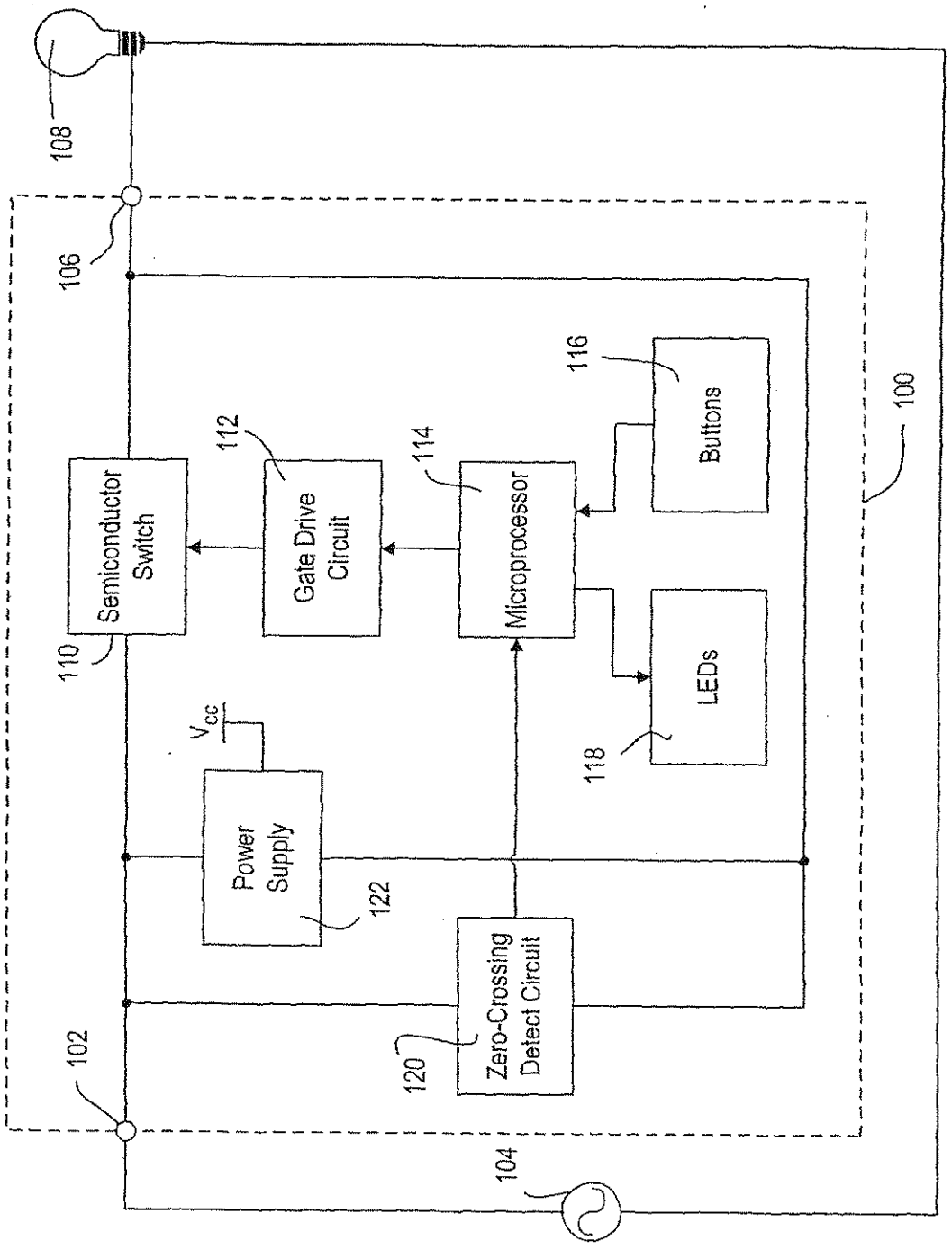


FIG. 1
PRIOR ART

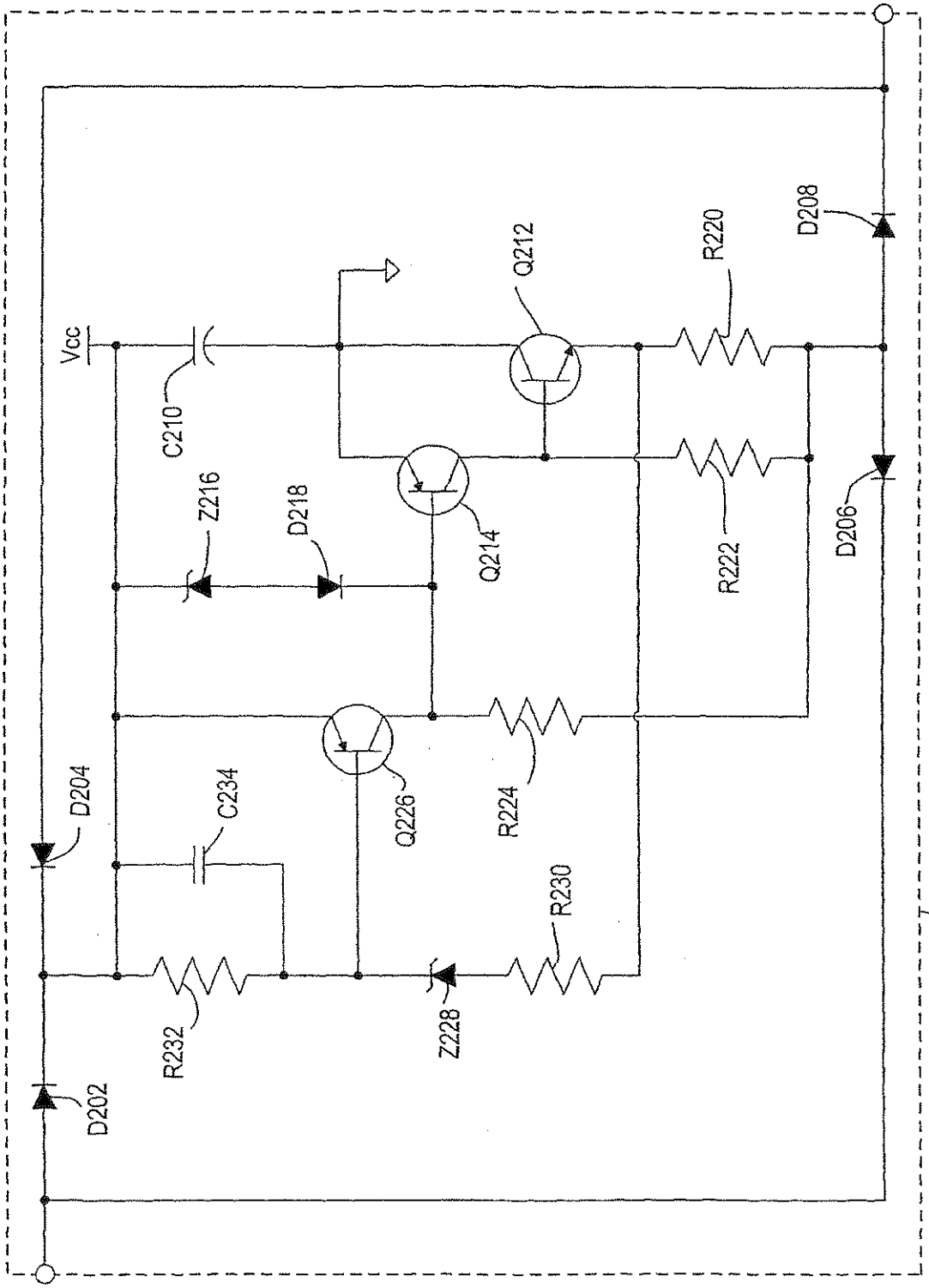


FIG. 2
PRIOR ART

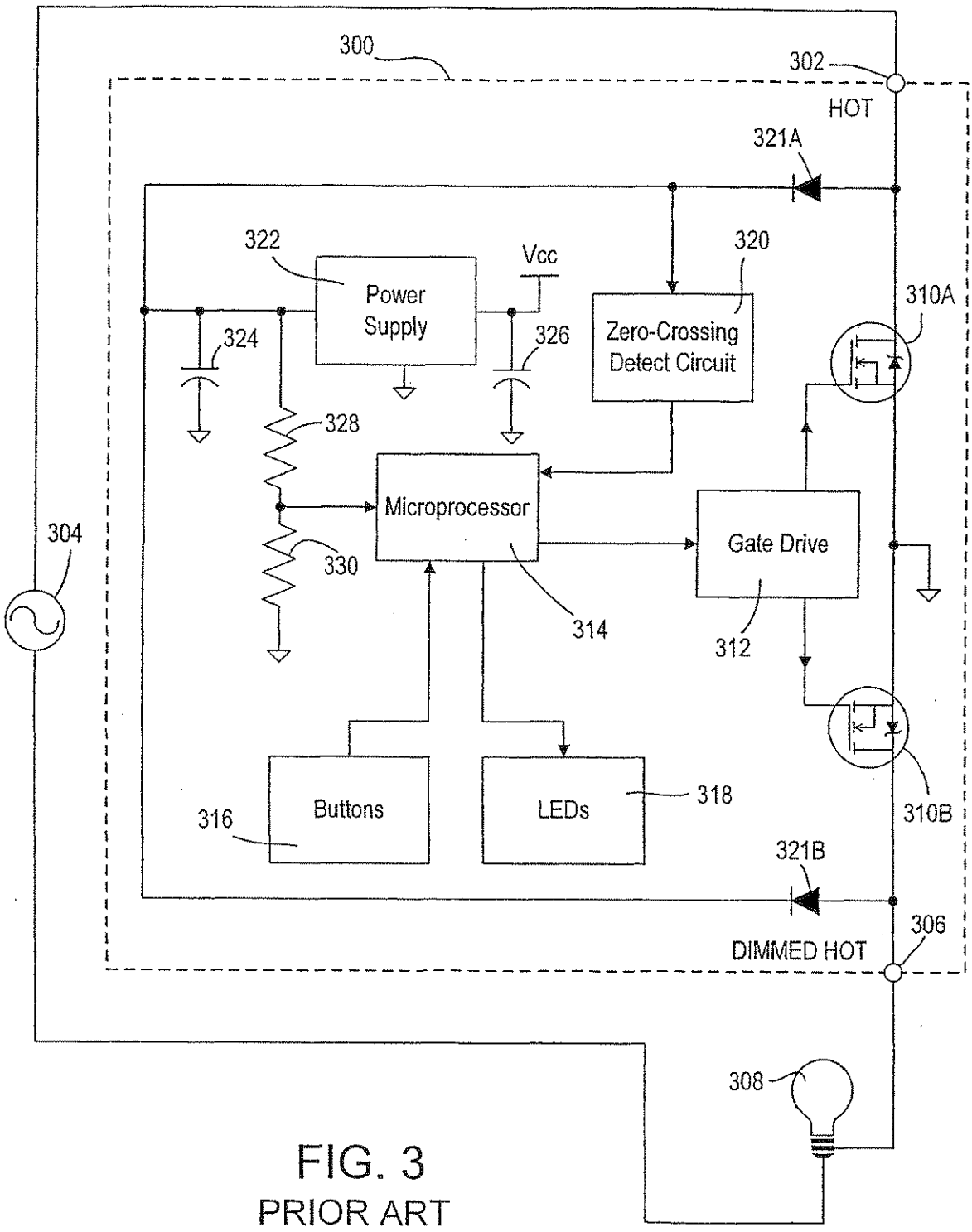


FIG. 3
PRIOR ART

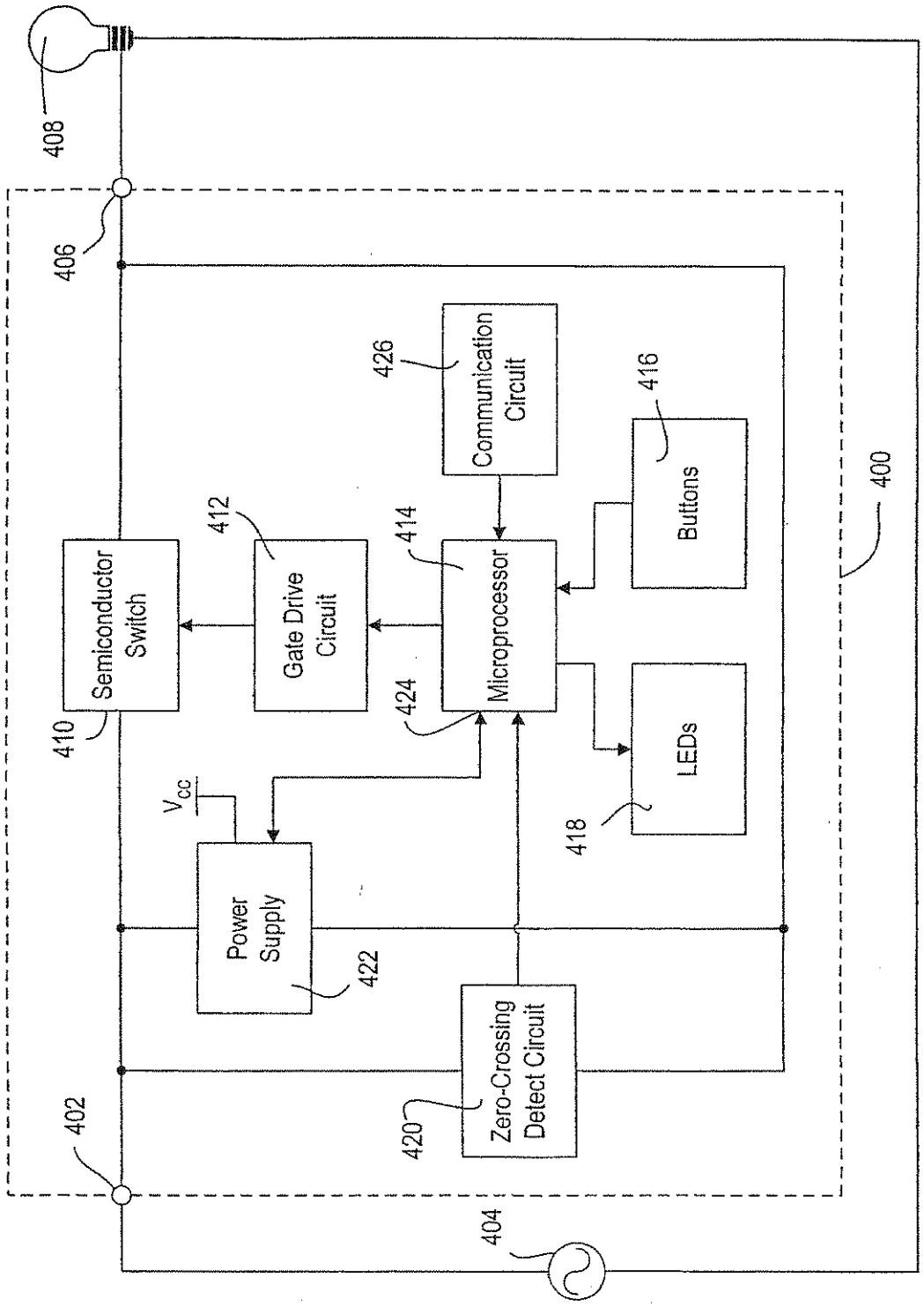

408
406
426
Communication Circuit
416
Buttons
400
412
414
Semiconductor Switch
Gate Drive Circuit
Microprocessor
410
424
LEDs
418
V_{cc}
Power Supply
422
Zero-Crossing Detect Circuit
420
402
404

FIG. 4

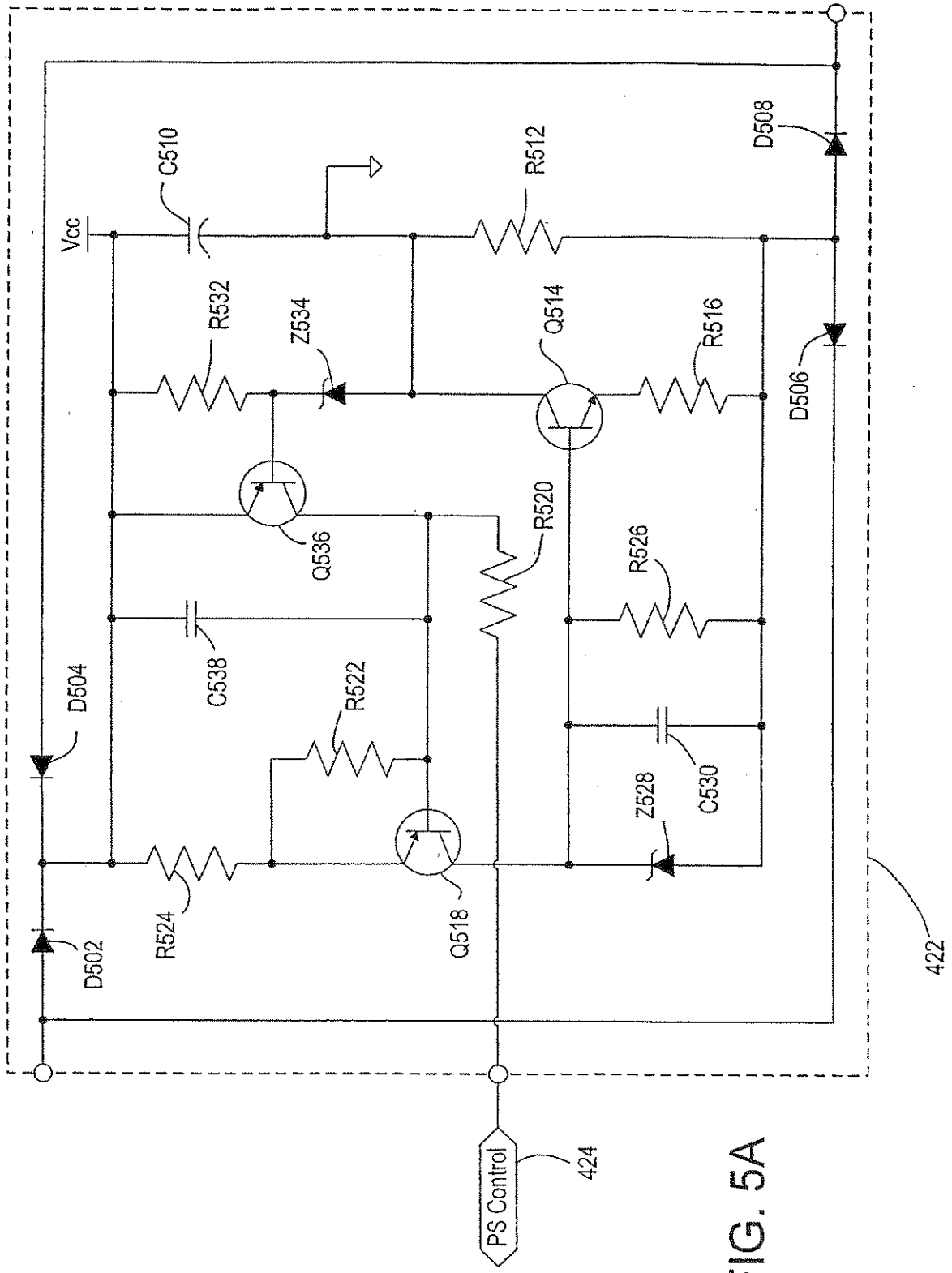

Vcc
C510
R512
D508
R532
Z534
Q514
R516
D506
Q536
R520
R526
C538
R522
D504
C530
Z528
R524
Q518
D502
422
PS Control
424

FIG. 5A

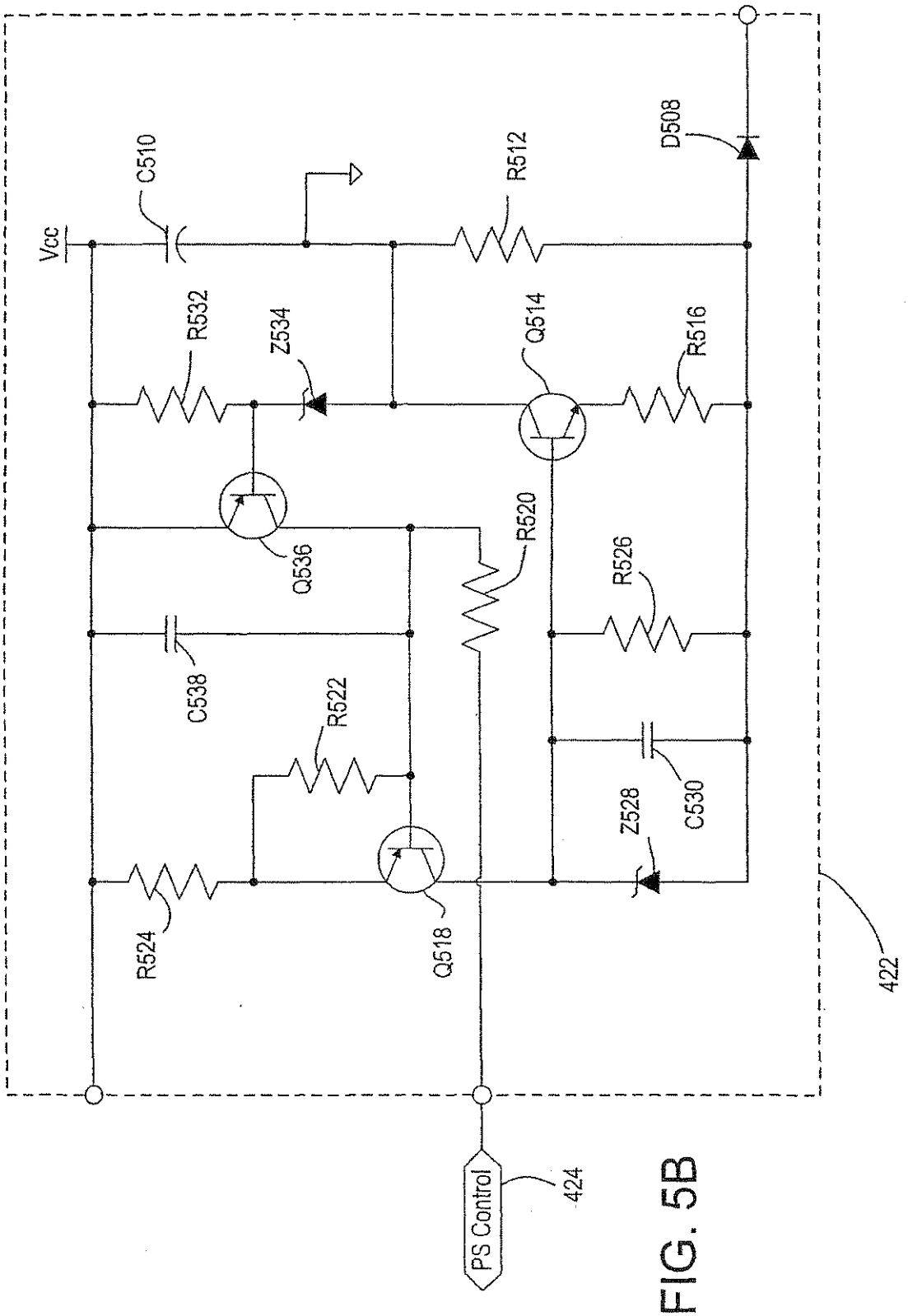

Vcc
C510
R512
D508
R532
Z534
Q514
R516
Q536
R520
R526
C538
R522
C530
Z528
R524
Q518
422
PS Control
424

FIG. 5B

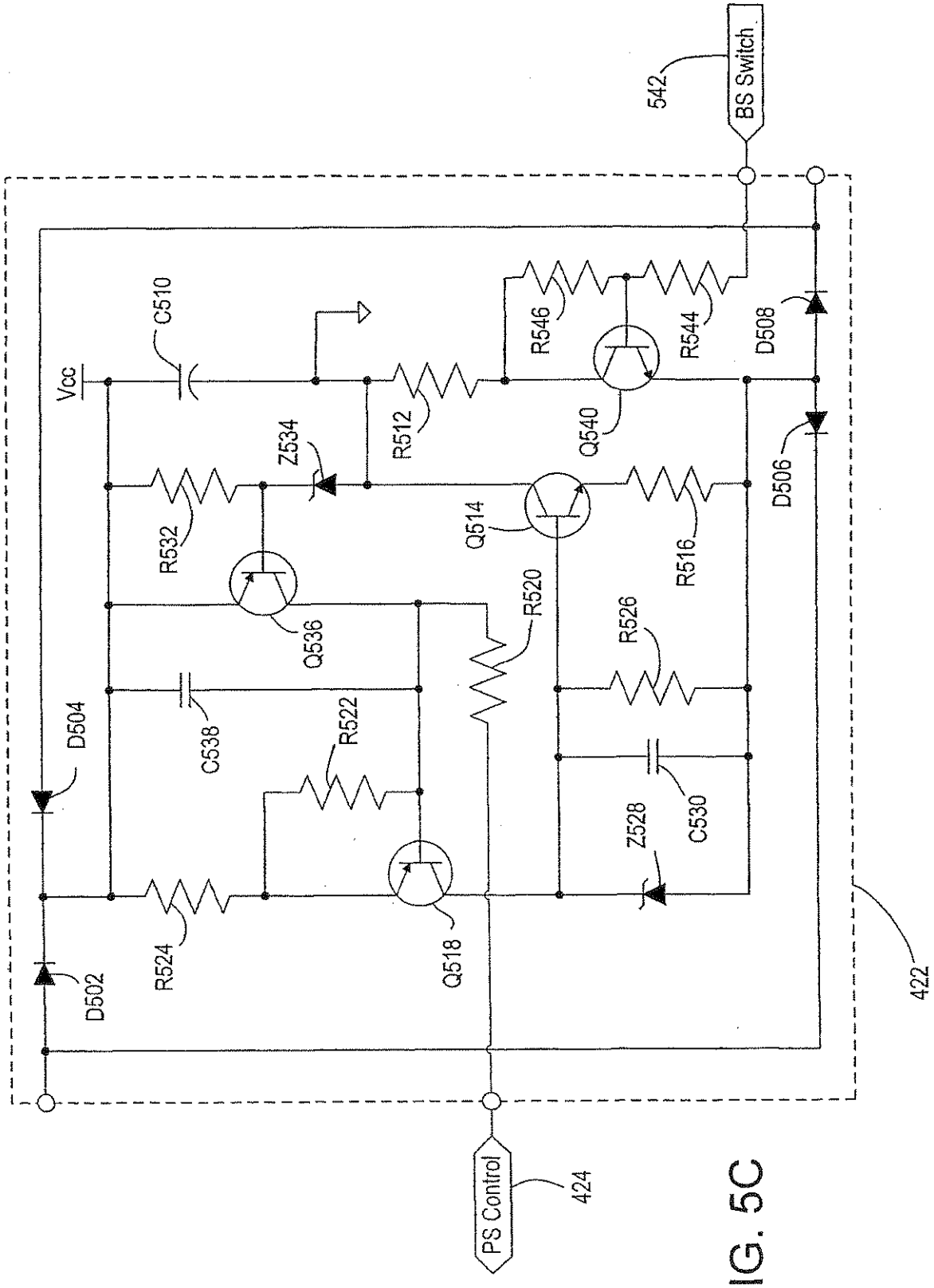

542
BS Switch
C510
Vcc
R546
R544
D508
R512
Q540
Z534
D506
R532
Q514
R516
R520
Q536
R526
D504
C538
R522
C530
Z528
R524
Q518
D502
422
PS Control
424

FIG. 5C

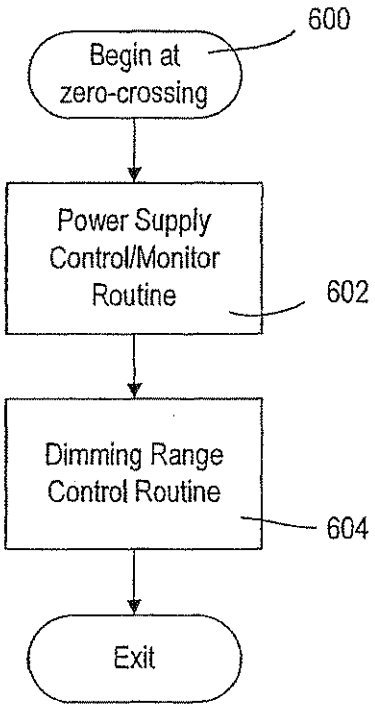
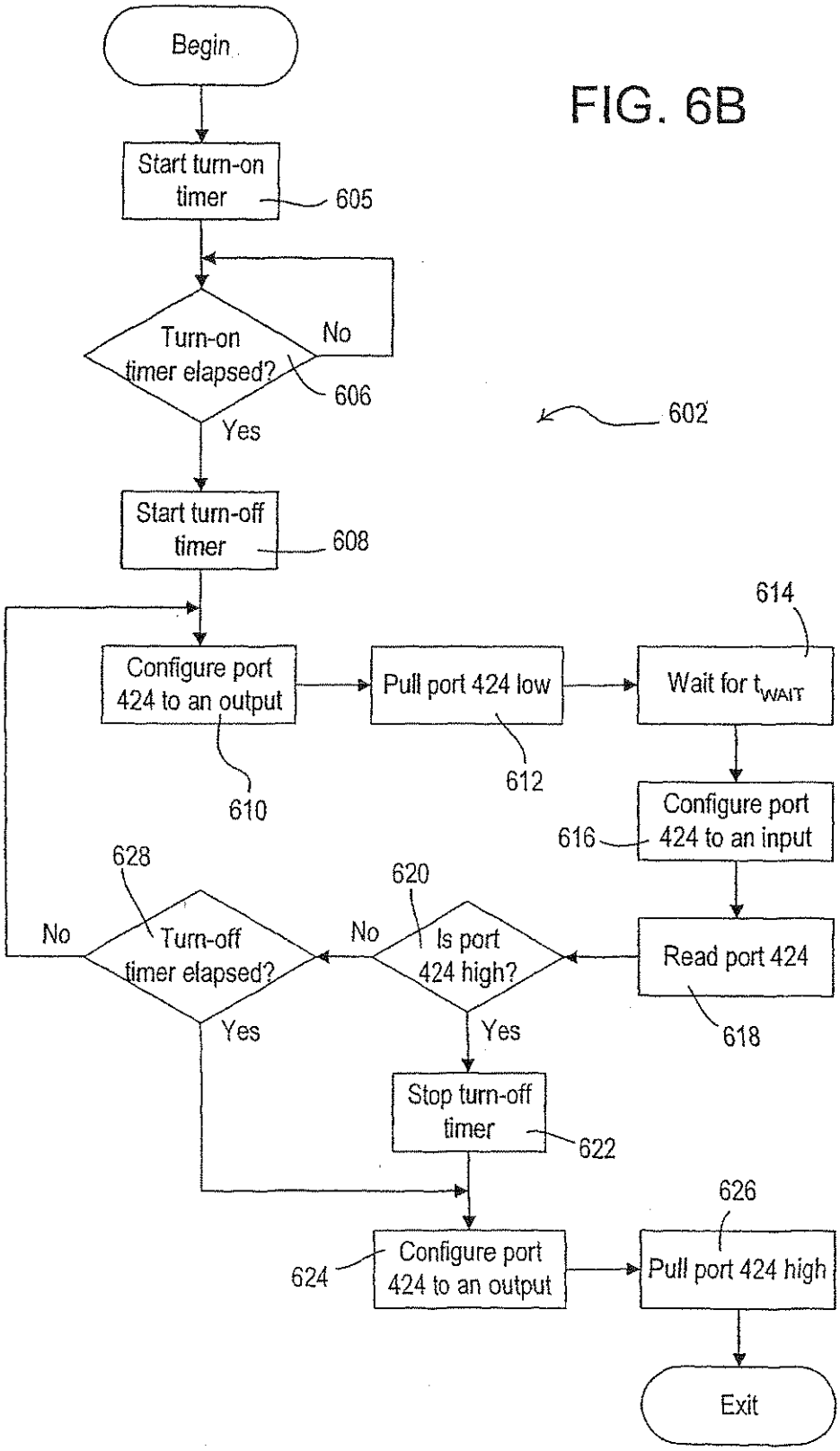

600
Begin at zero-crossing
Power Supply Control/Monitor Routine
602
Dimming Range Control Routine
604
Exit

FIG. 6A

FIG. 6B


Begin
Start turn-on timer
605
Turn-on timer elapsed?
No
606
Yes
602
Start turn-off timer
608
Configure port 424 to an output
610
Pull port 424 low
612
Wait for t_{WAIT}
614
Configure port 424 to an input
616
Read port 424
618
Is port 424 high?
620
No
Yes
Turn-off timer elapsed?
628
No
Yes
Stop turn-off timer
622
Configure port 424 to an output
624
Pull port 424 high
626
Exit

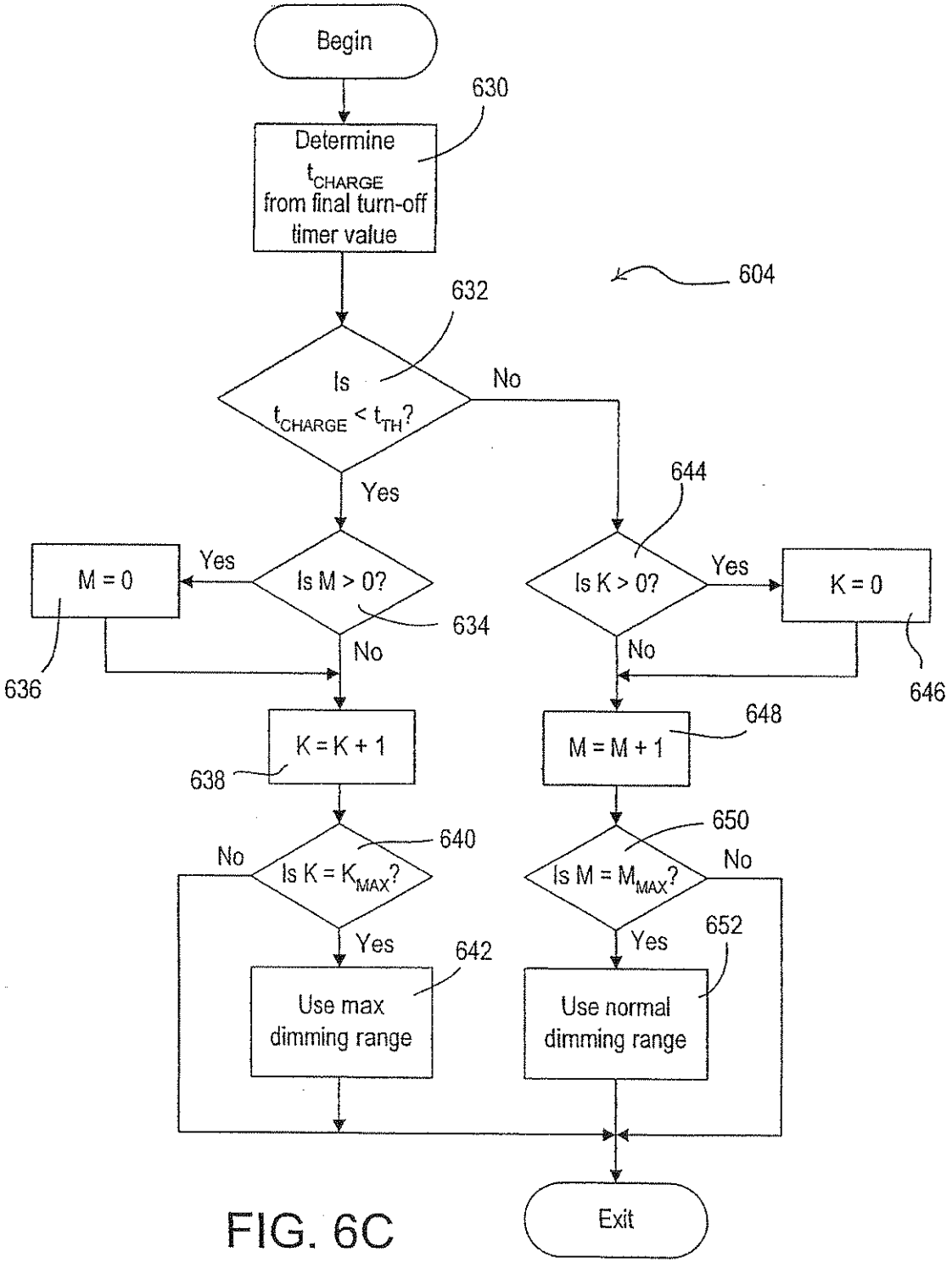

Begin
630
Determine t_{CHARGE} from final turn-off timer value
604
632
Is $t_{CHARGE} < t_{TH}$?
No
Yes
644
Is K > 0?
Yes
K = 0
646
No
Is M > 0?
Yes
M = 0
634
636
No
K = K + 1
638
M = M + 1
648
650
Is K = K_{MAX}?
640
No
Yes
Is M = M_{MAX}?
No
Yes
652
642
Use max dimming range
Use normal dimming range
Exit

FIG. 6C

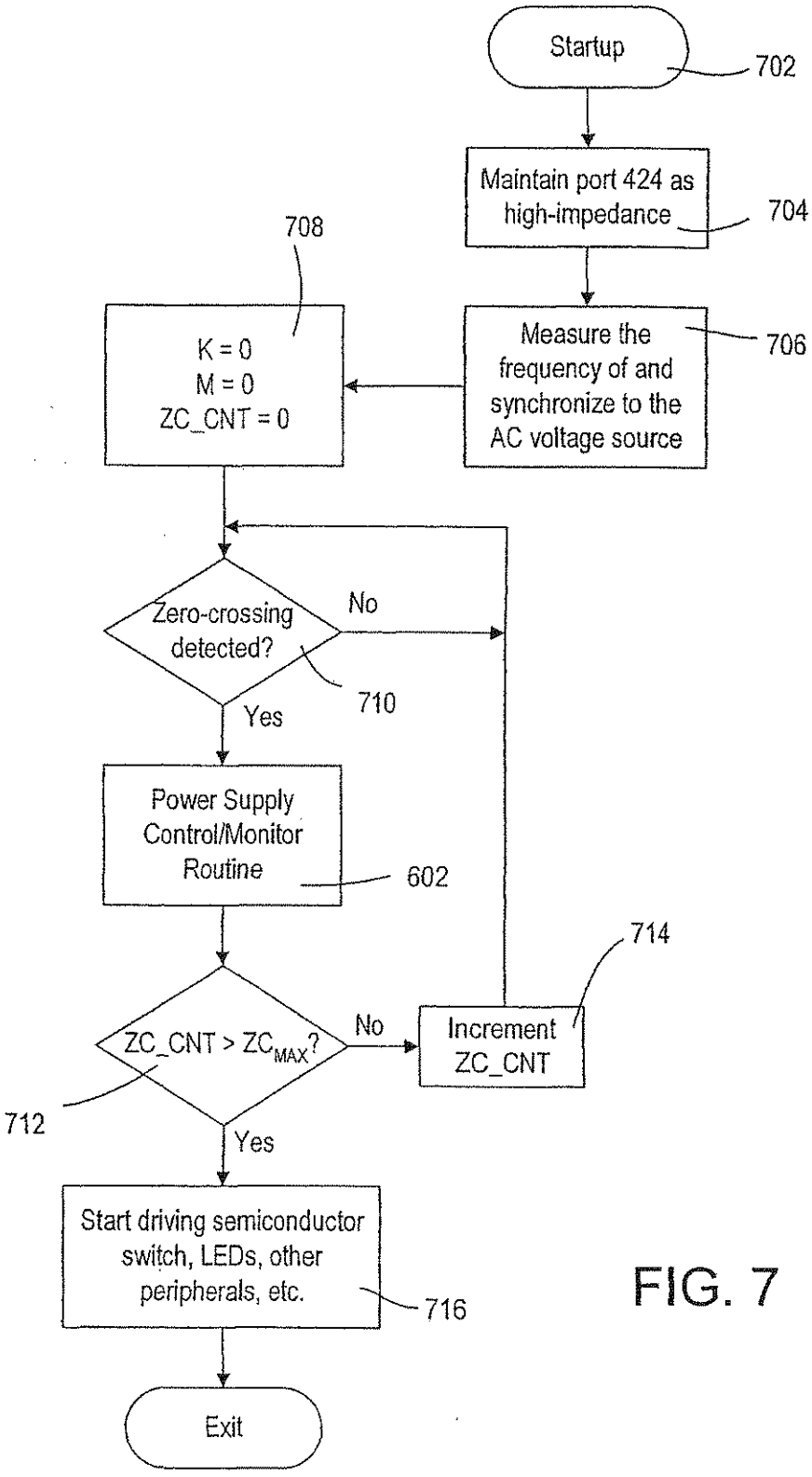

Startup
702
Maintain port 424 as high-impedance
704
708
K = 0
M = 0
ZC_CNT = 0
Measure the frequency of and synchronize to the AC voltage source
706
Zero-crossing detected?
No
710
Yes
Power Supply Control/Monitor Routine
602
714
ZC_CNT > ZC_MAX?
No
Increment ZC_CNT
712
Yes
Start driving semiconductor switch, LEDs, other peripherals, etc.
716
Exit

FIG. 7