FIG. 1

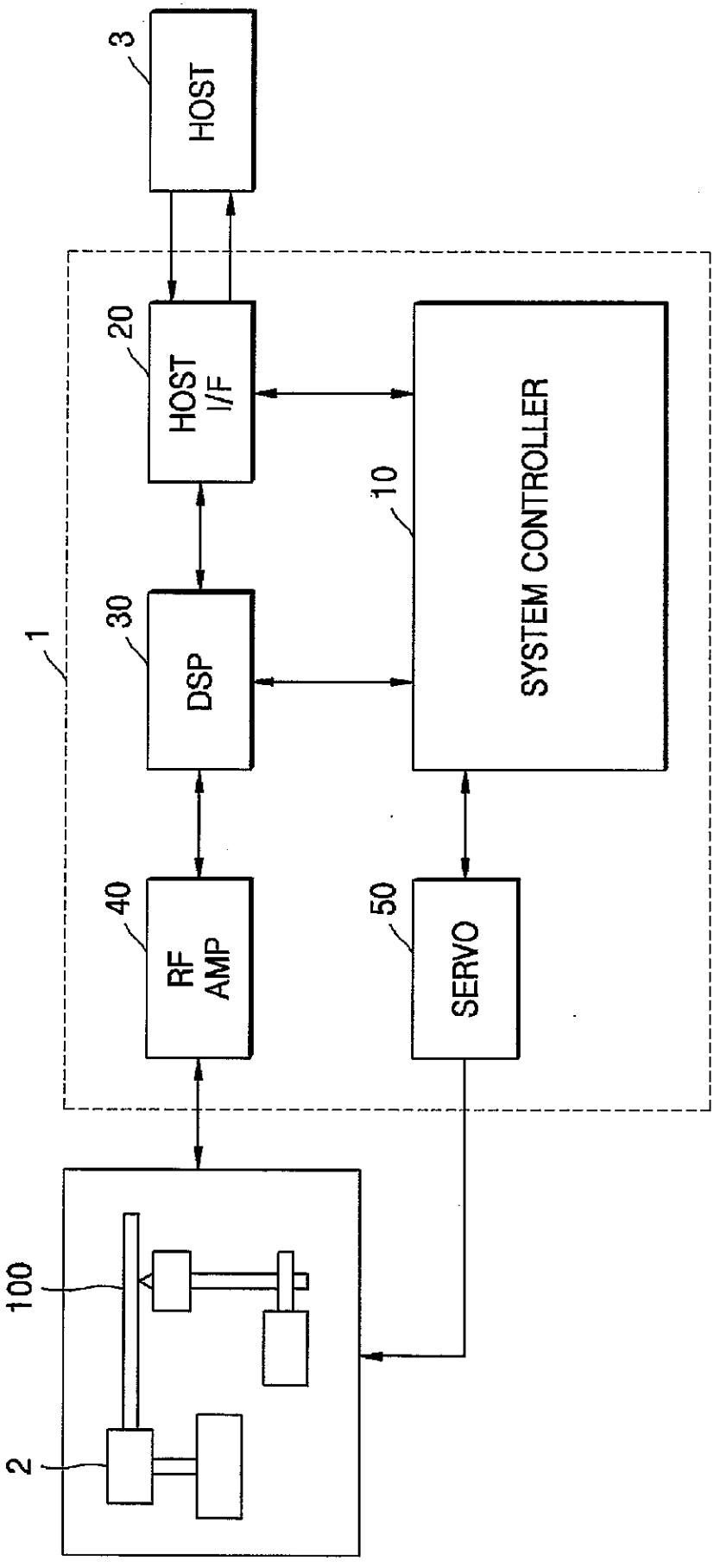

3
HOST
20
HOST I/F
10
SYSTEM CONTROLLER
1
30
DSP
40
RF AMP
50
SERVO
100
2

FIG. 2

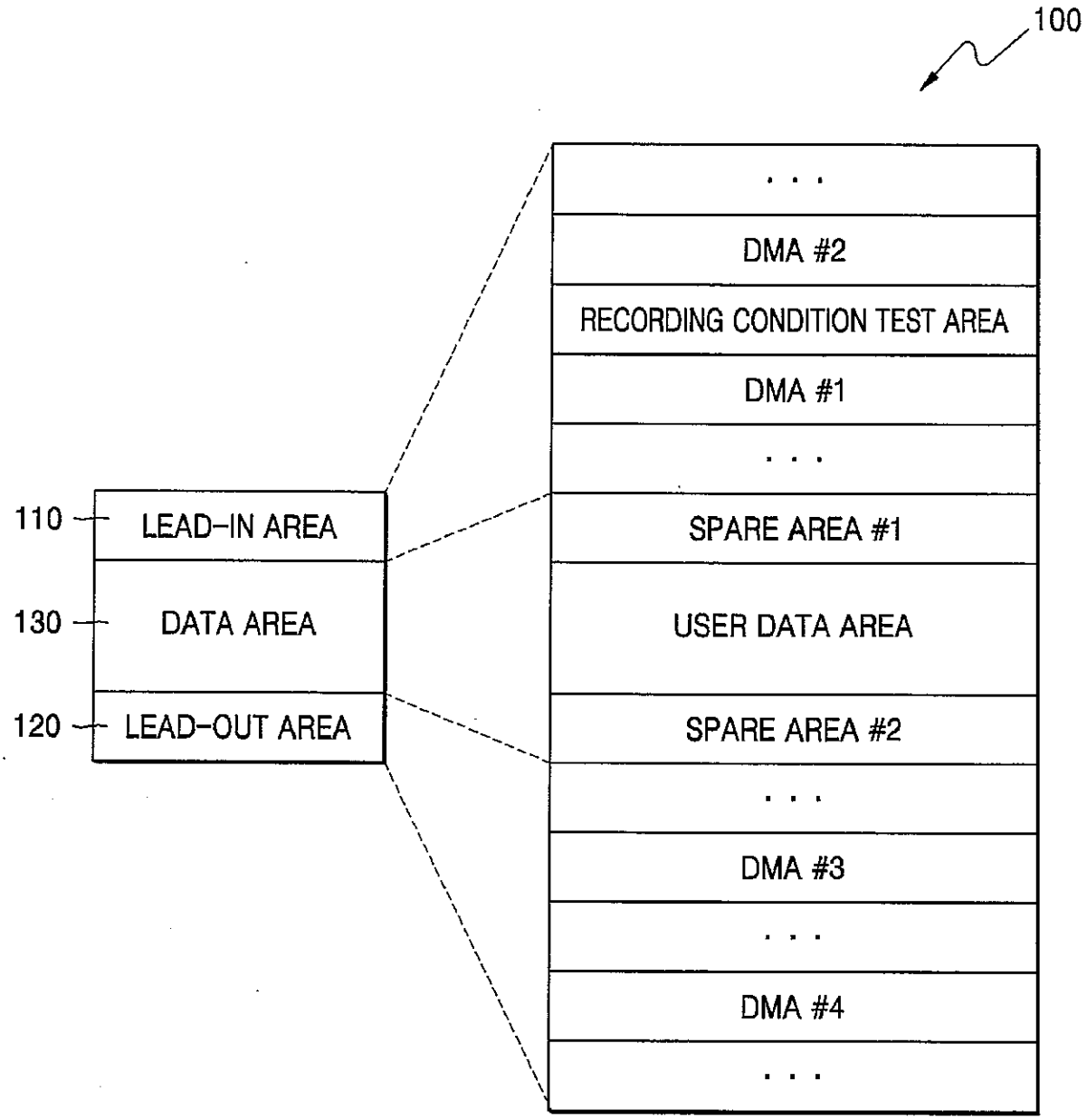

100
110
LEAD-IN AREA
130
DATA AREA
120
LEAD-OUT AREA
. . .
DMA #2
RECORDING CONDITION TEST AREA
DMA #1
. . .
SPARE AREA #1
USER DATA AREA
SPARE AREA #2
. . .
DMA #3
. . .
DMA #4
. . .

FIG. 3

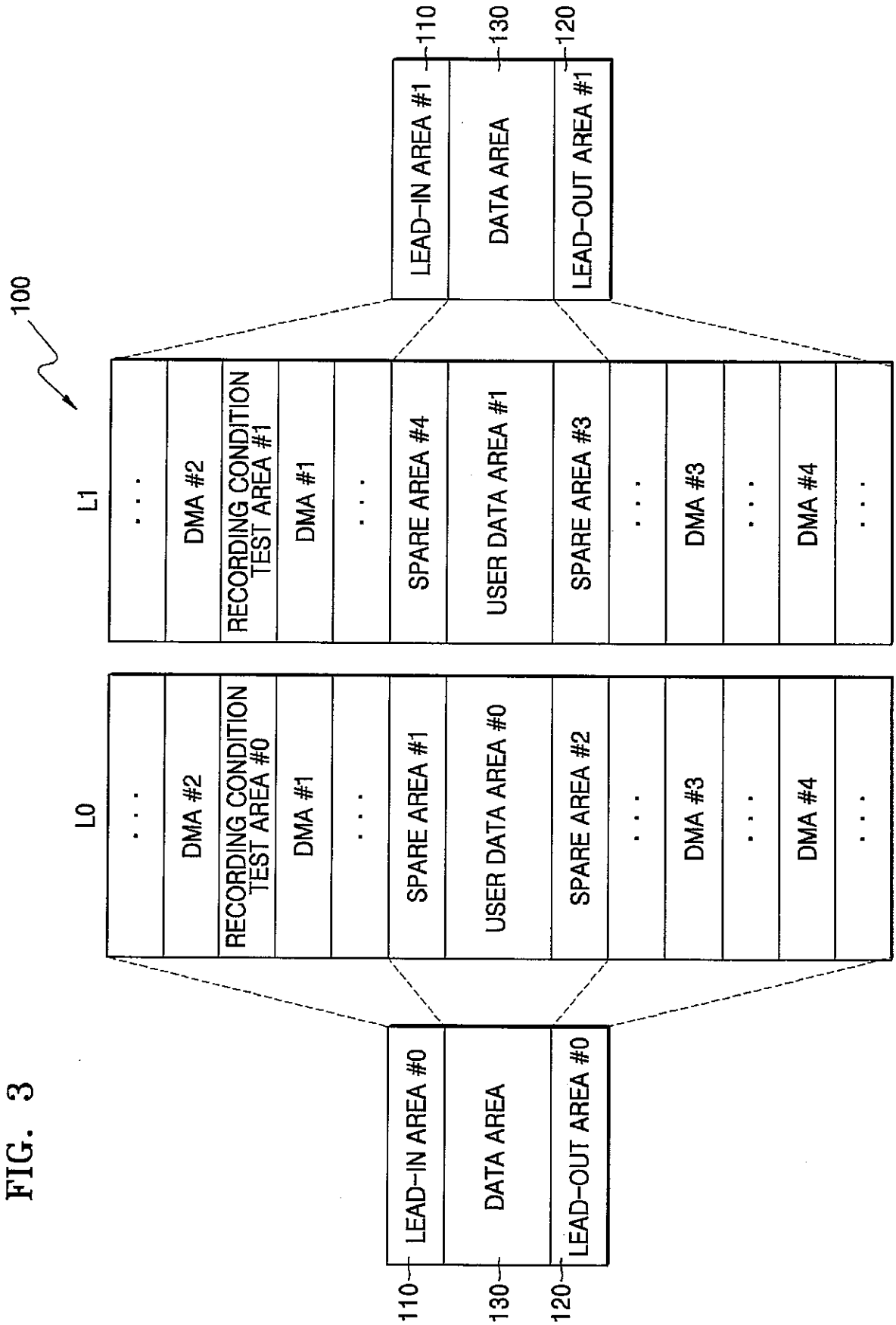

100
L1
L0
LEAD-IN AREA #1
DATA AREA
LEAD-OUT AREA #1
110
130
120
. . . .
DMA #2
RECORDING CONDITION TEST AREA #1
DMA #1
SPARE AREA #4
USER DATA AREA #1
SPARE AREA #3
DMA #3
DMA #4
RECORDING CONDITION TEST AREA #0
SPARE AREA #1
USER DATA AREA #0
SPARE AREA #2
LEAD-IN AREA #0
LEAD-OUT AREA #0

FIG. 4

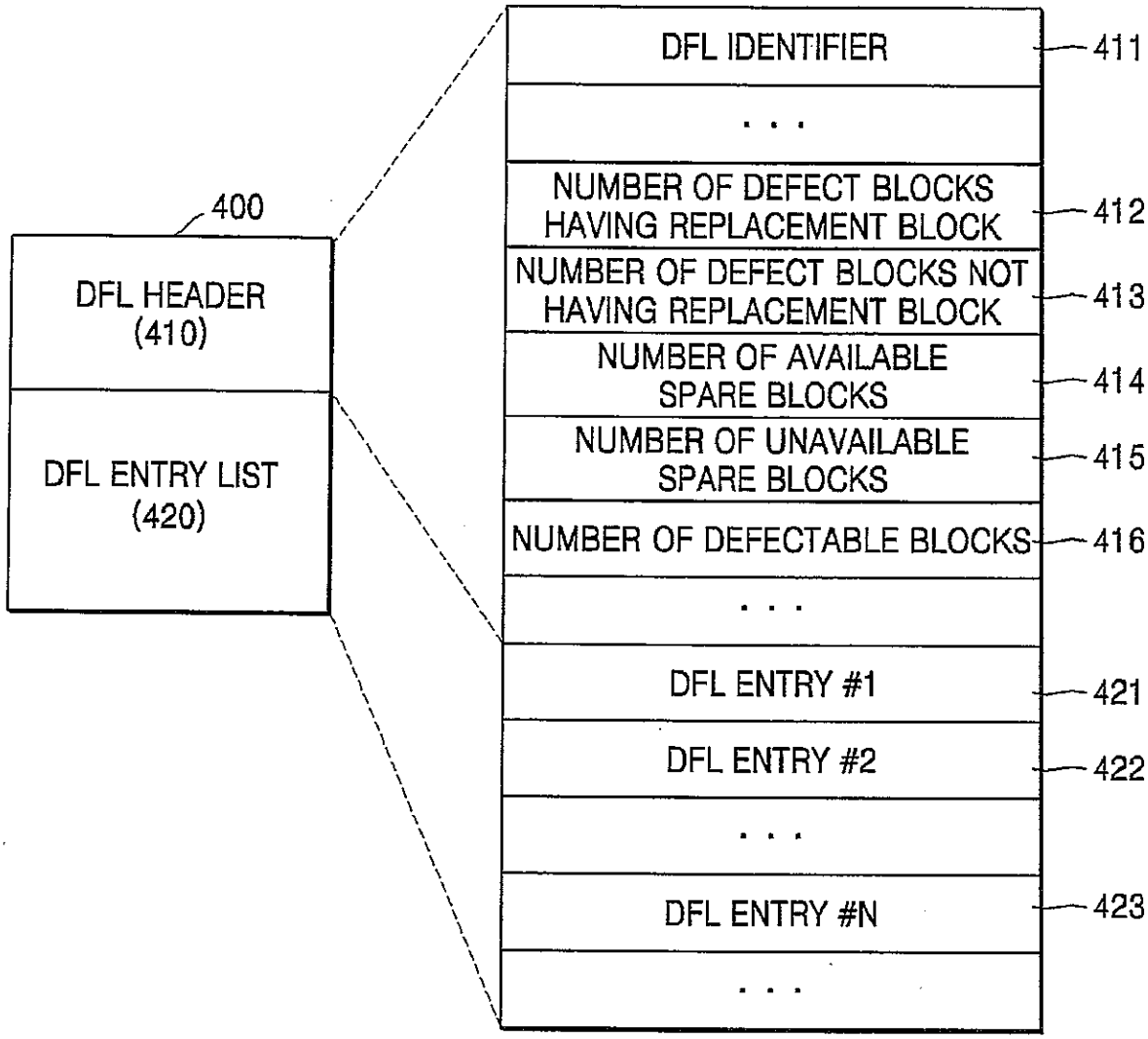

400
DFL HEADER (410)
DFL ENTRY LIST (420)
DFL IDENTIFIER
411
NUMBER OF DEFECT BLOCKS HAVING REPLACEMENT BLOCK
412
NUMBER OF DEFECT BLOCKS NOT HAVING REPLACEMENT BLOCK
413
NUMBER OF AVAILABLE SPARE BLOCKS
414
NUMBER OF UNAVAILABLE SPARE BLOCKS
415
NUMBER OF DEFECTABLE BLOCKS
416
DFL ENTRY #1
421
DFL ENTRY #2
422
DFL ENTRY #N
423

FIG. 5

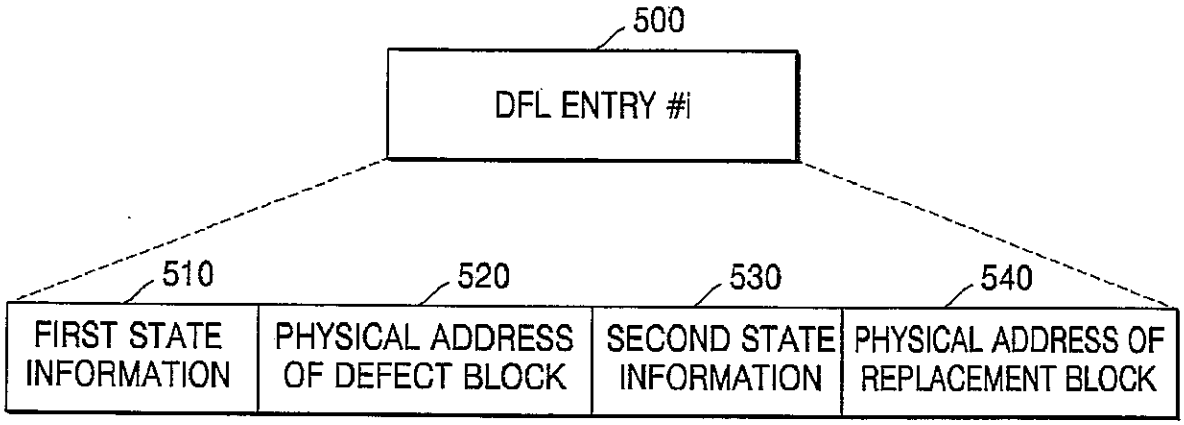

500
DFL ENTRY #i
510
520
530
540
FIRST STATE INFORMATION
PHYSICAL ADDRESS OF DEFECT BLOCK
SECOND STATE INFORMATION
PHYSICAL ADDRESS OF REPLACEMENT BLOCK

FIG. 6

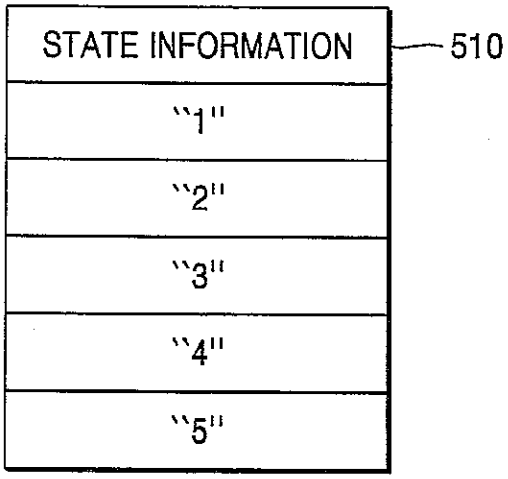

STATE INFORMATION
510
"1"
"2"
"3"
"4"
"5"

FIG. 7A

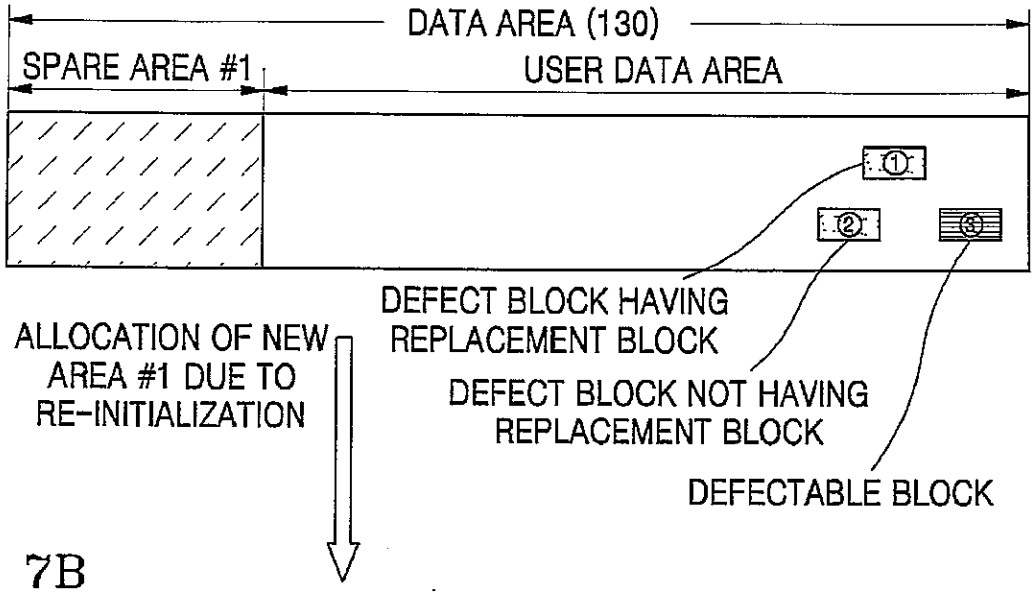

DATA AREA (130)
SPARE AREA #1
USER DATA AREA
①
②
③
DEFECT BLOCK HAVING REPLACEMENT BLOCK
ALLOCATION OF NEW AREA #1 DUE TO RE-INITIALIZATION
DEFECT BLOCK NOT HAVING REPLACEMENT BLOCK
DEFECTABLE BLOCK

FIG. 7B

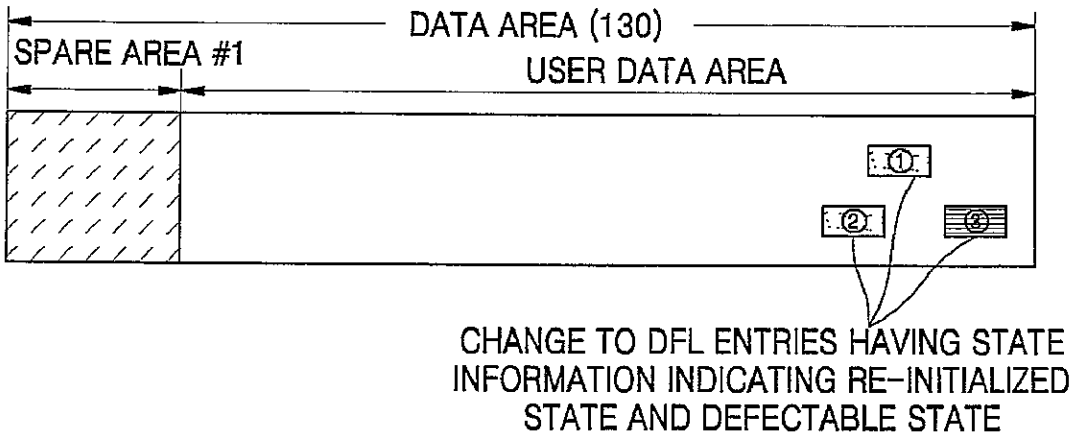
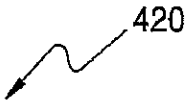

DATA AREA (130)
SPARE AREA #1
USER DATA AREA
①
②
③
CHANGE TO DFL ENTRIES HAVING STATE INFORMATION INDICATING RE-INITIALIZED STATE AND DEFECTABLE STATE

FIG. 8A



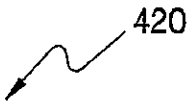
510 520 530 540

DFL ENTRIES RIGHT BEFORE RE-INITIALIZATION

FIRST STATE INFORMATION	PHYSICAL ADDRESS OF DEFECT BLOCK	SECOND STATE INFORMATION	PHYSICAL ADDRESS OF REPLACEMENT BLOCK
1	0010000h	0	...
2	0010100h	0	...
3	0010110h	0	...
...	...	...	...



FIG. 8B



510 520 530 540

DFL ENTRIES AFTER RE-INITIALIZATION

FIRST STATE INFORMATION	PHYSICAL ADDRESS OF DEFECT BLOCK	SECOND STATE INFORMATION	PHYSICAL ADDRESS OF REPLACEMENT BLOCK
3	0010000h	1	...
3	0010100h	1	...
3	0010110h	1	...
...	...	...	...

FIG. 9A

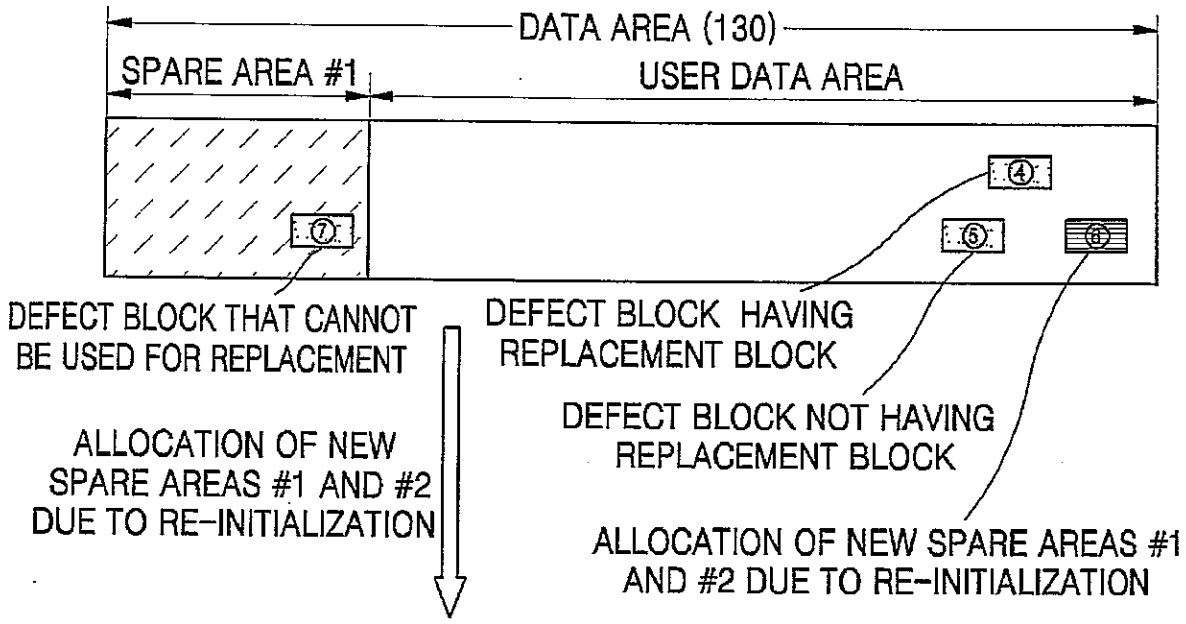

DATA AREA (130)
SPARE AREA #1
USER DATA AREA
④
⑤
⑥
⑦
DEFECT BLOCK THAT CANNOT BE USED FOR REPLACEMENT
DEFECT BLOCK HAVING REPLACEMENT BLOCK
DEFECT BLOCK NOT HAVING REPLACEMENT BLOCK
ALLOCATION OF NEW SPARE AREAS #1 AND #2 DUE TO RE-INITIALIZATION
ALLOCATION OF NEW SPARE AREAS #1 AND #2 DUE TO RE-INITIALIZATION

FIG. 9B

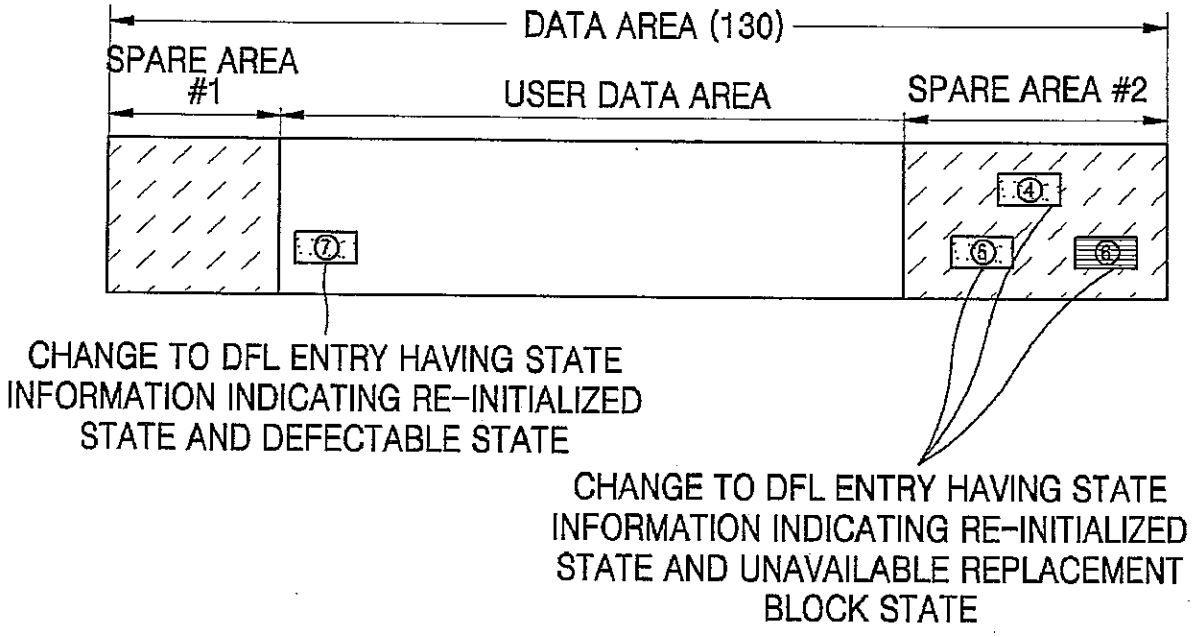
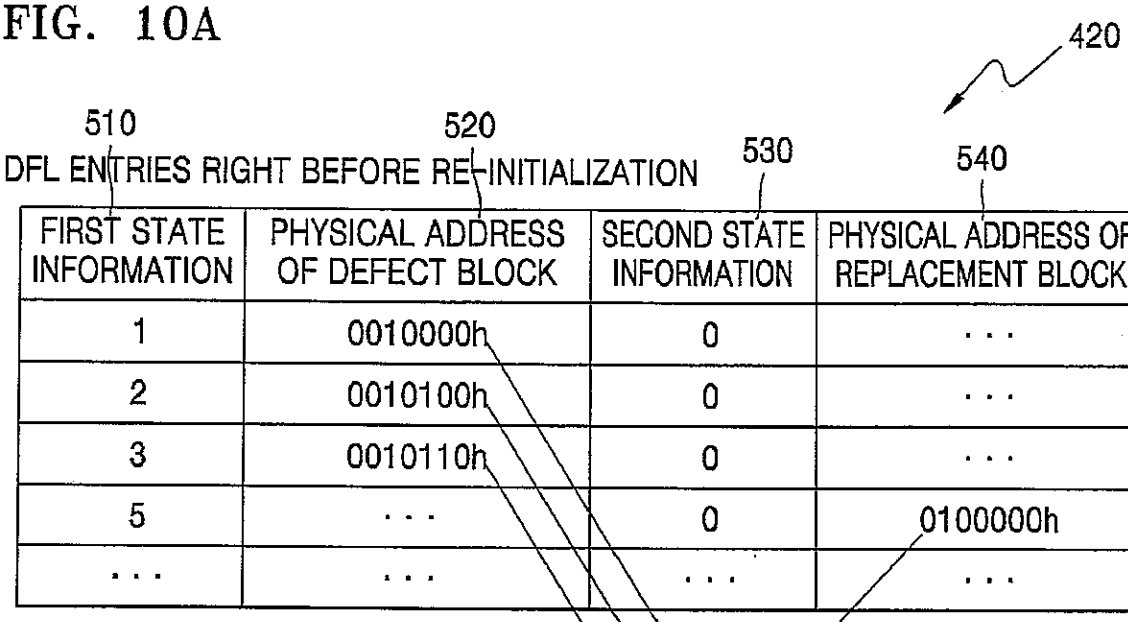
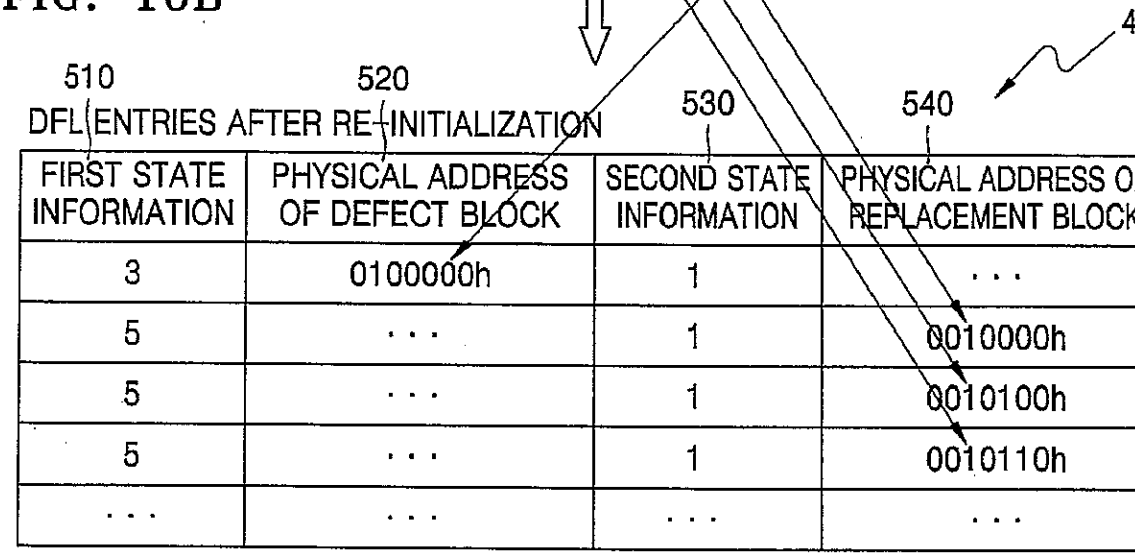

DATA AREA (130)
SPARE AREA #1
USER DATA AREA
SPARE AREA #2
④
⑤
⑥
⑦
CHANGE TO DFL ENTRY HAVING STATE INFORMATION INDICATING RE-INITIALIZED STATE AND DEFECTABLE STATE
CHANGE TO DFL ENTRY HAVING STATE INFORMATION INDICATING RE-INITIALIZED STATE AND UNAVAILABLE REPLACEMENT BLOCK STATE

FIG. 10A



FIRST STATE INFORMATION	PHYSICAL ADDRESS OF DEFECT BLOCK	SECOND STATE INFORMATION	PHYSICAL ADDRESS OF REPLACEMENT BLOCK
1	0010000h	0	· · ·
2	0010100h	0	· · ·
3	0010110h	0	· · ·
5	· · ·	0	0100000h
· · ·	· · ·	· · ·	· · ·

FIG. 10B



FIRST STATE INFORMATION	PHYSICAL ADDRESS OF DEFECT BLOCK	SECOND STATE INFORMATION	PHYSICAL ADDRESS OF REPLACEMENT BLOCK
3	0100000h	1	· · ·
5	· · ·	1	0010000h
5	· · ·	1	0010100h
5	· · ·	1	0010110h
· · ·	· · ·	· · ·	· · ·

FIG. 11A

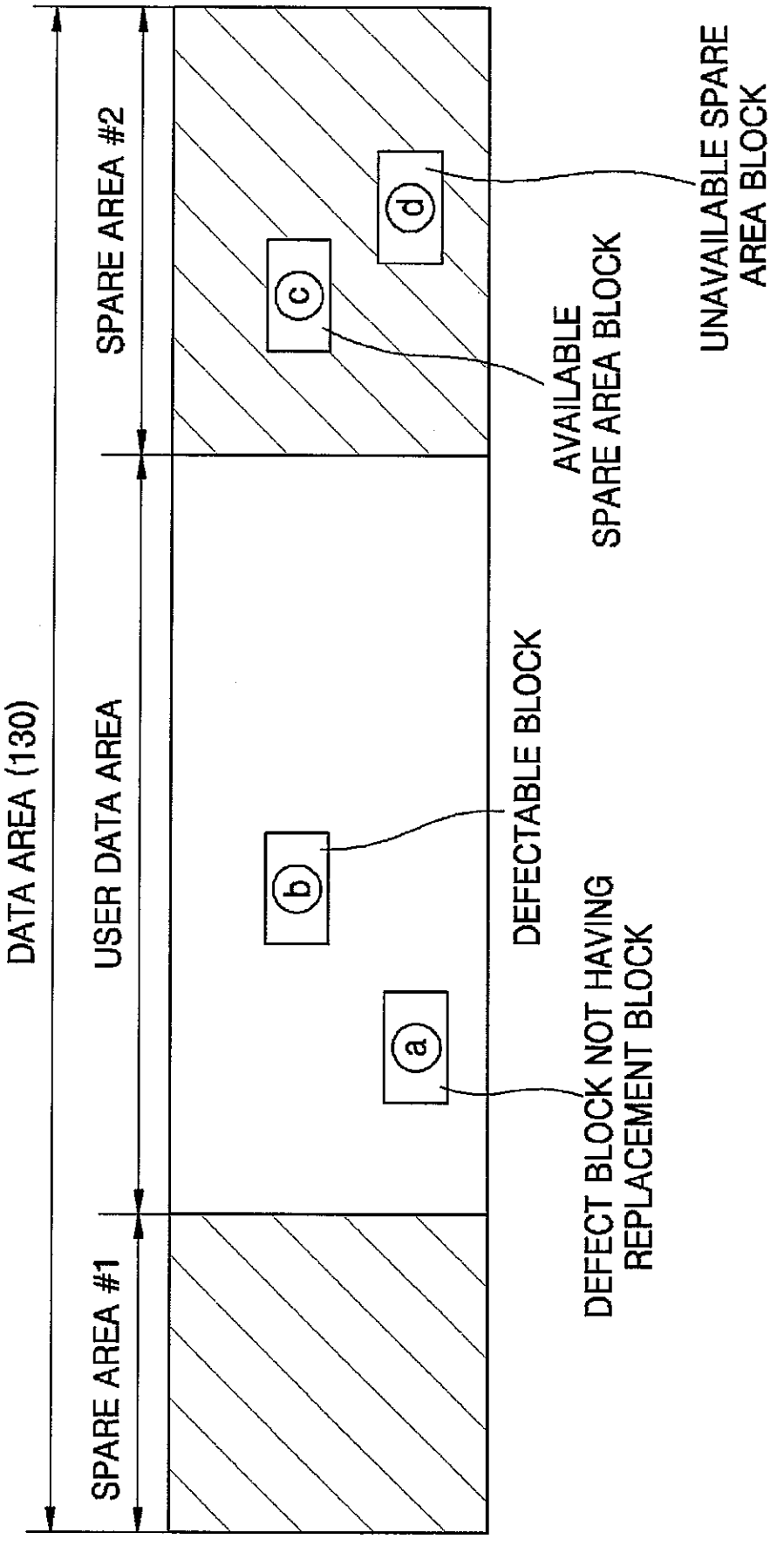

DATA AREA (130)
USER DATA AREA
SPARE AREA #1
SPARE AREA #2
a
b
c
d
DEFECTABLE BLOCK
DEFECT BLOCK NOT HAVING REPLACEMENT BLOCK
AVAILABLE SPARE AREA BLOCK
UNAVAILABLE SPARE AREA BLOCK

FIG. 11B

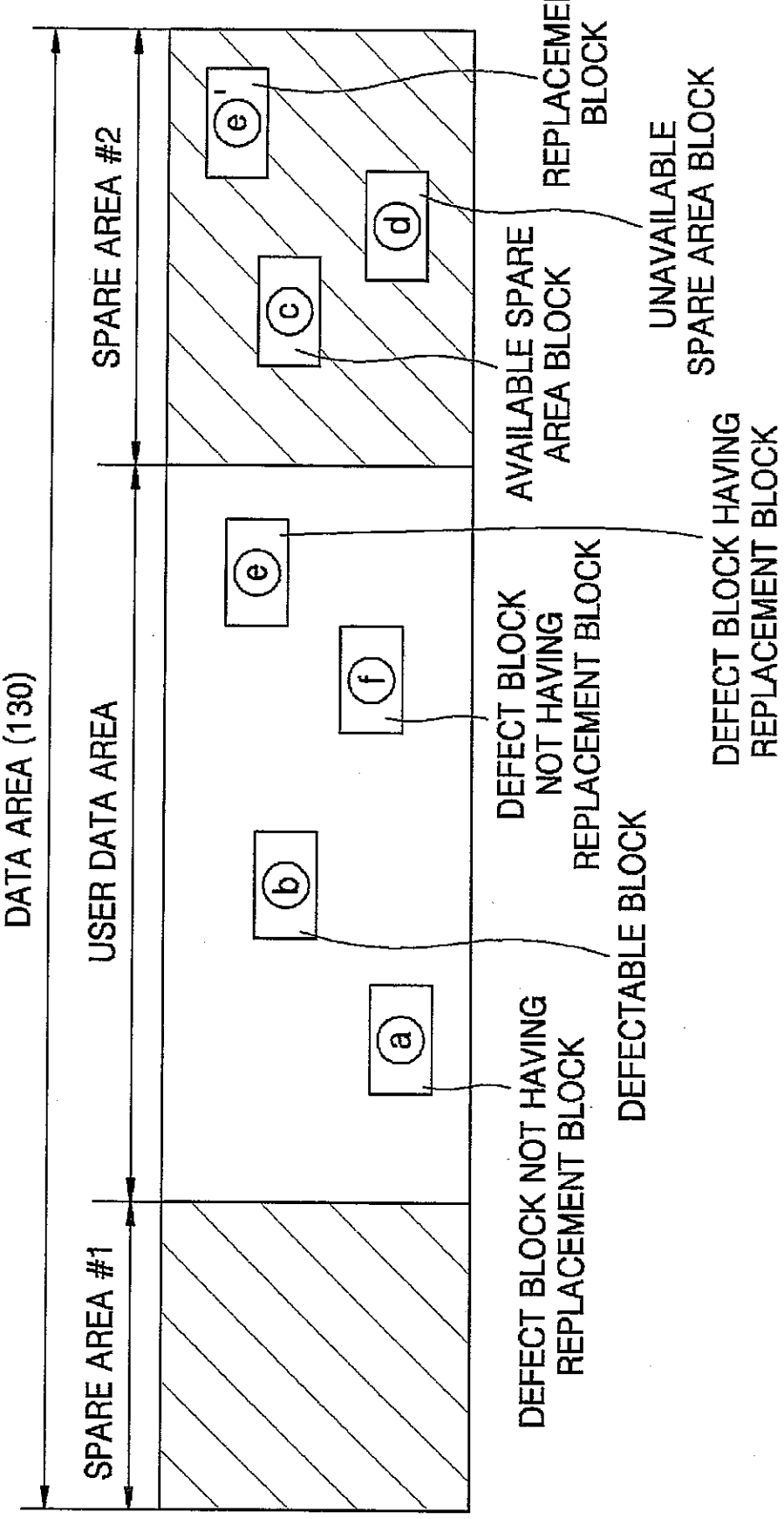

DATA AREA (130)
SPARE AREA #1
USER DATA AREA
SPARE AREA #2
a
b
e
f
c
d
e'
DEFECTABLE BLOCK
DEFECT BLOCK NOT HAVING REPLACEMENT BLOCK
DEFECT BLOCK NOT HAVING REPLACEMENT BLOCK
AVAILABLE SPARE AREA BLOCK
DEFECT BLOCK HAVING REPLACEMENT BLOCK
UNAVAILABLE SPARE AREA BLOCK
REPLACEMENT BLOCK

FIG. 12A

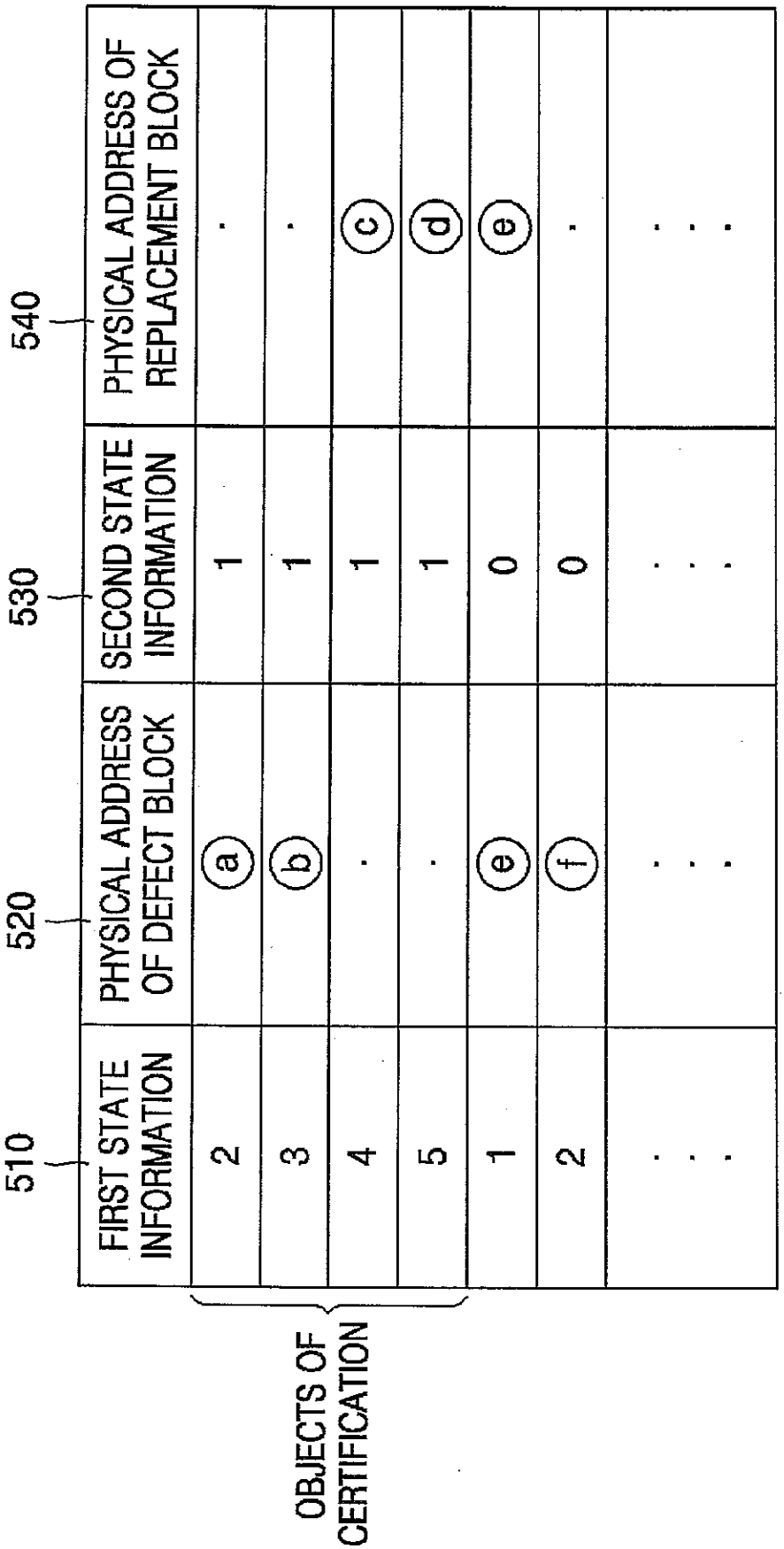

420
510
520
530
540
FIRST STATE INFORMATION
PHYSICAL ADDRESS OF DEFECT BLOCK
SECOND STATE INFORMATION
PHYSICAL ADDRESS OF REPLACEMENT BLOCK
2
ⓐ
1
3
ⓑ
1
4
·
1
ⓒ
5
·
1
ⓓ
1
ⓔ
0
2
ⓕ
0
·
OBJECTS OF CERTIFICATION

FIG. 12B

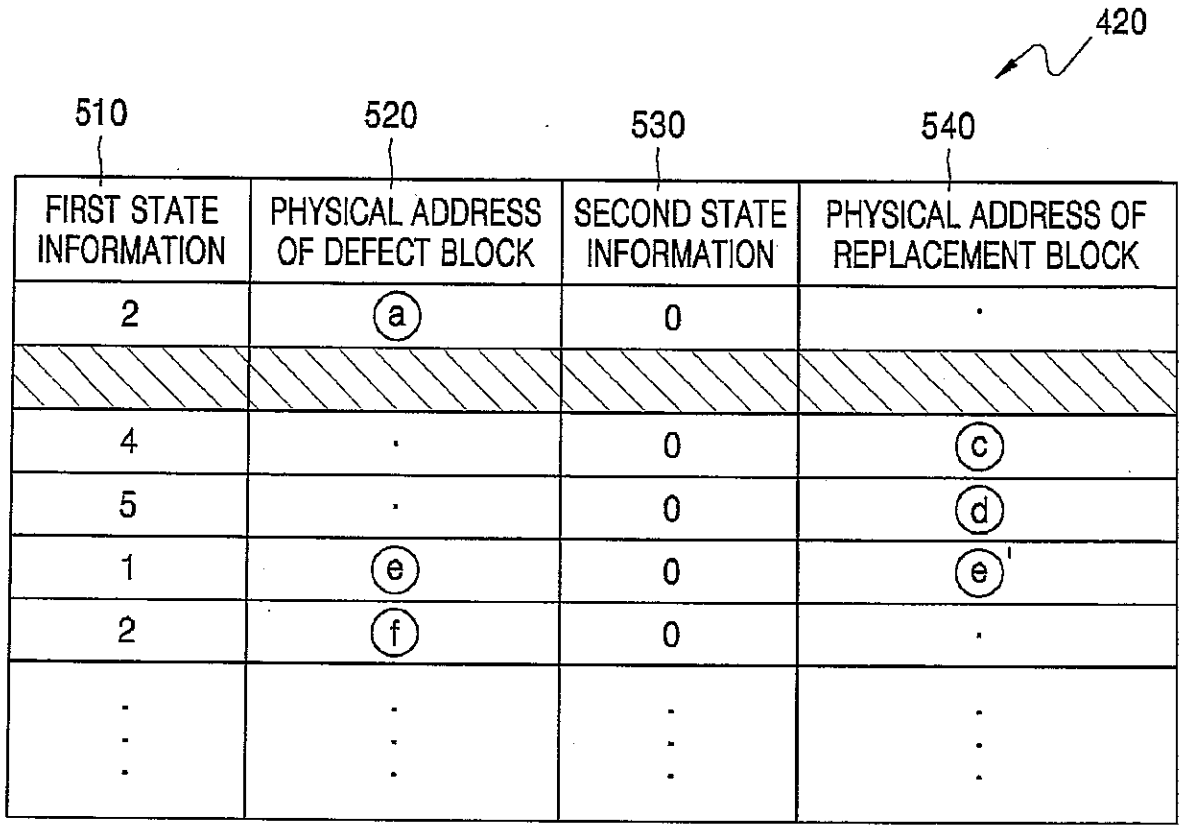
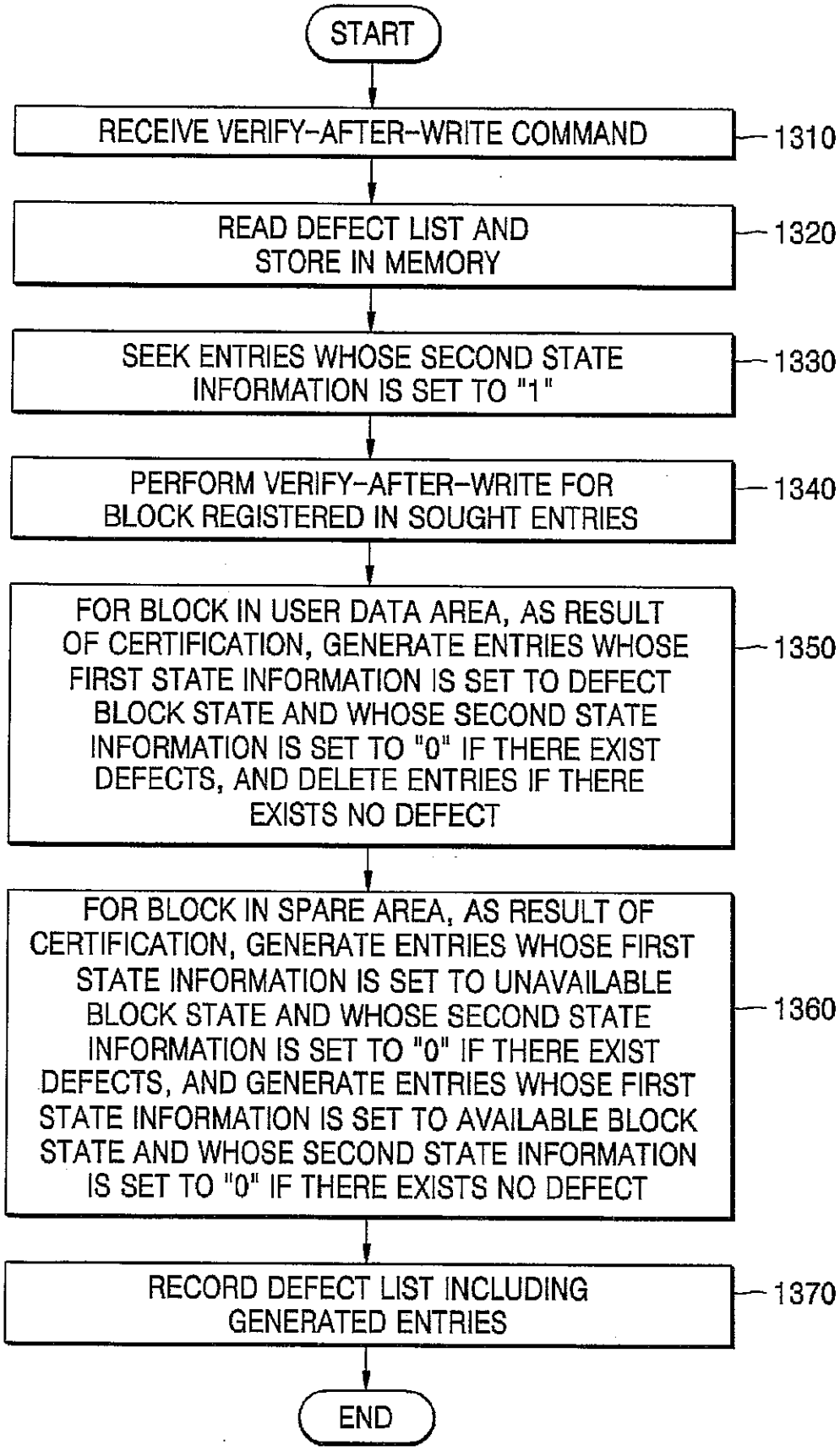

420
510
520
530
540
FIRST STATE INFORMATION
PHYSICAL ADDRESS OF DEFECT BLOCK
SECOND STATE INFORMATION
PHYSICAL ADDRESS OF REPLACEMENT BLOCK
2
a
0
4
0
c
5
0
d
1
e
0
e'
2
f
0

FIG. 13


START
RECEIVE VERIFY-AFTER-WRITE COMMAND
1310
READ DEFECT LIST AND STORE IN MEMORY
1320
SEEK ENTRIES WHOSE SECOND STATE INFORMATION IS SET TO "1"
1330
PERFORM VERIFY-AFTER-WRITE FOR BLOCK REGISTERED IN SOUGHT ENTRIES
1340
FOR BLOCK IN USER DATA AREA, AS RESULT OF CERTIFICATION, GENERATE ENTRIES WHOSE FIRST STATE INFORMATION IS SET TO DEFECT BLOCK STATE AND WHOSE SECOND STATE INFORMATION IS SET TO "0" IF THERE EXIST DEFECTS, AND DELETE ENTRIES IF THERE EXISTS NO DEFECT
1350
FOR BLOCK IN SPARE AREA, AS RESULT OF CERTIFICATION, GENERATE ENTRIES WHOSE FIRST STATE INFORMATION IS SET TO UNAVAILABLE BLOCK STATE AND WHOSE SECOND STATE INFORMATION IS SET TO "0" IF THERE EXIST DEFECTS, AND GENERATE ENTRIES WHOSE FIRST STATE INFORMATION IS SET TO AVAILABLE BLOCK STATE AND WHOSE SECOND STATE INFORMATION IS SET TO "0" IF THERE EXISTS NO DEFECT
1360
RECORD DEFECT LIST INCLUDING GENERATED ENTRIES
1370
END