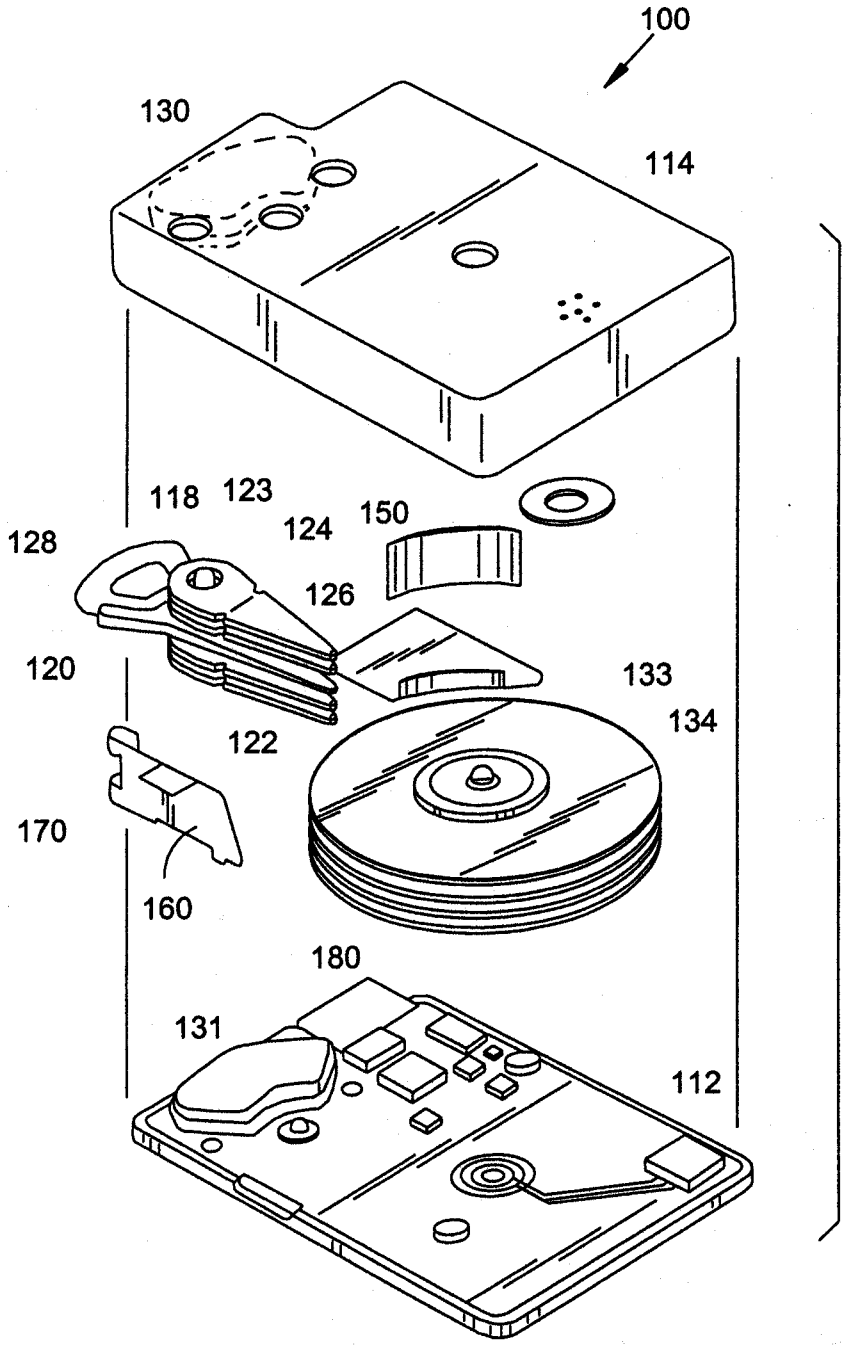

100
130
114
118
123
124
150
128
126
120
133
134
122
170
160
180
131
112

FIG. 1

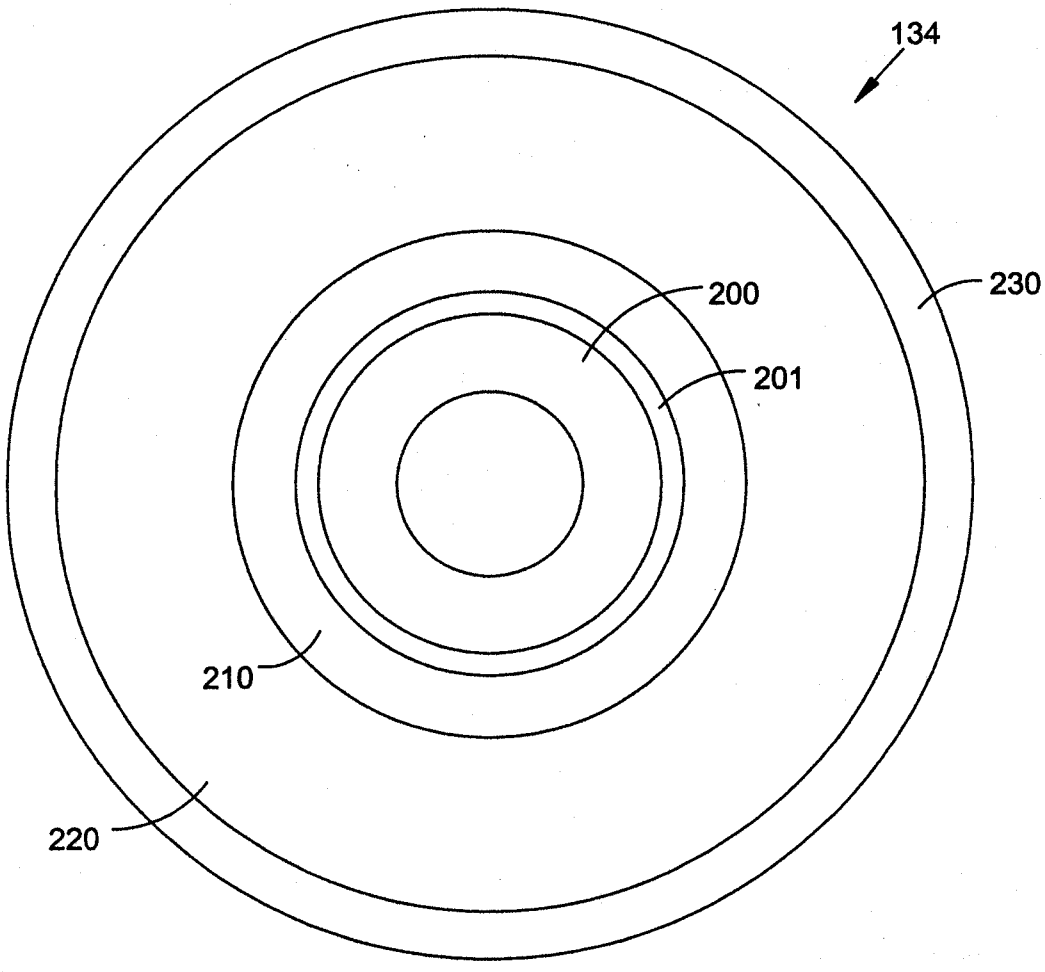


FIG. 2

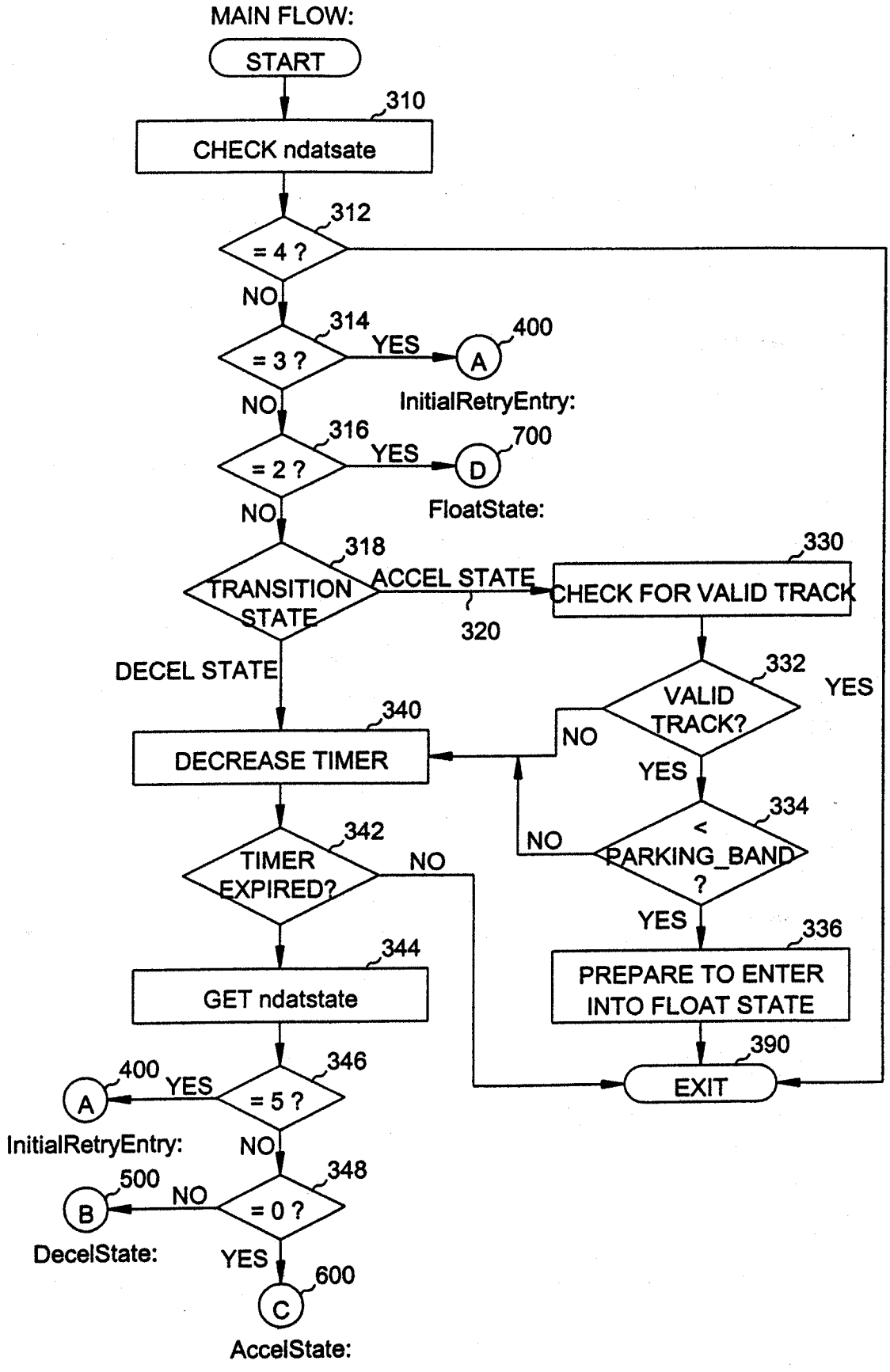

MAIN FLOW:
START
310
CHECK ndatsate
312
= 4 ?
NO
314
= 3 ?
YES
400
A
InitialRetryEntry:
NO
316
= 2 ?
YES
700
D
FloatState:
NO
318
TRANSITION STATE
ACCEL STATE
320
330
CHECK FOR VALID TRACK
DECEL STATE
332
VALID TRACK?
YES
NO
340
DECREASE TIMER
YES
334
< PARKING_BAND ?
NO
342
TIMER EXPIRED?
NO
YES
336
PREPARE TO ENTER INTO FLOAT STATE
344
GET ndatstate
390
EXIT
400
A
YES
346
= 5 ?
InitialRetryEntry:
NO
500
B
NO
348
= 0 ?
DecelState:
YES
600
C
AccelState:

FIG. 3

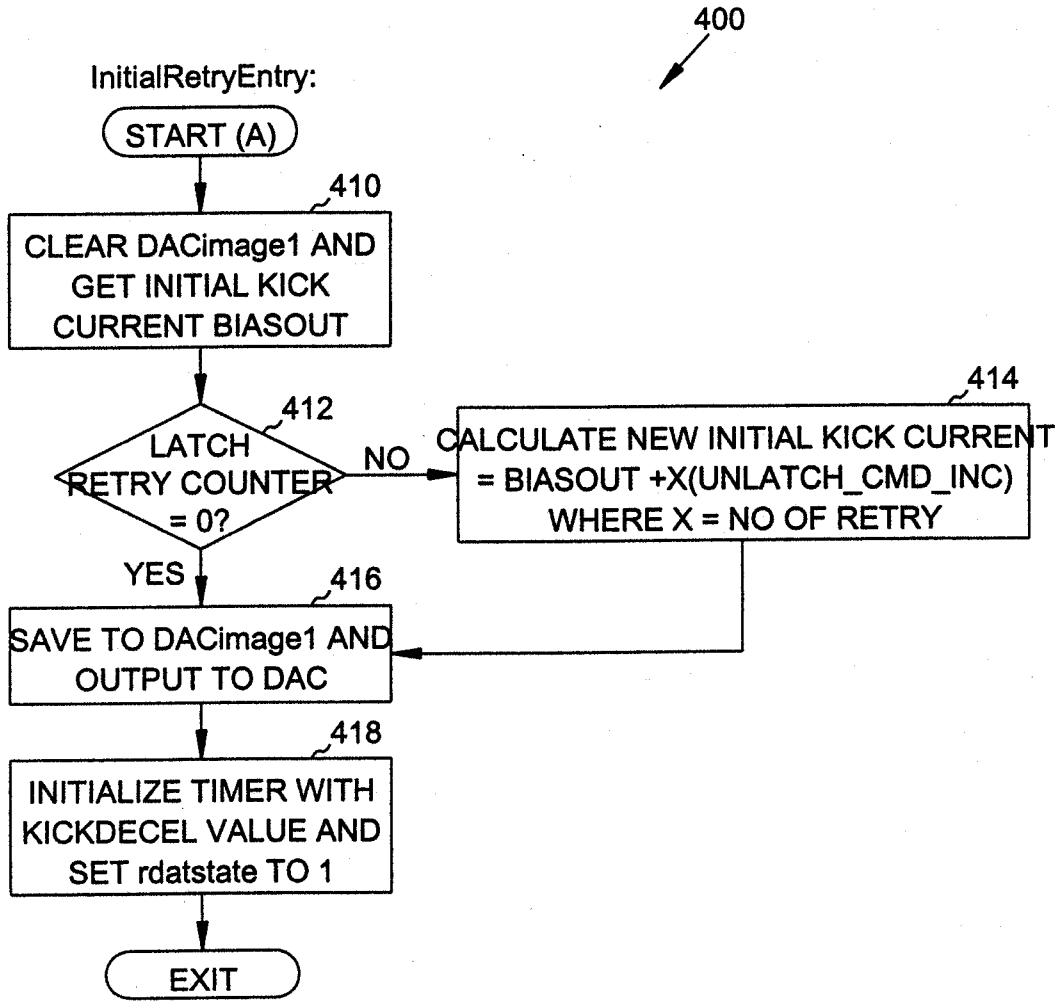

400
InitialRetryEntry:
START (A)
410
CLEAR DACimage1 AND GET INITIAL KICK CURRENT BIASOUT
412
LATCH RETRY COUNTER = 0?
NO
414
CALCULATE NEW INITIAL KICK CURRENT = BIASOUT +X(UNLATCH_CMD_INC) WHERE X = NO OF RETRY
YES
416
SAVE TO DACimage1 AND OUTPUT TO DAC
418
INITIALIZE TIMER WITH KICKDECEL VALUE AND SET rdatstate TO 1
EXIT

FIG. 4

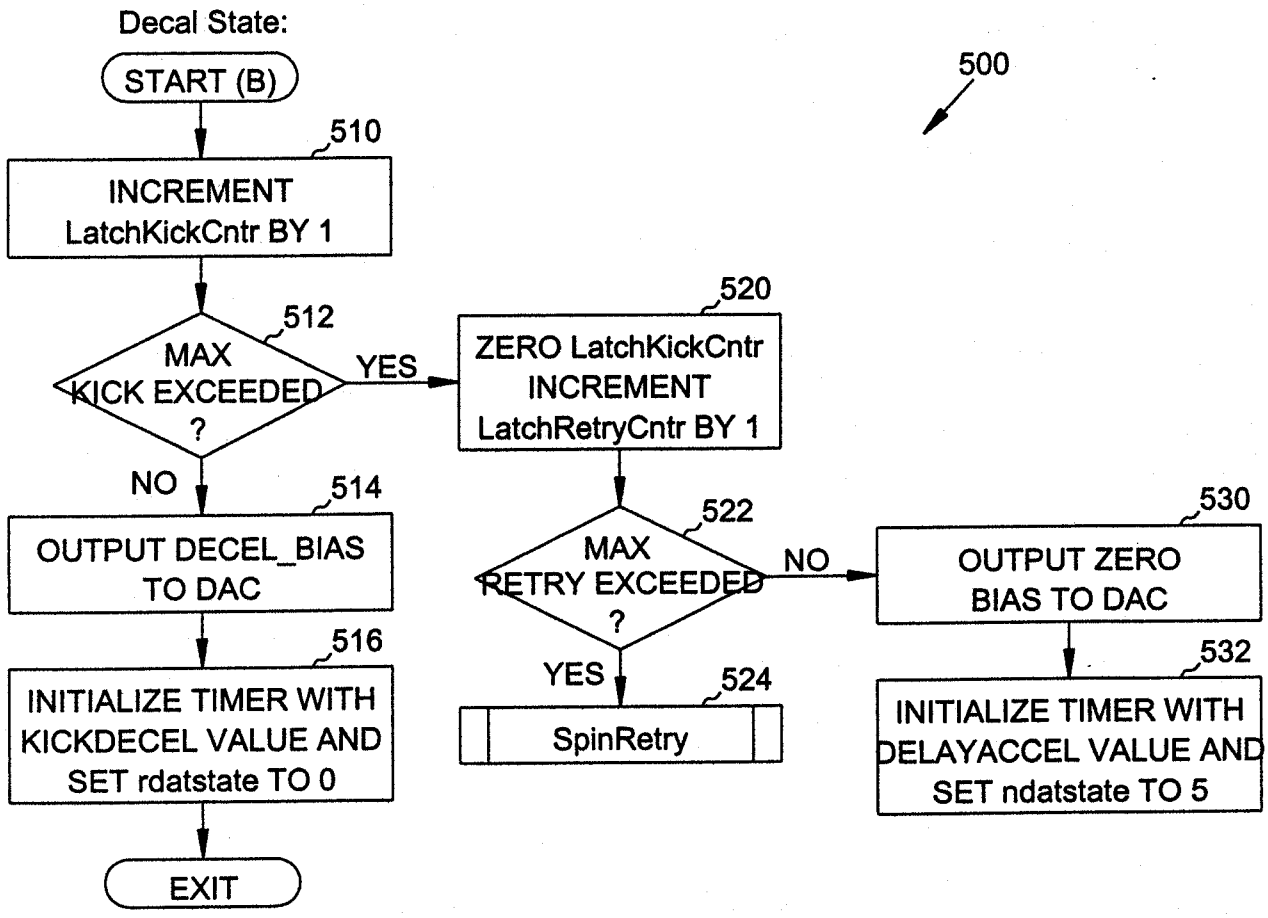

Decal State:
START (B)
500
510
INCREMENT LatchKickCntr BY 1
512
MAX KICK EXCEEDED ?
YES
520
ZERO LatchKickCntr
INCREMENT LatchRetryCntr BY 1
NO
514
OUTPUT DECEL_BIAS TO DAC
522
MAX RETRY EXCEEDED ?
NO
530
OUTPUT ZERO BIAS TO DAC
516
INITIALIZE TIMER WITH KICKDECEL VALUE AND SET rdatstate TO 0
YES
524
SpinRetry
532
INITIALIZE TIMER WITH DELAYACCEL VALUE AND SET ndatstate TO 5
EXIT

FIG. 5

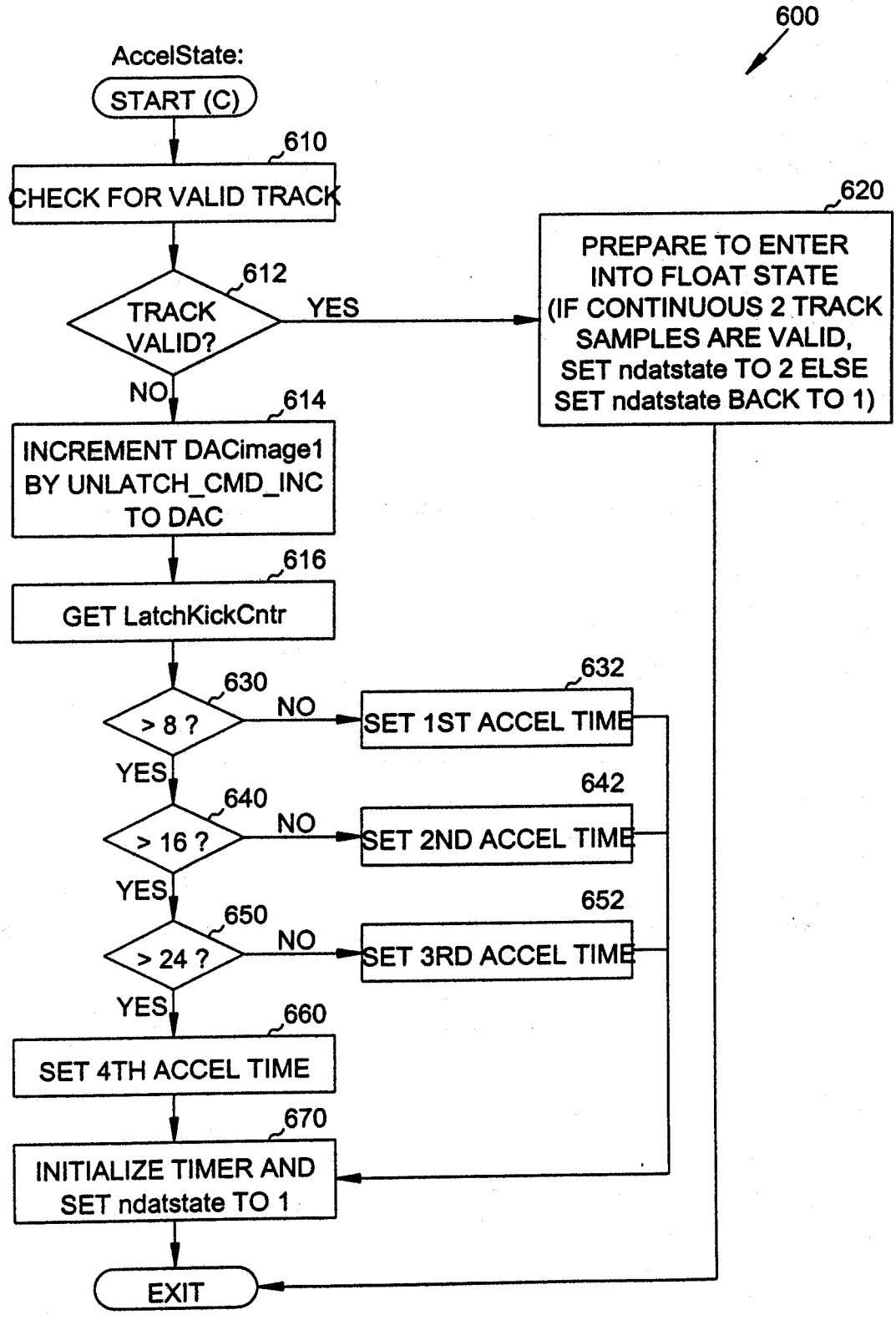

600
AccelState:
START (C)
610
CHECK FOR VALID TRACK
612
TRACK VALID?
YES
620
PREPARE TO ENTER INTO FLOAT STATE (IF CONTINUOUS 2 TRACK SAMPLES ARE VALID, SET ndatstate TO 2 ELSE SET ndatstate BACK TO 1)
NO
614
INCREMENT DACimage1 BY UNLATCH_CMD_INC TO DAC
616
GET LatchKickCntr
630
> 8 ?
NO
632
SET 1ST ACCEL TIME
YES
640
> 16 ?
NO
642
SET 2ND ACCEL TIME
YES
650
> 24 ?
NO
652
SET 3RD ACCEL TIME
YES
660
SET 4TH ACCEL TIME
670
INITIALIZE TIMER AND SET ndatstate TO 1
EXIT

FIG. 6

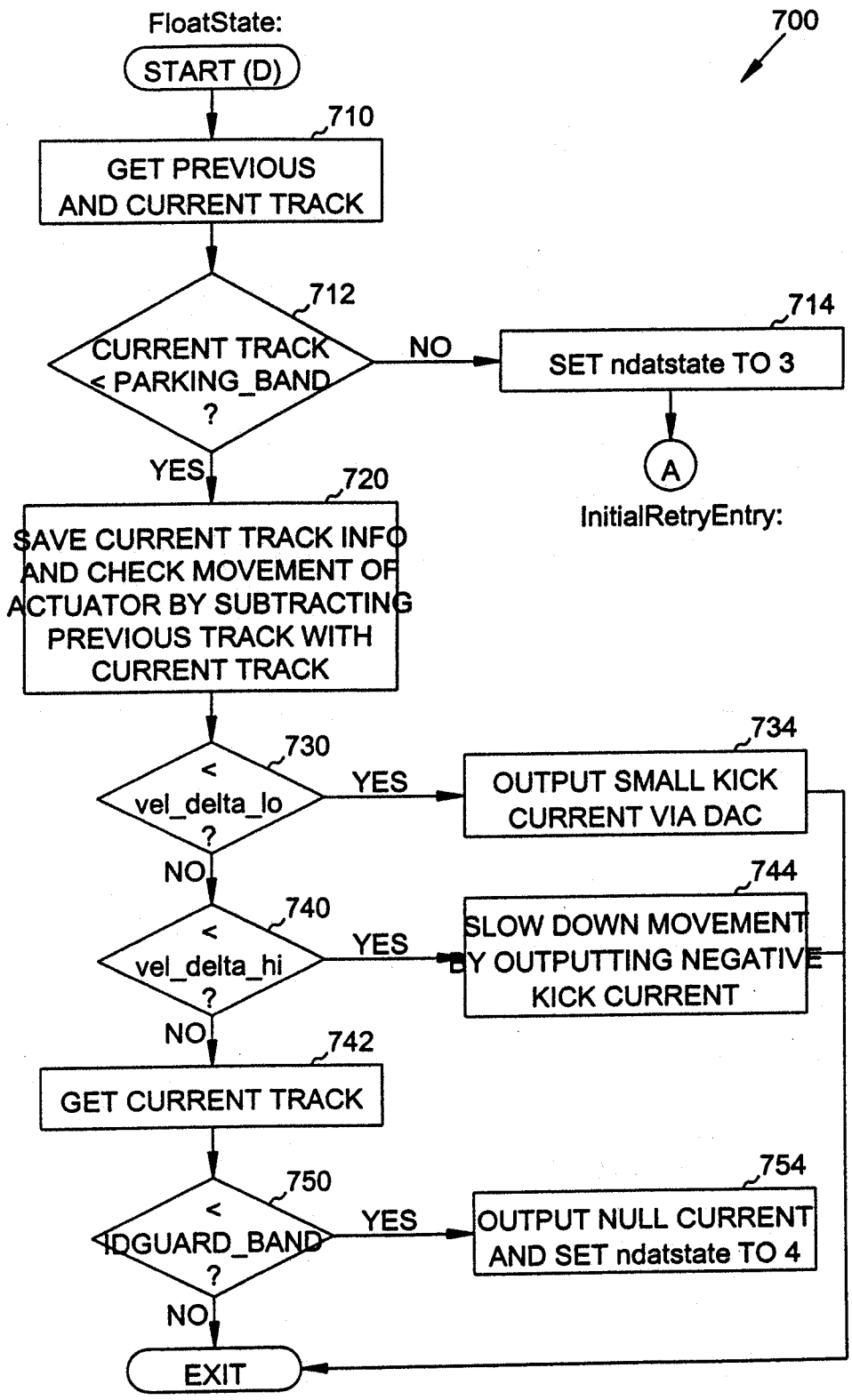

FloatState:
700
START (D)
710
GET PREVIOUS AND CURRENT TRACK
712
CURRENT TRACK < PARKING_BAND ?
NO
714
SET ndatstate TO 3
A
InitialRetryEntry:
YES
720
SAVE CURRENT TRACK INFO AND CHECK MOVEMENT OF ACTUATOR BY SUBTRACTING PREVIOUS TRACK WITH CURRENT TRACK
730
< vel_delta_lo ?
YES
734
OUTPUT SMALL KICK CURRENT VIA DAC
NO
740
< vel_delta_hi ?
YES
744
SLOW DOWN MOVEMENT BY OUTPUTTING NEGATIVE KICK CURRENT
NO
742
GET CURRENT TRACK
750
< IDGUARD_BAND ?
YES
754
OUTPUT NULL CURRENT AND SET ndatstate TO 4
NO
EXIT

FIG. 7

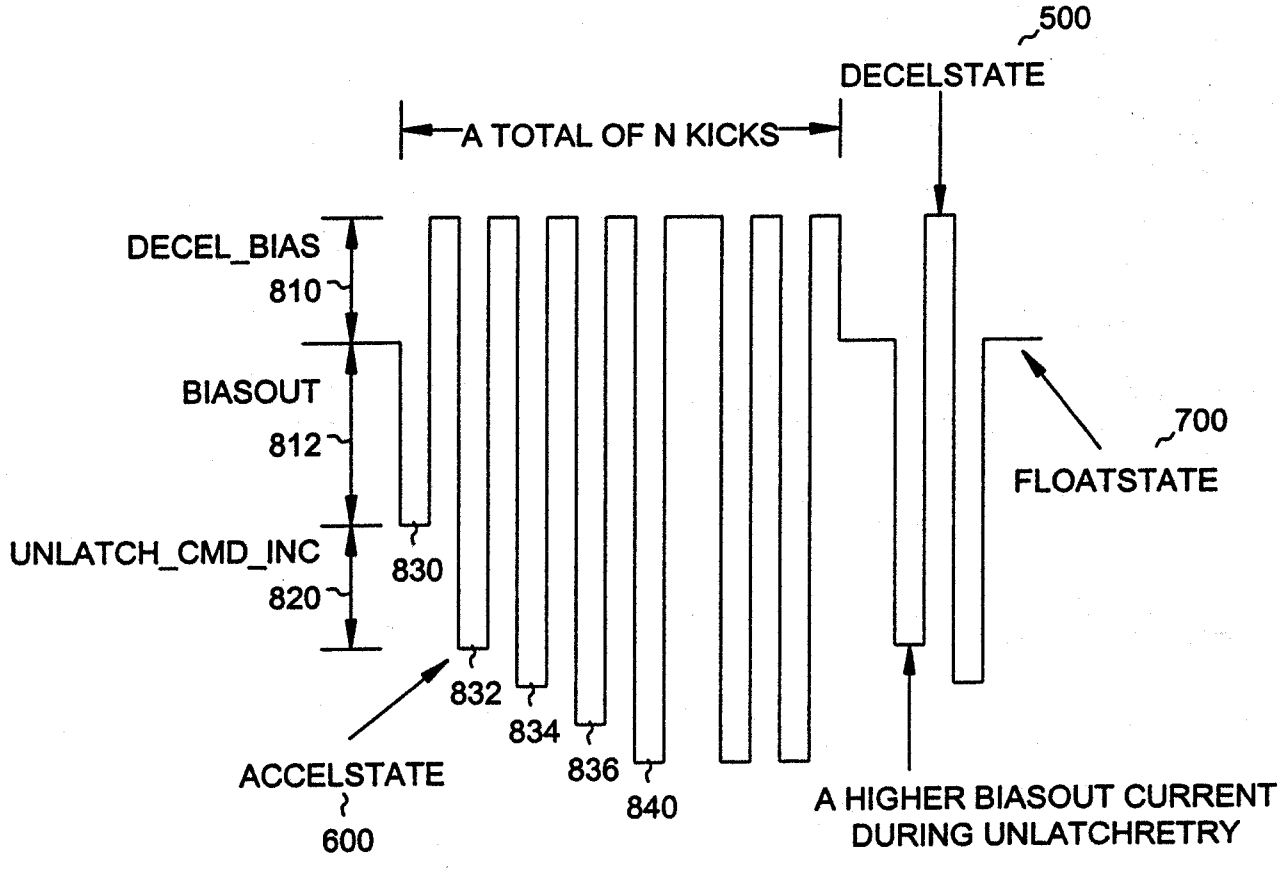

500
DECELSTATE
A TOTAL OF N KICKS
DECEL_BIAS
810
BIASOUT
812
UNLATCH_CMD_INC
820
830
832
834
836
840
700
FLOATSTATE
ACCELSTATE
600
A HIGHER BIASOUT CURRENT
DURING UNLATCHRETRY

FIG. 8

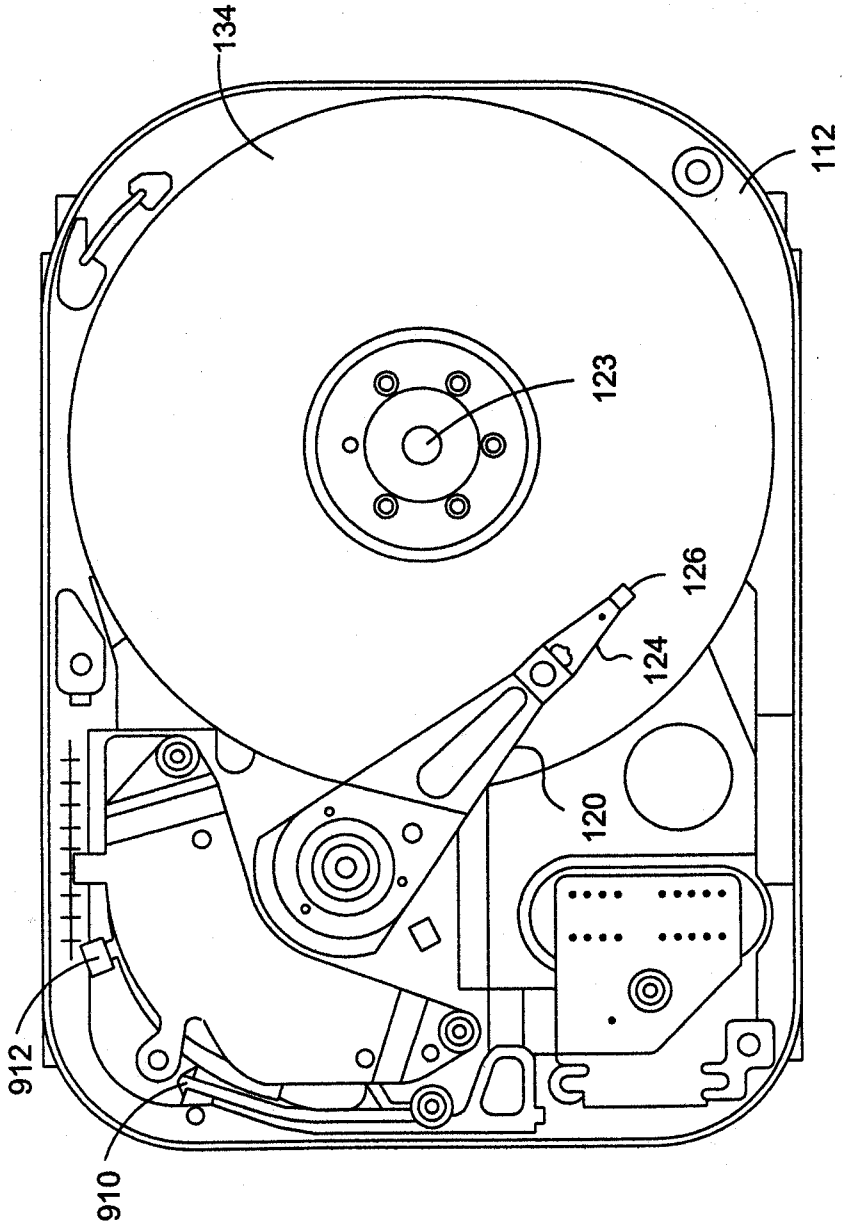


FIG. 9

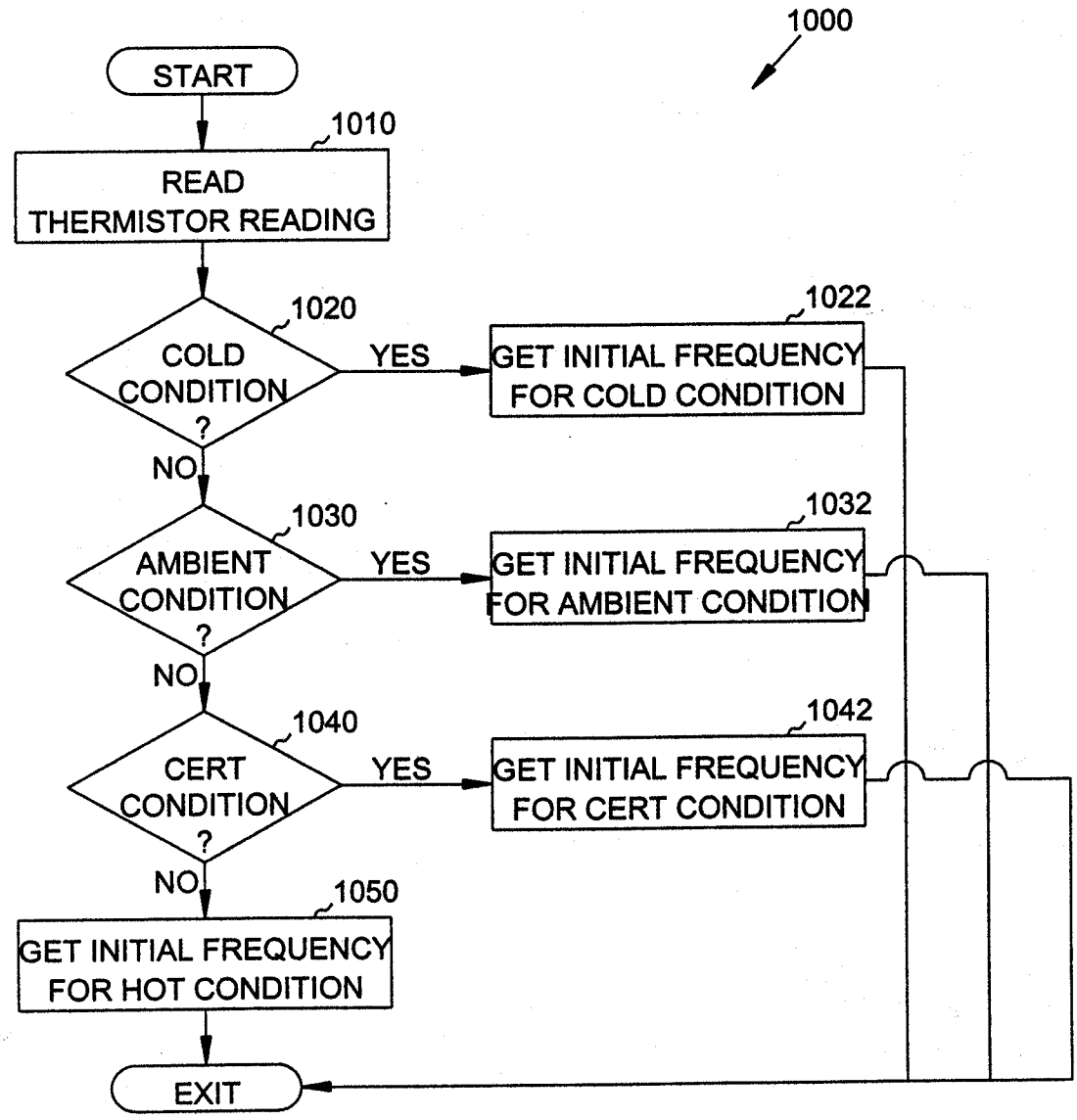

1000
START
1010
READ THERMISTOR READING
1020
COLD CONDITION ?
YES
1022
GET INITIAL FREQUENCY FOR COLD CONDITION
NO
1030
AMBIENT CONDITION ?
YES
1032
GET INITIAL FREQUENCY FOR AMBIENT CONDITION
NO
1040
CERT CONDITION ?
YES
1042
GET INITIAL FREQUENCY FOR CERT CONDITION
NO
1050
GET INITIAL FREQUENCY FOR HOT CONDITION
EXIT

FIG. 10

1110 FREQ. (Hz)	1120 AVE. KICKS	1130 TOTAL KICKS	1140 THERMISTOR READING (IN HEX)
360	6	349	DB - DC
370	6	301	DB - DD
381	6	315	DB - DC
392	6	300	DB - DD
405	6	339	DD - DE
418	7	374	DB - DE
432	8	400	DA - DD
447	8	442	DB - DE
463	9	494	DB - DD
480	9	461	DB - DD
498	10	500	DA - DD
518	9	499	DB - DD
540	9	486	DB - DD
563	9	466	DB - DD
589	10	519	DD - DE
617	9	453	DB - DC
648	9	480	DB - DC
682	9	461	DB - DD
720	11	587	DB - DD

FIG. 11

1110 FREQ. (Hz)	1120 AVE. KICKS	1130 TOTAL KICKS	1140 THERMISTOR READING (IN HEX)
360	6	300	DB - DD
370	6	346	DB - DD
381	5	253	DB - DD
392	4	240	DB - DD
405	6	342	DB - DD
418	7	364	DD - DE
432	6	343	DB - DD
447	7	395	DB - DD
463	8	409	DB - DD
480	9	491	DB - DD
498	9	483	DB - DD
518	8	446	DB - DD
540	8	441	DB - DD
563	8	434	DB - DD
589	9	490	DB - DD
617	8	405	DB - DD
648	9	464	DB - DD
682	8	404	DB - DD
720	10	505	DB - DD

FIG. 12

1110 FREQ. (Hz)	1120 AVE. KICKS	1130 TOTAL KICKS	1140 THERMISTOR READING (IN HEX)
360	9	450	DB
370	11	557	DB
381	9	487	DB
392	11	550	DA - DB
405	10	528	DB
418	10	500	DB
432	19	964	DB
447	11	558	D6 - DB
463	15	768	DB
480	14	737	DB
498	12	638	DB
518	12	627	DB
540	13	650	DB
563	11	595	DB
589	11	560	DB
617	13	687	DB
648	10	500	DB
682	10	542	DB
720	15	761	DB - DD

FIG. 13

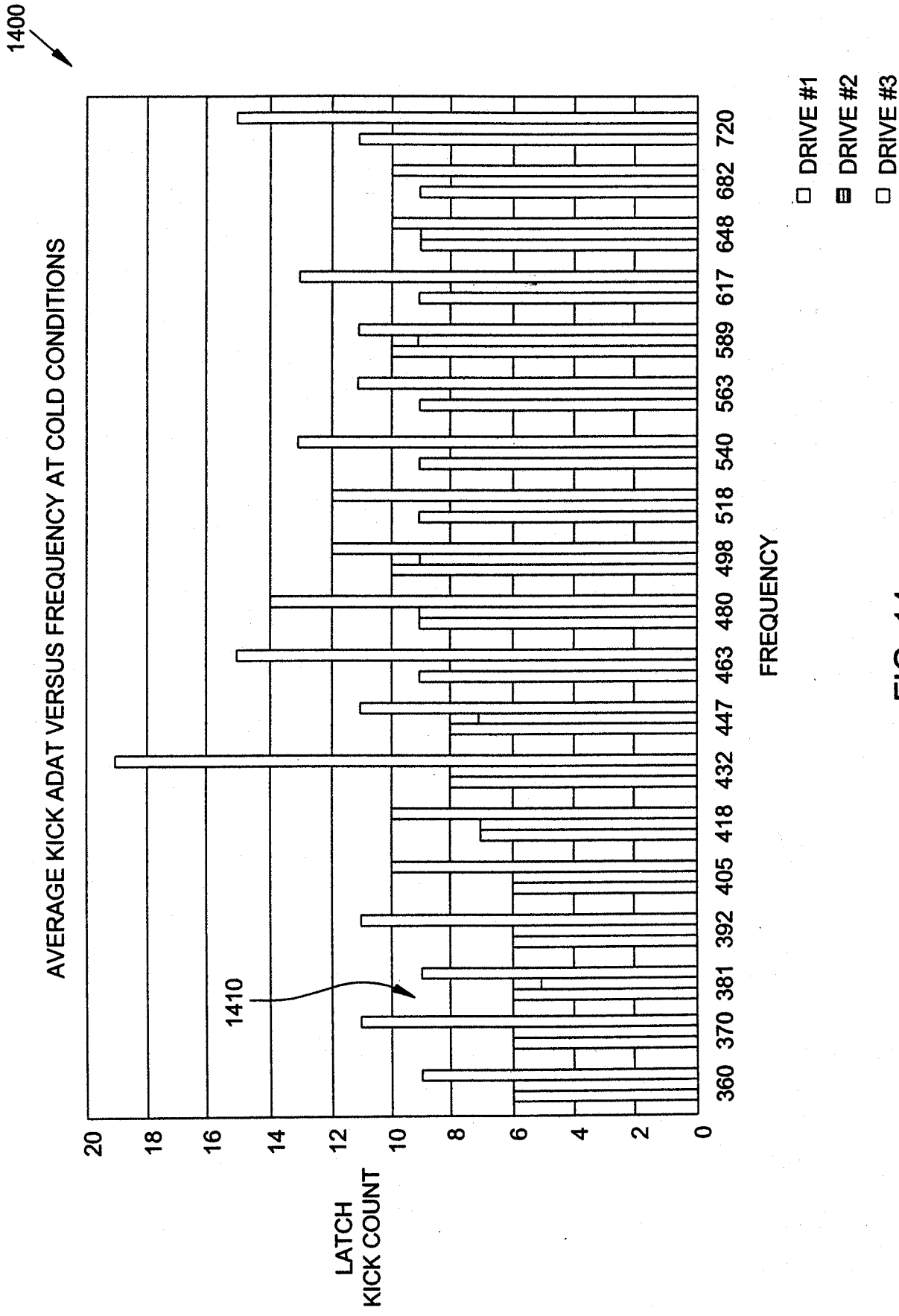

1400
AVERAGE KICK ADAT VERSUS FREQUENCY AT COLD CONDITIONS
LATCH KICK COUNT
20
18
16
14
12
10
8
6
4
2
0
1410
360 370 381 392 405 418 432 447 463 480 498 518 540 563 589 617 648 682 720
FREQUENCY
DRIVE #1
DRIVE #2
DRIVE #3

FIG. 14

TEMPERATURE CONDITION	INITIAL FREQUENCY (Hz) (NEXT 8 KICKS)	SECOND FREQUENCY (Hz) (NEXT 8 KICKS)	THIRD FREQUENCY (Hz) (NEXT 8 KICKS)	FINAL FREQUENCY (Hz) (NEXT 8 KICKS)
COLD	381	563	518	480
AMBIENT	563	518	480	381
CERT TEST	480	518	563	381
HOT	518	563	480	381

FIG. 15

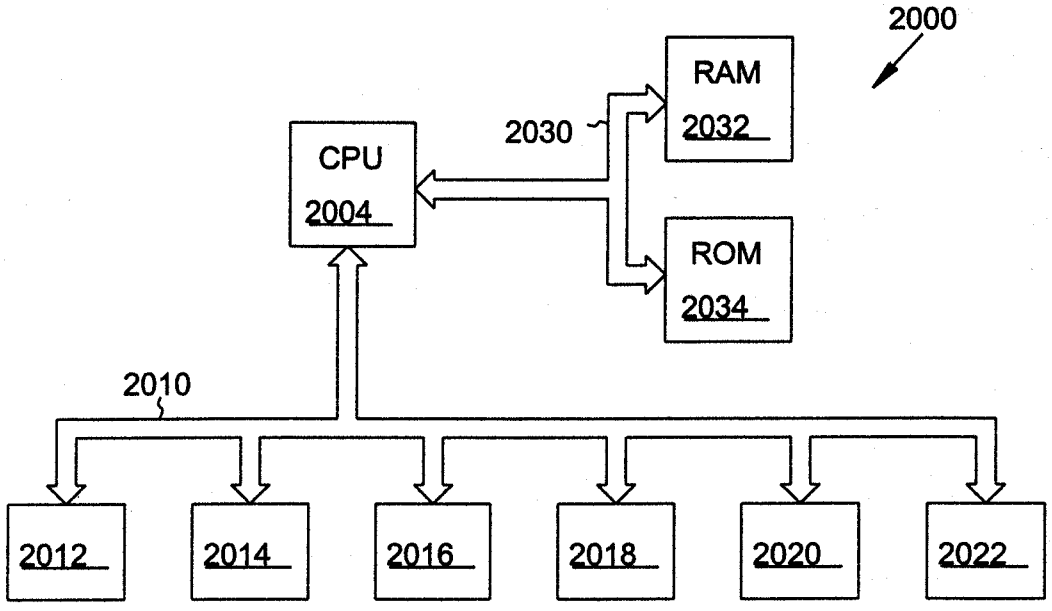

2000
RAM
2032
2030
CPU
2004
ROM
2034
2010
2012
2014
2016
2018
2020
2022

FIG. 16