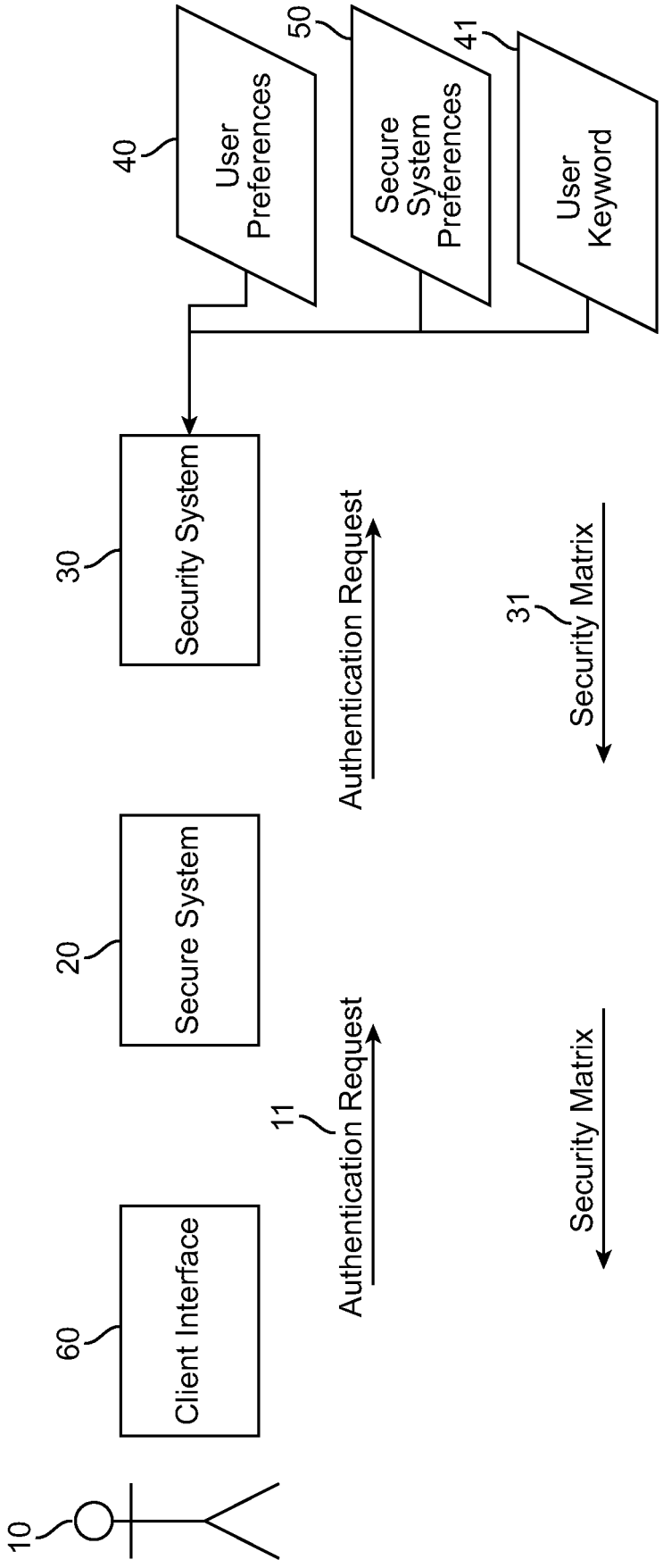
10
60
Client Interface
11
Authentication Request
20
Secure System
Security Matrix
30
Security System
Authentication Request
31
Security Matrix
40
User Preferences
50
Secure System Preferences
41
User Keyword

FIG. 1

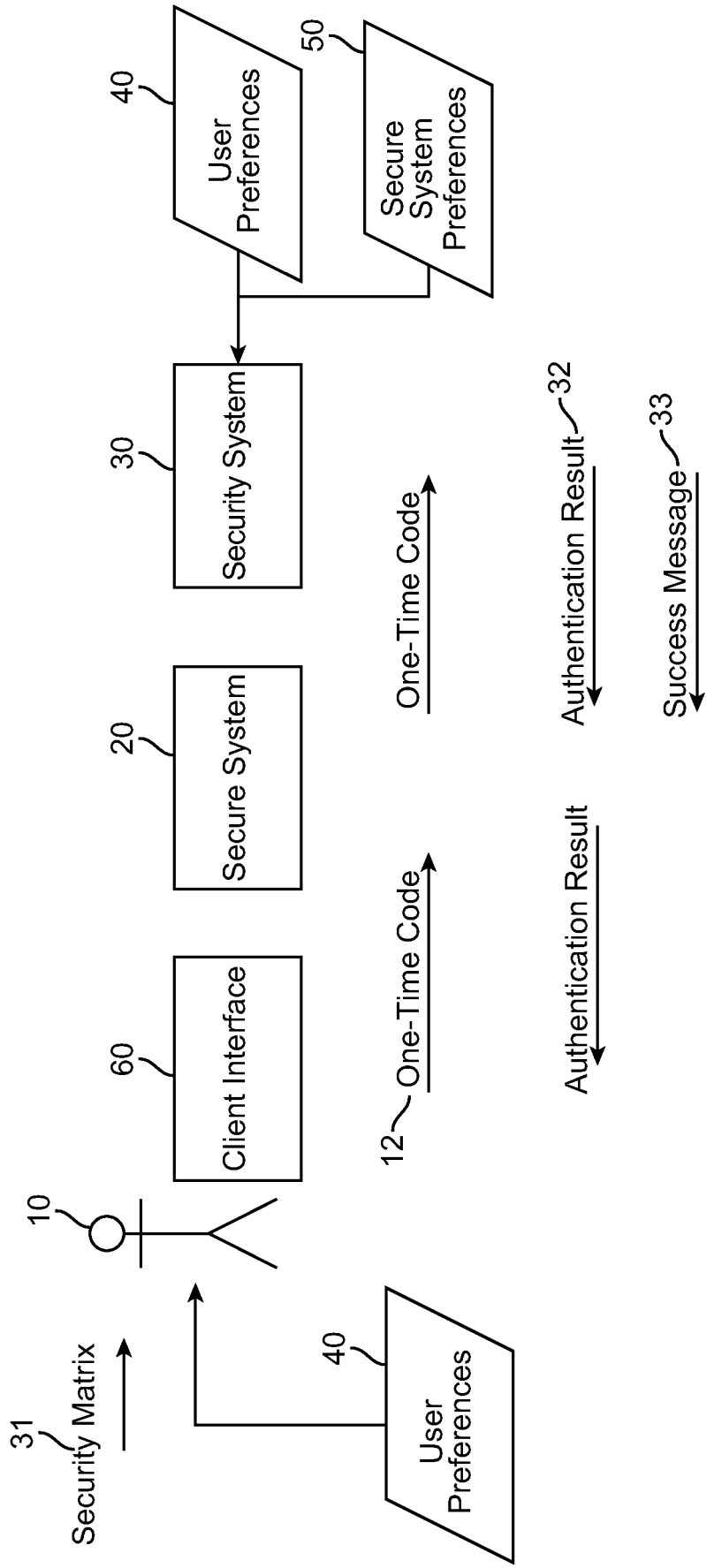
31
Security Matrix
10
40
User Preferences
60
Client Interface
20
Secure System
30
Security System
40
User Preferences
50
Secure System Preferences
12
One-Time Code
One-Time Code
Authentication Result
Authentication Result
32
Success Message
33

FIG. 2

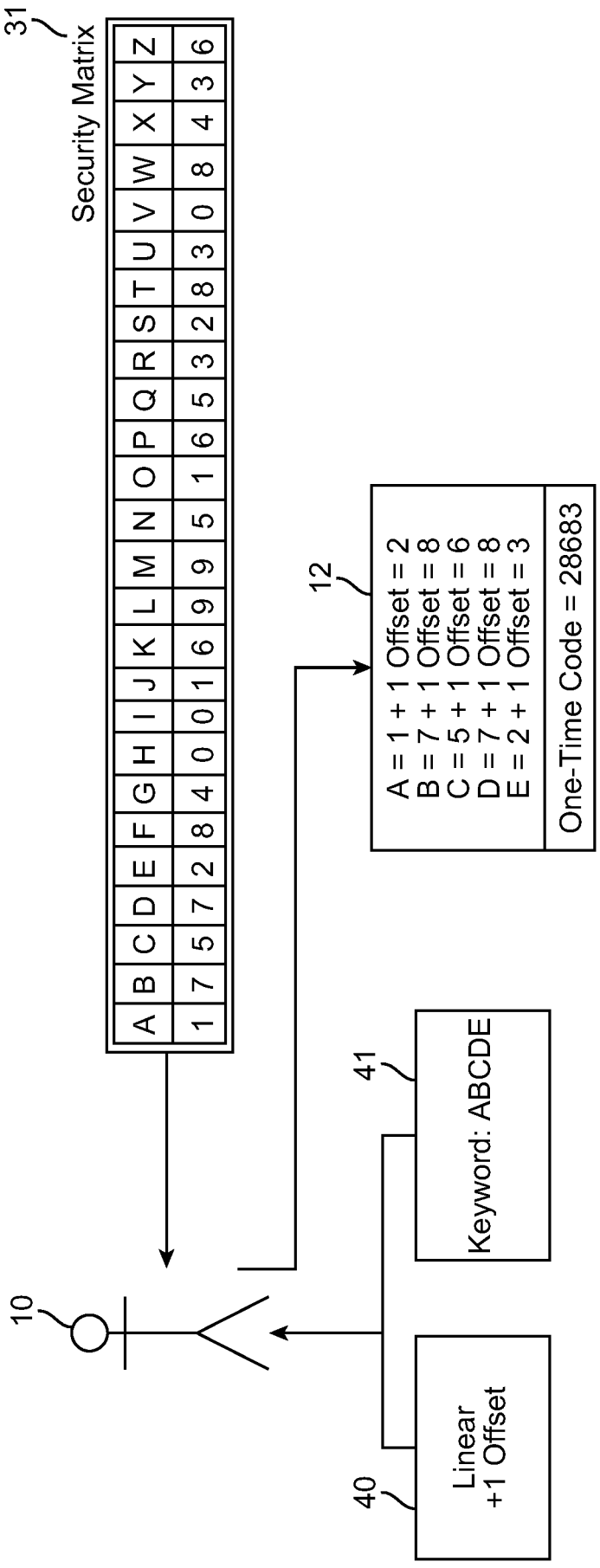
31
Security Matrix
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
1 7 5 7 2 8 4 0 0 1 6 9 9 5 1 6 5 3 2 8 3 0 8 4 3 6
12
A = 1 + 1 Offset = 2
B = 7 + 1 Offset = 8
C = 5 + 1 Offset = 6
D = 7 + 1 Offset = 8
E = 2 + 1 Offset = 3
One-Time Code = 28683
10
41
Keyword: ABCDE
40
Linear
+1 Offset

FIG. 3

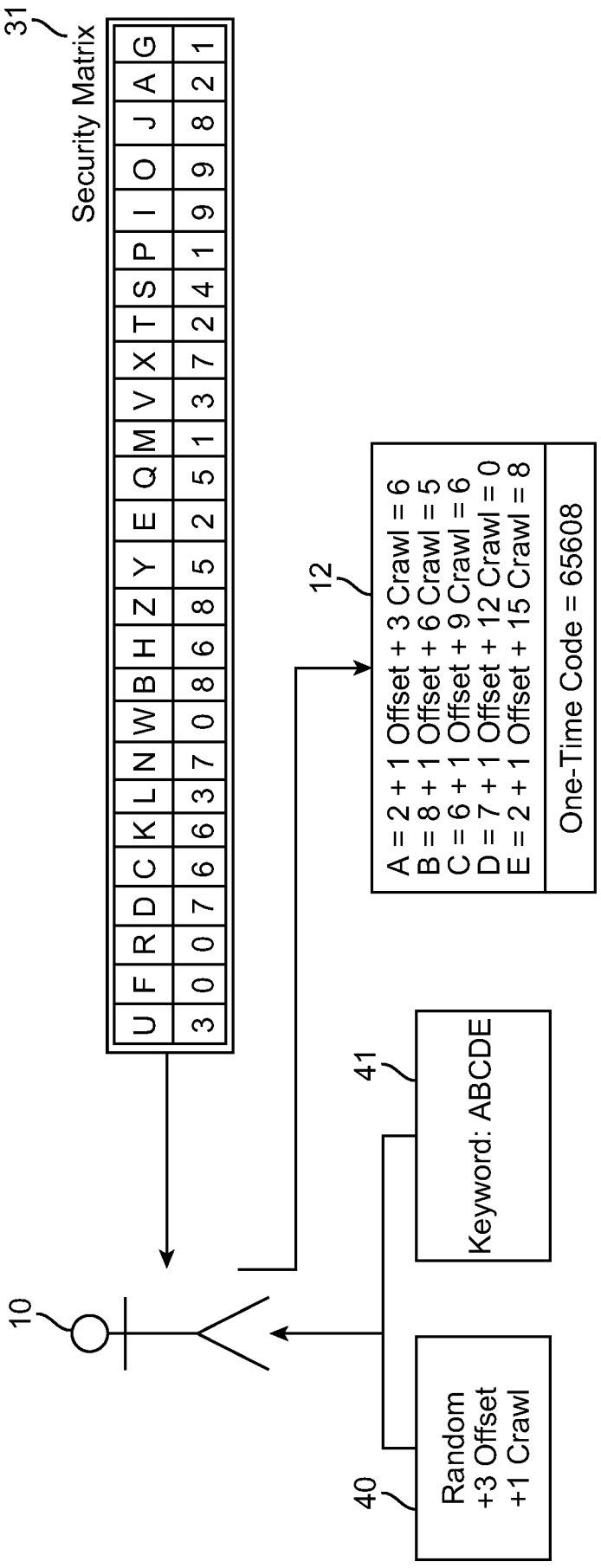
31
Security Matrix
U F R D C K L N W B H Z Y E Q M V X T S P I O J A G
3 0 0 7 6 6 3 7 0 8 6 8 5 2 5 1 3 7 2 4 1 9 9 8 2 1
12
A = 2 + 1 Offset + 3 Crawl = 6
B = 8 + 1 Offset + 6 Crawl = 5
C = 6 + 1 Offset + 9 Crawl = 6
D = 7 + 1 Offset + 12 Crawl = 0
E = 2 + 1 Offset + 15 Crawl = 8
One-Time Code = 65608
41
Keyword: ABCDE
10
40
Random
+3 Offset
+1 Crawl

FIG. 4

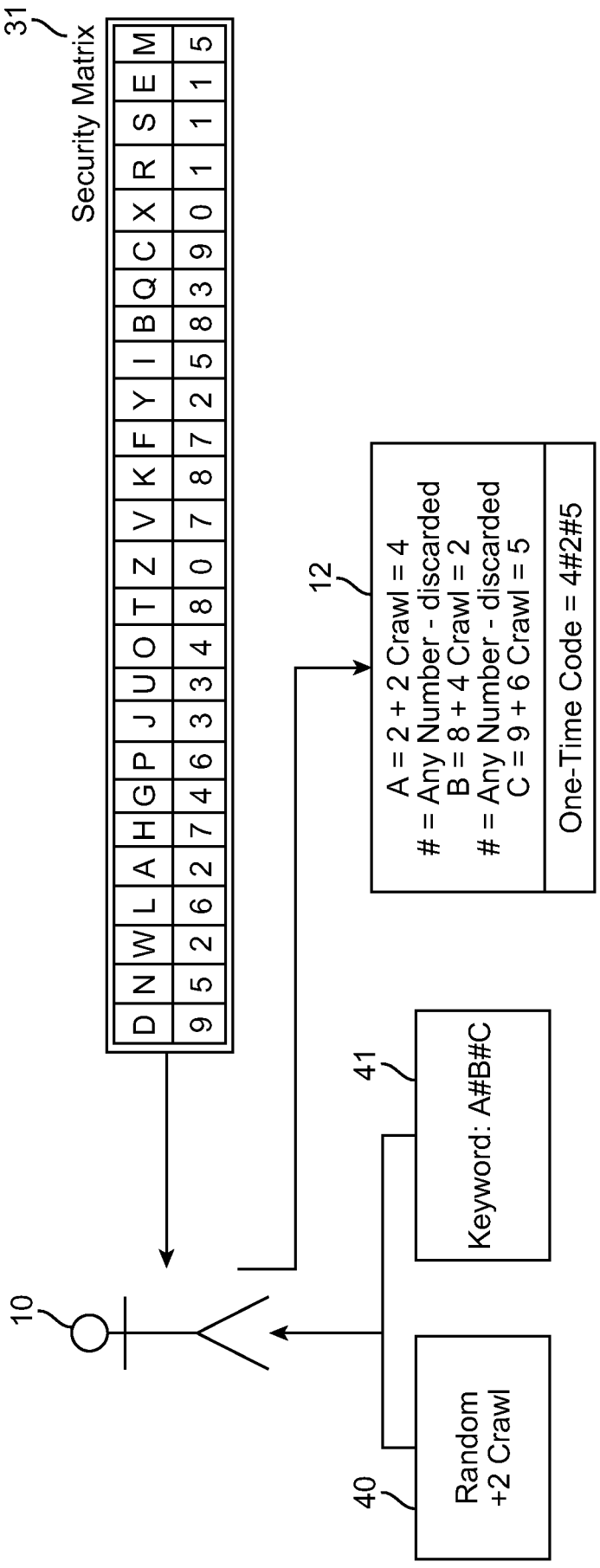
31
Security Matrix
D N W L A H G P J U O T Z V K F Y I B Q C X R S E M
9 5 2 6 2 7 4 6 3 3 4 8 0 7 8 7 2 5 8 3 9 0 1 1 5
12
A = 2 + 2 Crawl = 4
# = Any Number - discarded
B = 8 + 4 Crawl = 2
# = Any Number - discarded
C = 9 + 6 Crawl = 5
One-Time Code = 4#2#5
41
Keyword: A#B#C
40
Random
+2 Crawl
10

FIG. 5

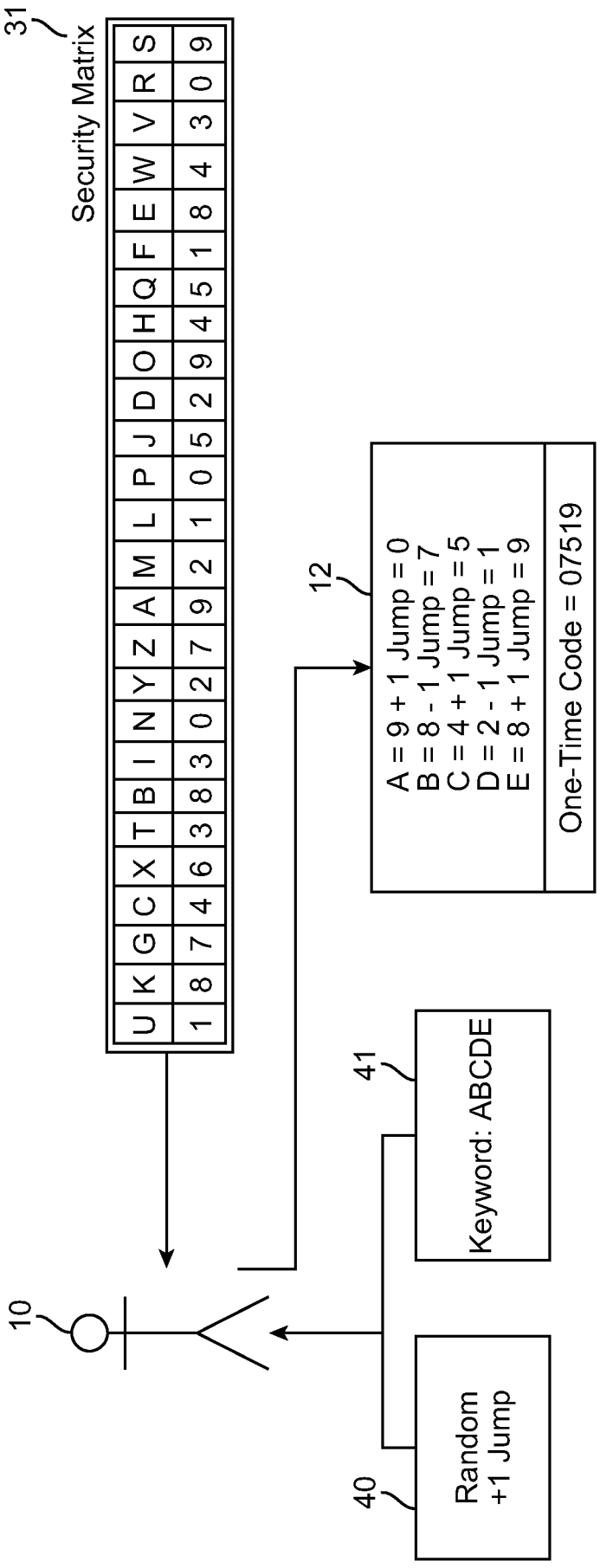
31
Security Matrix
U K G C X T B I N Y Z A M L P J D O H Q F E W V R S
1 8 7 4 6 3 8 3 0 2 7 9 2 1 0 5 2 9 4 5 1 8 4 3 0 9
12
A = 9 + 1 Jump = 0
B = 8 - 1 Jump = 7
C = 4 + 1 Jump = 5
D = 2 - 1 Jump = 1
E = 8 + 1 Jump = 9
One-Time Code = 07519
10
41
Keyword: ABCDE
40
Random
+1 Jump

FIG. 6

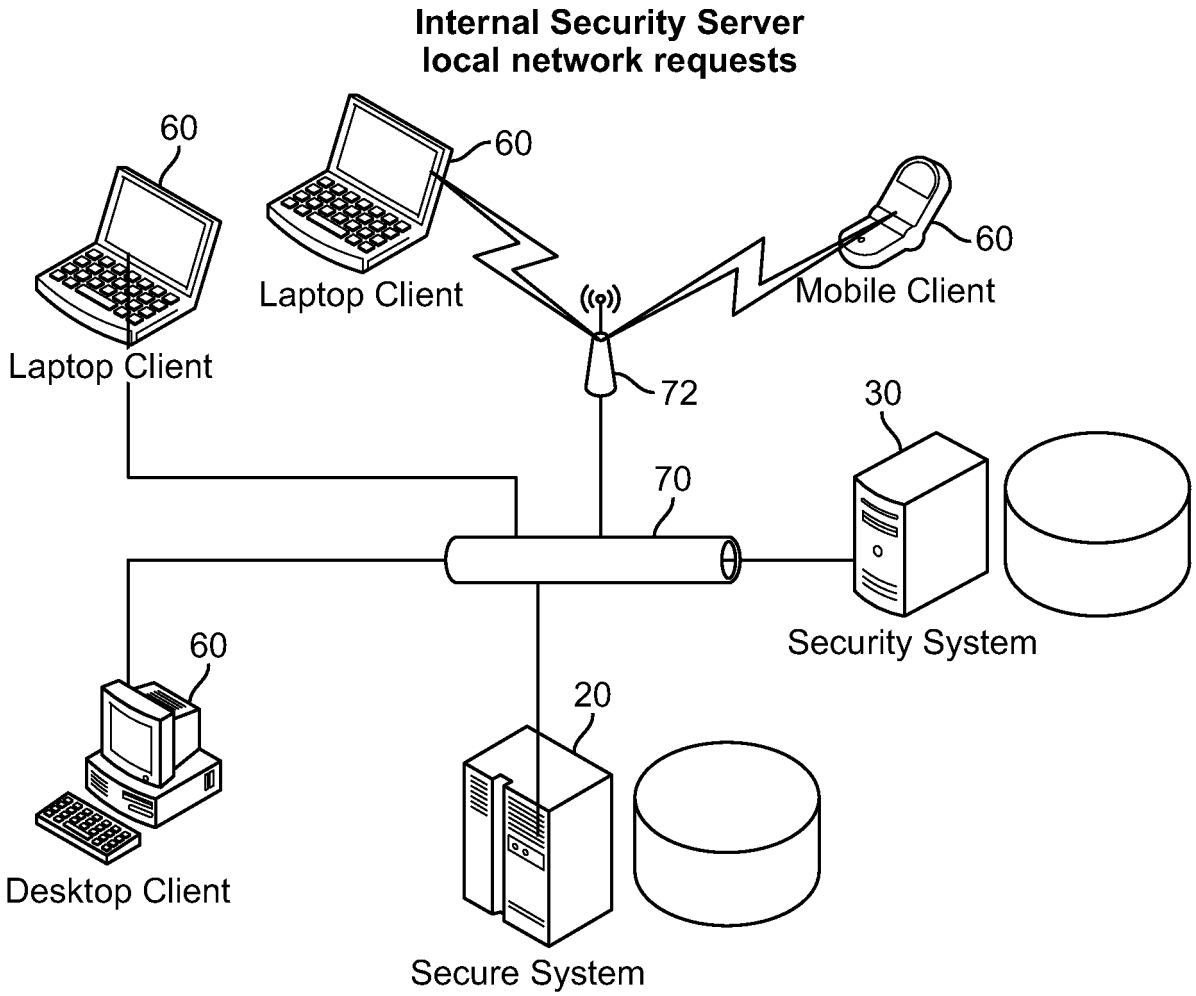
Internal Security Server
local network requests
60
Laptop Client
60
Laptop Client
60
Mobile Client
72
30
70
Security System
60
Desktop Client
20
Secure System

FIG. 7A

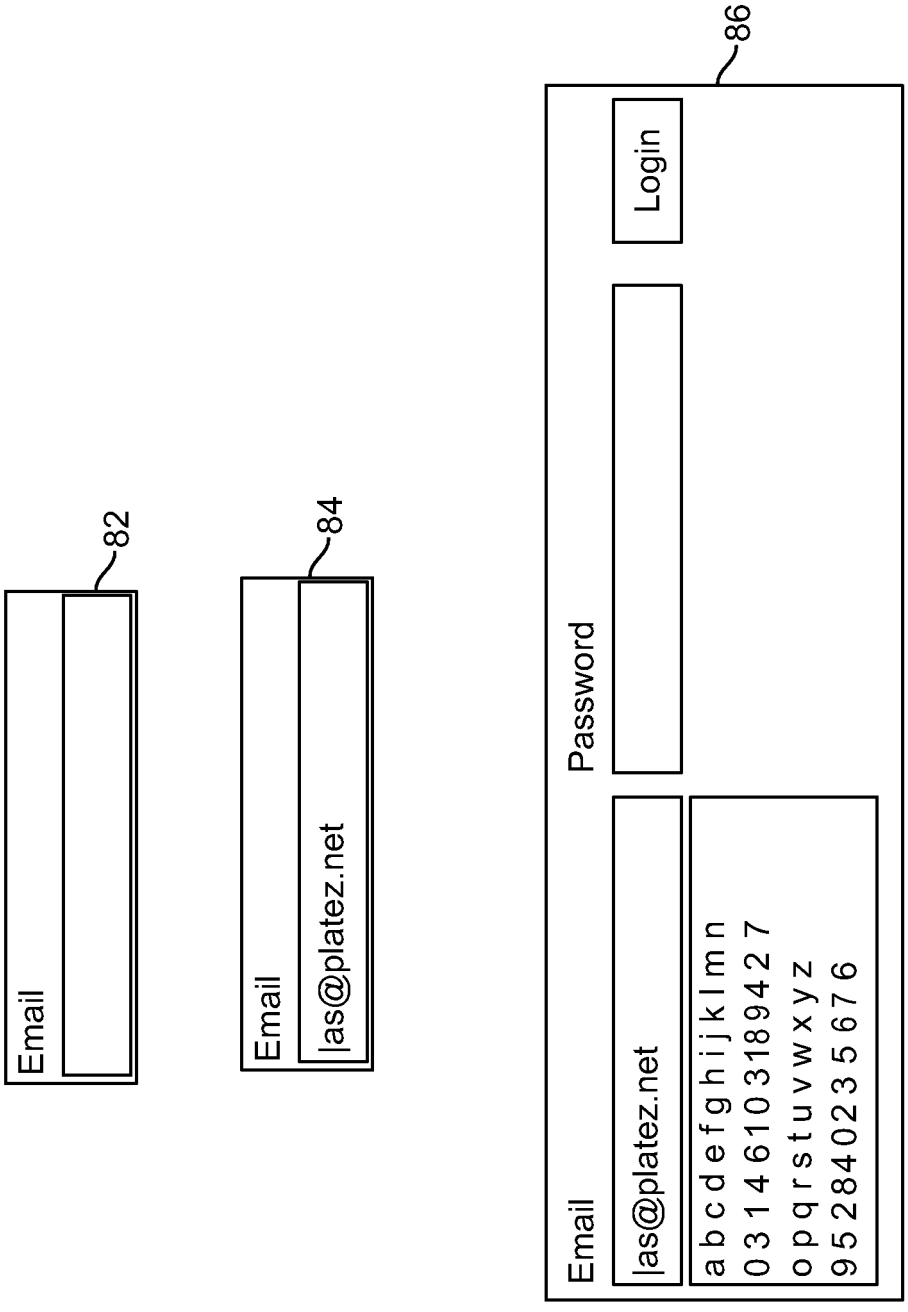
82
Email
84
Email
|as@platez.net
86
Email
|as@platez.net
Password
Login
a b c d e f g h i j k l m n
0 3 1 4 6 1 0 3 1 8 9 4 2 7
o p q r s t u v w x y z
9 5 2 8 4 0 2 3 5 6 7 6

FIG. 7B

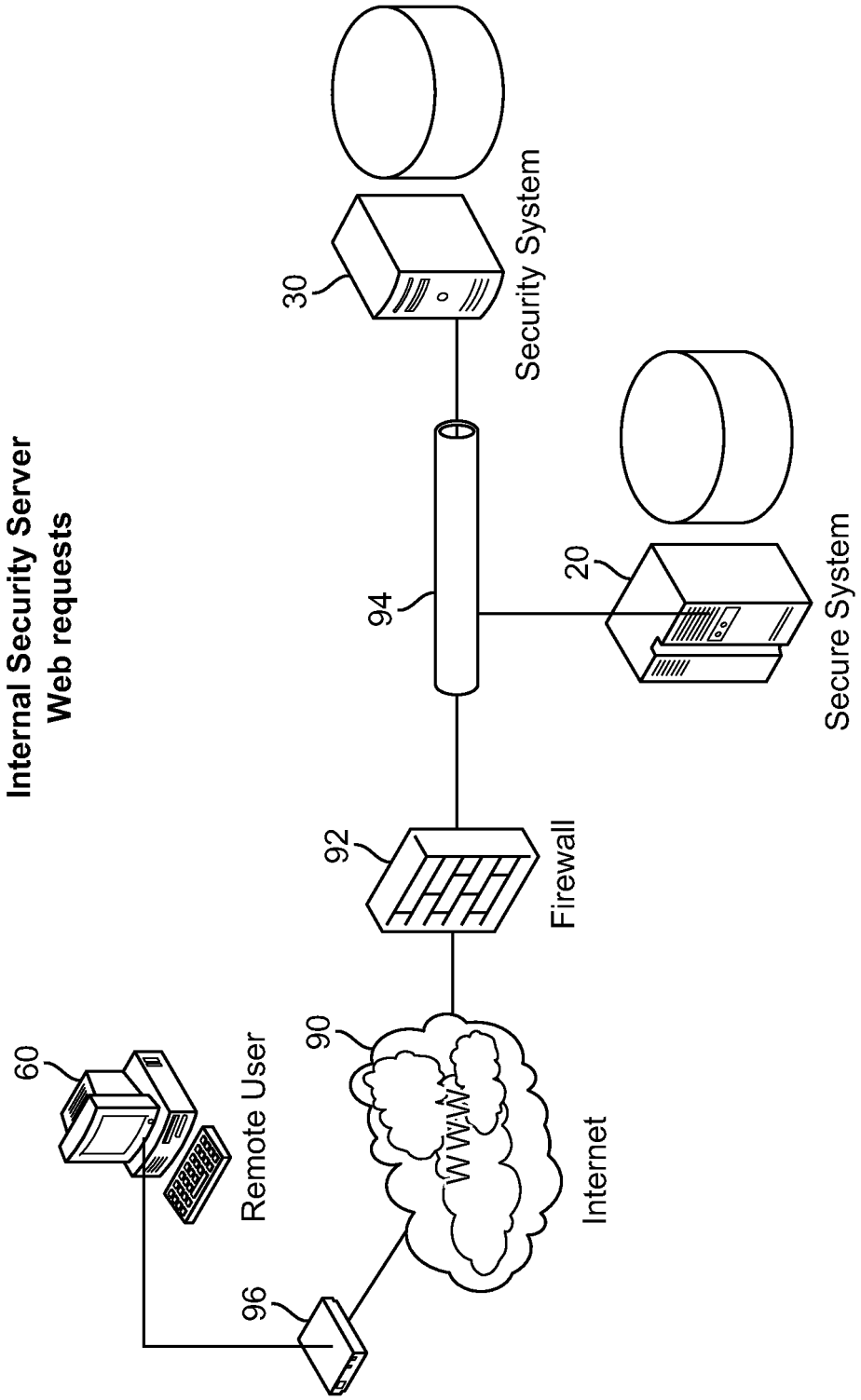
Internal Security Server
Web requests
30
Security System
94
20
Secure System
92
Firewall
90
WWW
Internet
60
Remote User
96

FIG. 8

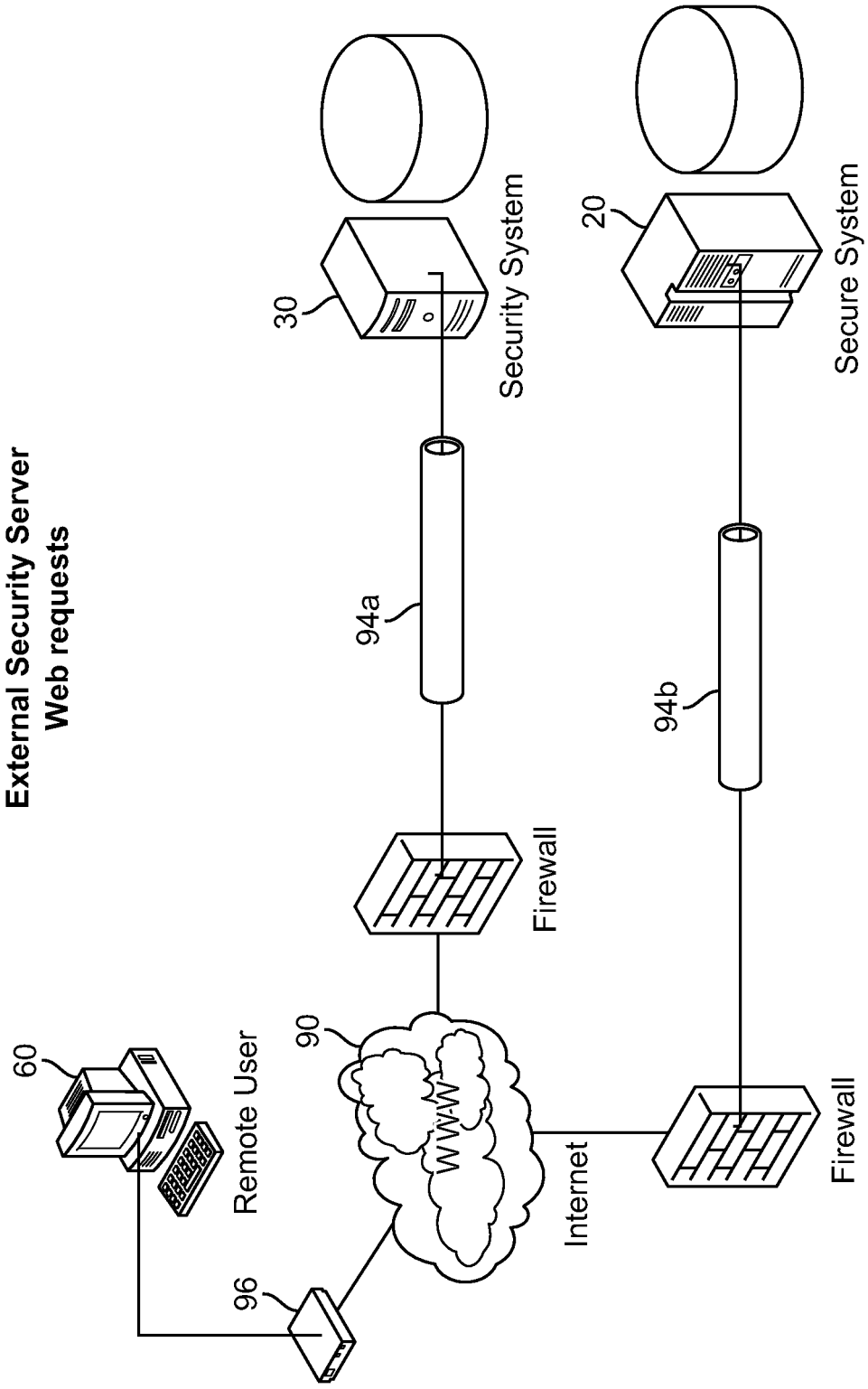
External Security Server
Web requests
60
Remote User
96
90
WWW
Internet
Firewall
94a
30
Security System
94b
Firewall
20
Secure System

FIG. 9

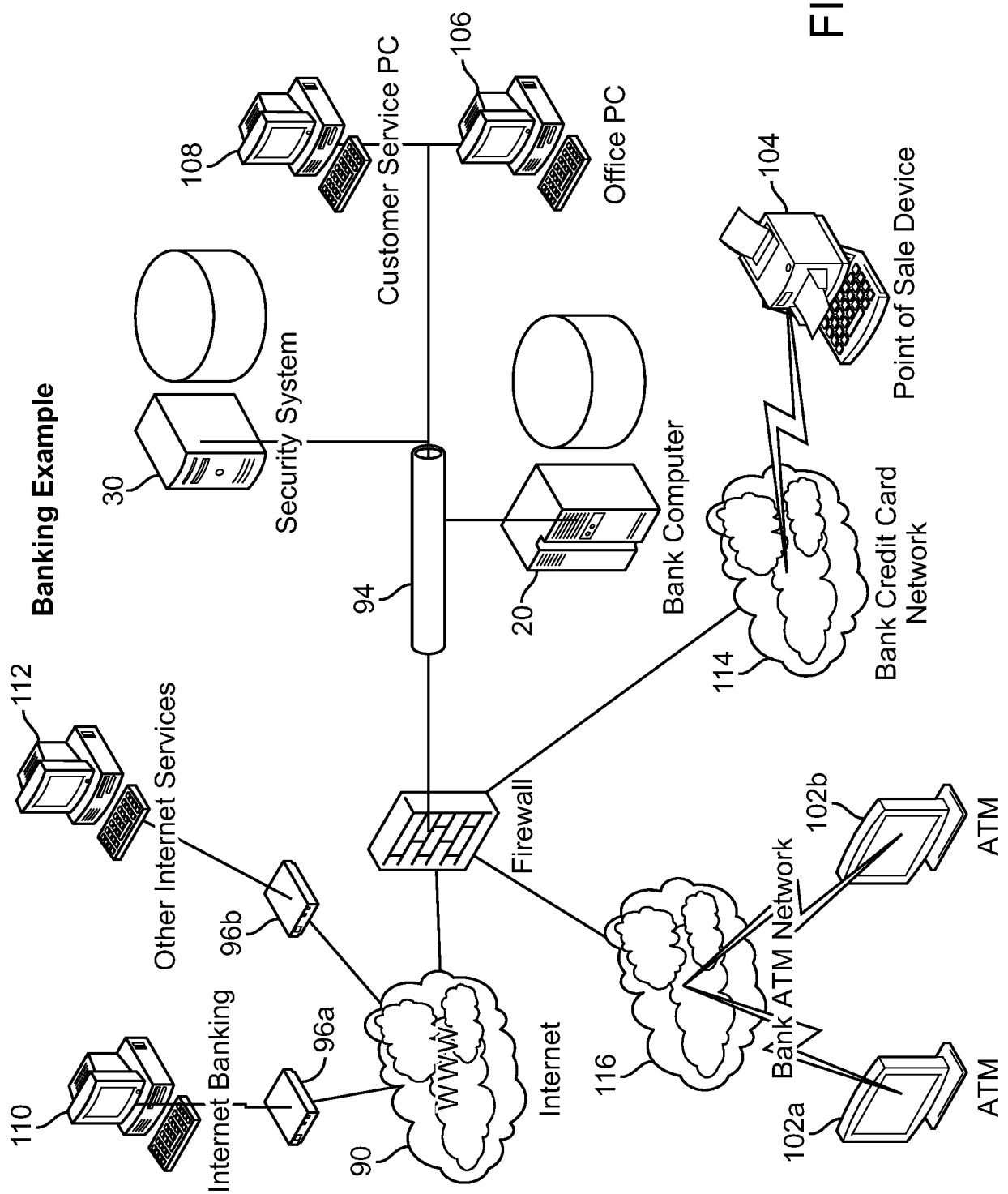
Banking Example
Customer Service PC
Office PC
Security System
Bank Computer
Point of Sale Device
Bank Credit Card Network
Other Internet Services
Internet Banking
Firewall
WWW
Internet
Bank ATM Network
ATM
ATM
108
106
30
104
94
20
112
114
96b
96a
110
90
116
102b
102a

FIG. 10

Authentication Request 11
Unique User ID
ID of the system requesting the authentication

One-Time Code 12
Unique User ID
ID of the system requesting the validation
One-Time Code as entered by the end user

Security Matrix 31
Collection of Key/Value pairs composed according to the Secure System Preferences 50

Authentication Result 32
Session ID, OK, or Error

Success Message 33
Unique User ID
ID of the system validated against
Session ID

Table 1

FIG. 11

Segment	Option	Description
Order	Linear abstraction	Key letters presented in a linear order of A to Z, 0 to 9
Order	Random abstraction	Key letters presented in a randomised order
Offset	Positive offset	Amount to be added to each Value associated to the Key. Numbers wrap such that 9+1 = 0 and Letters wrap such that Z+1 = A. i.e. +1
Offset	Negative offset	Amount to be subtracted from each Value associated to the Key. Numbers wrap such that 0-1 = 9 and Letters wrap such that A-1 = Z. i.e. -1
Crawl	Positive increment	Amount added to each Value associated to the Key and then incremented. Numbers wrap such that 9+1 = 0 and Letters wrap such that Z+1 = A. i.e. +1 (causing the sequence 0,1,2,3,4,5,6 to be added incrementally)
Crawl	Negative increment	Amount subtracted from each Value associated to the Key and then decremented. Numbers wrap such that 0-1 = 9 and Letters wrap such that A-1 = Z. i.e. -2 (causing the sequence 0,-2,-4,-6,-8 to be subtracted incrementally)
Jump	Odd	Amount is added to every Value located at an odd index of the keyword and subtracted from every Value located at an even index of the keyword
Jump	Even	Amount is subtracted from every Value located at an odd index of the keyword and added to every Value located at an even index of the keyword
Mask	As defined	A Mask is a template extension to the keyword, such that a placeholder is defined at certain indexes of the keyword. The placeholder can be any number/letter/symbol and is not affected by any other option. Additionally, the # symbol represents a wildcard match, allowing the user to define a keyword that appears longer than it really is.
Randomizer	Single	User chooses a Single Key from the Key Scope whose associated value is then used to modify each individual Value in the keyword. For example, FRED = 6152 is the keyword, P = 3 is the chosen Randomizer Single Key, so the one time code is 9485, assuming no other modifier is applied.
Randomizer	Key	User chooses a Second full Key having the same length as the keyword, each Token in this Randomizer Key is used to modify each associated Value in the keyword. For example, FRED = 6152 is the keyword, JOHN = 1493 is the Randomizer Key, so the one time code is 7545, assuming no other modifier is applied.

Table 3

FIG. 12

Segment	Option	Description
Return Format	XML	Security Matrix is returned as an XML structure
Return Format	HTML	Security Matrix is returned as a preformatted HTML inclusion
Return Format	Image	Security Matrix is returned as an image
Return Format	CSV	Security Matrix is returned as comma separated plain text
Key Scope	Set of A to Z, a to z, 0 to 9 symbols or images	Security System builds the Security Matrix KEYS using this selection of information. This information also determines the valid keyword composition.
Value Scope	Set of A to Z, a to z, 0 to 9 symbols or images	Security System builds the Security Matrix VALUES using this selection of information.

Table 4

FIG. 13

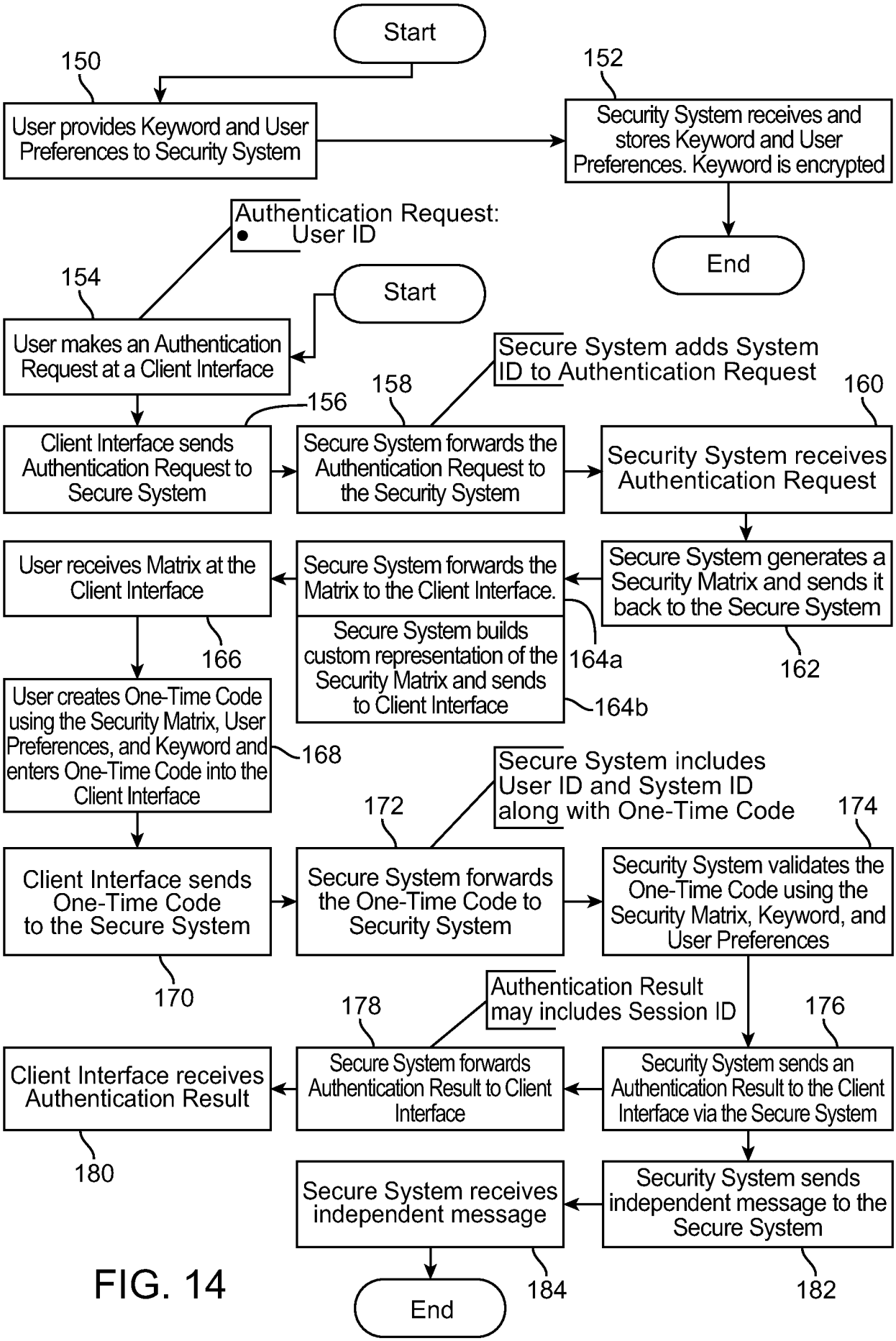
Start
150
User provides Keyword and User Preferences to Security System
152
Security System receives and stores Keyword and User Preferences. Keyword is encrypted
End
Authentication Request:
• User ID
154
Start
User makes an Authentication Request at a Client Interface
Secure System adds System ID to Authentication Request
158
156
160
Client Interface sends Authentication Request to Secure System
Secure System forwards the Authentication Request to the Security System
Security System receives Authentication Request
User receives Matrix at the Client Interface
Secure System forwards the Matrix to the Client Interface.
Secure System generates a Security Matrix and sends it back to the Secure System
Secure System builds custom representation of the Security Matrix and sends to Client Interface
164a
164b
162
166
User creates One-Time Code using the Security Matrix, User Preferences, and Keyword and enters One-Time Code into the Client Interface
168
Secure System includes User ID and System ID along with One-Time Code
172
174
Client Interface sends One-Time Code to the Secure System
Secure System forwards the One-Time Code to Security System
Security System validates the One-Time Code using the Security Matrix, Keyword, and User Preferences
170
Authentication Result may includes Session ID
178
176
Client Interface receives Authentication Result
Secure System forwards Authentication Result to Client Interface
Security System sends an Authentication Result to the Client Interface via the Secure System
180
Secure System receives independent message
Security System sends independent message to the Secure System
End
184
182

FIG. 14

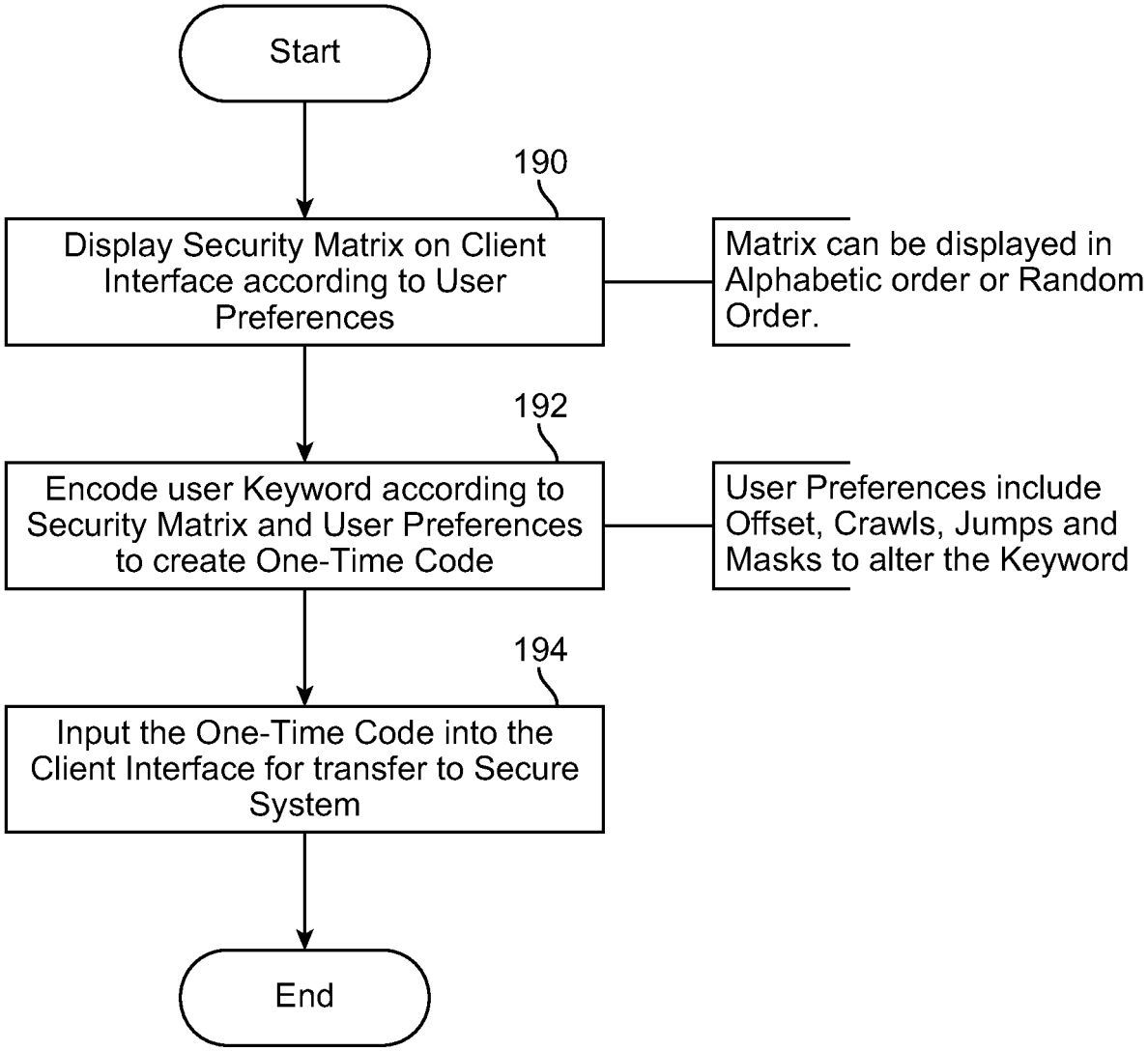
Start
190
Display Security Matrix on Client Interface according to User Preferences
Matrix can be displayed in Alphabetic order or Random Order.
192
Encode user Keyword according to Security Matrix and User Preferences to create One-Time Code
User Preferences include Offset, Crawls, Jumps and Masks to alter the Keyword
194
Input the One-Time Code into the Client Interface for transfer to Secure System
End

FIG. 15