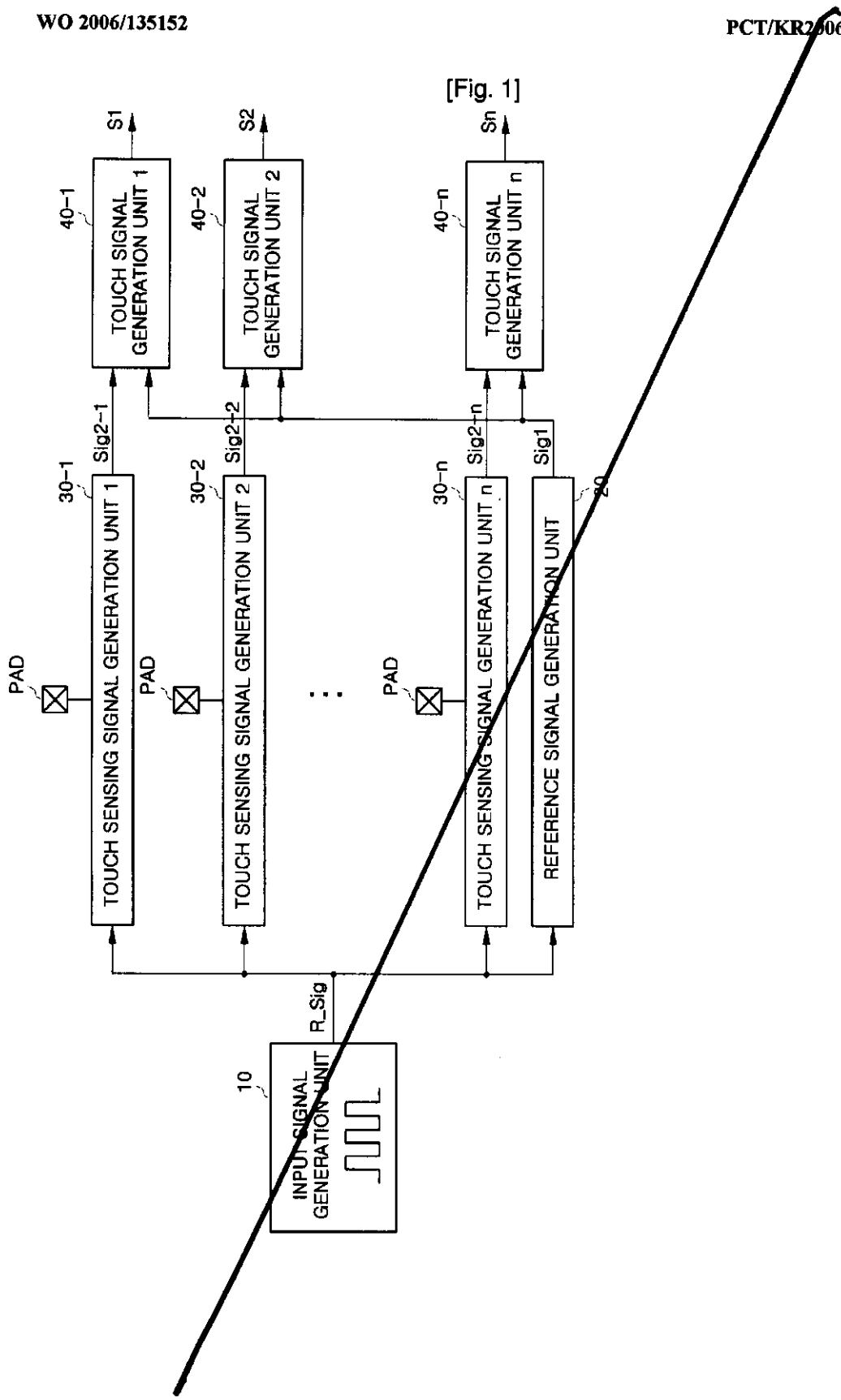
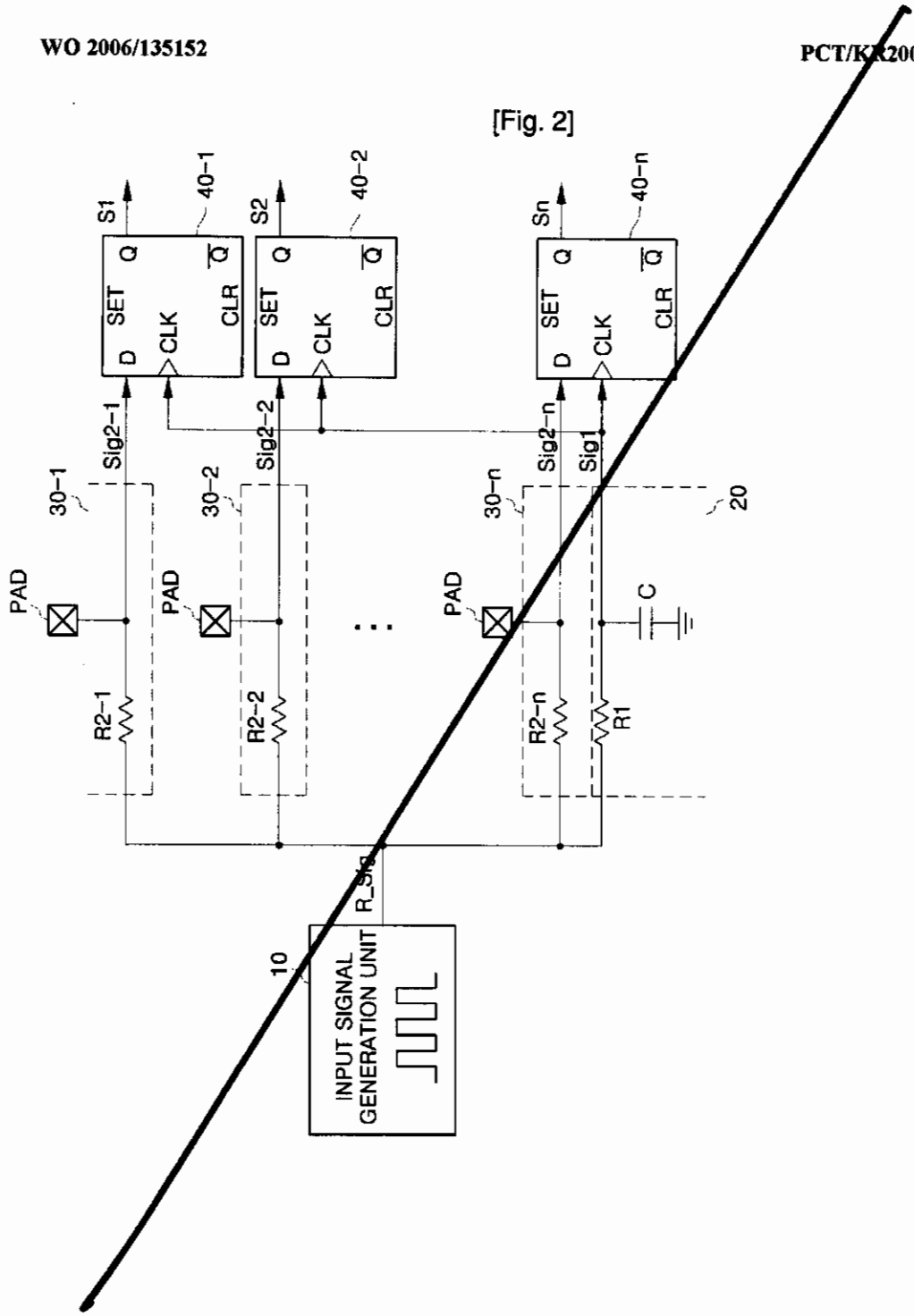
WO 2006/135152 PCT/KR2006/001841

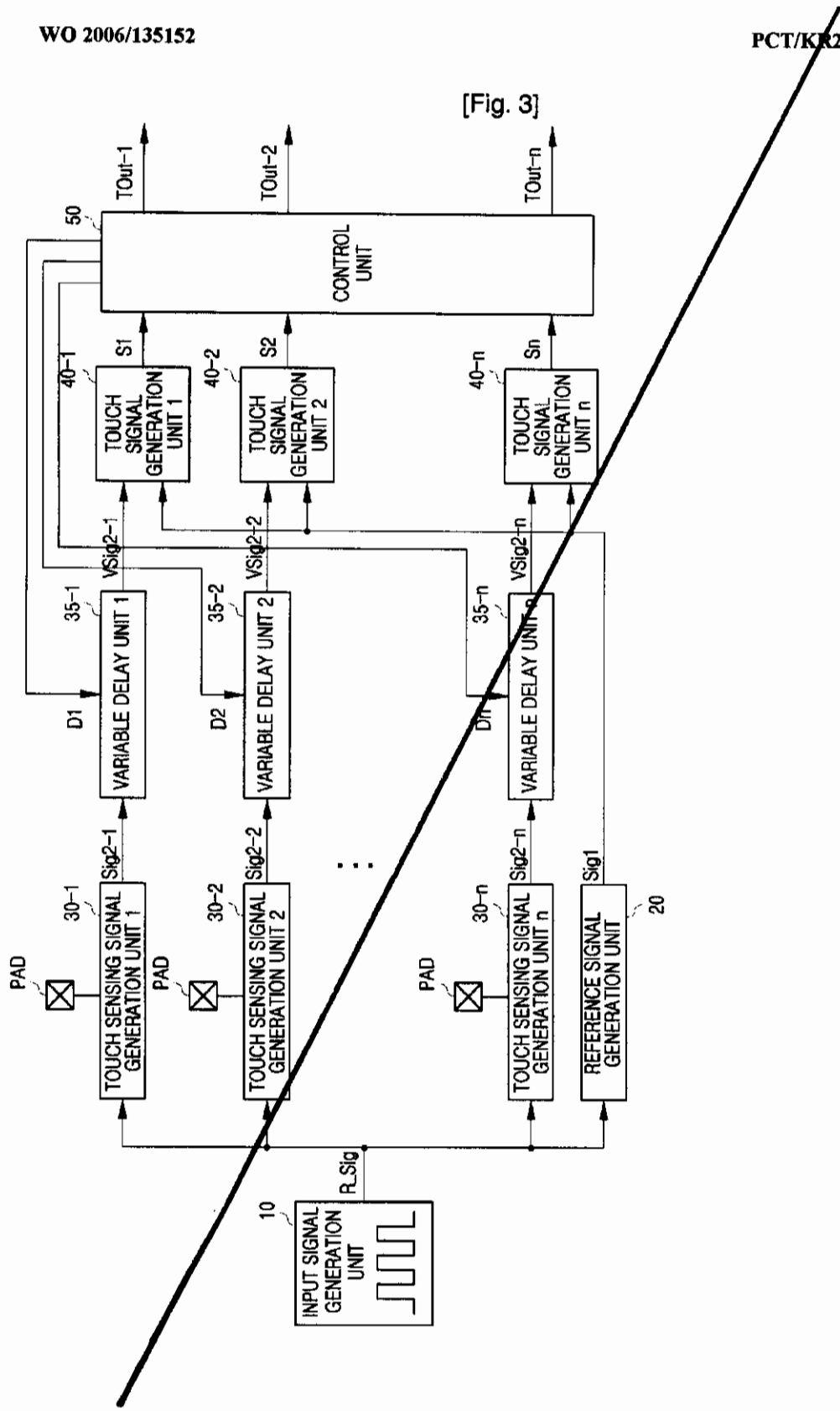
[Fig. 1]



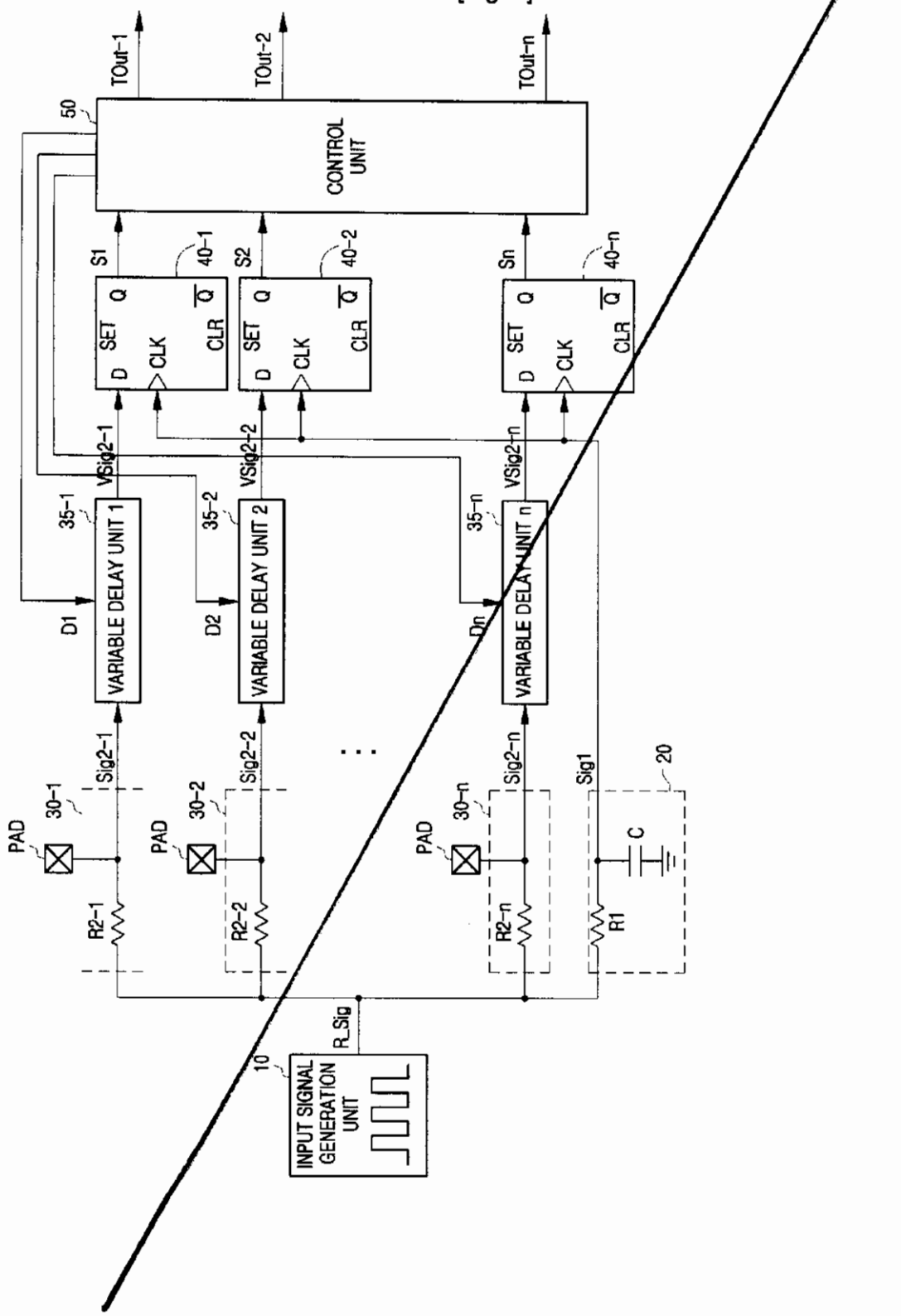
[Fig. 2]


S1
S2
Sn
40-1
40-2
40-n
SET
CLR
CLK
D
Q
Sig2-1
Sig2-2
Sig2-n
Sig1
30-1
30-2
30-n
20
PAD
C
R2-1
R2-2
R2-n
R1
10
INPUT SIGNAL GENERATION UNIT

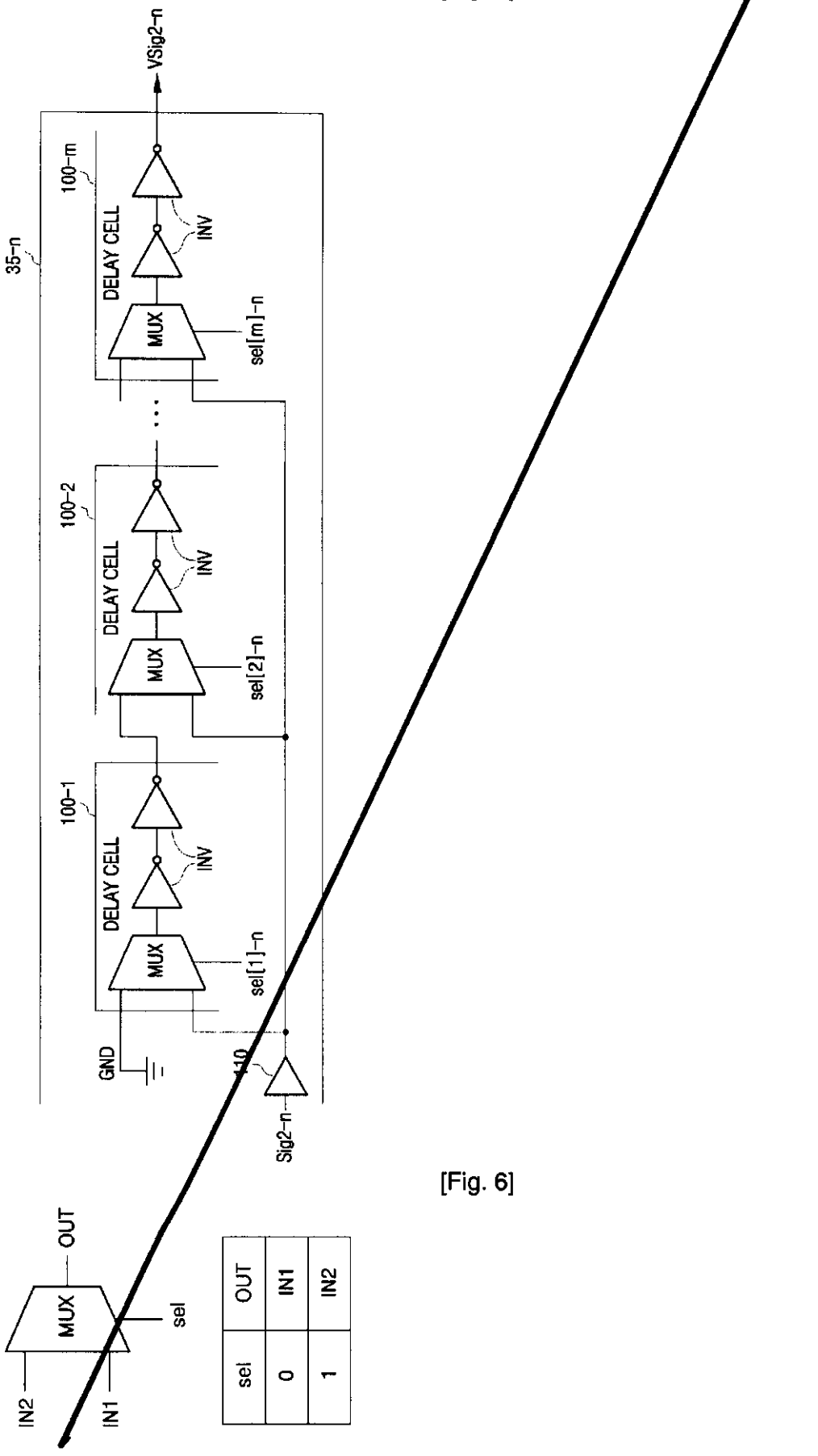
[Fig. 3]


TOut-1
TOut-2
TOut-n
50
CONTROL UNIT
40-1
S1
TOUCH SIGNAL GENERATION UNIT 1
40-2
S2
TOUCH SIGNAL GENERATION UNIT 2
40-n
Sn
TOUCH SIGNAL GENERATION UNIT n
VSig2-1
VSig2-2
VSig2-n
35-1
35-2
35-n
D1
D2
Dn
VARIABLE DELAY UNIT 1
VARIABLE DELAY UNIT 2
VARIABLE DELAY UNIT n
Sig2-1
Sig2-2
Sig2-n
Sig1
30-1
30-2
30-n
PAD
TOUCH SENSING SIGNAL GENERATION UNIT 1
TOUCH SENSING SIGNAL GENERATION UNIT 2
TOUCH SENSING SIGNAL GENERATION UNIT n
REFERENCE SIGNAL GENERATION UNIT
20
R_Sig
10
INPUT SIGNAL GENERATION UNIT

[Fig. 4]


TOut-1
TOut-2
TOut-n
50
CONTROL UNIT
S1
S2
Sn
40-1
40-2
40-n
SET
CLR
CLK
D
Q
VSig2-1
VSig2-2
VSig2-n
35-1
35-2
35-n
VARIABLE DELAY UNIT 1
VARIABLE DELAY UNIT 2
VARIABLE DELAY UNIT n
D1
D2
Dn
Sig2-1
Sig2-2
Sig2-n
Sig1
30-1
30-2
30-n
PAD
R2-1
R2-2
R2-n
R1
C
20
10
INPUT SIGNAL GENERATION UNIT
R_Sig

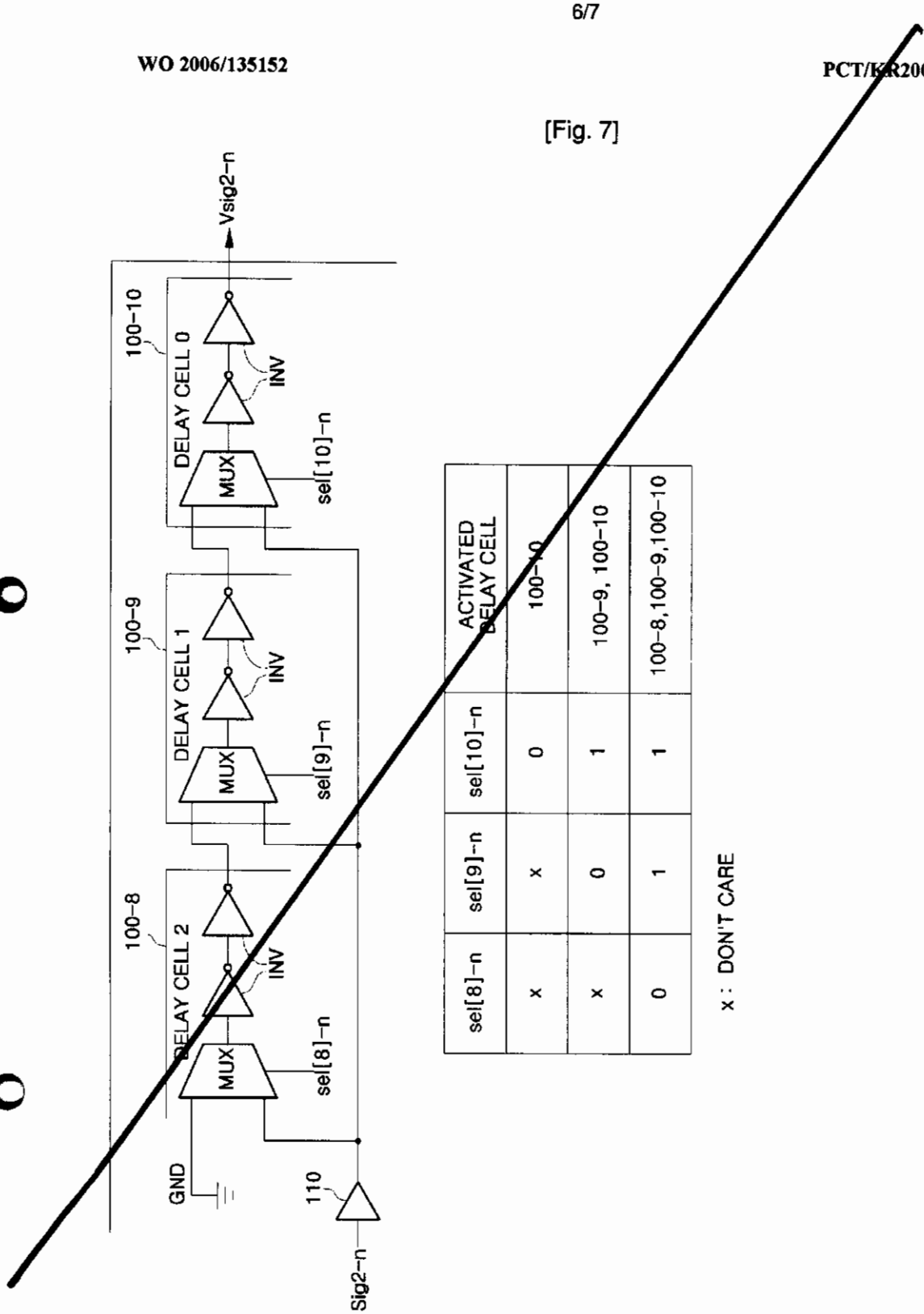
[Fig. 5]



[Fig. 6]

sel	OUT
0	IN1
1	IN2

[Fig. 7]



sel[8]-n	sel[9]-n	sel[10]-n	ACTIVATED DELAY CELL
x	x	0	100-10
x	0	1	100-9, 100-10
0	1	1	100-8,100-9,100-10

x : DON'T CARE

[Fig. 8]

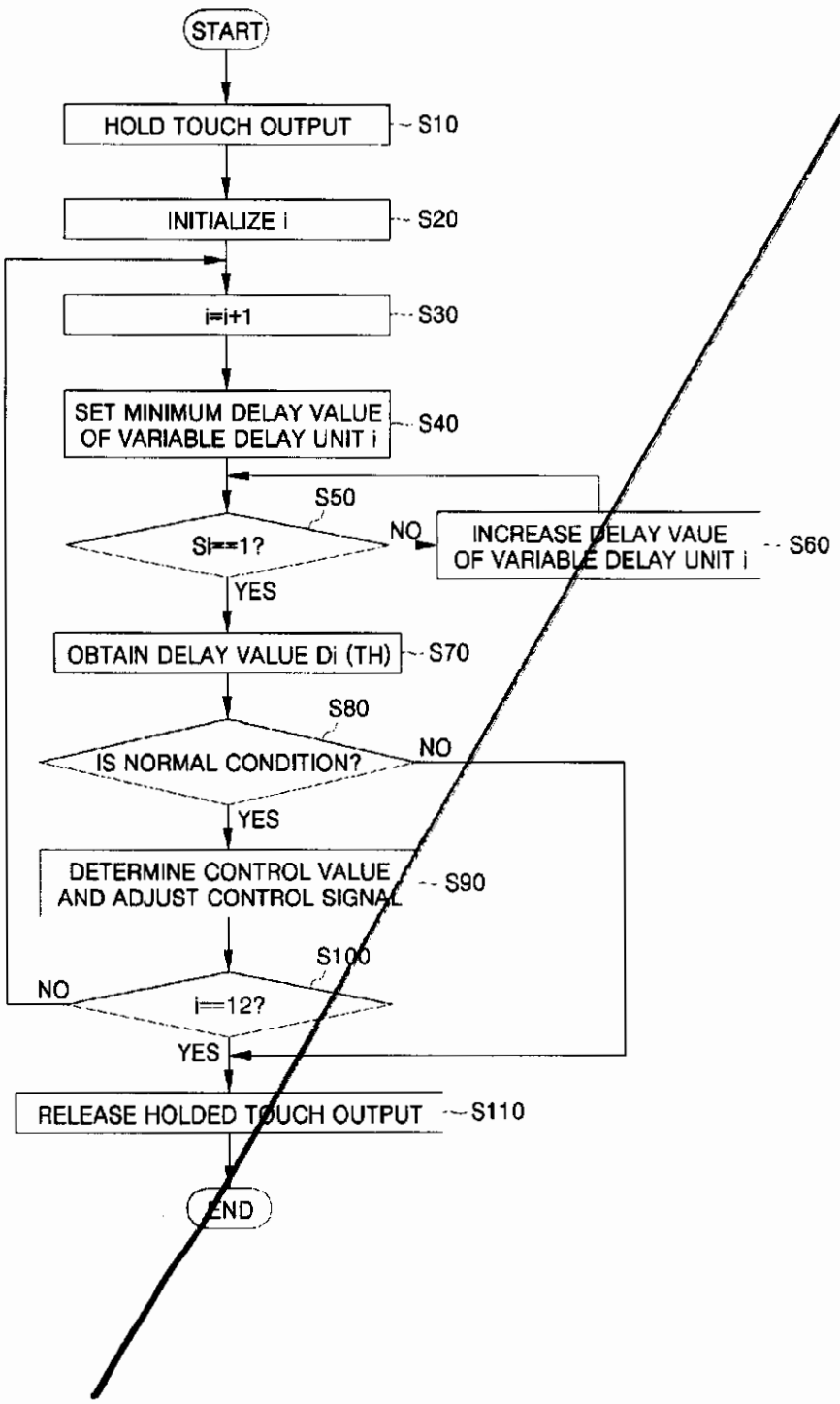

START
HOLD TOUCH OUTPUT
S10
INITIALIZE i
S20
i=i+1
S30
SET MINIMUM DELAY VALUE OF VARIABLE DELAY UNIT i
S40
S50
SI==1?
NO
INCREASE DELAY VAUE OF VARIABLE DELAY UNIT i
S60
YES
OBTAIN DELAY VALUE Di (TH)
S70
S80
IS NORMAL CONDITION?
NO
YES
DETERMINE CONTROL VALUE AND ADJUST CONTROL SIGNAL
S90
S100
NO
i==12?
YES
RELEASE HOLDED TOUCH OUTPUT
S110
END

FIG. 1

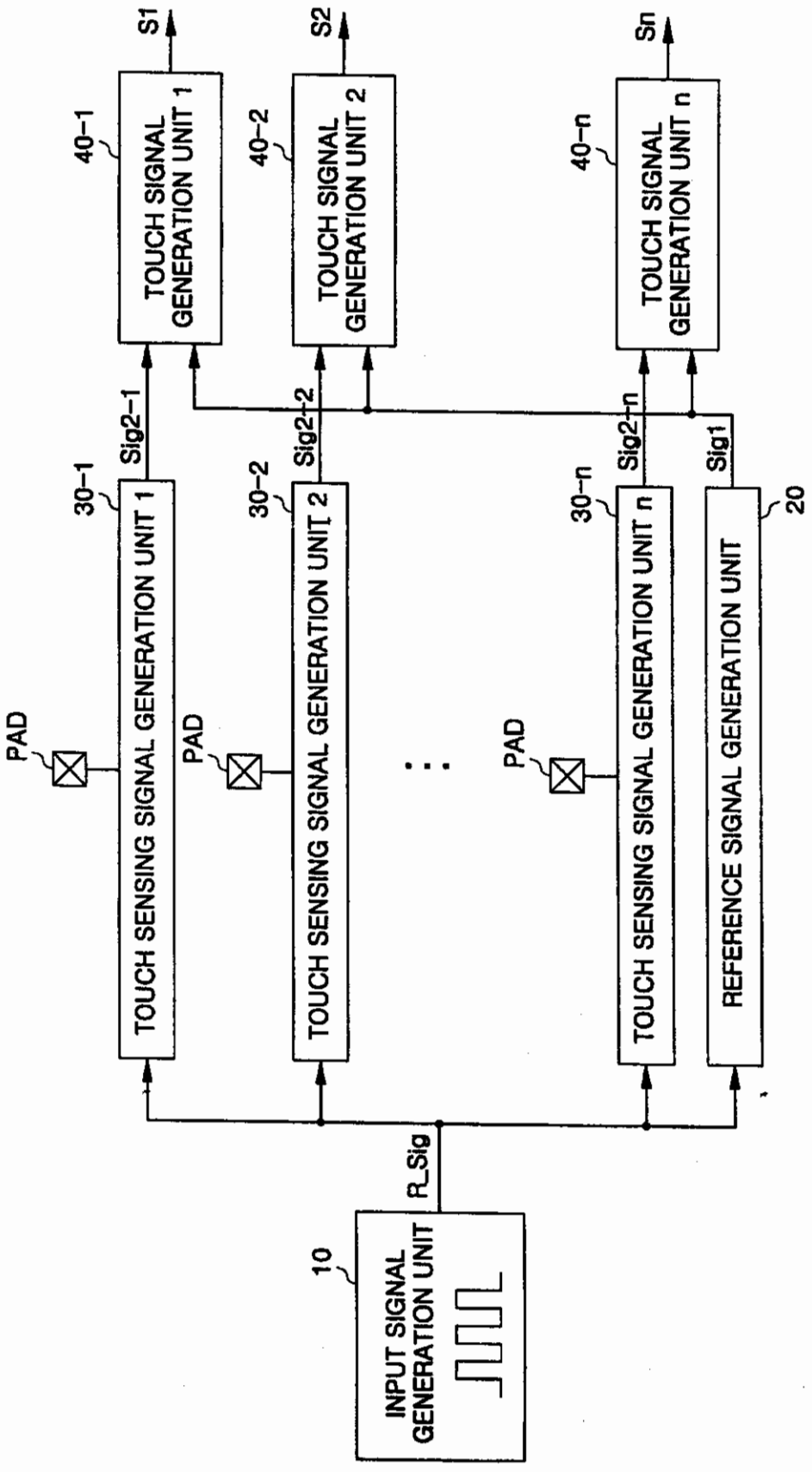

10
INPUT SIGNAL GENERATION UNIT
R_Sig
20
REFERENCE SIGNAL GENERATION UNIT
Sig1
30-1
TOUCH SENSING SIGNAL GENERATION UNIT 1
Sig2-1
30-2
TOUCH SENSING SIGNAL GENERATION UNIT 2
Sig2-2
30-n
TOUCH SENSING SIGNAL GENERATION UNIT n
Sig2-n
PAD
PAD
PAD
40-1
TOUCH SIGNAL GENERATION UNIT 1
S1
40-2
TOUCH SIGNAL GENERATION UNIT 2
S2
40-n
TOUCH SIGNAL GENERATION UNIT n
Sn

FIG. 2

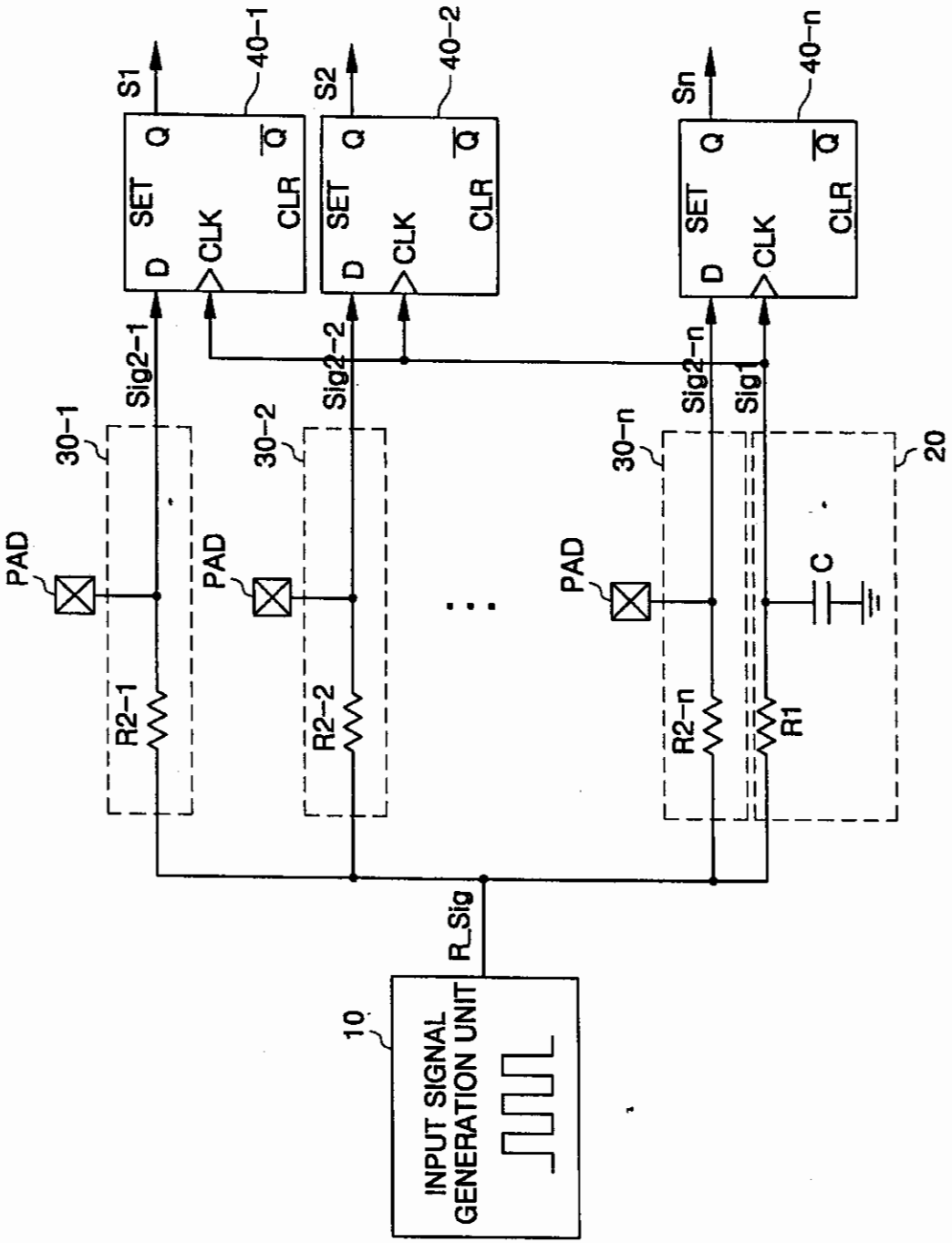

INPUT SIGNAL GENERATION UNIT
10
R_Sig
PAD
30-1
30-2
30-n
20
R2-1
R2-2
R2-n
R1
C
Sig2-1
Sig2-2
Sig2-n
Sig1
S1
S2
Sn
40-1
40-2
40-n
SET
CLR
CLK
D
Q

FIG. 3

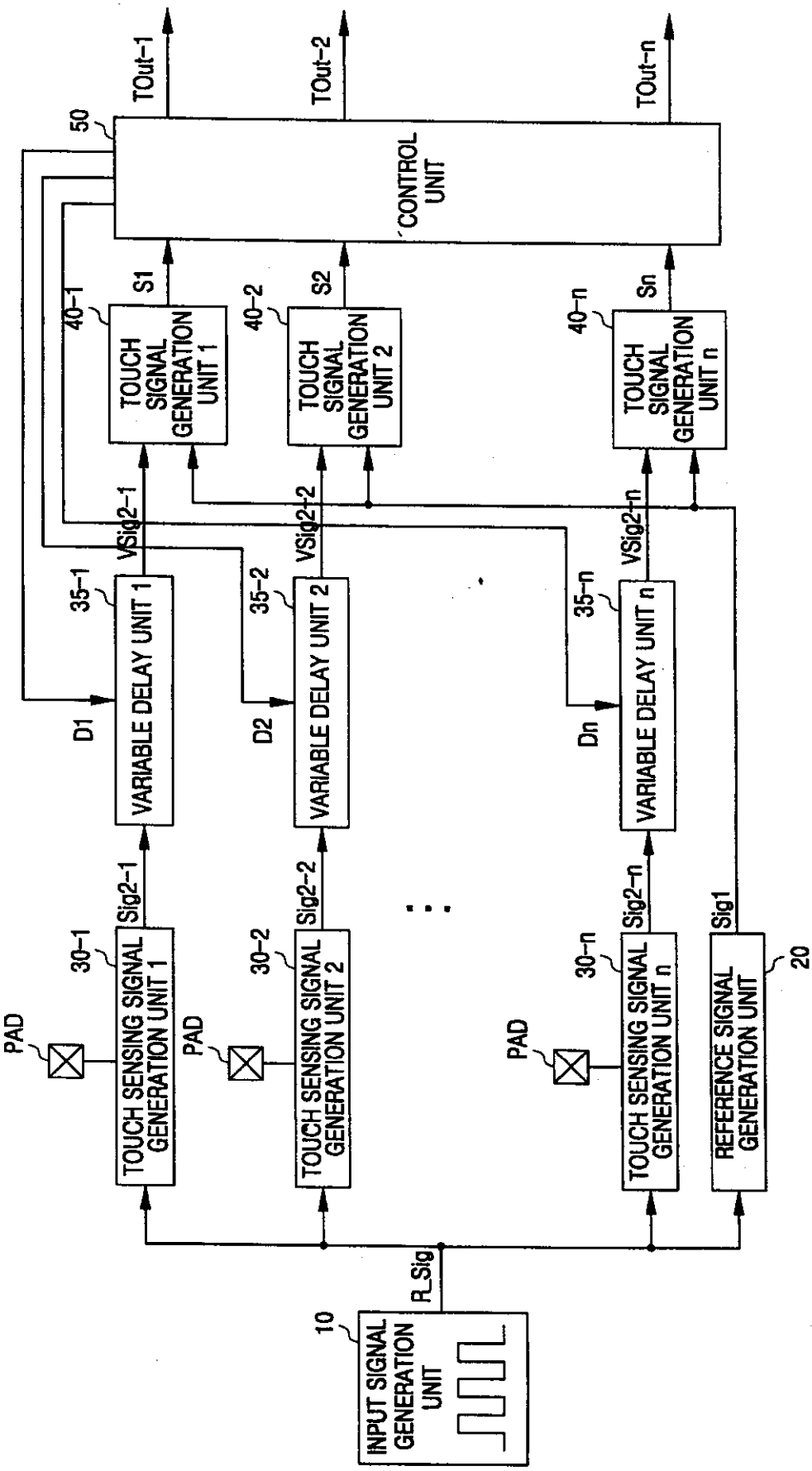

INPUT SIGNAL GENERATION UNIT
10
R_Sig
TOUCH SENSING SIGNAL GENERATION UNIT 1
30-1
TOUCH SENSING SIGNAL GENERATION UNIT 2
30-2
TOUCH SENSING SIGNAL GENERATION UNIT n
30-n
REFERENCE SIGNAL GENERATION UNIT
20
Sig2-1
Sig2-2
Sig2-n
Sig1
PAD
PAD
PAD
VARIABLE DELAY UNIT 1
35-1
VARIABLE DELAY UNIT 2
35-2
VARIABLE DELAY UNIT n
35-n
D1
D2
Dn
VSig2-1
VSig2-2
VSig2-n
TOUCH SIGNAL GENERATION UNIT 1
40-1
TOUCH SIGNAL GENERATION UNIT 2
40-2
TOUCH SIGNAL GENERATION UNIT n
40-n
S1
S2
Sn
CONTROL UNIT
50
TOut-1
TOut-2
TOut-n

FIG. 4A

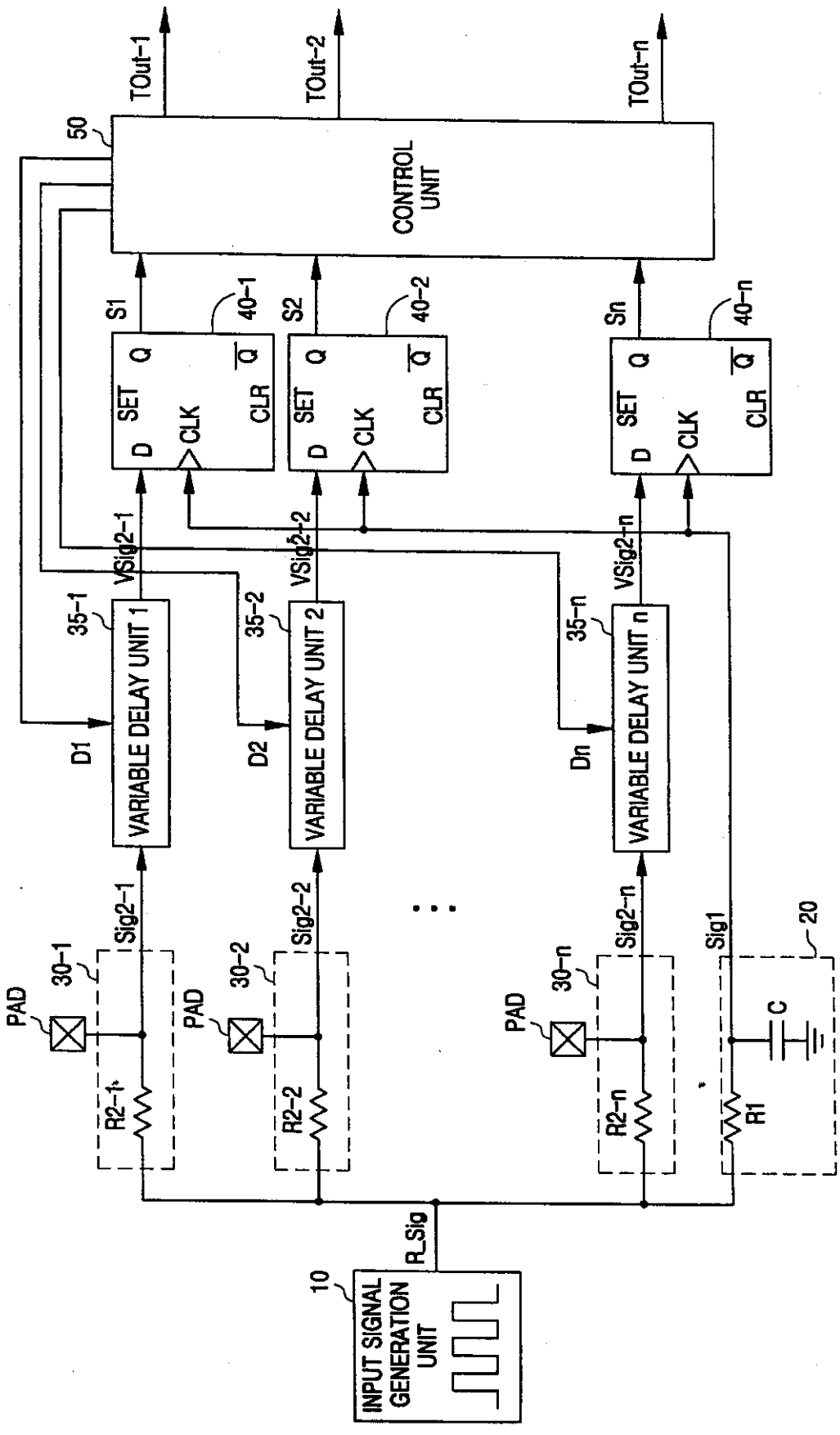

TOut-1
TOut-2
TOut-n
50
CONTROL UNIT
S1
S2
Sn
40-1
40-2
40-n
D
SET
Q
CLK
CLR
VSig2-1
VSig2-2
VSig2-n
35-1
35-2
35-n
D1
D2
Dn
VARIABLE DELAY UNIT 1
VARIABLE DELAY UNIT 2
VARIABLE DELAY UNIT n
Sig2-1
Sig2-2
Sig2-n
Sig1
30-1
30-2
30-n
PAD
R2-1
R2-2
R2-n
R1
C
20
R_Sig
10
INPUT SIGNAL GENERATION UNIT

FIG. 4B

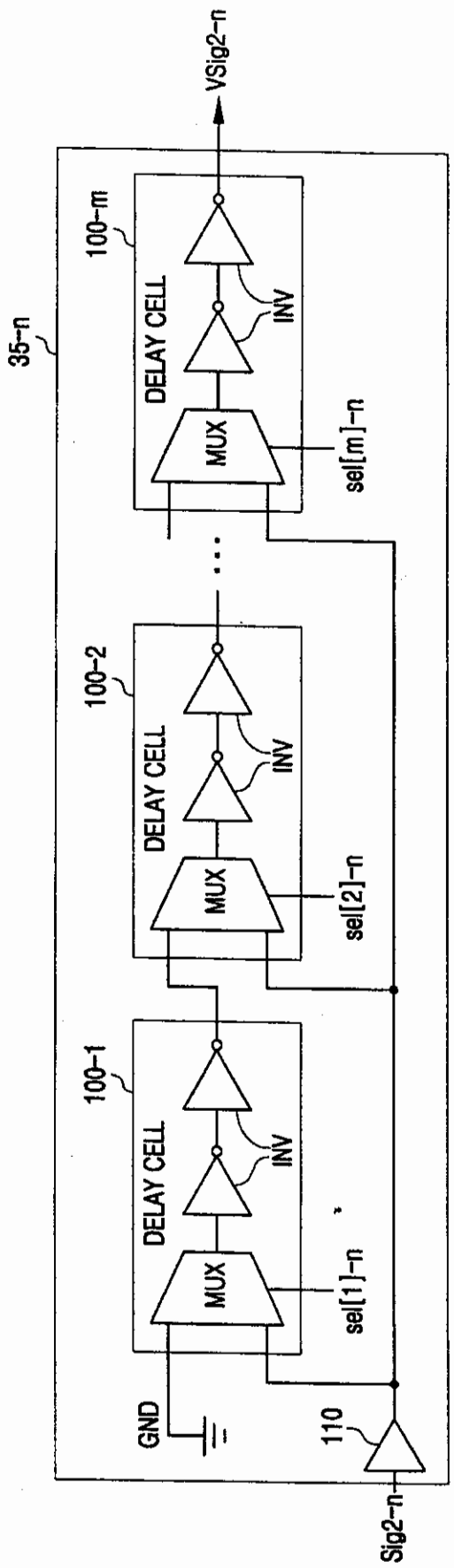
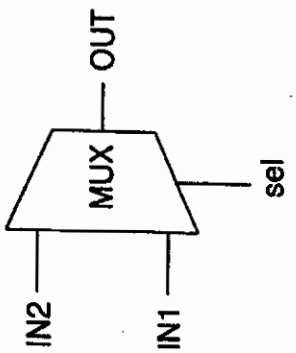
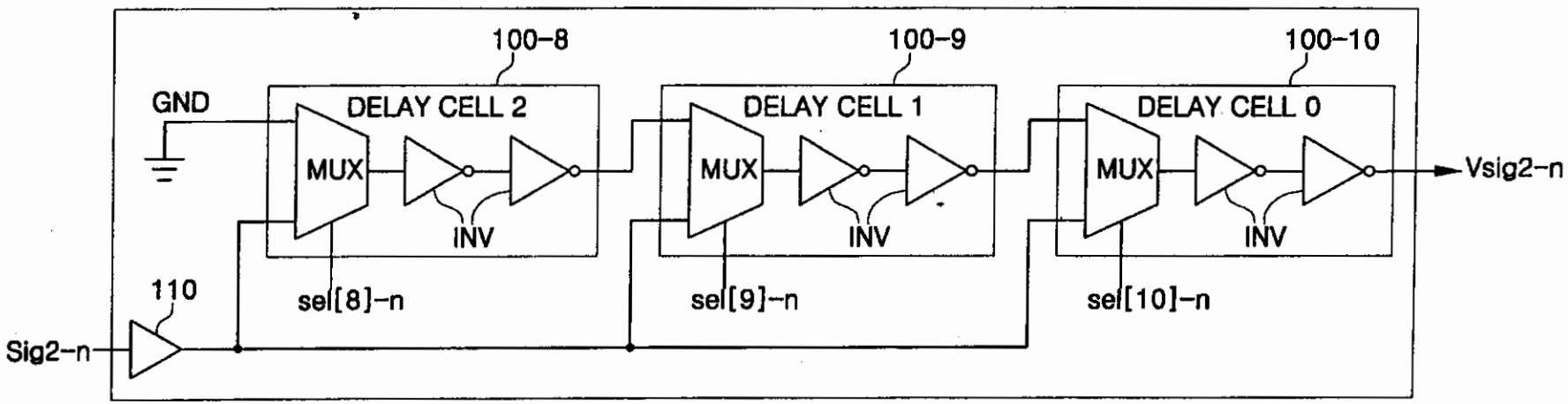

VSig2-n
35-n
100-m
DELAY CELL
MUX
INV
sel[m]-n
100-2
DELAY CELL
MUX
INV
sel[2]-n
100-1
DELAY CELL
MUX
INV
sel[1]-n
GND
110
Sig2-n

FIG. 4C



sel	OUT
0	IN1
1	IN2

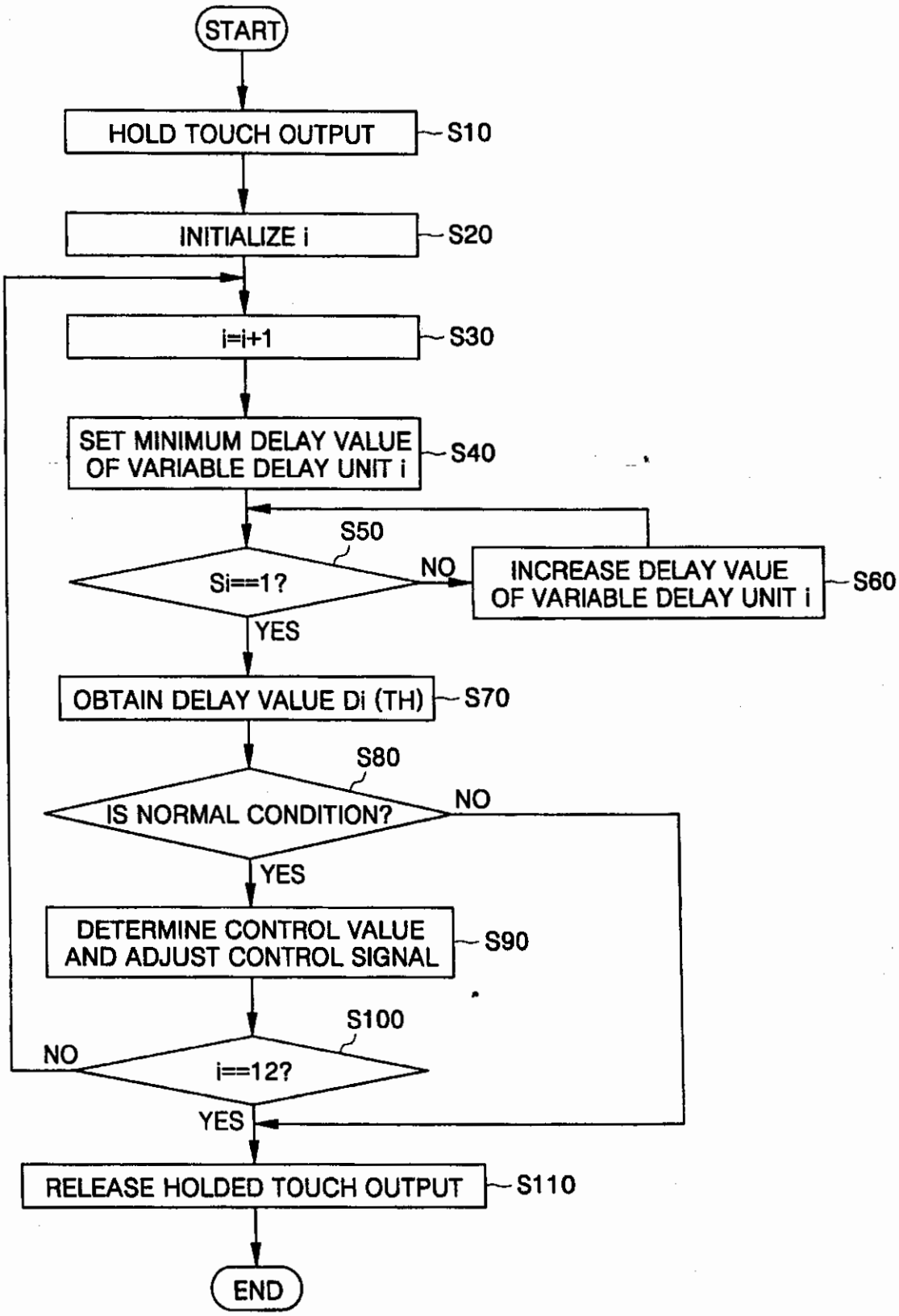
FIG. 4D



sel[8]-n	sel[9]-n	sel[10]-n	ACTIVATED DELAY CELL
x	x	0	100-10
x	0	1	100-9, 100-10
0	1	1	100-8,100-9,100-10

x : DON'T CARE

FIG. 5


START
HOLD TOUCH OUTPUT
S10
INITIALIZE i
S20
i=i+1
S30
SET MINIMUM DELAY VALUE OF VARIABLE DELAY UNIT i
S40
S50
Si==1?
NO
INCREASE DELAY VAUE OF VARIABLE DELAY UNIT i
S60
YES
OBTAIN DELAY VALUE Di (TH)
S70
S80
IS NORMAL CONDITION?
NO
YES
DETERMINE CONTROL VALUE AND ADJUST CONTROL SIGNAL
S90
S100
NO
i==12?
YES
RELEASE HOLDED TOUCH OUTPUT
S110
END