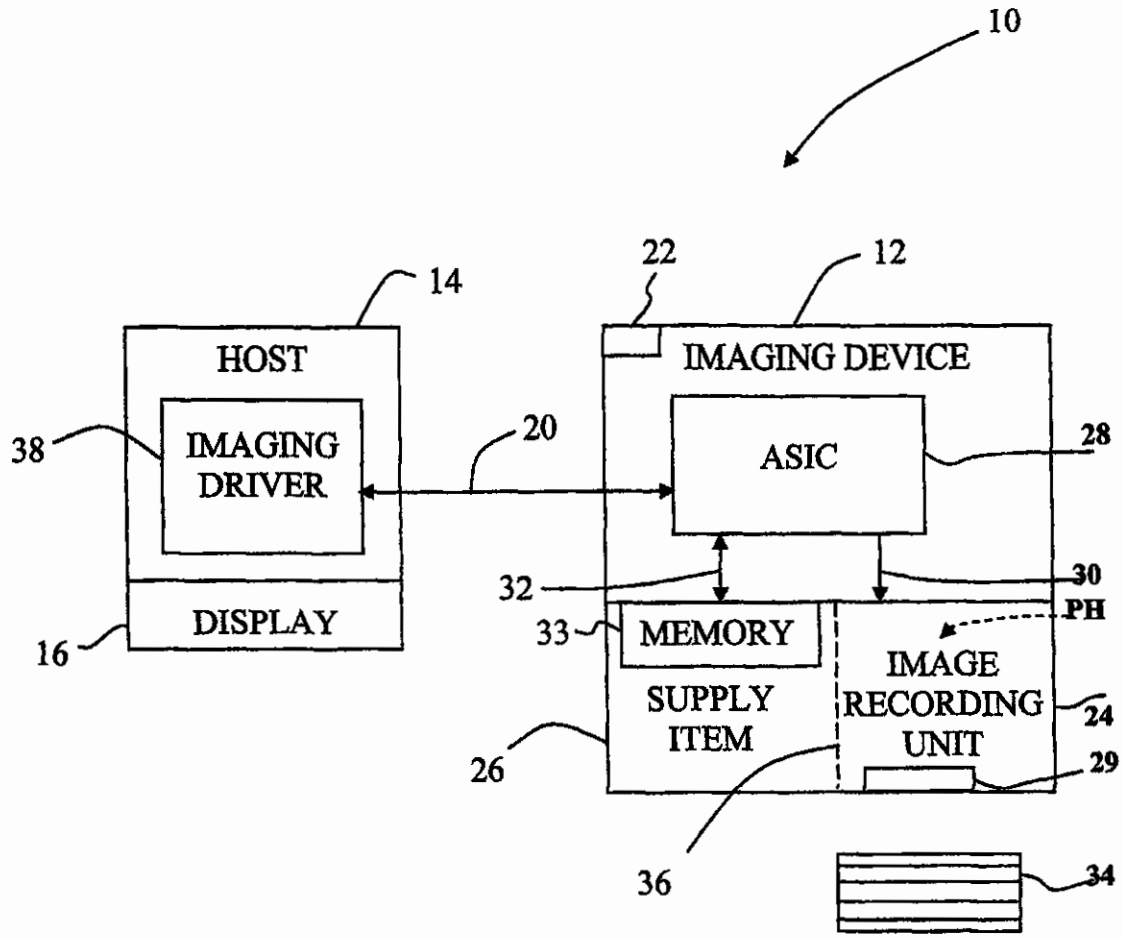

10
22
12
14
HOST
IMAGING DEVICE
38
IMAGING DRIVER
20
ASIC
28
32
30
PH
33
MEMORY
DISPLAY
16
IMAGE RECORDING UNIT
24
SUPPLY ITEM
26
29
36
34

Fig. 1

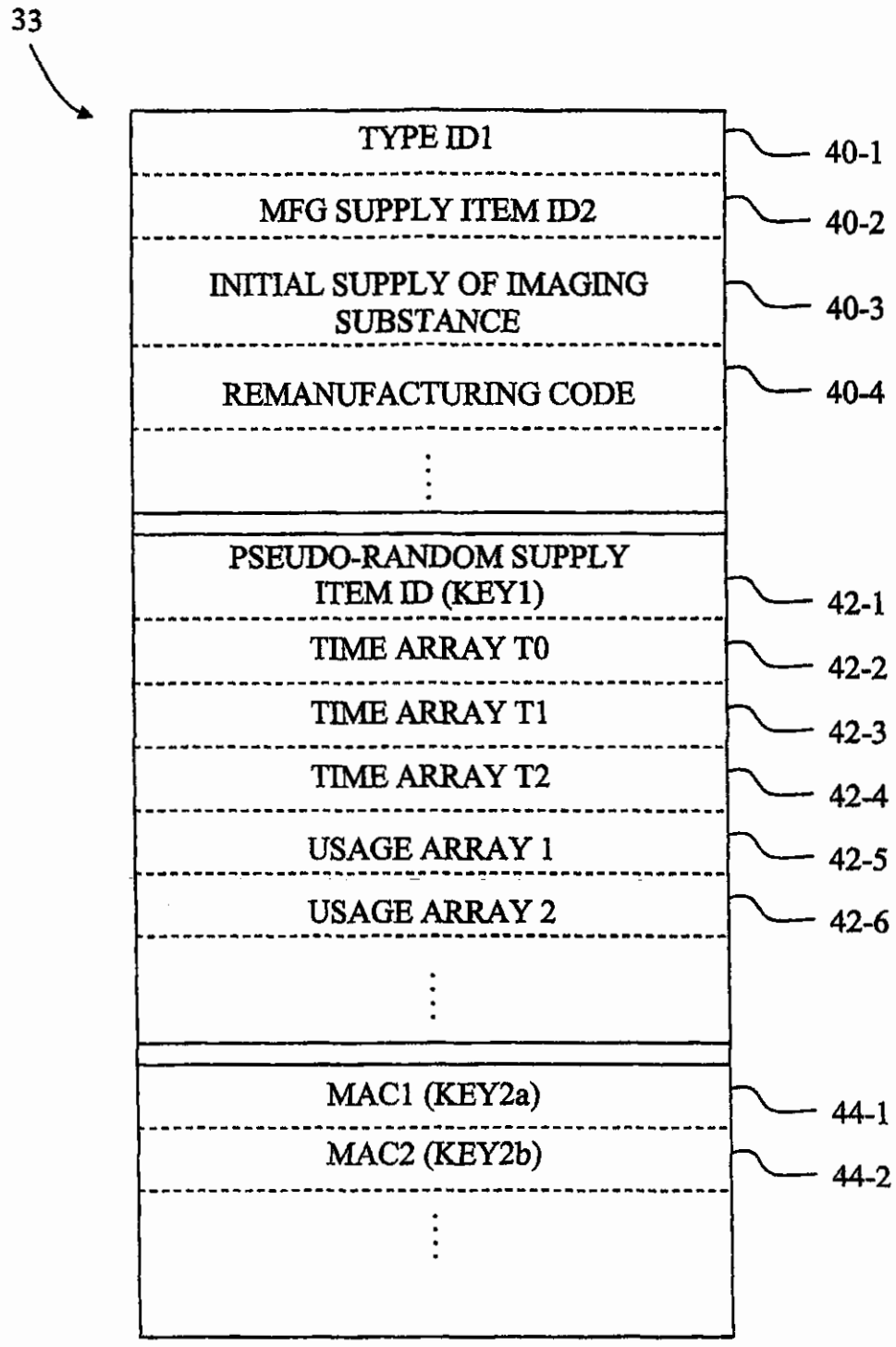

33
TYPE ID1
40-1
MFG SUPPLY ITEM ID2
40-2
INITIAL SUPPLY OF IMAGING SUBSTANCE
40-3
REMANUFACTURING CODE
40-4
PSEUDO-RANDOM SUPPLY ITEM ID (KEY1)
42-1
TIME ARRAY T0
42-2
TIME ARRAY T1
42-3
TIME ARRAY T2
42-4
USAGE ARRAY 1
42-5
USAGE ARRAY 2
42-6
MAC1 (KEY2a)
44-1
MAC2 (KEY2b)
44-2

Fig. 2

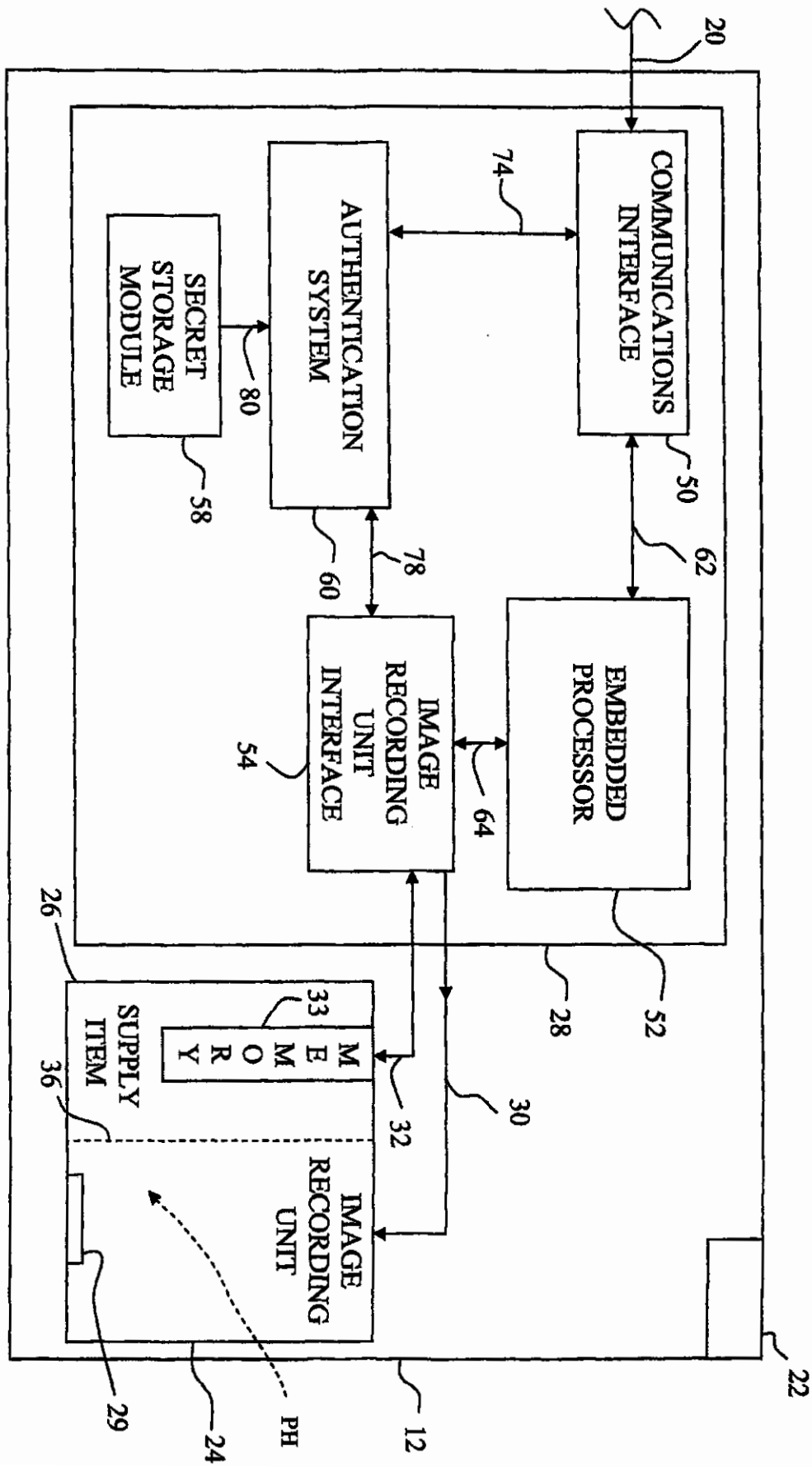

20
COMMUNICATIONS INTERFACE
74
AUTHENTICATION SYSTEM
SECRET STORAGE MODULE
80
58
50
62
60
78
IMAGE RECORDING UNIT INTERFACE
54
64
EMBEDDED PROCESSOR
52
28
26
33
MEMORY
32
30
SUPPLY ITEM
36
IMAGE RECORDING UNIT
29
24
PH
12
22

Fig. 3

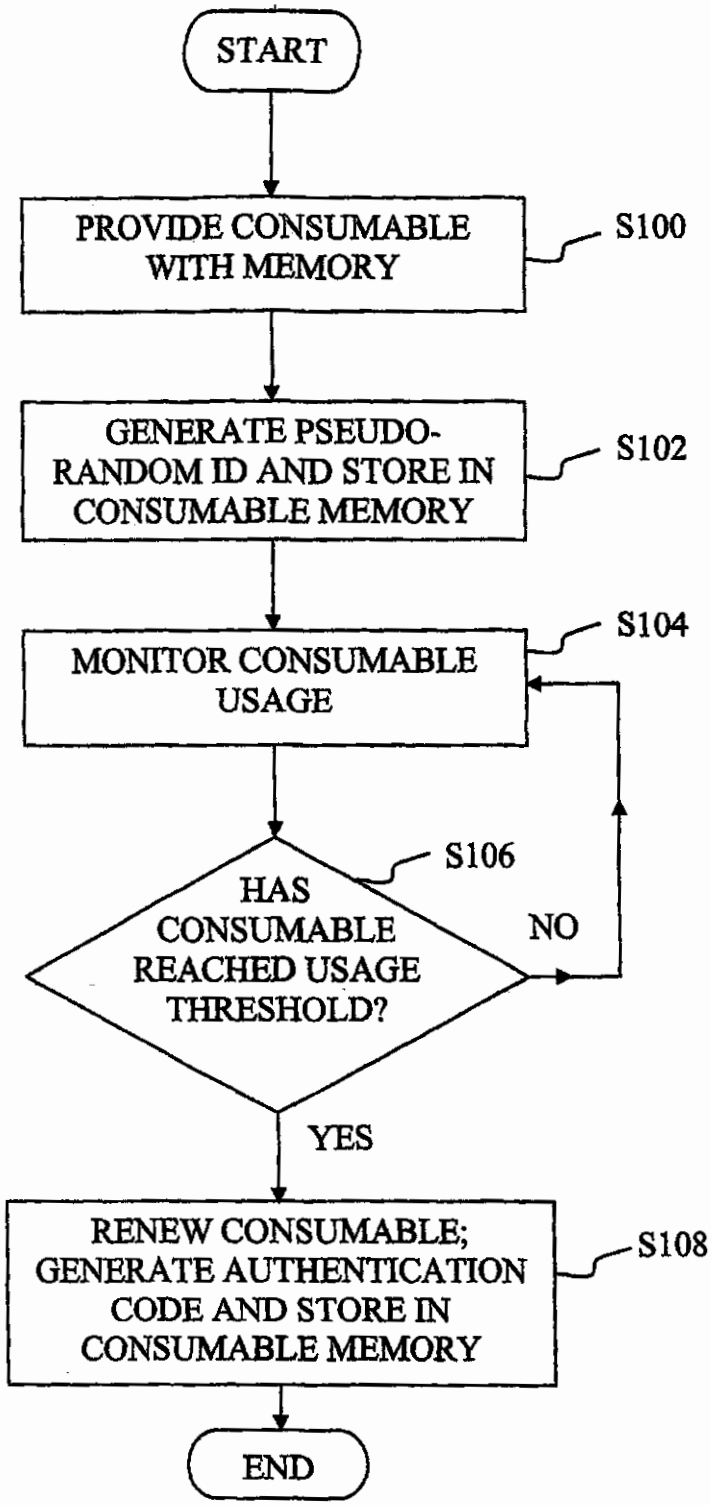

START
PROVIDE CONSUMABLE WITH MEMORY
S100
GENERATE PSEUDO-RANDOM ID AND STORE IN CONSUMABLE MEMORY
S102
MONITOR CONSUMABLE USAGE
S104
HAS CONSUMABLE REACHED USAGE THRESHOLD?
S106
NO
YES
RENEW CONSUMABLE; GENERATE AUTHENTICATION CODE AND STORE IN CONSUMABLE MEMORY
S108
END

Fig. 4A

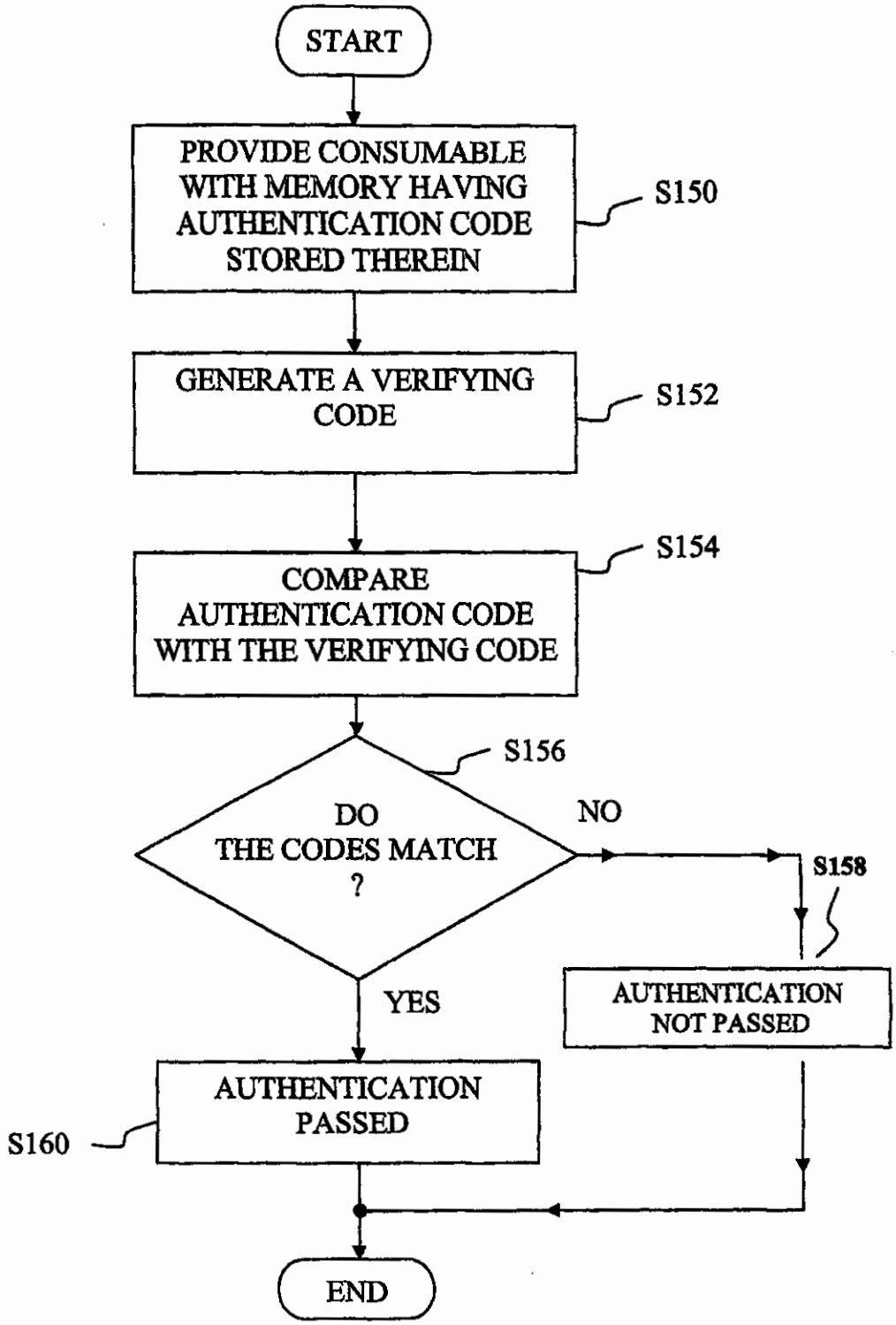

START
PROVIDE CONSUMABLE WITH MEMORY HAVING AUTHENTICATION CODE STORED THEREIN
S150
GENERATE A VERIFYING CODE
S152
COMPARE AUTHENTICATION CODE WITH THE VERIFYING CODE
S154
S156
DO THE CODES MATCH ?
NO
S158
AUTHENTICATION NOT PASSED
YES
AUTHENTICATION PASSED
S160
END

Fig. 4B

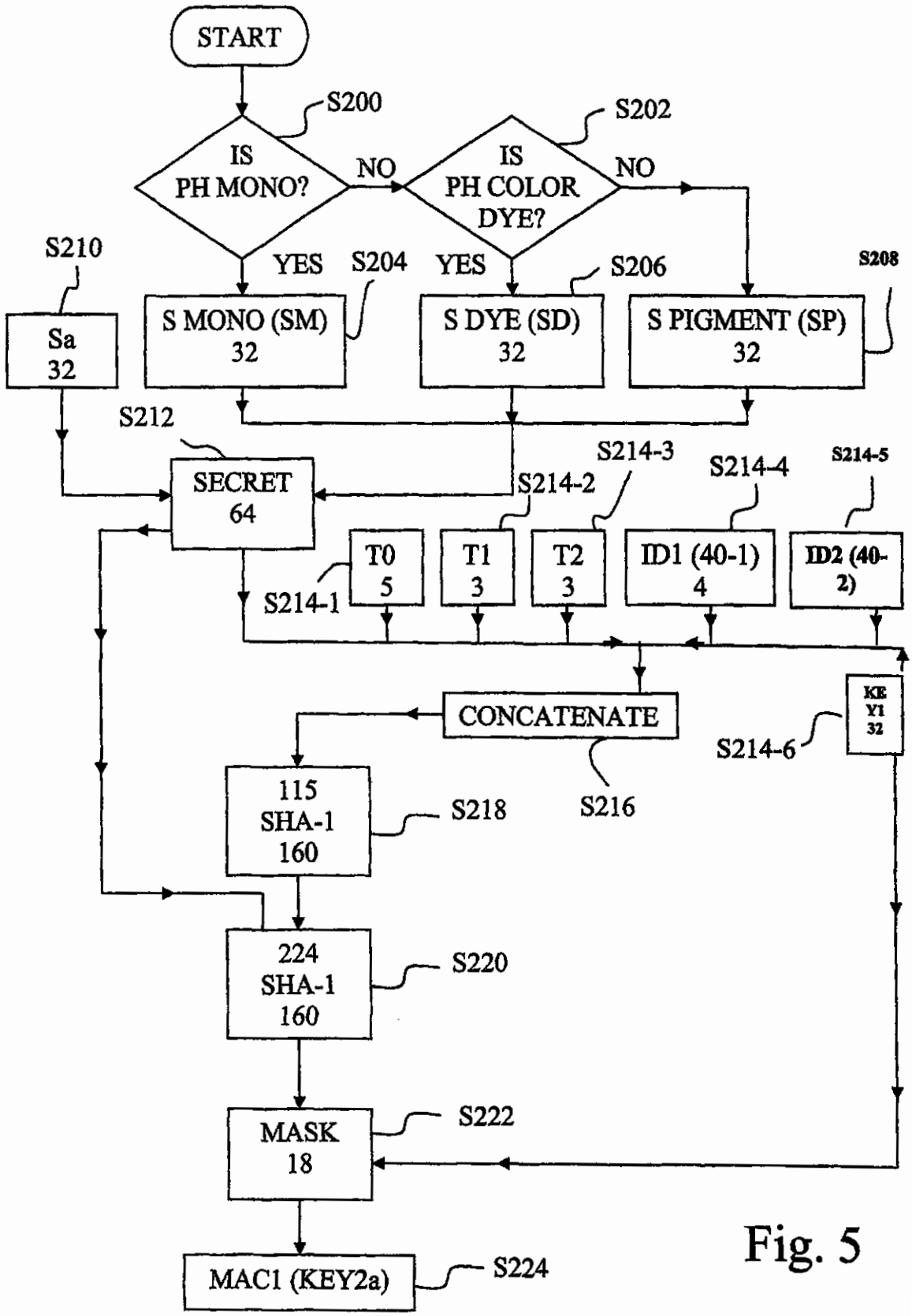

START
S200
IS PH MONO?
NO
S202
IS PH COLOR DYE?
NO
YES
S204
YES
S206
S208
S210
Sa 32
S MONO (SM) 32
S DYE (SD) 32
S PIGMENT (SP) 32
S212
SECRET 64
S214-3
S214-4
S214-5
S214-2
T0 5
T1 3
T2 3
ID1 (40-1) 4
ID2 (40-2)
S214-1
CONCATENATE
KEY1 32
S214-6
S216
115 SHA-1 160
S218
224 SHA-1 160
S220
MASK 18
S222
MAC1 (KEY2a)
S224

Fig. 5

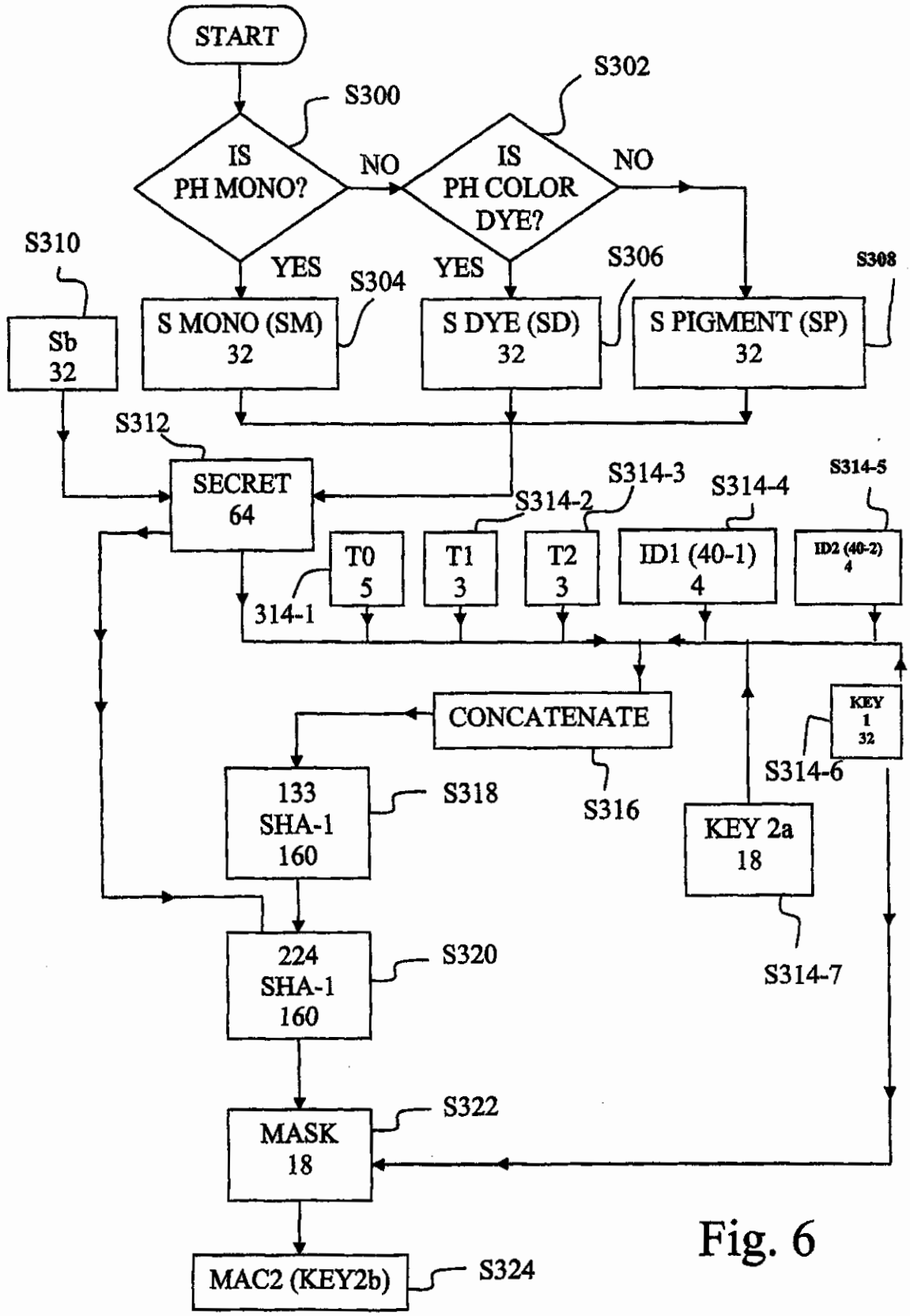

START
S300
IS PH MONO?
NO
S302
IS PH COLOR DYE?
NO
YES
YES
S310
Sb 32
S304
S MONO (SM) 32
S306
S DYE (SD) 32
S308
S PIGMENT (SP) 32
S312
SECRET 64
S314-3
S314-2
S314-4
S314-5
T0 5
T1 3
T2 3
ID1 (40-1) 4
ID2 (40-2) 4
314-1
CONCATENATE
S316
KEY 1 32
S314-6
133 SHA-1 160
S318
KEY 2a 18
224 SHA-1 160
S320
S314-7
MASK 18
S322
MAC2 (KEY2b)
S324

Fig. 6

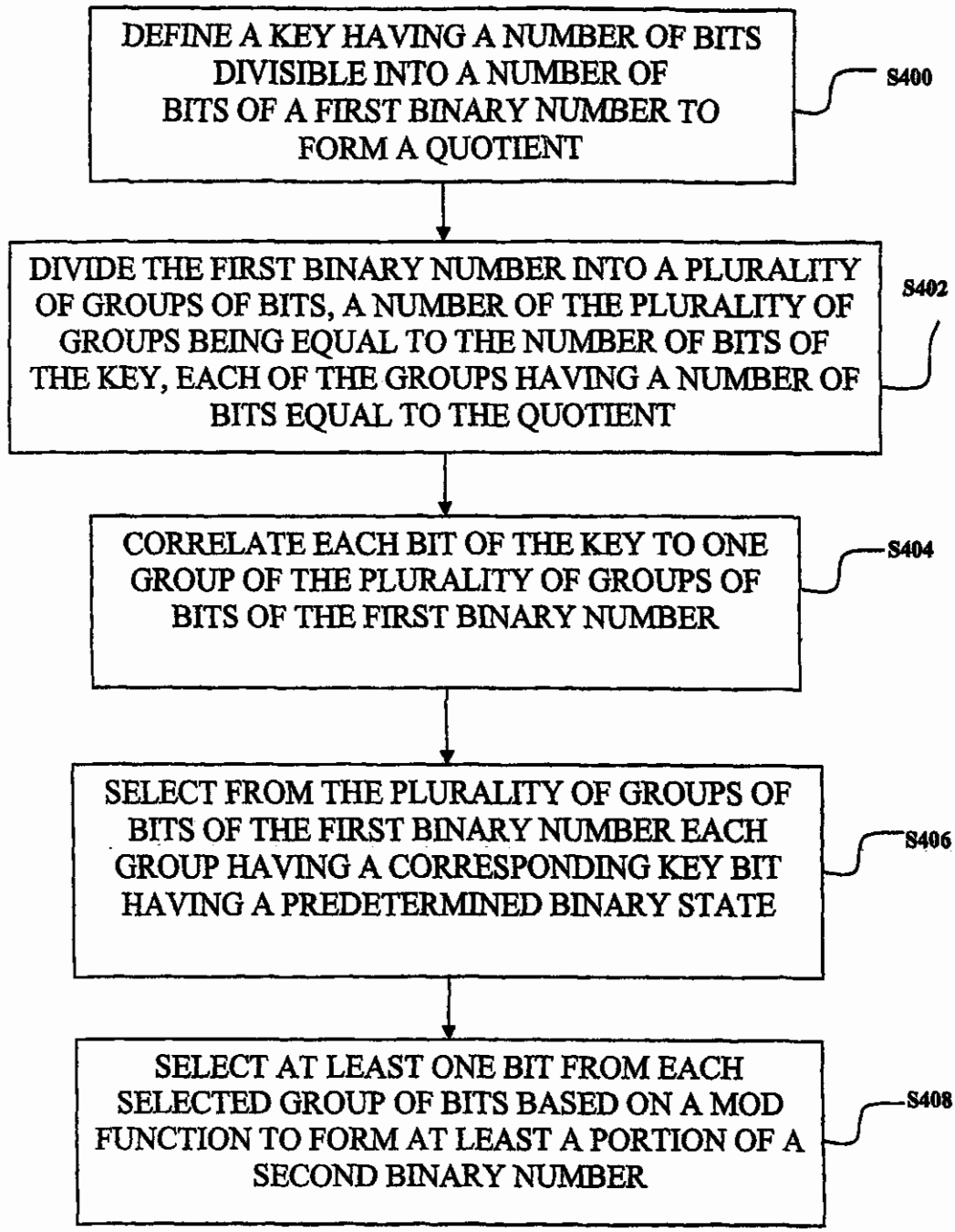

DEFINE A KEY HAVING A NUMBER OF BITS DIVISIBLE INTO A NUMBER OF BITS OF A FIRST BINARY NUMBER TO FORM A QUOTIENT
S400
DIVIDE THE FIRST BINARY NUMBER INTO A PLURALITY OF GROUPS OF BITS, A NUMBER OF THE PLURALITY OF GROUPS BEING EQUAL TO THE NUMBER OF BITS OF THE KEY, EACH OF THE GROUPS HAVING A NUMBER OF BITS EQUAL TO THE QUOTIENT
S402
CORRELATE EACH BIT OF THE KEY TO ONE GROUP OF THE PLURALITY OF GROUPS OF BITS OF THE FIRST BINARY NUMBER
S404
SELECT FROM THE PLURALITY OF GROUPS OF BITS OF THE FIRST BINARY NUMBER EACH GROUP HAVING A CORRESPONDING KEY BIT HAVING A PREDETERMINED BINARY STATE
S406
SELECT AT LEAST ONE BIT FROM EACH SELECTED GROUP OF BITS BASED ON A MOD FUNCTION TO FORM AT LEAST A PORTION OF A SECOND BINARY NUMBER
S408

Fig. 7