

FIG. 1

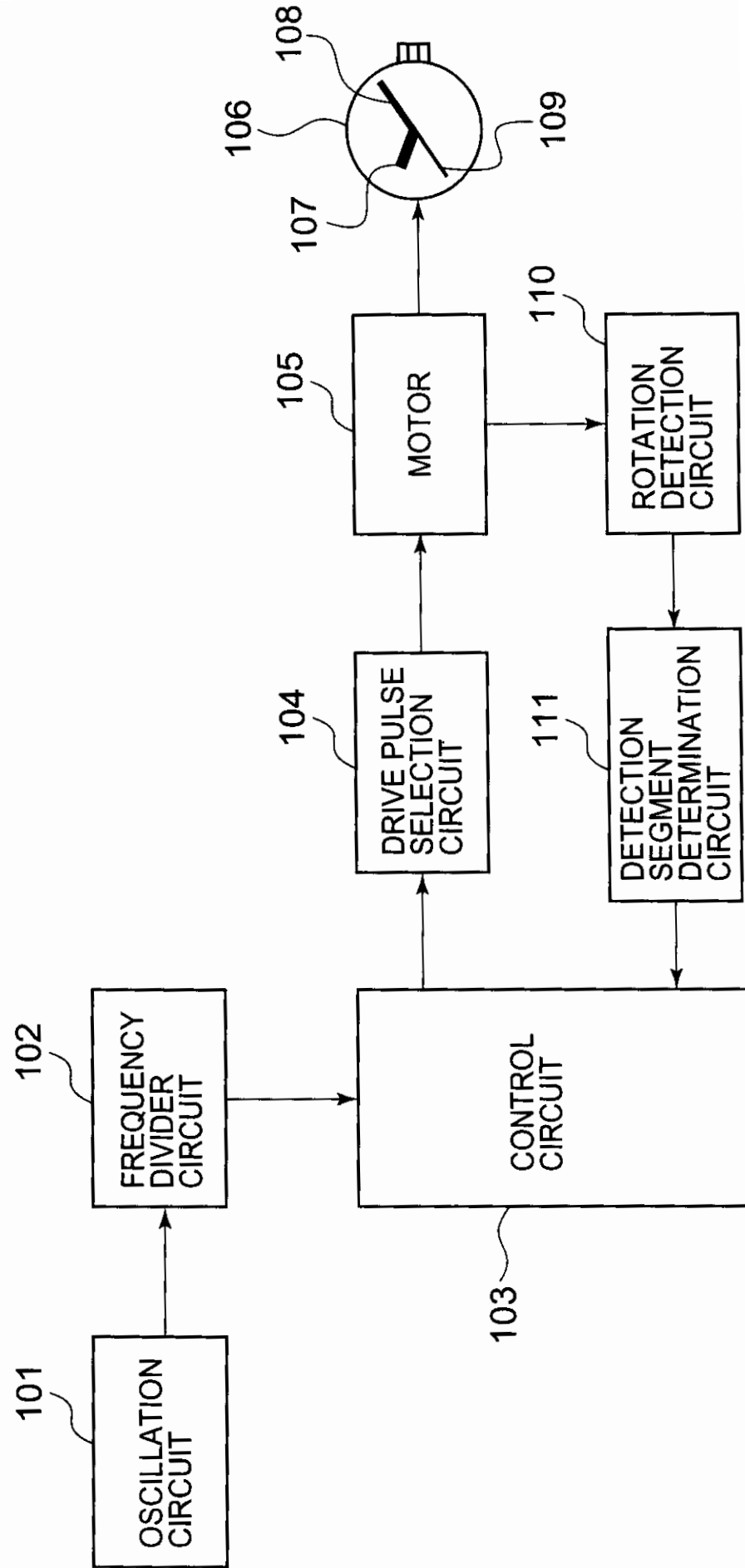


FIG. 2

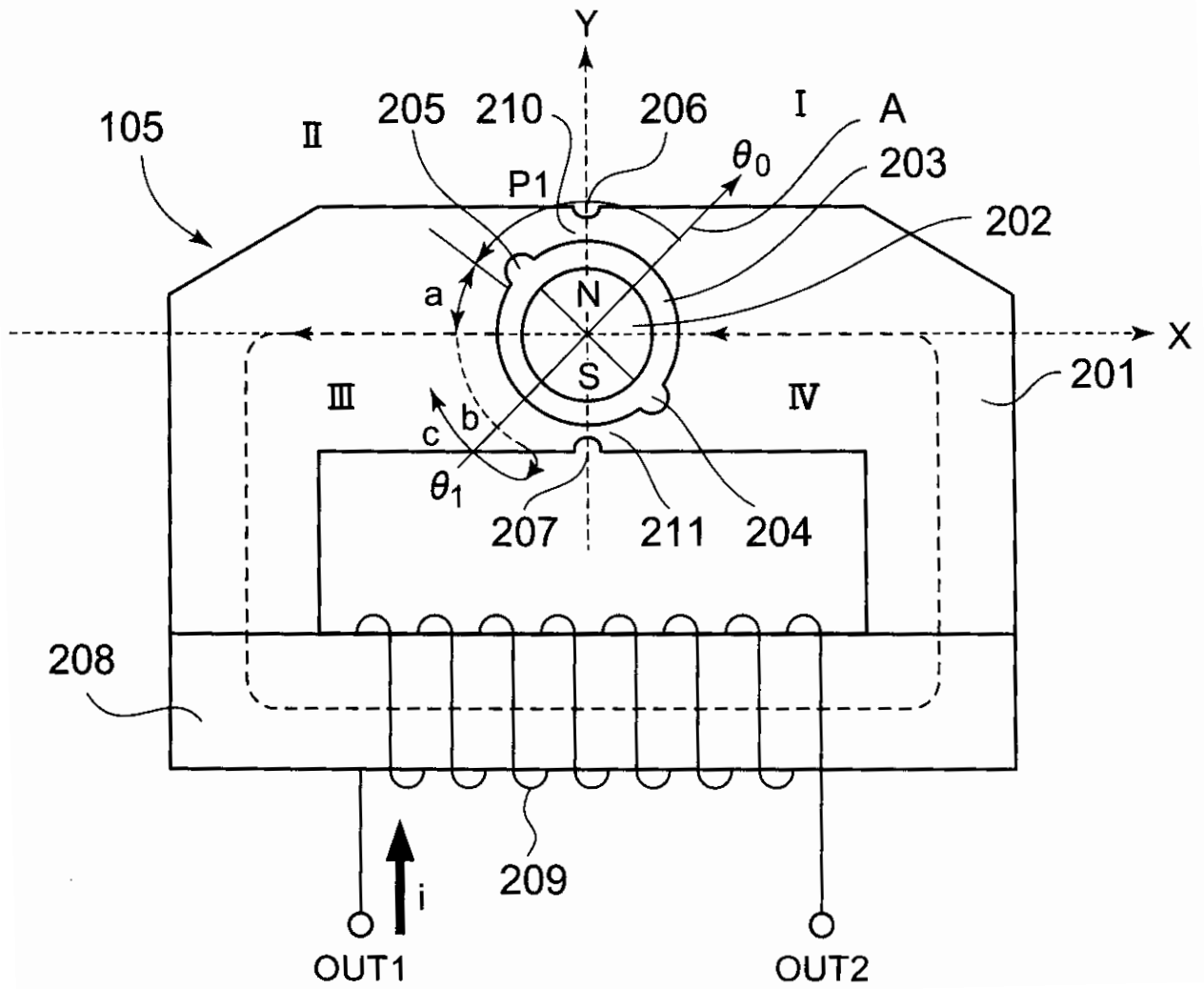
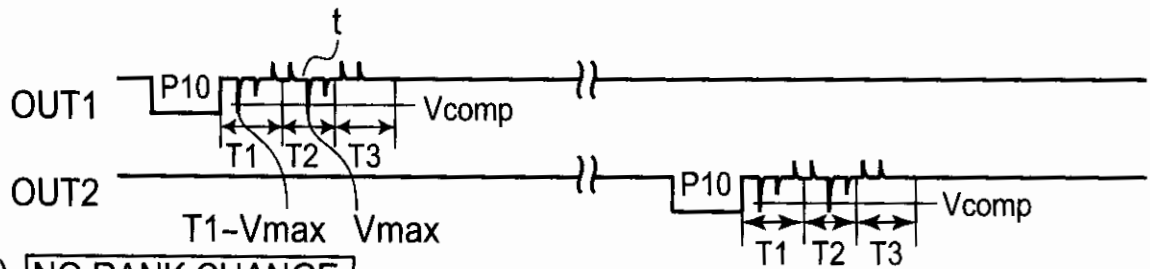
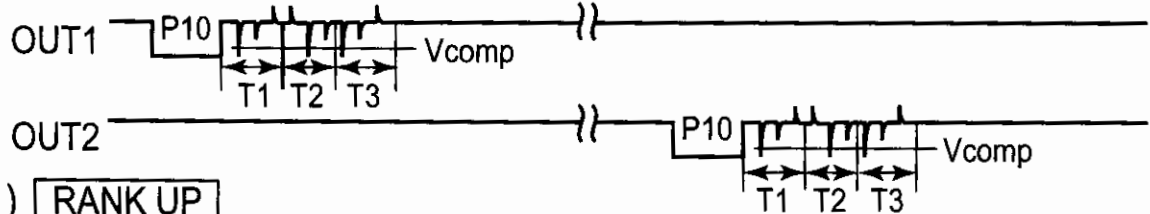


FIG. 3

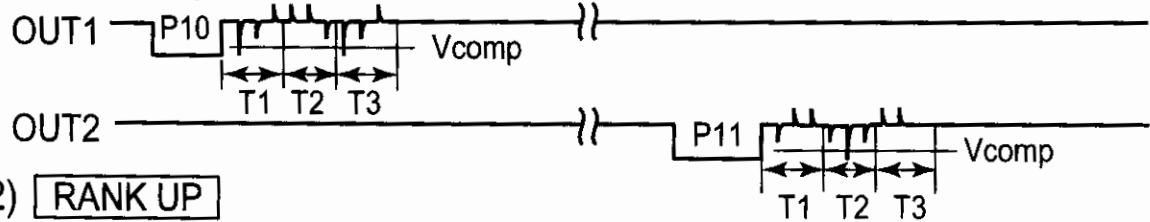
(a1) NO RANK CHANGE



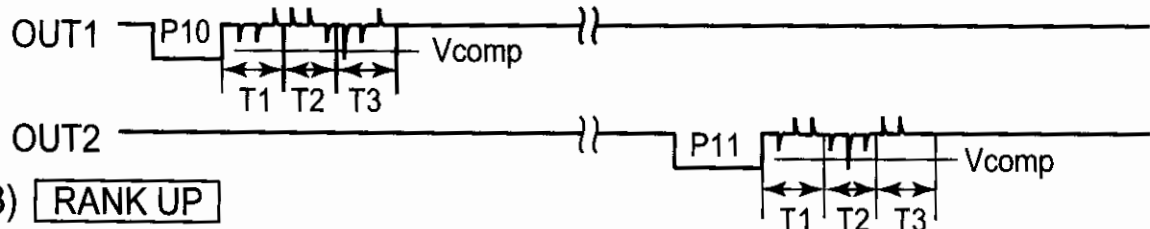
(a2) NO RANK CHANGE



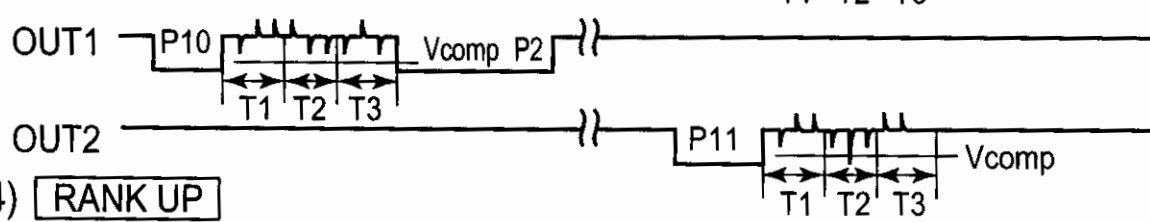
(b1) RANK UP



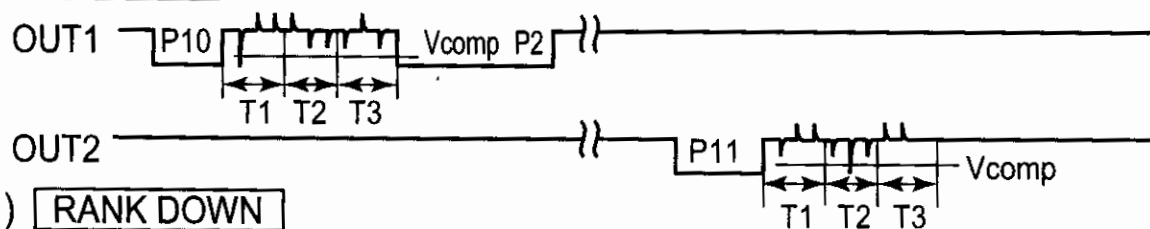
(b2) RANK UP



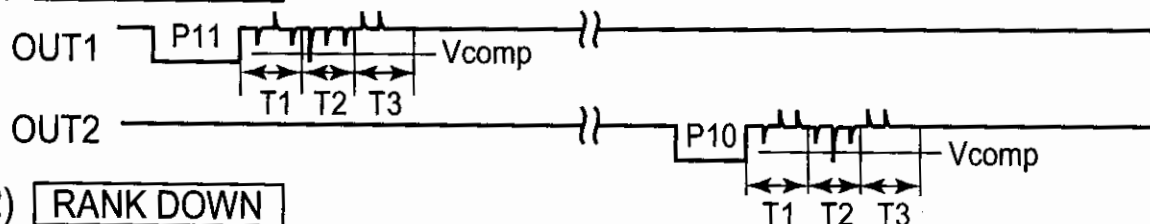
(b3) RANK UP



(b4) RANK UP



(c1) RANK DOWN



(c2) RANK DOWN

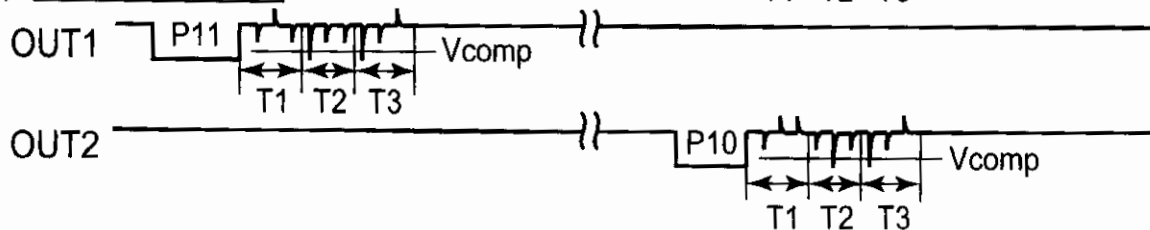


FIG. 4

DETECTION OF ROTATION				RANK OPERATION		
T1	T2	T3	DETERMINATION	DECISION	P1	P2
0	1	1/0	ROTATION WITH RESERVED CAPACITY	DOWN	-1 RANK	NO OPERATION
1	1	1/0	ROTATION WITHOUT RESERVED CAPACITY	MAINTAINED	0	NO OPERATION
1/0	0	1	ROTATION WITH LEAST ENERGY	UP	+1 RANK	NO OPERATION
1/0	0	0	NON-ROTATION	P2 + UP	+1 RANK	WITH OPERATION

FIG. 5

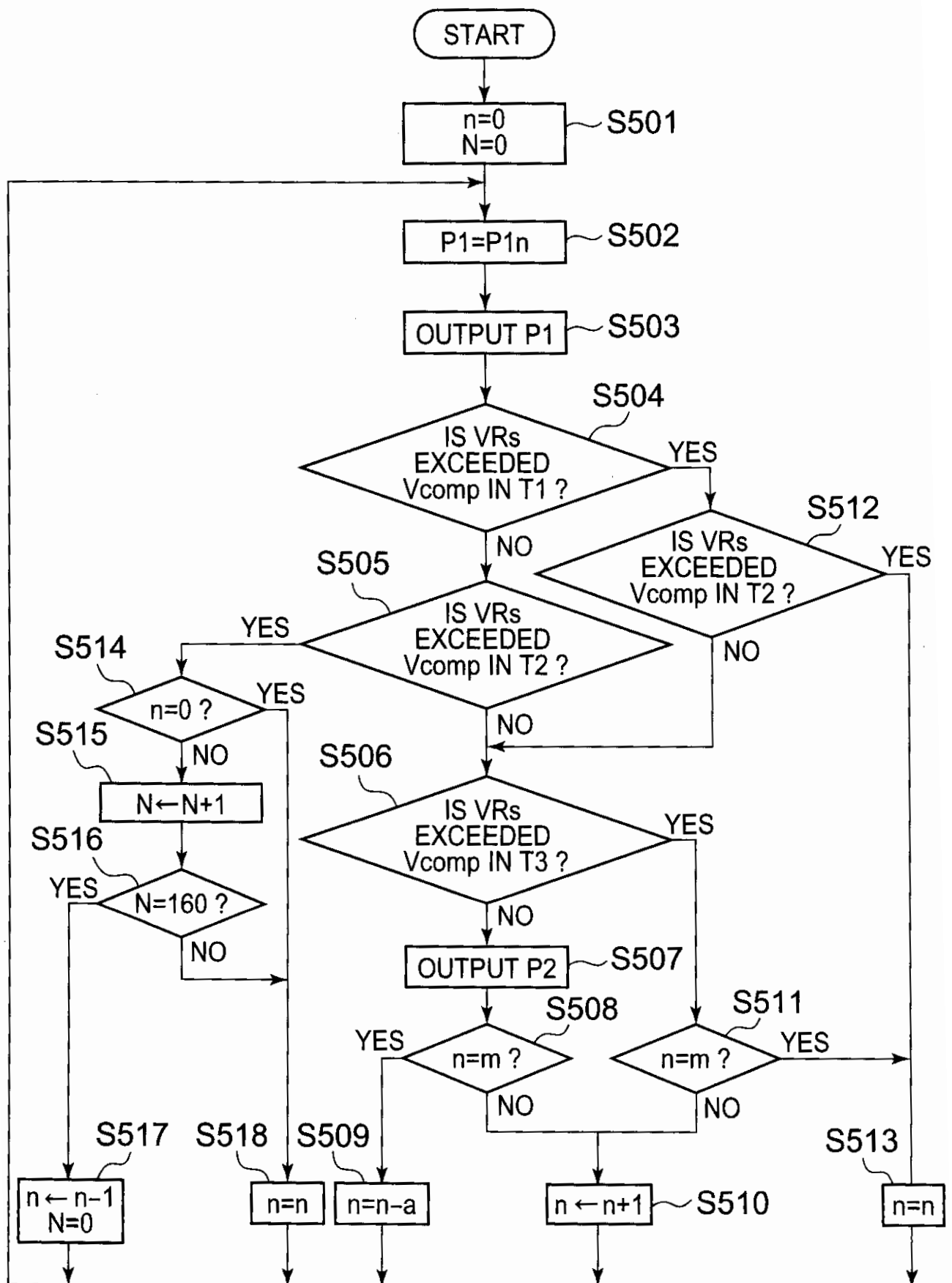


FIG. 6

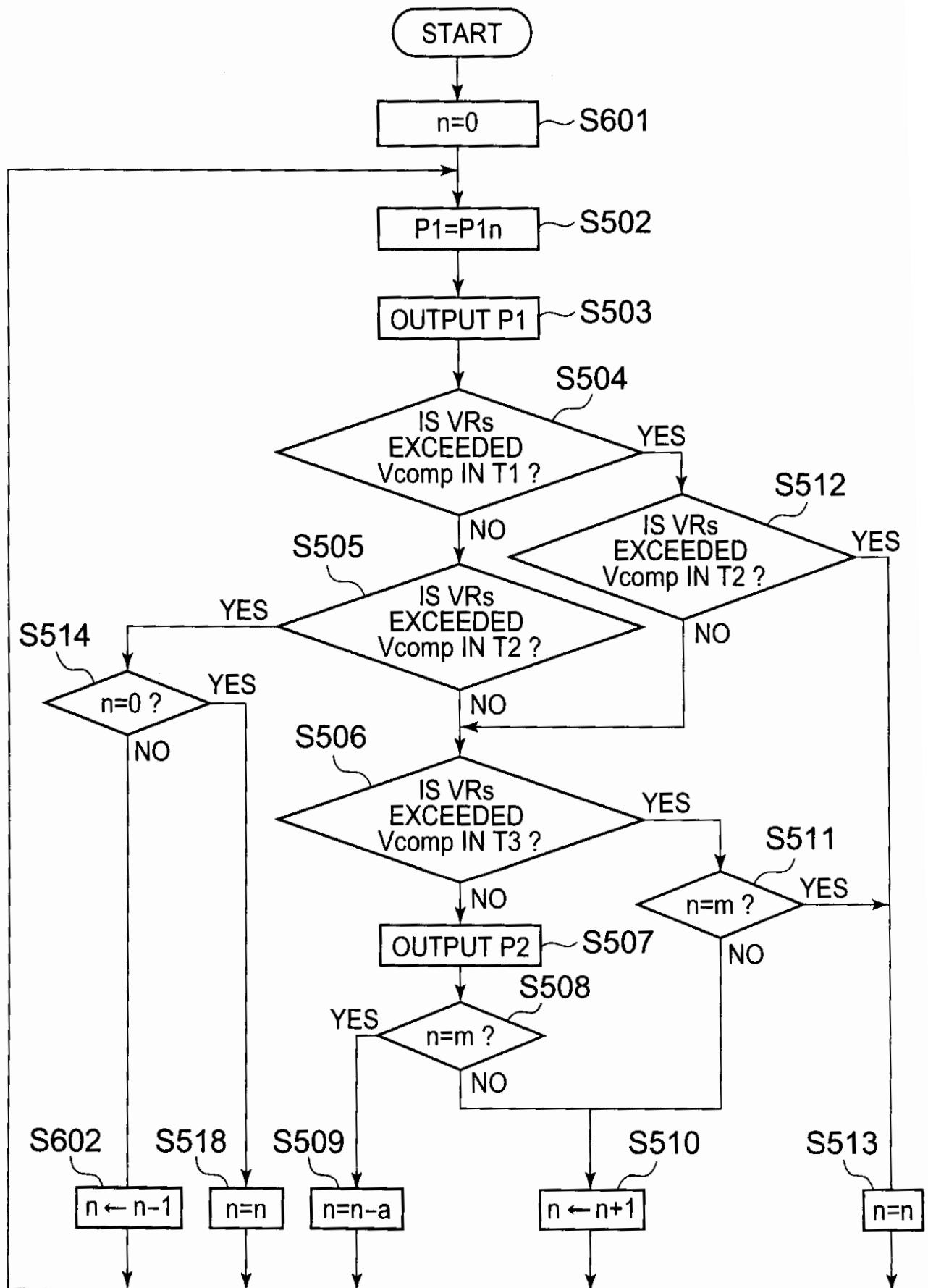


FIG. 7

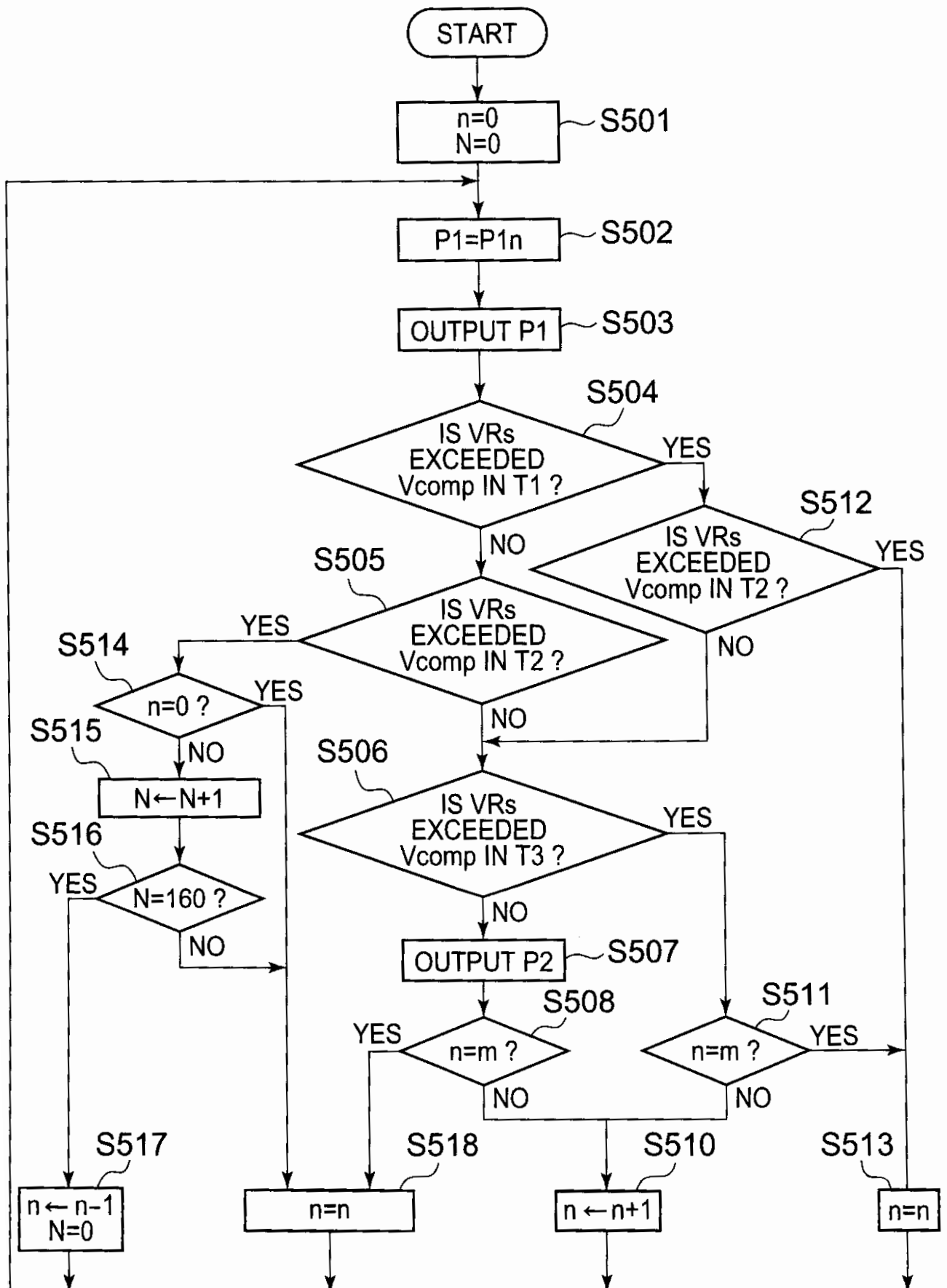


FIG. 8

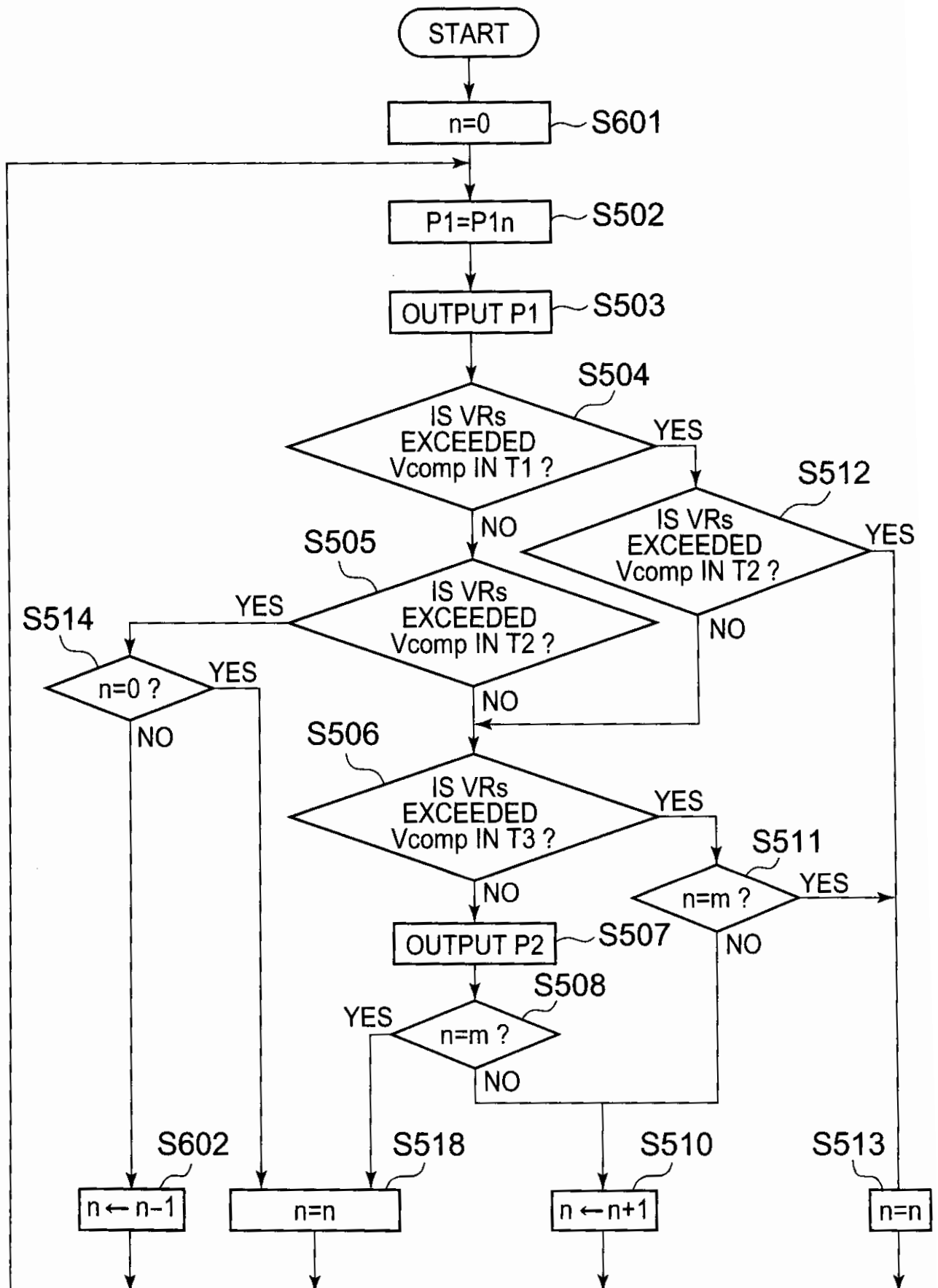


FIG. 9

STATE	ROTATION BEHAVIOR	VRs OUTPUT TIMING	T1	T2	T3	PULSE ACTION
NORMAL LOAD			0	1	0	PULSE DOWN
MINIMUM LOAD INCREMENT			0	1	1	PULSE DOWN
MEDIUM LOAD INCREMENT			1	1	1	MAINTAINED
LARGE LOAD INCREMENT			1	0	1	PULSE UP
P1 NON-ROTATION			0	0	0	PULSE UP + P2

FIG. 10

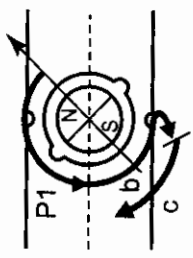
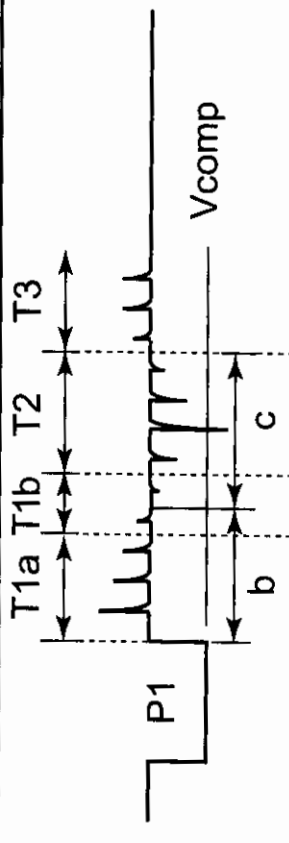
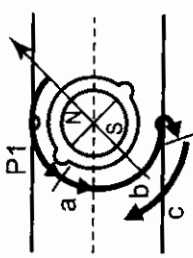
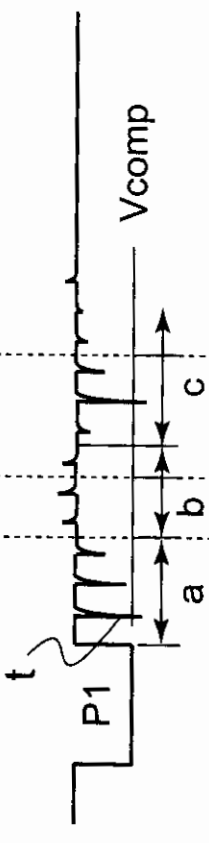
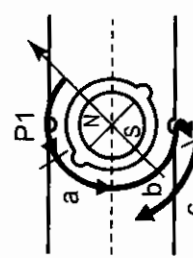
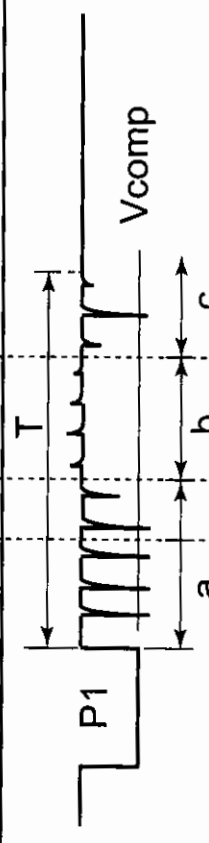
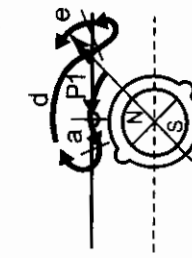
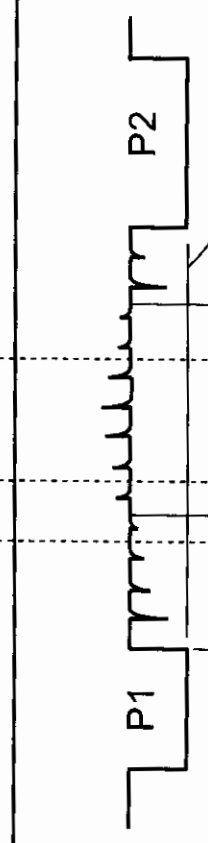
STATE	ROTATION BEHAVIOR	VRs OUTPUT TIMING	PULSE ACTION
NORMAL LOAD			PULSE DOWN
SMALL LOAD INCREMENT			MAINTAINED
LARGE LOAD INCREMENT			PULSE UP
NON-ROTATION			PULSE UP + P2

FIG. 11

DETECTION OF ROTATION					RANK OPERATION		
T1a	T1b	T2	T3	DETERMINATION	DECISION	P1	P2
1/0	0	0	0	NON-ROTATION	P2+UP	+1 RANK	WITH OPERATION
1/0	0	0	1	LARGE LOAD INCREMENT	UP	+1 RANK	NO OPERATION
0	0	1	0	NORMAL LOAD	DOWN	-1 RANK	NO OPERATION
0	0	1	1	NORMAL LOAD	DOWN	-1 RANK	NO OPERATION
1/0	1	0	0	NON-ROTATION	P2+UP	+1 RANK	WITH OPERATION
1/0	1	0	1	LARGE LOAD INCREMENT	UP	+1 RANK	NO OPERATION
1/0	1	1	0	LARGE LOAD INCREMENT	UP	+1 RANK	NO OPERATION
1/0	1	1	1	LARGE LOAD INCREMENT	UP	+1 RANK	NO OPERATION
1	0	1	0	SMALL LOAD INCREMENT	MAINTAINED	± 0 RANK	NO OPERATION
1	0	1	1	SMALL LOAD INCREMENT	MAINTAINED	± 0 RANK	NO OPERATION

FIG. 12

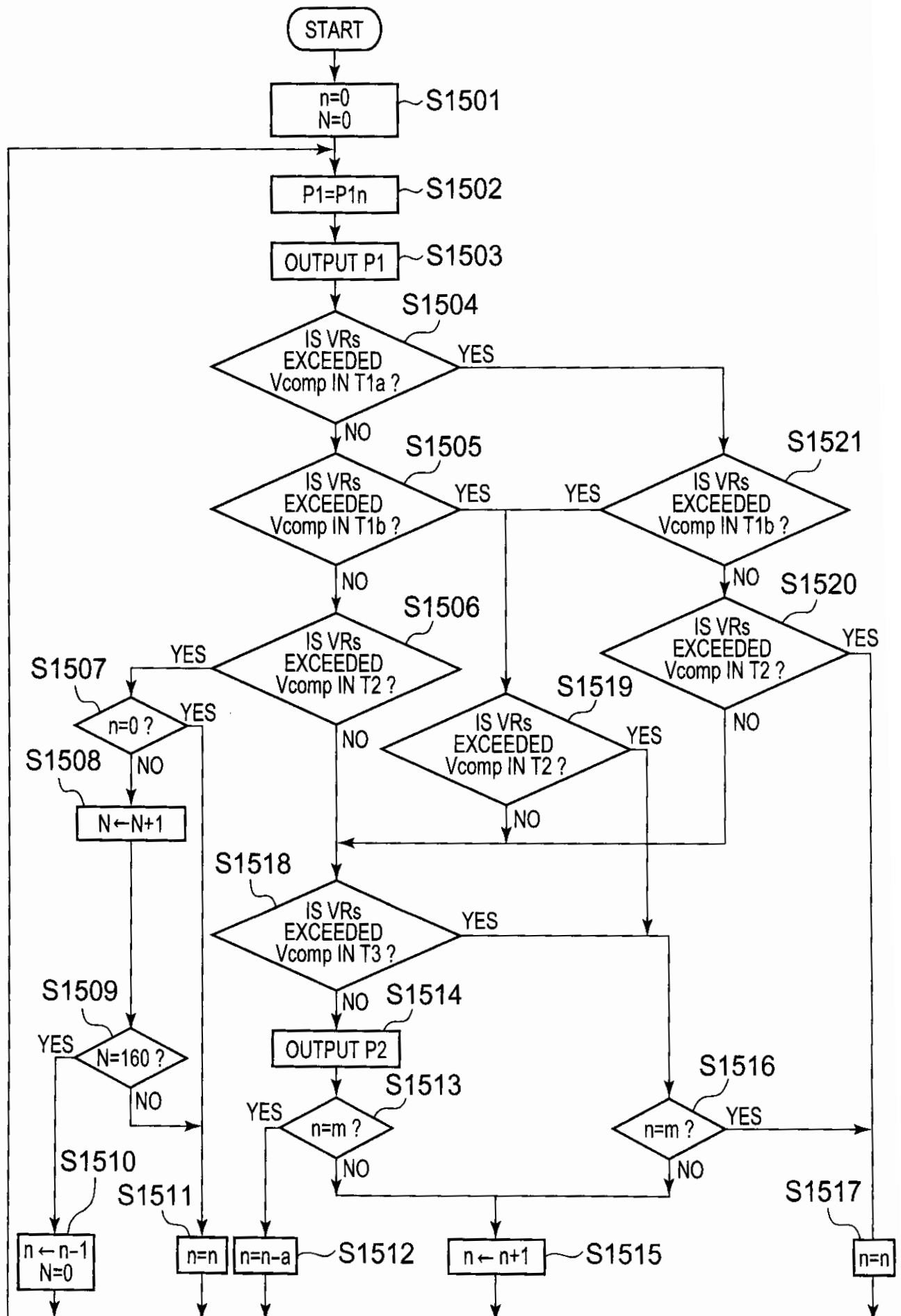


FIG. 13

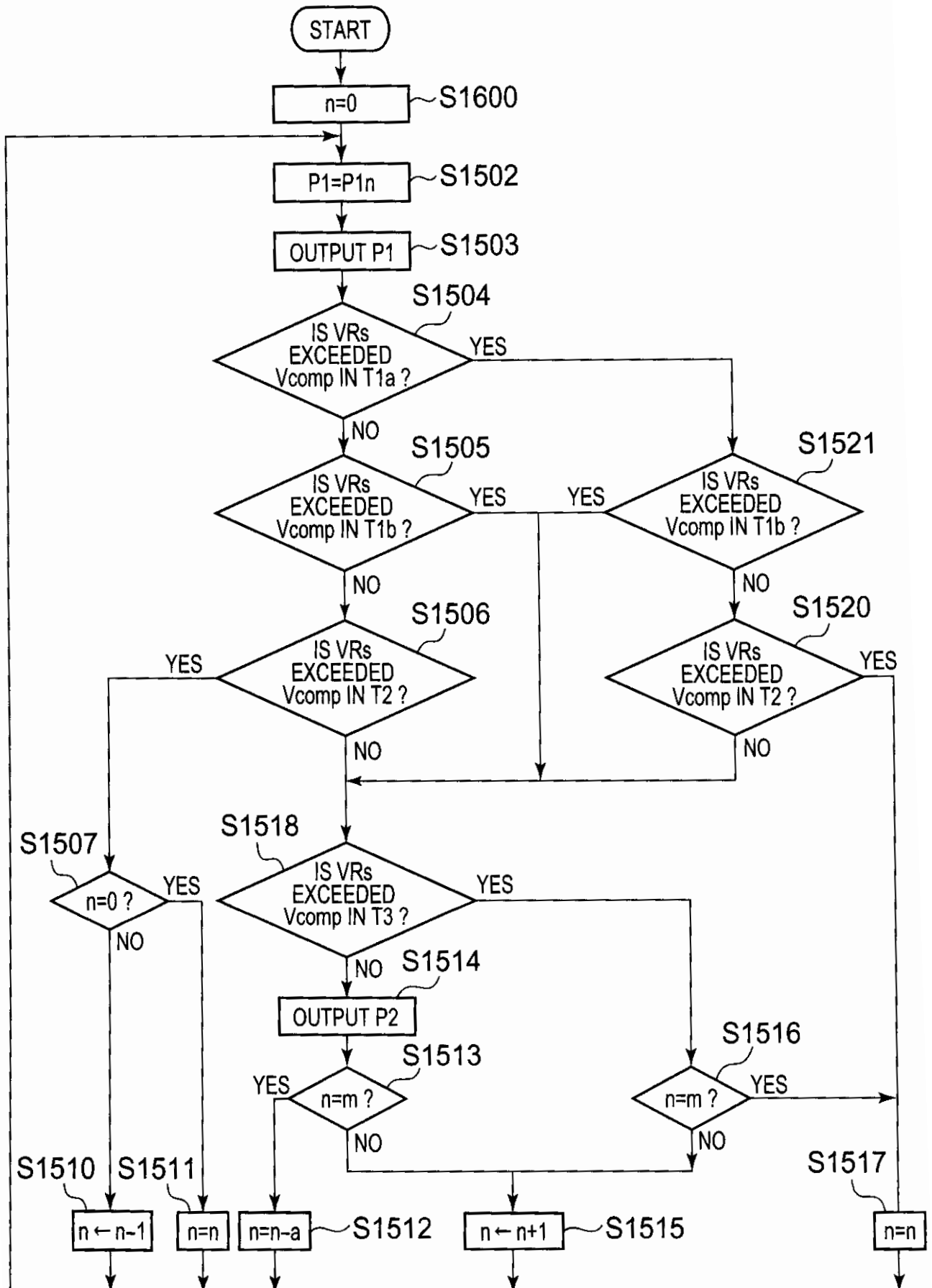


FIG. 14

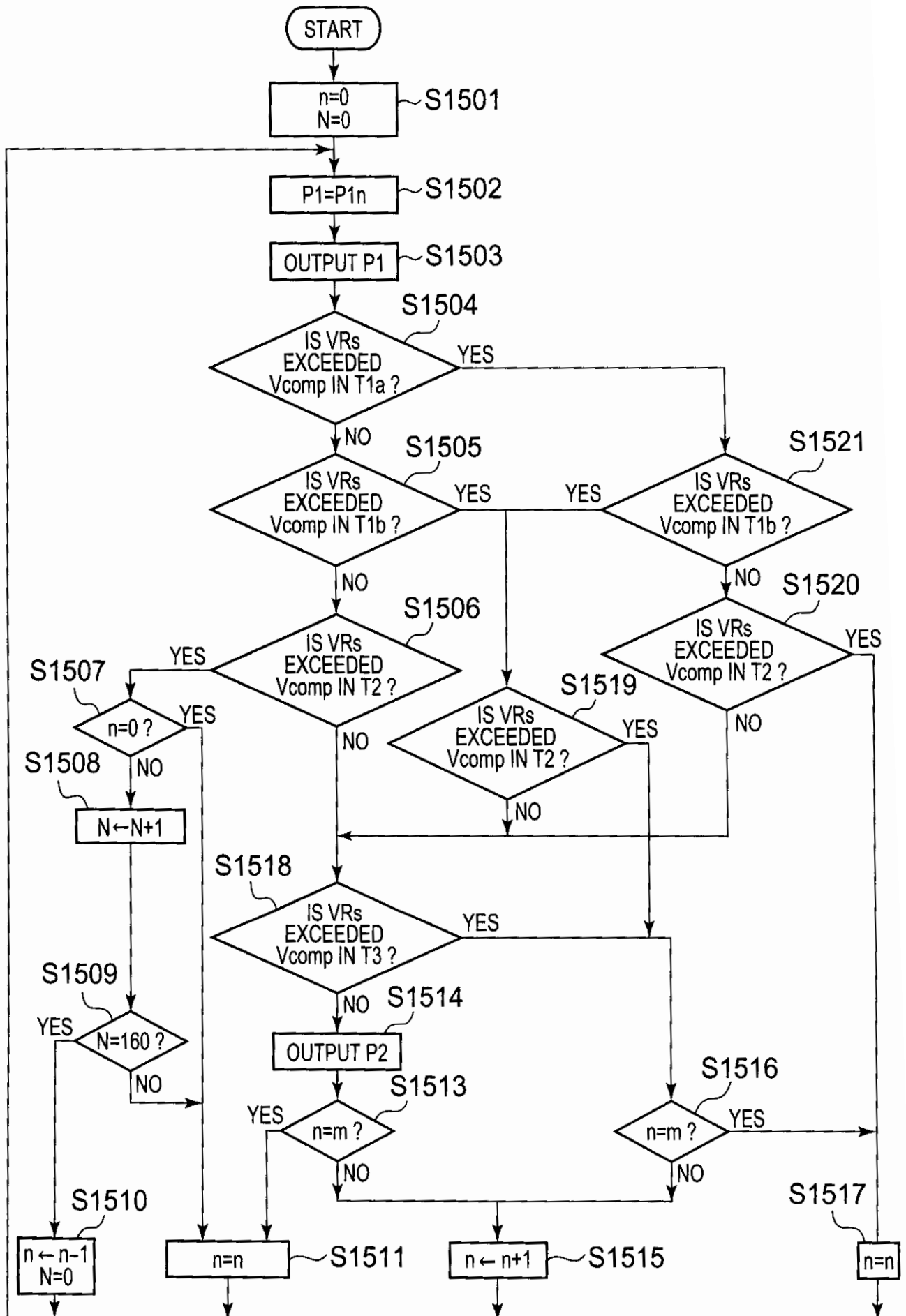


FIG. 15

