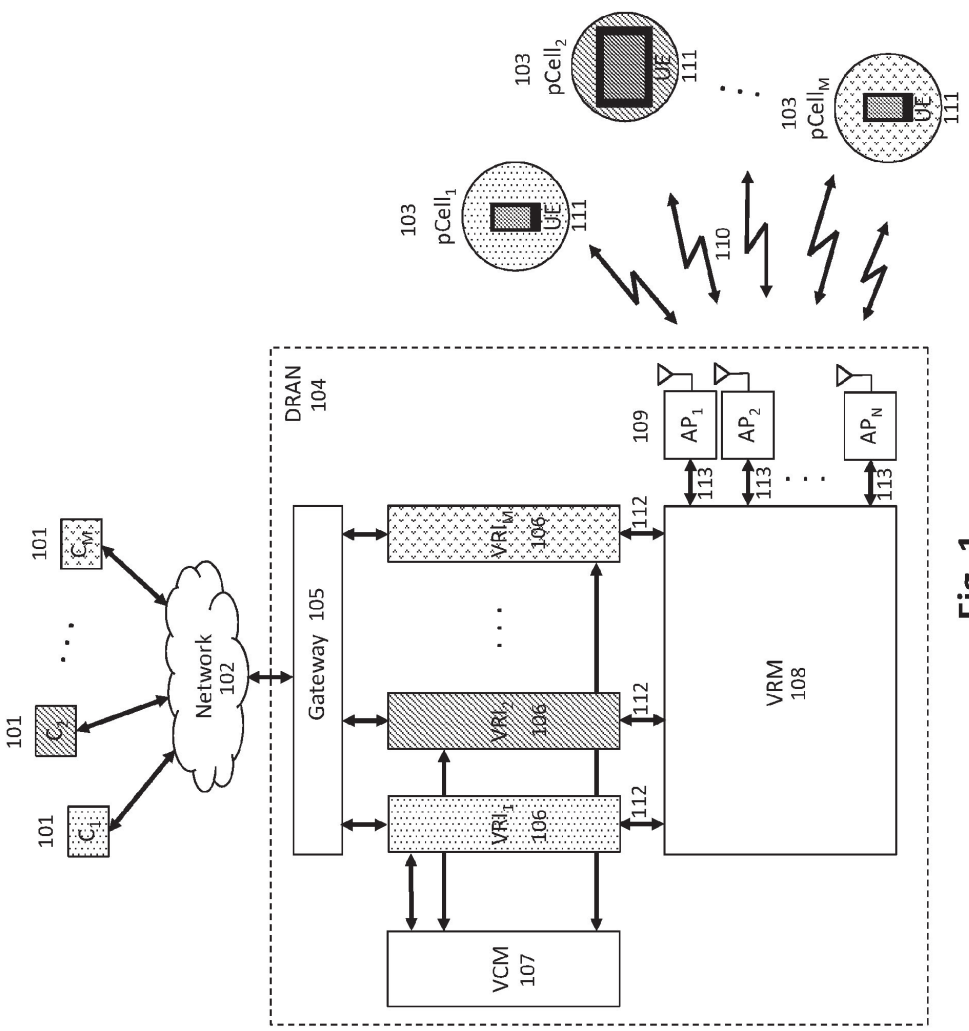
101
C_1
101
C_2
101
C_M
Network
102
DRAN
104
Gateway 105
VRI_1
106
VRI_2
106
VRI_M
106
112
112
112
VCM
107
VRM
108
109
AP_1
AP_2
AP_N
113
113
113
103
$pCell_1$
UE
111
103
$pCell_2$
UE
111
103
$pCell_M$
UE
111
110

Fig. 1

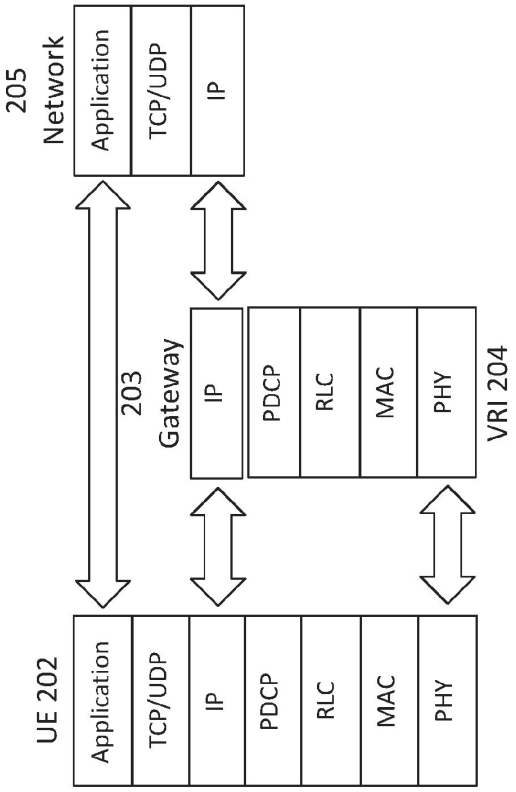
205
Network
Application
TCP/UDP
IP
203
Gateway
IP
PDCP
RLC
MAC
PHY
VRI 204
UE 202
Application
TCP/UDP
IP
PDCP
RLC
MAC
PHY

Fig. 2b

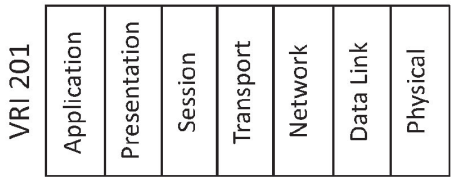
VRI 201
Application
Presentation
Session
Transport
Network
Data Link
Physical

Fig. 2a

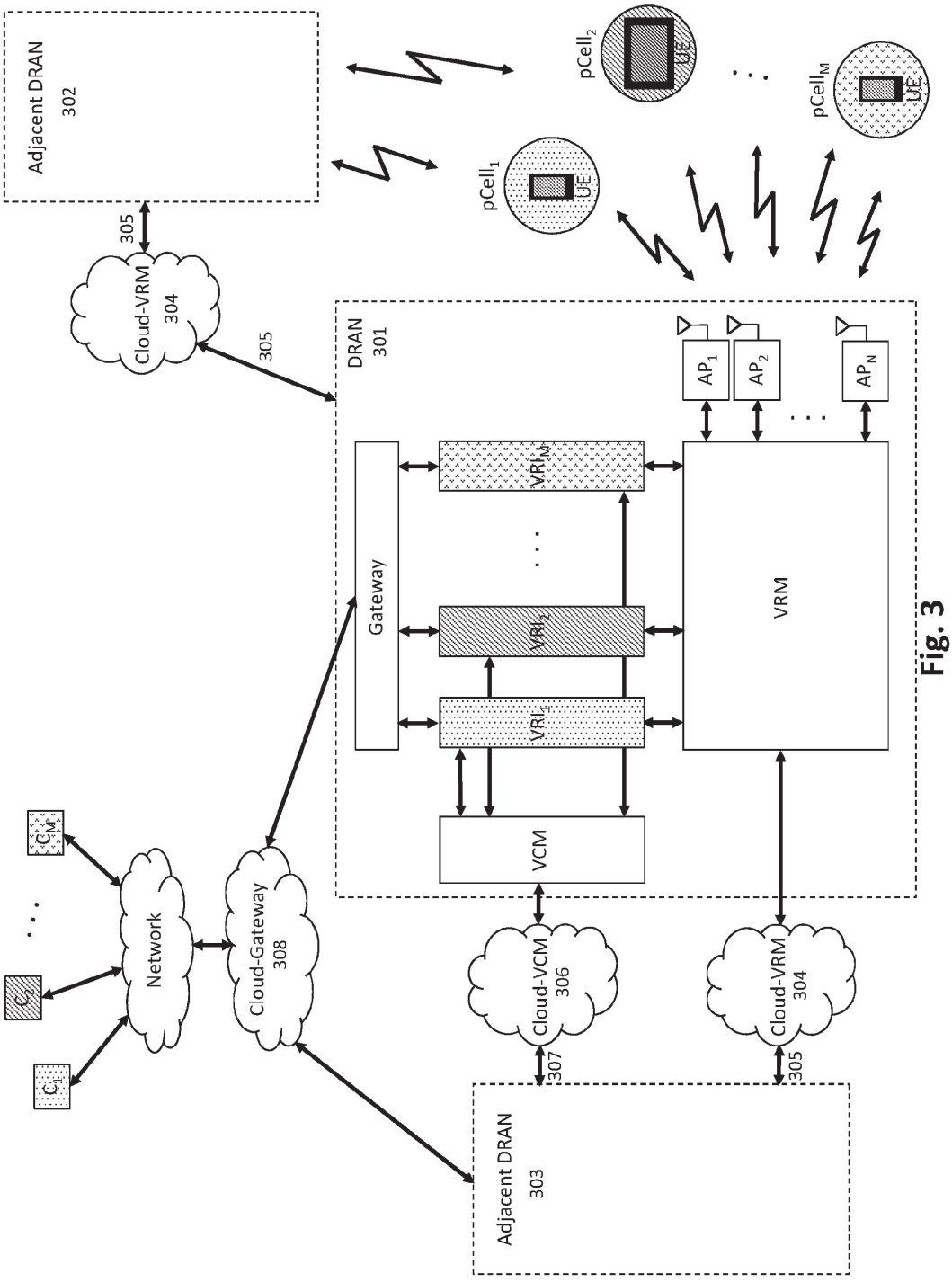
Adjacent DRAN
302
305
Cloud-VRM
304
305
DRAN
301
pCell1
UE
pCell2
UE
pCellM
UE
AP1
AP2
APN
Gateway
VRIM
VRI2
VRI1
VRM
VCM
Network
Cloud-Gateway
308
Cloud-VCM
306
307
Cloud-VRM
304
305
Adjacent DRAN
303

Fig. 3

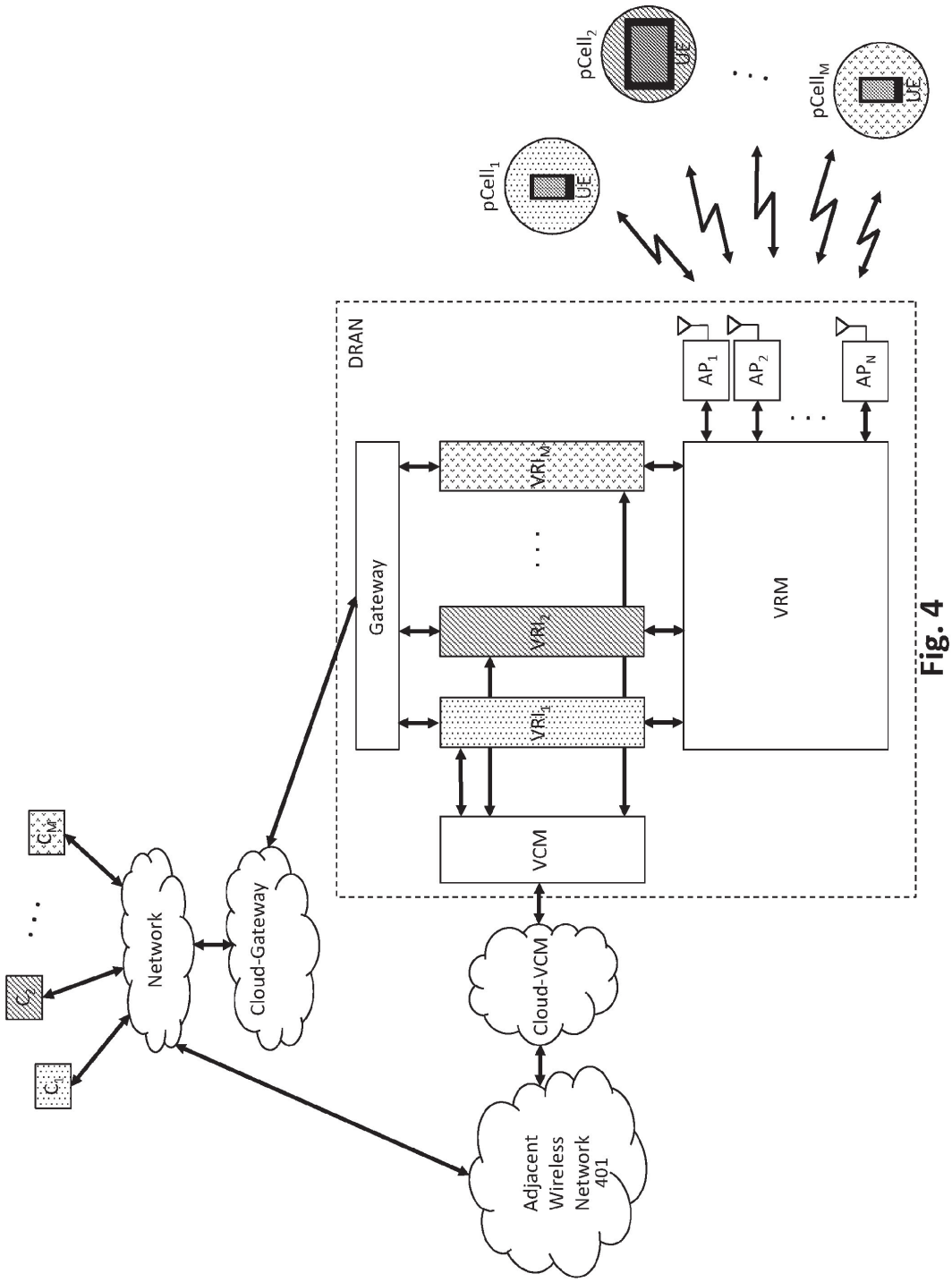
pCell1
UE
pCell2
UE
pCellM
UE
DRAN
AP1
AP2
APN
Gateway
VRIM
VRI2
VRI1
VRM
VCM
Cloud-Gateway
Cloud-VCM
Network
C1
C2
CM
Adjacent Wireless Network 401

Fig. 4

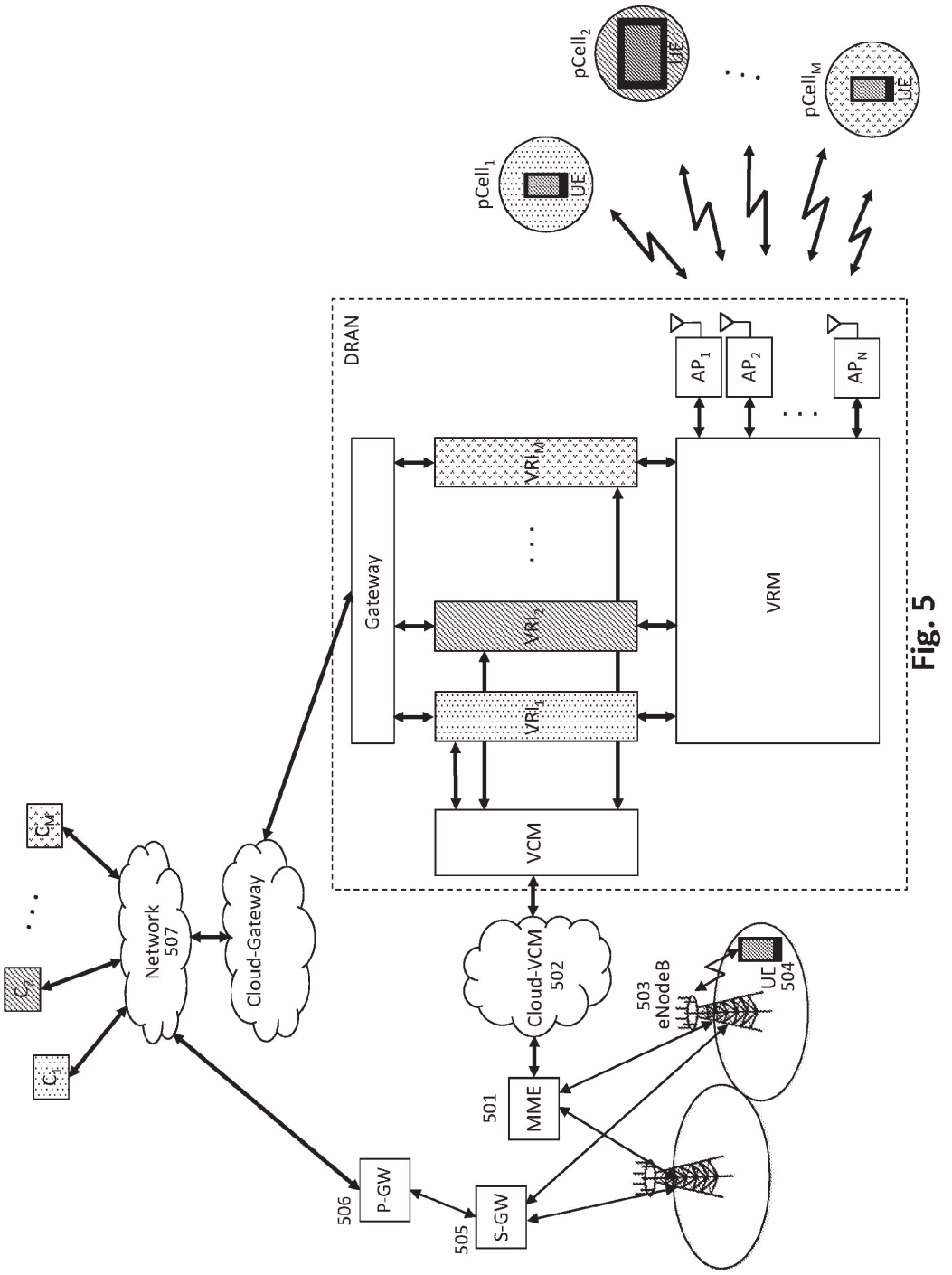
pCell1
pCell2
pCellM
UE
DRAN
AP1
AP2
APN
VRIM
VRI2
VRI1
Gateway
VRM
VCM
Cloud-VCM
502
503
eNodeB
UE
504
501
MME
506
P-GW
505
S-GW
Network
507
Cloud-Gateway
C1
C2
CM

Fig. 5

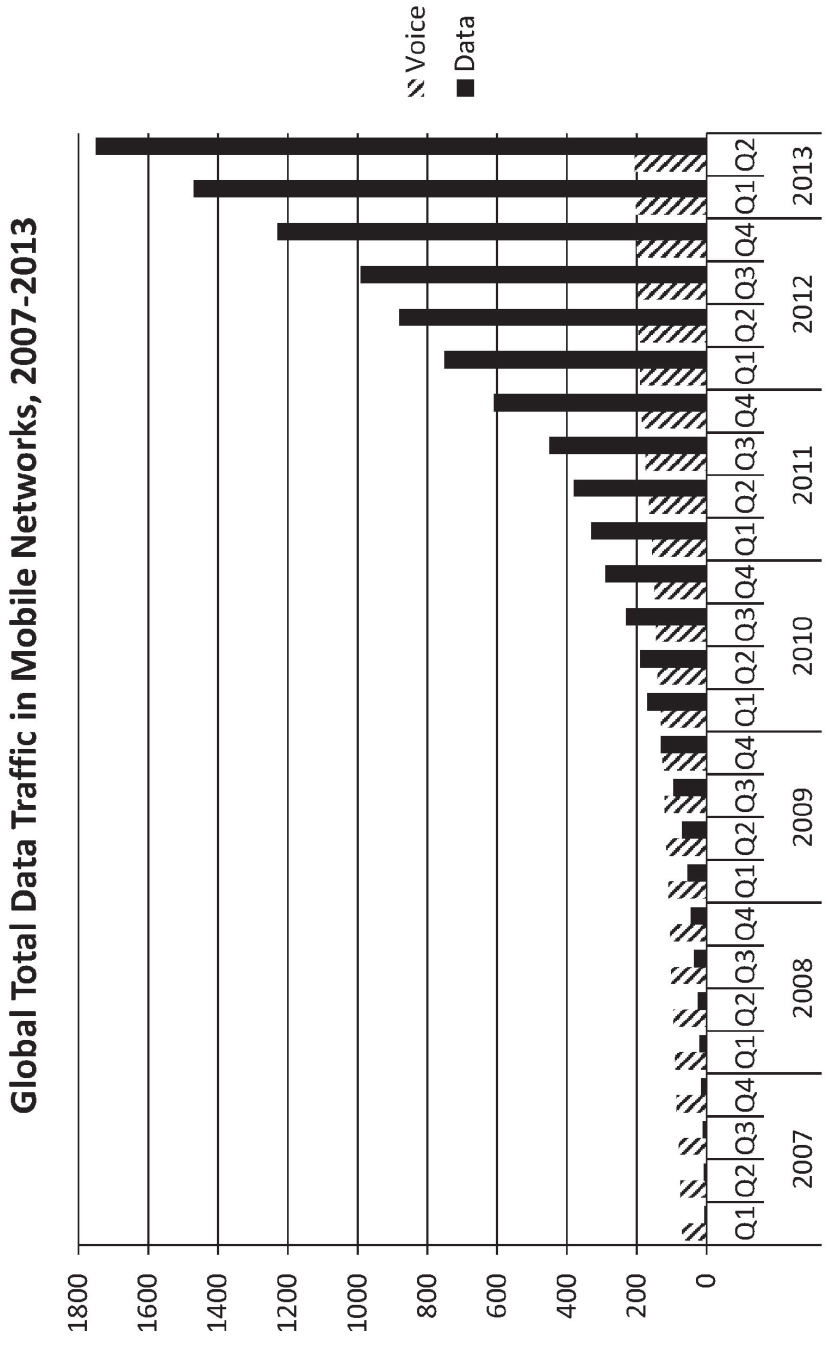

Fig. 6
(Prior Art)

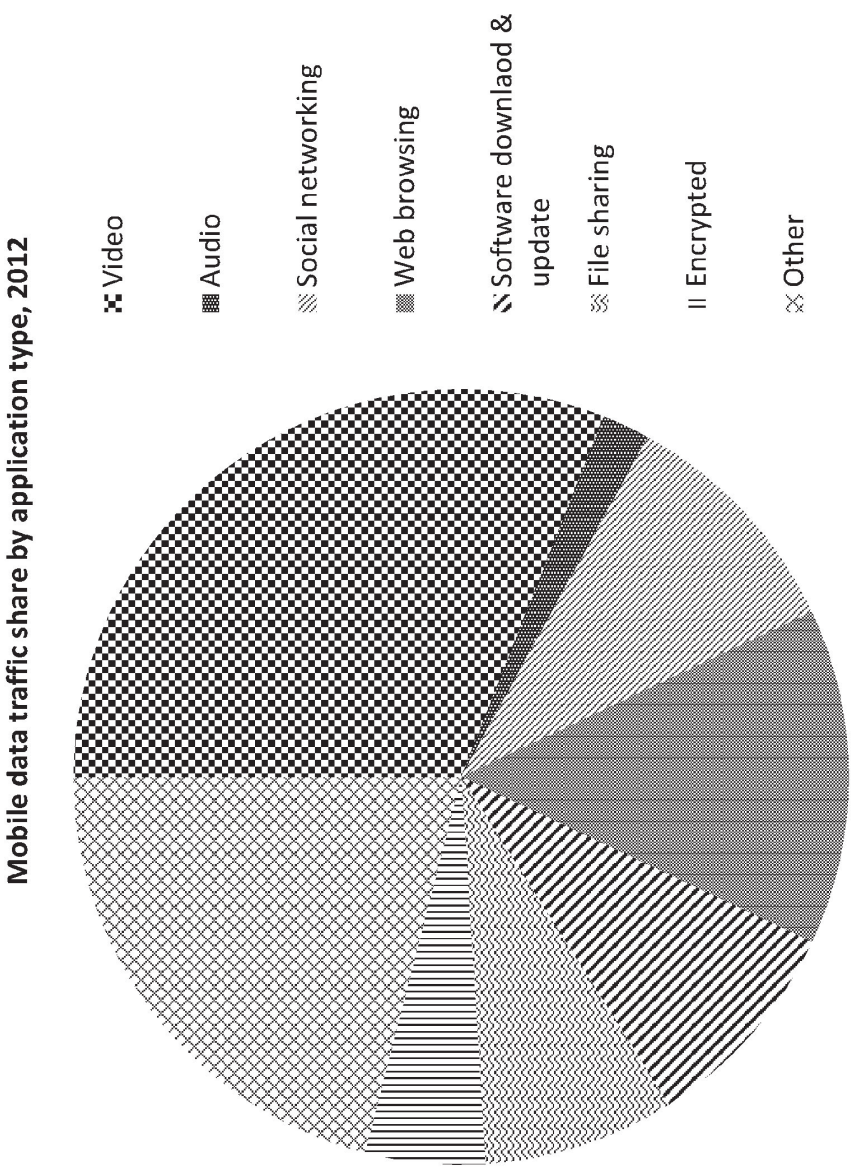

Fig. 7
(Prior Art)

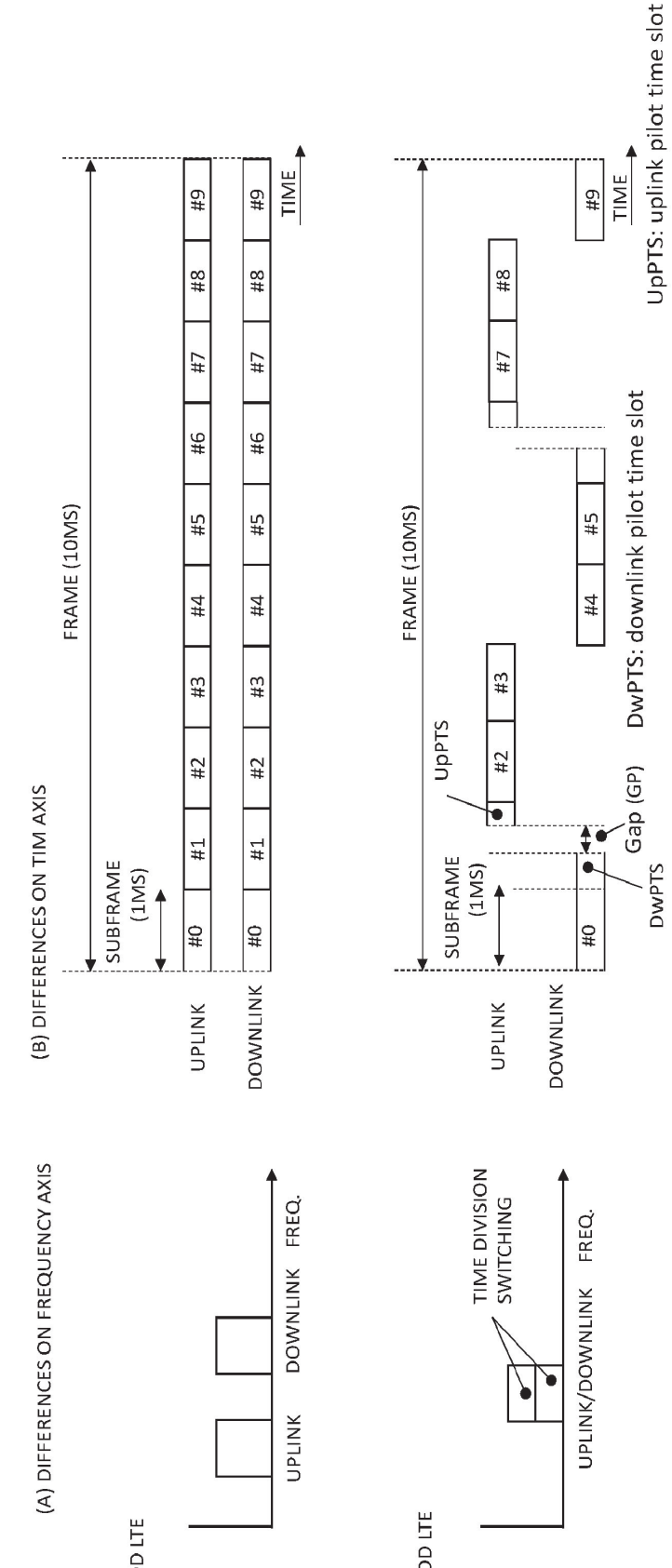

FIG. 8
(PRIOR ART)

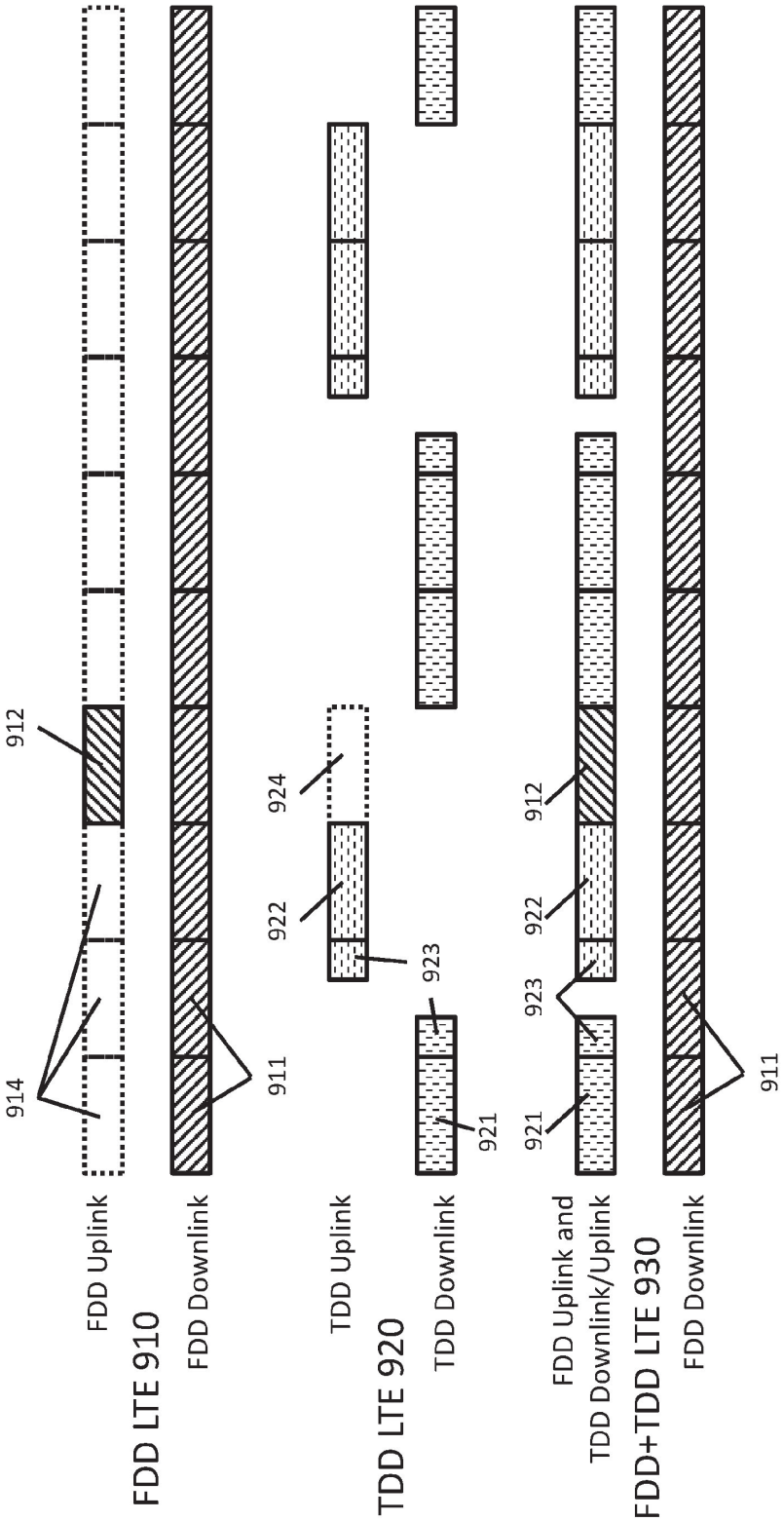
FDD LTE 910
FDD Uplink
FDD Downlink
912
914
911
TDD LTE 920
TDD Uplink
TDD Downlink
922
924
923
921
FDD+TDD LTE 930
FDD Uplink and
TDD Downlink/Uplink
FDD Downlink
912
922
923
921
911

Fig. 9

TDD LTE Duplex Configurations

UL/DL Config.	UL/DL Switch Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Fig. 10
(Prior Art)

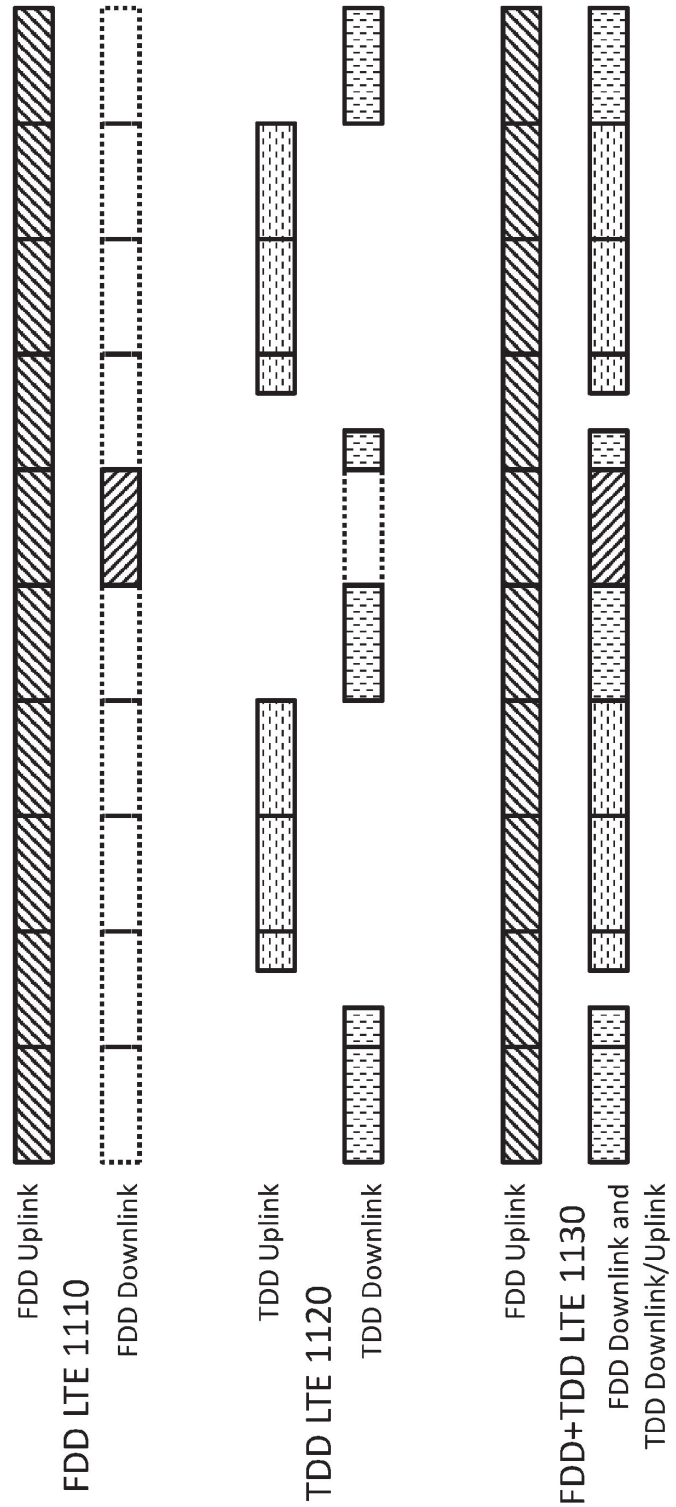
FDD LTE 1110
FDD Uplink
FDD Downlink
TDD LTE 1120
TDD Uplink
TDD Downlink
FDD+TDD LTE 1130
FDD Uplink
FDD Downlink and
TDD Downlink/Uplink

Fig. 11

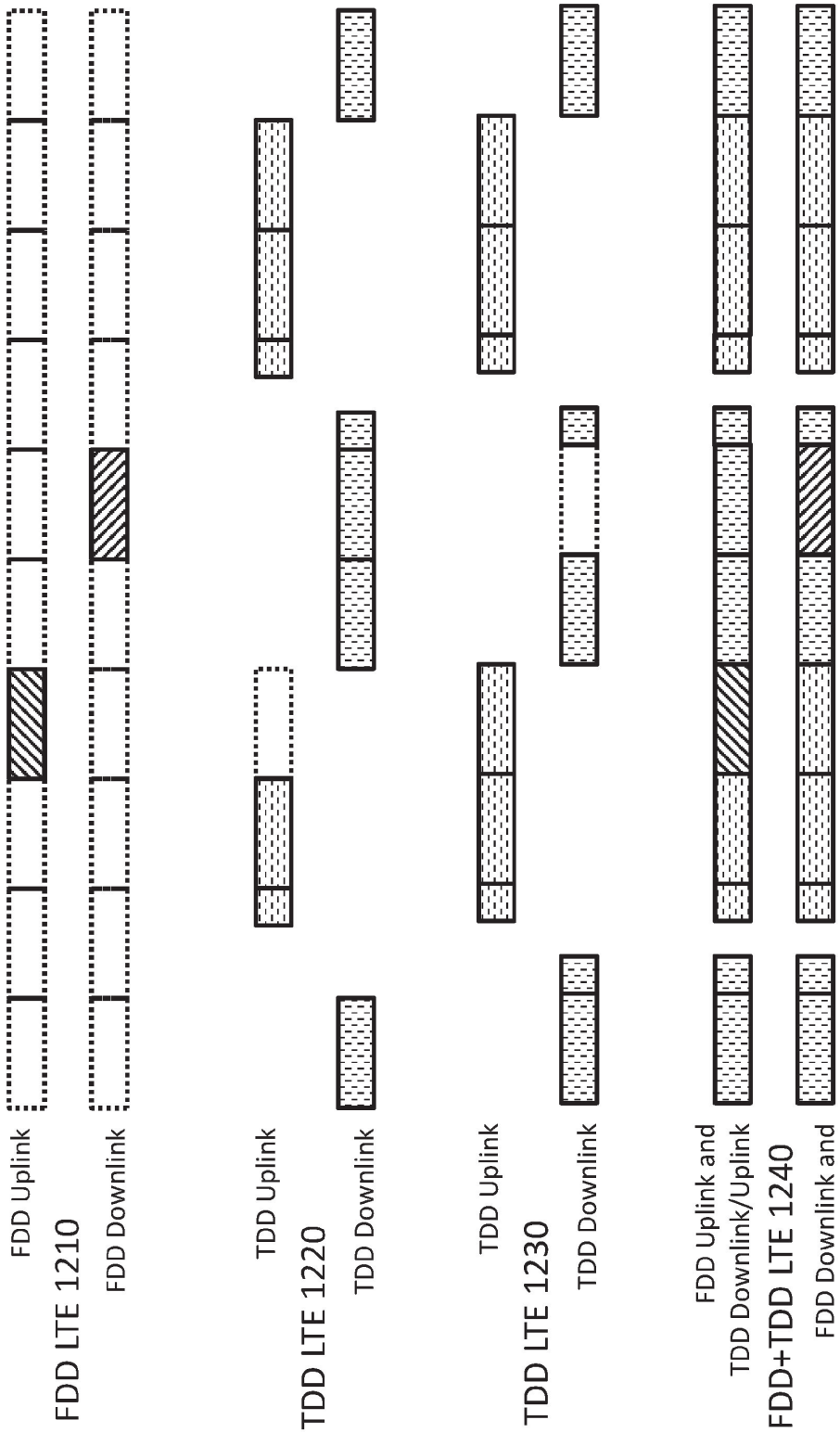
FDD LTE 1210
FDD Uplink
FDD Downlink
TDD LTE 1220
TDD Uplink
TDD Downlink
TDD LTE 1230
TDD Uplink
TDD Downlink
FDD+TDD LTE 1240
FDD Uplink and TDD Downlink/Uplink
FDD Downlink and TDD Downlink/Uplink

Fig. 12

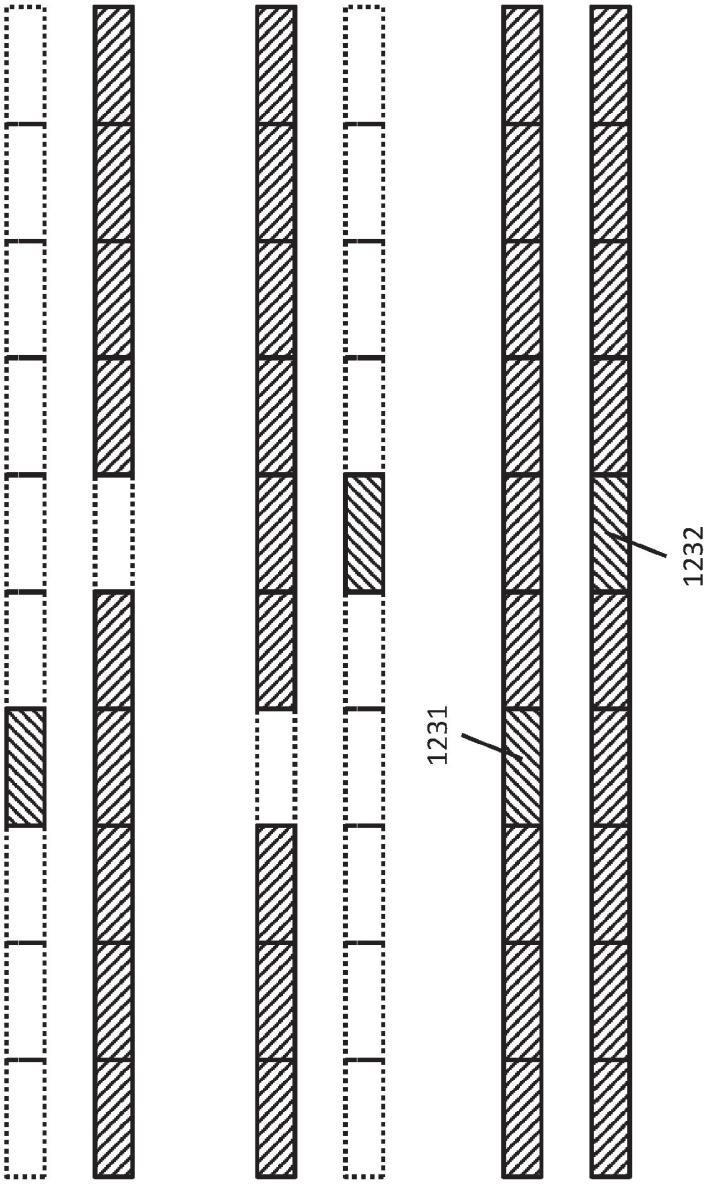
FDD Uplink
FDD LTE 1310
FDD Downlink
FDD Downlink
FDD LTE 1320
FDD Uplink
1231
FDD Uplink and
TDD Downlink/Uplink
FDD+TDD LTE 1230
FDD Downlink and
TDD Downlink/Uplink
1232

Fig. 13

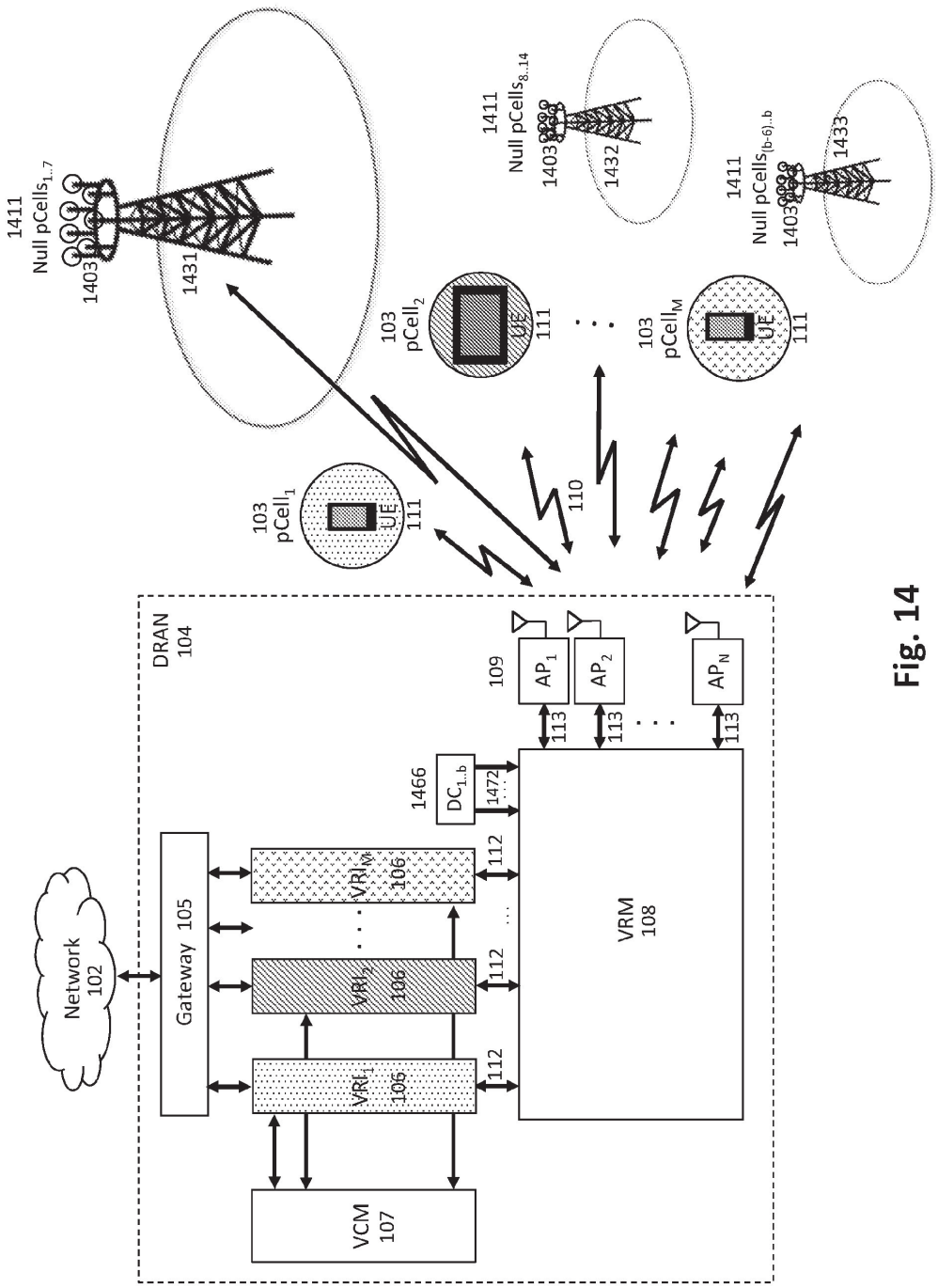
1411
Null pCells1..7
1403
1431
1411
Null pCells8..14
1403
1432
1411
Null pCells|b-6|..b
1403
1433
103
pCell1
UE
111
103
pCell2
UE
111
103
pCellM
UE
111
110
DRAN
104
109
AP1
AP2
APN
113
1466
DC1..b
1472
VRM
108
112
VRI1
VRI2
VRIM
106
VCM
107
Gateway 105
Network
102

Fig. 14

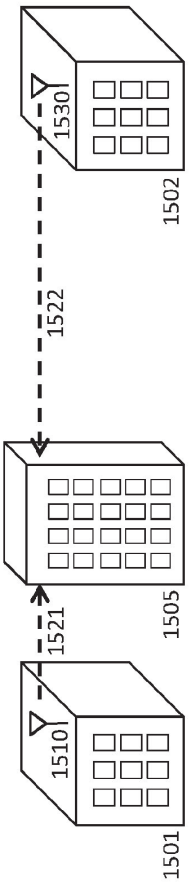

Fig. 15a

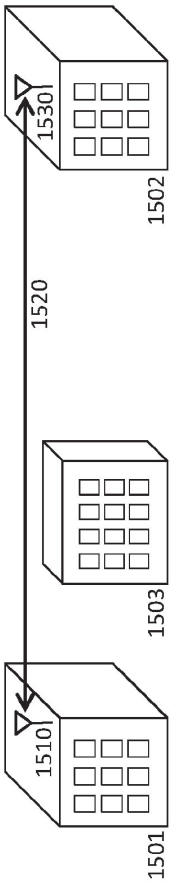

Fig. 15b

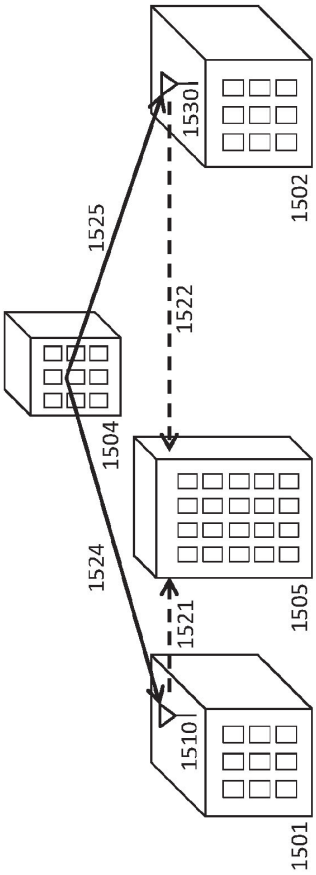

Fig. 15c

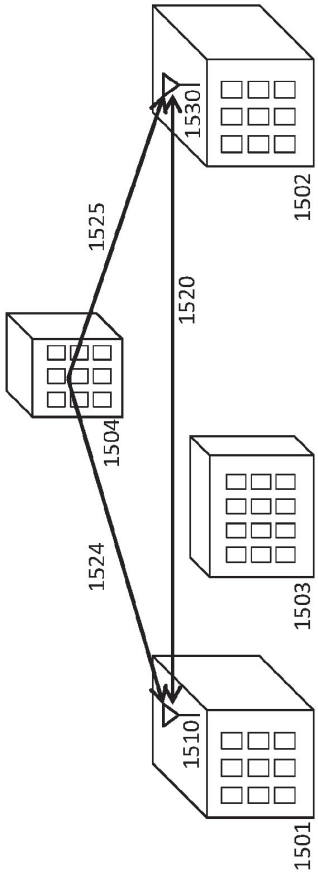

Fig. 15d

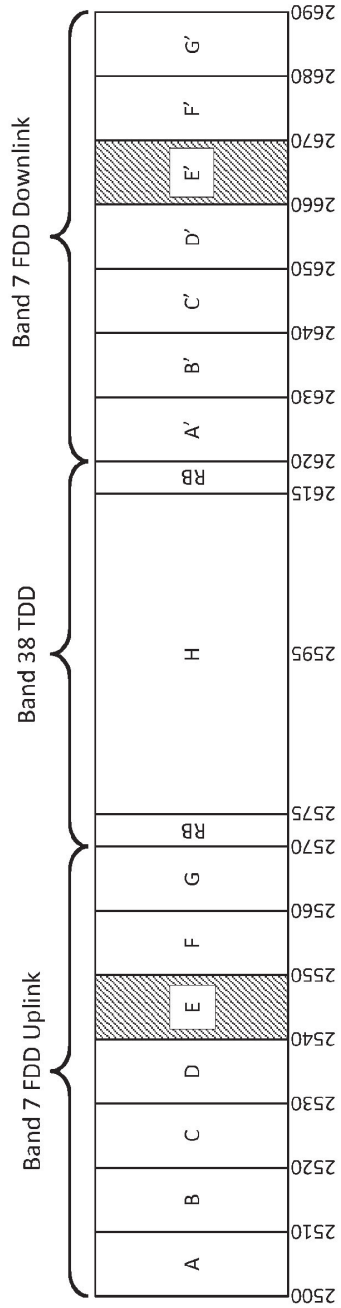

Fig. 16a
(Prior Art)

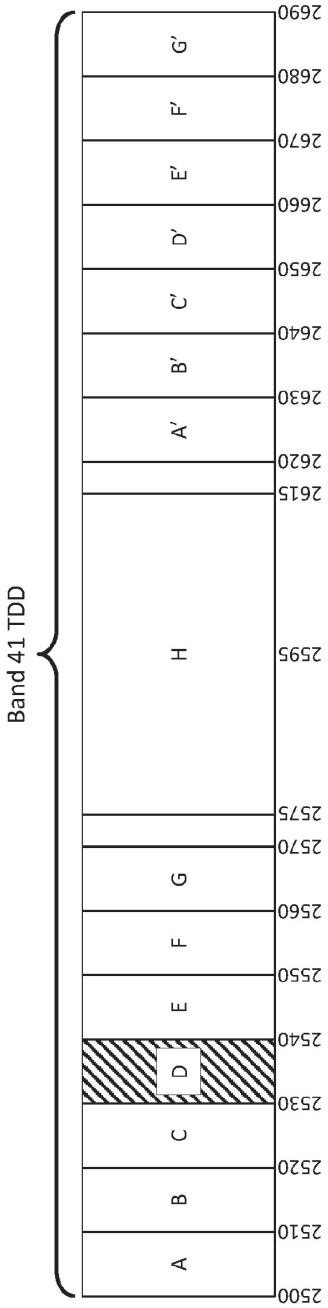

Fig. 16b
(Prior Art)