

FIG. 1

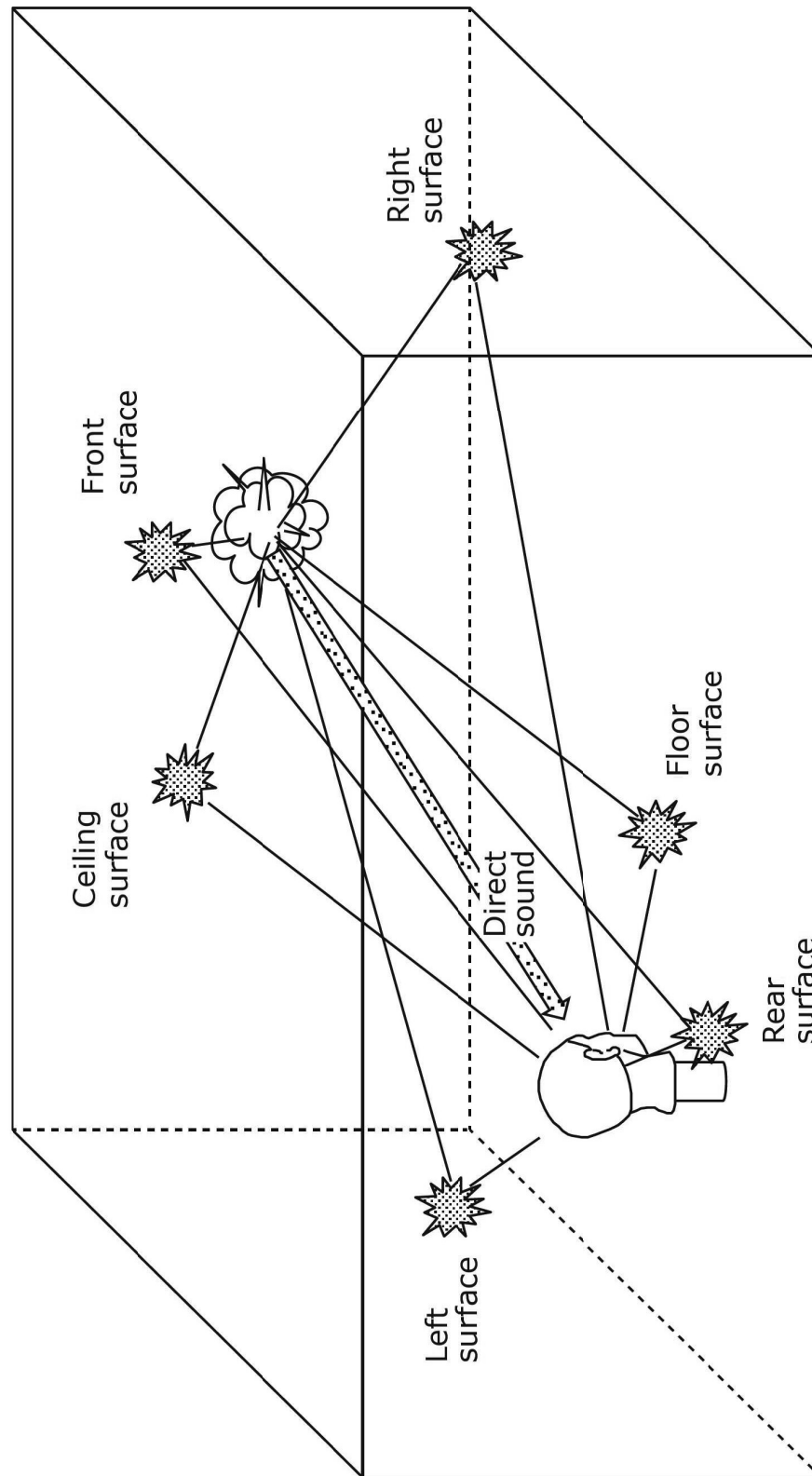


FIG. 2

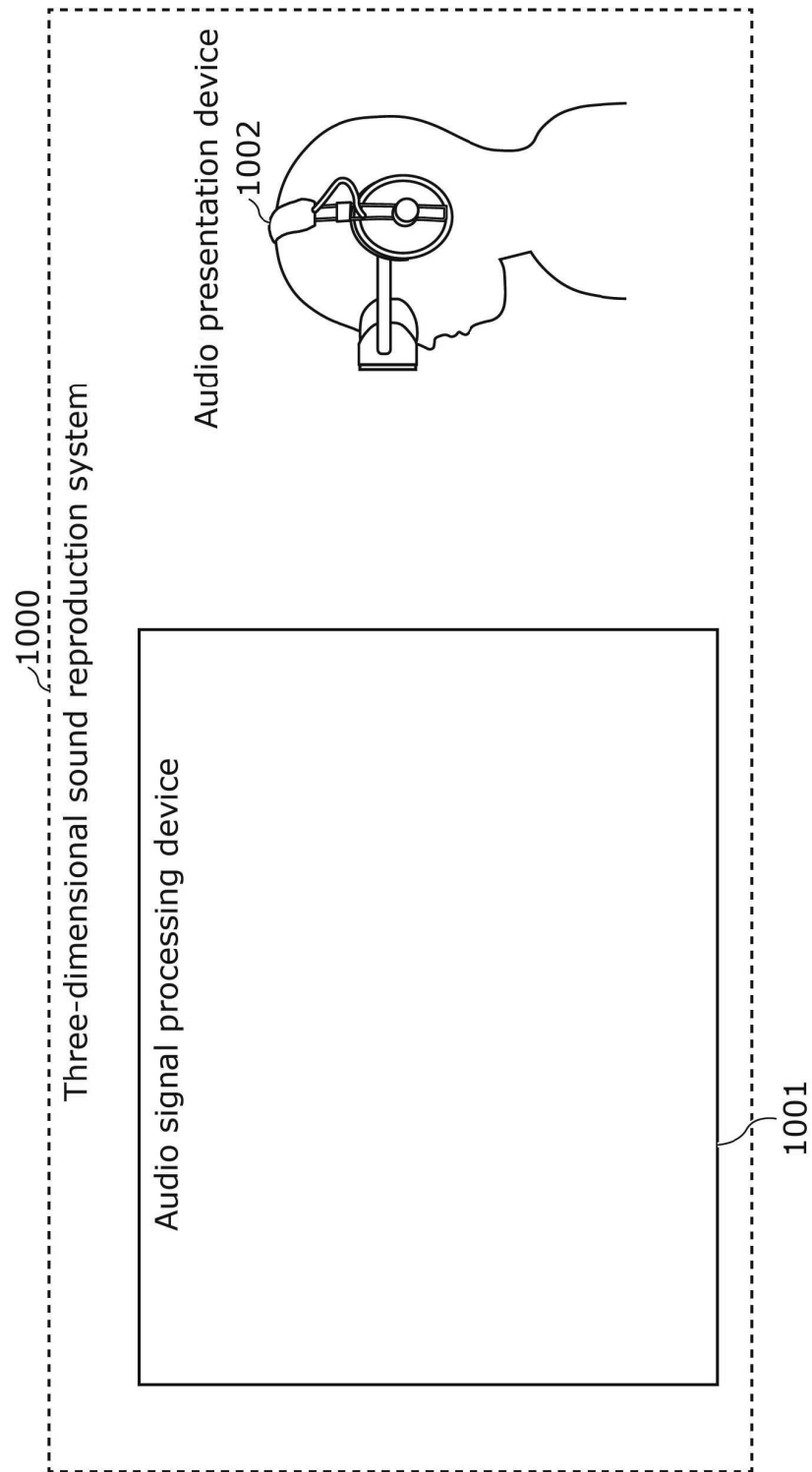


FIG. 3A

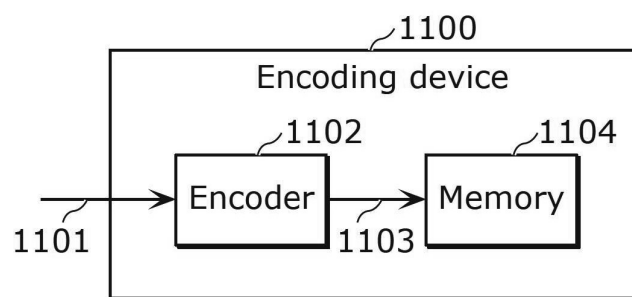


FIG. 3B

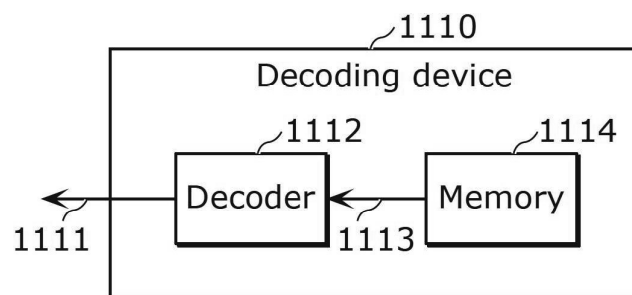


FIG. 3C

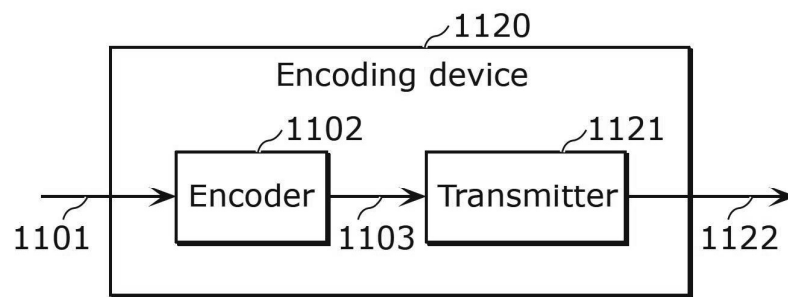


FIG. 3D

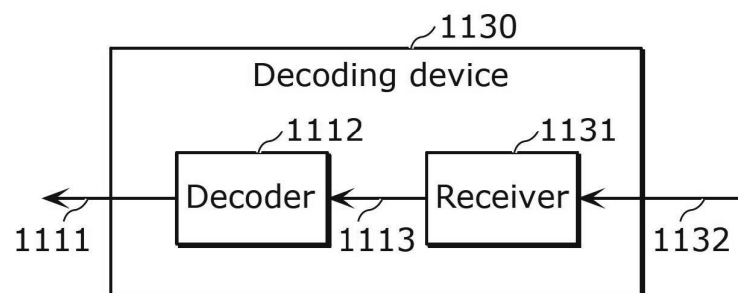


FIG. 4A

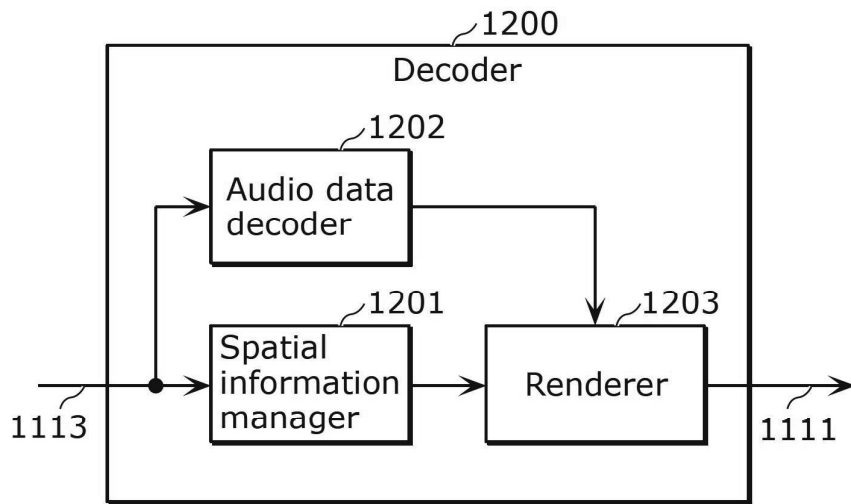


FIG. 4B

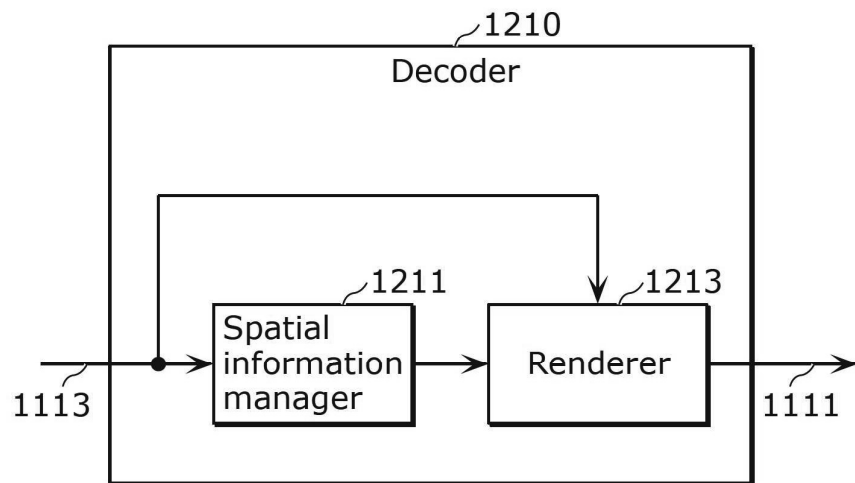


FIG. 5

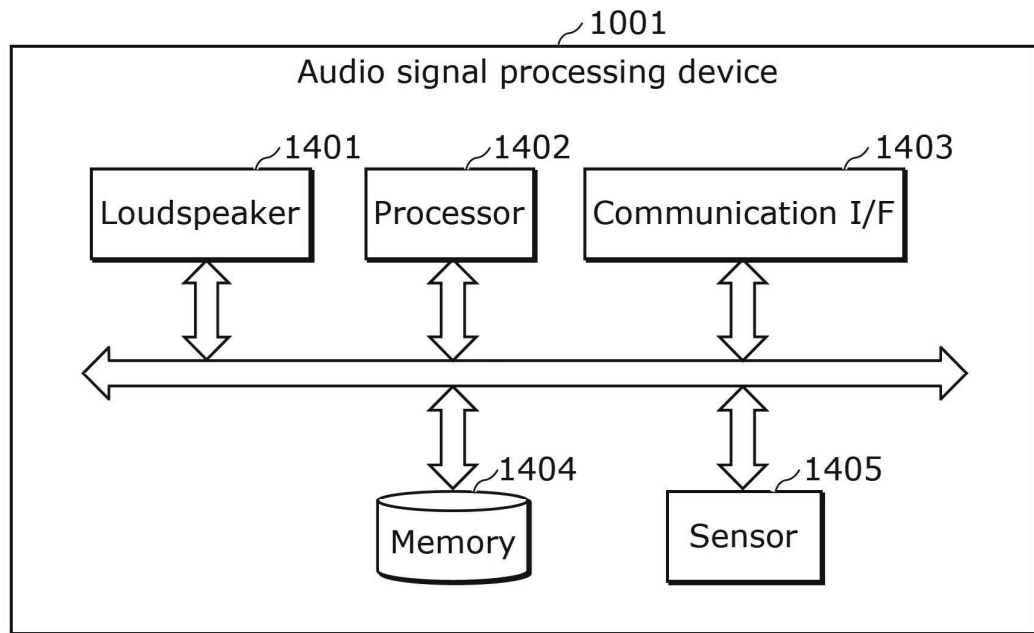


FIG. 6

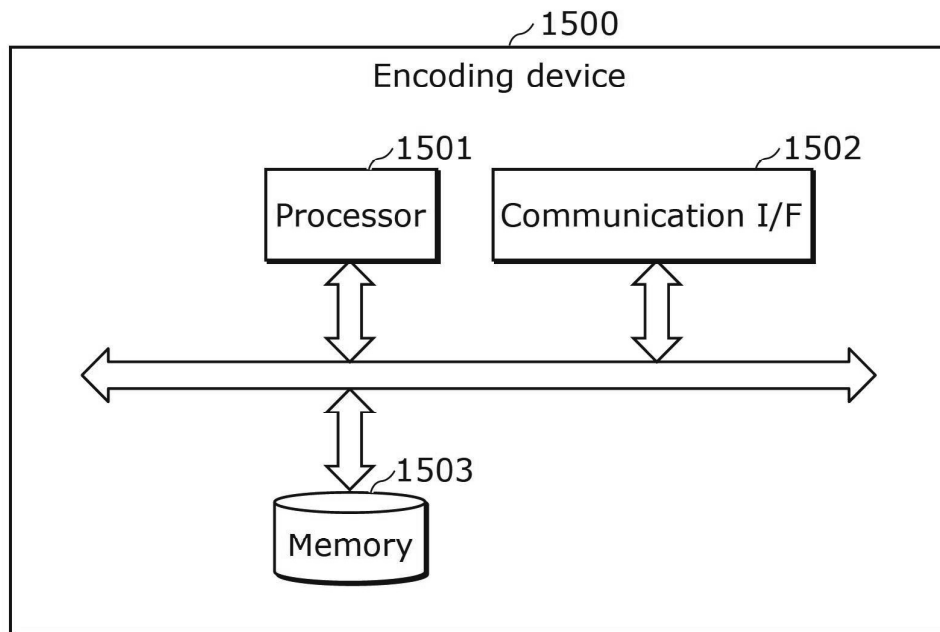


FIG. 7

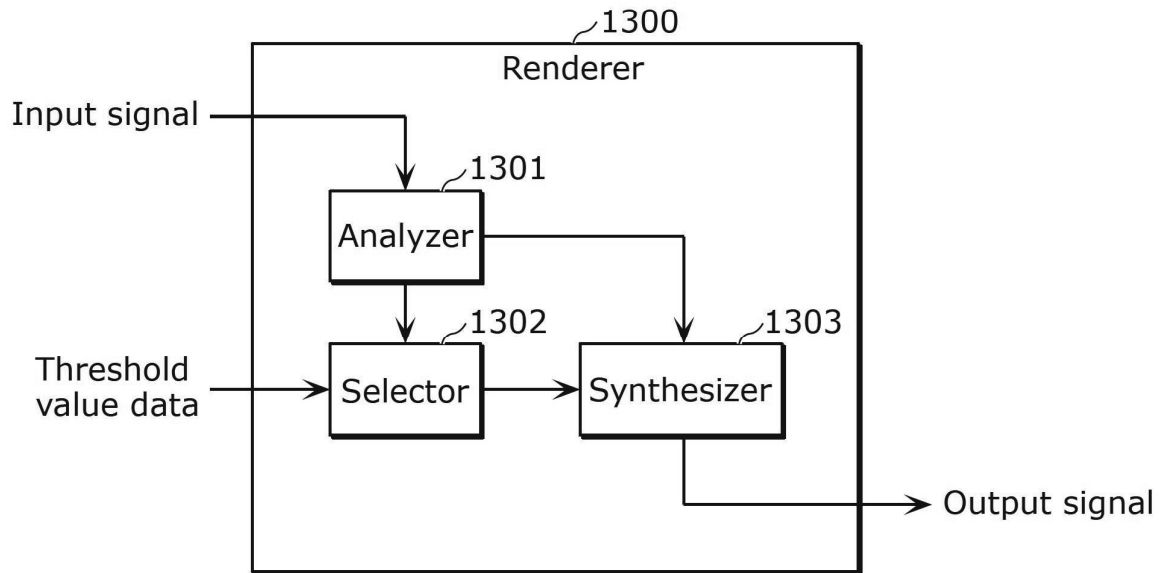


FIG. 8

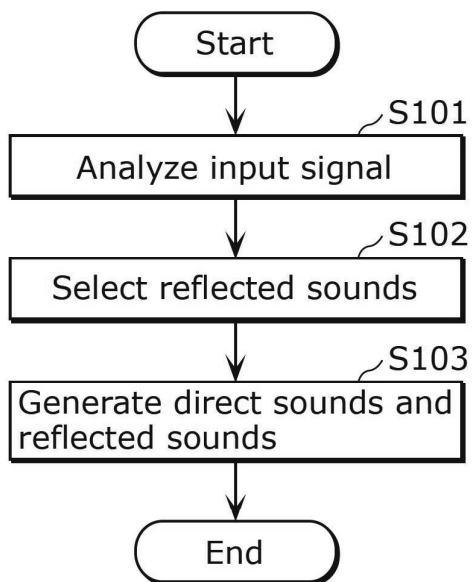


FIG. 9

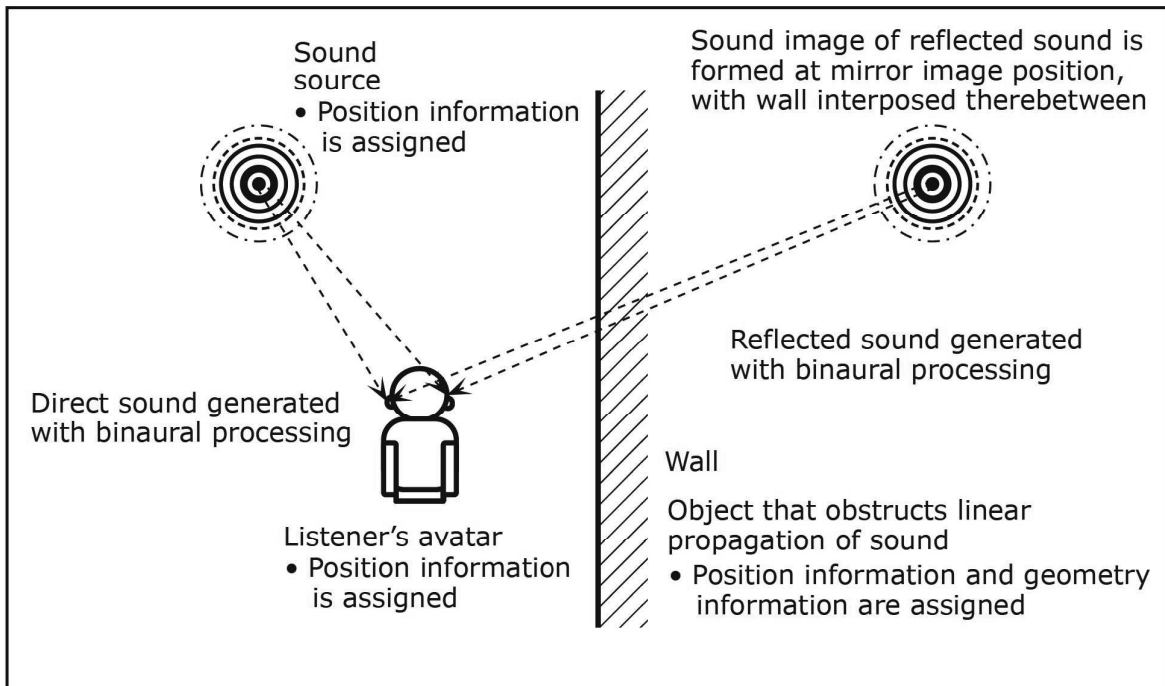


FIG. 10

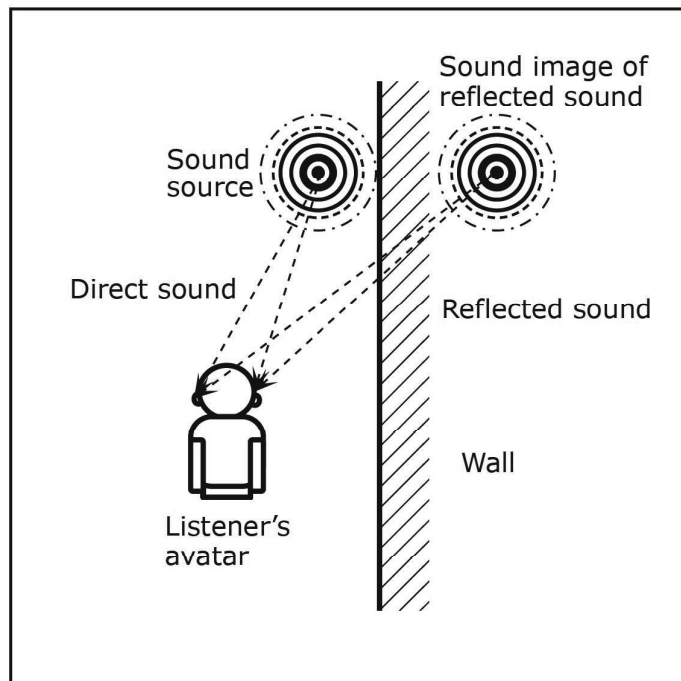


FIG. 11

T	Threshold value
5 ms	-12.5
10 ms	-15.8
20 ms	-22.5
30 ms	-30.5
40 ms	-38.2
50 ms	-45.1
60 ms	-53.0

FIG. 12A

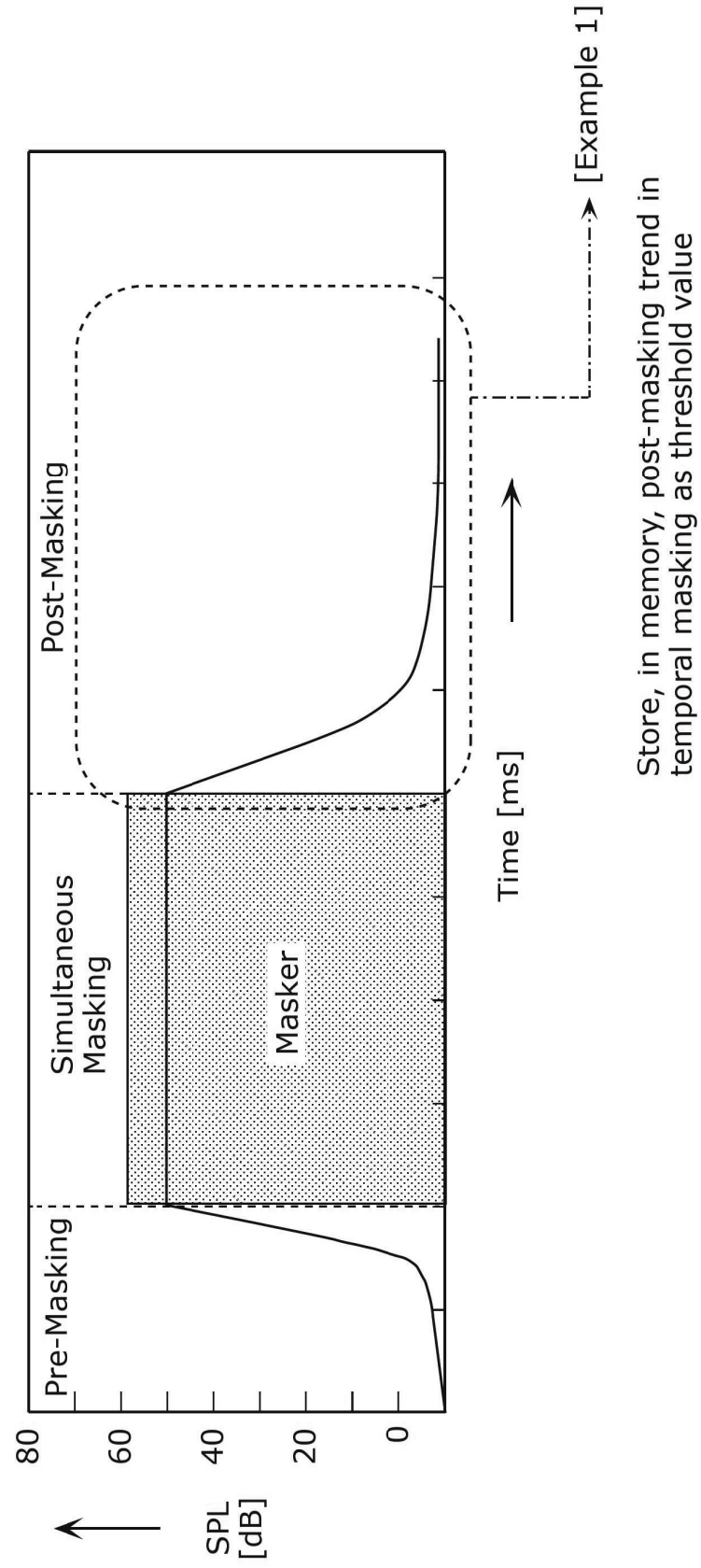


FIG. 12B

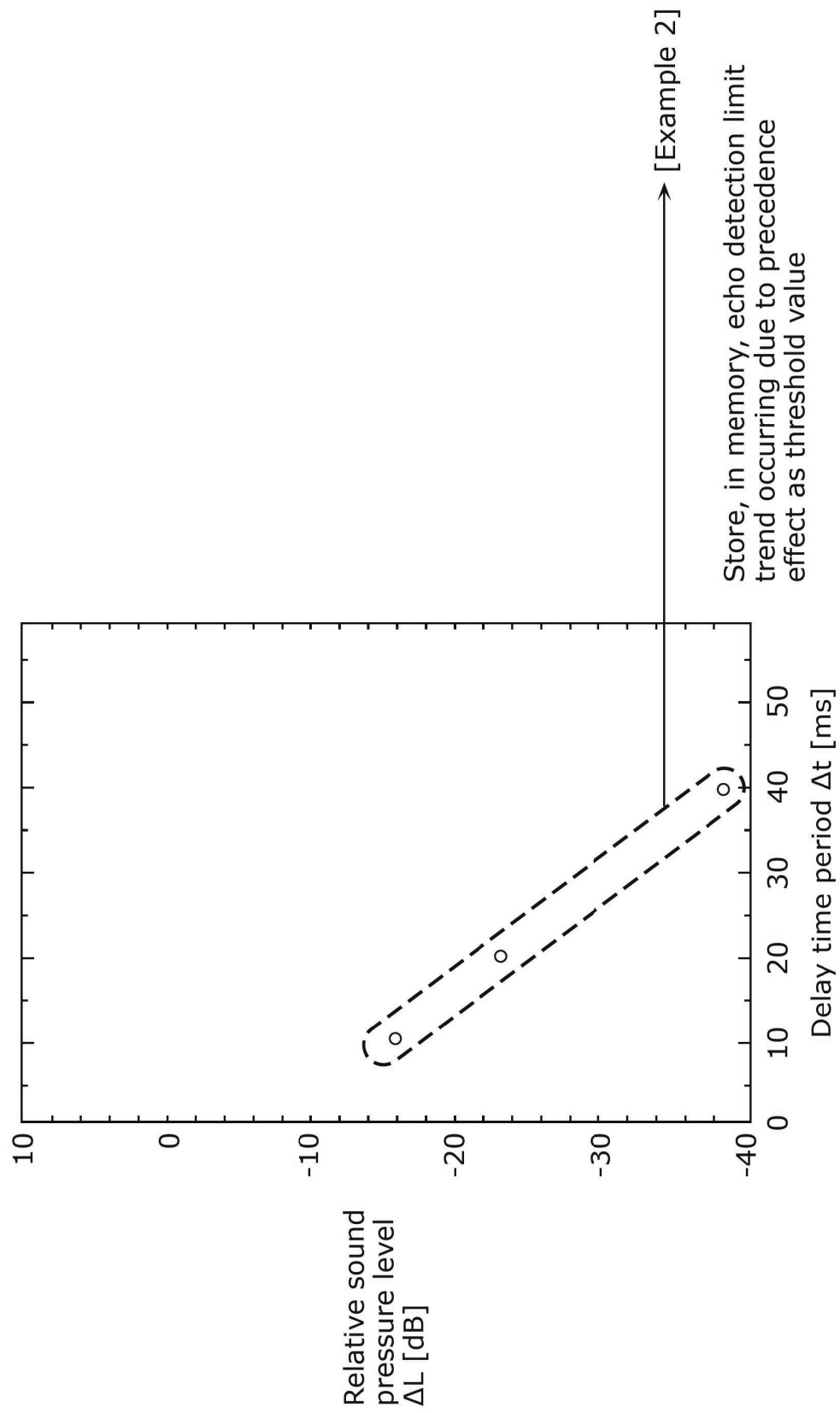


FIG. 12C

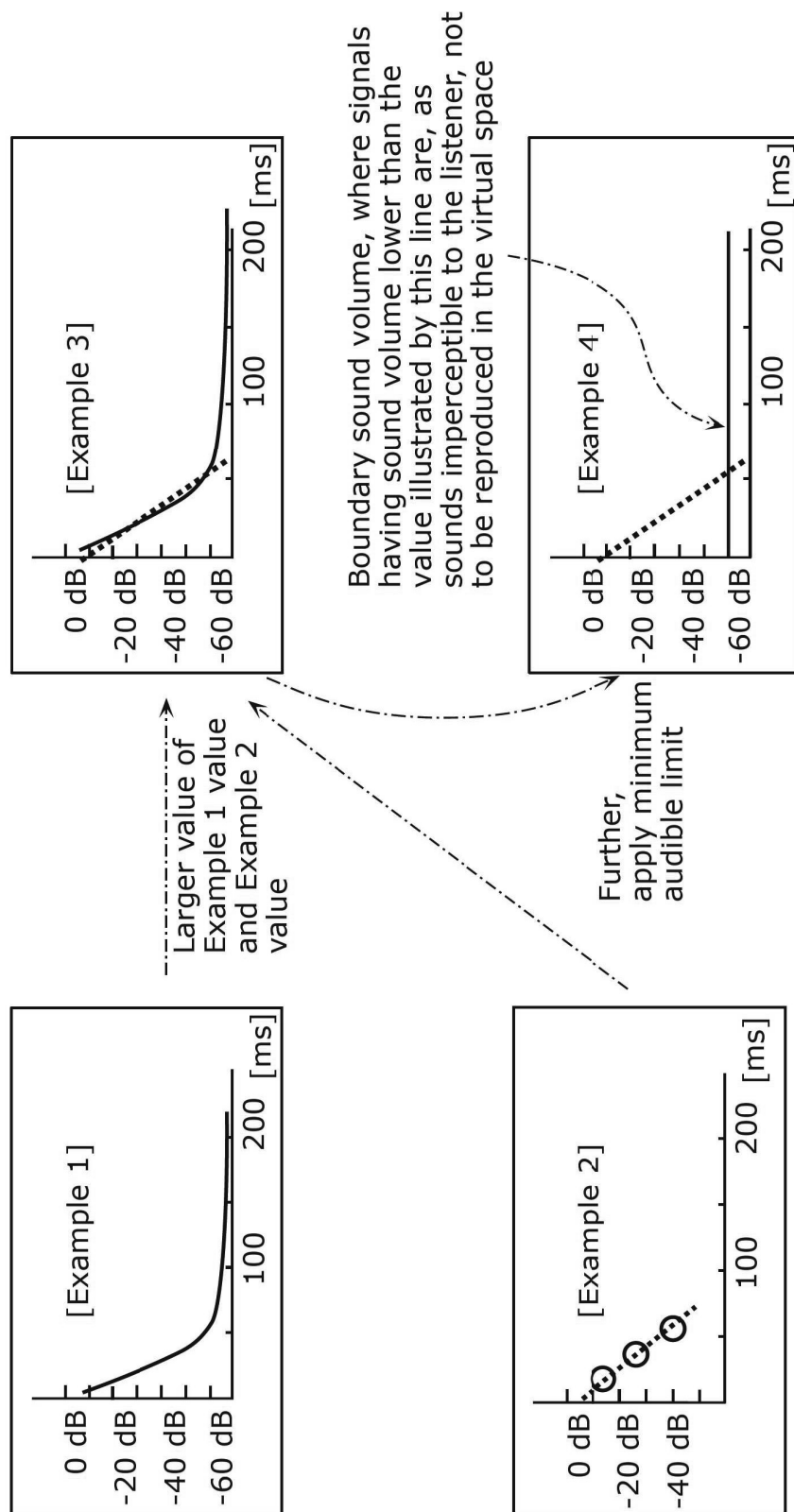


FIG. 13

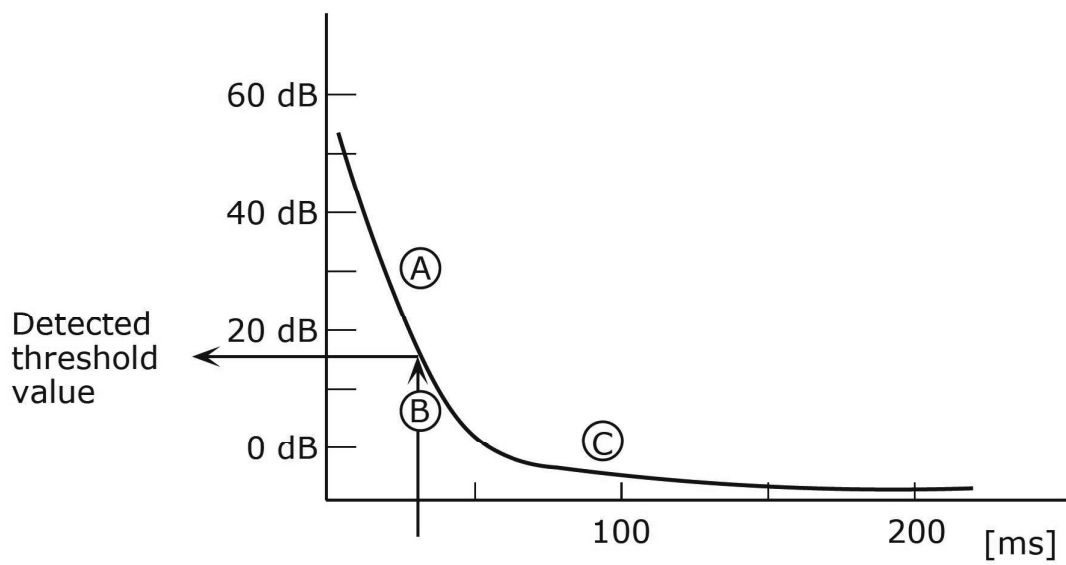


FIG. 14

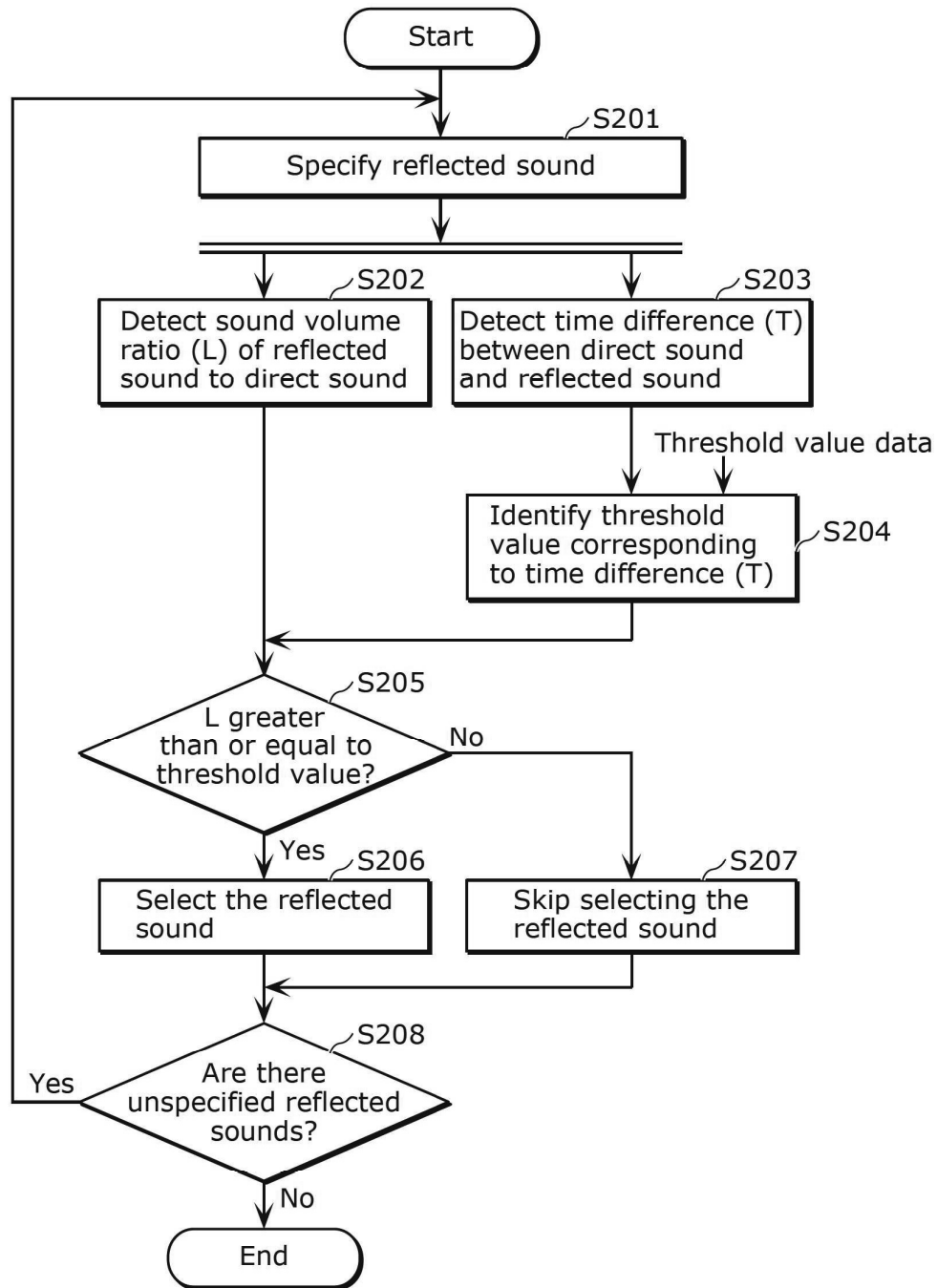


FIG. 15

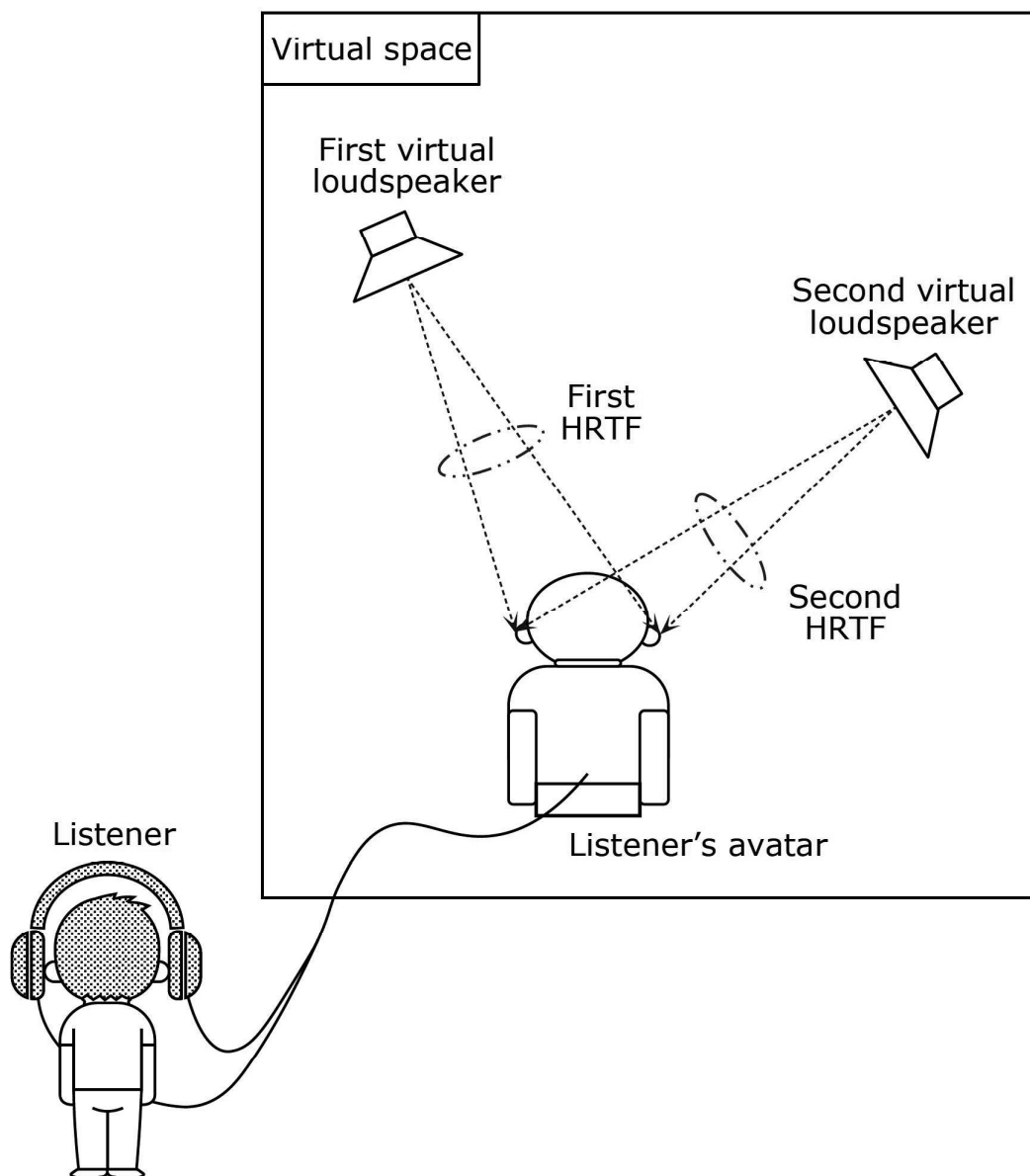


FIG. 16

Experimental parameters (horizontal plane direction)

Position of first virtual loudspeaker	0 — 180° (45° intervals)
Position of second virtual loudspeaker	0 — 315° (45° intervals)
Time difference	3, 5, 10, 20, 40 ms
Sound volume ratio	−44 — −1 dB (Set according to time difference)
Subject	25 people

FIG. 17

Experimental parameters (vertical plane direction)

Position of first virtual loudspeaker	Horizontal plane: 0, 90° Angle of elevation: −135, −45 — 135° (45° intervals)
Position of second virtual loudspeaker	Horizontal plane: 0, 90° Angle of elevation: −135, −45 — 135° (45° intervals)
Time difference	10 ms
Sound volume ratio	−22 — −1 dB (3 dB intervals)
Subject	25 people

FIG. 18

Direct sound direction (θ)	Reflected sound direction (γ)	T	Threshold value
0°	0°	5 ms	-12.5
		10 ms	-15.8
		20 ms	-22.5
		30 ms	-30.5
		40 ms	-38.2
		50 ms	-45.1
		60 ms	-53.0
	45°	5 ms	• •
		10 ms	• •
	315°	5 ms	• •
		10 ms	• •
		20 ms	• •
		30 ms	• •
		40 ms	• •
		50 ms	• •
		60 ms	• •
45°	0°	5 ms	• •

FIG. 19

Angular difference (Φ)	τ	Threshold value
0°	5 ms	-12.5
	10 ms	-15.8
	20 ms	-22.5
	30 ms	-30.5
	40 ms	-38.2
	50 ms	-45.1
	60 ms	-53.0
45°	5 ms	• •
	10 ms	• •
	20 ms	• •
	30 ms	• •
	40 ms	• •
	50 ms	• •
	60 ms	• •
		
315°	5 ms	• •
	10 ms	• •
	20 ms	• •
	30 ms	• •
	40 ms	• •
	50 ms	• •
	60 ms	• •

FIG. 20

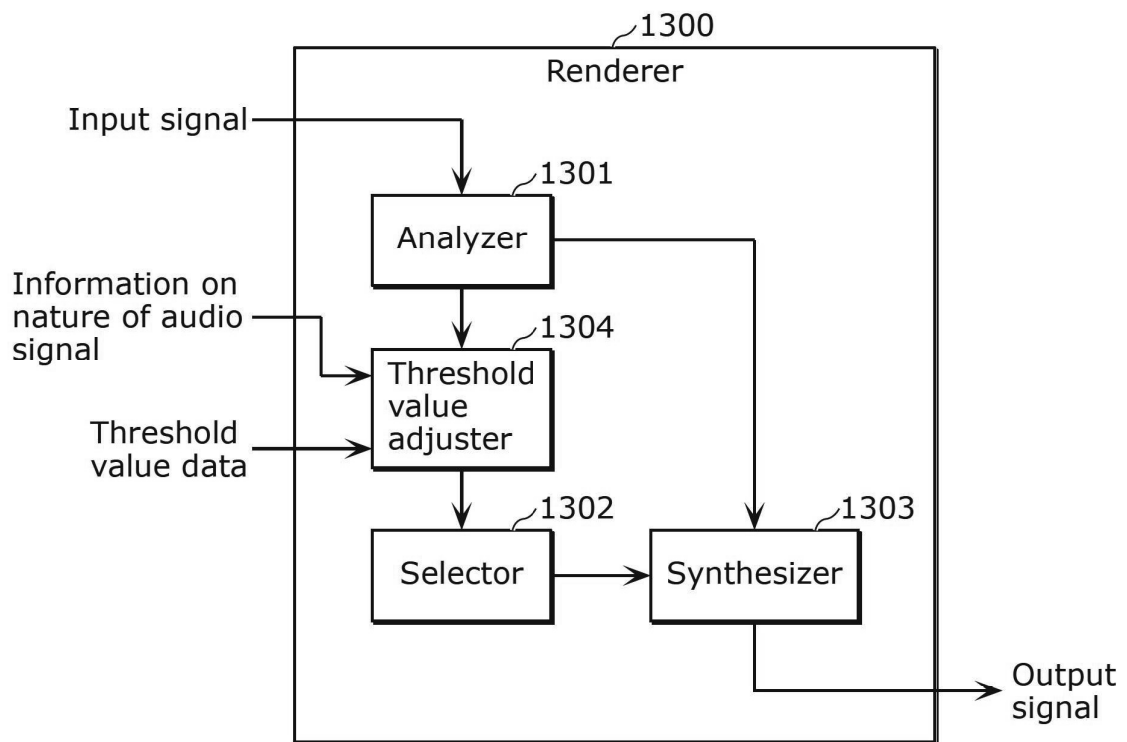


FIG. 21

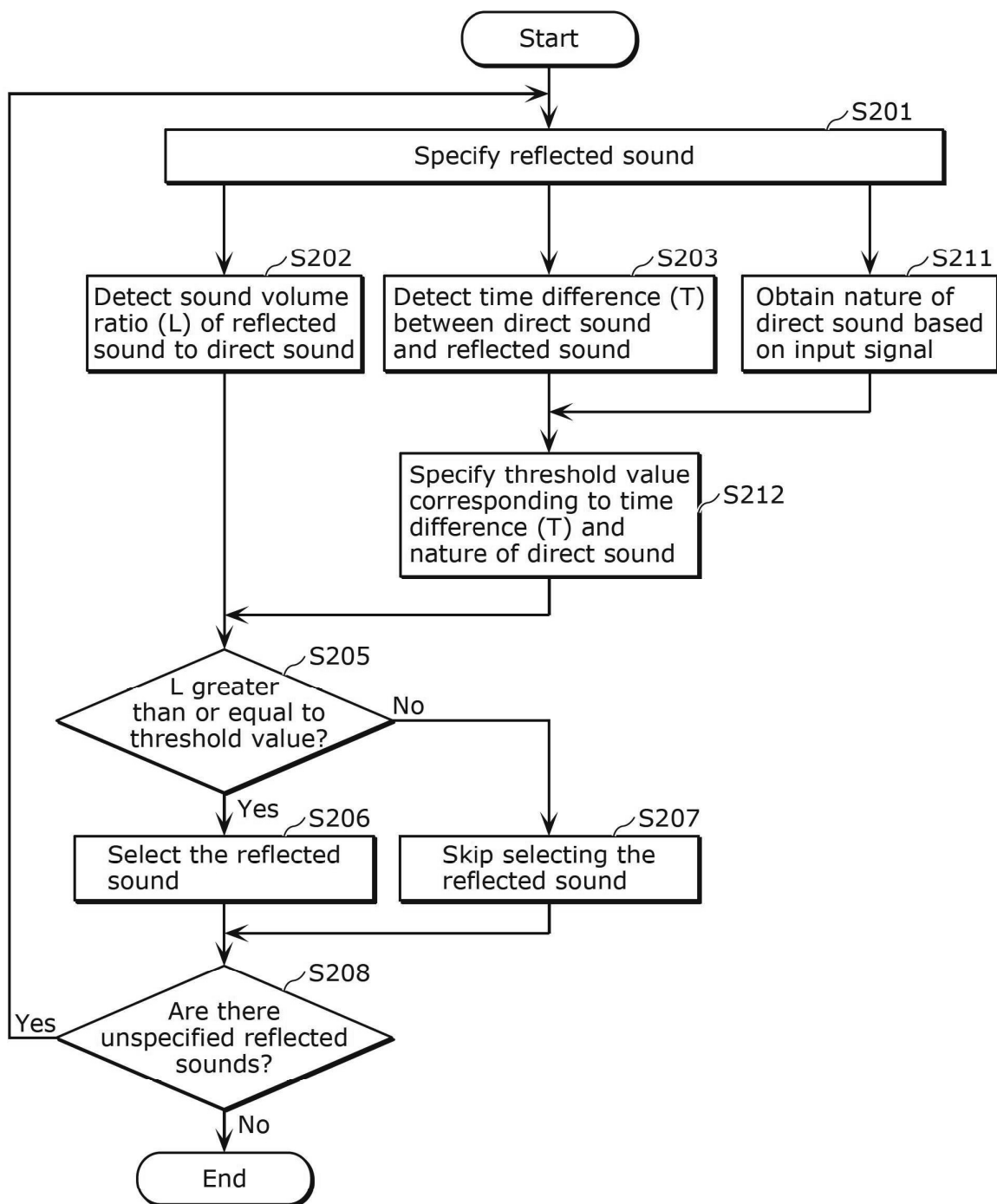


FIG. 22

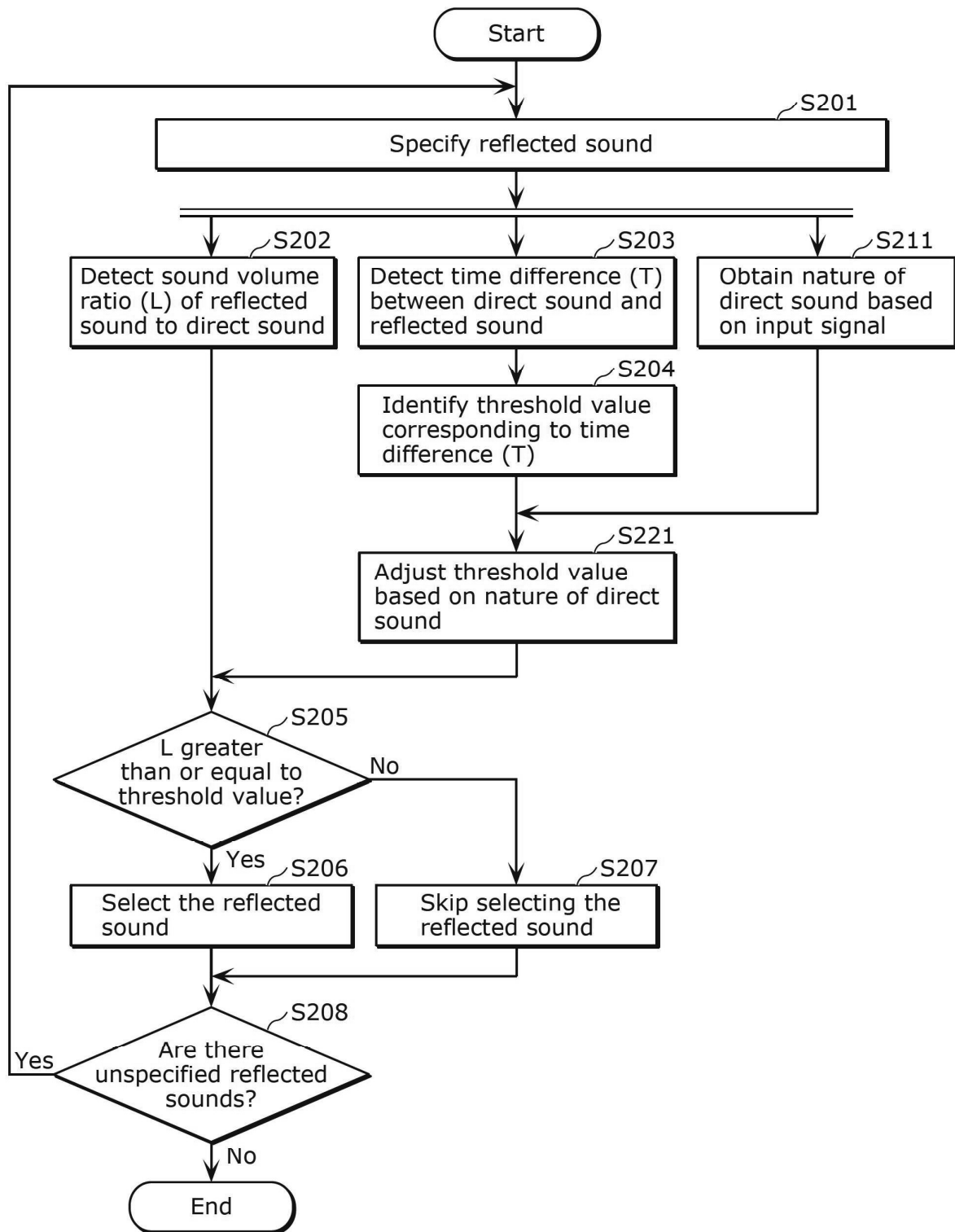


FIG. 23

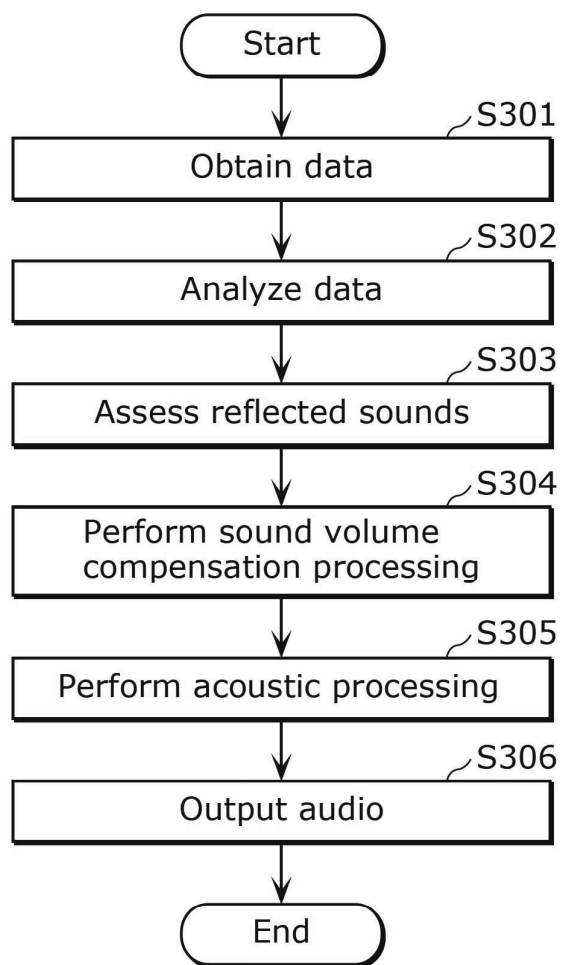


FIG. 24

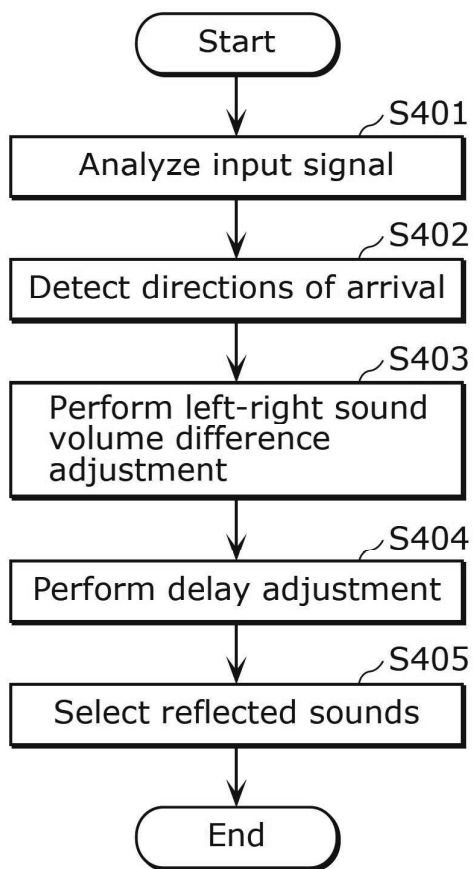


FIG. 25

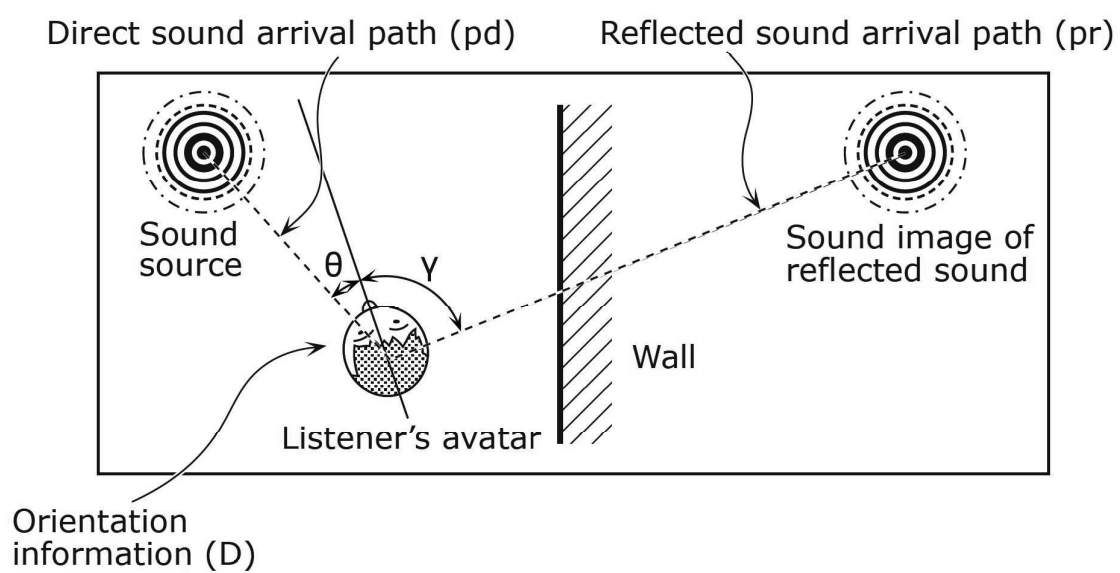


FIG. 26

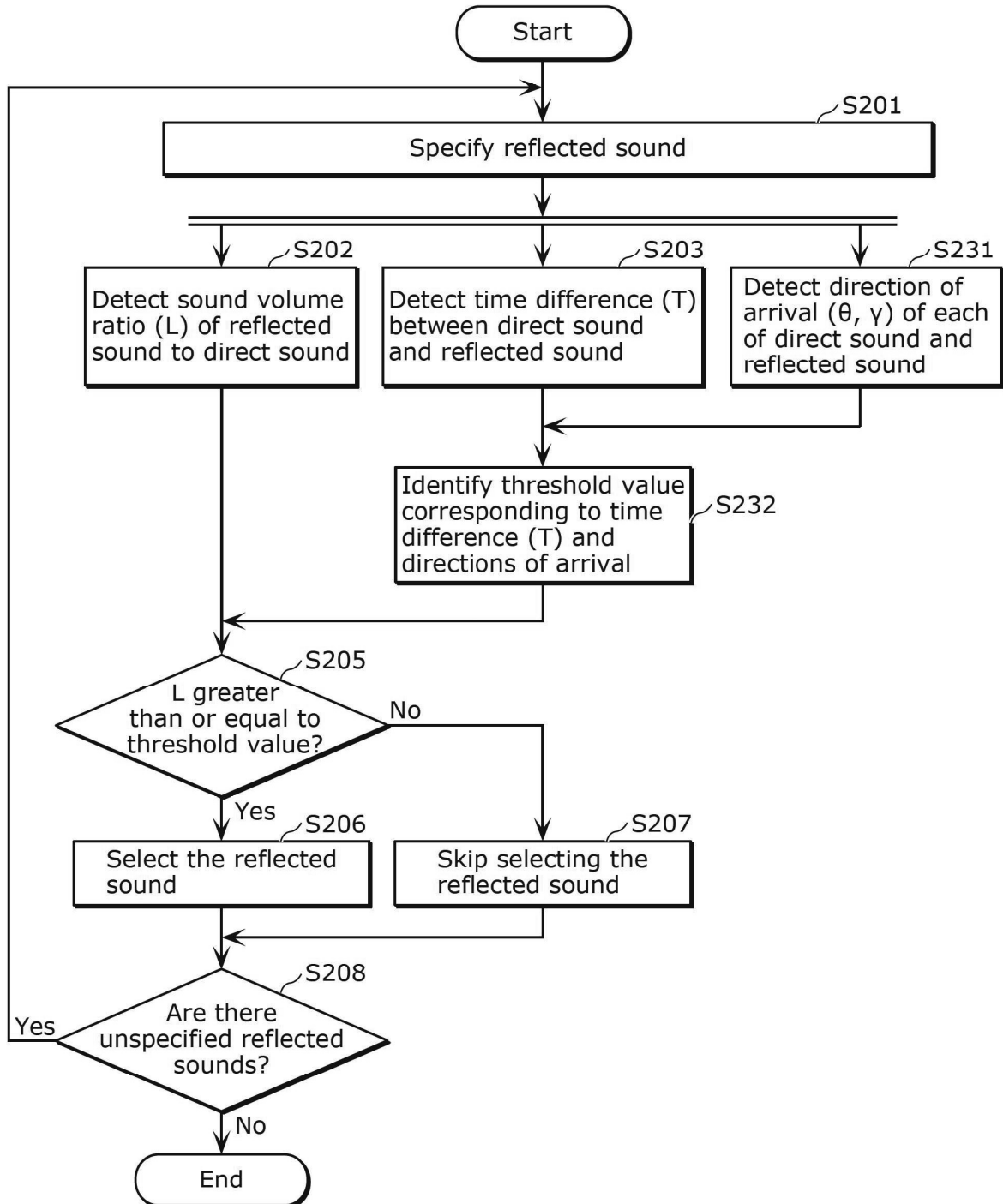


FIG. 27

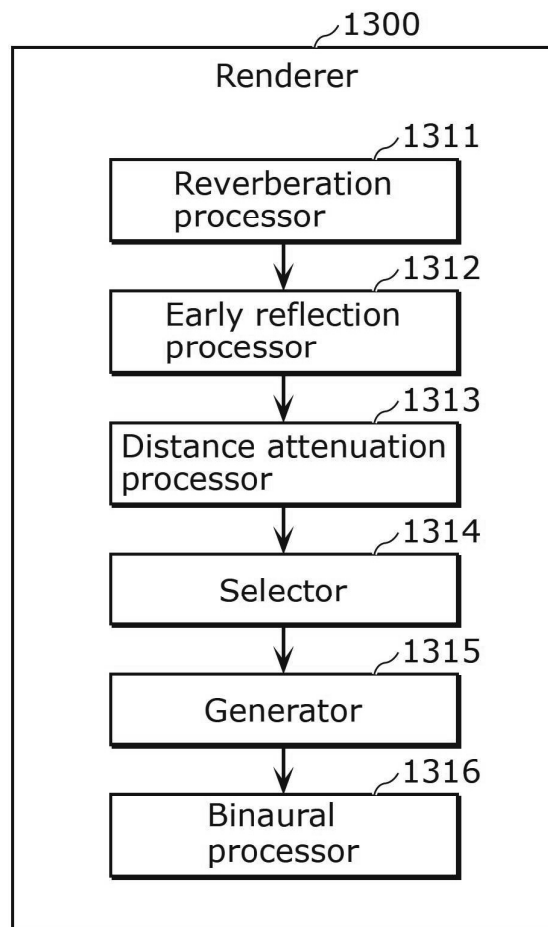


FIG. 28

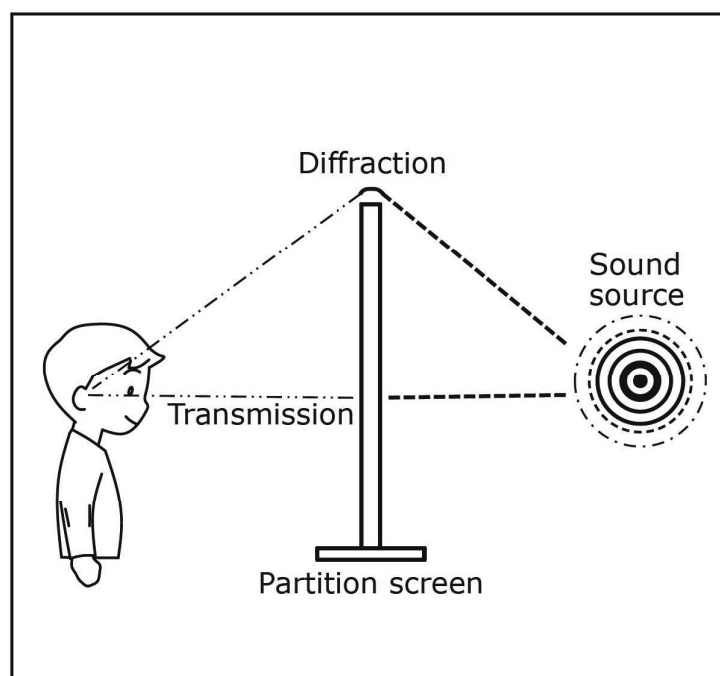


FIG. 29

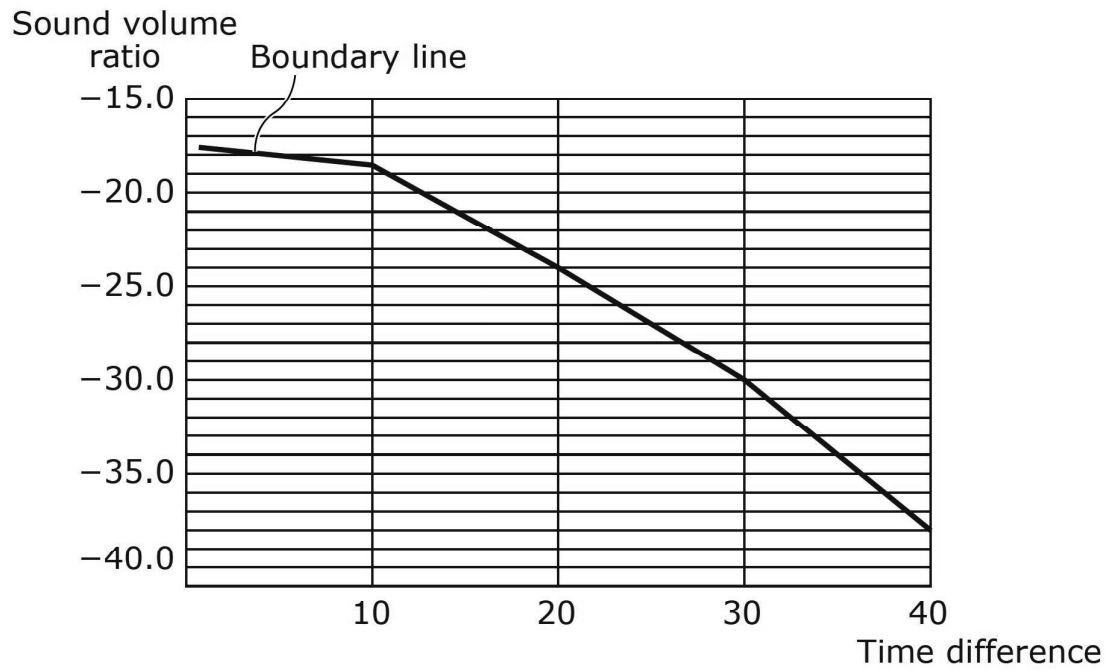


FIG. 30

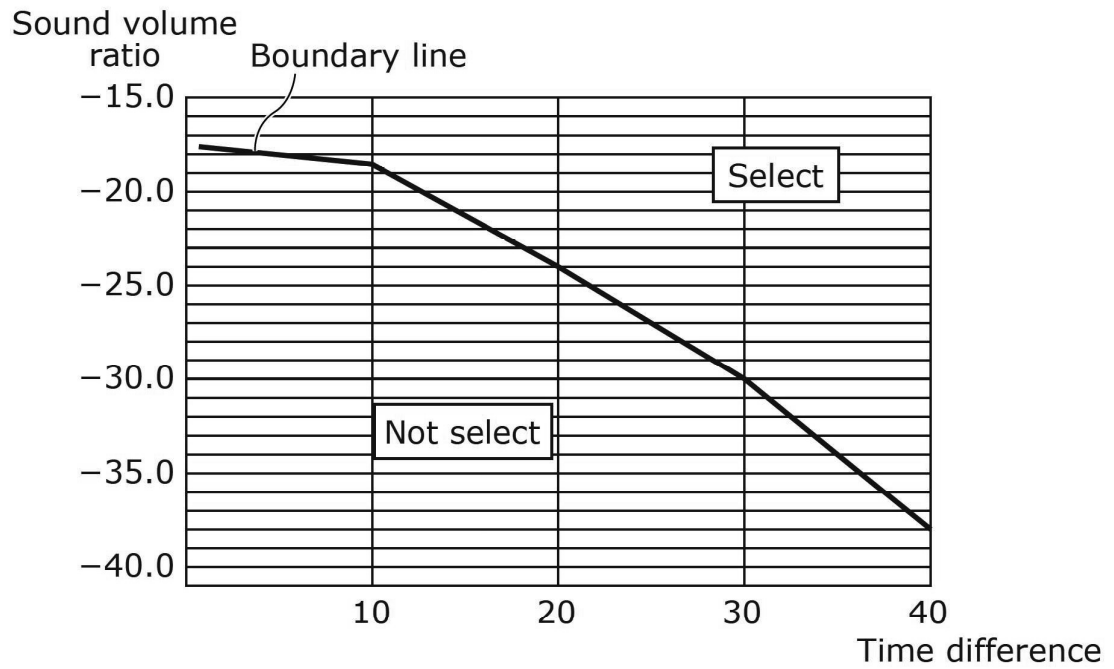


FIG. 31

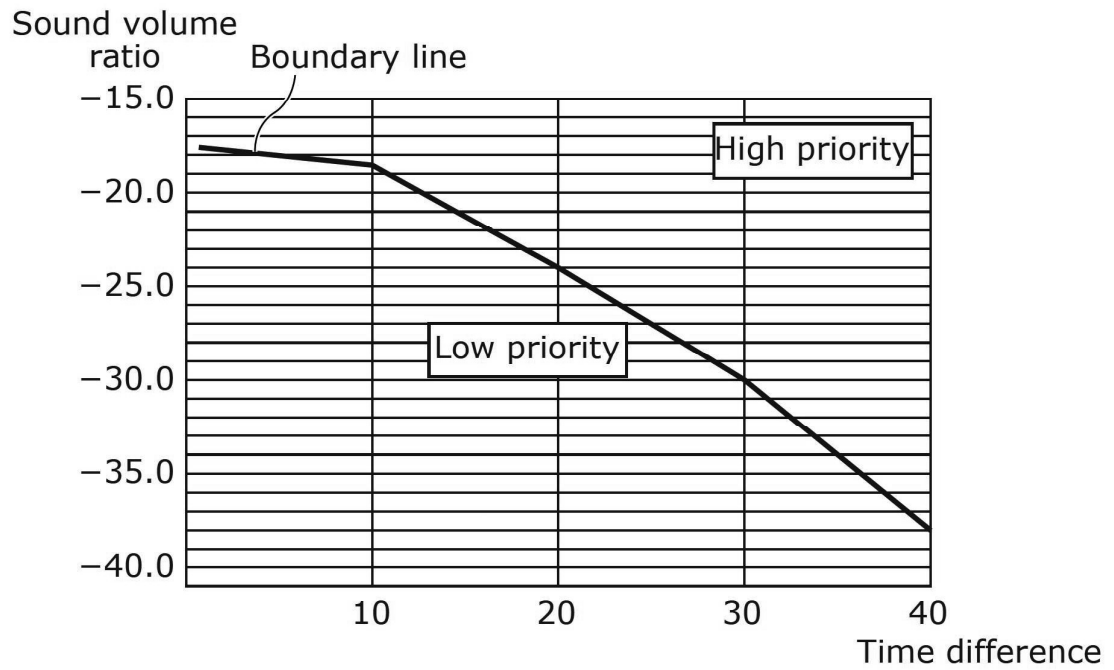


FIG. 32

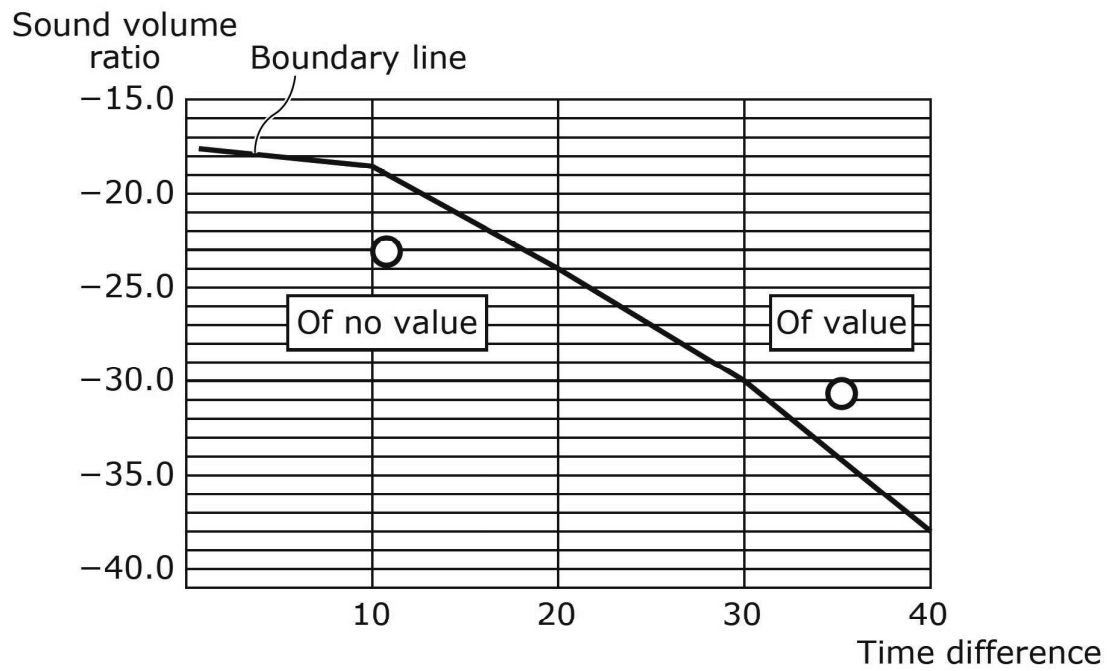


FIG. 33

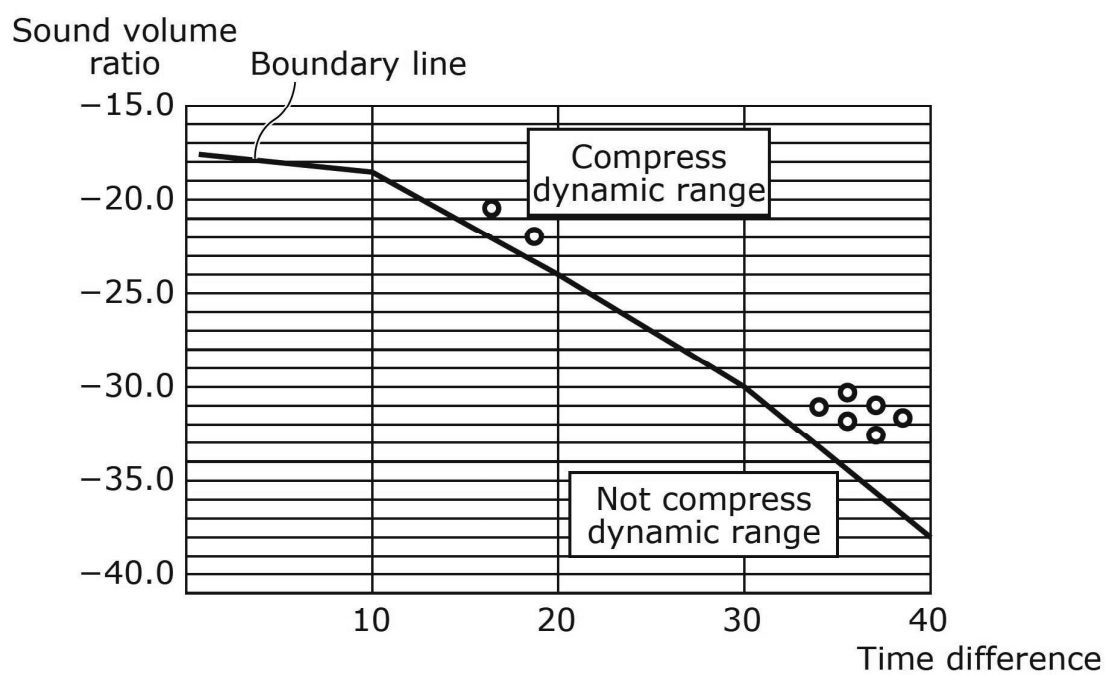


FIG. 34

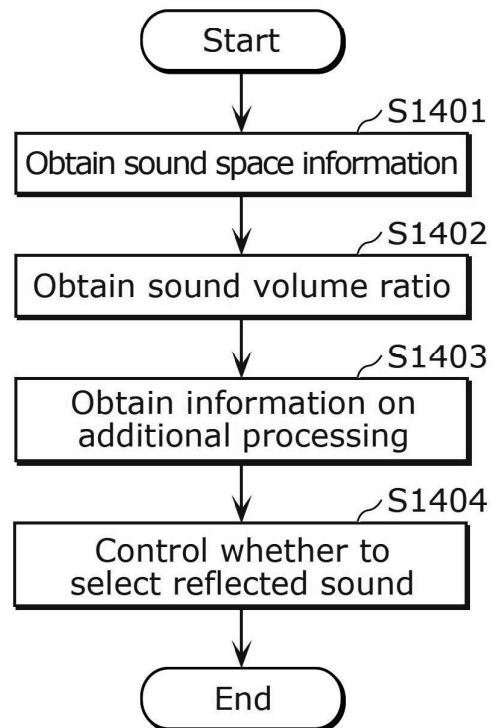


FIG. 35

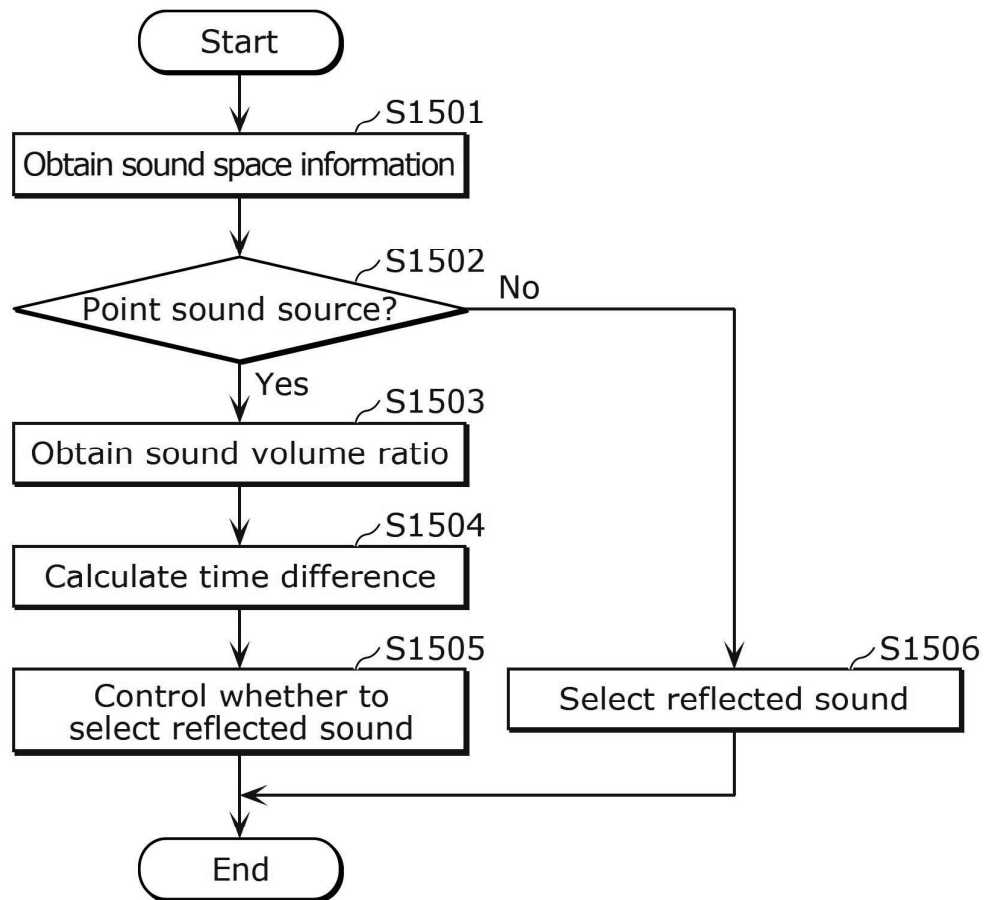


FIG. 36

