FIG. 1

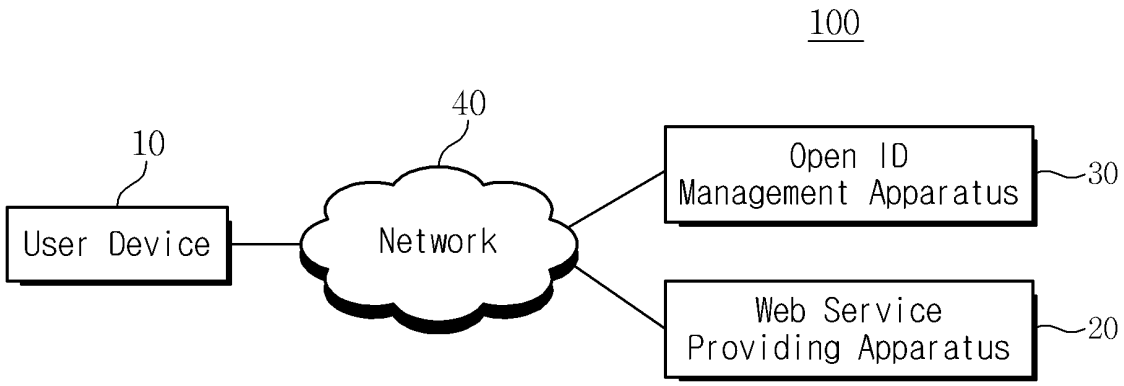

100
40
10
User Device
Network
Open ID
Management Apparatus
30
Web Service
Providing Apparatus
20

FIG. 2

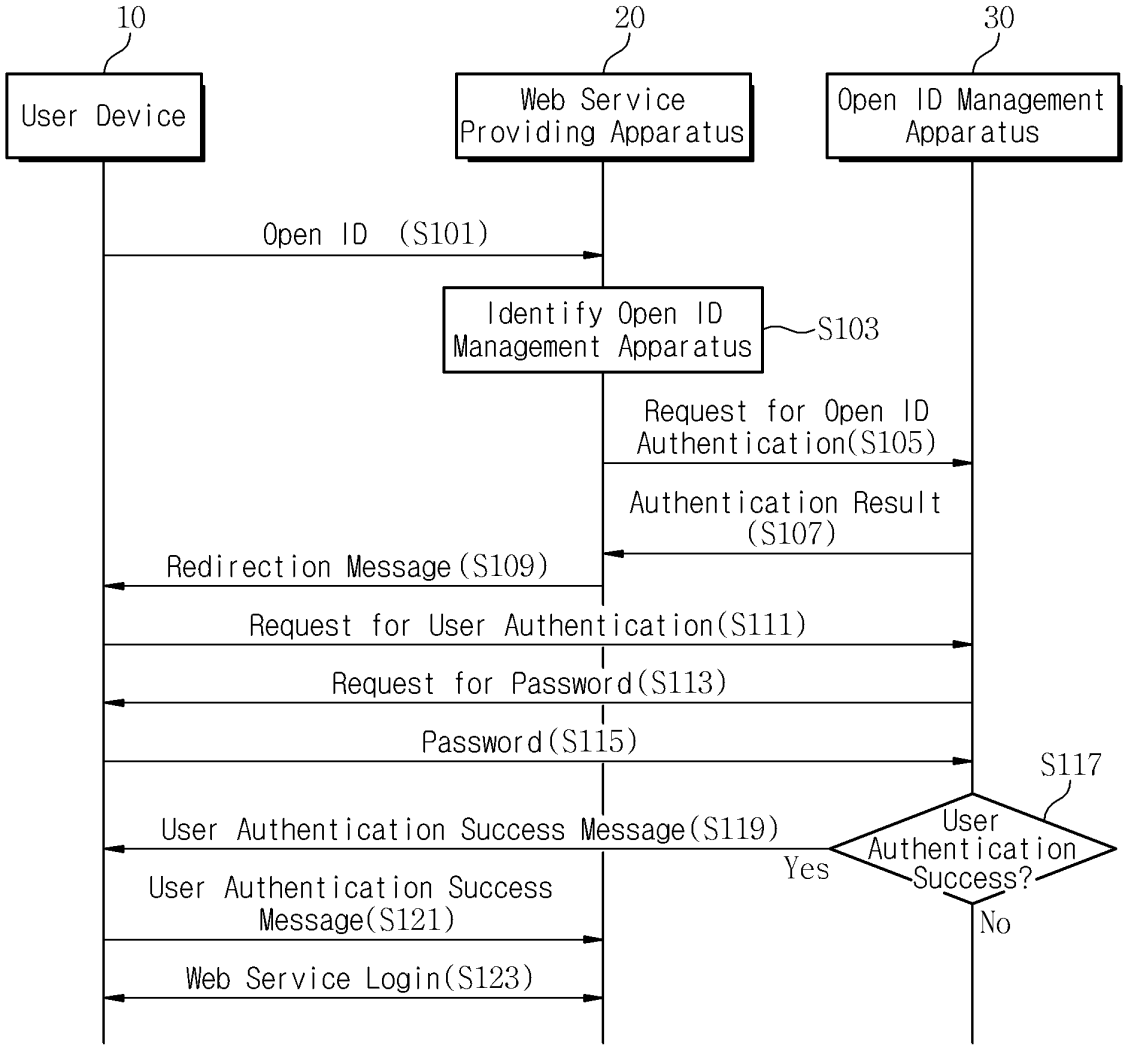

10
User Device
20
Web Service
Providing Apparatus
30
Open ID Management
Apparatus
Open ID (S101)
Identify Open ID
Management Apparatus
S103
Request for Open ID
Authentication(S105)
Authentication Result
(S107)
Redirection Message(S109)
Request for User Authentication(S111)
Request for Password(S113)
Password(S115)
S117
User
Authentication
Success?
Yes
No
User Authentication Success Message(S119)
User Authentication Success
Message(S121)
Web Service Login(S123)

FIG. 3

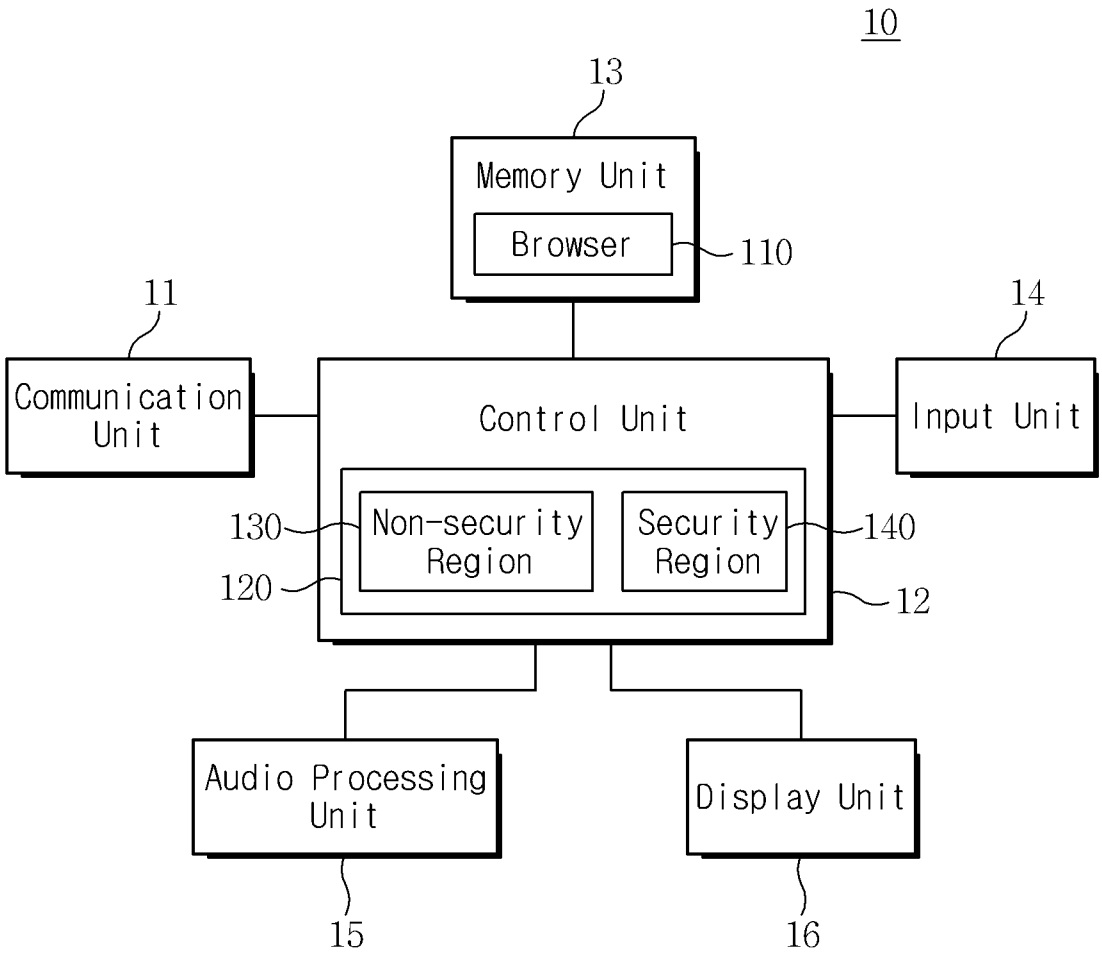

10
13
Memory Unit
Browser
110
11
14
Communication Unit
Control Unit
Input Unit
130
Non-security Region
Security Region
140
120
12
Audio Processing Unit
Display Unit
15
16

FIG. 4

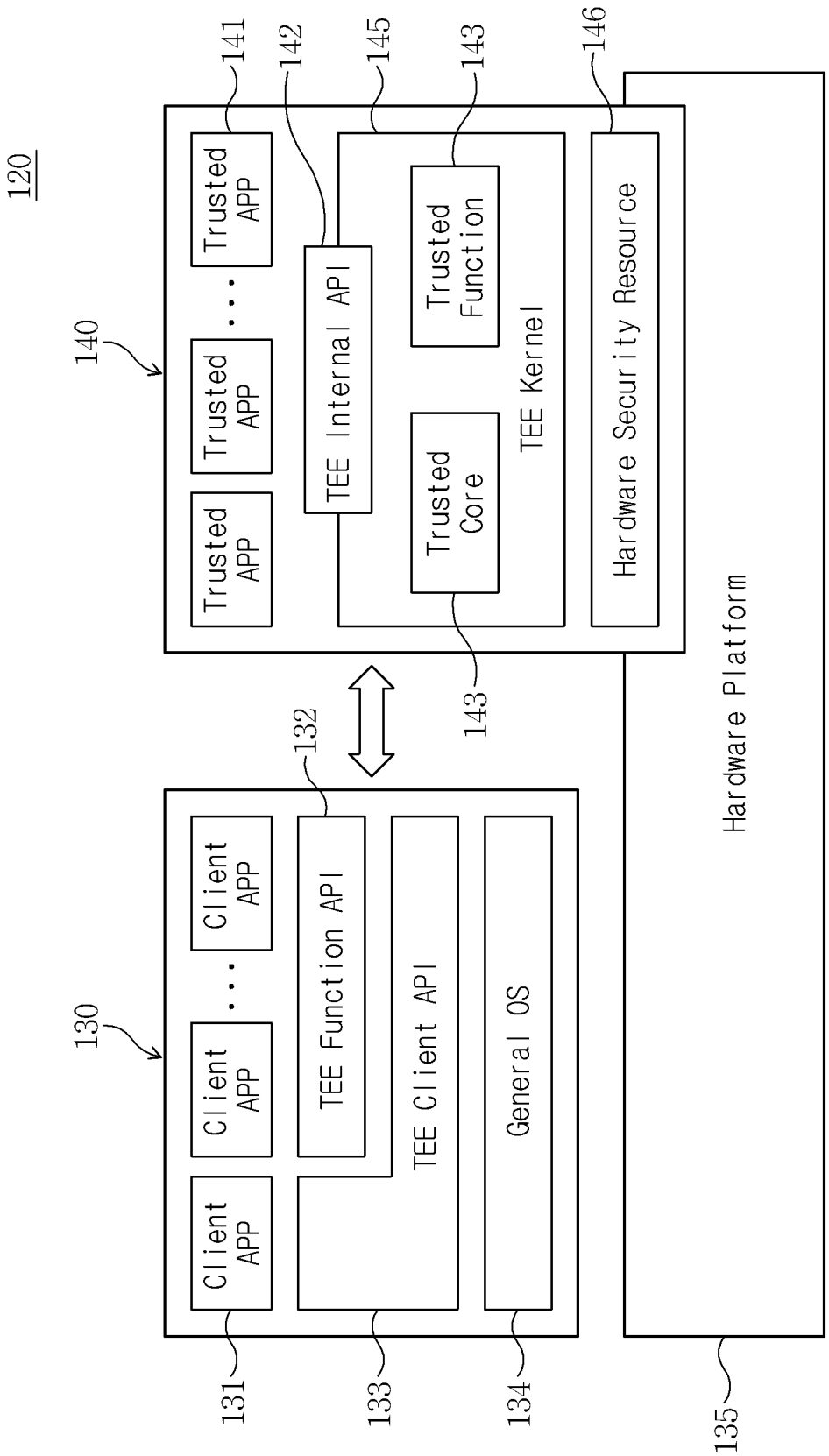

120
140
Trusted APP
Trusted APP
Trusted APP
141
142
145
143
146
TEE Internal API
Trusted Function
Trusted Core
TEE Kernel
Hardware Security Resource
Hardware Platform
132
130
Client APP
Client APP
Client APP
TEE Function API
TEE Client API
General OS
131
133
134
135

FIG. 5

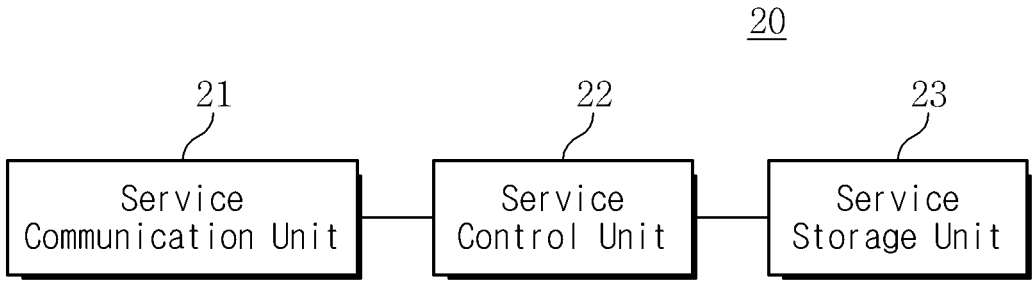

20
21
22
23
Service Communication Unit
Service Control Unit
Service Storage Unit

FIG. 6

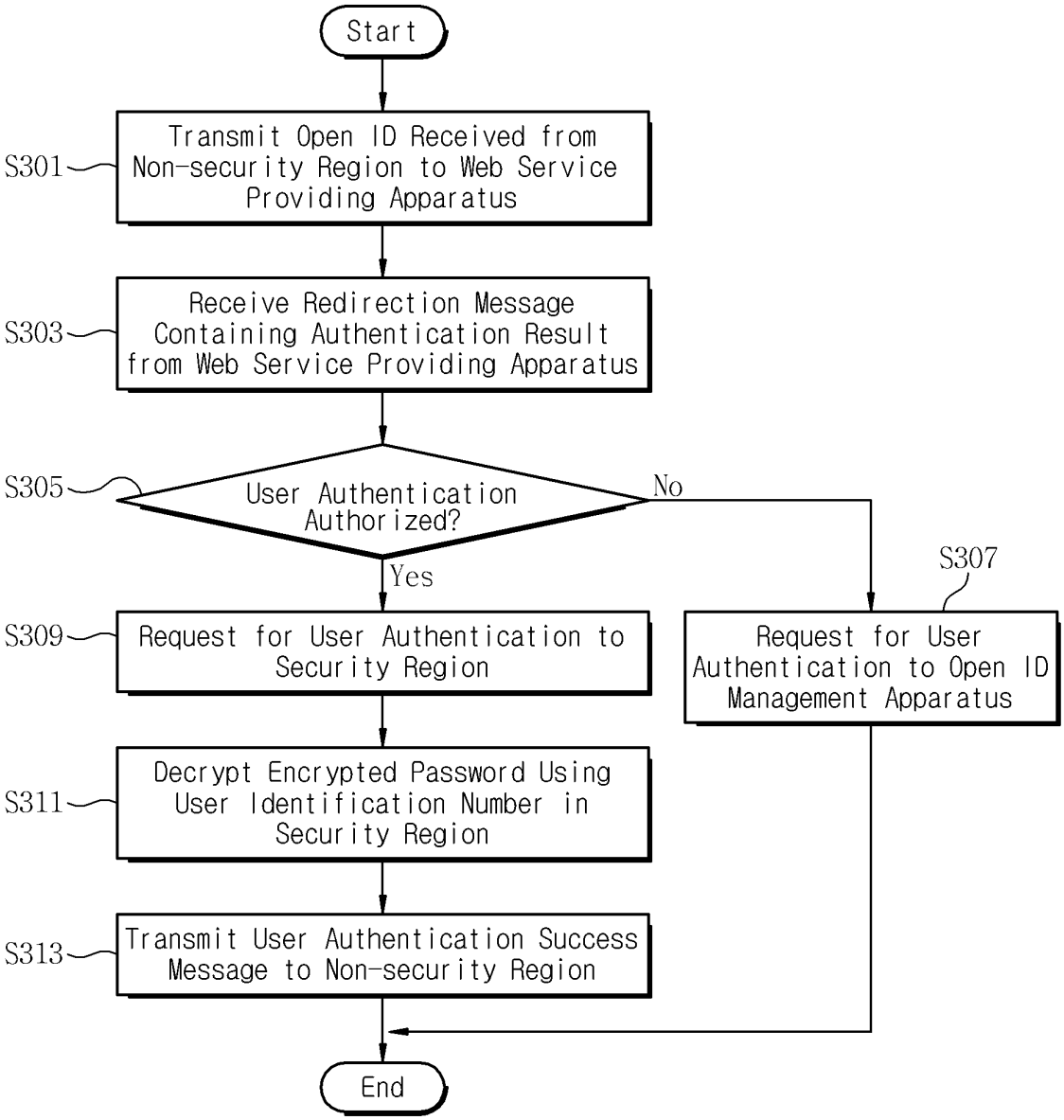

Start
S301
Transmit Open ID Received from Non-security Region to Web Service Providing Apparatus
S303
Receive Redirection Message Containing Authentication Result from Web Service Providing Apparatus
S305
User Authentication Authorized?
No
Yes
S307
Request for User Authentication to Open ID Management Apparatus
S309
Request for User Authentication to Security Region
S311
Decrypt Encrypted Password Using User Identification Number in Security Region
S313
Transmit User Authentication Success Message to Non-security Region
End

FIG. 7

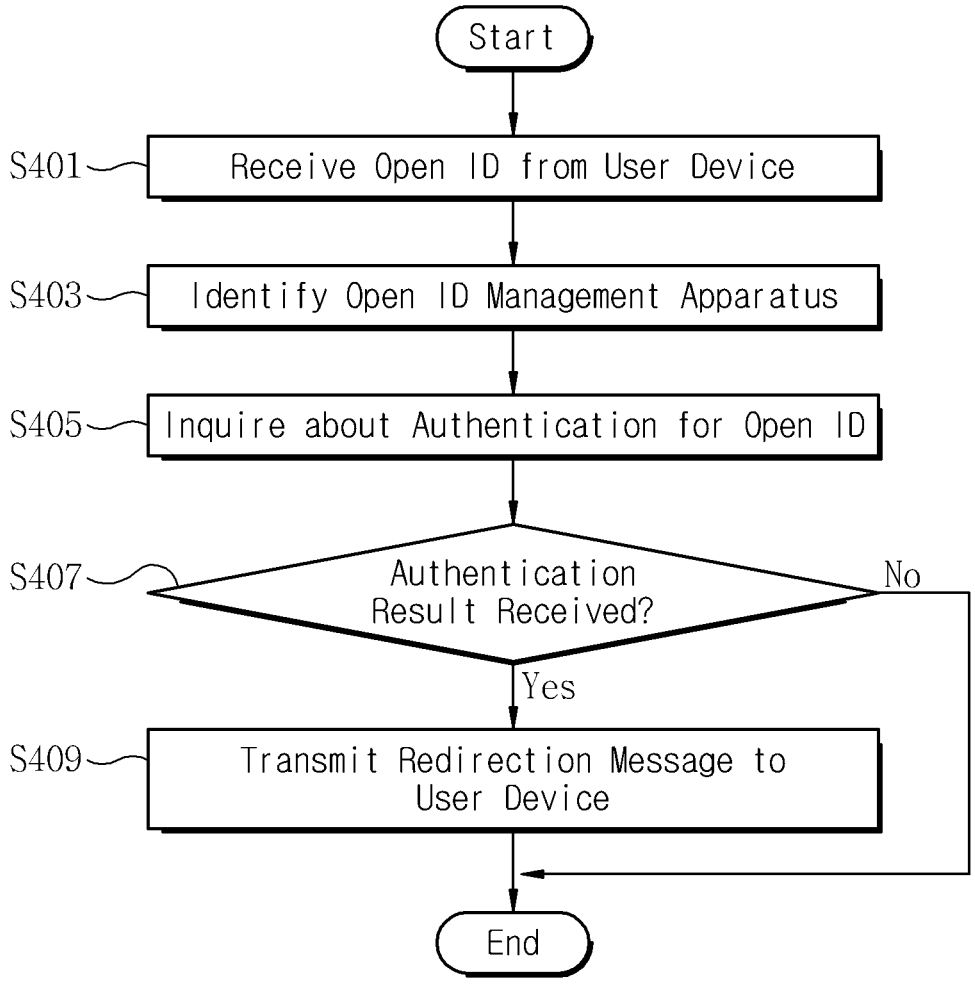
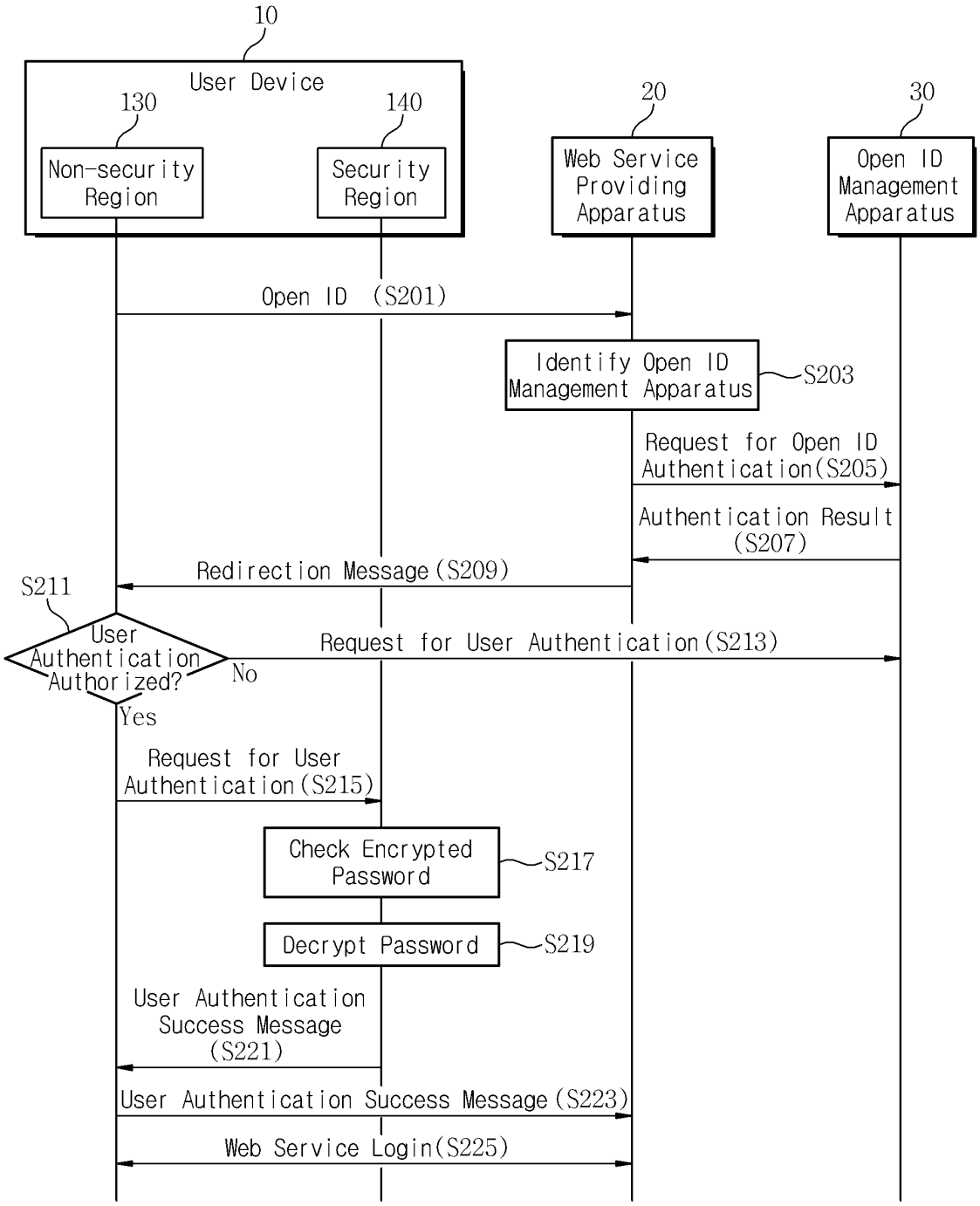

Start
S401
Receive Open ID from User Device
S403
Identify Open ID Management Apparatus
S405
Inquire about Authentication for Open ID
S407
Authentication Result Received?
No
Yes
S409
Transmit Redirection Message to User Device
End

FIG. 8


10
User Device
130
Non-security Region
140
Security Region
20
Web Service Providing Apparatus
30
Open ID Management Apparatus
Open ID (S201)
Identify Open ID Management Apparatus
S203
Request for Open ID Authentication(S205)
Authentication Result (S207)
Redirection Message(S209)
S211
User Authentication Authorized?
No
Request for User Authentication(S213)
Yes
Request for User Authentication(S215)
Check Encrypted Password
S217
Decrypt Password
S219
User Authentication Success Message (S221)
User Authentication Success Message(S223)
Web Service Login(S225)