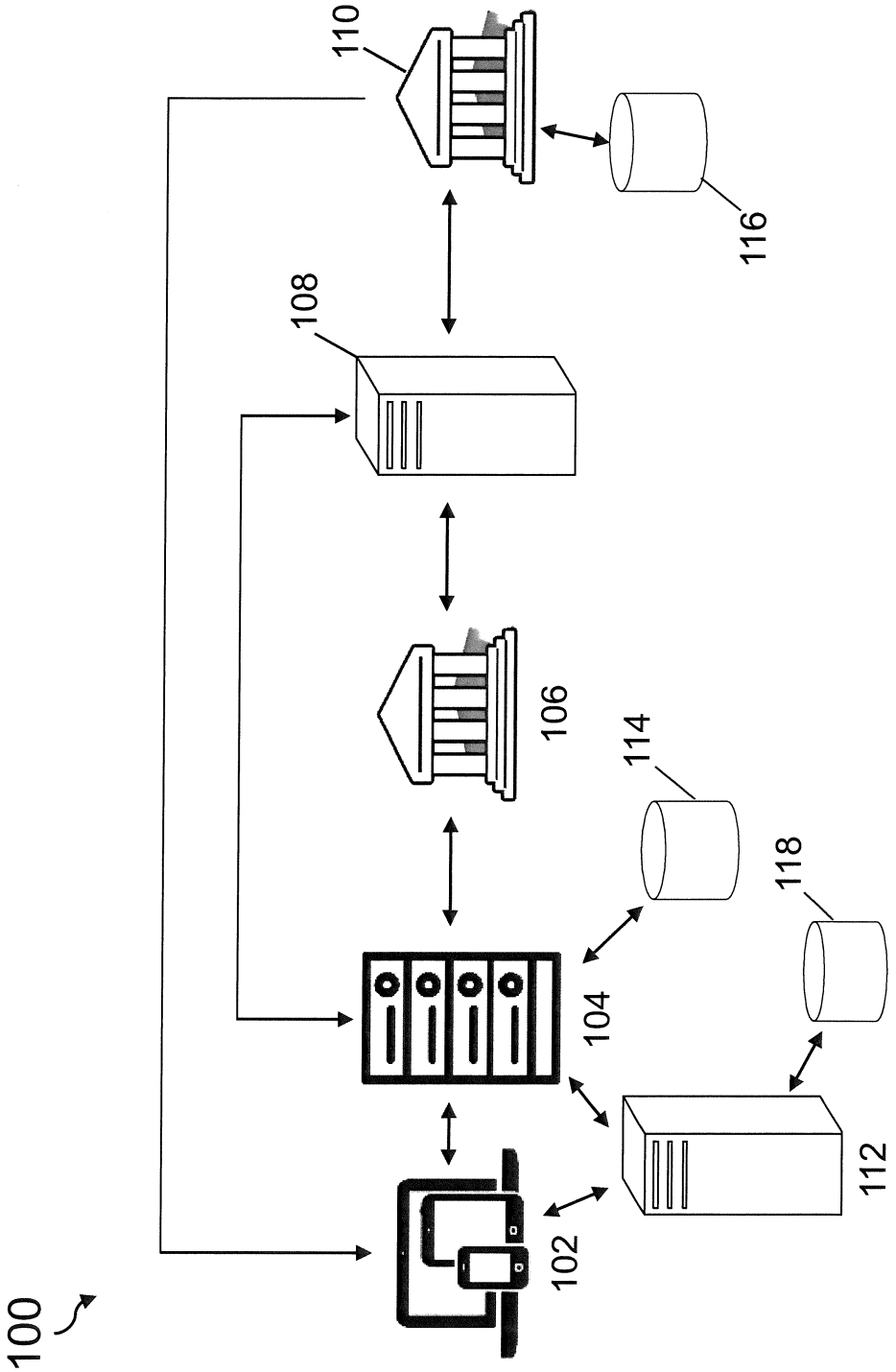

Fig. 1

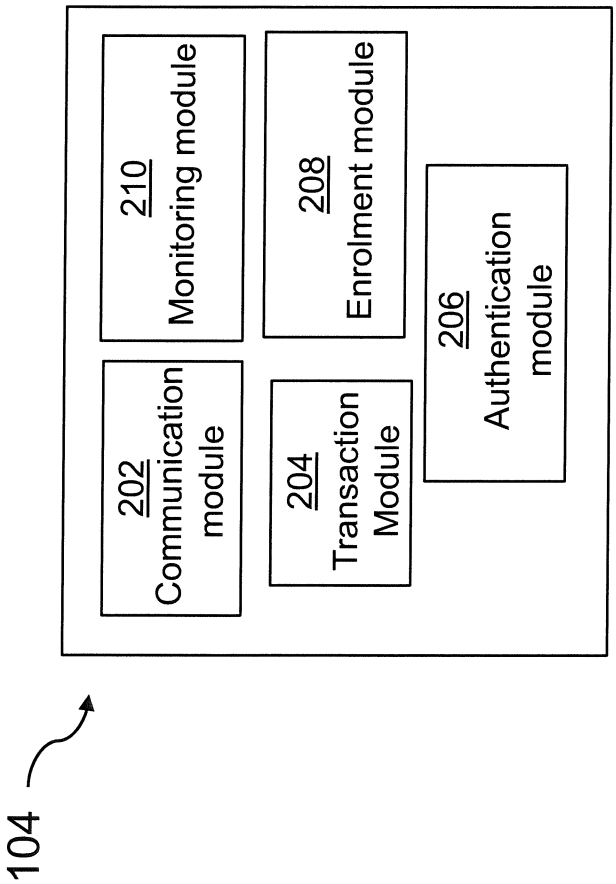
104
202 Communication module
204 Transaction Module
206 Authentication module
208 Enrolment module
210 Monitoring module

Fig. 2

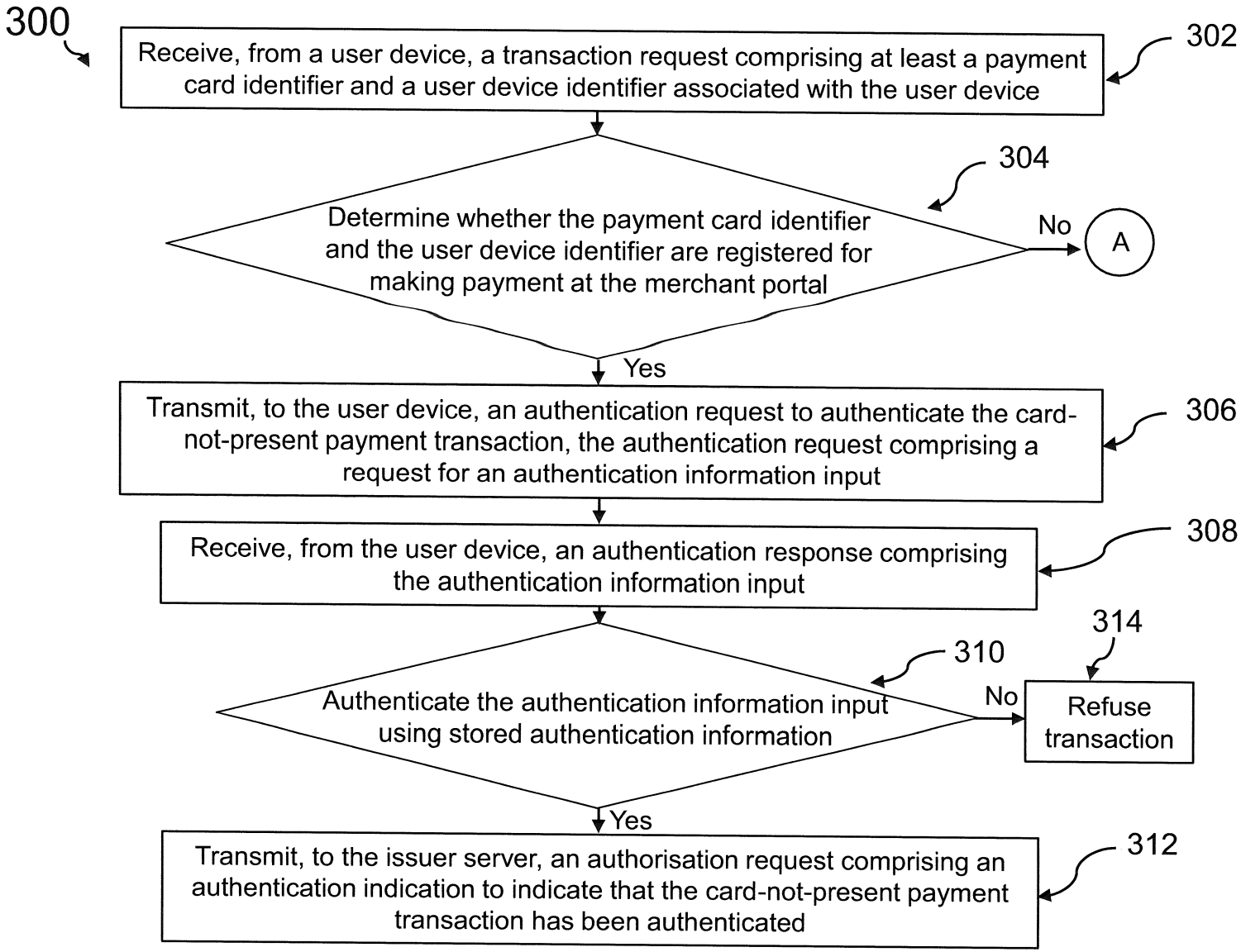
300
Receive, from a user device, a transaction request comprising at least a payment card identifier and a user device identifier associated with the user device
302
Determine whether the payment card identifier and the user device identifier are registered for making payment at the merchant portal
304
No
A
Yes
Transmit, to the user device, an authentication request to authenticate the card-not-present payment transaction, the authentication request comprising a request for an authentication information input
306
Receive, from the user device, an authentication response comprising the authentication information input
308
Authenticate the authentication information input using stored authentication information
310
No
314
Refuse transaction
Yes
Transmit, to the issuer server, an authorisation request comprising an authentication indication to indicate that the card-not-present payment transaction has been authenticated
312

Fig. 3

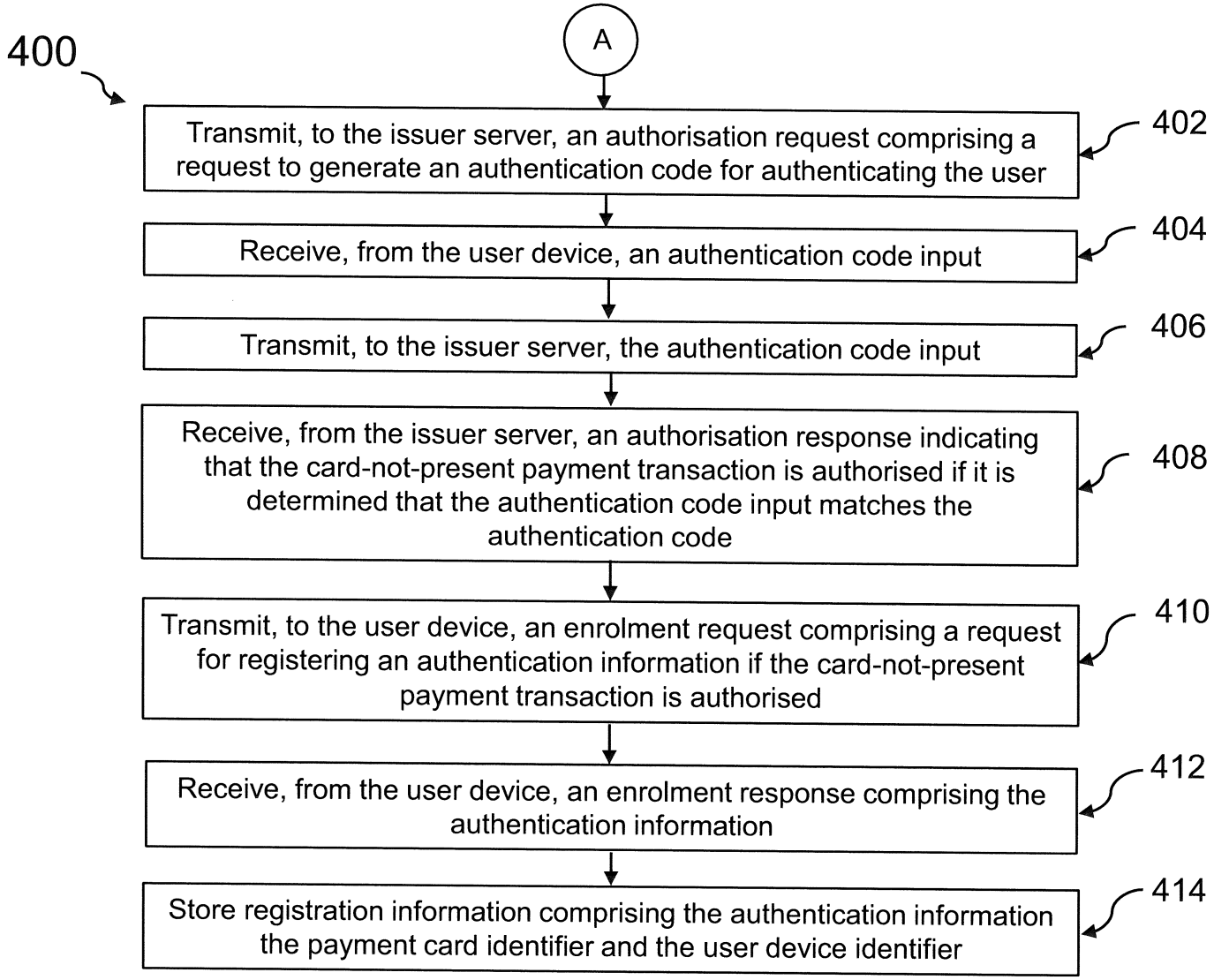
400
A
Transmit, to the issuer server, an authorisation request comprising a request to generate an authentication code for authenticating the user
402
Receive, from the user device, an authentication code input
404
Transmit, to the issuer server, the authentication code input
406
Receive, from the issuer server, an authorisation response indicating that the card-not-present payment transaction is authorised if it is determined that the authentication code input matches the authentication code
408
Transmit, to the user device, an enrolment request comprising a request for registering an authentication information if the card-not-present payment transaction is authorised
410
Receive, from the user device, an enrolment response comprising the authentication information
412
Store registration information comprising the authentication information the payment card identifier and the user device identifier
414

Fig. 4

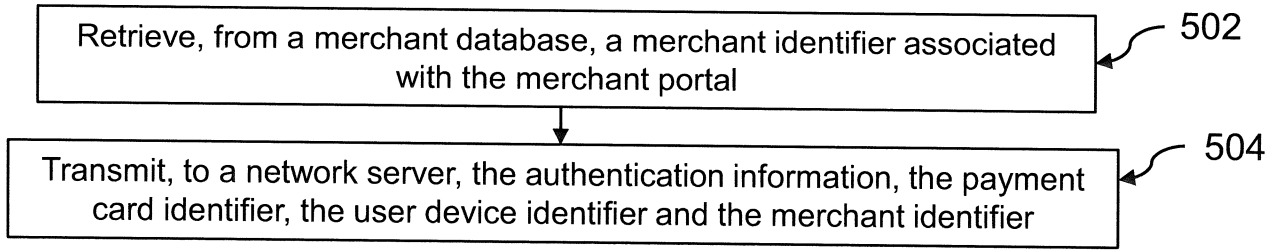

Fig. 5A

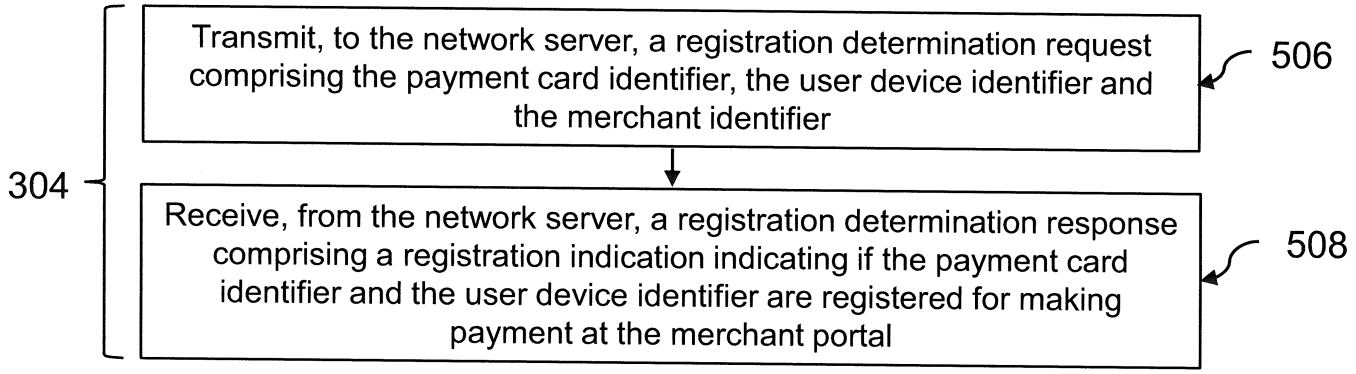

Fig. 5B

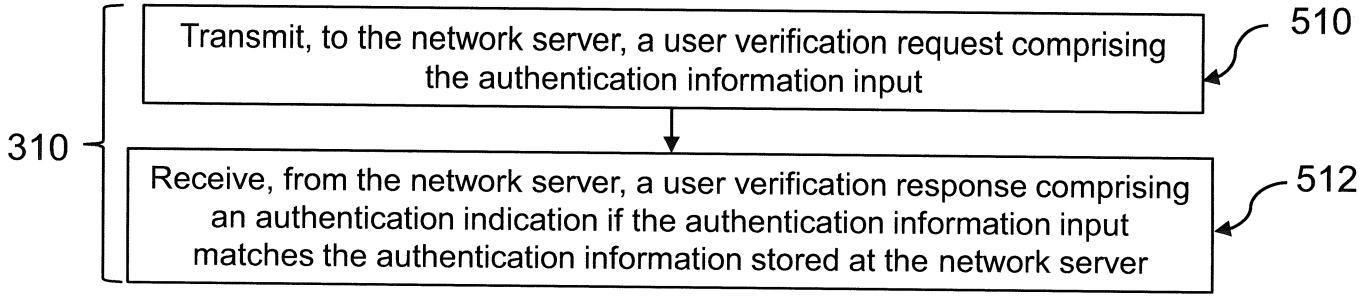

Fig. 5C

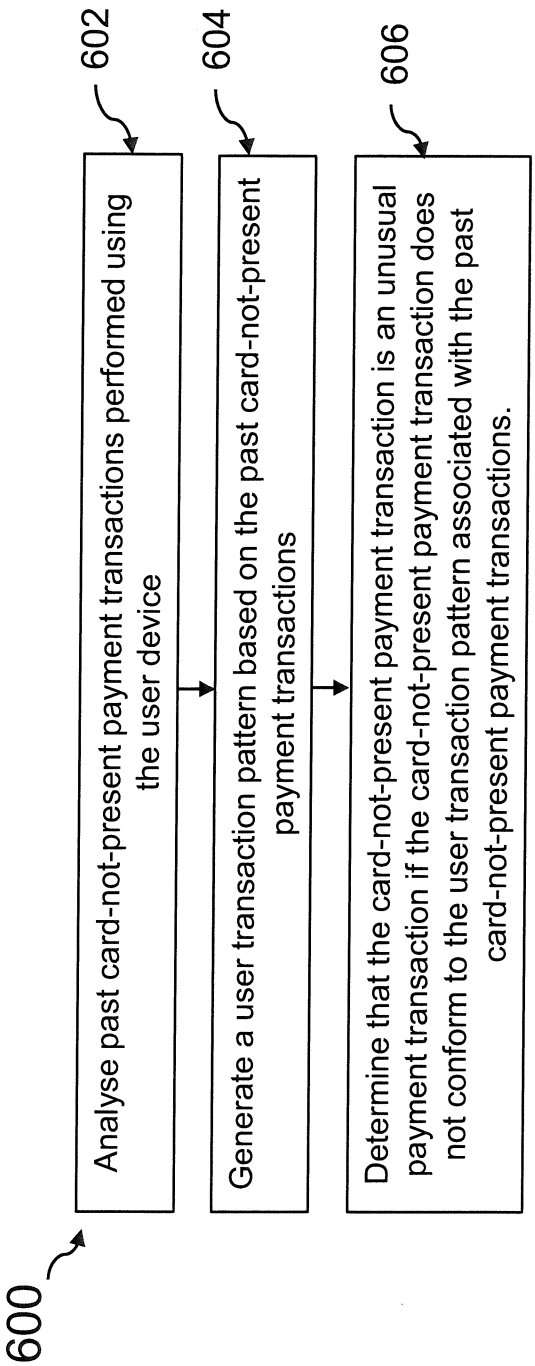
600
602
Analyse past card-not-present payment transactions performed using the user device
604
Generate a user transaction pattern based on the past card-not-present payment transactions
606
Determine that the card-not-present payment transaction is an unusual payment transaction if the card-not-present payment transaction does not conform to the user transaction pattern associated with the past card-not-present payment transactions.

Fig. 6

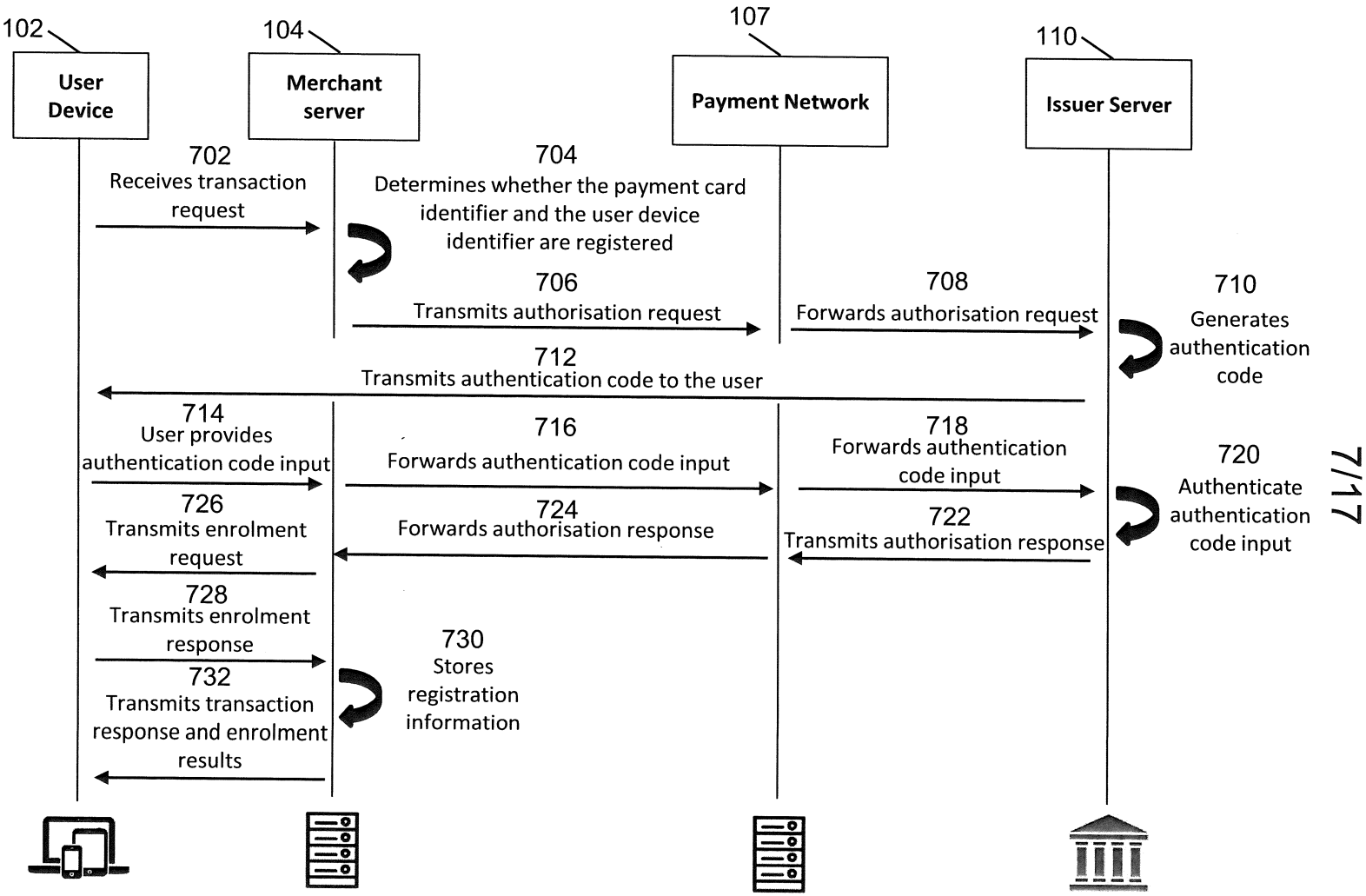
102
User Device
104
Merchant server
107
Payment Network
110
Issuer Server
702
Receives transaction request
704
Determines whether the payment card identifier and the user device identifier are registered
706
Transmits authorisation request
708
Forwards authorisation request
710
Generates authentication code
712
Transmits authentication code to the user
714
User provides authentication code input
716
Forwards authentication code input
718
Forwards authentication code input
720
Authenticate authentication code input
722
Transmits authorisation response
724
Forwards authorisation response
726
Transmits enrolment request
728
Transmits enrolment response
730
Stores registration information
732
Transmits transaction response and enrolment results
7/17

Fig. 7

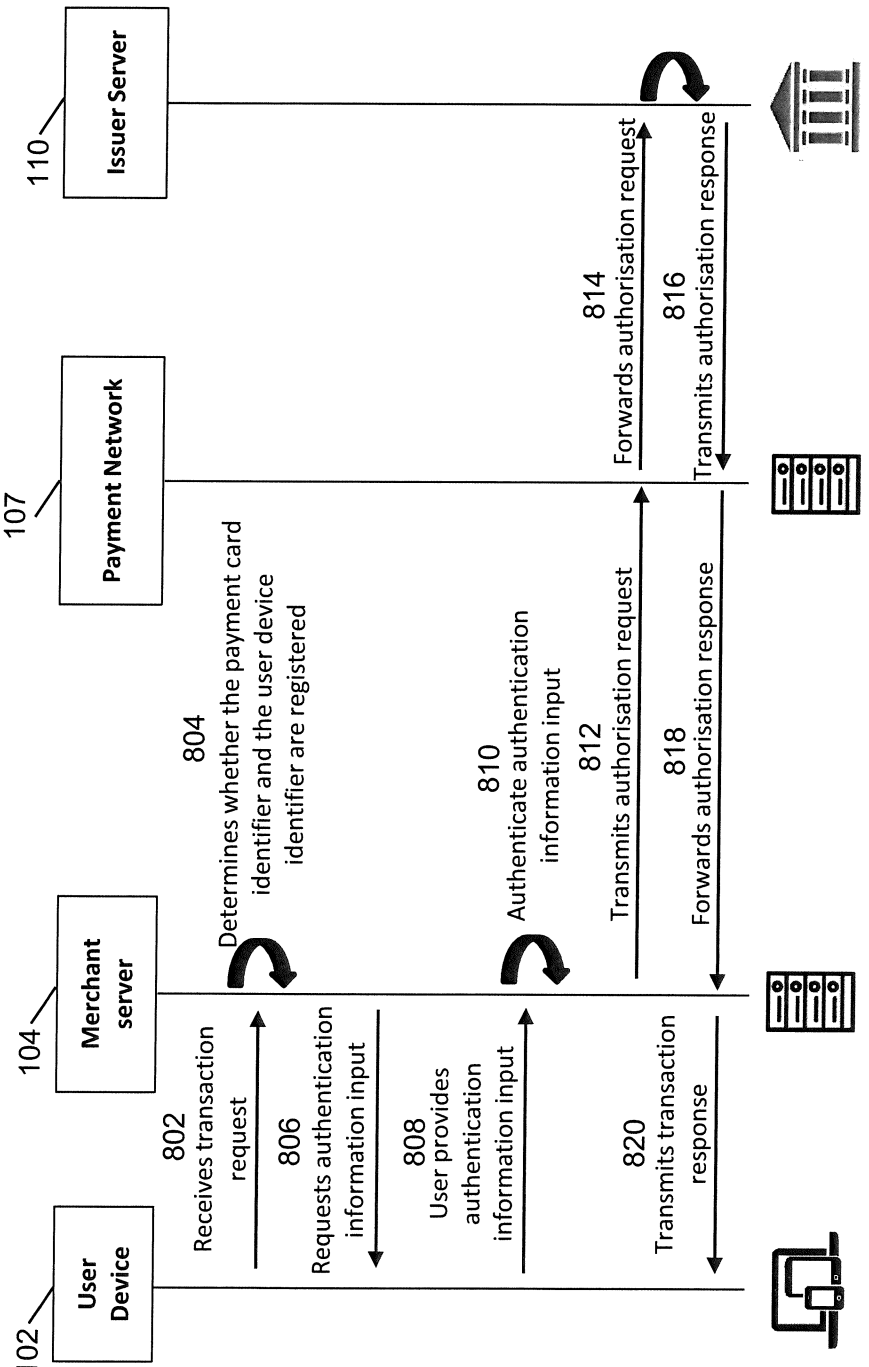
102
User Device
104
Merchant server
107
Payment Network
110
Issuer Server
802
Receives transaction request
804
Determines whether the payment card identifier and the user device identifier are registered
806
Requests authentication information input
808
User provides authentication information input
810
Authenticate authentication information input
812
Transmits authorisation request
814
Forwards authorisation request
816
Transmits authorisation response
818
Forwards authorisation response
820
Transmits transaction response

Fig. 8

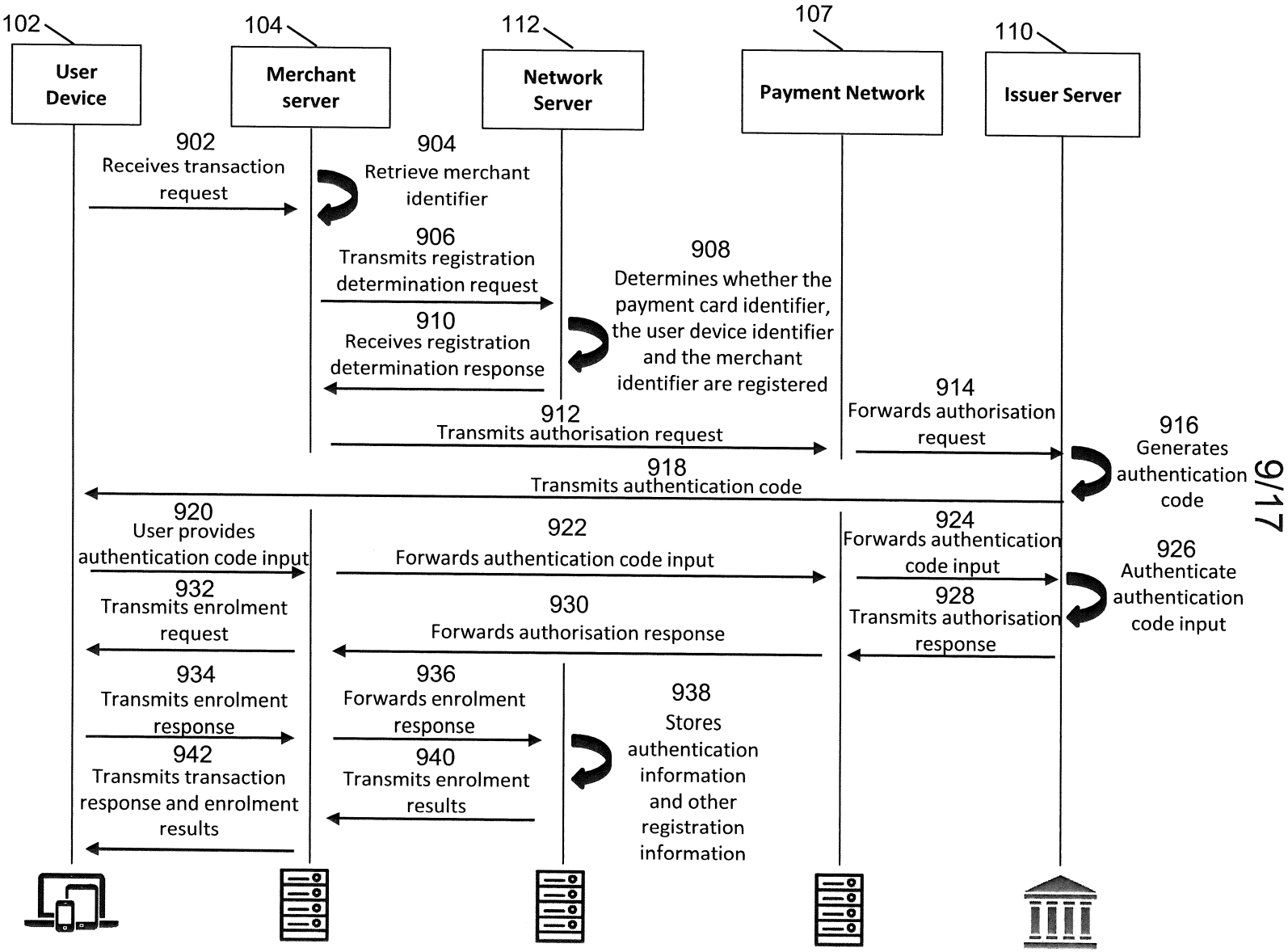
102
User Device
104
Merchant server
112
Network Server
107
Payment Network
110
Issuer Server
902
Receives transaction request
904
Retrieve merchant identifier
906
Transmits registration determination request
908
Determines whether the payment card identifier, the user device identifier and the merchant identifier are registered
910
Receives registration determination response
912
Transmits authorisation request
914
Forwards authorisation request
916
Generates authentication code
918
Transmits authentication code
920
User provides authentication code input
922
Forwards authentication code input
924
Forwards authentication code input
926
Authenticate authentication code input
928
Transmits authorisation response
930
Forwards authorisation response
932
Transmits enrolment request
934
Transmits enrolment response
936
Forwards enrolment response
938
Stores authentication information and other registration information
940
Transmits enrolment results
942
Transmits transaction response and enrolment results

Fig. 9

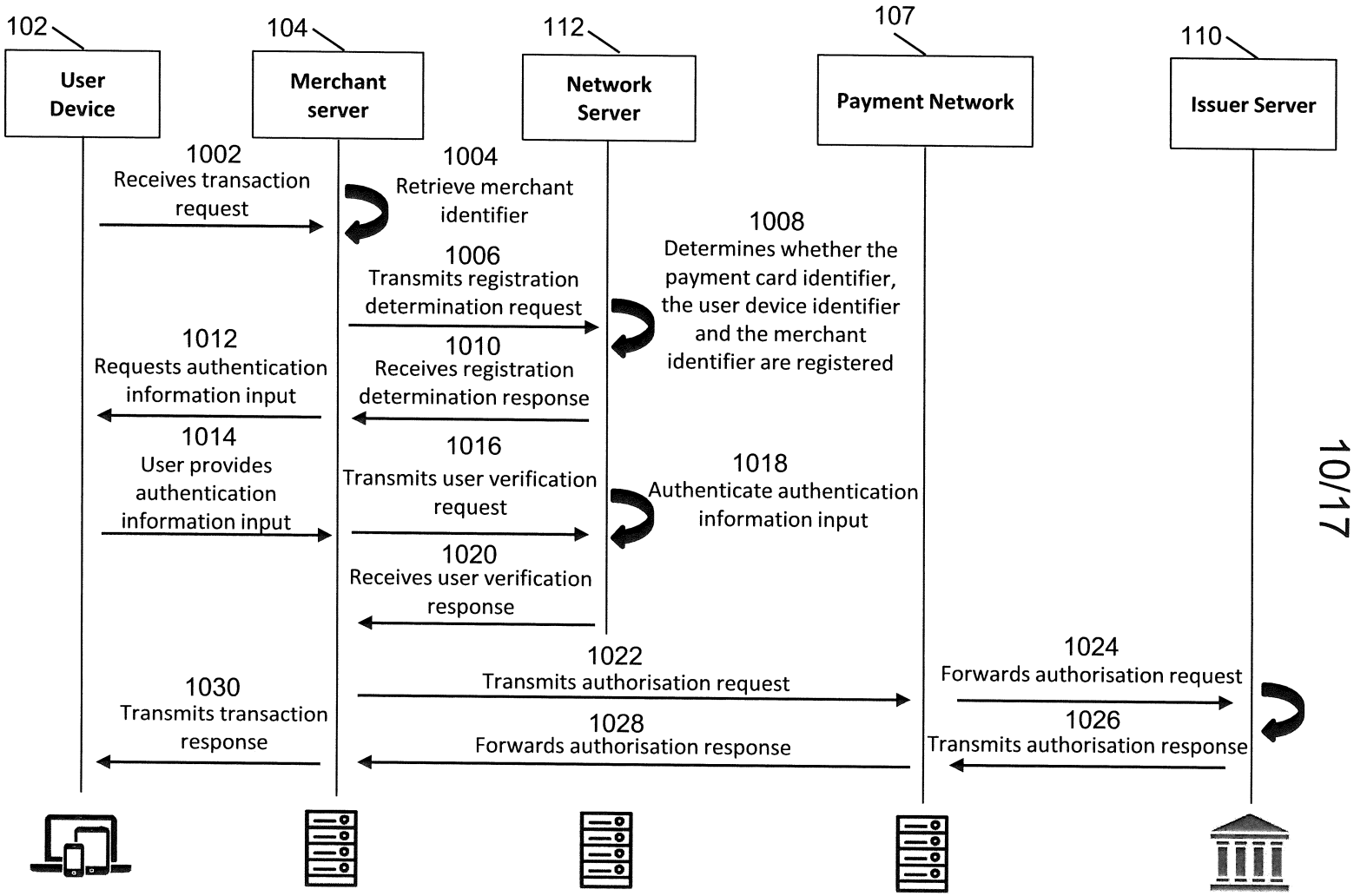
102
User Device
104
Merchant server
112
Network Server
107
Payment Network
110
Issuer Server
1002
Receives transaction request
1004
Retrieve merchant identifier
1006
Transmits registration determination request
1008
Determines whether the payment card identifier, the user device identifier and the merchant identifier are registered
1010
Receives registration determination response
1012
Requests authentication information input
1014
User provides authentication information input
1016
Transmits user verification request
1018
Authenticate authentication information input
1020
Receives user verification response
1022
Transmits authorisation request
1024
Forwards authorisation request
1026
Transmits authorisation response
1028
Forwards authorisation response
1030
Transmits transaction response

Fig. 10

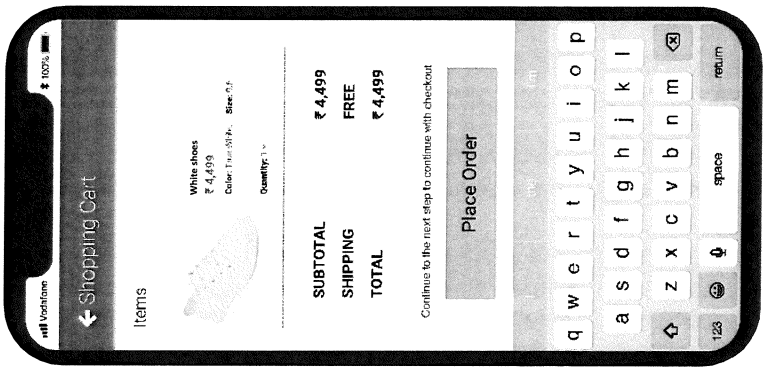

Fig. 11A

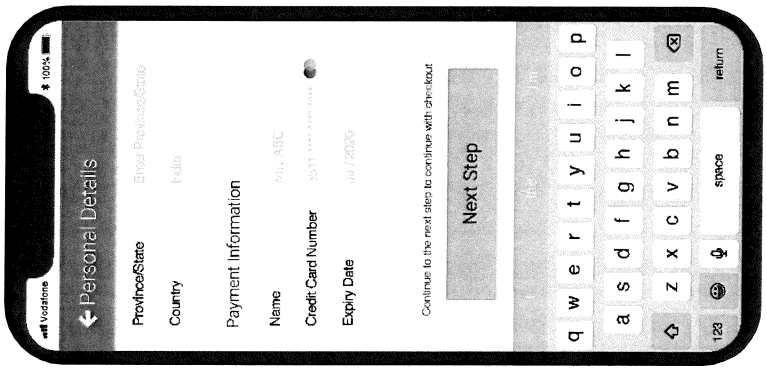

Fig. 11B

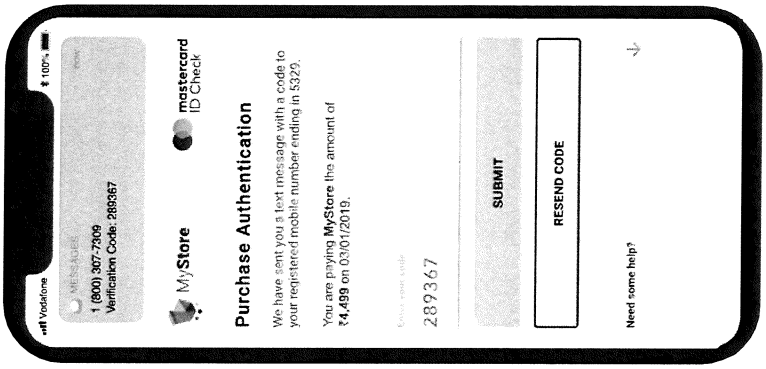

Fig. 11C

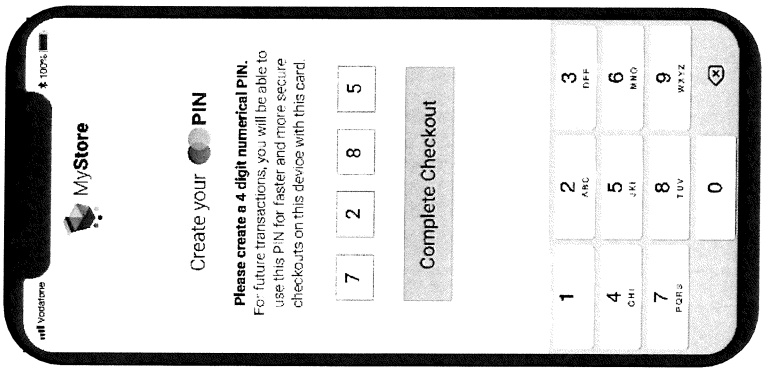

Fig. 11D

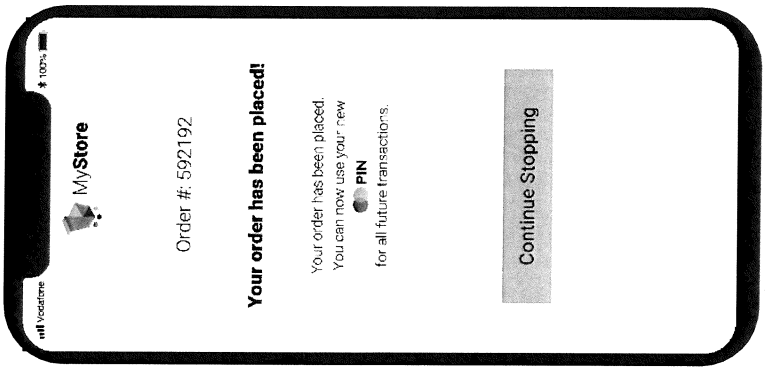

Fig. 11E

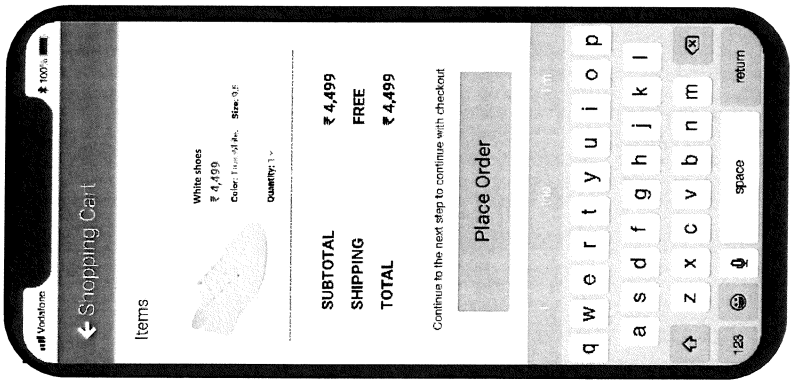

Fig. 12A

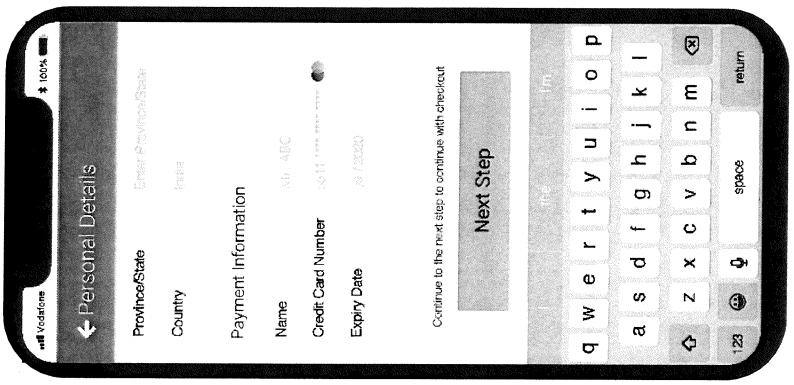

Fig. 12B

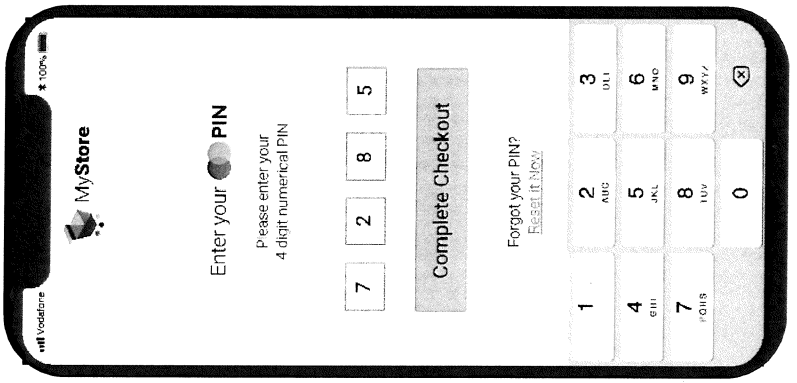

Fig. 12D

Fig. 12C

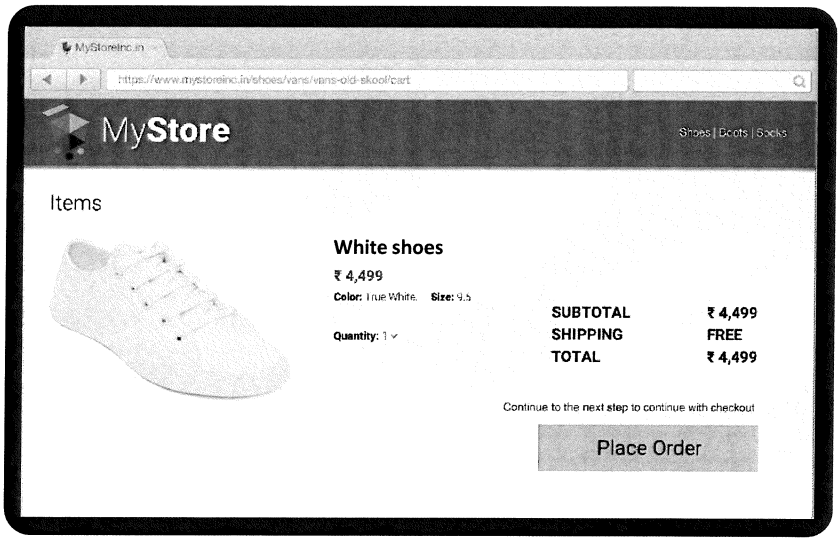

Fig. 13A

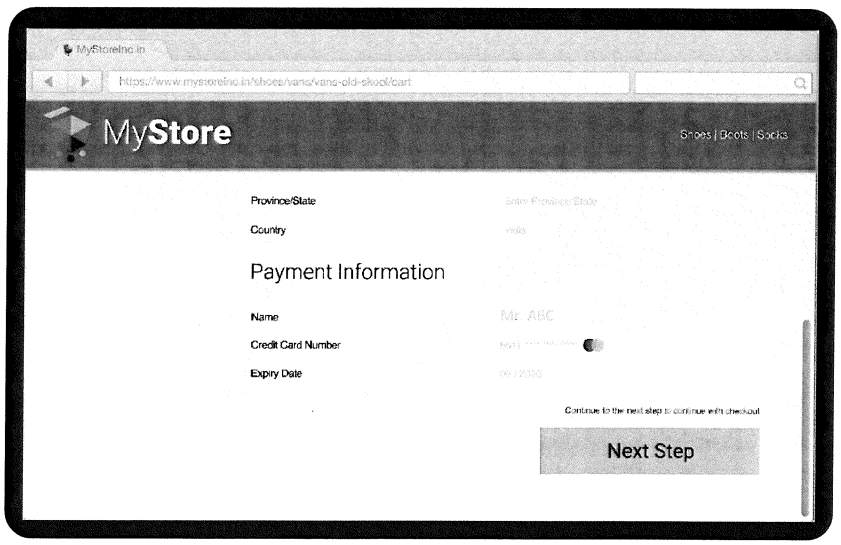

Fig. 13B

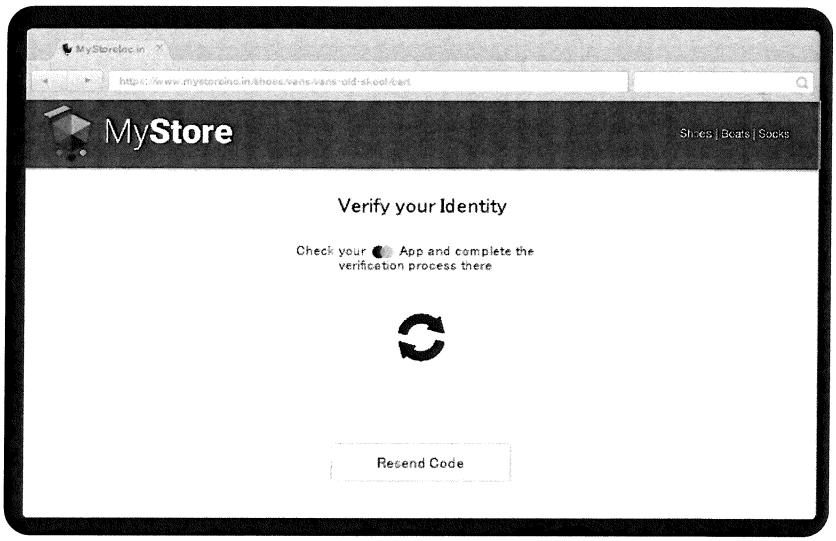

Fig. 13C

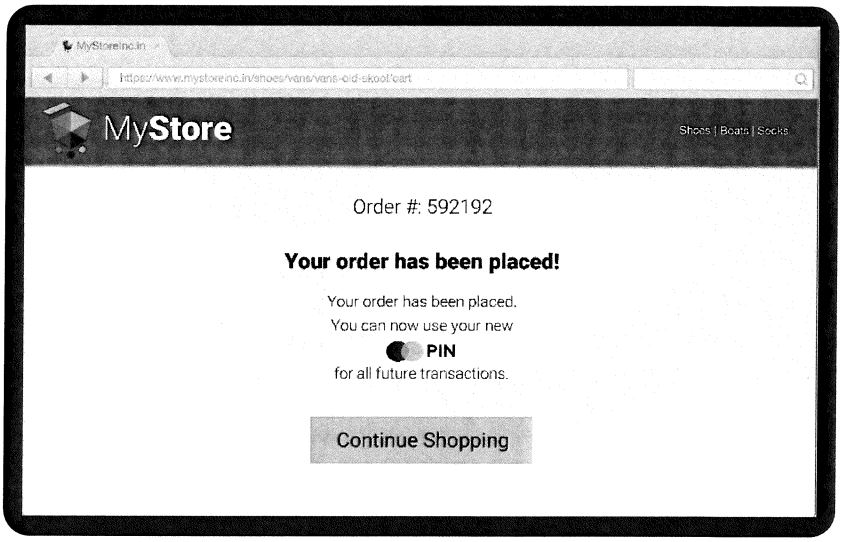

Fig. 13D

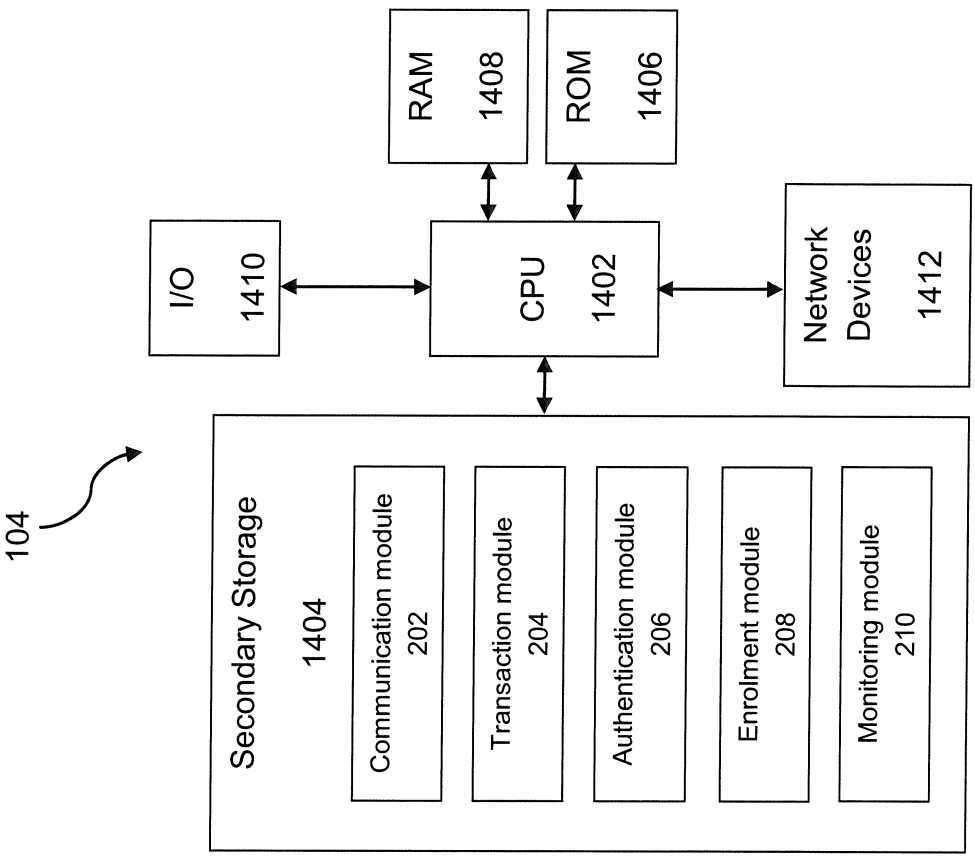
104
Secondary Storage
1404
Communication module
202
Transaction module
204
Authentication module
206
Enrolment module
208
Monitoring module
210
I/O
1410
CPU
1402
RAM
1408
ROM
1406
Network
Devices
1412

Fig. 14