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(43)

2003-0071644
2003 09 06

(21) 10-2003-0012609
(22) 2003 02 28

(30) JP-P-2002-00056365 2002 03 01 (JP)

(71) 가 가 1 1 1

(72) 가 가 가 1가 가

(74)

:

(54) / EEPROM

, 1 가 1 , 가 가 1

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1

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1

2 1

3 1

4 2, 3

DISABLE

5 1

6 1

7 1

8 1

가/

9 1

10 9

11 1

12 1

13 12

14 12

15 14

< >

6a, 6b :

7a, 7b :

8a, 8b :

15 : /

/ 가

(EEPROM)

가

While Write) , RWW(Read

, 2001 11 22

2001-325795

가

가

()

가

가

가

가

가

1

, 1

가

1

가

/

1

1

(1) B(0) B(n-1)

B0 B(n-1)

m

C(0) C(m-1)

C(0) C(m-1) B(0) B(n-1)

, 1

가

1 C(0)

(SW)(16(0))가 (17(0))가

((2(0)) SW)(3(0)), (3(0))

(2(0)), (4(0)),

(16(0))

가, C(0) 가, / 가 (15) RESET (14) 가 (16(0))

(6b) 가 C(0) (15) C(0) (3(0))가 / (12b) (16(0))

(7b) C(0) (16(0)) (2(0)) (3(0)) / (11b) /

(6a, 6b), (7a, 7b), (8a, 8b) / C(0) (15)

가 MOS

1 (11b) 가 (11b) (15)

가 C(0) C(0) / C(1) (15) 가 (6a)

(4(1)) 가 (18(1)) (2(1)) (12a) (7a) 가

(16(1)) (7a) (11)

a) C(1) (14) (7a)

가 C(0) C(2) C(3) C(m-1)

C(0) (18(0))

가 C(0) C(0)가

C(2) C(m-1) (2(2) 2(m-1))

가 C(0)

(17(0)) C(0) 가 (18(0)) 가 (18(0))

(14) 가 (3(0)), (16(0))가 / (12b) (18(0))

(6b) 가 C(0) (2(0)) (16(0)) (11b)

가 / (7b) C(0) (4(0))

(6a, 6b), (7a, 7b) (8a, 8b) C(0)

가 가

1 가 (15) 가 (11b) , NG

가 / 가

C(0) 가

, ,
 , 가
 , 1
 2 , 1 C(0) (3(0))
 (18(0))가 , 1 (6a, 6b) (3(0)) (3(0))
 2 , 2 가 (18(0))
 2 , (3(0)) (31a, 31b) , (32a, 32
 b) (32a, 32b) ENBa, ENBb
 ENBb 가 'H'
 , (11) ENBa 'H'
 D) (32b) ENBb='H' (AN
 G3 , AND C3 , / (6b)
 가 , SELb='H' SELb
 (6b) ADb가 (31b) C(0) , / (2(0))
 AND G1 (32a) ENBa AND G1 ,
 ENBa 'L' , AND (6a) G1 ENBb가 'H'
 가 'L' (31a) SELa C(0)가 C(0)
 (6a) SELa='H' (31a)
 ADa가 (2(0))
 'H' () SELb SELa
 C(0) C(0) 가
 G2가 (32a) AND G1 가 AND
 AND G2 C(0) 가 AND
 C2 C(0)가 ENBb가 , AND G2
 POL='H' C(0) 가 SELa='L'
) C4 SELa, SELb가 'L' , 가 (NOR
 4 1 , 2 DISABLE
 C(0) C(0) NOR G4 C(0)가
 (383) , DISABLE='H' (383) (383)
 가 C(0)
 가
 , 2 SELa, SELb가 'L'

(31a, 31b) 가 ENBa, ENBb (6a) / (31a, 31b) (6b)

3, 2 가 1 C(0) (3(0))

(31b) (3(0)) C(0) 가 ADb가 (2(0))
 2(0)) C(0) (6b) 가 ADb가 (2(0))
 (31a) C(0)가 (6a) DISABLE 'H' ADa가 (2(0))가
 (31a) 가

5 C(0) C(1) 1 2 i, i+1 (4(i), 4(i+1))
 1) (16(i), 16(i+1)) (7a) / (7b) (7a, 7b) (4(i), 4(i+1))
 1 (18(i), 18(i+1))가

5, NMOS Q3 (32a) SELa(i), SELa(i+1)
) Q4 (4(i), 4(i+1)) (32b) (7a) , NMO
 S (4(i), 4(i+1)) / (7b) SELb(i), 5ELb(i+1))
 C(i)가 C(i) Q4가 C(i) (4(i)) / SELb(i)가 'H' (7b)
 C(i) C(i)가 Q3 C(i) (4(i)) SELa(i)가 'H' (7b)

6, 1 C(0) (3(0)) ENBa, ENBb (41(0))
 2

(41(0)) 2 (3(0)) (32b)
 (402a, 402b) (402a, 402b) (8a) / (8b) 1
 (403a, 403b) (18(0)) (403a, 403b) (2(0))

(32b) SELb가 'H' C(0)가
 (402b)가 (402b) (8b) (403b)가 가 / (8b) (403b)가 (2(0)) 가 (403b)가 (2(0)) 가 VSW)가 (2(0))

C(0)가 (403a)가 가 2 SELb 'L' (402a)가 (403a)가 (2(0)) (8a) Vddr가 (403a)가 (2(0))

(0) (14) (42(0)) C(0) WRITE ERASE C
 (42(0)) (42(0)) C(0) (42(0)) C(0) (43(0))가, C
 (0)가 (42(0)) (43(0)) ENBb='H'

7, 1 (10)

(501), (10) 1 (501), 2 (502) 3 (503, 504) 3 (502)

(505), (503) (505)

(505) (6a) (502) 가 3 (503) WRITE

(6b) 가 3 (504) /

2 (502) (506) ERASE (506)

가 (504) / (6b)

8, 6 (42(0)) (43(0)) 1

(18(0)) (18(0)) 1, C(0) (18(1) 18(m-1)) 가

t(n-1), R(0) R(n-1) Rst(0) Rst(n-1) AND (111(0) 111(n-1)) AND Set(0) Se (112(0) 112(n-1))

AND (111(0) 111(n-1)) AND (112(0) 112(n-1)) 1

(17(0)) (113(0) 113(n-1)) 가 (113(0)) 가

AND (111(0) C(0) 112(0)) B0가 C(0)

AND (111(0) 112(0)) 가 AND 가

AND (111(0) SET 2 1 AND (111(0) 111(n-1)) 1 SET, RESET A

ND (111(0) 111(n-1) 113(0) 113(n-1)) SET 가/ 가

RESET (112(0) 112(n-1)) 1 RESET (112(0) (1

12(n-1)) 113(0) RESET 113(n-1) 가/ 가

R(0) B(n-1) () ()

6 42(0)

R(0) R(n-1) OR (431(0))(C(0)) 6 (43(0)) (3(0), 16(0))

C(1) C(m-1) 1 (18(1) 18(m-1)) 8

가 C(1) (18(1)) C(0)

B(n-1) C(1) B0 가 가

(113(n)) (111(n), 112(n)) R(n) 가

SET, OR RESET가 R(n) (431(1)) (431(1)) 1 C(1) (3(1

)), (16(1))

8, C(0) 가 , OR (431(0)) LOW

LOW (3(0), 16(0))가 C(0) 가

C(1)

9 1 C(i), (i = 0 m-1) , 10 9 B0

9 B(0) B(n-1) , B0 , 10 BL1 BL4
 WL1 WL3 , MC가 , B(0) B(n-1)
 BL WL B(0) B(n-1) (702
)가 (701)가 , (704)
 (703) B(0) B(n-1)

11 , 1 (11a) (11b)

OR (901, 902) 2 (32a)가 POLi(i=0 ((m-1) 가
 (904) (11a) , (906)
 (905) (11b)
 가 NG , (907)
 가 , 가 NG / (15) , 가 가
 (15) , 가
 , 1 15 , ()
 ()가 , 8 , 가
 가 ()

1 , 가 , (14) WRITE가 ,
 (10) 가
 / (6b) 가 (18) (42)
 R 가 'H' C

ENBb='H') (C(0)) (431(0))가 'H'(C(0)
 C(0) SELb가 'H' , C(0)

, ENBb SELb , / (6b)
 가 C(0) (2(0)) , (2(0) 2(m-1)) /
 (8b) 가 , C(0) (4(0)) / (7b)

, I/O , (907) (905)
 , 가 , C(0) , C(1)
 ELb가 'L' , 가 C(0) , ENBb가 'L', S

, (2(1)) (6a) 가 C(1) (2(1)) ,
 (2(1)) 가 (4(1)) ,
 (7a) (11a)

' , C(0) , C(0) ENBb가 'H' (904)
 POL 'H' , C(0)
 C(0) 가 ,

(14) ERASE가 (10) (506)가
 'H'가 SELh가 'H' 가 C(0)가
 C(0) / (8b) (7b) / (6b) 가
 (506) 가
 12 15
 12
 13 12 (Pre Program)
 14 12 (Erase)
 15 12 (Weak Program)
 12 가 (Start) (Initial set) (Select)
 (Error='H') (가 yes) 13 (Pre Prog)
 ram) (Error='H') (Erase)
 OK) (Weak Program) (Error='H') 14 (Over Erase Verify OK) 15 (Erase Verifit)
 (Block Reg. Reset) (431(0)) LOW C(0)
 가 8 (Read Setup)가 OR 가
 () ()¹ 가 ()
 () 가
 가 가 가 가
 가
 , NG 가

, 가 가

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(57)

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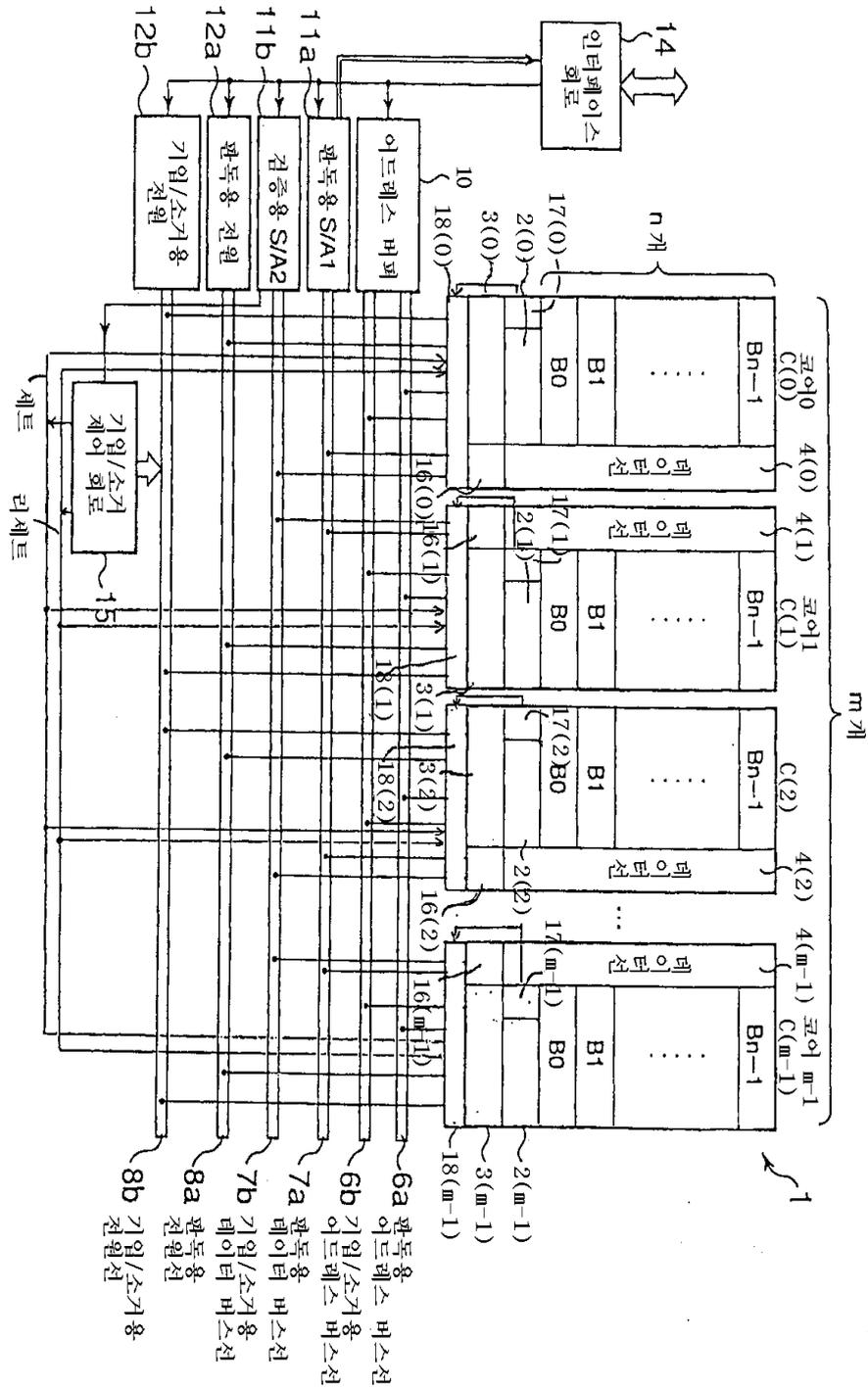
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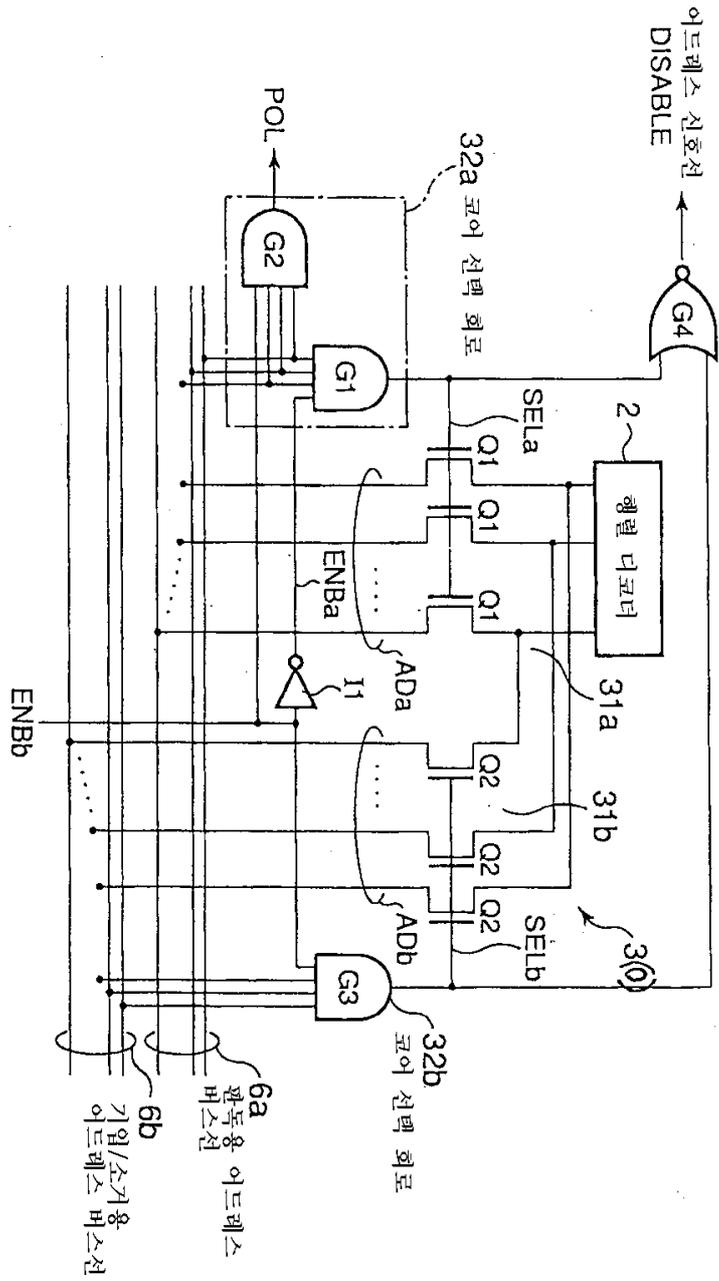
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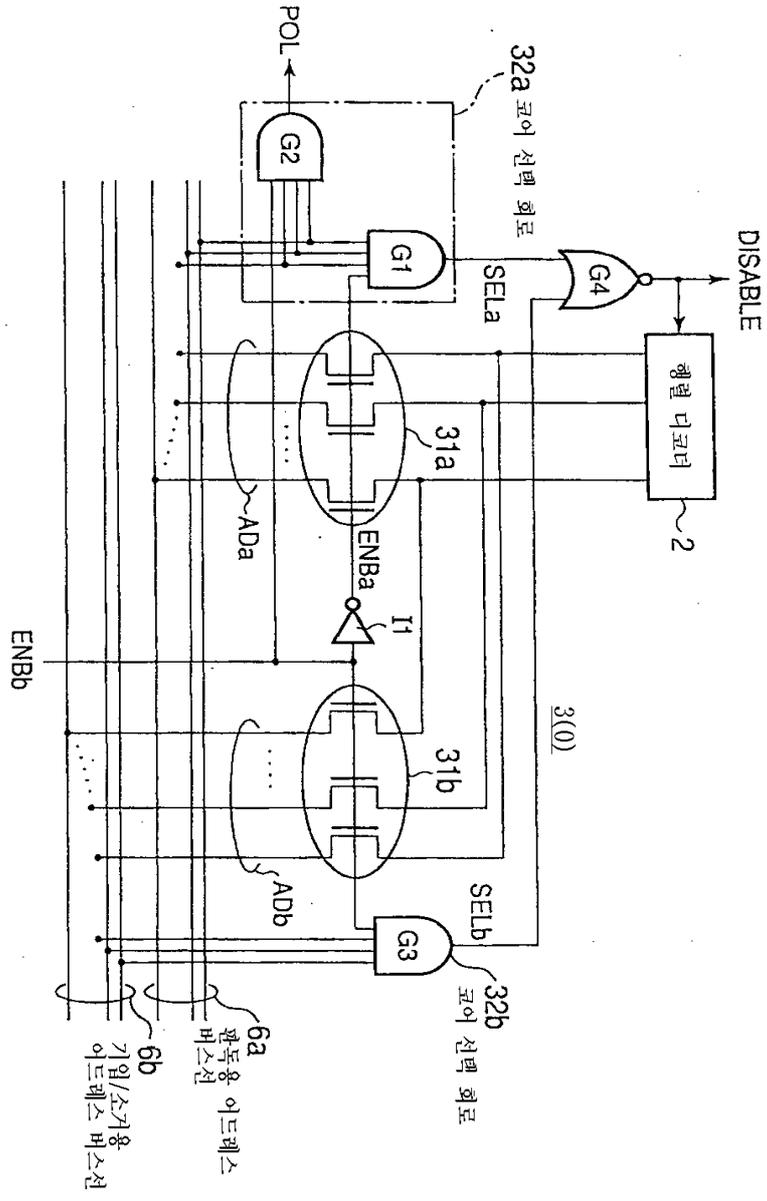
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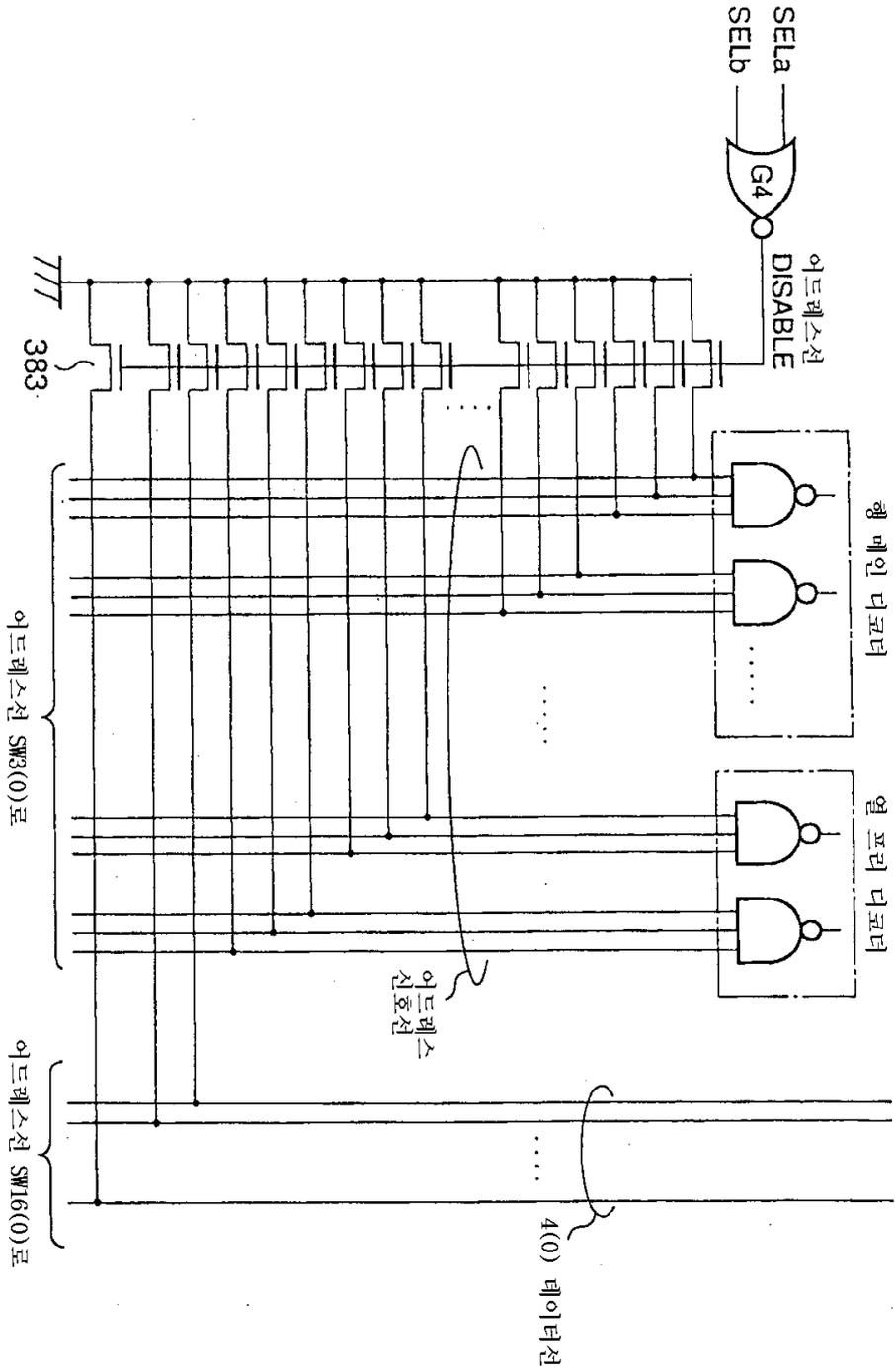
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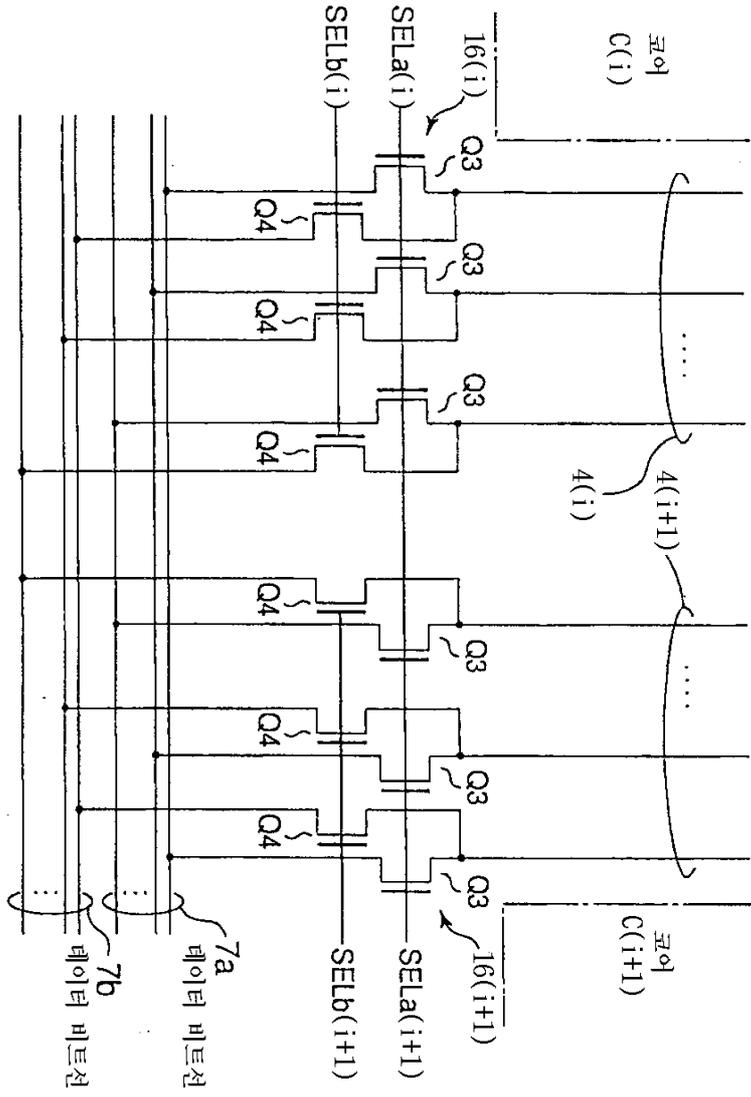


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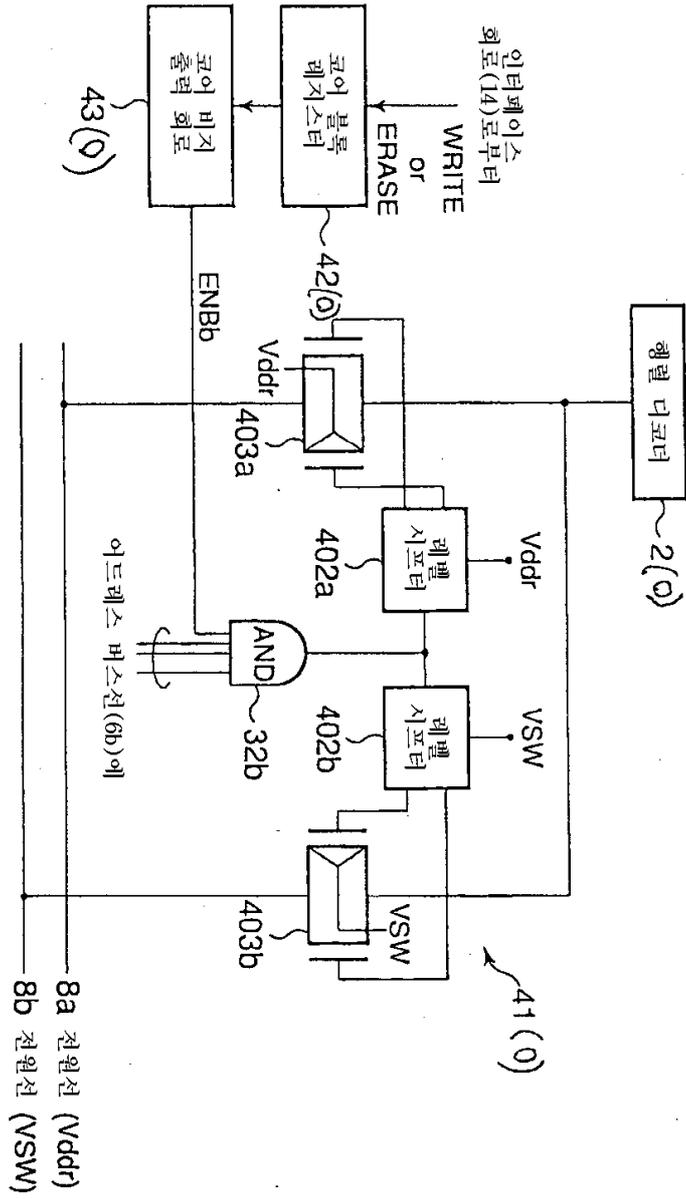


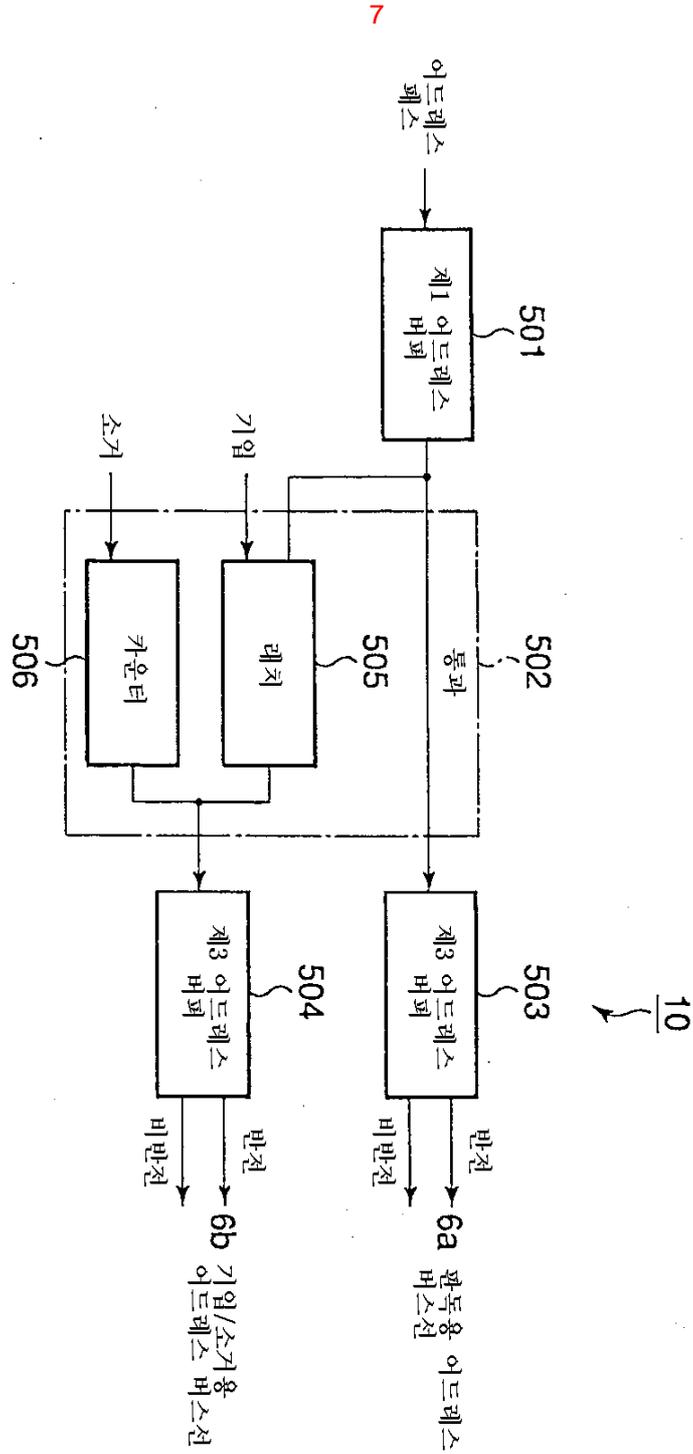


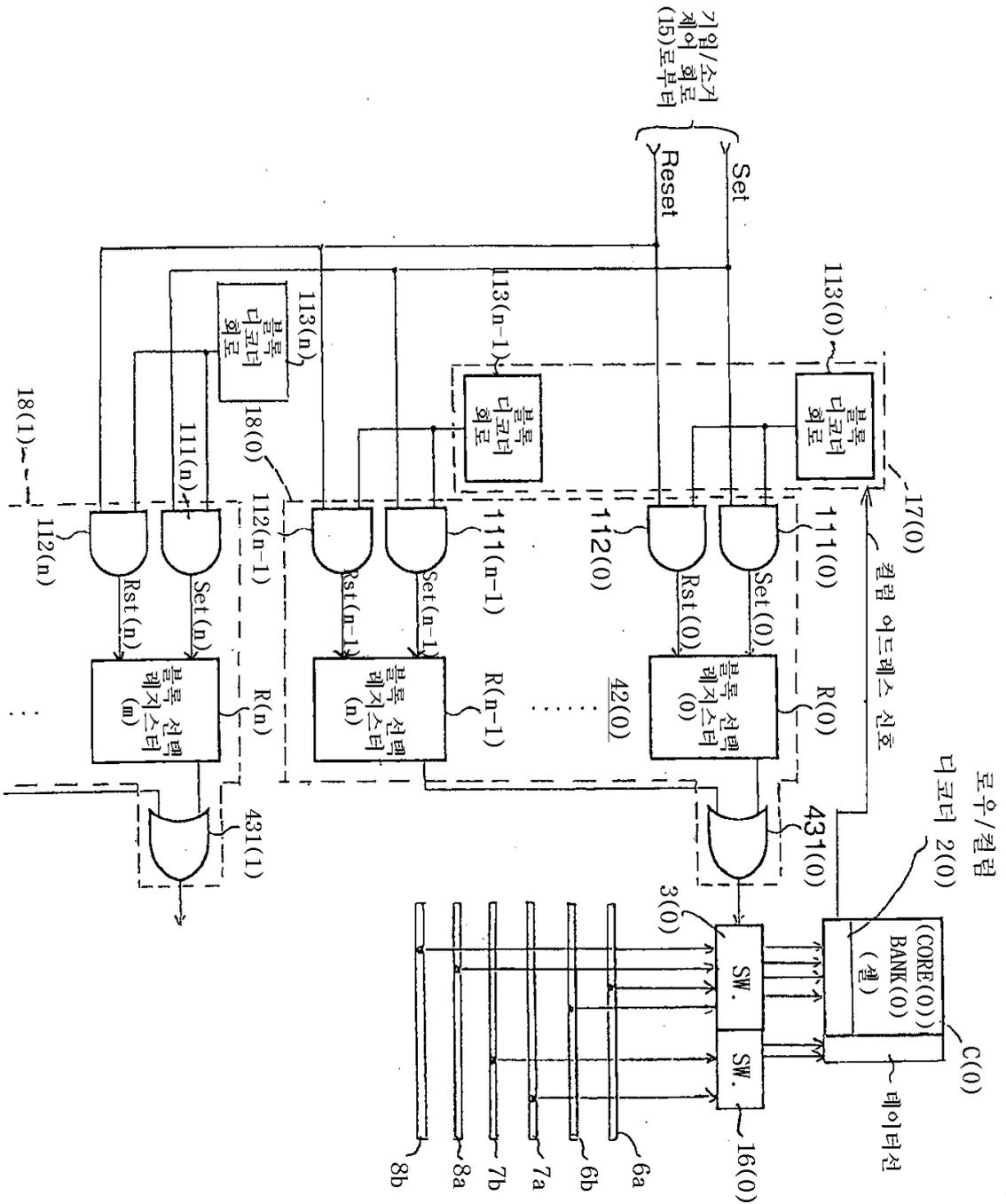
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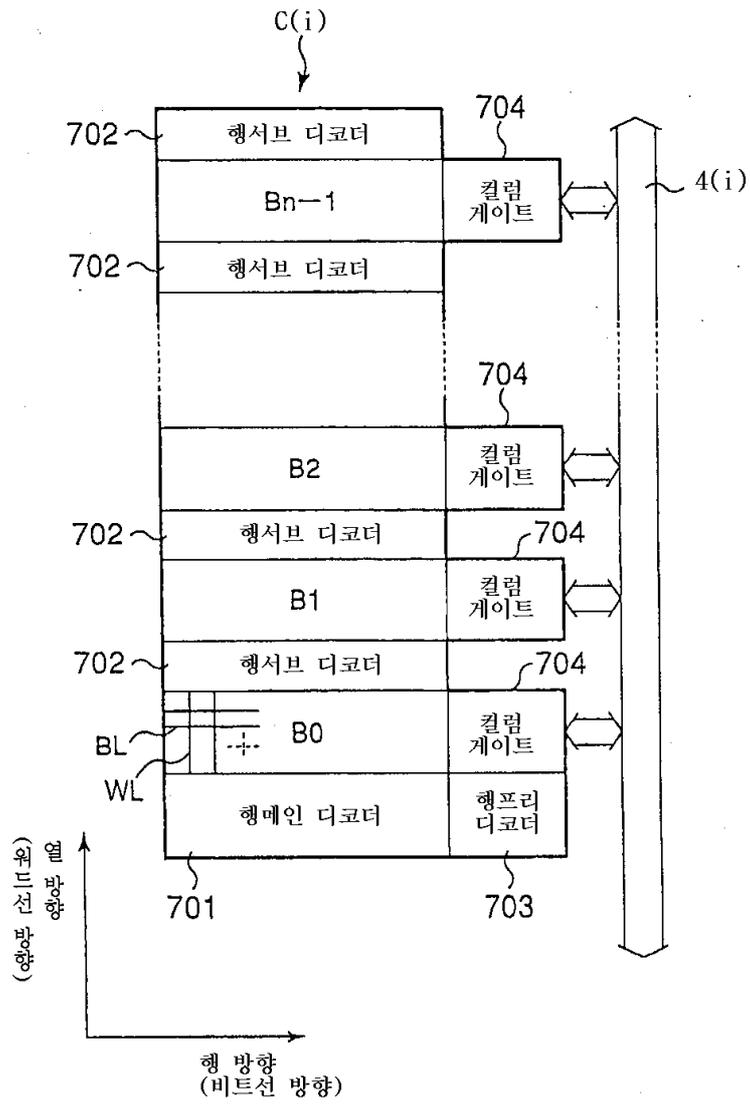


9

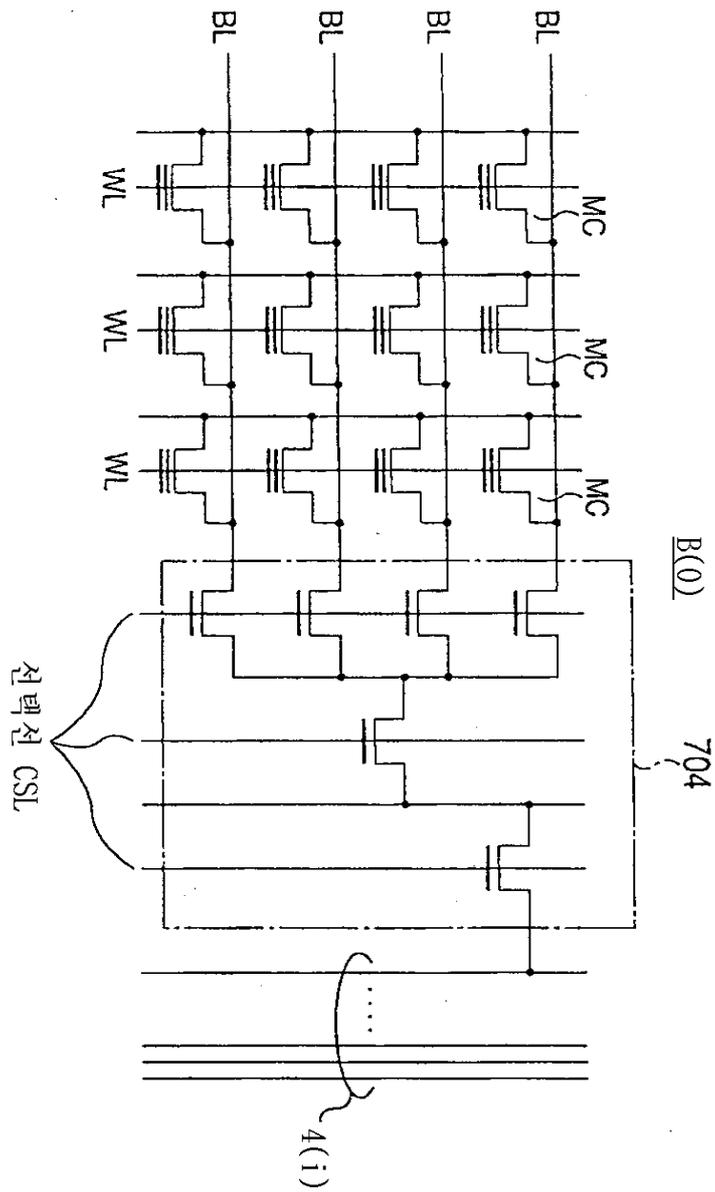


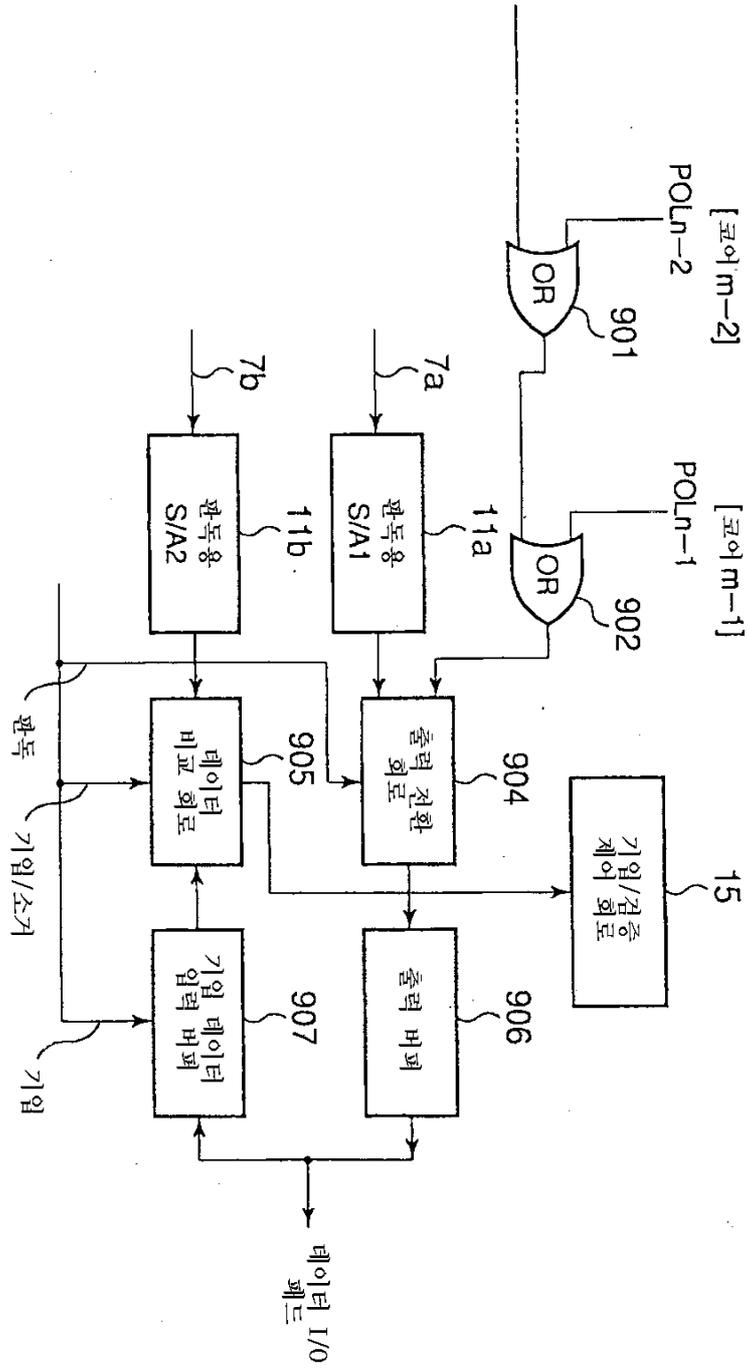




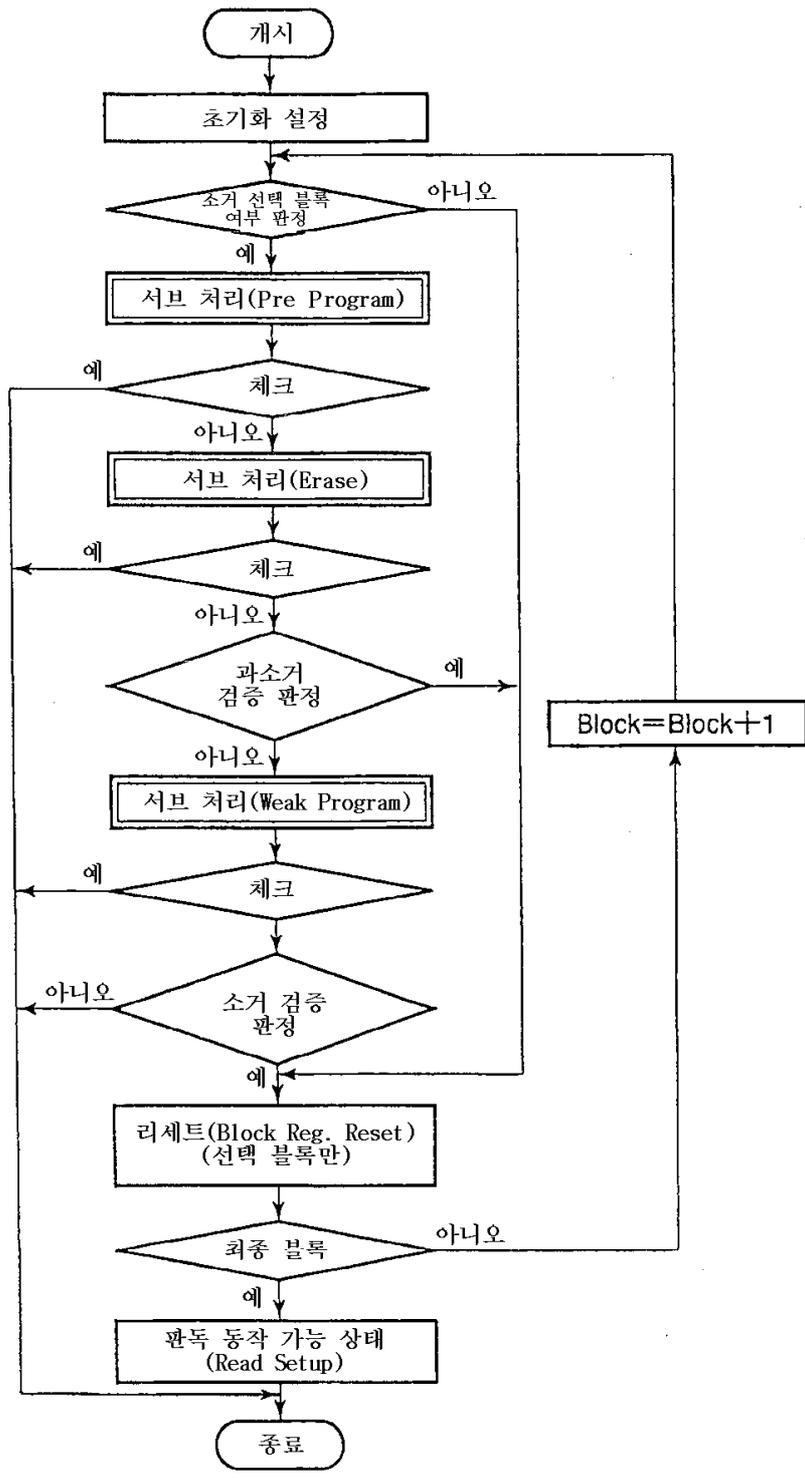


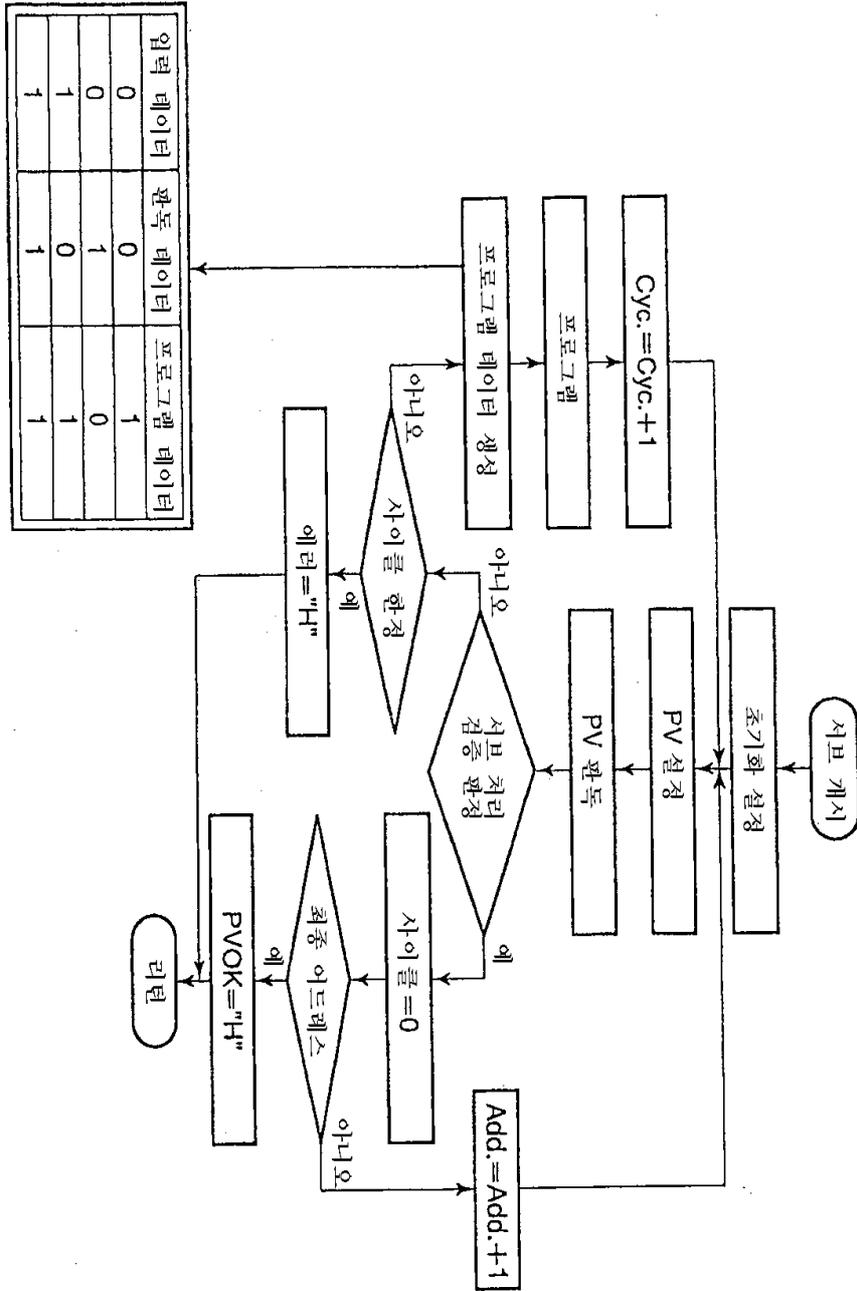
10





12





14

