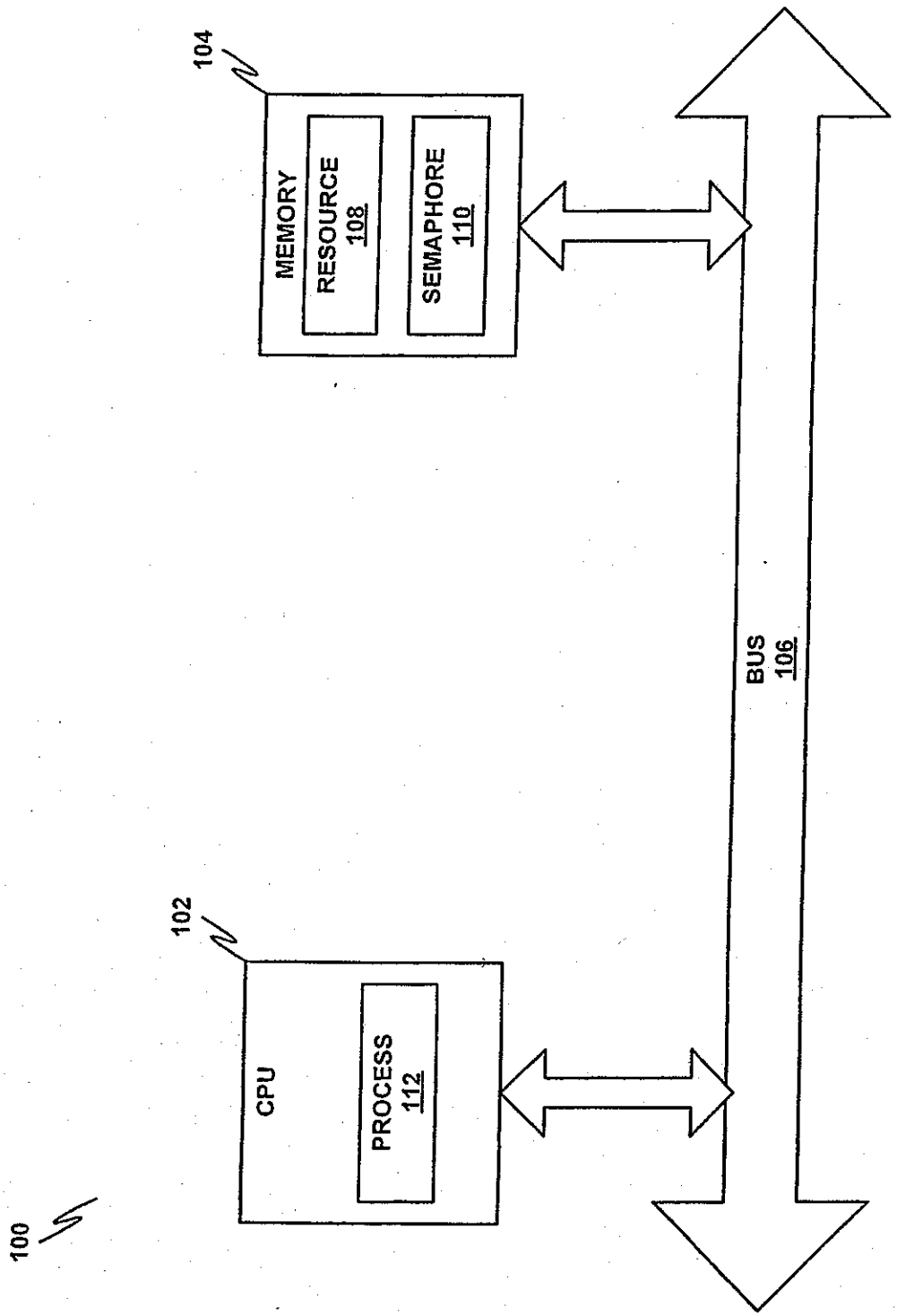

104
MEMORY
RESOURCE 108
SEMAPHORE 110
BUS 106
102
CPU
PROCESS 112
100

FIG. 1

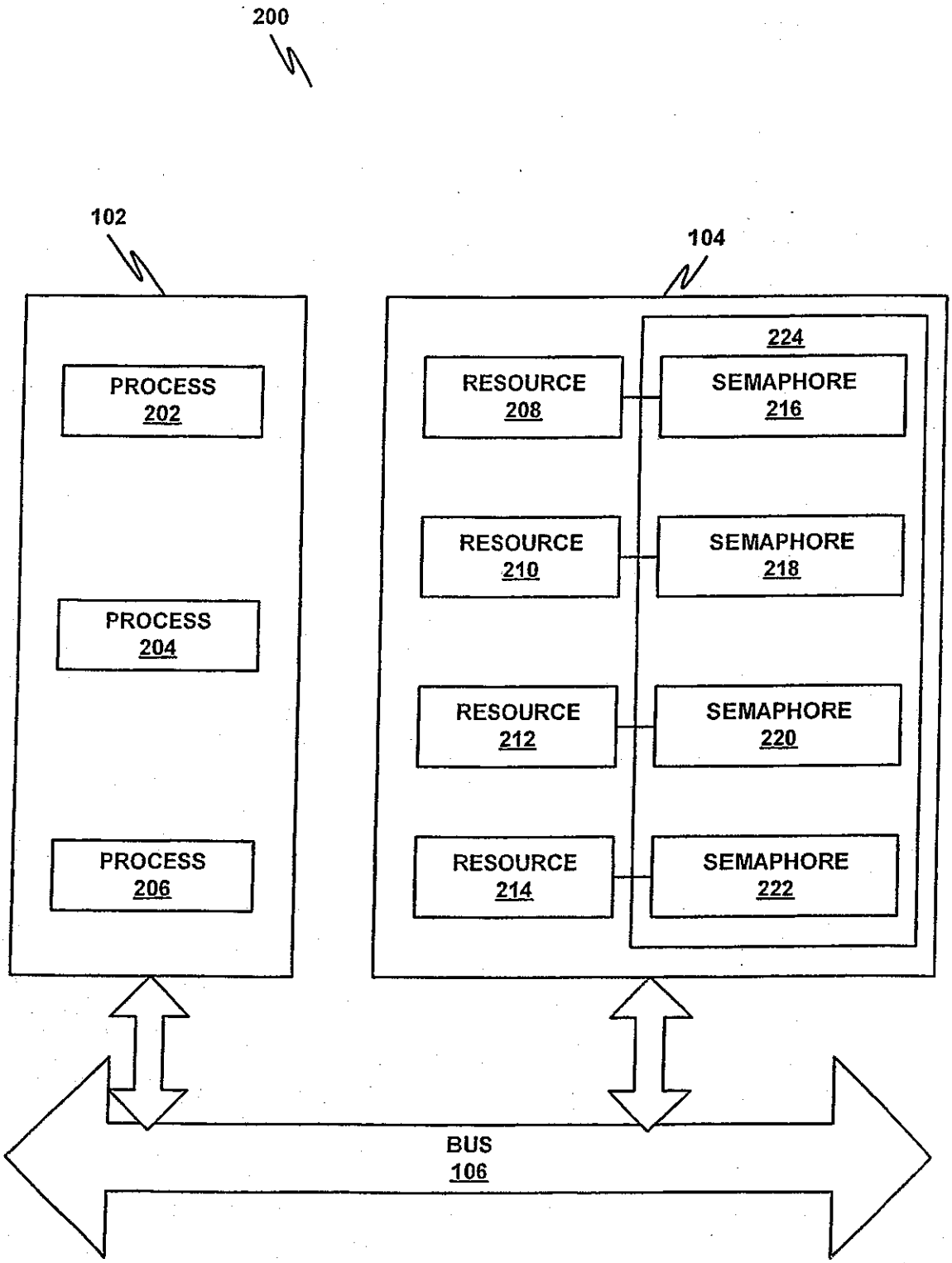


FIG. 2
(PRIOR ART)

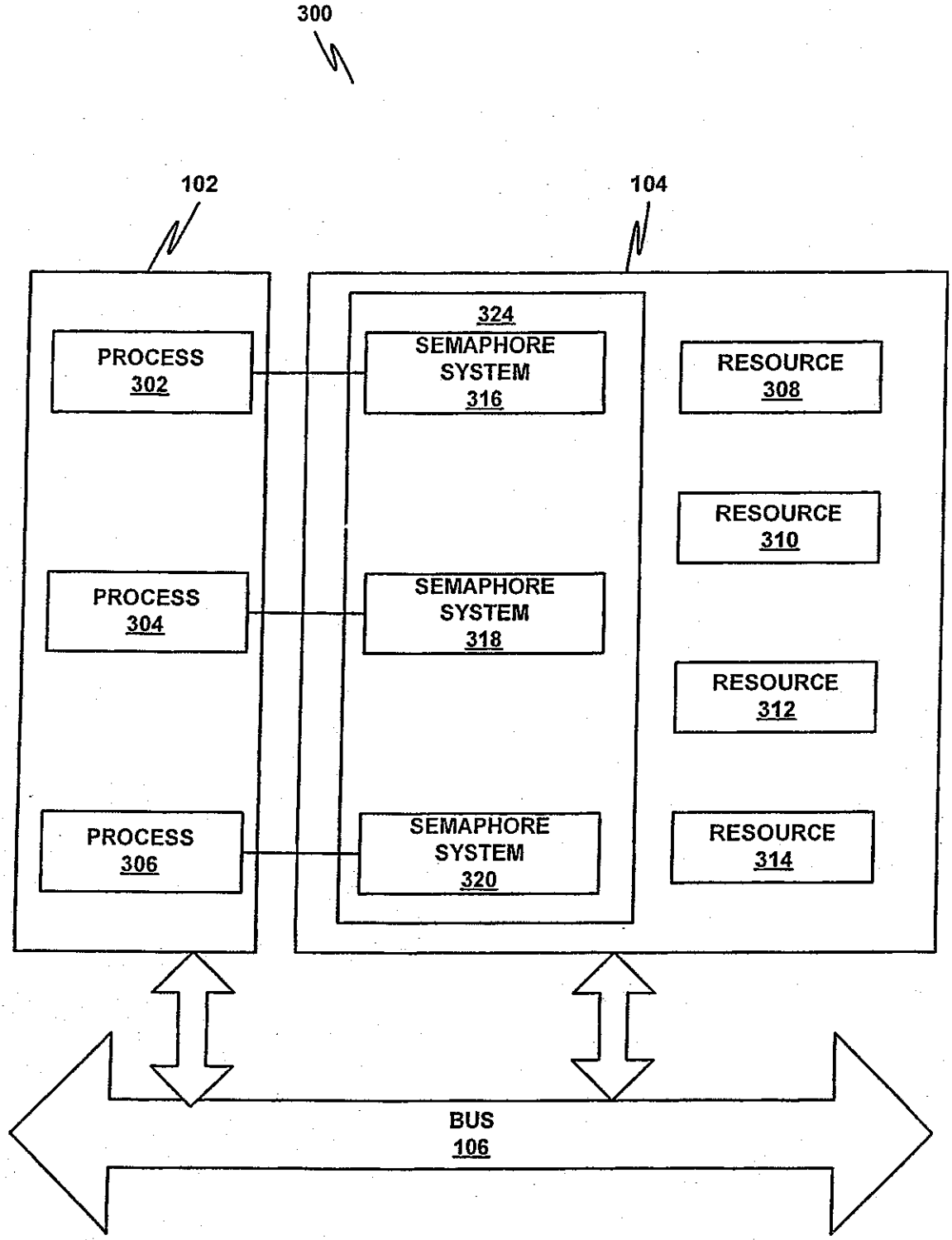

300
102
104
324
PROCESS
302
SEMAPHORE
SYSTEM
316
RESOURCE
308
RESOURCE
310
PROCESS
304
SEMAPHORE
SYSTEM
318
RESOURCE
312
PROCESS
306
SEMAPHORE
SYSTEM
320
RESOURCE
314
BUS
106

FIG. 3

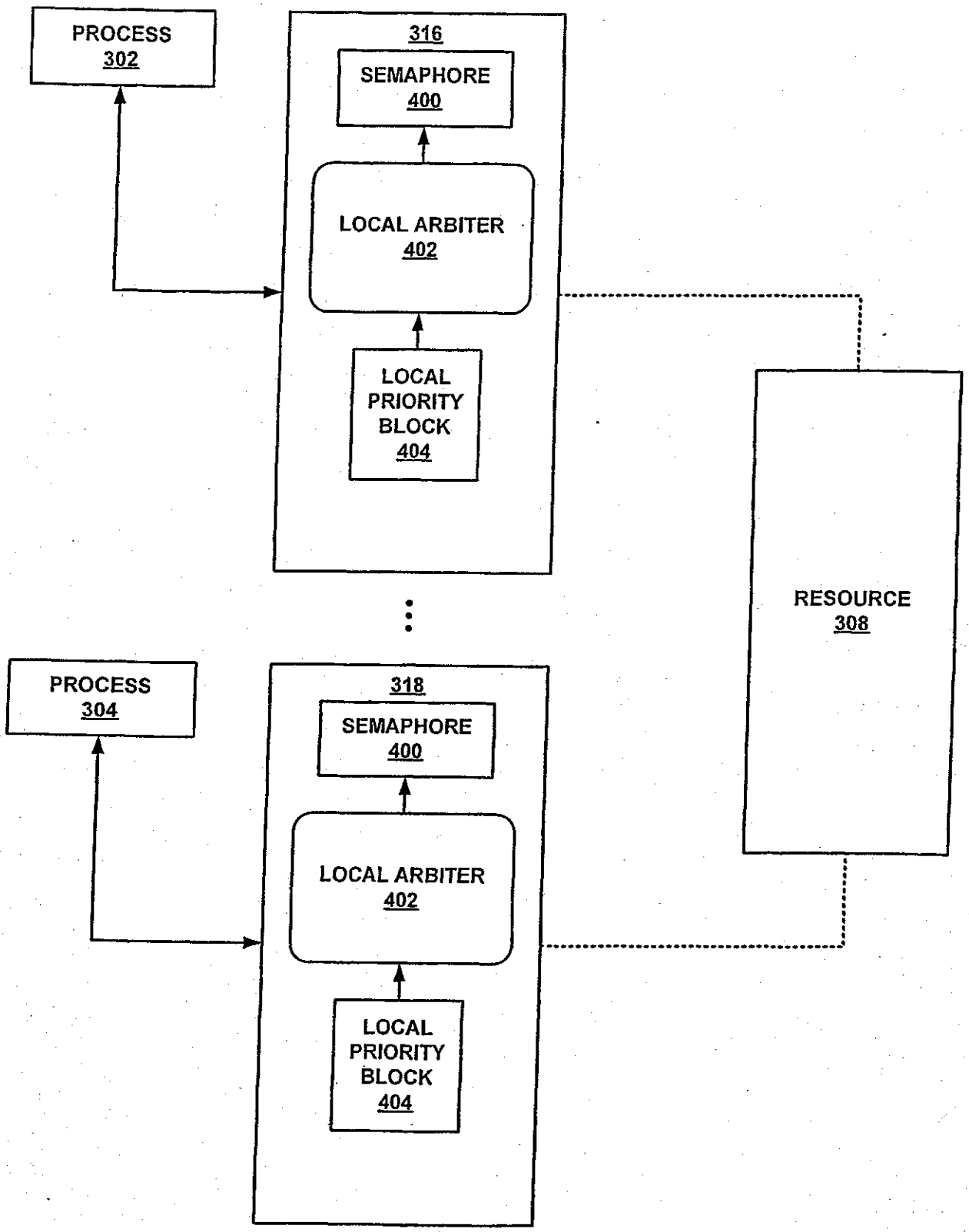

PROCESS
302
316
SEMAPHORE
400
LOCAL ARBITER
402
LOCAL
PRIORITY
BLOCK
404
RESOURCE
308
PROCESS
304
318
SEMAPHORE
400
LOCAL ARBITER
402
LOCAL
PRIORITY
BLOCK
404

FIG. 4

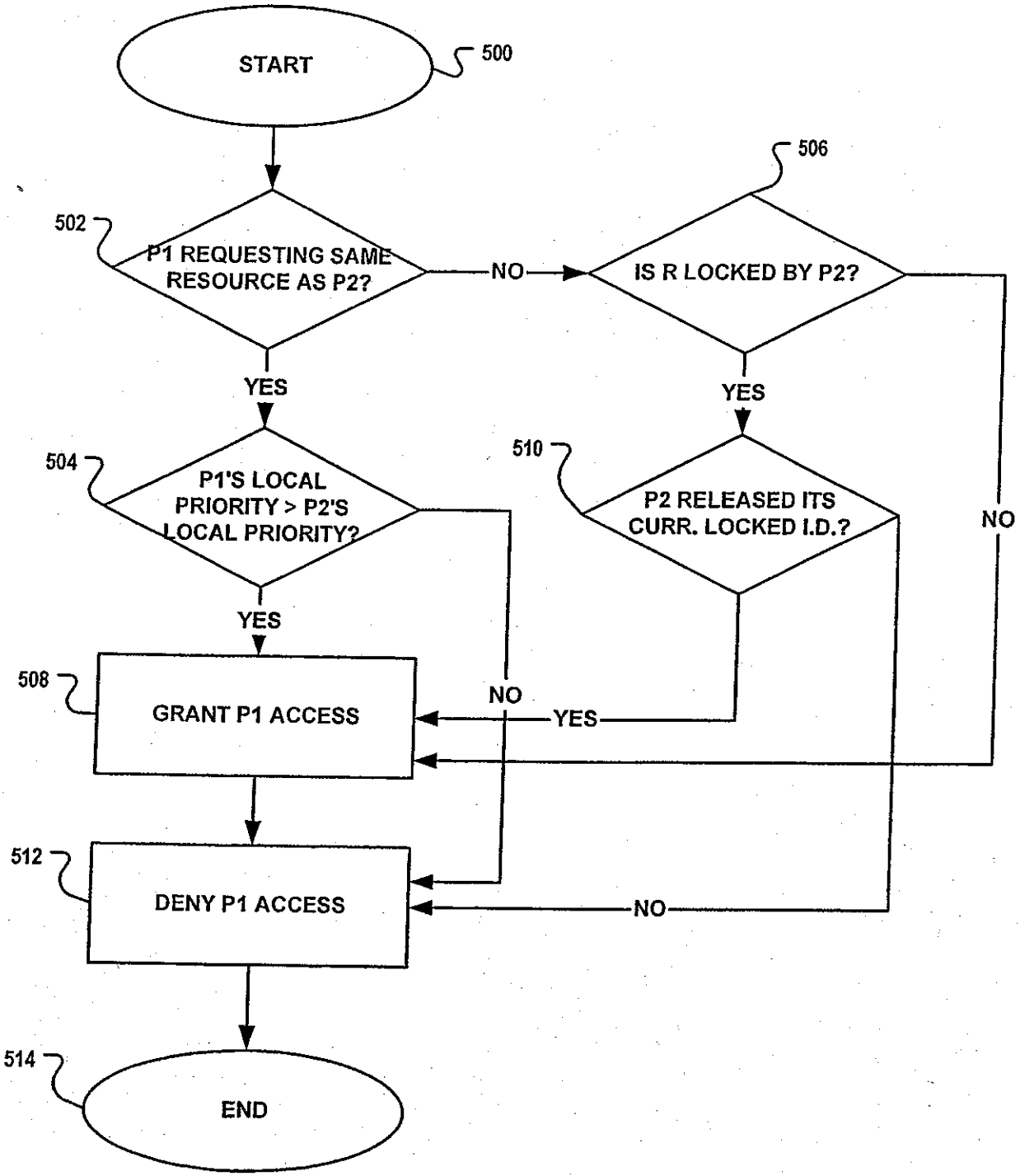

START
500
502
P1 REQUESTING SAME RESOURCE AS P2?
NO
506
IS R LOCKED BY P2?
YES
YES
504
P1'S LOCAL PRIORITY > P2'S LOCAL PRIORITY?
510
P2 RELEASED ITS CURR. LOCKED I.D.?
NO
YES
508
GRANT P1 ACCESS
NO
YES
512
DENY P1 ACCESS
NO
514
END

FIG. 5

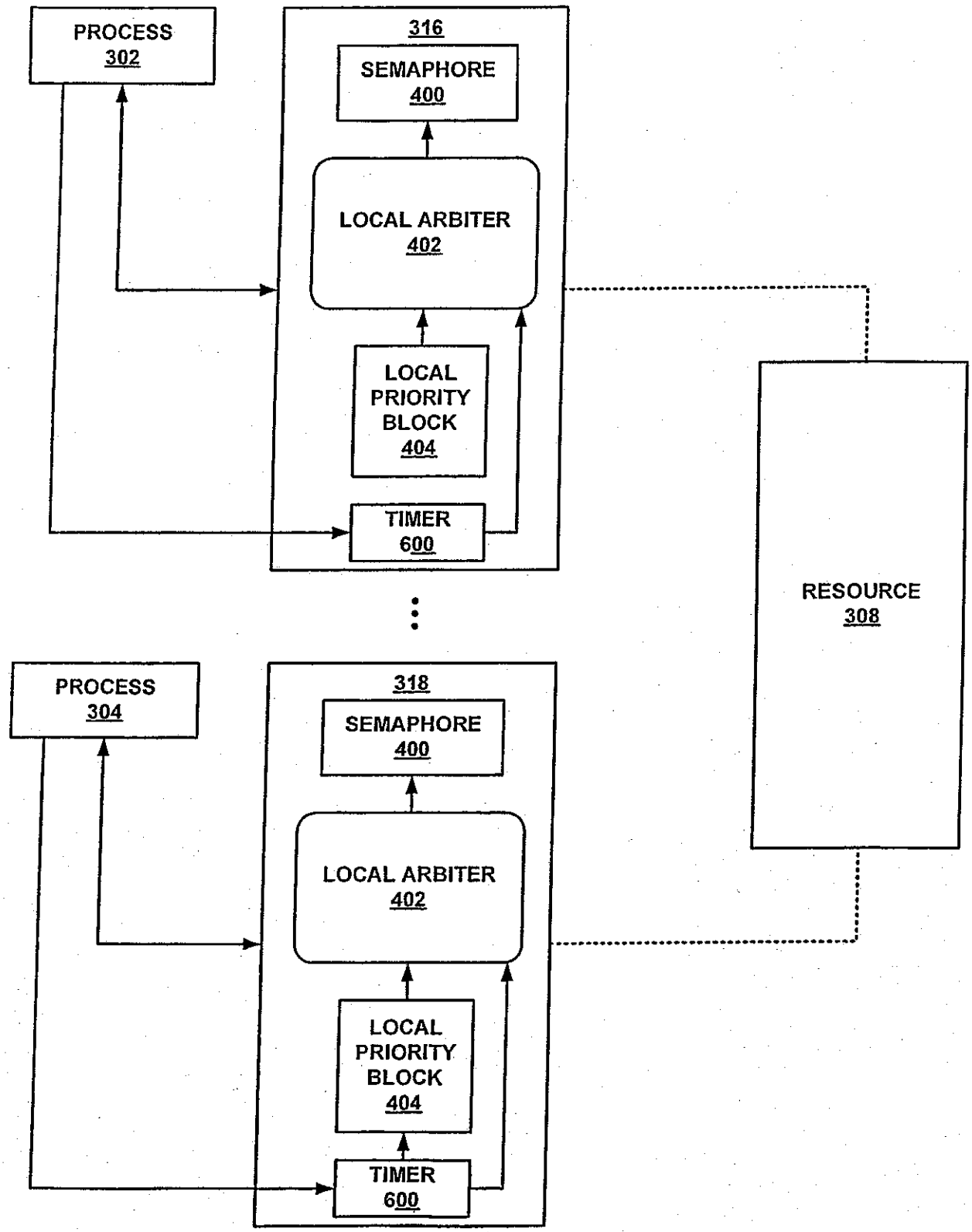

PROCESS
302
316
SEMAPHORE
400
LOCAL ARBITER
402
LOCAL
PRIORITY
BLOCK
404
TIMER
600
RESOURCE
308
PROCESS
304
318
SEMAPHORE
400
LOCAL ARBITER
402
LOCAL
PRIORITY
BLOCK
404
TIMER
600

FIG. 6

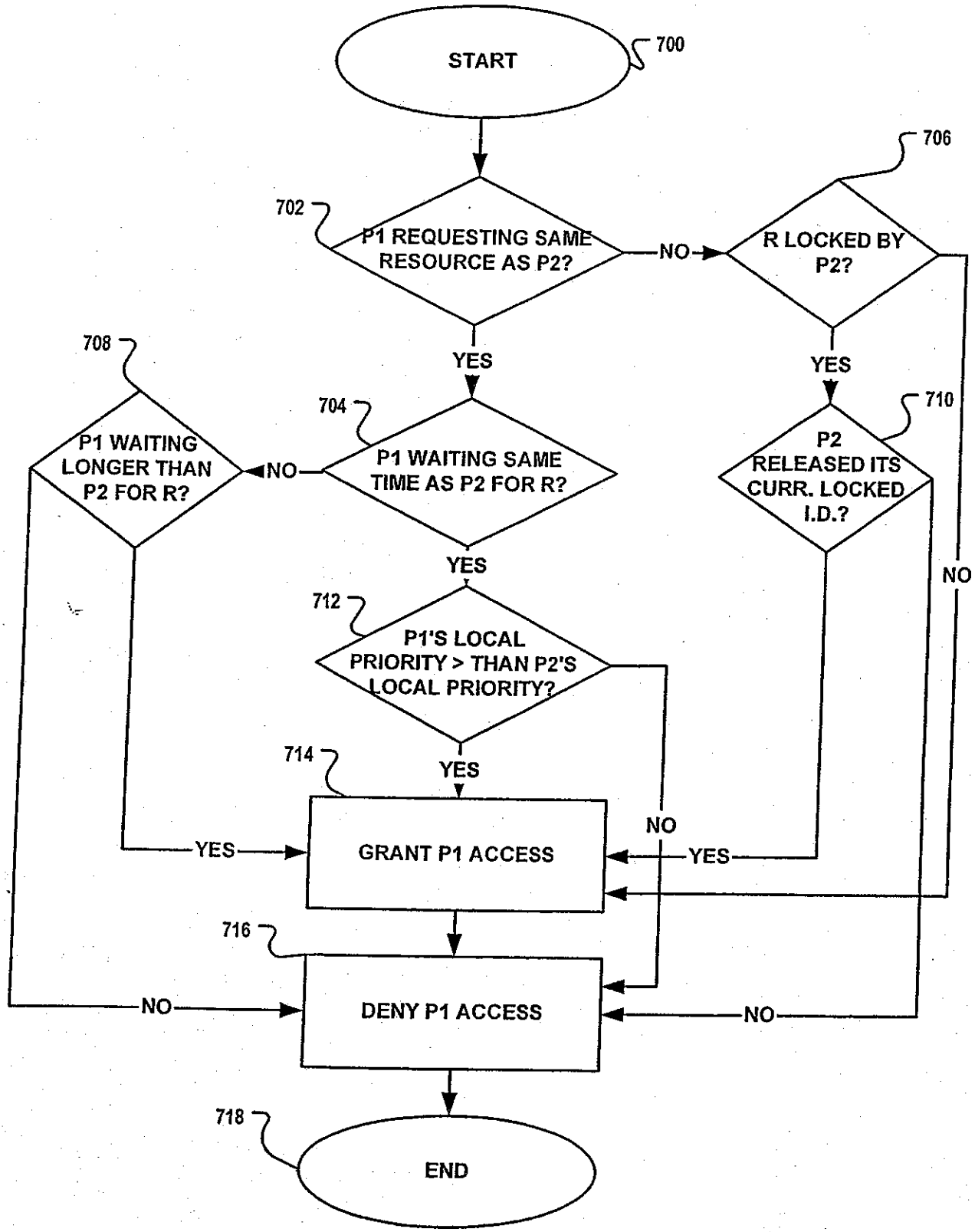

START
700
P1 REQUESTING SAME RESOURCE AS P2?
702
NO
R LOCKED BY P2?
706
YES
YES
P1 WAITING SAME TIME AS P2 FOR R?
704
NO
P1 WAITING LONGER THAN P2 FOR R?
708
P2 RELEASED ITS CURR. LOCKED I.D.?
710
YES
NO
P1'S LOCAL PRIORITY > THAN P2'S LOCAL PRIORITY?
712
YES
NO
YES
YES
GRANT P1 ACCESS
714
NO
NO
DENY P1 ACCESS
716
END
718

FIG. 7

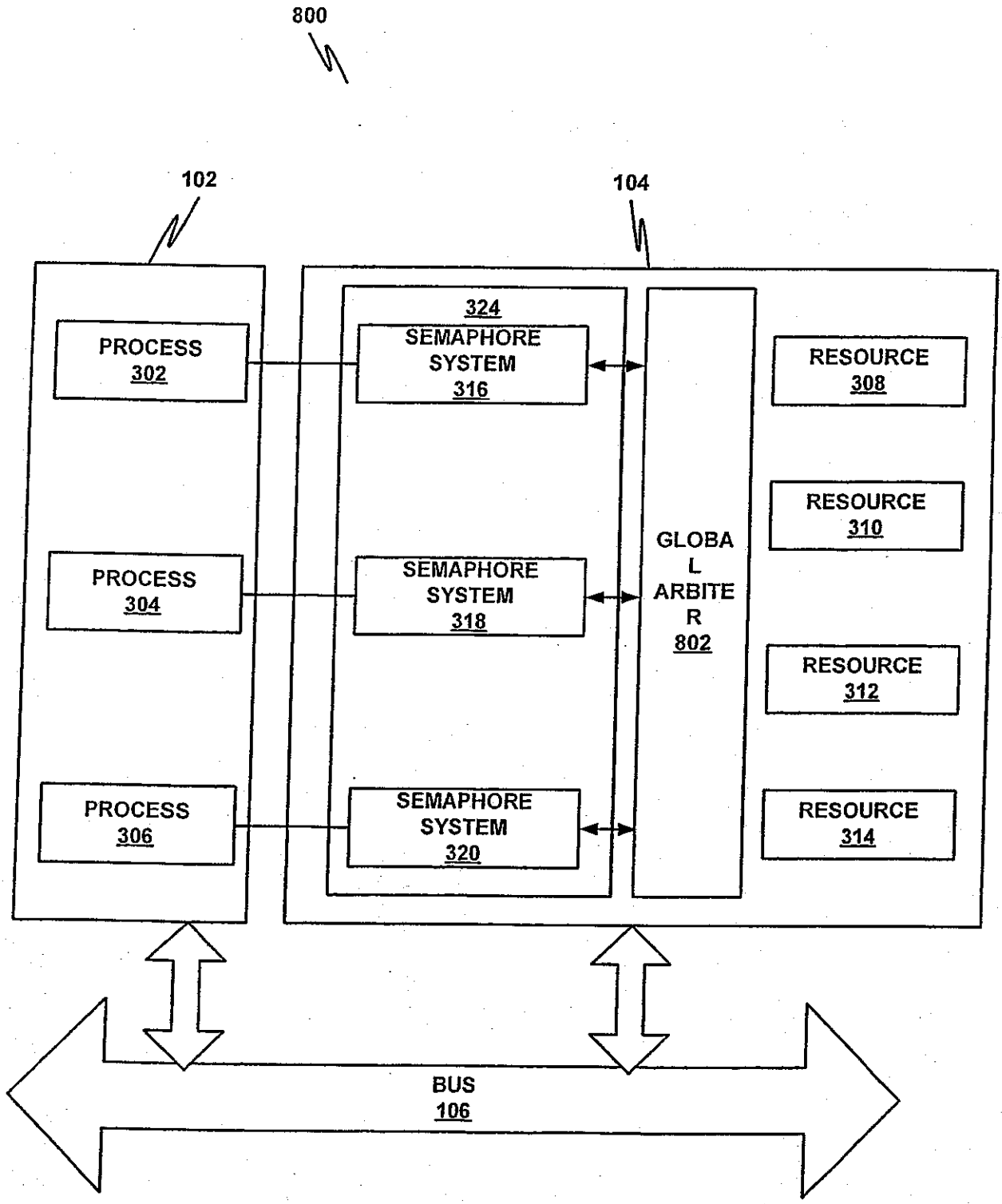

800
102
104
PROCESS
302
PROCESS
304
PROCESS
306
324
SEMAPHORE
SYSTEM
316
SEMAPHORE
SYSTEM
318
SEMAPHORE
SYSTEM
320
GLOBAL
ARBITER
802
RESOURCE
308
RESOURCE
310
RESOURCE
312
RESOURCE
314
BUS
106

FIG. 8

12 JUL 2006

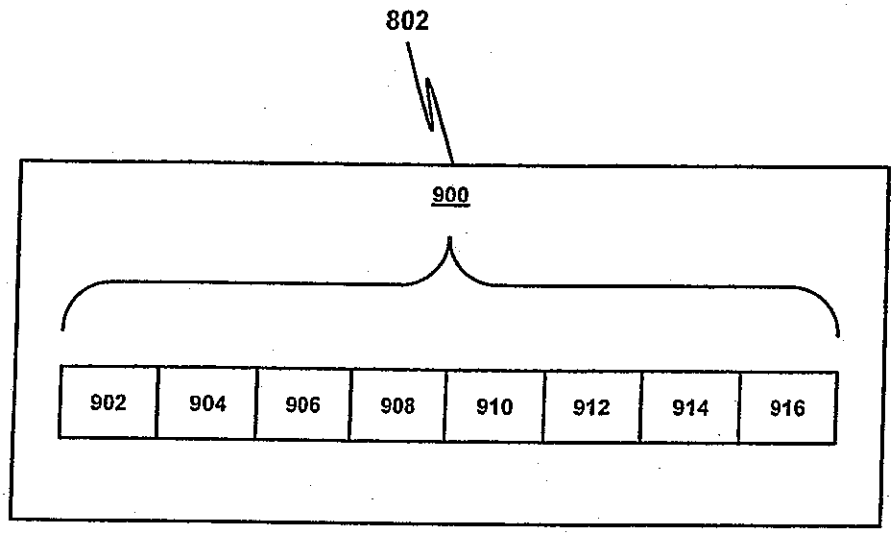


FIG. 9

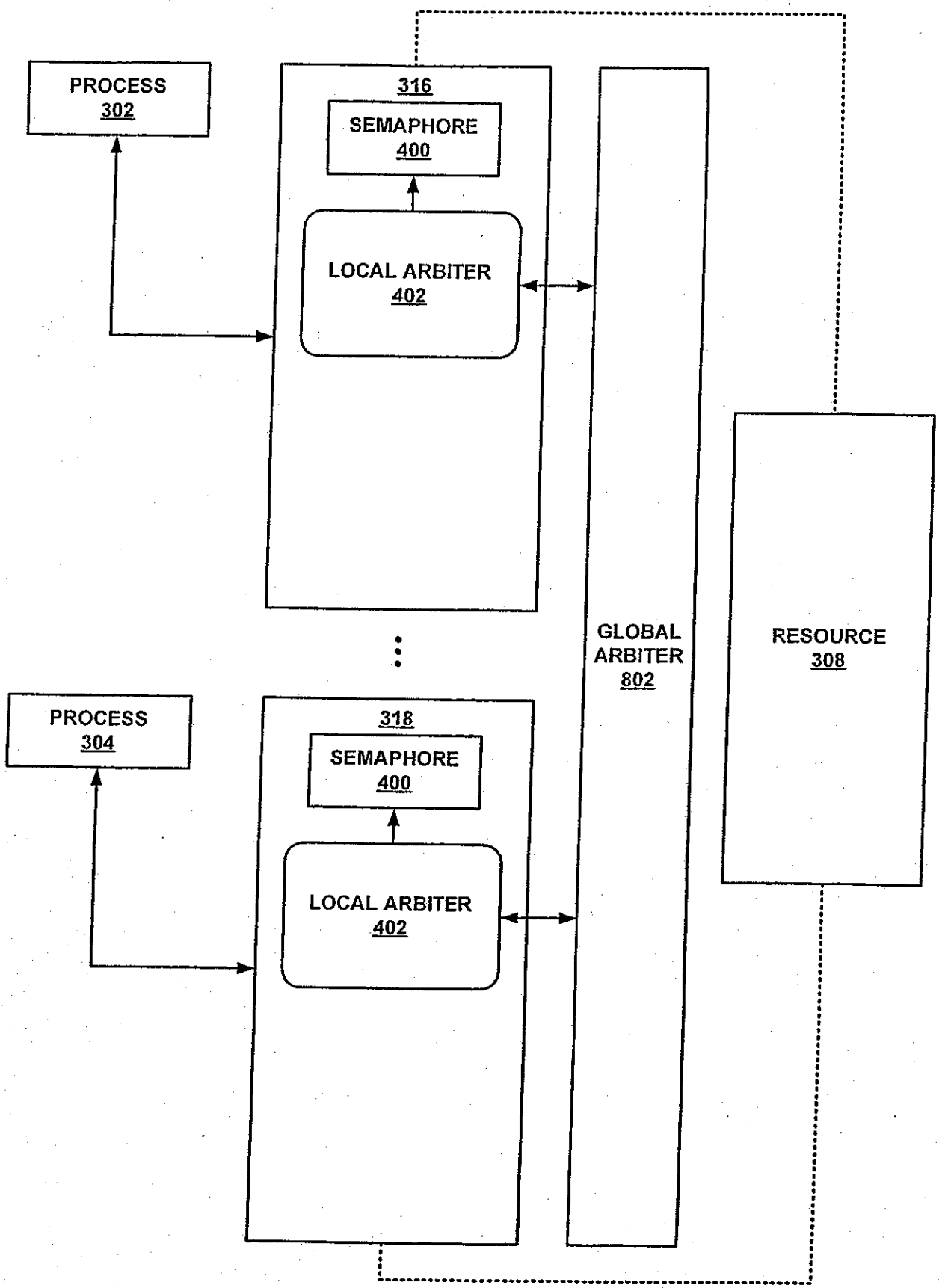

PROCESS
302
316
SEMAPHORE
400
LOCAL ARBITER
402
GLOBAL
ARBITER
802
RESOURCE
308
PROCESS
304
318
SEMAPHORE
400
LOCAL ARBITER
402

FIG. 10

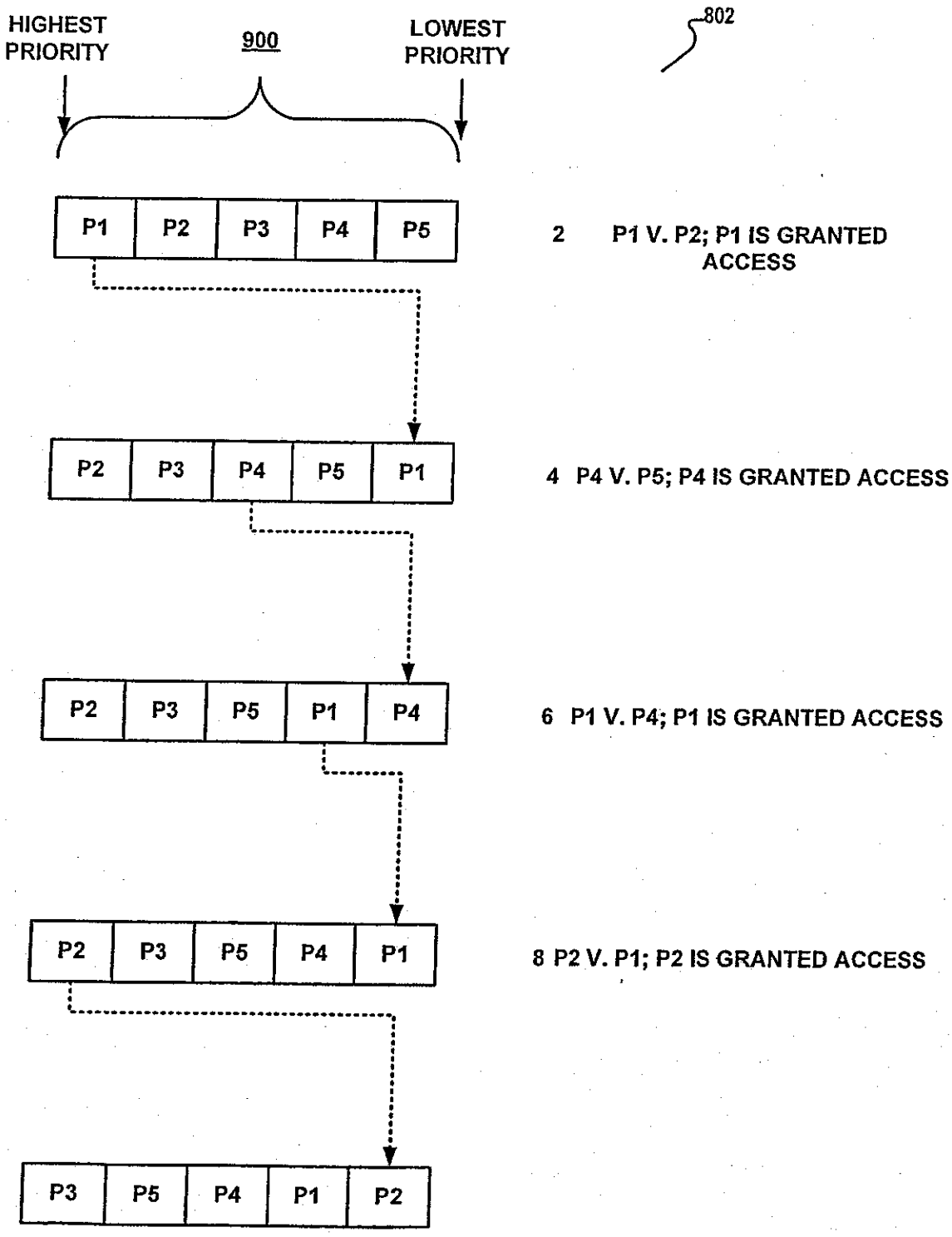

HIGHEST PRIORITY
900
LOWEST PRIORITY
802
1
P1 P2 P3 P4 P5
2 P1 V. P2; P1 IS GRANTED ACCESS
3
P2 P3 P4 P5 P1
4 P4 V. P5; P4 IS GRANTED ACCESS
5
P2 P3 P5 P1 P4
6 P1 V. P4; P1 IS GRANTED ACCESS
7
P2 P3 P5 P4 P1
8 P2 V. P1; P2 IS GRANTED ACCESS
9
P3 P5 P4 P1 P2

FIG. 11

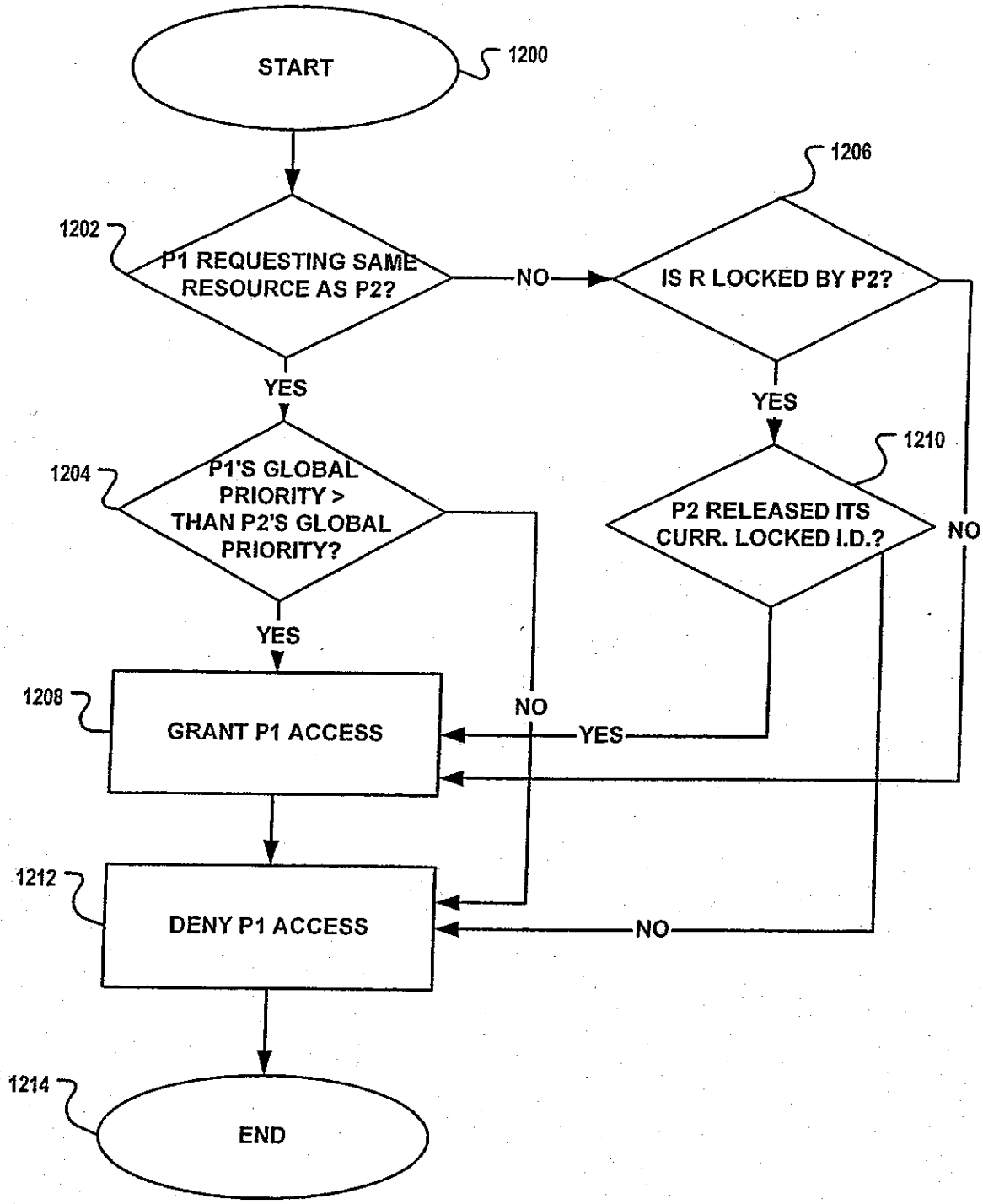

START
1200
1202
P1 REQUESTING SAME RESOURCE AS P2?
NO
1206
IS R LOCKED BY P2?
YES
YES
1204
P1'S GLOBAL PRIORITY > THAN P2'S GLOBAL PRIORITY?
1210
P2 RELEASED ITS CURR. LOCKED I.D.?
NO
YES
1208
GRANT P1 ACCESS
NO
YES
1212
DENY P1 ACCESS
NO
1214
END

FIG. 12

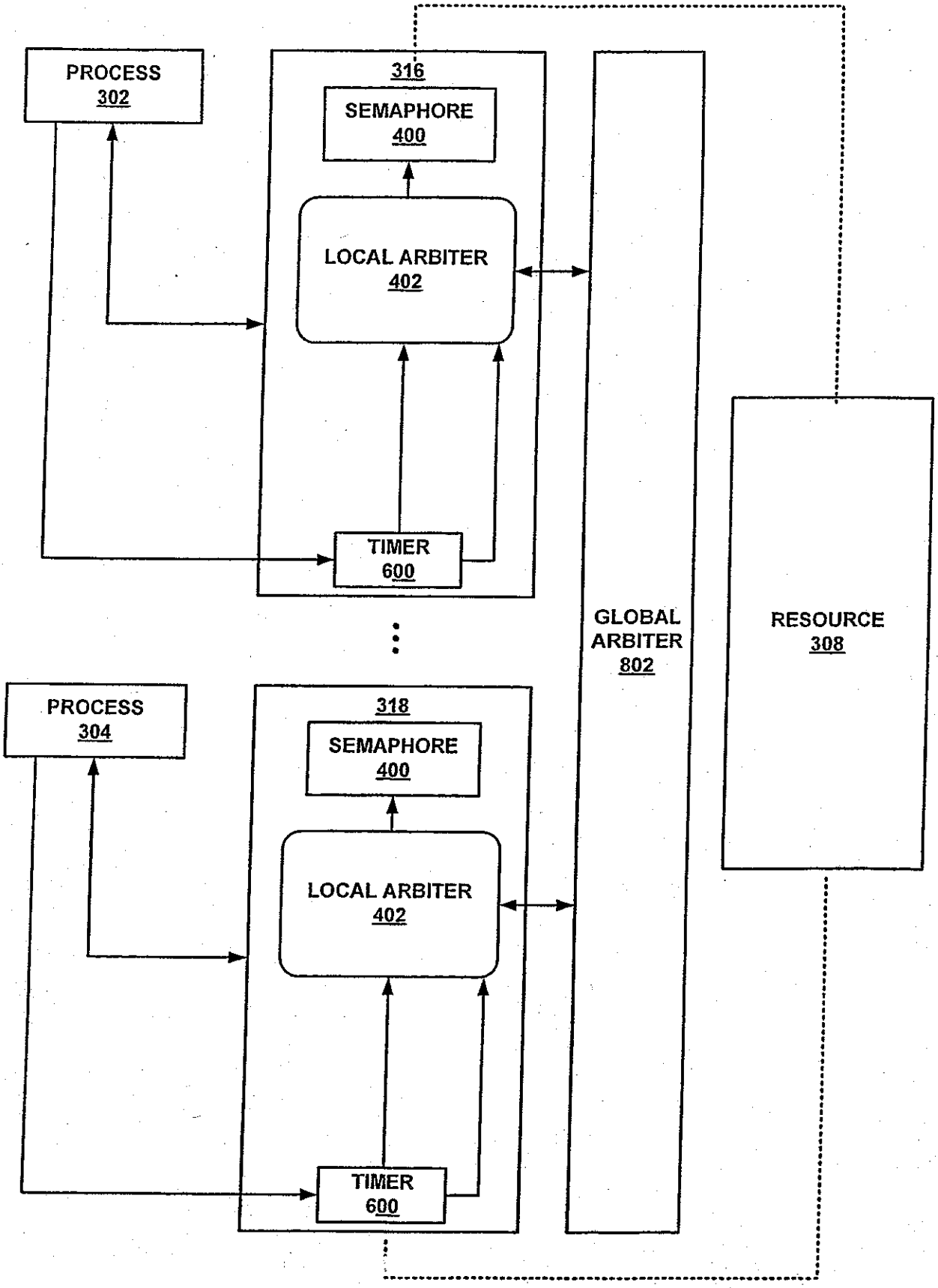

PROCESS
302
316
SEMAPHORE
400
LOCAL ARBITER
402
TIMER
600
GLOBAL
ARBITER
802
RESOURCE
308
PROCESS
304
318
SEMAPHORE
400
LOCAL ARBITER
402
TIMER
600

FIG. 13

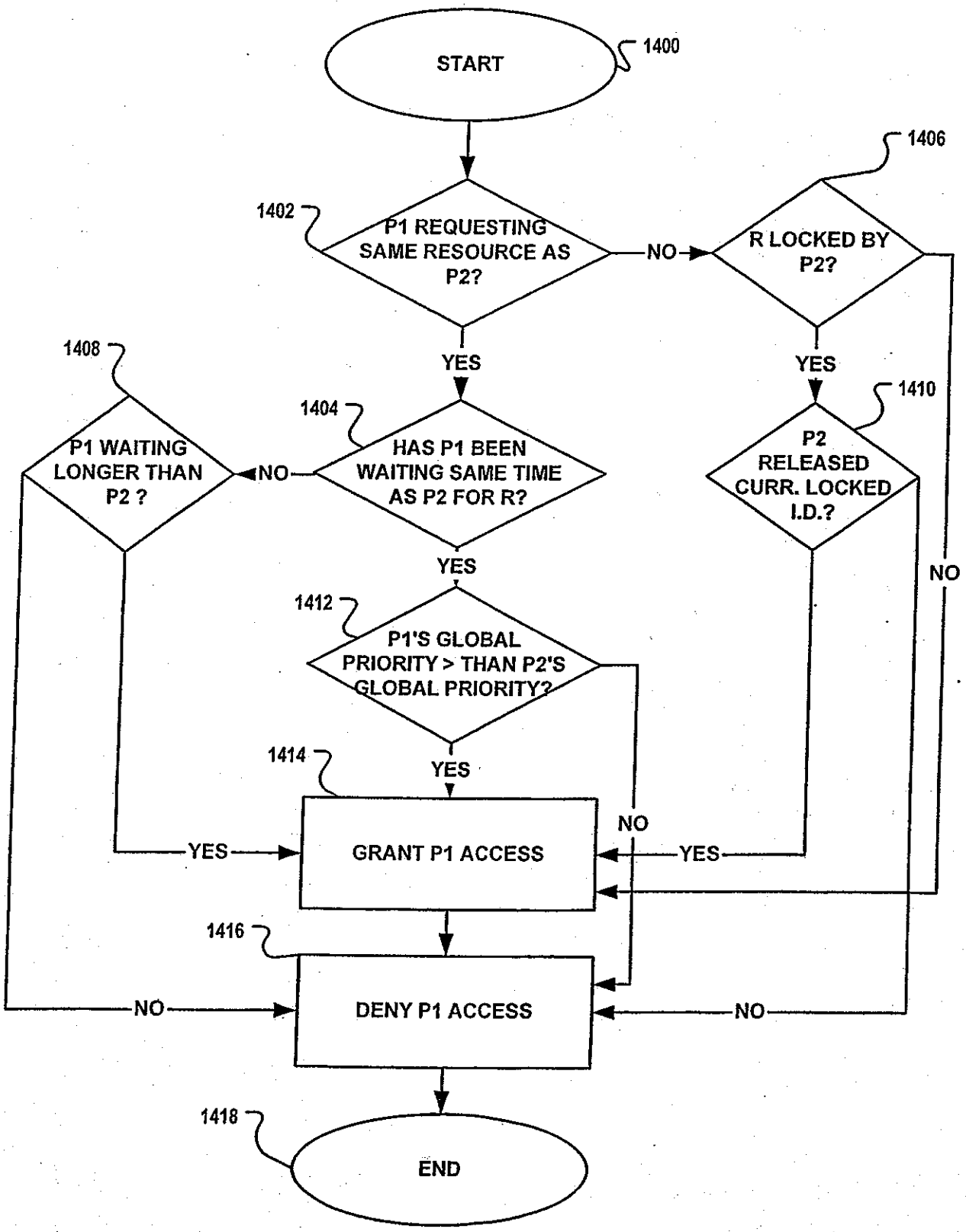

START
1400
1402
P1 REQUESTING SAME RESOURCE AS P2?
NO
1406
R LOCKED BY P2?
YES
YES
1408
P1 WAITING LONGER THAN P2 ?
1404
HAS P1 BEEN WAITING SAME TIME AS P2 FOR R?
1410
P2 RELEASED CURR. LOCKED I.D.?
NO
NO
YES
1412
P1'S GLOBAL PRIORITY > THAN P2'S GLOBAL PRIORITY?
1414
YES
NO
YES
GRANT P1 ACCESS
YES
1416
NO
DENY P1 ACCESS
NO
1418
END

FIG. 14

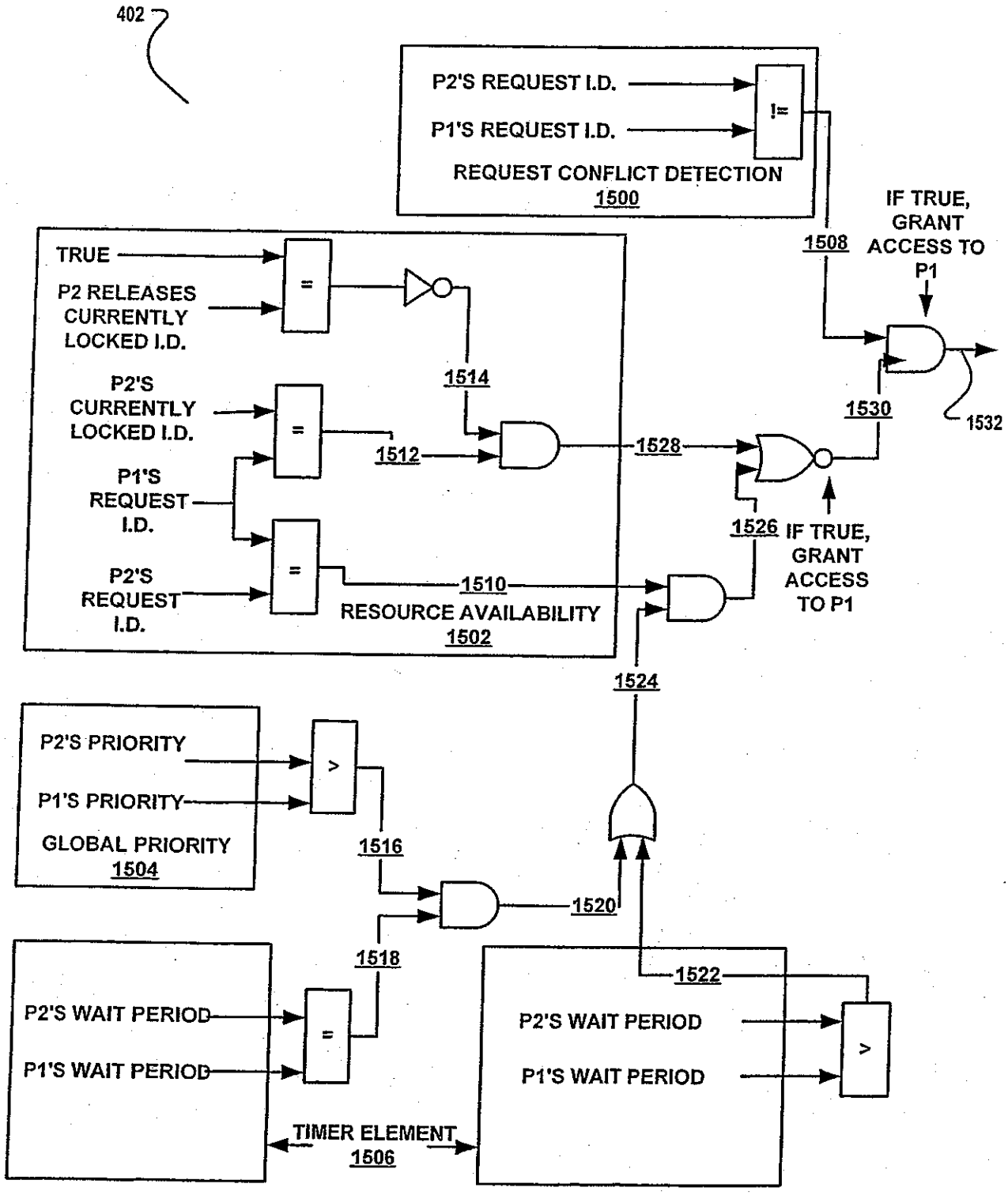

402
P2'S REQUEST I.D.
P1'S REQUEST I.D.
!=
REQUEST CONFLICT DETECTION
1500
IF TRUE, GRANT ACCESS TO P1
1508
TRUE
P2 RELEASES CURRENTLY LOCKED I.D.
=
1514
P2'S CURRENTLY LOCKED I.D.
=
1512
1528
1530
1532
P1'S REQUEST I.D.
P2'S REQUEST I.D.
=
1510
RESOURCE AVAILABILITY
1502
1526
IF TRUE, GRANT ACCESS TO P1
1524
P2'S PRIORITY
P1'S PRIORITY
GLOBAL PRIORITY
1504
>
1516
1520
1518
1522
P2'S WAIT PERIOD
P1'S WAIT PERIOD
=
P2'S WAIT PERIOD
P1'S WAIT PERIOD
>
TIMER ELEMENT
1506

FIG. 15