

FIG. 1

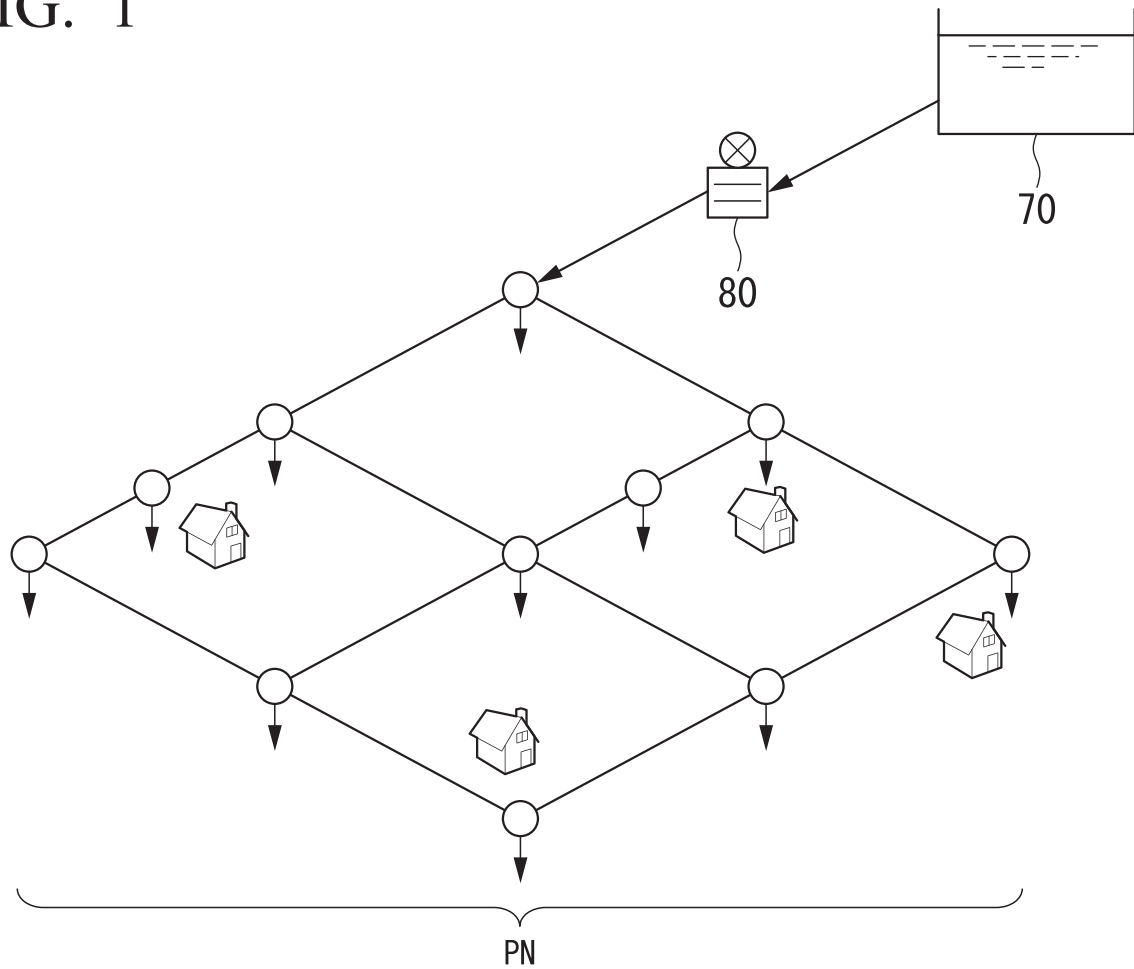


FIG. 2

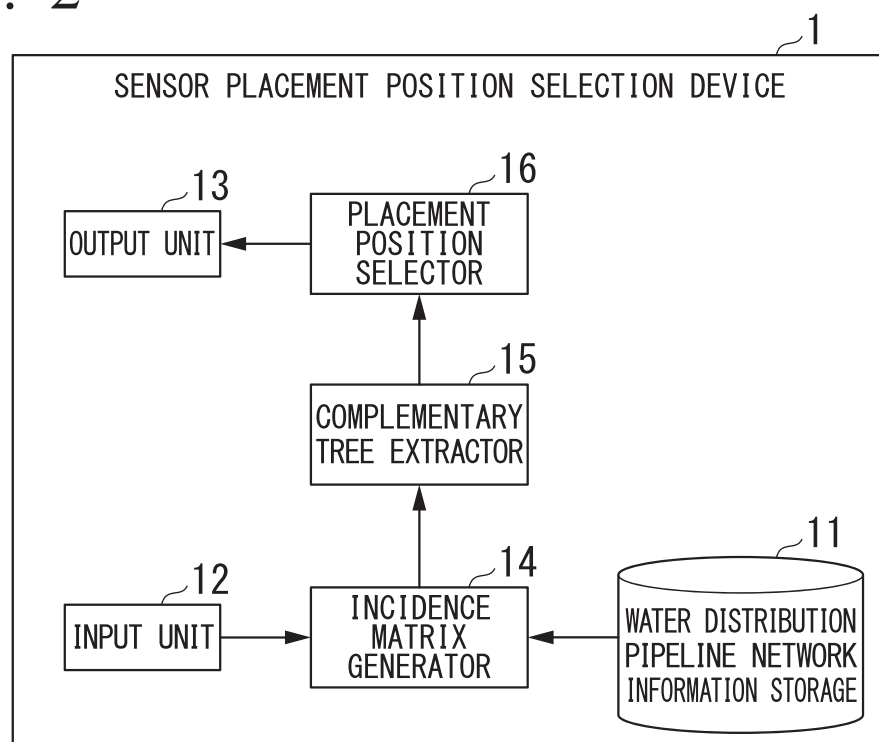


FIG. 3

#NUMBER OF NODES	NUMBER OF PIPELINES				
9	11				
#NODE INFORMATION					
#NUMBER	EFFECTIVE WATER HEAD [m]		INSTALLATION ALTITUDE [m]		
1	0		0		
2	0		0		
3	0		0		
4	0		0		
5	0		0		
6	0		0		
7	0		0		
8	0		0		
9	0		0		
#PIPELINE INFORMATION					
#NUMBER	START POINT	END POINT	DIAMETER [m]	PIPELINE LENGTH [m]	PIPELINE FRICTION COEFFICIENT [-]
1	1	2	0.1	1	0.01
2	2	3	0.1	1	0.01
3	3	4	0.1	1	0.01
4	4	5	0.1	1	0.01
5	1	5	0.1	1	0.01
6	1	6	0.1	1	0.01
7	6	7	0.1	1	0.01
8	5	7	0.1	1	0.01
9	5	8	0.1	1	0.01
10	8	9	0.1	1	0.01
11	7	9	0.1	1	0.01
#DEFINITION END					

FIG. 4

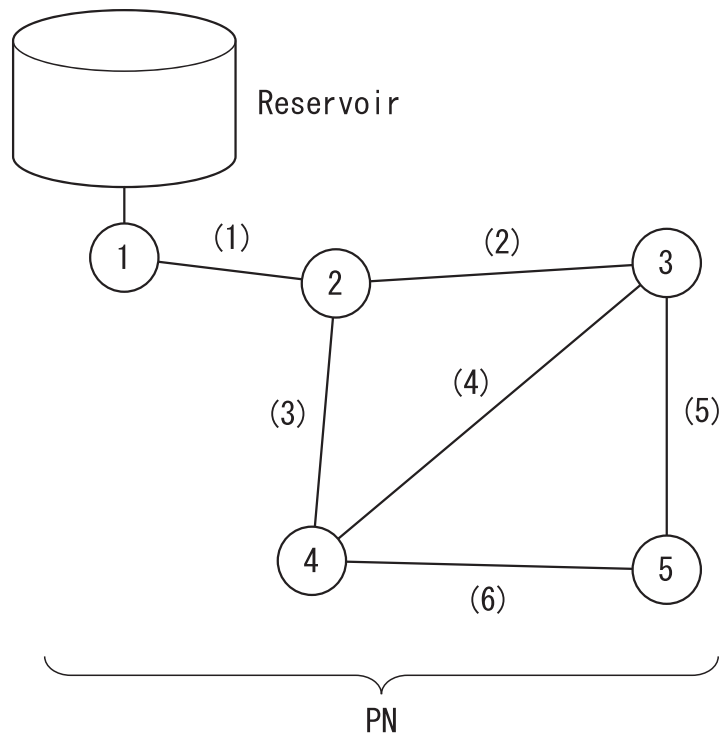


FIG. 5

NODE NUMBER	AMOUNT OF WATER USED [m ³ /s]	ALTITUDE [m]
1	q ₁	H ₁
2	q ₂	H ₂
3	q ₃	H ₃
4	q ₄	H ₄
5	q ₅	H ₅

PIPELINE NUMBER	START POINT	END POINT	DIAMETER [m]	LENGTH [m]	FRICTIONAL LOSS COEFFICIENT
1	1	2	D ₁₂	L ₁₂	λ_{12}
2	2	3	D ₂₃	L ₂₃	λ_{23}
3	2	4	D ₂₄	L ₂₄	λ_{24}
4	3	4	D ₃₄	L ₃₄	λ_{34}
5	3	5	D ₃₅	L ₃₅	λ_{35}
6	4	5	D ₄₅	L ₄₅	λ_{45}

FIG. 6

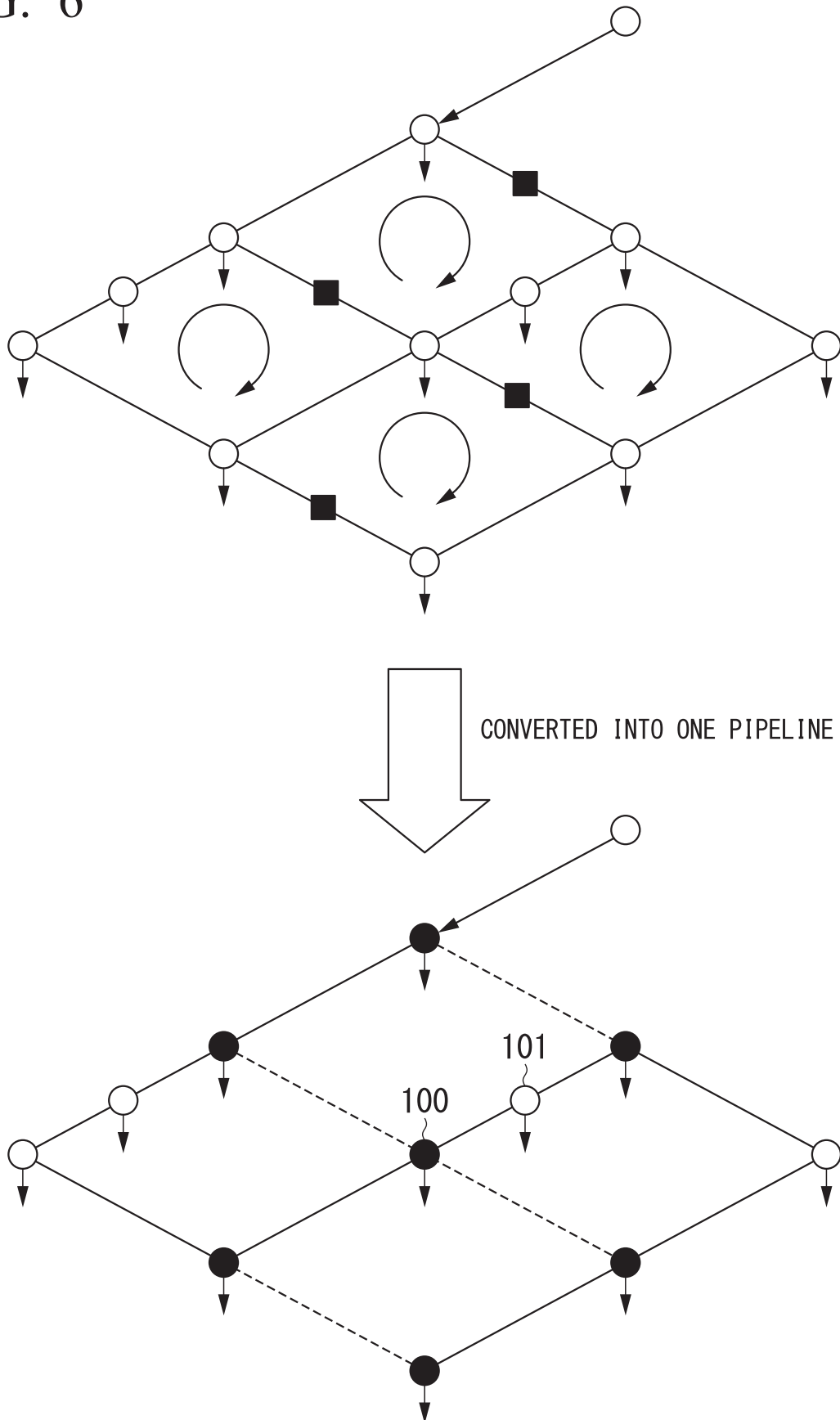


FIG. 7

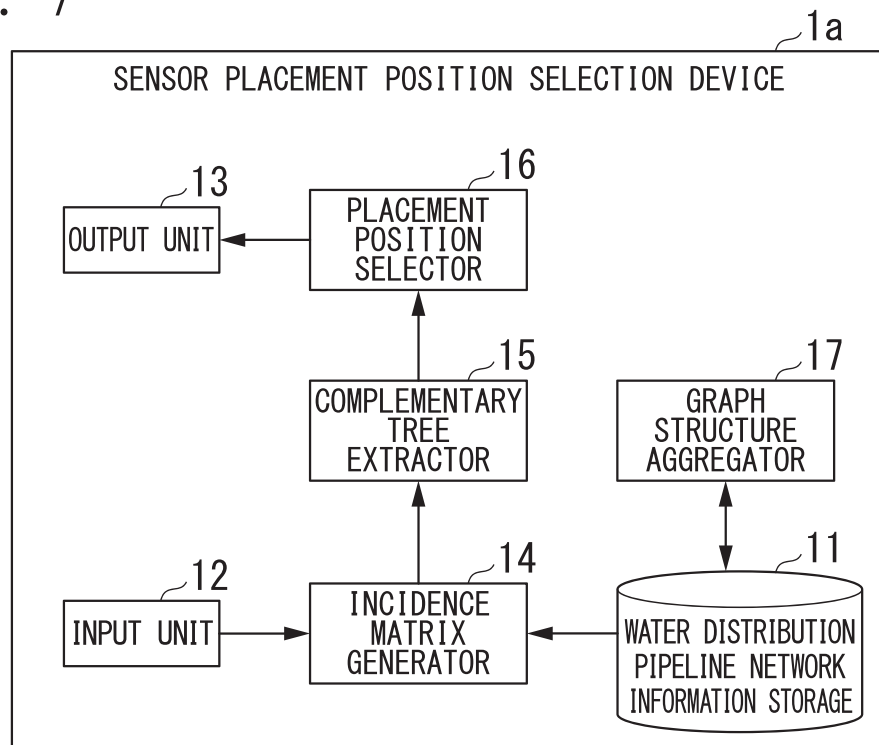


FIG. 8

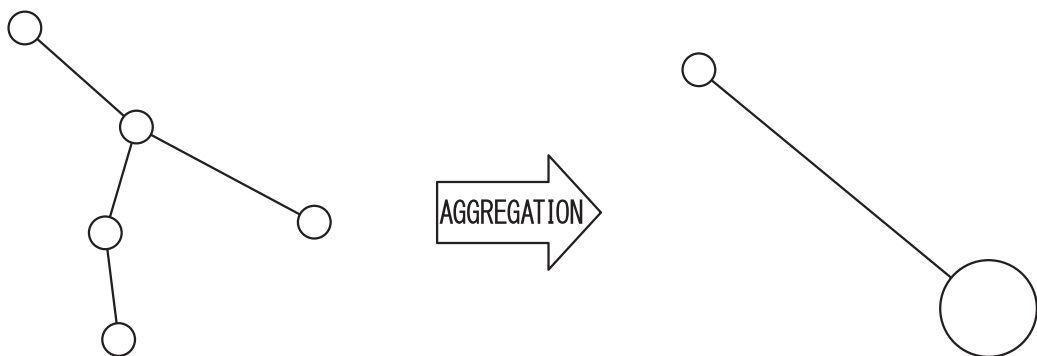


FIG. 9

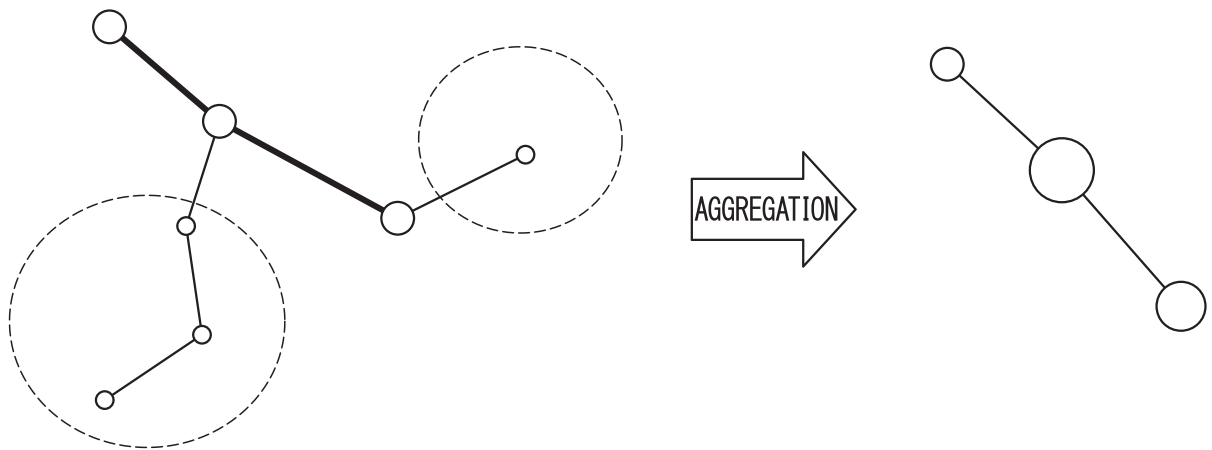
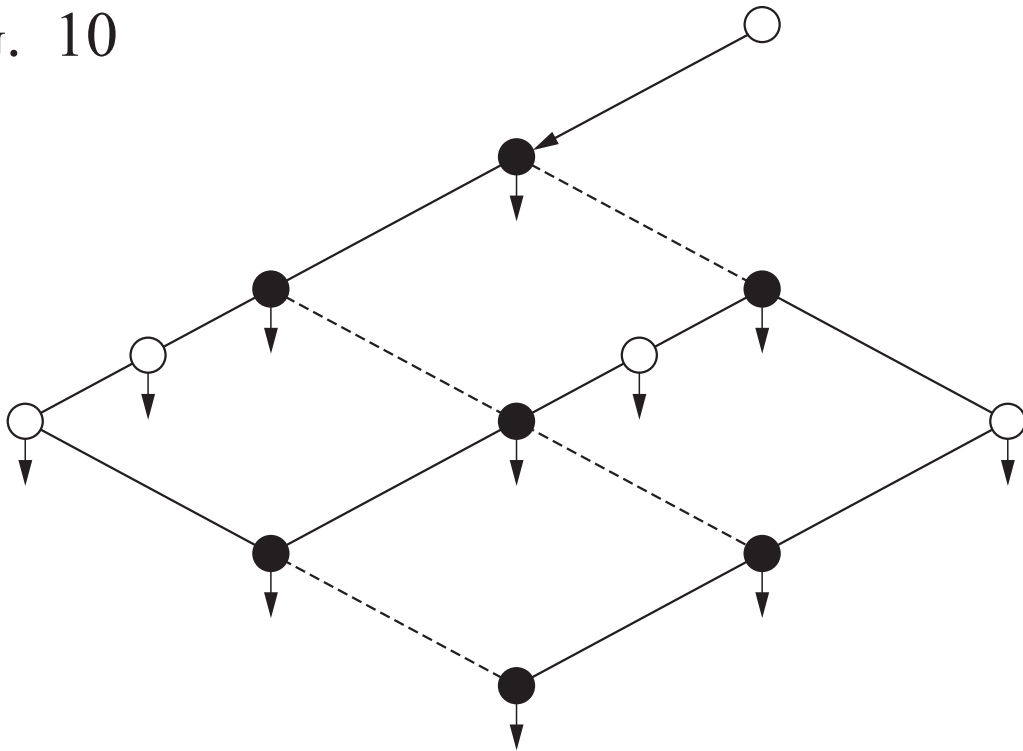
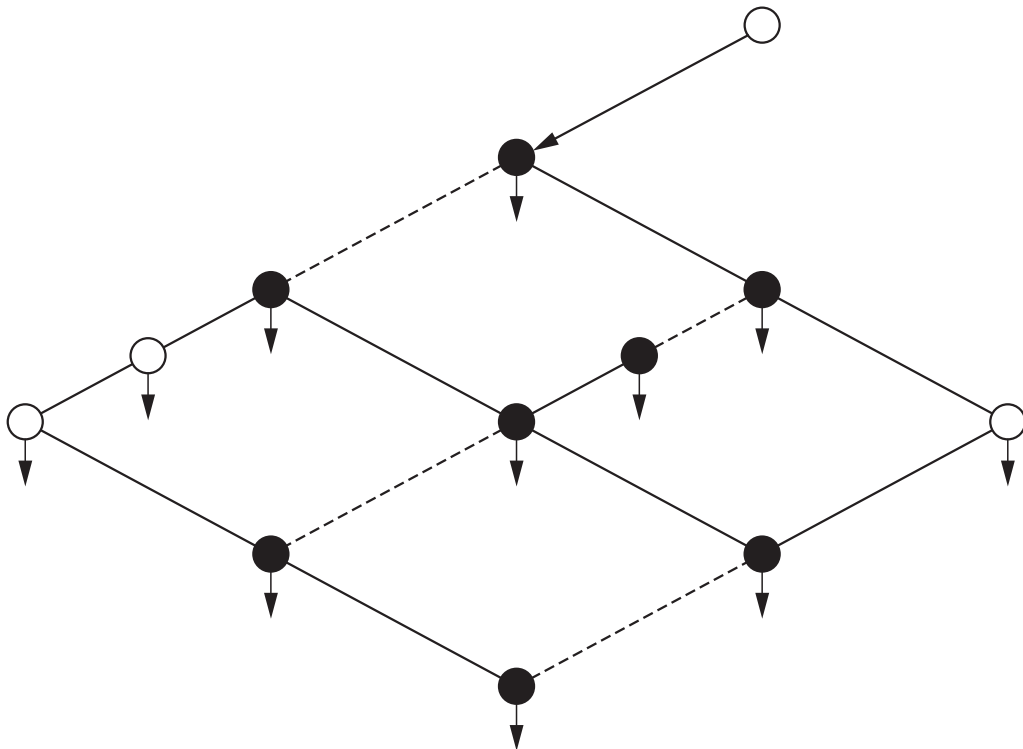


FIG. 10



NUMBER OF WATER PRESSURE SENSORS : 7
 RESOLUTION OF WATER LEAKAGE DIAGNOSIS : 11 NODE



NUMBER OF WATER PRESSURE SENSORS : 8
 RESOLUTION OF WATER LEAKAGE DIAGNOSIS : 10 NODE

FIG. 11

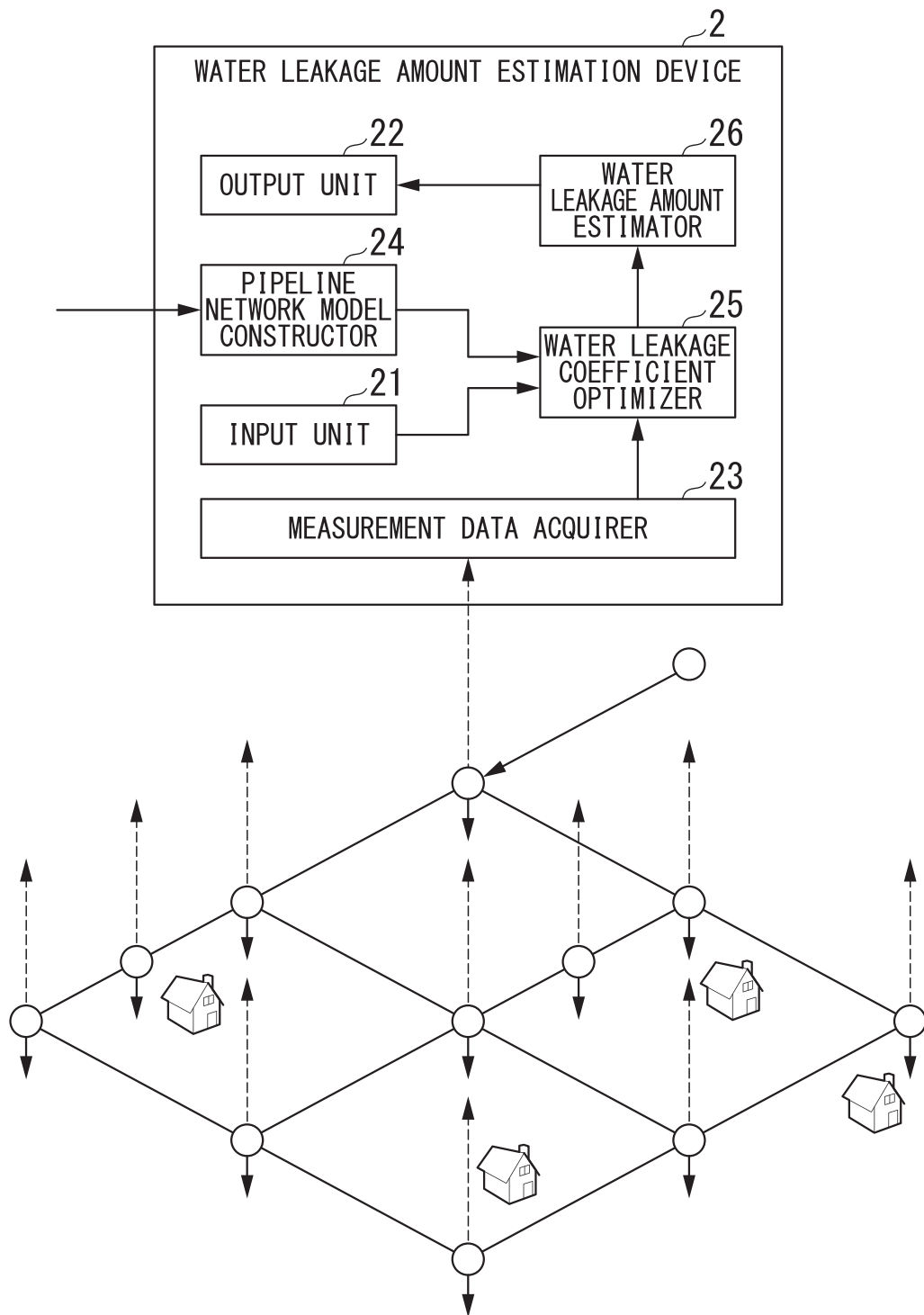


FIG. 12

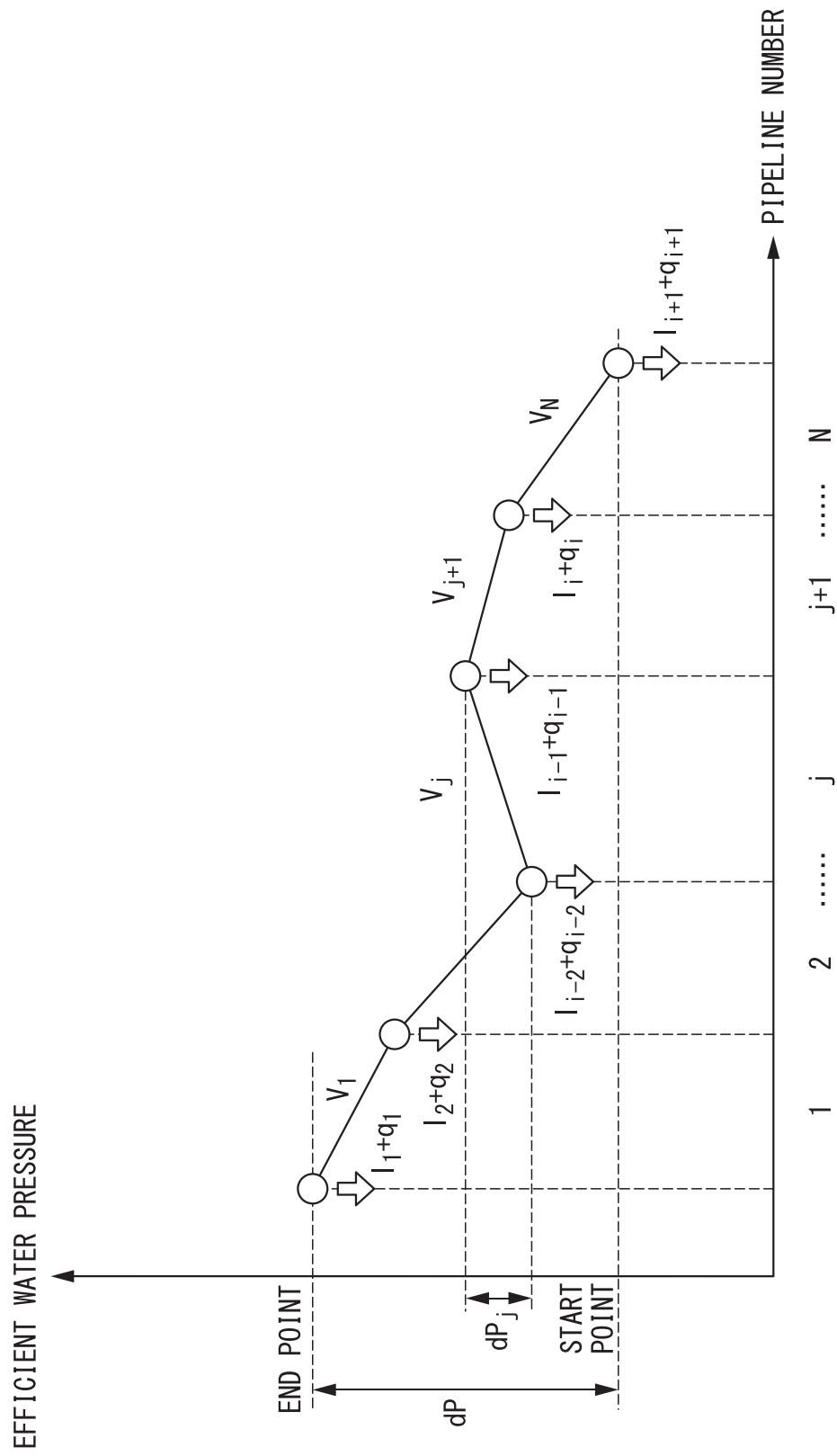


FIG. 13

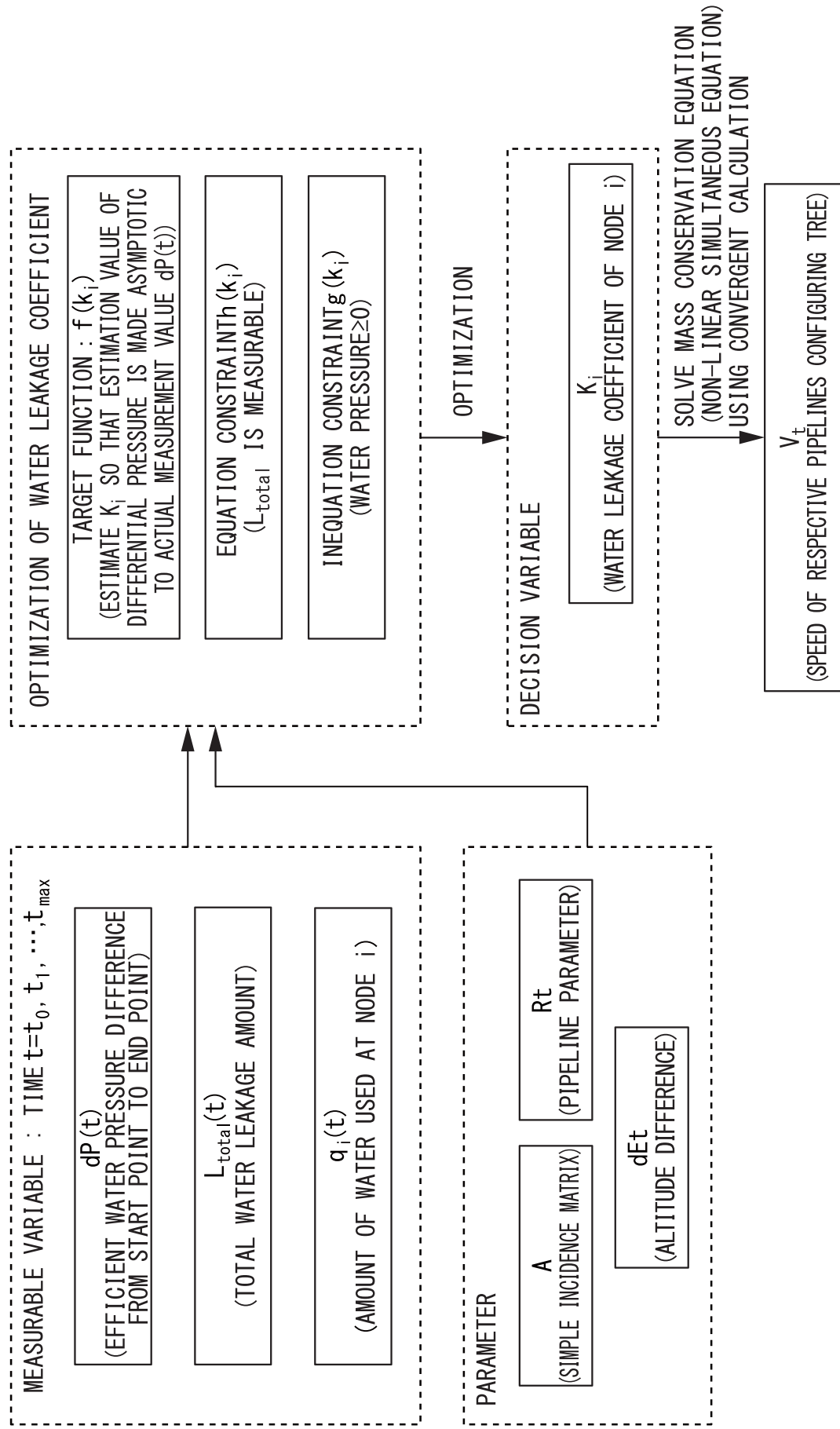


FIG. 14

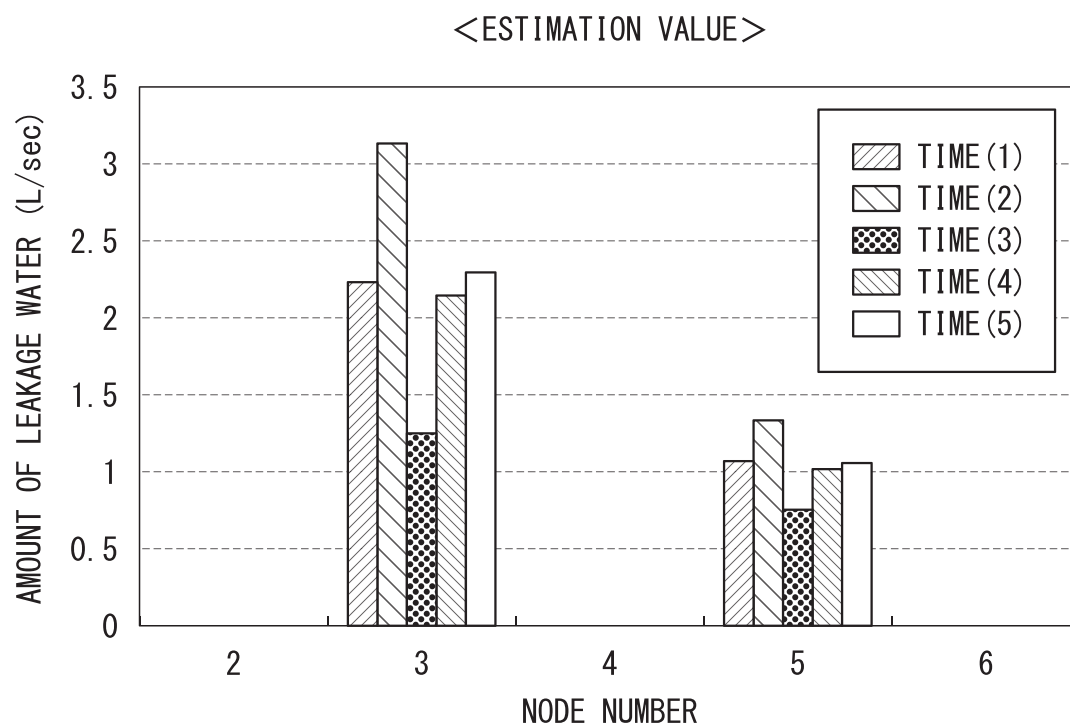
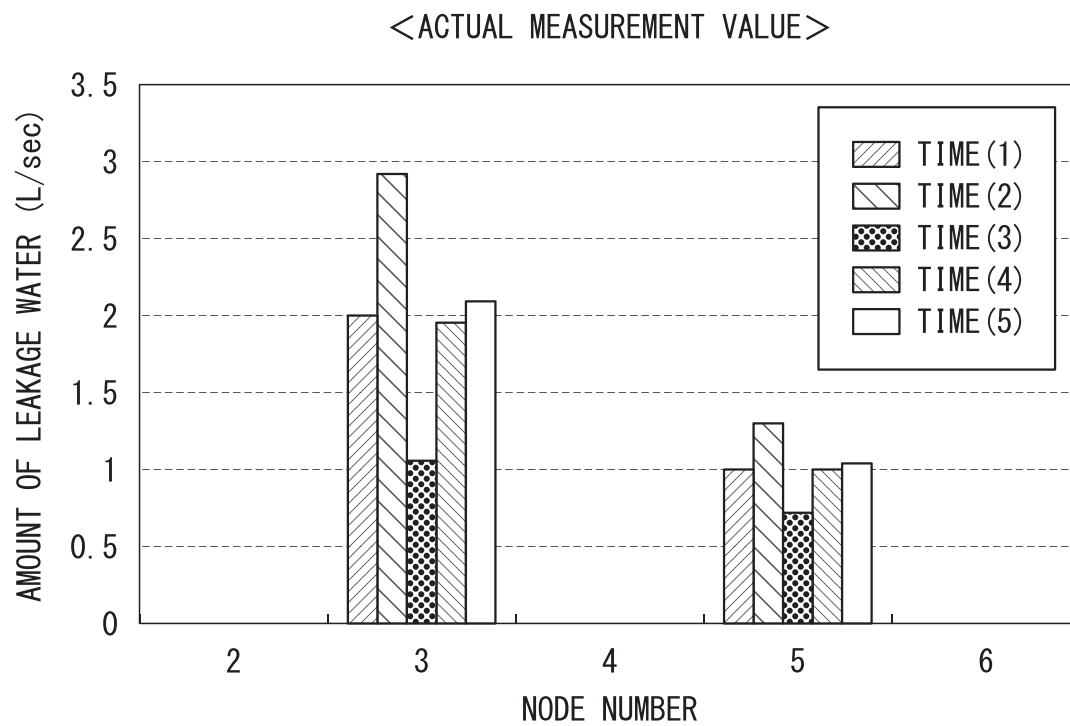


FIG. 15

