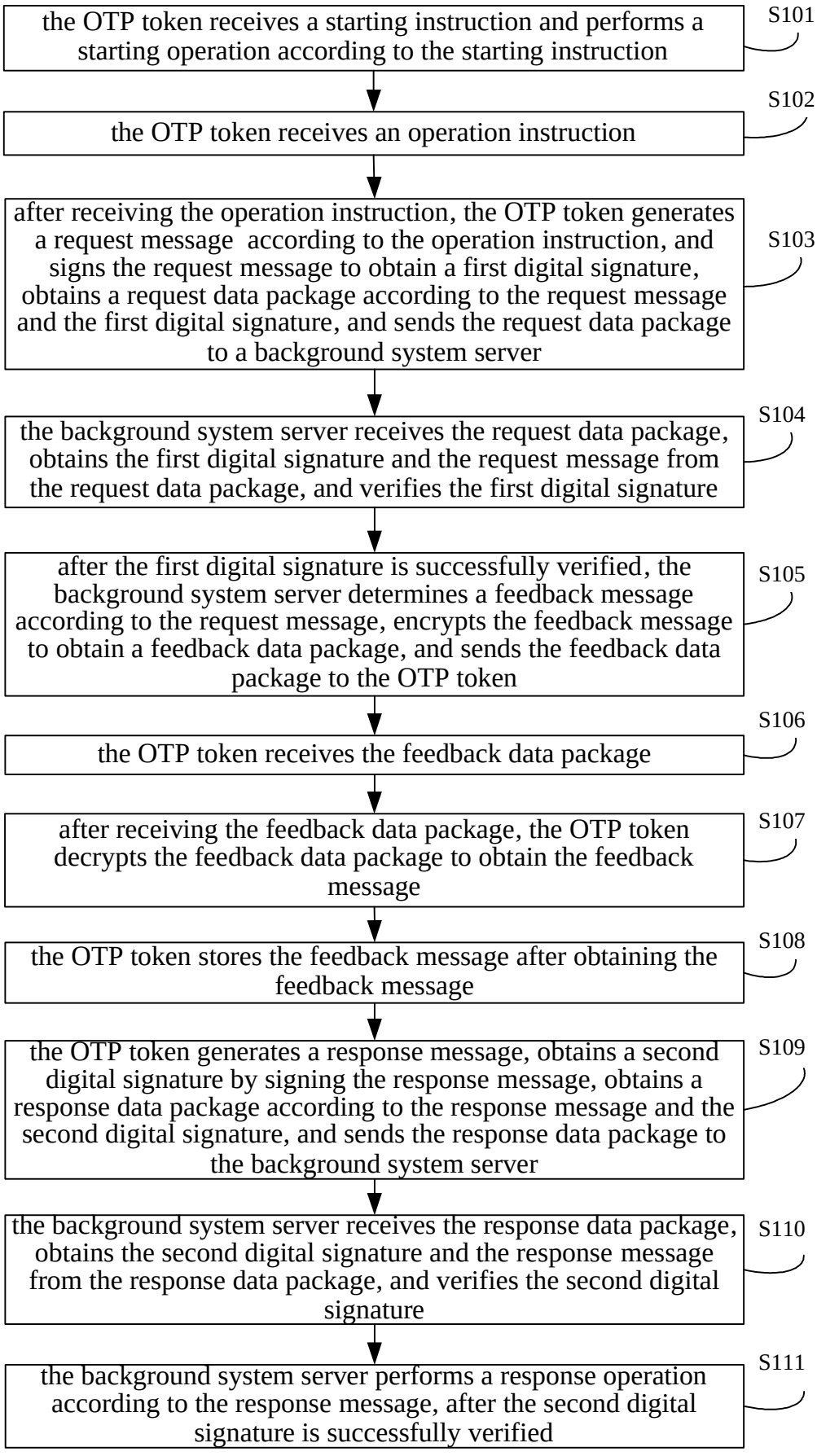

the OTP token receives a starting instruction and performs a starting operation according to the starting instruction
S101
the OTP token receives an operation instruction
S102
after receiving the operation instruction, the OTP token generates a request message according to the operation instruction, and signs the request message to obtain a first digital signature, obtains a request data package according to the request message and the first digital signature, and sends the request data package to a background system server
S103
the background system server receives the request data package, obtains the first digital signature and the request message from the request data package, and verifies the first digital signature
S104
after the first digital signature is successfully verified, the background system server determines a feedback message according to the request message, encrypts the feedback message to obtain a feedback data package, and sends the feedback data package to the OTP token
S105
the OTP token receives the feedback data package
S106
after receiving the feedback data package, the OTP token decrypts the feedback data package to obtain the feedback message
S107
the OTP token stores the feedback message after obtaining the feedback message
S108
the OTP token generates a response message, obtains a second digital signature by signing the response message, obtains a response data package according to the response message and the second digital signature, and sends the response data package to the background system server
S109
the background system server receives the response data package, obtains the second digital signature and the response message from the response data package, and verifies the second digital signature
S110
the background system server performs a response operation according to the response message, after the second digital signature is successfully verified
S111

Fig. 1

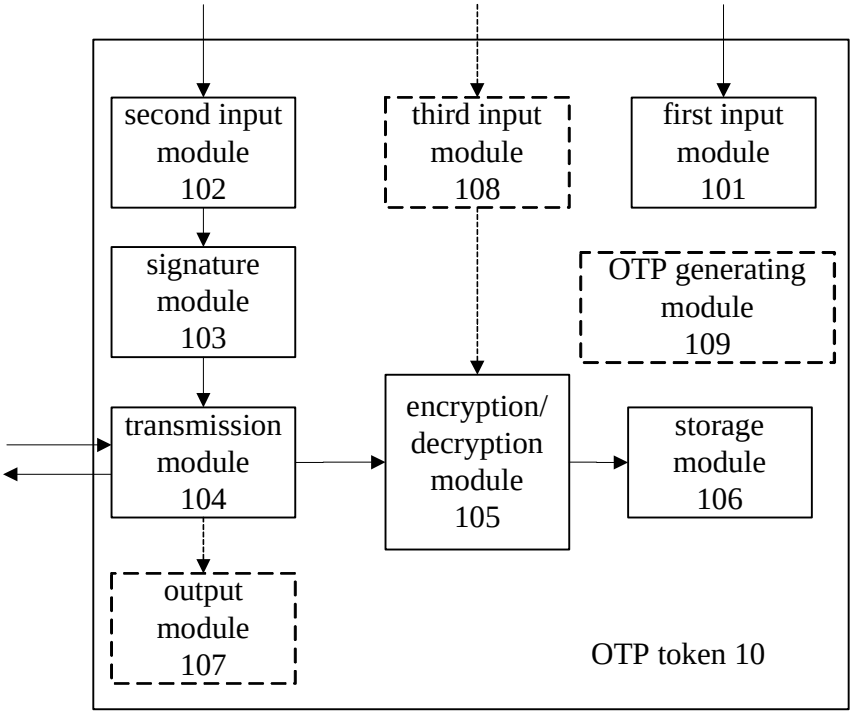

second input module 102
third input module 108
first input module 101
signature module 103
OTP generating module 109
transmission module 104
encryption/ decryption module 105
storage module 106
output module 107
OTP token 10

Fig. 2

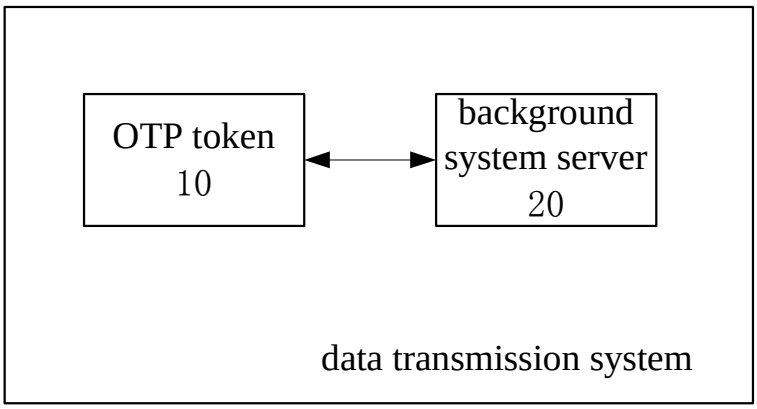

OTP token 10
background system server 20
data transmission system

Fig. 3

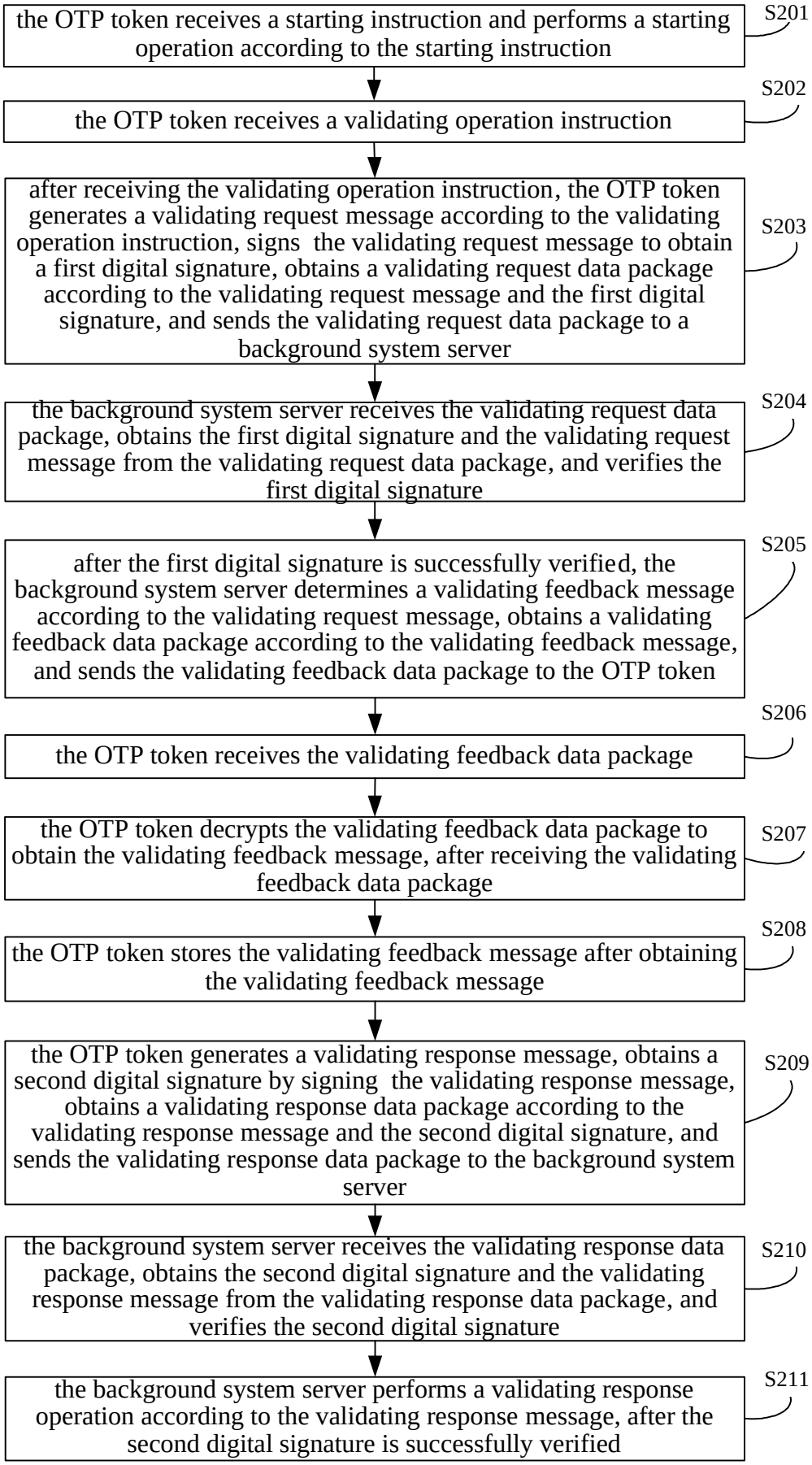

the OTP token receives a starting instruction and performs a starting operation according to the starting instruction
S201
the OTP token receives a validating operation instruction
S202
after receiving the validating operation instruction, the OTP token generates a validating request message according to the validating operation instruction, signs the validating request message to obtain a first digital signature, obtains a validating request data package according to the validating request message and the first digital signature, and sends the validating request data package to a background system server
S203
the background system server receives the validating request data package, obtains the first digital signature and the validating request message from the validating request data package, and verifies the first digital signature
S204
after the first digital signature is successfully verified, the background system server determines a validating feedback message according to the validating request message, obtains a validating feedback data package according to the validating feedback message, and sends the validating feedback data package to the OTP token
S205
the OTP token receives the validating feedback data package
S206
the OTP token decrypts the validating feedback data package to obtain the validating feedback message, after receiving the validating feedback data package
S207
the OTP token stores the validating feedback message after obtaining the validating feedback message
S208
the OTP token generates a validating response message, obtains a second digital signature by signing the validating response message, obtains a validating response data package according to the validating response message and the second digital signature, and sends the validating response data package to the background system server
S209
the background system server receives the validating response data package, obtains the second digital signature and the validating response message from the validating response data package, and verifies the second digital signature
S210
the background system server performs a validating response operation according to the validating response message, after the second digital signature is successfully verified
S211

Fig. 4

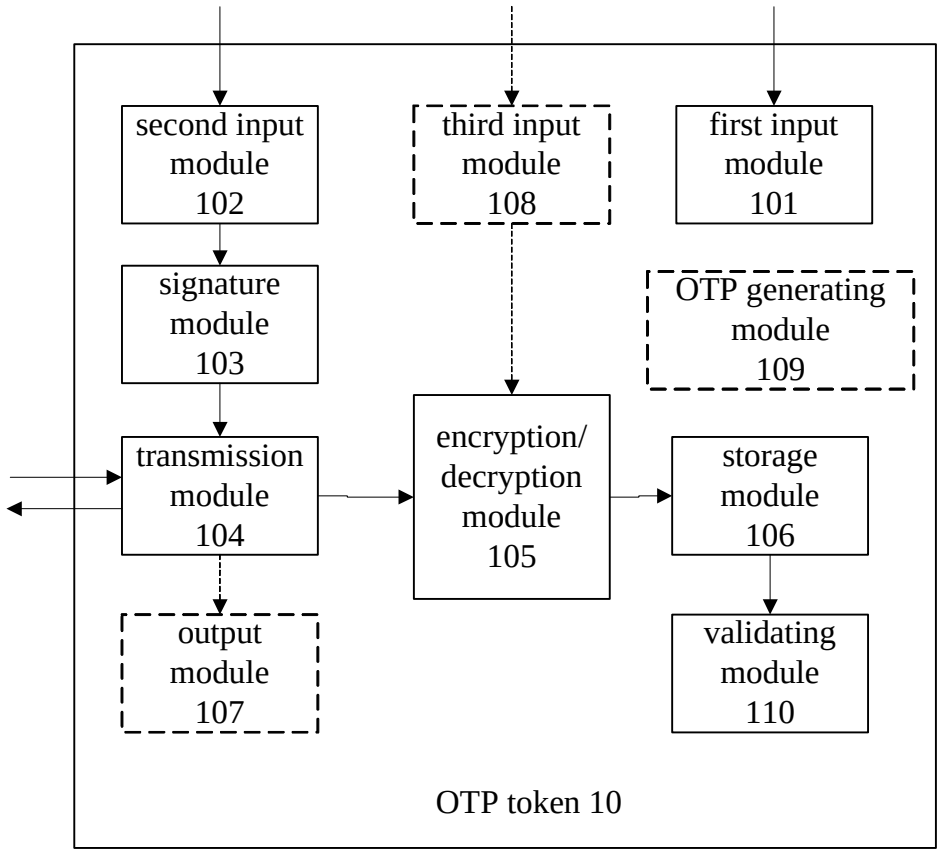

second input module 102
third input module 108
first input module 101
signature module 103
OTP generating module 109
transmission module 104
encryption/ decryption module 105
storage module 106
output module 107
validating module 110
OTP token 10

Fig. 5

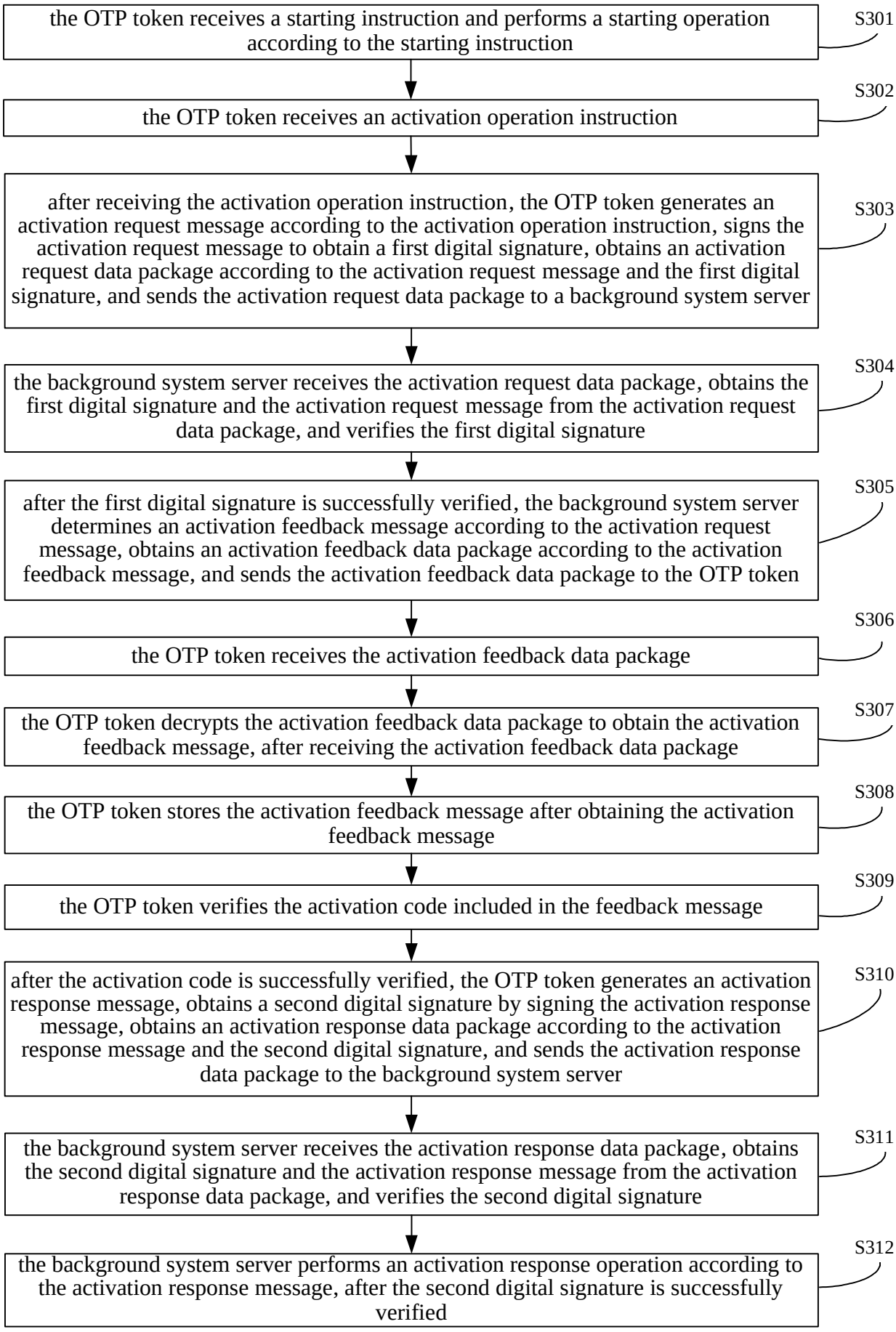

the OTP token receives a starting instruction and performs a starting operation according to the starting instruction
S301
the OTP token receives an activation operation instruction
S302
after receiving the activation operation instruction, the OTP token generates an activation request message according to the activation operation instruction, signs the activation request message to obtain a first digital signature, obtains an activation request data package according to the activation request message and the first digital signature, and sends the activation request data package to a background system server
S303
the background system server receives the activation request data package, obtains the first digital signature and the activation request message from the activation request data package, and verifies the first digital signature
S304
after the first digital signature is successfully verified, the background system server determines an activation feedback message according to the activation request message, obtains an activation feedback data package according to the activation feedback message, and sends the activation feedback data package to the OTP token
S305
the OTP token receives the activation feedback data package
S306
the OTP token decrypts the activation feedback data package to obtain the activation feedback message, after receiving the activation feedback data package
S307
the OTP token stores the activation feedback message after obtaining the activation feedback message
S308
the OTP token verifies the activation code included in the feedback message
S309
after the activation code is successfully verified, the OTP token generates an activation response message, obtains a second digital signature by signing the activation response message, obtains an activation response data package according to the activation response message and the second digital signature, and sends the activation response data package to the background system server
S310
the background system server receives the activation response data package, obtains the second digital signature and the activation response message from the activation response data package, and verifies the second digital signature
S311
the background system server performs an activation response operation according to the activation response message, after the second digital signature is successfully verified
S312

Fig. 6

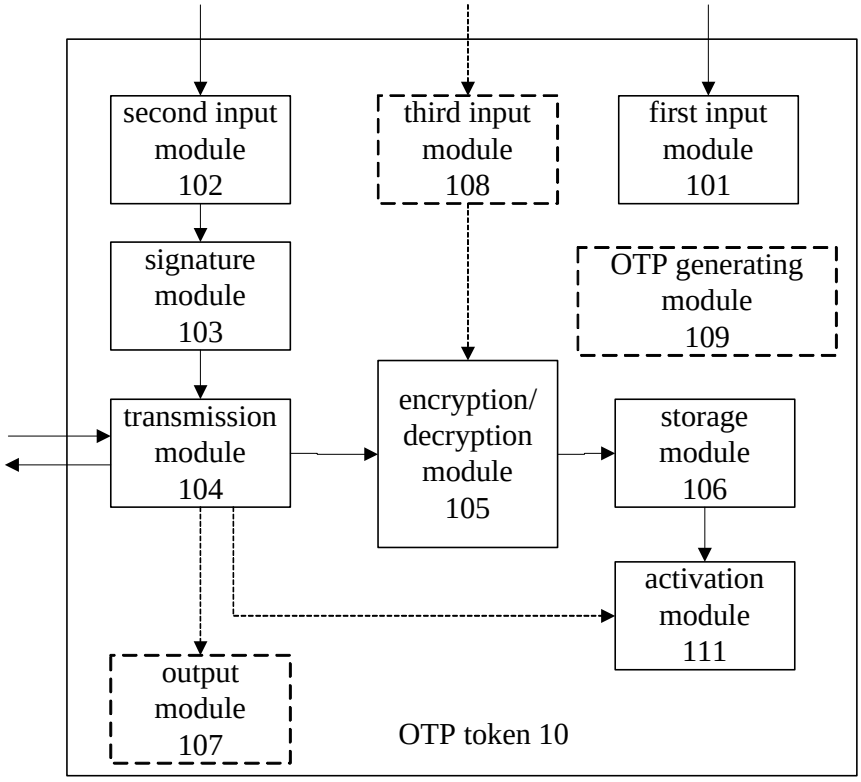

second input module 102
third input module 108
first input module 101
signature module 103
OTP generating module 109
transmission module 104
encryption/ decryption module 105
storage module 106
activation module 111
output module 107
OTP token 10

Fig. 7

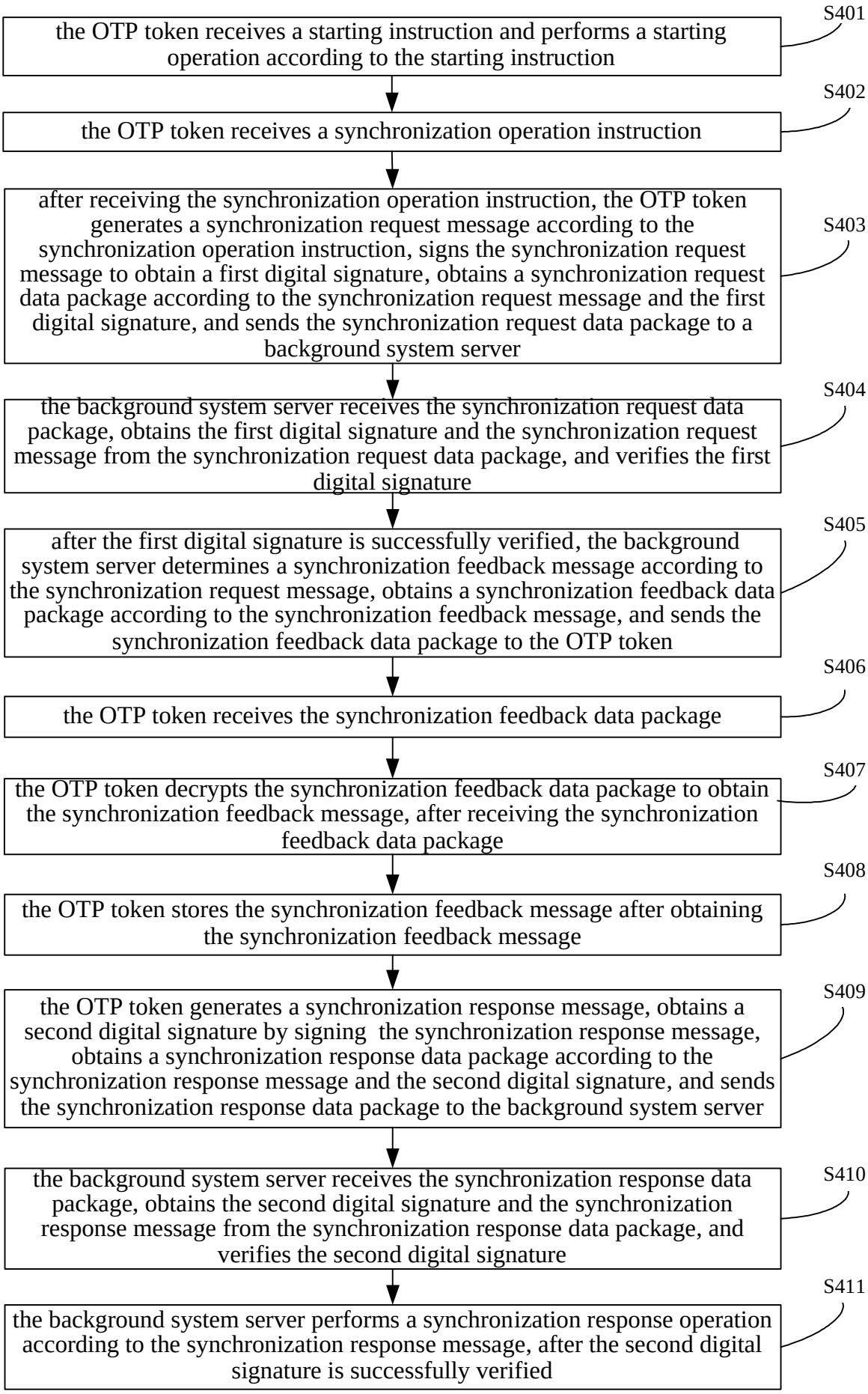

S401
the OTP token receives a starting instruction and performs a starting operation according to the starting instruction
S402
the OTP token receives a synchronization operation instruction
S403
after receiving the synchronization operation instruction, the OTP token generates a synchronization request message according to the synchronization operation instruction, signs the synchronization request message to obtain a first digital signature, obtains a synchronization request data package according to the synchronization request message and the first digital signature, and sends the synchronization request data package to a background system server
S404
the background system server receives the synchronization request data package, obtains the first digital signature and the synchronization request message from the synchronization request data package, and verifies the first digital signature
S405
after the first digital signature is successfully verified, the background system server determines a synchronization feedback message according to the synchronization request message, obtains a synchronization feedback data package according to the synchronization feedback message, and sends the synchronization feedback data package to the OTP token
S406
the OTP token receives the synchronization feedback data package
S407
the OTP token decrypts the synchronization feedback data package to obtain the synchronization feedback message, after receiving the synchronization feedback data package
S408
the OTP token stores the synchronization feedback message after obtaining the synchronization feedback message
S409
the OTP token generates a synchronization response message, obtains a second digital signature by signing the synchronization response message, obtains a synchronization response data package according to the synchronization response message and the second digital signature, and sends the synchronization response data package to the background system server
S410
the background system server receives the synchronization response data package, obtains the second digital signature and the synchronization response message from the synchronization response data package, and verifies the second digital signature
S411
the background system server performs a synchronization response operation according to the synchronization response message, after the second digital signature is successfully verified

Fig. 8

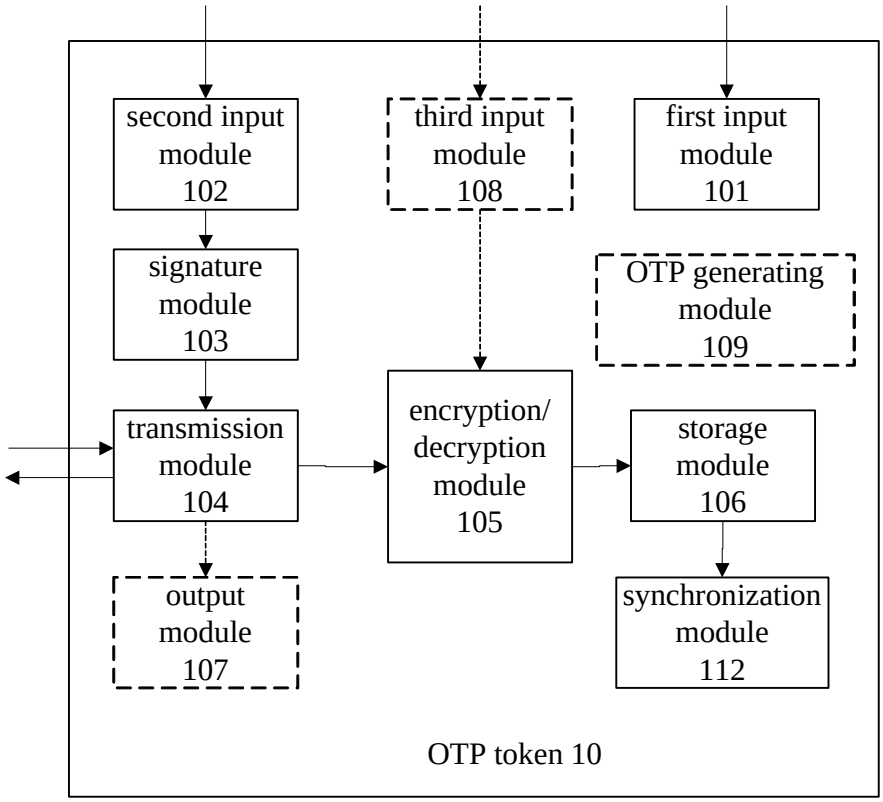

second input module 102
third input module 108
first input module 101
signature module 103
OTP generating module 109
transmission module 104
encryption/ decryption module 105
storage module 106
output module 107
synchronization module 112
OTP token 10

Fig. 9