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2001 07 23

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(22) 2000 06 02

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2000 - 065398 2000 03 09 (JP)

(71) 가 가
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(201)

(101) (103) (201) (105)
 . (108)
 ,
 (109) (104) (101) (105)
 (113) (112)

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EEPROM

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RWW EEPROM

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RWW EEPROM

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RWW EEPROM

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RWW EEPROM

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RWW EEPROM

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13 5 7

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EEPROM

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17 .
18 .
19 EEPROM .
20 19 .
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22 RWW EEPROM .
23 .
24 ROM .
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101 :
102 :
103 :
104 :
105 :
106 :
107 :
108 :
109 :
110 : I/O
111 :
112 :
113 :

201 :

304 :

305a :

305b :

306a :

306b :

315 :

316a, 316b :

317a, 317b :

319 a, 319b :

320a, 320b :

321a, 321b :

307 :

308 :

309 :

310 :

311 :

312 :

313a, 313b :

314a, 314b : I/O

401 :

402 :

403 :

404 :

410a, 410b :

420a, 420b :

421a, 421b :

601 :

602 :

503 :

604 :

605 :

615 :

606 :

608 :

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612 :

611 :

612 :

513 :

614 :

616 :

701 :

800 :

801 :

802 : ROM

821 :

EEPROM

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, EEPROM , DRAM

[1]

1 , BL MC , WL 1 , EEPROM 2 MOS (101) , MC , NOR E
EPROM 가 2

가 가 " 0" 가 가 " 1"
가 가 BL WL 가

03) (106) 가 (107) , (102) (101) (1
 104) (104) , (103) , (113) (
 , 16 (104)가 , 16 / , 16 B
 L (103) 16

) (101) , (3
 SBL (201; 201a 201c)가
 (201) (105)가 (114)
 (104) (105) (105) 16
 (113) , (112)가

(201) (201) (101)
 (105) (104)
 (108), (109), I/O (110) (1
 11) .

(108) , (4) ,
 (201) (2) .
 (109) , (108) I/O (110) , I/O
 HIT < 0:15> .

(110) , 3 (105) , S/A(RD0), S/A(RD1),
 S/A(RD2) , 00="S/A(RD0)," 01="S/A(RD0)," 10="S/A(RD1)," 11="S/A(RD2) "
 (114) , (105) 가 . ,
 (110) , 00 HIT < 0:15> 가 0 ,

" 01"
 (109) 가 , I/O (110) HIT < 0:15>
 0 (112) , (104) (113)
 (109) , (108) IO
 가 , " 0101" (= "IO5) , HIT5가 " 1" , HIT < 0:4> , HIT
 < 6:15> " 0" , " 01" (105)

S/A(RD0)가 HIT5 (112) , S/A(RD0) (113) HIT < 0:4> , HIT < 6:15> = "" 0" , IO="0 4," IO="6 15 " (112) 가, (104)

5) (114) , (12) 가 가 , 3 16+3 가 (201) (10)

3

[2]

3 4 RWW(Read While Write) EERPOM RW
W EEPROM , 가 2 , 가 3
가 (101)가 2 BANK0, BANK1

2 BANK0, BANK1 가 (301), (302),
(303)가 BANK0, BANK1 , 1
(304)가 2 BANK0, BANK1 ,
2 가 (305a) , 2 (305b)가
(306a) (306b)

(308) (310) , ,
(307) (305a) () , ,

(309) (311) , (308) ,
(305b)

가 BANK0, BANK1 가 (315) (310)
" H" 가 (315) " L"

BANK0, BANK1 , (306a) (DLS
W1; 316a) , (306b) (DLSW2; 316b)
, 16 , 16 (31
6a, 316b)가 (304) 가 , 2 (317
a, 317b)가 .

2 (315) " H" , (315) (316b, 317b)가 , . ,
(306b) . (315) " L" , (316a, 317a)가 ,
(306a) .

2 (305a, 305b) 가 , 2 (AddS
W1, AddSW2; 318a, 318b)가 (318a, 318b) (315)
. , (315) " H" , (318b)가 ,
(305b) 가 (301) . (315) " L" ,
(318a)가 , (305a) 가 (301)

(319a) , (306a)
(319b) , (306b)
, 16 , (319a, 319b) 16 . ,
(306a, 306b) 1 (320a, 3
20b)가 .

(320a) , 가 , (319a)
(321a)가 . (321a) ,
HITa< 0:15> 가 , (320b)
(319b)
(321b)가 (321b) ,
HITb< 0:15> .

(322) , (323) .

HITa, HITb
(305a, 305b) , (313a, 313
b) , 4 , 2 (314a, 314b) (312)
I/O (I/O) 가 (313a, 313b) ,
(305a, 305b) (312)
1 가 I/O (314a, 314b) I/O
HITa< 0:15> , HITb< 0:15> .

(307)
 (313a) (213)
 HITa< 0:15> " 0" (319a)
 (313a) , I/O="157가" HI
 Ta< 0:15> , HITa0 14 " 0" , HITa15="" 1" I/O="15 " (31
 9a) (320a)

(308) (309)
 (313b) (312) HITb<it
 ; 0:15> " 0" (319b) (322)
 HITb0 14가 " 0" , HITb15="" 1" , I/O="157가" , I/O="15 " HITb< 0:15>
 (320b) (322) (319b)

EEPROM , RWW 2 2
 , 2
 , 1 가 ,
 , 2 , 2

2 가 , (304)가 ,
 1 가 , 1 가
 가
 [3]

5 6 , RWW EEPROM , 가 ,
 1, 2 , 2 가 2 BANK0, BANK1 (401) ,
 (401) , (403) 1 (,
 ; 403) (403)

(401) (403) ,
 (401) (403) ,
 (402, 404)가

2 가 , 2 (305a, 305b) , BANK0, BANK1
 (315)가 , (315) (318a, 3
 18b)가 , (305b) 가, (3
 18b) (402, 404) , (305a) 가

4 , 3 가 , 가 , 3
 (420a, 420b)
 (318a, 318b)

10 , 3 4 RWW EEPROM , RWW (431a)
 (431b) (432a, 432b)가 BANK0, BANK1
 (432a, 432b)가 (433, 434)
 BANK0, BANK1

10 , BANK0 , 0 n , BABK1
 8 BLK0 BLK7
 RBLK가 RBLK가 (403)

3,4 , 10 , BANK0 1 BLK7 x
 PBLK , 3,4

[5]

8 , 7 , 가 , 7
 (420a, 420b) HITa, HITb가 가 ,
 HITa, HITb

6 (312) , (313a, 313b)

HITa, HITb , (420a, 420b) , (420a, 420b) ,
 가

11 , 10 ,
 1 BLK7 , 1 RBLK , 0 RBL
 K 1 BLK7 가 .
 , 가 가 ,

[6]

9 , ,
 (403) , 3 5 , BANK0, BANK1 (401)
 (403) BANK0, BANK1 (403)

, BANK0, BANK1 (401) , 가
가

, BANK0, BANK1 (318a, 318b) , (403) 2
(305a, 305b) (501a, 501b)가 , BANK0, BANK
1 , 2 (305a, 305b) (420a, 420b)가 ,
(403) , (305a, 305b) (502a, 502b)가 .

BANK0, BANK1 (420a, 420b) , 2 (313a, 313b)
(411a, 411b) HITa, HITb가 , (403)
(502a, 502b) , (411a, 411b) HITa, HITb가

, (502a) (501a) , (502b)
(502b) . (312)
, HITa, HITb
, (502 a, 502b) , OR G
, (403) (404) , .

가 , , 가 , BANK0, BANK1 (420a, 420b)
, (315) , BANK0, BABK1 가
, (403) 가 , BANK0, BANK1 (420a, 420b)
, (305a, 305b) , (502a, 502b)가 ,
(403) , (403) .

, (403) , BANK0, BANK1 , 12 ,
(403) RBLK1 , BANK0 n , BLK7 ,
RBLK2, RBLK3 BANK1 BLK6, BLK7 .

, (403)
, 가 , 12 ,
(503)가 , BANK0가 ,
, (432a) 가 .

[7]

10 11 , BANK0, BANK1 , 가 , 가
BANK1

15 , (610) , (611) , (613) , (615), (606) , 607 (6) 15) , (603) () (606) , 8 (, 8)가 , .

14 , , EEPROM 가 , (612) , (613) , (614) , (615)가 , (605)가 , HIT (602) , (602)

(613) , (616) ERS (612) , (603) " " , " (615) , (607) , (608) , 0V, 0 V ()가 VBB가 , ,

(603) , 17 . NAND G11 , (, ERS="" L") NAND TG1 N1 N2 (, ERS="" H") , C11

N1 I1 , LS1 , " H" VSW, " L" VSS() , LS2 , " H" VSW, " L" VBB , LS2 , I2, I3, I4 MBi , I2 I5 , Mi

Mi, MBi , Mi="VSW(" , 4.8V), MBi="VBB(" , 0V)가 , Mi, MBi가, Mi="VBB(" , -7.5V), MBi="VSW(" , 2.5V)가 , " " 가 .

(602) , GAI, GBI, GCI , (613) HIT VCC가 , (

4 (606) 18 F 1 F4 NAND G21가 8
 AND (604) 1 , " L" 가 . N
 I8 I10 G21 2 NAND G22, G23 , 2 LS3, LS4,
 , BLK가 .

NAND G22, G23 , 가 ,
 , ERS="" L" , TG2가 , CI2가 , 8
 , Bi가 TG2 , NAND G23 . NAND G22 ,
 Bi가 I6 . , NAND G23 N3 ,
 " L" 가 .

N3 , LS3 , " H" VSW, " L" VSS ,
 I10 LS4 , " H" VSW, " L" VBB 18
 , BLKF1 BLKF4 " H" (=VSW)가 .

ERS="" H" , TG2 , CI2가 .
 , NAND G22 " L" 가 , NAND G23 , Bi가 CI2
 , , NAND G23 N3 , 가
 , " H" 가 . , BLKF1 BLKF4 " L" (=VBB)가"

BLKF1 BLKF4 , (607) (608)
 (604) . (604) , Mi, MBi , WL
 BLKF가 .

가 , , Mi="" L" (=VBB), " MBi="" H" (=VSW)가" (603)
 , Mi="" H" (=VSW), " MBi="" L" (=VBB)가" . , BLK0가
 , (606) , BLKF1 BLKF4="" L" (=VBB)가" ,
 (607) , (608a) , 가 BRa="" H" , BRBa="" L" 가 , 가 .

2가 , BLK0 , (604a) 가 , NMOS QN
 , VSS(="0V)가" . (604a) 가
 , BLKF1가 (608a) , VBB 가 , VBB
 . , VBB 가 가 가 . ,
 , VSS , (608b, 608c, ...)가 , Mi, MBi ,
 가 , , 가 . ,

[9]

8 , , " " , , 1 1 (4)

9 , 가

, NAND 8 (603) 19 SELB NOR G31
 , NOR G31 , NOR G32, G 33
 (; 701) . NOR (701) CI1 .

EEPROM

, " " , , (701) " 1" (= " H")
 , SELB= " L" NAND G21 " L" (701) , " H"
 가 가
 (701) , " 0" (= " L")

, (606) (701) ,
 " 1" , (612)
 8 가 , Mi, MBI
 " " , , Mi= " L" , MBI= " H" 9 , 8
 15 (612) (613)

, (603) (701)
 , 가

20 21 , 9 EEPROM (S1), 20 , (S2), (S3).
 가 가 (701) " 1" (S4).
 가 (S5).

가 NG , (S6). , (S
 7), OK가 , (S8), S2 가, error= " 1" (S9), 21 S
 30

S5 OK , (S10), (S11),
 21 (S12), (S21), (S22), 가

4). 가 (S23). 가 NG , (S2) S21
 , (S25), (S26), S21
 , error="" 1" , S30 . OK가 ,
 S23 OK , (S28), (S29),
 (S30), ,
 (S31), .
 8 , 20 S4가 , 20 21 .

[10]

22 , RWW EEPROM ,
 (701)가 2 BANK0, BANK1 ,
 , 가 . BANK0, BANK1 (701)가 2
 (701) , (703)가 . 3 가 ,
 (702, 704)가 .

(305a) (305b) , 2
 (313a, 313b) , (318a, 318b),
 (410a, 410b)가 , (310) BANK0, BANK1
 (315) , 3
 3 , 8 (312) 가
 , (311) .

, RWW EEPROM ,
 , 가 가 .

[11]

가 . ROM , 가 , 가 , 가 ROM
 , 가 , 가 , 가 .
 가 가 , 가 .

() , 가 ,
 , . ,
 , .

23 , , 가
 RAM , , EEPROM , DRAM S
 가 가 .
 23 , .
 (800) , (800)
 (803) , (804)

(802) (800) , (801) , (801) , ROM
 , (802) ,
 , ROM (802) ,
 (804) . ROM (802) , () ,
 (804) 가 .

ROM (802) , 24 , 가 가
 MC ROM (811) . ROM (811)
 , (804) ROM 가 가 ,
 (813)가 , (811) . ,
 (812) , (814) . (812)가

가 , , 25 , 25 (b) ,
 () , A가 , () ,
 B , B가 , ()
 , 가 .

25 (a) , ROM (800) , A가 ,
 , ROM (800) . ,
 (802) (803) , () 가 , ROM
 B . B , ROM (800) .

25 (a) , C , A C , ()
 (801) , ROM (802) ,
 , ROM (802) , 가 .

ROM (802) , 가 , (801)

가 ()

[12]

26 , 23 ROM (802) , (821)

(821) , 27 (801) , (8

22) (803)

(821) , 25 (a) 가 , A

가 , (821) 가 (803)

(822) , A (821) , B가 (801)

ROM , 가 , 가

(area panelty)

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가 RWW EEPROM

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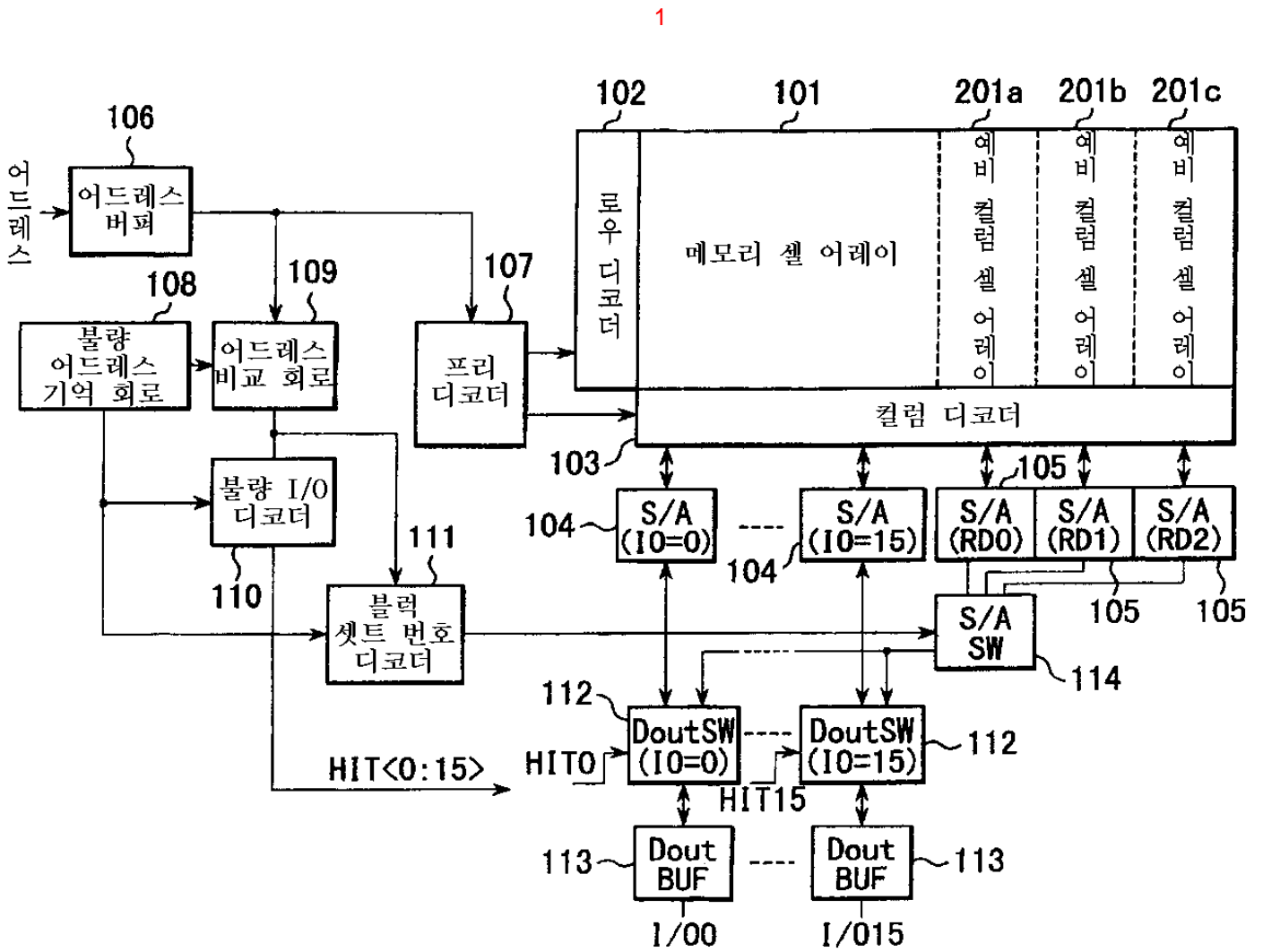
8

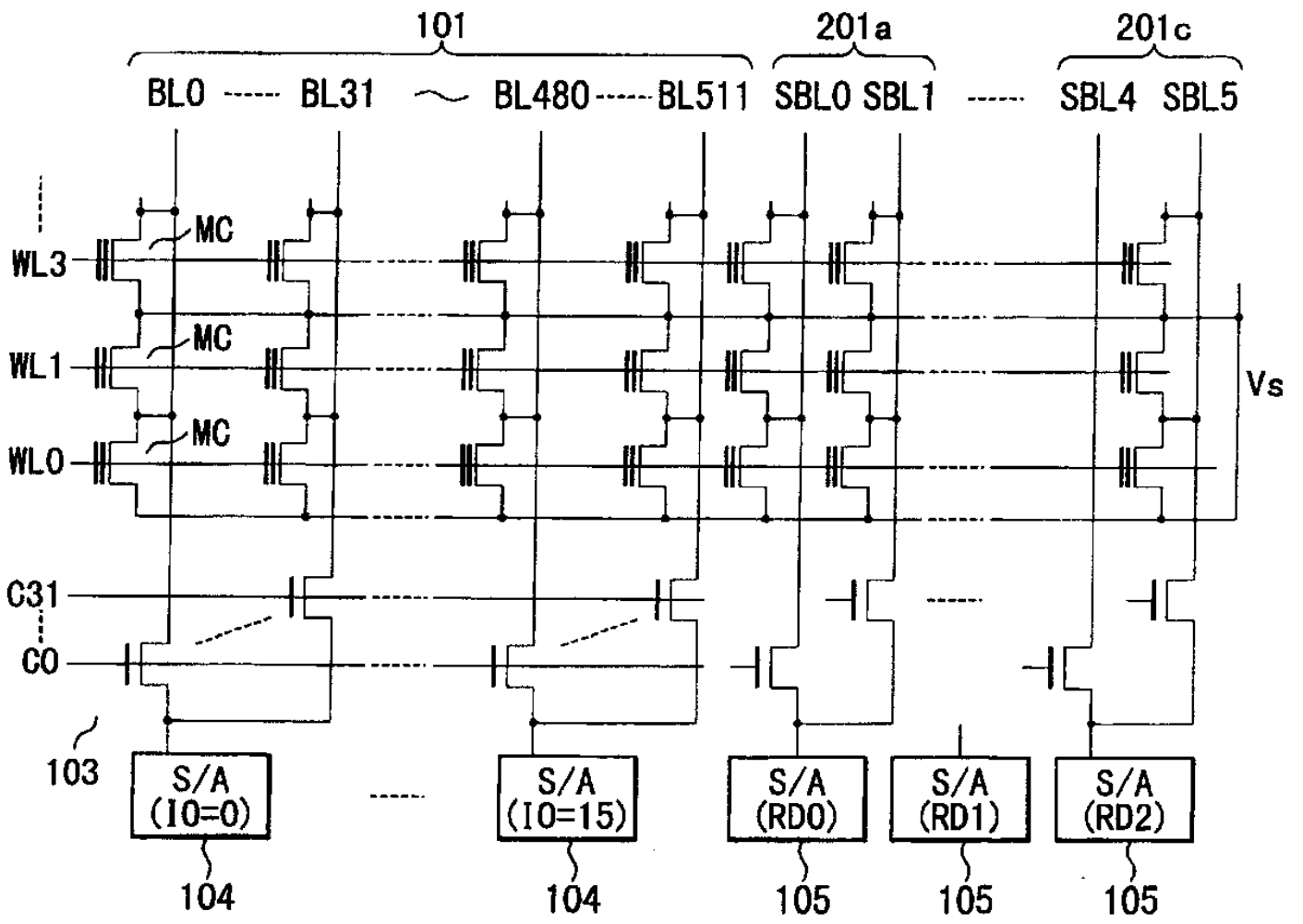
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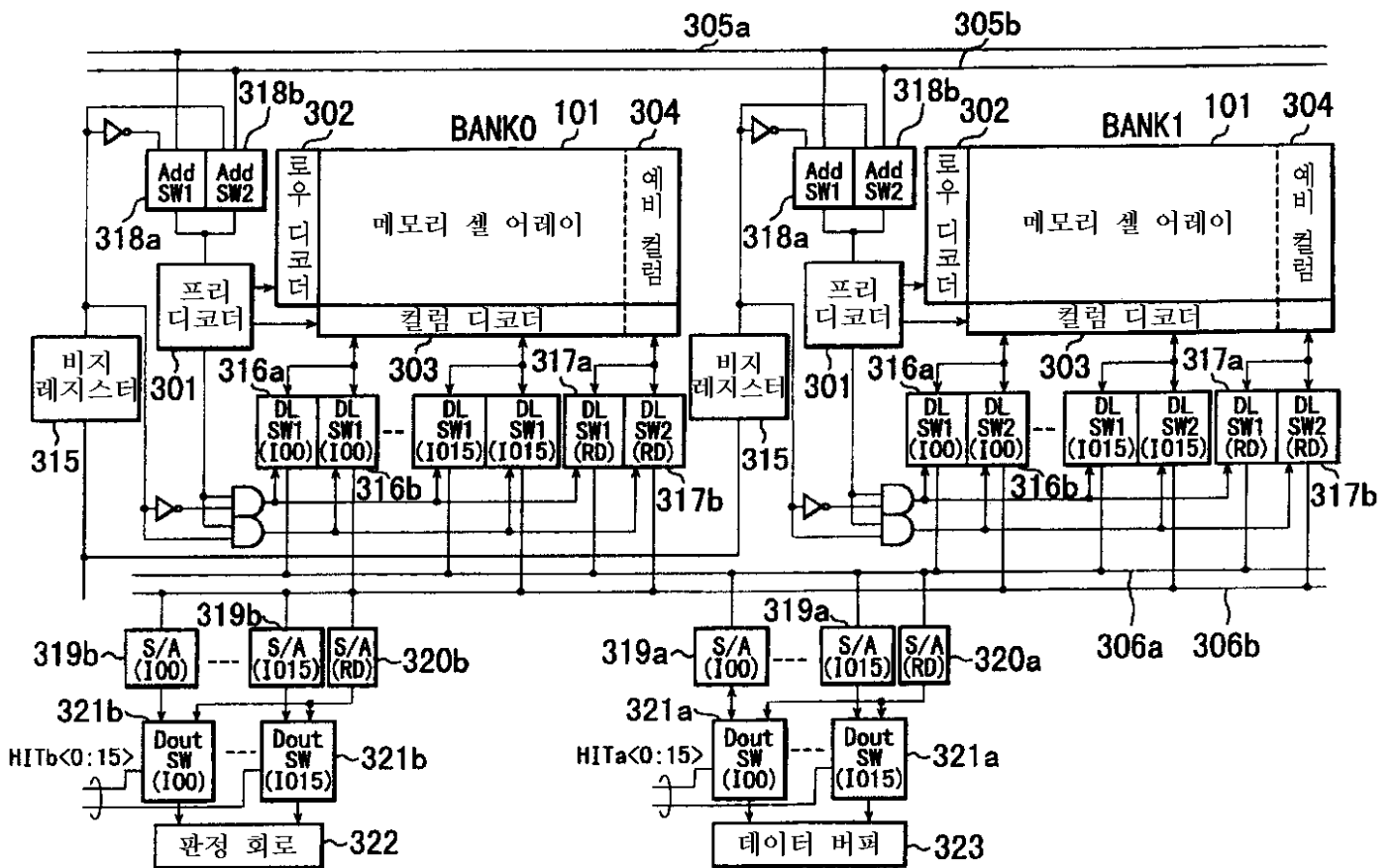
가

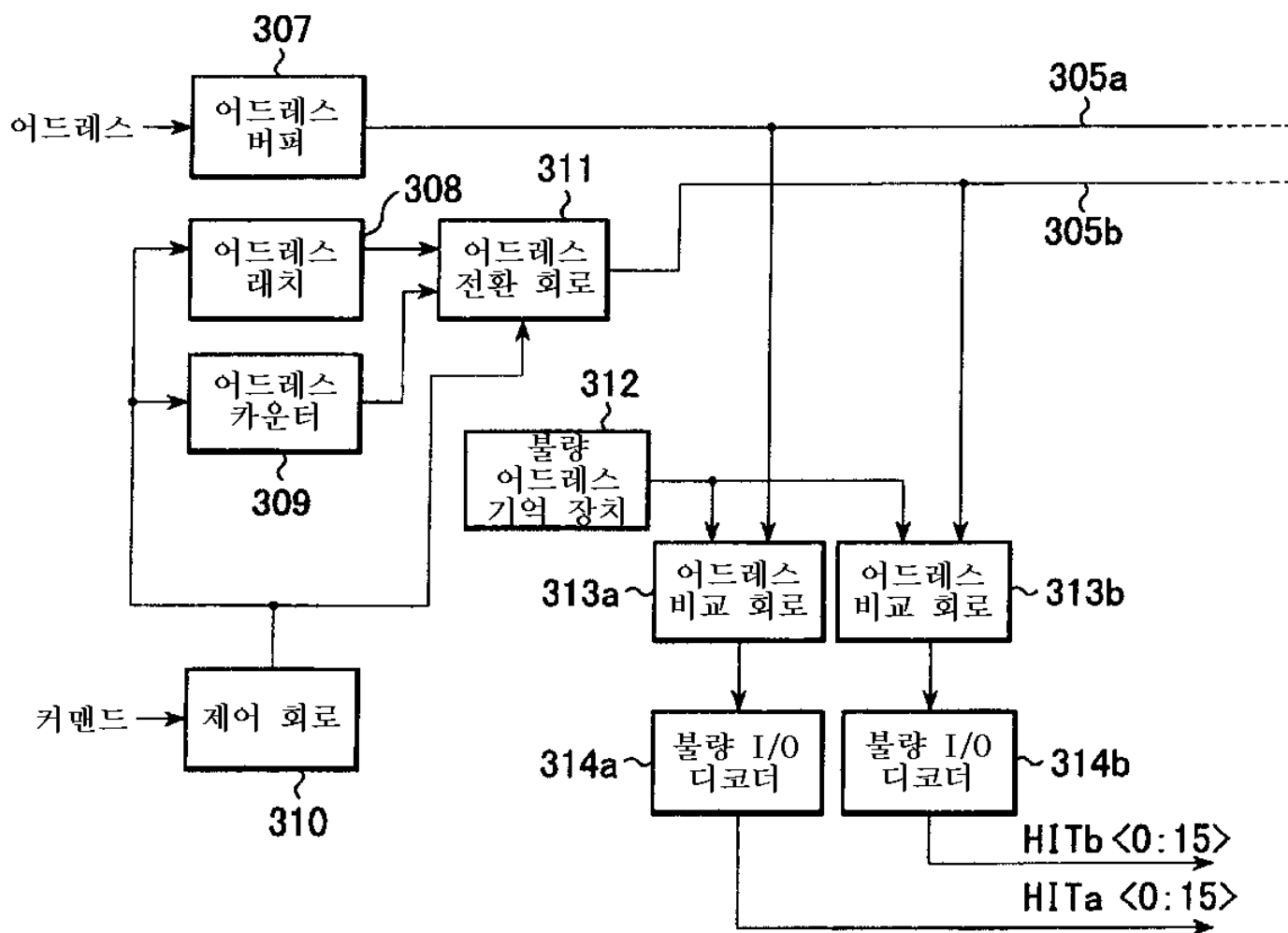
14.

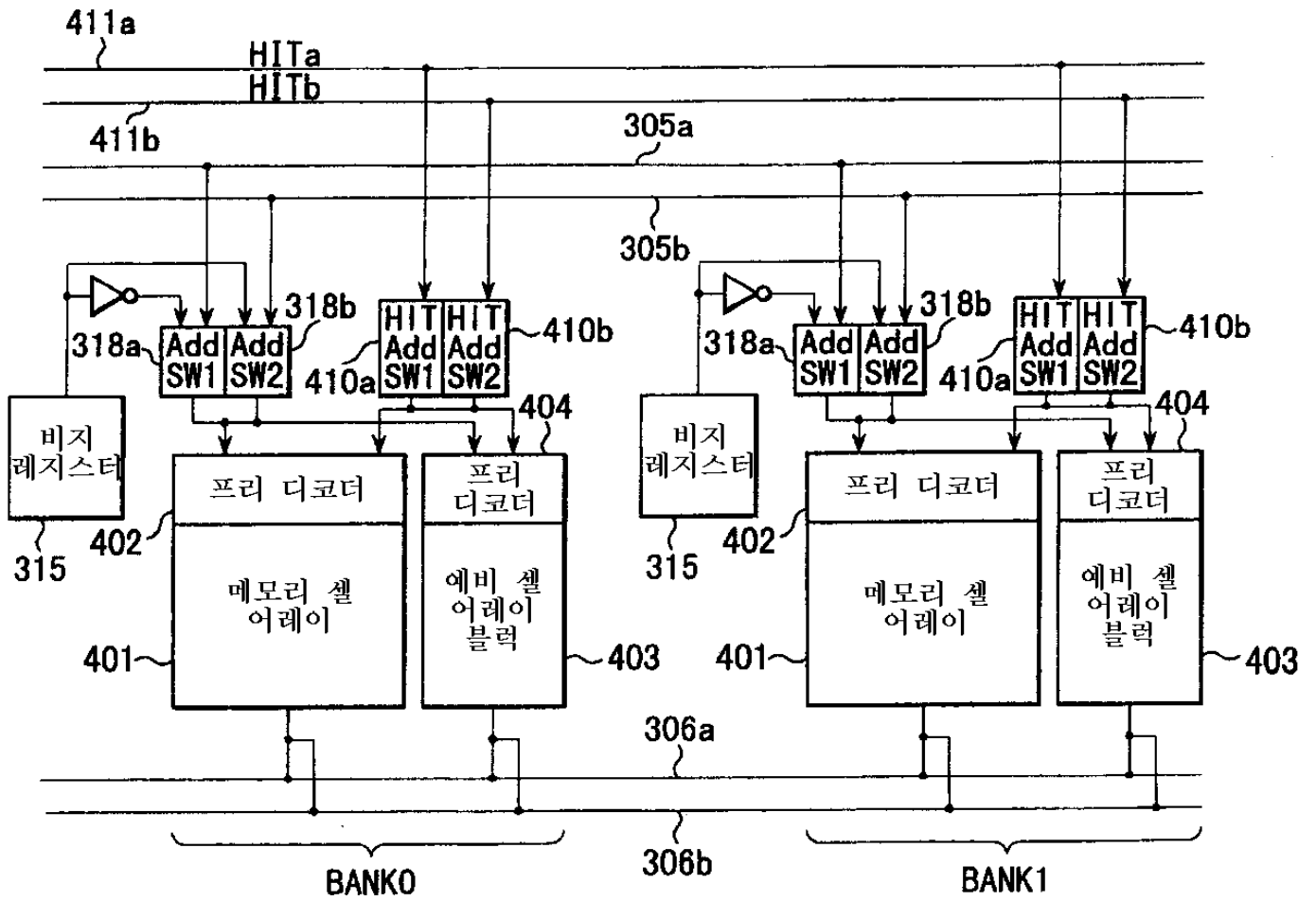
11 12



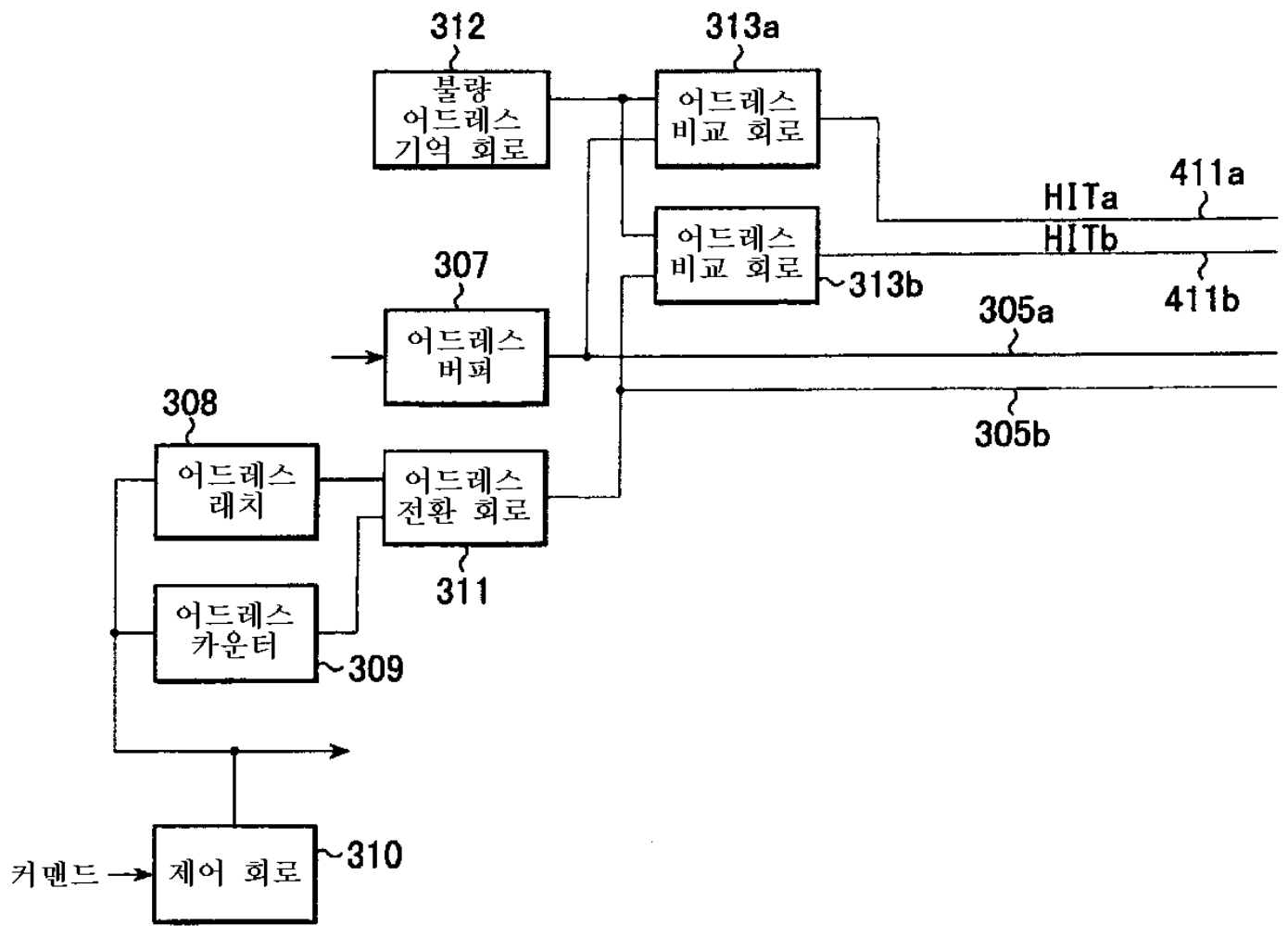


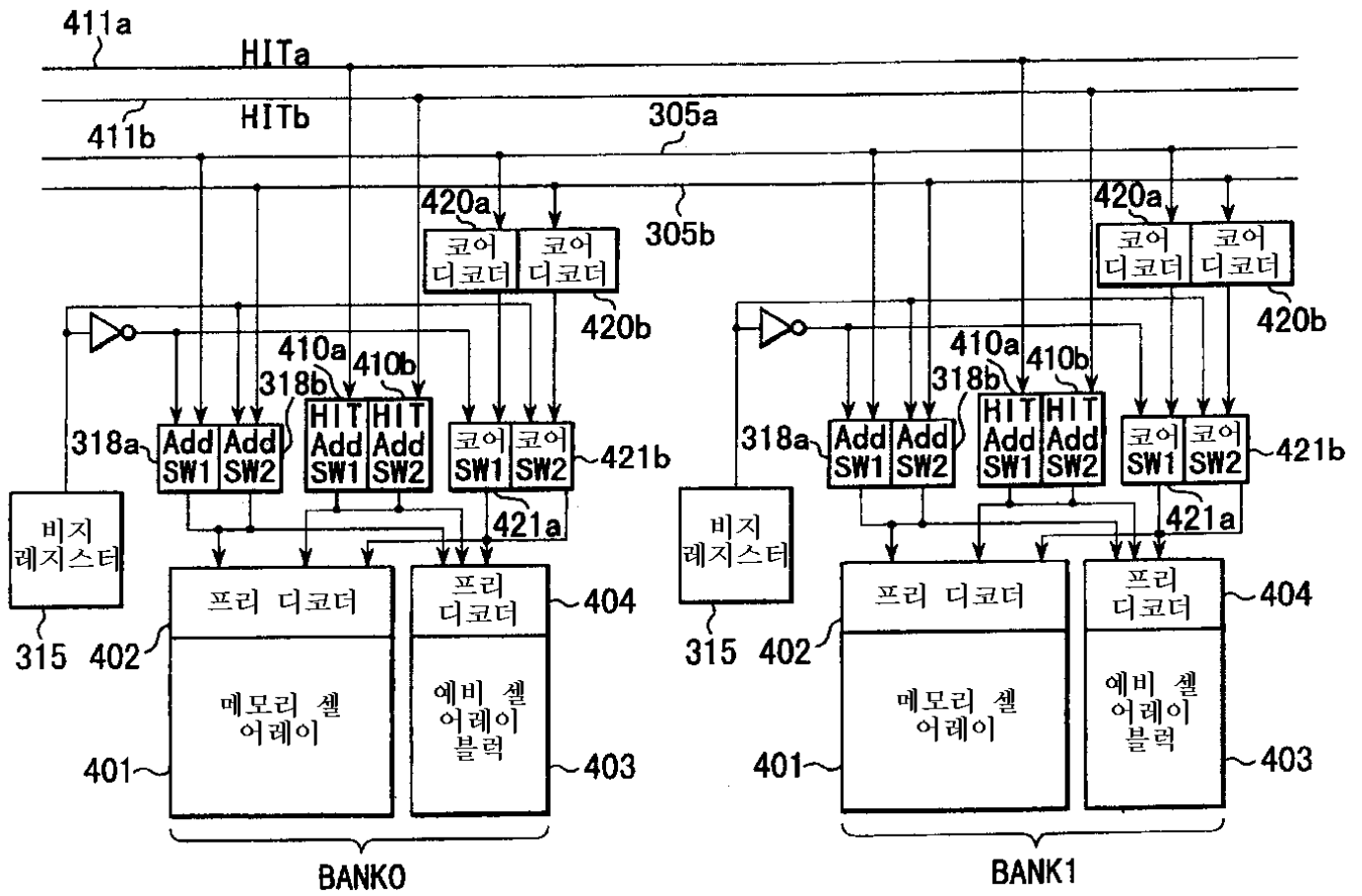


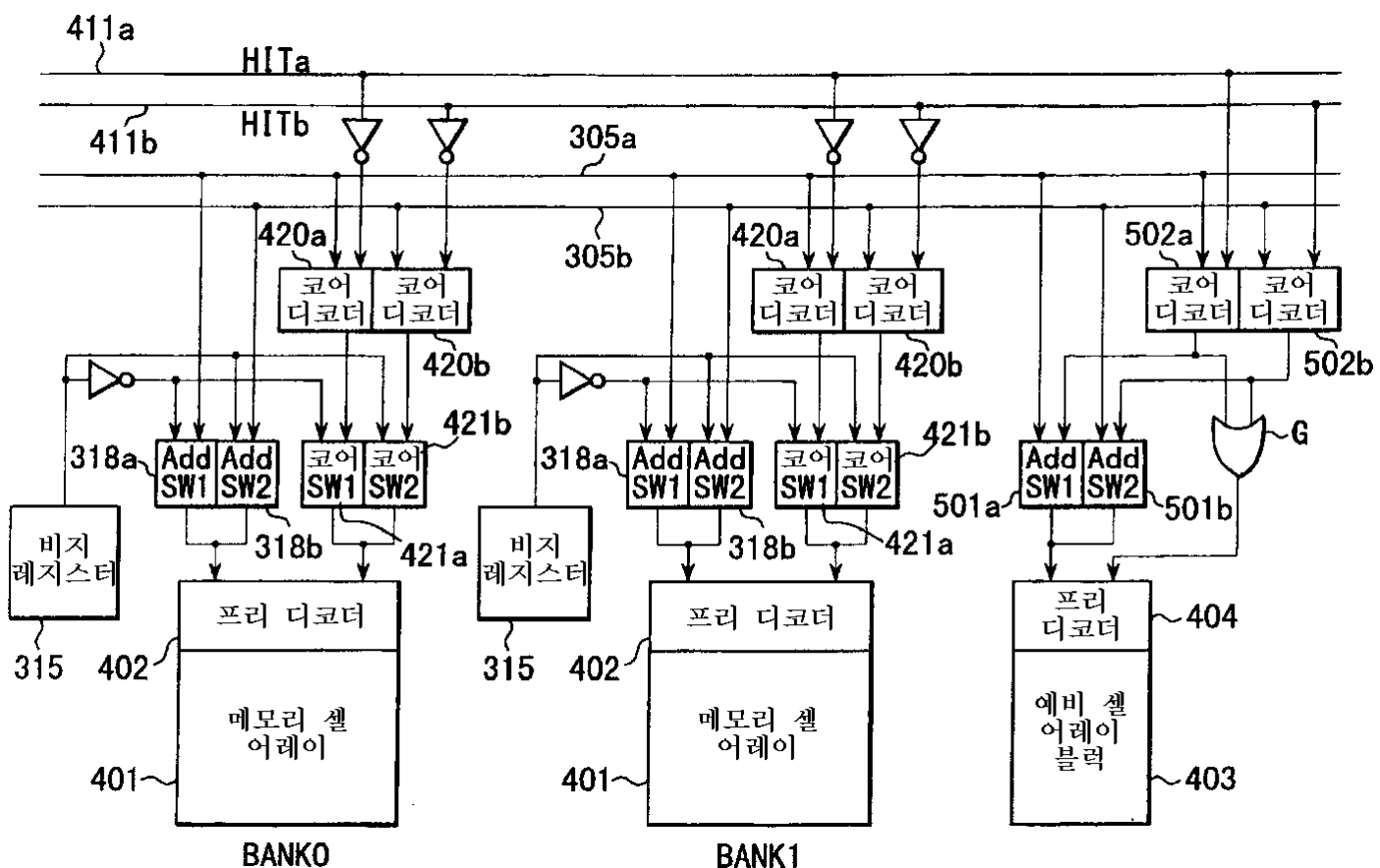
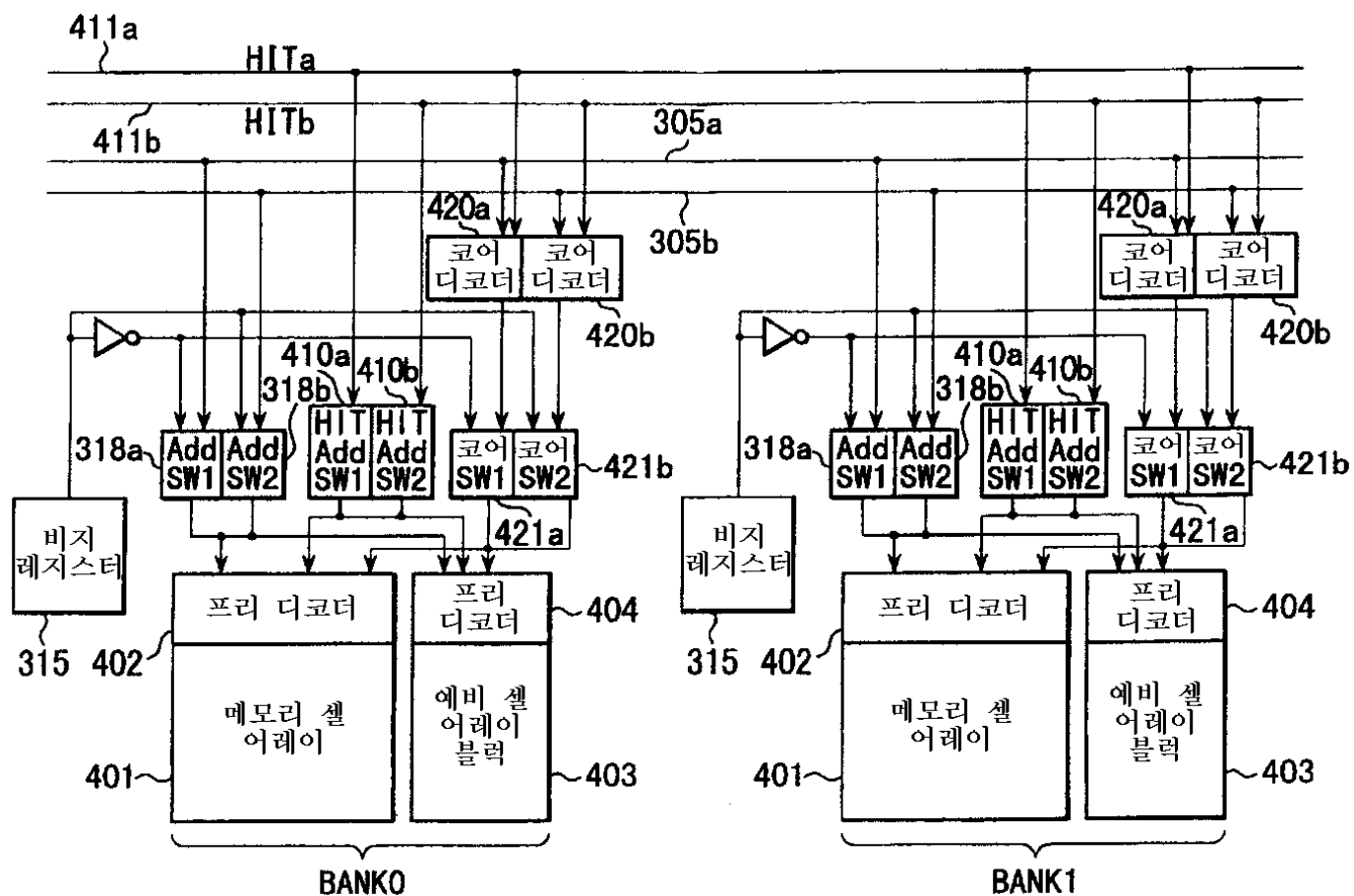




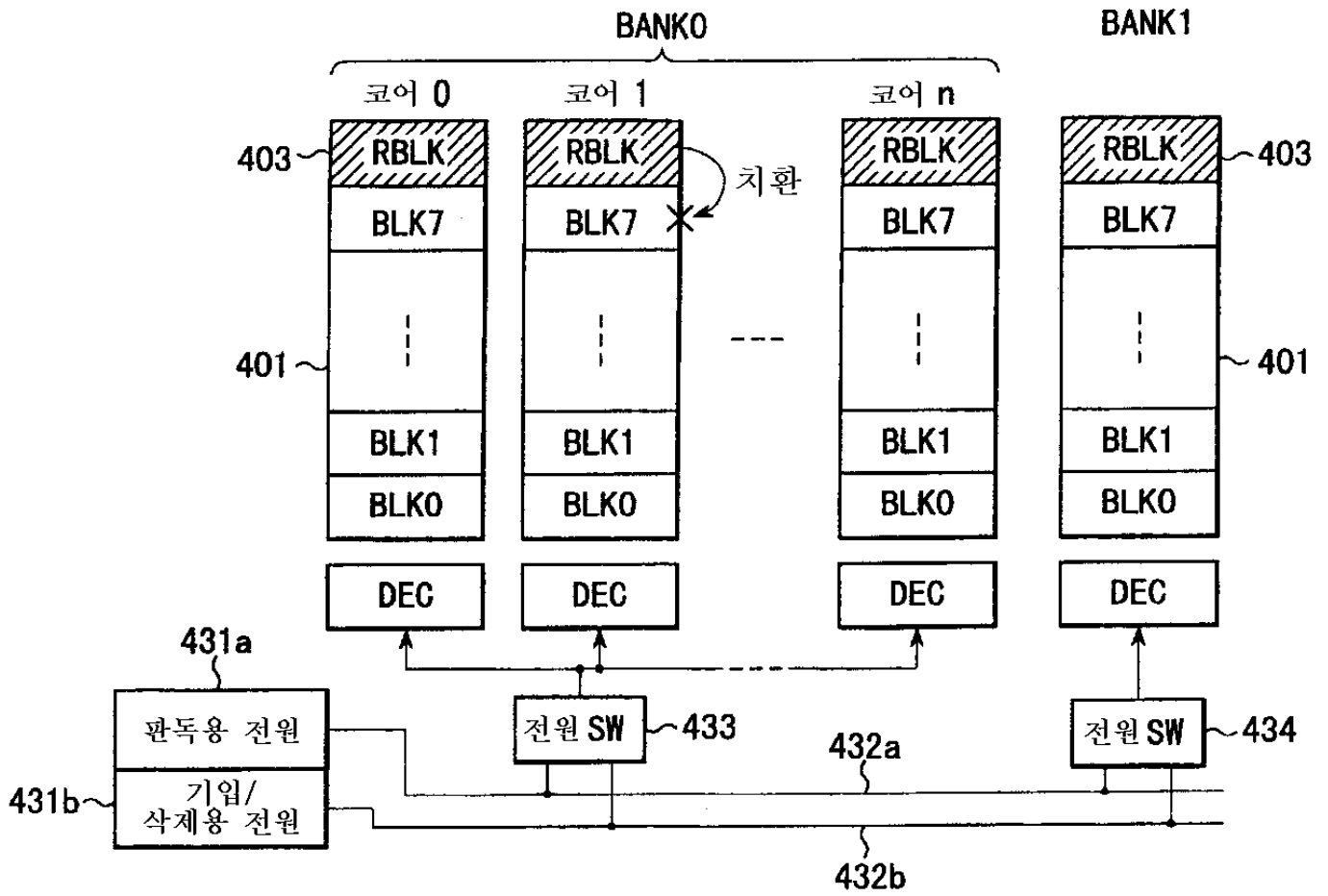
6

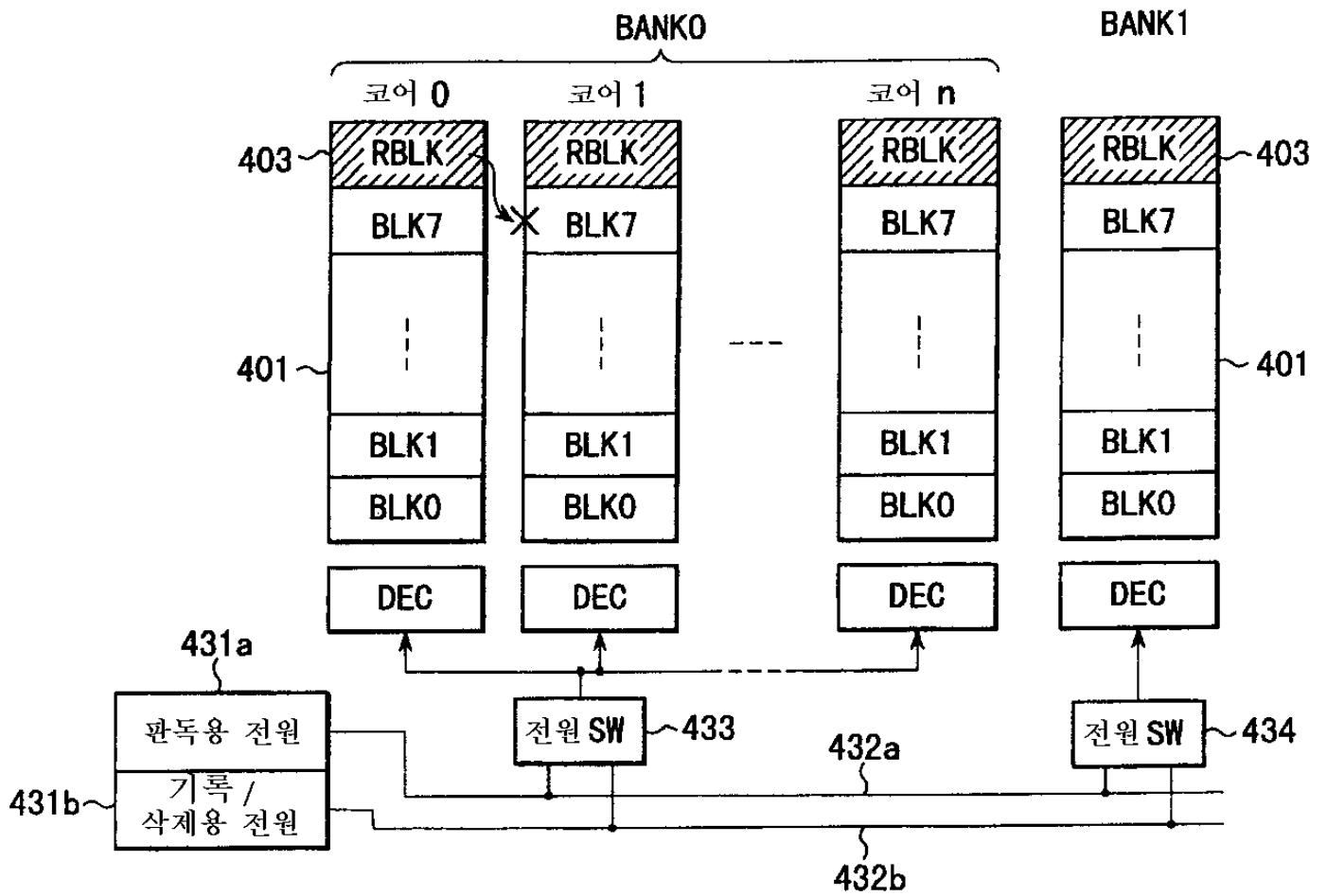




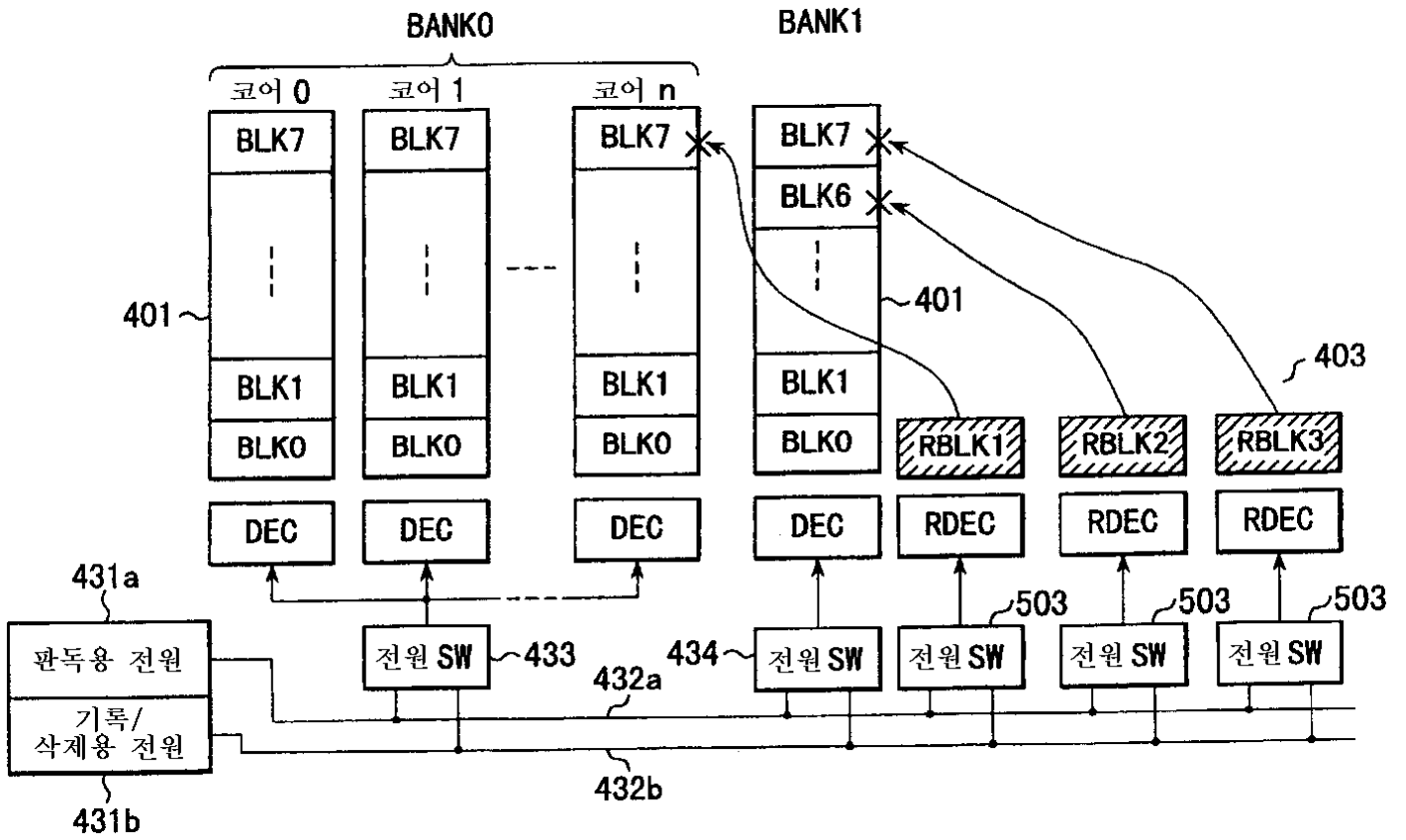


10

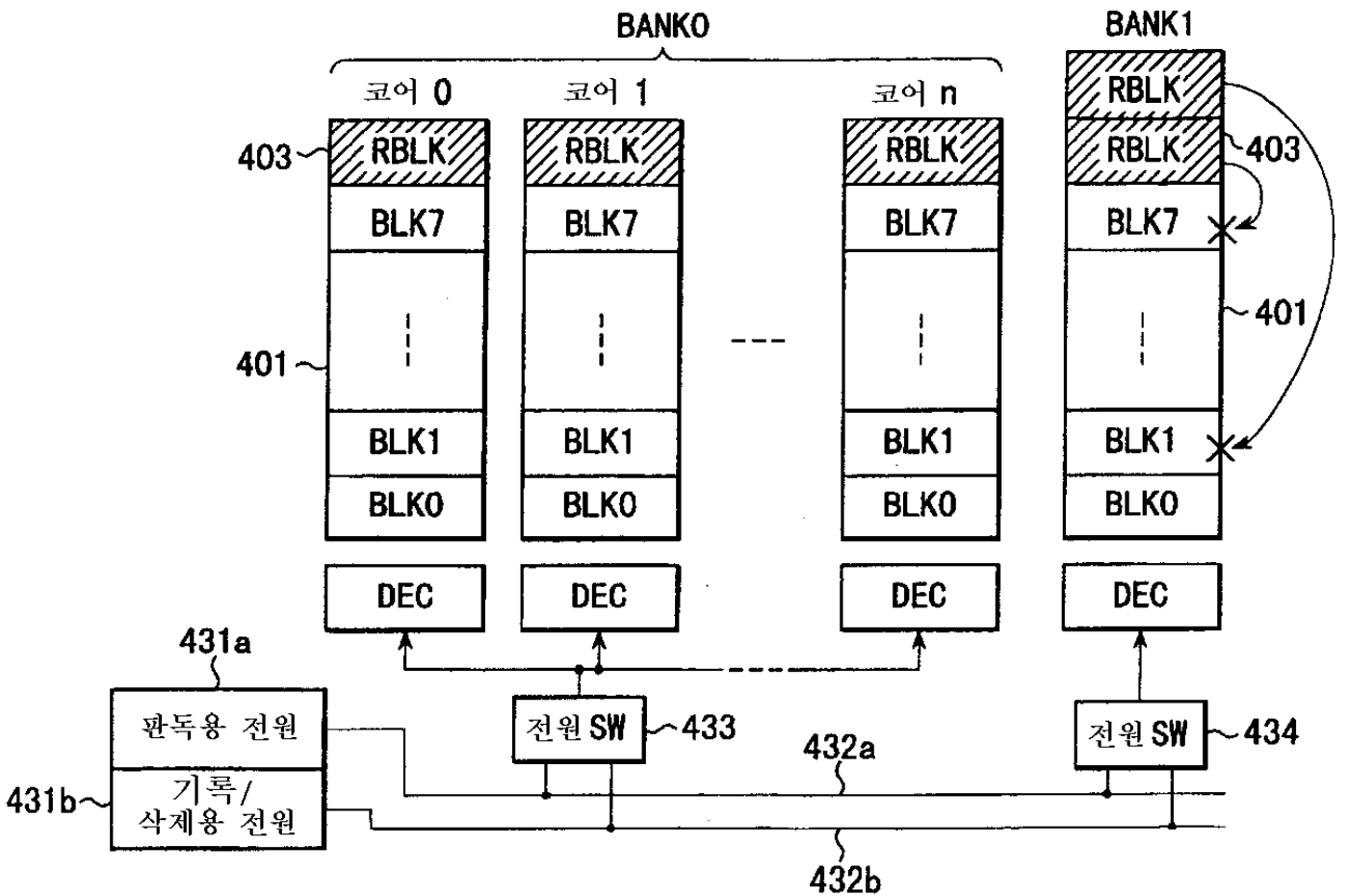


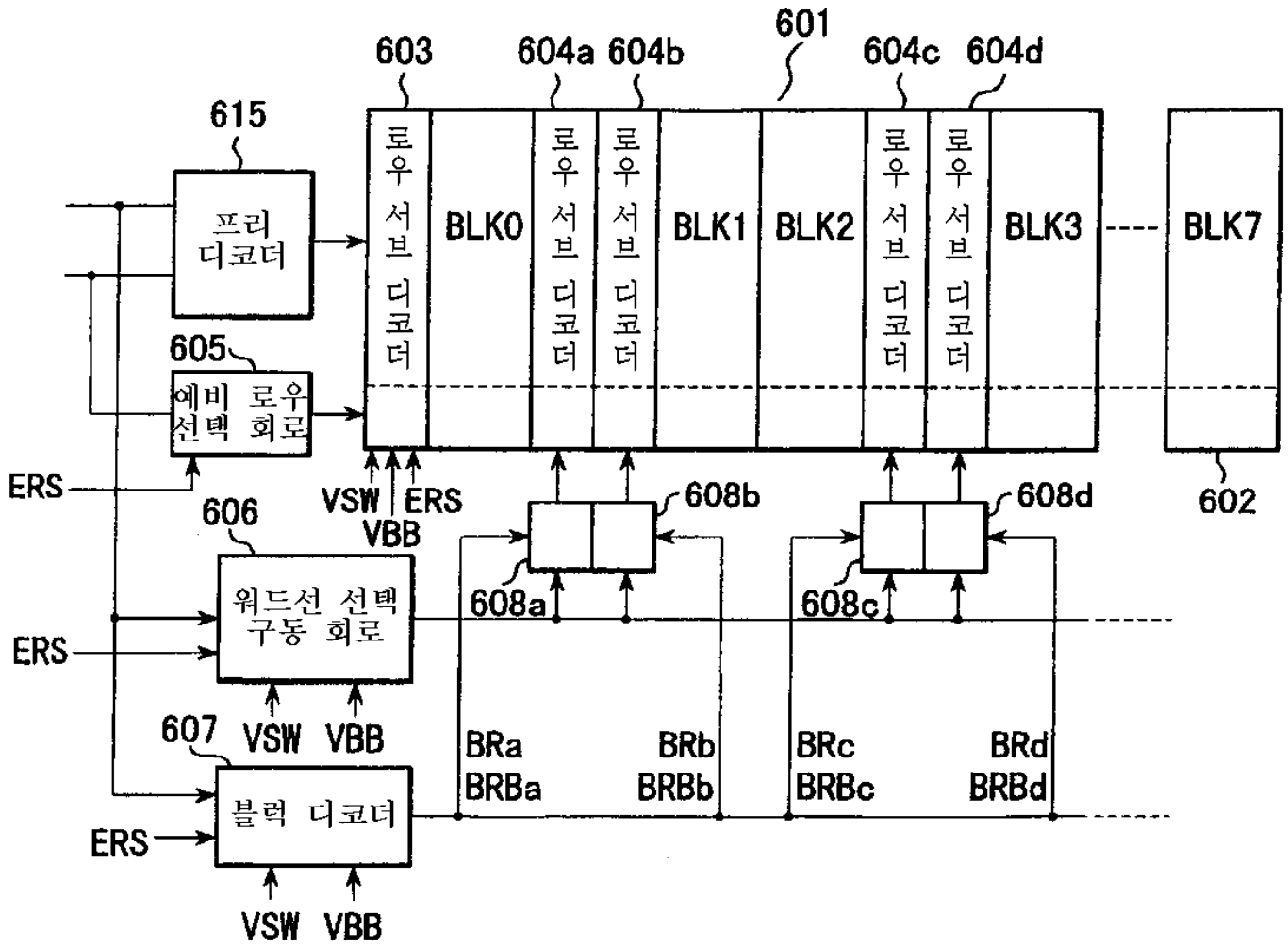


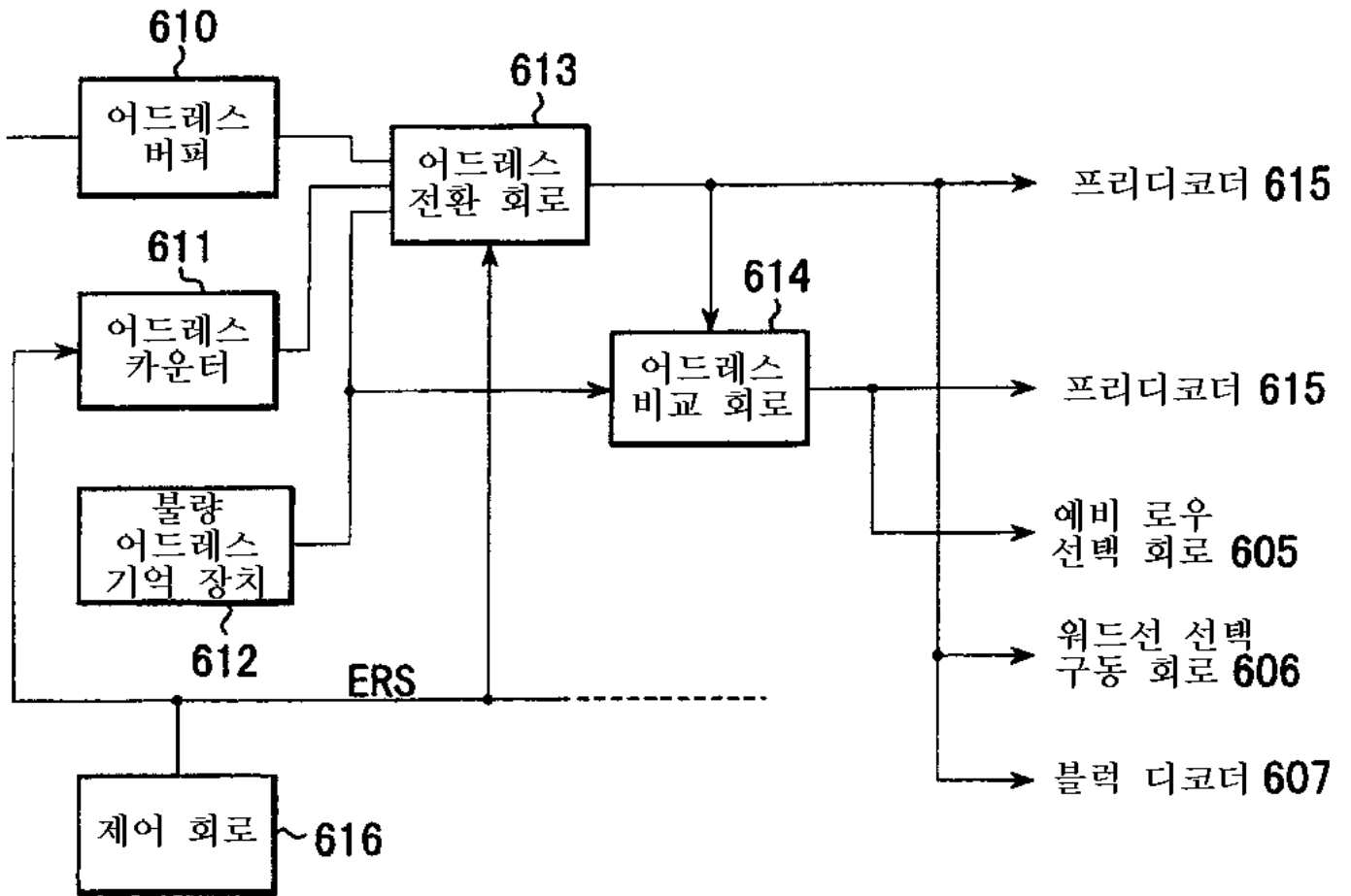
12

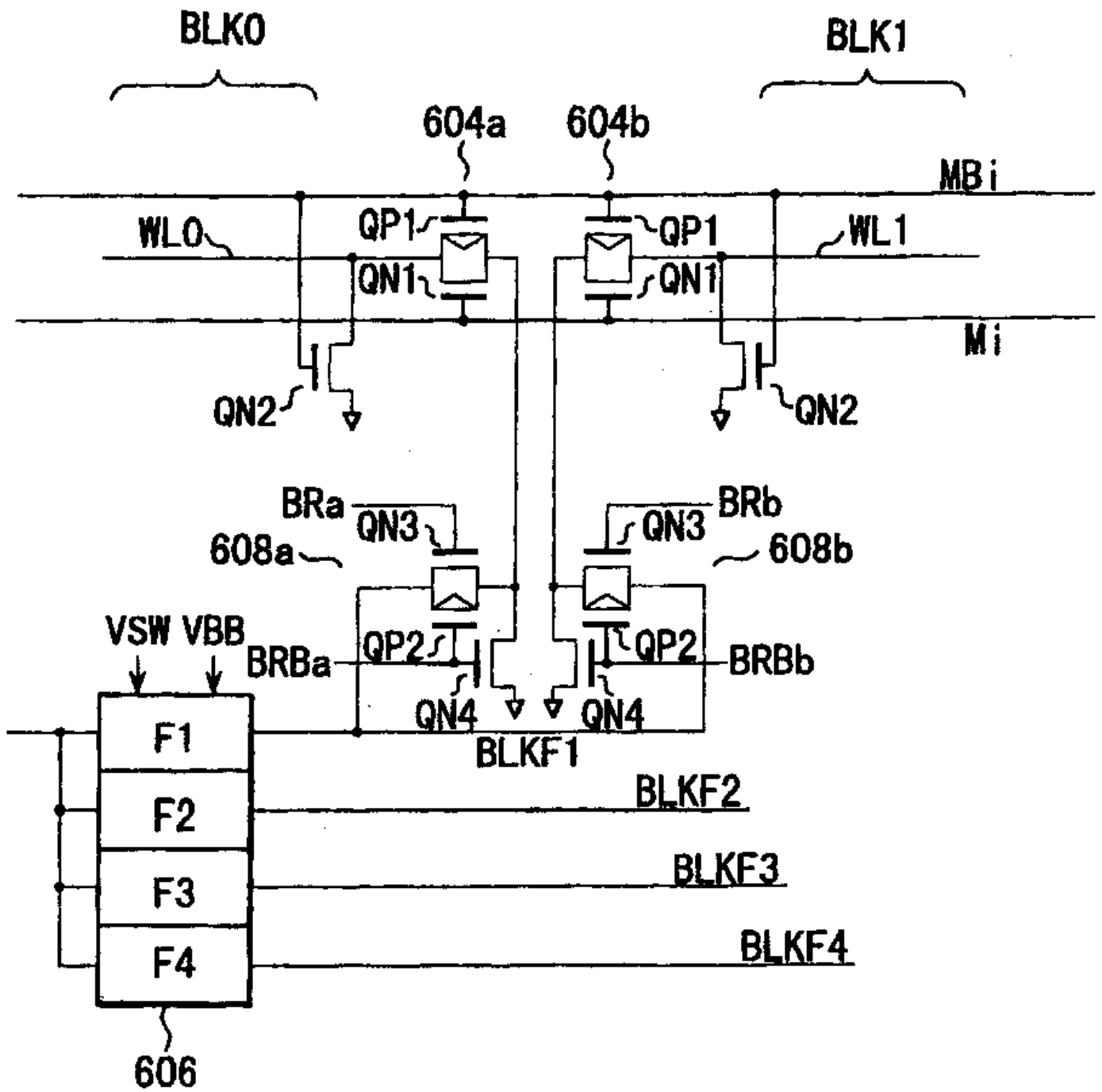


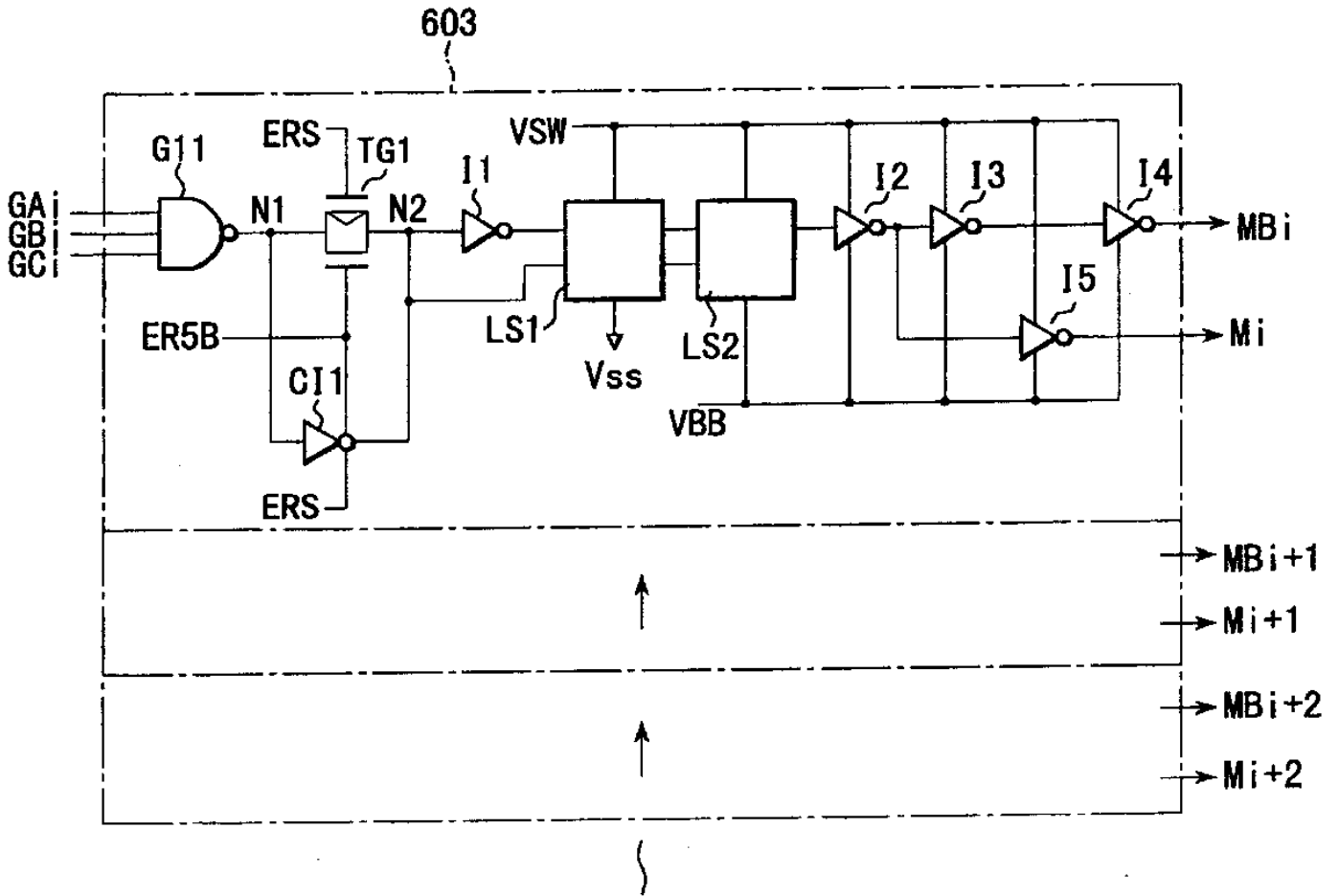
13





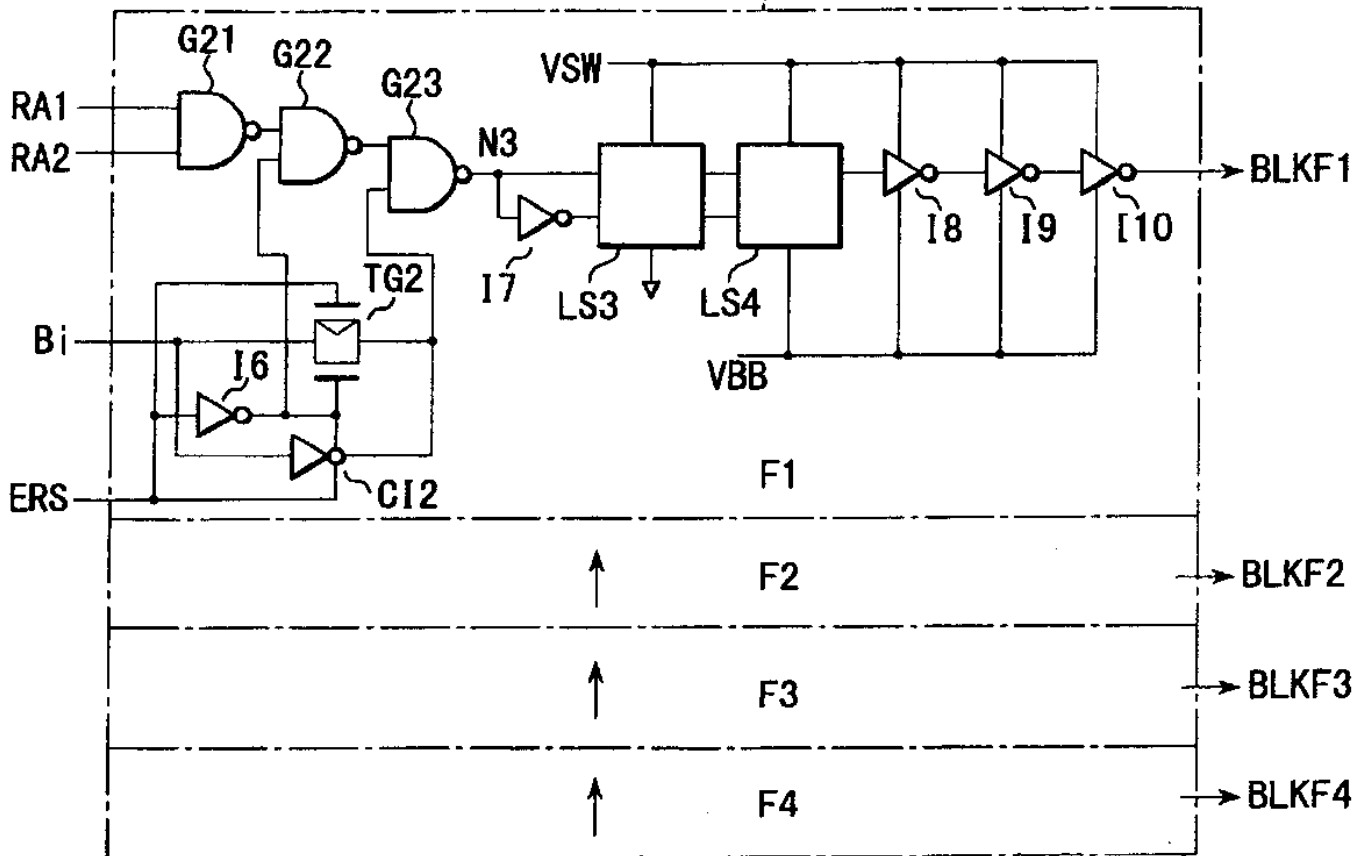


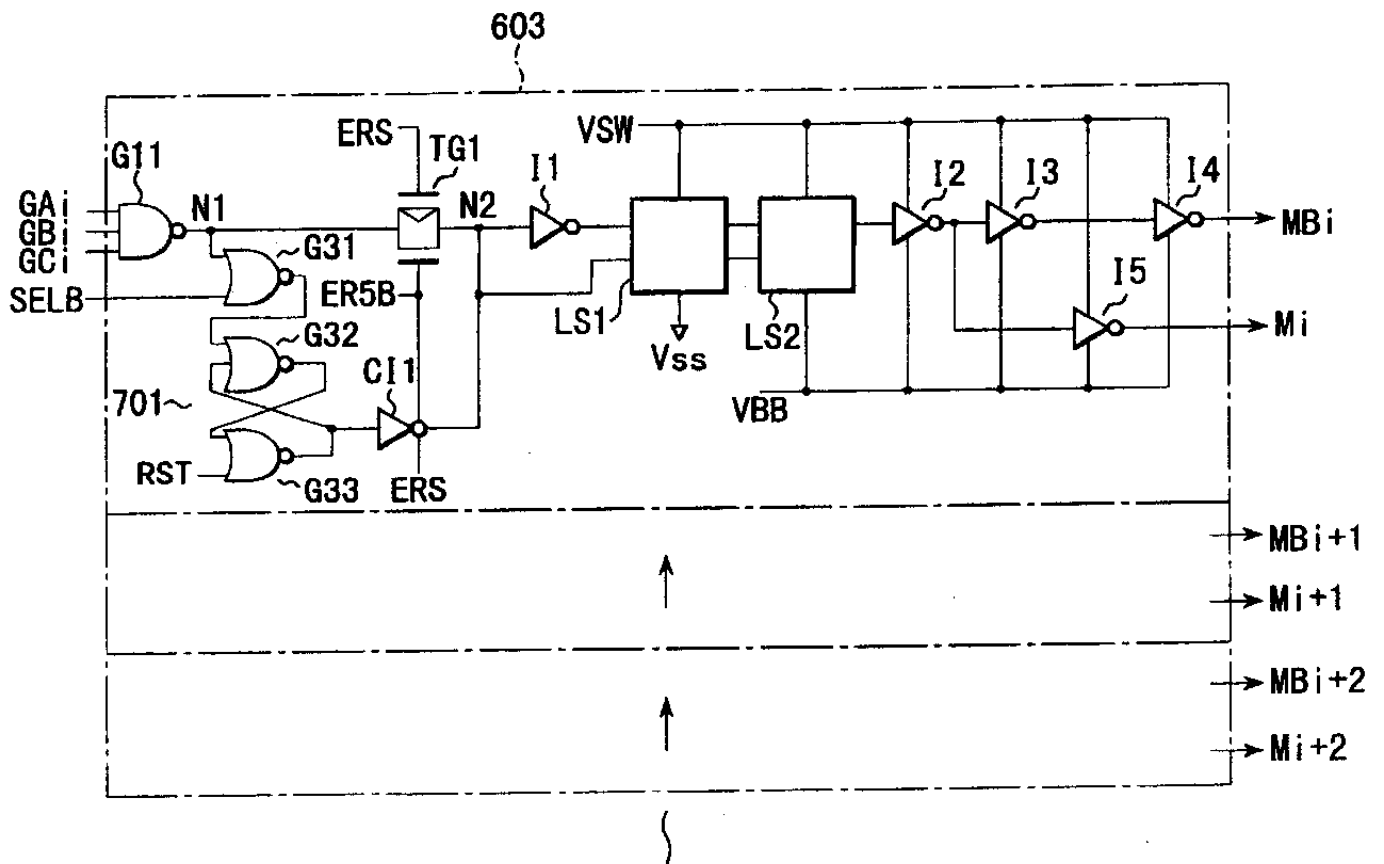




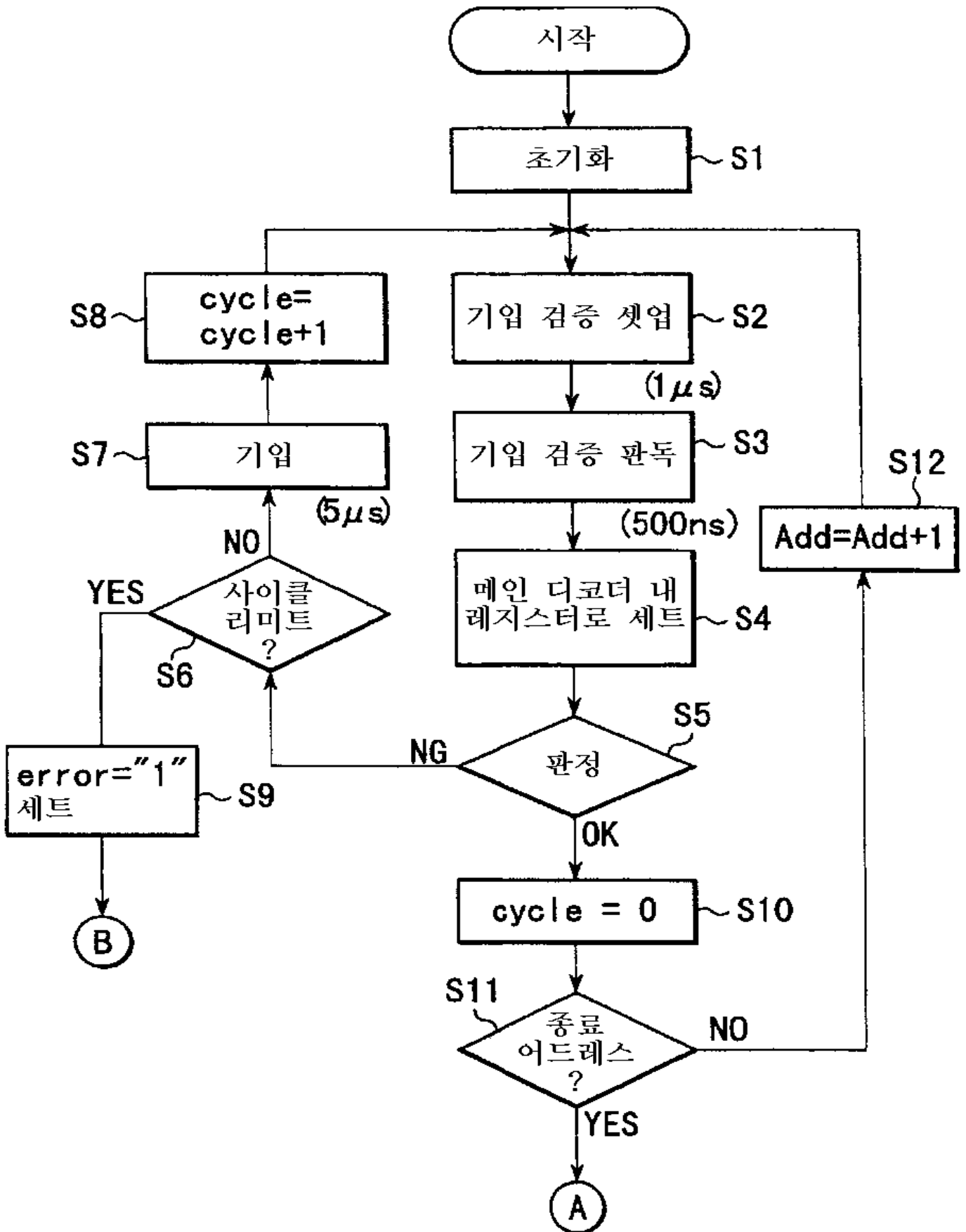
18

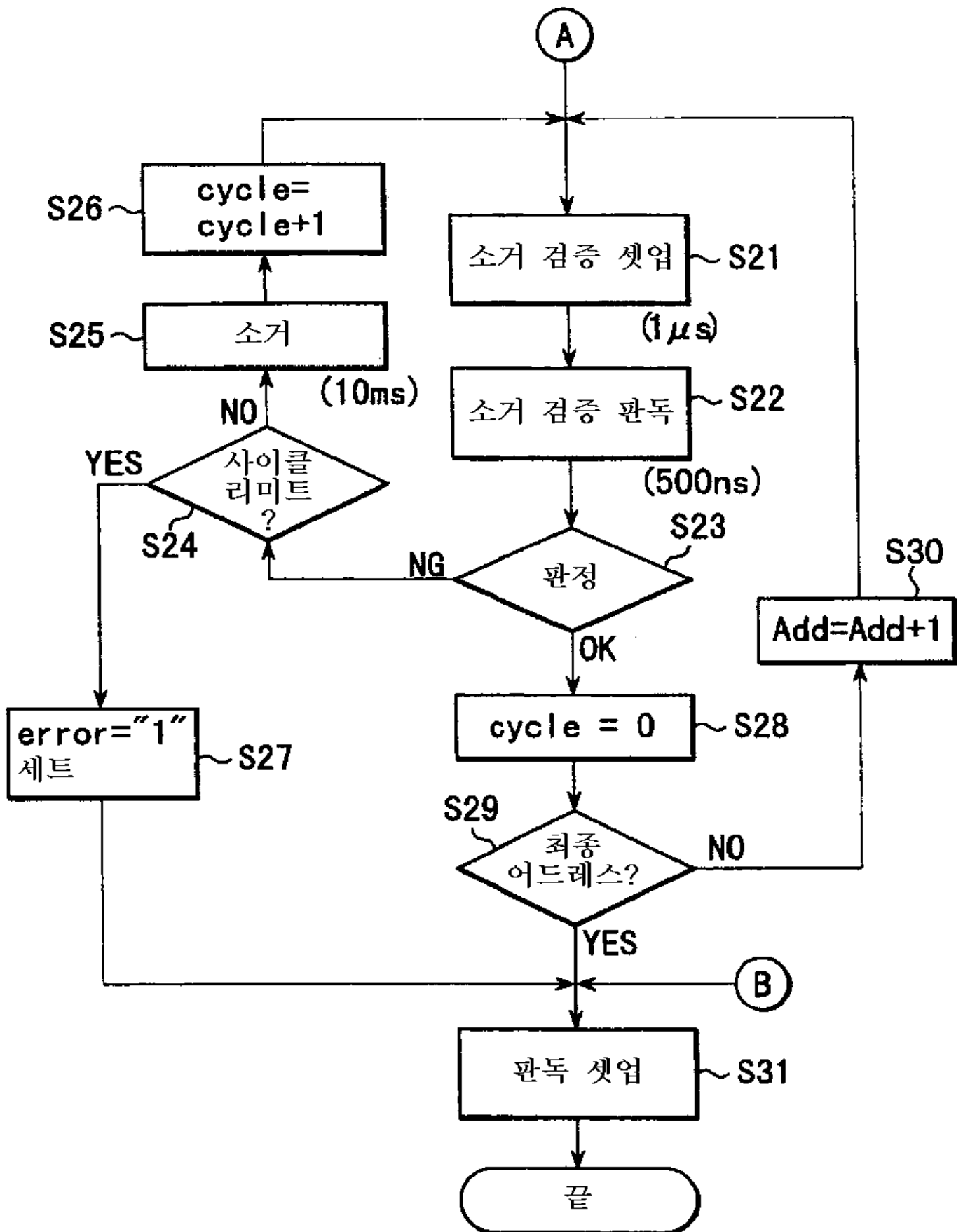
606

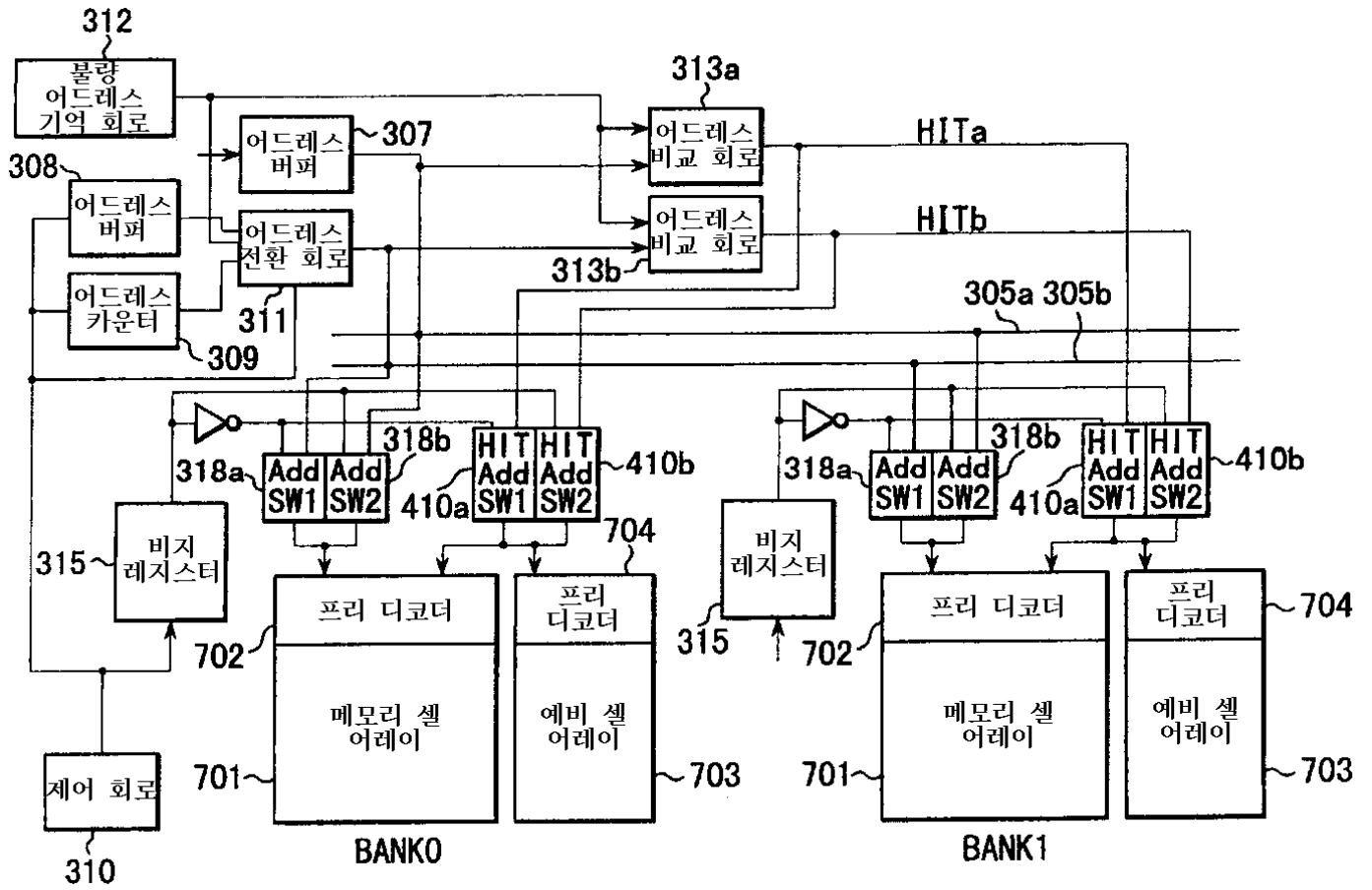


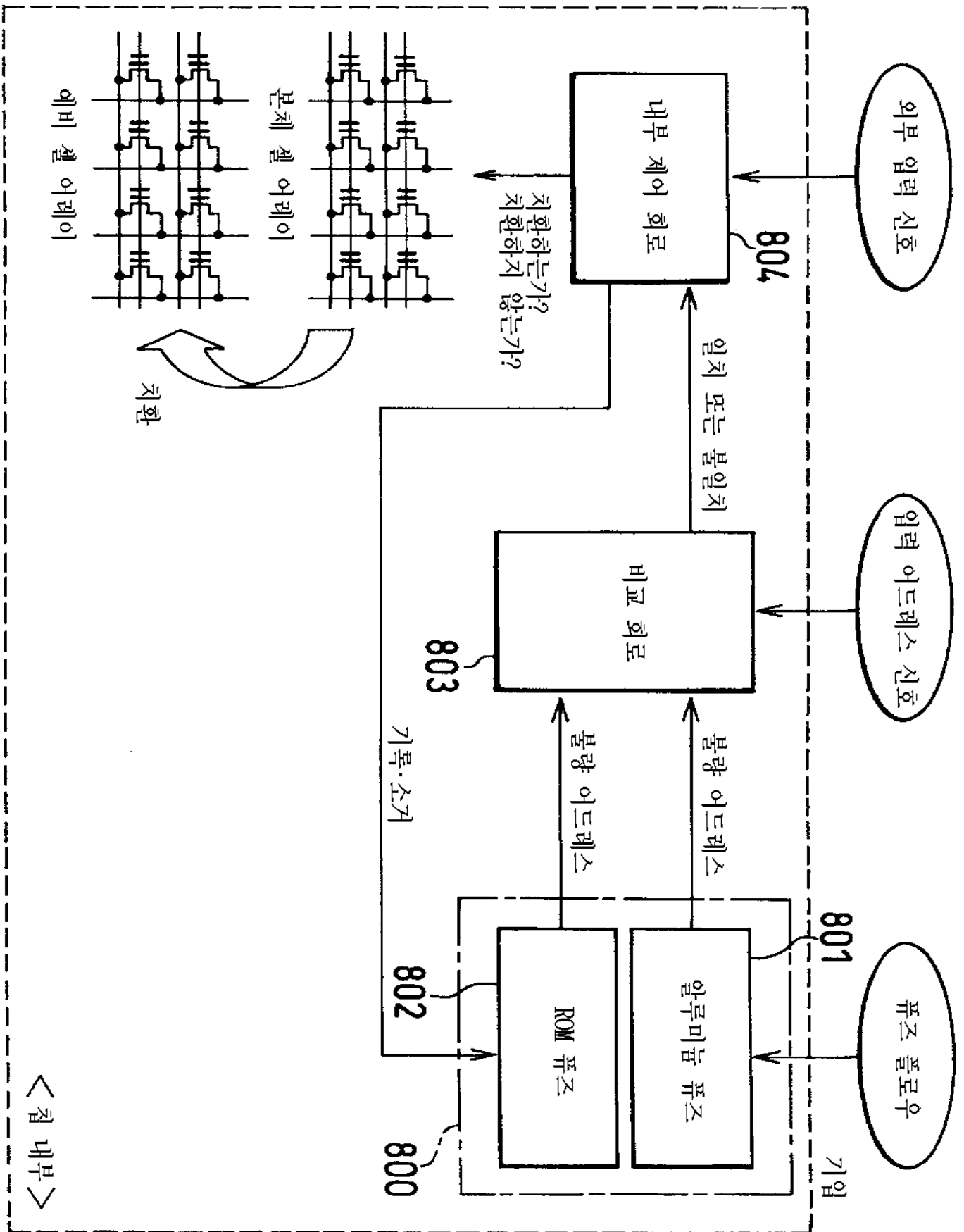


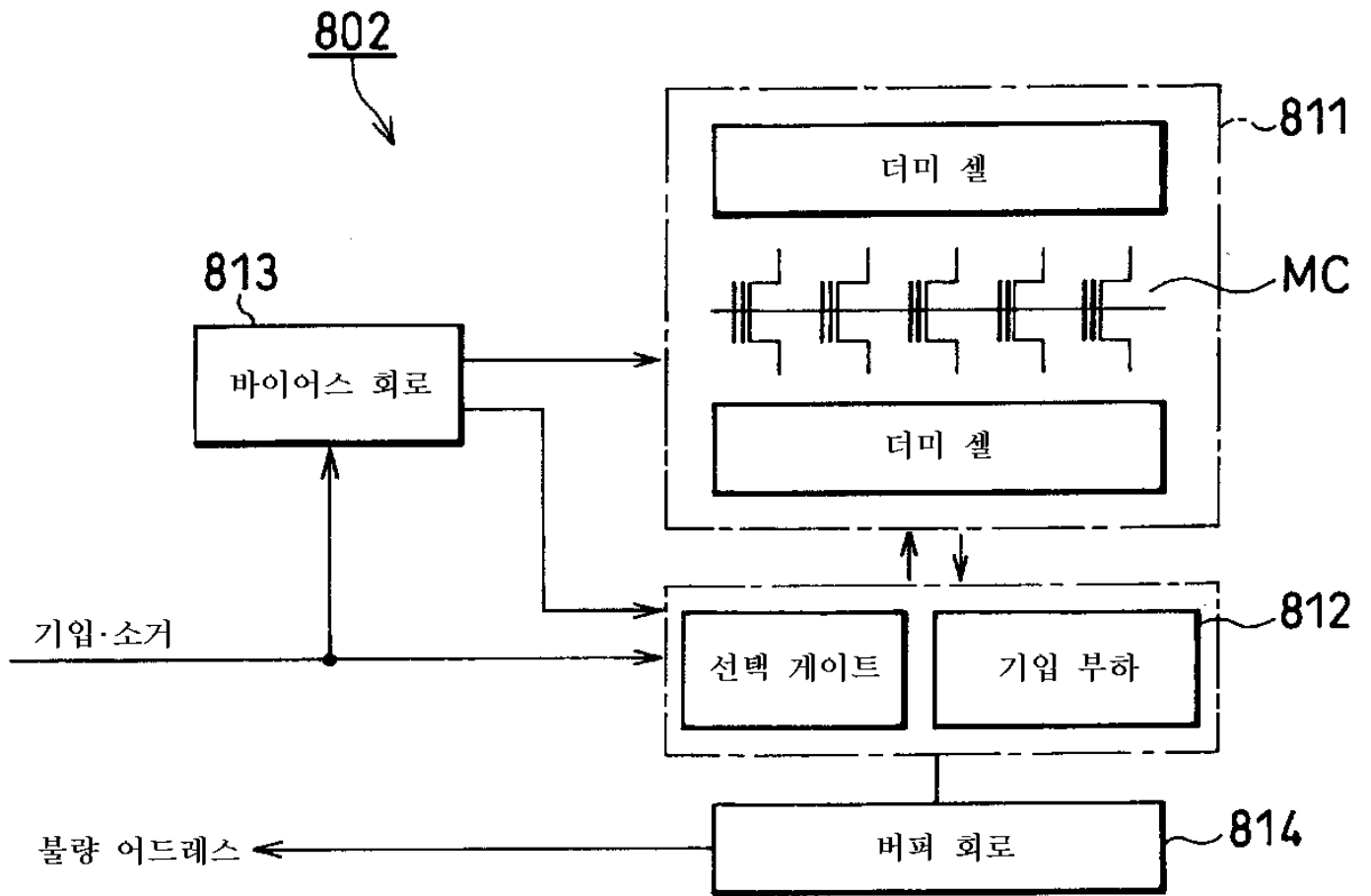
20



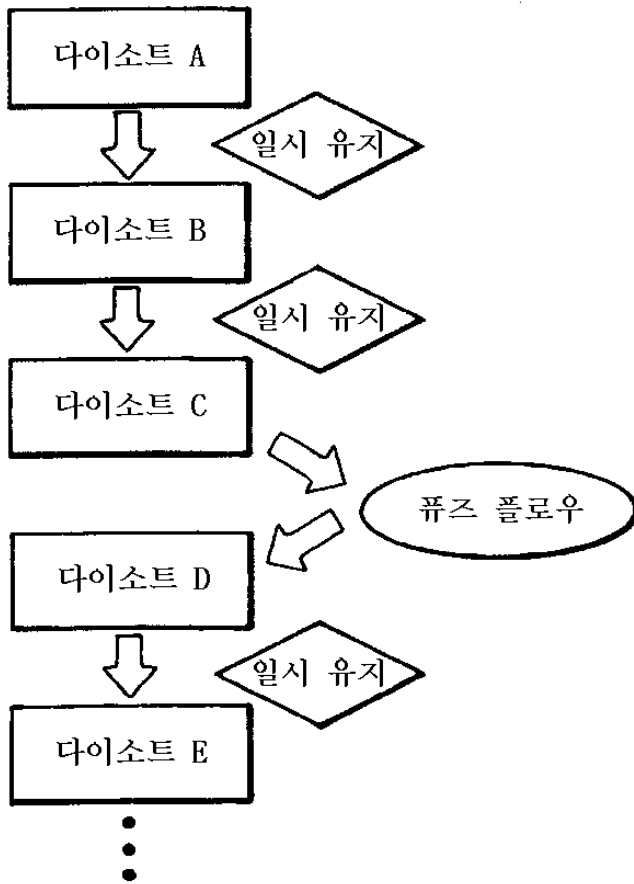




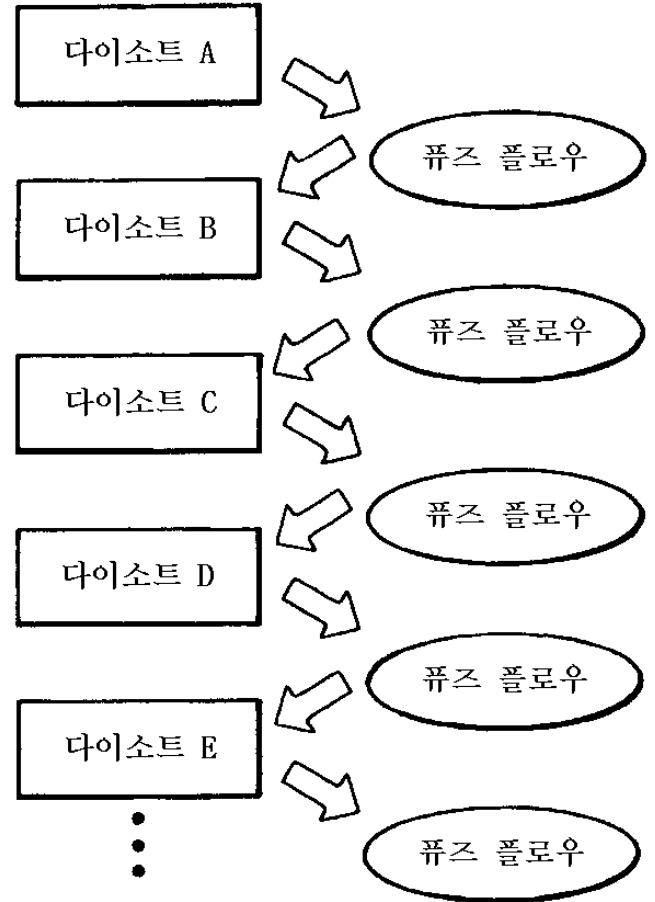


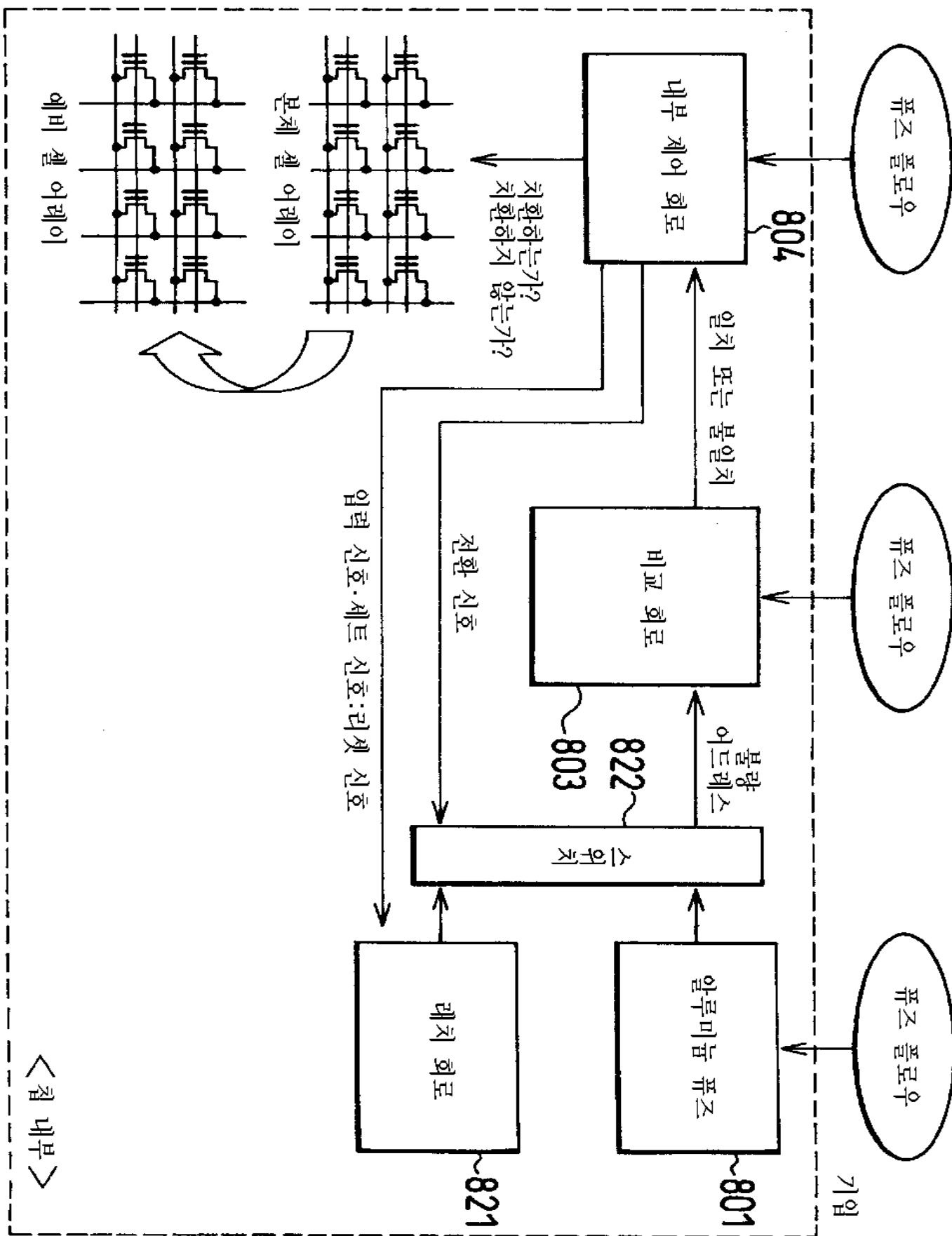


(a) 일시 유지하는 경우



(b) 일시 유지하지 않는 경우





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