

100

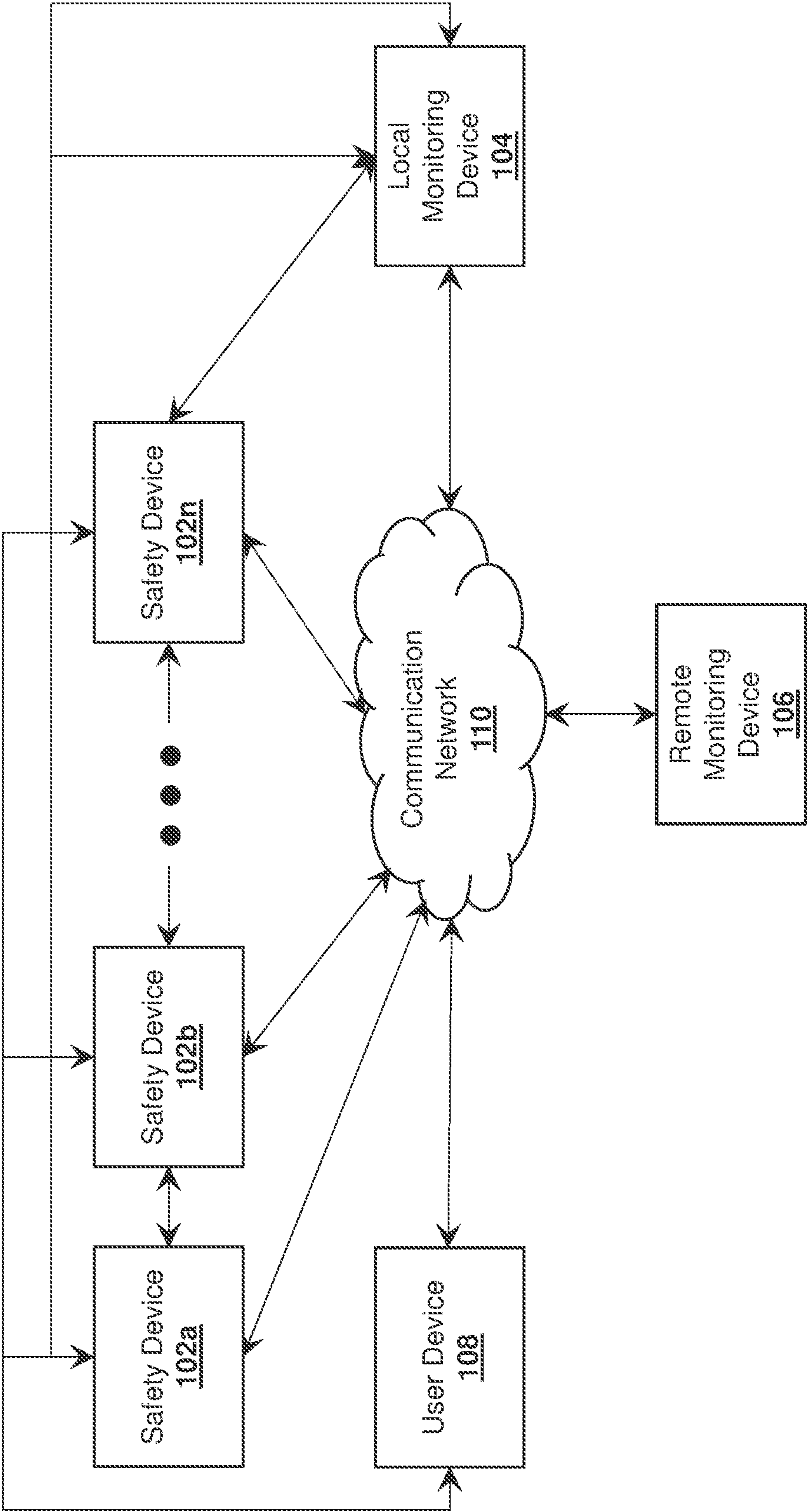


FIG. 1

200

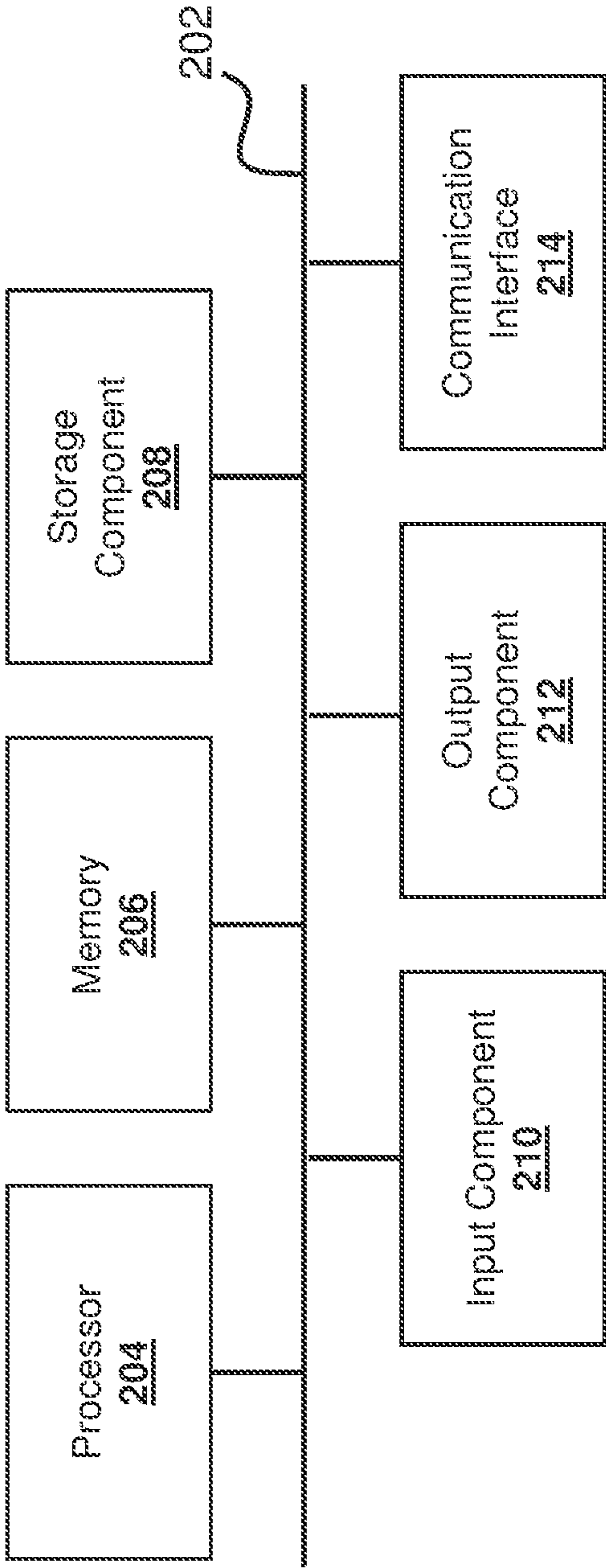


FIG. 2

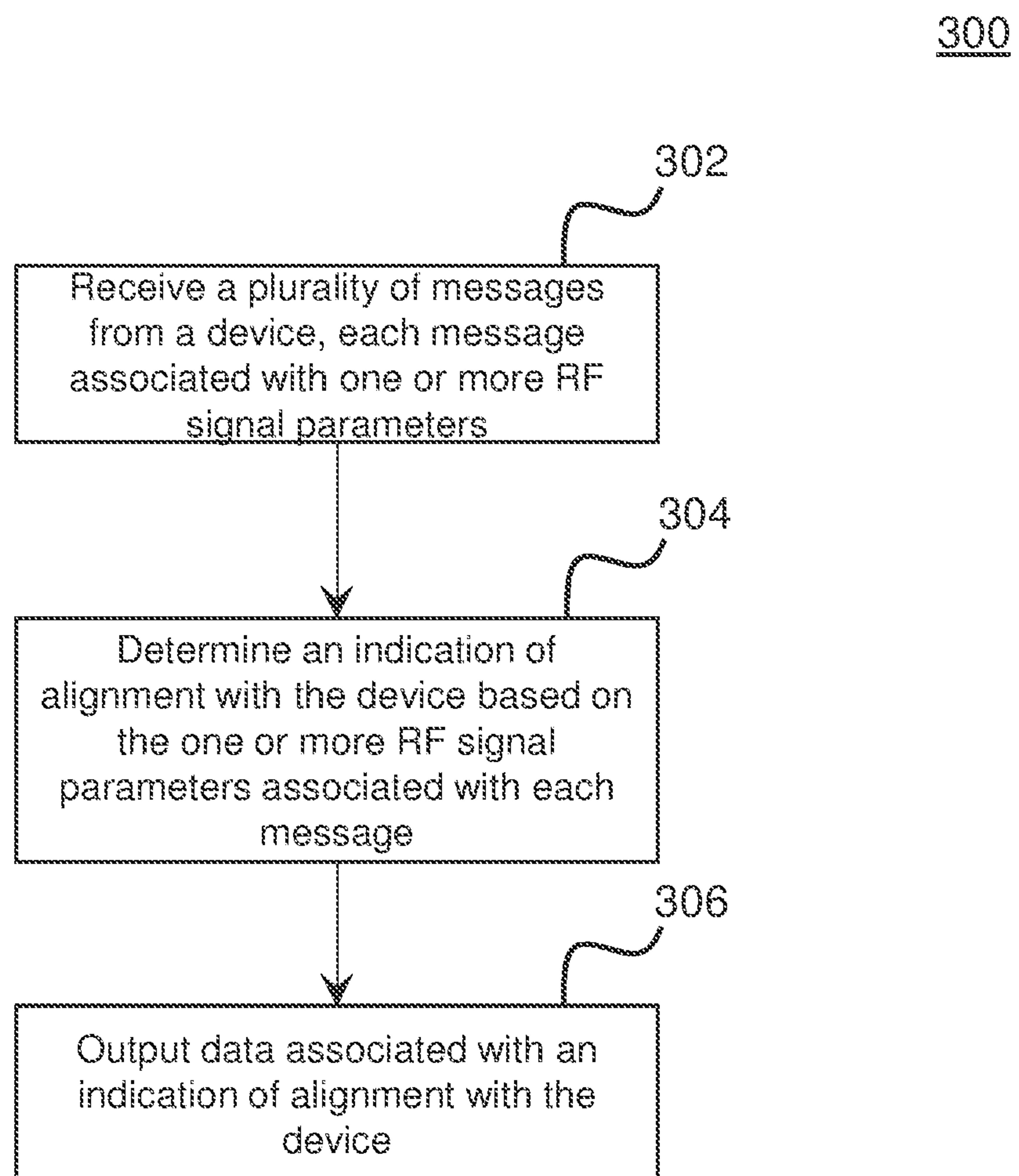


FIG. 3A

DEVICE ID:	User_Device_102b
Message ID:	0001
Power Level (-10db, 3db, 13db, 20db):	-10db

DEVICE ID:	User_Device_102b
Message ID:	0002
Power Level (-10db, 3db, 13db, 20db):	3db

•
•
•

DEVICE ID:	User_Device_102b
Message ID:	0008
Power Level (-10db, 3db, 13db, 20db):	20db

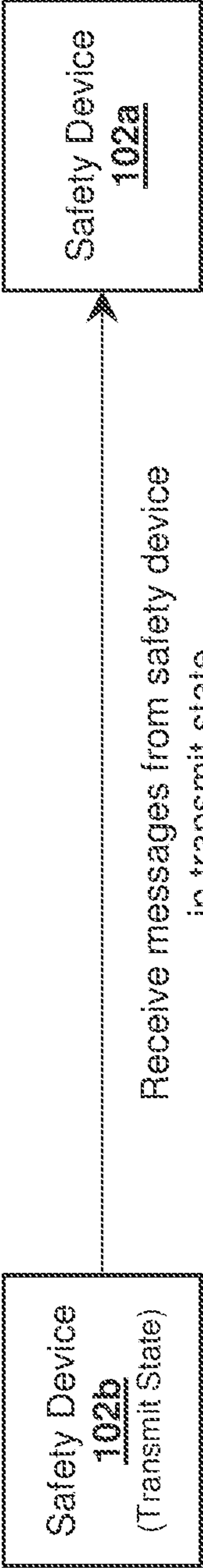


FIG. 3B

315

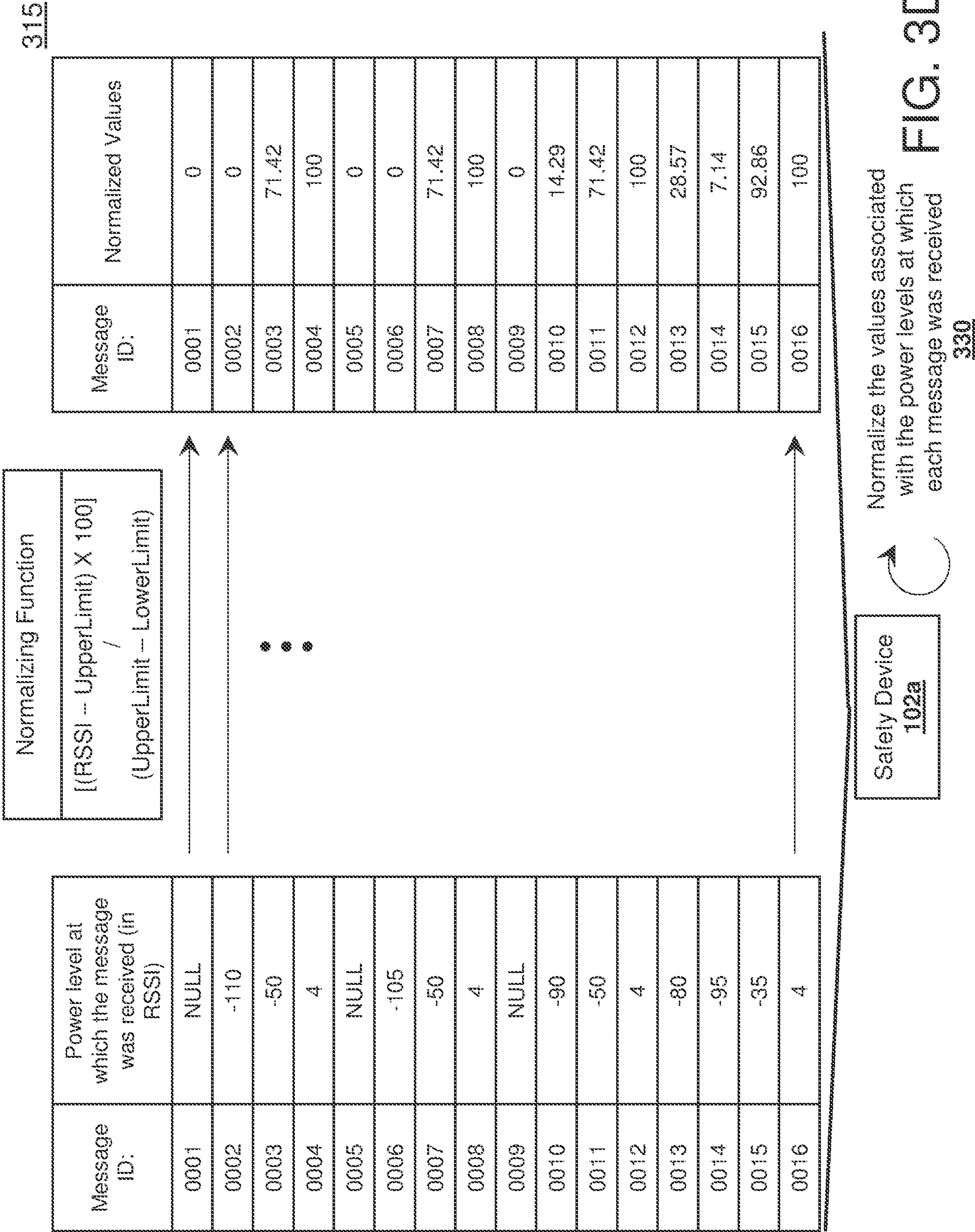
Message ID:	Power level at which the message was received (in RSSI)
0001	0
0002	-110
0003	-50
0004	4
0005	0
0006	-105
0007	-50
0008	4
0009	0
0010	-100
0011	-50
0012	4
0013	-120
0014	-95
0015	-35
0016	4

Safety Device
102a

Determine values associated with power levels at which each message was received

325

FIG. 3C



315

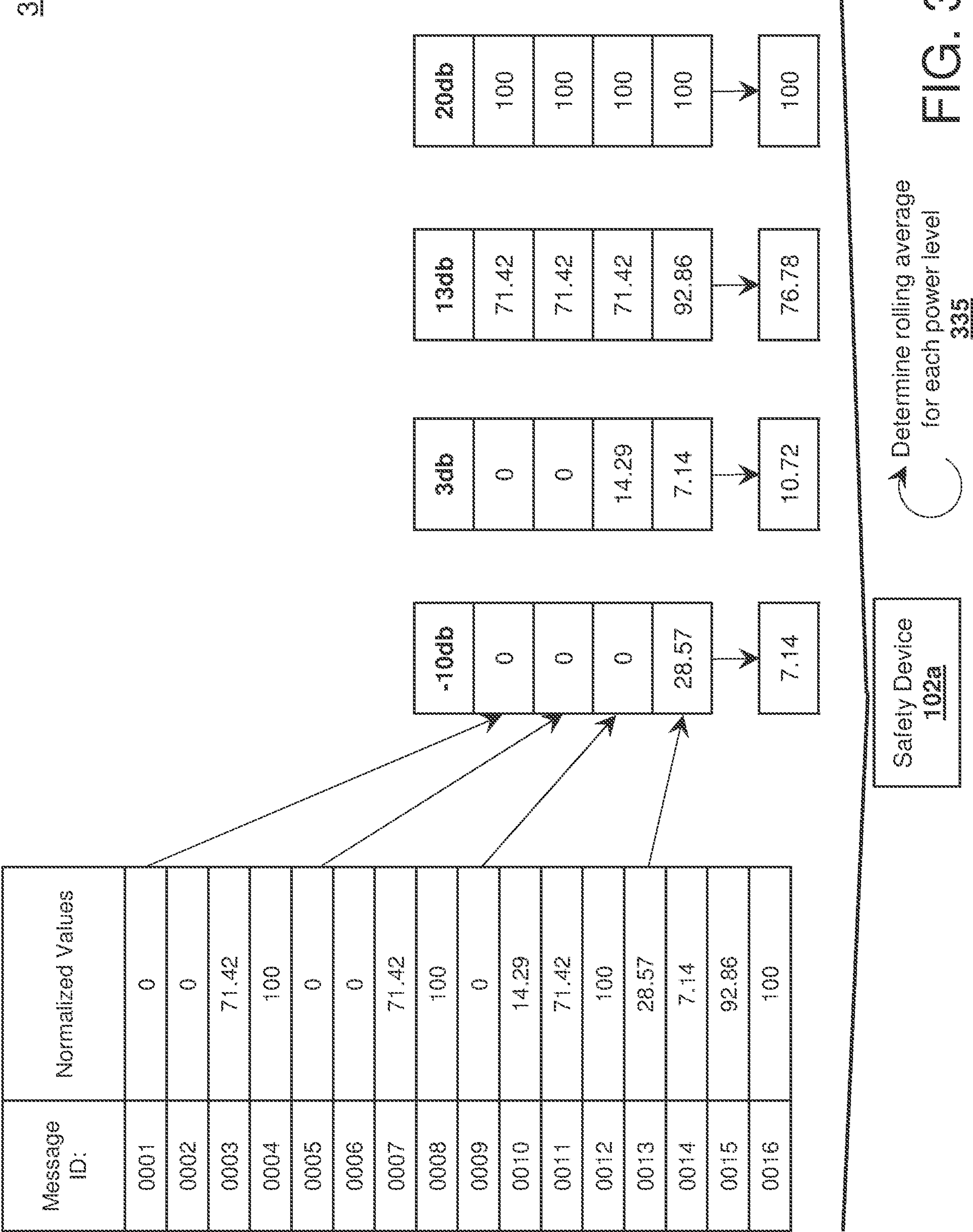


FIG. 3E

315

Power level at which the message was transmitted	Rolling average of values associated with the power levels at which each message was received (in RSSI)	Scaling factor corresponding to power level at which message was transmitted	Alignment value
-10db	7.14	0.30	2.14
3db	10.72	0.20	2.14
13db	76.78	0.20	15.36
20db	100	0.30	30

-10db	3db	13db	20db
0	0	71.42	100
0	0	71.42	100
0	14.29	71.42	100
28.57	7.14	92.86	100

7.14

10.72

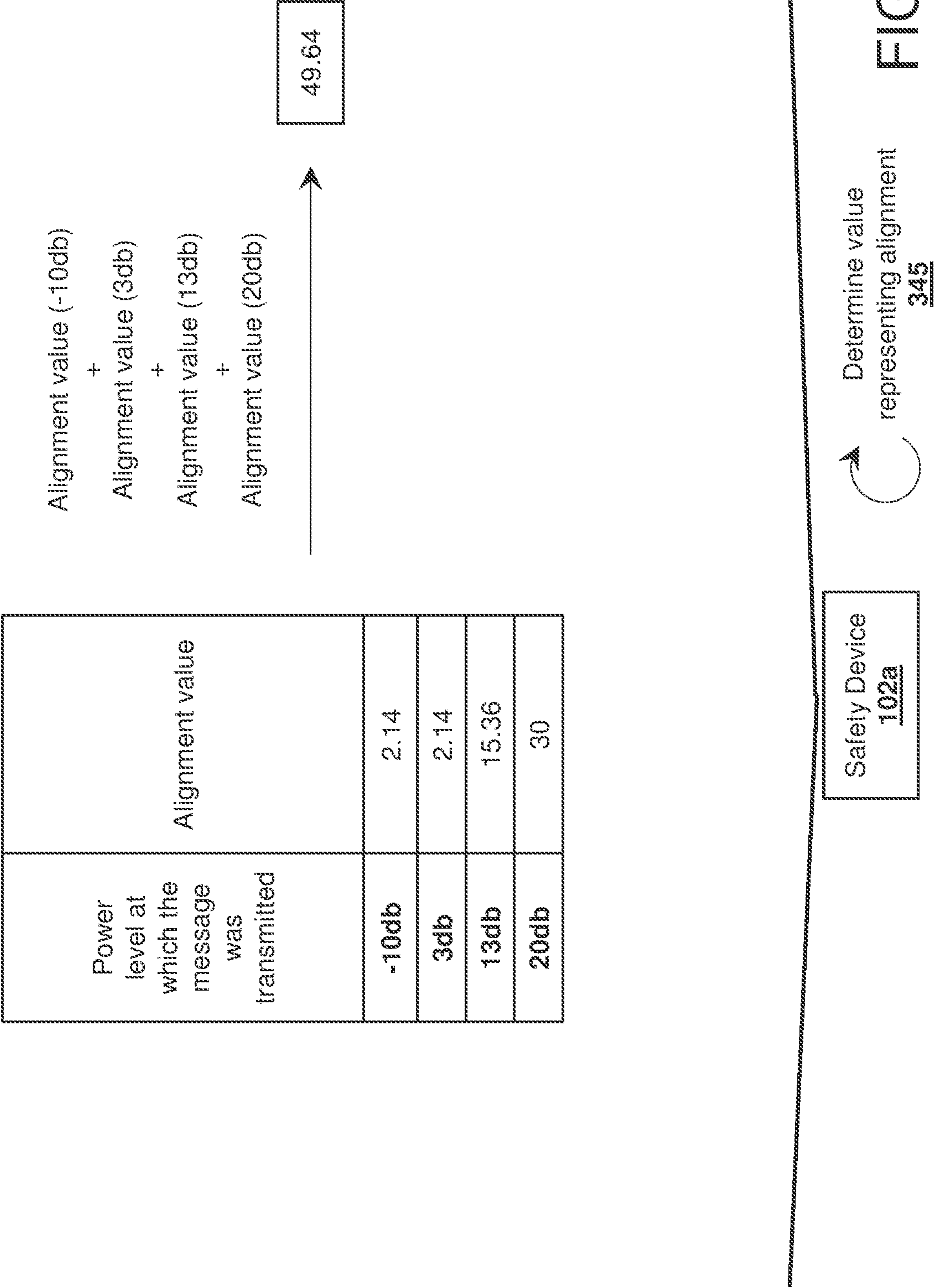
76.78

100

Safety Device
102a

Determine alignment values
340

FIG. 3F



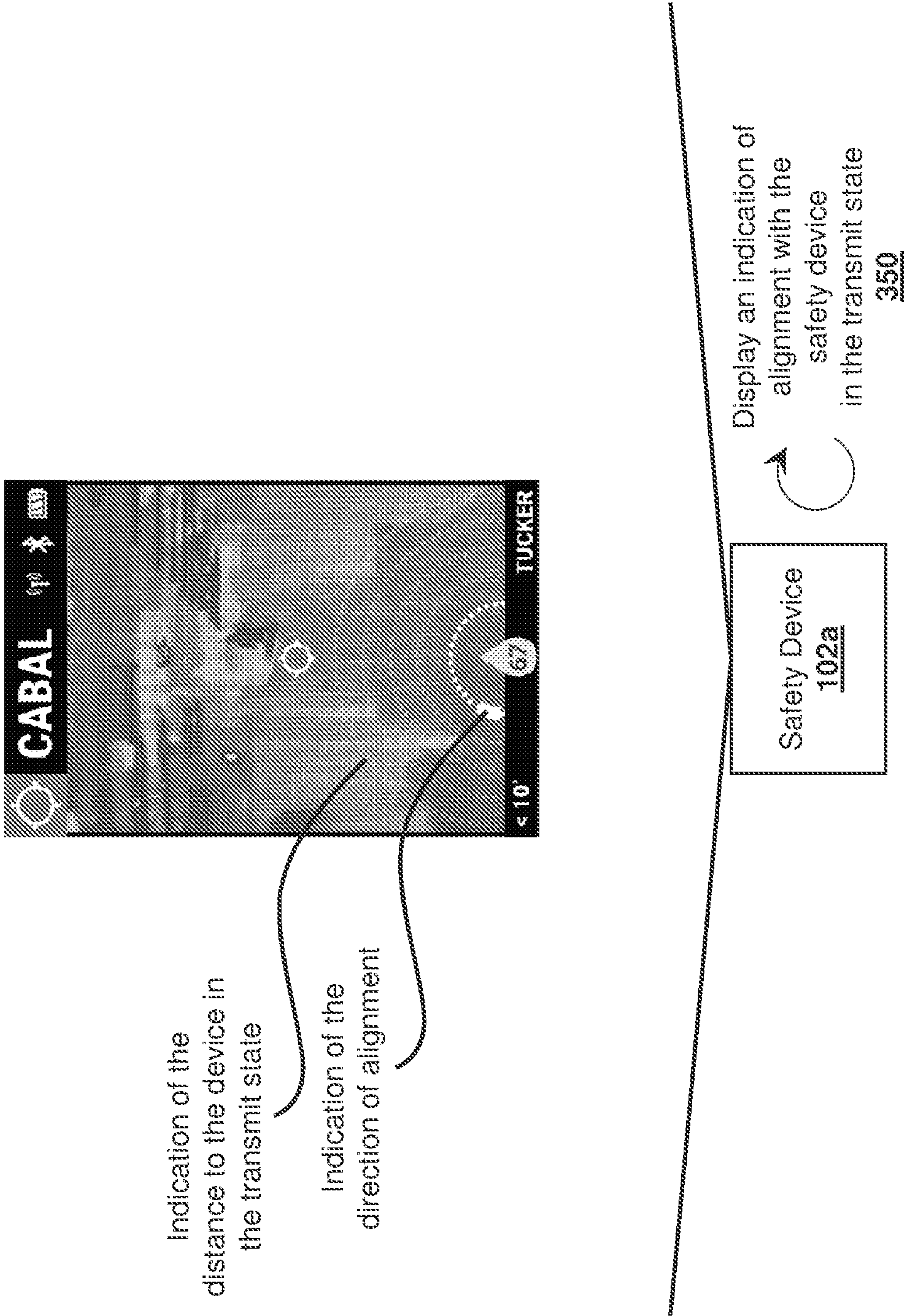


FIG. 3H

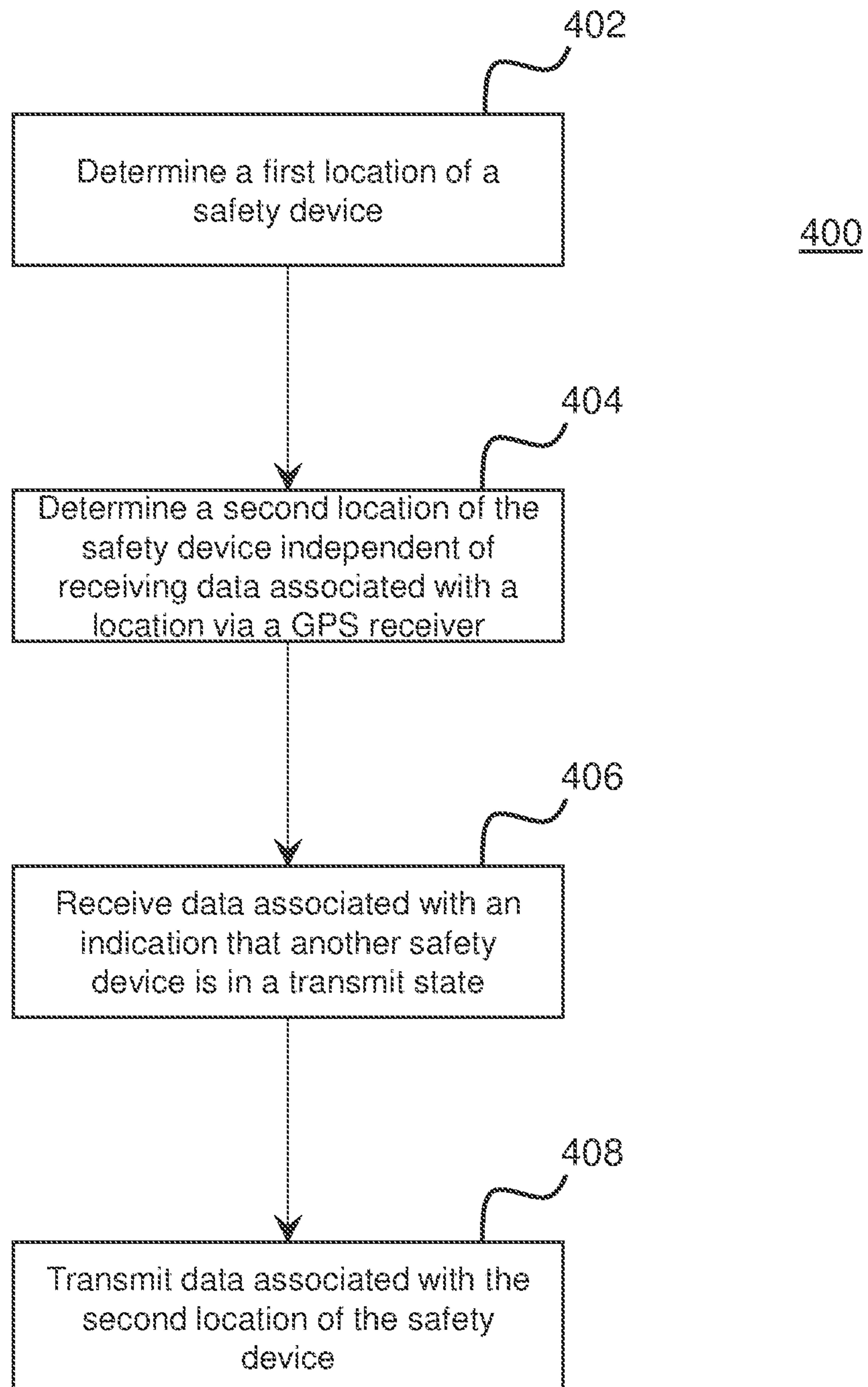
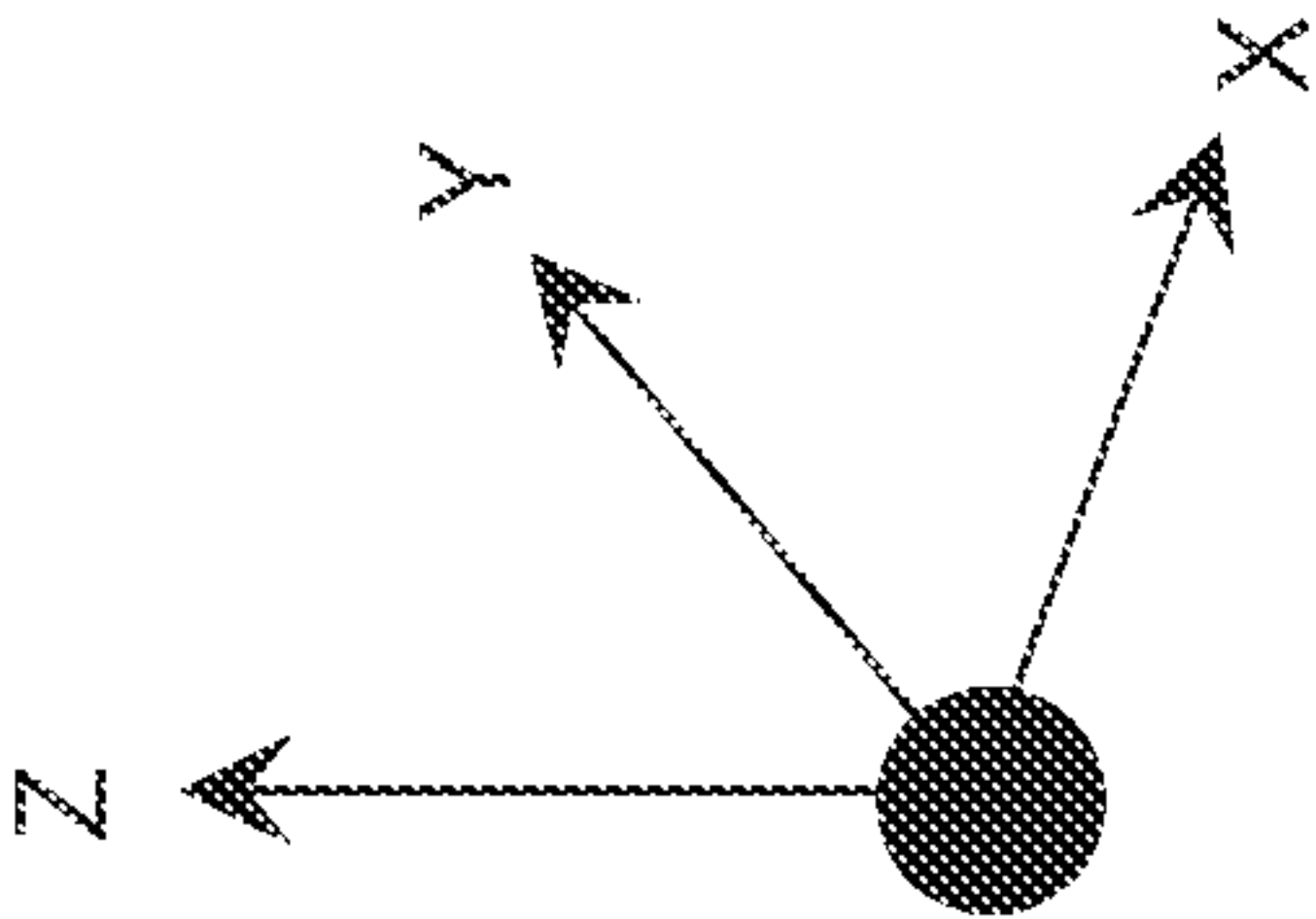


FIG. 4A

415

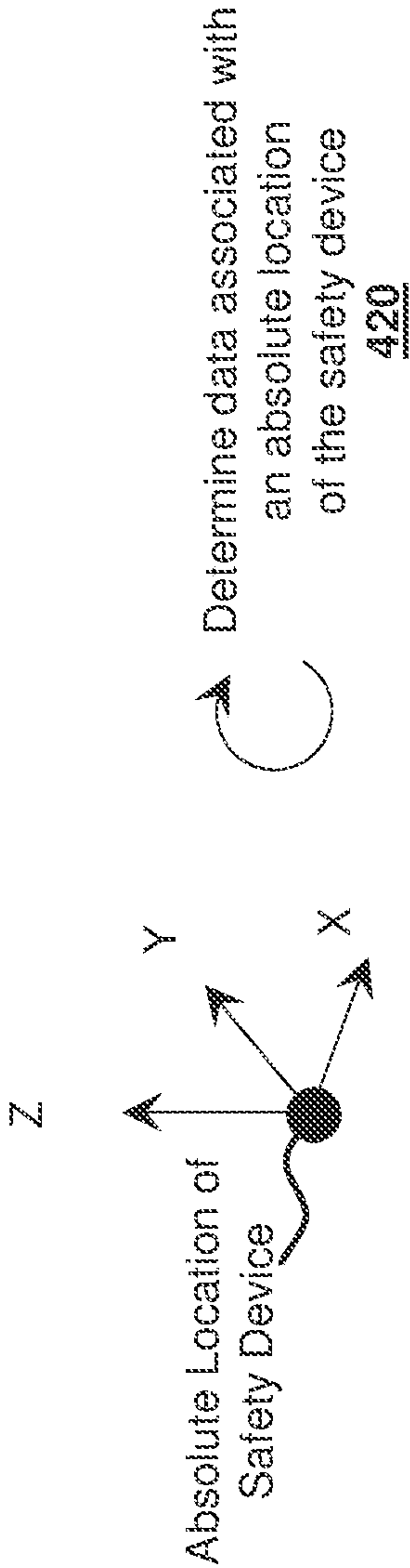
Absolute Location of
Safety Device



GPS = 37.7749°N, 122.4194°W
IMU = X_1, Y_1, Z_1

FIG. 4B

415



GPS = 37.7749°N, 122.4194°W
IMU = X_1, Y_1, Z_1



Safety Device
102a

FIG. 4C

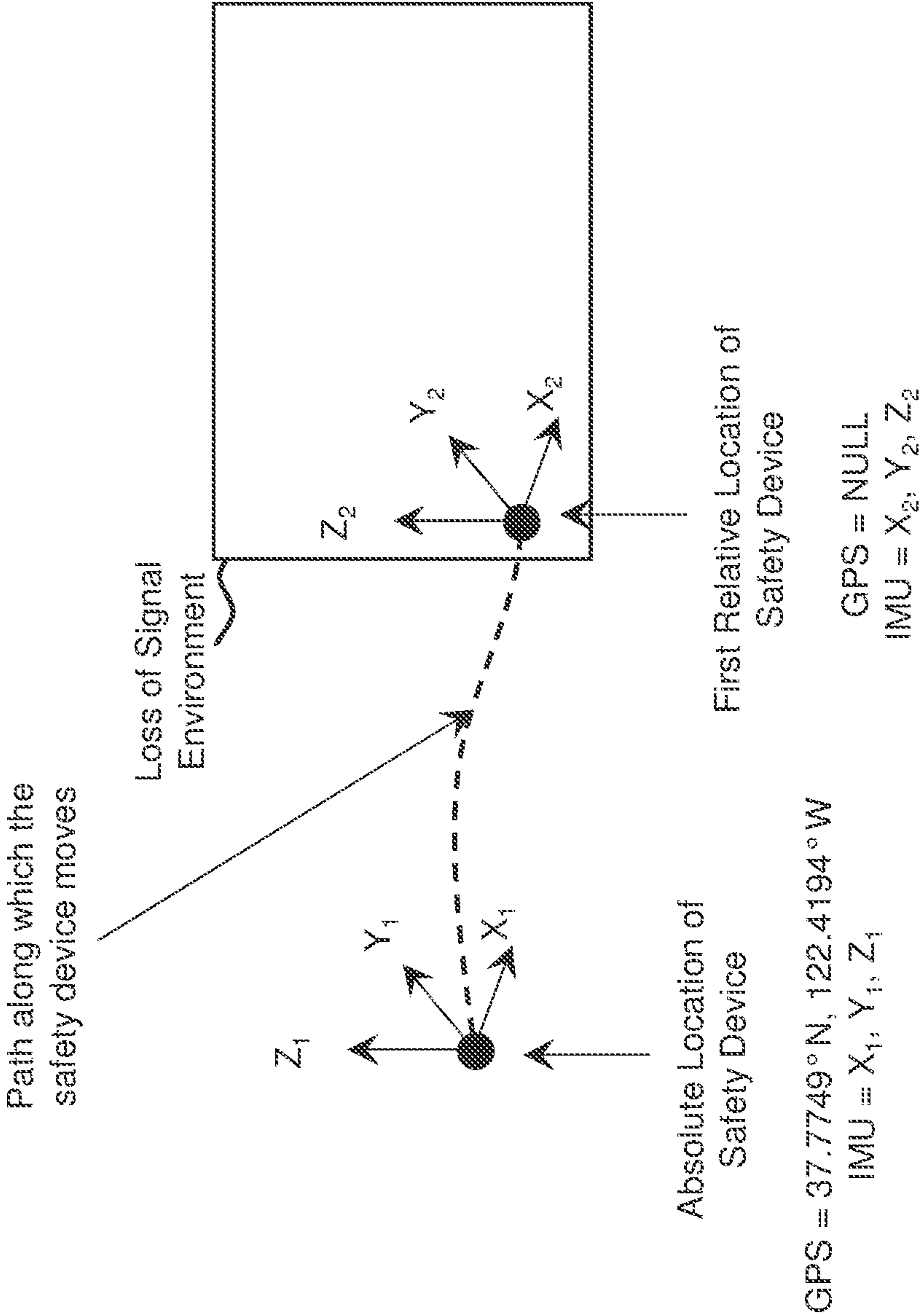


FIG. 4D

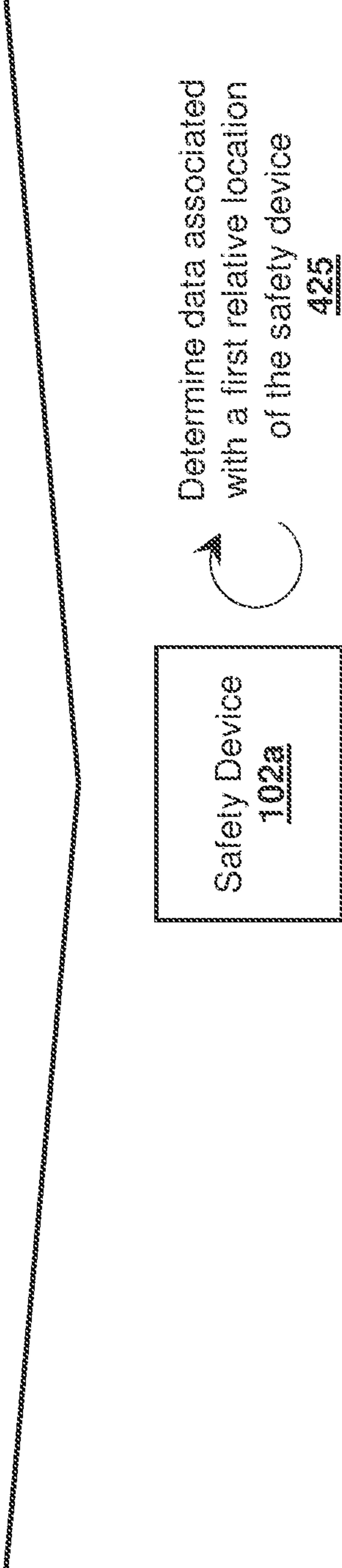
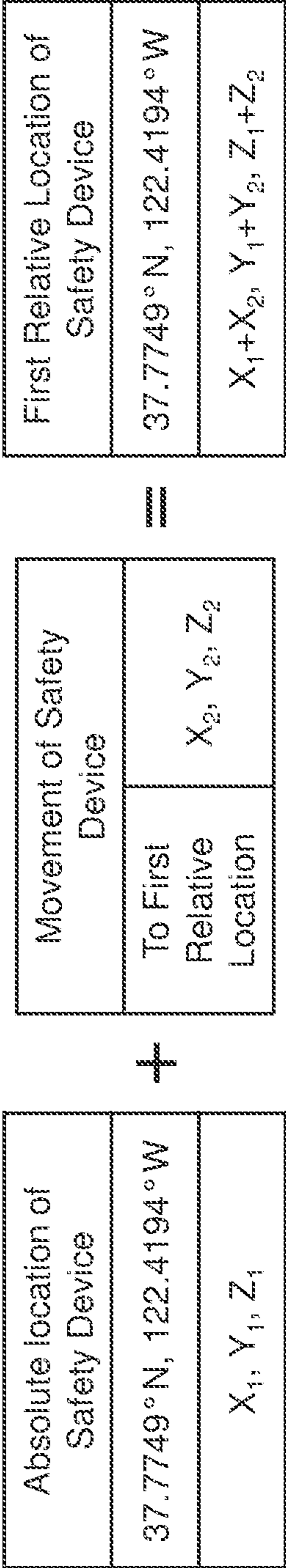


FIG. 4E

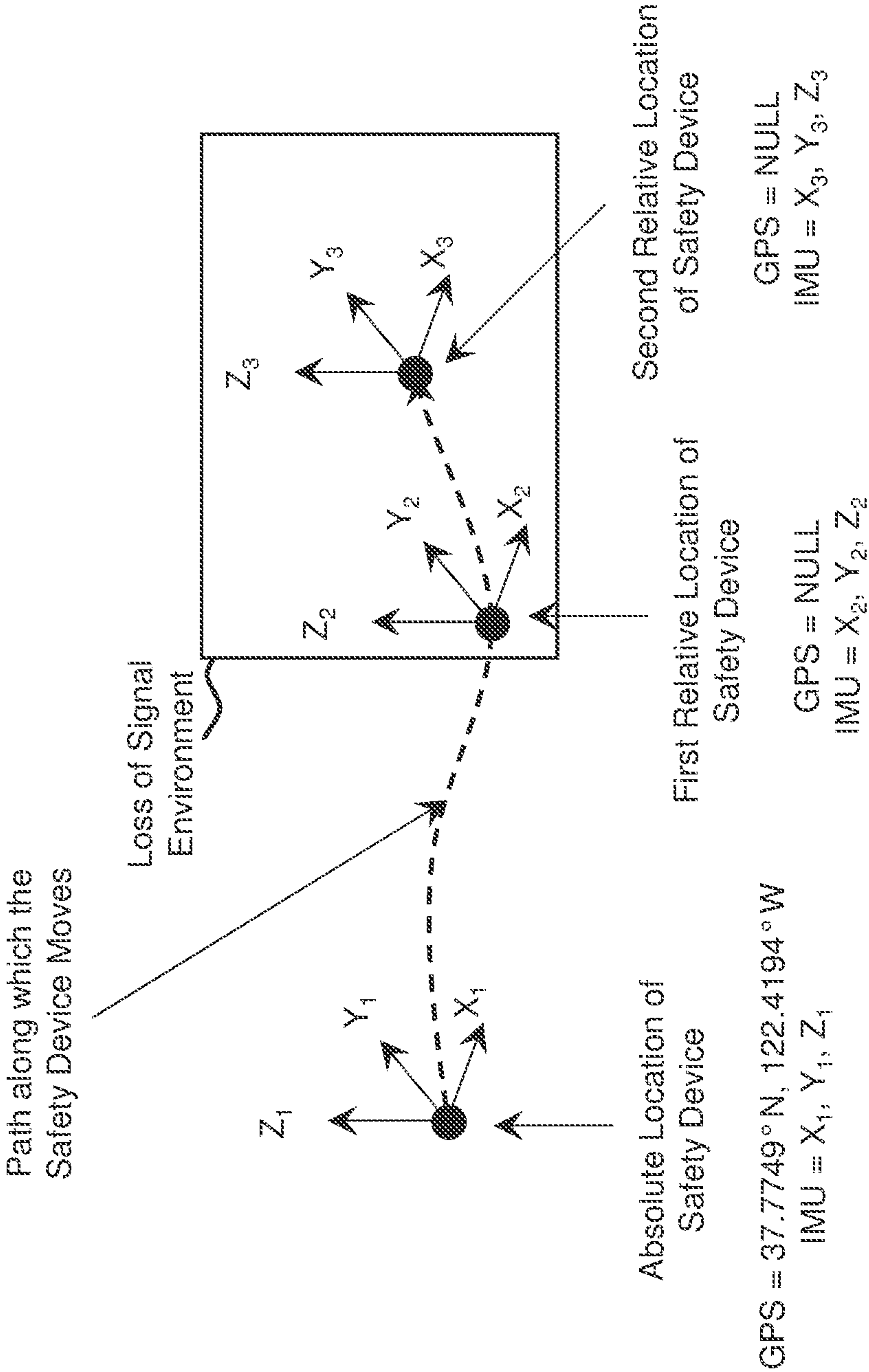


FIG. 4F

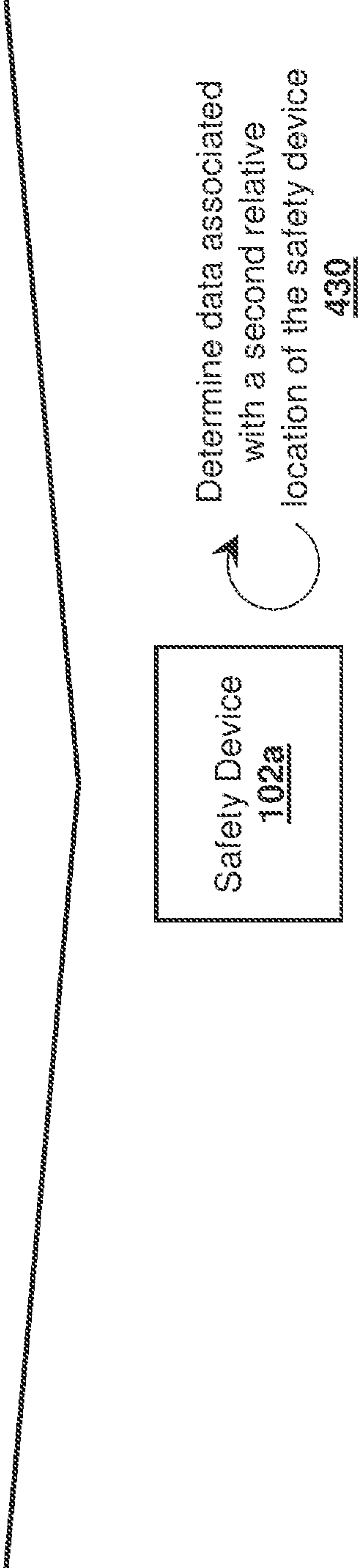
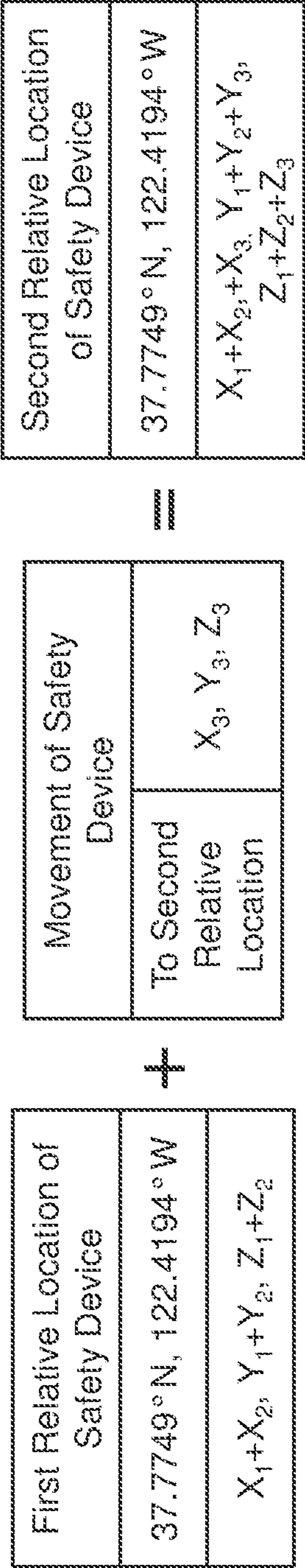


FIG. 4G

415

DEVICE ID:	User_Device_102b
Message ID:	0001
Power Level (1-4):	1
Device State:	TRANSMIT
Time:	0:01

Receive data associated with an indication that a safety device is in a transmit state

435

Safety Device
102b

Safety Device
102a

Transmit data associated with the second relative location of the safety device

440

DEVICE ID:	User_Device_102a
Message ID:	0002
Device Location	Second Relative Location
Device State:	FIRST STATE
Time:	0:02

Local
Monitoring
Device
104

Remote
Monitoring
Device
106

FIG. 4H

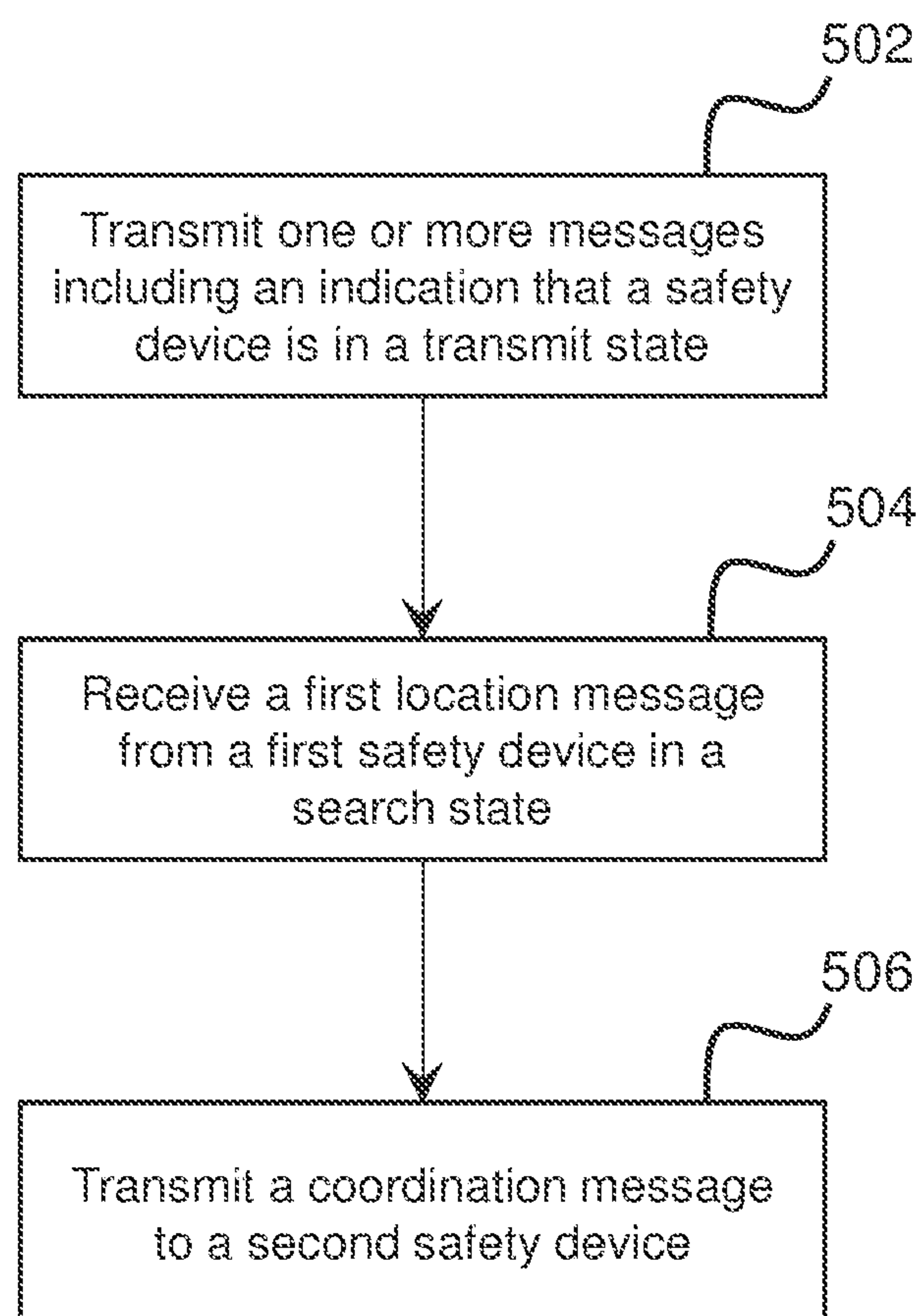
500

FIG. 5A

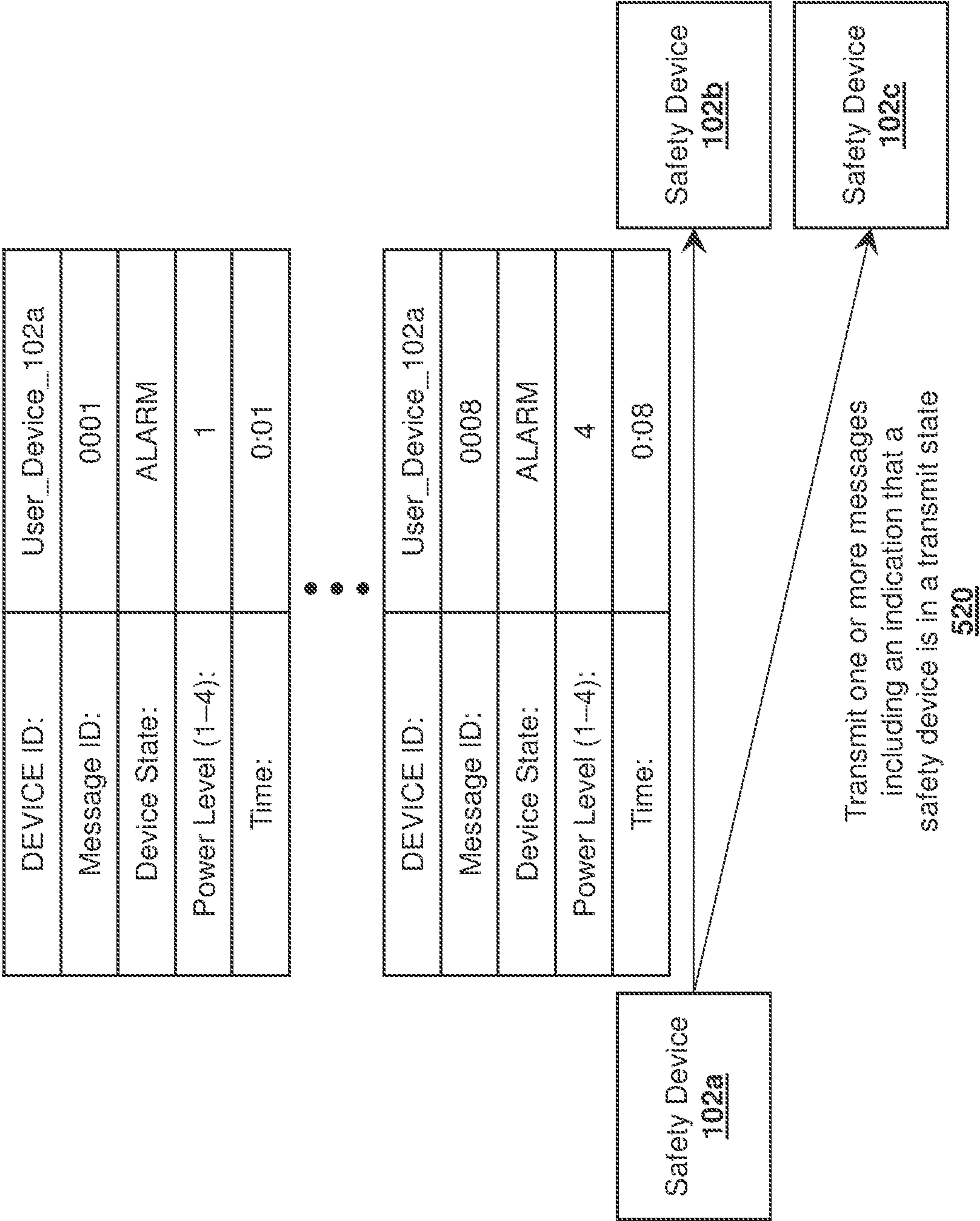


FIG. 5B

515

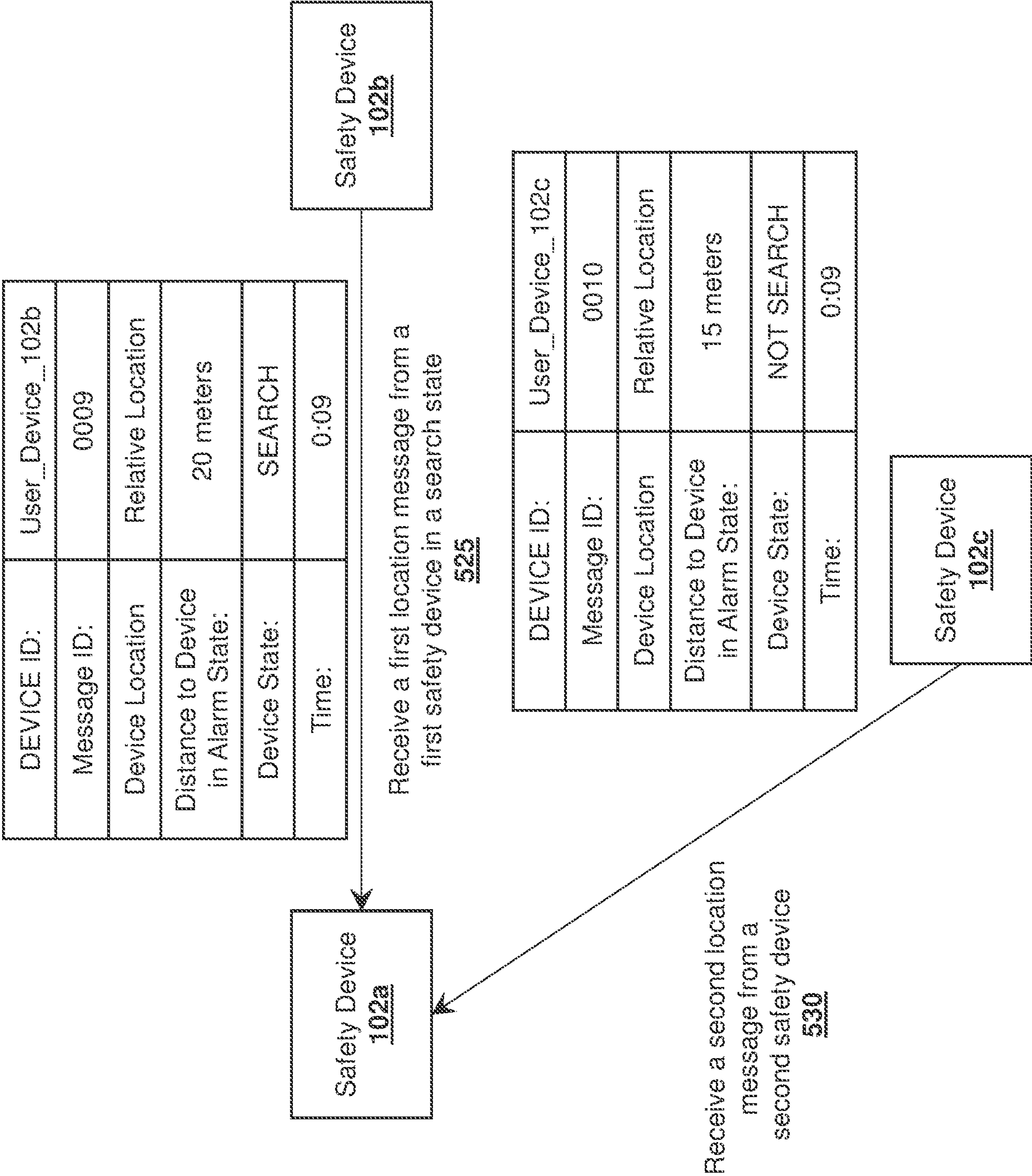


FIG. 5C

515

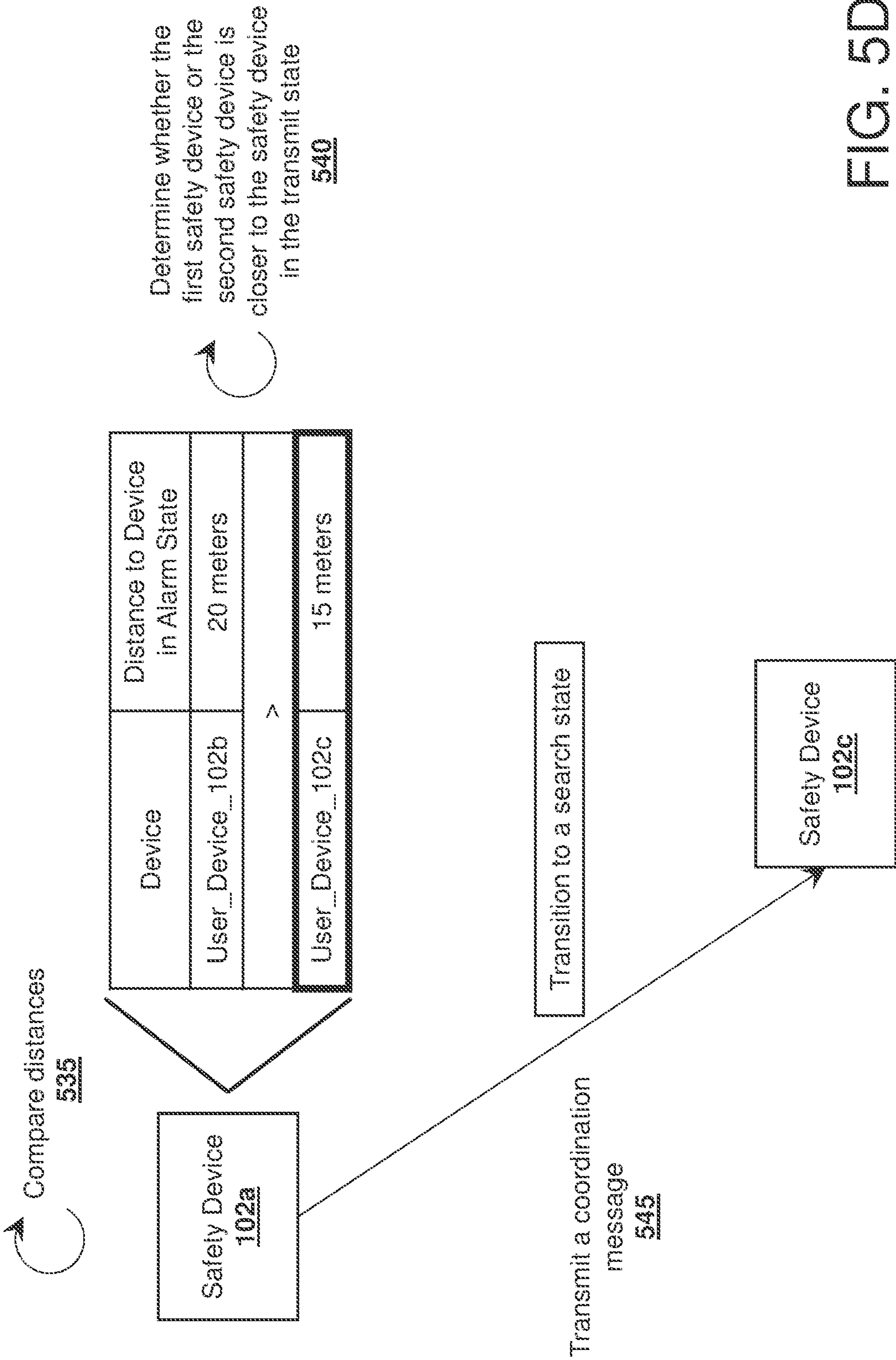


FIG. 5D

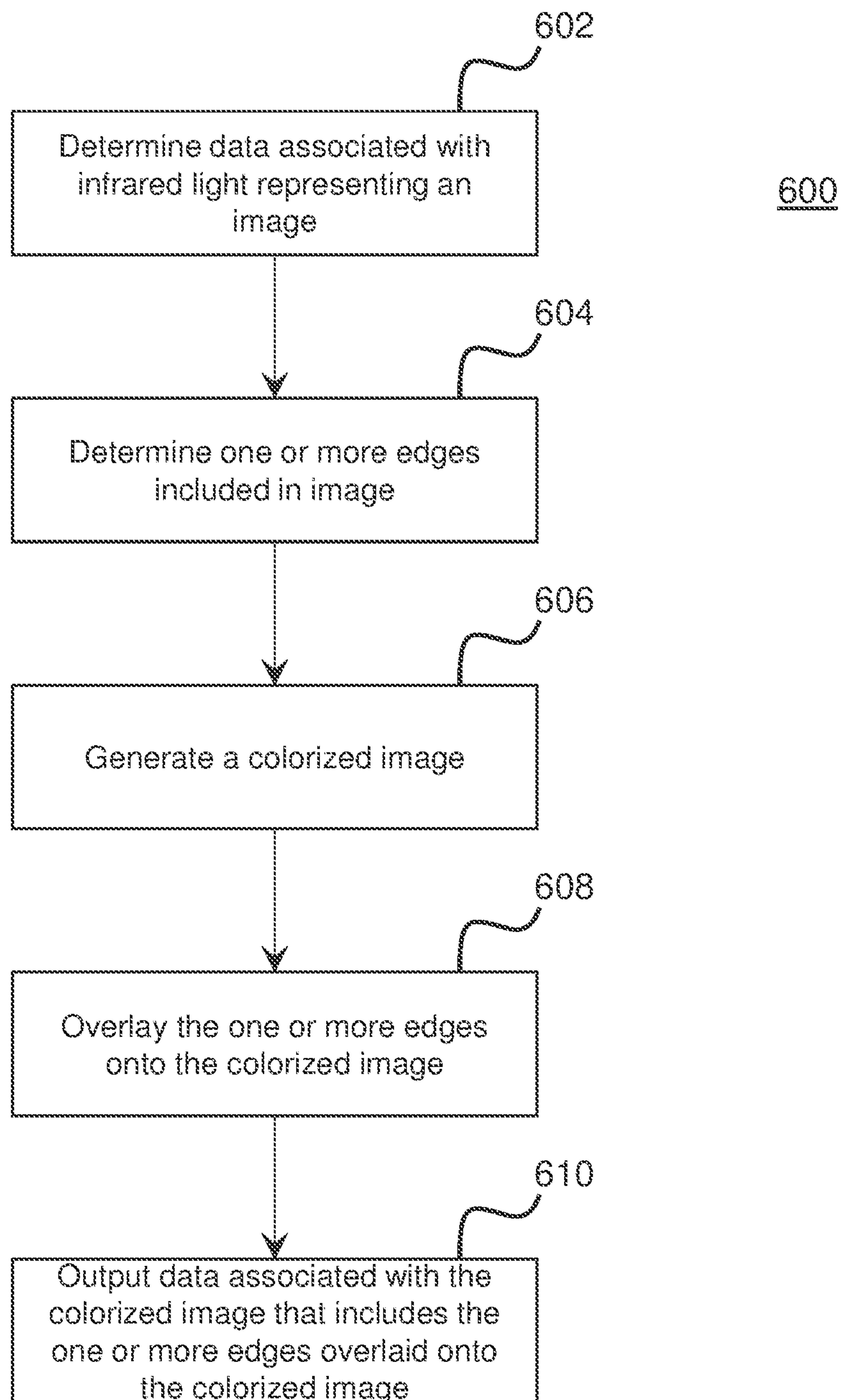


FIG. 6A

615

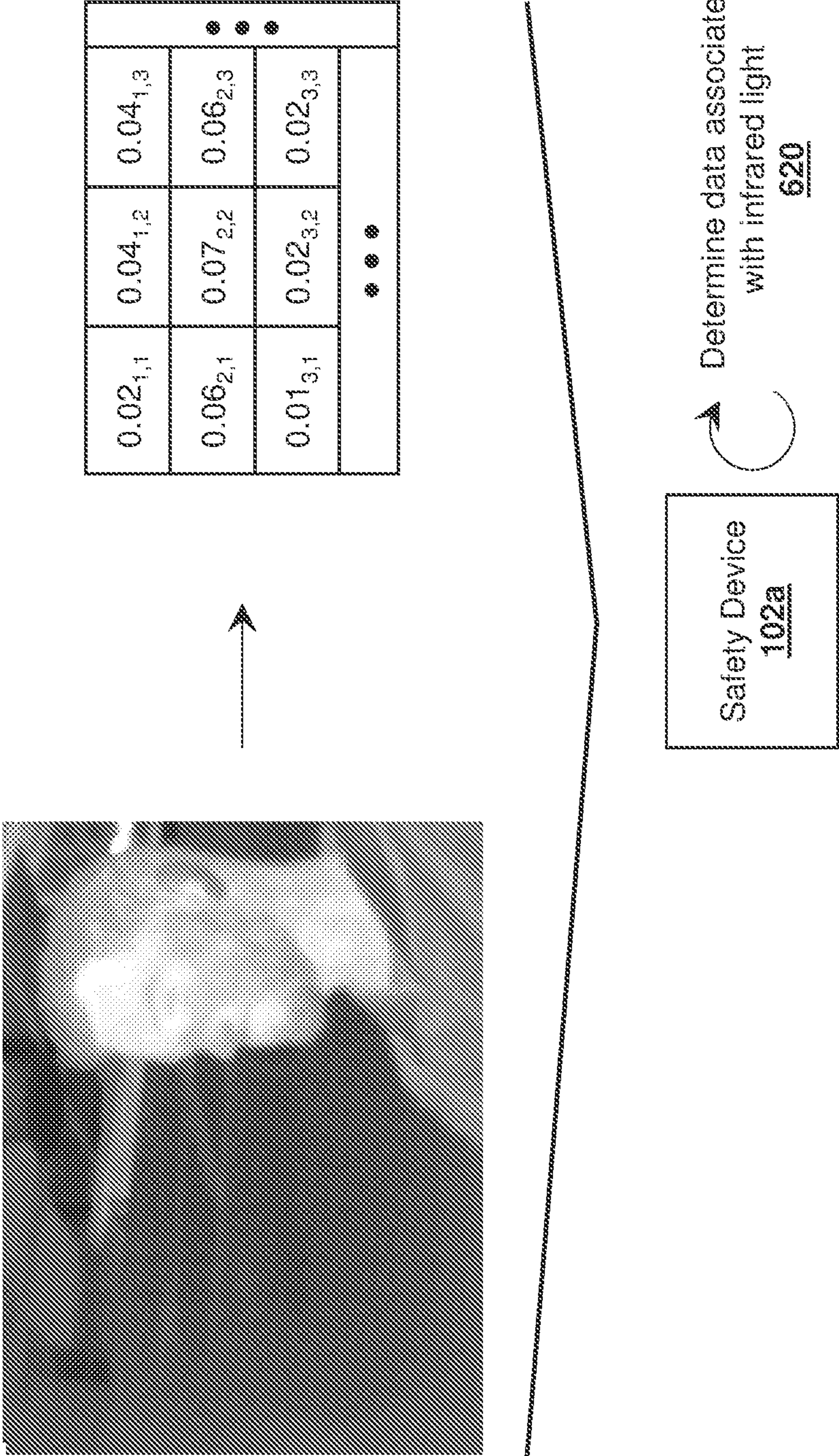


FIG. 6B

615



0.02 _{1,1}	0.04 _{1,2}	0.04 _{1,3}	•
0.06 _{2,1}	0.07 _{2,2}	0.06 _{2,3}	•
0.01 _{3,1}	0.02 _{3,2}	0.02 _{3,3}	•
• • •			

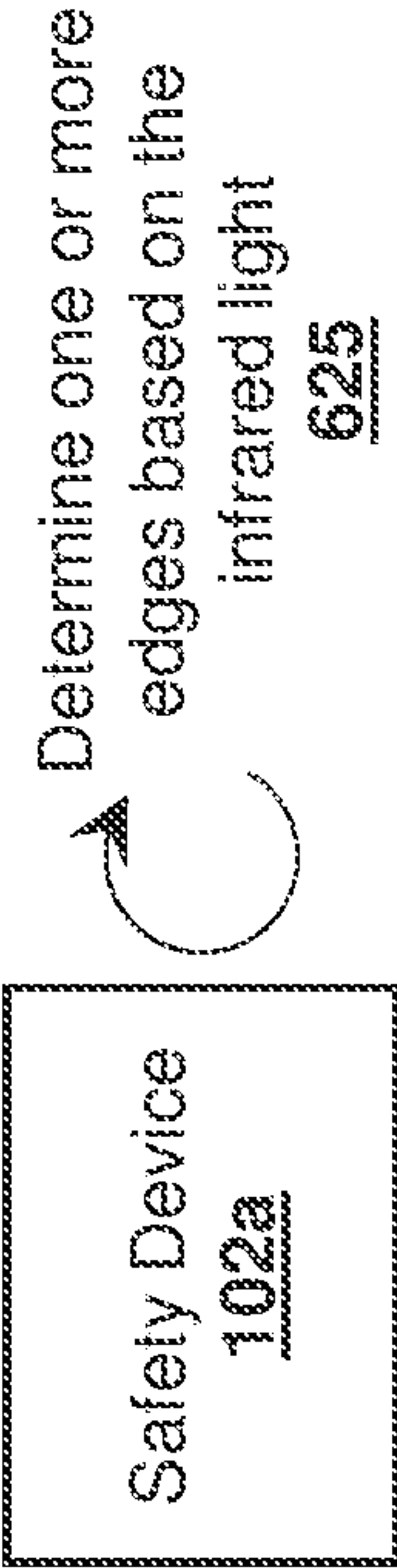


FIG. 6C

615

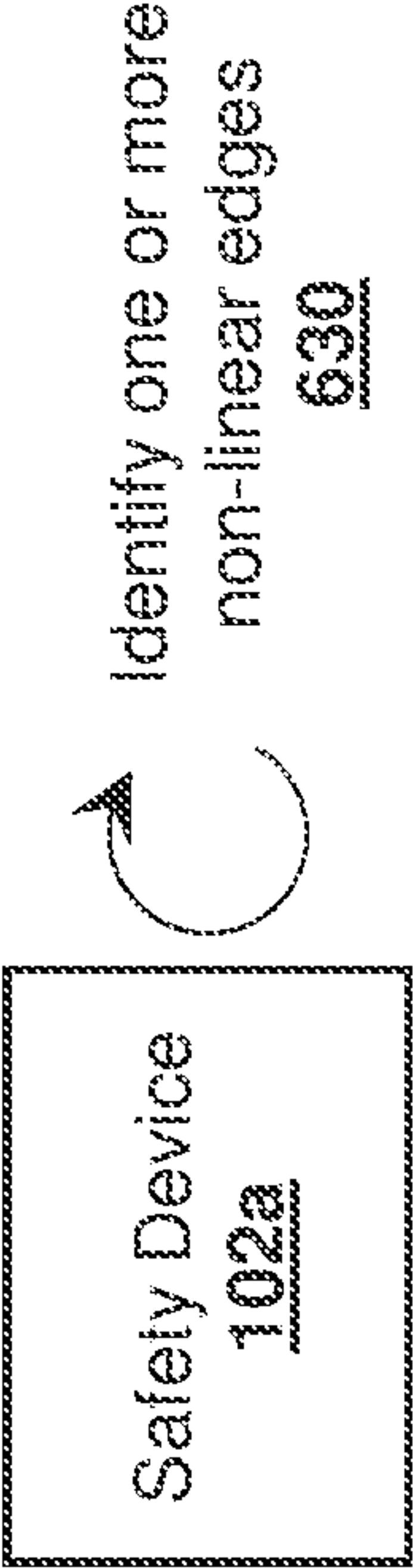
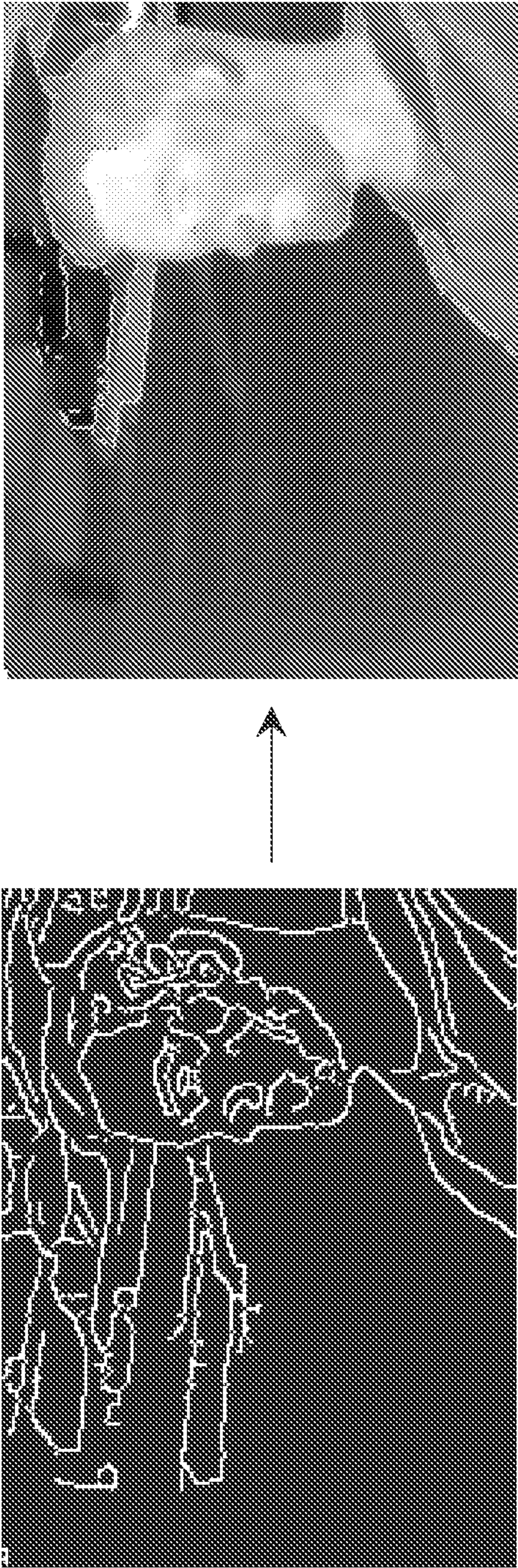


FIG. 6D

615

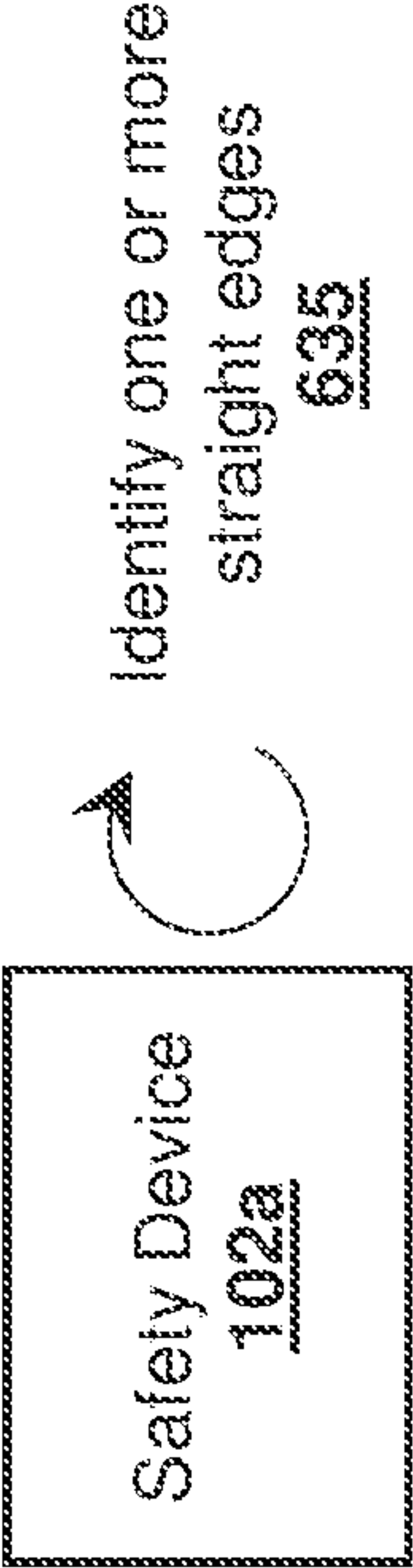
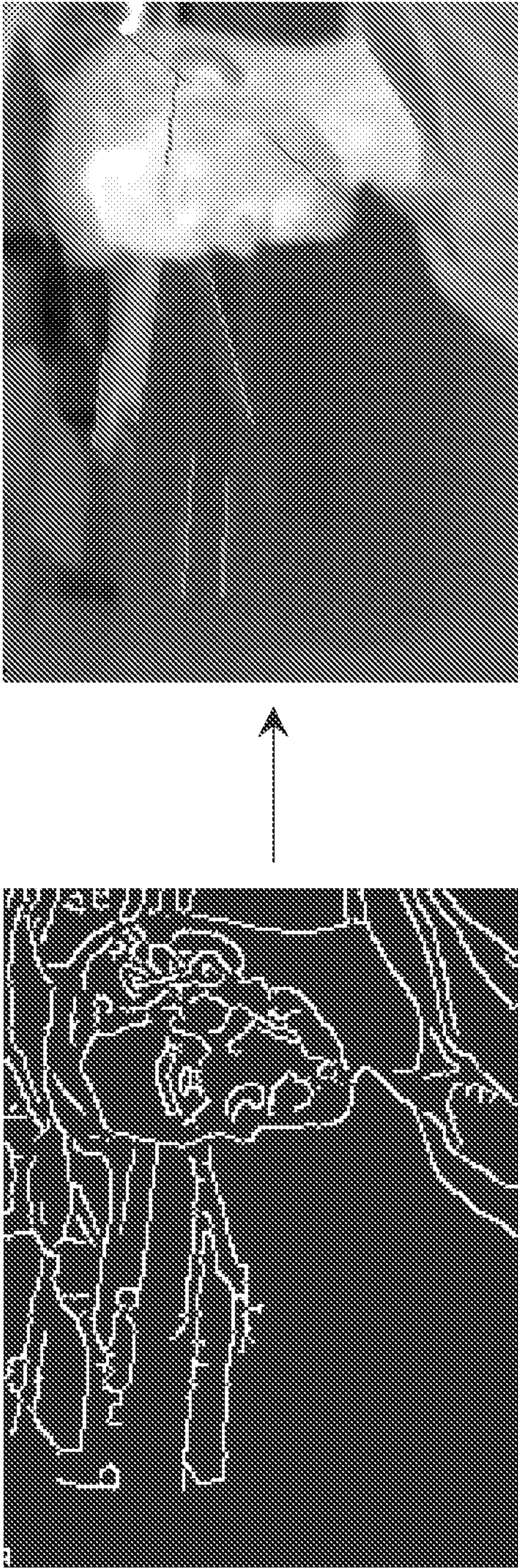
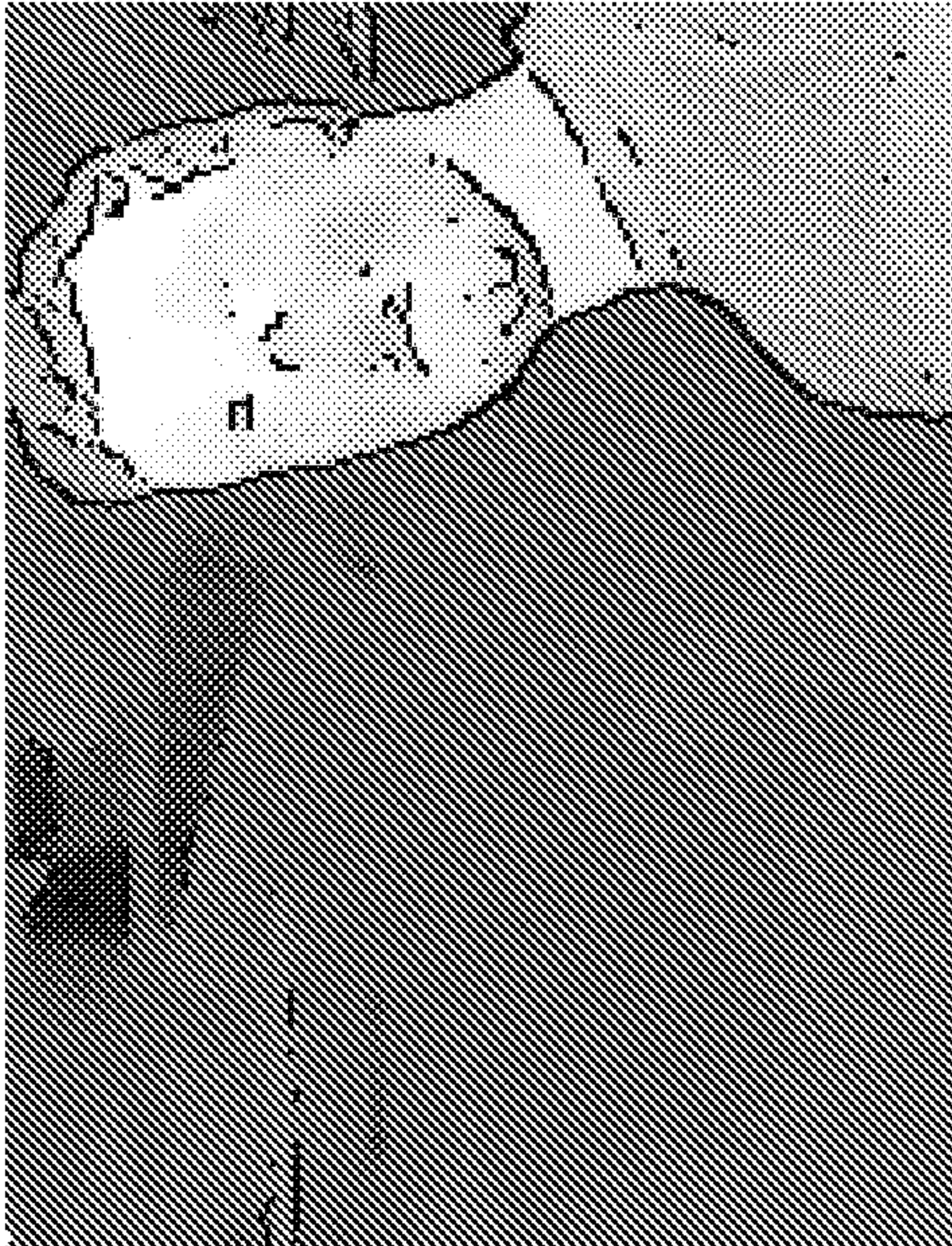


FIG. 6E

615



0.02 _{1,1}	0.04 _{1,2}	0.04 _{1,3}	•
0.06 _{2,1}	0.07 _{2,2}	0.06 _{2,3}	•
0.01 _{3,1}	0.02 _{3,2}	0.02 _{3,3}	•
• • •			

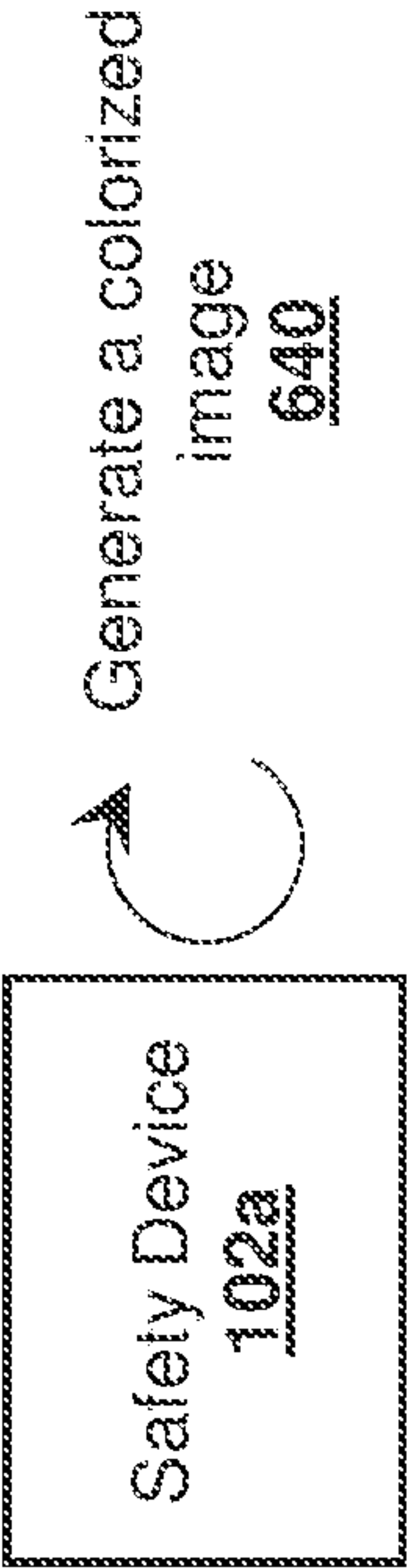
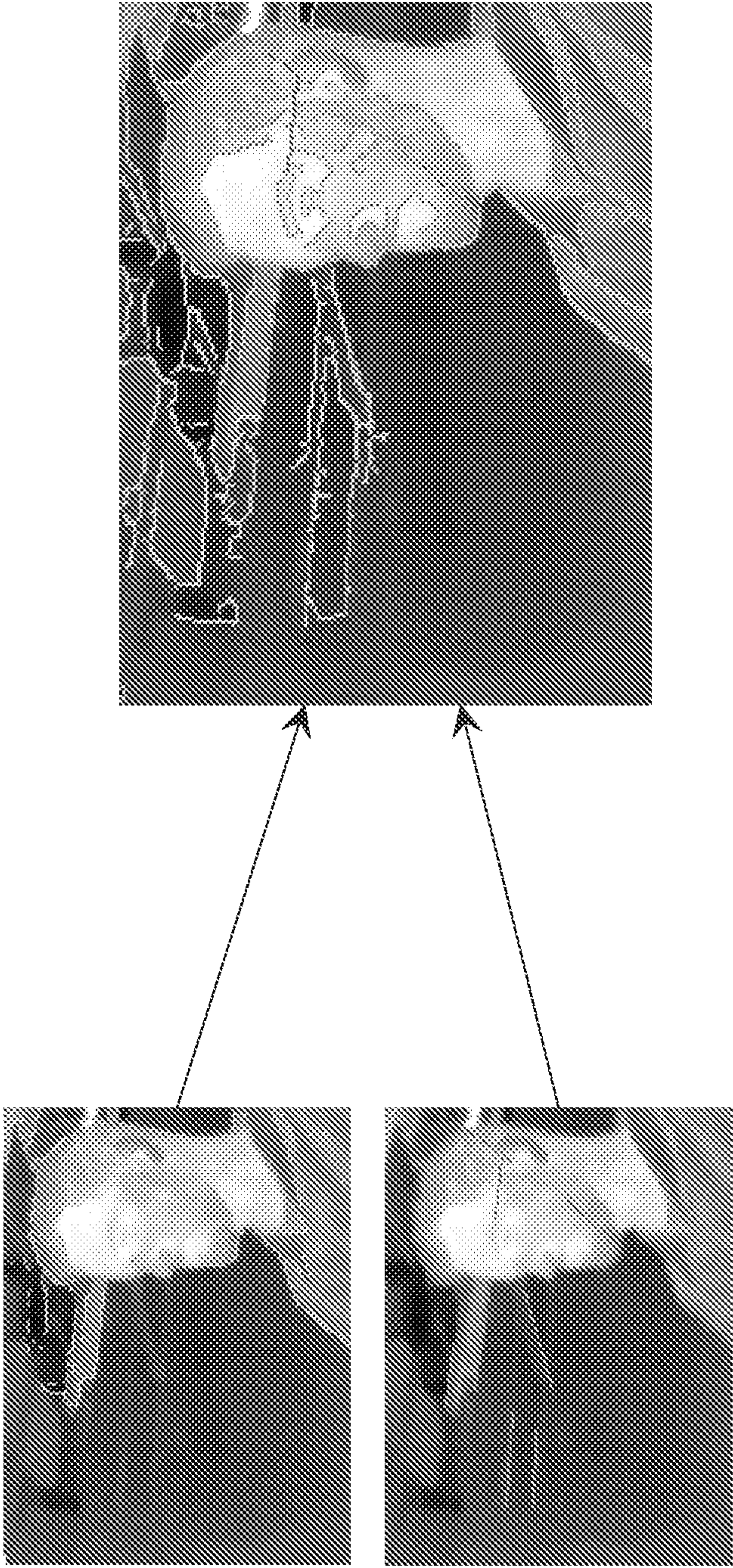


FIG. 6F

615



Safety Device
102a

Overlay the one or
more edges onto a
colorized image
645

FIG. 6G

615

Generate data associated with
the colored image that includes the one
or more edges overlaid onto the colored image
650



RGB _{1,1}	RGB _{1,2}	RGB _{1,3}	•
RGB _{2,1}	RGB _{2,2}	RGB _{2,3}	•
RGB _{3,1}	RGB _{3,2}	RGB _{3,3}	•
• • •			

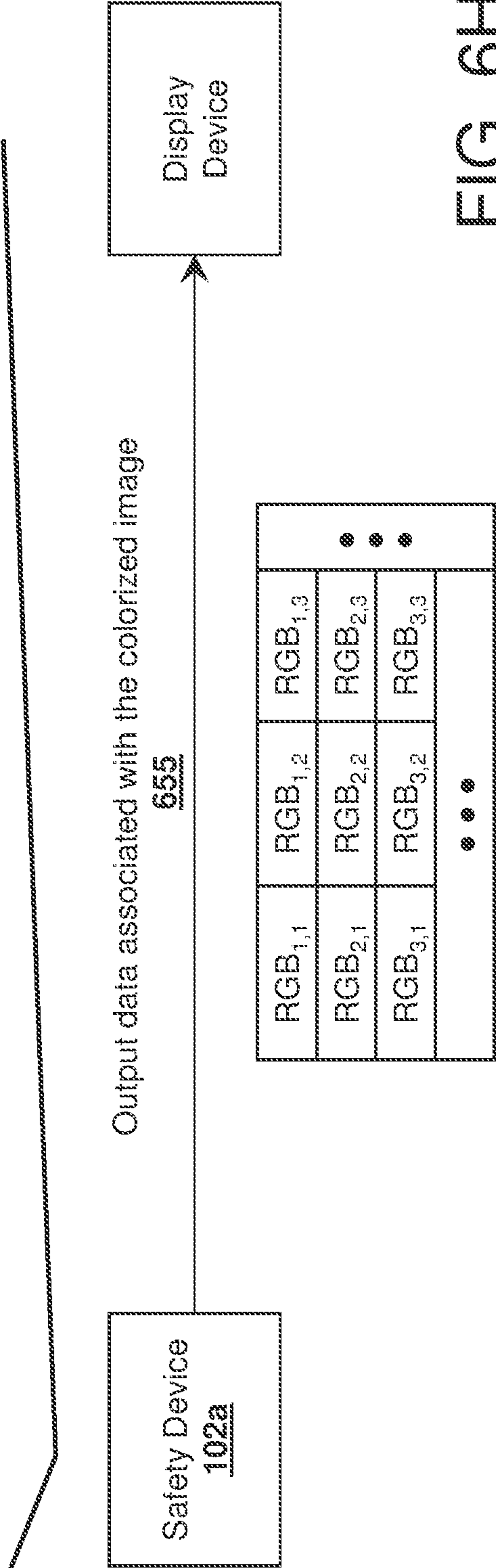


FIG. 6H

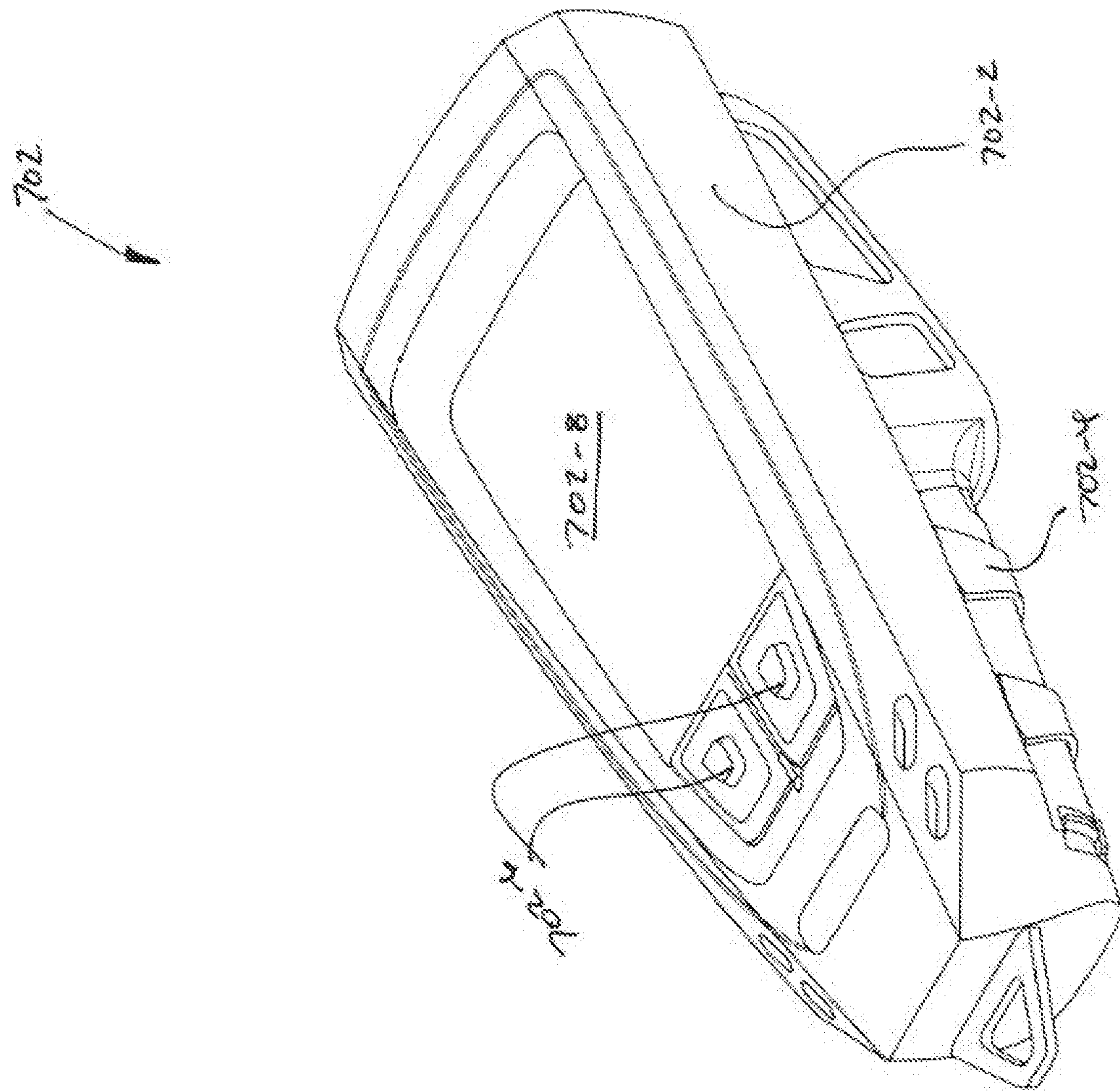


FIG. 7A

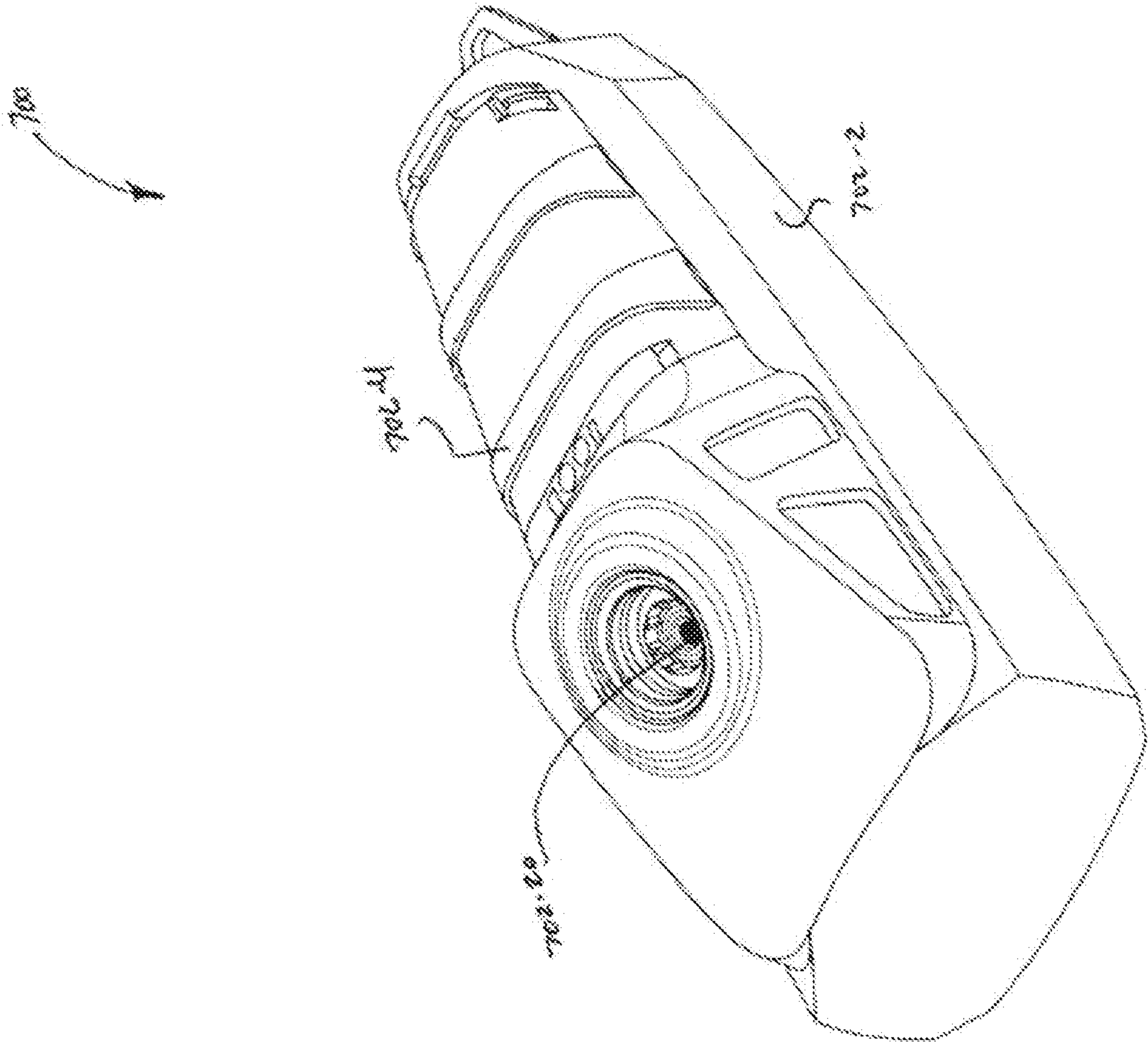


FIG. 7B

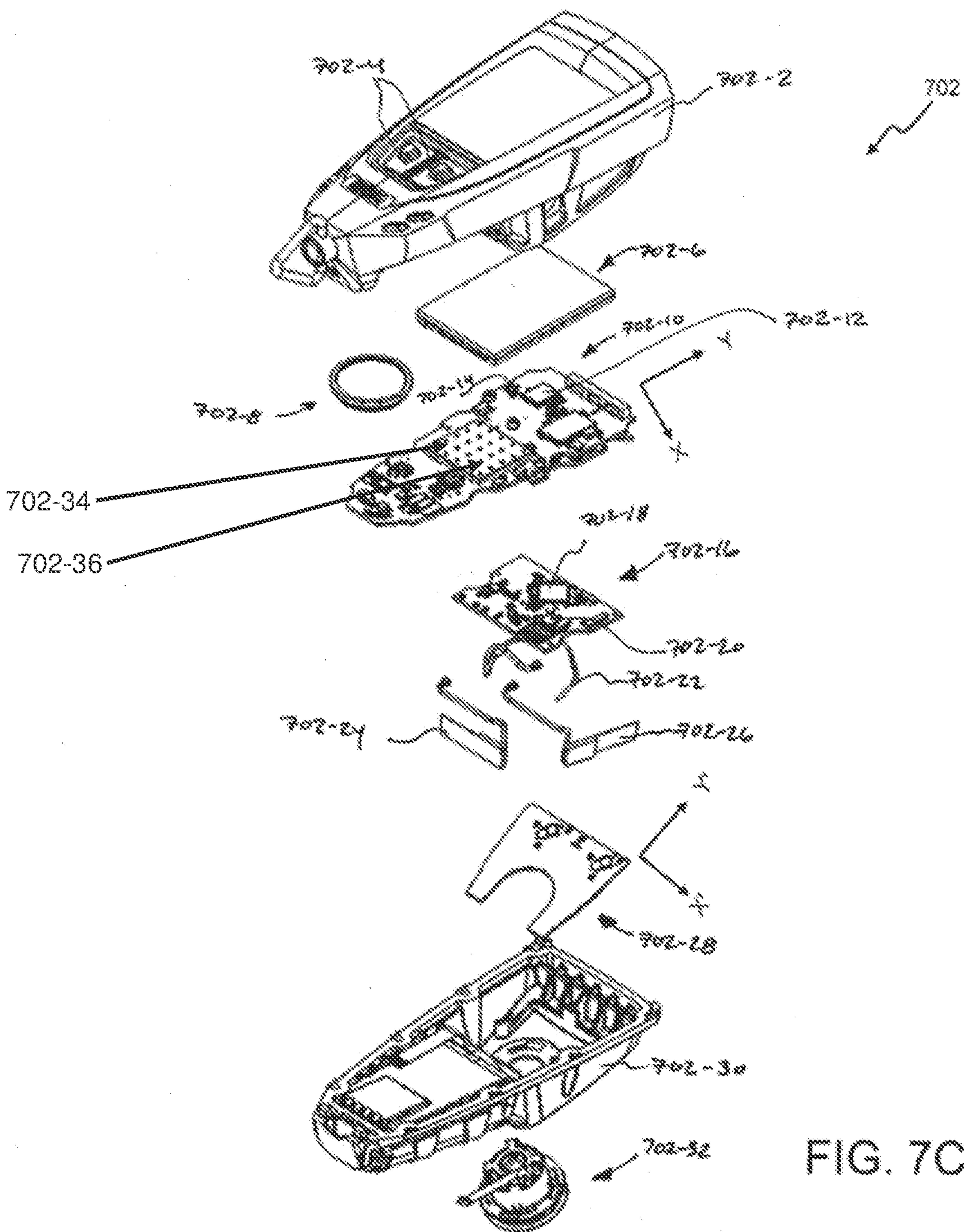
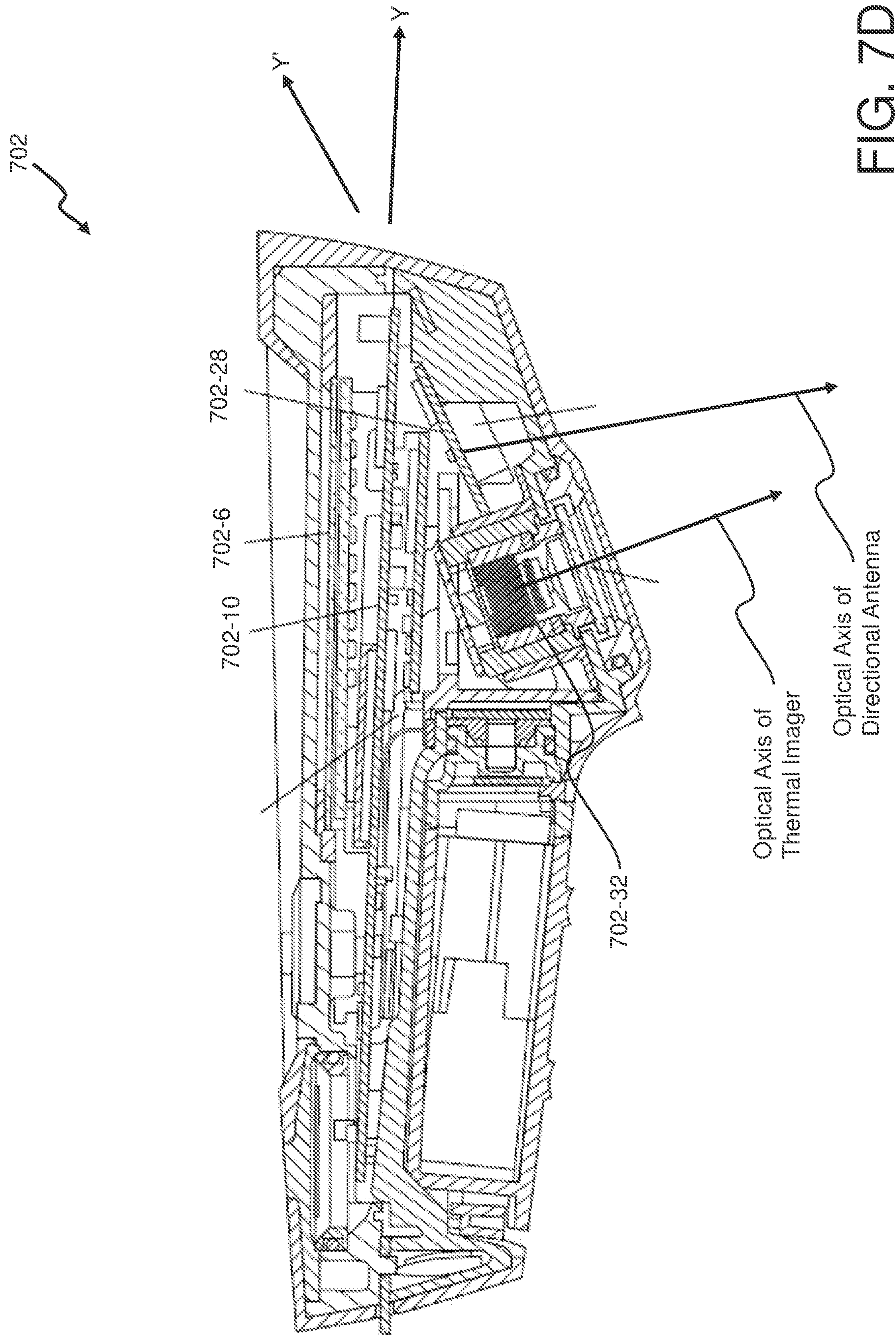


FIG. 7C



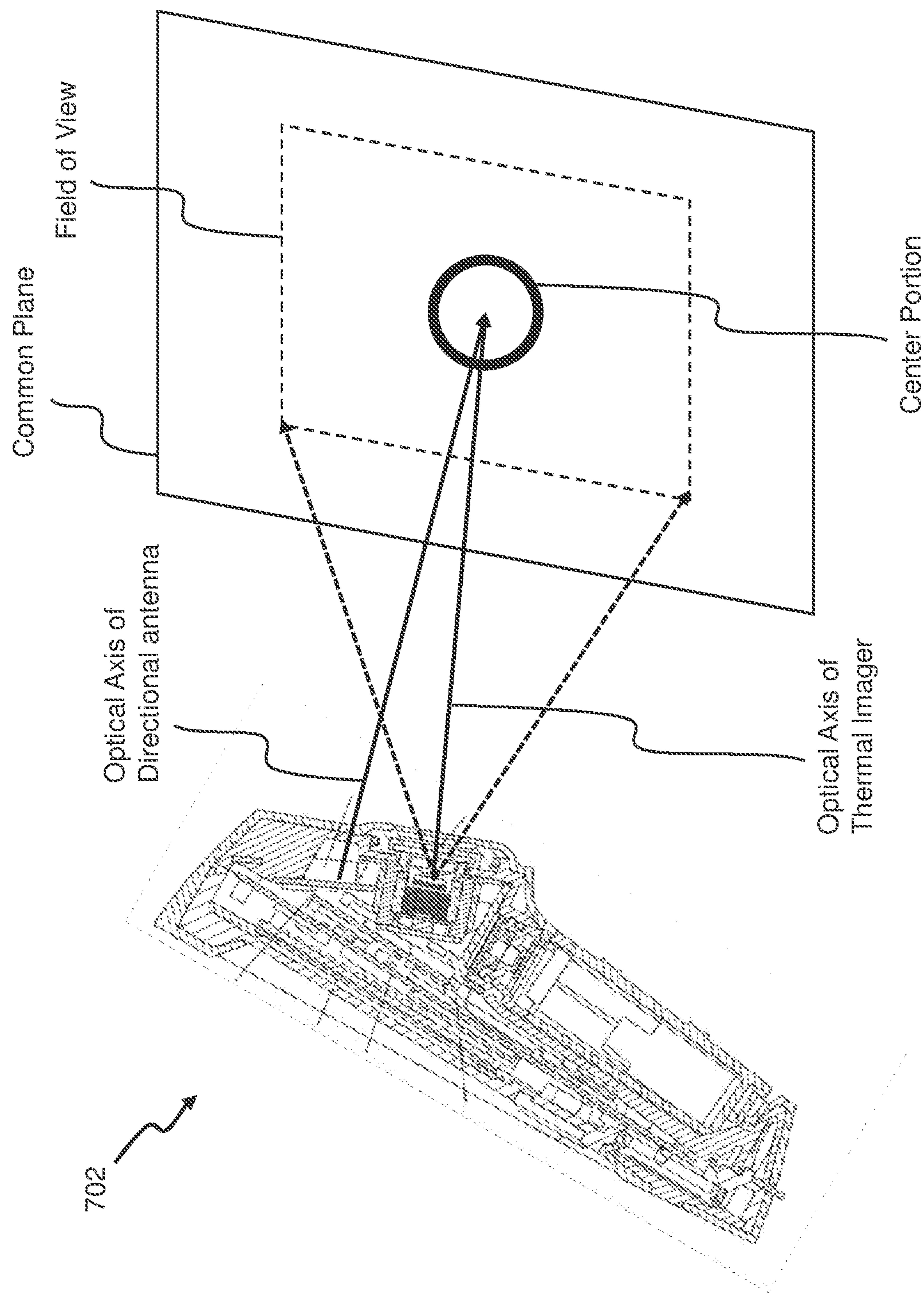


FIG. 7E