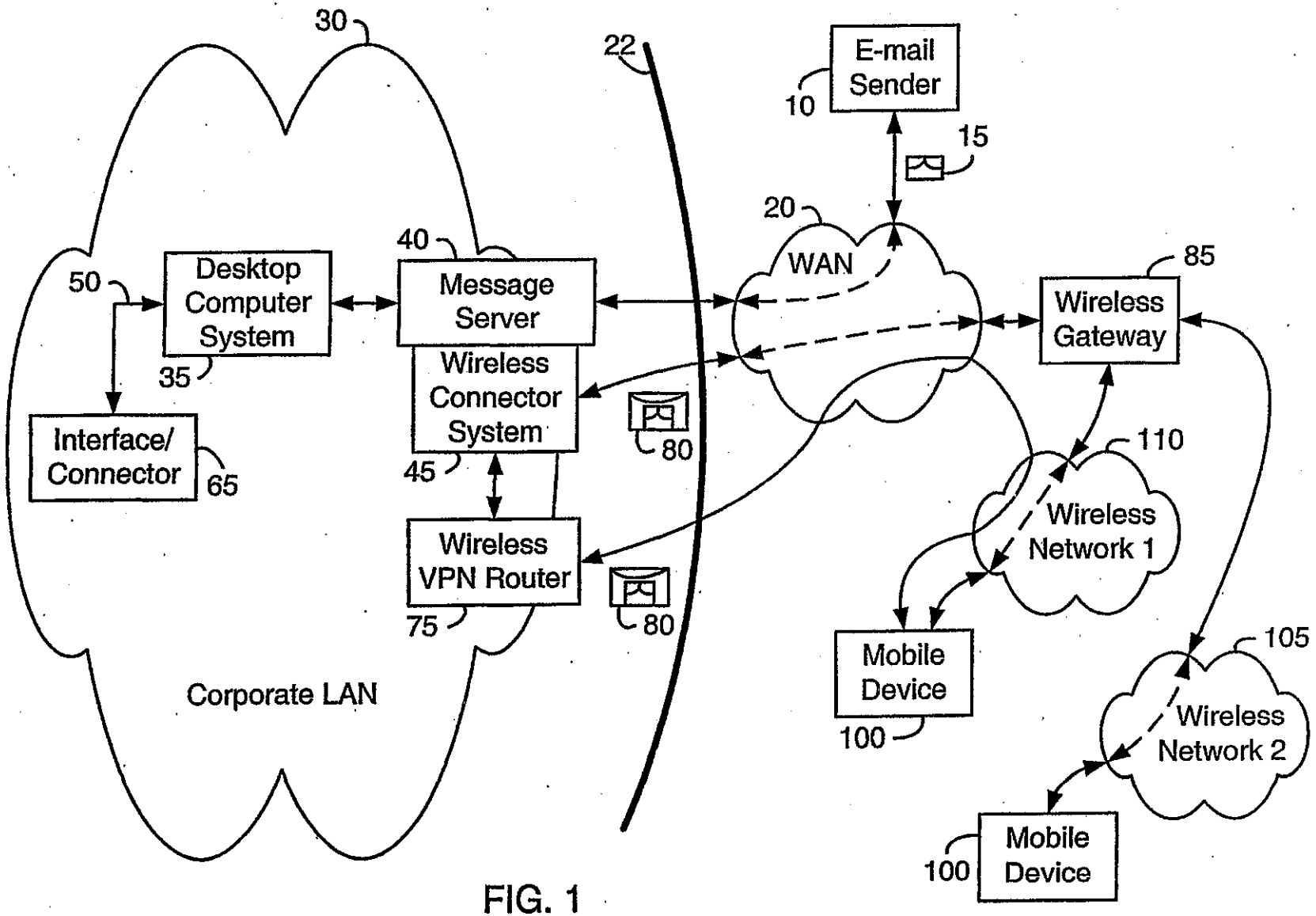



FIG. 1



12 DEC 2005

12 DEC 2005



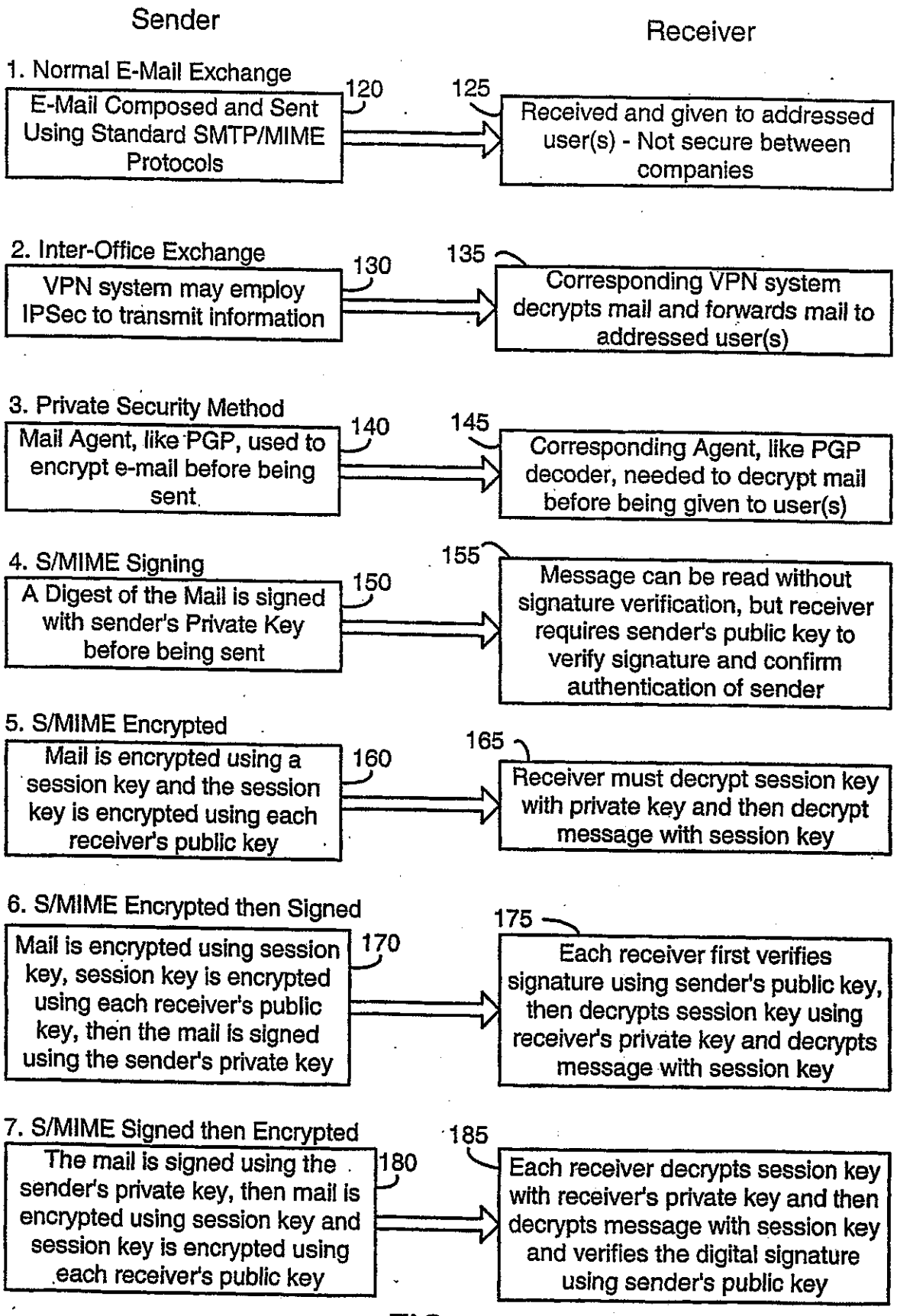



FIG. 2

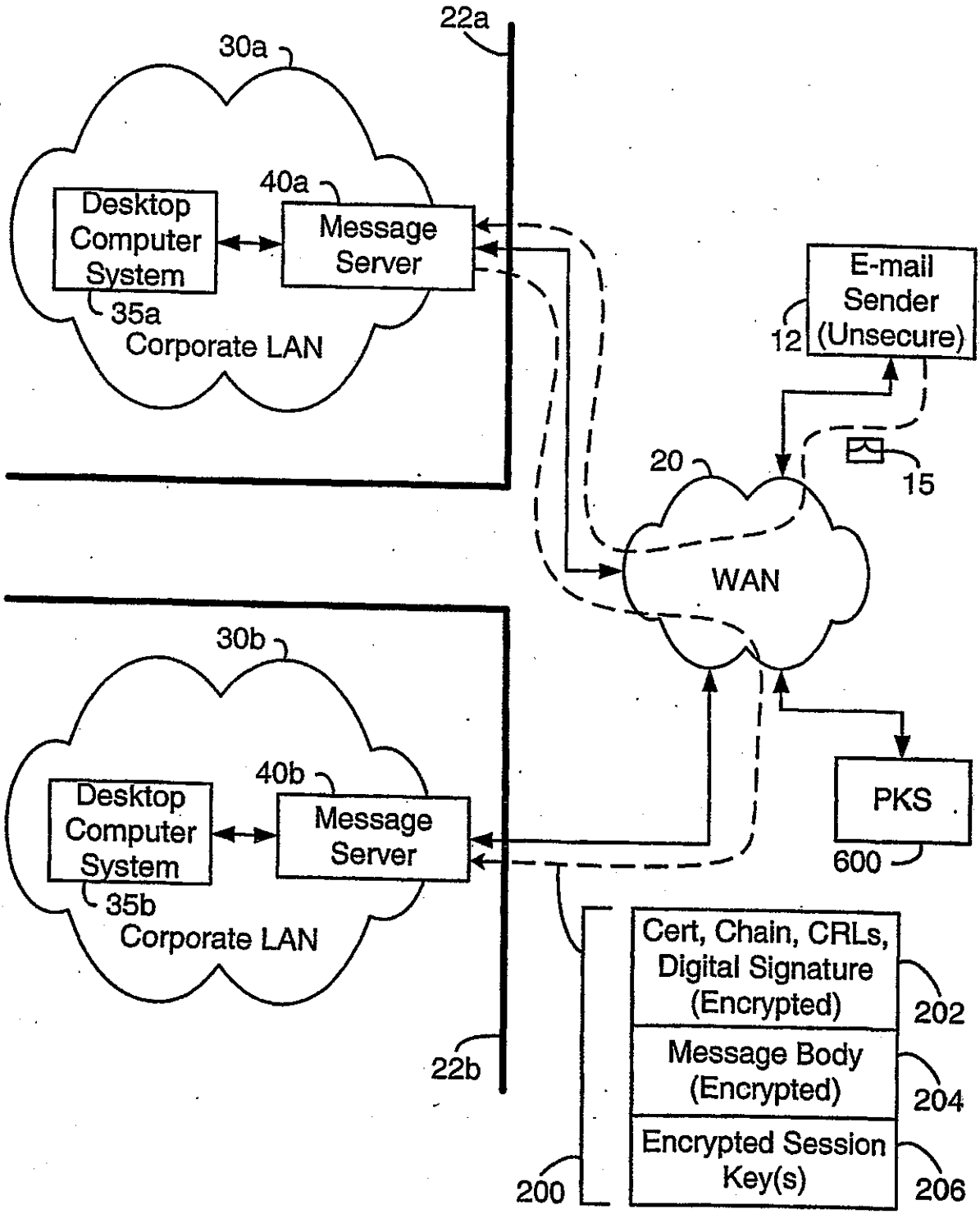

22a
30a
40a
Desktop Computer System
Message Server
35a
Corporate LAN
E-mail Sender (Unsecure)
12
15
20
WAN
30b
40b
Desktop Computer System
Message Server
35b
Corporate LAN
PKS
600
22b
Cert, Chain, CRLs, Digital Signature (Encrypted)
202
Message Body (Encrypted)
204
Encrypted Session Key(s)
206
200

FIG. 3

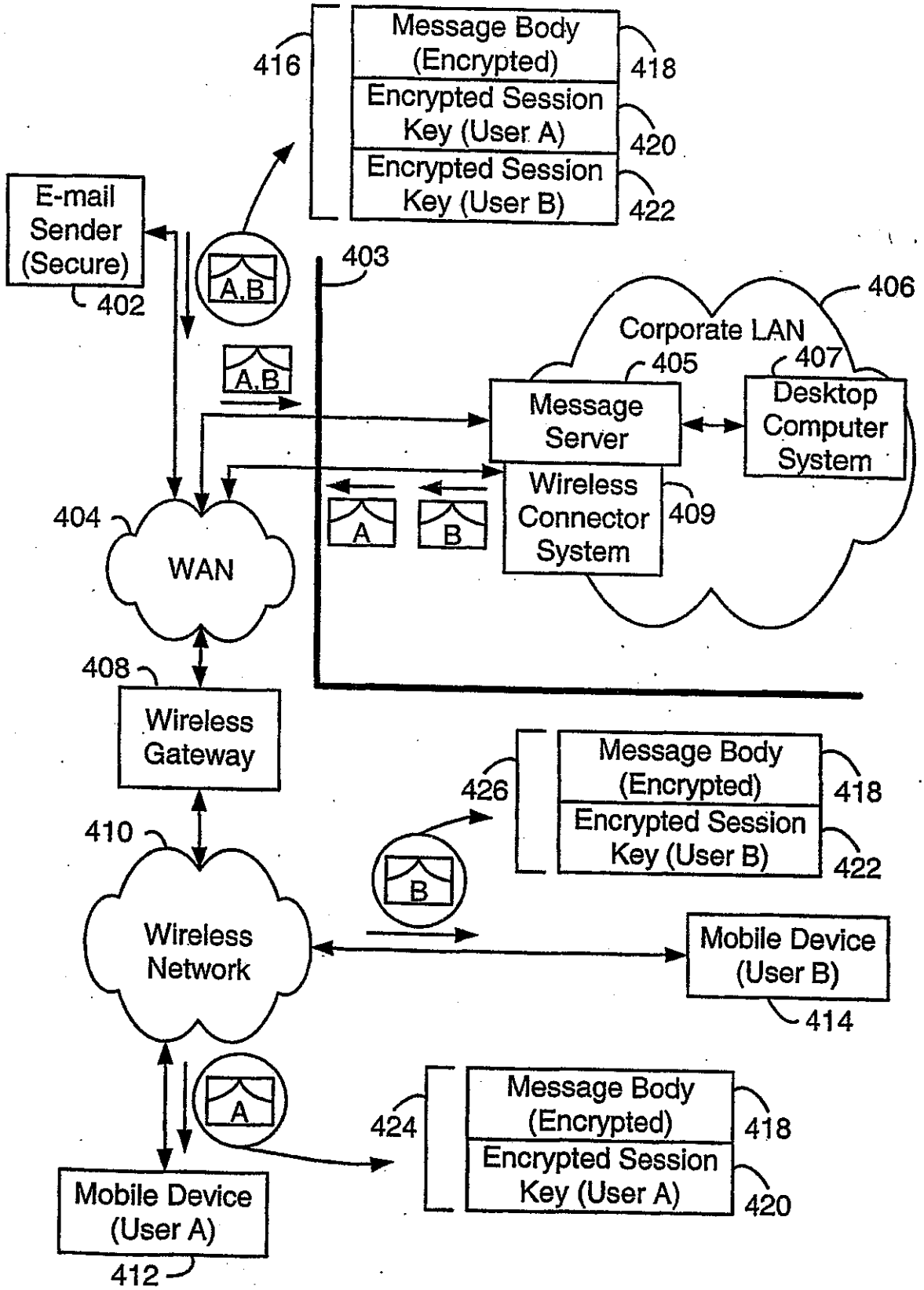

Message Body (Encrypted)
416
418
Encrypted Session Key (User A)
420
Encrypted Session Key (User B)
422
E-mail Sender (Secure)
402
A,B
403
406
Corporate LAN
405
407
Message Server
Desktop Computer System
A,B
Wireless Connector System
409
404
A
B
WAN
408
Wireless Gateway
426
Message Body (Encrypted)
418
Encrypted Session Key (User B)
422
410
B
Wireless Network
Mobile Device (User B)
414
A
424
Message Body (Encrypted)
418
Encrypted Session Key (User A)
420
Mobile Device (User A)
412

FIG. 4

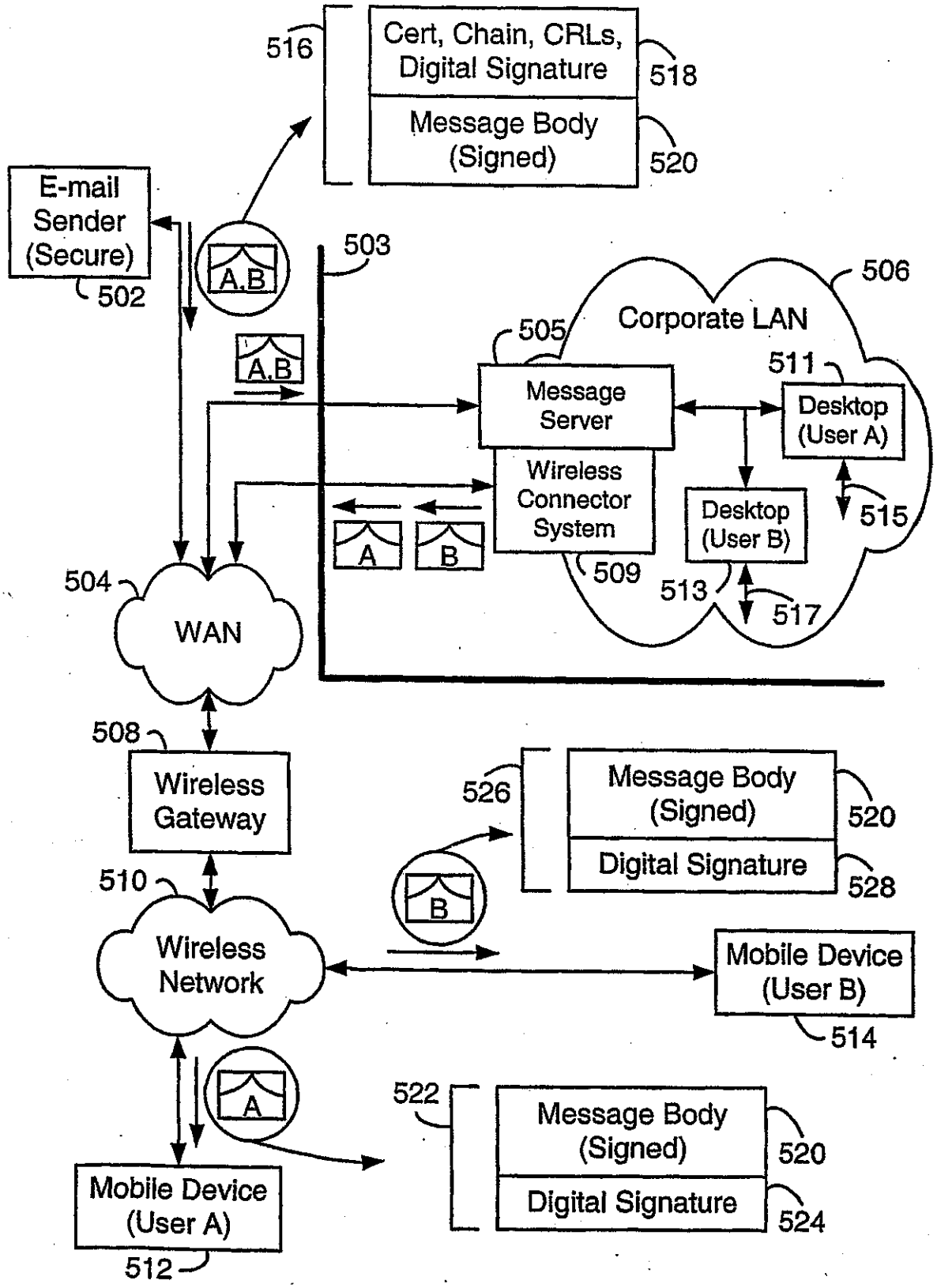

516
Cert, Chain, CRLs, Digital Signature
518
Message Body (Signed)
520
E-mail Sender (Secure)
502
A,B
503
506
Corporate LAN
505
511
Message Server
Desktop (User A)
Wireless Connector System
Desktop (User B)
515
A
B
504
WAN
509
513
517
508
Wireless Gateway
526
Message Body (Signed)
520
Digital Signature
528
B
510
Wireless Network
Mobile Device (User B)
514
A
522
Message Body (Signed)
520
Digital Signature
524
Mobile Device (User A)
512

FIG. 5

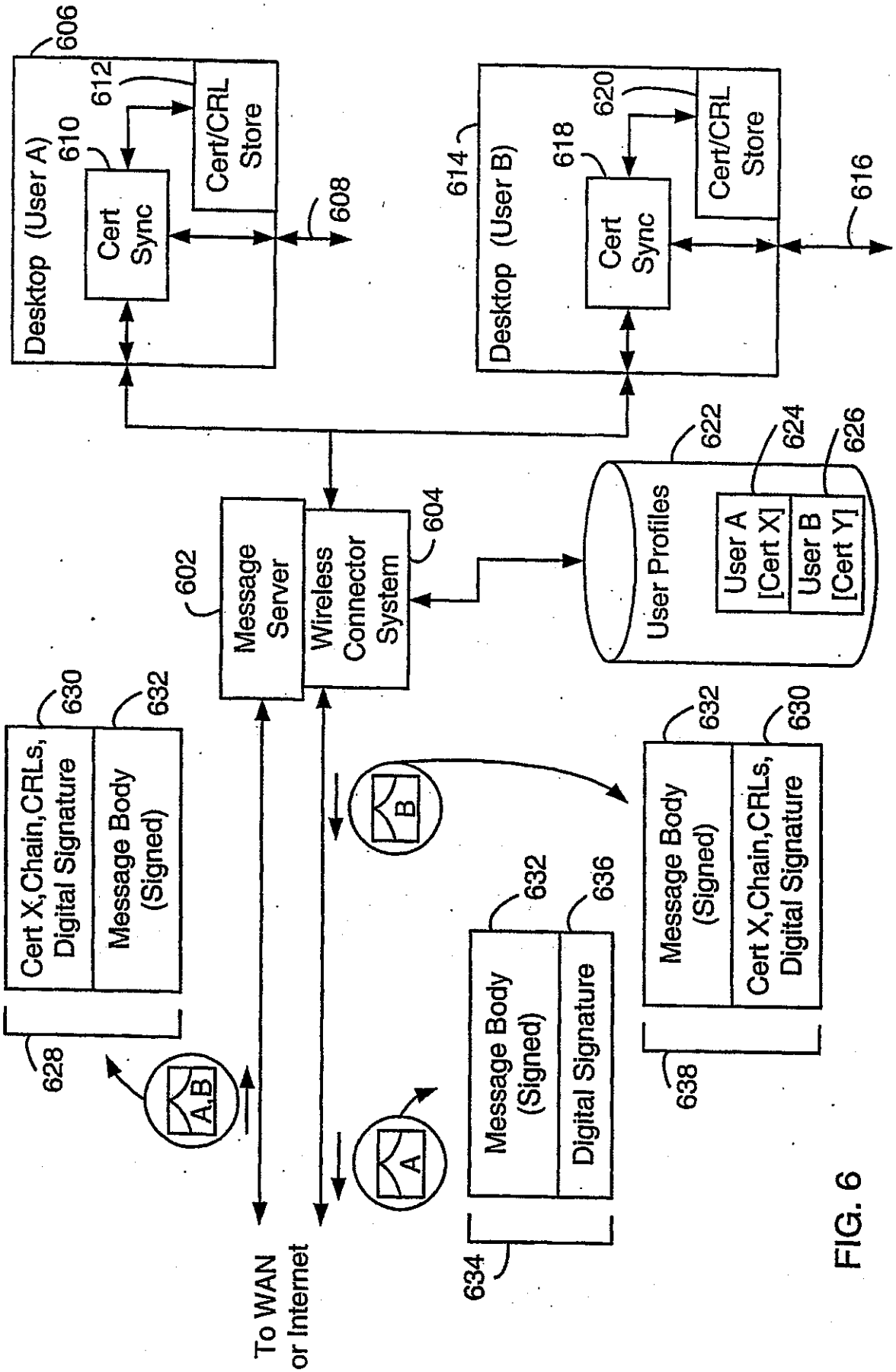

606
Desktop (User A)
610
Cert Sync
612
Cert/CRL Store
608
614
Desktop (User B)
618
Cert Sync
620
Cert/CRL Store
616
602
Message Server
Wireless Connector System
604
622
User Profiles
624
User A [Cert X]
626
User B [Cert Y]
630
Cert X,Chain,CRLs, Digital Signature
632
Message Body (Signed)
628
A,B
B
A
632
Message Body (Signed)
636
Digital Signature
634
632
Message Body (Signed)
630
Cert X,Chain,CRLs, Digital Signature
638
To WAN or Internet

FIG. 6

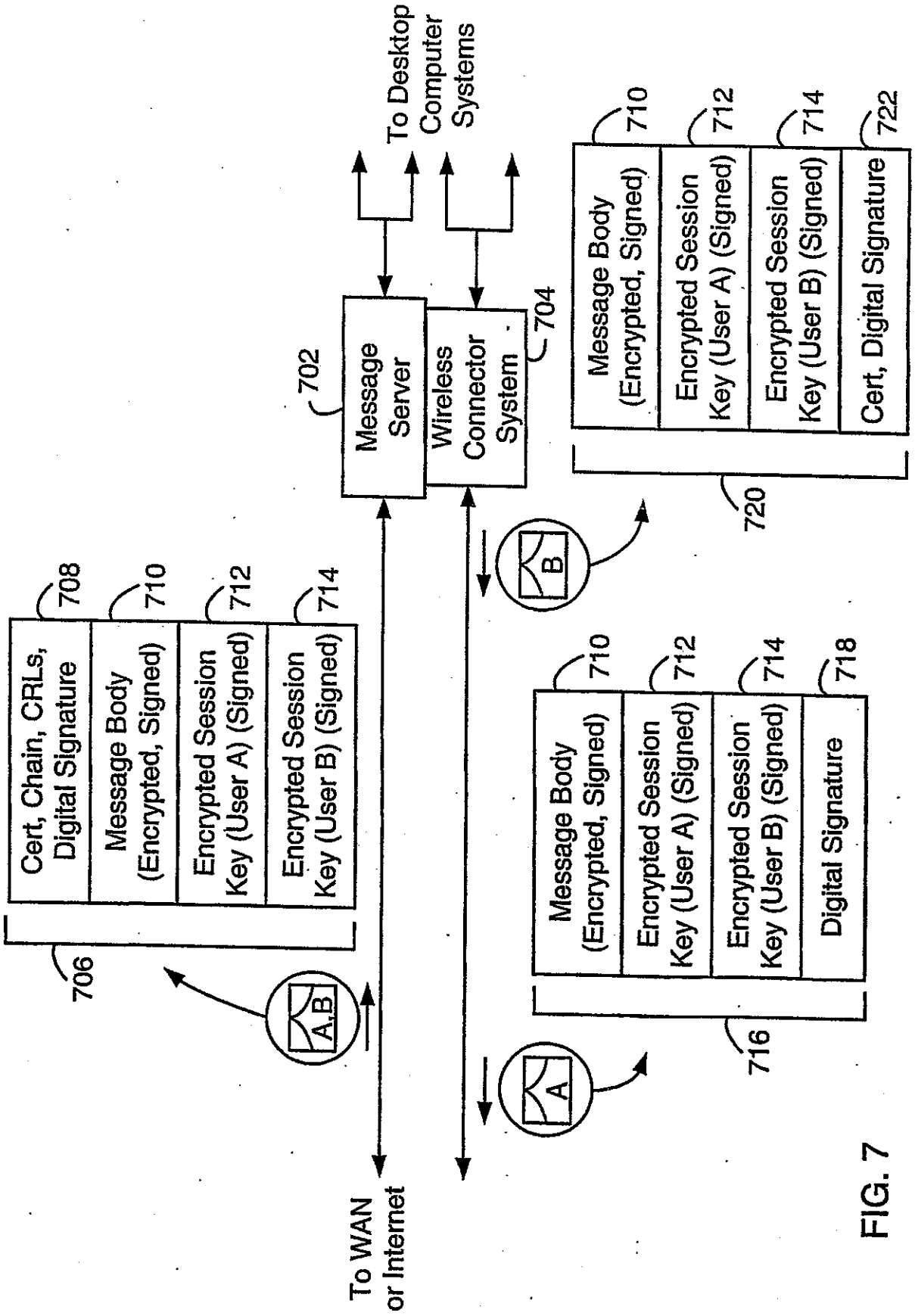

To Desktop Computer Systems
Message Server
Wireless Connector System
702
704
To WAN or Internet
Cert, Chain, CRLs, Digital Signature
Message Body (Encrypted, Signed)
Encrypted Session Key (User A) (Signed)
Encrypted Session Key (User B) (Signed)
708
710
712
714
706
A,B
B
A
Message Body (Encrypted, Signed)
Encrypted Session Key (User A) (Signed)
Encrypted Session Key (User B) (Signed)
Cert, Digital Signature
710
712
714
722
720
Message Body (Encrypted, Signed)
Encrypted Session Key (User A) (Signed)
Encrypted Session Key (User B) (Signed)
Digital Signature
710
712
714
718
716

FIG. 7

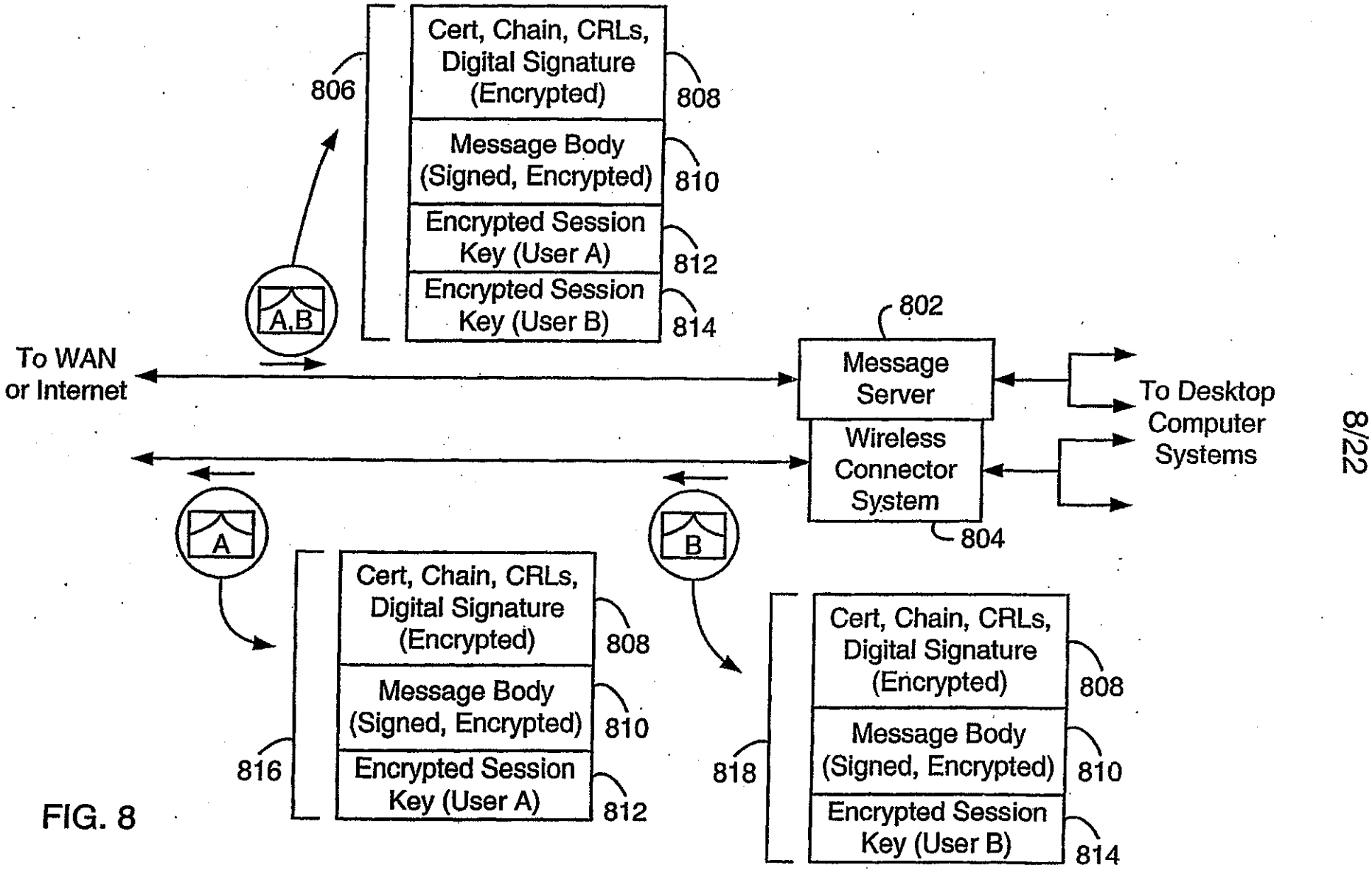



FIG. 8



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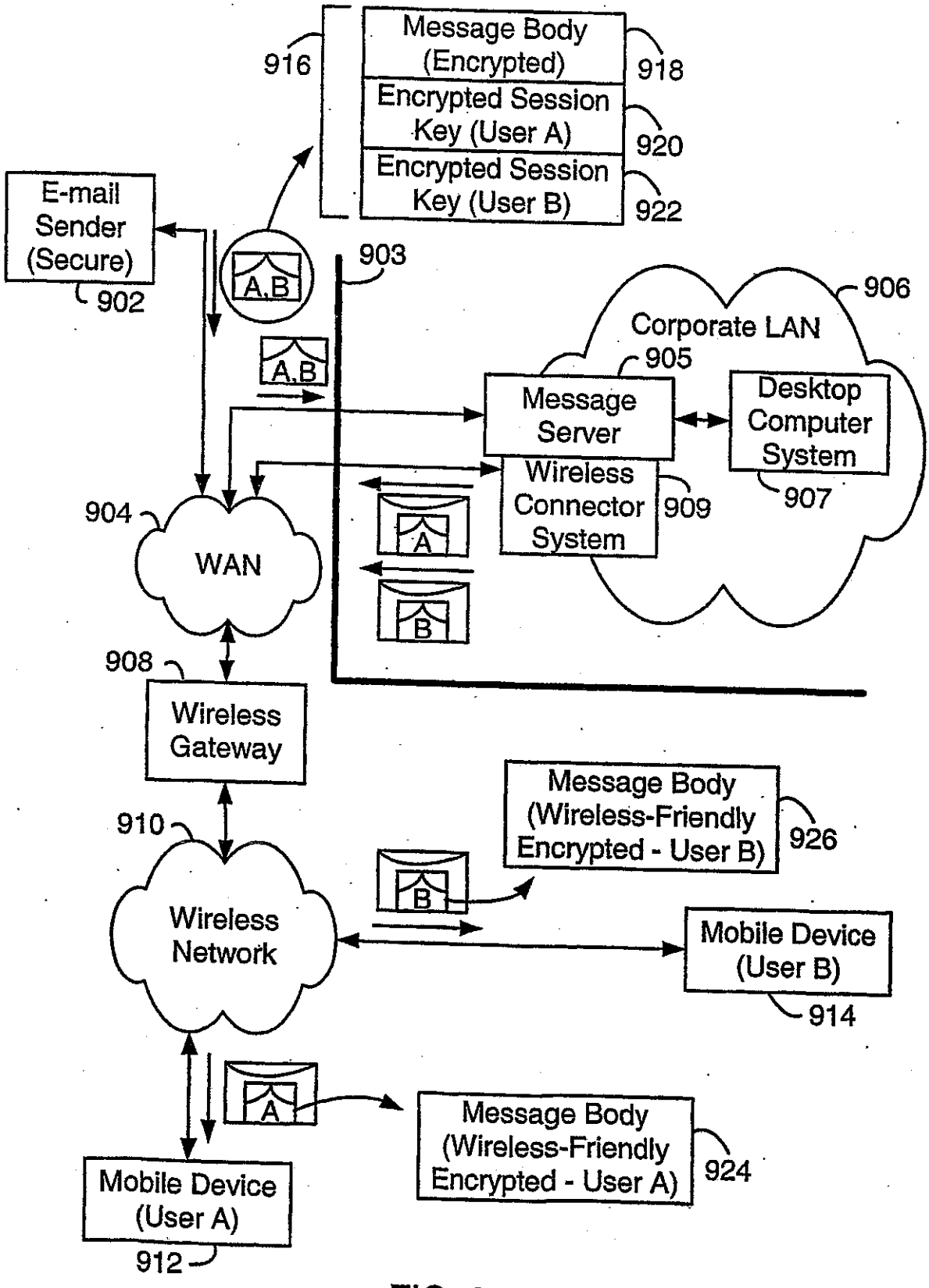

916
Message Body (Encrypted)
918
Encrypted Session Key (User A)
920
Encrypted Session Key (User B)
922
E-mail Sender (Secure)
902
A,B
903
906
Corporate LAN
905
A,B
Message Server
Desktop Computer System
907
Wireless Connector System
909
904
WAN
A
B
908
Wireless Gateway
Message Body (Wireless-Friendly Encrypted - User B)
926
910
B
Wireless Network
Mobile Device (User B)
914
A
Message Body (Wireless-Friendly Encrypted - User A)
924
Mobile Device (User A)
912

FIG. 9

12 DEC 2005



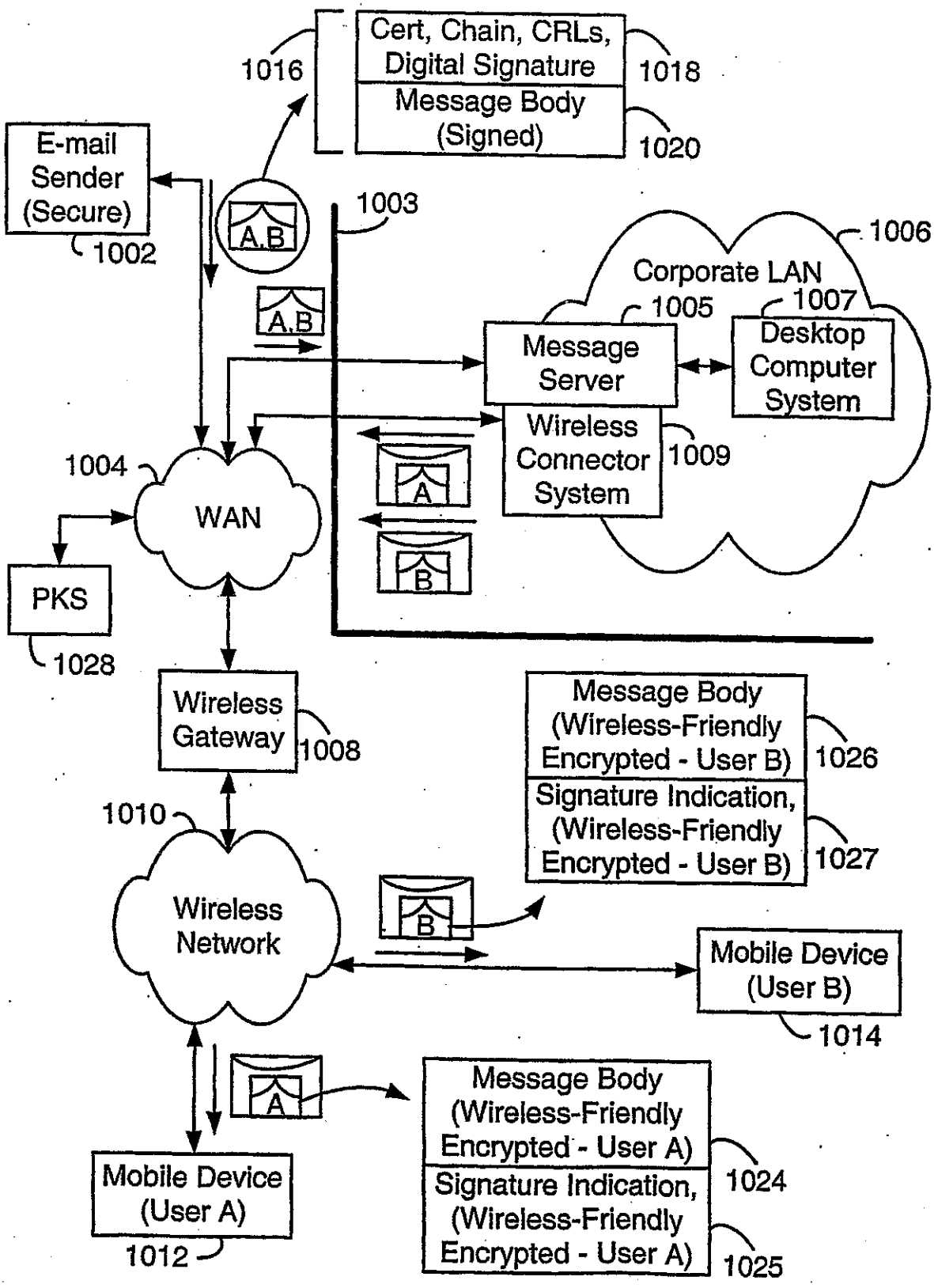



FIG. 10

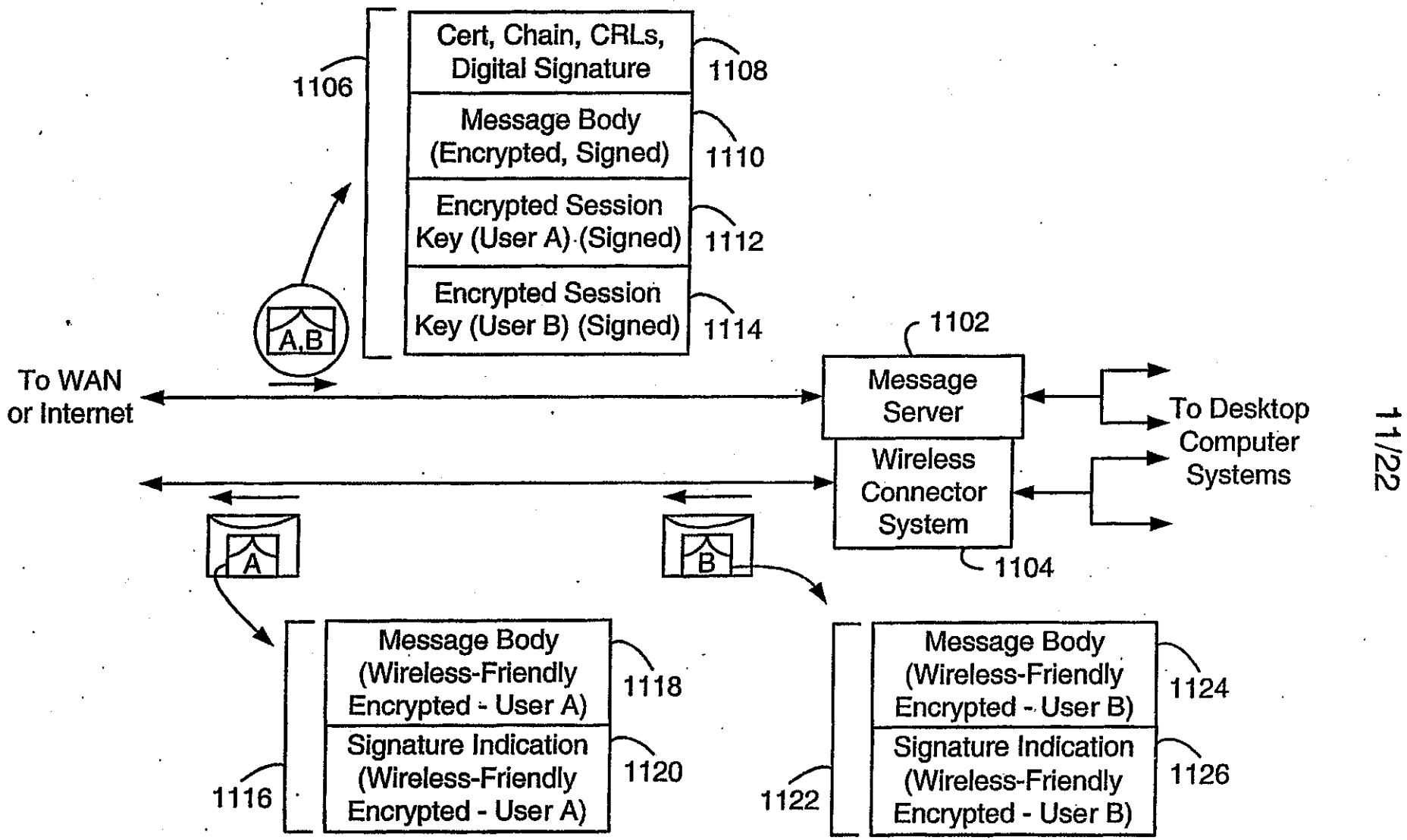



FIG. 11



12 DEC 2005

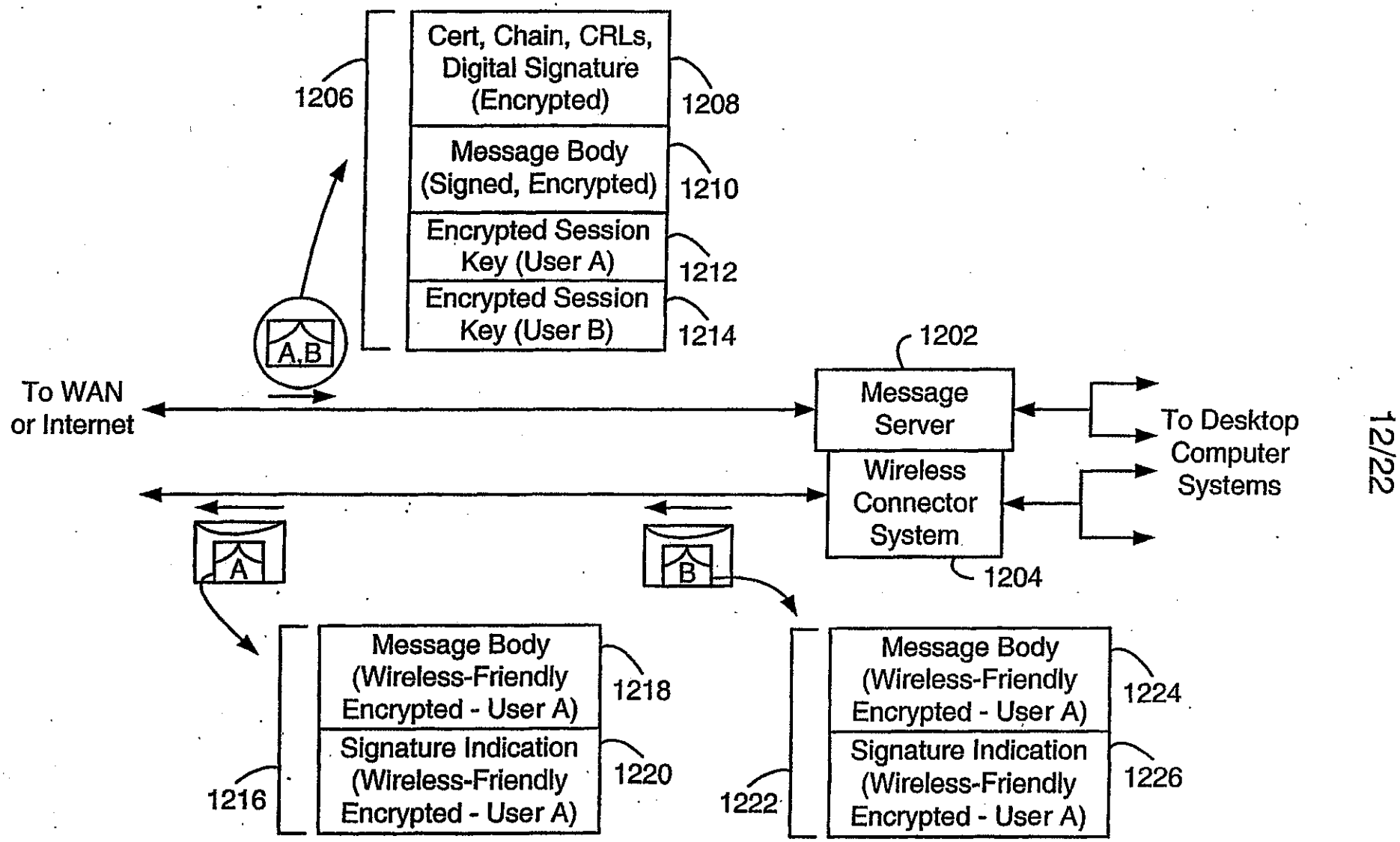



FIG. 12



12 DEC 2005

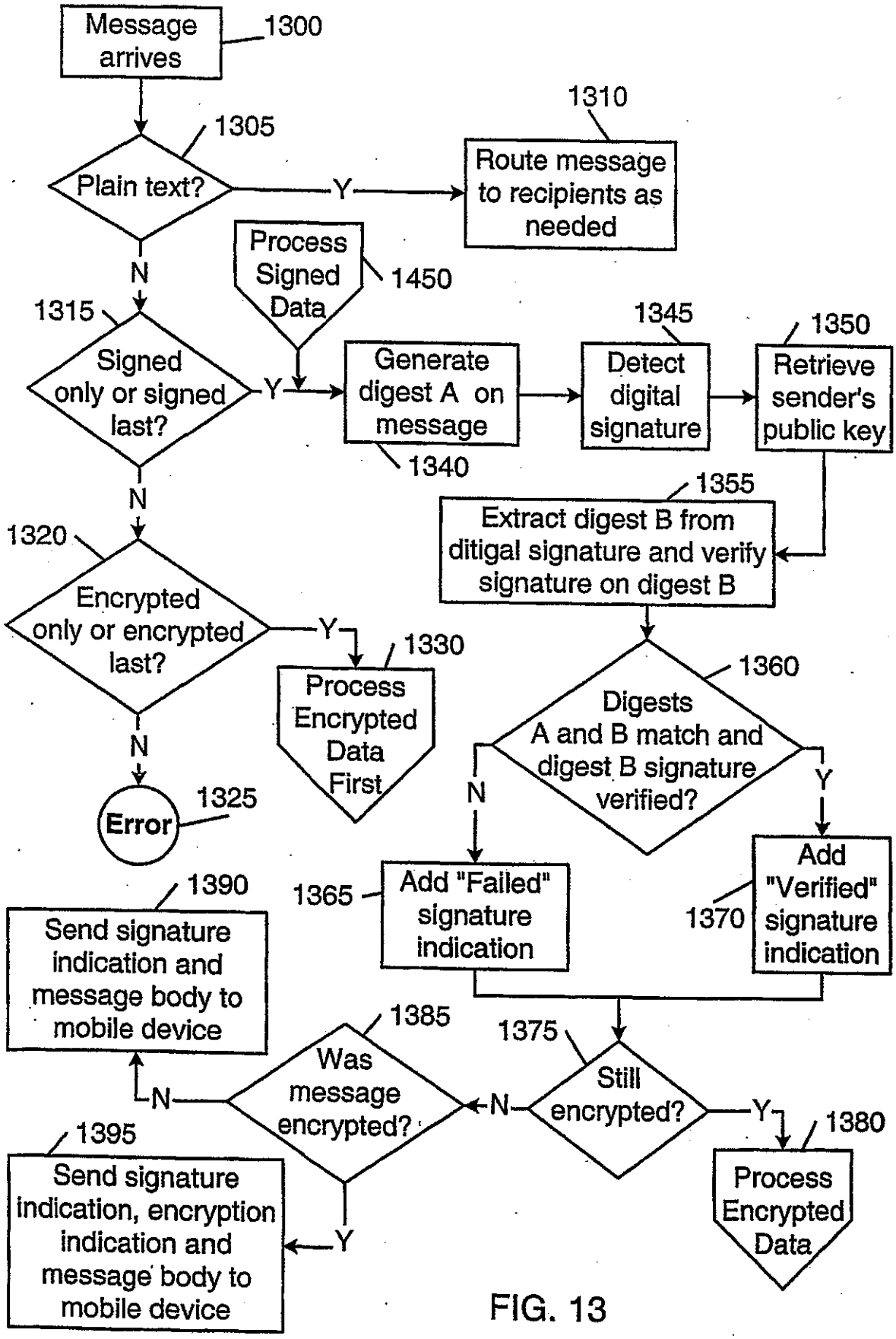

Message arrives
1300
1305
Plain text?
Y
1310
Route message to recipients as needed
N
Process Signed Data
1450
1315
Signed only or signed last?
Y
Generate digest A on message
1340
1345
Detect digital signature
1350
Retrieve sender's public key
N
1355
Extract digest B from ditigal signature and verify signature on digest B
1320
Encrypted only or encrypted last?
Y
1330
Process Encrypted Data First
1360
Digests A and B match and digest B signature verified?
N
Y
N
1325
Error
1365
Add "Failed" signature indication
1370
Add "Verified" signature indication
1390
Send signature indication and message body to mobile device
1385
Was message encrypted?
1375
Still encrypted?
N
N
Y
1380
Process Encrypted Data
1395
Send signature indication, encryption indication and message body to mobile device
Y

FIG. 13

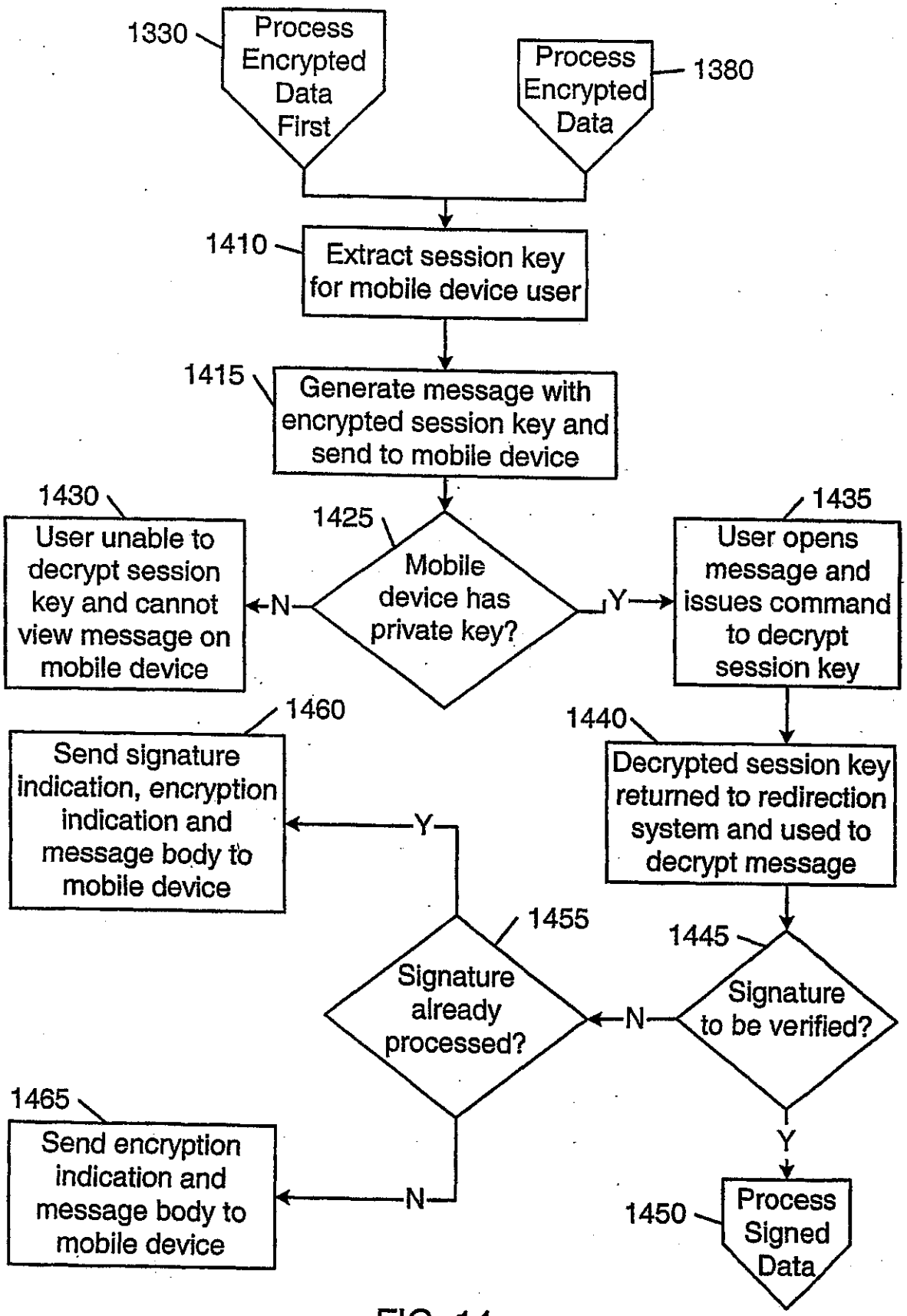

1330
Process Encrypted Data First
Process Encrypted Data
1380
1410
Extract session key for mobile device user
1415
Generate message with encrypted session key and send to mobile device
1425
Mobile device has private key?
N
Y
1430
User unable to decrypt session key and cannot view message on mobile device
1435
User opens message and issues command to decrypt session key
1440
Decrypted session key returned to redirection system and used to decrypt message
1445
Signature to be verified?
N
Y
1450
Process Signed Data
1455
Signature already processed?
Y
N
1460
Send signature indication, encryption indication and message body to mobile device
1465
Send encryption indication and message body to mobile device

FIG. 14

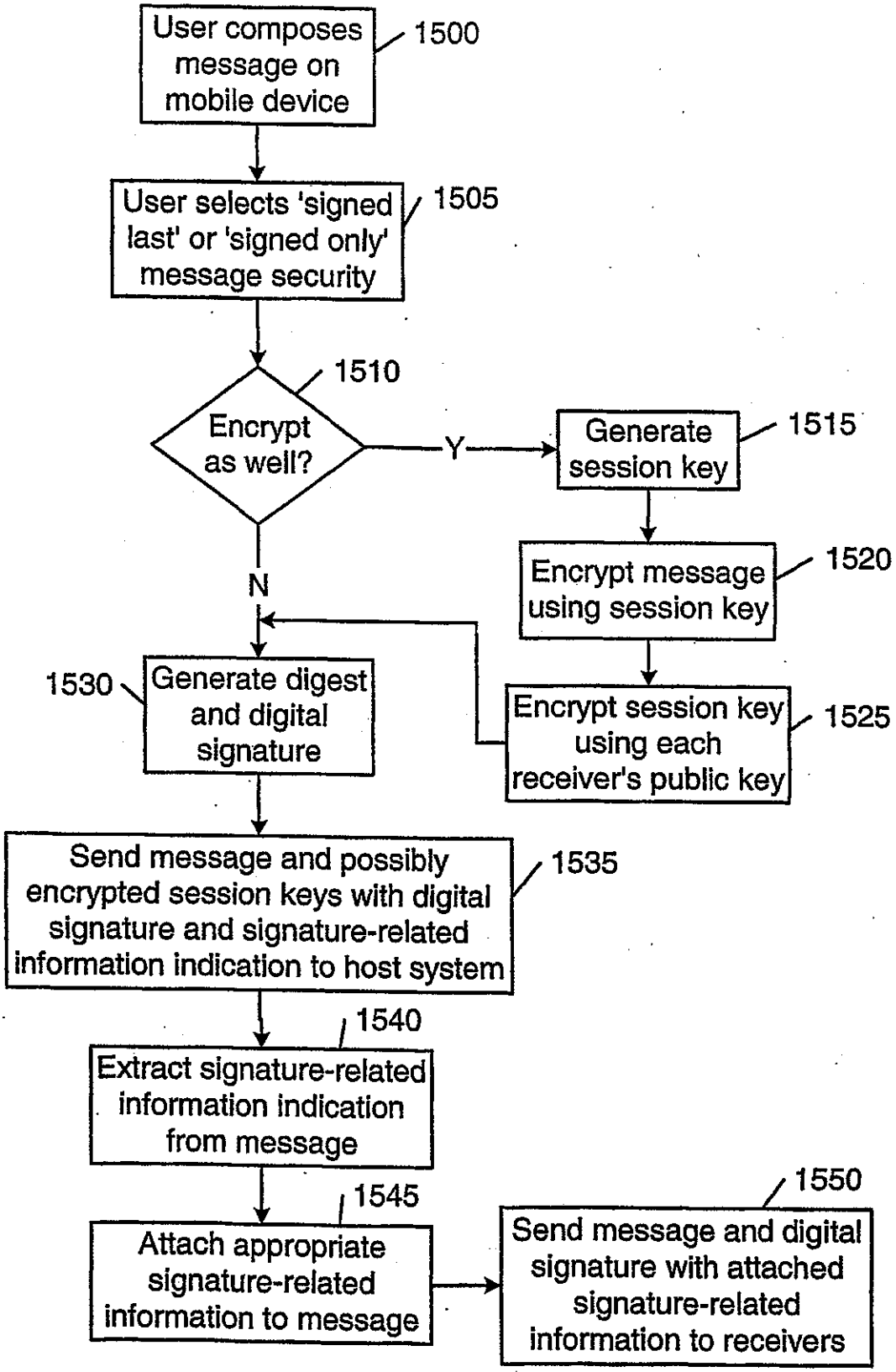

User composes message on mobile device
1500
User selects 'signed last' or 'signed only' message security
1505
Encrypt as well?
1510
Y
N
Generate session key
1515
Encrypt message using session key
1520
Encrypt session key using each receiver's public key
1525
Generate digest and digital signature
1530
Send message and possibly encrypted session keys with digital signature and signature-related information indication to host system
1535
Extract signature-related information indication from message
1540
Attach appropriate signature-related information to message
1545
Send message and digital signature with attached signature-related information to receivers
1550

FIG. 15

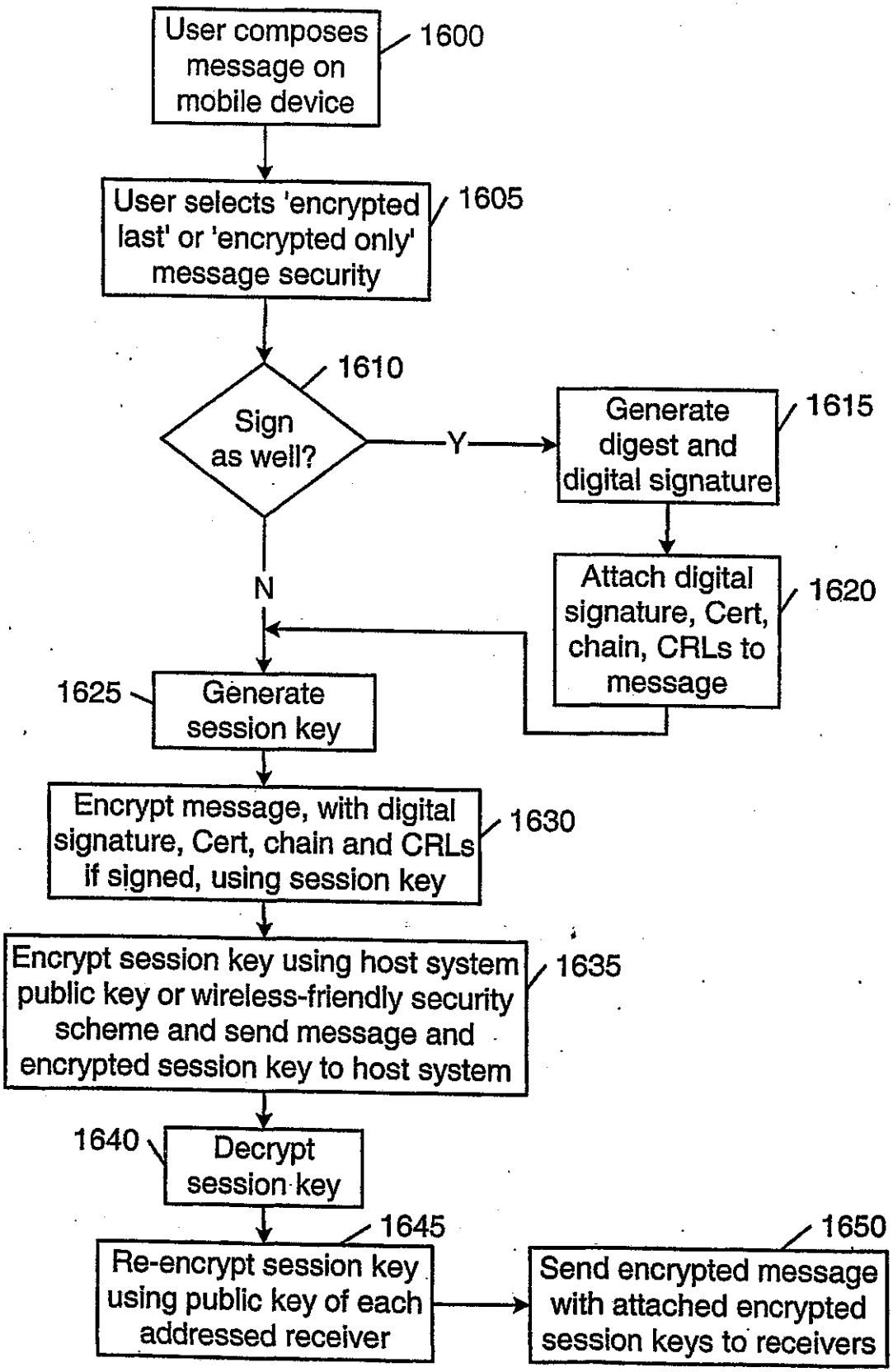

User composes message on mobile device
1600
User selects 'encrypted last' or 'encrypted only' message security
1605
1610
Sign as well?
Y
Generate digest and digital signature
1615
N
Attach digital signature, Cert, chain, CRLs to message
1620
1625
Generate session key
Encrypt message, with digital signature, Cert, chain and CRLs if signed, using session key
1630
Encrypt session key using host system public key or wireless-friendly security scheme and send message and encrypted session key to host system
1635
1640
Decrypt session key
1645
Re-encrypt session key using public key of each addressed receiver
1650
Send encrypted message with attached encrypted session keys to receivers

FIG. 16

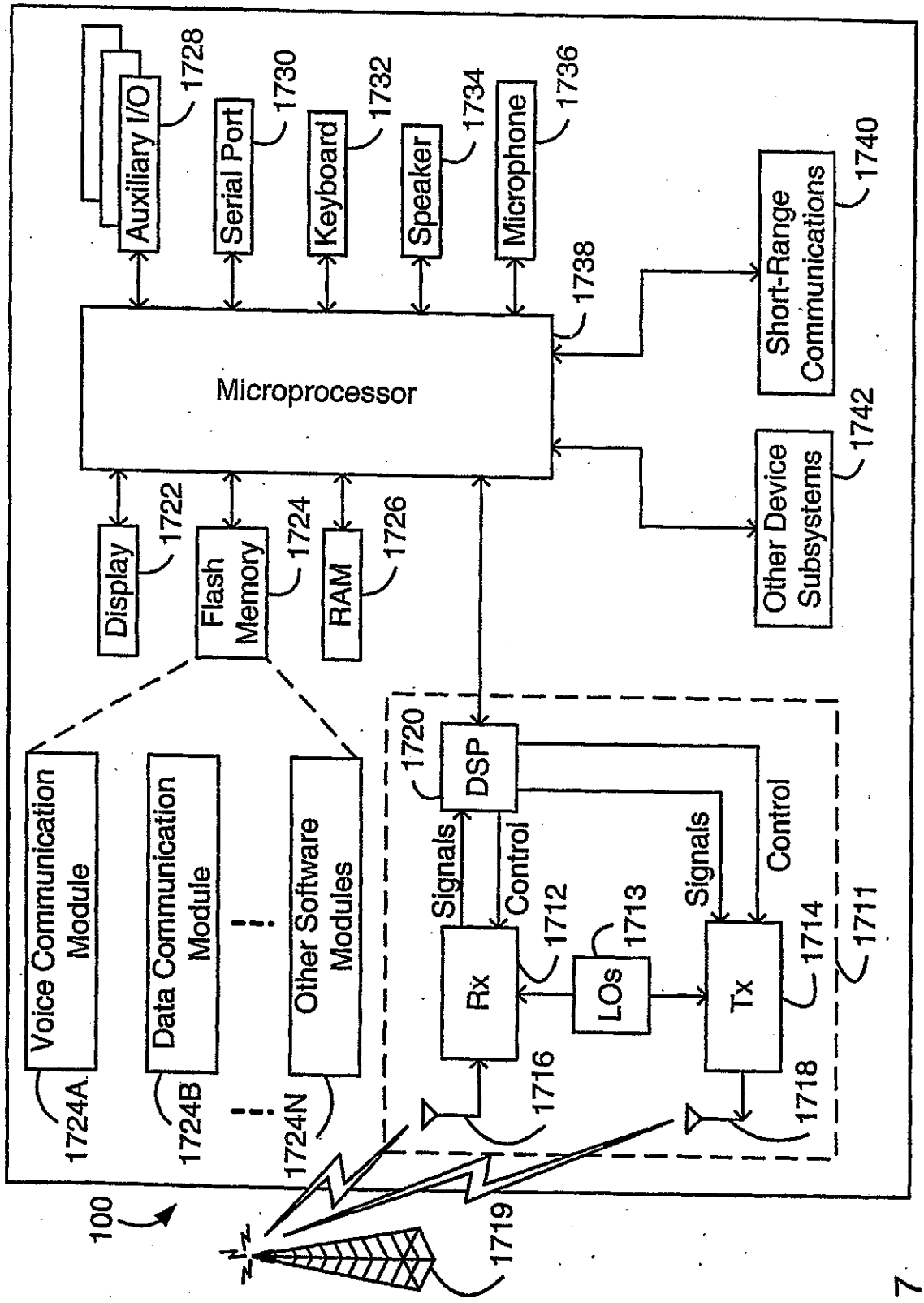

Auxiliary I/O
1728
Serial Port
1730
Keyboard
1732
Speaker
1734
Microphone
1736
1738
Microprocessor
Short-Range Communications
1740
Other Device Subsystems
1742
Display
1722
Flash Memory
1724
RAM
1726
Voice Communication Module
1724A
Data Communication Module
1724B
Other Software Modules
1724N
1720
DSP
Signals
Control
Rx
1712
LOs
1713
Signals
Control
Tx
1714
1711
1716
1718
100
1719

FIG. 17

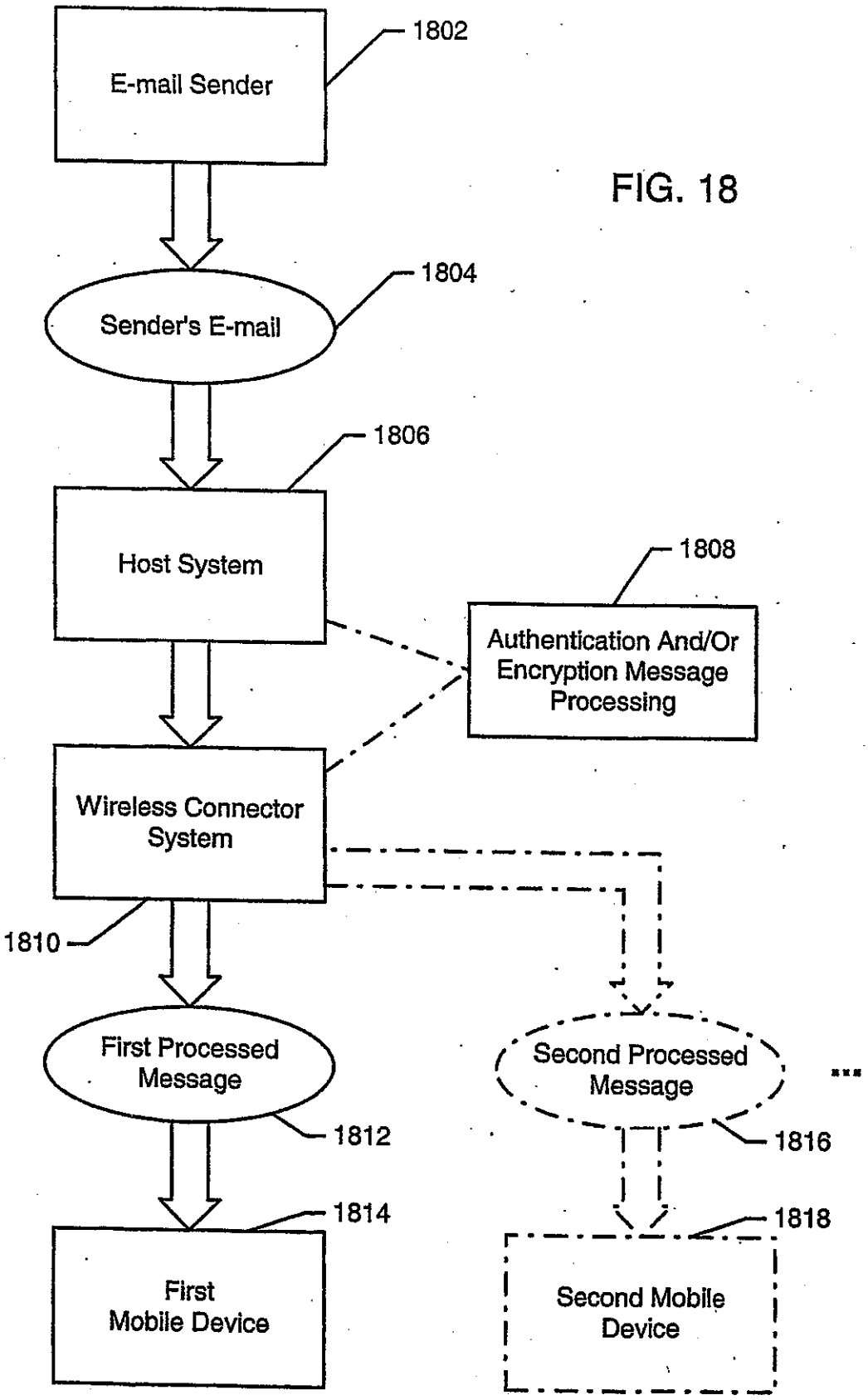

E-mail Sender
1802
Sender's E-mail
1804
Host System
1806
Authentication And/Or Encryption Message Processing
1808
Wireless Connector System
1810
First Processed Message
1812
Second Processed Message
1816
First Mobile Device
1814
Second Mobile Device
1818

FIG. 18

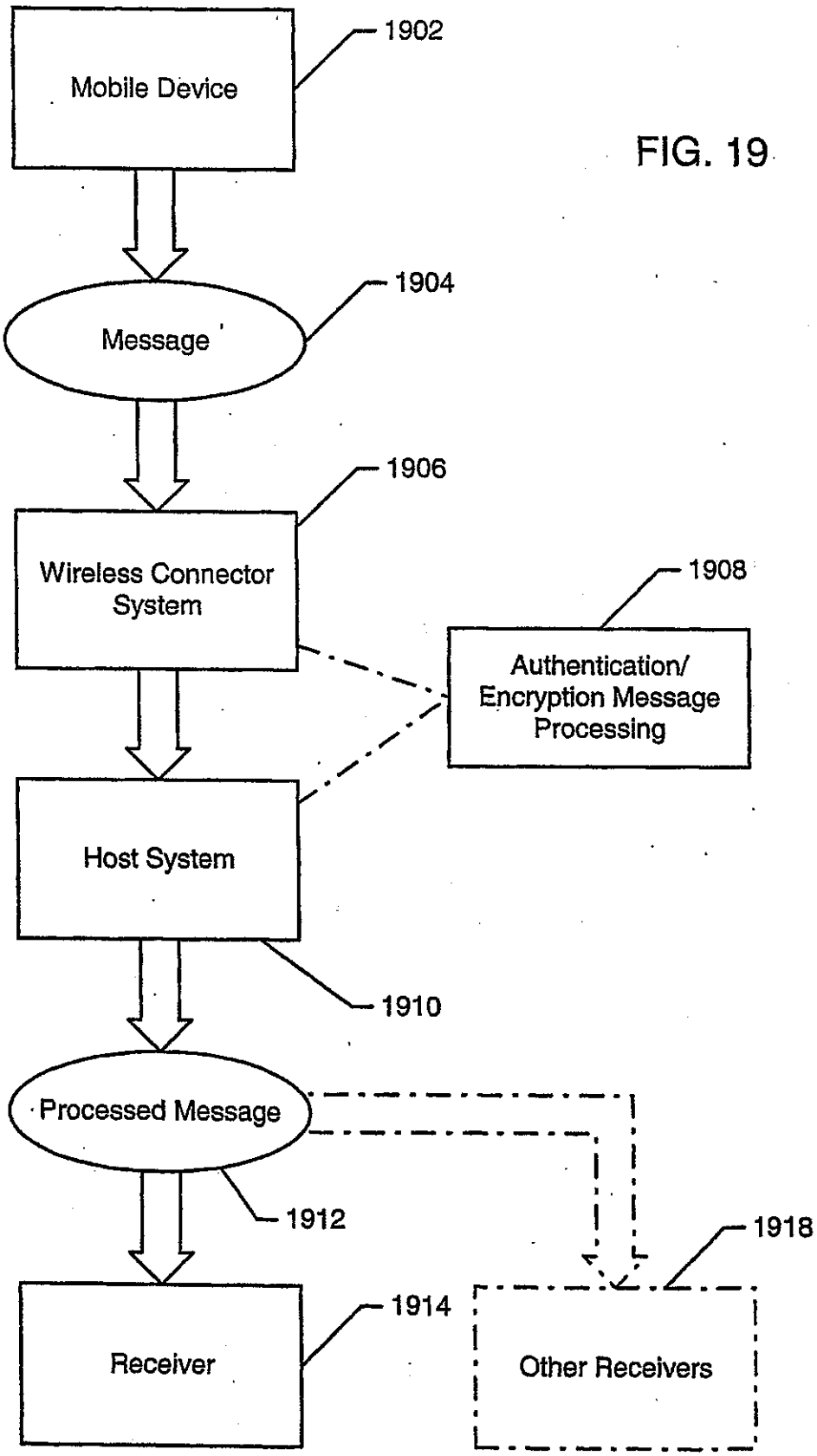

Mobile Device
1902
Message
1904
Wireless Connector System
1906
Authentication/ Encryption Message Processing
1908
Host System
1910
Processed Message
1912
Receiver
1914
Other Receivers
1918

FIG. 19

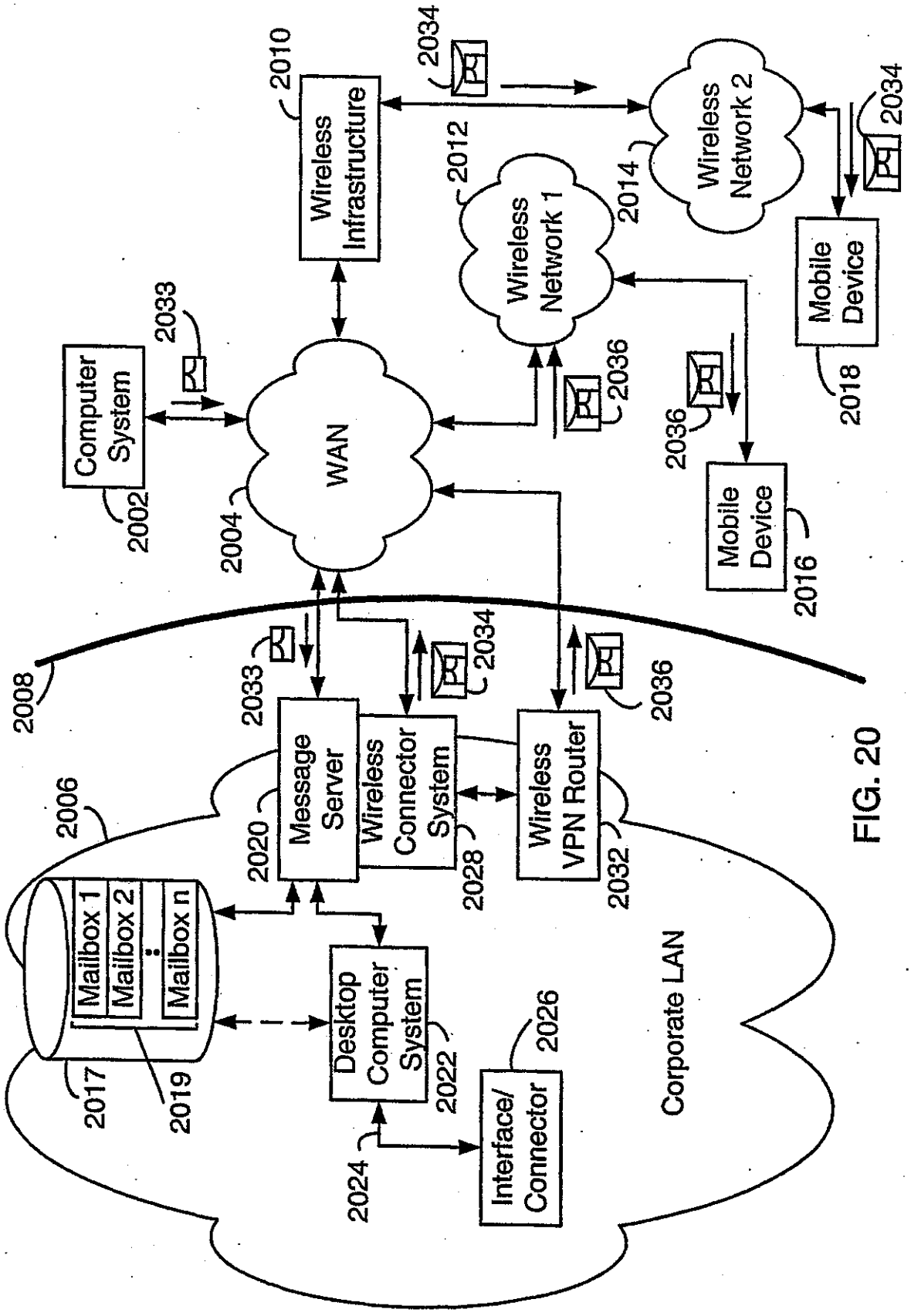

Wireless Infrastructure
2010
2034
Wireless Network 2
2012
2014
Wireless Network 1
Mobile Device
2018
Computer System
2033
2002
WAN
2004
2036
Mobile Device
2016
2008
Message Server
2020
Wireless Connector System
2028
Wireless VPN Router
2032
2006
Mailbox 1
Mailbox 2
Mailbox n
2017
2019
Desktop Computer System
2022
Interface/ Connector
2026
2024
Corporate LAN

FIG. 20

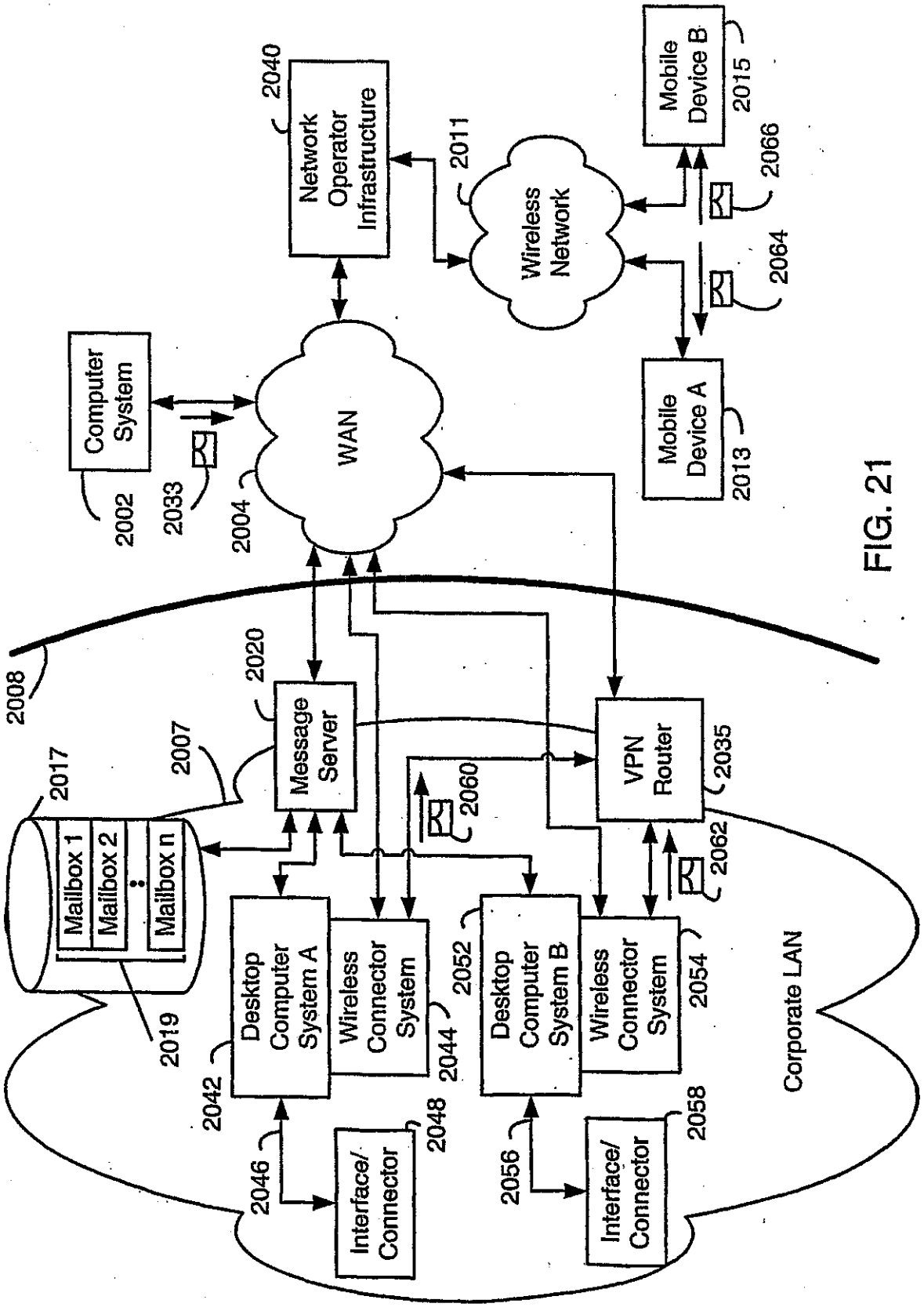

Computer System
2002
2033
WAN
2004
Network Operator Infrastructure
2040
2011
Wireless Network
Mobile Device B
2015
2066
2064
Mobile Device A
2013
2008
2020
Message Server
2007
2017
Mailbox 1
Mailbox 2
Mailbox n
2019
2060
VPN Router
2035
2062
Desktop Computer System A
Wireless Connector System
2042
2044
Desktop Computer System B
Wireless Connector System
2052
2054
Interface/ Connector
2046
2048
Interface/ Connector
2056
2058
Corporate LAN

FIG. 21

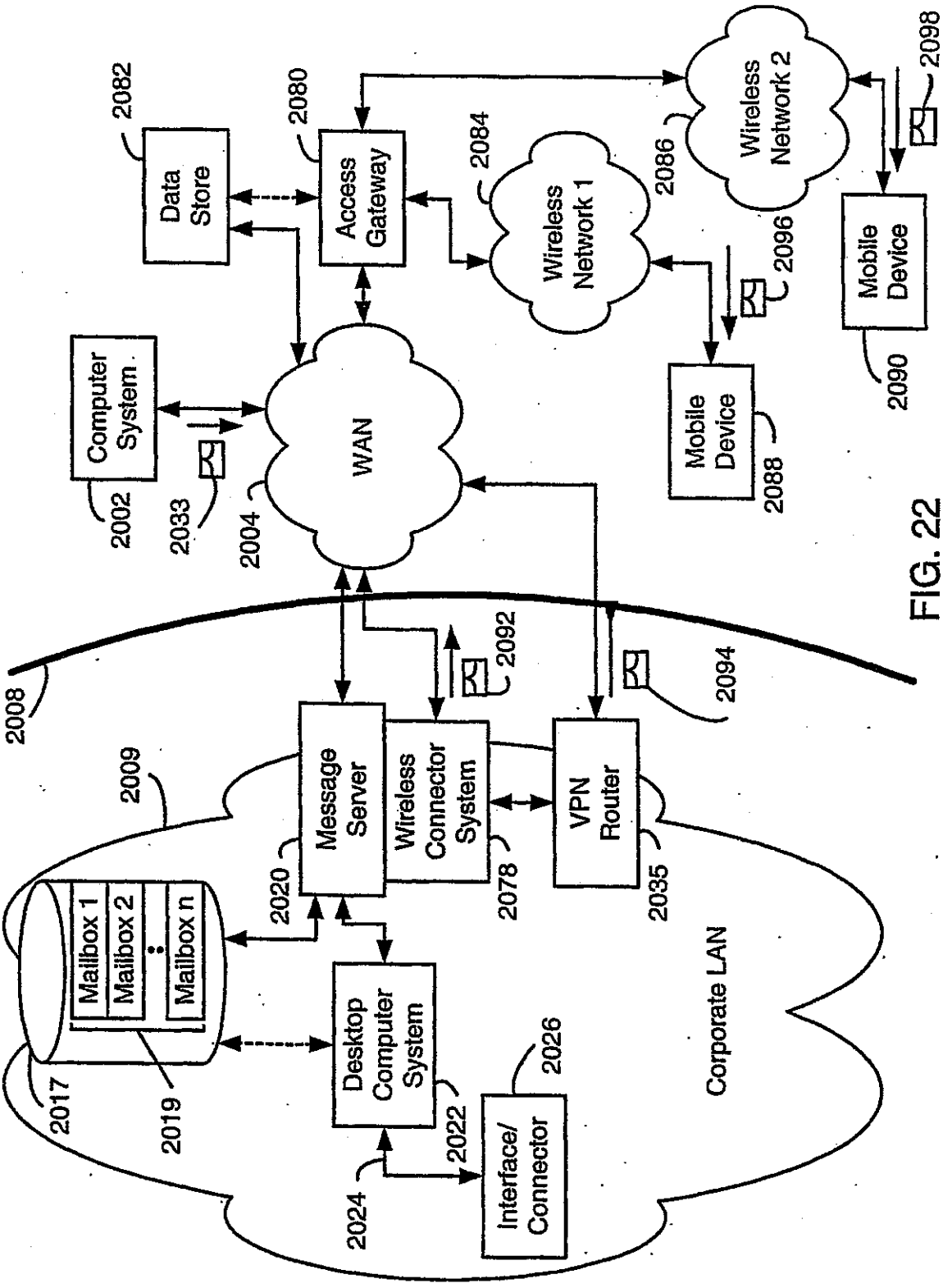

2082
Data Store
2080
Access Gateway
2084
Wireless Network 1
2086
Wireless Network 2
2098
Mobile Device
2096
2090
Computer System
2002
2033
WAN
2004
Mobile Device
2088
2008
2092
2094
2009
Message Server
2020
Wireless Connector System
2078
VPN Router
2035
Mailbox 1
Mailbox 2
Mailbox n
2017
2019
Desktop Computer System
2022
2024
Interface/ Connector
2026
Corporate LAN

FIG. 22