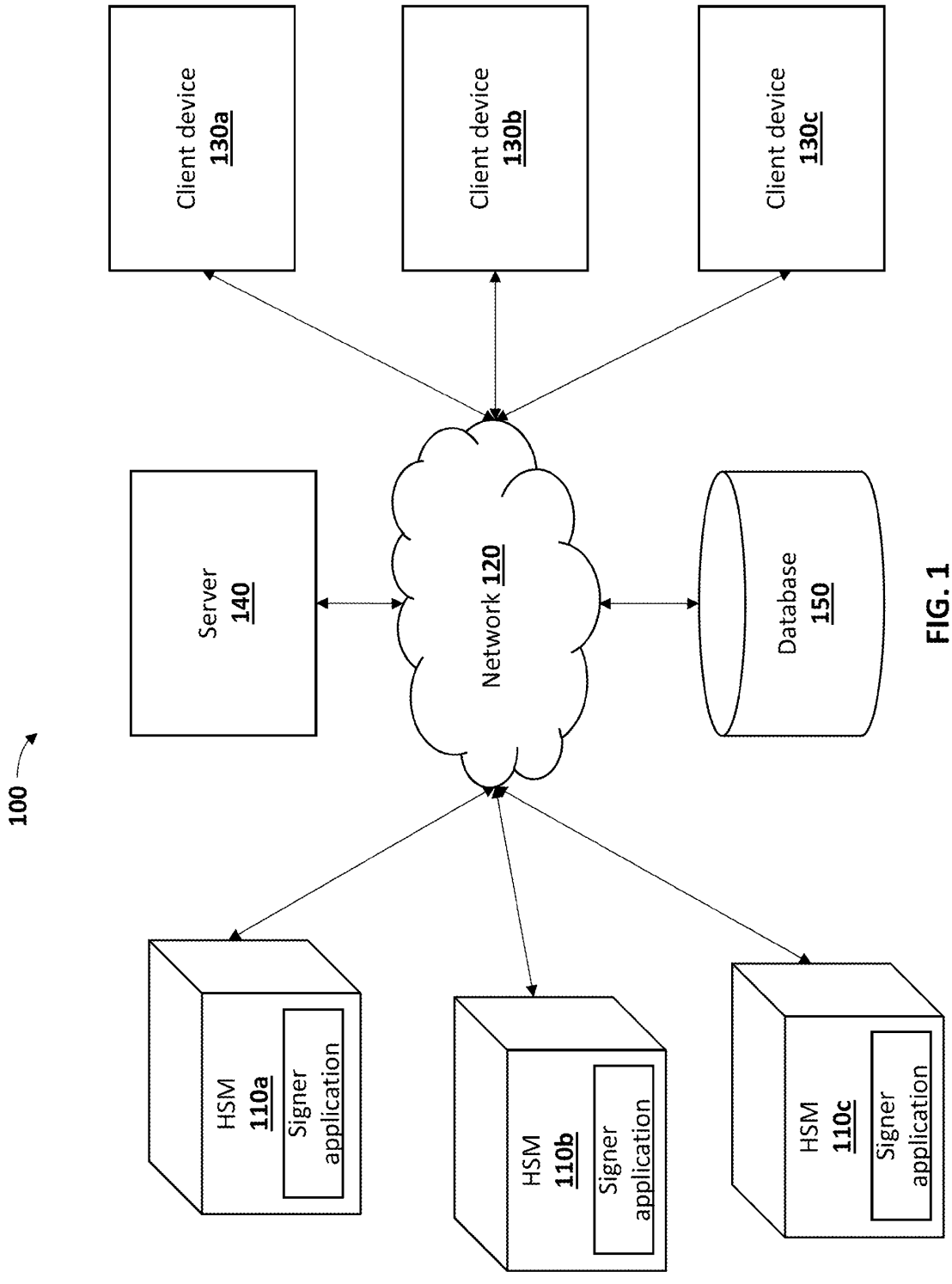

100
Client device 130a
Client device 130b
Client device 130c
Server 140
Network 120
Database 150
HSM 110a
Signer application
HSM 110b
Signer application
HSM 110c
Signer application

FIG. 1

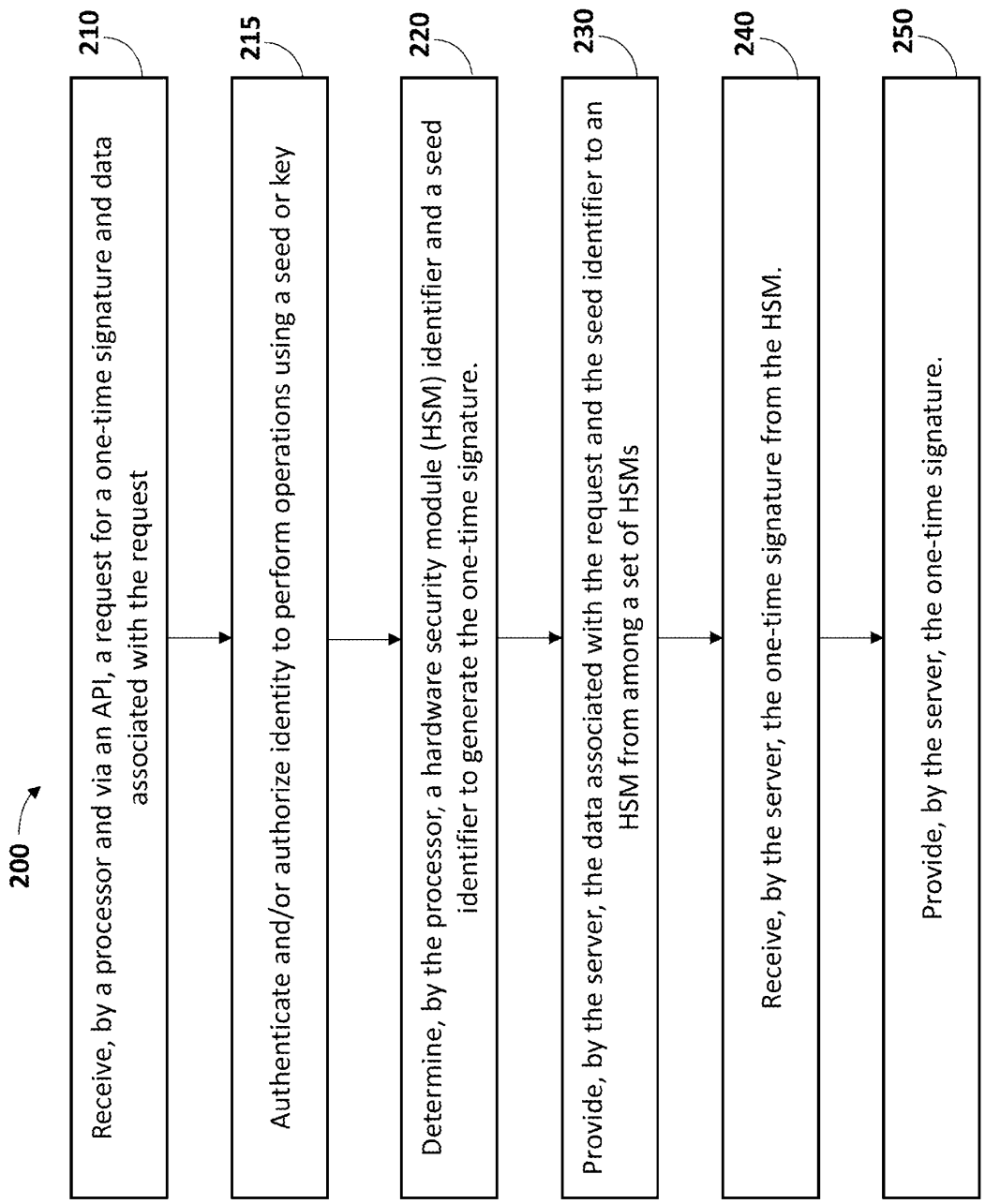

200
210
Receive, by a processor and via an API, a request for a one-time signature and data associated with the request
215
Authenticate and/or authorize identity to perform operations using a seed or key
220
Determine, by the processor, a hardware security module (HSM) identifier and a seed identifier to generate the one-time signature.
230
Provide, by the server, the data associated with the request and the seed identifier to an HSM from among a set of HSMs
240
Receive, by the server, the one-time signature from the HSM.
250
Provide, by the server, the one-time signature.

FIG. 2

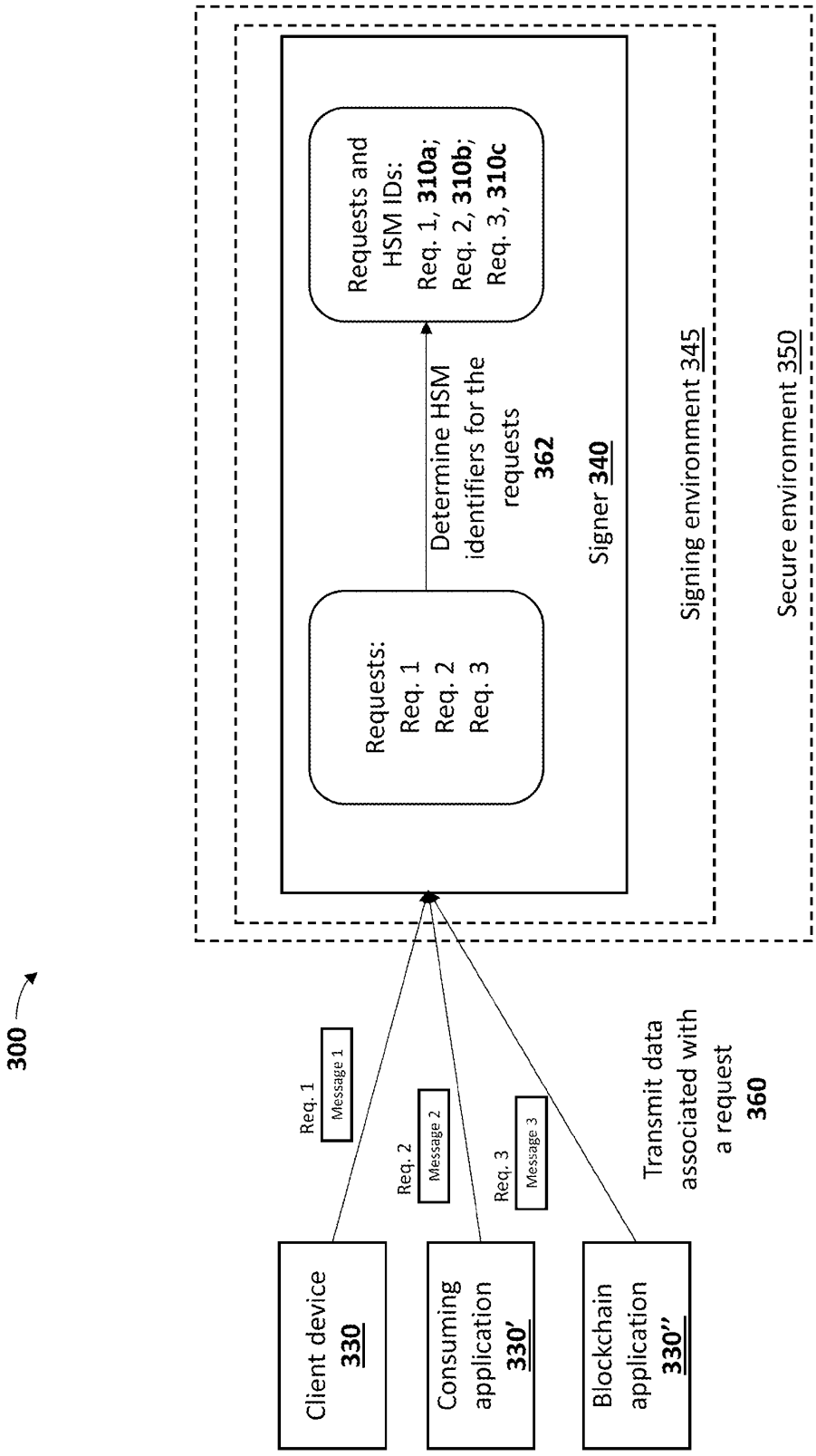

300
Secure environment 350
Signing environment 345
Signer 340
Requests:
Req. 1
Req. 2
Req. 3
Determine HSM identifiers for the requests
362
Requests and HSM IDs:
Req. 1, 310a;
Req. 2, 310b;
Req. 3, 310c
Req. 1
Message 1
Req. 2
Message 2
Req. 3
Message 3
Transmit data associated with a request
360
Client device
330
Consuming application
330'
Blockchain application
330''

FIG. 3A

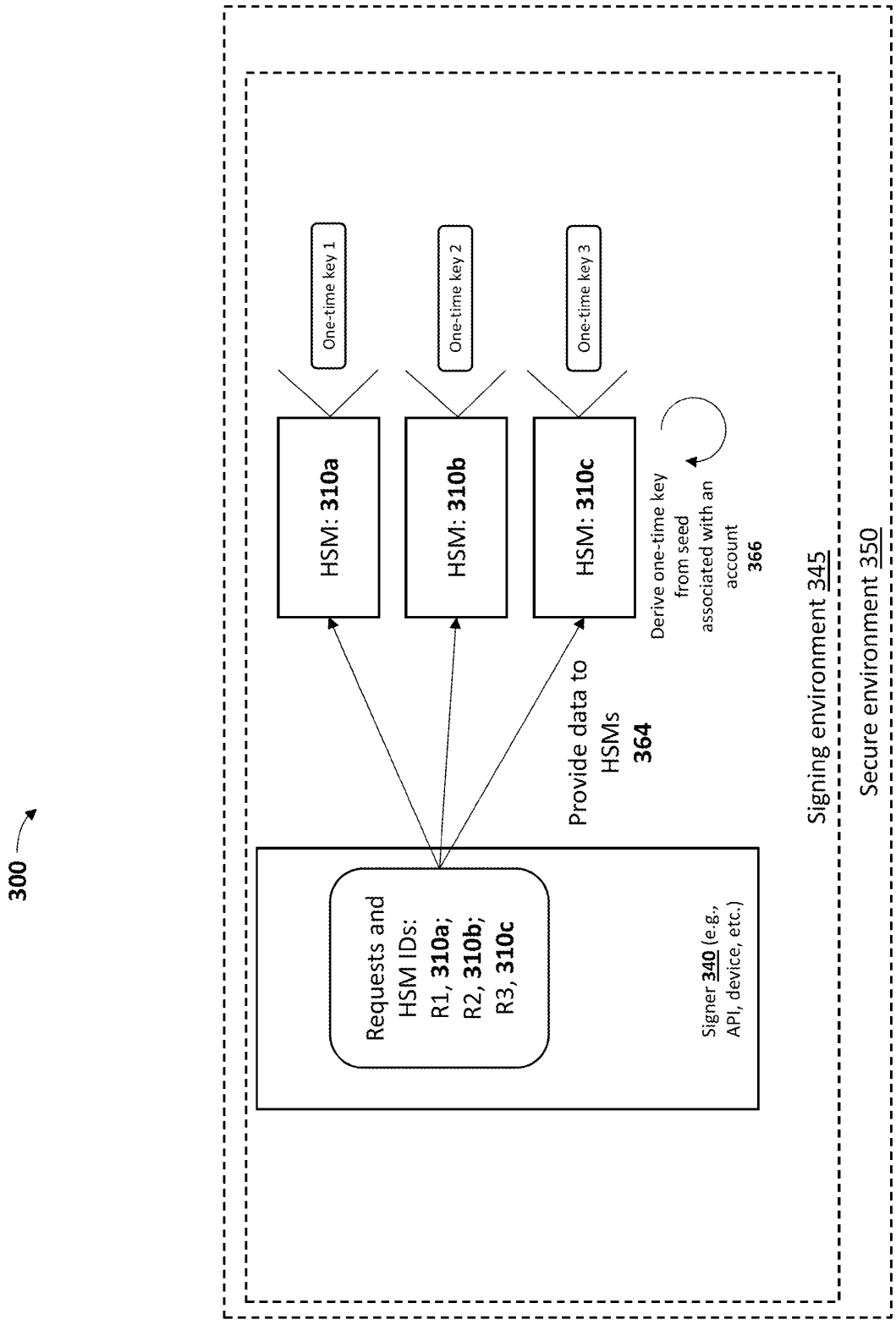

300
Secure environment 350
Signing environment 345
Signer 340 (e.g., API, device, etc.)
Requests and HSM IDs: R1, 310a; R2, 310b; R3, 310c
Provide data to HSMs 364
Derive one-time key from seed associated with an account 366
HSM: 310a
HSM: 310b
HSM: 310c
One-time key 1
One-time key 2
One-time key 3

FIG. 3B

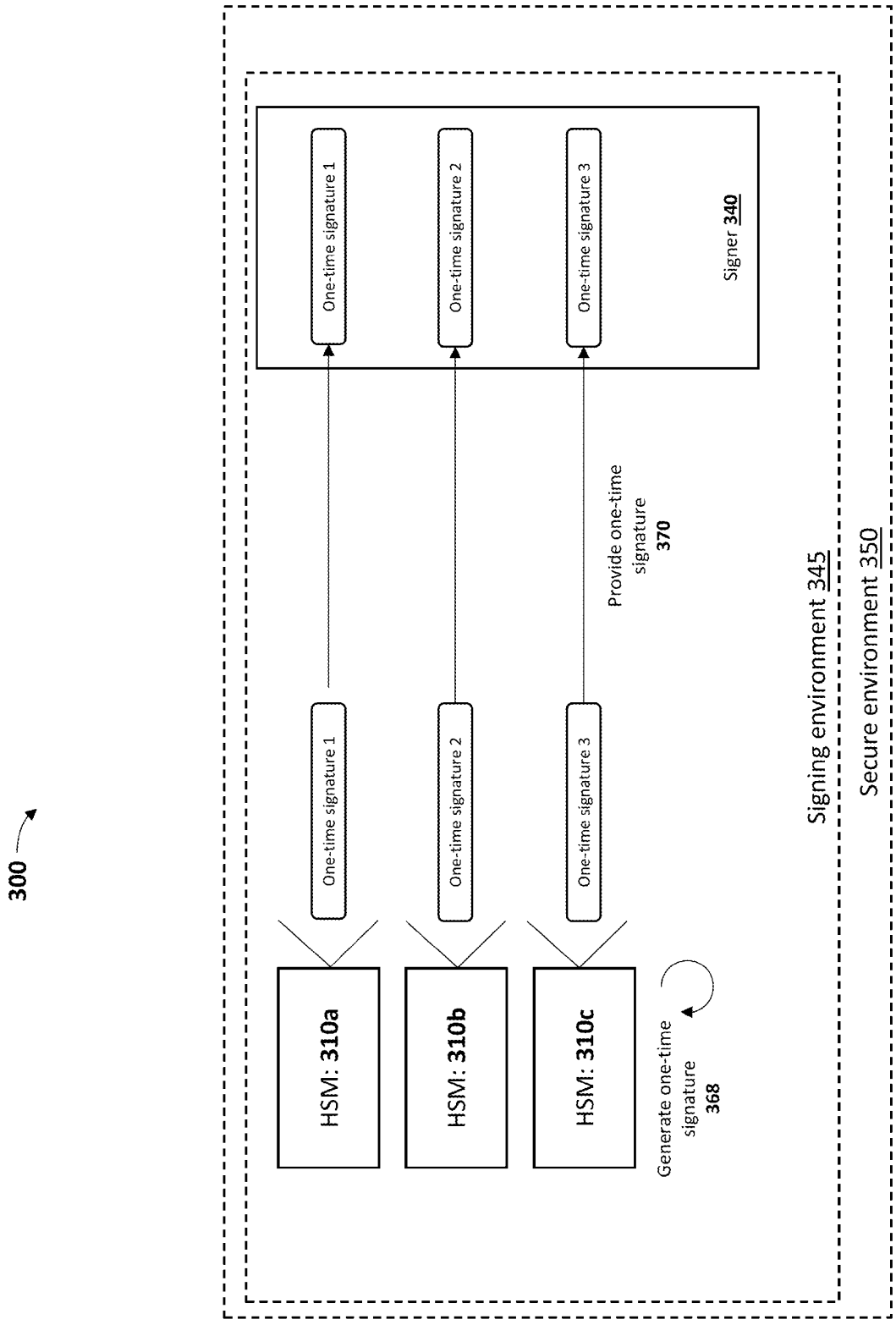

300
Secure environment 350
Signing environment 345
Signer 340
One-time signature 1
One-time signature 2
One-time signature 3
Provide one-time signature 370
One-time signature 1
One-time signature 2
One-time signature 3
HSM: 310a
HSM: 310b
HSM: 310c
Generate one-time signature 368

FIG. 3C

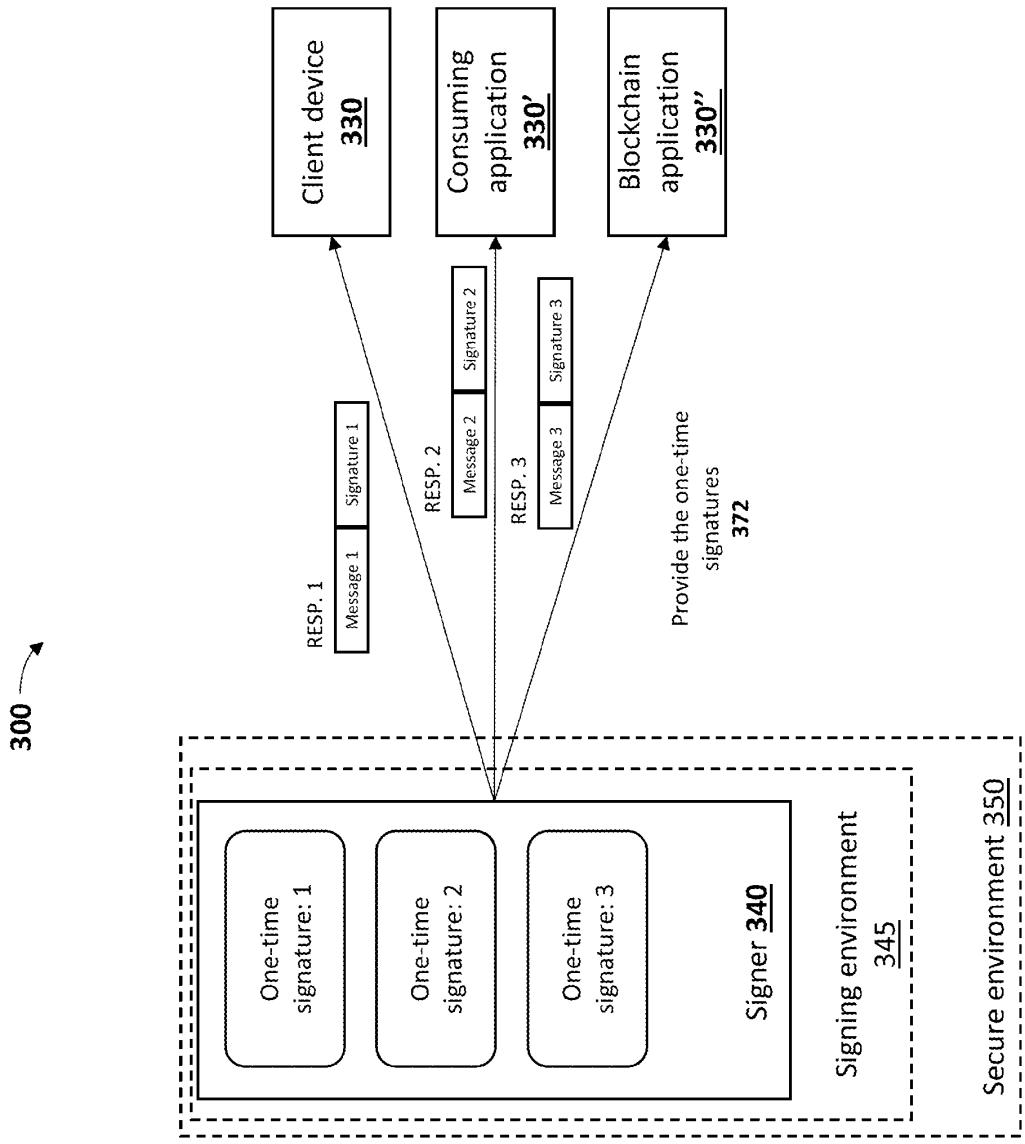

300
Client device
330
Consuming application
330'
Blockchain application
330''
RESP. 1
Message 1
Signature 1
RESP. 2
Message 2
Signature 2
RESP. 3
Message 3
Signature 3
Provide the one-time signatures
372
One-time signature: 1
One-time signature: 2
One-time signature: 3
Signer 340
Signing environment 345
Secure environment 350

FIG. 3D

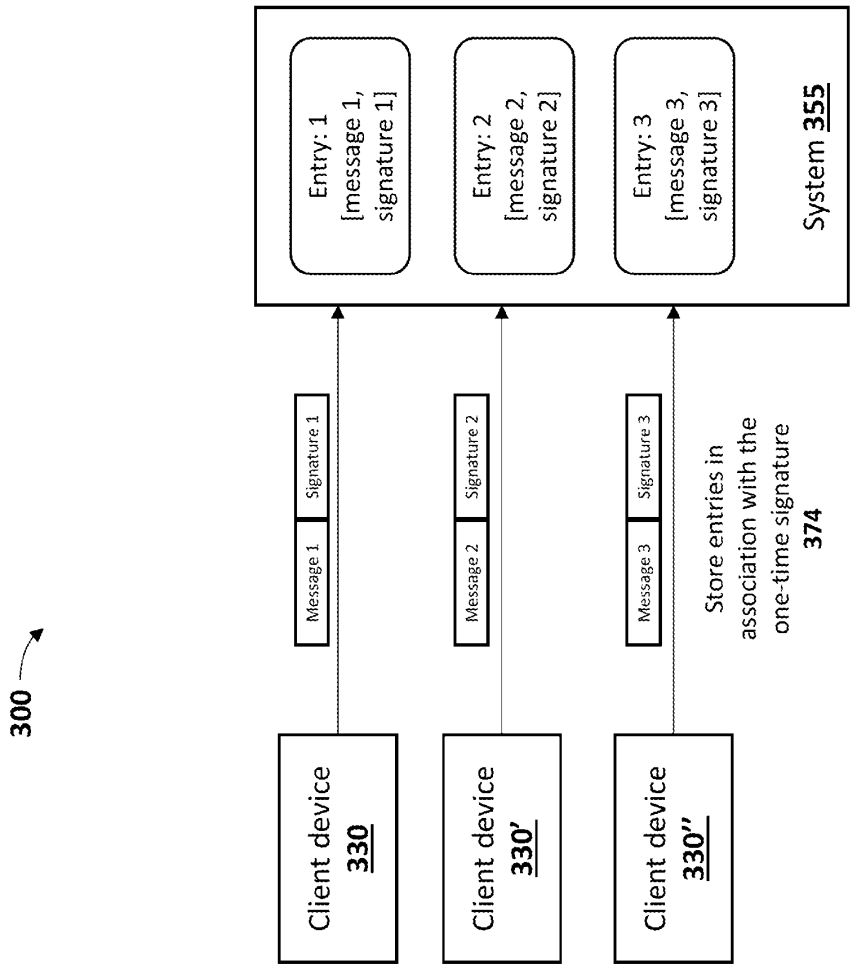

300
Client device 330
Client device 330'
Client device 330''
Message 1
Signature 1
Message 2
Signature 2
Message 3
Signature 3
Store entries in association with the one-time signature 374
Entry: 1 [message 1, signature 1]
Entry: 2 [message 2, signature 2]
Entry: 3 [message 3, signature 3]
System 355

FIG. 3E