FIG. 1

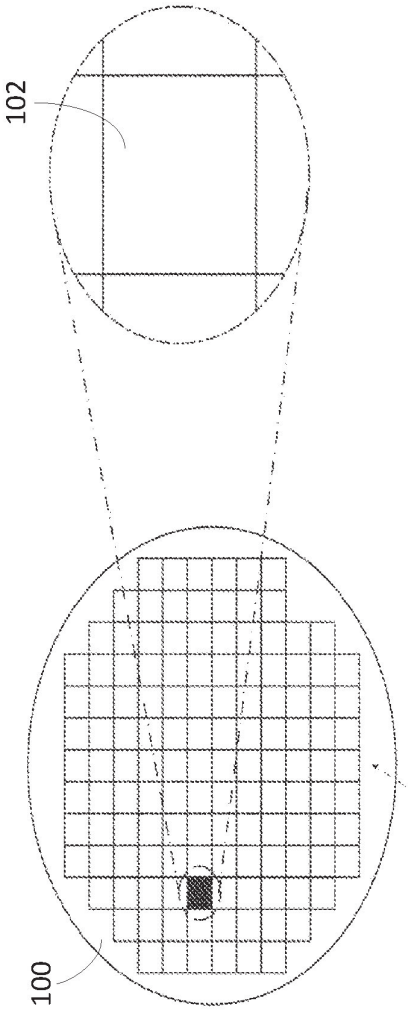


FIG. 2

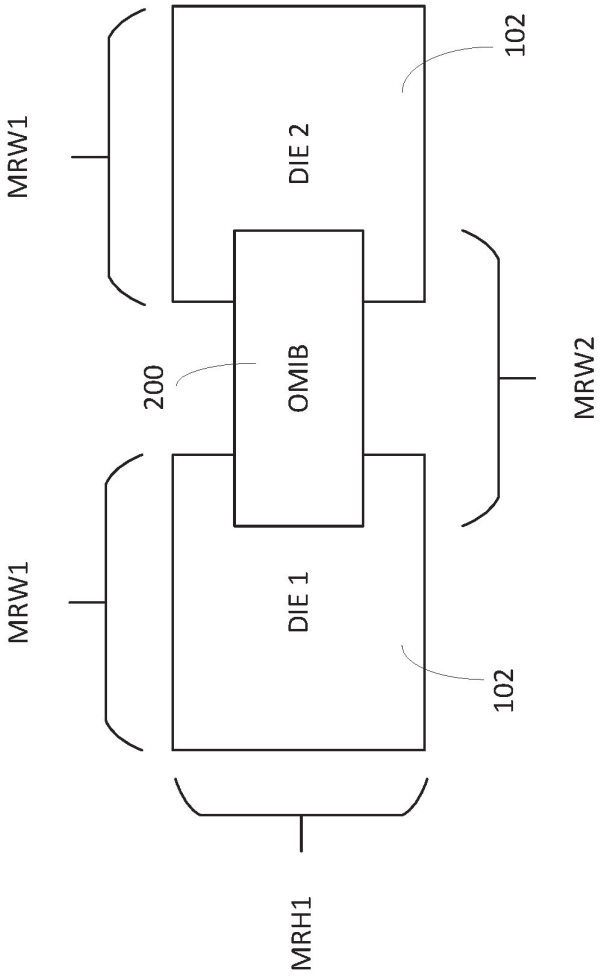


FIG. 3

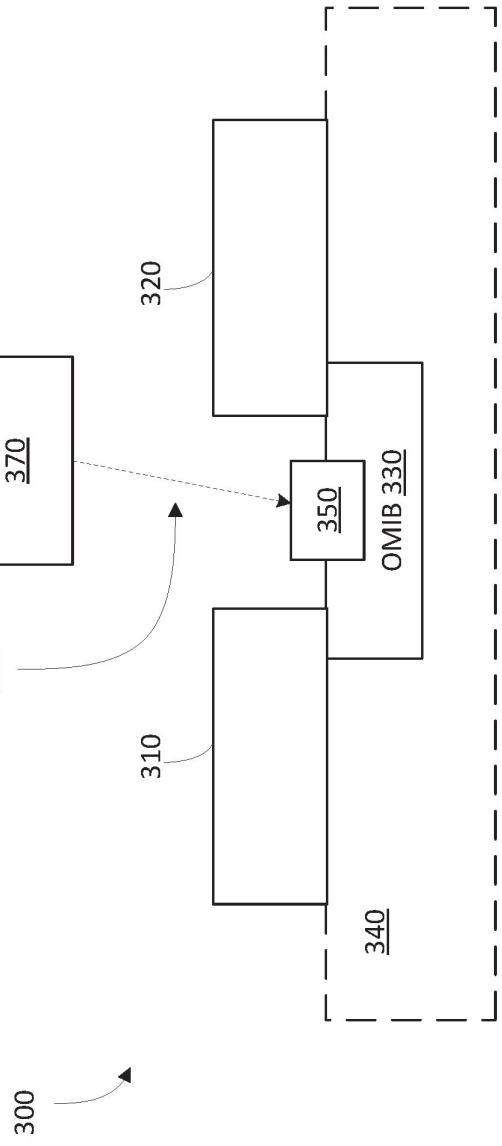


FIG. 4

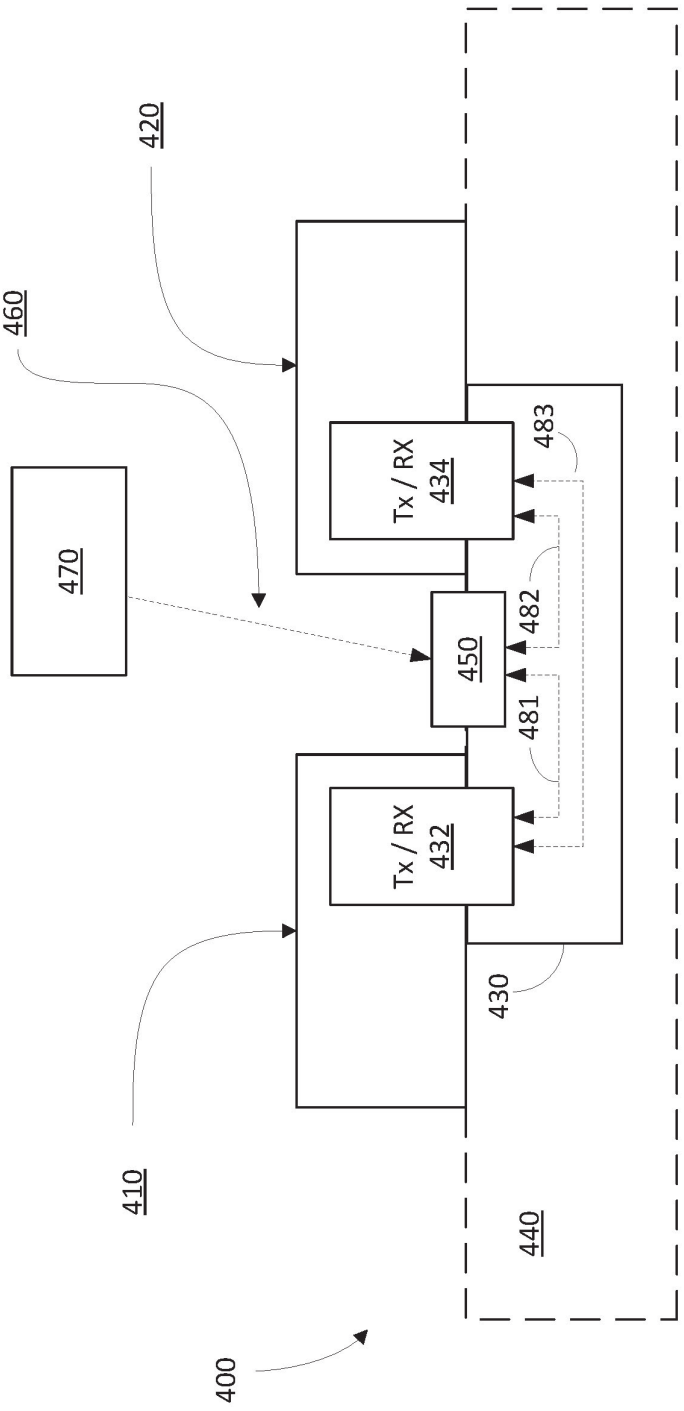


FIG. 5A
(INTRA-OMI

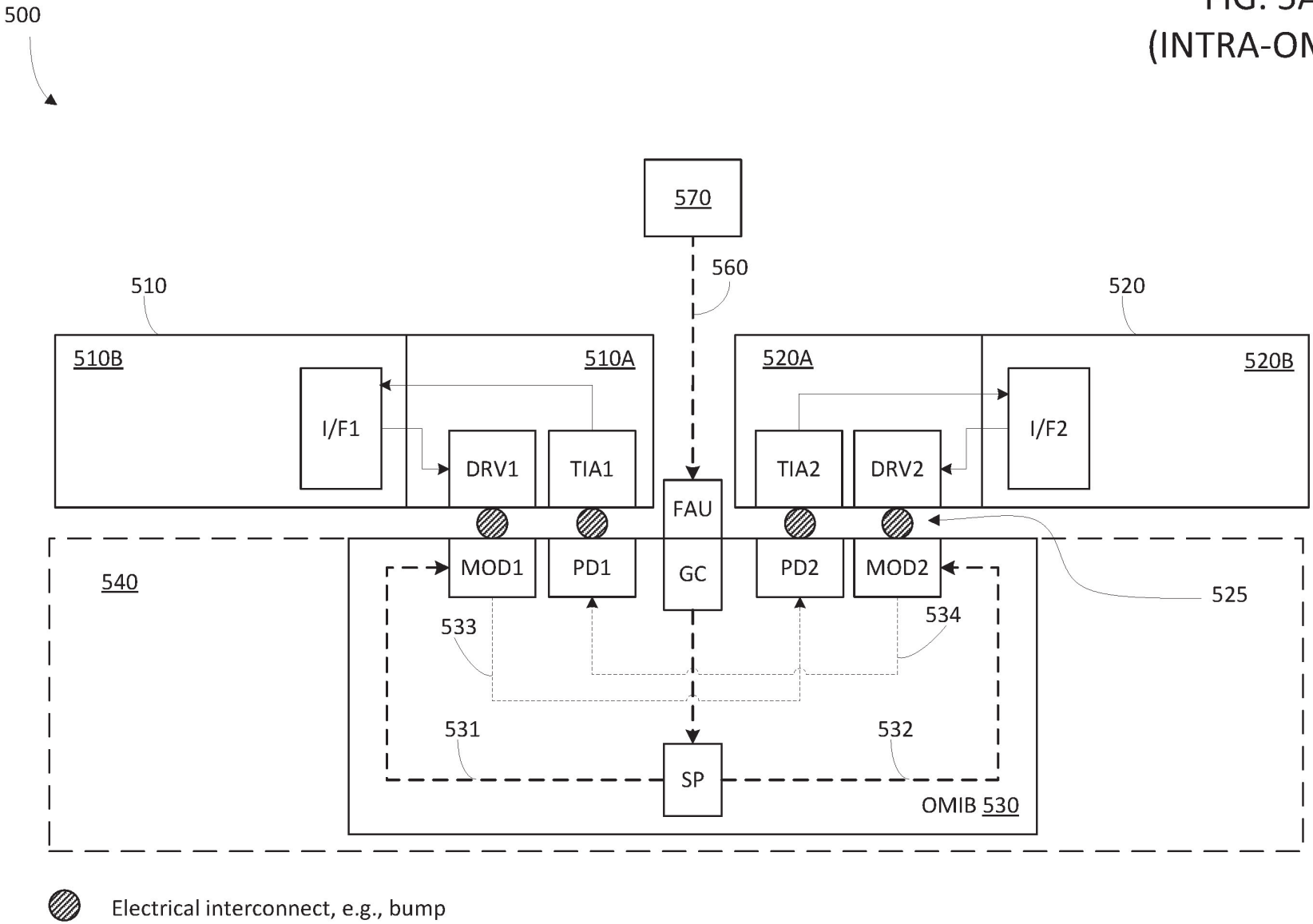


FIG. 5B
(INTRA-OMI

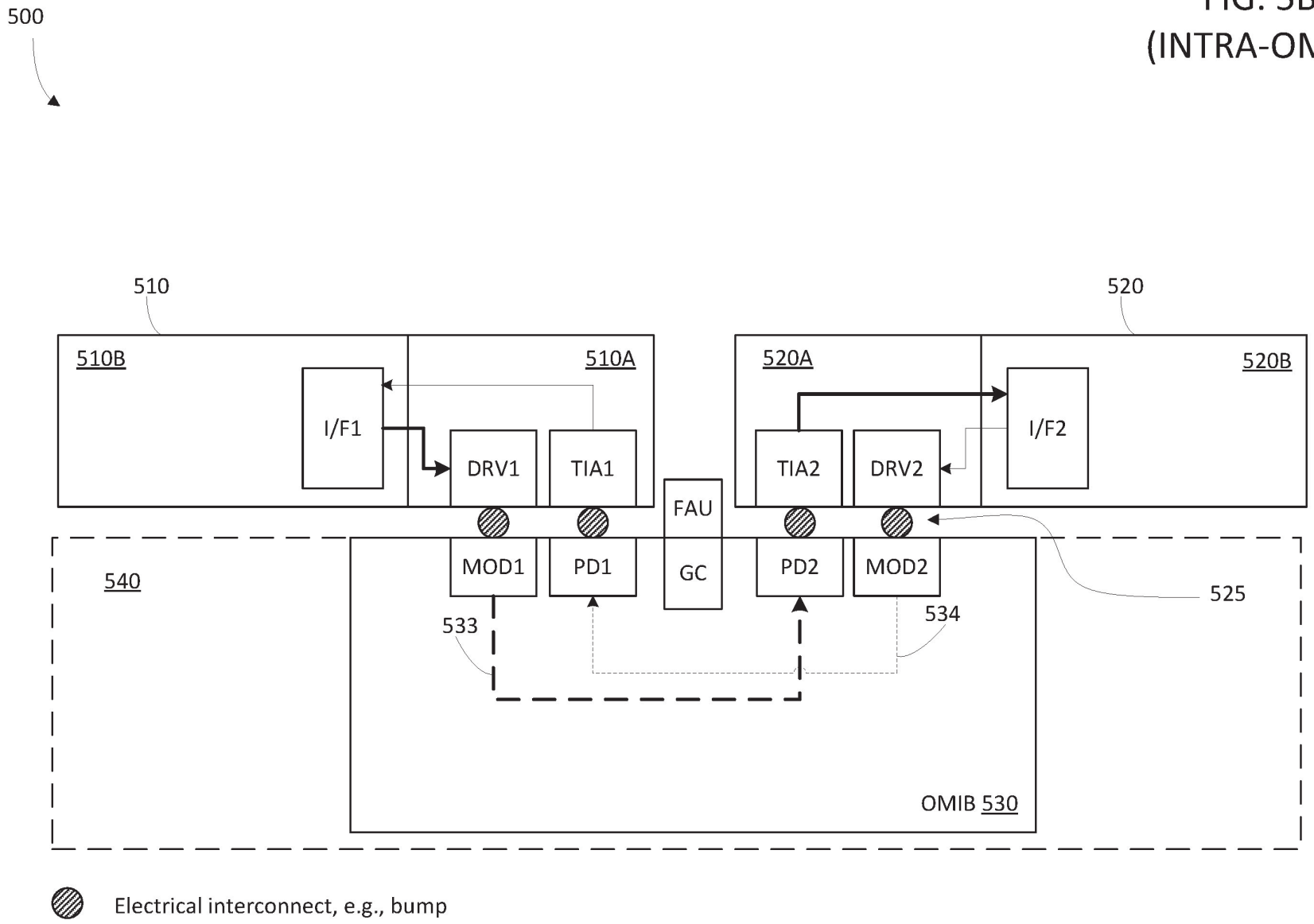


FIG. 5C
(INTER-OMI

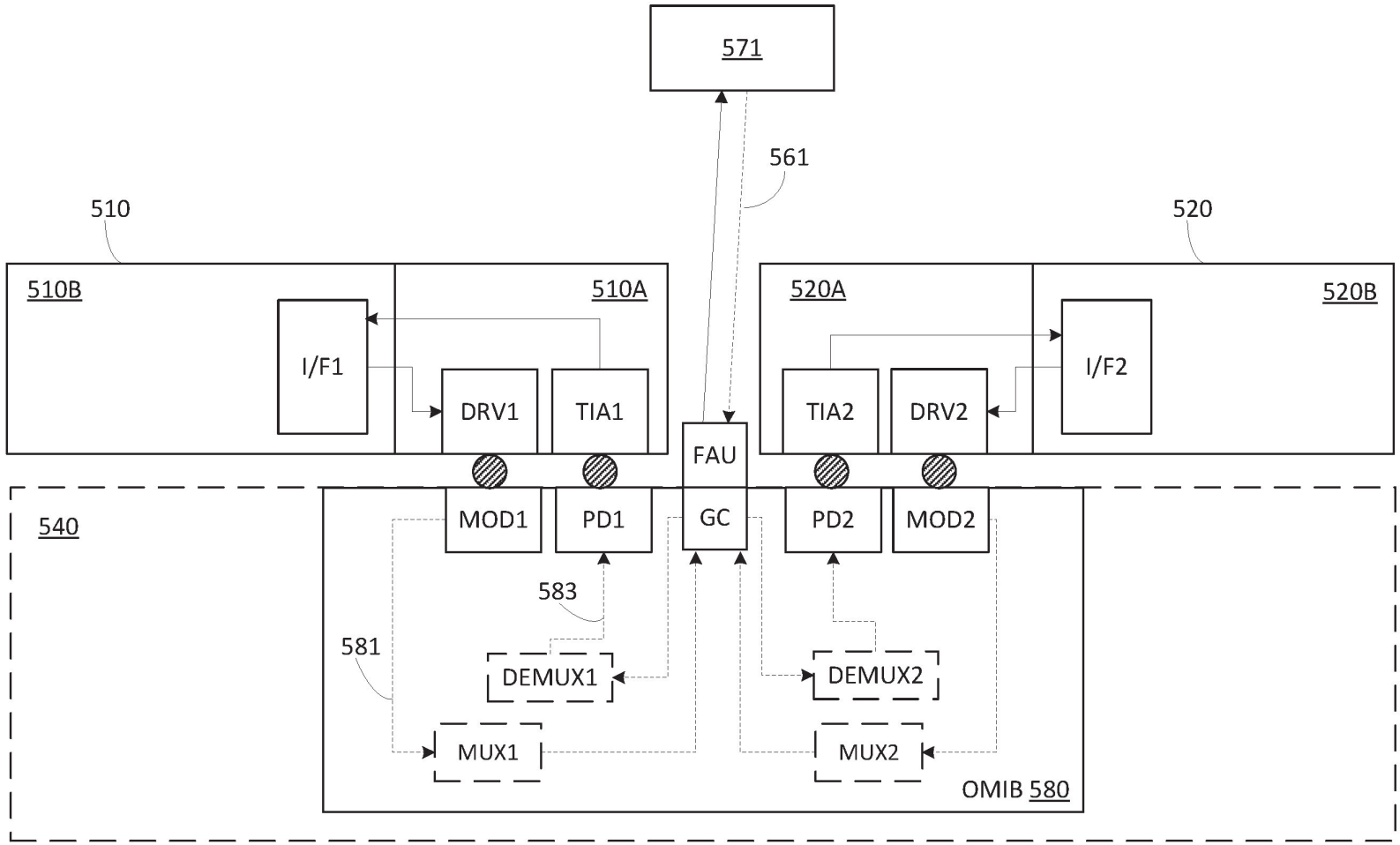


FIG. 5D

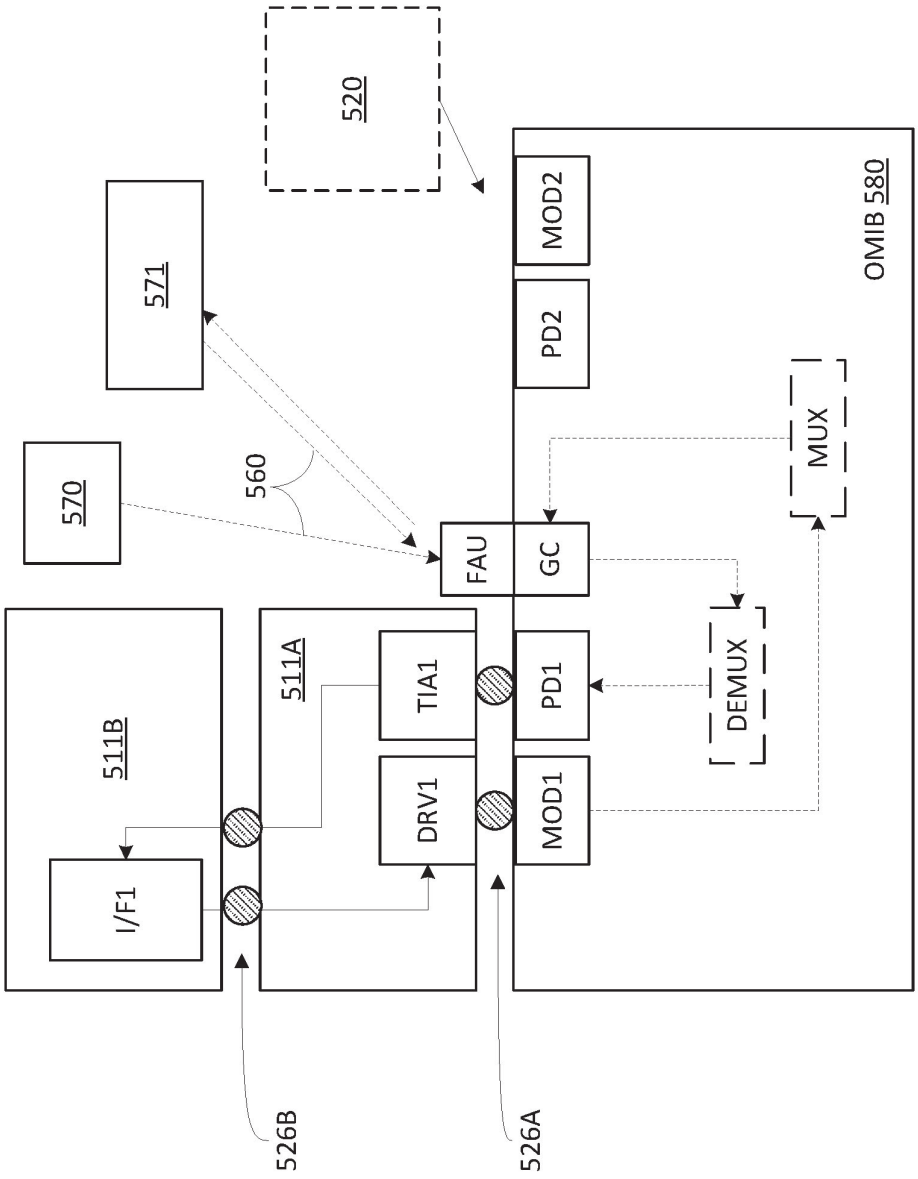

520
571
570
560
511B
511A
I/F1
TIA1
DRV1
FAU
GC
PD1
MOD1
PD2
MOD2
MUX
DEMUX
OMIB 580
526B
526A

FIG. 5E

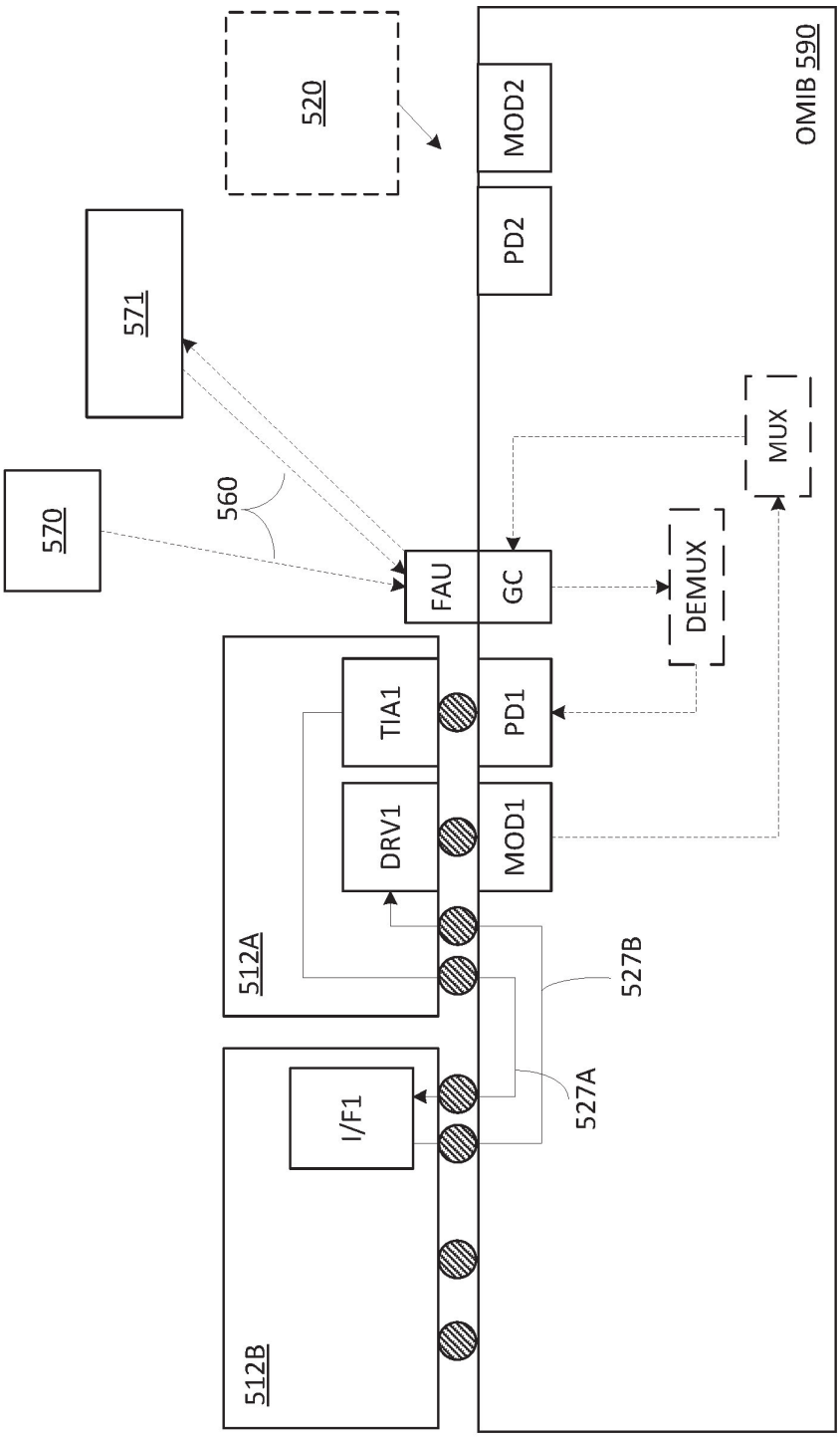

520
571
570
560
OMIB 590
MOD2
PD2
MUX
DEMUX
FAU
GC
TIA1
PD1
DRV1
MOD1
512A
527B
527A
I/F1
512B

FIG. 6

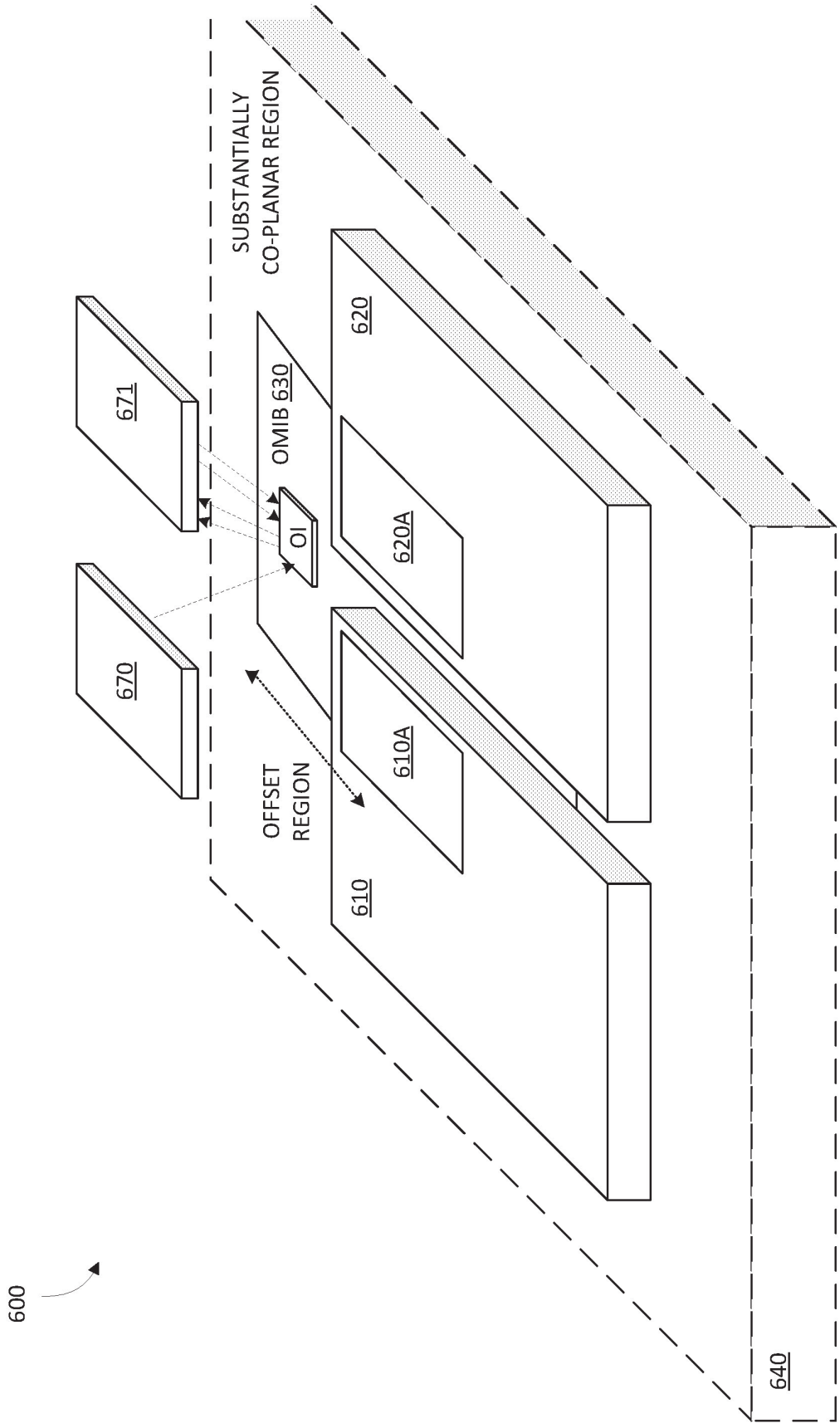

600
671
670
OMIB 630
OI
620
620A
610A
610
OFFSET REGION
SUBSTANTIALLY CO-PLANAR REGION
640

FIG. 7A

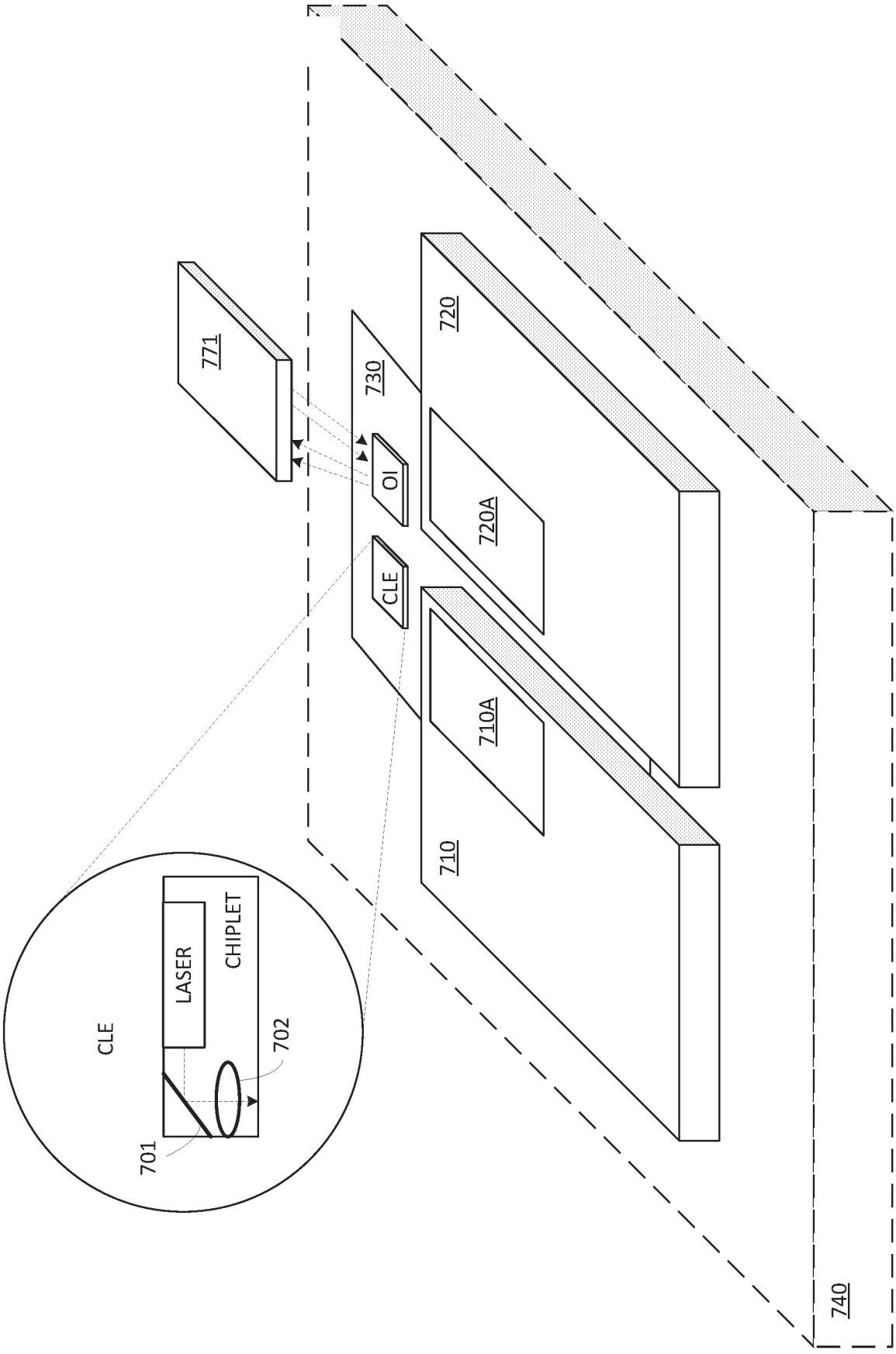


FIG. 7B

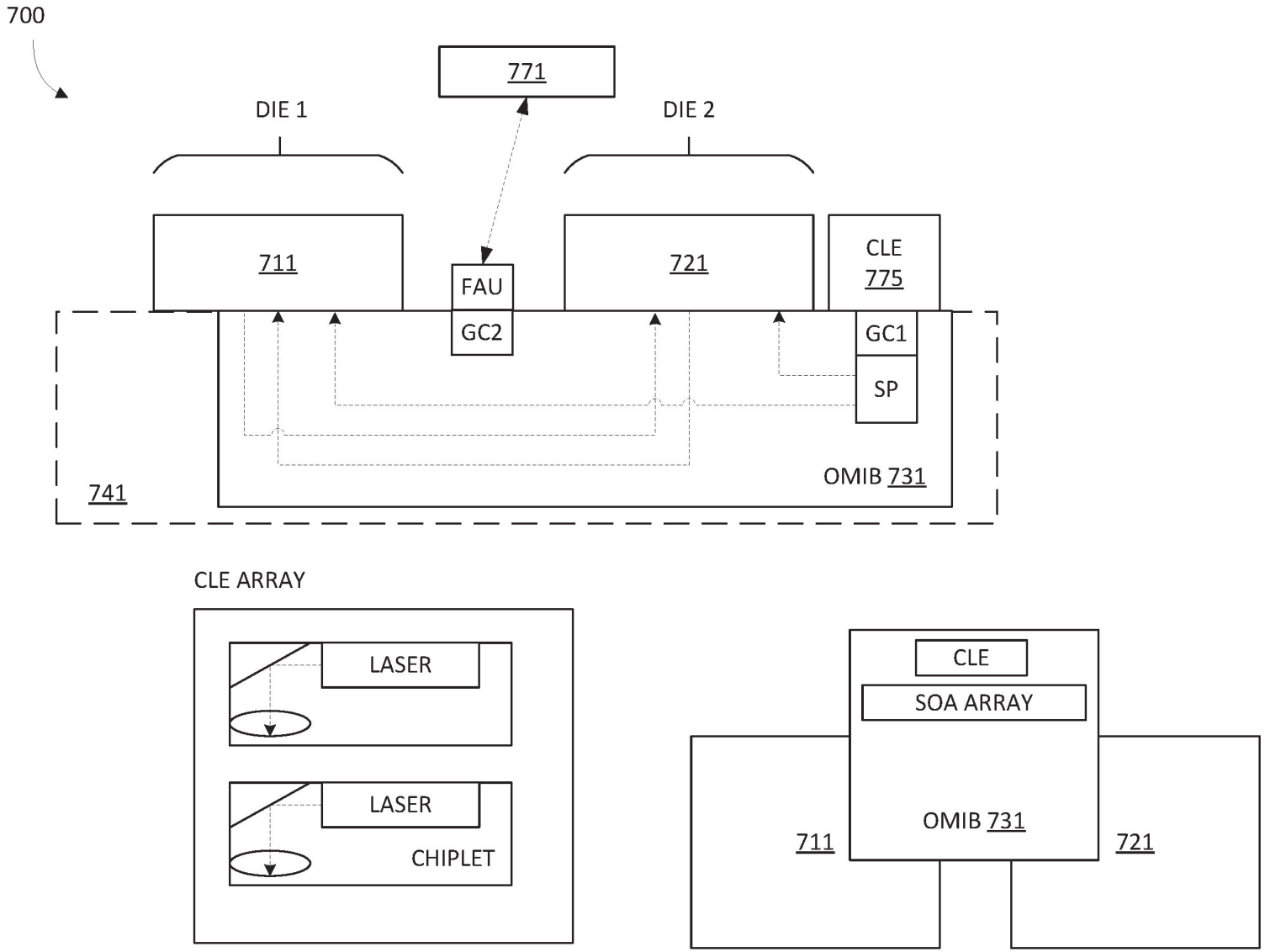

700
771
DIE 1
DIE 2
711
FAU
GC2
721
CLE
775
GC1
SP
OMIB 731
741
CLE ARRAY
LASER
LASER
CHIPLET
CLE
SOA ARRAY
711
OMIB 731
721

FIG. 8A

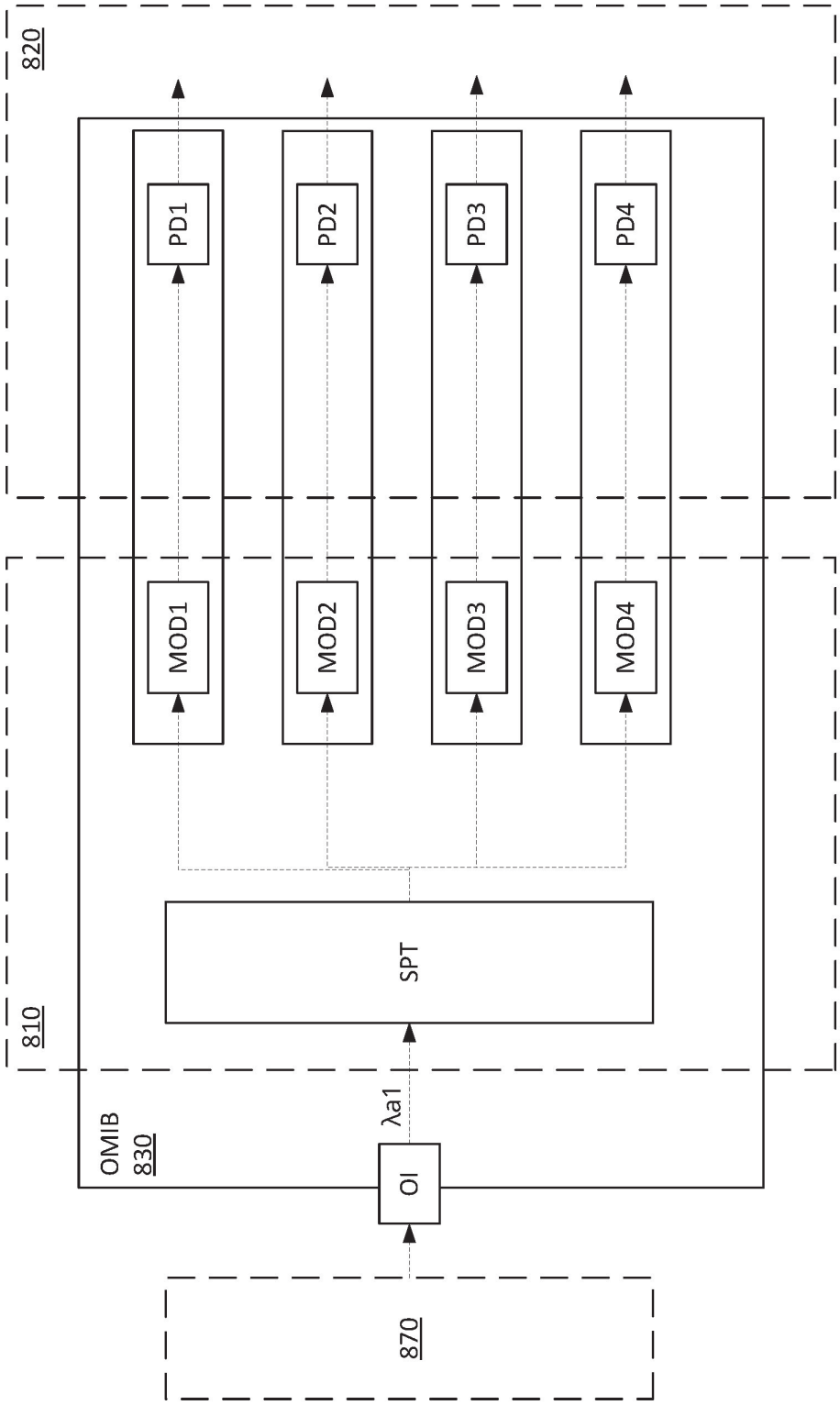

820
PD1
PD2
PD3
PD4
MOD1
MOD2
MOD3
MOD4
SPT
810
λa1
OMIB
830
OI
870

FIG. 8B

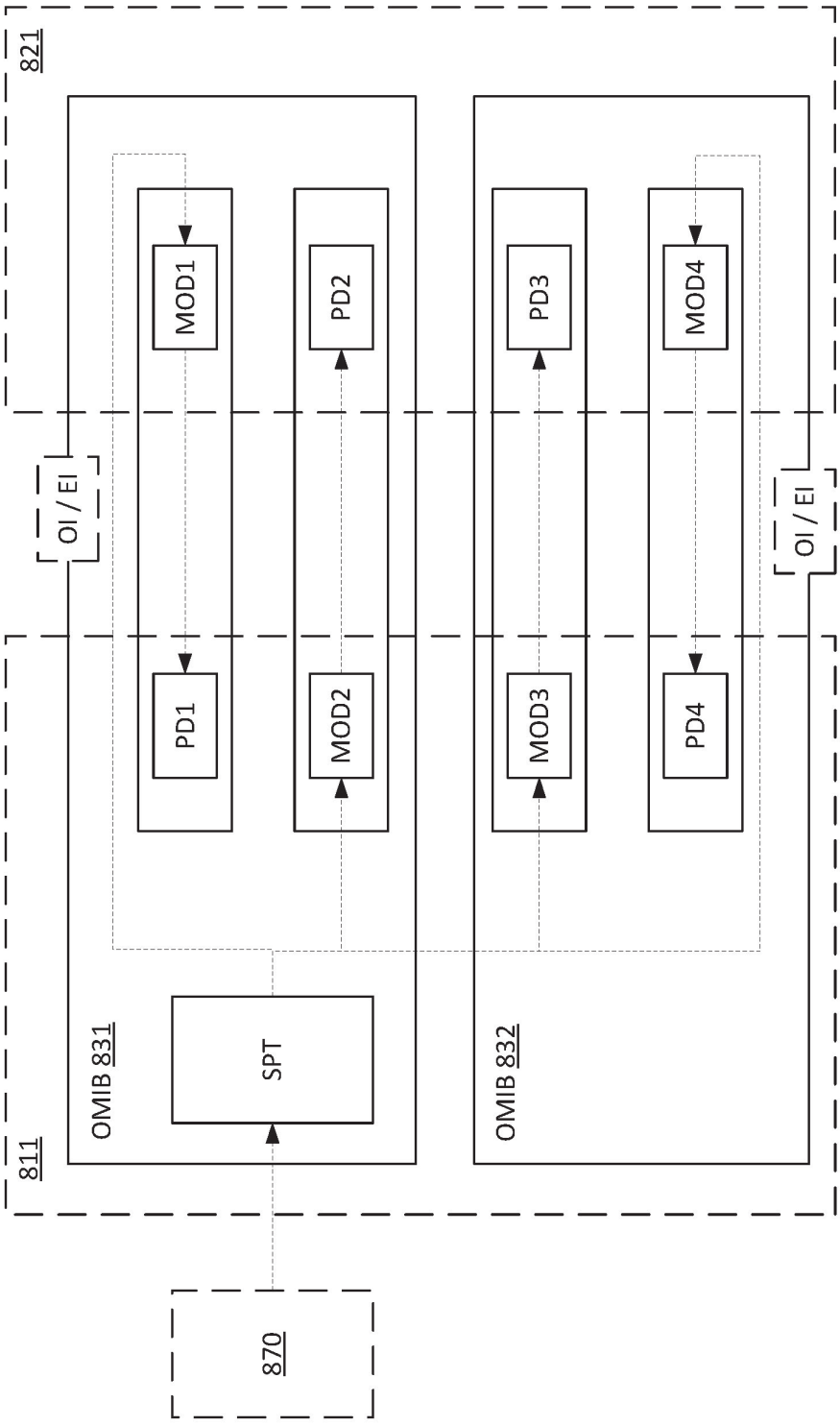

821
MOD1
PD2
PD3
MOD4
OI / EI
OI / EI
PD1
MOD2
MOD3
PD4
OMIB 831
SPT
OMIB 832
811
870

FIG. 9

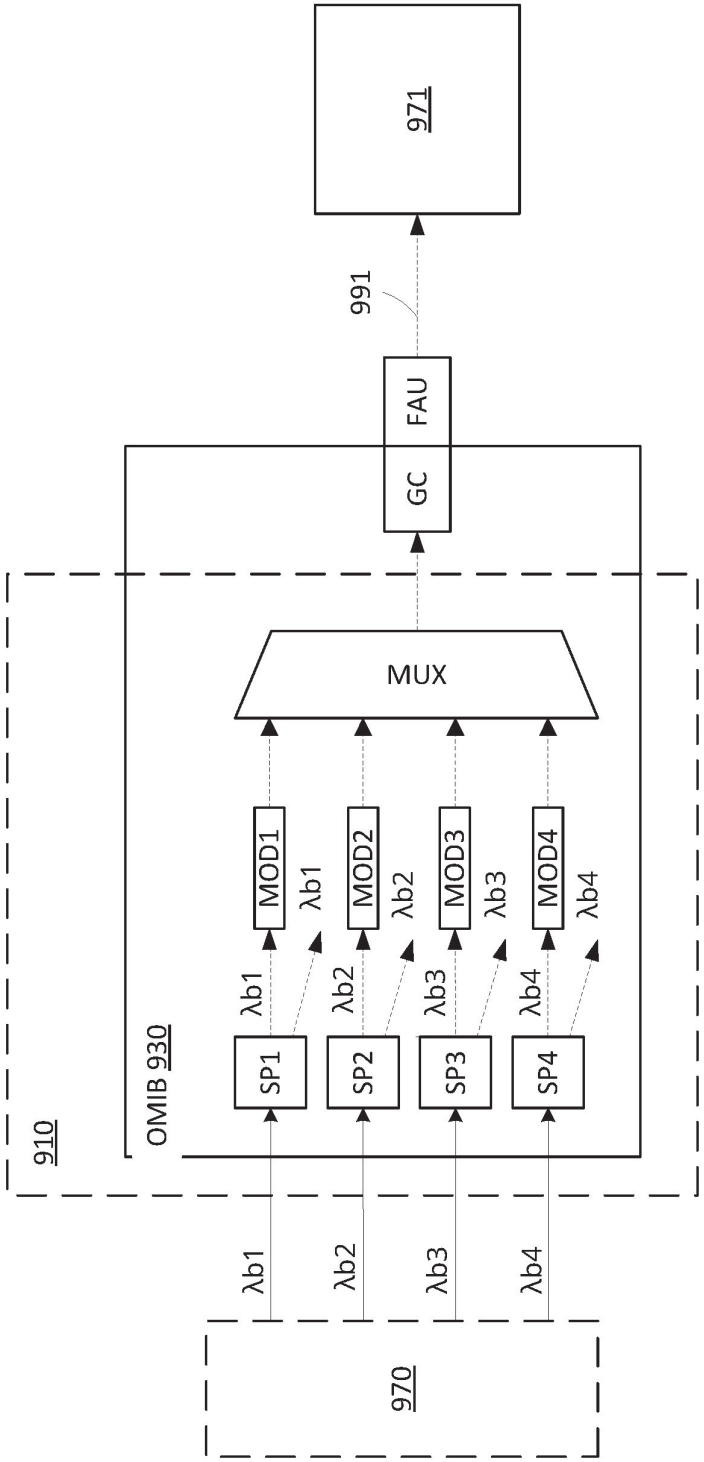

971
991
FAU
GC
MUX
MOD1
MOD2
MOD3
MOD4
λb1
λb2
λb3
λb4
SP1
SP2
SP3
SP4
OMIB 930
910
970

FIG. 10

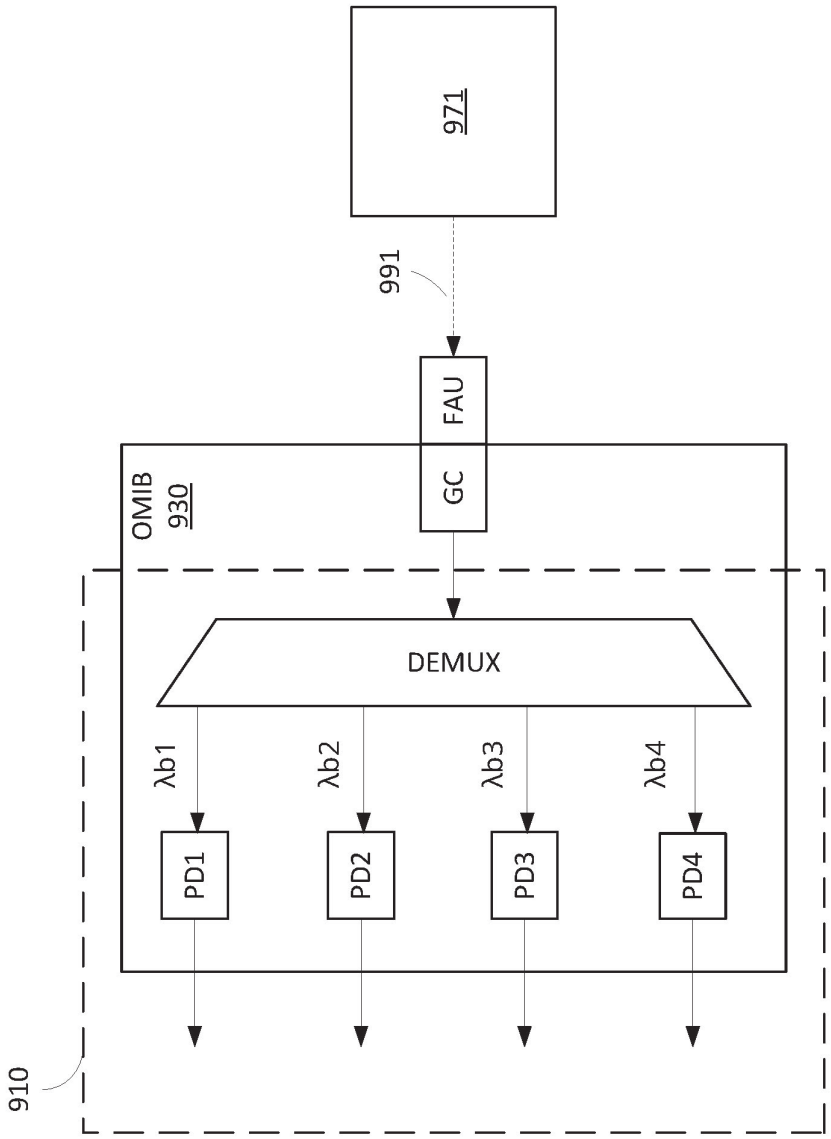

971
991
FAU
GC
OMIB
930
DEMUX
λb1
λb2
λb3
λb4
PD1
PD2
PD3
PD4
910

FIG. 11

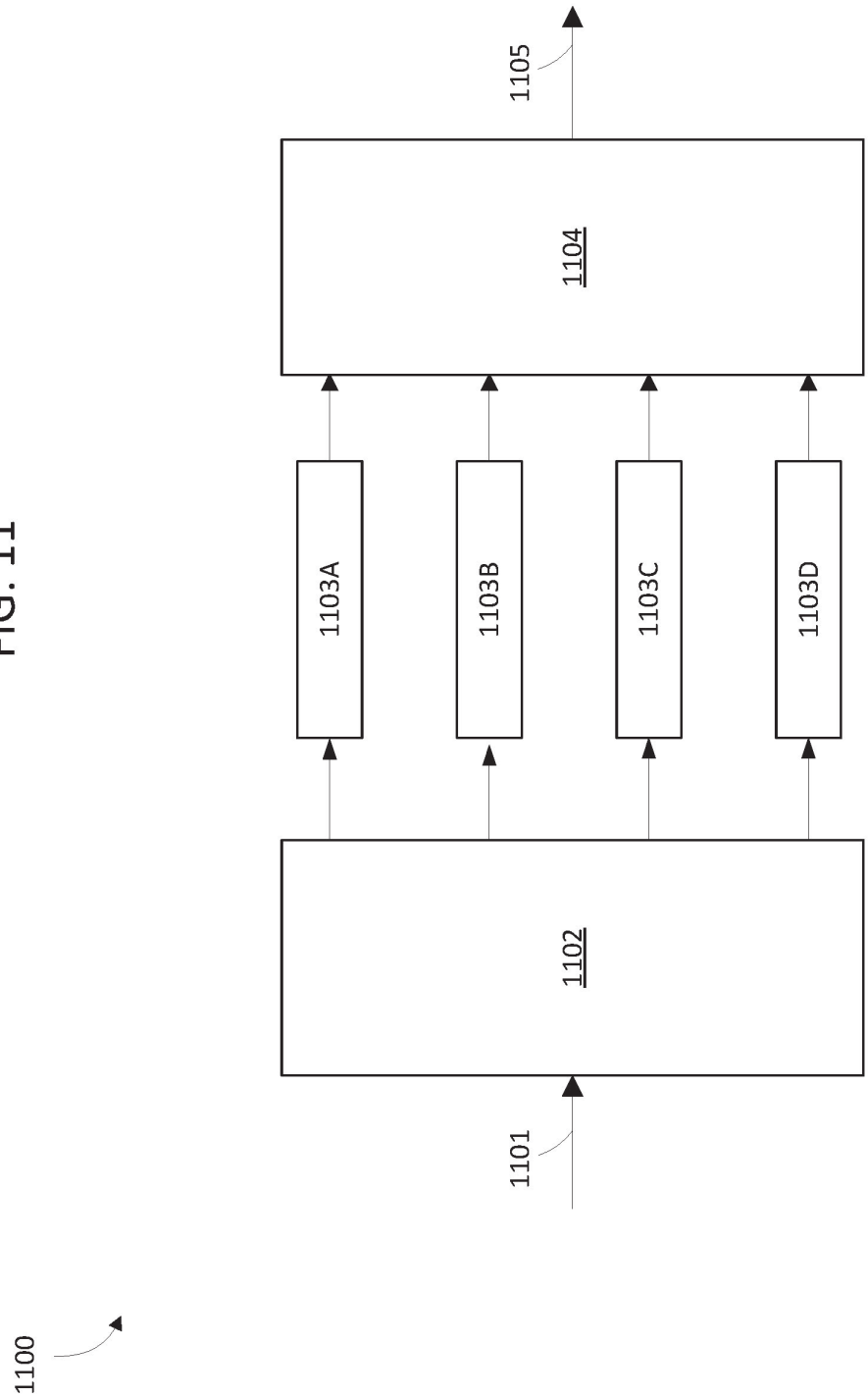


FIG. 12

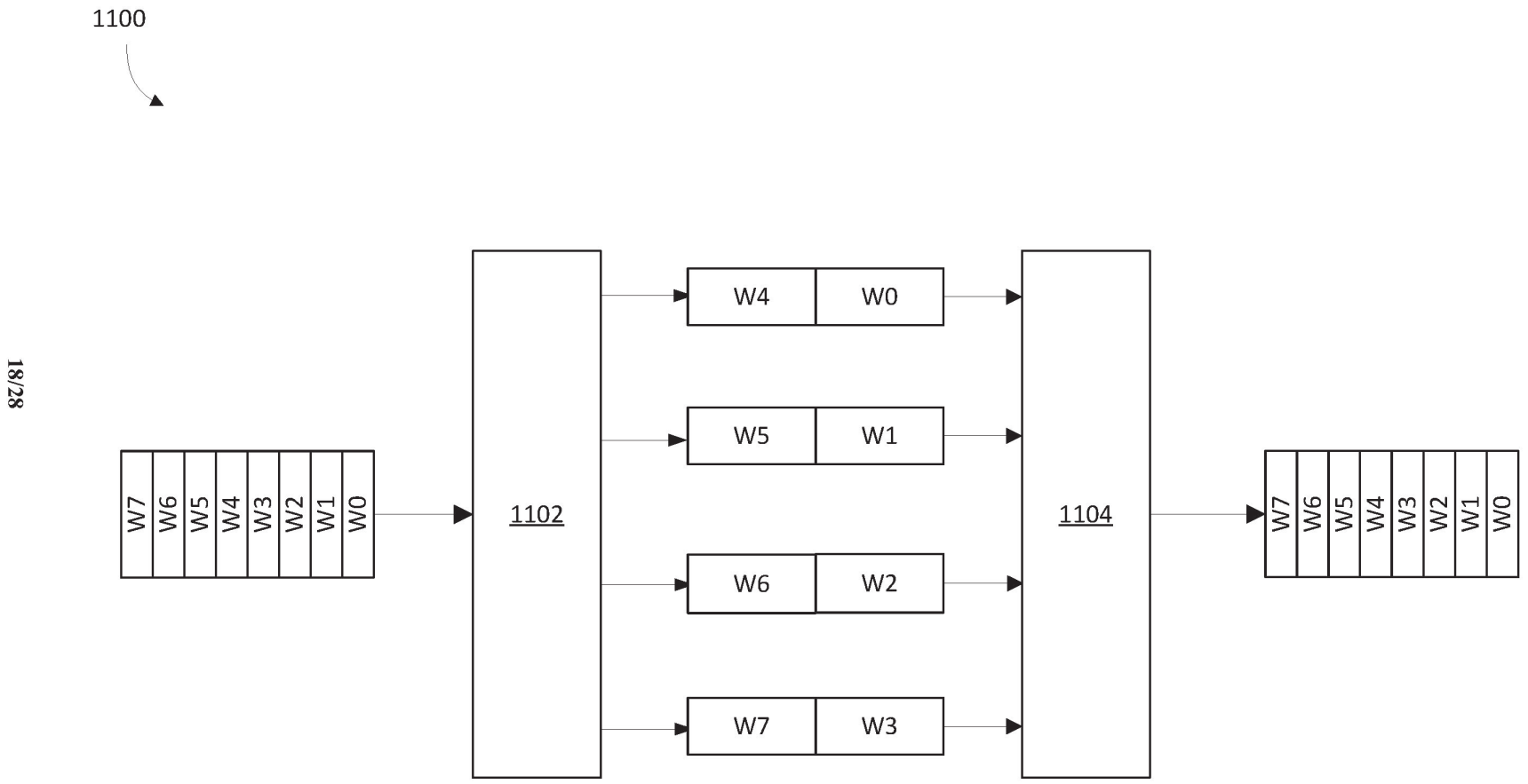

1100
W7
W6
W5
W4
W3
W2
W1
W0
1102
W4
W0
W5
W1
W6
W2
W7
W3
1104
W7
W6
W5
W4
W3
W2
W1
W0

FIG. 13

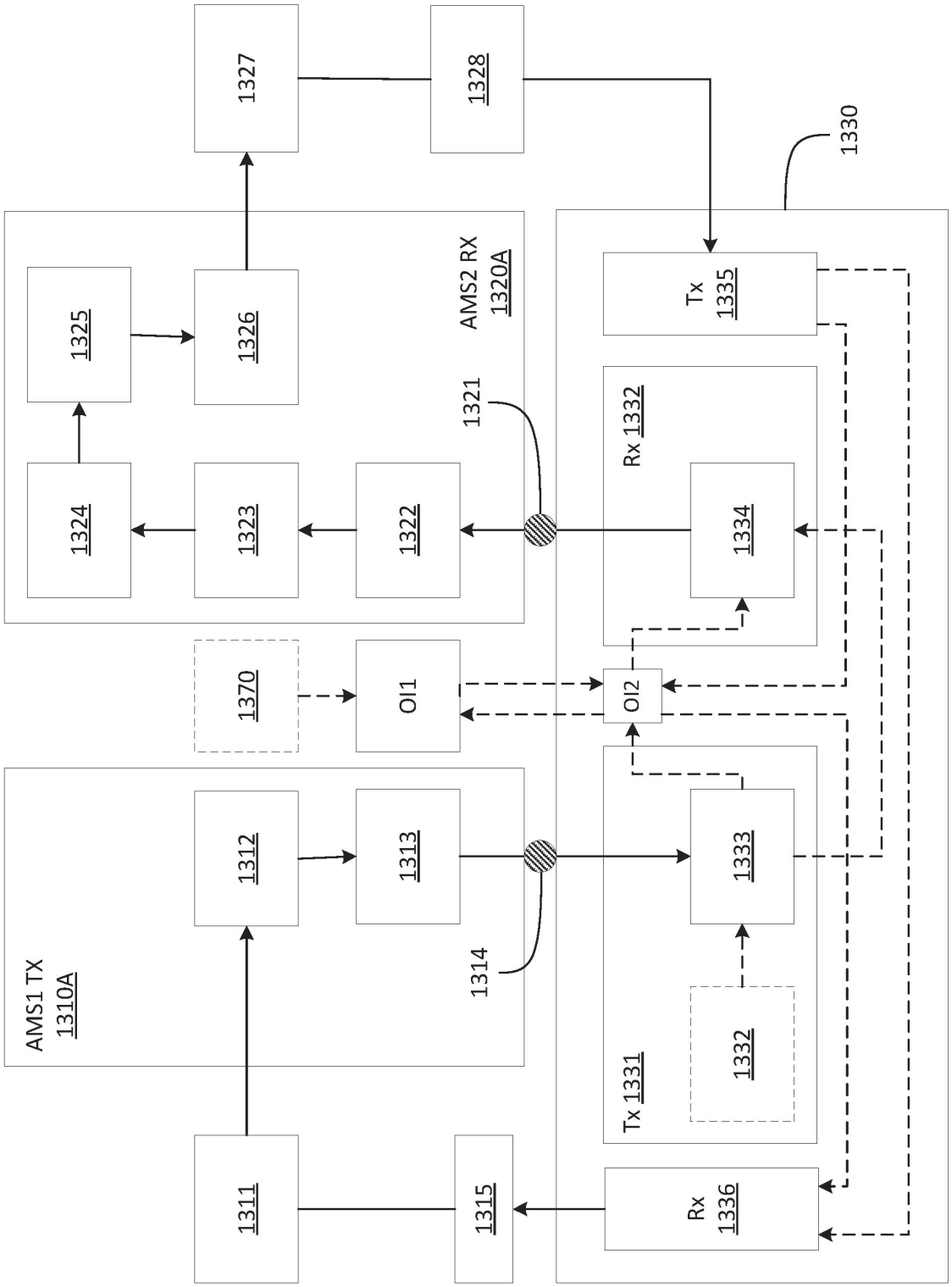

1327
1328
1330
AMS2 RX
1320A
1325
1326
1321
Tx
1335
Rx 1332
1324
1323
1322
1334
1370
OI1
OI2
AMS1 TX
1310A
1312
1313
1333
1314
1332
Tx 1331
1311
1315
Rx
1336

FIG. 14A

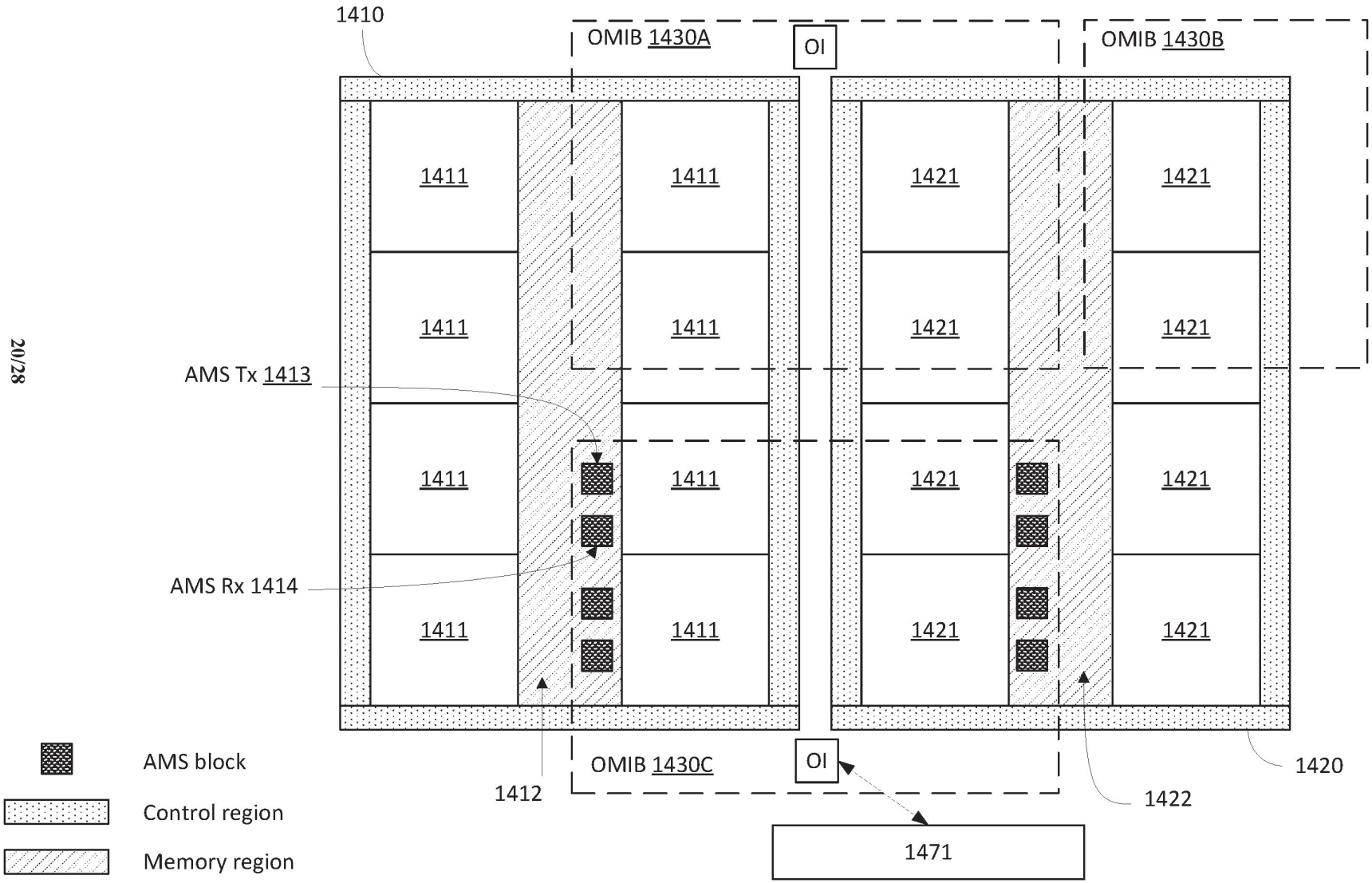

1410
OMIB 1430A
OI
OMIB 1430B
1411
1421
AMS Tx 1413
AMS Rx 1414
OMIB 1430C
OI
1412
1420
1422
1471
AMS block
Control region
Memory region

FIG. 14B

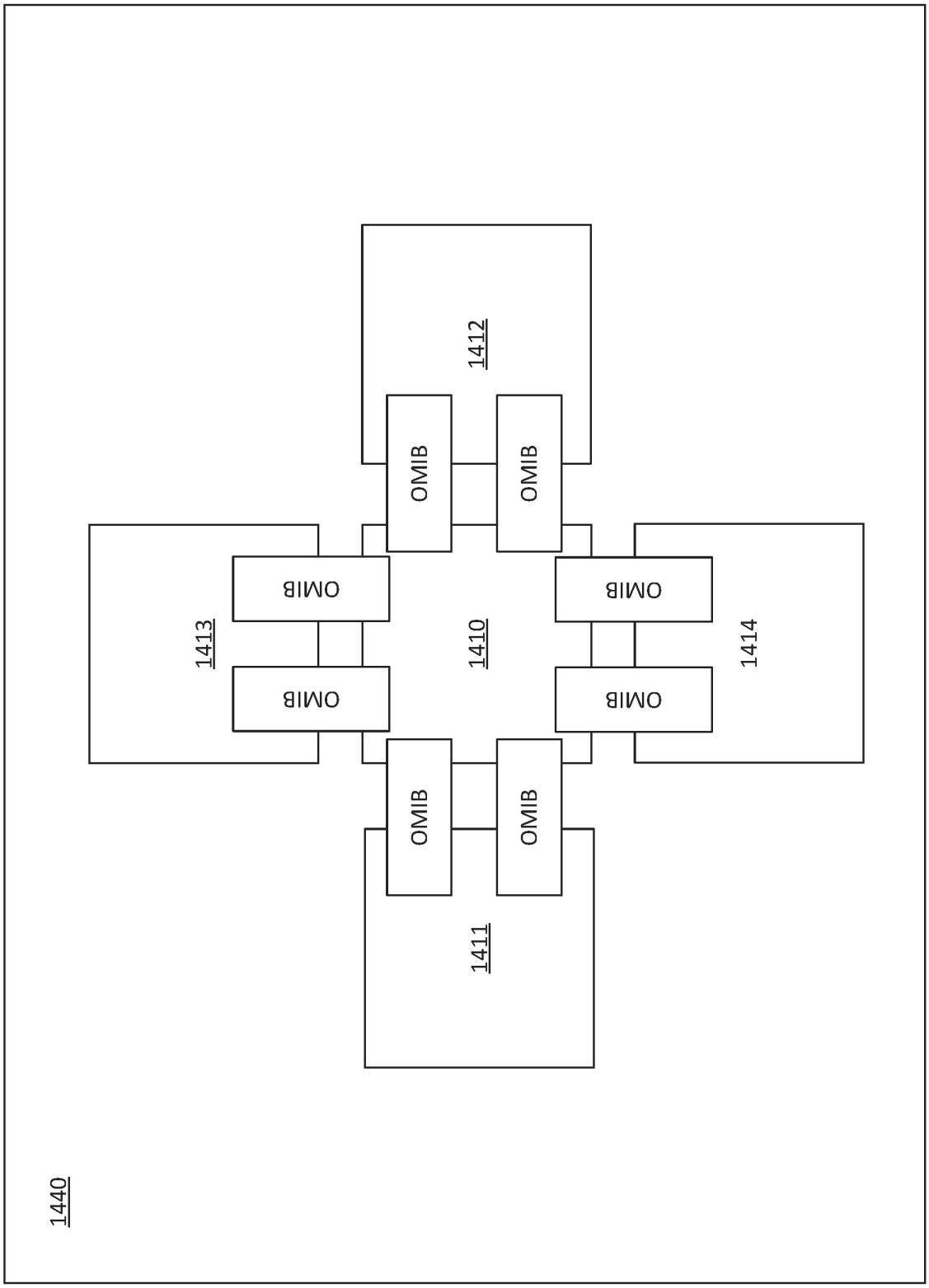


FIG. 14C

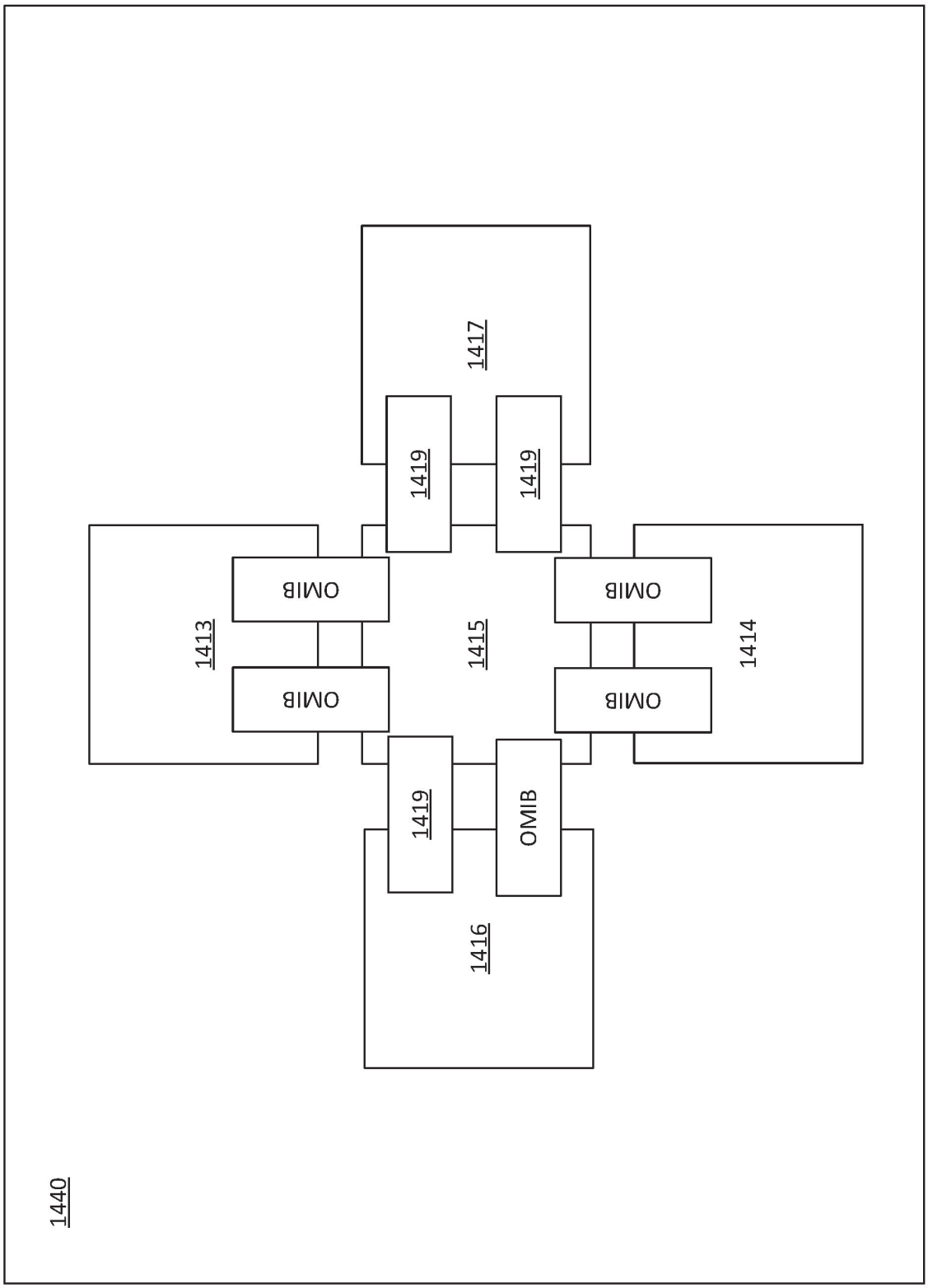
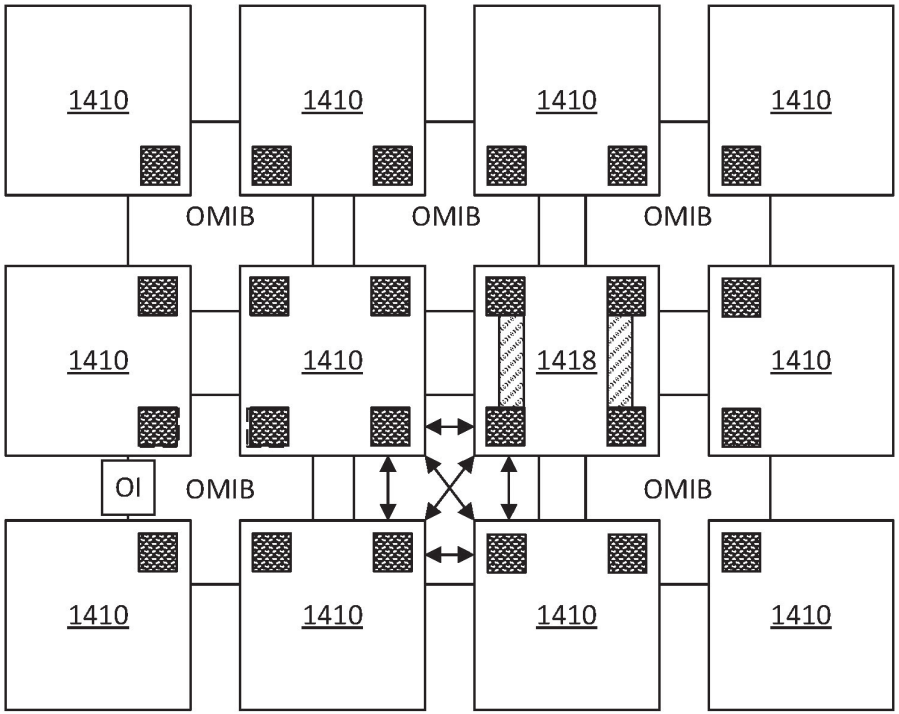

1440
1413
1414
1415
1416
1417
1419
1419
1419
OMIB
OMIB
OMIB
OMIB
OMIB

FIG. 14D



AMS block

Memory region

FIG. 15

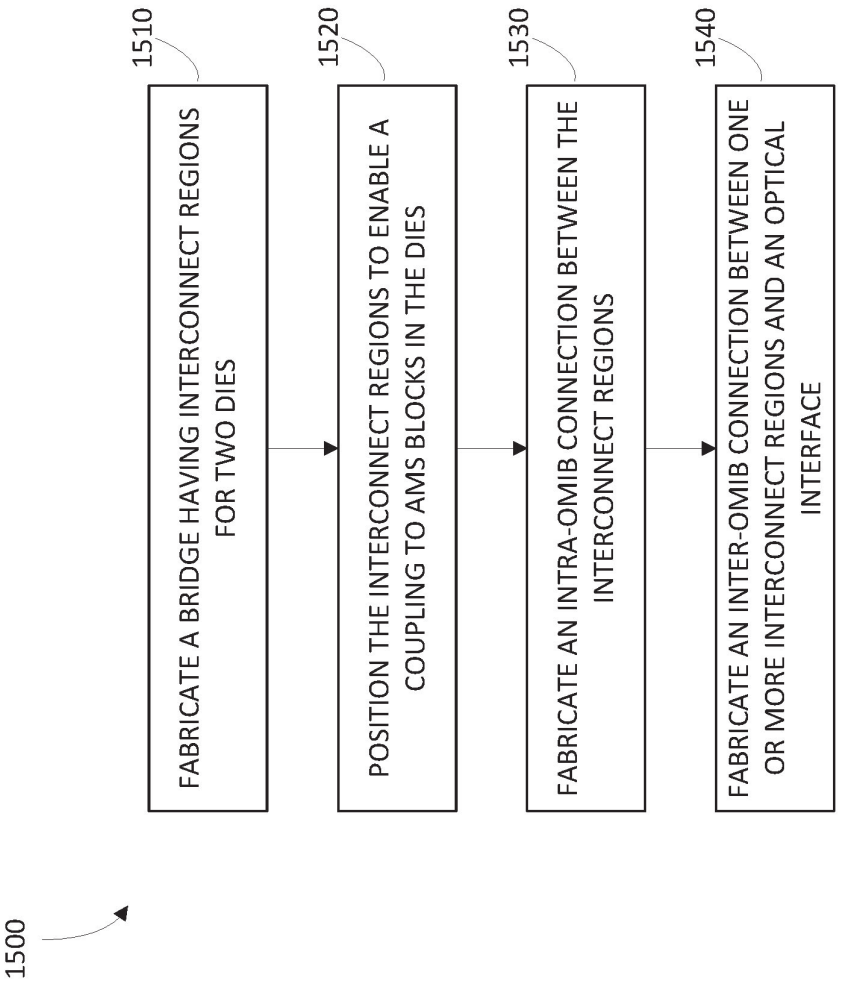
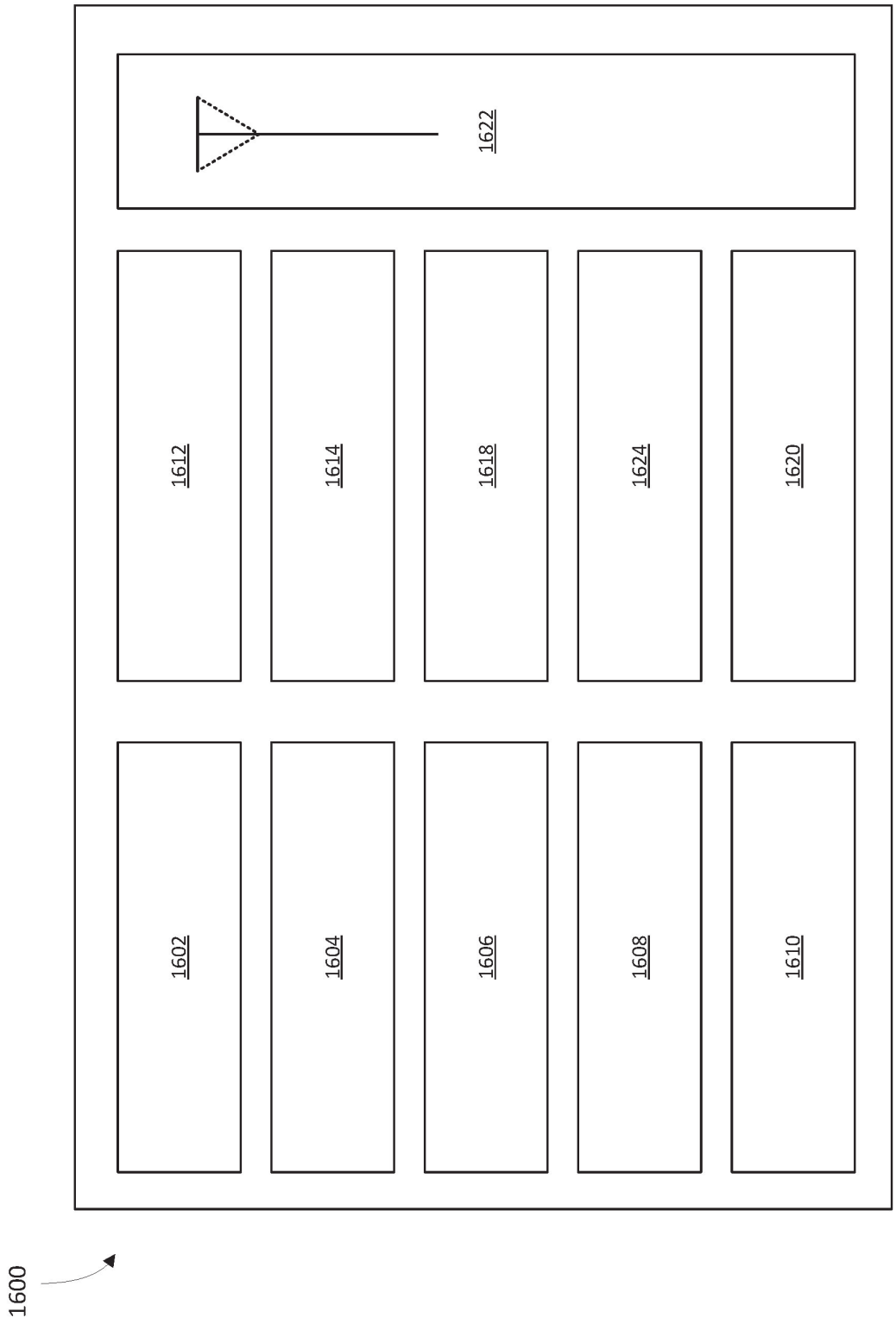

1500
1510
FABRICATE A BRIDGE HAVING INTERCONNECT REGIONS FOR TWO DIES
1520
POSITION THE INTERCONNECT REGIONS TO ENABLE A COUPLING TO AMS BLOCKS IN THE DIES
1530
FABRICATE AN INTRA-OMIB CONNECTION BETWEEN THE INTERCONNECT REGIONS
1540
FABRICATE AN INTER-OMIB CONNECTION BETWEEN ONE OR MORE INTERCONNECT REGIONS AND AN OPTICAL INTERFACE

FIG. 16



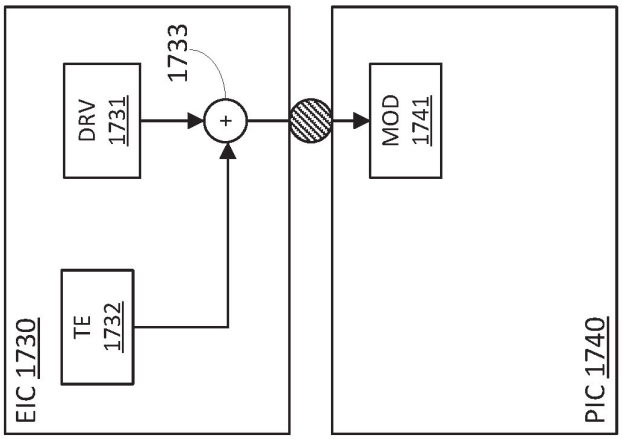


FIG. 17B

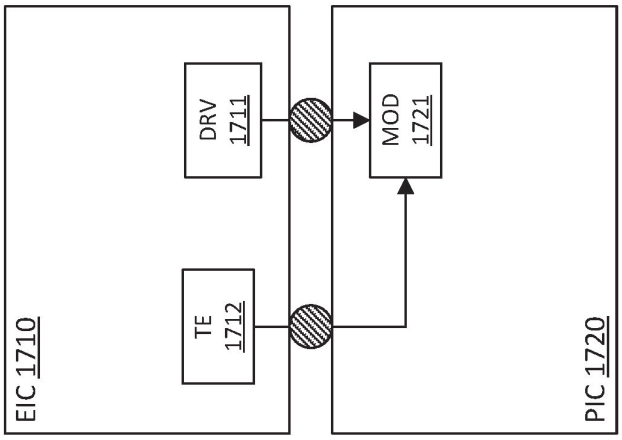


FIG. 17A

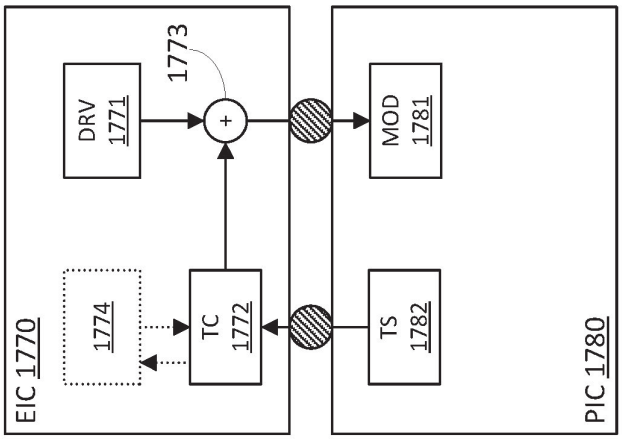


FIG. 17D

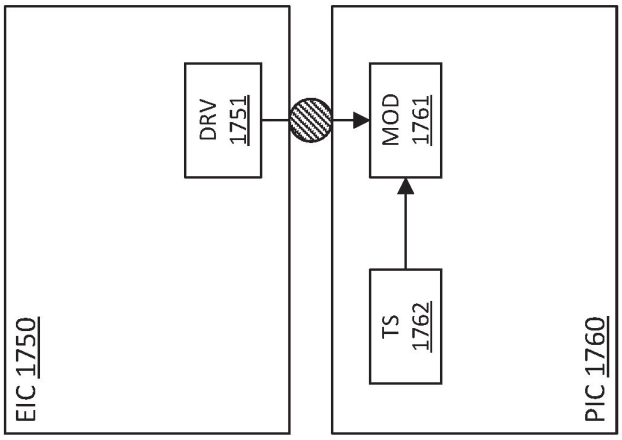
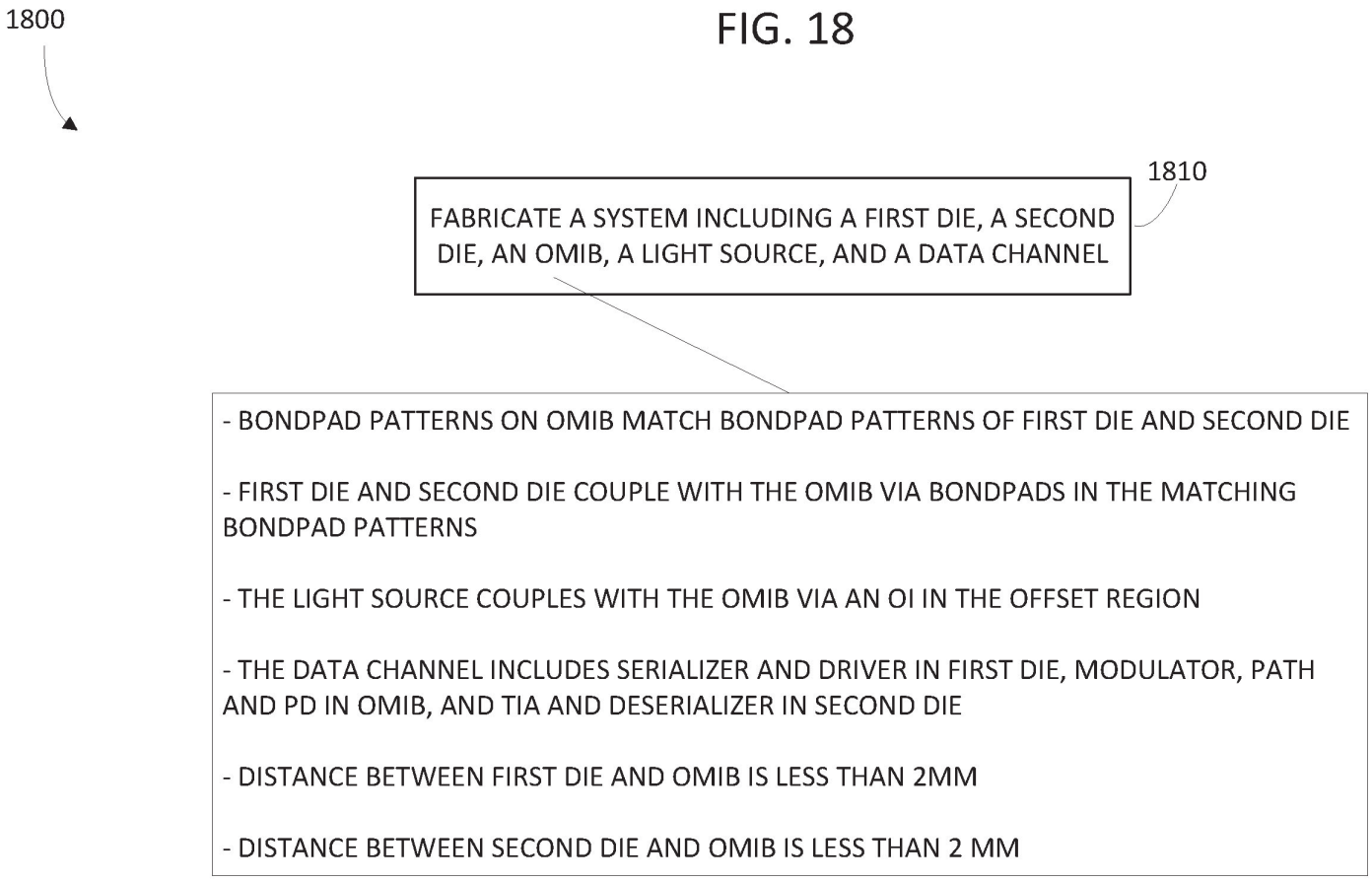


FIG. 17C

FIG. 18


1800
1810
FABRICATE A SYSTEM INCLUDING A FIRST DIE, A SECOND DIE, AN OMIB, A LIGHT SOURCE, AND A DATA CHANNEL
- BONDPAD PATTERNS ON OMIB MATCH BONDPAD PATTERNS OF FIRST DIE AND SECOND DIE
- FIRST DIE AND SECOND DIE COUPLE WITH THE OMIB VIA BONDPADS IN THE MATCHING BONDPAD PATTERNS
- THE LIGHT SOURCE COUPLES WITH THE OMIB VIA AN OI IN THE OFFSET REGION
- THE DATA CHANNEL INCLUDES SERIALIZER AND DRIVER IN FIRST DIE, MODULATOR, PATH AND PD IN OMIB, AND TIA AND DESERIALIZER IN SECOND DIE
- DISTANCE BETWEEN FIRST DIE AND OMIB IS LESS THAN 2MM
- DISTANCE BETWEEN SECOND DIE AND OMIB IS LESS THAN 2 MM