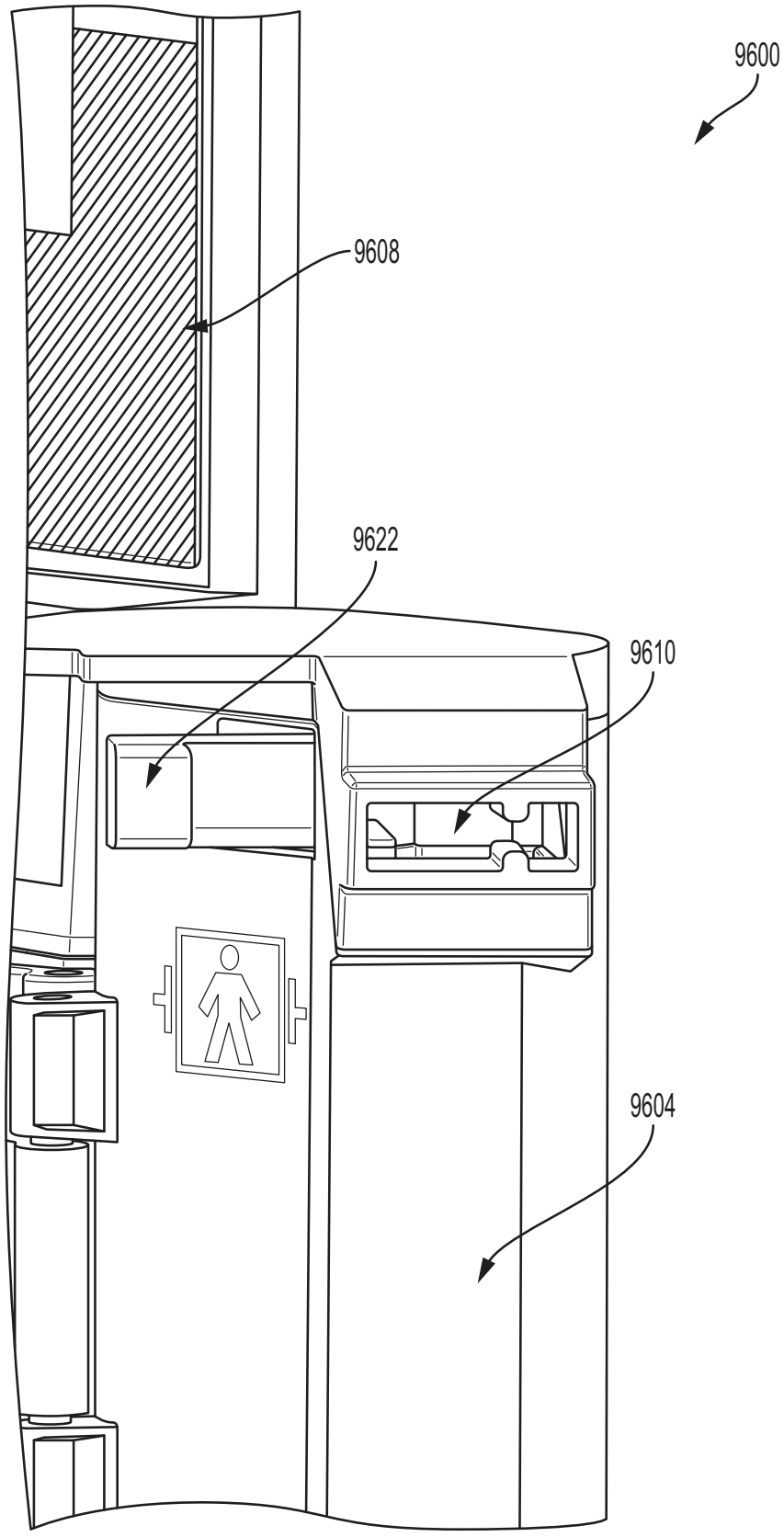


FIG. 96N

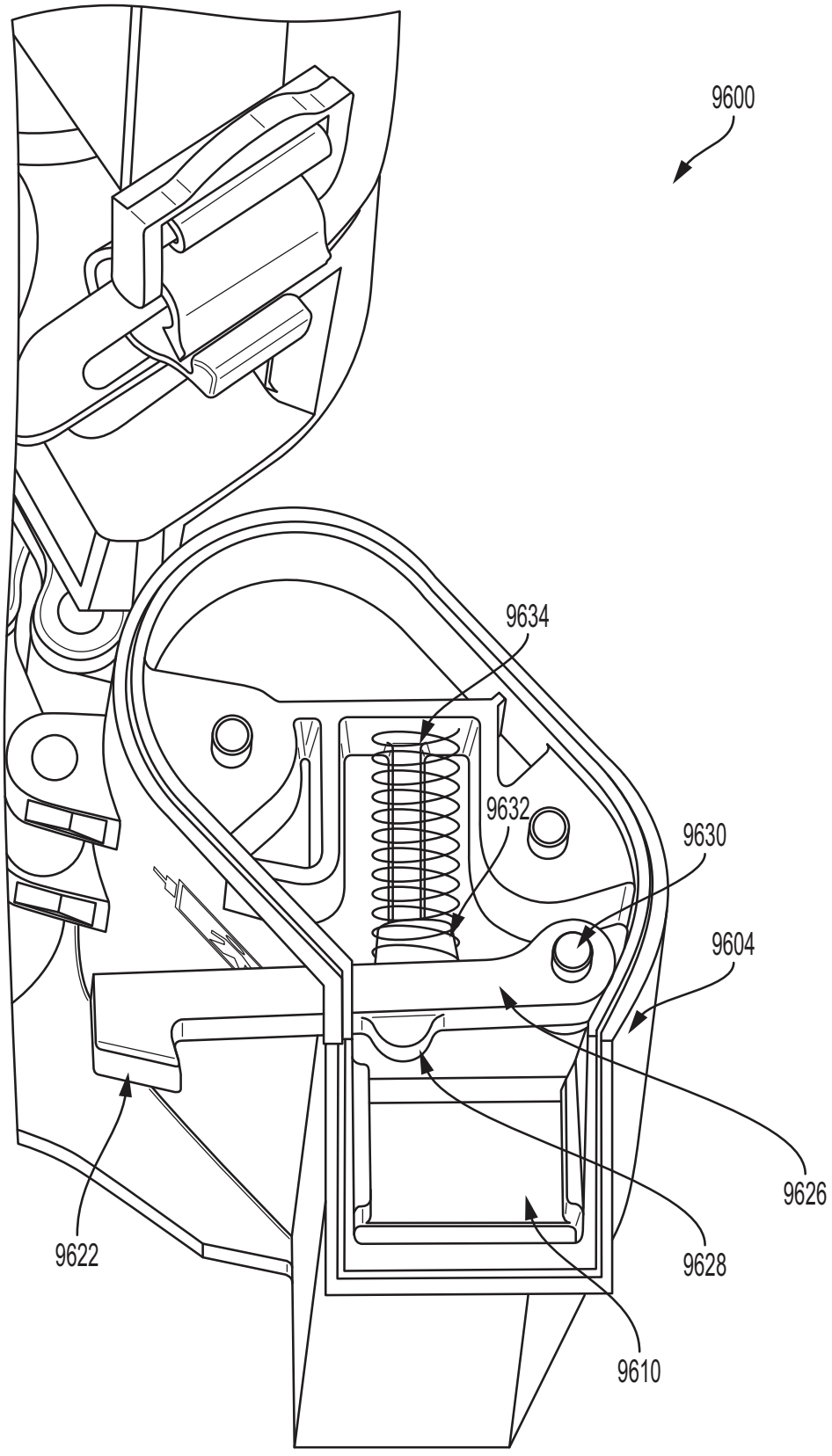


FIG. 96O

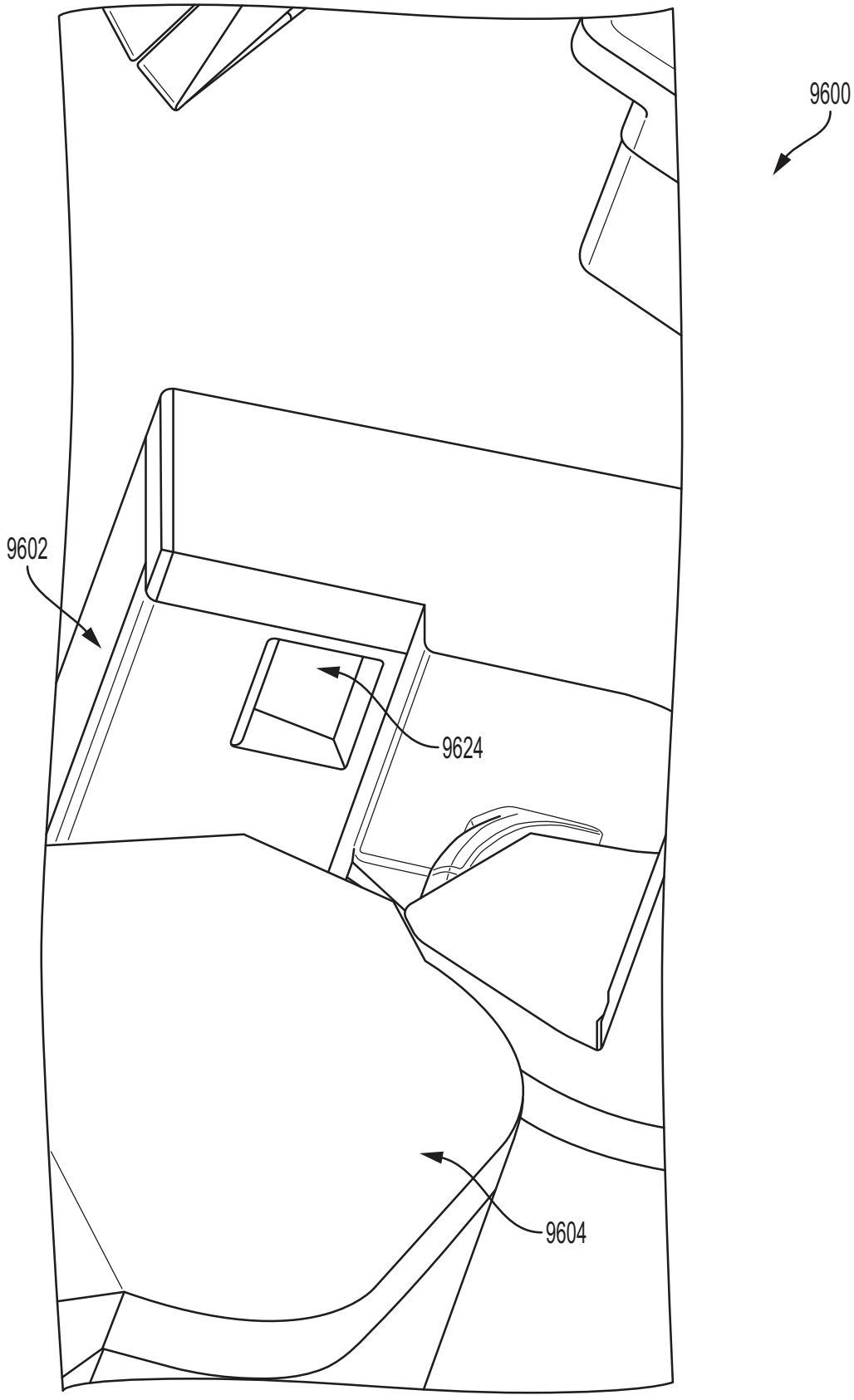


FIG. 96P

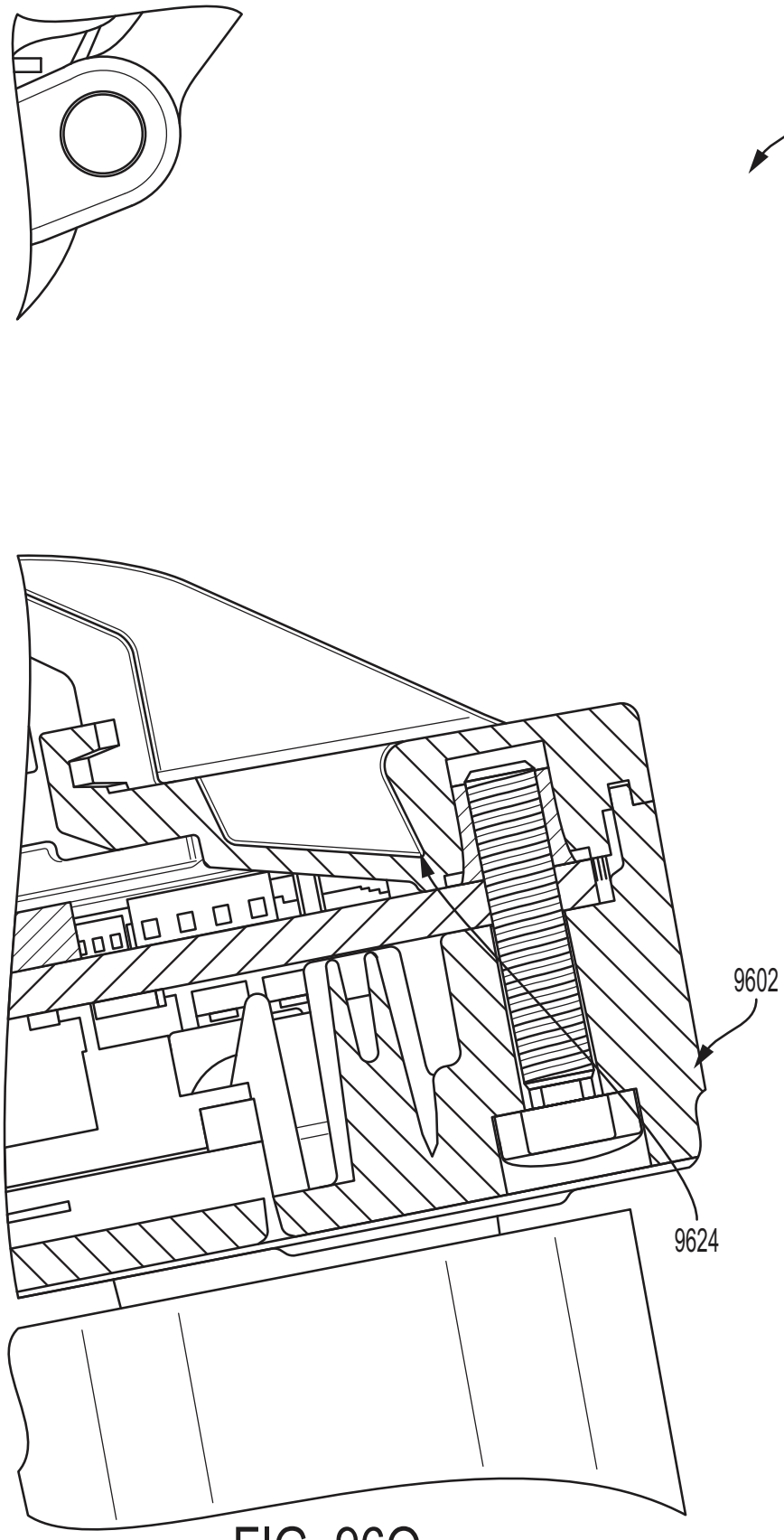


FIG. 96Q

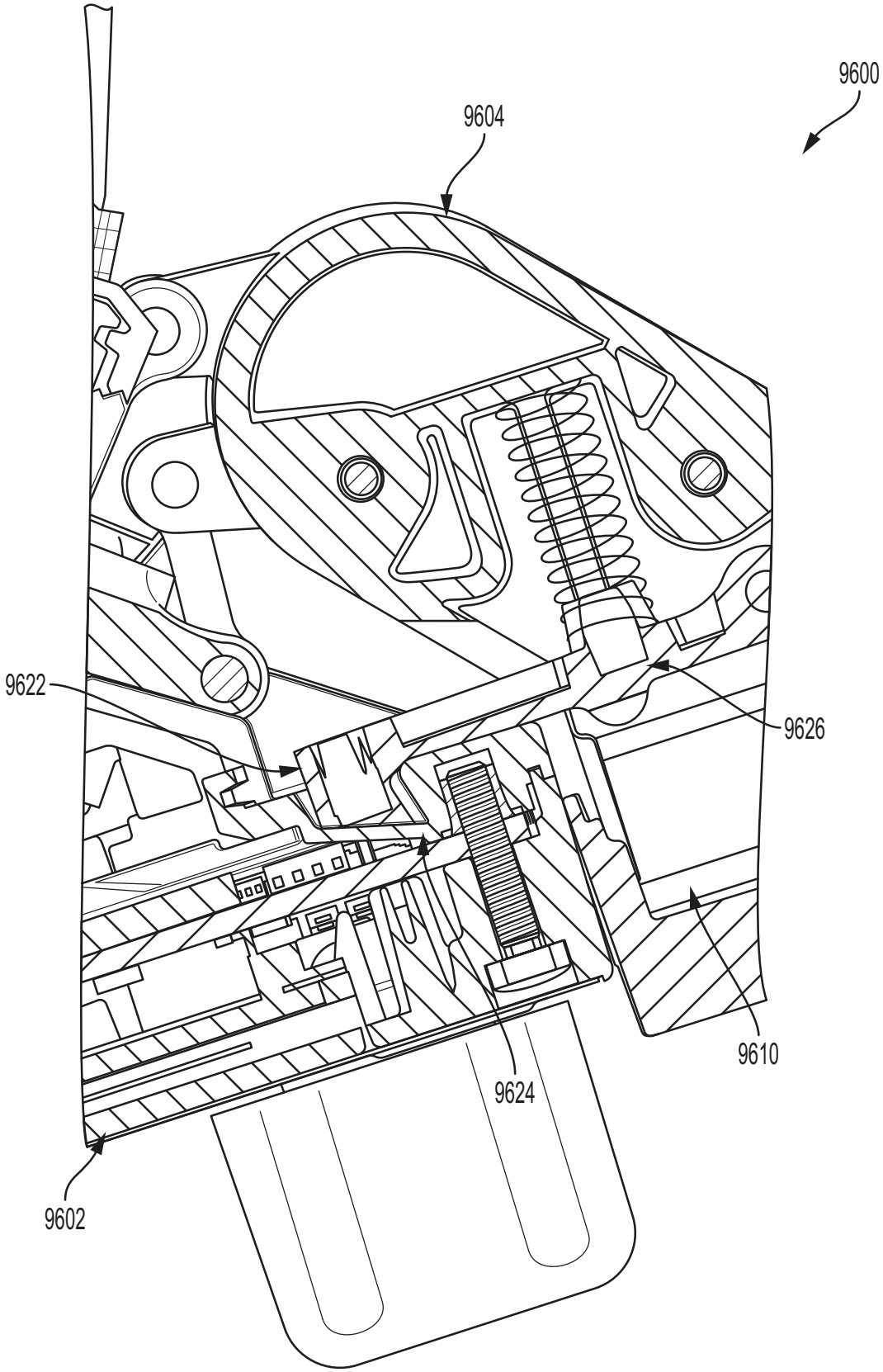


FIG. 96R

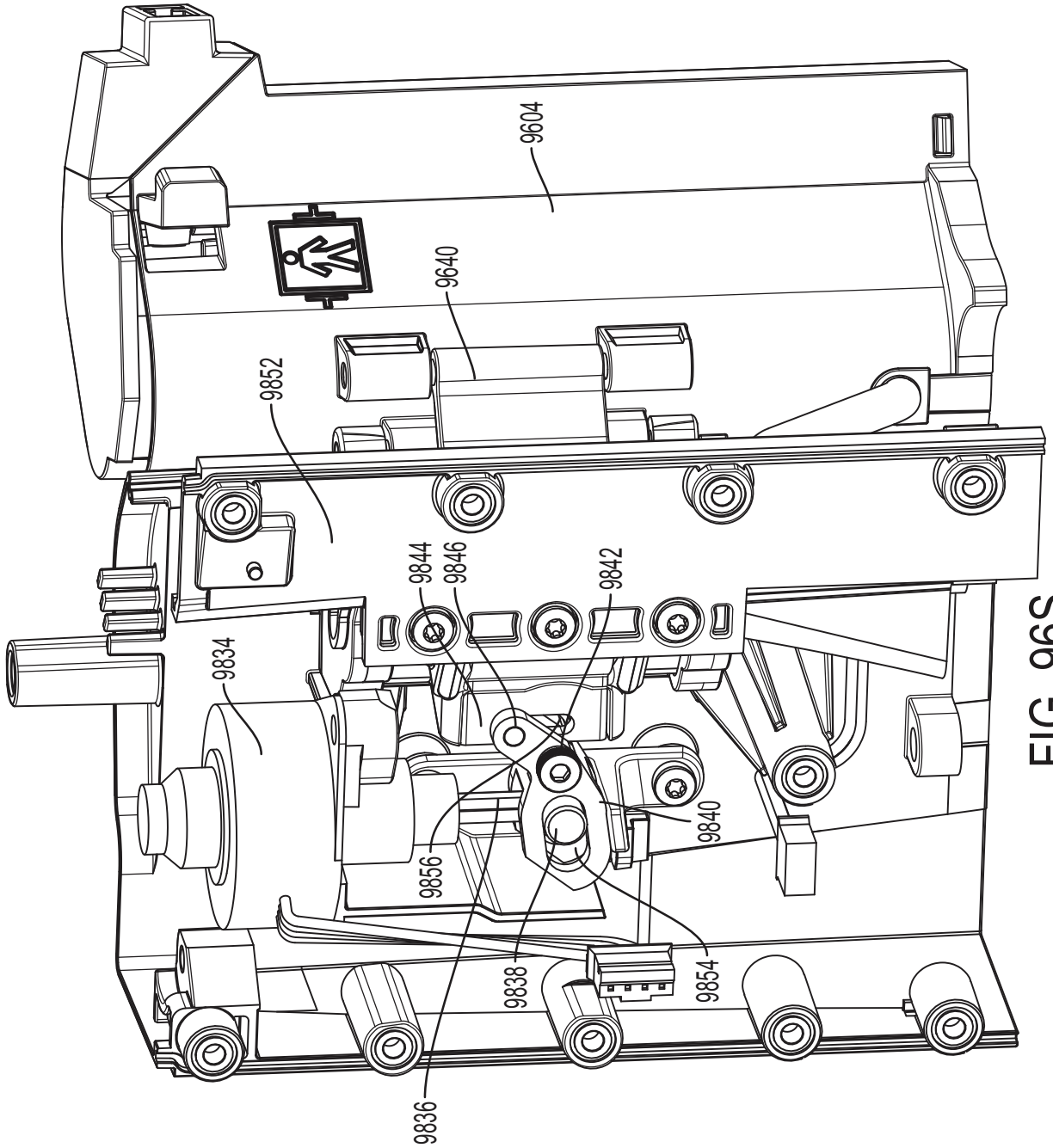


FIG. 96S

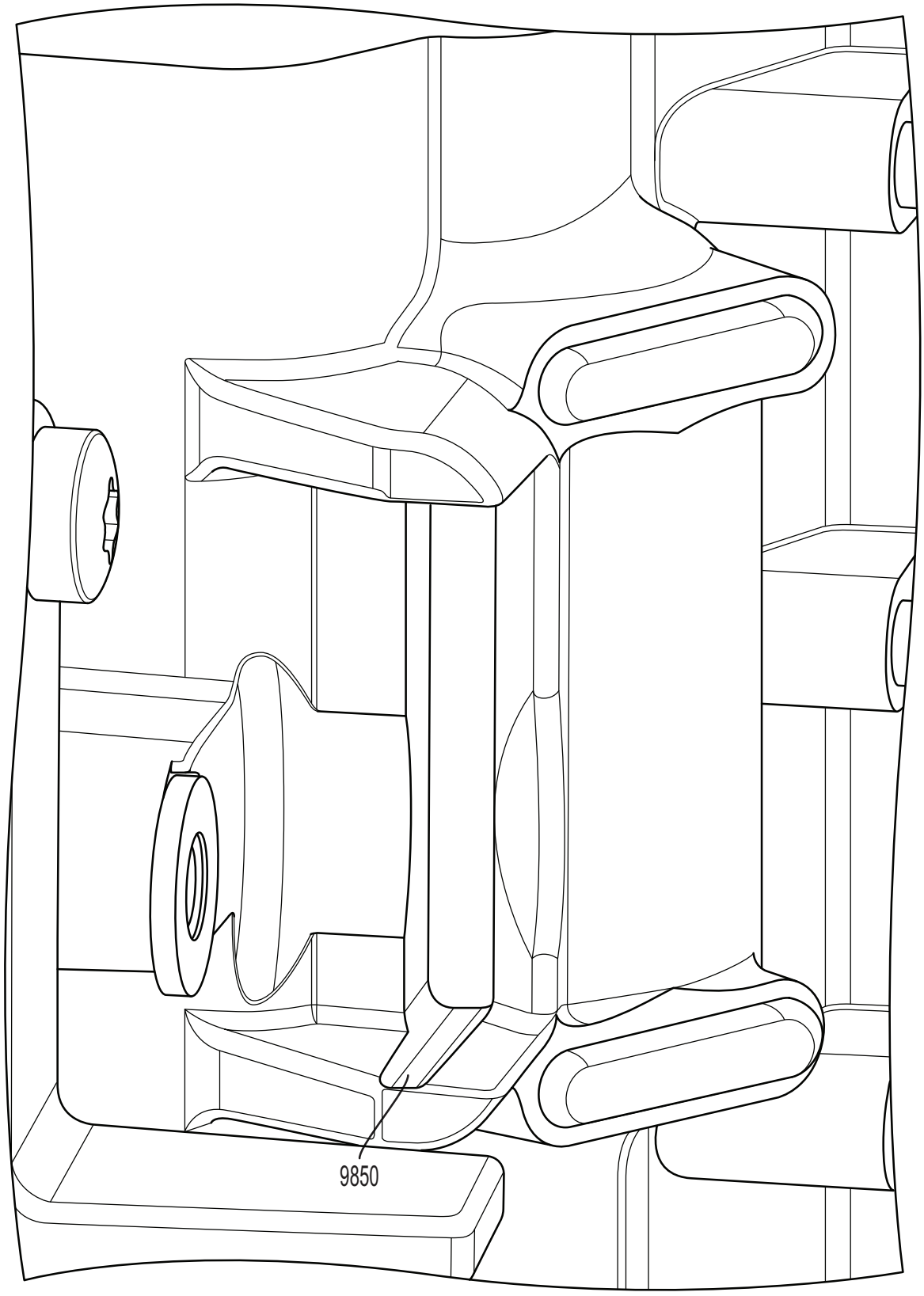


FIG. 96T

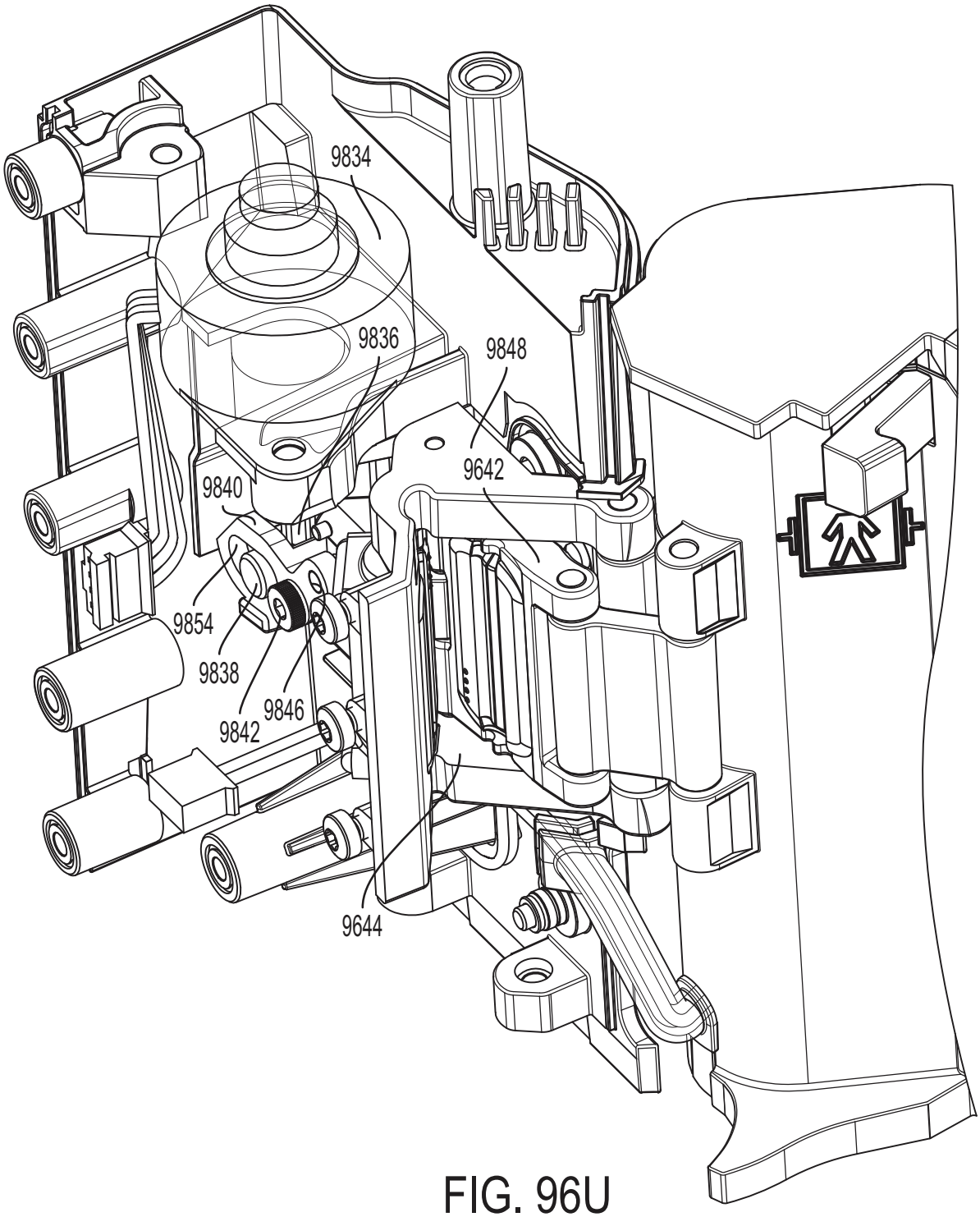


FIG. 96U

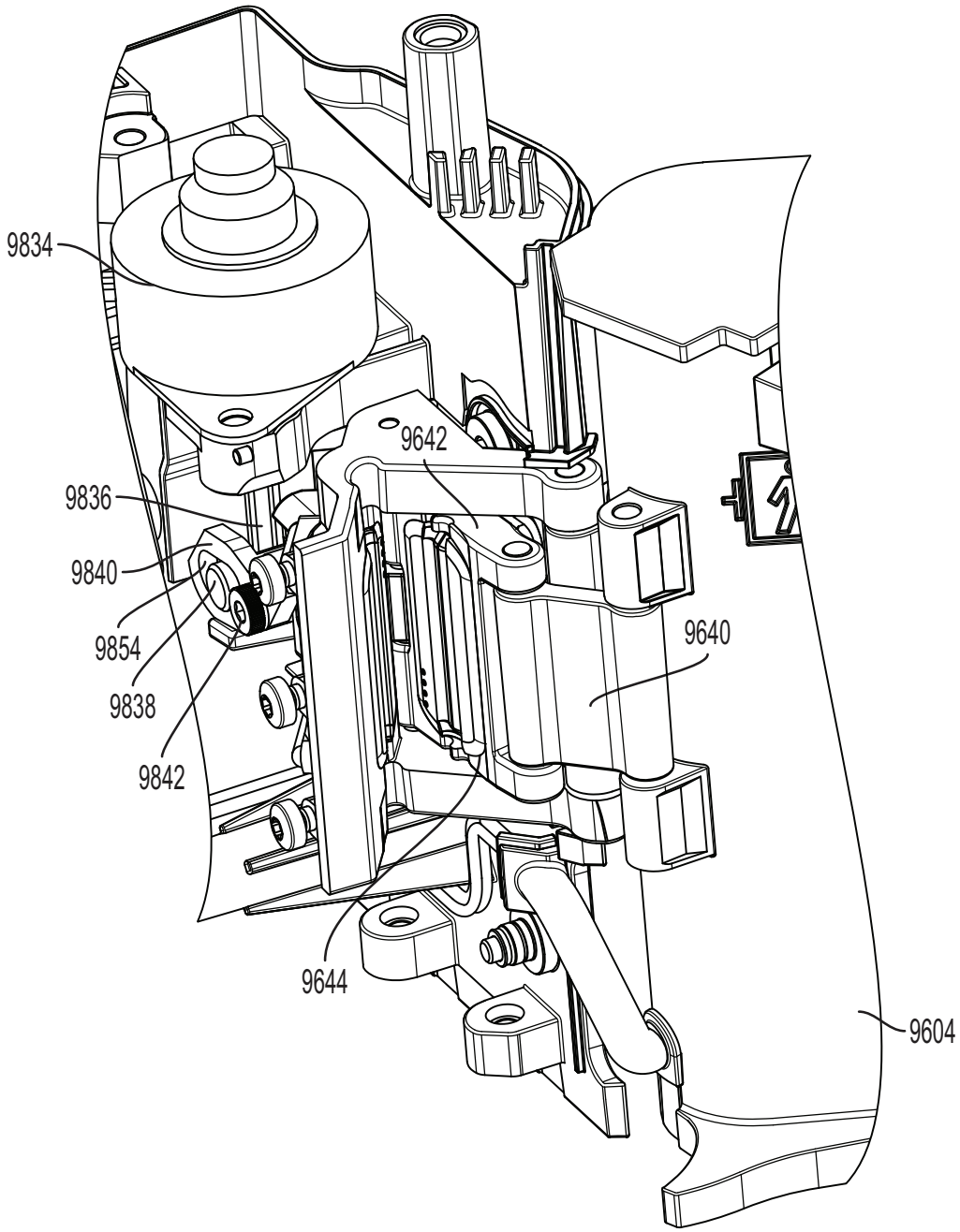


FIG. 96V

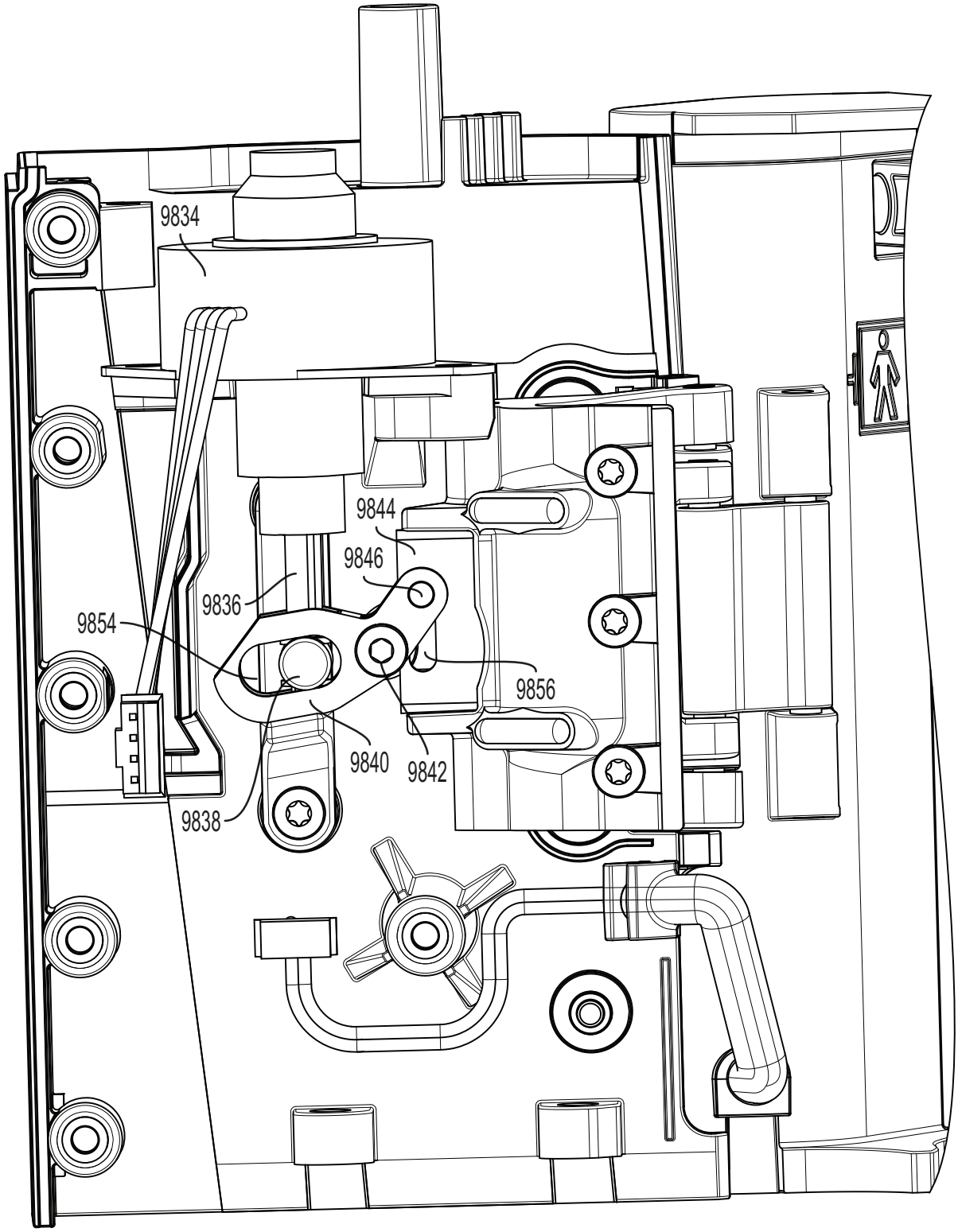


FIG. 96W

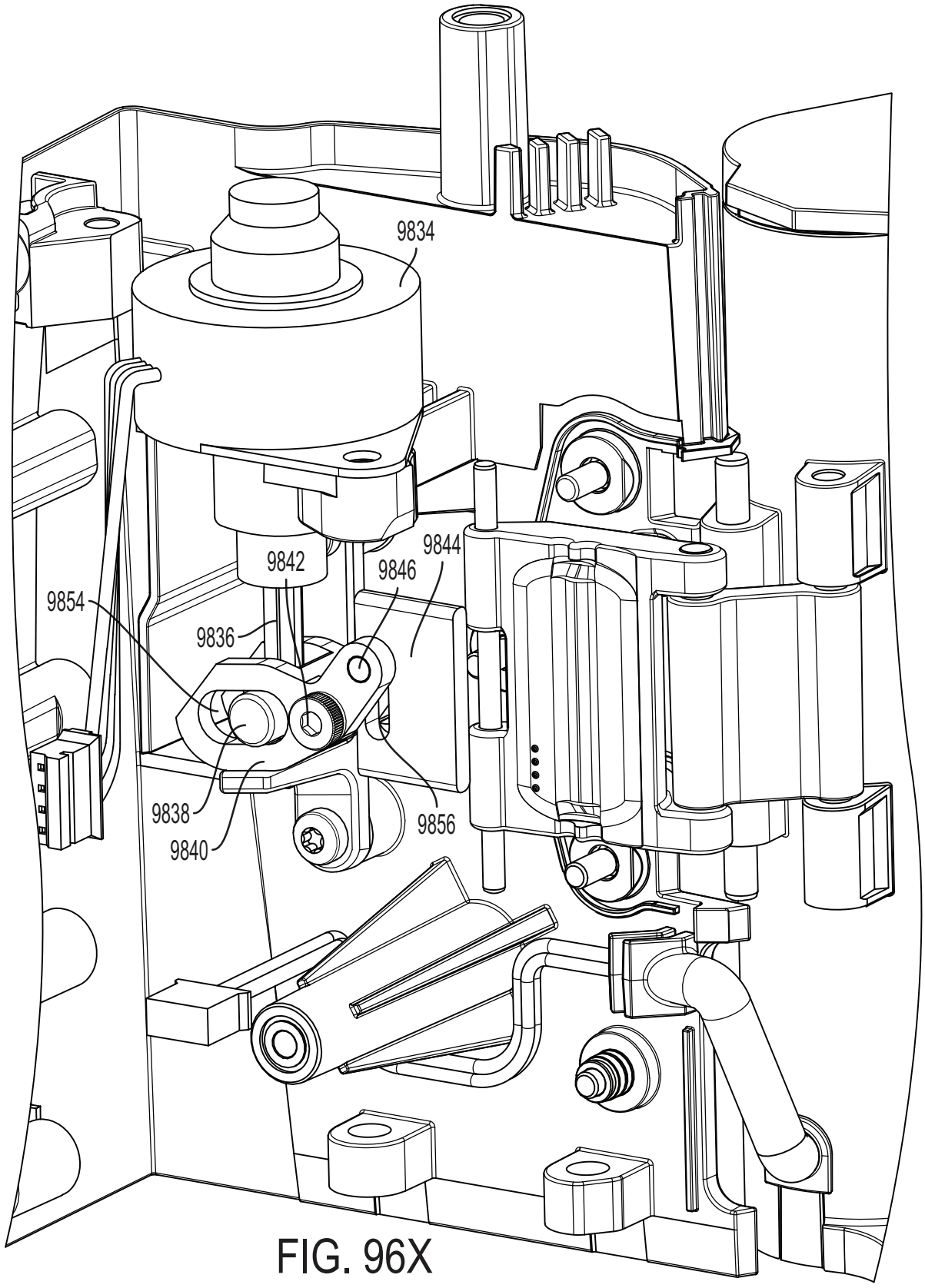


FIG. 96X

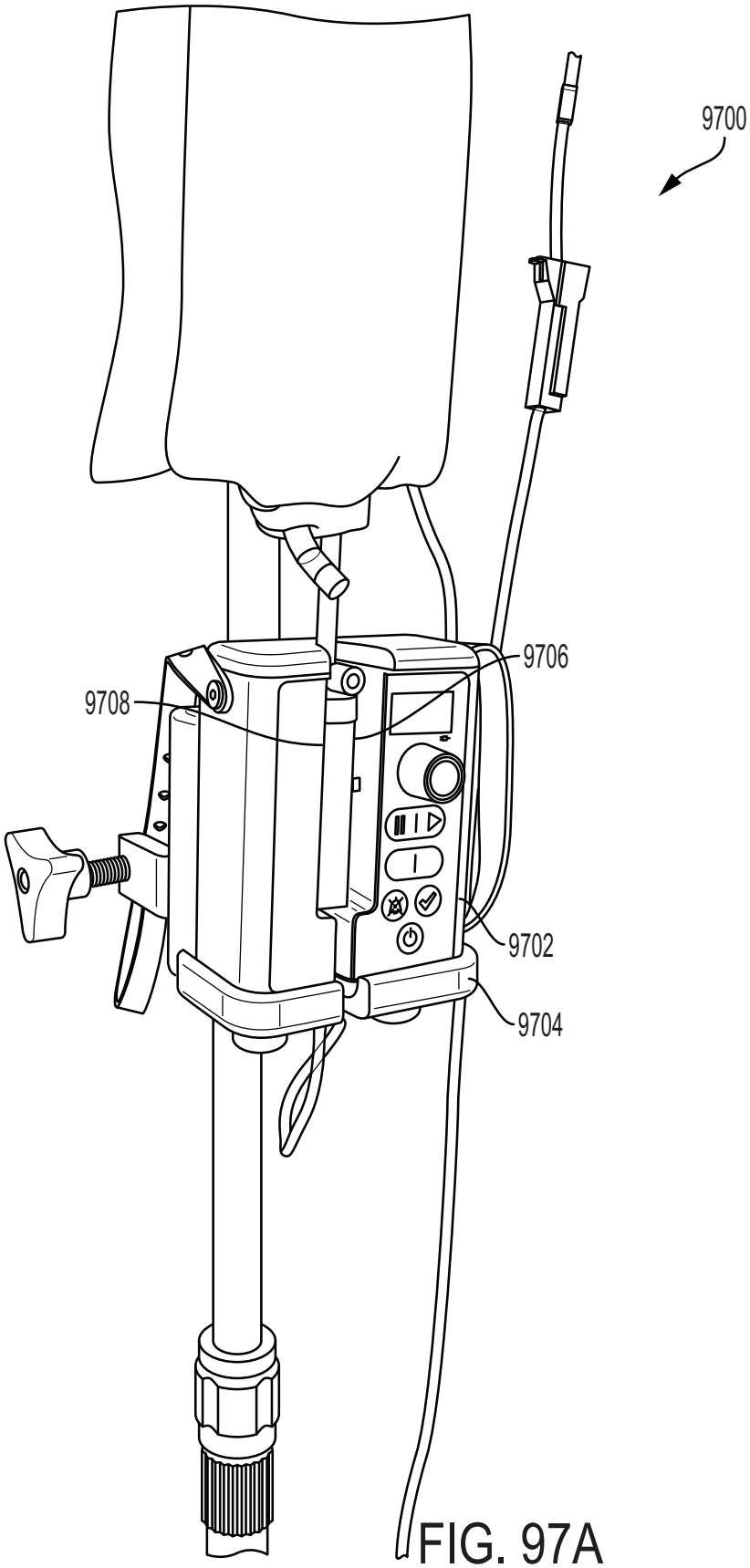


FIG. 97A

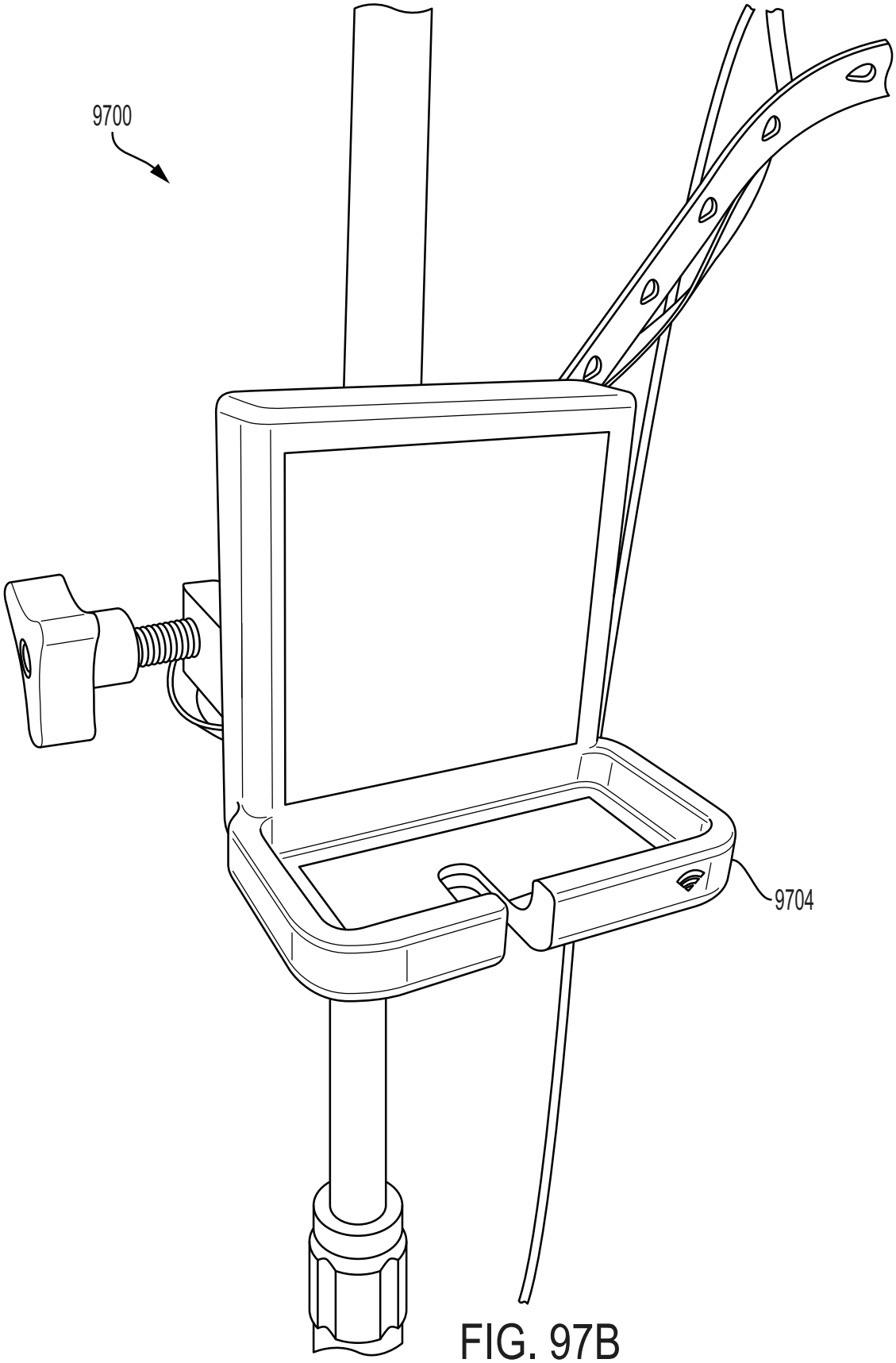


FIG. 97B

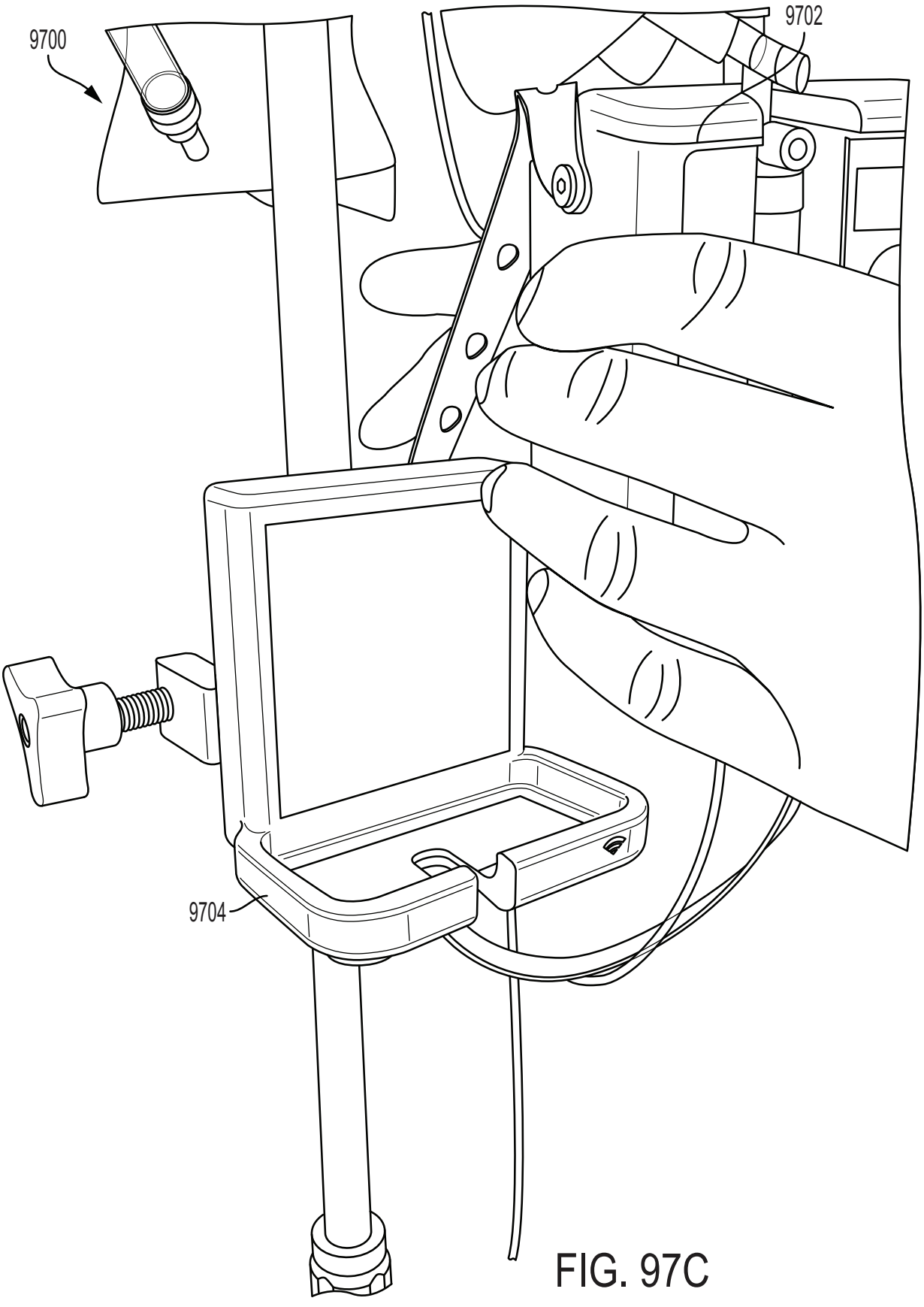


FIG. 97C

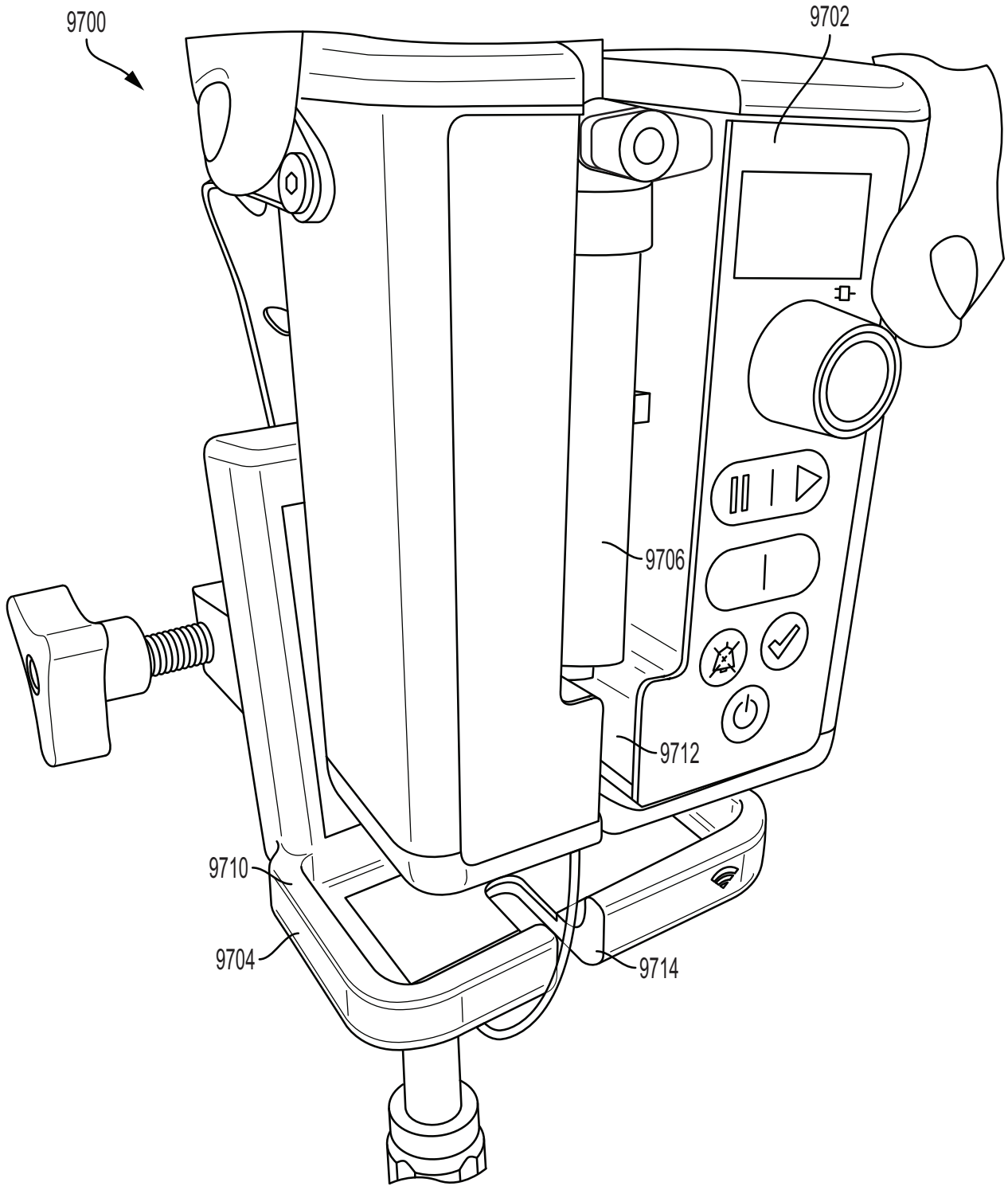


FIG. 97D

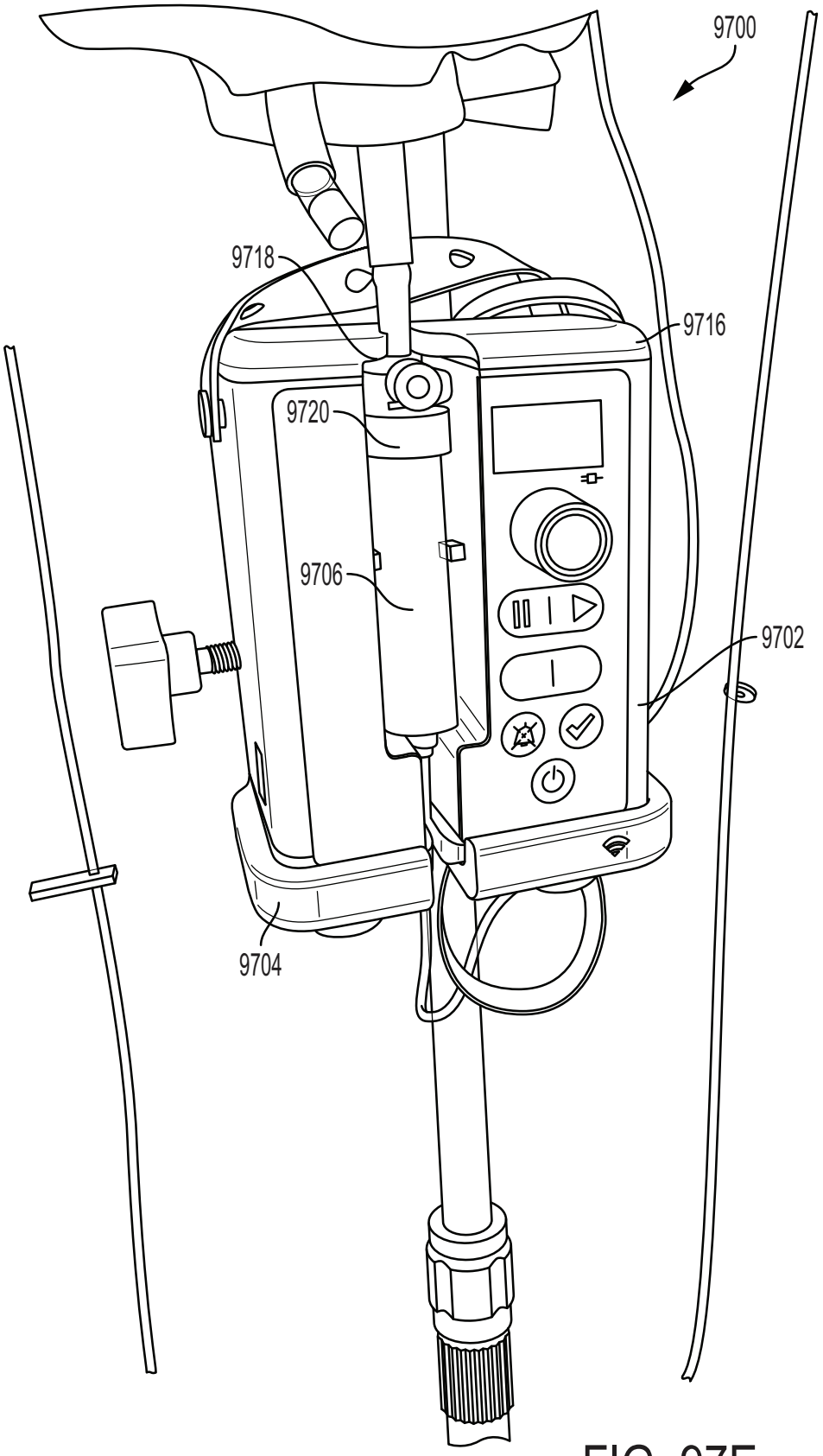


FIG. 97E

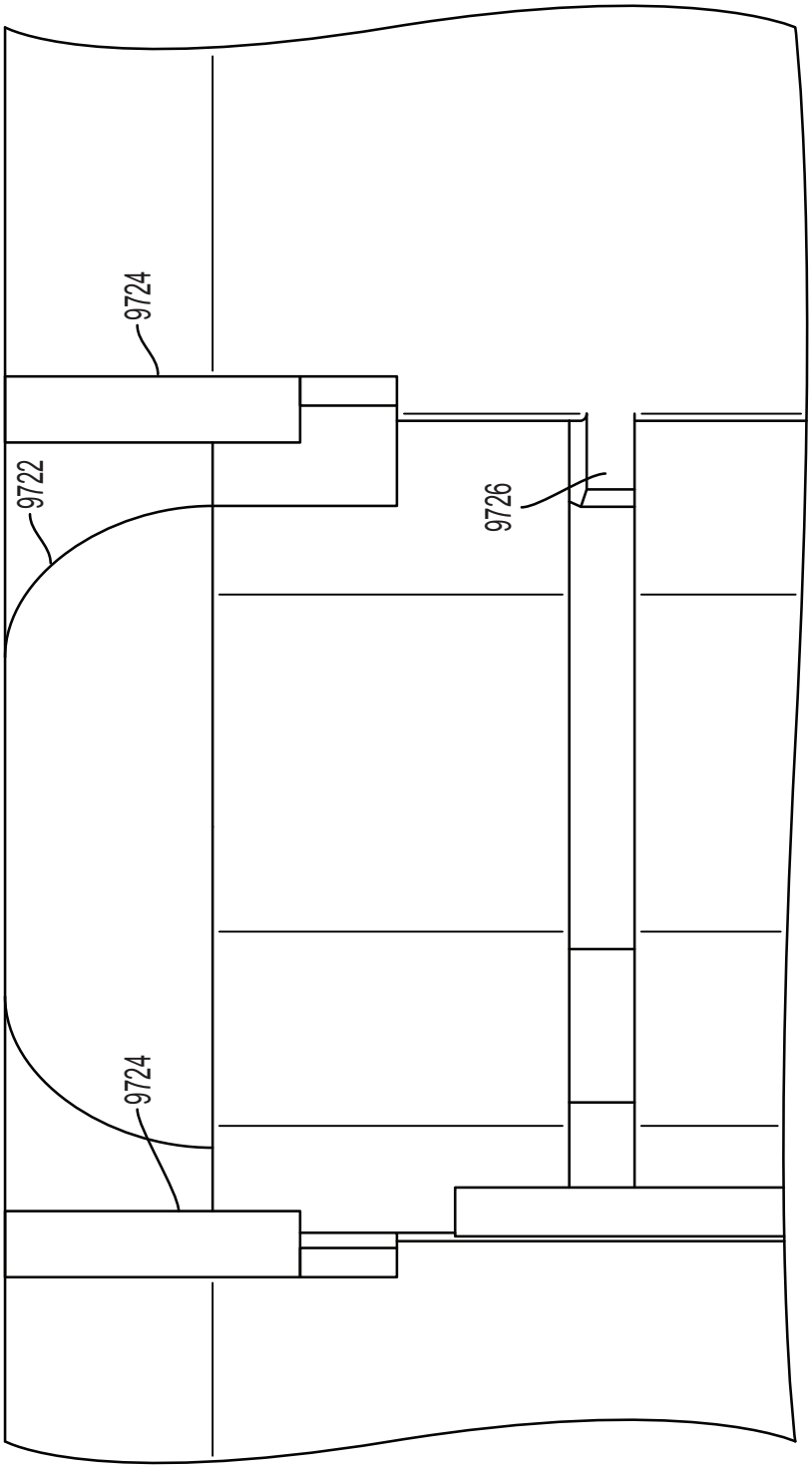


FIG. 97F

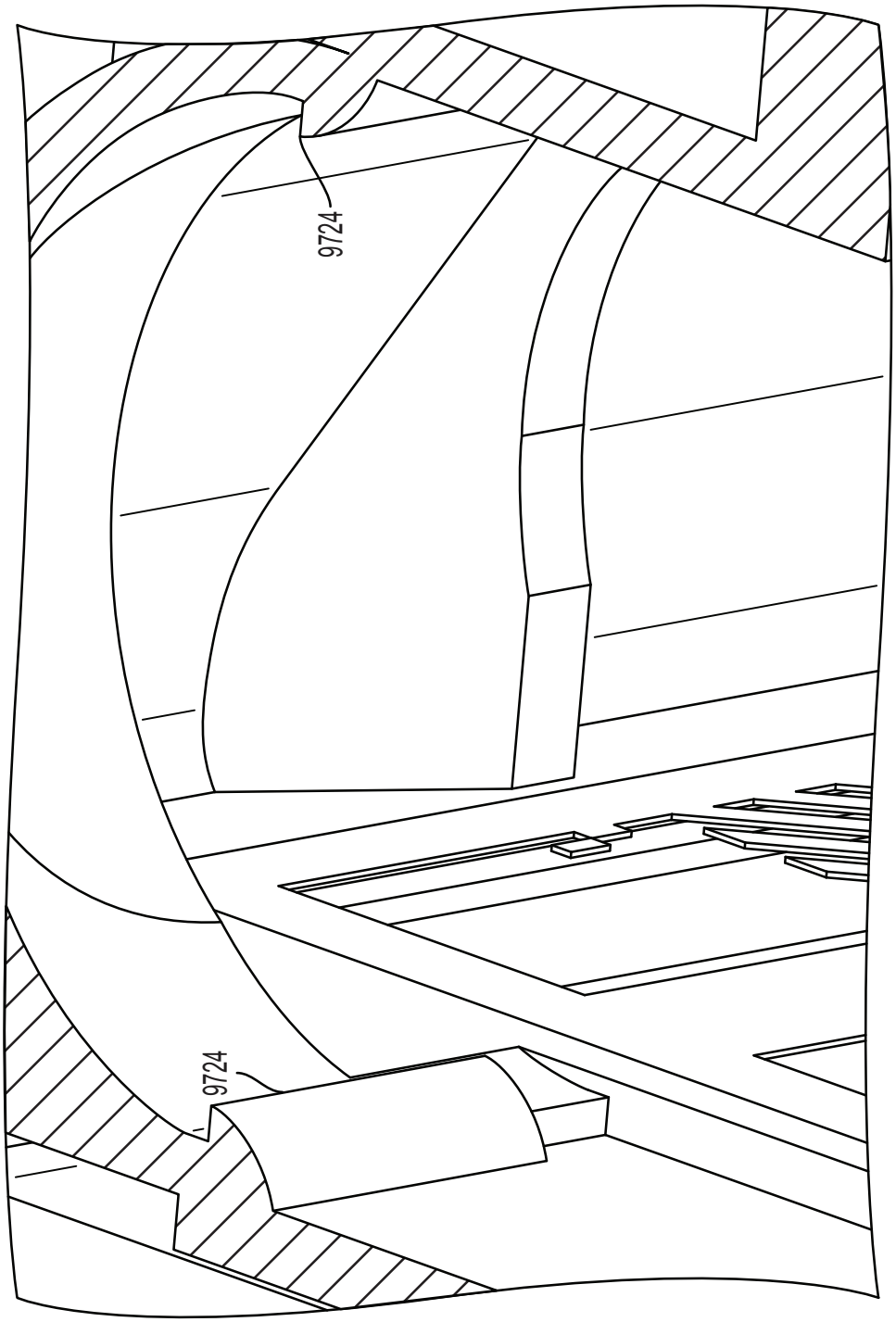


FIG. 97G

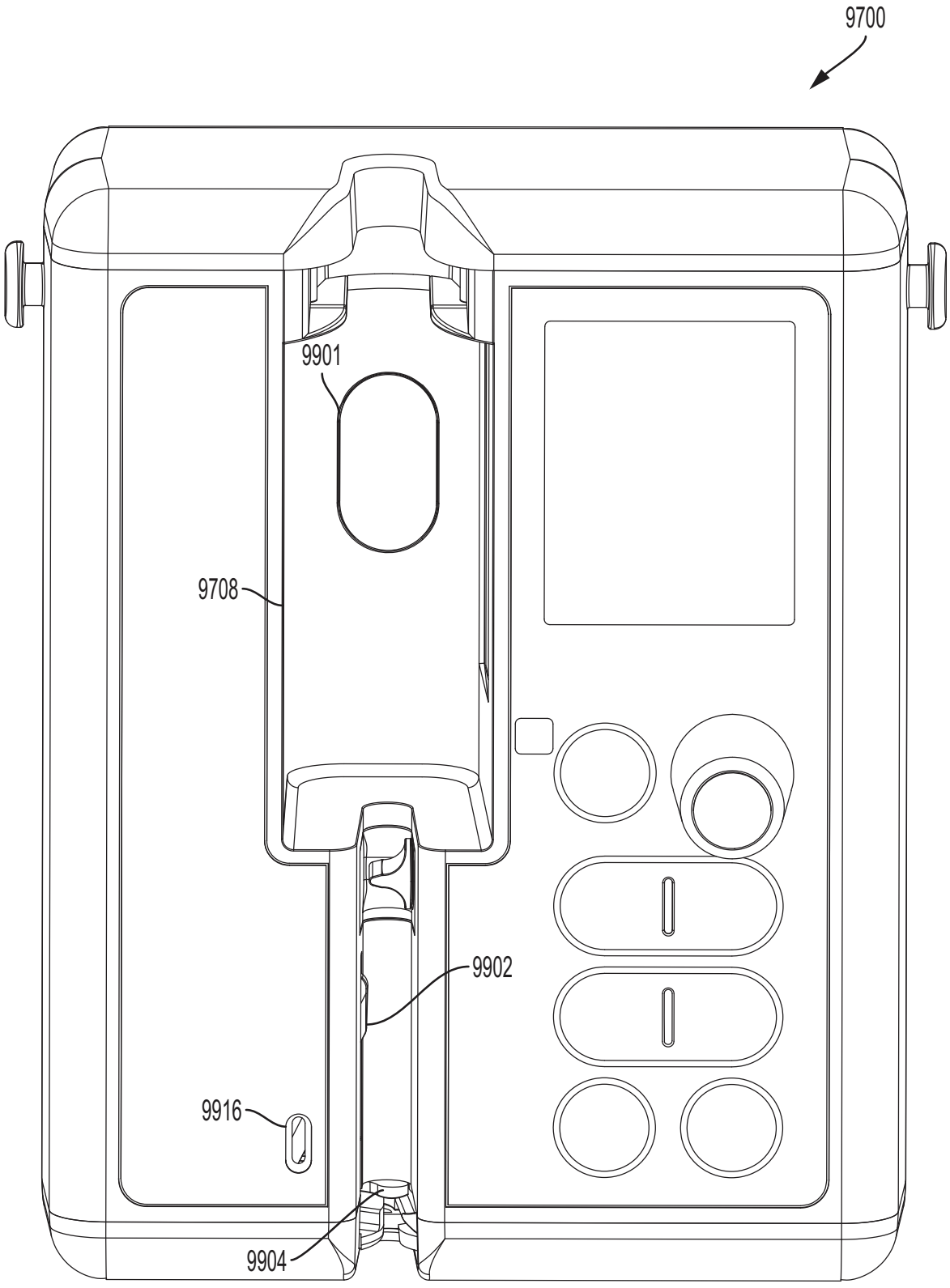


FIG. 97H

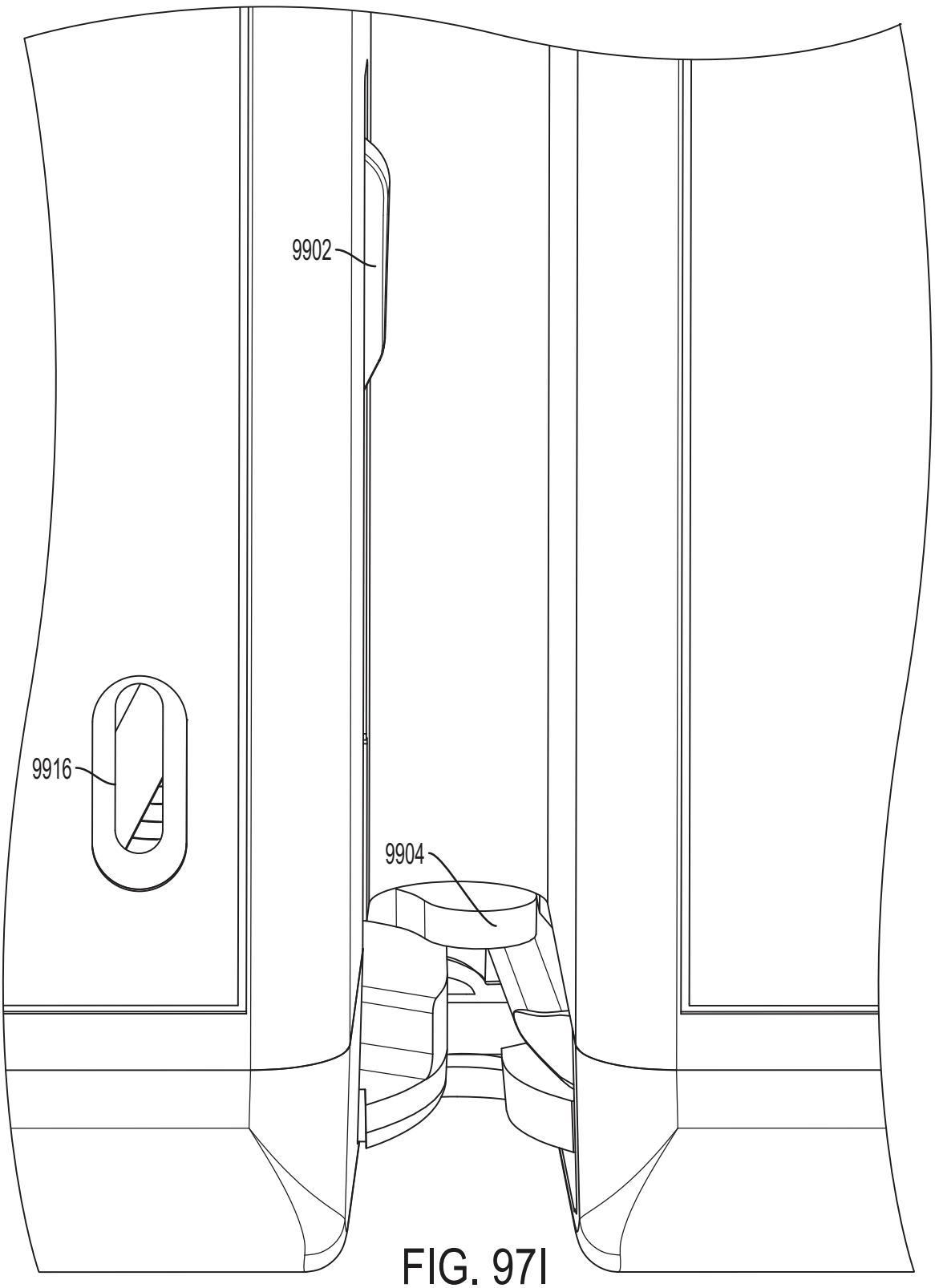


FIG. 97I

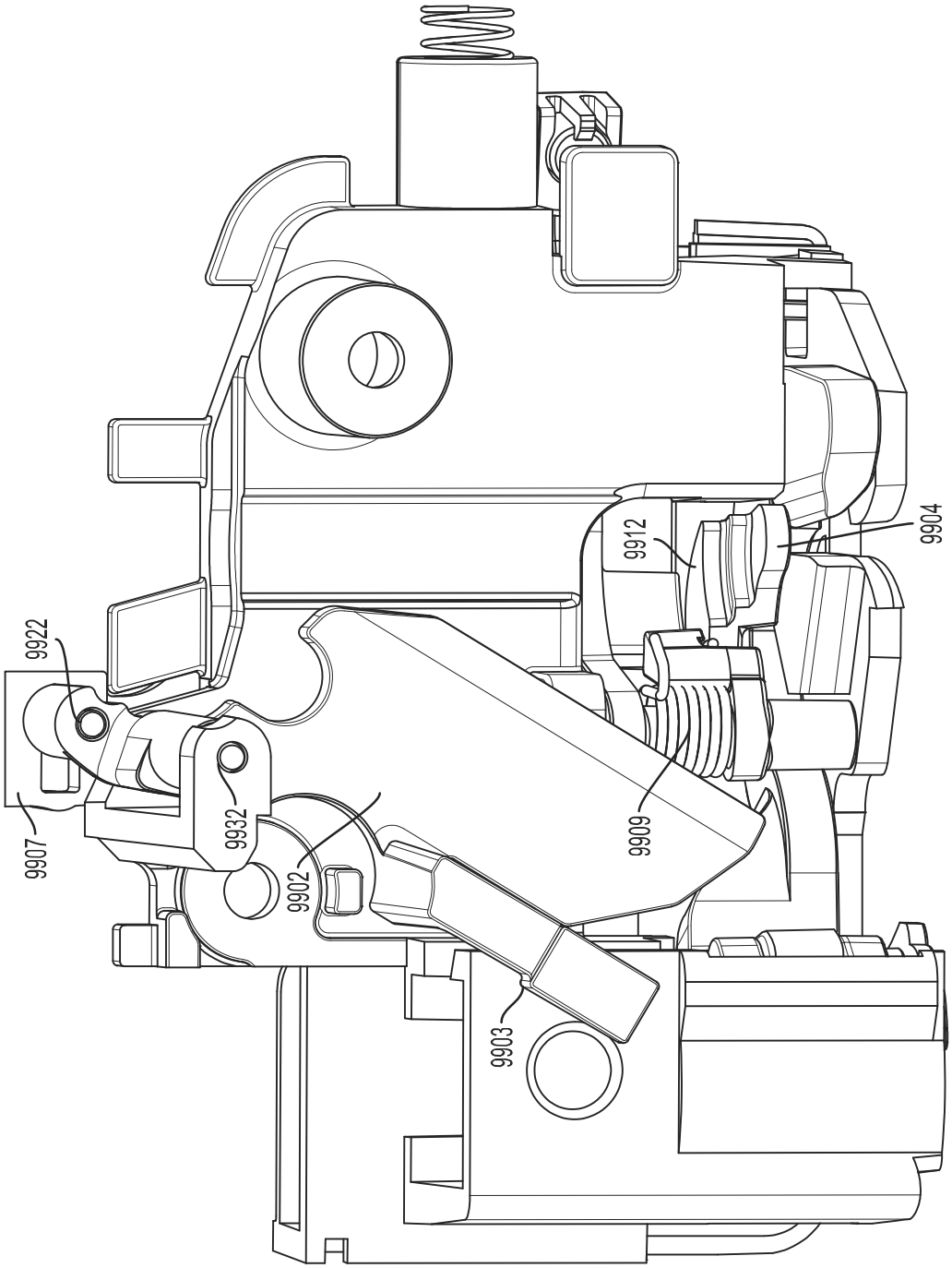


FIG. 97J

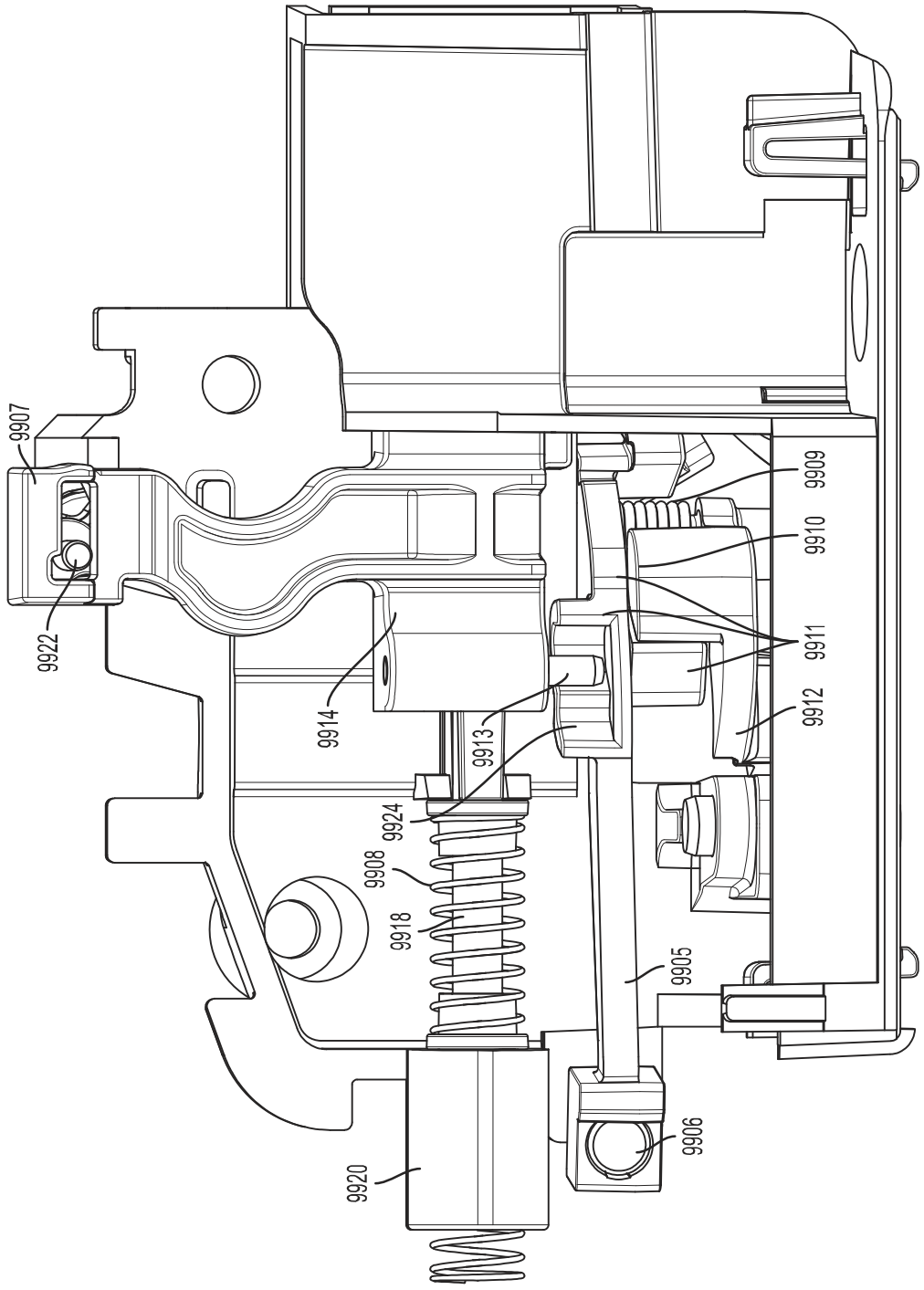

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FIG. 97K

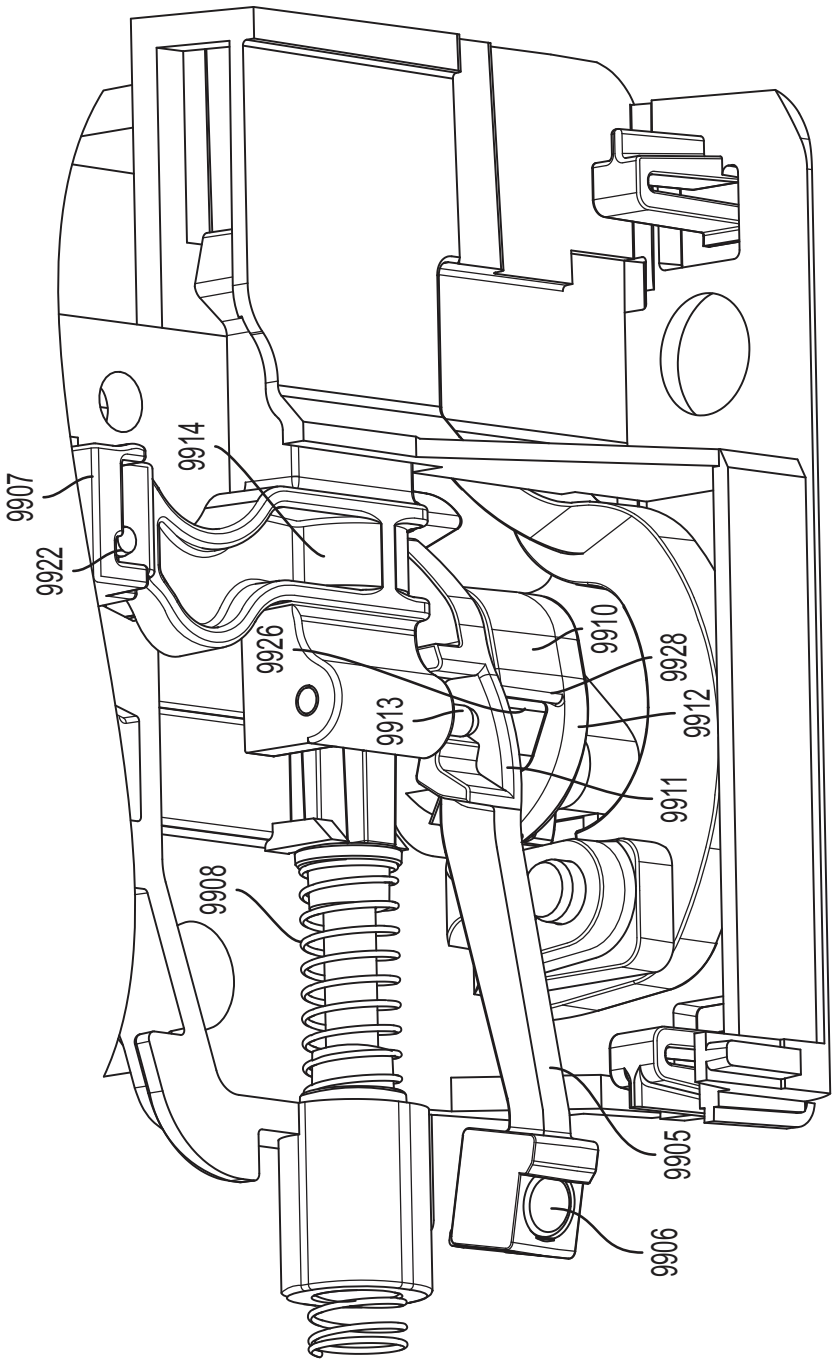


FIG. 97L

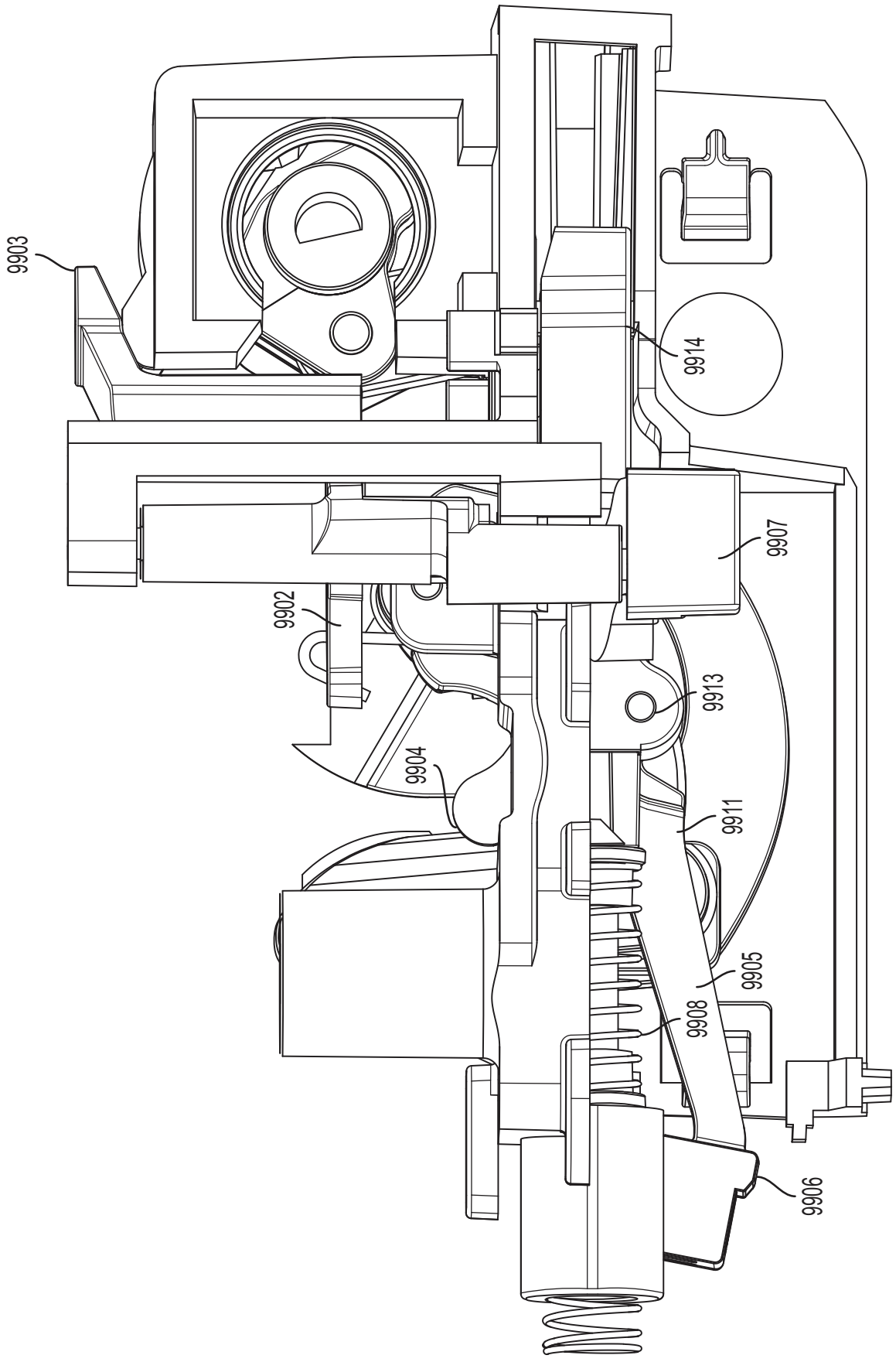


FIG. 97M

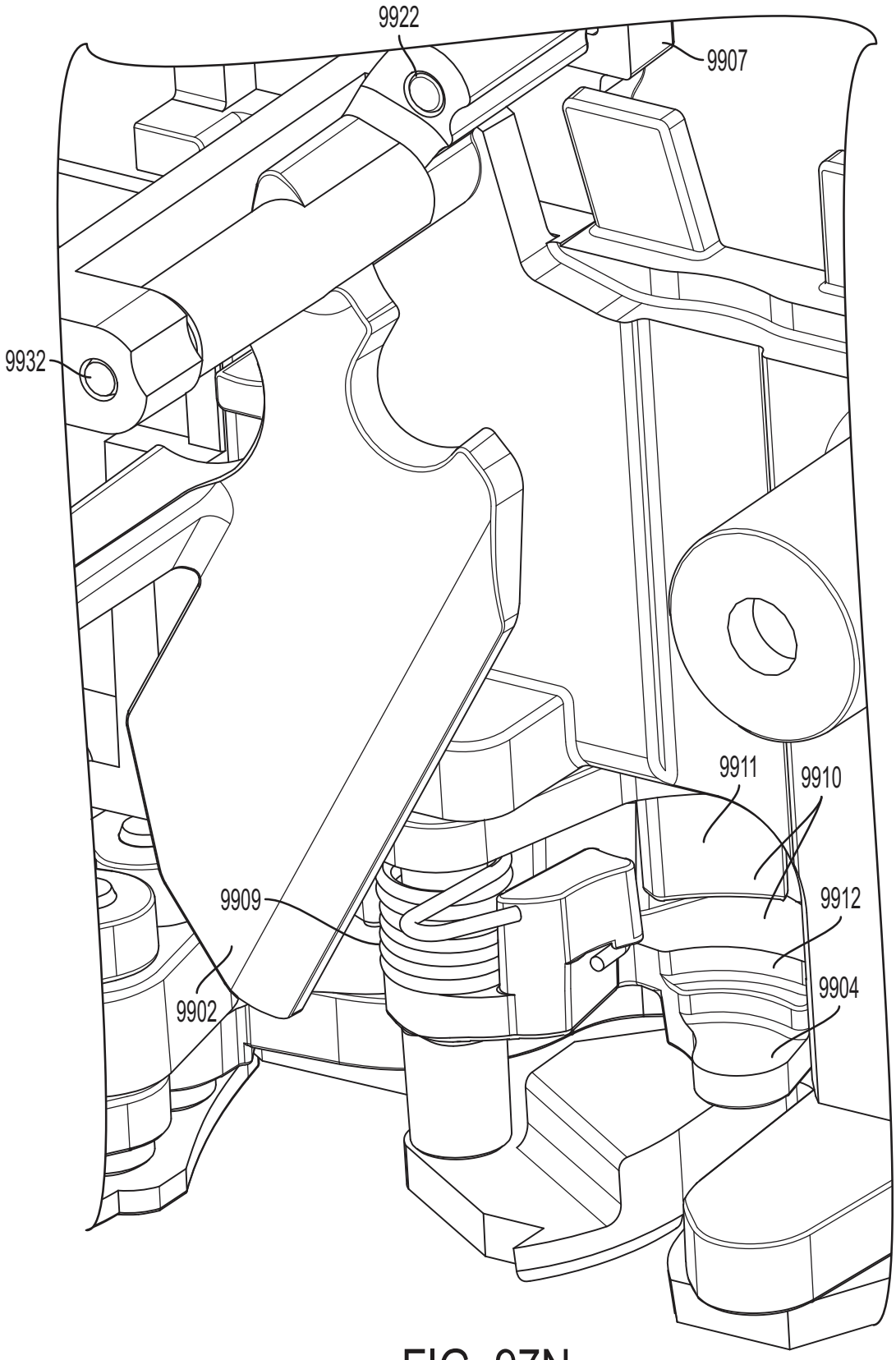


FIG. 97N

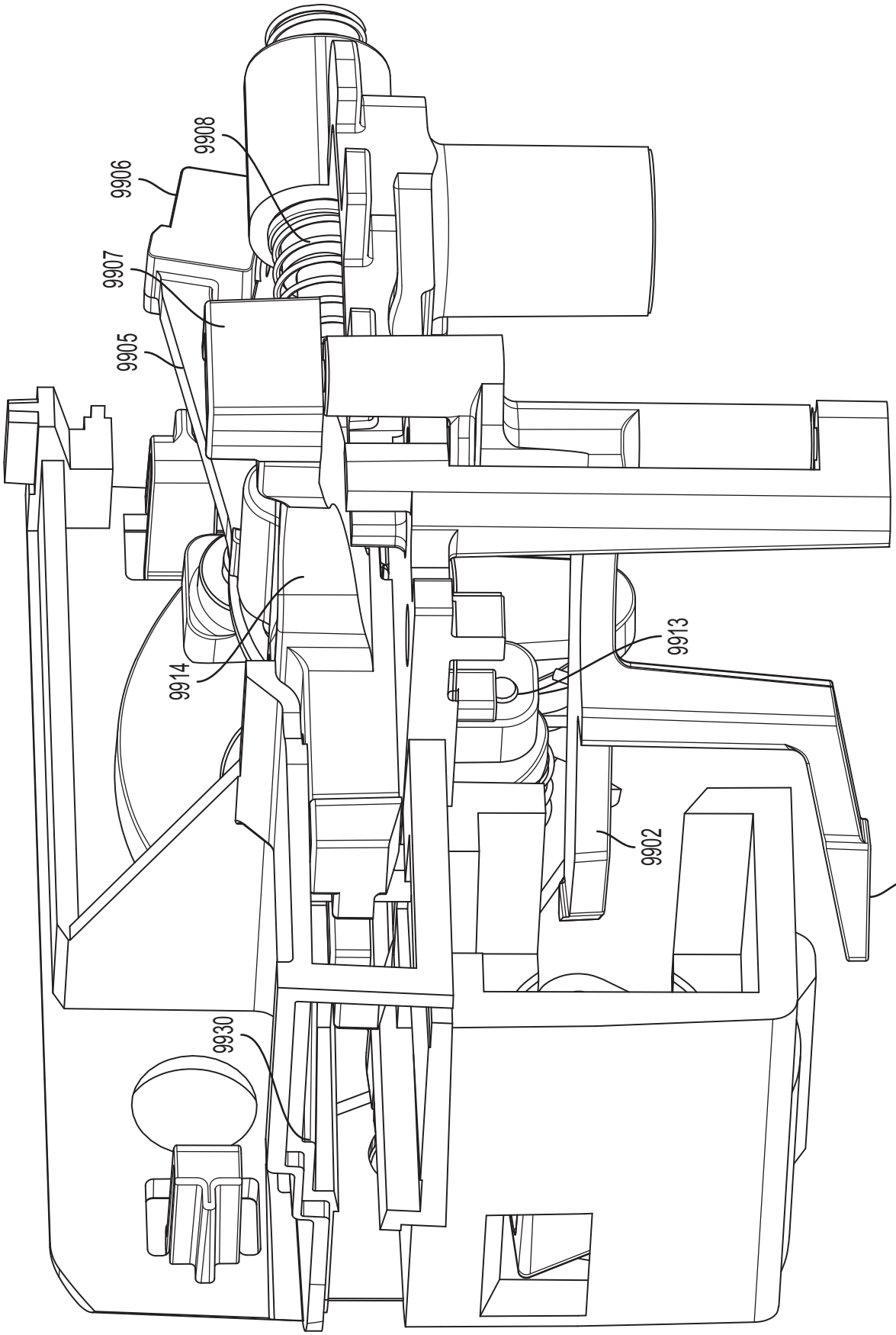


FIG. 97O

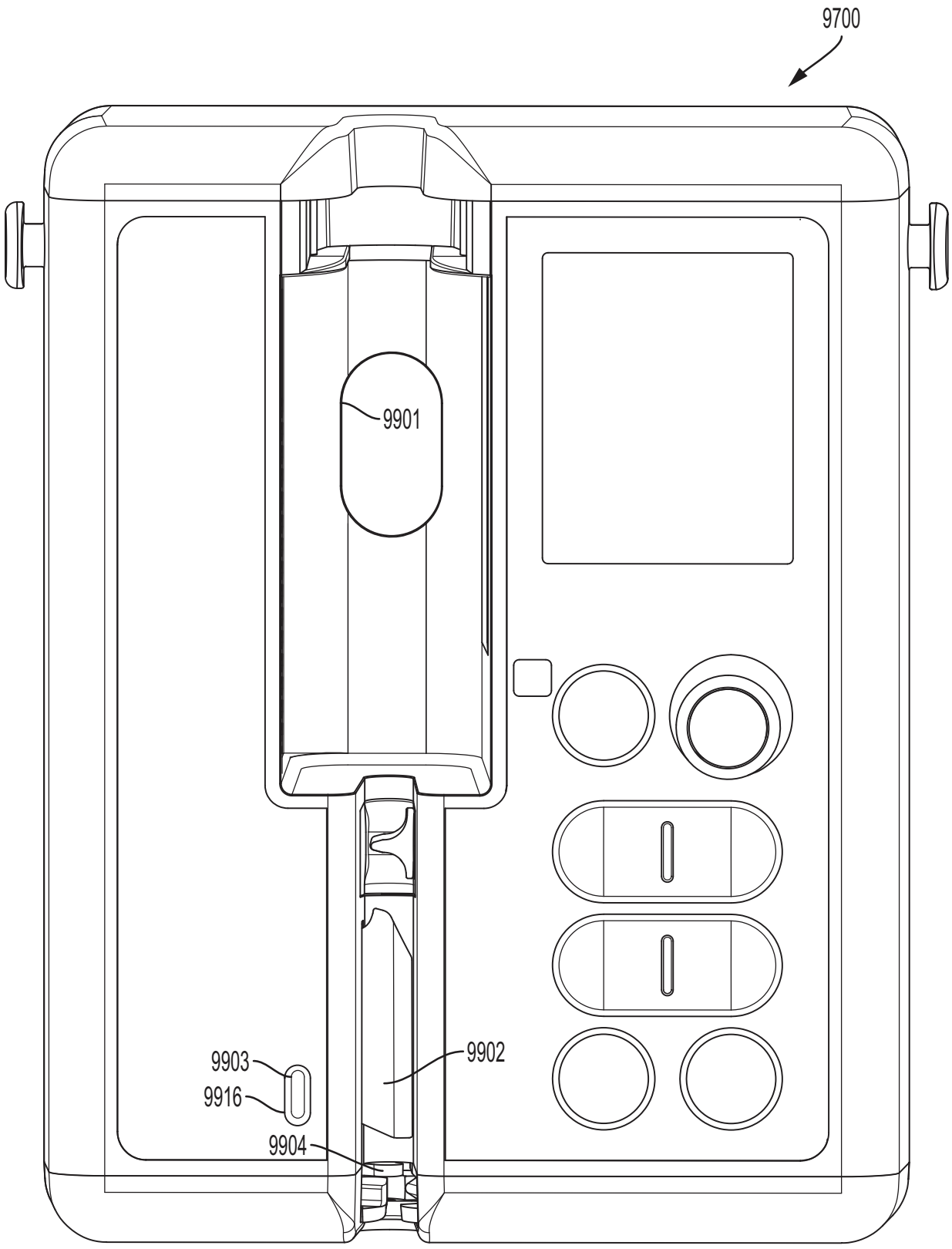


FIG. 97P

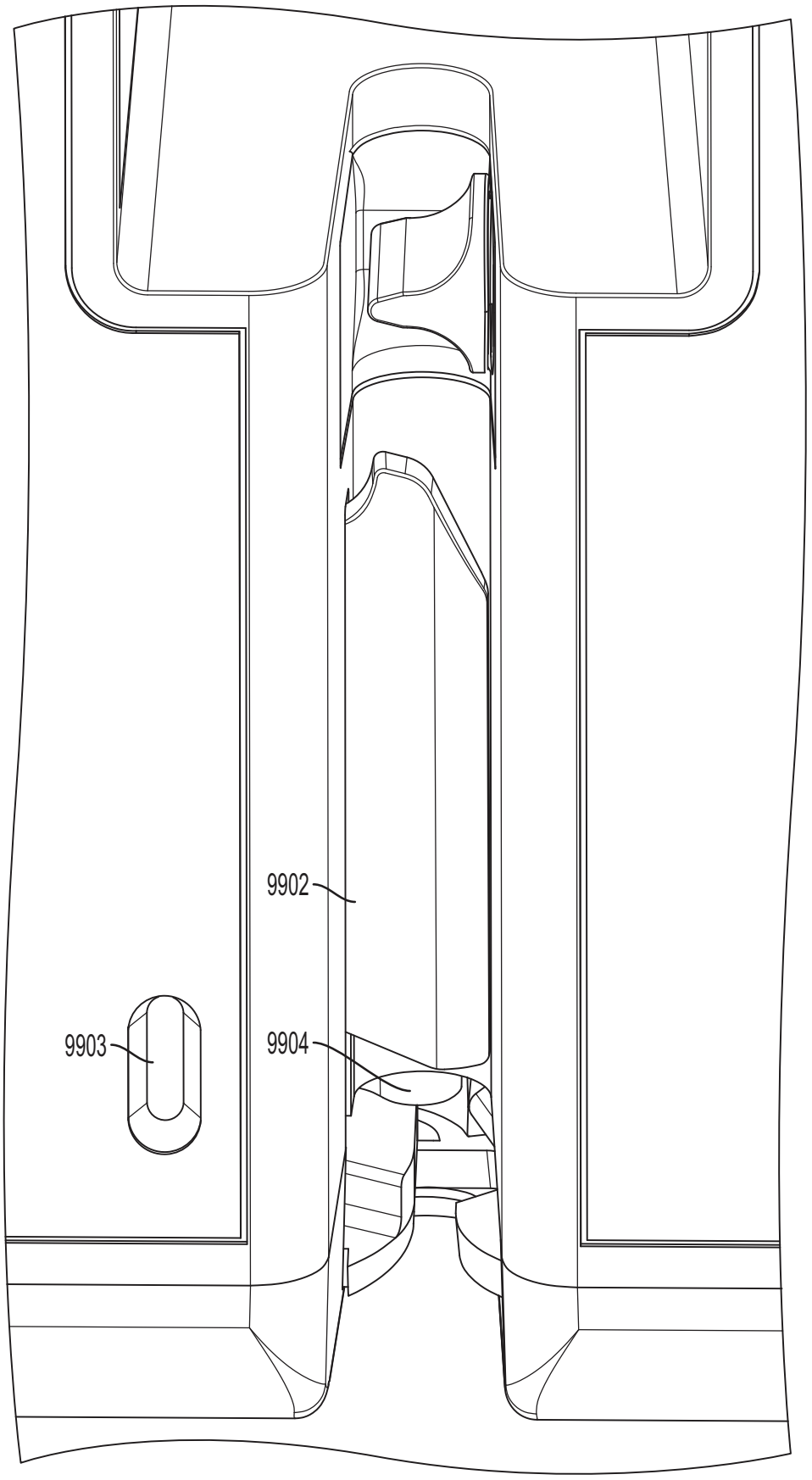


FIG. 97Q

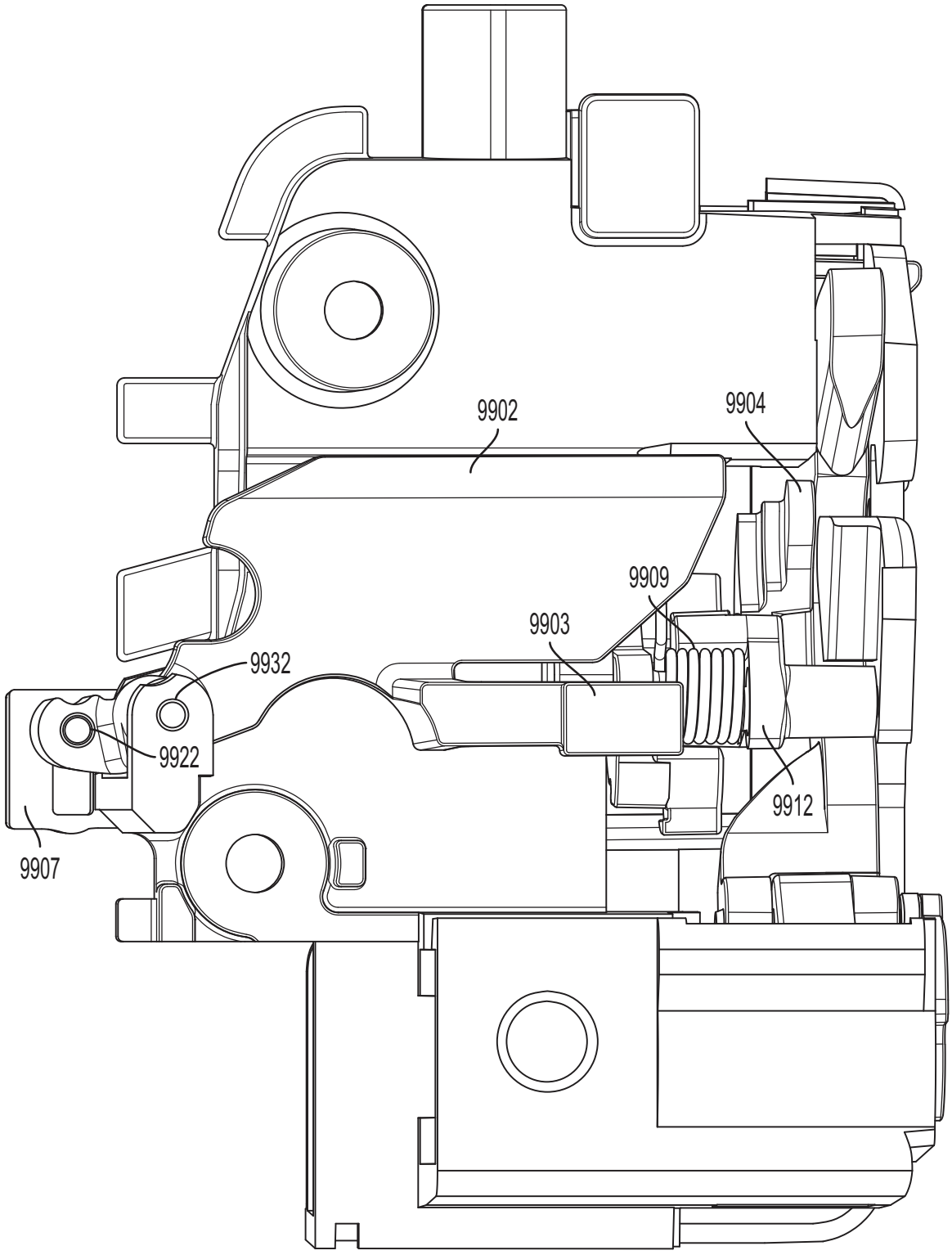


FIG. 97R

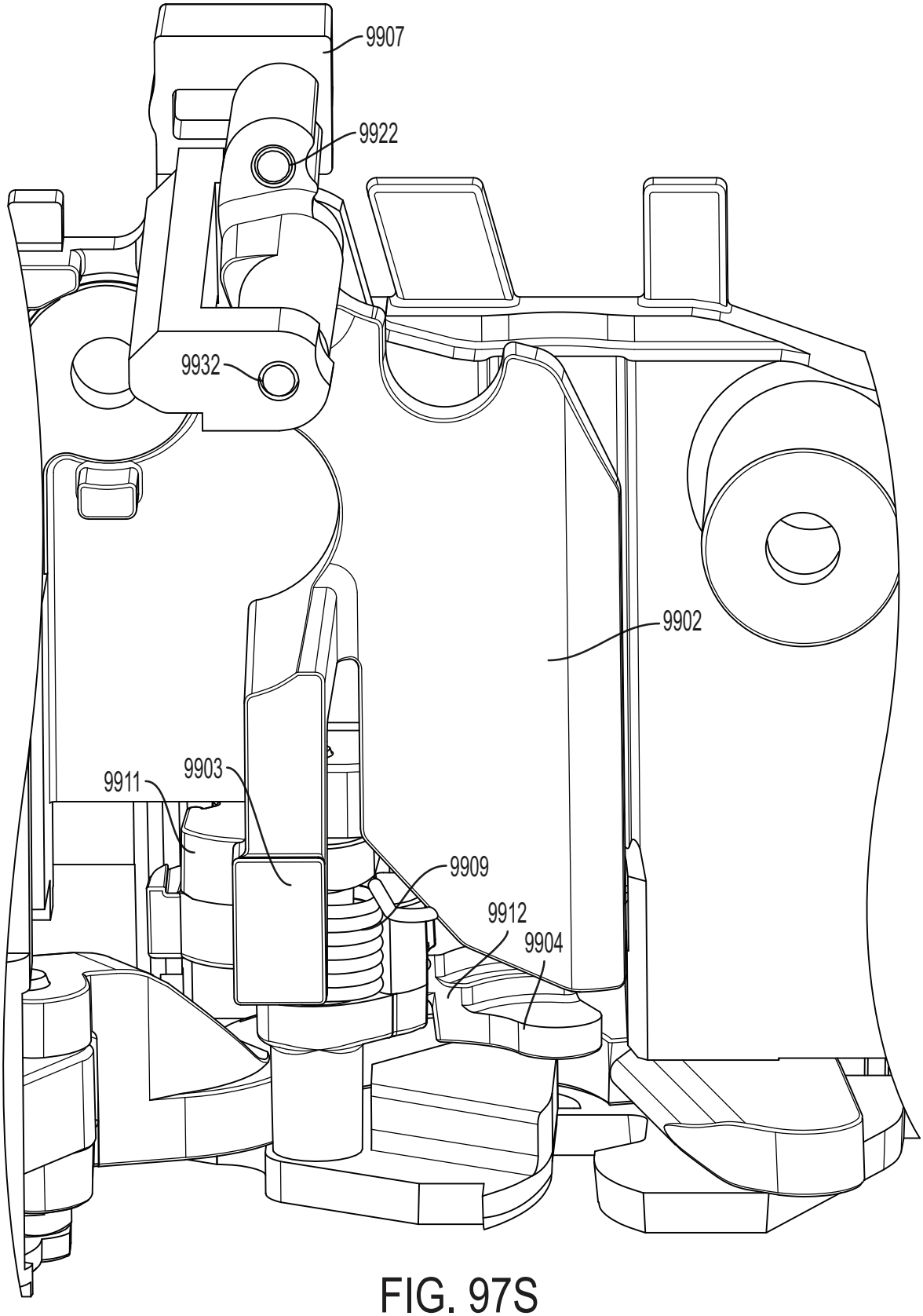


FIG. 97S

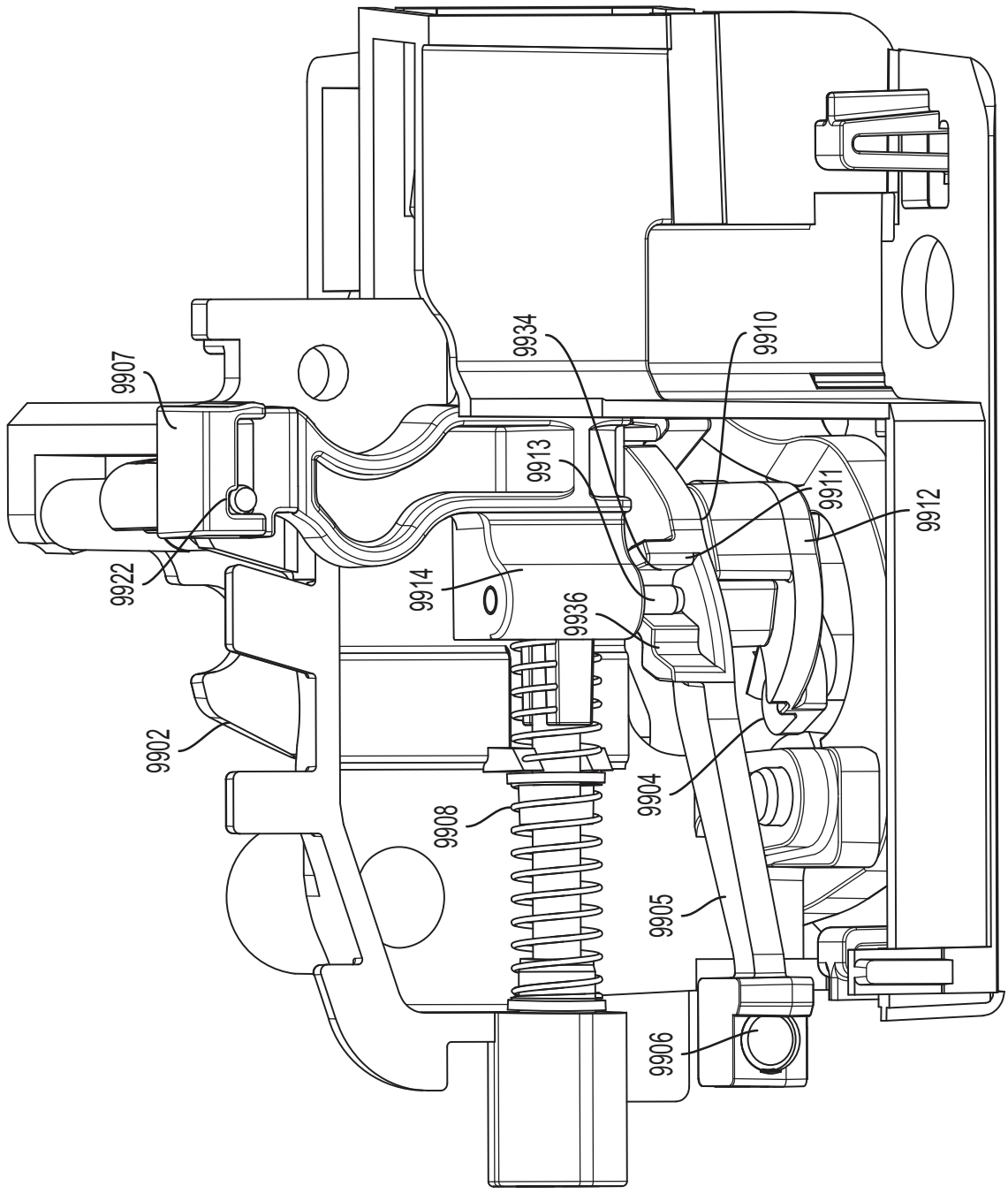

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FIG. 97T

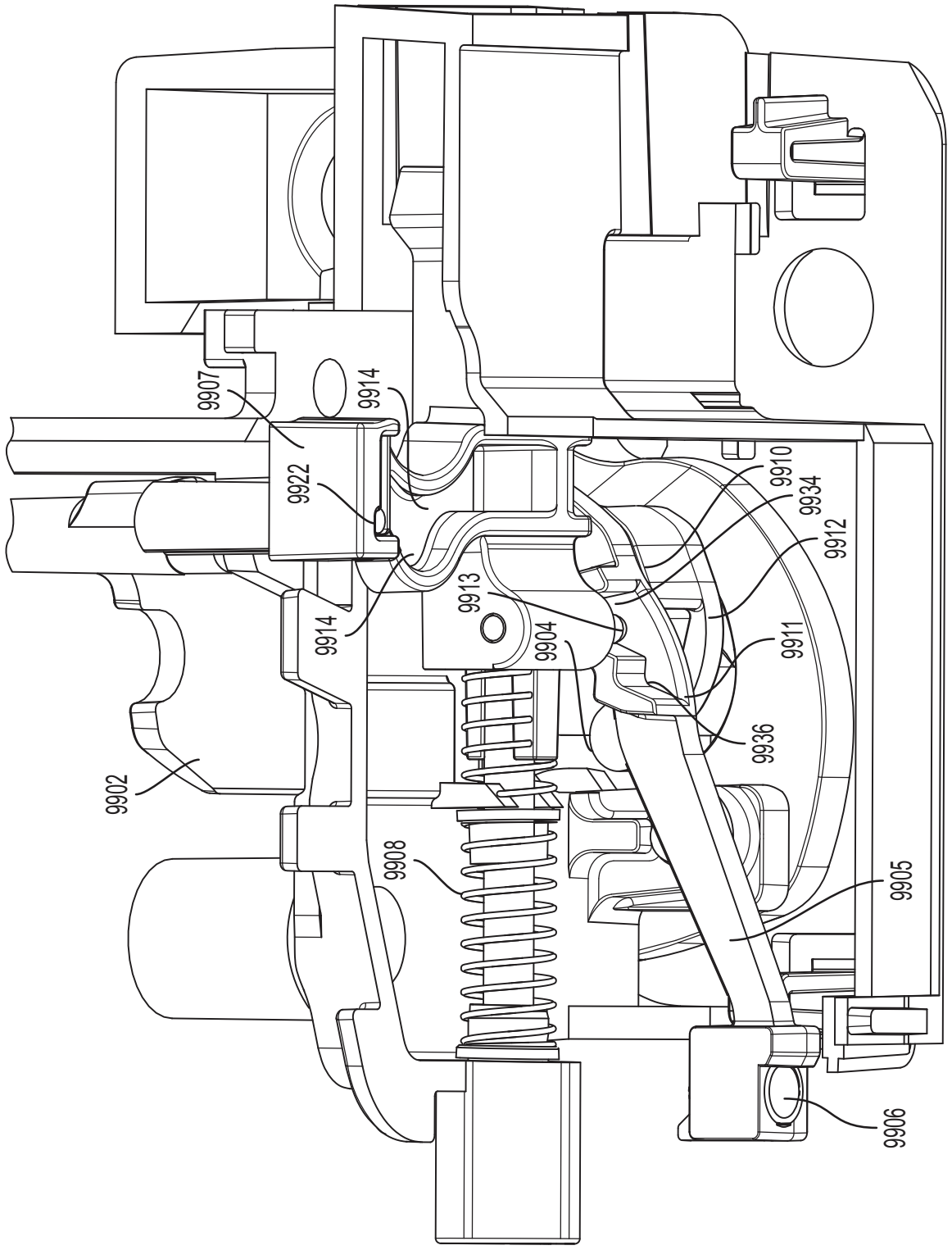

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FIG. 97U

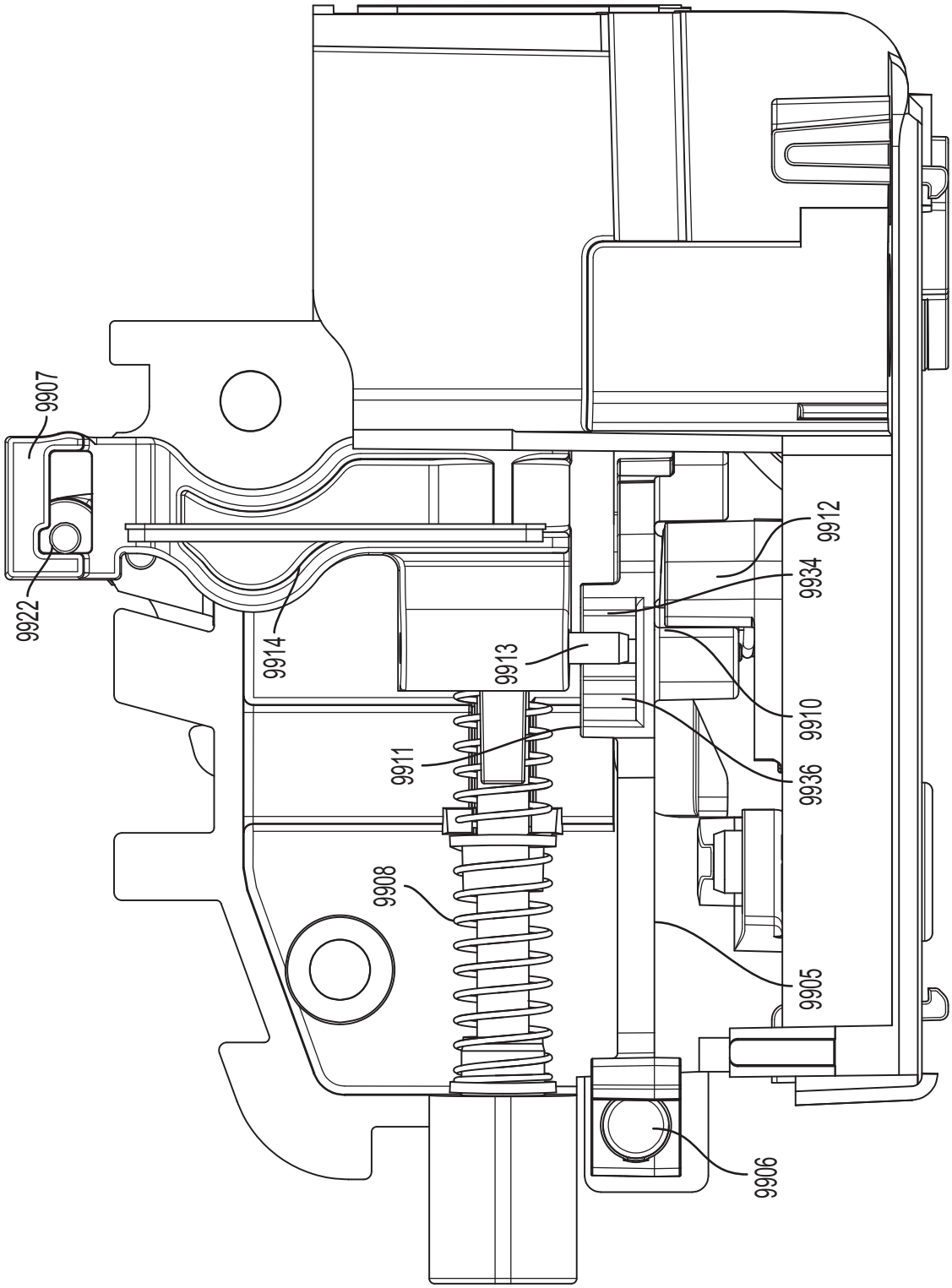


FIG. 97V

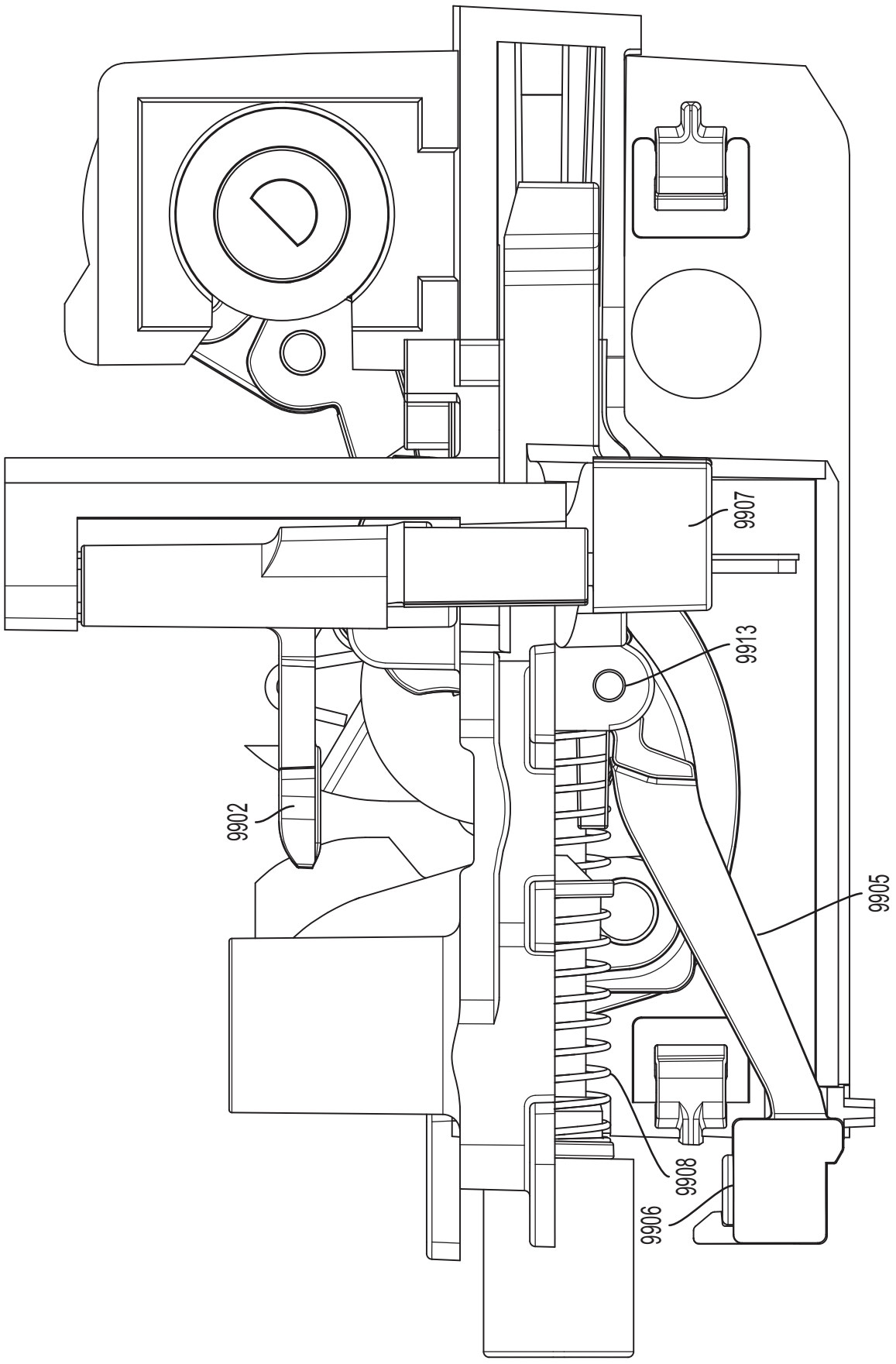


FIG. 97W

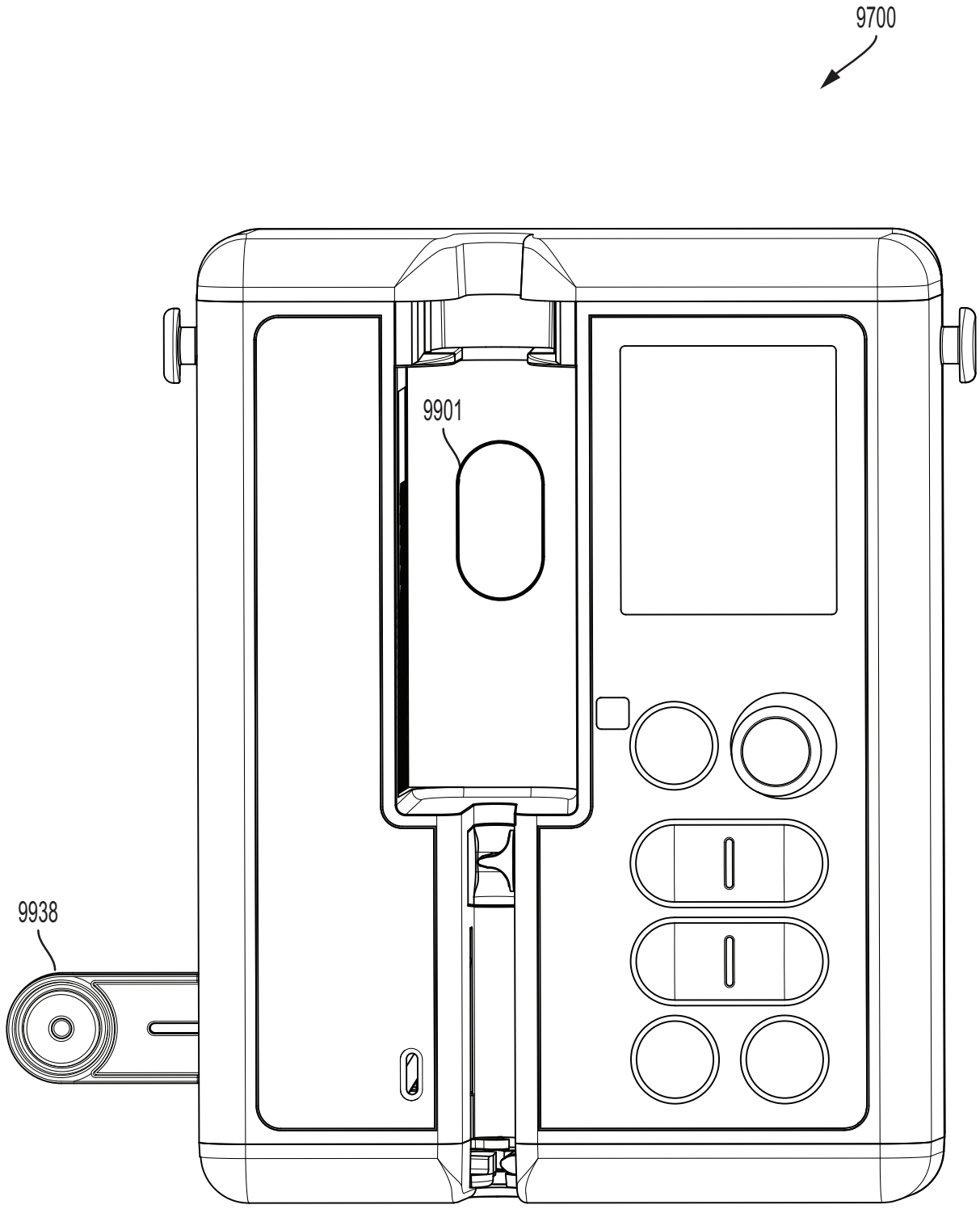


FIG. 97X

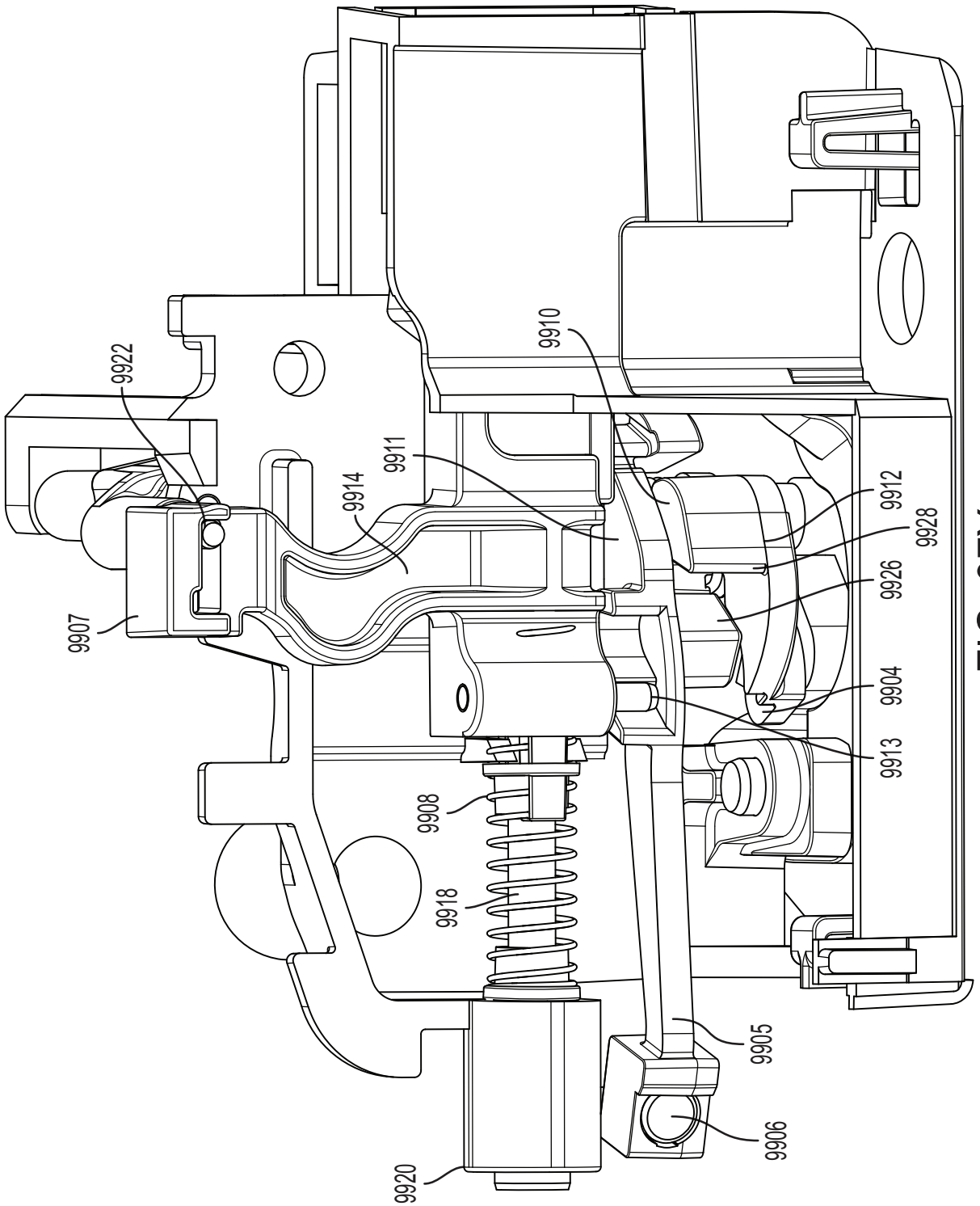

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FIG. 97Y

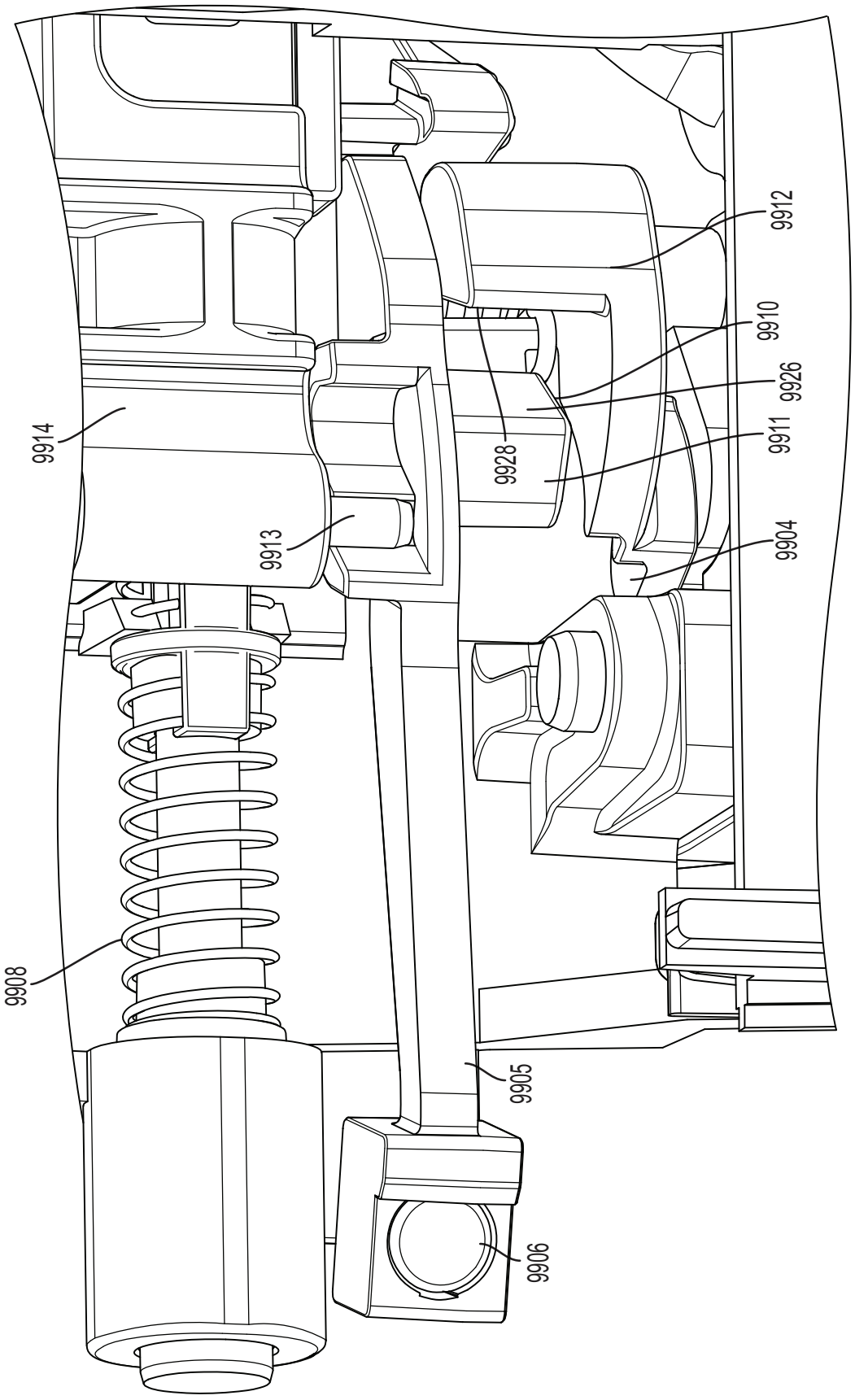


FIG. 97Z

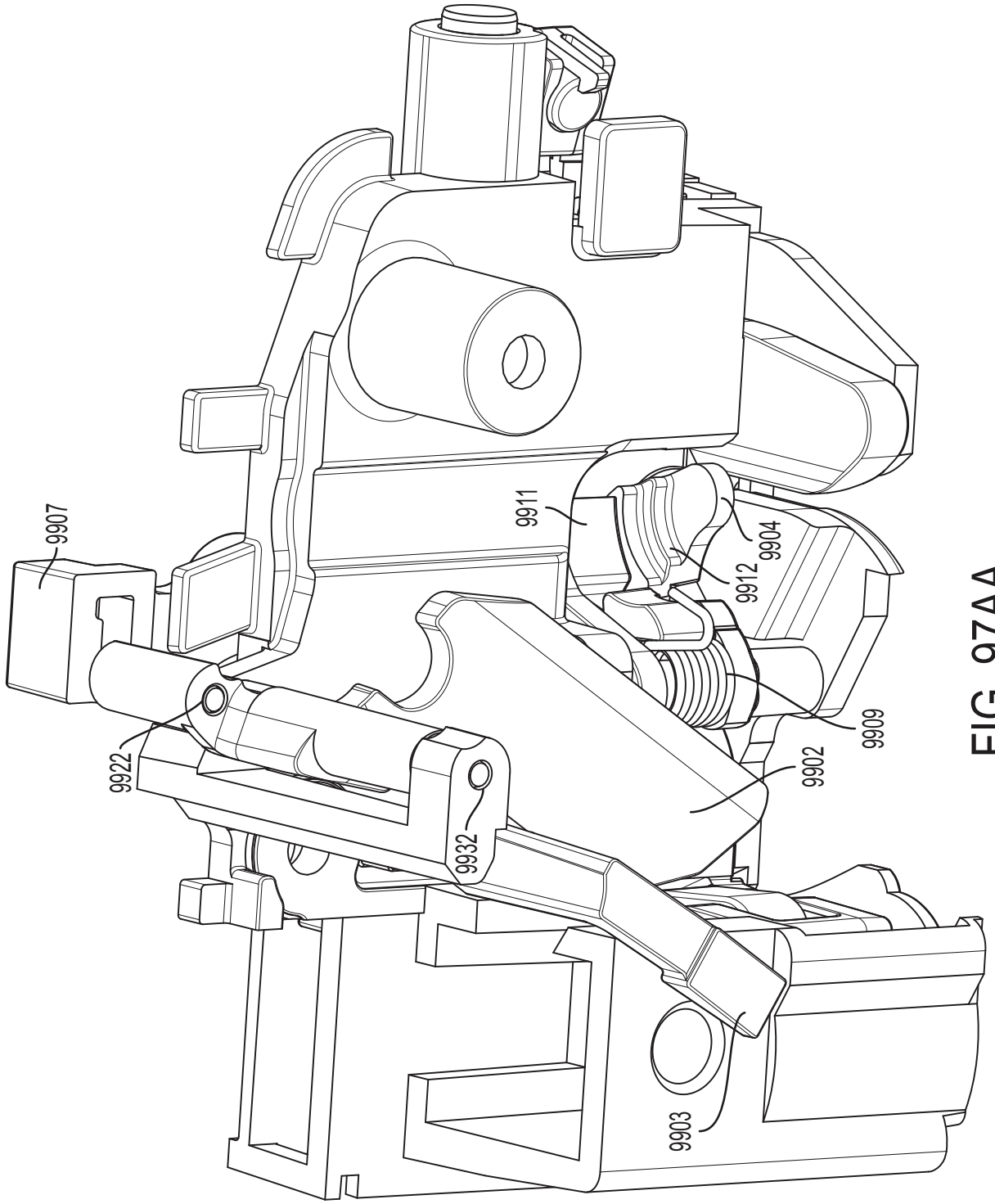


FIG. 97AA

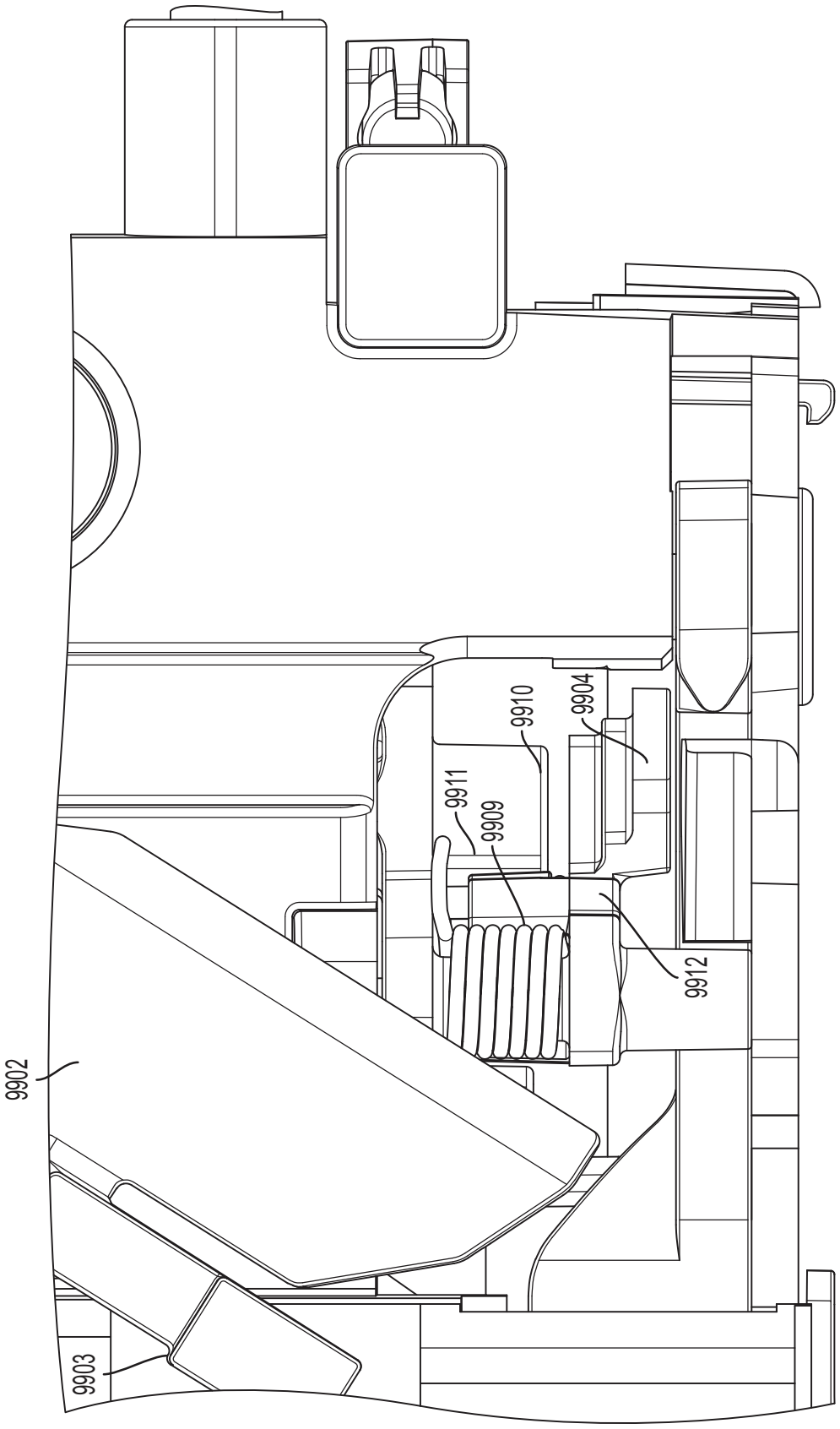


FIG. 97AB

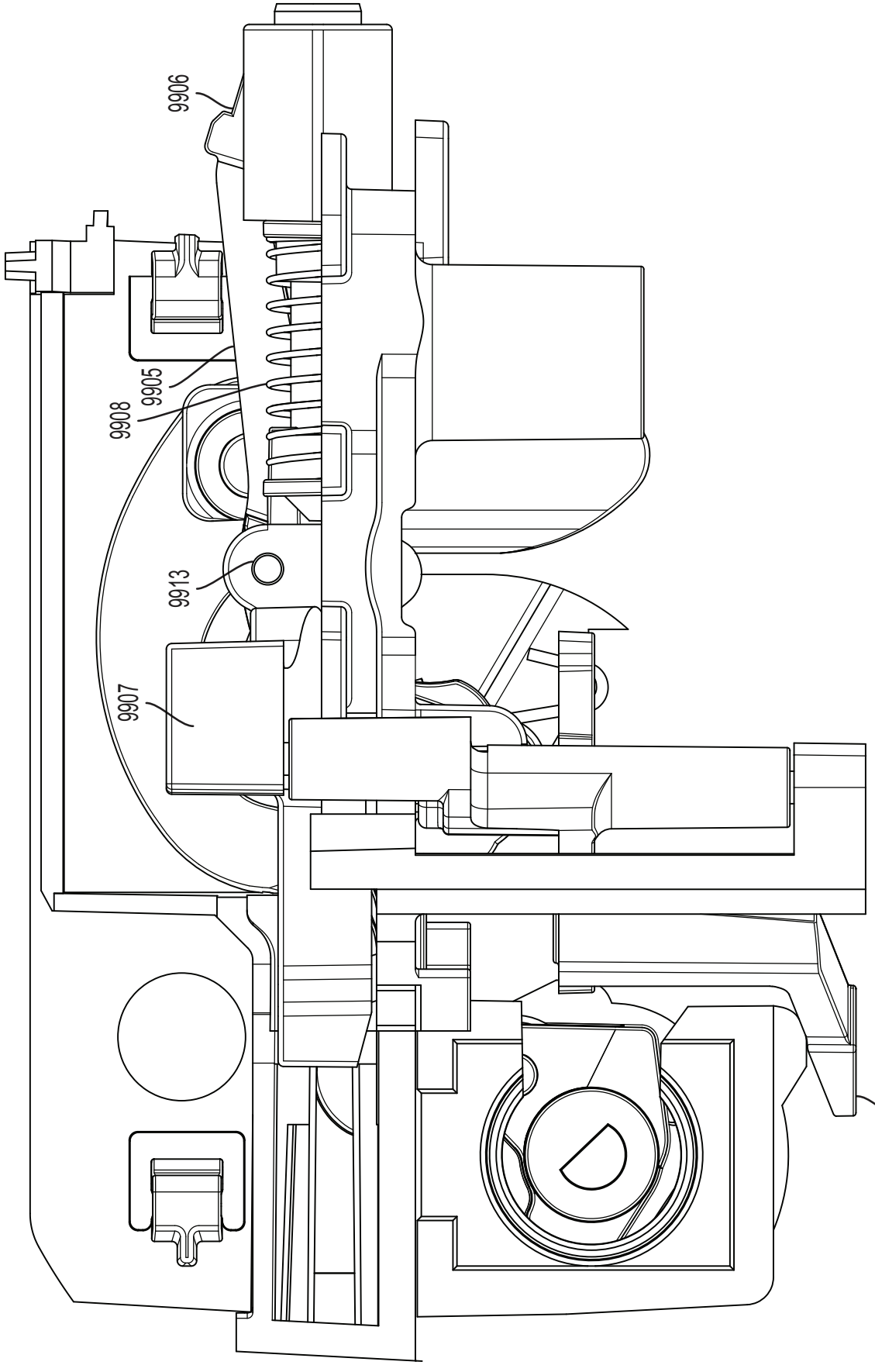


FIG. 97AC

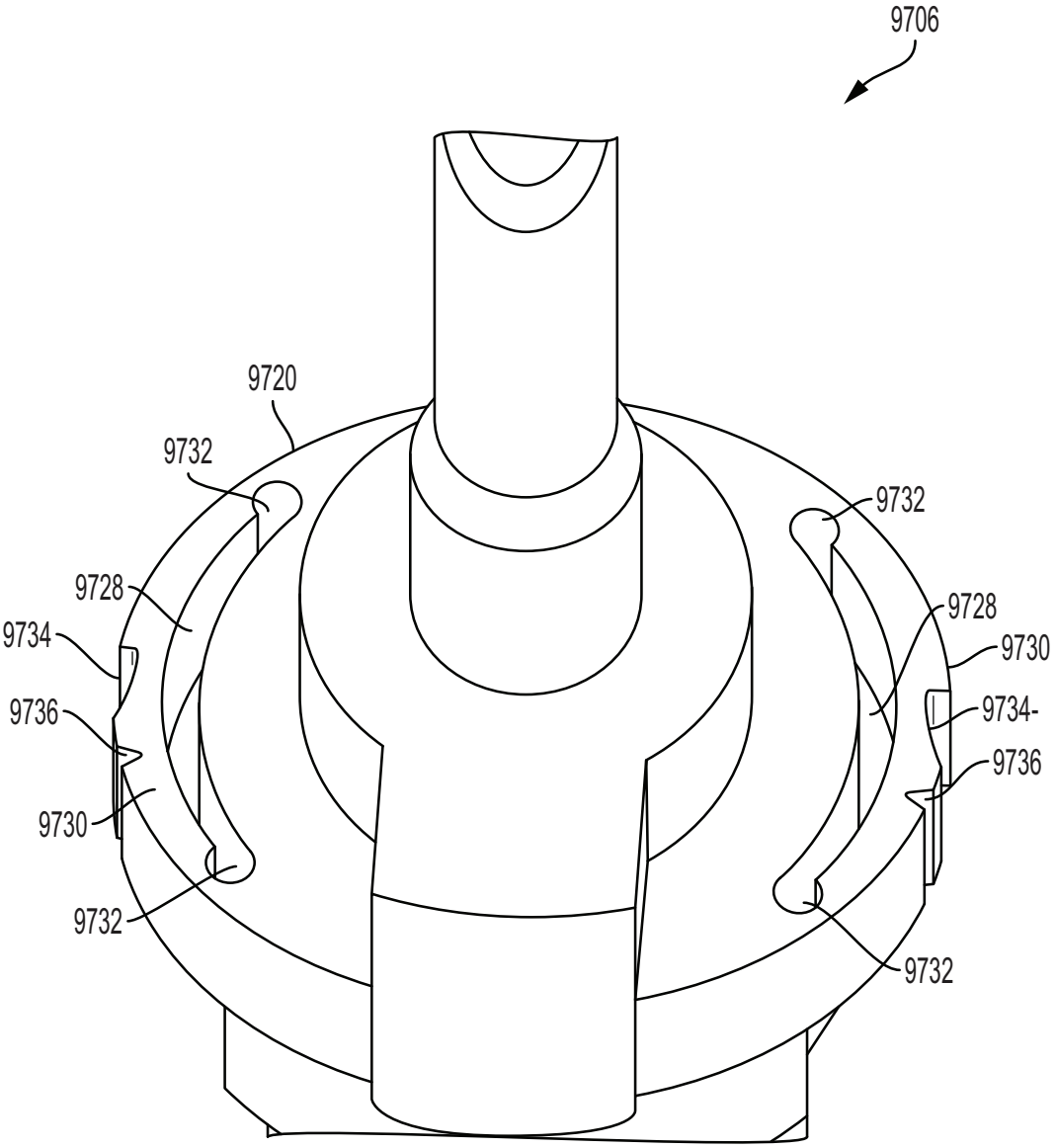

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FIG. 98

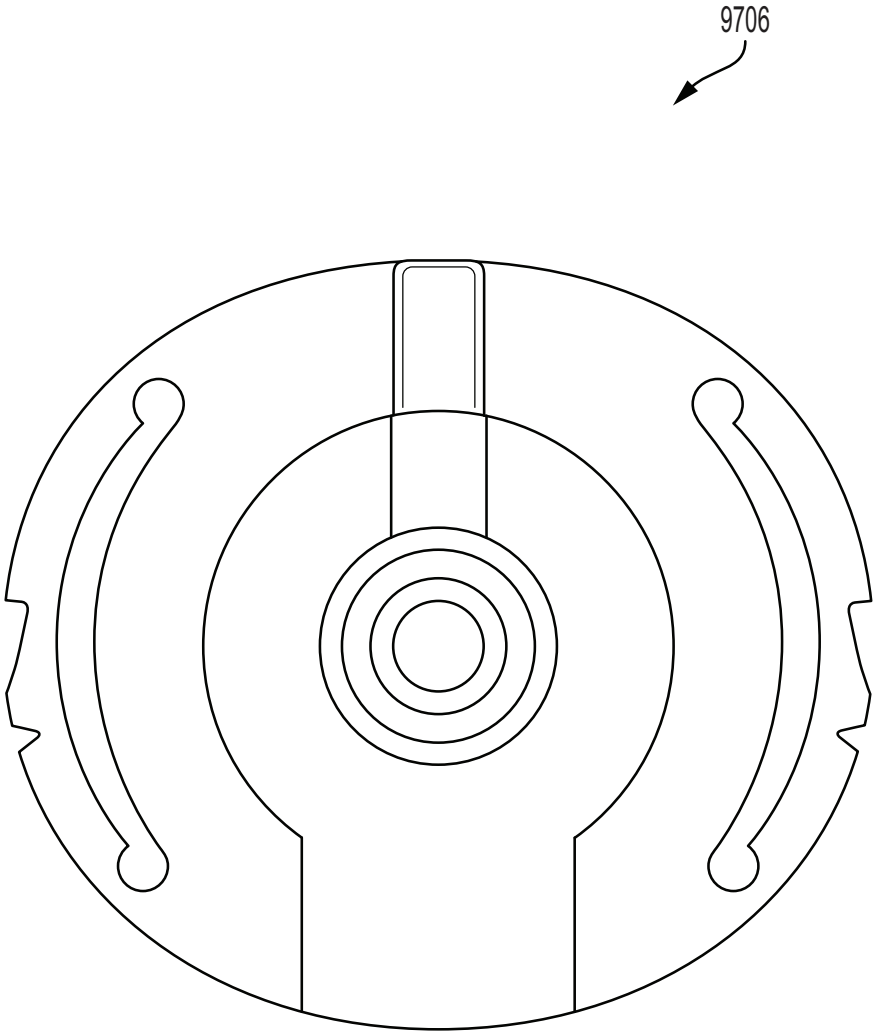


FIG. 99

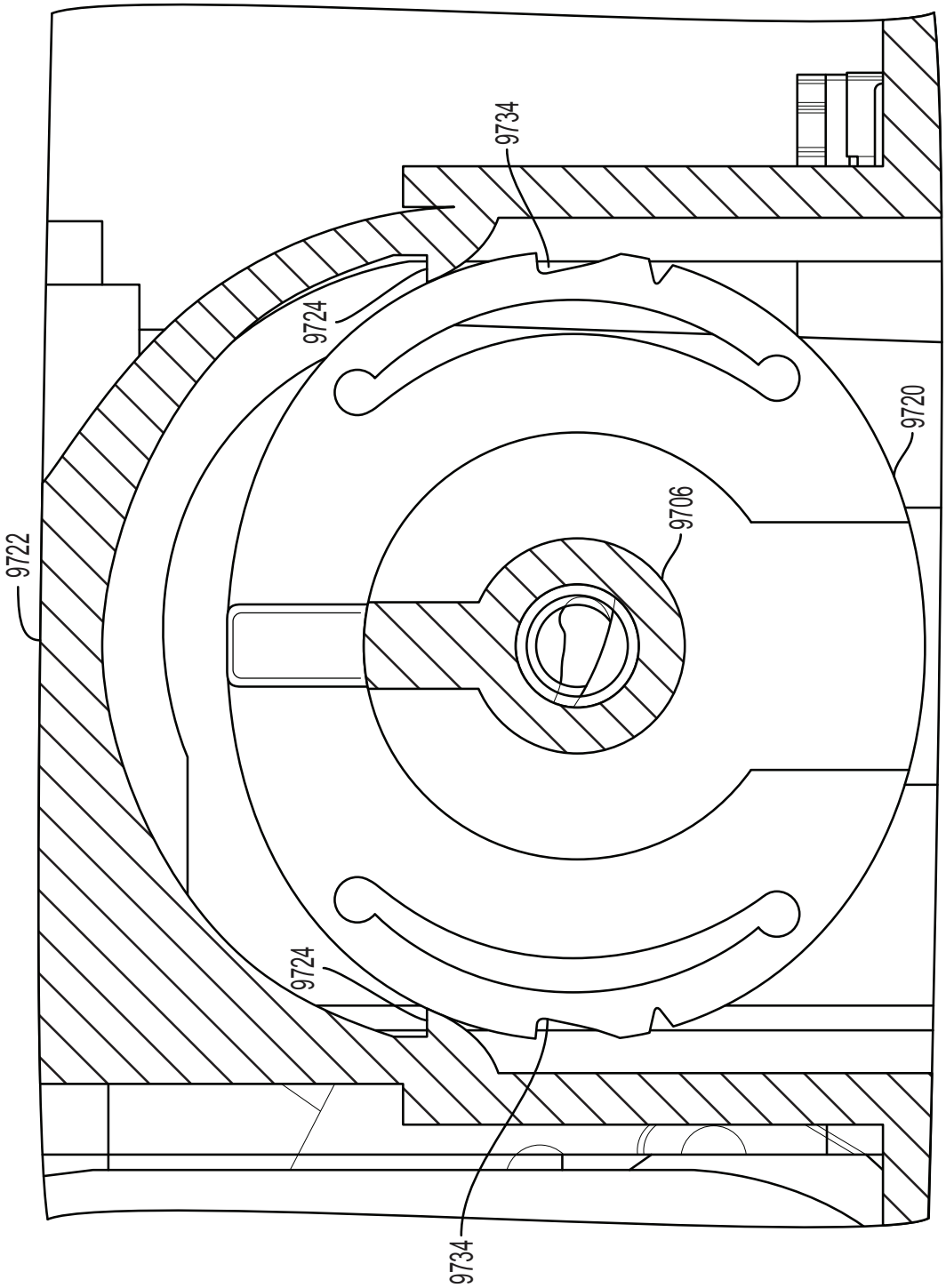


FIG. 100

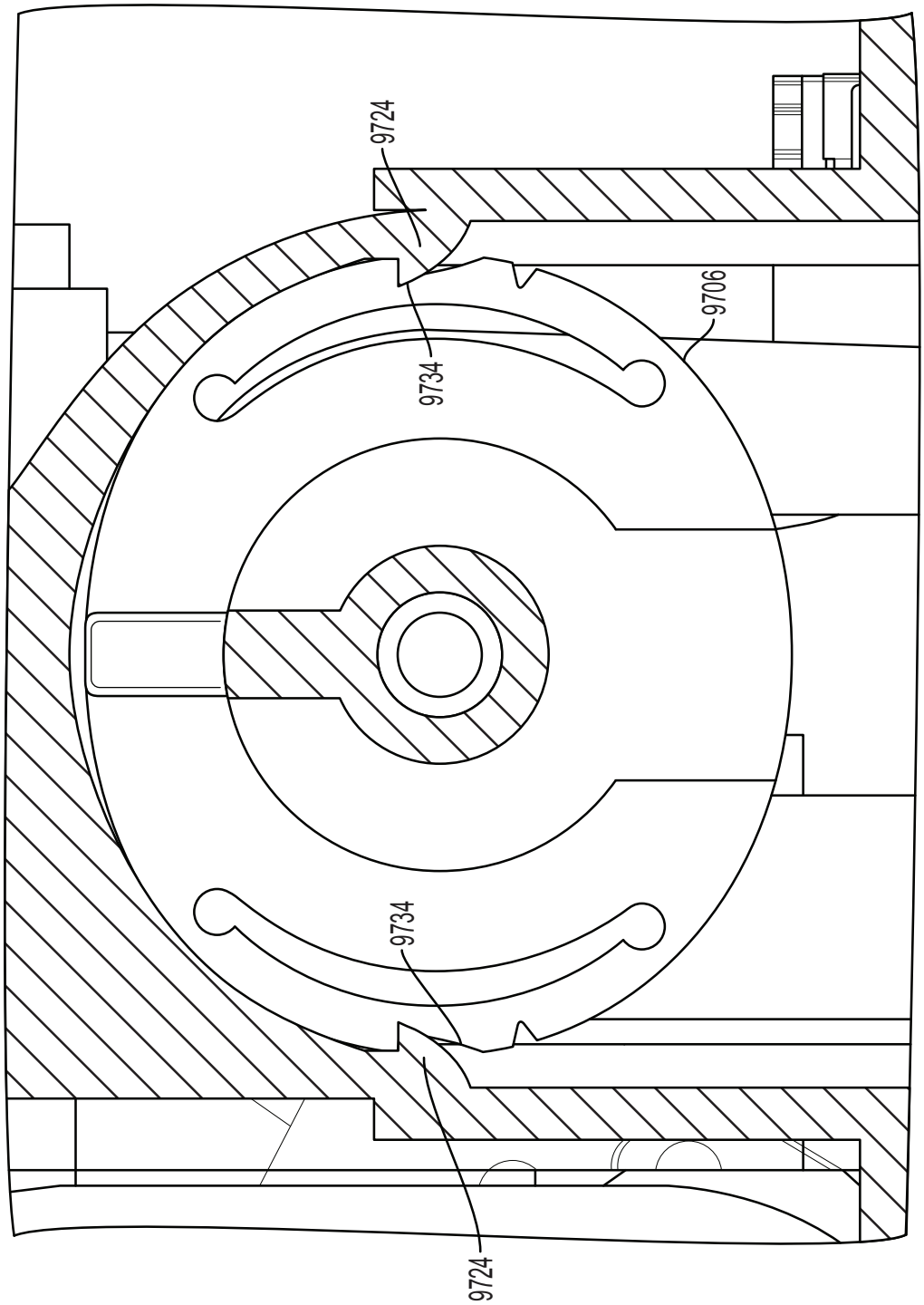


FIG. 101

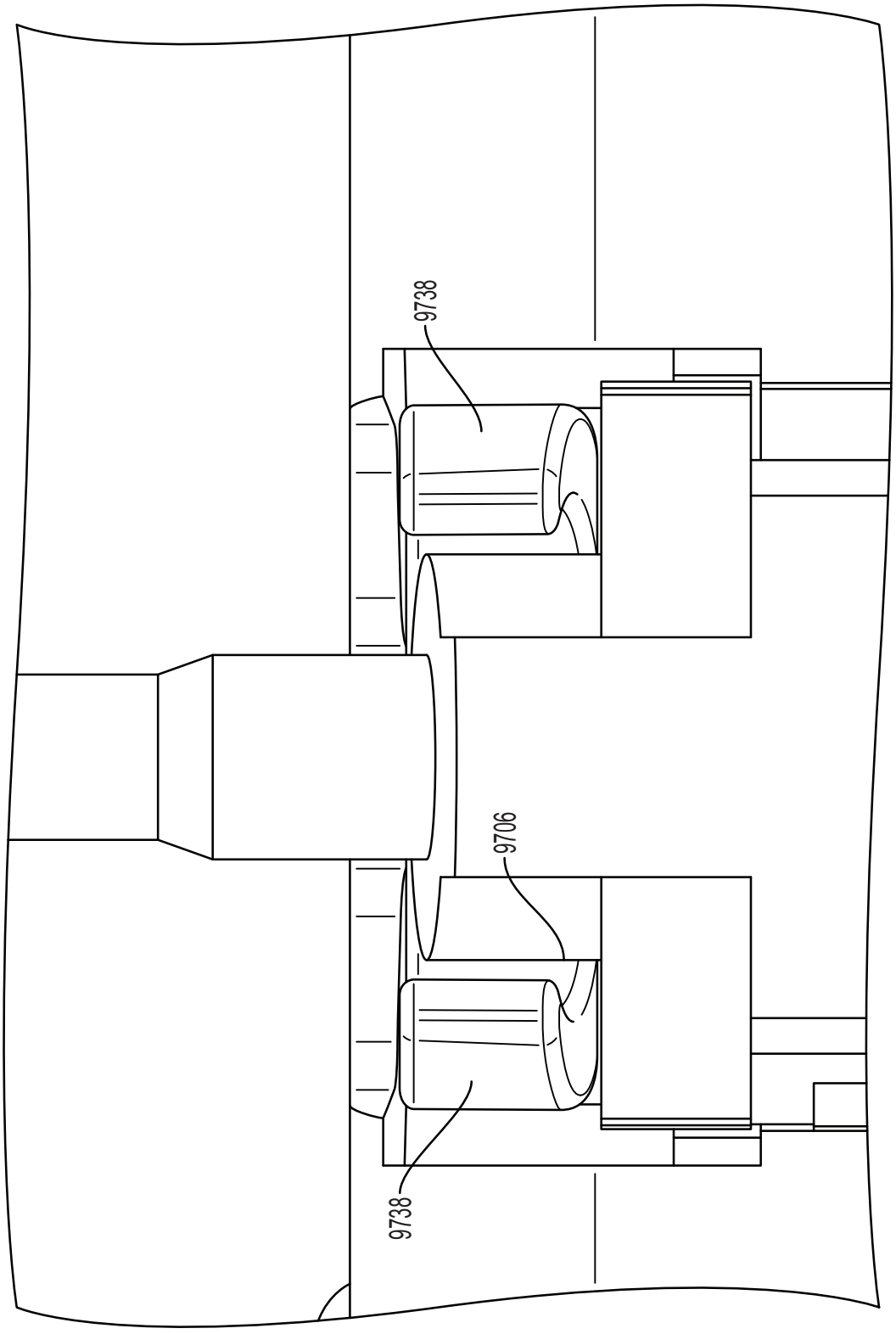


FIG. 102

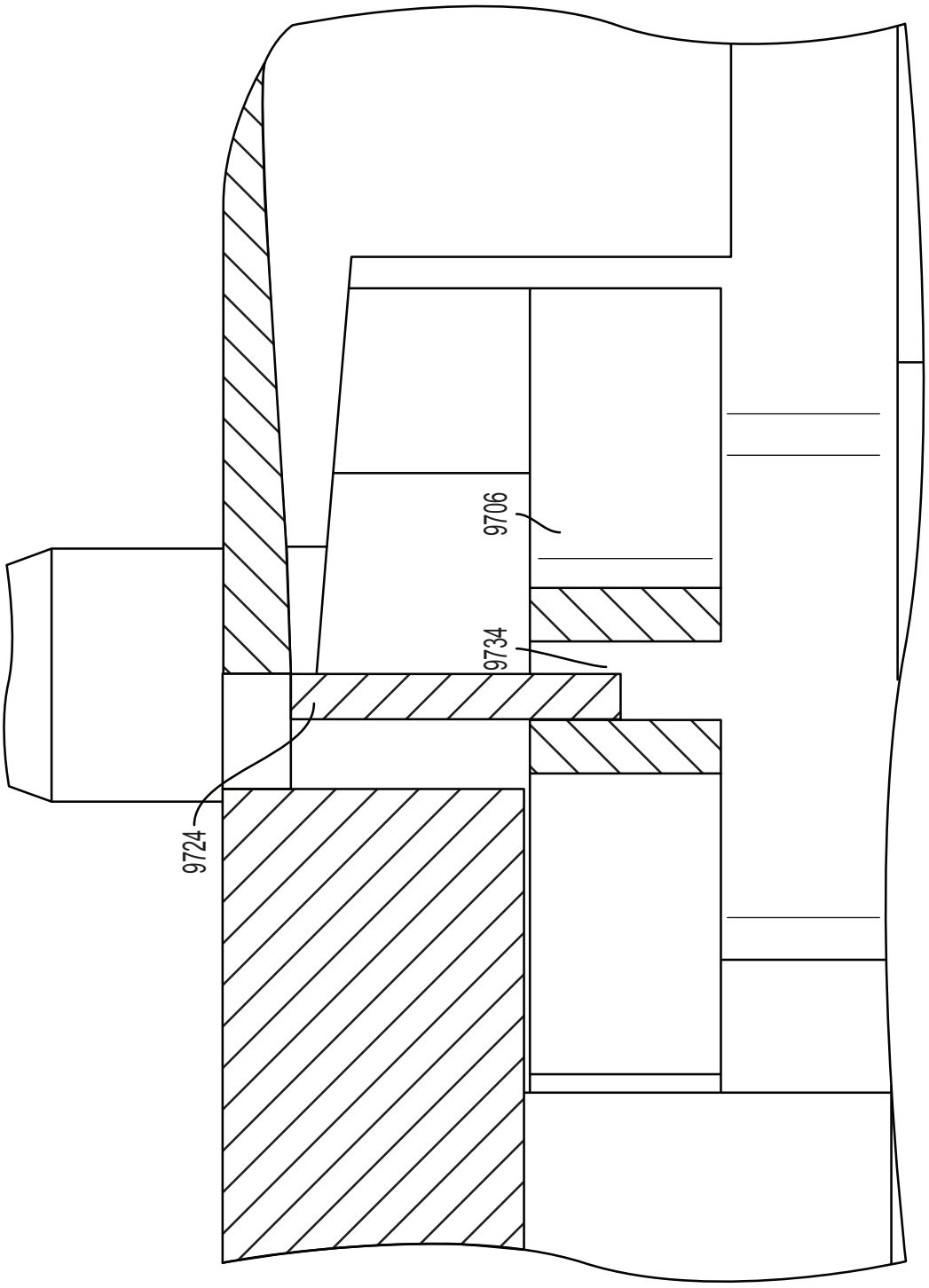


FIG. 103

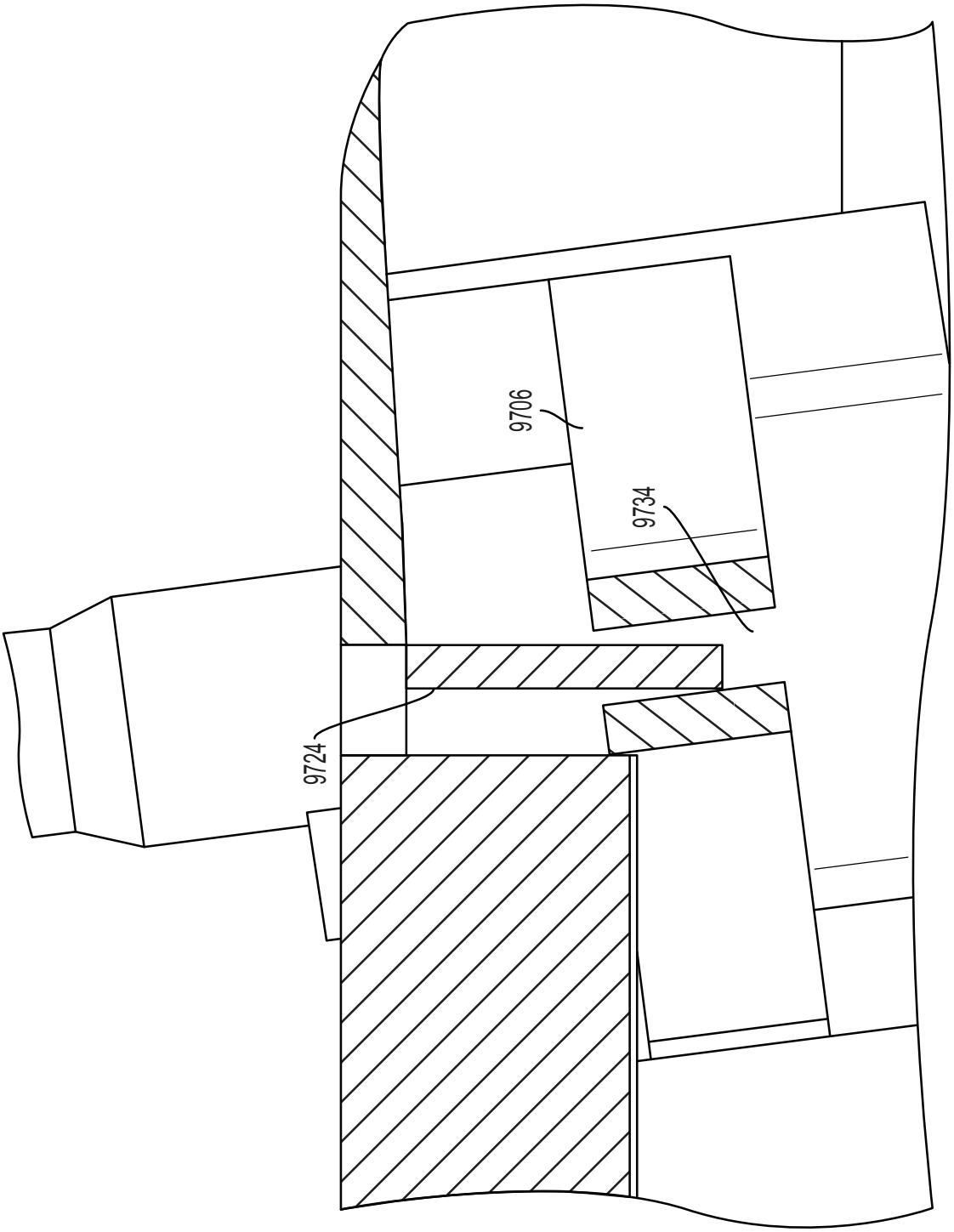


FIG. 104

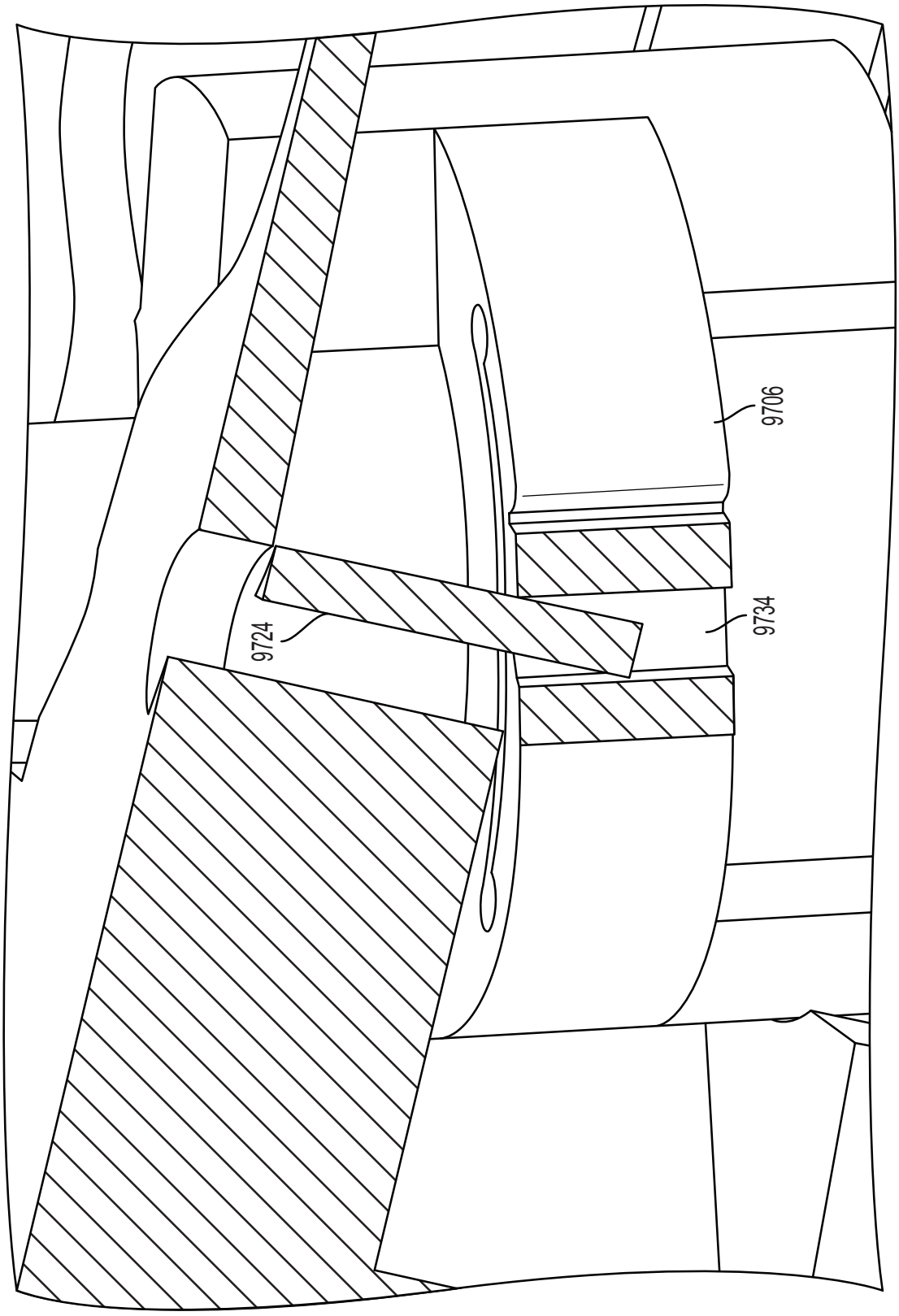


FIG. 105

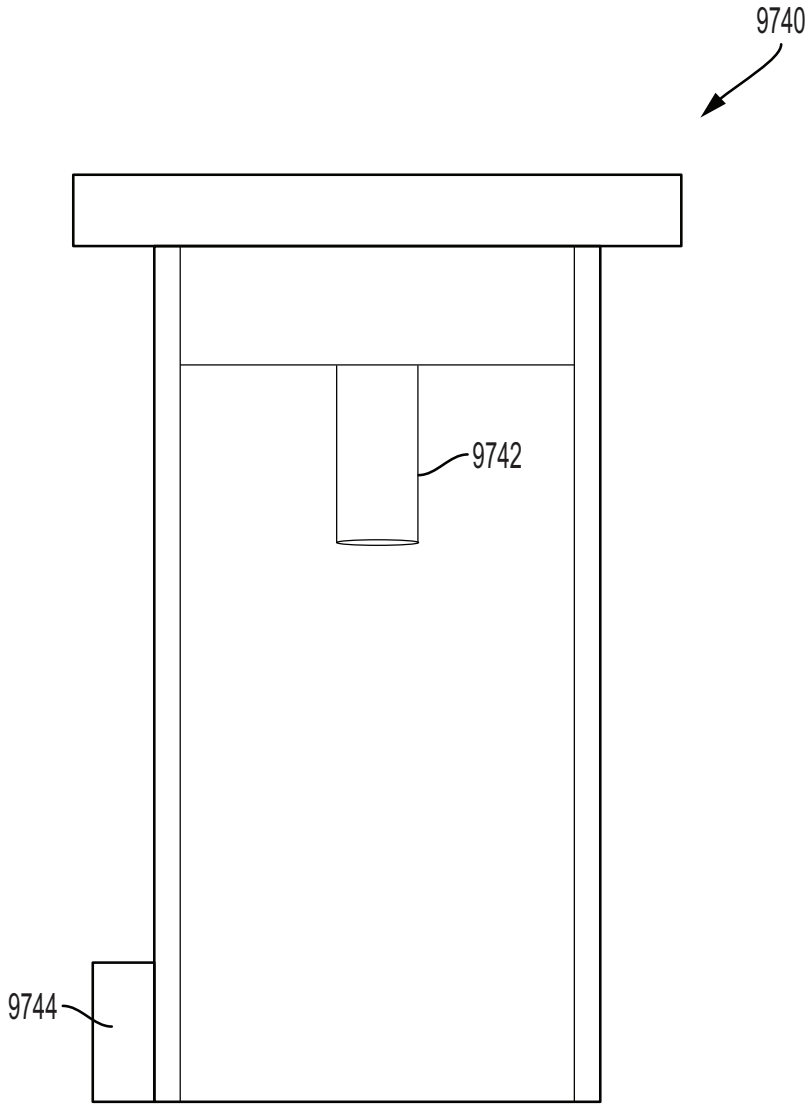


FIG. 106

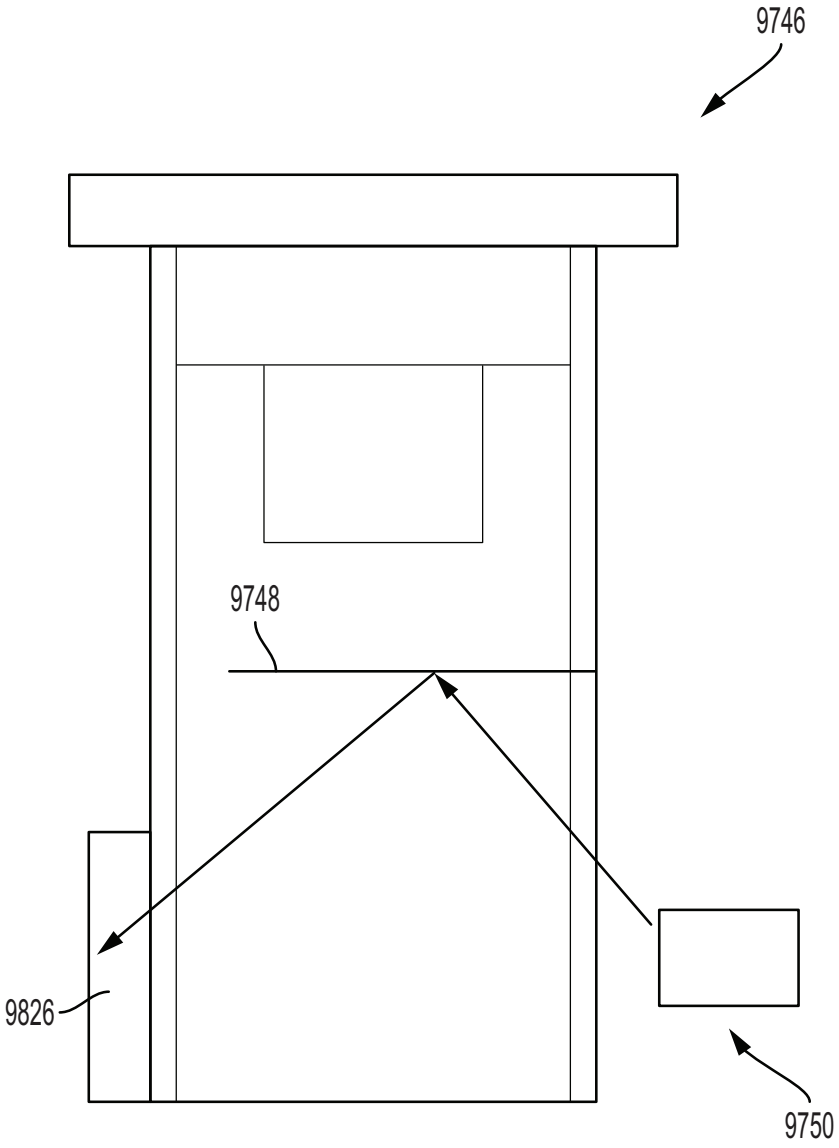


FIG. 107

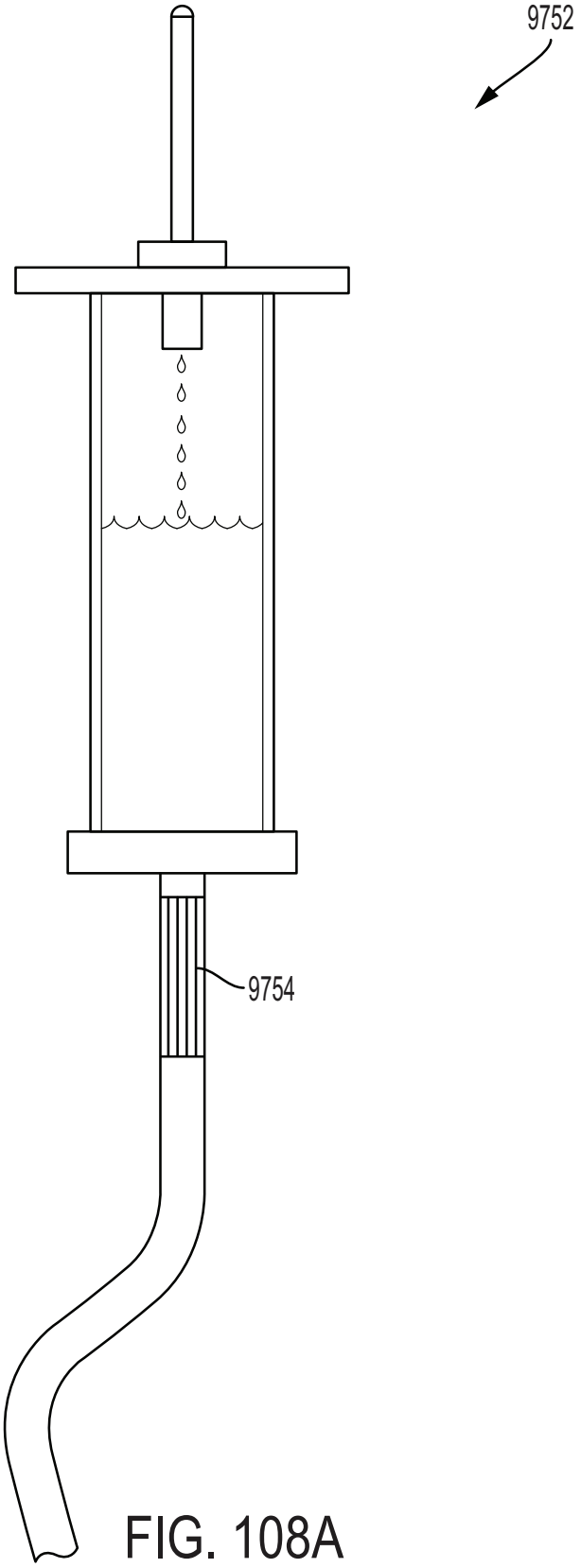


FIG. 108A

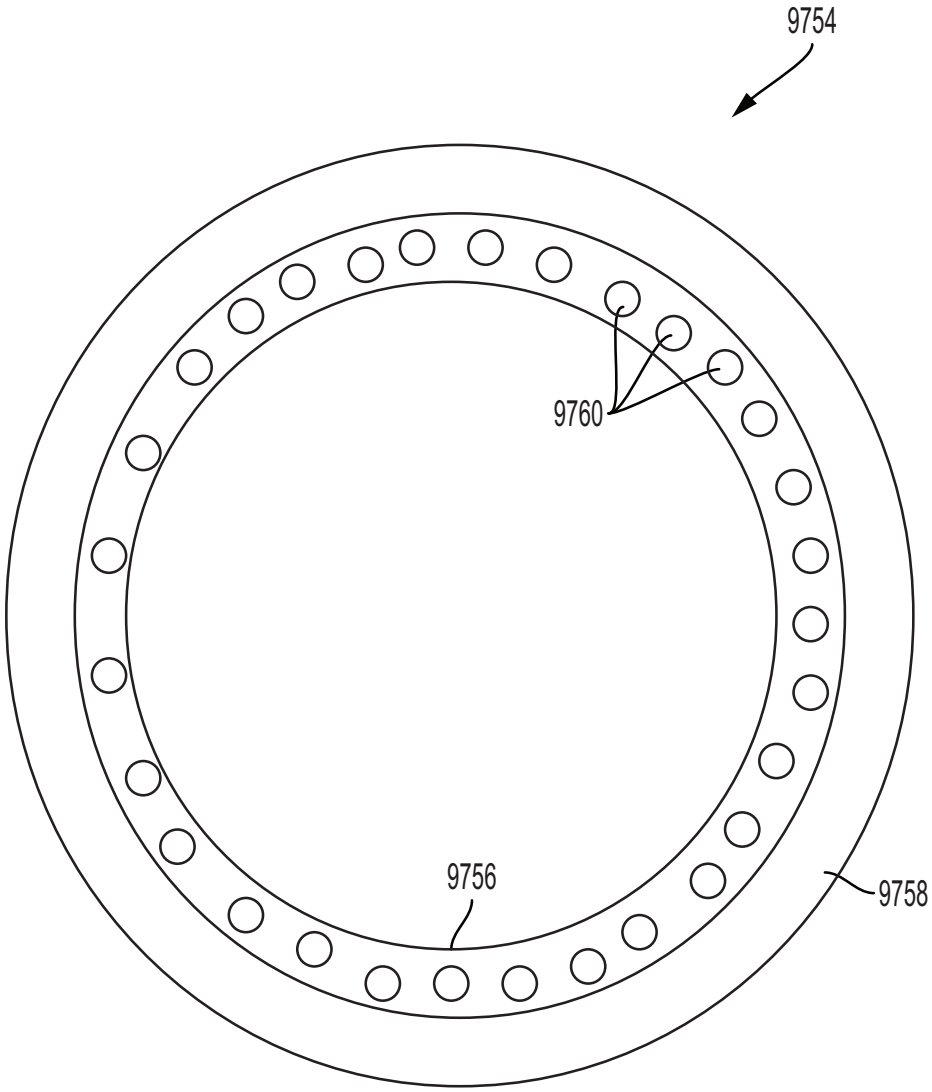


FIG. 108B

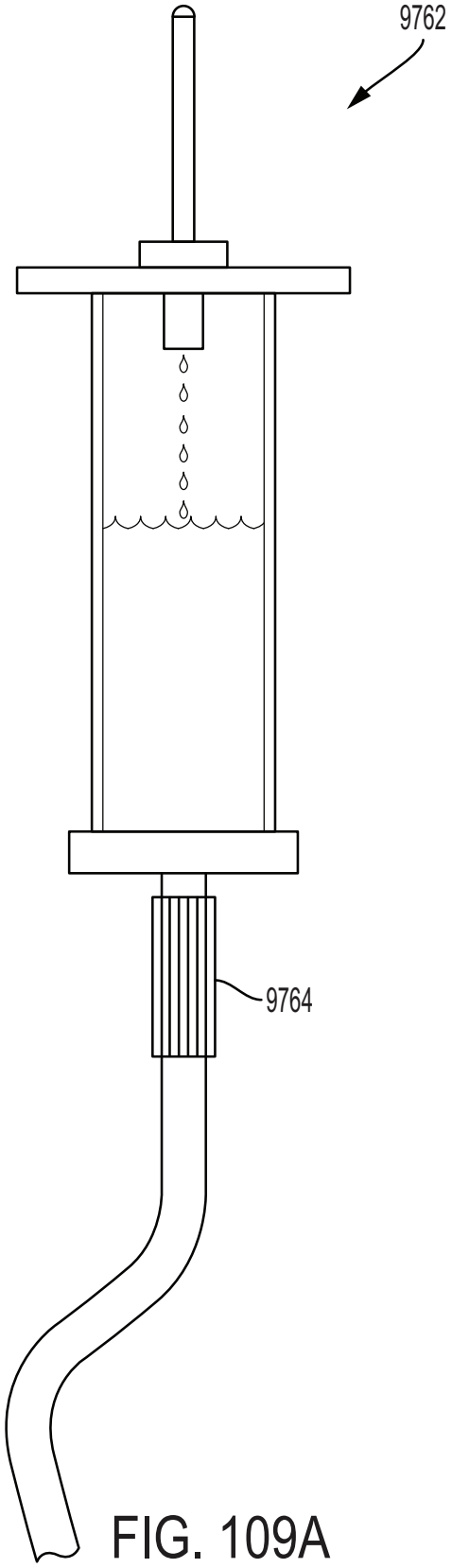


FIG. 109A

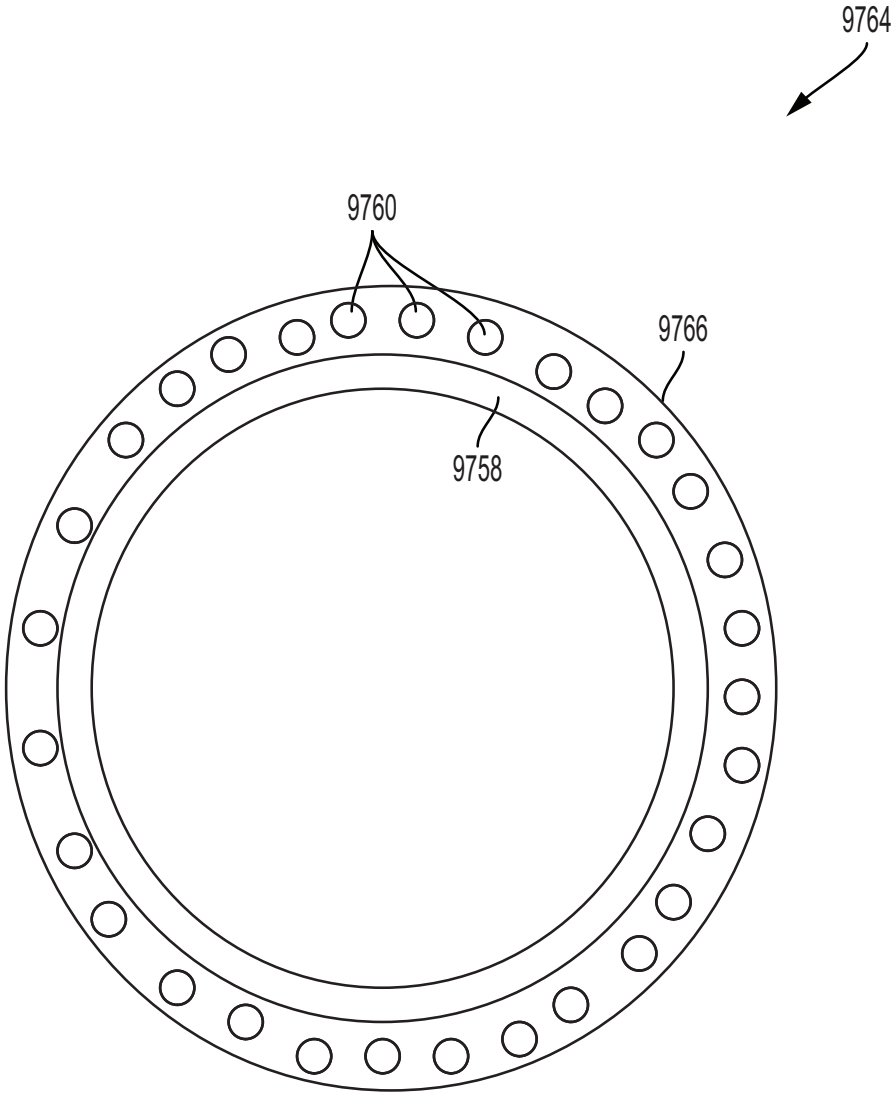


FIG. 109B

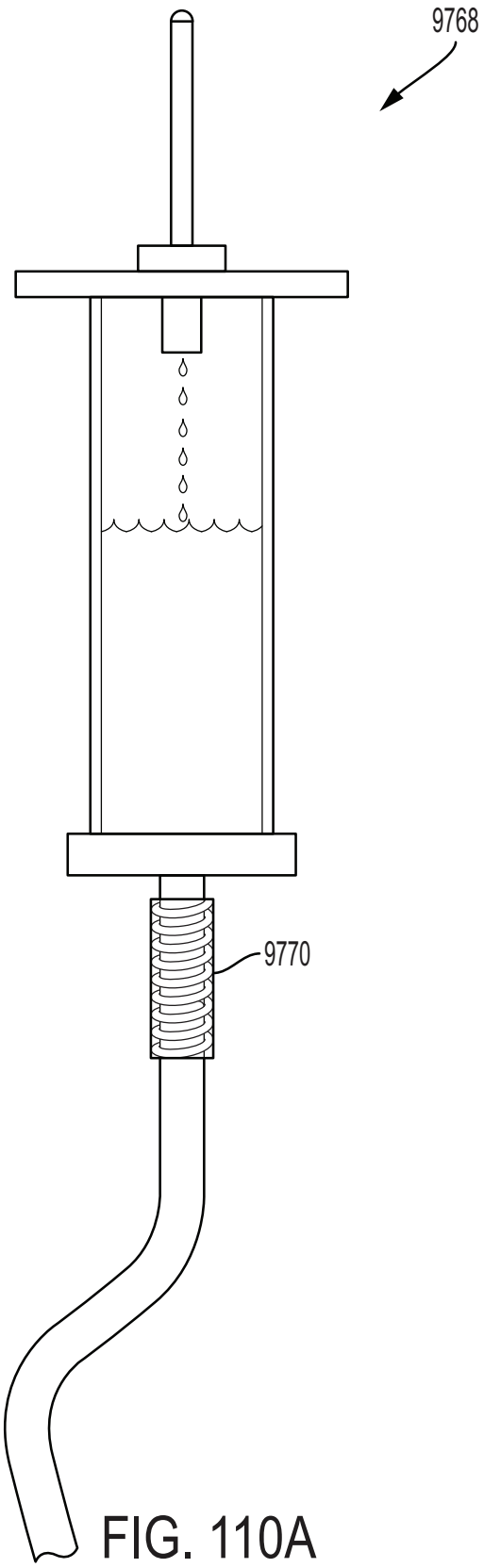


FIG. 110A

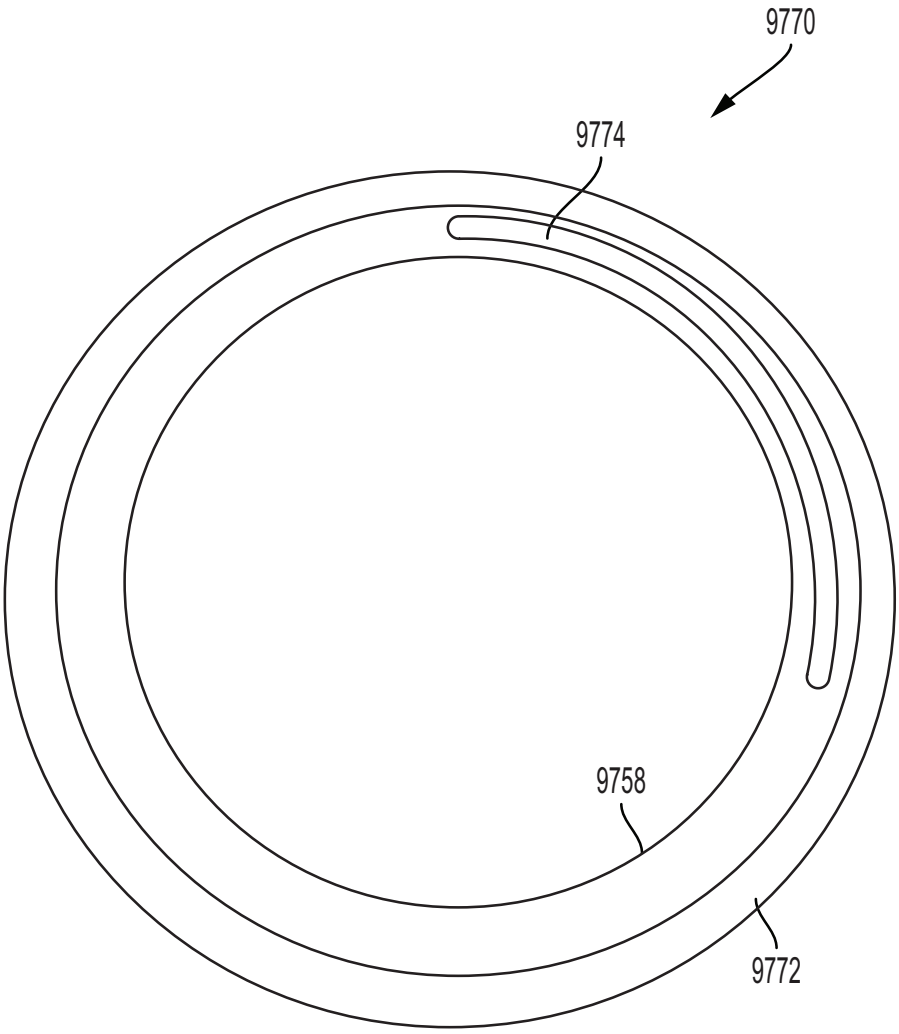


FIG. 110B

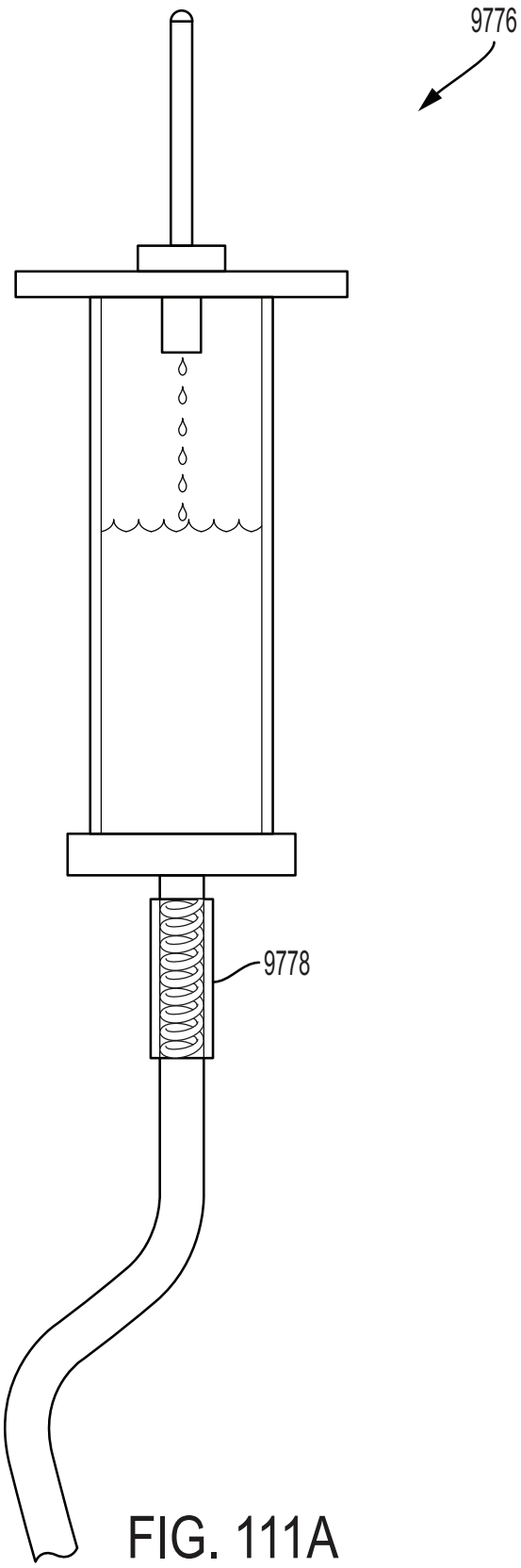


FIG. 111A

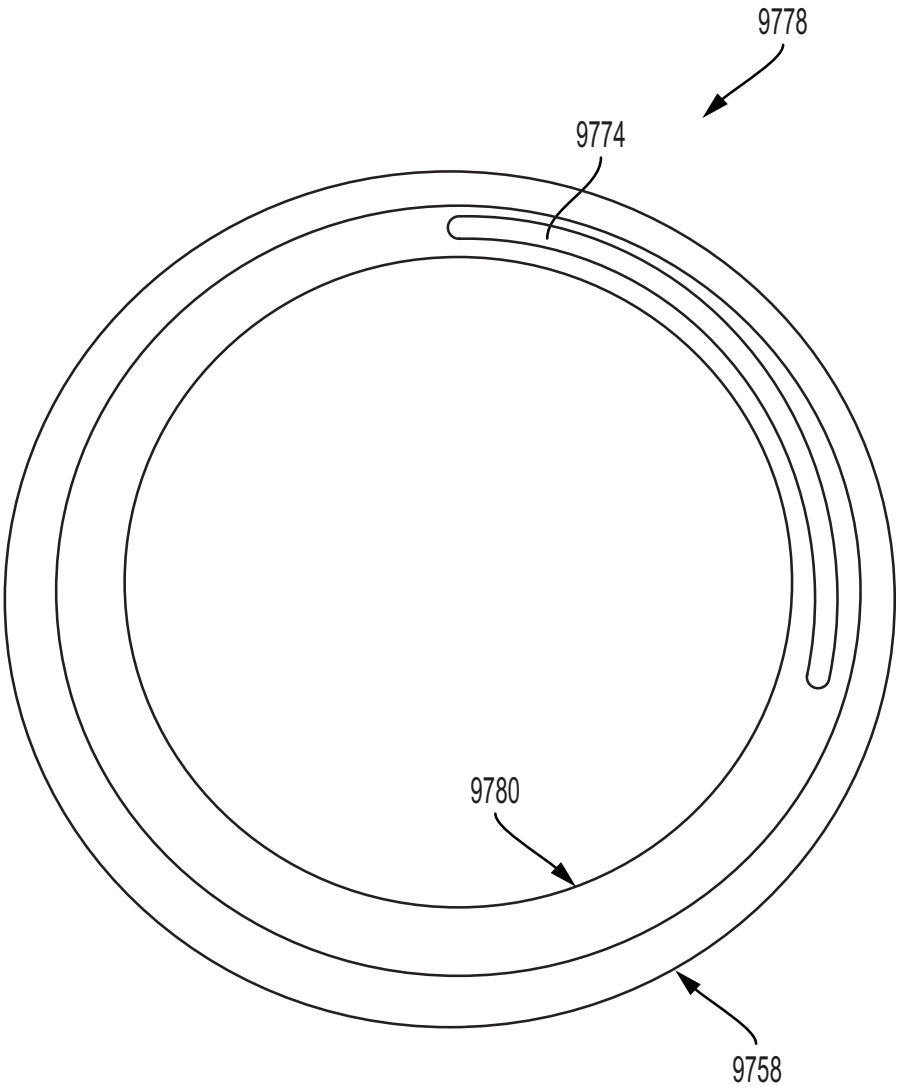


FIG. 111B

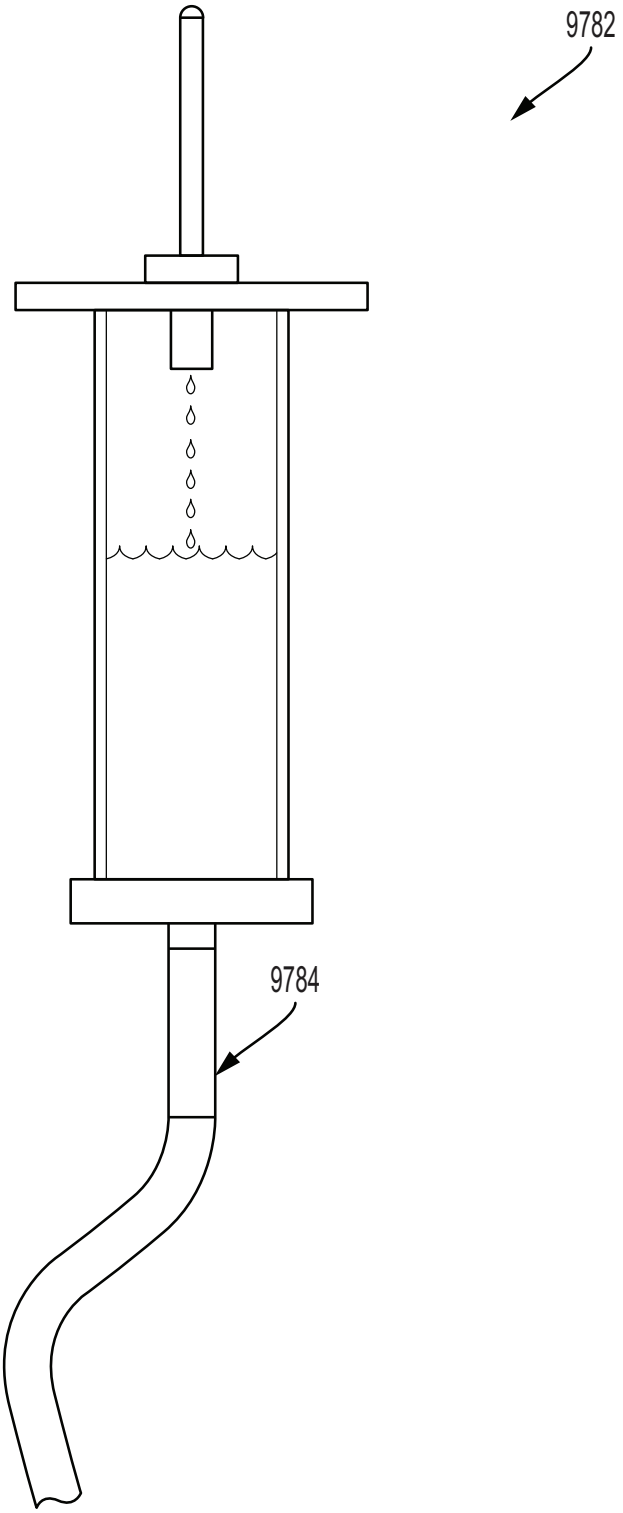


FIG. 112

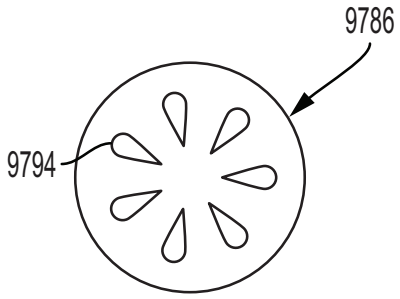


FIG. 113

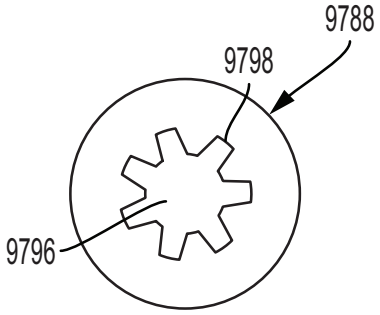


FIG. 114

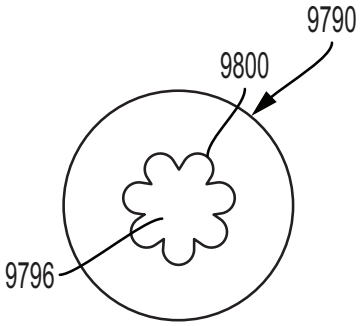


FIG. 115

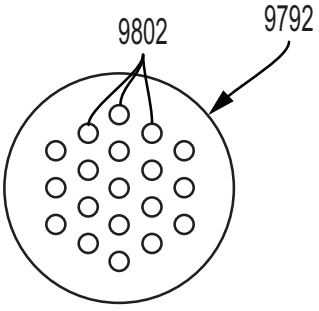


FIG. 116

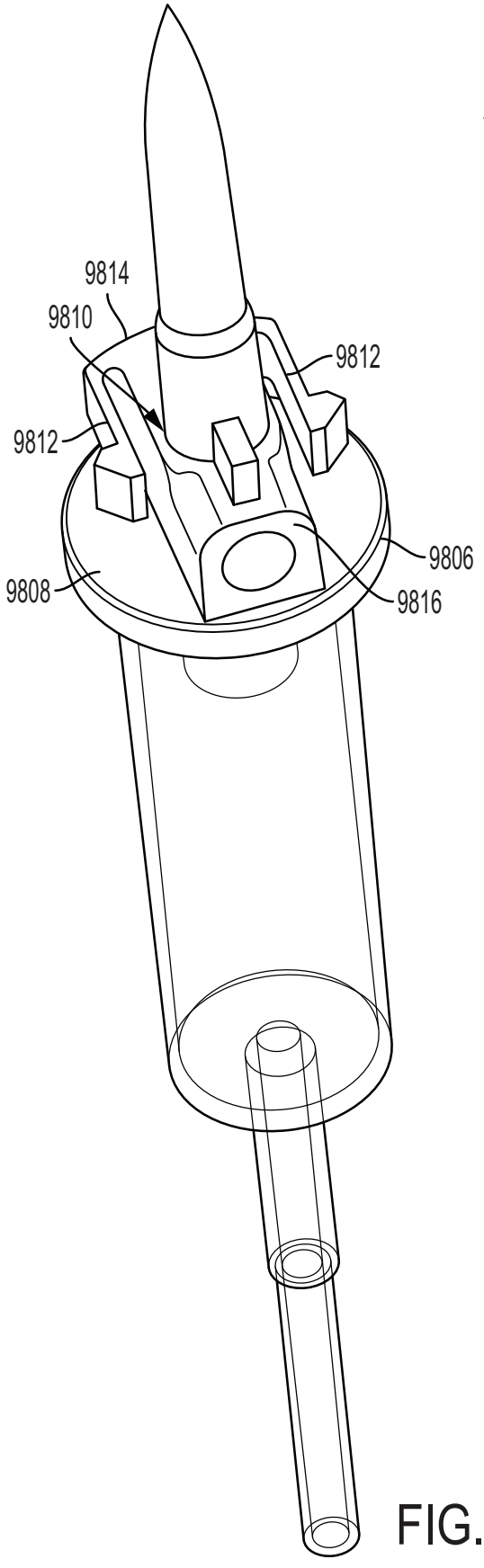


FIG. 117

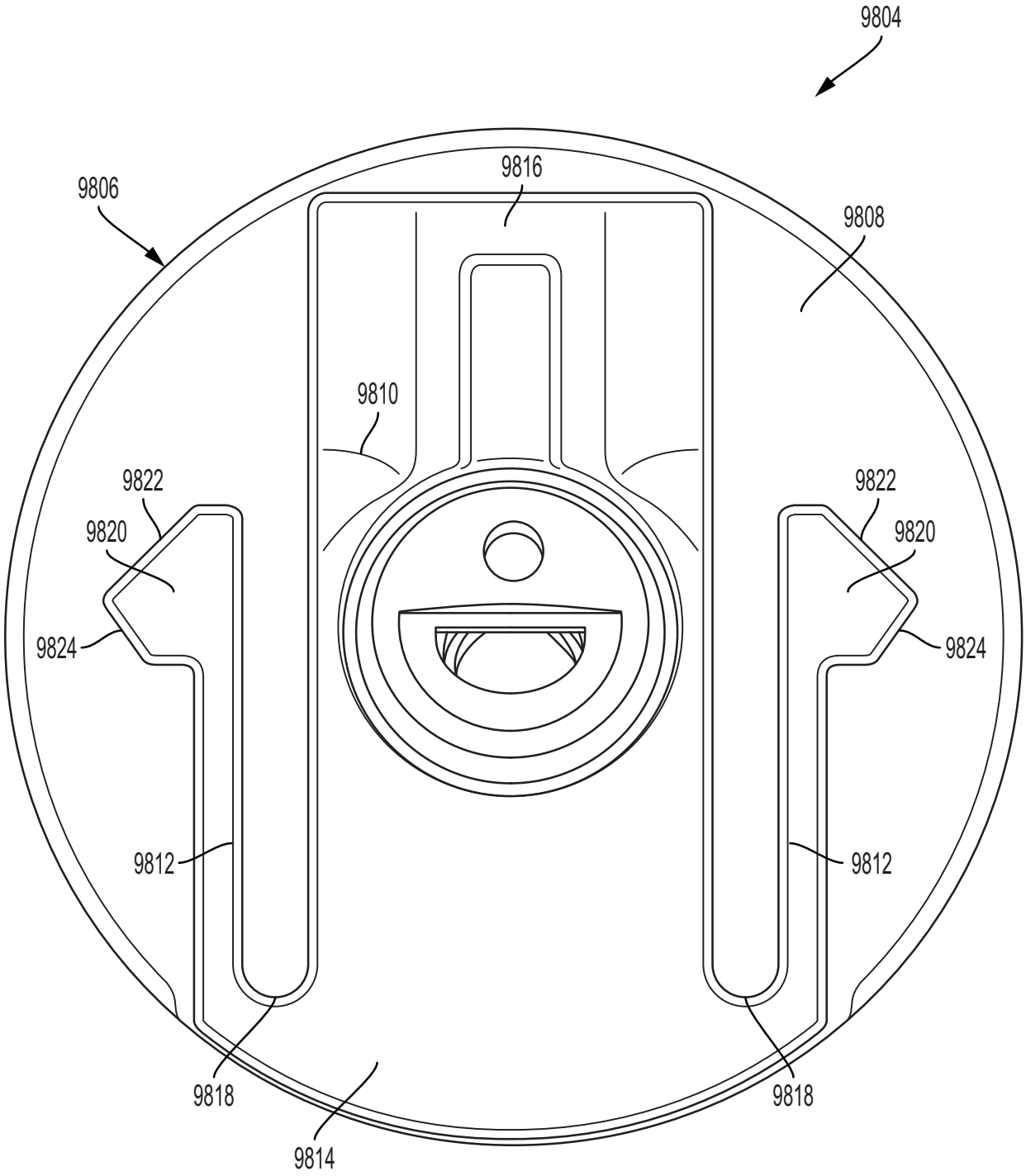

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FIG. 118

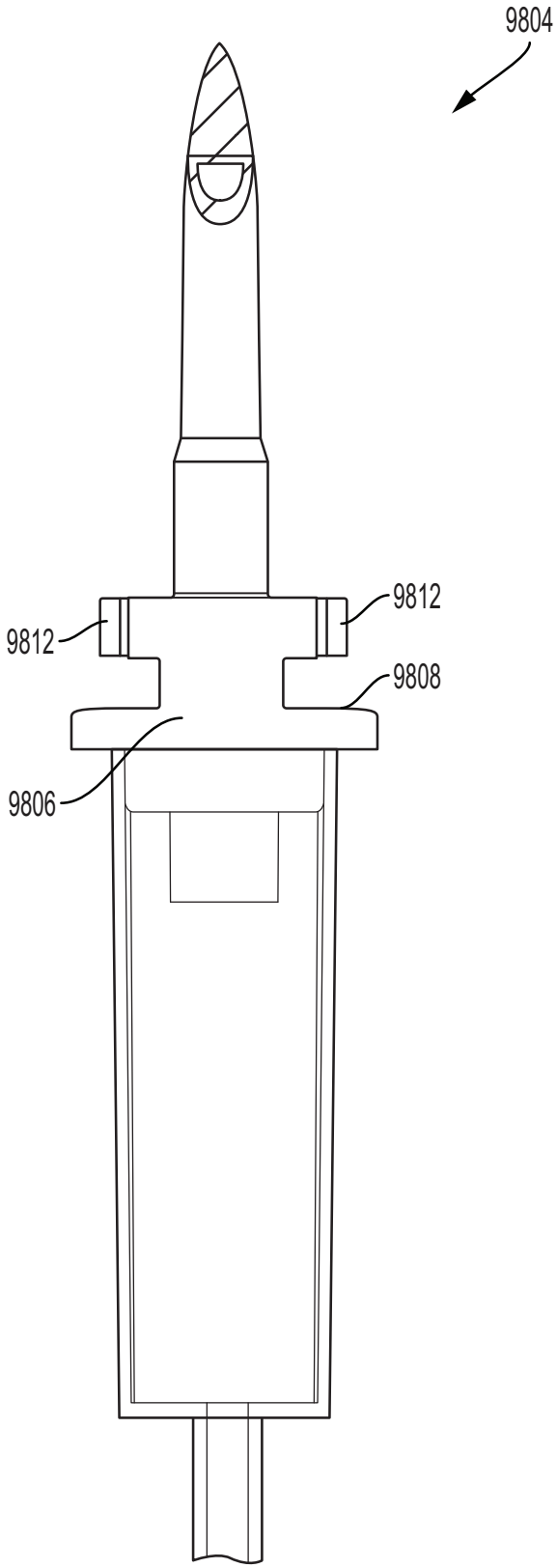


FIG. 119

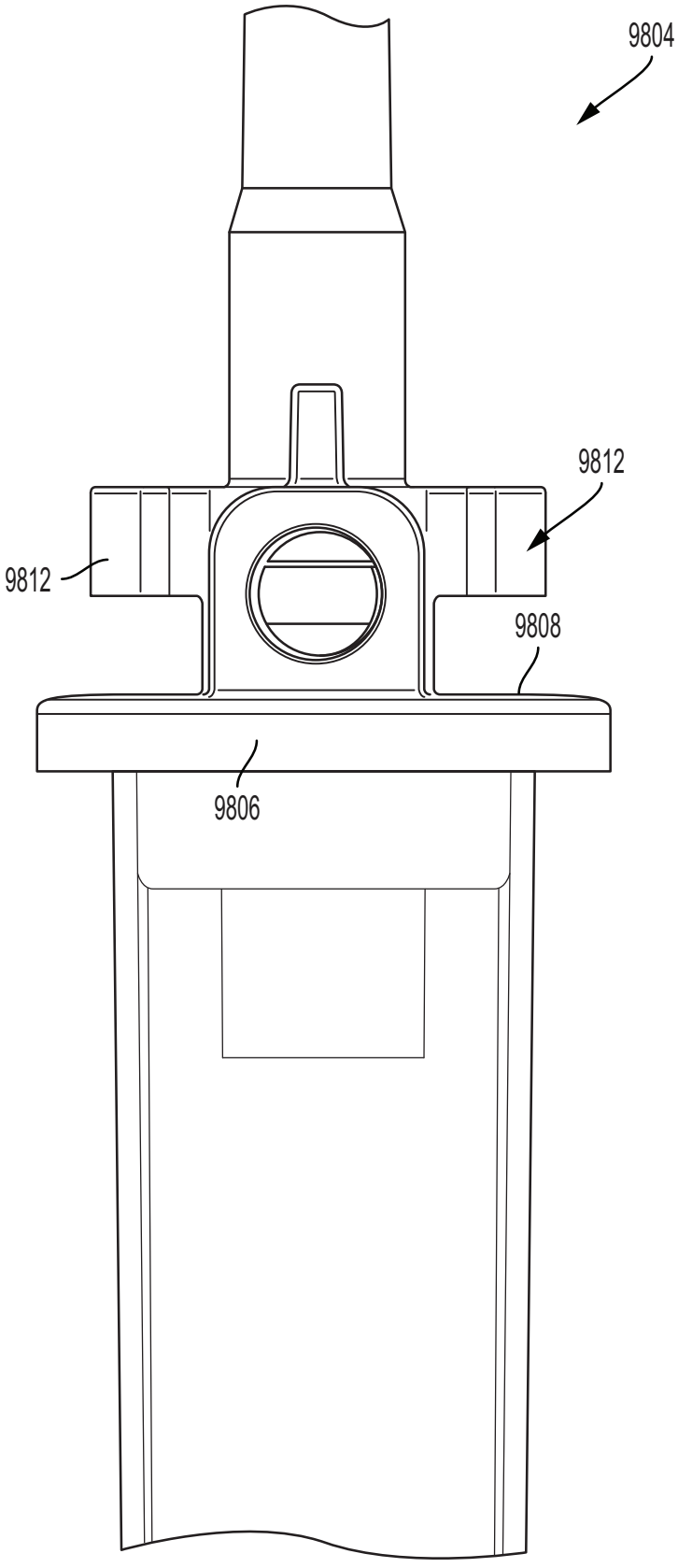


FIG. 120

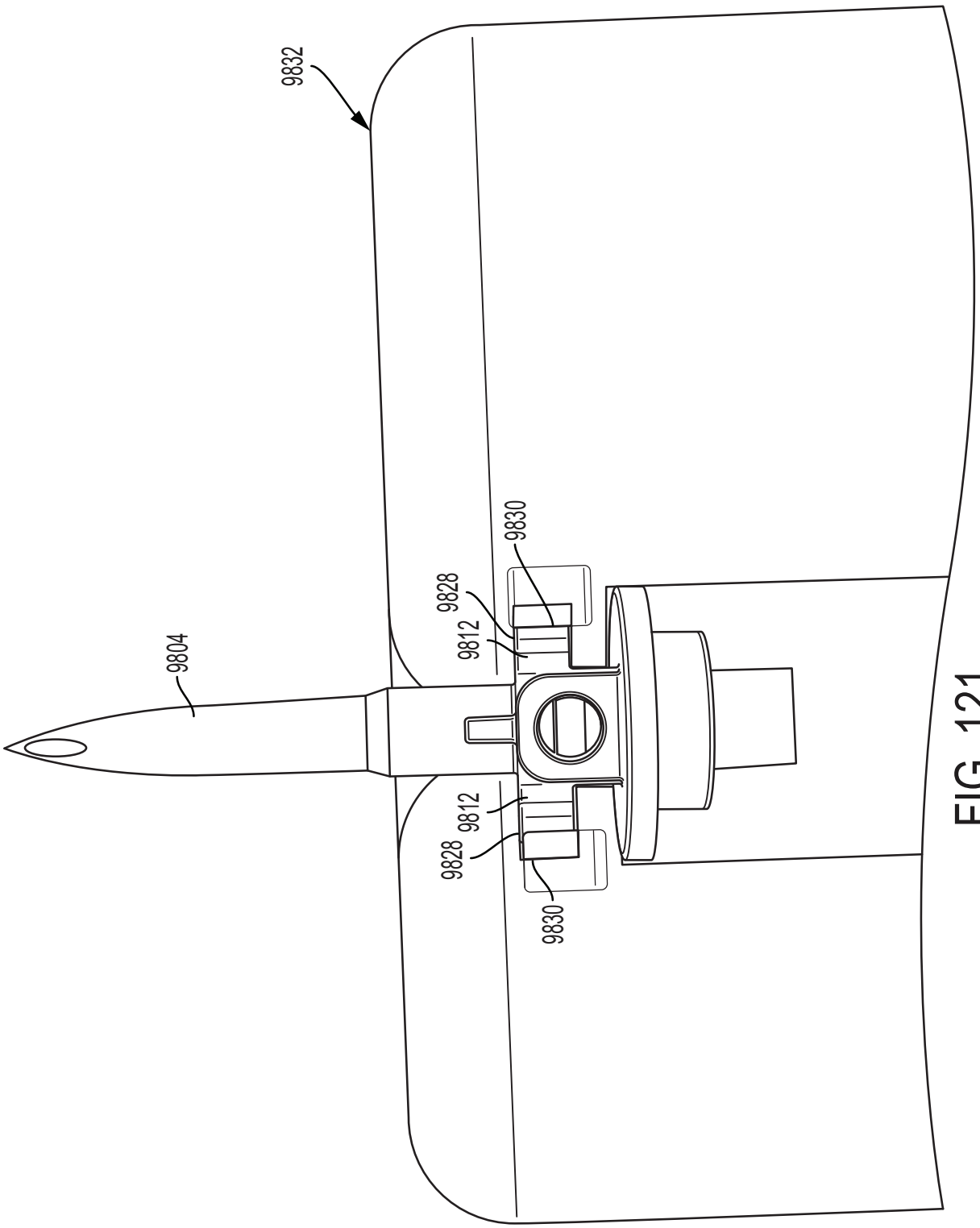


FIG. 121

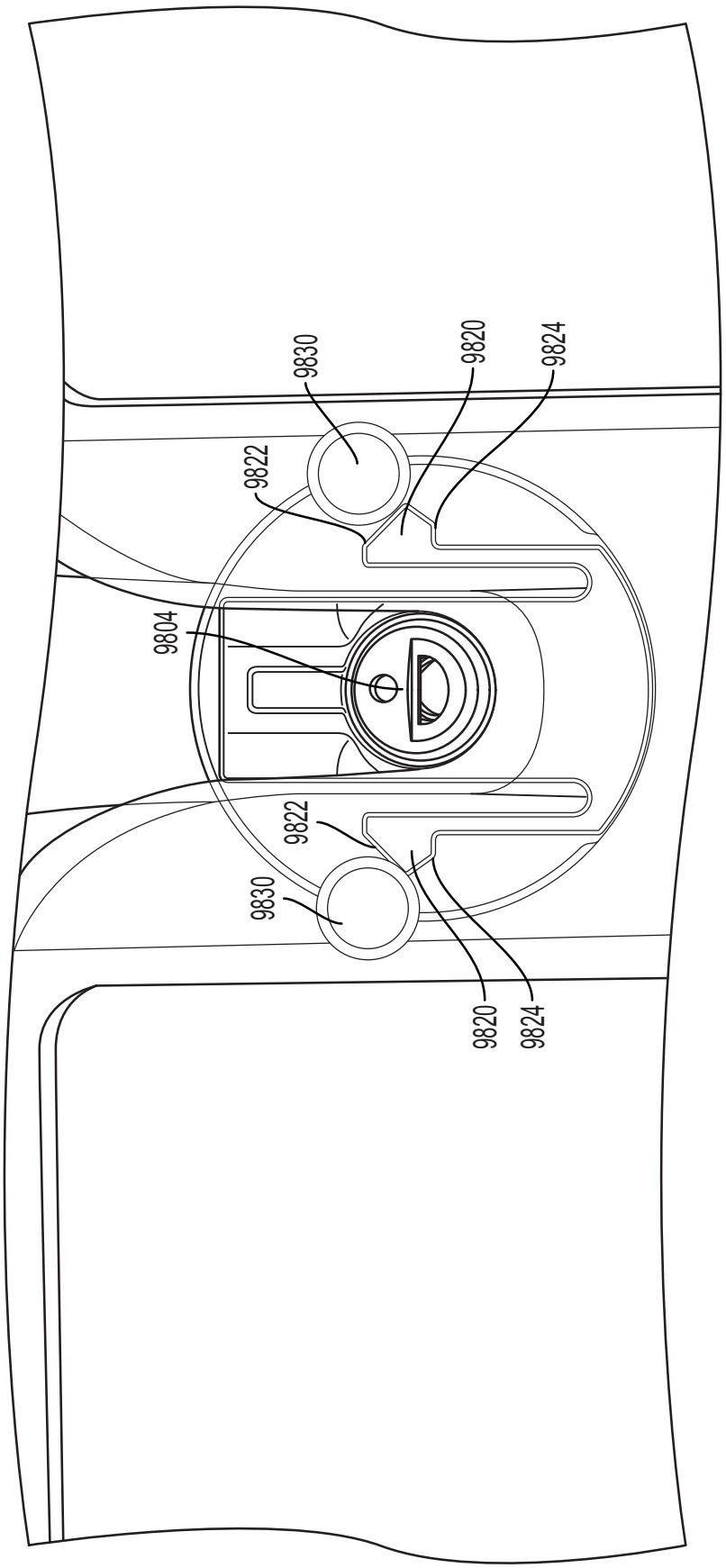


FIG. 122

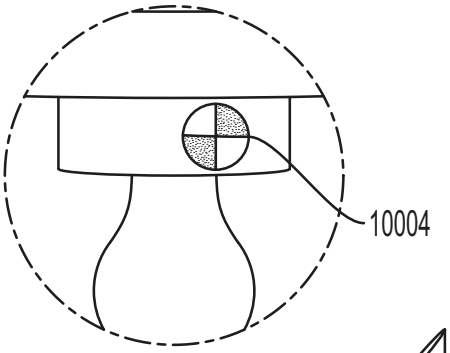


FIG. 124

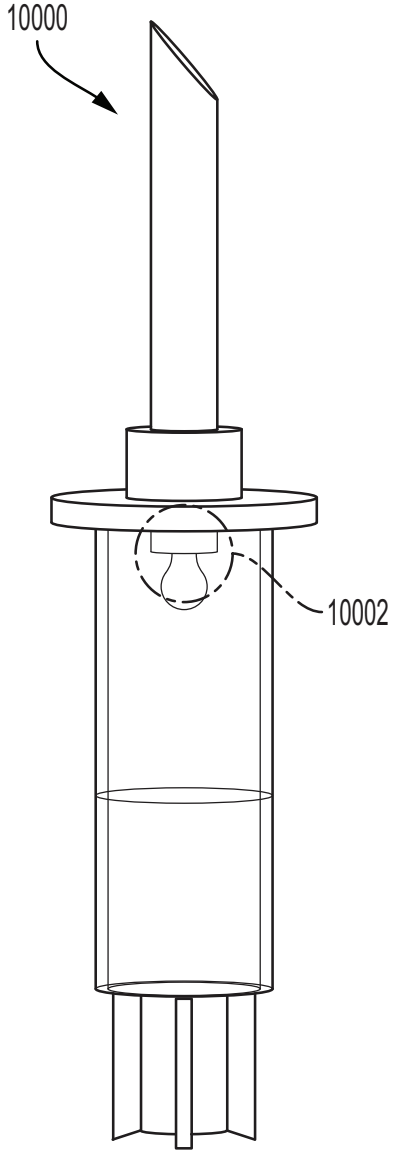


FIG. 123

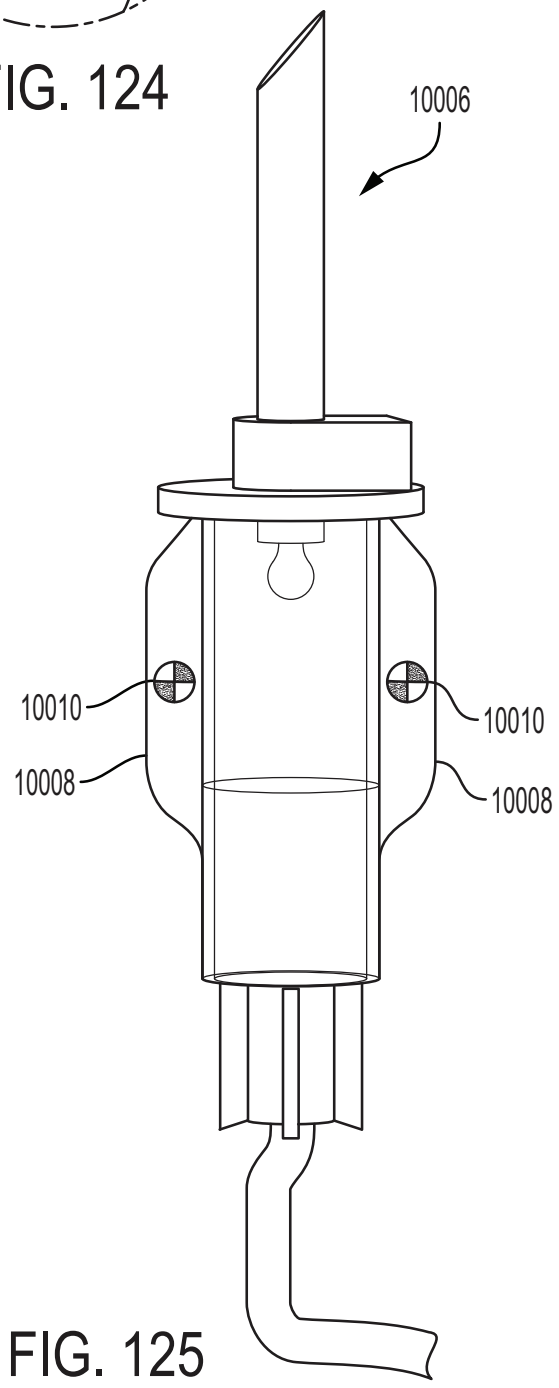


FIG. 125

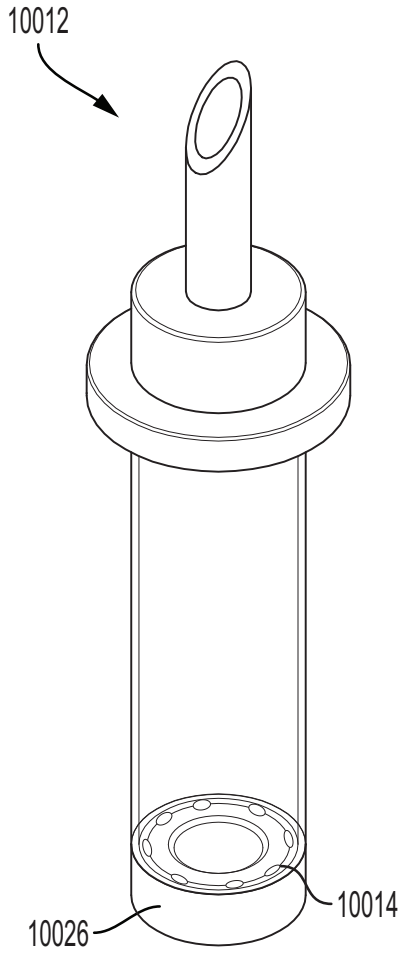


FIG. 126

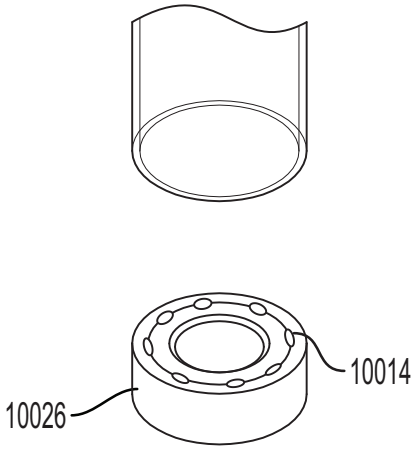


FIG. 127

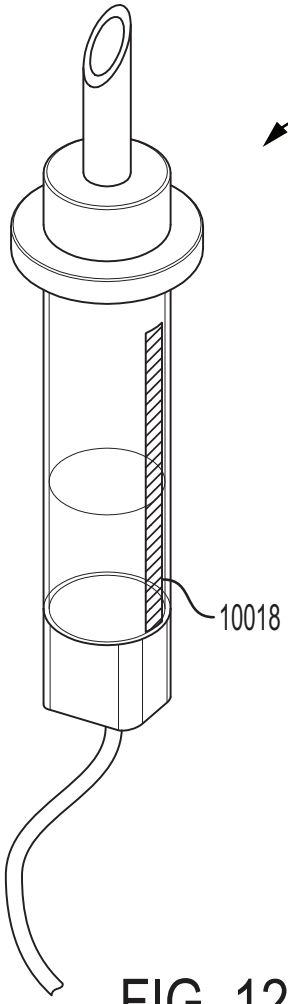


FIG. 128

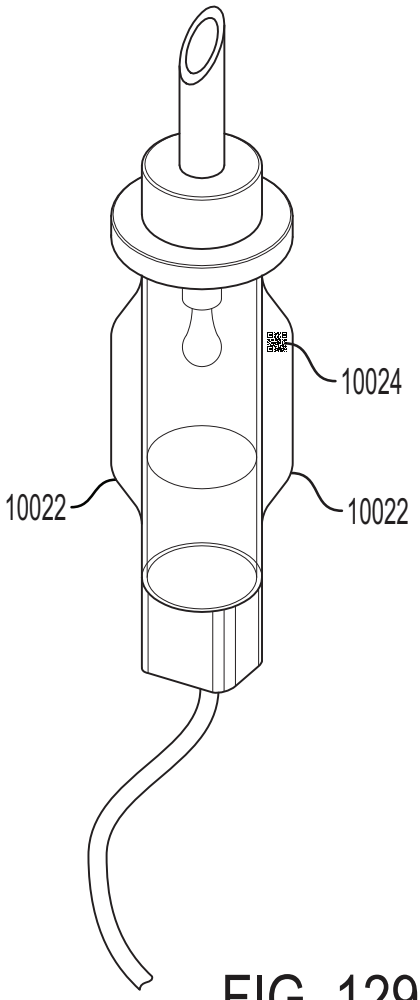


FIG. 129

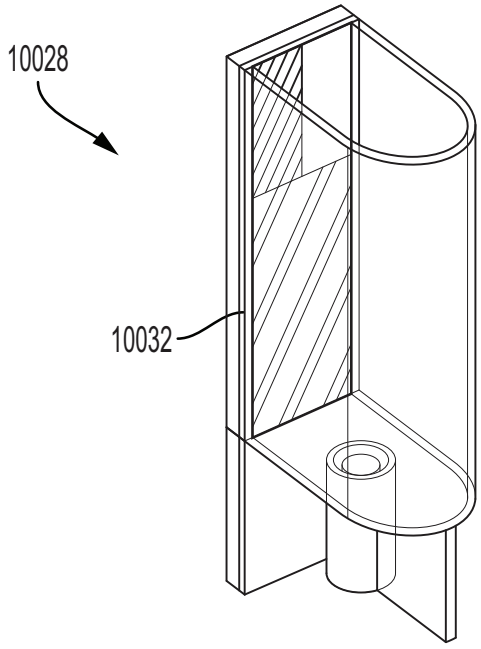


FIG. 130

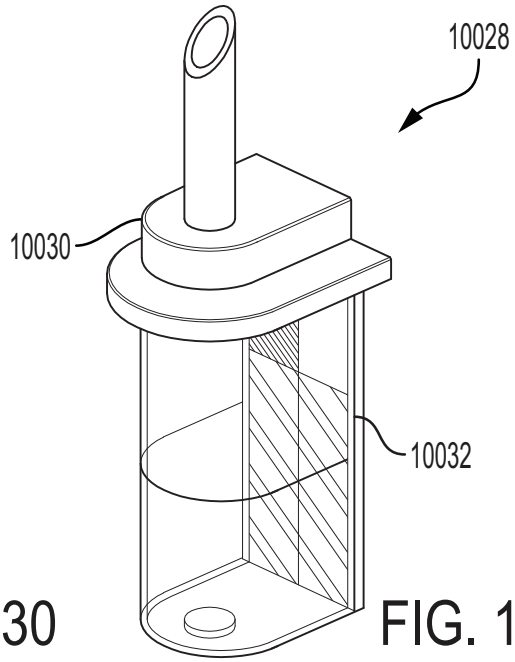


FIG. 131

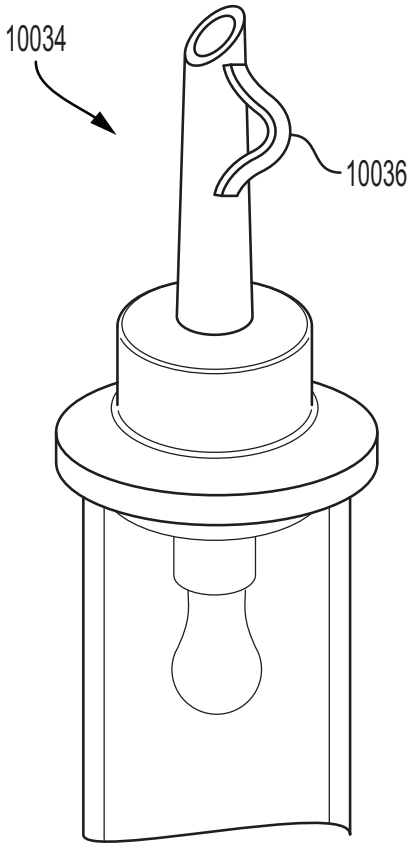


FIG. 132

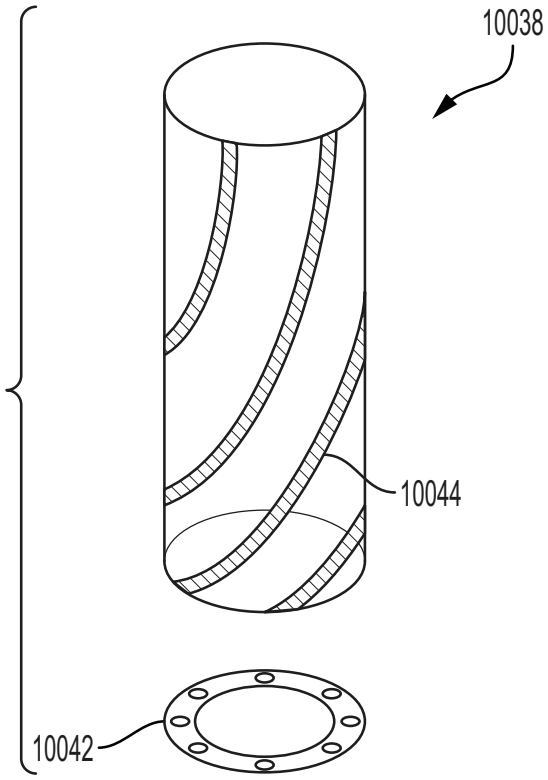


FIG. 133

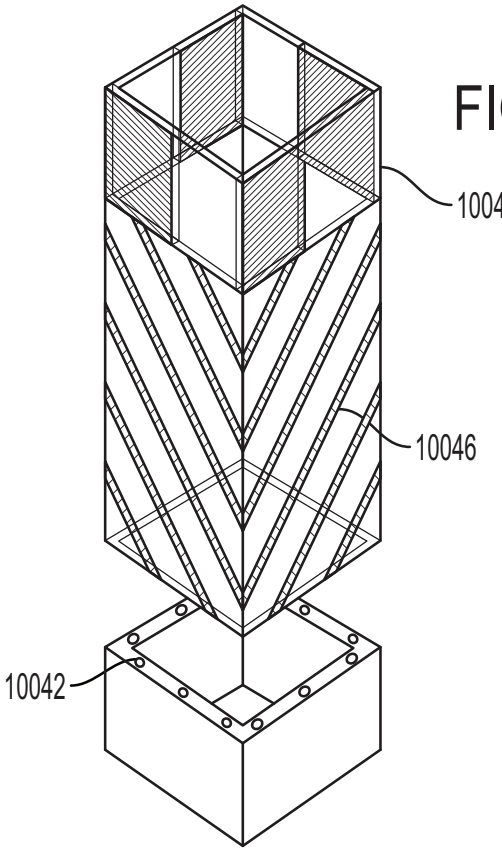


FIG. 134

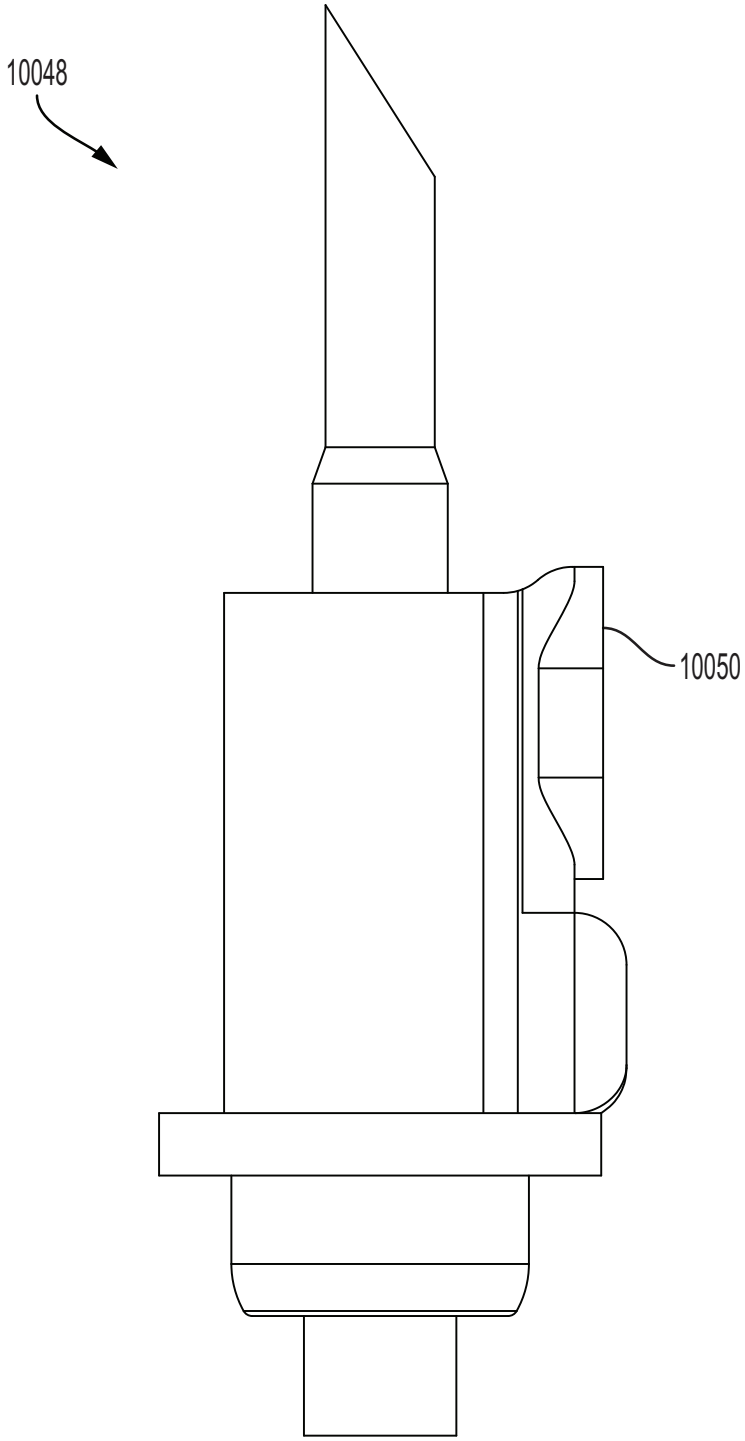


FIG. 135A

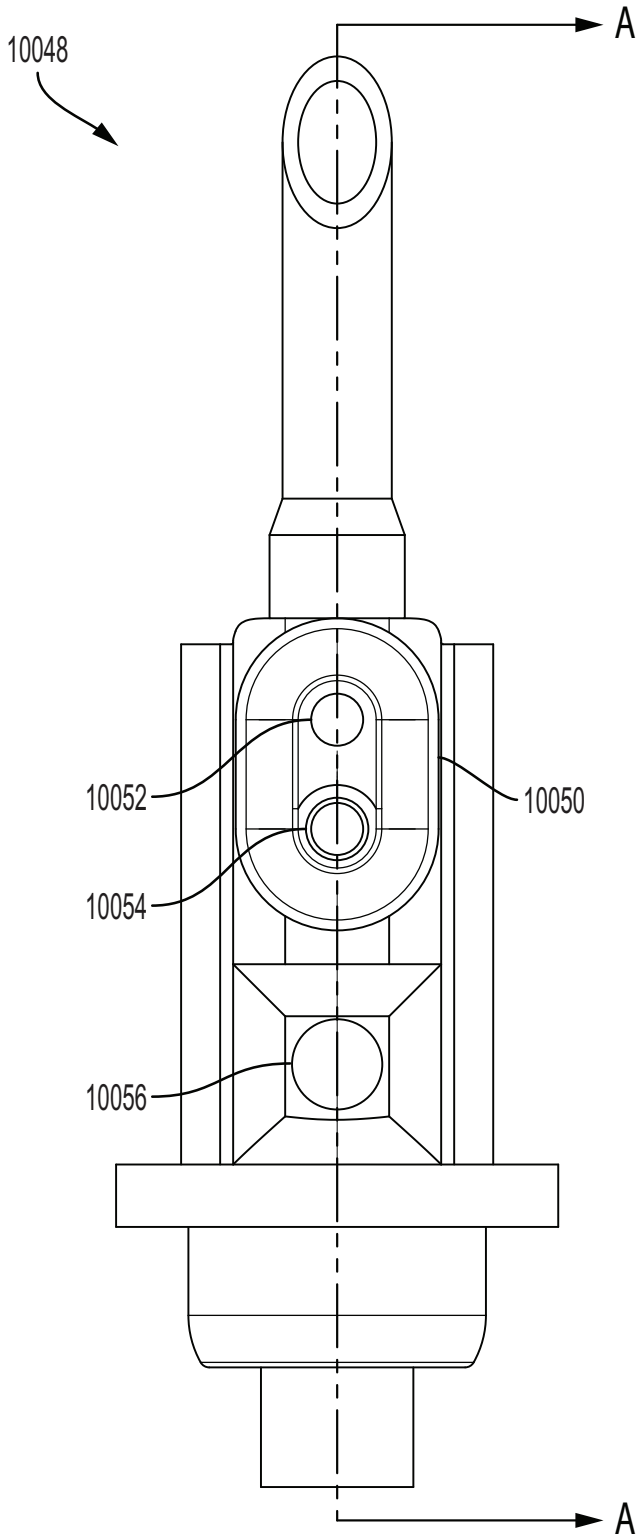
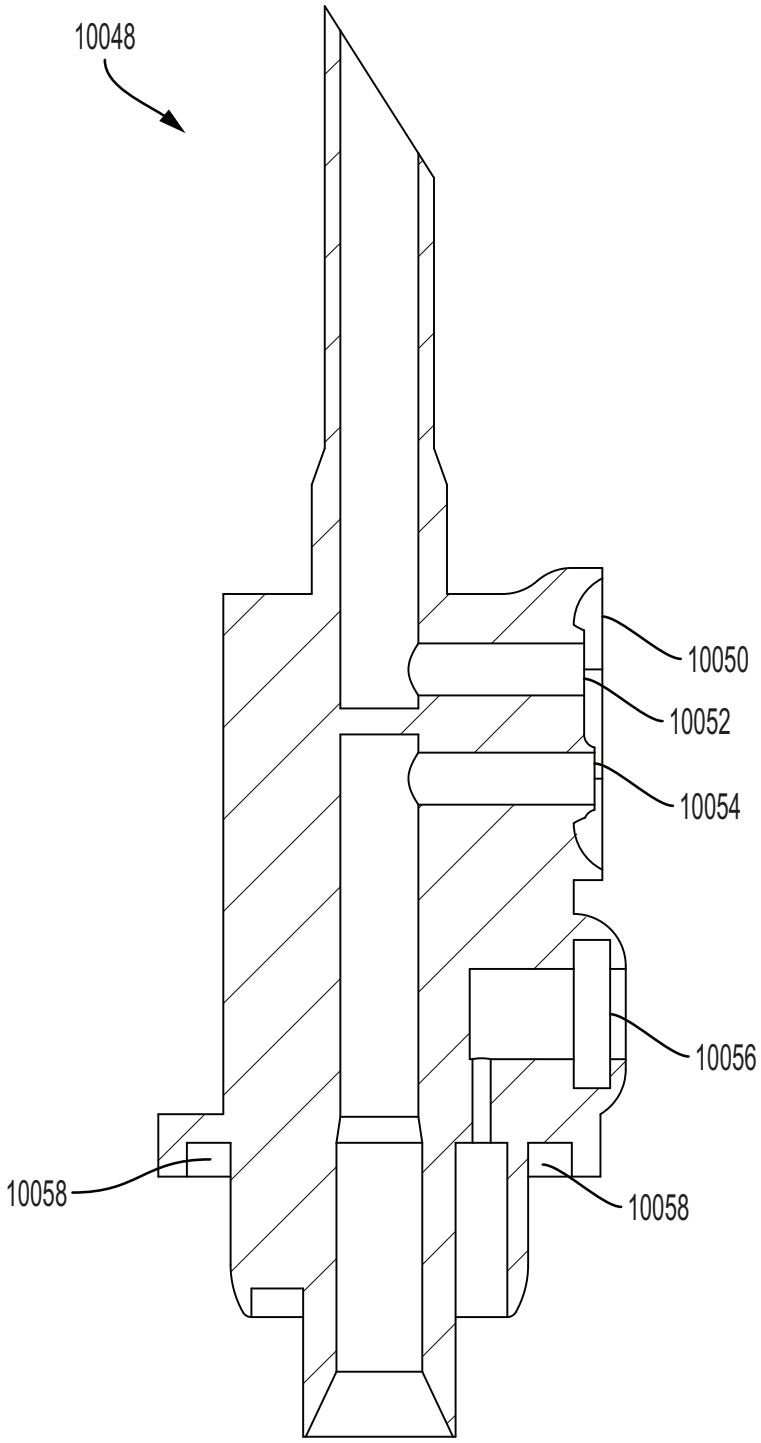


FIG. 135B



SECTION A-A FIG. 135C

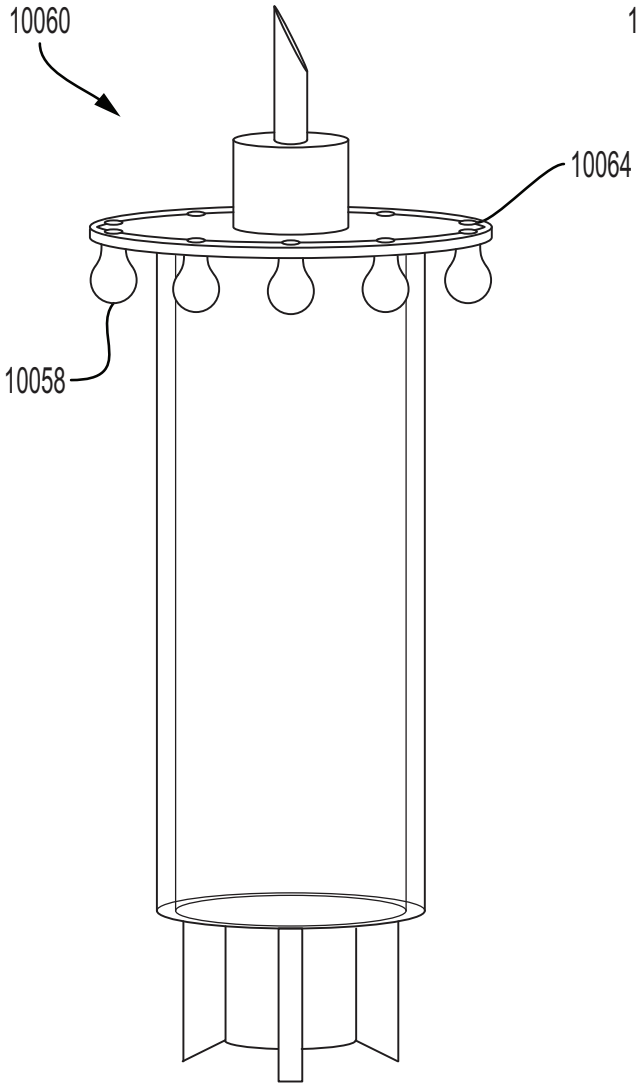


FIG. 136

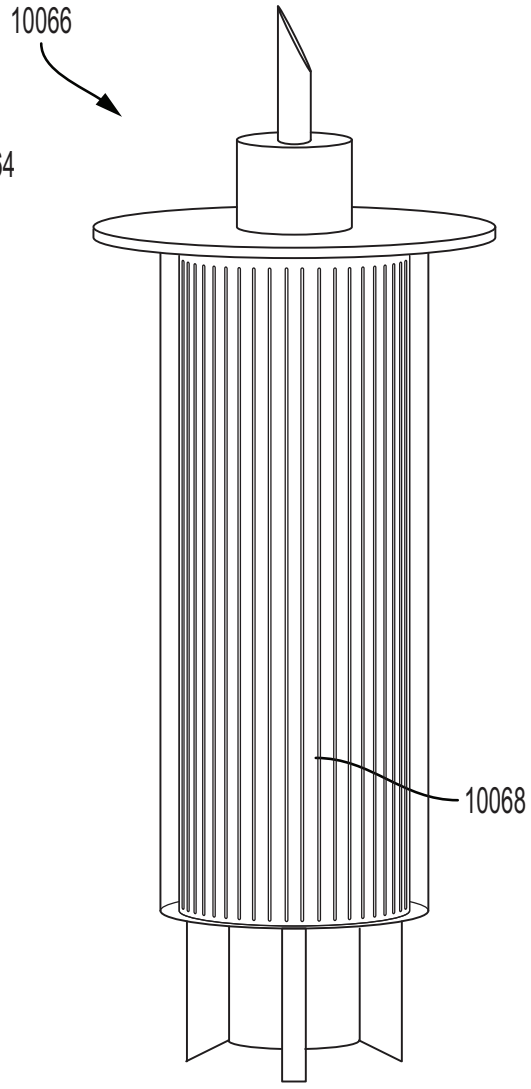


FIG. 137

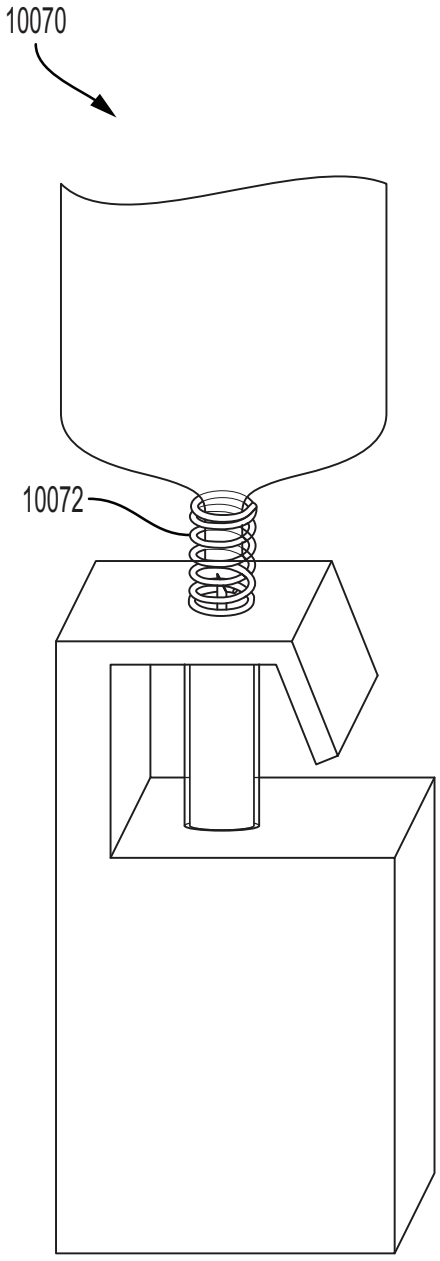


FIG. 138

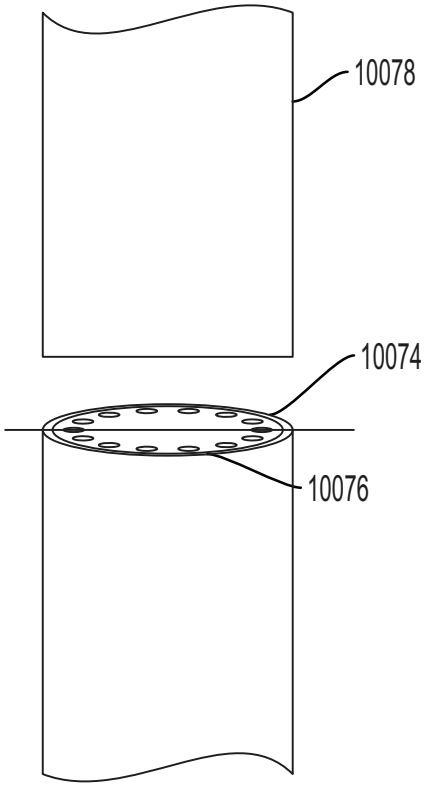


FIG. 139

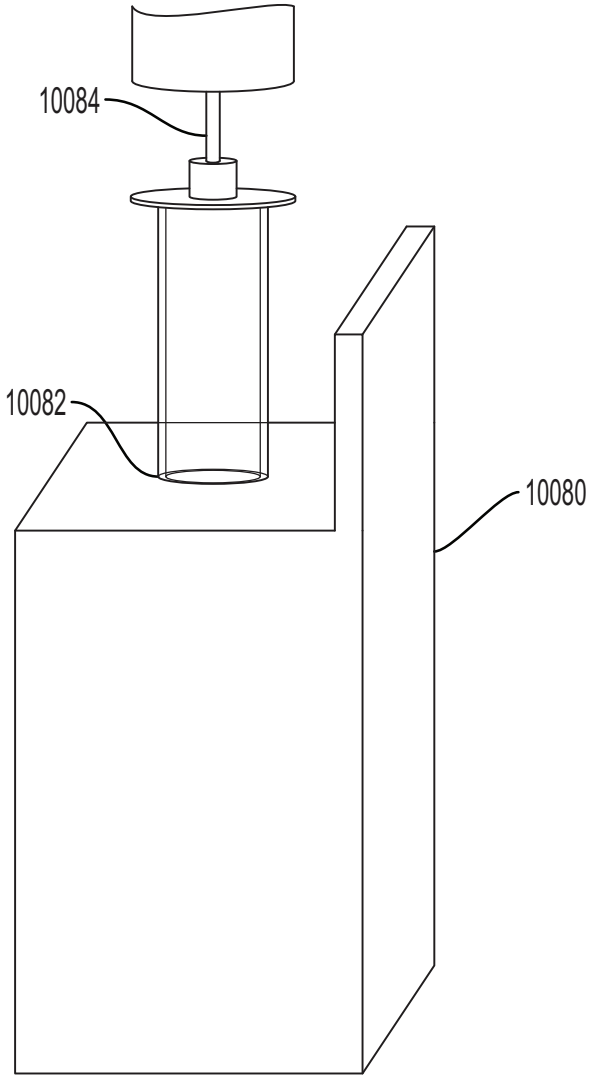


FIG. 140

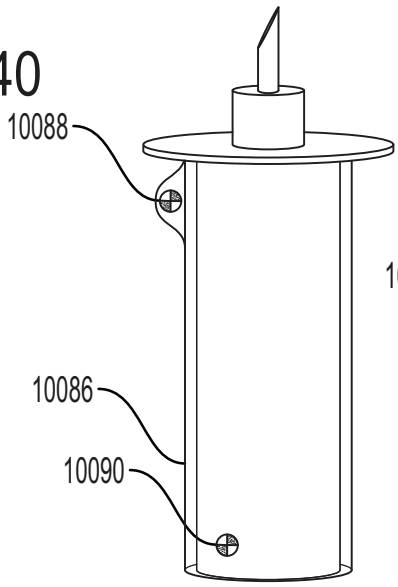


FIG. 141A

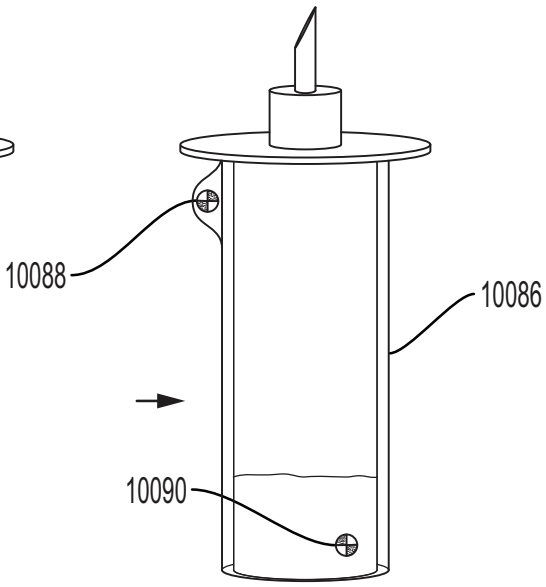


FIG. 141B

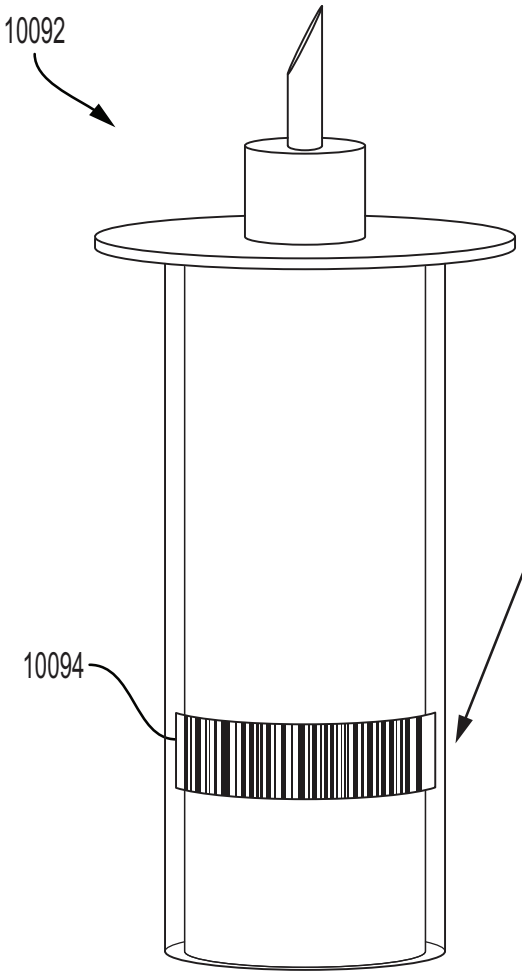


FIG. 142A

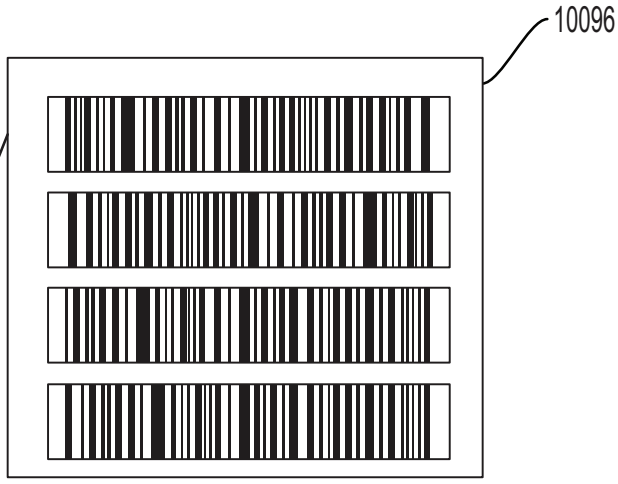


FIG. 142B

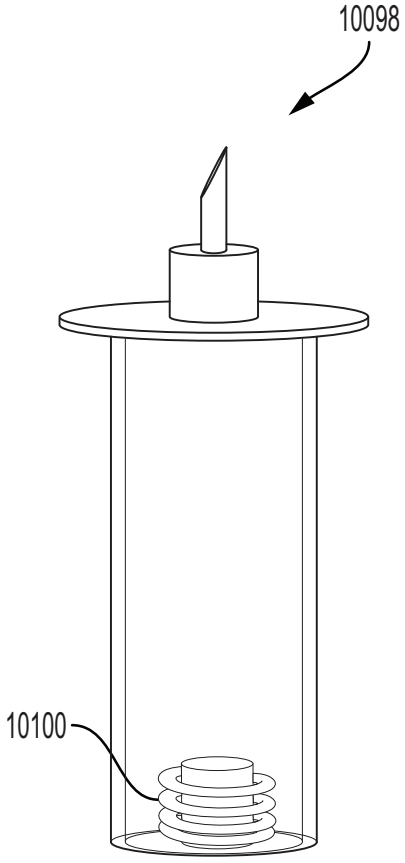


FIG. 143

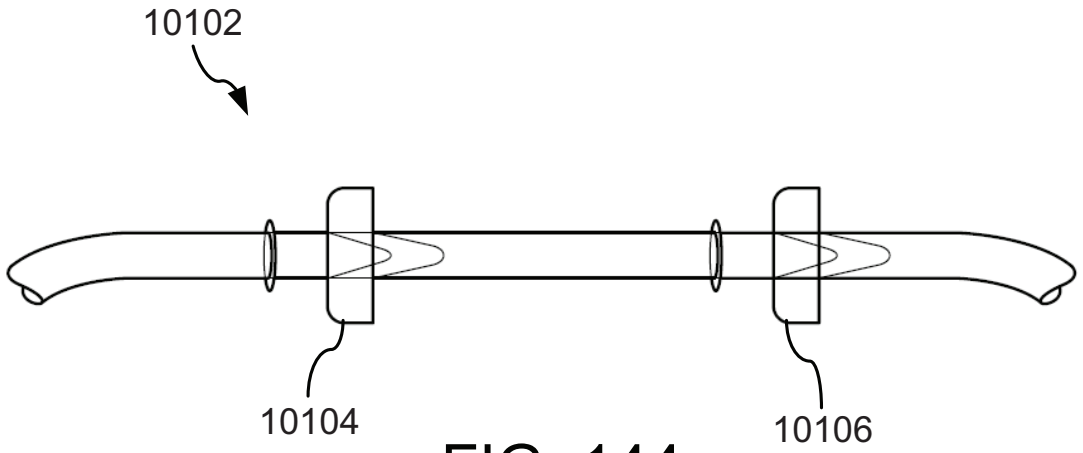


FIG. 144

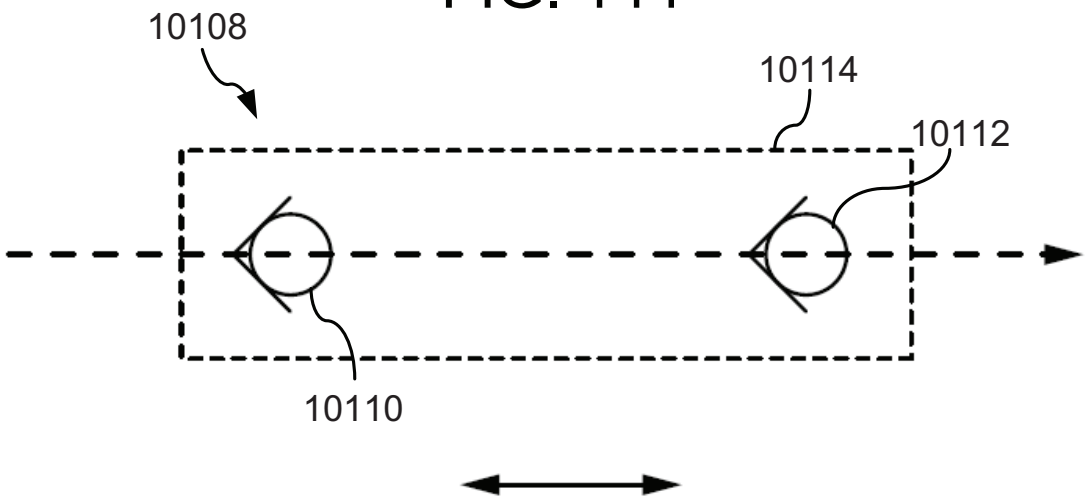


FIG. 145

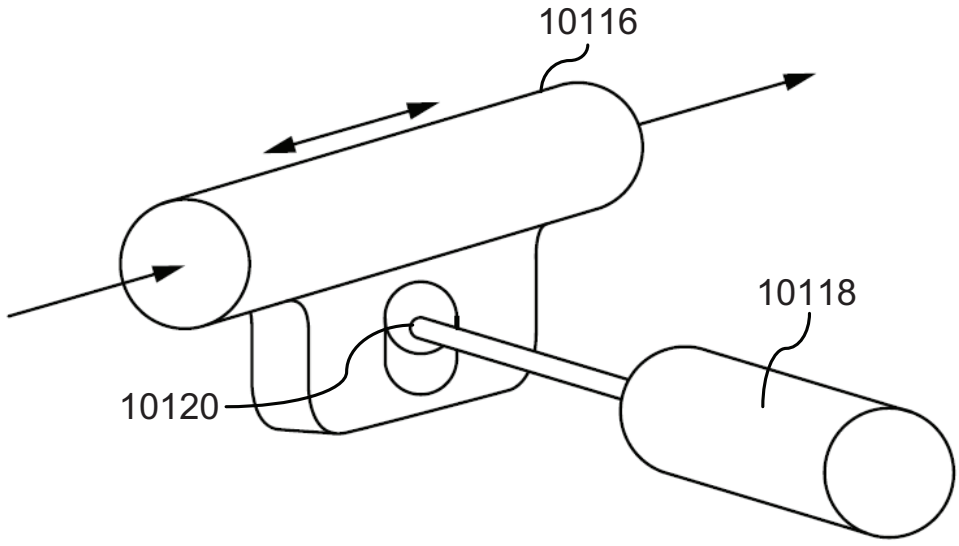


FIG. 146

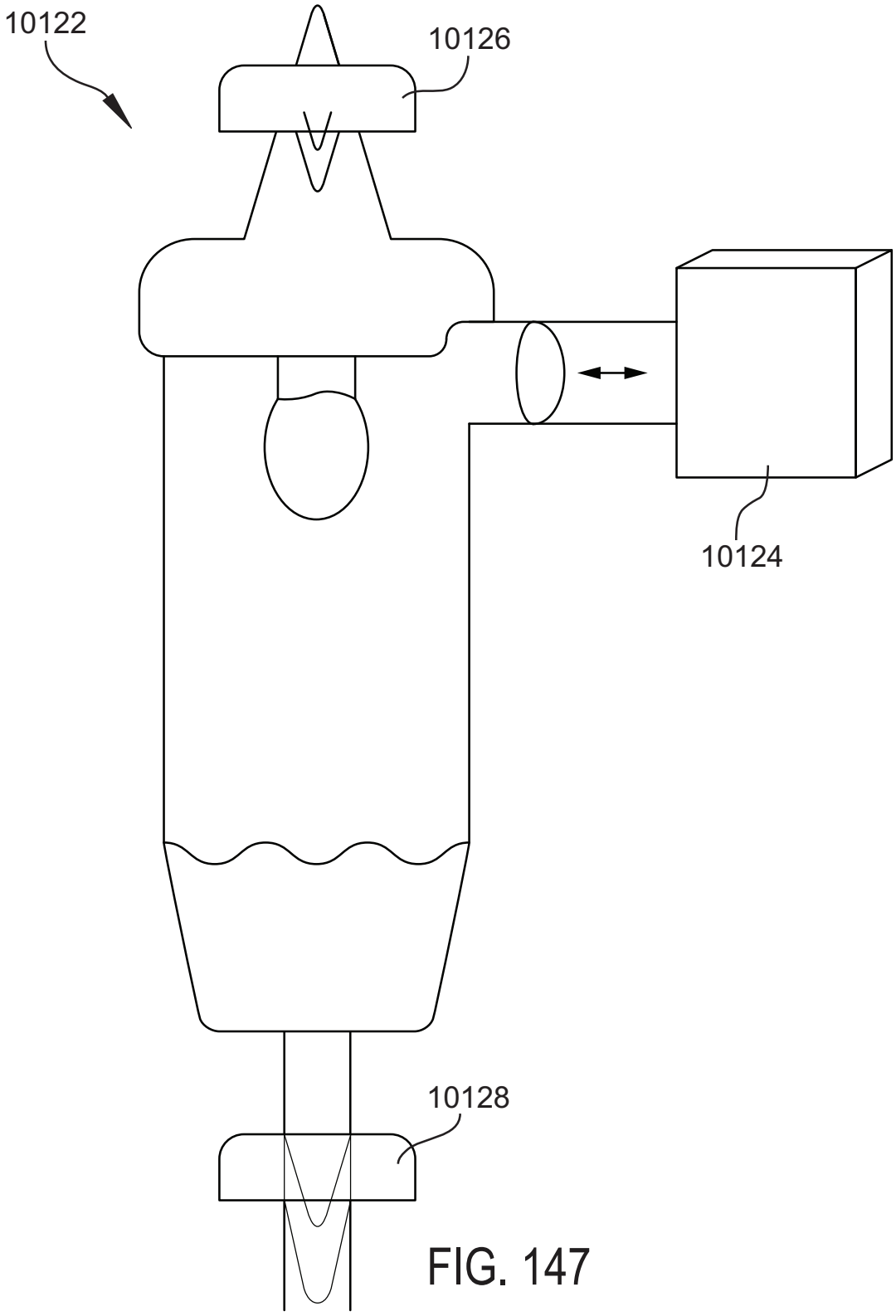


FIG. 147