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(54) **CONTROL TOWER FOR DEFINING ACCESS PERMISSIONS BASED ON DATA TYPE**

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(21) Appl. No.: **19/201,634**

(22) Filed: **May 7, 2025**

Related U.S. Application Data

(63) Continuation of application No. 18/136,425, filed on Apr. 19, 2023, now Pat. No. 12,314,435, which is a continuation of application No. 17/209,500, filed on Mar. 23, 2021, now Pat. No. 11,645,416, which is a continuation of application No. 17/005,124, filed on Aug. 27, 2020, now Pat. No. 10,963,589, which is a continuation of application No. 16/653,312, filed on Oct. 15, 2019, now Pat. No. 11,886,611, which is a continuation-in-part of application No. 16/457,257, filed on Jun. 28, 2019, now Pat. No. 12,130,937, which is a continuation-in-part of application No. 16/383,388, filed on Apr. 12, 2019, now Pat. No. 11,935,020, which is a continuation-in-part of application No. 16/215,558, filed on Dec. 10, 2018, now Pat. No. 11,409,902, which is a continuation of application No. 16/204,831, filed on Nov. 29, 2018, now Pat. No. 11,386,223, which is a continuation-in-part of application No. 15/723,078, filed on Oct. 2, 2017, now Pat. No. 10,992,679, which is a continuation-in-part of application No. 15/629,423, filed on Jun. 21, 2017, now Pat. No. 11,615,402.

(60) Provisional application No. 62/766,400, filed on Oct. 16, 2018, provisional application No. 62/403,396, filed on Oct. 3, 2016, provisional application No. 62/529,360, filed on Jul. 6, 2017, provisional application No. 62/357,737, filed on Jul. 1, 2016.

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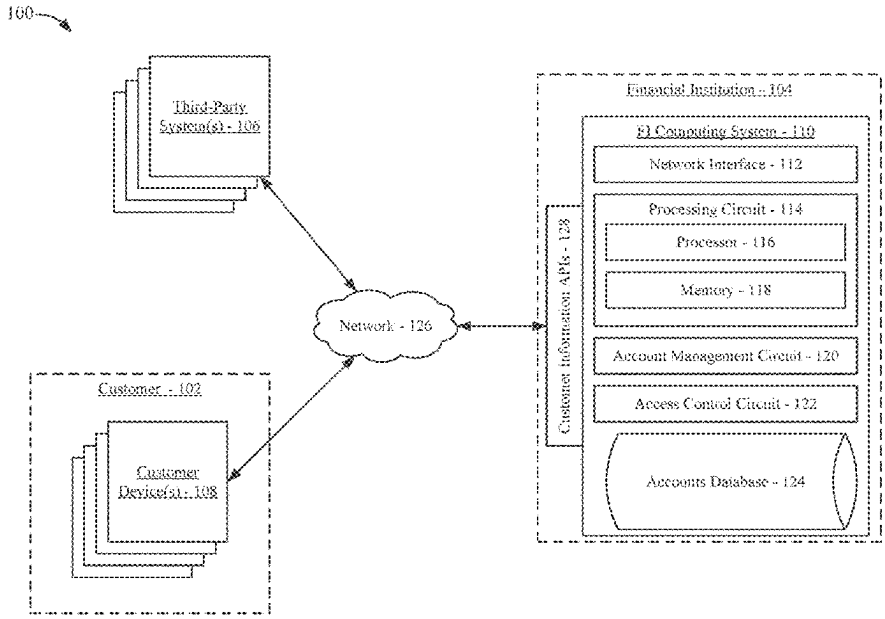
H04L 9/40	(2022.01)

(52) **U.S. Cl.**

CPC ***G06F 21/6245*** (2013.01); ***H04L 63/10*** (2013.01); *G06F 16/215* (2019.01); *G06F 21/6263* (2013.01)

(57) **ABSTRACT**

Systems, methods, and apparatuses for defining access permissions based on data type are disclosed. A system provides an account listing via an internet portal accessed on a user device. The account listing can include a financial account linked with a service provider client application. The system provides, via the internet portal, an access permissions listing comprising one or more security settings attributable to the service provider client application. Upon receiving selection of security settings, the system determines whether an incoming application programming interface (API) call comprising an account request transmitted from a service provider computing system complies with the selected security settings. Upon determining that the request does not comply with the security settings, the system declines the account request.



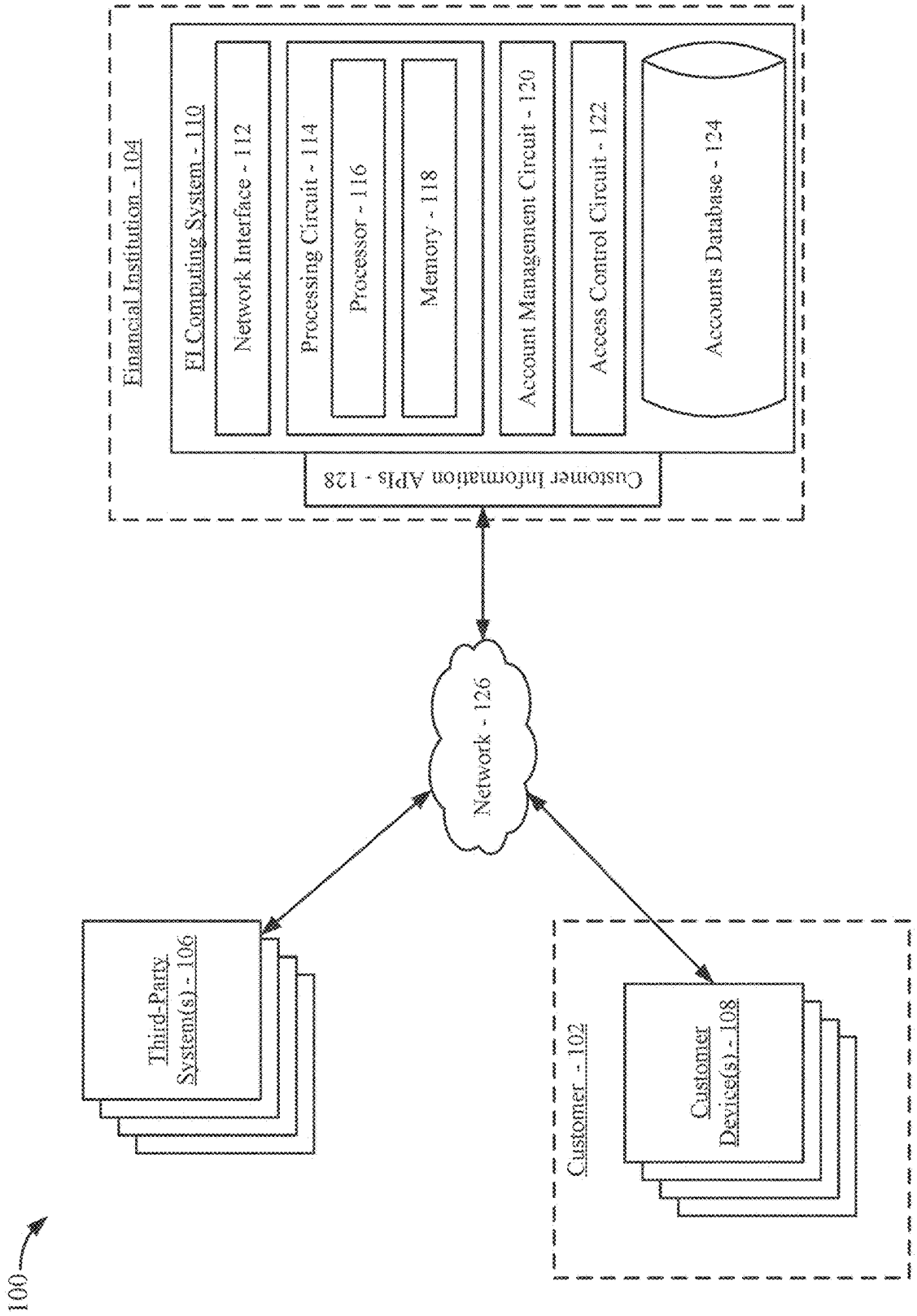

100
Financial Institution - 104
FI Computing System - 110
Network Interface - 112
Processing Circuit - 114
Processor - 116
Memory - 118
Account Management Circuit - 120
Access Control Circuit - 122
Accounts Database - 124
Customer Information APIs - 128
Network - 126
Third-Party System(s) - 106
Customer - 102
Customer Device(s) - 108

FIG. 1

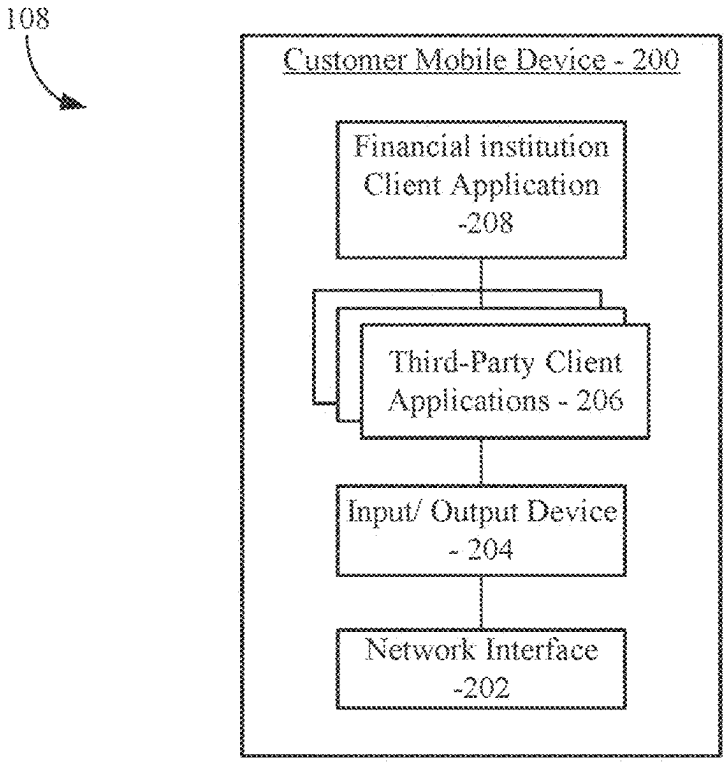

108
Customer Mobile Device - 200
Financial institution Client Application -208
Third-Party Client Applications - 206
Input/ Output Device - 204
Network Interface -202

FIG. 2

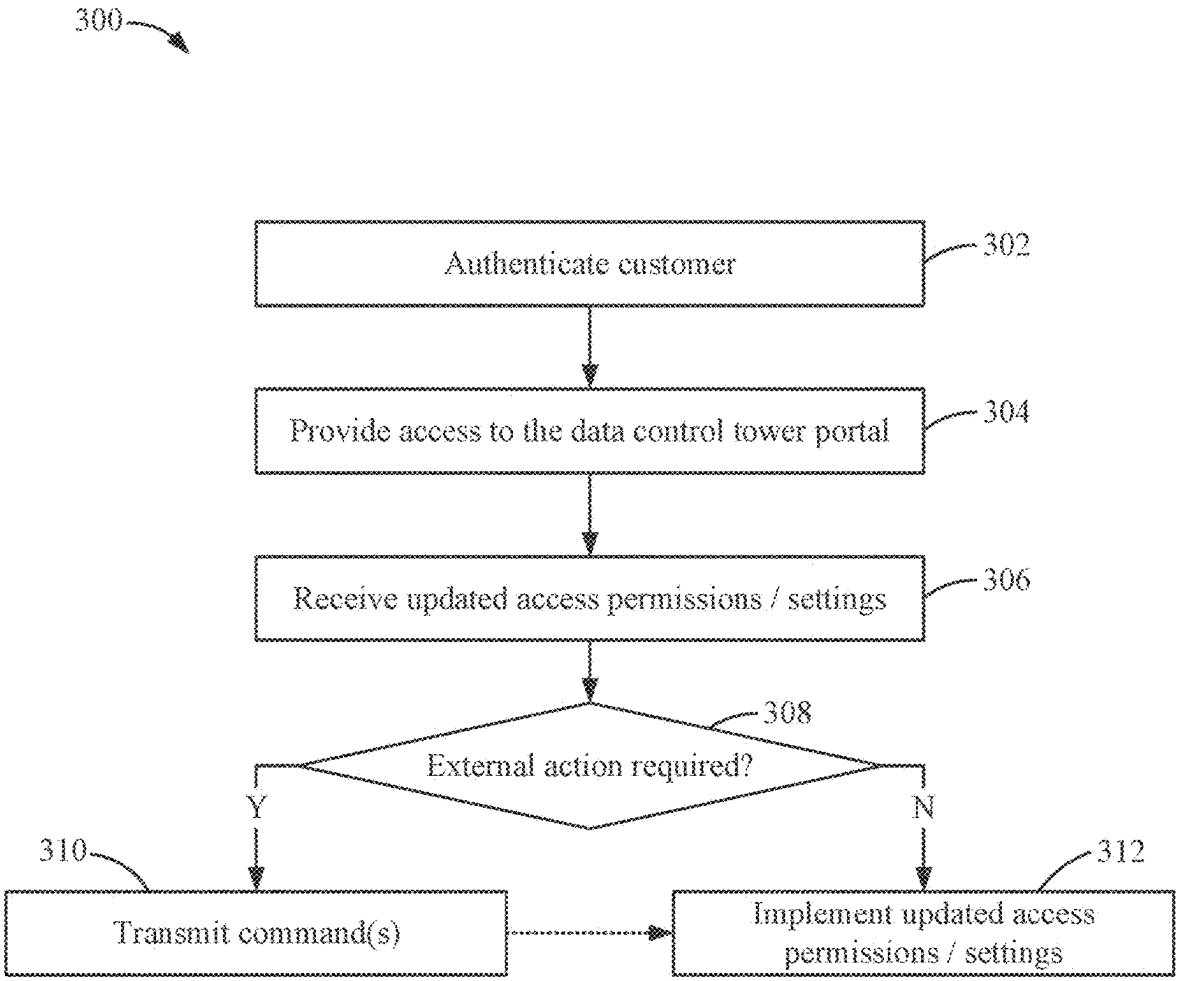

300
Authenticate customer
302
Provide access to the data control tower portal
304
Receive updated access permissions / settings
306
External action required?
308
Y
N
310
Transmit command(s)
312
Implement updated access permissions / settings

FIG. 3

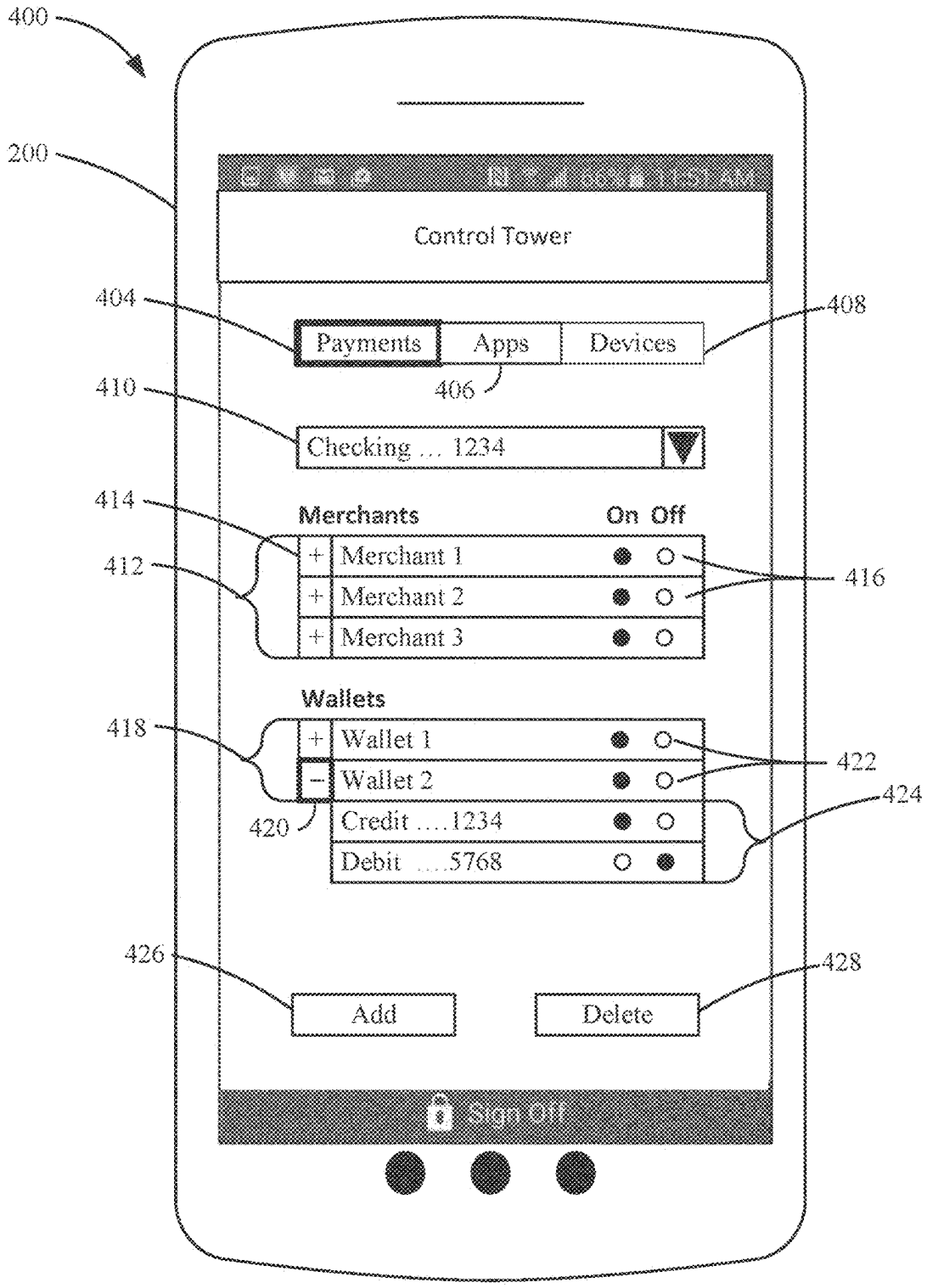

400
200
Control Tower
404
Payments
Apps
Devices
408
406
410
Checking ... 1234
414
Merchants
On Off
412
+ Merchant 1
+ Merchant 2
+ Merchant 3
416
Wallets
418
+ Wallet 1
− Wallet 2
Credit 1234
Debit 5768
422
424
420
426
428
Add
Delete
Sign Off

FIG. 4

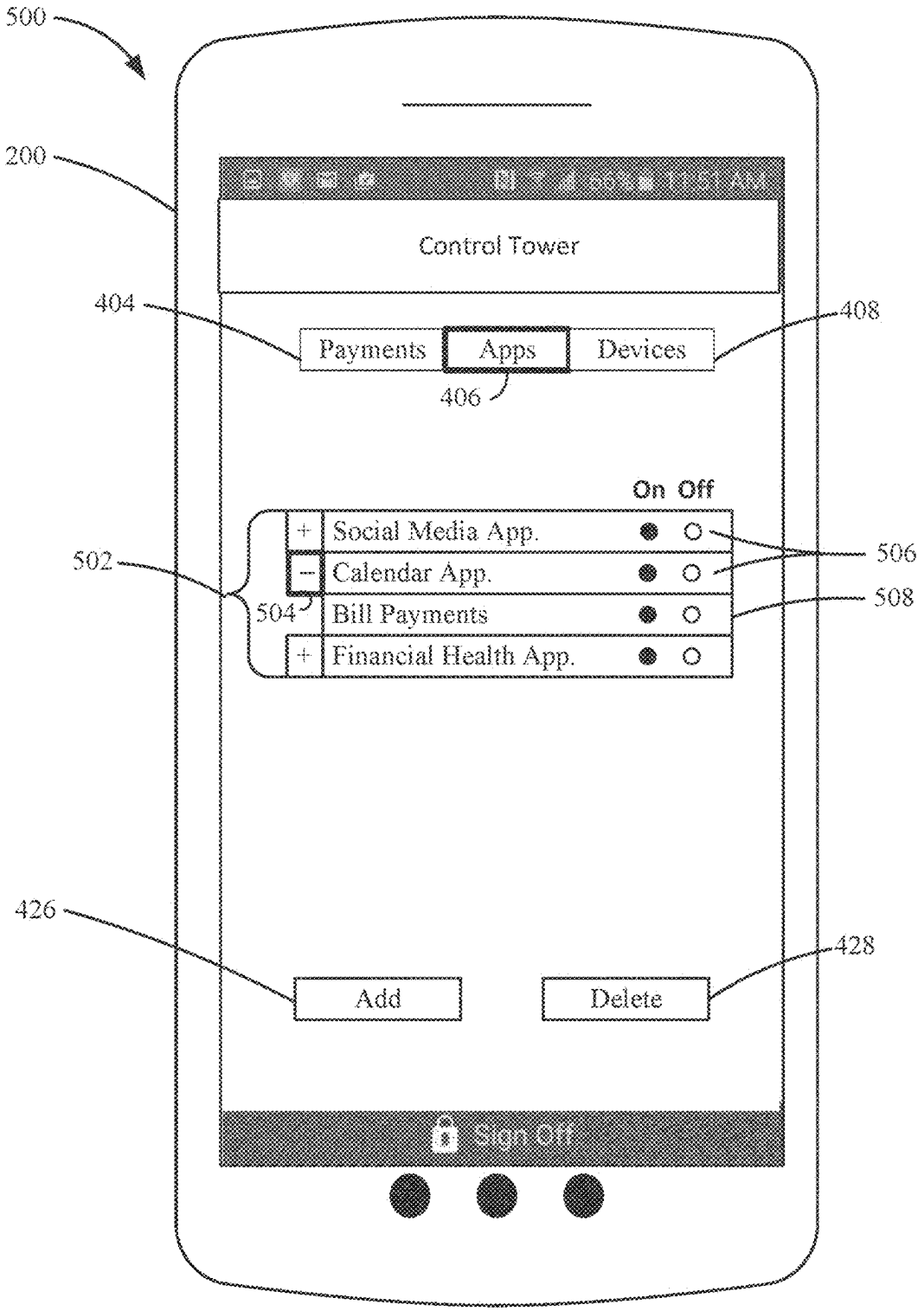

500
200
Control Tower
404
Payments
Apps
Devices
408
406
On Off
Social Media App.
Calendar App.
Bill Payments
Financial Health App.
502
504
506
508
426
428
Add
Delete
Sign Off

FIG. 5

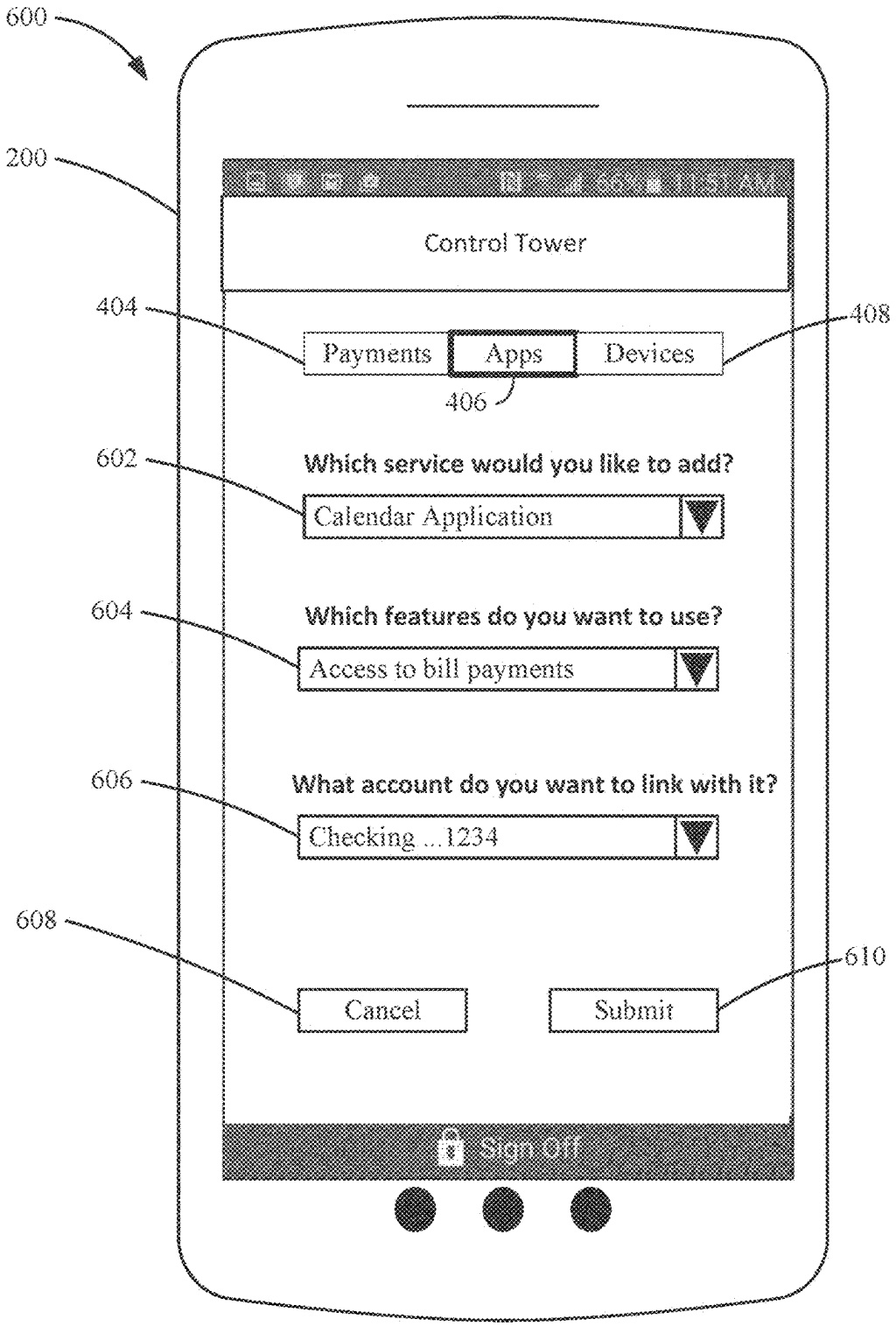

600
200
Control Tower
404
Payments
Apps
Devices
408
406
602
Which service would you like to add?
Calendar Application
604
Which features do you want to use?
Access to bill payments
606
What account do you want to link with it?
Checking ...1234
608
Cancel
Submit
610
Sign Off

FIG. 6

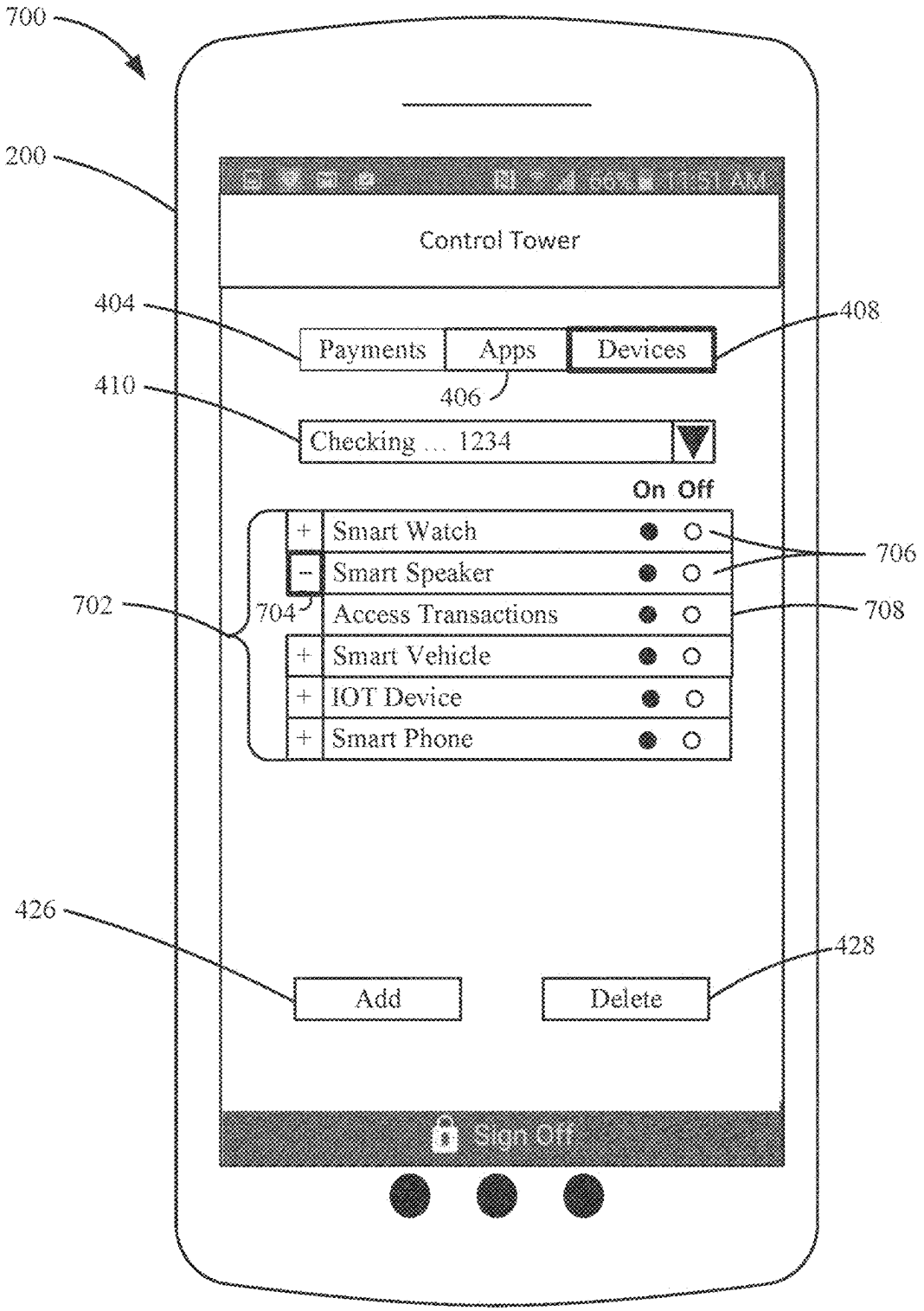

700
200
Control Tower
404
Payments
Apps
Devices
408
406
410
Checking ... 1234
On Off
Smart Watch
Smart Speaker
Access Transactions
Smart Vehicle
IOT Device
Smart Phone
706
702
704
708
426
428
Add
Delete
Sign Off

FIG. 7

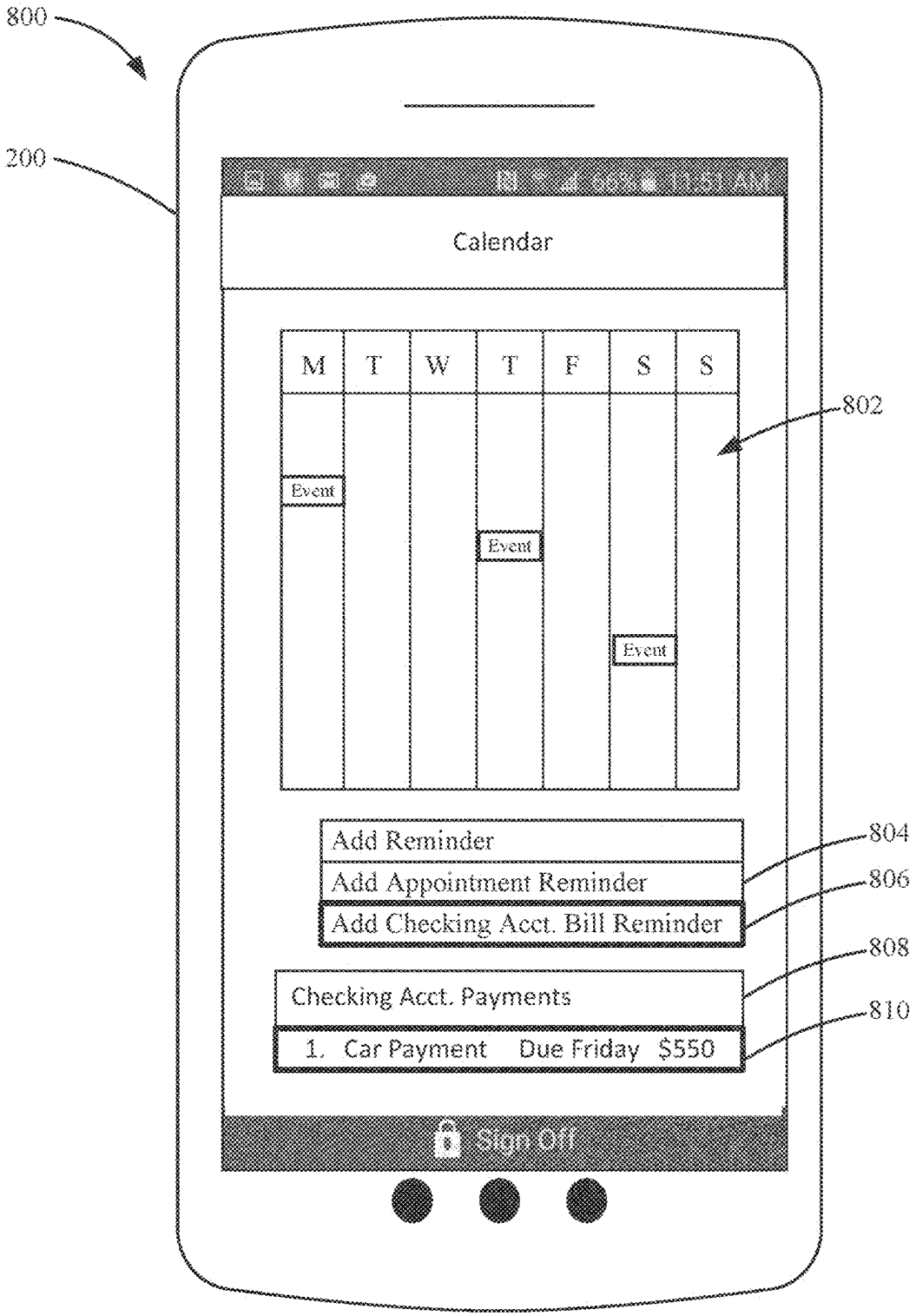

800
200
Calendar
M
T
W
T
F
S
S
802
Event
Event
Event
Add Reminder
Add Appointment Reminder
Add Checking Acct. Bill Reminder
804
806
Checking Acct. Payments
1. Car Payment Due Friday $550
808
810
Sign Off

FIG. 8

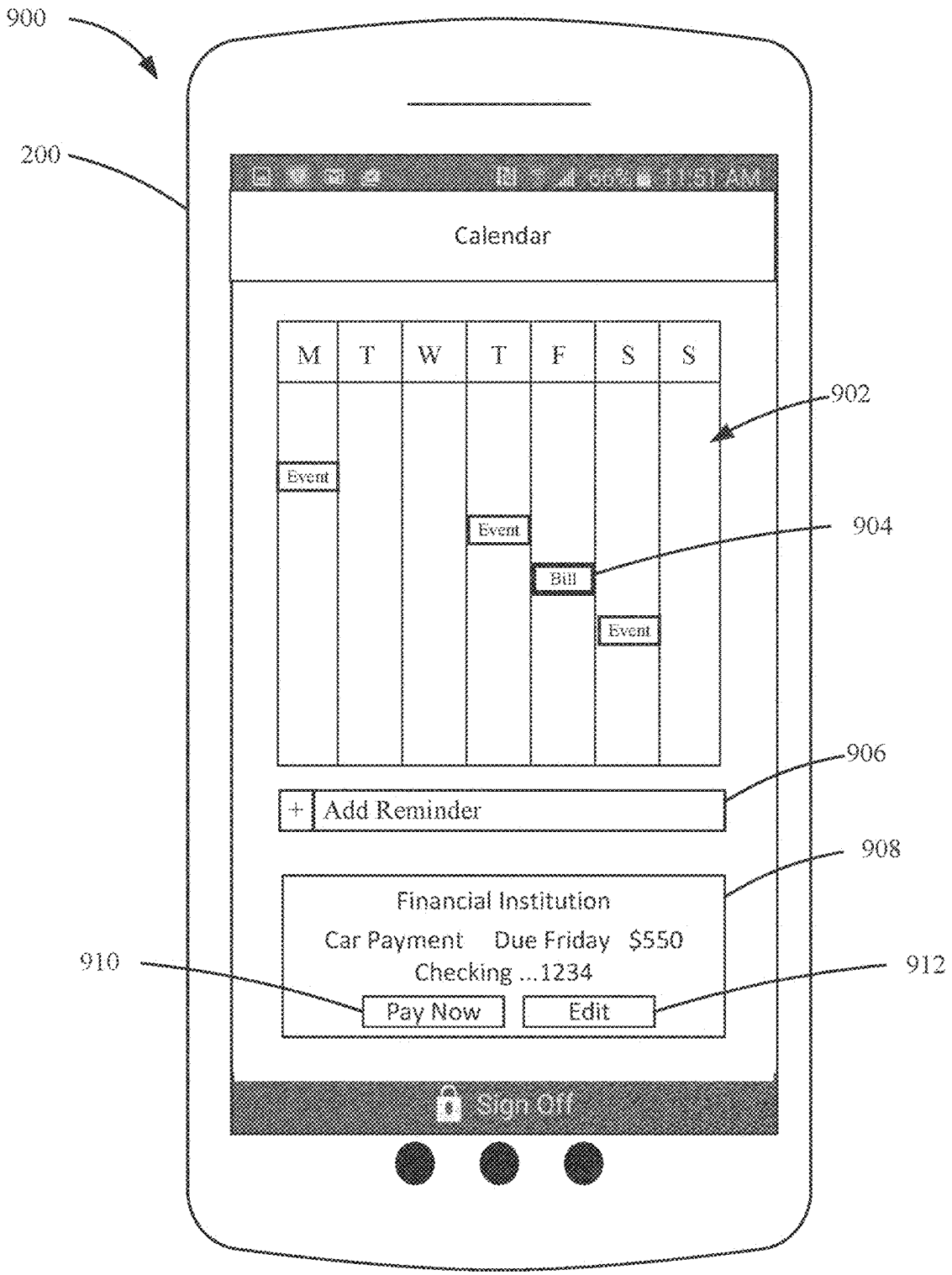

900
200
Calendar
M
T
W
T
F
S
S
902
Event
Event
904
Bill
Event
906
+
Add Reminder
908
Financial Institution
Car Payment Due Friday $550
Checking ...1234
910
912
Pay Now
Edit
Sign Off

FIG. 9

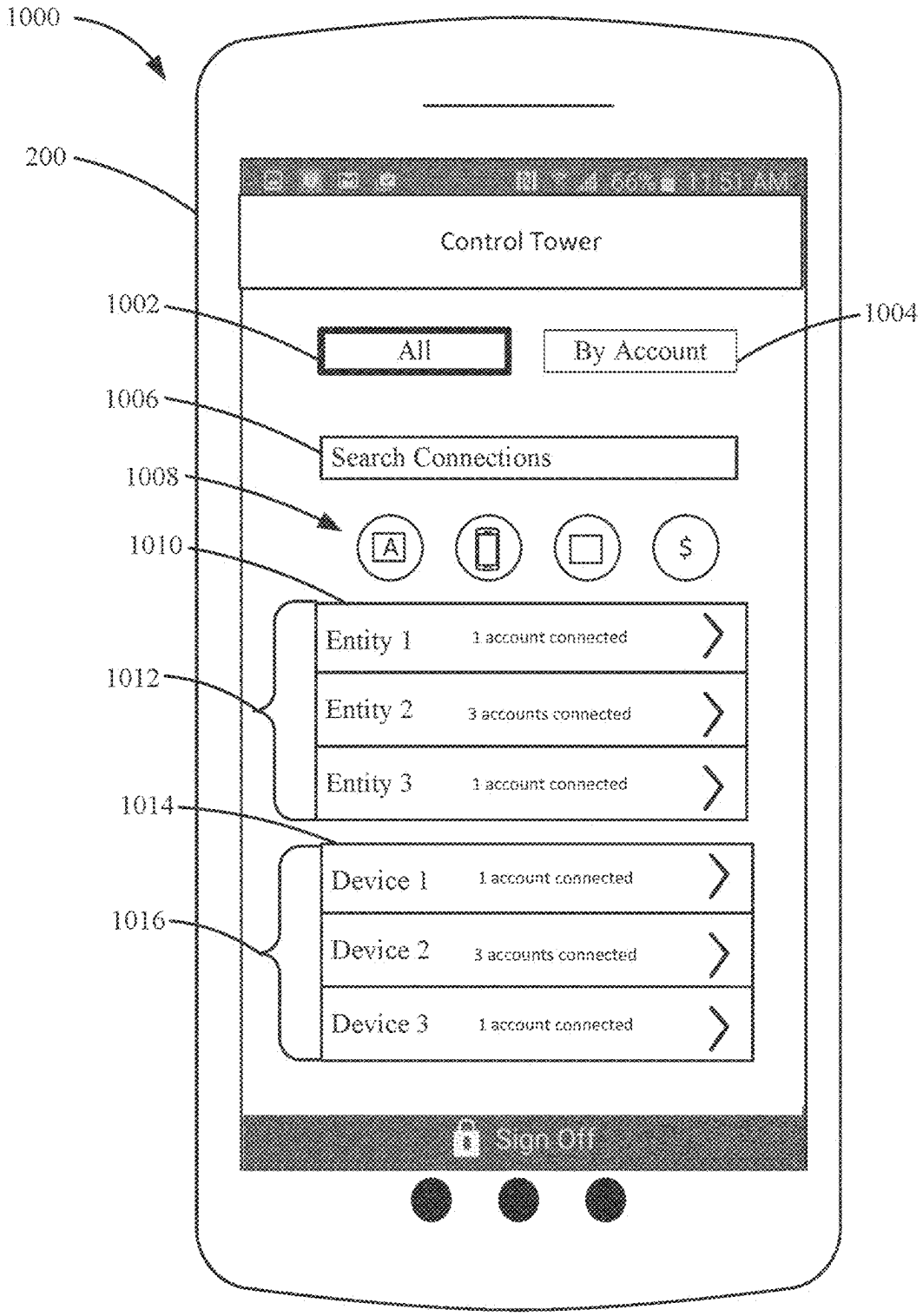

1000
200
Control Tower
1002
All
By Account
1004
1006
Search Connections
1008
A
$
1010
Entity 1
1 account connected
1012
Entity 2
3 accounts connected
Entity 3
1 account connected
1014
Device 1
1 account connected
1016
Device 2
3 accounts connected
Device 3
1 account connected
Sign Off

FIG. 10

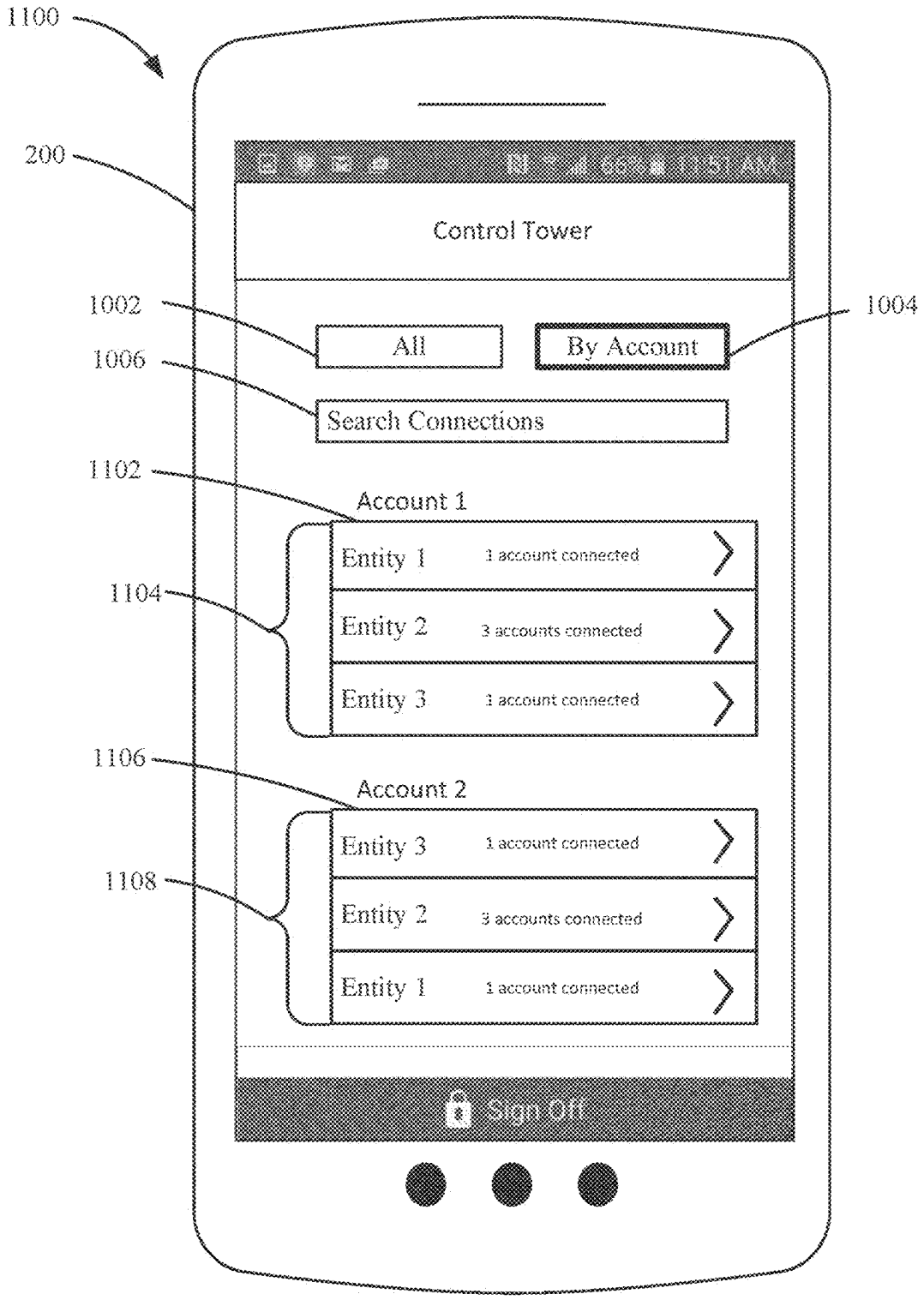

1100
200
Control Tower
1002
1004
All
By Account
1006
Search Connections
1102
Account 1
Entity 1
1 account connected
1104
Entity 2
3 accounts connected
Entity 3
1 account connected
1106
Account 2
Entity 3
1 account connected
1108
Entity 2
3 accounts connected
Entity 1
1 account connected
Sign Off

FIG. 11

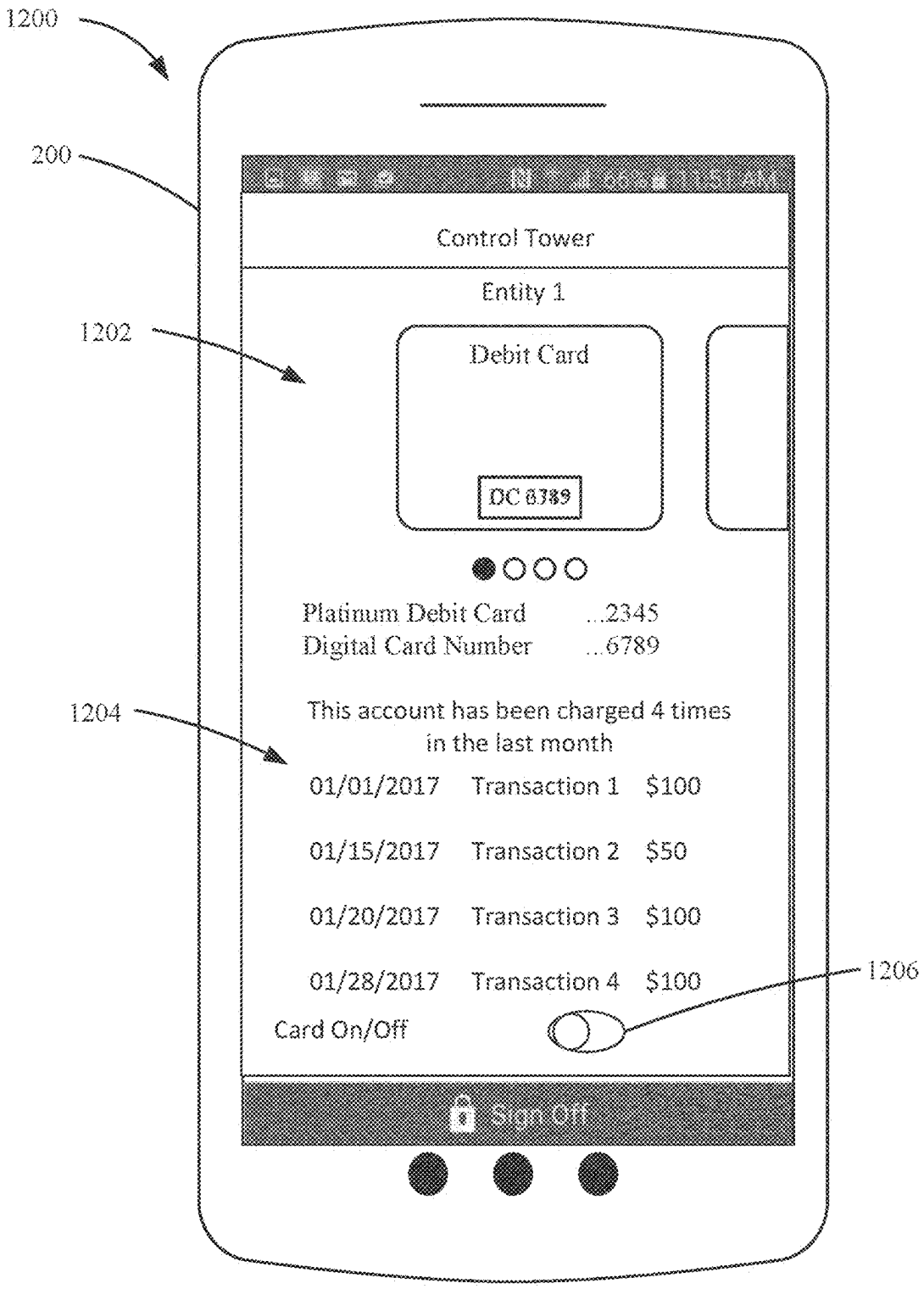

1200
200
1202
1204
1206
Control Tower
Entity 1
Debit Card
DC 6789
Platinum Debit Card ...2345
Digital Card Number ...6789
This account has been charged 4 times in the last month
01/01/2017 Transaction 1 $100
01/15/2017 Transaction 2 $50
01/20/2017 Transaction 3 $100
01/28/2017 Transaction 4 $100
Card On/Off
Sign Off

FIG. 12

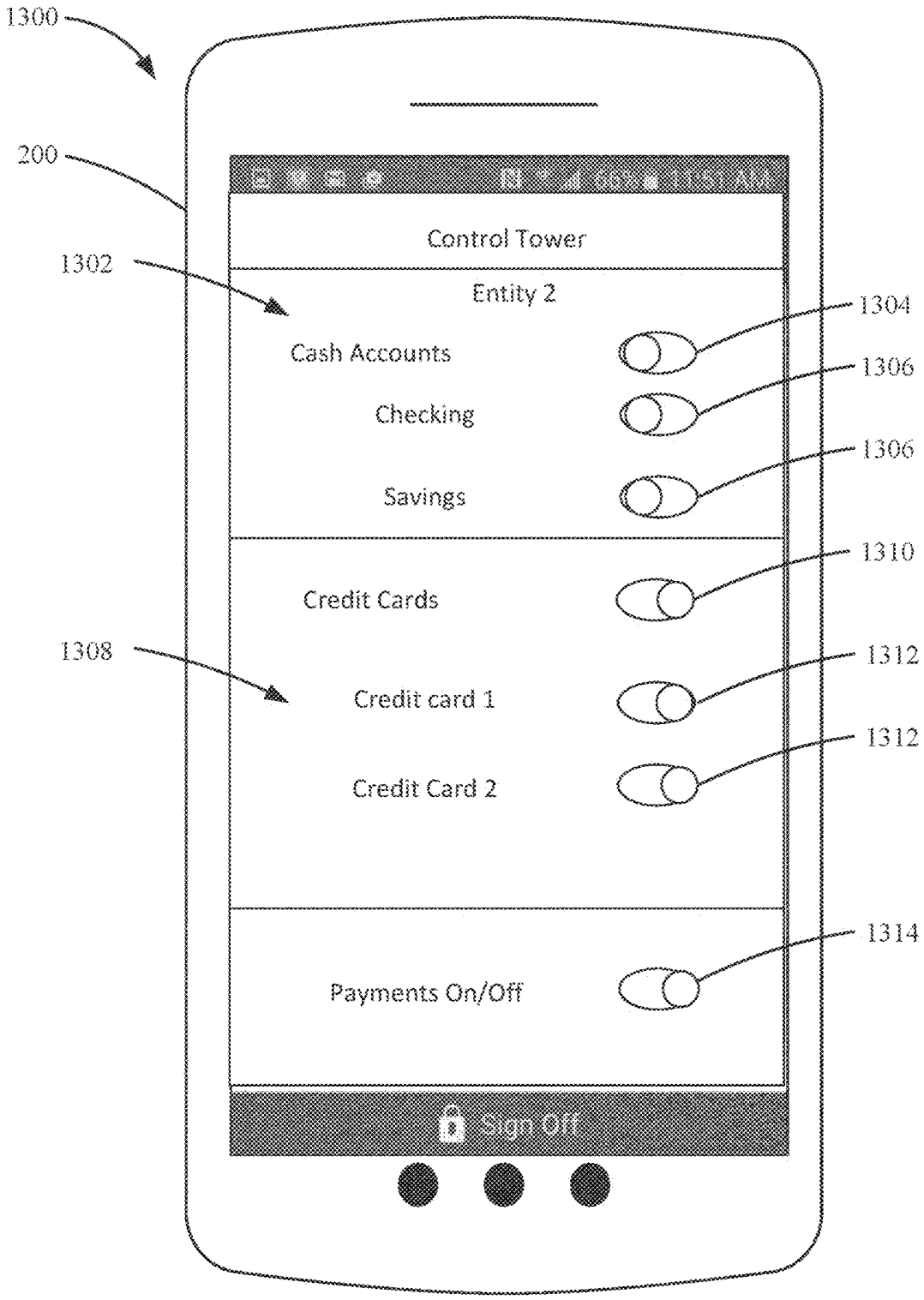

1300
200
Control Tower
1302
Entity 2
1304
Cash Accounts
1306
Checking
1306
Savings
1310
Credit Cards
1308
1312
Credit card 1
1312
Credit Card 2
1314
Payments On/Off
Sign Off

FIG. 13

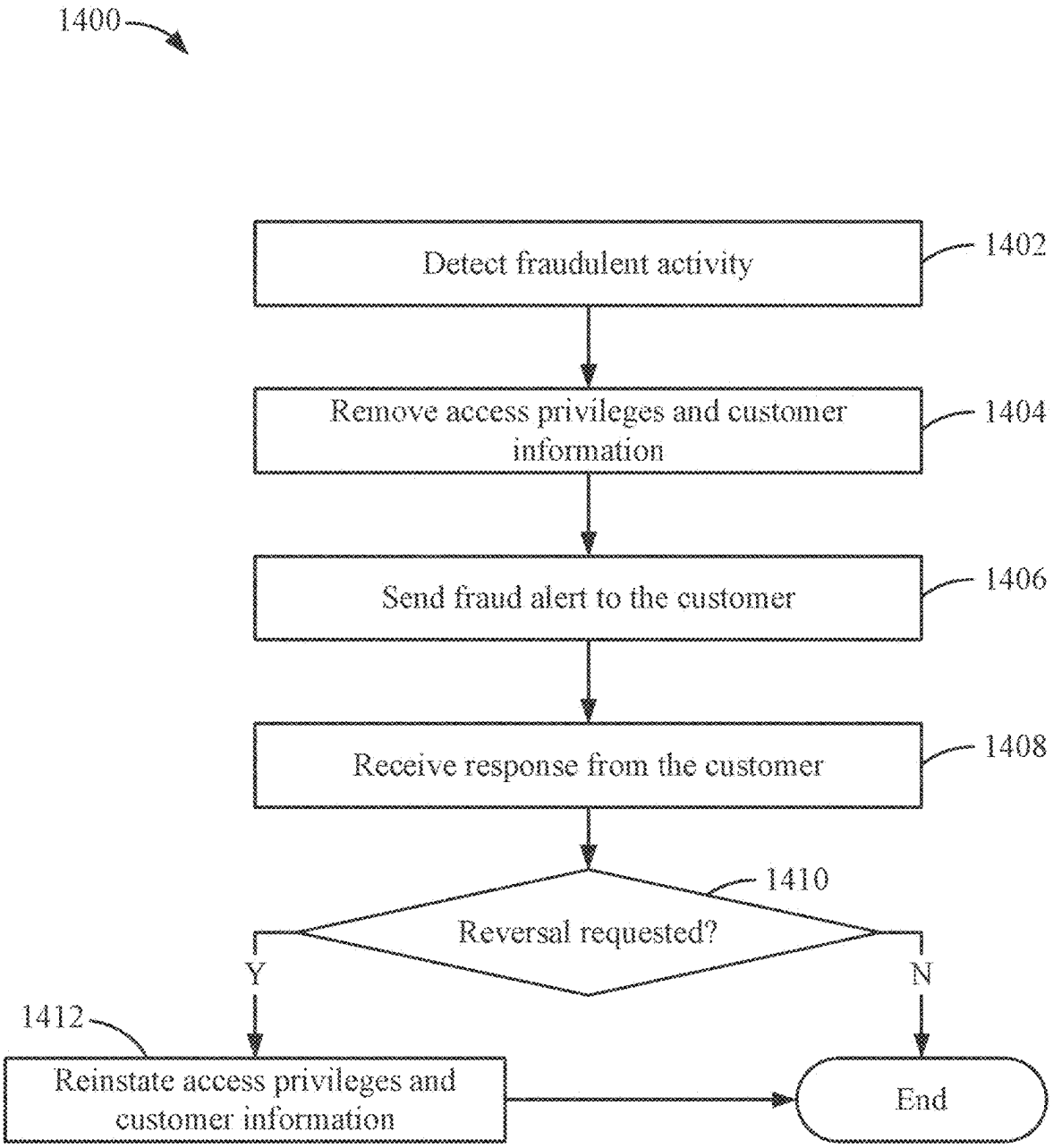

1400
Detect fraudulent activity
1402
Remove access privileges and customer information
1404
Send fraud alert to the customer
1406
Receive response from the customer
1408
Reversal requested?
1410
Y
N
1412
Reinstate access privileges and customer information
End

FIG. 14

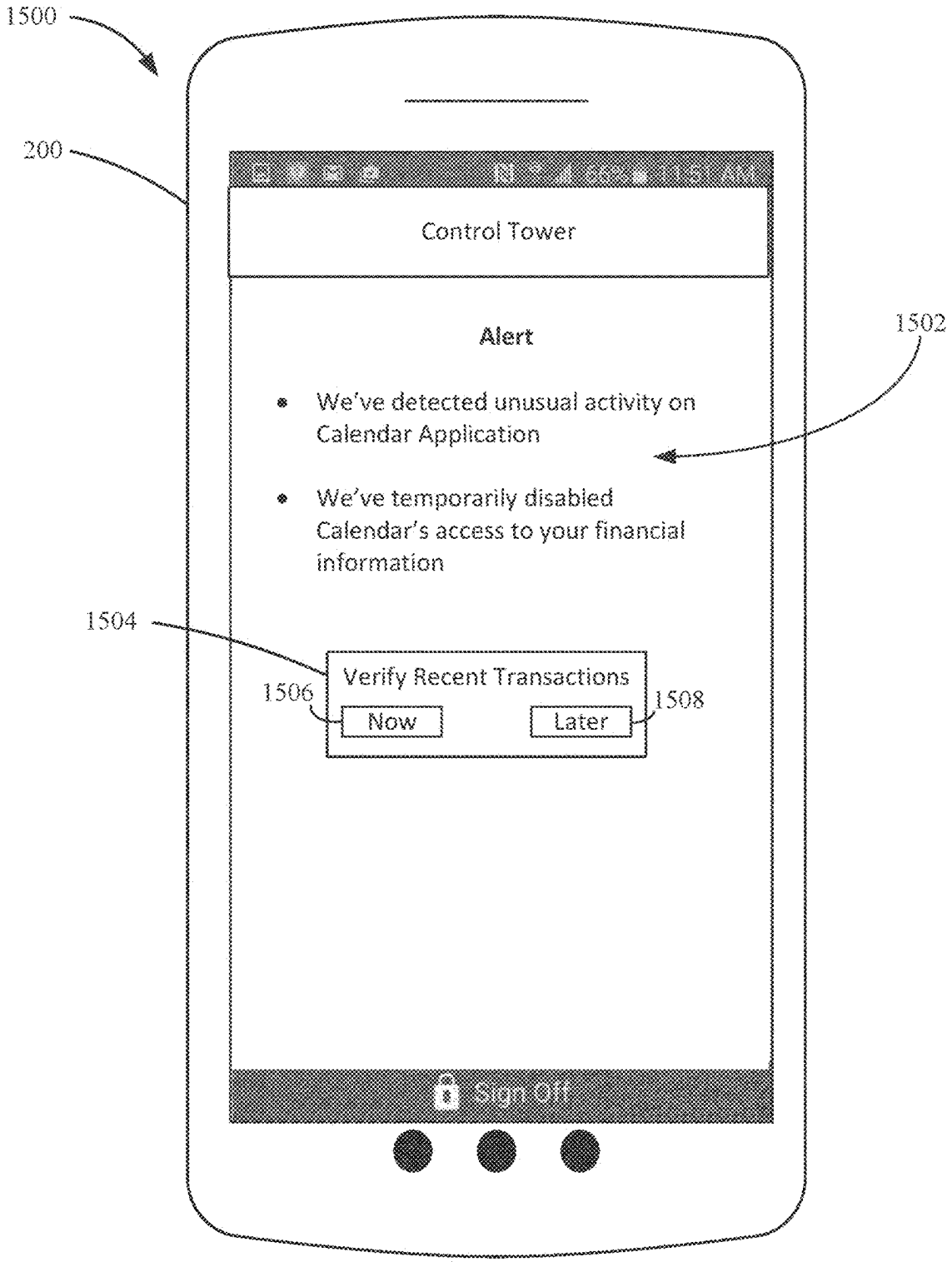

1500
200
Control Tower
Alert
1502
We've detected unusual activity on Calendar Application
We've temporarily disabled Calendar's access to your financial information
1504
Verify Recent Transactions
1506
Now
Later
1508
Sign Off

FIG. 15

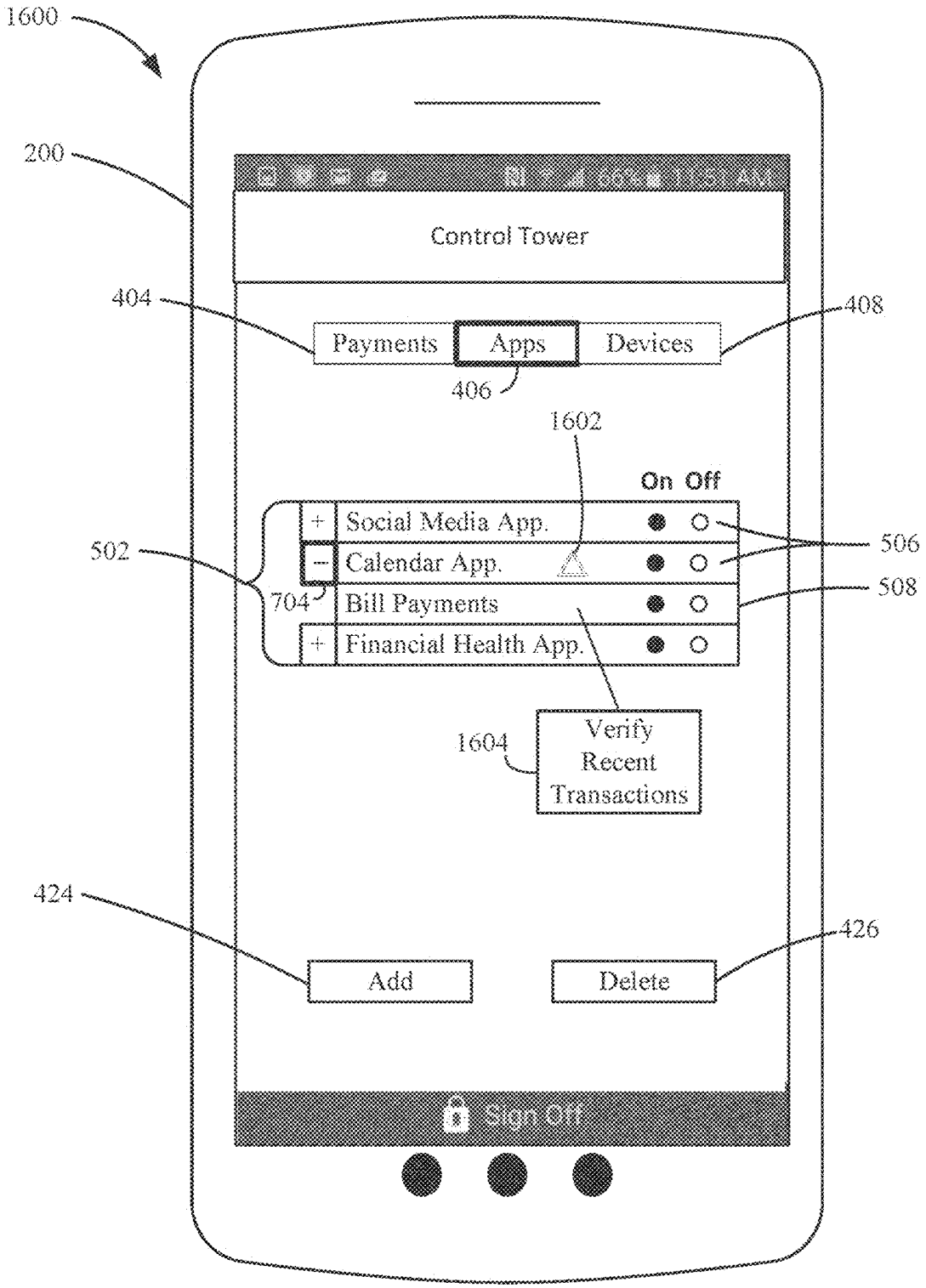

1600
200
Control Tower
404
Payments
Apps
Devices
408
406
1602
On Off
502
+
Social Media App.
506
−
Calendar App.
704
Bill Payments
508
+
Financial Health App.
1604
Verify Recent Transactions
424
Add
Delete
426
Sign Off

FIG. 16

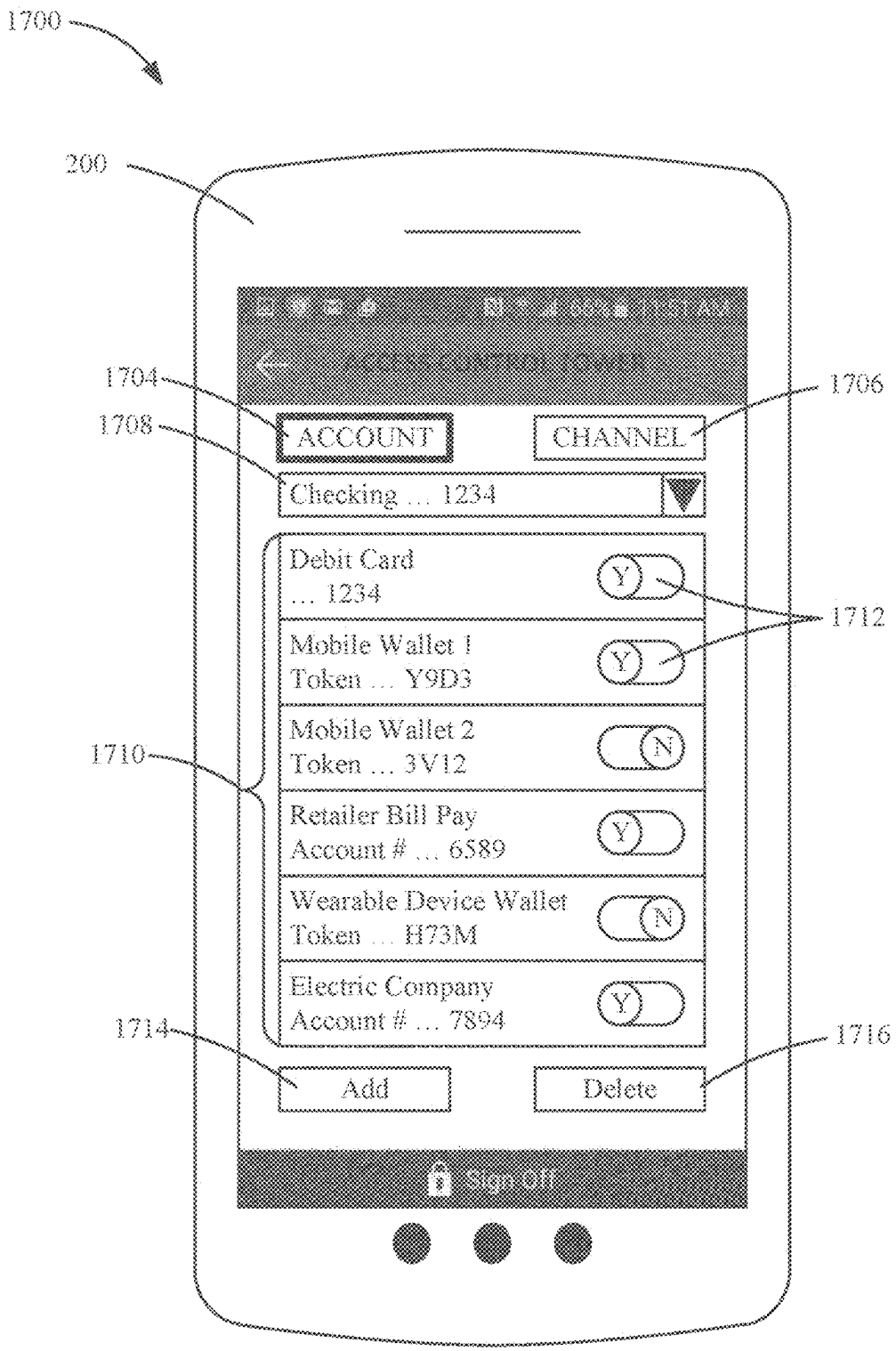

1700
200
1704
1706
1708
ACCOUNT
CHANNEL
Checking … 1234
Debit Card
… 1234
Y
Mobile Wallet 1
Token … Y9D3
Y
1712
Mobile Wallet 2
Token … 3V12
N
1710
Retailer Bill Pay
Account # … 6589
Y
Wearable Device Wallet
Token … H73M
N
Electric Company
Account # … 7894
Y
1714
1716
Add
Delete
Sign Off

FIG. 17

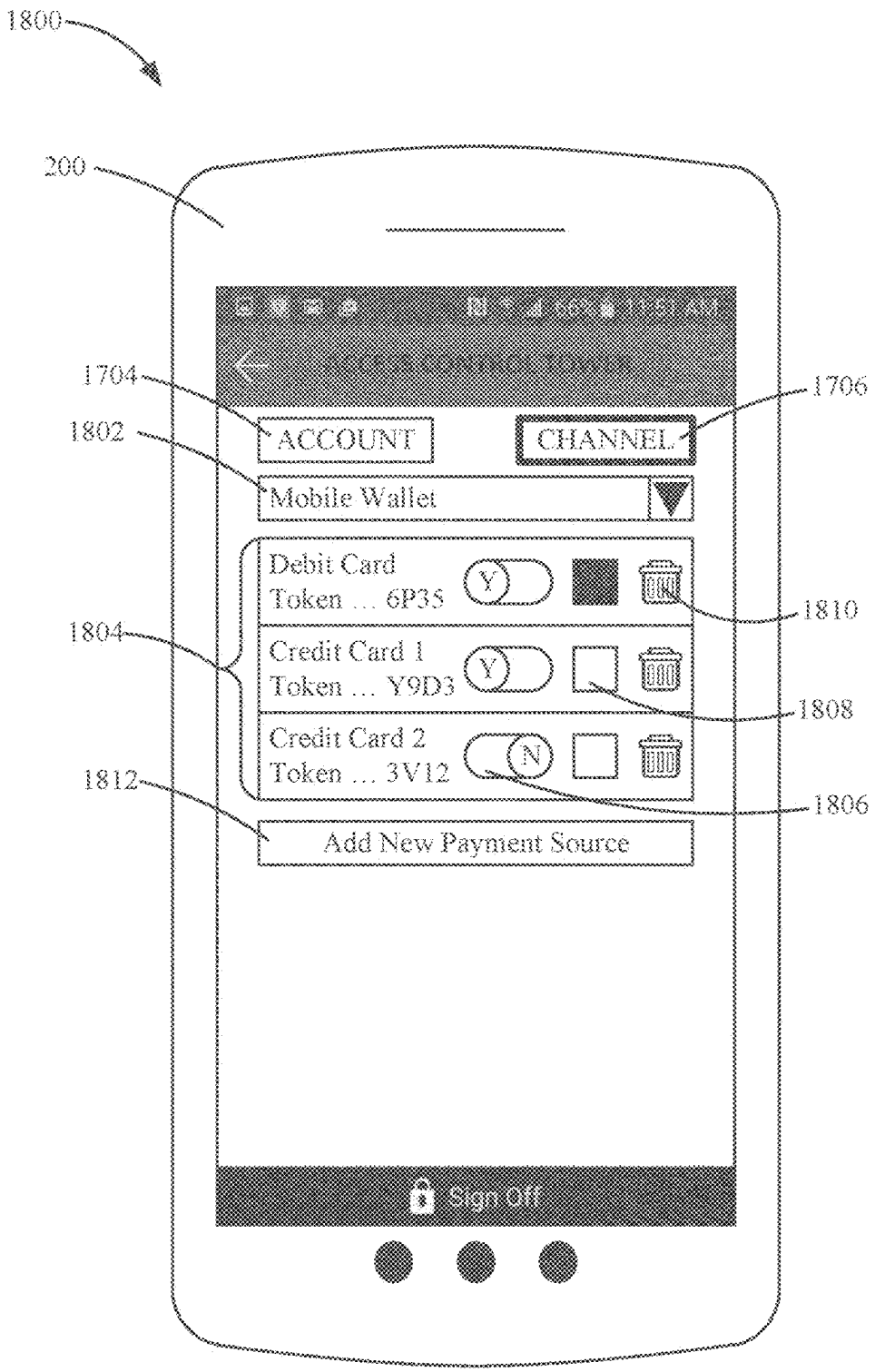

1800
200
1704
1706
1802
ACCOUNT
CHANNEL
Mobile Wallet
Debit Card
Token … 6P3S
Y
1810
1804
Credit Card 1
Token … Y9D3
Y
1808
Credit Card 2
Token … 3V12
N
1812
1806
Add New Payment Source
Sign Off

FIG. 18

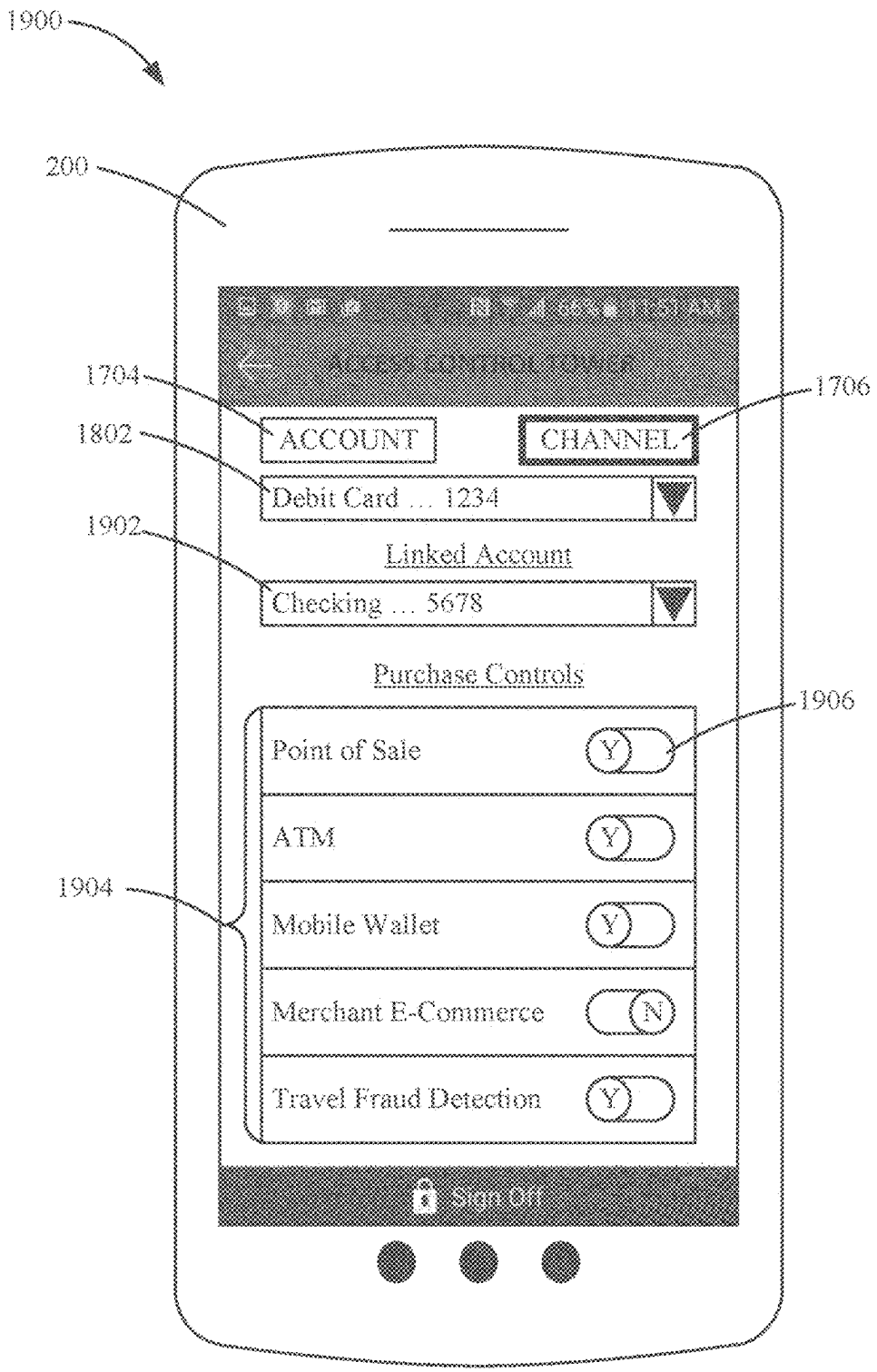

1900
200
1704
1706
1802
1902
1906
1904
ACCOUNT
CHANNEL
Debit Card … 1234
Linked Account
Checking … 5678
Purchase Controls
Point of Sale
Y
ATM
Y
Mobile Wallet
Y
Merchant E-Commerce
N
Travel Fraud Detection
Y
Sign Off

FIG. 19

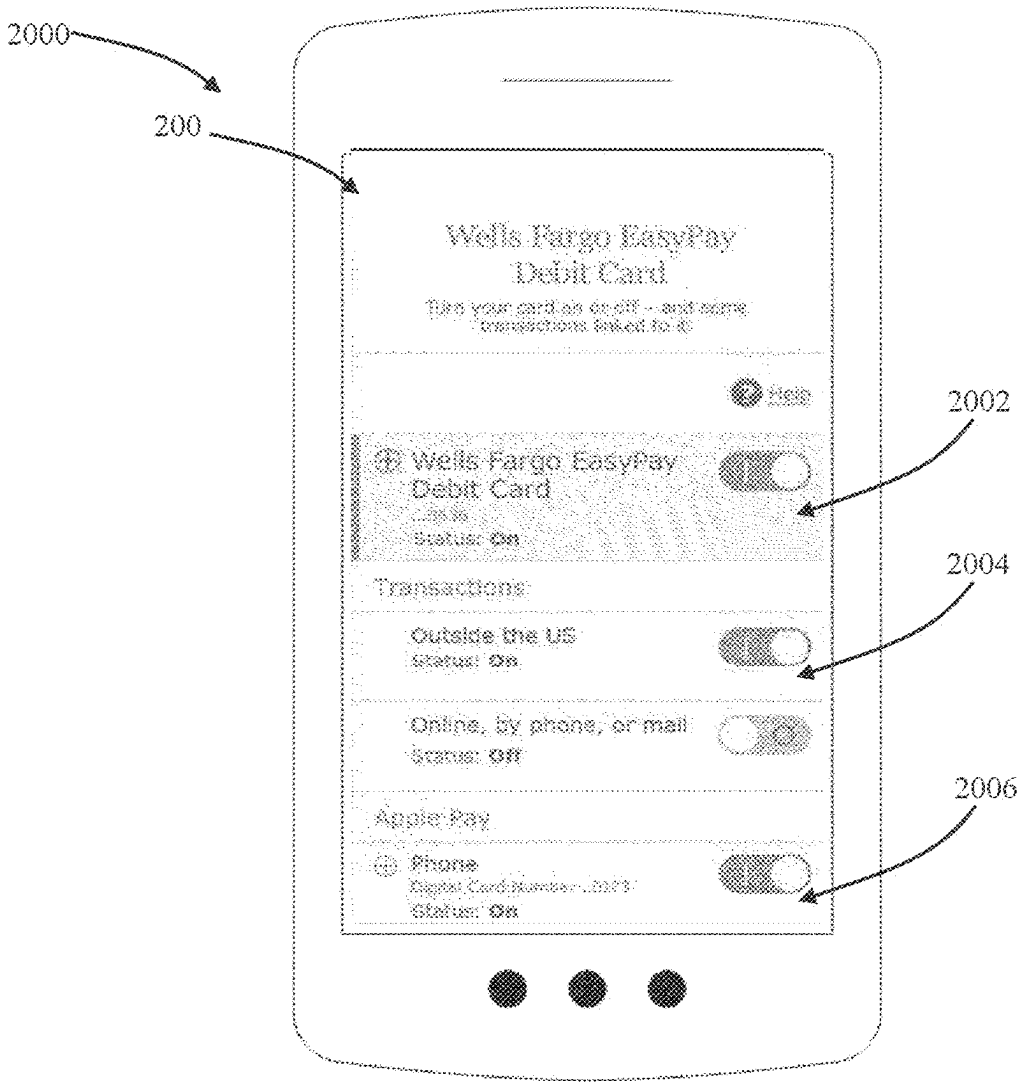

2000
200
Wells Fargo EasyPay
Debit Card
Wells Fargo EasyPay
Debit Card
Status: On
Transactions
Outside the US
Status: On
Online, by phone, or mail
Status: Off
Apple Pay
Phone
Status: On
2002
2004
2006

FIG. 20

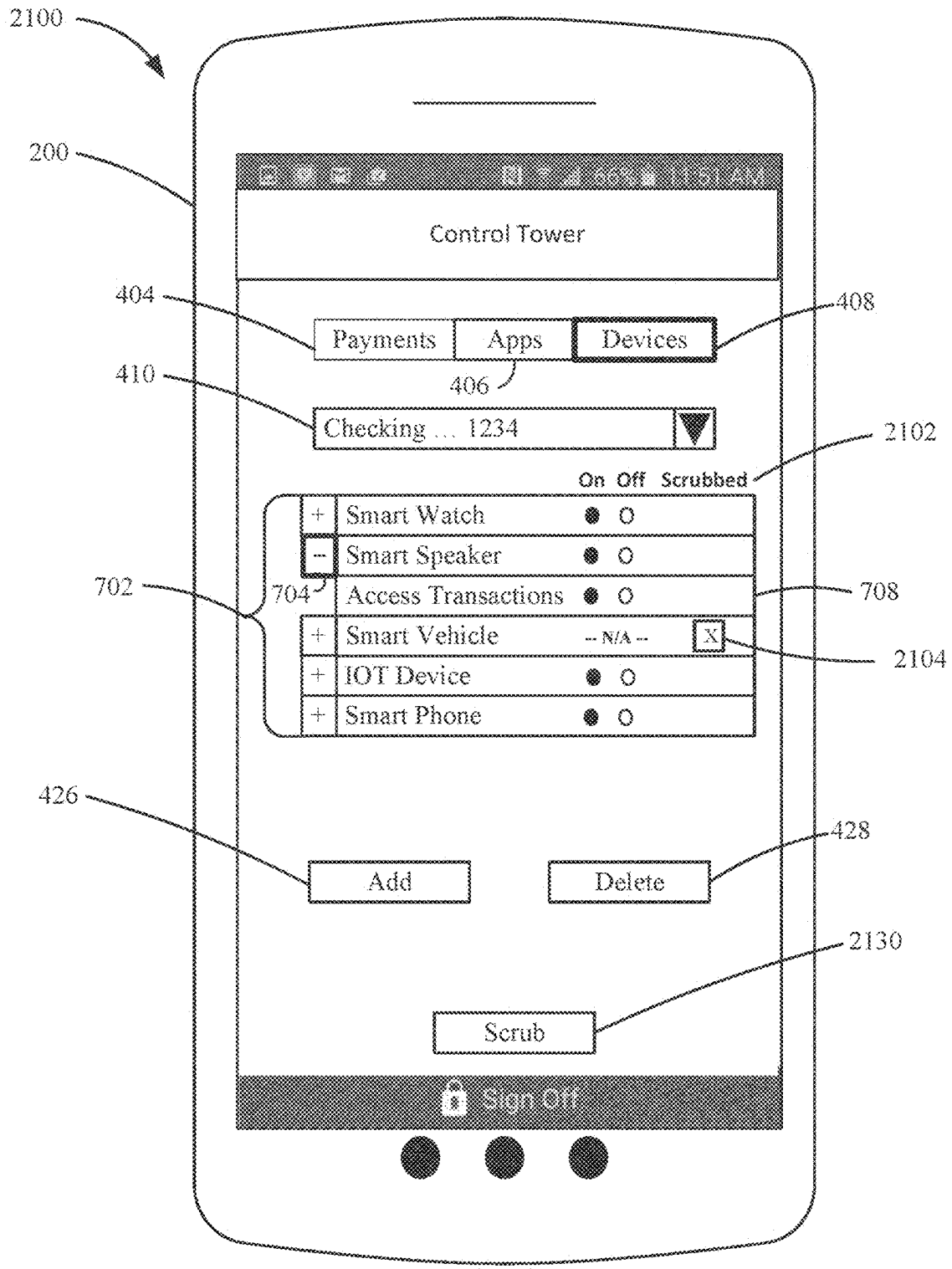

2100
200
Control Tower
404
Payments
Apps
Devices
408
406
410
Checking ... 1234
2102
On Off Scrubbed
Smart Watch
Smart Speaker
Access Transactions
702
704
708
Smart Vehicle
-- N/A --
X
2104
IOT Device
Smart Phone
426
428
Add
Delete
2130
Scrub
Sign Off

FIG. 21

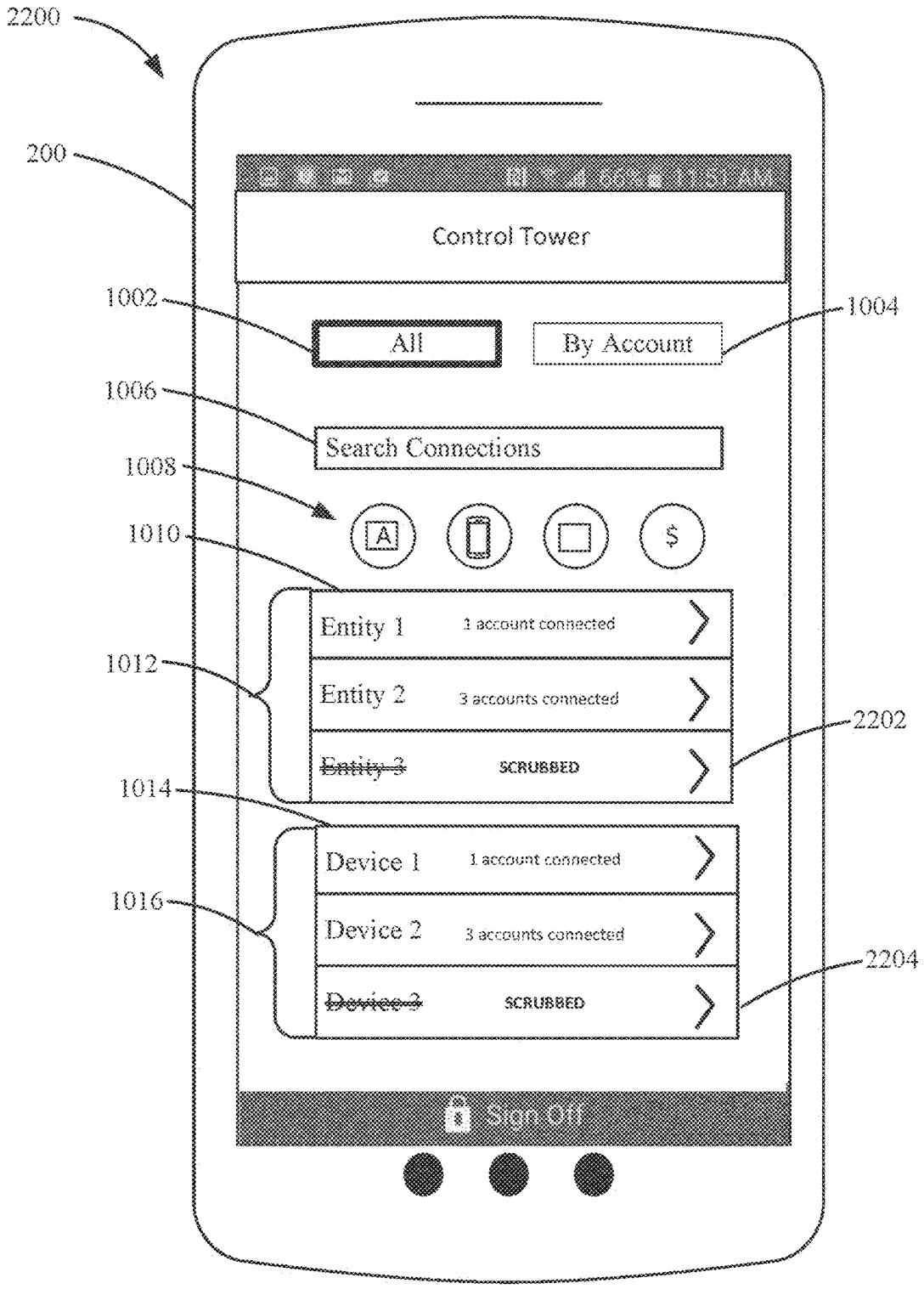

2200
200
Control Tower
1002
All
By Account
1004
1006
Search Connections
1008
A
$
1010
Entity 1
1 account connected
1012
Entity 2
3 accounts connected
2202
Entity 3
SCRUBBED
1014
Device 1
1 account connected
1016
Device 2
3 accounts connected
2204
Device 3
SCRUBBED
Sign Off

FIG. 22

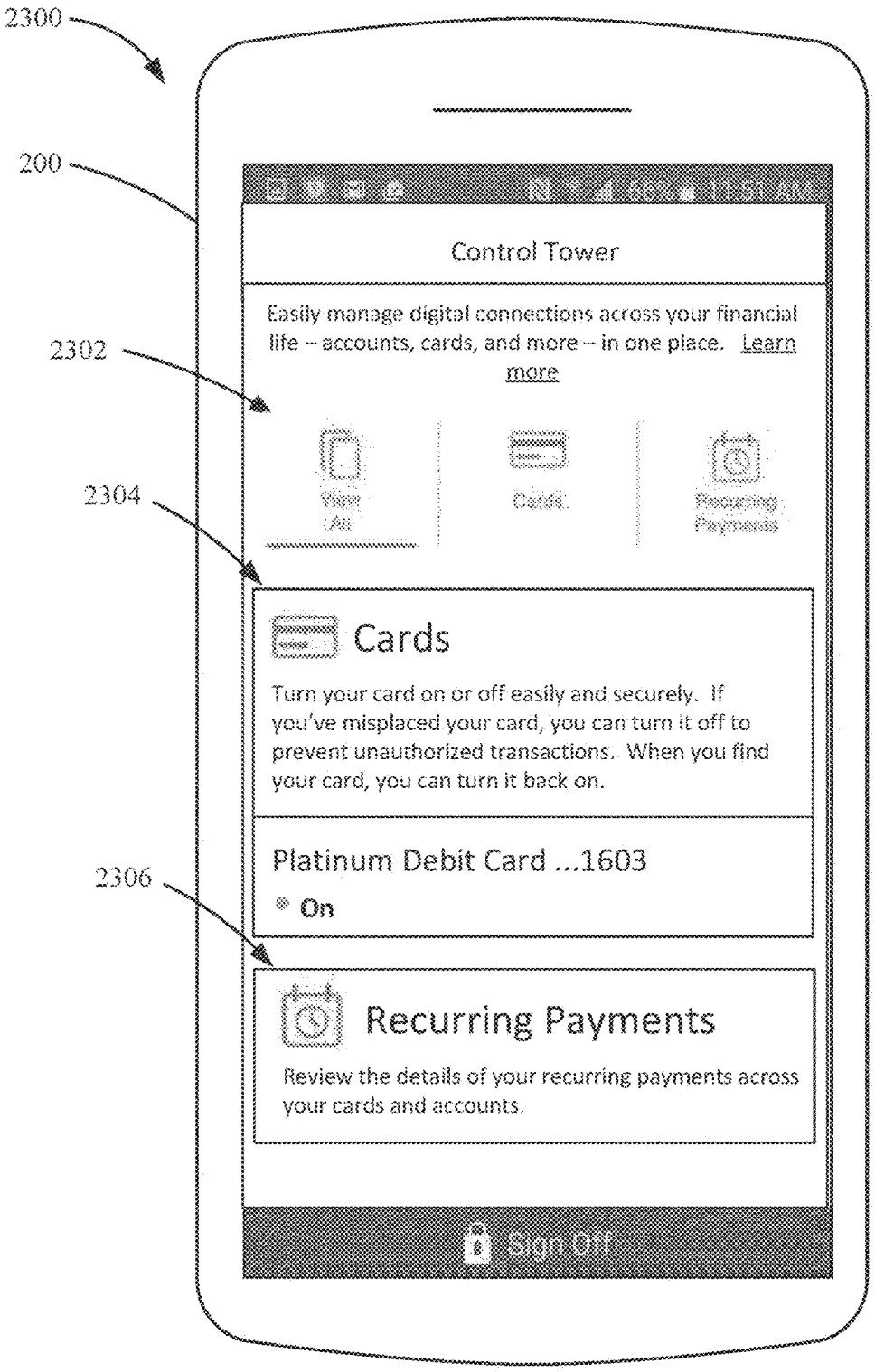

2300
200
2302
2304
2306
Control Tower
Easily manage digital connections across your financial life -- accounts, cards, and more -- in one place. Learn more
Cards
Turn your card on or off easily and securely. If you've misplaced your card, you can turn it off to prevent unauthorized transactions. When you find your card, you can turn it back on.
Platinum Debit Card ...1603
On
Recurring Payments
Review the details of your recurring payments across your cards and accounts.
Sign Off

FIG. 23

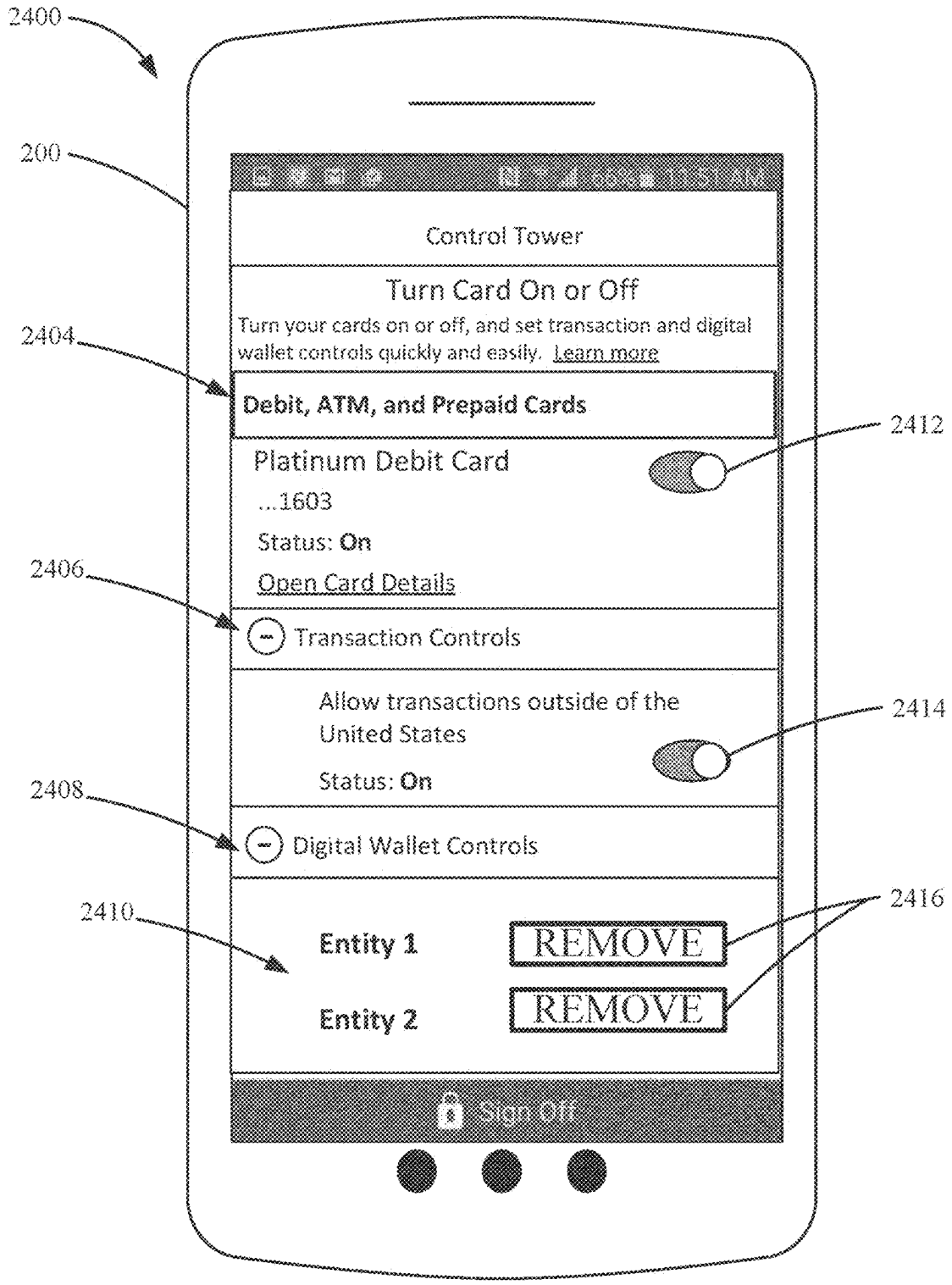

2400
200
Control Tower
Turn Card On or Off
Turn your cards on or off, and set transaction and digital wallet controls quickly and easily. Learn more
2404
Debit, ATM, and Prepaid Cards
2412
Platinum Debit Card
...1603
Status: On
Open Card Details
2406
Transaction Controls
Allow transactions outside of the United States
2414
Status: On
2408
Digital Wallet Controls
2410
2416
Entity 1
REMOVE
Entity 2
REMOVE
Sign Off

FIG. 24

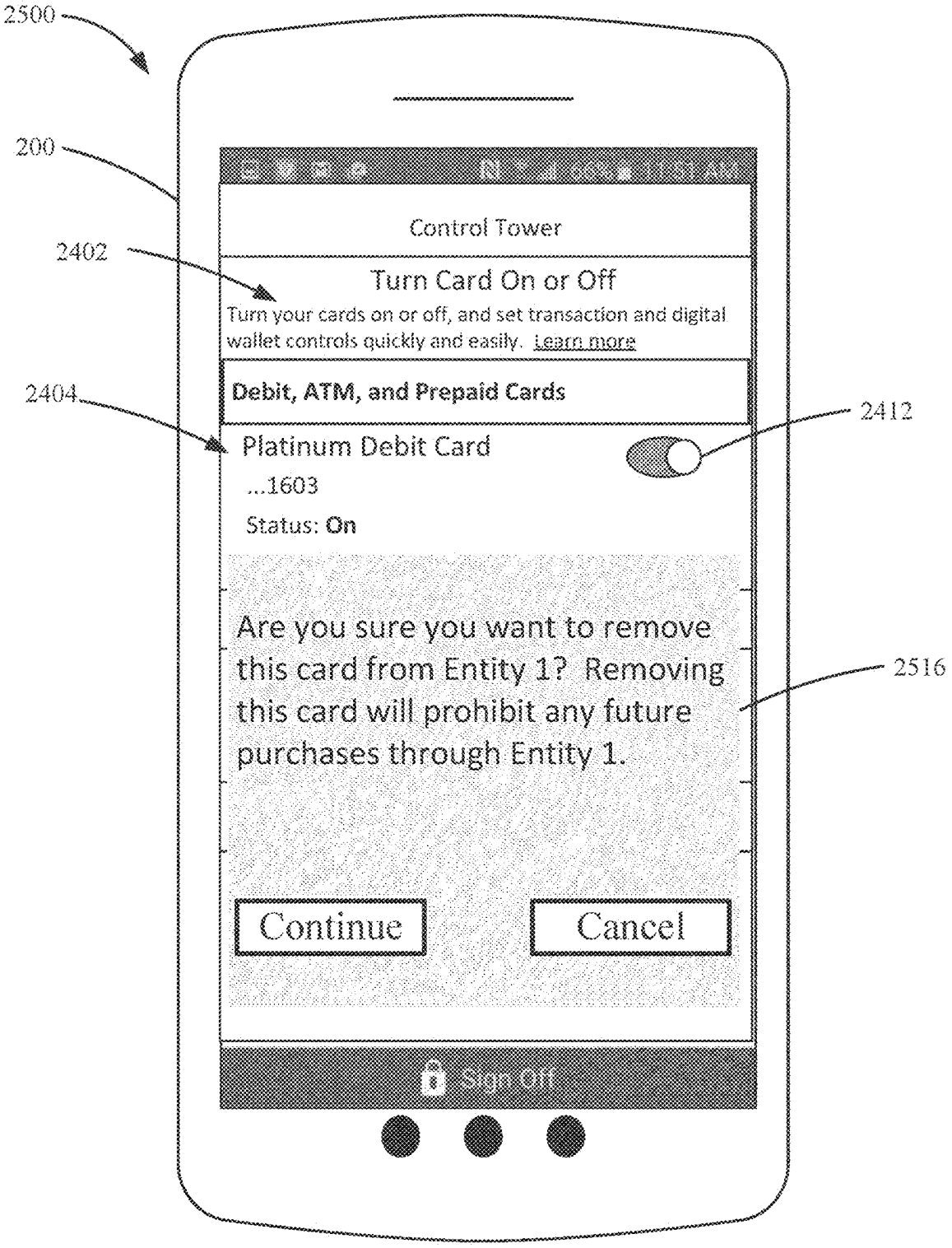

2500
200
2402
2404
2412
2516
Control Tower
Turn Card On or Off
Turn your cards on or off, and set transaction and digital wallet controls quickly and easily. Learn more
Debit, ATM, and Prepaid Cards
Platinum Debit Card
...1603
Status: On
Are you sure you want to remove this card from Entity 1? Removing this card will prohibit any future purchases through Entity 1.
Continue
Cancel
Sign Off

FIG. 25

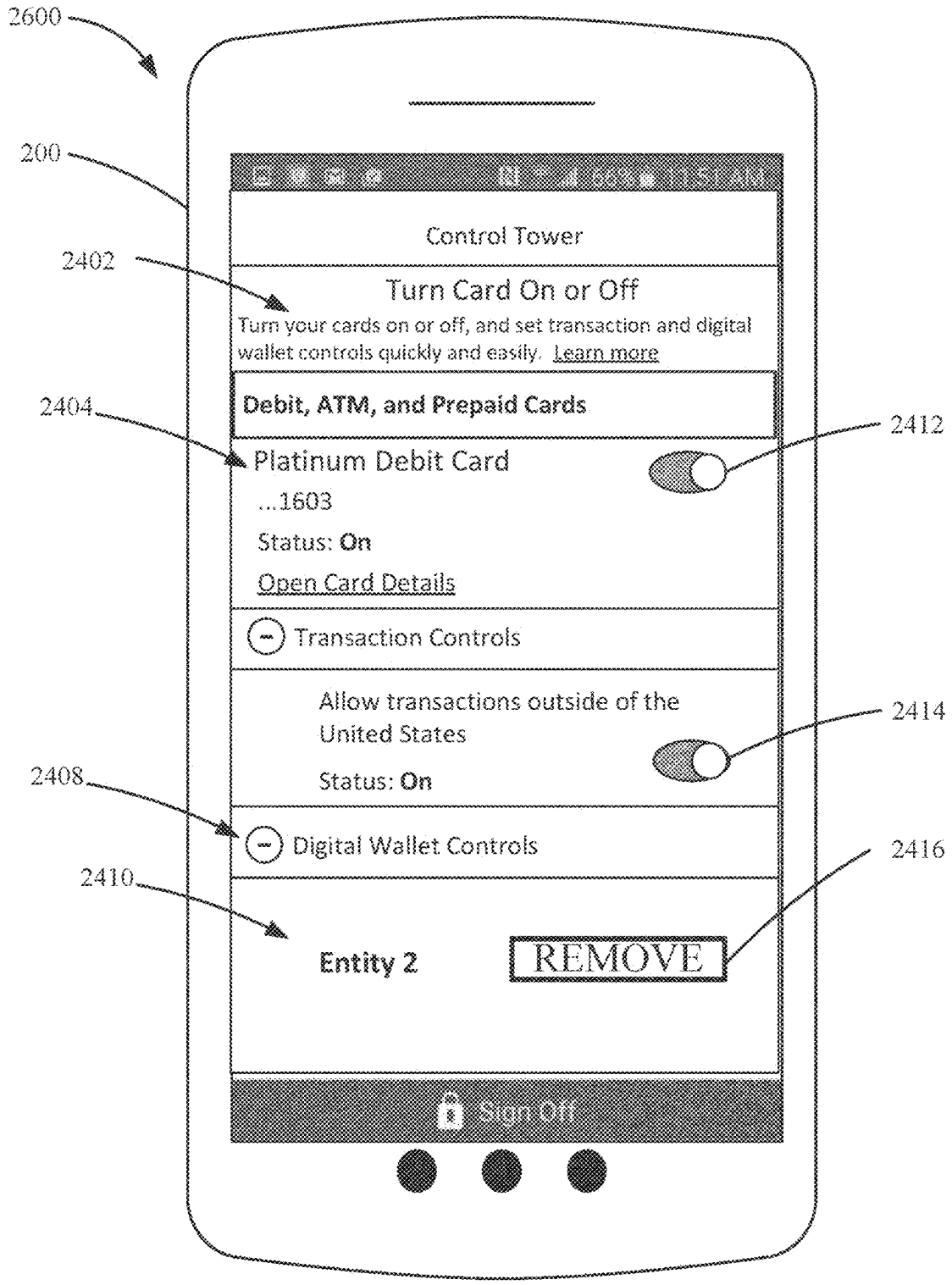

2600
200
2402
2404
2412
2414
2408
2410
2416
Control Tower
Turn Card On or Off
Turn your cards on or off, and set transaction and digital wallet controls quickly and easily. Learn more
Debit, ATM, and Prepaid Cards
Platinum Debit Card
...1603
Status: On
Open Card Details
Transaction Controls
Allow transactions outside of the United States
Status: On
Digital Wallet Controls
Entity 2
REMOVE
Sign Off

FIG. 26

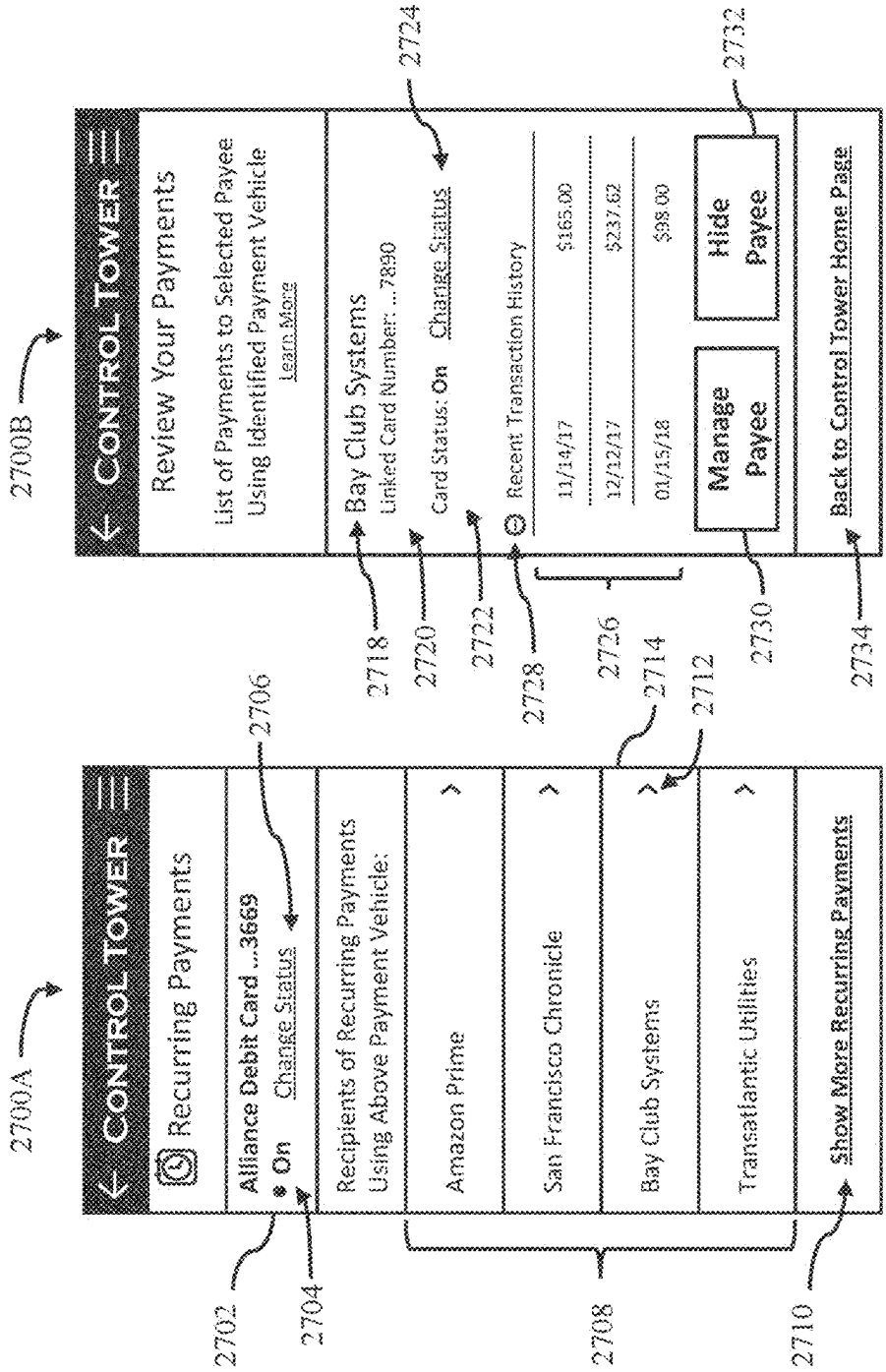


FIG. 27A

FIG. 27B

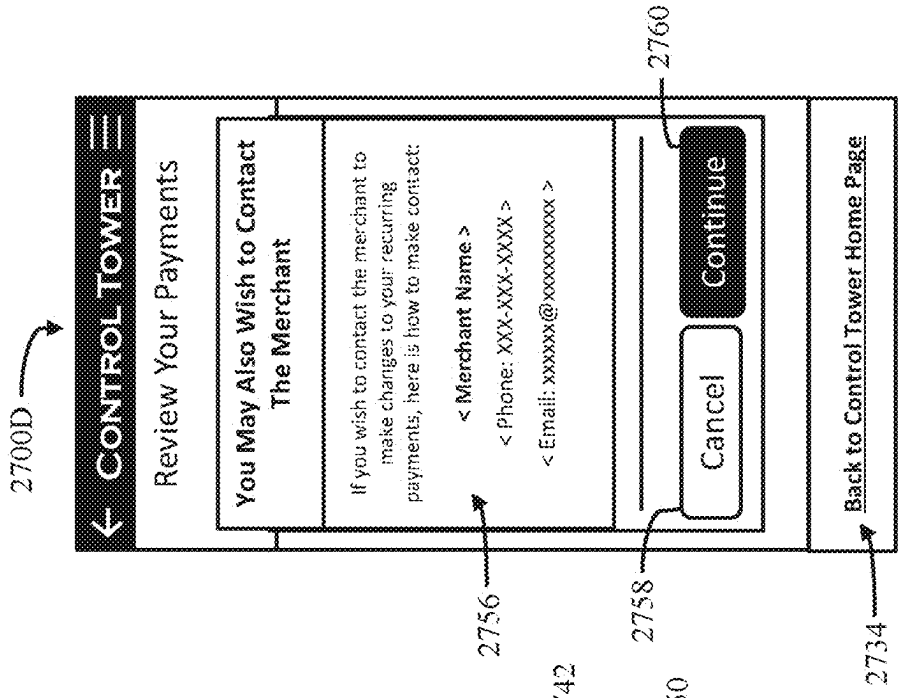


FIG. 27D

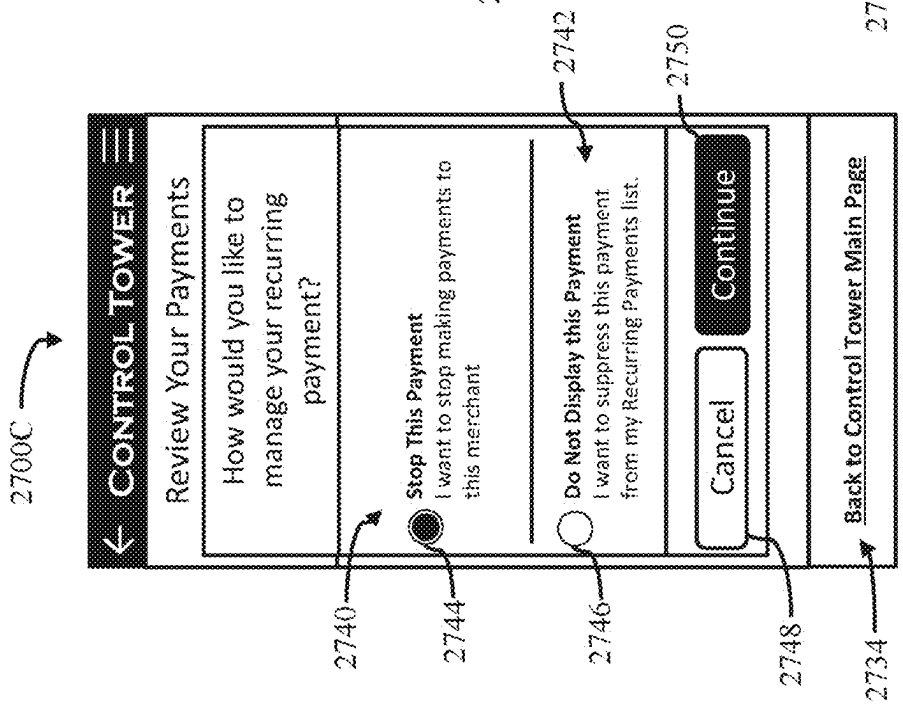


FIG. 27C

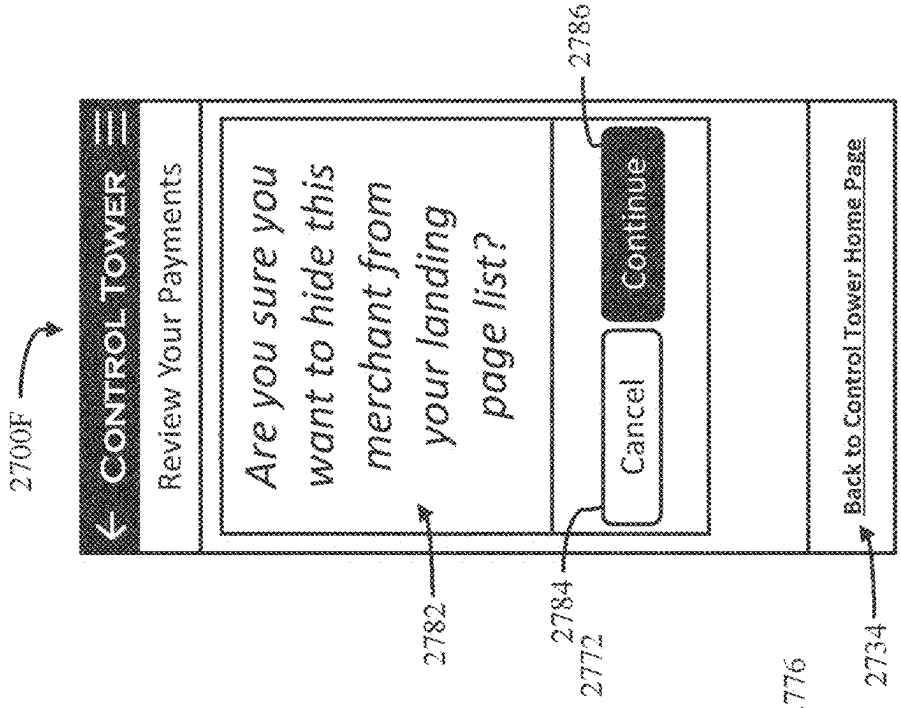


FIG. 27F

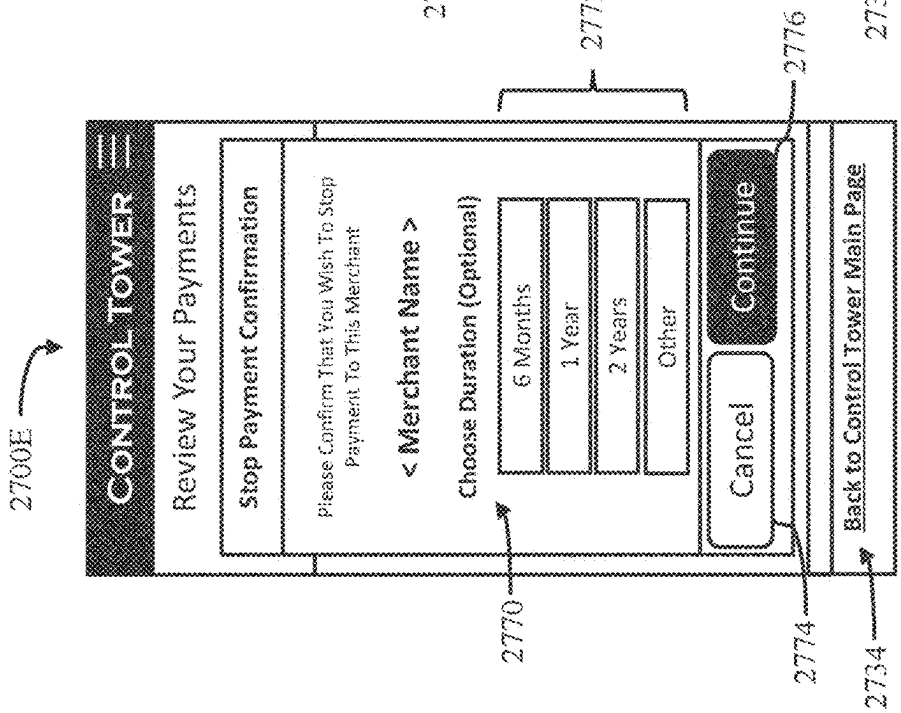


FIG. 27E

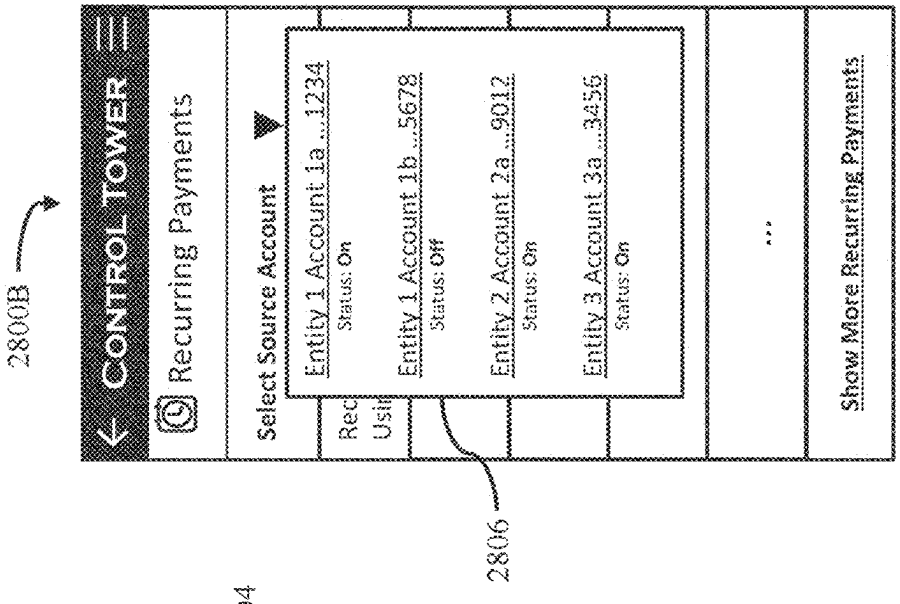


FIG. 28B

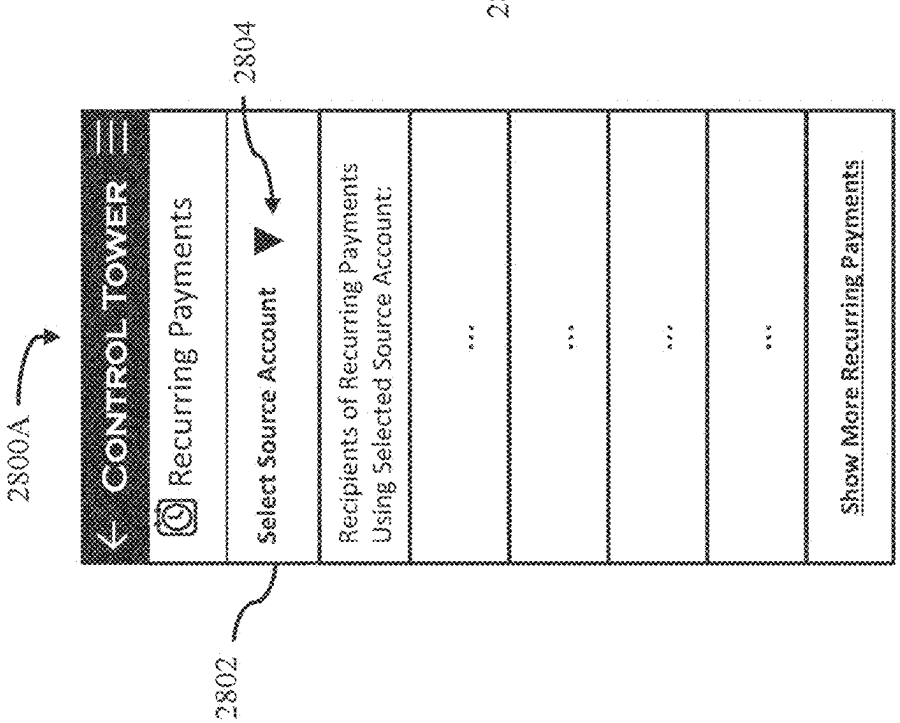


FIG. 28A

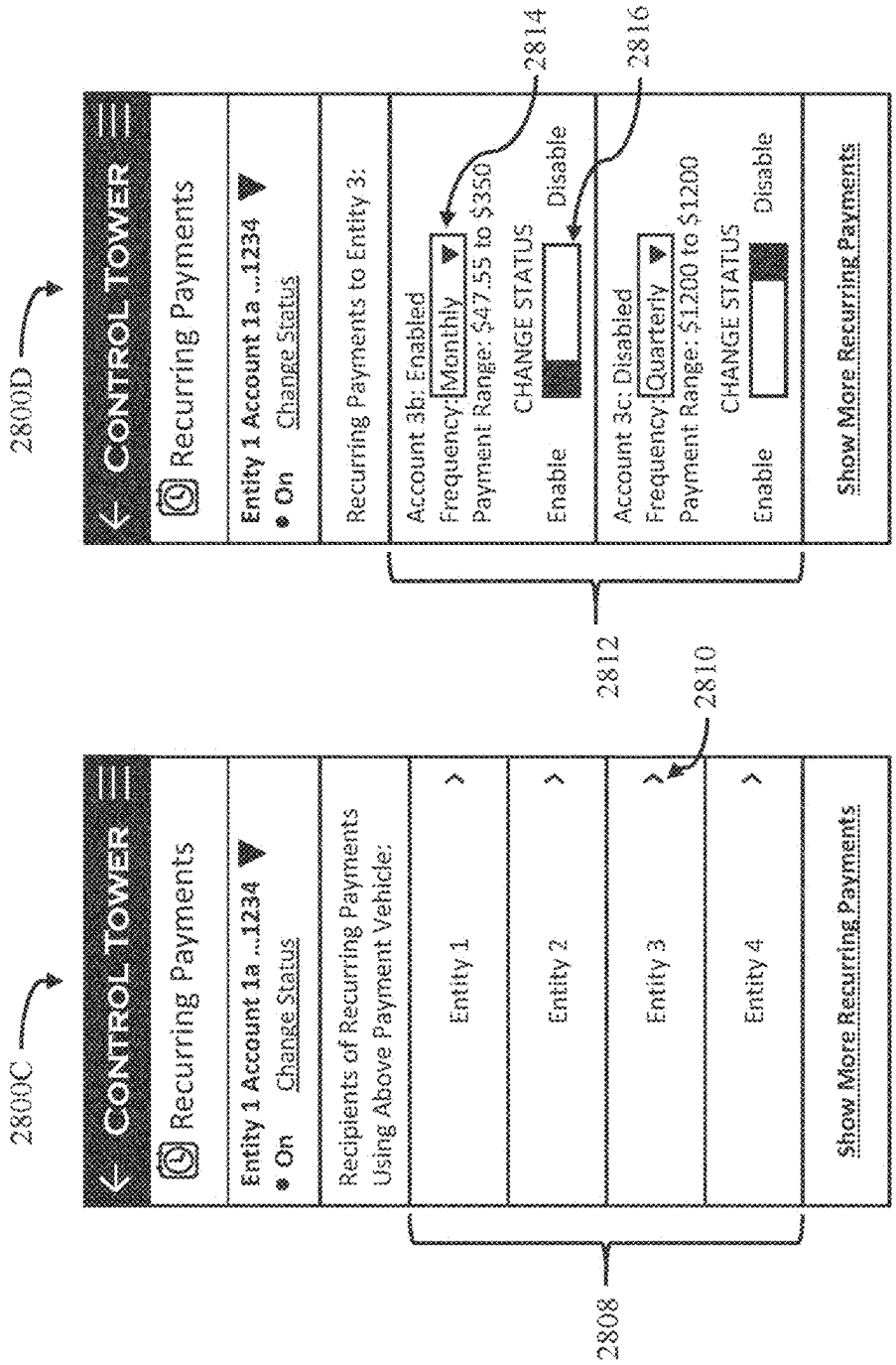


FIG. 28C

FIG. 28D

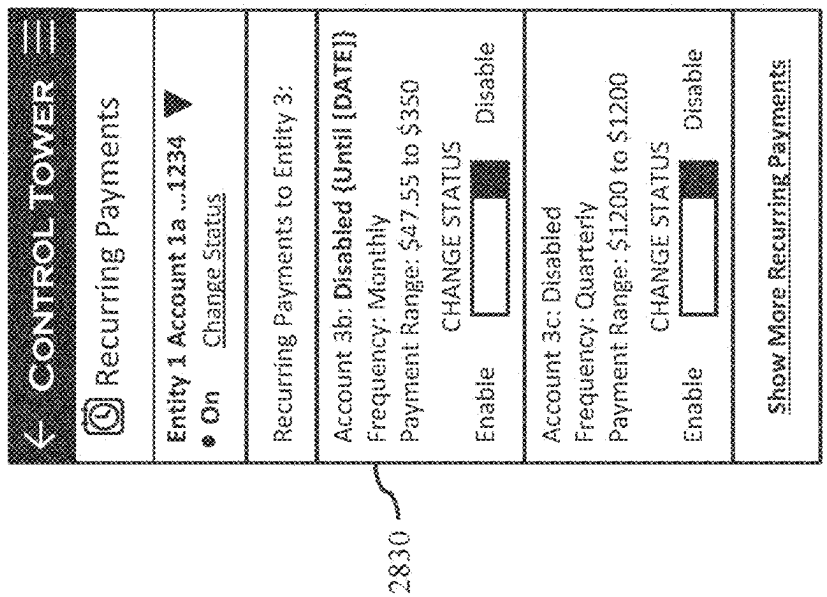


FIG. 28F

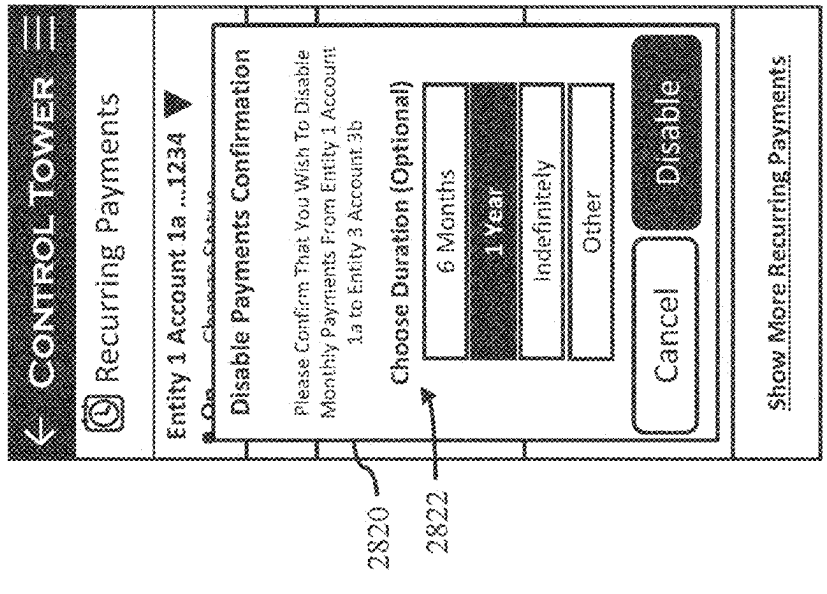


FIG. 28E

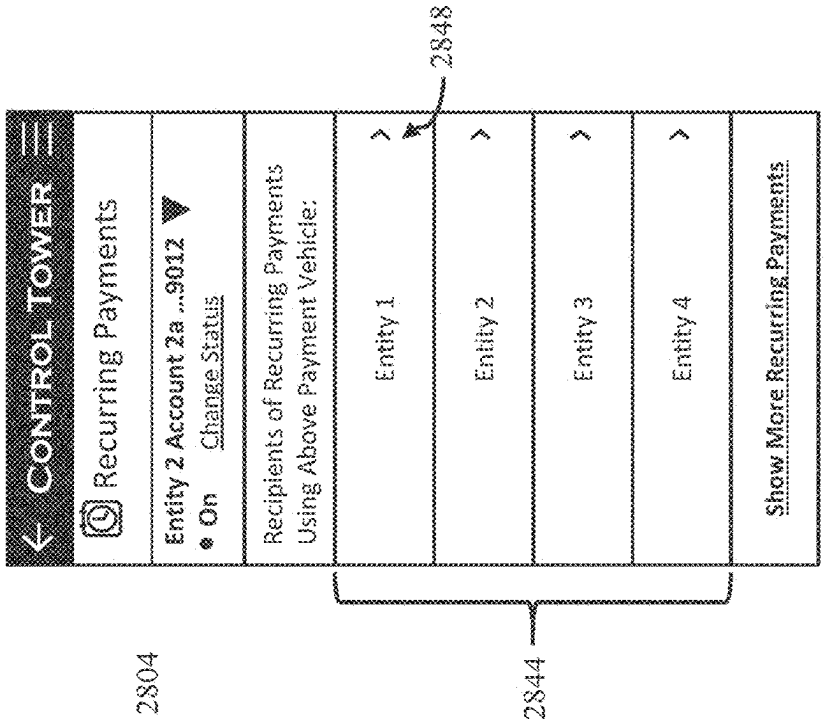


FIG. 28H

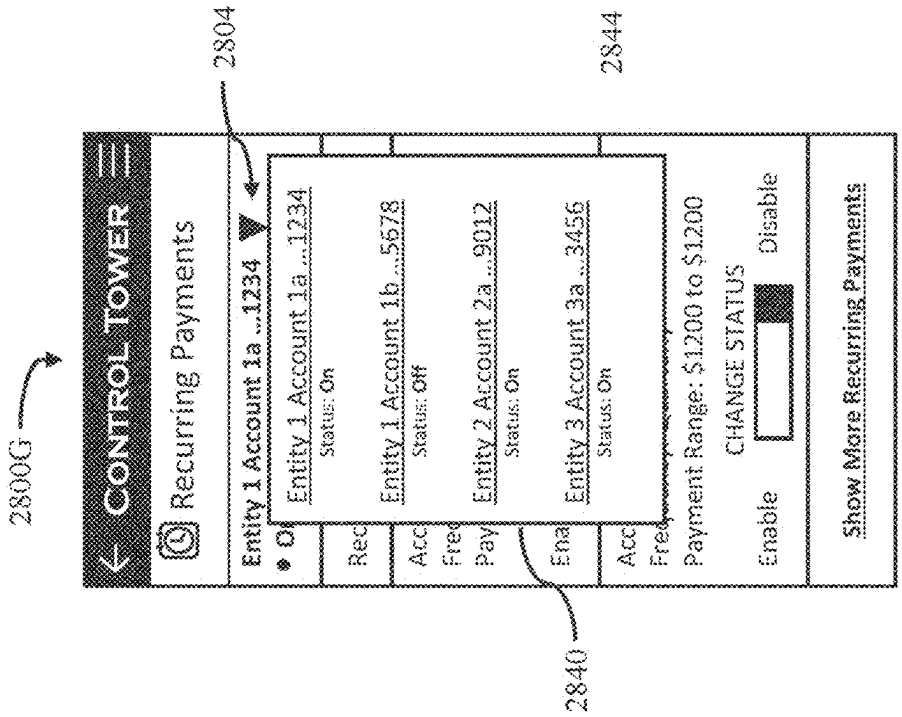


FIG. 28G

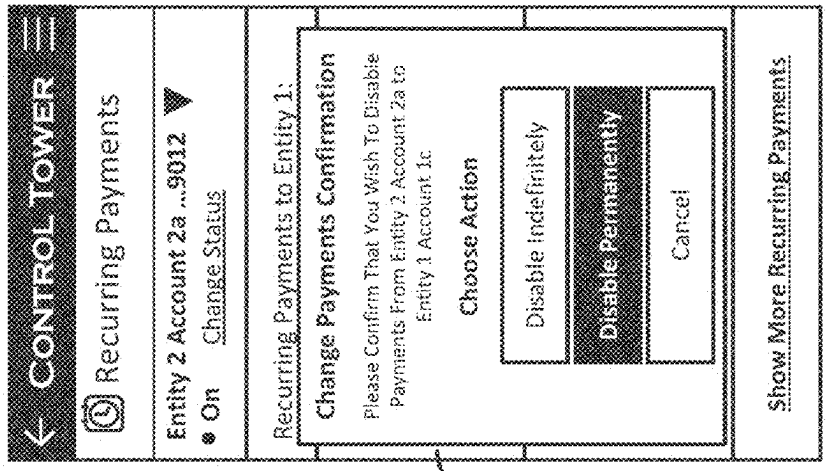


FIG. 28J

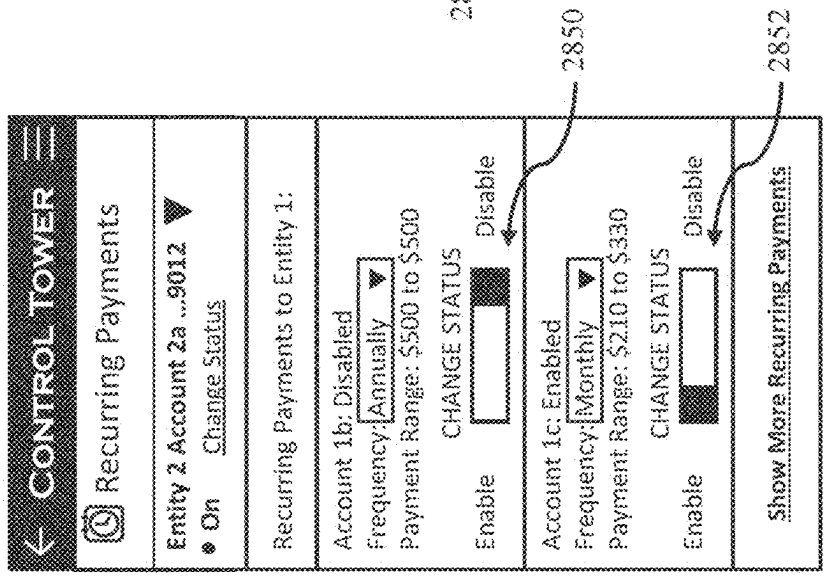


FIG. 28I

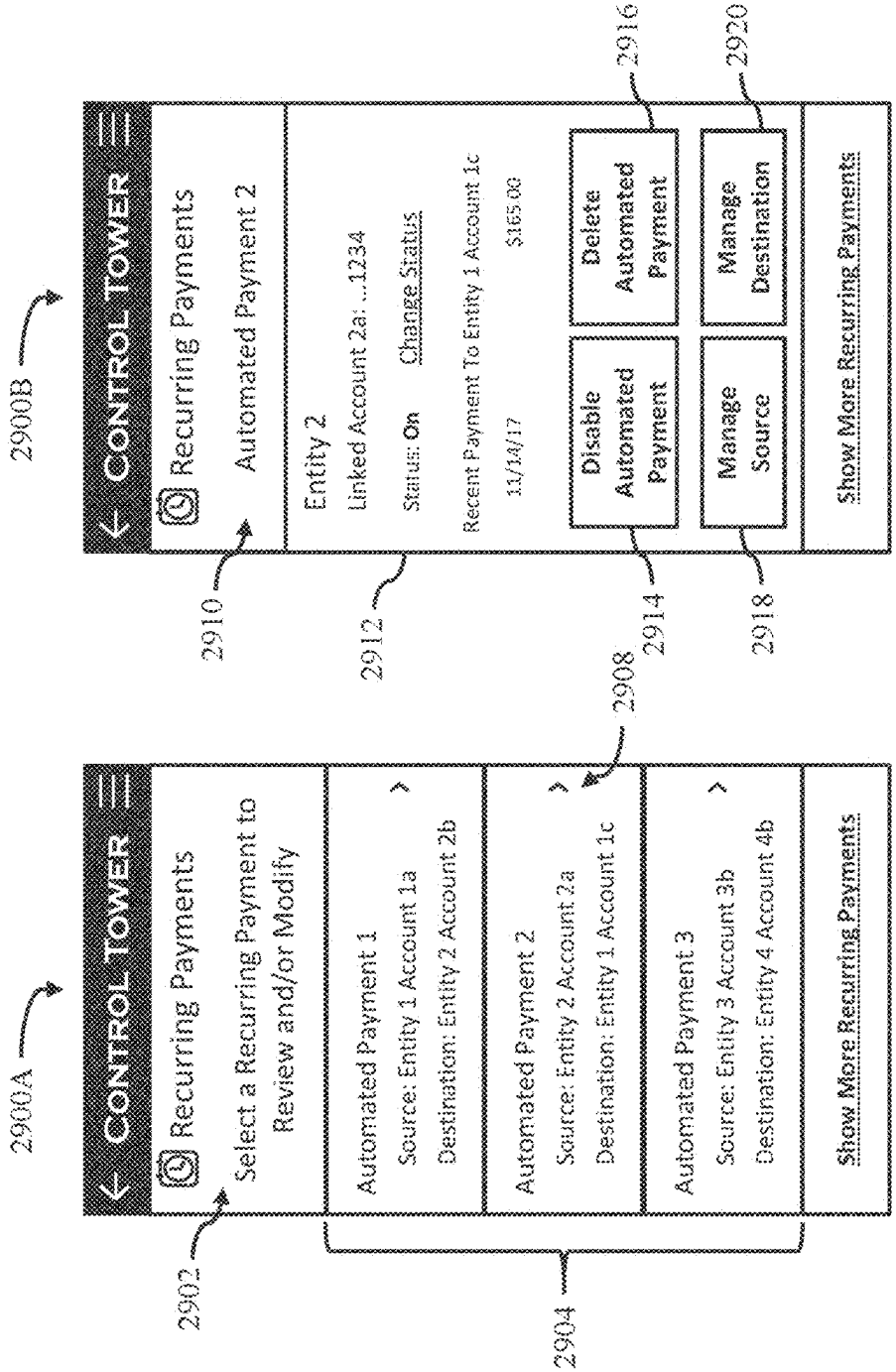


FIG. 29A

FIG. 29B

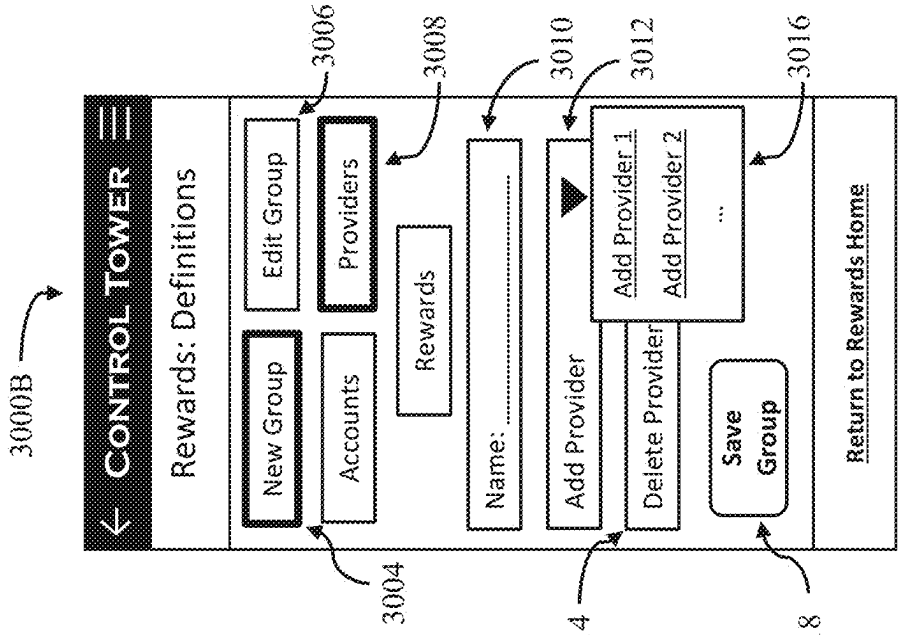


FIG. 30B

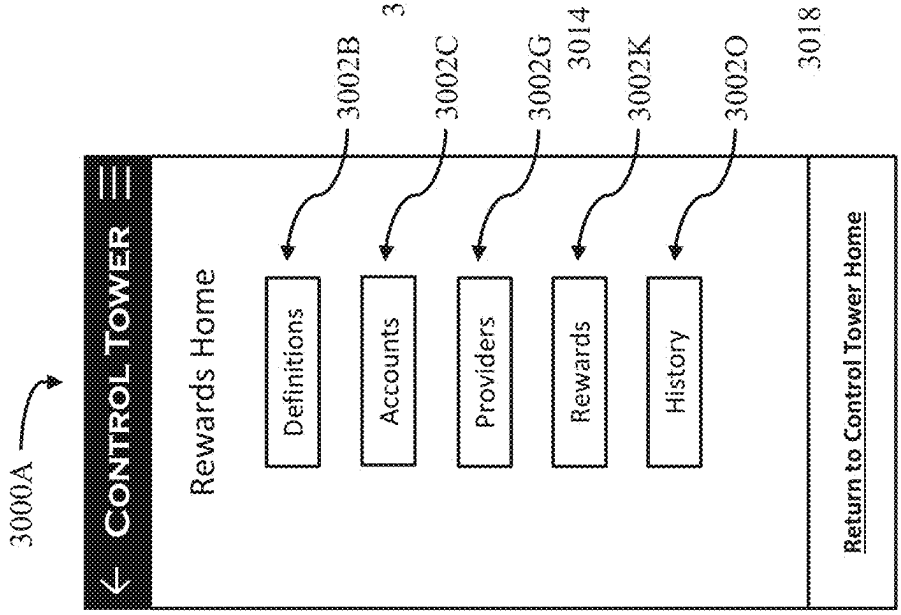


FIG. 30A

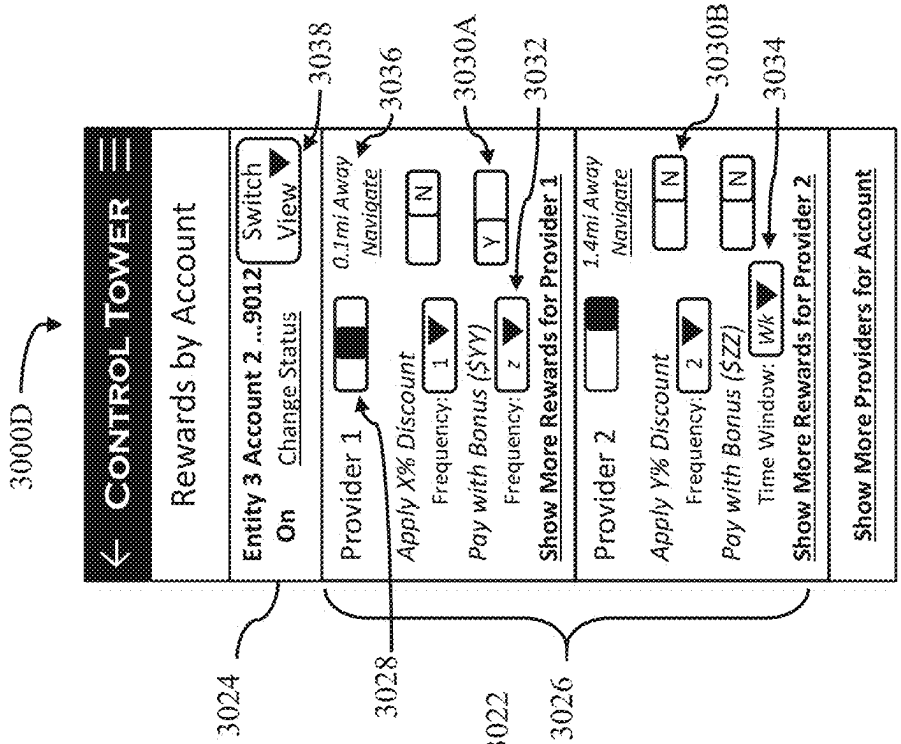


FIG. 30D

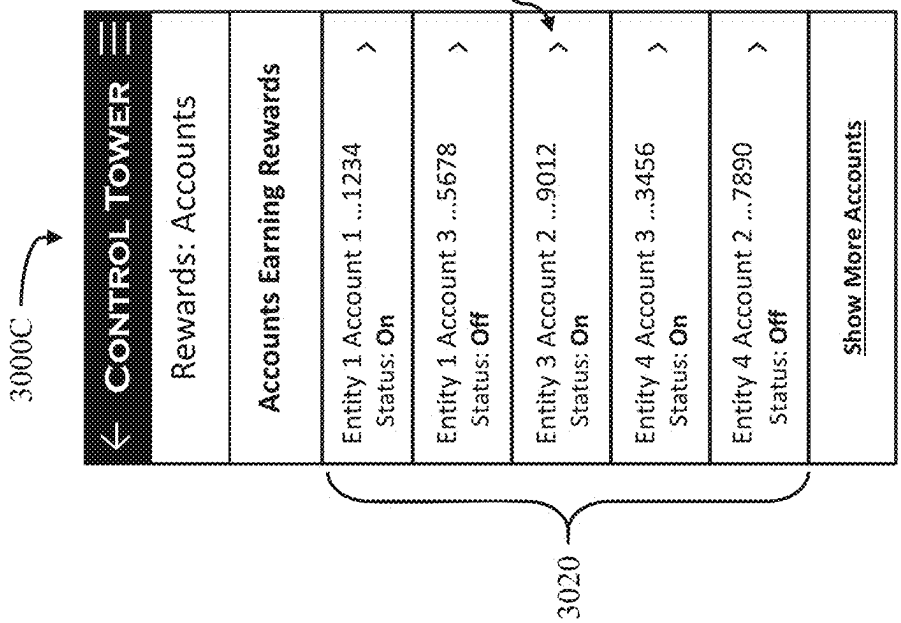


FIG. 30C

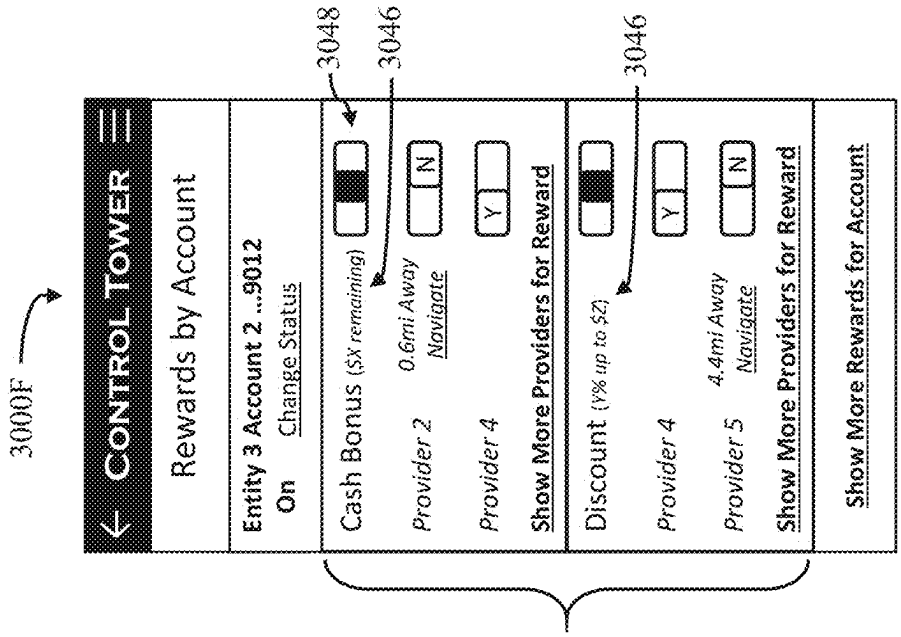


FIG. 30F

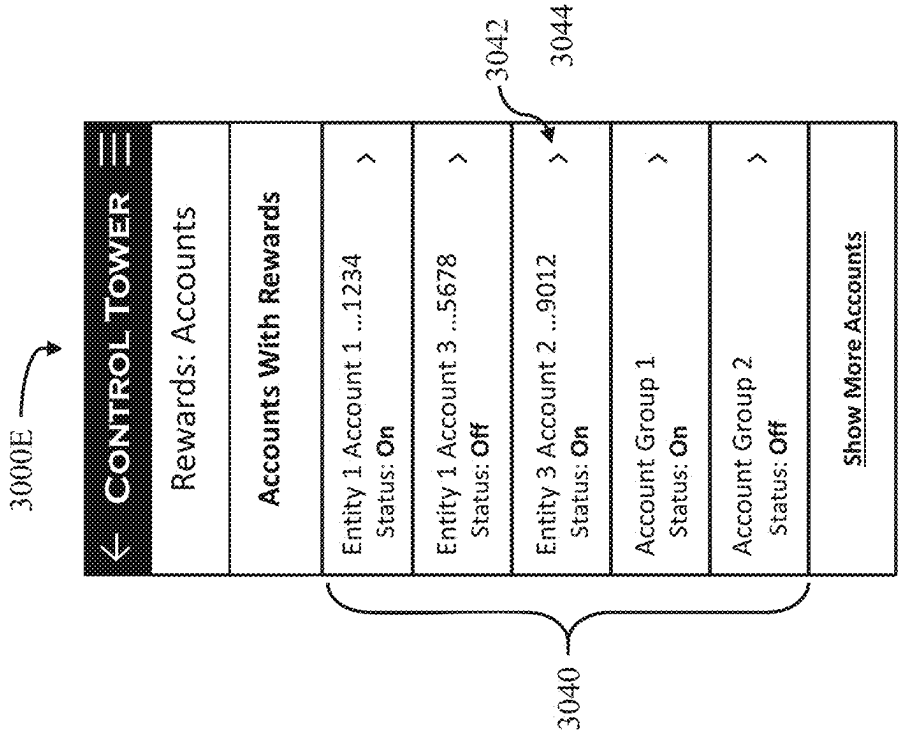


FIG. 30E

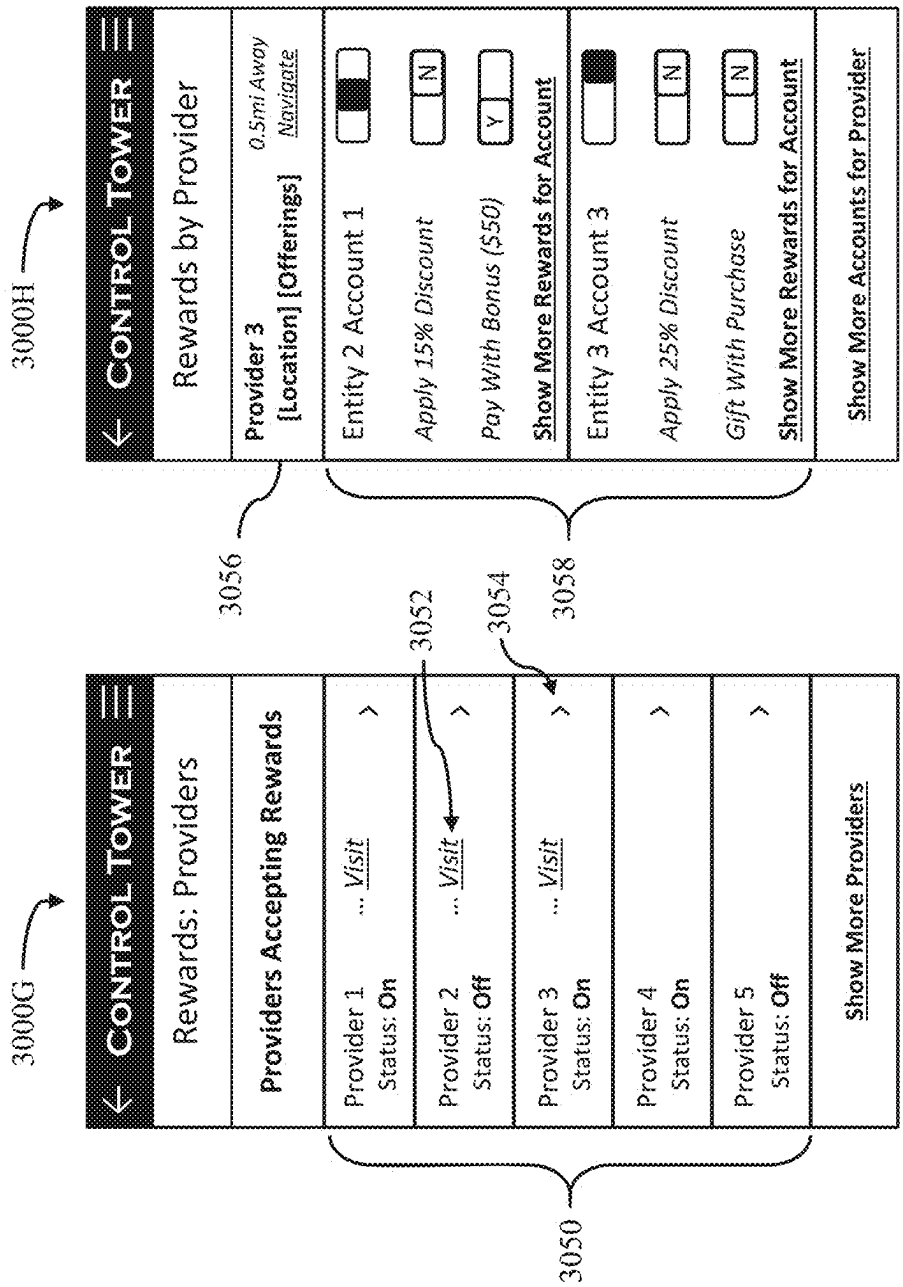


FIG. 30G

FIG. 30H

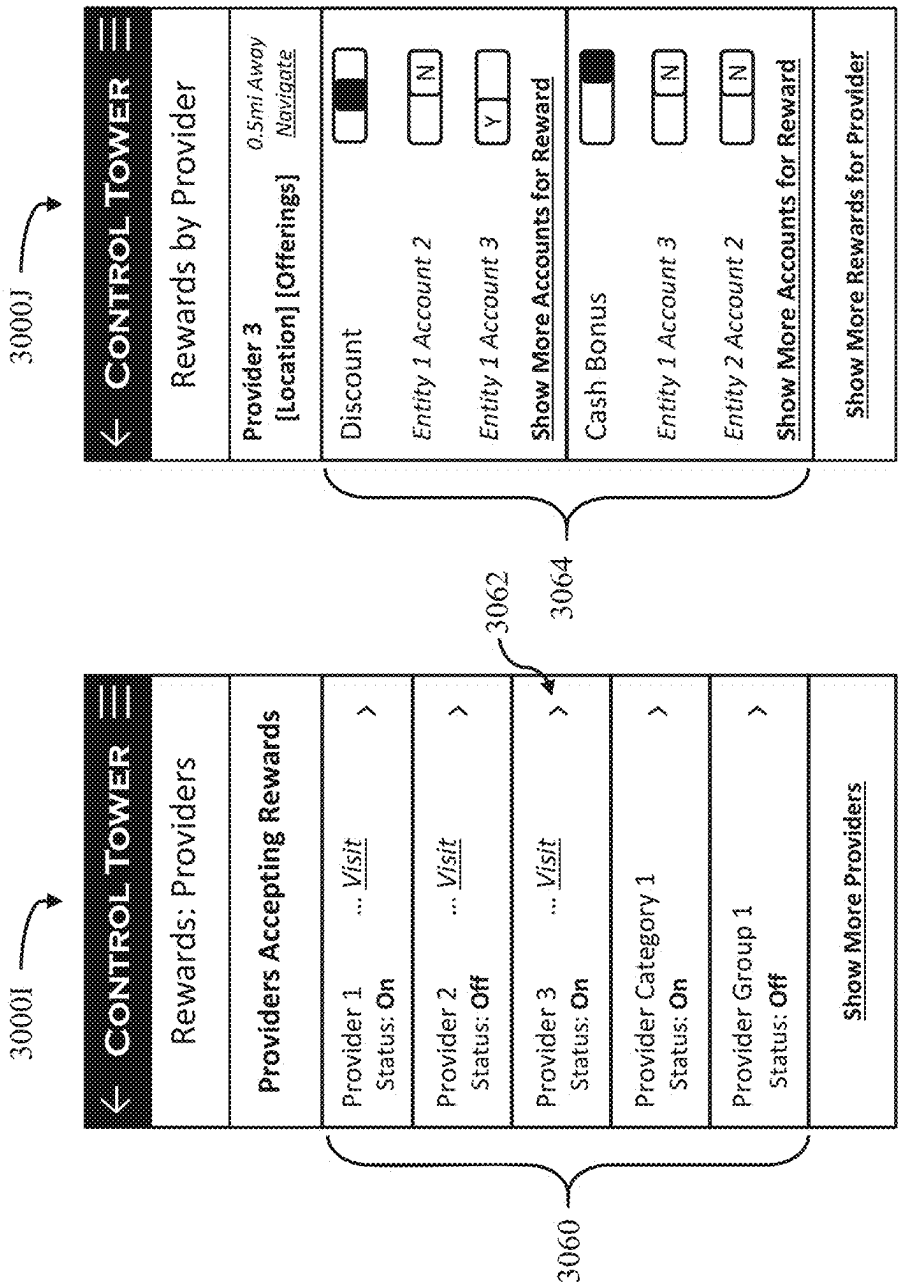


FIG. 30I

FIG. 30J

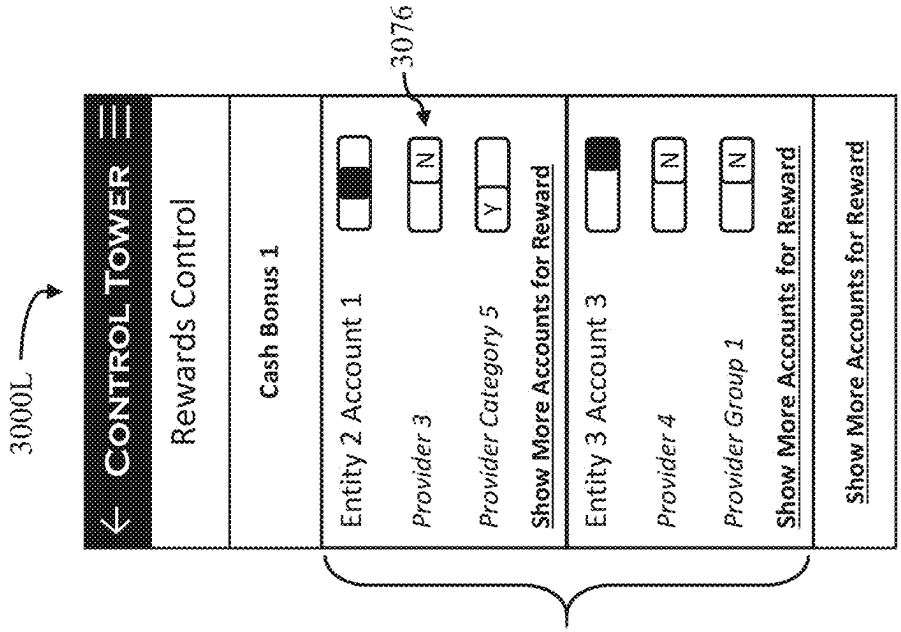


FIG. 30L

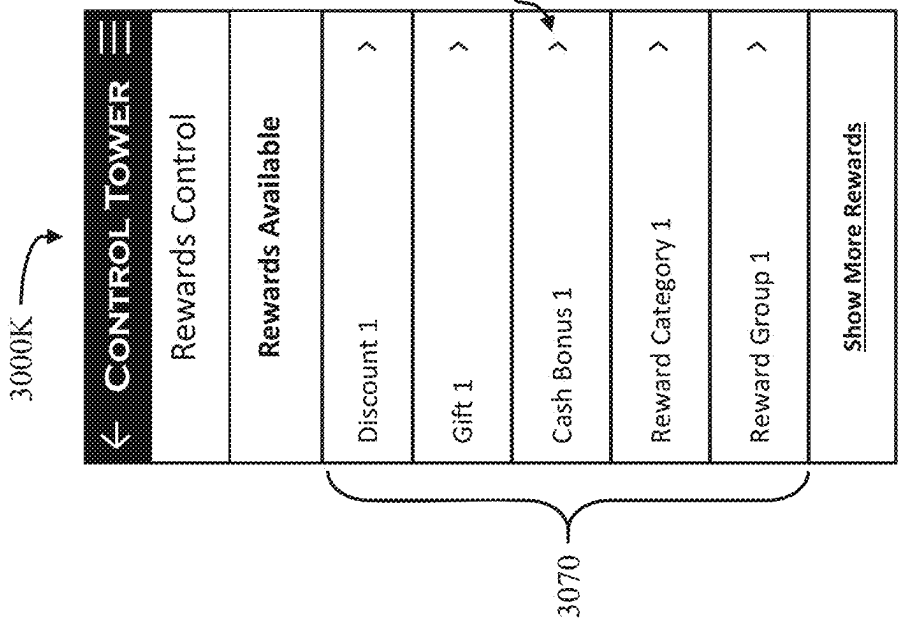


FIG. 30K

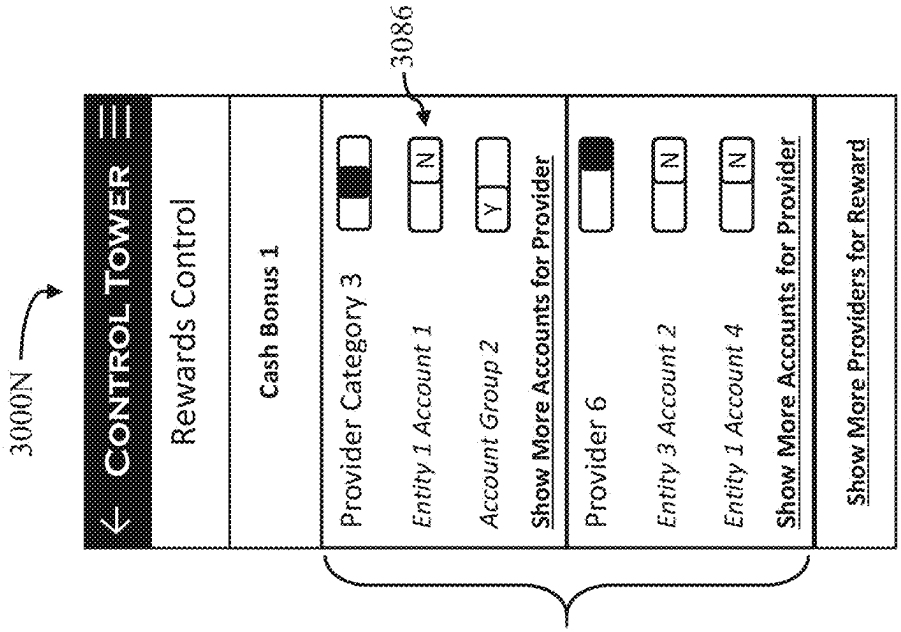


FIG. 30N

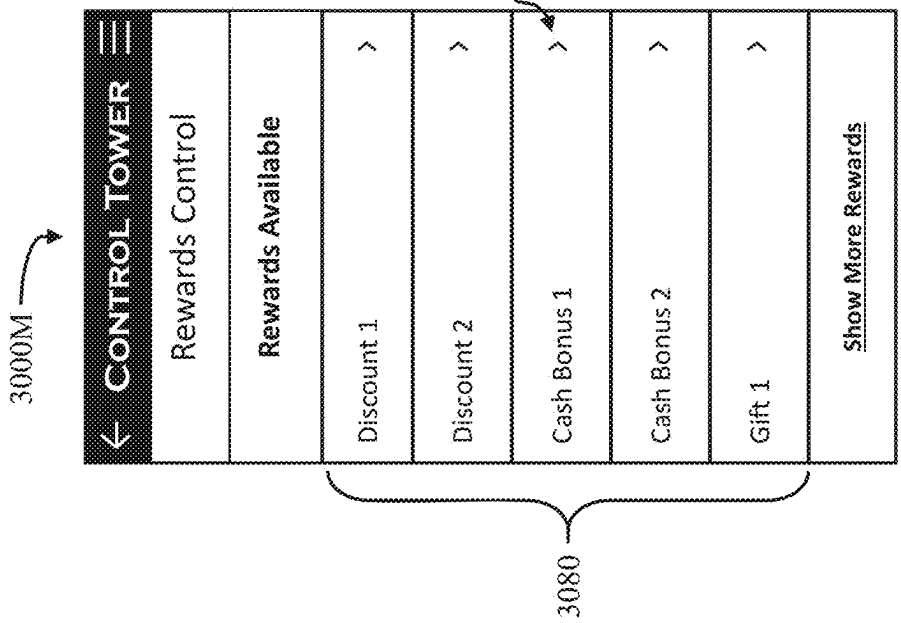


FIG. 30M

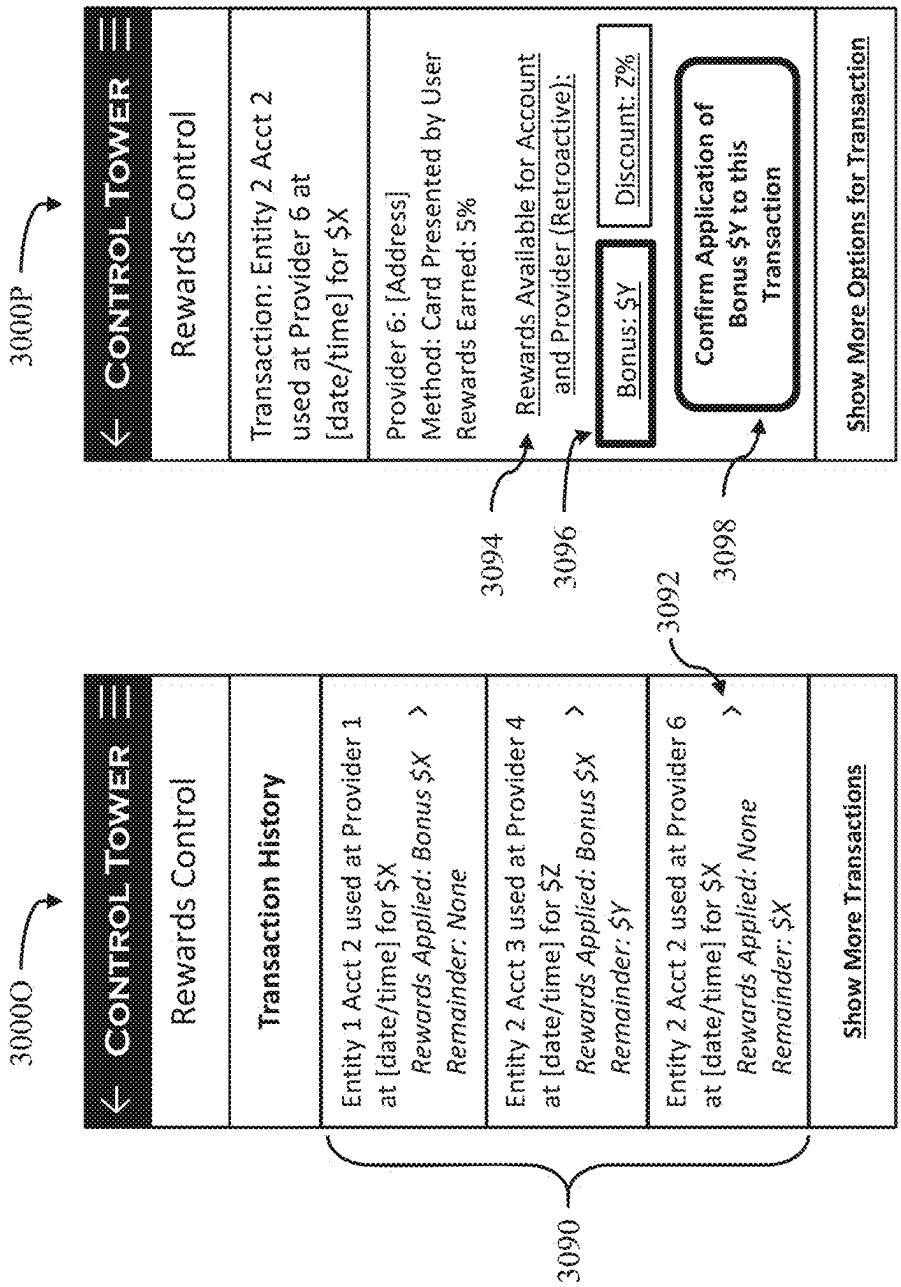


FIG. 30O

FIG. 30P

CONTROL TOWER FOR DEFINING ACCESS PERMISSIONS BASED ON DATA TYPE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 18/136,425 filed Apr. 19, 2023, which is a continuation of U.S. patent application Ser. No. 17/209,500 filed Mar. 23, 2021, which is a continuation of U.S. patent application Ser. No. 17/005,124 filed Aug. 27, 2020 (now U.S. Pat. No. 10,963,589), which is a continuation of U.S. patent application Ser. No. 16/653,312 filed Oct. 15, 2019, which is a continuation-in-part of U.S. patent application Ser. No. 16/457,257 filed Jun. 28, 2019, which is a continuation-in-part of U.S. patent application Ser. No. 16/383,388 filed Apr. 12, 2019, which is a continuation-in-part of U.S. patent application Ser. No. 16/215,558 filed Dec. 10, 2018, which is a continuation of U.S. patent application Ser. No. 16/204,831 filed Nov. 29, 2018, which claimed priority to U.S. Provisional Patent Application No. 62/766,400 filed Oct. 16, 2018. U.S. patent application Ser. No. 16/204,831 is a continuation-in-part of U.S. patent application Ser. No. 15/723,078 filed Oct. 2, 2017, which claimed priority to U.S. Provisional Patent Application No. 62/529,360 filed Jul. 6, 2017, and to U.S. Provisional Patent Application No. 62/403,396 filed Oct. 3, 2016. U.S. patent application Ser. No. 15/723,078 is a continuation-in-part of U.S. patent application Ser. No. 15/629,423 filed Jun. 21, 2017, which claimed priority to U.S. Provisional Application No. 62/357,737 filed Jul. 1, 2016. Each of the above is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] Embodiments of the present disclosure relate to systems and methods for managing customer data and customer preferences across a plurality of platforms.

BACKGROUND

[0003] Many customers link information (e.g., account types, account balances, payment account information, etc.) maintained by a financial institution to devices (e.g., in a mobile wallet on a smartphone, wearable devices, Internet of Things devices, etc.) and to third-party systems (e.g., financial health monitoring services, merchant e-commerce systems, social media platforms, mobile wallet systems, etc.). The customer may share the information with a plurality of different services. For example, the customer may provide account information to a financial health monitoring service, payment card information to a plurality of different mobile wallet services, payment card information to their favorite retailers, and the like. Once the access is provided, the customer can manage preferences relating to the access at each of the third-party systems (e.g., via a third-party website or smartphone application). However, this process can be cumbersome when the customer has authorized a plurality of third-parties to have access to the information maintained by the financial institution. Moreover, information shared by the customer becomes stored in additional databases, exposing the customer to additional security risks and making the customer's information more likely to become available to unwanted parties (as a result of, for example, the additional databases being hacked or the customer information otherwise being intentionally or unintentionally leaked).

SUMMARY

[0004] Various embodiments relate to a method that may comprise providing a portal. The portal may be provided via a network such as the internet. The portal may be accessible via, for example, a user device. For example, the portal may be accessible via an application running on a user device. A user accessing the portal may be presented with one or more graphical interfaces. The portal may allow the user to view information on one or more accounts of the user. The method may comprise accepting a selection to enable use of a virtual rewards currency. The selection may be accepted via the portal. The selection may be to enable use of the virtual rewards currency for one or more subsequent electronic transactions. The electronic transactions may involve a select account. The method may comprise receiving an authorization request for an electronic transaction. The authorization request may be received from or via a provider device. The electronic transaction may involve a purchase by the user. The purchase may be from a provider corresponding to the provider device. The provider may be, for example, a merchant, online or otherwise. The provider device may have received account information corresponding to the select account for the purchase. The provider device may have received the account information from the user. The user may have provided the account information by inputting information. The information may have been input into the provider device. The user may, alternatively or additionally, present a payment vehicle associated with the select account to the provider, such as by presenting a payment card (e.g., a credit or debit card) at a point of sale device of the provider. Alternatively or additionally, the account information may be presented via, for example, a mobile wallet application implemented via the user device. The method may comprise applying the virtual rewards currency to cover at least a portion of the purchase.

[0005] In one or more implementations, the method may comprise accepting a second selection to disable use of the virtual rewards currency with respect to the select account. The second selection may be received via the portal.

[0006] In one or more implementations, the method may comprise presenting an indication that the virtual rewards currency was applied to the purchase. The indication may be presented graphically. The indication may be presented via the portal.

[0007] In one or more implementations, the method may comprise transmitting an approval of the electronic transaction involving the purchase by the user. The approval may be transmitted to the provider device.

[0008] In one or more implementations, the portal may allow the user to view information on accounts held by two or more entities. The information may be provided via communications with corresponding computing systems of the entities.

[0009] In one or more implementations, the virtual rewards currency may take different forms. The virtual rewards currency may be, or may comprise, a bonus earned for one of the accounts which may be accessible via the portal. The bonus may be, for example, a "cash back" bonus that may be earned based on use of the account for trans-

actions. Alternatively or additionally, the virtual rewards currency may be a discount, gift, and/or another item of value provided to the user.

[0010] In one or more implementations, the portal may be implemented by a computing system of a financial institution. The financial institution may hold one or more accounts of the user.

[0011] In one or more implementations, the portal may allow the user to retroactively apply a second virtual rewards currency to a past transaction. The past transaction may have originally been processed without use of the second virtual rewards currency.

[0012] In one or more implementations, the portal may be configured to receive from the user device location data. The location may correspond to the location of the user device. The location data may have been detected using a location sensor of the user device. The portal may, alternatively or additionally, be configured to present a distance of the user device from the provider.

[0013] In one or more implementations, the portal may provide a selectable icon corresponding to the provider. The icon may be configured to, when selected, result in the presentation of directions to a physical location of the provider. The directions may be presented via an application, such as a map or navigation application, launched on the user device upon selection of the icon. Alternatively or additionally, the icon may be configured to, when selected, result in the presentation of a website or application. The website or application may be associated with the provider, and may be presented on the user device.

[0014] Various embodiments relate to a method that may comprise presenting an option to activate use of a virtual rewards currency. The option may be presented via a user device. The option may be to activate use of the virtual rewards currency for one or more subsequent transactions. A subsequent transaction may involve a select account. The select account may be held by a financial services provider. The method may comprise accepting an indication that a user of the user device has opted to activate use of the virtual rewards currency for the subsequent transaction involving the select account. The indication may be accepted via the user device. The method may comprise processing the transaction for which use of the virtual rewards currency was activated. The transaction may be processed such that the virtual rewards currency is applied to the transaction. The transaction may processed via a computing system of the financial services provider.

[0015] In one or more implementations, the option is presented via a portal. The portal may be, but need not be, implemented by a computing system of the financial services provider. For example, the portal may be implemented by a computing system of an entity other than the financial services provider.

[0016] In one or more implementations, processing the transaction may comprise receiving a request for authorization of the transaction. The request may be received from a merchant device, such as a point-of-sale device or a device of an online merchant. The method may comprise transmitting an approval of the transaction to the merchant device.

[0017] In one or more implementations, the computer system of the financial services provider may receive the request for authorization from the merchant device. The computer system of the financial services provider may transmit the approval to the merchant device.

[0018] In one or more implementations, the method may comprise detecting a physical location of the user device. The physical location may be detected via a user device. The physical location may be detected via a location sensor of the user device. The method may comprise presenting a second option for navigating to the physical location. The second option may be presented via the user device. The option may be for navigating via the user device, such as via a navigation application running on the user device.

[0019] In one or more implementations, the second option may be presented via a first application running on the user device. The method may comprise accepting a second indication that the user of the user device has opted to navigate to the physical location. The second indication may be accepted via an input device of the user device. The input device may or include, for example, a touchscreen, a virtual or physical keyboard, or otherwise. The method may comprise launching a second application. The second application may be launched via an operating system of the user device. The second application may presents a virtual map. The virtual map may correspond to the user device's present location.

[0020] Various embodiments relate to a computing system having a processor and a memory storing executable code which causes the computing system, when executed, to perform specific functions. The computing system may be configured to provide a portal. The portal may be presented via the internet or other network. The computing system may present (via a portal or otherwise) an option to use a virtual rewards currency. The option may be to use the virtual rewards currency with respect to a select account of a user. The option may be selectable via a user device, such a user device accessing the portal. The computing system may be configured to accept an indication that the user of the user device has opted to use the virtual rewards currency. The indication may be accepted via the portal. The computing system may be configured to apply the virtual rewards currency to a transaction involving the select account.

[0021] In one or more implementations, the computing system may be implemented by or otherwise associated with a financial services provider at which the select account is held. The computing system may instead be implemented by or otherwise associated with an entity other than a financial services provider at which the select account is held.

[0022] In one or more implementations, the transaction may be a past transaction, such as an already-processed transaction or otherwise one that was initiated prior to opting to use the virtual rewards currency. The transaction may also be a future transaction, such as an in-process transaction or otherwise one that is initiated subsequent to opting to use the virtual rewards currency.

[0023] One embodiment relates to a method of managing access to customer information associated with a customer of a financial institution. The method includes receiving, by a financial institution computing system associated with a financial institution, a request to view a set of access permissions from a first user device associated with the user. The method also includes identifying, by the financial institution computing system, the set of access permissions associated with the user, the set of access permissions identifying an entity or device that may request information regarding the user from the financial institution. The method also includes generating an access permission dataset based on the identified set of access permissions. The method also

includes transmitting, by the financial institution computing system, the access permission dataset to the user device to facilitate the presentation of a data control interface to the customer via the user device, the data control interface configured to receive user inputs to change the set of data access permissions.

[0024] Another embodiment relates to a financial institution computing system associated with a financial institution. The financial institution computing system includes a network interface configured to communicate data over a network and an access control circuit. The access control circuit is configured to receive, by the network interface, a request to view a set of access permissions from a first user device associated with the user. The access control circuit is also configured to identify the set of access permissions associated with the user, the set of access permissions identifying an entity or device that may request information regarding the user from the financial institution. The access control circuit is further configured to generate an access permission dataset based on the identified set of access permissions. The access control circuit is further configured to transmit, by the network interface, the access permission dataset to the user device to facilitate the presentation of a data control interface to the customer via the user device, the data control interface configured to receive user inputs to change the set of data access permissions.

[0025] Various embodiments of the disclosure relate to methods, systems, and non-transitory computer readable medium for managing access to customer information of a customer. The customer information may be stored at a service provider computing system of a service provider. A third-party account may be linked with the customer information. The third-party account may be stored at a third party computing system. The third-party account may be linked with the customer information by the service provider computing system and/or by the third-party computing system. The link may define a subset of the customer information that is accessible to the third-party computing system. An instruction to delete customer data stored in a database of the third-party computing system may be received. The instruction to delete may be received from a service provider client application running on a computing device of the customer. The instruction to delete may be received by the service provider computing system. The instruction to delete may be generated in response to a corresponding selection by the customer. The instruction to delete may be generated by the service provider client application. The selection may be made via a graphical user interface presented by the service provider client application. A scrub command may be generated. The scrub command may be generated by the service provider computing system. The scrub command may identify the customer and/or the customer data to be deleted. The scrub command may be generated in response to receiving the instruction to delete. The scrub command may be transmitted to the third party computing system. The scrub command may be transmitted to cause the third-party computing system to delete the customer data that may have been identified by the scrub command. The customer data may be deleted by the third-party computing system from a database thereof.

[0026] In various implementations, an API call may be received. The API call may be received from the third-party computing system. The API call may be received by the service provider computing system. The API call may specify a subset of the customer information. The subset of the customer information specified in the API call may be transmitted to the third-party computing system. The customer information may be transmitted in response to receiving the API call from the third-party computing system. Restrictions may be placed on what customer data is accessible to the third-party computing system. Additionally or alternatively, restrictions may be placed on how accessible customer data may be used by the third party computing system. One or more restrictions may be placed by the customer. One or more restrictions may be placed via the service provider client application. Status information indicating whether the link is active or inactive may be transmitted to the computing device of the customer. The status information may be presented via the service provider client application running on the computing device. The scrub command may instruct the third-party computing system to delete the third-party account of the customer from the third-party computing system. The scrub command may instruct the third-party computing system to delete customer data of a specified type from the database of the third-party computing system. The scrub command may instruct the third-party computing system to delete all customer data, or a subset thereof, stored at the third-party computing system.

[0027] Various embodiments of the disclosure relate to a computing device, which may be a mobile computing device. The computing device may be associated with a customer of a service provider. The computing device may comprise a processor and memory with instructions which, when executed by the processor, cause the device to perform specific functions. The specific functions, or a subset thereof, may be performed via a service provider client application running on the computing device. The computing device may receive a request to link a third-party account of the customer with customer information stored at a service provider computing system. The third-party account may be stored at a third party computing system. The link may define a subset of the customer information that is accessible to the third-party computing system. The computing device may also present a graphical user interface. The graphical user interface may provide the customer with status information on the link. The graphical user interface may also allow the customer to make a selection to delete customer data stored in a database of the third-party computing system. The computing device may transmit an instruction to delete to the service provider computing system. The instruction to delete may be transmitted in response to the selection. The service provider computing system may generate a scrub command. The scrub command may be generated in response to receiving the instruction to delete. The scrub command may identify the customer and/or the customer data to be deleted. The scrub command may be transmitted to the third party computing system. The scrub command may be transmitted by the service provider computing system. The scrub command may be configured to cause deletion of the specified customer data. The customer data may be deleted by the third-party computing system.

[0028] In various implementations, the graphical user interface allows the customer to place restrictions on at least one of (1) what customer data is accessible to the third-party computing system and (2) how accessible customer data may be used by the third party. The graphical user interface may be presented via the service provider client application

running on the computing device. The graphical user interface may identify the third-party account that is linked. The scrub command instructs the third-party computing system to delete a third-party account of the customer, to delete customer data of a specified type, and/or delete all customer data stored at the third-party computing system.

[0029] Various embodiments of the disclosure relate to a computing device, which may be a mobile computing device. The computing device may be associated with a customer of a service provider. The computing device may comprise a processor and memory with instructions which, when executed by the processor, cause the device to perform specific functions. The computing device may run a service provider client application. The computing device may perform the specific functions, or a subset thereof, via the service provider client application. The computing device may present a first graphical user interface. The first graphical user interface may, at least in part, identify a third-party account that is linked with customer information. The customer information may be stored at a service provider computing system of the service provider. The third-party account may be stored at a third party computing system. The link may define a subset of the customer information that is accessible to the third-party computing system. The computing device may also present a second graphical user interface. The second graphical user interface may include a selectable link which, when selected, transmits a message to the service provider computing system. The message may indicate that the customer wishes to delete customer data stored in a database of the third-party computing system. The service provider computing system may generate a scrub command. The scrub command may be generated in response to receiving the message. The scrub command may identify the customer and/or the customer data to be deleted. The computing device may transmits the scrub command to the third party computing system. The scrub command may be transmitted to cause the third-party computing system to delete the specified customer data.

[0030] Various embodiments of the disclosure relate to a computing device comprising a network interface configured to communicate via a telecommunications network. The computing device may also comprise one or more user interfaces for visually presenting graphical elements and for receiving user inputs. The computing device may moreover comprise a processor and a memory having stored thereon instructions which, when executed by the processor, cause the processor to perform specific functions. The computing device may be configured to present an interactive graphical interface via the user interfaces. The graphical interface may identify an entity for which an access permission to user information is controlled. The user information may be stored at a service provider computing system. The computing device may also be configured to present a display icon via the interactive graphical interface. The display icon may be selecting between a first user information and a second user information to be made accessible to the entity. The computing device may moreover be configured to receive, from the user interfaces, a signal. The signal may indicate a user input corresponding with a selection of one of the first user information and the second user information via the display icon. The computing device may additionally be configured to use the network interface to transmit to the service provider computing system an indication of which one of the first user information and the second user information has been selected. The service provider computing system may grant the entity access to the selected user information. Access to the selected user information may be granted following receipt by the service provider computing system of a request from the entity for user information.

[0031] In various implementations, the computing device may be configured to present, via the interactive graphical interface, an indication of whether access to user information is permitted or restricted for the entity. The computing device may also be configured to present, via the interactive graphical interface, a second display icon for selecting between at least a first setting to permit access to user information for the entity, and a second setting to restrict access to user information for the entity. The computing device may be a first computing device, and the entity may be a second computing device associated with the user. In certain versions, the second computing device may be a smartphone. In certain versions, the second computing device may be a tablet computer. In certain versions, the second computing device may be a wearable device. In certain versions, the second computing device may be a smart speaker. In certain versions, the second computing device may be a vehicle. The interactive graphical interface may be presented via a first application. The entity may be a second application. The second application may be configured to communicate with the service provider computing system to request access to user information. In certain versions, the first and second applications may both run on the computing device. In certain versions, the second application runs on a second computing device. The entity may be a third-party computing system. The user information may be account data for financial transactions involving the third-party computing system.

[0032] Various embodiments of the disclosure relate to a method for controlling access permissions to user devices. The method may comprise presenting, via one or more user interfaces, an interactive graphical interface. The graphical interface may identify an entity for which an access permission to user information may be controlled. The one or more user interfaces may be configured to visually present graphical elements and receive user inputs. The user information may be stored at a service provider computing system. The method may also comprise presenting, via the interactive graphical interface, a display icon. The display icon may be for selecting between a first user information and a second user information to be made accessible to the entity. The method may moreover comprise receiving, from the user interfaces, a signal. The signal may indicate a user input corresponding with a selection of one of the first user information and the second user information via the display icon. The method may additionally comprise using a network interface to transmit to the service provider computing system an indication of which one of the first user information and the second user information has been selected. The service provider computing system may grant the entity access to the selected user information. Access to the selected user information may be granted following receipt by the service provider computing system of a request from the entity for user information.

[0033] In various implementations, an indication of whether access to user information is permitted or restricted for the entity may be presented via the interactive graphical interface. A second display icon may be presented via the interactive graphical interface. The second display icon may

be for selecting between at least a first setting to permit access to user information for the entity, and a second setting to restrict access to user information for the entity. The computing device may be a first computing device, and the entity may be a second computing device associated with the user. In certain versions, the second computing device may be a smartphone. In certain versions, the second computing device may be a tablet computer. In certain versions, the second computing device may be a smart speaker. In certain versions, the second computing device may be a vehicle. In certain versions, the second computing device may be a wearable device. The interactive graphical interface may be presented via a first application. The entity may be a second application configured to communicate with the service provider computing system to request access to the user information. The entity may be a third-party computing system. The third-party computing system may be associated with a merchant. The user information may be account data for transacting with the third-party computing system. The user information may be account data for making purchases from a merchant.

[0034] Various embodiments of the disclosure relate to a non-transitory computer readable medium having machine instructions stored thereon, the instructions being executable by a processor of a computing device to cause the processor to perform specific operations. The operations may comprise presenting an interactive graphical interface via one or more user interfaces. The graphical interface may identify an entity for which an access permission to user information is controlled. The one or more user interfaces may be configured to visually present graphical elements and receive user inputs. The user information may be stored at a service provider computing system. The operations may also comprise presenting a display icon via the interactive graphical interface. The display icon may be for selecting between a first user information and a second user information to be made accessible to the entity. The operations may moreover comprise receiving a signal from the user interfaces. The signal may indicate a user input corresponding with a selection of one of the first user information and the second user information via the display icon. The operations may additionally comprise using a network interface to transmit to the service provider computing system an indication of which one of the first user information and the second user information has been selected. The service provider computing system may grant the entity access to the selected user information.

[0035] In various implementations, the operations may comprise presenting, via the interactive graphical interface, an indication of whether access to user information is permitted or restricted for the entity. The operations may also comprise presenting, via the interactive graphical, a second display icon for selecting between at least a first setting to permit access to user information for the entity, and a second setting to restrict access to user information for the entity.

[0036] Various embodiments of the disclosure relate to a computing device. The computing device may comprise a network interface configured to communicate via a telecommunications network, one or more user interfaces for visually presenting graphical elements and for receiving user inputs, and a processor and a memory having stored thereon instructions which, when executed by the processor, cause the processor to perform specific functions. The computing device may be configured to present an interactive graphical interface via the user interfaces. The interactive graphical interface may identify an entity for which an access permission to user information is controlled. The user information may be stored at a service provider computing system. The computing device may also be configured to present a display icon via the interactive graphical interface. The display icon may be for selecting the access permission corresponding to the entity. The access permission may be selectable between at least a first setting to permit access to user information, and a second setting to restrict access to user information. The computing device may moreover be configured to receive a signal from the user interfaces. The signal may indicate a user input corresponding with a toggling of the display icon between the first and second settings. The computing device may additionally be configured to use the network interface to transmit to the service provider computing system at least one of an identification of the selected access permission and an indication that the access permission for the entity has changed. The service provider computing system may determine whether to grant the entity with access to the user information according to the access permission.

[0037] In various implementations, the computing device may be configured to present, via the interactive graphical interface, an identification of the user information accessible to the entity. The user information may be a first user information. The computing device may be configured to present a second display icon via the interactive graphical interface. The second icon may be for selecting between the first user information and a second user information to be made available to the entity. The computing device may be a first computing device. The entity may be a second computing device associated with the user. In some versions, the second computing device may be a smartphone. In some versions, the second computing device may be a tablet computer. In some versions, the second computing device may be a wearable device. In some versions, the second computing device may be a smart speaker. In some versions, the second computing device may be a vehicle. The interactive graphical interface may be presented via a first application. The entity may be a second application. The second application may be configured to communicate with the service provider computing system to request access to the user information. In some versions, the first and second applications may both run on the computing device. The entity may be a third-party computing system. The third-party computing system may be associated with a merchant. The user information may be account data for making purchases from the merchant.

[0038] Various embodiments of the disclosure relate to a method for controlling access permissions to user devices. The method may comprise presenting an interactive graphical interface via one or more user interfaces. The interactive graphical interface may identify an entity for which an access permission to user information is controlled. The one or more user interfaces may be configured to visually present graphical elements and receive user inputs. The user information may be stored at a service provider computing system. The method may also comprise presenting a display icon via the interactive graphical interface. The display icon may be for selecting the access permission corresponding to the entity between at least a first setting to permit access to user information, and a second setting to restrict access to

user information. The method may moreover comprise receiving a signal from the user interfaces. The signal may indicate a user input corresponding with a toggling of the display icon between the first and second settings. The method may additionally comprise using a network interface to transmit to the service provider computing system at least one of an identification of the selected access permission and an indication that the access permission for the entity has changed. The network interface may be configured to communicate via a telecommunications network. The service provider computing system may determine whether to grant the entity with access to the user information according to the access permission.

[0039] In various implementations, an identification of the user information accessible to the entity may be presented via the interactive graphical interface. The user information may be a first user information. A second display icon may be presented via the interactive graphical interface. The second display icon may be for selecting between the first user information and a second user information to be made available to the entity. The computing device may be a first computing device, and the entity may be a second computing device associated with the user. The second computing device may be a smartphone, a tablet computer, a smart speaker, a vehicle, and/or a wearable device. The interactive graphical interface may be presented via a first application. The entity may be a second application configured to communicate with the service provider computing system to request access to the user information. The first and second applications may both run on the computing device. The entity may be a third-party computing system. The third-party computing system may be associated with a merchant. The user information may be account data. The account data may be for making purchases from the merchant.

[0040] Various embodiments of the disclosure relate to a non-transitory computer readable medium having machine instructions stored thereon. The instructions may be executable by a processor of a computing device to cause the processor to perform specific operations. The operations may comprise presenting an interactive graphical interface via one or more user interfaces. The interactive graphical interface may identify an entity for which an access permission to user information is controlled. The one or more user interfaces may be configured to visually present graphical elements and receive user inputs. The user information may be stored at a service provider computing system. The operations may also comprise presenting a display icon via the interactive graphical interface. The display icon may be for selecting the access permission corresponding to the entity. The display icon may allow selection of the access permission between at least a first setting to permit access to user information, and a second setting to restrict access to user information. The operations may moreover comprise receiving, from the user interfaces, a signal indicating a user input corresponding with a toggling of the display icon between the first and second settings. The operations may additionally comprise using a network interface to transmit to the service provider computing system at least one of an identification of the selected access permission and an indication that the access permission for the entity has changed. The network interface may be configured to communicate via a telecommunications network. The service provider computing system may determine whether to grant the entity with access to the user information according to the access permission.

[0041] In various implementations, a second display icon may be presented via the interactive graphical interface. The second display icon may be for selecting between a first user information and a second user information to be made accessible to the entity.

[0042] Various embodiments of the disclosure relate to a service provider computing system comprising a network interface configured to communicate via a telecommunications network, a processor, and a memory having stored thereon instructions which, when executed by the processor, cause the processor to perform specific functions. The service provider computing system may receive, via the network interface, an access request from a third-party platform. The access request may identify a user and data corresponding to the user. The service provider computing system may also verify that the identified user has granted the third-party platform access to the identified data. In response to verifying that the identified user has granted access, the service provider computing system may use the network interface to transmit the identified data to the third-party platform. The service provider computing may moreover receive, from a user device of the user, an instruction. The instruction may identify the third-party platform and/or indicate what is to be done with the data provided to the third-party platform. The service provider computing system may additionally use the network interface to transmit a command to the third-party platform to cause the third-party platform to, consistent with the instruction from the user device, delete the data received from the service provider computing system and/or restrict how the data from the service provider computing system is used.

[0043] In various implementations, the command may be or include an API call to the third-party platform. The API call may identify the user and/or the data to be deleted and/or restricted. The access request may be an API call transmitted by the third-party platform to the service provider computing system. The command may instruct the third-party platform to delete the data from all computer-readable storage media controlled by the third-party platform. The instruction may identify a selection made, via a graphical interface presented by a client application running on the user device, between permitting a use of the data and prohibiting the use of the data. The data may identify a credit or debit card. The use may correspond with use of the credit or debit card in an identified category of financial transactions. The command may instruct the third-party platform to delete a user account of the user.

[0044] Various embodiments of the disclosure relate to a method of reclaiming user data. The method may comprise receiving an access request from a third-party platform. The access request may identify a user and/or data corresponding to the user. The method may also comprise verifying that the identified user has granted the third-party platform access to the identified data. The method may moreover comprise transmitting the identified data to the third-party platform in response to verifying that the identified user has granted access. The method may additionally comprise receiving, from a user device of the user, an instruction identifying the third-party platform and/or indicating what is to be done with the data provided to the third-party platform. The method may further comprise transmitting a command to the

third-party platform to cause the third-party platform to, consistent with the instruction from the user device, delete the data or restrict how the third-party platform uses the data.

[0045] In various implementations, the command may include an API call to the third-party platform. The API call may identify the user and/or the data to be deleted and/or restricted. The command may instruct the third-party platform to delete the data from all computer-readable storage media controlled by the third-party platform. The command may instruct the third-party platform to delete a user account of the user. The third-party platform may be a social media platform. The user account may be a social media account of the user. The third-party platform may be a third-party computing system of a merchant. The data may be account data to be used for a purchase at the merchant. The user device may be a first user device of the user. The third-party platform may be a third-party client application running on at least one of the first user device and a second user device of the user. The instruction may identify a selection made, via a graphical interface presented by a client application running on the user device, between permitting a use of the data and prohibiting the use of the data. The data may include account data usable in financial transactions. The use may correspond with use of the data in an identified category of financial transactions. The account data may be for a credit or debit card. The identified category of financial transactions may be foreign transactions.

[0046] Various embodiments of the disclosure relate to a non-transitory computer readable medium having machine instructions stored thereon, the instructions being executable by a processor of a computing device to cause the processor to perform specific operations related to reclaiming user data. The operations may comprise receiving an access request from a third-party platform, the access request identifying a user and data corresponding to the user. The operations may also comprise verifying that the identified user has granted the third-party platform access to the identified data. The operations may moreover comprise, in response to verifying that the identified user has granted access, transmitting the identified data to the third-party platform. The operations may additionally comprise receiving, from a user device of the user, an instruction identifying the third-party platform and indicating what is to be done with the data provided to the third-party platform. The operations may further comprise transmitting a command to the third-party platform to cause the third-party platform to, consistent with the instruction from the user device, delete the data or restrict how the third-party platform uses the data.

[0047] Various embodiments relate to a method comprising providing a portal. The portal may include one or more graphical interfaces allowing a user to disable automated payments from selected accounts to selected recipients. The portal may be accessed via a user device. The portal may be configured to accept a first selection to disable a first automated payment in which a first financial account is used to make automated payments to a first recipient. The portal may be configured to accept a second selection of a second automated payment in which a second financial account is used to make automated payments to a second recipient. The first financial account may be held by one (a first) financial institution and the second financial account may be held by another (a second) financial institution. The first and second selections may be accepted via the user device accessing the portal.

[0048] In one or more implementations, at least one of the first and second recipients is a third financial account. The third financial account may be held at one of the first and second financial institutions. Alternatively, the third financial account may be held at a third financial institution.

[0049] In one or more implementations, the method may comprise disabling one or both of the first and second automated payments.

[0050] In one or more implementations, the portal may be implemented by a computing system of the first financial institution. Disabling the first automated payment may comprise declining a subsequent payment request from a first device corresponding to the first recipient.

[0051] In one or more implementations, disabling the second automated payment may comprise transmitting an indication to a computing system of the second financial institution that the second automated payment has been disabled.

[0052] In one or more implementations, the portal may be implemented by a first computing system of an entity other than the first and second financial institutions. Disabling the first recurring payment may comprise sending a transmission to a second computing system of the first financial institution. The transmission may be sent by the first computing system. The transmission may indicate that the first recurring payment is to be disabled.

[0053] In one or more implementations, disabling the second recurring payment may comprise sending a transmission to a third computing system of the second financial institution. The transmission may be sent by the first computing system. The transmission may indicate that the second recurring payment is to be disabled.

[0054] In one or more implementations, the transmission to the second computing system may comprise an API call to the second computing system. The API call may be accompanied by a security token authenticating the first computing system. The API call may additionally or alternatively be accompanied by an identification of a user and/or an account number associated with the first financial account.

[0055] Various embodiments relate to a method comprising providing a portal with one or more graphical interfaces. The graphical interfaces may allow a user to control automated payments from one or more financial accounts to one or more recipients. The portal may allow the user to control automated payments via a user device. The portal may be configured to accept selection of a financial account used to make automated payments. The portal may be configured to accept selection of a recipient of the automated payments from the selected financial account. The portal may be configured to accept an indication that the automated payments are to be disabled. One or more of the selections and the indication may be accepted via the user device. The method may comprise disabling the automated payments from the financial account to the recipient.

[0056] In one or more implementations, the method may be implemented by a computing system of a financial institution at which the financial account is held. The method may comprise declining a subsequent payment request. The

subsequent payment request may be received from a computing device corresponding to the recipient of the automated payments.

[0057] In one or more implementations, the method may be implemented by a third-party computing system of a third-party that is not a financial institution at which the financial account is held. The method may comprise sending a transmission indicating that the automated payments have been disabled. The transmission may be sent to a financial institution computing system of the financial institution.

[0058] In one or more implementations, the portal may be configured to accept selection of a second financial account used to make automated payments. The portal may be configured to accept selection of a second recipient of the automated payments from the second financial account. The portal may be configured to accept an indication that the automated payments from the second financial account to the second recipient are to be disabled. One or more of the selections may be accepted via the user device. The method may comprise disabling the automated payments from the second financial account to the second recipient.

[0059] Various embodiments relate to a method of providing a portal accessible to a user device via a network. The portal may be configured to present a list that includes a first selectable icon corresponding to a first financial account. The list may include a second selectable icon corresponding to a second financial account. The list may be presented via a first graphical interface. The first and second financial accounts may be held at different financial institutions. The portal may be configured to accept a first indication that one of the first and second financial accounts has been selected by the user via one of the first and second selectable icons. The first indication may be accepted via the user device. The portal may be configured to present a selectable option to stop one or more subsequent recurring payments from the selected one of the first and second financial accounts. The selectable option may be presented via a second graphical interface. The second graphical interface may be accessed on the user device. The portal may be configured to accept a second indication that the option to stop subsequent recurring payments has been selected by the user via the selectable option. The second indication may be accepted from the user device.

[0060] In one or more implementations, the method is not implemented by either of the financial institutions at which the first and second financial accounts are held.

[0061] In one or more implementations, the method is implemented by a computing system associated with a financial institution holding one of the first and second financial accounts used for the recurring payments. The method may comprise declining a subsequent recurring payment request. The subsequent recurring payment request may be received from an entity device corresponding to a recipient of the recurring payments to be stopped.

[0062] In one or more implementations, the portal may be configured to accept a selection of the other of the first and second financial accounts from which recurring payments are made. The selection may be accepted from the user device. The portal may be configured to accept a second selection to stop subsequent recurring payments from the other of the first and second financial accounts. The second selection may be accepted via the user device.

[0063] Various embodiments relate to a method comprising providing a portal with one or more graphical interfaces. The one or more graphical interfaces may allow a user to disable selected financial accounts for identified entities such that payments from the selected financial accounts will be declined for the identified entities. The selected financial accounts may be disabled via a user device. The portal may be configured to present to the user a first graphical interface with a list that includes a first selectable icon corresponding to a first entity, and a second selectable icon corresponding to a second entity. The first graphical interface may identify a financial account used to make recurring payments to the first and second entities. The first graphical interface may be accessible via the user device. The portal may be configured to accept a first indication that one of the first and second entities has been selected by the user via one of the first and second selectable icons. The first indication may be accepted from the user device. The portal may be configured to present to the user a selectable option to stop one or more subsequent recurring payments to the selected one of the first and second entities. The selectable option may presented via a second graphical interface. The second graphical interface may be accessed on the user device. The portal may be configured to accept a second indication that the option to stop subsequent recurring payments has been selected by the user via the selectable option. The second indication may be accepted from the user device. The portal may be configured to decline a recurring payment request. The recurring payment request may be received from an entity device corresponding to the selected one of the first and second entities. The recurring payment request may be received subsequent to acceptance of the second indication.

[0064] In one or more implementations, the portal may be configured to present a duration selector. The duration selector may be configured to allow the user to identify a duration during which recurring payment requests from the selected one of the first and second entities will be declined.

[0065] In one or more implementations, the duration selector may be configured to allow the user to select a number of months during which recurring payment requests will be declined, after which recurring payment requests will not be declined.

[0066] In one or more implementations, the portal may be implemented by a computing system of a financial institution holding the financial account used for the recurring payments. The portal need not be implemented by a computing system of a financial institution holding the financial account used for the recurring payments. The portal may instead be implemented by a computing system of a third-party entity other than the financial institution holding the financial account used for the recurring payments.

[0067] In one or more implementations, the portal may be configured to allow the user to define a set of access permissions identifying an entity or device that may request information regarding the user from the computing system.

[0068] In one or more implementations, the portal may be implemented by a computing system of a financial institution holding the financial account used for the recurring payments. The method may comprise accepting payment requests from a first entity device of the first entity and from a second entity device of the second entity. The payment requests may be accepted before accepting the second indication via the portal. The method may comprise initiating debits from the financial account for each payment request.

[0069] In one or more implementations, the portal may be accessed via a mobile application running on the user device.

[0070] In one or more implementations, the portal may be configured to display one or more prior recurring payments to the selected one of the first and second entities. The recurring payments may be displayed after accepting the first indication.

[0071] In one or more implementations, the portal may be configured to display a status of the financial account. The status may be displayed after accepting the first indication.

[0072] In one or more implementations, the method may comprise accepting an authorization to approve recurring payment requests from devices of the first and second entities. The authorization may be accepted via the user device.

[0073] In one or more implementations, the central portal may be configured to allow the user to disable selected financial accounts with respect to identified financial wallet accounts such that payments via the identified financial wallet accounts will be declined for the selected financial accounts.

[0074] In one or more implementations, the financial account may be a debit card of the user. The recurring payments may be made using the debit card.

[0075] Various embodiments relate to a computing system configured to provide a portal. The portal may be accessible to a user device via a network. The portal may be configured to allow a user to disable selected financial accounts for identified entities such that payments from the selected financial accounts will be declined for the identified entities. The user may be allowed to disable selected financial accounts via the user device accessing the central portal. The portal may be configured to present a list that includes a first selectable icon corresponding to a first entity, and a second selectable icon corresponding to a second entity. The list may be presented via a first graphical interface. The first graphical interface may identify a financial account used to make recurring payments to the first and second entities. The portal may be configured to accept a first indication that one of the first and second entities has been selected by the user via one of the first and second selectable icons. The first indication may be accepted from the user device. The portal may be configured to present a selectable option to stop one or more subsequent recurring payments to the selected one of the first and second entities. The selectable option may be presented via a second graphical interface accessed on the user device. The portal may be configured to accept a second indication that the option to stop subsequent recurring payments has been selected by the user via the selectable option. The second indication may be accepted from the user device. The computing system may be configured to decline a recurring payment request. The recurring payment request may be received from an entity device corresponding to the selected one of the first and second entities. The request may be received subsequent to acceptance of the second indication via the central portal.

[0076] In one or more implementations, the portal may be configured to present a duration selector. The duration selector may be configured to allow the user to identify a duration during which recurring payment requests from the selected one of the first and second entities will be declined.

[0077] In one or more implementations, the computing system may be associated with a financial institution holding the financial account used for the recurring payments. The central portal may be further configured to allow the user to define a set of access permissions identifying an entity or device that may request information regarding the user from the computing system.

[0078] Various embodiments relate to a user device running an application. The application may be configured to access, via a network, a portal implemented by a computing system. The portal may be configured to allow a user to disable selected financial accounts for identified entities such that payments from the selected financial accounts will be declined or approved for the identified entities by the computing system. The application may be configured to present a list that includes a first selectable icon corresponding to a first entity, and a second selectable icon corresponding to a second entity. The list may be presented via a first graphical interface. The first graphical interface may identify a financial account used to make recurring payments to the first and second entities. The application may be configured to accept a first indication that one of the first and second entities has been selected by the user via one of the first and second selectable icons. The first indication may be accepted via one or more user interfaces of the user device. The application may be configured to present a selectable option to stop one or more subsequent recurring payments to the selected one of the first and second entities. The selectable option may be presented via a second graphical interface. The application may be configured to accept a second indication that the option to stop subsequent recurring payments has been selected by the user via the selectable option. The second indication may be accepted via the one or more user interfaces. The application may be configured to transmit the second indication to cause the computing system to decline a recurring payment request. The payment request may be received by the computing system from an entity device corresponding to the selected one of the first and second entities. The payment request may be received subsequent to acceptance of the second indication.

[0079] In one or more implementations, the application may be configured to present a duration selector. The duration selector may be configured to allow the user to identify a duration during which recurring payment requests from the selected one of the first and second entities will be declined.

[0080] In one or more implementations, the computing system may be associated with a financial institution holding the financial account used for the recurring payments. The portal may be configured to allow the user to define a set of access permissions identifying an entity or device that may request information regarding the user from the computing system.

[0081] In one or more implementations, the application may be configured to present a hide-payee selector. The hide-payee selector may be configured to allow the user to select a payee to be excluded from a recurring payments list.

[0082] These and other features, together with the organization and manner of operation thereof, will become apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

[0083] FIG. **1** is a block diagram of an information control system, according to an example embodiment.

[0084] FIG. **2** is a block diagram of a customer mobile device, according to an example embodiment.

[0085] FIG. **3** is a flow diagram of a method of managing access to customer information maintained by a financial institution, according to an example embodiment.

[0086] FIGS. **4-7** each show example data control tower customer interfaces, according to example embodiments.

[0087] FIGS. **8-9** show third party client application customer interfaces, according to example embodiments.

[0088] FIGS. **10-13** each show example data control tower customer interfaces, according to example embodiments.

[0089] FIG. **14** is a flow diagram of a method of mitigating potential fraud associated with access to customer information, according to an example embodiment.

[0090] FIG. **15** shows an example customer alert interface, according to an example embodiment.

[0091] FIG. **16** shows an example data control tower customer interface, according to an example embodiment.

[0092] FIGS. **17-19** each show example data control tower customer interfaces, according to example embodiments.

[0093] FIG. **20** shows an example account control customer interface, according to an example embodiment.

[0094] FIG. **21** shows an example device control customer interface for management of various devices, according to an example embodiment.

[0095] FIG. **22** shows an example account control customer interface for management of connections of various accounts, according to an example embodiment.

[0096] FIG. **23** shows an example account control customer interface for management of various accounts, according to an example embodiment.

[0097] FIG. **24** shows an example account control customer interface allowing for accounts to be turned on/off or removed/deleted, according to an example embodiment.

[0098] FIG. **25** shows an example account control customer interface allowing a customer to confirm that an account is to be removed/deleted, according to an example embodiment.

[0099] FIG. **26** shows an example account control customer interface once an account has been removed/deleted, according to an example embodiment.

[0100] FIGS. **27**A-**27**F show example recurring payment/stop payment interfaces, according to an example embodiment.

[0101] FIGS. **28**A-**28**J show example automated payment control interfaces, according to example embodiments.

[0102] FIGS. **29**A and **29**B show example automated payment control interfaces, according to example embodiments.

[0103] FIGS. **30**A-**30**P show example rewards control interfaces, according to various potential embodiments.

DETAILED DESCRIPTION

[0104] Referring to the figures generally, systems, methods, and apparatuses for providing a customer a central location to manage permissions provided to third-parties and devices to access and use customer information maintained by a financial institution or other service provider are described. The central location serves as a central portal where a customer of the financial institution can manage all access to account information and personal information stored at the financial institution. Accordingly, the customer does not need to log into each individual third-party system or customer device to manage previously provided access to the customer information or to provision new access to the customer information.

[0105] Referring to FIG. **1**, a view of an information management system **100** is shown according to an example embodiment. As described below in further detail, the information management system **100** facilitates the sharing of customer information associated with a customer **102** and maintained by a financial institution **104** to third-parties systems **106** and customer devices **108**. The shared customer information can include any combination of account information associated with financial accounts held by the customer **102** with the financial institution **104** (e.g., types of accounts owned, account numbers, account balances, transaction information, bill due dates, etc.), documents that the customer **102** stores with the financial institution **104** or that are generated by the financial institution **104** (e.g., account statements, tax documents, scanned driver's license/passport, any uploaded files, etc.), and customer personal information stored by the financial institution **104** (e.g., identity information, authentication information, etc.).

[0106] The customer **102** is an account holder with the financial institution **104**. The financial institution **104** includes a financial institution computing system **110**. The financial institution computing system **110** maintains information about accounts held with the financial institution **104** and facilitates the movement of funds into and out of the accounts. Additionally, the financial institution computing system **110** facilitates the sharing of and the provision of access to information associated with customer accounts to the customer **102**, to customer devices **108**, and to third-party systems **106**. The financial institution computing system **110** includes a network interface **112**. The network interface **112** is structured to facilitate data communication with other computing systems (e.g., the customer devices **108**, the third-party systems **106**, etc.) via a network **126**. The network interface **112** includes hardware and program logic that facilitates connection of the financial institution computing system **110** to the network **126**. For example, the network interface **112** may include a wireless network transceiver (e.g., a cellular modem, a Bluetooth transceiver, a WiFi transceiver, etc.) and/or a wired network transceiver (e.g., an Ethernet transceiver). In some arrangements, the network interface **112** includes the hardware and programming logic sufficient to support communication over multiple channels of data communication (e.g., the Internet and an internal financial institution network). Further, in some arrangements, the network interface **112** is structured to encrypt data sent over the network **126** and decrypt received encrypted data.

[0107] The financial institution computing system **110** includes a processing circuit **114** having a processor **116** and memory **118**. The processor **116** may be implemented as a general-purpose processor, an application specific integrated circuit (ASIC), one or more field programmable gate arrays (FPGAs), a digital signal processor (DSP), a group of processing components, or other suitable electronic processing components. The memory **118** includes one or more memory devices (e.g., RAM, NVRAM, ROM, Flash Memory, hard disk storage, etc.) that store data and/or computer code for facilitating the various processes described herein. Moreover, the memory **118** may be or include tangible, non-transient volatile memory or non-volatile memory.

[0108] The financial institution computing system **110** includes an account management circuit **120** and an access control circuit **122**. Although shown as separate circuits in FIG. **1**, in some arrangements, the account management circuit **120** and/or the access control circuit **122** are part of the processing circuit **116**. Other arrangements may include more or less circuits without departing from the spirit and scope of the present disclosure. Further, some arrangements may combine the activities of one circuit with another circuit to form a single circuit. Therefore, those of ordinary skill in the art will appreciate that the present arrangement is not meant to be limiting. The account management circuit **120** is structured to perform various account management functions, including maintaining an accounts database **124**, updating account balances, applying interest to accounts, processing payments related to accounts, and the like. The access control circuit **122** is structured to manage the sharing and provision of customer information to third-party systems **106** and to customer devices **108** based on permissions and preferences of the customer **102**.

[0109] The financial institution computing system **110** includes the accounts database **124**. In some arrangements, the accounts database **124** is part of the memory **118**. The accounts database **124** is structured to hold, store, categorize, and otherwise serve as a repository for information associated with accounts (e.g., loan accounts, savings accounts, checking accounts, credit accounts, etc.) held by the financial institution **104**. For example, the accounts database **124** may store account numbers, account balances, transaction information, account ownership information, and the like. The accounts database **124** is structured to selectively provide access to information relating to accounts at the financial institution **104** (e.g., to the customer **102** via a customer device **108**). In some arrangements, the financial institution computing system **110** includes other databases, such as customer document and information databases structured to store non-account related information or other documents associated with the customer **102** for distribution to third-parties at the approval of the customer **102**.

[0110] Still referring to FIG. **1**, the system **100** includes at least one third-party system **106**. Each third-party system **106** is affiliated with a third-party that the customer **102** can authorize to access information associated with the customer **102** that is stored, generated, maintained, and/or controlled in part by the financial institution **104**. For example, the third-party systems **106** may be affiliated with any combination of merchants (e.g., brick-and-mortar retailers, e-commerce merchants, etc.), financial health companies (e.g., investment firms, Mint®, etc.), mobile wallet systems (e.g., third-party mobile wallet systems not affiliated with or operated by the financial institution **104**, mobile wallet systems affiliated with or operated by the financial institution **104**), payment networks (e.g., payment networks affiliated with credit cards offered by the financial institution **104**), social media networks, service providers (e.g., tax filing services), cloud storage systems (e.g., document backup systems, such as Google® Drive, Dropbox®, etc.), utility providers (e.g., electric companies, cable companies, cell phone providers, gas companies, etc.), messaging networks, personal organizers (e.g., calendar and scheduling services, bill pay services, e-mail systems, etc.), governments, businesses (e.g., employers, businesses requesting information concerning the customer **102**), or the like. Each of the third-parties may be provided access to different portions of the information associated with the customer **102** that is stored, generated, maintained, and/or controlled in part by the financial institution **104**. For example, an e-commerce merchant may be provided access to payment account and billing address information, while a financial health company may be provided access to account balance information and transaction information. As described in further detail below, the customer **102** can provide a given third-party access to designated information, limit access to information, and revoke access to information through an access control portal ("access control tower") provided by the financial institution **104**.

[0111] The customer **102** is associated with various customer devices **108**. The customer devices **108** may include, for example, smartphones, tablet computers, laptop computers, desktop computers, wearables (e.g., smart watches, smart glasses, fitness trackers, etc.), internet of things ("IOT") devices (e.g., Amazon Echo®, smart appliances, etc.). Each of the customer devices **108** may be provided access to different portions of the information associated with the customer **102** that is stored, generated, maintained, and/or controlled in part by the financial institution **104**. For example, a smartphone may be provided access to payment account and billing address information for a mobile wallet running on the smartphone, while an IOT device may be provided access to payment information, account balance information, and transaction information to execute purchases and review transactions. As described in further detail below, the customer **102** can provide a given customer device **108** access to designated information, limit access to information, and revoke access to information through the access control tower provided by the financial institution **104**. In some arrangements, the customer devices **108** do not communicate with the financial institution computing system **110** via the network **126**. For example, the customer devices **108** can include payment cards (e.g., credit cards, debit cards, smart cards, etc.) that have account information that can be linked by the financial institution computing system **110** to account information and customer preferences stored at the financial institution computing system **110**.

[0112] The devices of the system **100** communicate via the network **126**. The network **126** may include any combination of the Internet and an internal private network (e.g., a private network maintained by the financial institution **104**). Through data communication over the network **126**, the financial institution computing system **110** can share customer information with the third-party systems **106** and the customer devices **108**.

[0113] The financial institution computing system **110** includes customer information APIs **128** that define how the financial institution computing system **110** communicates customer information with the third-party systems **106** and the customer devices **108**. The APIs facilitate the sharing of and access to the customer information stored at the financial institution computing system **110** based on permissions and preferences provided by the customer **102**.

[0114] The access control circuit **122** controls access to the customer information by the third-party systems **106** and the customer devices **108** via the APIs **128**. In some arrangements, the financial institution computing system **110** provisions requested customer data to a given third-party system **106** or customer device **108** for local storage on the third-party system **106** or the customer device **108**. For

example, the financial institution computing system **110** can provision payment information, such as payment tokens associated with payment accounts, to a mobile wallet system for local storage at the mobile wallet system. In other arrangements, the financial institution computing system **110** provides access to remotely display, present, or analyze customer information stored at the financial institution computing system **110** while the financial institution computing system **110** retains control over the customer information. For example, the financial institution computing system **110** can provide access to a financial health system to present designated customer account information through a financial health website, such as balances, transaction information, and the like, when the financial health system requests the information, without directly transmitting the data to the financial health system.

[0115] Generally, through the information management system **100**, the customer **102** can provision access to customer information to third-party systems **106** and to customer devices **108** (e.g., by permitting the third-party system **106** or the customer device **108** to communicate with the financial institution computing system **110** to retrieve the customer information). The customer information is maintained by the financial institution **104** via the financial institution computing system **110**. The customer information can include any information associated with the customer **102** that is generated by or maintained by the financial institution **104**, including customer account information (e.g., account numbers, billing address, balance information, transaction information, account type information, account statements, etc.), personal information (e.g., date of birth, social security number, tax identifications, addresses, phone numbers, e-mail addresses, aliases, etc.), information provided to the financial institution **104** during the account opening process (e.g., driver's license scans, passport scans, marriage certificates, property deeds, etc.). Additionally, customer information can include any other information provided by the customer **102** to the financial institution **104** for the purposes of controlling access to the provided information. This other information may include data files, personal information, documents, or the like. The customer **102** can provision access to the customer information through the third-party, the customer device **108**, or via the FI computing system data control tower. Additionally, the customer **102** can manage all previously provided access permissions via the data control tower to change an access level, set permissions, revoke access, or the like. As described herein, the provision of the customer information can be managed on a payment level (e.g., managing all third-party and device access to customer account identifying information such as account numbers and billing addresses for the purposes of making payments), on an application level (e.g., managing third party and device access to customer information for purposes of incorporating such information into third party applications), and on a device level (e.g., managing the devices that may receive the customer information).

[0116] Referring now to FIG. **2**, a more detailed view of a customer device **108** is shown, according to an example embodiment. The customer device **108** shown in FIG. **2** is a customer mobile device **200**. The customer mobile device **200** is structured to exchange data over the network **126**, execute software applications, access websites, generate graphical customer interfaces, and perform other operations described herein. The customer mobile device **200** may include one or more of a smartphone or other cellular device, a wearable computing device (e.g., eyewear, a watch or bracelet, etc.), a tablet, a portable gaming device, a laptop, and other portable computing devices.

[0117] In the example shown, the customer mobile device **200** includes a network interface **202** enabling the customer mobile device **200** to communicate via the network **126**, an input/output device ("I/O" device) **204**, third party client applications **206**, and a financial institution client application **208**. I/O device **204** includes hardware and associated logics configured to to exchange information with a customer and other devices (e.g., a merchant transaction terminal). An input aspect of the I/O device **204** allows the customer to provide information to the customer mobile device **200**, and may include, for example, a mechanical keyboard, a touchscreen, a microphone, a camera, a fingerprint scanner, any customer input device engageable to the customer mobile device **200** via a USB, serial cable, Ethernet cable, and so on. An output aspect of the I/O device **204** allows the customer to receive information from the customer mobile device **200**, and may include, for example, a digital display, a speaker, illuminating icons, LEDs, and so on. The I/O device **204** may include systems, components, devices, and apparatuses that serve both input and output functions, allowing the financial institution computing system **110** exchange information with the customer mobile device **200**. Such systems, components, devices and apparatuses include, for example, radio frequency transceivers (e.g., RF or NFC-based transceivers) and other short range wireless transceivers (e.g., Bluetooth®, laser-based data transmitters, etc.).

[0118] Third party client applications **206** are structured to provide the customer with access to services offered by various third parties (e.g., associated with third party systems **106**). Some third party client applications **206** may be hard coded onto the memory of the customer mobile device **200**, while other third party client application **206** may be web-based interface applications, where the customer has to log onto or access the web-based interface before usage, and these applications are supported by a separate computing system comprising one or more servers, processors, network interface circuits, or the like (e.g., third party systems **106**), that transmit the applications for use to the mobile device.

[0119] In some arrangements, the third party client applications **206** are structured to permit management of at least one customer account associated with a third party service. Accordingly, a particular third party client application **206** may be communicably coupled to a third party system **106** via the network **126**. Through this communicative coupling, the third party system **106** may provide displays regarding the particular third party service or application. For example, one third party client application **206** may include a calendar application, and the displays provided by third party client application **206** may enable the customer **102** to input information regarding customer events, meetings, appointments (e.g., information regarding the timing and location of customer events). Upon the customer **102** inputting such information regarding the customer events, the customer-input information is stored at a third party system **106**, and incorporated into future displays provided to the customer **102** via the third party client application. Through such displays, the customer **102** is able view the previously-input information via a calendar interface. Other third party client

applications **206** include, but are not limited to financial health applications (e.g., applications configured to provide the customer **102** with financial advice), and social media applications.

[0120] In some embodiments, some of the third party client applications **206** include APIs specifically configured to request information from the financial institution computing system **110**. For example, the financial institution **104** may have arrangements with third parties providing third party client applications **206**. Under such arrangements, the customer **102** is able to provide particular third party client applications **206** with access to subsets of information pertaining to the customer **102** stored at the financial institution computing system **110** (e.g., in the accounts database **124**). Upon the customer **102** providing such permission to a third party client application **206**, the customer mobile device **200** may transmit information requests to the financial institution computing system **110** via such APIs, and utilize information received from the financial institution computing system **110** to update the displays rendered viewable by the customer **102** via the third party client application **206**.

[0121] To illustrate, the customer **102** may provide a calendar application with customer bill payment information stored at the financial institution computing system **110**. The calendar application may include a widget specifically configured to enable the customer **102** to insert the bill payment information into the calendar application. This way, the customer **102** is reminded of bill payments in the third party client application **206**.

[0122] In various arrangements, the particular communications channel through which customer financial information is provided to the third party client application **206** may vary depending on the implementation of the third party client application **206**. For example, if the third party client application **206** is web-based, a third party system **106** providing the third party client application **206** to the customer mobile device **200** may receive the customer information maintained at the financial institution computing system **110**, and incorporate that information into various displays rendered on the customer mobile device **200** via the third party client application **206**

[0123] In situations where a third party client application **206** is a native application on the customer mobile device **200**, the customer mobile device **200** may formulate and transmit an information request via an API in the third party client application **206** to the financial institution computing system **110**. The information request may include an identifier (e.g., encryption key) that is based at least in part on the identity of the third party client application **206**, on the type of information that may be shared with the third party client application **206**, and/or on the customer devices **108** from which the information request may be transmitted. In some implementations, the information request may be routed via financial institution client application **208**. For example, the third party client application **206** may make a request to the financial institution client application **208**, which obtains the requested information from the financial institution computing system **110**. As such, depending on the application permissions provided by the customer **102** via the methods described herein, the financial institution computing system **110** (and/or the financial institution client application **208**) may allow or deny the third party client application **206** access to the requested information.

[0124] The financial institution client application **208** is structured to provide displays to the customer mobile device **200** that enable the customer **102** to manage financial accounts. Accordingly, the financial institution client application **208** is communicably coupled to the financial institution computing system **110** (e.g., the account management circuit **120** and the access control circuit **122**) and is structured to permit management of the customer financial accounts and transactions. The displays provided by the financial institution client application **208** may be indicative of current account balances, pending transactions, profile information (e.g., contact information), and the like.

[0125] Further, in some embodiments, the financial institution client application **208** is structured to present displays pertaining to the access control tower discussed herein. In this regard, via the financial institution client application **208**, the customer mobile device **200** is configured to receive various datasets from the financial institution computing system **110** describing the entities (e.g., third party systems **106**, customer devices **108**, third party applications **206**) to which the customer **102** has provided access to customer financial information. The customer mobile device **200**, via the financial institution client application **208**, is configured to render such datasets into various data control tower interfaces. As described herein, through such interfaces, the customer **102** is able to modify the quantity of information available to these entities, and provide additional entities with access to information at the financial institution computing system **110**.

[0126] In some embodiments, the customer mobile device **200** is configured (e.g., via the financial institution client application **208**) to perform various operations described herein as being performed by the financial institution computing system **110**. For example, in one embodiment, financial institution client application **208** includes APIs structured to integrate with various third party client applications **206** on the customer mobile device **200**. Through such APIs, customer information received from the financial institution computing system **110** via the financial institution client application **208** may be shared with the third party client applications **206**, and utilized by the third party client applications **206**.

[0127] In some embodiments, the financial institution client application **208** is a separate software application implemented on the customer mobile device **200**. The financial institution client application **208** may be downloaded by the customer mobile device **200** prior to its usage, hard coded into the memory of the customer mobile device **200**, or be a web-based interface application such that the customer mobile device **200** may provide a web browser to the application, which may be executed remotely from the customer mobile device **200**. In the latter instance, the customer **102** may have to log onto or access the web-based interface before usage of the applications. Further, and in this regard, the financial institution client application **208** may be supported by a separate computing system including one or more servers, processors, network interface circuits, etc. that transmit applications for use to the customer mobile device **200**.

[0128] It should be understood that other customer devices **108** (e.g., customer devices **108** other than a customer mobile device **200**) may include applications that are similar to the third party client applications **206** and financial institution client application **208** discussed above. For

example, a customer smart appliance may include an application associated with the financial institution **104** that enables the customer **102** to view the access control tower, and manage customer accounts. In another example, a customer smart speaker may include an application through which the customer **102** may modify access permissions to various entities via voice commands.

[0129] Referring to FIG. **3**, a flow diagram of a method **300** of managing access to customer information maintained by the financial institution **104** is shown according to an example embodiment. The method **300** is performed by the financial institution computing system **110** (e.g., by the access control circuit **122**, by the processor **116**, etc.).

[0130] The method **300** begins when a customer **102** is authenticated at **302**. The financial institution computing system **110** receives an authentication request from the customer **102** via a computing device associated with the customer (e.g., a smartphone via a mobile banking application, a computing device via a web-based banking portal, etc.). In an alternate arrangement, the request may be received via an ATM (or other computing device allowing a user to perform financial transactions, such as receiving cash, making payments, transferring funds, etc.) associated with the financial institution **104**. The authentication request indicates that an individual purporting to be the customer **102** is attempting to access the access control tower to manage access to the customer information associated with the customer **102**. The authentication request includes customer authentication information (e.g., customer name, password, biometric, debit card dip in an ATM, PIN, etc.). Based on the customer authentication information, the request is either granted or denied. If the request is denied, step **302** of the method **300** does not occur, and the method **300** ends. The description of the method **300** continues for situations in which the customer **102** is authenticated.

[0131] Access to the data control tower portal is provided at **304**. After the customer **102** is authenticated, the financial institution computing system **110** provides the customer **102** access to the data control tower portal. The access to the data control tower portal may be facilitated through a computing device associated with the customer (e.g., a smartphone via a mobile banking application, a computing device via a web-based banking portal, etc.). The computing device presents interactive graphical customer interfaces to the customer **102** through which the customer **102** can manage the access controls for the customer information. The data control tower portal may be part of a mobile banking application or a remote banking website associated with the financial institution **104**. As noted above, in some arrangements, the access to the customer information can be managed on a payments level (e.g., managing all of the third parties that the customer **102** may engage in a transaction with accounts held by the customer **102** at the financial institution **104**), on a device level (e.g., managing which customer devices **108** have access to data stored at the financial institution computing system **110**), and on an application level (e.g., managing all third party client applications **206** on a customer mobile device **200** that have access to information stored at the financial institution computing system **110**). FIGS. **4-7** and FIGS. **11-13** show example customer interfaces associated with the data control tower that demonstrate various management features of the data control tower.

[0132] Referring to FIG. **4**, a data control tower customer interface **400** is shown according to an example embodiment. The customer interface **400** is shown as a display on the customer mobile device **200**. The customer interface **400** includes a payments toggle **404**, an applications toggle **406**, and a devices toggle **408**. As shown by the bolded outline of the payments toggle **404**, the payments toggle **404** is selected. Accordingly, the customer interface **400** is a payment level customer interface. While in the payment level customer interface, the customer **102** can select an account held by with the financial institution **104** via the dropdown box **410**. As shown in FIG. **4**, the customer **102** has selected a checking account. After selecting a specific account, a merchant listing **412** and a wallet listing **418** is populated. Each entry in the merchant listing **412** identifies a merchant (e.g., brick-and-mortar merchants and ecommerce merchants) to which the customer **102** has provided or may provide permission to make a payment with an account (e.g., the selected checking account) held by the customer **102** at the financial institution **104**.

[0133] To populate the merchant listing **412**, the financial institution computing system **110** may access the accounts database **124**. For example, the access control circuit **122** may retrieve a customer transaction history from the accounts database **124** and identify various merchants at which the customer **102** performed transactions using the selected checking account (or other accounts held by the customer **102** at the financial institution **104**). Alternatively, the customer **102** may have previously permitted the financial institution **104** to provide account information to various merchants (e.g., via the add button **426** described below). Alternatively, the financial institution computing system **110** may transmit various requests to third party systems **106** which, in response (e.g., via various APIs provided at the third party systems **106**) may transmit indications to the financial institution computing system **110** that the customer **102** has provided information describing the checking account (e.g., an account number) to the third party system **106**. For example, the financial institution **104** may have arrangements with various merchants. Under such arrangements, the merchants may agree to notify the financial institution **104** upon the customer providing information associated with the financial institution **104** (e.g., information pertaining to a customer account) to the merchant.

[0134] Each entry in the merchant listing **412** may include a display button **414** as well as a status indicator **416**. By pressing the display button **414** associated with a particular entry, the customer may provide an input to program logic being executed by the customer mobile device **200** (e.g., program logic that is part of the financial institution client application **208**) to update the interface **400** to incorporate a merchant access mechanism for the merchant of the entry. The merchant access mechanism may be incorporated into the interface **400** in a similar manner as the wallet access mechanisms **424** described below. The merchant access mechanism may identify the information pertaining to the checking account (or other account) that was provided to the merchant. In various embodiments, the merchant access mechanism may include a tokenized account number (e.g., a surrogate value for the actual account number of the checking account), an actual account number, a debit card number, and so on.

[0135] The status indicators **416** indicate the status of various access permissions that the customer **102** has pro-

vided to various merchants. In the example shown in FIG. **4**, the customer **102** is currently permitting each of the merchants identified in the merchant listing **412** to access at least some form of customer information maintained at the financial institution computing system **110**. However, in some embodiments, the customer **102** may provide an input to program logic being executed by the customer mobile device **200** by interacting with the status indicators **416**. For example, the customer **102** may revoke a particular merchant's permission to access customer information by pressing the "off" portion of a particular status indicator **416**. In response, the customer mobile device **200** may transmit a notification signal to the financial institution computing system **110** and, in response, the access control circuit **122** may update the permissions for that merchant such that the financial institution computing system **110** will not grant various information requests regarding the customer **102** transmitted by the third party system **106** to the financial institution computing system **110** over the network **126**. Alternatively or additionally, the financial institution computing system **110** may update settings associated with the customer **102**'s account such that any transaction request from that merchant is denied. Thus, by the interface **400**, the customer **102** is able to control the access of various third party systems **106** to information.

[0136] Still referring to FIG. **4**, the interface **400** further includes a wallet listing **418**. The wallet listing **418** may include various entries (e.g., wallet **1** and wallet **2**) describing various payment services that the customer has permitted the financial institution **104** to provide account information to. The payment services may include applications through which the customer **102** may perform various types of transactions (e.g., online transactions, person-to-person transactions, mobile wallet transactions, etc.). As such, entries in the wallet listing **418** may include mobile wallet applications (e.g., Samsung Pay®, Apple Pay®, etc.) and person-to-person payment applications (e.g., Venmo®, Zelle™, PayPal®, etc.). Similar to the entries in the merchant listing **412** discussed above, each entry may include a display button **420** and a status indicator **422**. As indicated by the bolded outline of the display button **420**, the display button **420** associated with a particular entry in the wallet listing **418** has been selected by the customer **102**. As shown, upon the customer **102** selecting the display button **420**, various wallet access mechanisms **424** are shown.

[0137] The wallet access mechanisms **424** may include the information that the customer **102** has permitted the payment service associated with the entry (e.g., wallet **2**) of the wallet listing to access by the methods described herein. In the example shown, the wallet access mechanisms **424** present the customer **102** information pertaining to all account information that the customer **102** has permitted the payment service to access. As such, wallet access mechanisms **424** include an account number associated with both a credit account and a debit account (e.g., associated with the checking account). It should be understood that, in alternative arrangements, only wallet access mechanisms associated with the account selected via the dropdown box **410** may be shown. Additionally, different wallet access mechanisms **424** such as tokens, account names, and the like associated with the customer **102**'s accounts may also be shown. As shown in FIG. **4**, the customer **102** has turned off the payment service's access to the debit card number associated with the checking account, and permitted the payment service to access to access the credit card number associated with a credit account held by the customer **102**. In some embodiments, responsive to the customer **102** revoking an access permission to a particular wallet, the financial institution computing system **110** may transmit a signal to a third party wallet provider associated with the wallet configured to cause a payment token or the like to be deleted at the third party wallet provider.

[0138] The customer interface **400** also includes an add button **426** and a delete button **428**. If the customer **102** interacts with the add button **426**, the customer **102** can add a new merchant and/or payment service to the merchant listing **412** and/or wallet listing **418**. For example, in response to the customer **102** selecting the add button **426**, an additional interface is presented to the customer **102**. The additional interface may include a drop down menu listing various merchants that the customer **102** may select to provide permission to access the customer information. Additionally, the interface may enable the customer **102** to identify the particular information that may be provided to the identified merchant. Upon the customer selecting a particular merchant to grant permission, the financial institution computing system **110** may update the access permissions stored in association with the account of the customer **102**. As a result, upon receipt of a request from the identified merchant (e.g., via a third party system **106** over the network **126**), the financial institution computing system **110** may provide the selected information to the merchant.

[0139] Referring to FIG. **5**, a data control tower customer interface **500** is shown according to an example embodiment. The customer interface **500** is similar to the customer interface **400**. As such, like numbering is used between FIGS. **4** and **5** to designate like components of the customer interfaces **400** and **500**. The customer interface **500** is shown as being displayed on the customer mobile device **200**. As with the customer interface **400**, the customer interface **500** includes the payments toggle **404**, the application toggle **406**, and the devices toggle **408**. As shown by the bolded outline of the applications toggle **406**, the applications toggle **406** is selected. Accordingly, the customer interface **500** is an application level management customer interface. As shown, the interface **500** includes a listing **502** of various applications that the customer **102** has provided access to various forms of customer information maintained at the financial institution computing system **110**. The listing **502** may include various third party client applications **206** installed on the customer mobile device **200** and/or other customer devices **108** that the customer **102** has provided access to information stored at the financial institution computing system **110**.

[0140] Similar to the interface **400** discussed above, each entry in the application listing **502** may include a display button **504** and a status indicator **506**. As indicated by the bolded outline of the display button **504**, the customer **102** has selected the display button **504** to cause an application access mechanism **508** to be shown. The application access mechanism **508** may include a description of the customer information to which the customer **102** has provided the application access. In the example shown, the application associated with the selected display button **504** is a calendar application and the access mechanism is the customer's bill payments. By providing the calendar application with access to the customer **102**'s bill payments, the customer **102** may be reminded of upcoming payments via the calendar appli-

cation. As such, various events or reminders may be created by the calendar application based on the information provided by the financial institution **104**. For example, upon the customer **102** providing the calendar application with access to customer bill payment information (e.g., describing the recipient of the upcoming payment, the due date, and the amount owed), the calendar application may list upcoming payments owed by the customer **102**.

[0141] The customer **102** may first provide the calendar application with access to customer bill payment information by, for example, hitting the add button **426**. Upon the customer **102** hitting the add button **426**, the customer **102** may be brought to another interface enabling the customer **102** to identify an application to provide with access to customer financial data.

[0142] Referring now to FIG. **6**, a data control tower customer interface **600** is shown according to an example embodiment. Like numbering is used between FIGS. **4-6** to designate like components of the customer interfaces **400**, **500**, and **600**. The customer interface **600** is shown as displayed on the customer mobile device **200**. As with the customer interfaces **400** and **500**, the interface **600** includes a payment toggle **404**, and application toggle **406**, and a devices toggle **408**. As shown by the bolded outline of the application toggle **406**, the application toggle **406** is selected. In some embodiments, the customer interface **600** is presented upon the customer **102** selecting the add button **426** of the interface **500** discussed above. The interface **600** includes an application dropdown **602**, a features dropdown **604**, an account selection dropdown **606**, a cancel button **608**, and a submit button **610**. The application dropdown **602** includes a list of various applications. For example, upon the customer **102** selecting the add button **426** on the interface **500**, program logic being executed by a processor of the customer mobile device **200** may access an application registry to identify various applications installed on the customer mobile device **200**. The application dropdown **602** may include an entry for each application installed on the customer mobile device **200**. Alternatively, the application dropdown **602** may include a subset of the applications installed on the customer mobile device **200**. For example, the financial institution **104** may only share customer information with a set of applications provided by trusted entities. As such, the program logic being executed by the processor of the customer mobile device **200** may cross reference the applications that are installed on the customer mobile device **200** with a list of trusted applications (e.g., based on application keys, titles, or the like) and incorporate the trusted applications that are installed on the customer mobile device **200** into the application dropdown.

[0143] The features dropdown **604** may include a dropdown list of various forms of information maintained by the financial institution computing system **110**. Using the features dropdown, the customer **102** may select the forms of information to share with the application selected via the application dropdown **602**. In some arrangements, the forms of information provided by the features dropdown **604** may be dependent on the particular application selected by the customer **102**. Accordingly, once the customer **102** selects an application via the application dropdown, the features dropdown **604** may be populated. In the example shown, the customer **102** has selected a calendar application via the application dropdown **602** and selected to provide the calendar application with access to information regarding customer bill payments. After providing the calendar application with such access, the customer **102** may setup the calendar application to use the bill payment information. Such a setup process is described below in relation to FIGS. **8** and **9**.

[0144] The accounts dropdown **606** lists various accounts held by the customer **102** at the financial institution **104**. The customer **102** may select the account to use in conjunction with the selected application and/or feature. In the example shown, the customer **102** has selected a checking account to use in conjunction with a bill payment features integrated with the calendar application. Thus, according to the processes described below, the customer **102** may setup payments via the calendar application using the selected payment account. The cancel button **608** enables the customer **102** to cancel adding an application to the listing **502** of the interface **500**. In some embodiments, upon the customer **102** selecting the cancel button **608**, the customer **102** is brought back to the interface **500**. The submit button **610** enables the customer **102** to provide an input to the program logic being executed to the customer mobile device **200** to share the identified information with the selected application. As such, the selected information may be incorporated into the selected application to facilitate the customer **102**'s utilization of the selected application.

[0145] Referring now to FIG. **7**, a data control tower customer interface **700** is shown according to an example embodiment. The customer interface **600** is similar to the customer interfaces **400** and **500**. Like numbering is used between FIGS. **4-7** to designate like components. The customer interface **700** is shown as displayed on the customer mobile device **200**. As with customer interfaces **400** and **500**, the customer interface **700** includes the payments toggle **404**, the applications toggle **406**, and the devices toggle **408**. As shown by the bolded outline of the devices toggle **408**, the devices toggle **408** is selected by the customer **102**. Accordingly, the customer interface **700** is a device level management customer interface. While in the device level management customer interface, the customer **102** can manage the information that various customer devices **108** have access to.

[0146] In the example shown, the interface **700** includes a device listing **702**. The device listing may list various customer devices **108** that the customer **102** has registered with the financial institution **104**. For example, for each customer device **108**, the customer **102** may download and install an application provided by the financial institution **104**, or register the customer device **108** via a website provided by the financial institution computing system **110**. Upon registration and/or installation, a device identifier may be assigned to each customer device **108** by the financial institution computing system **110** and stored in association with the customer **102** (e.g., in the accounts database **124**). Upon the customer **102** accessing the data control tower portal (e.g., at step **304** of the method **300**), the financial institution computing system **110** may retrieve the various device identifiers stored in association with the customer **102** and transmit a device dataset to the customer mobile device **200** that is used by, for example, a mobile banking application of the customer mobile device **200** to populate the listing **702**.

[0147] Various forms of customer devices **108** may populate various entries of the listing **702**. Customer devices **108** may include, for example, smart phones, wearable comput-

ing devices (e.g., smart watches, smart glasses, and the like), smart speakers, vehicle computing devices, various IOT devices (e.g., thermostats, appliances, televisions, and the like), smart phones, tablets, video game consoles, and the like. Similar to the interfaces **400** and **500**, each entry in the listing **702** may include a display button **704** and a status indicator **706**. As shown by the bolded outline of the display button **704**, the display button **704** of that particular entry has been selected by the customer **102**. Selection of the display button **704** causes a device access mechanism **708** to be presented to the customer **102**. Device access mechanism **708** may inform the customer **102** as to the type of information that may be accessed via the customer device **108** associated with the entry. In the example shown, the customer **102**'s smart speaker (e.g., an Amazon Echo®) has been provided with access to the transaction history of the customer maintained at the accounts database **124**. In some embodiments, in response to the customer **102** selecting the display button **704**, a plurality of potential device access mechanisms **708** may be presented to the customer **102**. The device access mechanisms **708** may include all potential information that the customer may provide to the customer device **108** associated with the selected entry. Depending on the implementation, such device access mechanisms may include, amongst other things, customer account balance information, customer bill payment information, a customer transaction history, customer alerts, and customer account identifying information (e.g., account numbers, tokens, etc.).

[0148] By hitting the display button **704**, the customer **102** may selectively modify the access of various customer devices **108** to various forms of information via manipulation of the status indicators **706**. For example, by manipulating a status indicator **706** relating to a particular customer device **108**, the customer **102** may provide an input to program logic (e.g., of a mobile banking application) being executed by the processor the customer mobile device **200**. The input may cause the customer mobile device **200** to transmit a signal to the financial institution computing system **110** over the network **126** causing the financial institution computing system **110** to update customer account settings. For example, upon receipt of such a signal, the financial institution computing system **110** may update an entry of a customer device dataset maintained at the accounts database **124**. The entry may include the device identifier discussed above associated with the selected customer device **108** as well as various access permissions. The entry may be updated such that, if the customer **102** were to attempt to access information from the selected customer device **108**, the information would not be provided to the customer device **108** (e.g., the customer **102** may be presented with an "information unavailable" screen, or the like).

[0149] While the above examples relate to interfaces presented to the customer **102** via a customer mobile device **200**, it should be understood that the customer **102** may perform similar operations with respect to several other types of customer devices **108**. For example, the customer **102** may also adjust the third party systems **106** that have access to the customer financial information via a smartwatch, a smart appliance, a computing system in a vehicle of the customer **102**, a smart speaker, and any other customer device **108** via applications or websites associated with the financial institution **104** implemented thereon.

[0150] Referring again to FIG. **3** and the method **300**, updated access permissions or settings are received at **306**. The financial institution computing system **110** receives the updated access permissions or settings from the customer **102** via the access control tower portal (e.g., from a computing device that the customer **102** is using to access the access control tower portal). The updated access permissions or settings may relate to merchants, payment services, applications, and devices discussed with respect to FIGS. **4-7**.

[0151] The financial institution computing system **110** determines if external action is required to implement the updated access permissions or settings at **308**. In some arrangements, the type of access permission or setting being updated requires that the financial institution computing system **110** transmits commands to a customer device **108** or to a third-party system **106** to implement the updated access permissions or settings. For example, if the updated access permission or setting relates to revoking or provisioning a payment token stored on a customer device **108**, the financial institution computing system **110** may need to send a command to either (1) deactivate or remove the payment token from the customer device **108** or the third-party systems **106** affiliated with the mobile wallet (e.g., a third-party mobile wallet server, a payment network server that manages a token vault associated with the payment token, etc.) or (2) activate or provision the token to the mobile wallet via the customer device **108** and/or the third-party systems **106**. In other arrangements, the type of access permission or setting being updated can be performed at the financial institution computing system **110** without additional commands sent to a customer device **108** or a third-party system **106**. For example, if the updated access permission or setting relates to revoking a third-party's access to account balance information, the financial institution computing system **110** can perform an internal update at the financial institution computing system **110** adjusting the API permissions associated with the third-party without the need to send a command to the third-party system **106** associated with the affected third-party.

[0152] If external action is required, commands are transmitted to the appropriate recipient at **310**. The financial institution computing system **110** transmits the update commands to the appropriate third-party systems **106** and/or customer devices **108**. If no external action is required, the updated access permissions or settings are implemented at **312**. The financial institution computing system **110** updates internal account access permissions or settings in the accounts database **124**. Additionally, in some arrangements, the update to the account access permissions or settings requires both external and internal action. In such arrangements, both steps **310** and **312** are performed. Based on the updated settings and permissions, the financial institution computing system **110** facilitates the sharing (or denial of requests to access) customer information to the external systems (e.g., customer devices **108** and third-party systems **106**).

[0153] In an example implementation, the customer **102** may utilize the data control portal to update payment information stored at various third party systems **106**. For example, if the customer **102** gets a new account at the financial institution **104** or loses a credit card, the customer **102** may wish to update the payment information stored at the various third party systems **106**. In some embodiments,

upon the customer **102** updating account information stored in the accounts database **124**, the financial institution computing system **110** (e.g., via the access control circuit **122**) is configured to provide the updated information to the various third parties, applications, and devices to which the customer has provided access via the data control portal. For example, upon the customer changing an account number, the financial institution computing system **110** may transmit an information packet including the updated account information and a customer identifier to the third party system **106** associated with a particular merchant. Such customer identifiers may be established between the financial institution **104** and third party upon the customer providing the third party with access to information stored at the financial institution computing system **110**. Thus, based on the customer identifier, the third party system **106** may identify a customer account at the third party (e.g., a shopping account) and update the customer's financial information associated with the account. Such a process may be repeated for any third party systems **106** having access to customer financial information. As such, the customer need not update account information stored at individual third party systems **106**, as this can be accomplished via a single visit to the data control tower.

[0154] Referring now to FIG. **8**, a third party client application interface **800** is shown, according to an example embodiment. The third party client application interface **800** may be rendered by a third party client application **206** on the customer mobile device **200** upon the customer **102** providing the third party client application **206** with access to financial data (e.g., as discussed above with respect to FIGS. **5** and **6**). In the example shown, the third party client application **206** is a calendar application. As such, the interface **800** includes a calendar window **802** describing various customer events. The interface **800** also includes addition buttons **804** enabling the customer **102** to add items that are included in the calendar window **802**. In the example shown, among the addition buttons **804** is a financial event button **806**. In an example, the third party client application **206** rendering the interface **800** includes a widget specifically configured to generate the financial event button **806** upon receipt of financial data from the financial institution computing system **110**. In the example shown, the customer **102** has provided the third party client application **206** with information regarding customer bill payments (coinciding with the example shown in FIG. **6**).

[0155] In an example, upon the customer **102** selecting the financial events button **806**, the third party client application **206** configures the customer mobile device **200** to request customer bill payment information (e.g., via the customer mobile device **200** or via a combination of the customer mobile device **200** and a third party system **106**) from the financial institution computing system **110**. In response, the financial institution computing system **100** verifies that the access permissions stored in association with the customer **102** permit the requested information to be provided to the third party client application **206**. If so, the requested customer financial data is provided to a computing system (e.g., the customer mobile device **200** or a third party system **106**) associated with the third party client application **206**.

[0156] Third party client application interface **800** further includes a financial information window **808** that includes the customer financial information received from the financial institution computing system **110**. In the example shown, the financial information window **808** lists an upcoming bill payment **810**. As such, through the systems and methods disclosed herein, the customer **102** is able to request and view financial data from various vantage points.

[0157] Upon the customer **102** selecting the upcoming bill payment **810**, the displays presented via the third party client application **206** may be updated. Referring to FIG. **9**, another third party client application interface **900** is shown, according to an example embodiment. The application interface **900** may be presented to the customer **102** upon the customer **102** selecting the upcoming bill payment **810** discussed in relation to FIG. **8**. As shown, the interface includes a calendar window **902** describing various customer events. Calendar window **902** includes an additional event **904** that describes the upcoming bill payment **810** selected by the customer **102**. Additionally, the interface **900** includes an addition button **906** enabling the customer **102** to input information regarding an additional customer event.

[0158] Interface **900** also includes a payment window **908**. For example, the third party client application **206** rendering the interface **900** on the customer mobile device **200** may include a payments widget configured to generate transaction requests using customer account information received from the financial institution computing system **110** in accordance with various systems and methods disclosed herein. As discussed above in relation to FIG. **5**, the customer may indicate a preference to provide a third party client application **206** with access to customer checking account information. Thus, the financial institution computing system **110**, upon receiving an information request generated via the third party client application **206**, may transmit both the customer bill payment information and the customer checking account information. Such information may be used by the third party client application **206** to formulate a transaction request in response to the customer **102** indicating such a preference (e.g., via the payment button **910**). The payments widget may enable the customer **102** to request that a payment be made for the bill depicted by the additional event **904**. The interface **900** also enables the customer **102** to change the account information shared with the third party client application **206** via an edit button **912**. Upon the customer **102** selecting the edit button **912** an additional interface may be displayed to the customer **102** that enables the customer **102** to provide inputs to change the account used to make the depicted payment.

[0159] Referring now to FIG. **10**, a data control tower interface **1000** is shown, according to an example embodiment. The data control tower interface **1000** is shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interface **1000** serves as an alternative to the interfaces **400**, **500**, and **700** described above. As shown, the interface **1000** includes a generic access toggle **1002** and an account-by-account toggle **1004**. As indicated by the emboldened generic access toggle **1002**, the generic access toggle **1002** has been selected by the customer **102**. The interface **1000** includes a connection search box **1006**, functionality access points **1008**, an entity listing **1010**, and a device listing **1014**. The connection search box **1006** enables the customer **102** to input the identity of an entity (e.g., application, merchant, or device) to which the customer **102** has provided access to the customer information. The functionality access points **1008** include various icons providing the customer with access to various functionalities

provided via the financial institution client application **208**. For example, the functionality access points **1008** may provide the customer with access to view balances associated with their accounts, transfer funds between accounts, register for accounts, make payments via a mobile wallet associated with the financial institution **104**, and view statements associated with the accounts.

[0160] The entity listing **1010** lists each entity (e.g., applications and merchants) that the customer has provided any sort of access to the customer information stored at the financial institution computing system **110**. The entity listing **1010** includes a plurality of selectable entries **1012**. Each entry may list the number of accounts that have been connected to the associated entity. Upon the customer selecting a particular entity, a different interface may be presented to the customer **102** enabling the customer **102** to update that entity's access permissions. The device listing **1014** lists each customer device **108** having access to customer information. Similar to the entity listing **1010**, the device listing **1014** includes entries **1016** associated with particular customer devices **108**. While the entity listing **1010** and the device listing **1014** are shown as been separate from one another, it should be understood that, in one embodiment, the entity listing **1006** and device listing **1110** are combined into a single listing.

[0161] In various embodiments, the data control tower interface **1000** may take alternative forms. For example, in some embodiments, the generic access toggle **1002** enables the customer to view/scroll through various categories of accesses to customer information. For example, a first category box may generally include a listing of the customer's accounts or cards associated with the financial institution **104**. Via this category box, the customer may select any of the cards to view various forms of information regarding the selected card (e.g., balance, general off and on status, transaction listing, etc.). An example of such an interface presented to the customer when the customer selects a card is described with respect to FIG. **20**. Additional category boxes may include recurring payments made via the customer's accounts at the financial institution **104**, the customer's application data sharing preferences, and the customer's mobile wallets. As such, the data control tower interface **1000** provides the customer with a single access point to perform a various diverse array of actions with respect to their finances.

[0162] In some embodiments, an additional category of accesses to customer information may include aggregators that access the customer's information at the financial institution **104** on behalf of the customer to perform functions on behalf of the customer. By selecting a particular aggregator on the data control tower interface **1000**, the customer may provide inputs to disable the aggregator's access to customer information. For example, the financial institution computing system **110** may update access permissions associated with the customer information APIs **128** to deny information requests coming from third party systems **106** known to be associated with the aggregator. As such, the customer has control over the locations to which private information is disseminated. Other aggregators may utilize customer account information (e.g., account numbers) obtained from the financial institution **104** to make payments on behalf of the customer. For these types of aggregators, the data control tower interface **1000** enables the customer to quickly turn off payments made by these aggregators.

[0163] In some instances, aggregators that customers permit to access their information may provide the information to third parties (i.e., "sub-aggregators."). Such data transfers between aggregators and sub-aggregators limit the customers' ability to control locations at which their data is stored. Beneficially, the systems and methods described herein enable customers to prevent such transfers. This is accomplished through the financial institution **104** monitoring relationships between aggregators and various sub-aggregators. For example, as part of an information sharing arrangement between an aggregator and the financial institution **104** (e.g., to establish a customer information API **128**), the financial institution may require the aggregator to recurrently provide an updated listing of sub-aggregators with which they share information. Additionally, the financial institution **104** may require the aggregator to update their sharing of customer information with the sub-aggregators in response to the customer providing an input to do so via the data control tower portal described herein. Using the information provided by the aggregators under such an arrangement, the financial institution **104** may maintain a directory mapping aggregators to sub-aggregators.

[0164] In some embodiments, the directory is used to populate the data control tower interface **1000**. For example, upon the customer providing an input to view an aggregator's access permissions, the customer mobile device **200** may query the directory for a listing of sub-aggregators associated with that aggregator (i.e., a listing of sub-aggregators that the selected aggregator shares information with). The listing of sub-aggregators may appear on the data control tower interface **1000** in conjunction with a set of toggle switches enabling the customer to turn off that sub-aggregator's access to the customer's information. Upon the customer turning off a sub-aggregator's access, the customer mobile device **200** (e.g., either directly or via the financial institution computing system **110**) may issue a command to a third party system **106** associated with the selected aggregator to update data access permissions such that the customer information is no longer shared with the indicated sub-aggregator. Thus, the data control tower portal described herein provides the customer with very complete control of the locations at which their information is accessed.

[0165] In various embodiments, a customer may choose to restrict sharing of information in general or in relation to particular third parties, accounts, devices, applications, and/or types of information. The customer may limit sharing of information by selecting, for example, a "restrict sharing" icon in a data control tower user interface. In certain implementations, the customer may wish to prohibit a recipient of the customer's information (e.g., the third party, device, and/or application) from giving another third party, device, and/or application access to all of the information, or a subset of the information (e.g., more sensitive information, such as financial account information). In some versions, a level of sharing may be set on a spectrum ranging from "no sharing" to "all sharing allowed" using, for example, a slider that may be moved by swiping in one direction to reduce the level of sharing allowed, and an in opposing direction to increase the level of sharing allowed. In some implementations, example intermediary levels of sharing may correspond with, for example, permission to share non-personal information only, permission to share non-financial information only, permission to share anonymized information

only, permission to share with particular recipients or for particular purposes, etc. In certain implementations, setting a level or type of sharing that is permitted may allow the customer to set privacy settings with a third party to control what is allowed to happen with the customer's information. In some implementations, a limitation on information sharing may limit the services or functionalities that can be provided by, for example, a third party computing system, an application, or a device. For example, restricting the sharing of financial information by a wallet application may turn off one or more accounts (e.g., debit and credit cards) listed under the functionality of the wallet application (see, e.g., **424** in FIG. **4**) or the access to transactions to be provided to a computing device like a smart speaker (see, e.g., **704** in FIG. **7**)

[0166] Referring now to FIG. **11**, a data control tower interface **1100** is shown, according to an example embodiment. The data control tower interface **1100** is similar to the data control tower interface **1000** described with respect to FIG. **10** in that the interface **1100** also includes a generic access toggle **1002**, an account-by-account access toggle **1004**, and a connections search box **1006**. As indicated by the emboldened account-by-account access toggle **1004**, the account-by-account access toggle **1004** has been selected by the customer **102**.

[0167] As shown, the interface **1100** includes a first account listing **1102** and a second account listing **1106**. The first and second account listings **1102** and **1106** including listings **1104** and **1108** of various entities (e.g., applications, customer devices **108**, third party systems **106**) that the customer has provided information regarding the associated account to. As such, the customer **102** may quickly view various locations that currently have access to information associated with a particular account.

[0168] Referring now to FIG. **12**, an entity permission control interface **1200** is shown, according to an example embodiment. The entity permission control interface **1200** (or another interface similar thereto) may be presented to the customer **102** (e.g., via the financial institution client application **208**) upon the customer selecting an entity in any of the listings **1010**, **1014**, **1102**, and/or **1108** described with respect to FIGS. **10** and **11**. In the example shown, the interface **1200** is presented to the customer **102** upon the customer **102** selecting a merchant in merchant listing **1010** described with respect to FIG. **10**. As shown, the interface **1200** includes an account selection portion **1202**, a transaction listing **1204**, and an account access toggle switch **1206**. The account selection portion **1202** includes all of the accounts that the customer **102** has enabled the merchant to access. The account selection portion **1202** includes graphical depictions of the various accounts that the customer has provided access to. The customer **102** may swipe the account selection portion **1202** to select a particular account. Upon the customer selecting an account, the customer mobile device **200** may query the accounts database **124** to retrieve the customer's transactions with that particular account at the merchant, and use that data to populate the transaction listing **1204**. Alternatively, the customer mobile device **200** and/or financial institution computing system **110** may initiate communications with an associated third party system **106** to obtain the customer **102**'s transaction data. As such, the transaction listing **1204** presents the customer **102** with the customer's transactions at the associated merchant occurring within a predetermined period (e.g., as of account opening, last year, last month, etc.).

[0169] The account access toggle switch **1206** is configured to receive a customer input to permit/revoke the depicted merchant's access to information associated with the selected account. In the example shown, the customer **102** is providing the third party system **106** associated with the merchant with access to the account information. In response to the customer **102** switching the account access toggle switch **1206** to an opposing position, the customer mobile device **200** may transmit a command to the financial institution computing system **110** causing the financial institution computing system **110** to update the customer **102**'s access permissions to prevent the merchant from having access to the associated account information. In some embodiments, the account access toggle switch **1206** is configured to receive a customer input to temporarily inactivate the selected account.

[0170] In various embodiments, account information may be saved by a third party for use in future transactions. For example, a customer may make a purchase at a merchant using a particular account (e.g., a credit or debit card), and the merchant may save the account information so that the next time the customer makes a purchase from the merchant, the customer does not have to re-enter the account information. The customer may permit multiple online merchants to save information corresponding to several accounts for future use. The customer may subsequently change his or her mind and wish that the saved account information be deleted. This may be accomplished, in some implementations, via a user interface allowing the customer to select or toggle, for example, a "delete saved account information" option with respect to one or more entities, without having to make separate, cumbersome requests with each entity. Deleting saved account information need not necessarily, in certain implementations, restrict the entity from accessing the account information for use for a transaction in the future (without saving the account information after the transaction has completed). Rather, deleting the saved information removes the information from the entity's databases. Such removal decreases the risk that, if the entity's computing systems are hacked or the information in the databases is otherwise leaked or made public, the customer's information would be compromised. The ability to conveniently choose to delete saved information from one or more third-party databases via a control tower application, while still potentially making the information available to the third party on an as-needed basis in the future, is less cumbersome, saving time and computing resources, and enhances the security of sensitive customer information by better controlling its availability and retention.

[0171] Referring now to FIG. **13**, an entity permission control interface **1300** is shown, according to an example embodiment. The entity permission control interface **1300** (or another interface similar thereto) may be presented to the customer **102** (e.g., via the financial institution client application **208**) upon the customer **102** selecting an entity in any of the listings **1010**, **1014**, **1102**, and/or **1108** described with respect to FIGS. **10** and **11**. In the example shown, the interface **1300** is presented to the customer **102** upon the customer **102** selecting an application (e.g., a financial health application, or a payment services application) in listing **1010** described with respect to FIG. **10**. The interface **1300** includes a cash accounts listing **1302**, a credit account

listing **1308**, and a payments toggle switch **1314**. The cash accounts listing **1302** includes a general toggle switch **1304** and toggle switches **1306** associated with individual cash accounts of the customer **102**. With the general toggle switch **1304**, the customer **102** may permit or revoke the associated application's access to information (e.g., transaction history, balance information, etc.) associated with all of the customer's cash accounts. Using the toggle switches **1306**, the customer may revoke the application's access to individual cash accounts. Similarly, the credit account listing **1308** includes a general toggle switch **1310** and individual toggle switches **1310** enabling the customer **102** to permit or revoke access to information regarding the customer **102**'s credit accounts.

[0172] The payments toggle switch **1314** is configured to receive a customer input to enable or disable payments via the application associated with the selected application. Thus, using the toggle switches **1304**, **1306**, **1310**, and **1312**, the customer may permit the application to access information associated with the depicted accounts. Using the payments toggle switch **1314**, the customer generally enables payments to be made via the selected application. In other words, the payments toggle switch **1314** is configured to update a set of transaction rules maintained at the financial institution computing system **110** (e.g., via the account management circuit **120**). As a result, if the customer disables payments via a particular application, any transaction requests received from the customer mobile device **200** via that application will be denied. As, such, the data control portal enables the customer **102** to manage particular entities' access to information as well as the manner in which that information may be used.

[0173] Referring to FIG. **14**, a flow diagram of a method **1400** of mitigating potential fraud associated with access to customer information is shown according to an example embodiment. The method **1400** is performed by the financial institution computing system **110** (e.g., by the access control circuit **122**, by the processor **116**, etc.).

[0174] The method **1400** begins when fraudulent activity is detected at **1402**. In some arrangements, the financial institution computing system **110** determines there is fraudulent activity associated with the customer **102** based on analyzing customer information access patterns, transaction patterns, and the like. The fraudulent activity may relate to compromised financial information (e.g., a compromised payment token associated with fraudulent purchases, a compromised account number, a compromised payment device, etc.) or misappropriation of other customer information (e.g., fraudulent access to customer information stored at the financial institution computing system **110**, fraudulent downloads of data or document stored at the financial institution computing system **110**, or the like). In some arrangements, the fraudulent activity can be reported by the customer **102** (e.g., via a customer device **108**) if the customer **102** becomes aware of potential fraudulent activity associated with the customer information managed by the financial institution computing system **110**. Similarly, in some arrangements, the fraudulent activity can be reported by the third-party associated with the fraud. For example, if a merchant becomes aware that the merchant's e-commerce system has been hacked by fraudsters, and that the customer information stored on or able to be accessed by the e-commerce system is at risk, the merchant can transmit a message to the financial institution computing system **110** indicating the fraud. In still further arrangements, the financial institution computing system **110** can identify potentially fraudulent activity from other sources, such as news agencies that report on data breaches associated with the third-party systems **106**.

[0175] In an example, the financial institution computing system **110** detects an unusual pattern of activity in association with a third party client application **206**. For example, customer information may be requested via a third party client application **206** at a more frequent than usual rate. In another example, the financial institution computing system **110** (e.g., via the account management circuit **120**) detects an unusual pattern of activity based on customer transaction data. For example, if the account management circuit **120** receives a transaction request from a particular customer device **108** to request payment to a particular merchant, the account management circuit **120** may compare the amount of the transaction to transactions previously engaged in by the customer **102** (e.g., stored in the accounts database **124**) and, if the amount differs from previous transactions engaged in by the customer **102**, or if customer **102** has never engaged in a transaction at the particular merchant, detect an unusual pattern of activity.

[0176] After fraudulent activity is detected at **1402**, access privileges are removed at **1404**. The financial institution computing system **110** removes access privileges to the customer information in at least one of a plurality different ways. In some arrangements the financial institution computing system **110** revokes access privileges to the customer information stored at the financial institution computing system **110** (e.g., customer information stored in the accounts database **124**). In other arrangements or additionally, the financial institution computing system **110** can pull customer information from the third-party system **106** or at the customer device **108** associated with the detected fraudulent activity. For example, if a payment token is associated with the fraudulent activity, the financial institution computing system **110** can prevent a third-party mobile wallet from accessing the payment token via the customer information APIs **128** and/or pull the payment token from the third-party mobile wallet computing system if the payment token was previously transmitted to the third-party mobile wallet computing system.

[0177] An alert is sent to the customer **102** at **1406**. The financial institution computing system **110** transmits an alert to a customer device **108** associated with the customer **102**. The alert may be any of a text message, an automated telephone call, an e-mail, an in-application push notification, or a combination thereof. The alert indicates that potential fraudulent activity was detected with respect to the customer information. In some arrangements, the alert identifies a specific third-party system **106** associated with the potential fraudulent activity. For example, the alert may indicate that a specific third-party system **106** is attempting to access a piece of customer information that is out of the norm of access patterns associated with the third-party system **106**. In some arrangements, the alert is customer-interactive such that the customer **102** can reply to the alert (e.g., by interacting with a hyperlink, by interacting with embedded buttons, by replying, etc.) to indicate that the potential fraudulent activity was unauthorized or authorized.

[0178] Referring now to FIG. **15**, an alert interface **1500** is shown, according to an example embodiment. The alert interface **1500** may be rendered to the customer **102** via a

financial institution client application **208** on the customer mobile device **200**. Additionally, alert interfaces similar to the alert interface **1500** may be displayed on various other customer devices **108** at the same time that the alert interface **1100** is presented via the customer mobile device **200**. As such, the customer **102** is alerted of the detected fraudulent activity irrespective of the particular customer device **108** possessed by the customer **102** at the time the unusual activity is detected and the customer alerted. In this regard, fraud alerts in other forms are envisioned. For example, the financial institution computing system **110** may formulate a sound notification and transmit the sound notification to a customer device **108** that includes a smart speaker.

[0179] In the example shown, the alert interface **1500** includes a description **1502** of actions taken by the financial institution computing system **110** (e.g., via the access control circuit **122**) and the reason that such actions were taken. For example, the financial institution computing system **110** (e.g., via the access control circuit **122**) may update the access privileges associated with a particular third party client application **206** on the customer mobile device **200**, and the description **1502** may indicate as much to the customer **102**. Additionally, the alert interface **1500** includes a customer action window **1504**. The customer action window **1104** requests the customer **102** to verify recent transactions that caused delivery of the alert to the customer **102**. Customer action window **1504** includes a first option **1506** enabling the customer **102** to view recent transactions (or information requests) and to indicate their legitimacy to the financial institution computing system **110**. Customer action window **1504** also includes a deferral option **1508** enabling the customer **102** to put off the verification process to a later time.

[0180] Referring now to FIG. **16**, a data control tower customer interface **1600** is shown according to an example embodiment, the customer interface **1600** is similar to the customer interface **500** discussed above. Like numbering is used between FIGS. **5** and **16** to designate like components. As with the customer interface **1400**, an application toggle **406** has been selected by the customer **102**. In some embodiments, the customer interface **1600** is presented to the customer **102** after the customer **102** selects the deferral option **1508** presented to the customer **102** on the alert interface **1100** discussed above.

[0181] In various embodiments, the interface **1600** is presented to the customer **102** upon the customer **102** accessing the data control tower (e.g., via performance of the steps **302** and **304** discussed above) after unusual activity with respect to customer application activity has been detected. In the example shown, the interface **1600** includes an unusual activity indication **1602** notifying the customer **102** that unusual activity has been detected with respect to a particular application listed in the application listing **502**. Additionally, the customer interface **1600** includes a verification button **1604** enabling the customer **102** to view the transactions that caused the display of the unusual activity information **1302**.

[0182] Referring back to FIG. **14** and the method **1400**, a customer response is received at **1408**. In some arrangements, the financial institution computing system **110** receives a response from the customer **102** via the customer device **108**. The customer response may be input by the customer **102** into the alert transmitted to a customer device **108** at **1406**. The customer response provides an indication as to whether the potential fraudulent activity is authorized or unauthorized. In arrangements where the potential fraudulent activity is authorized by the customer **102**, the customer response may include a reversal request. The financial institution computing system **110** determines if the customer response includes a reversal request at **1410**. If a reversal request was received, the access privileges removed at **1404** are restored at **1412**. If a reversal request was not received, or after the access privileges are restored at **1412**, the method **1400** ends.

[0183] Referring generally to FIGS. **17-19**, example data control tower interfaces are shown, according to various example embodiments. For example, the interfaces shown in FIGS. **17-19** may serve as alternatives to those shown in FIGS. **4-7** described herein. Referring to FIG. **17**, a data control tower user interface **1700** is shown according to an example embodiment. The user interface **1700** is shown as a display on the mobile device **200** described with respect to FIG. **2**. The user interface **1700** includes an account toggle **1704** and a channel toggle **1706**. As shown by the bolded outline of the account toggle **1704**, the account toggle **1704** is selected. Accordingly, the user interface **1700** is an account level management user interface. While in the account level management user interface, the customer **102** can select an account held with the financial institution **104** via the drop down box **1708**. As shown in FIG. **17**, the customer **102** has selected a checking account. After selecting a specific account, a listing **1710** of connected account access channels is populated. The listing **1710** identifies each channel that the customer **102** has previously configured to access the checking account. Each entry in the listing **1710** identifies a specific channel (e.g., a debit card, mobile wallet **1**, mobile wallet **2**, etc.), a channel access mechanism (e.g., a debit card number, a token identifier, an account number, etc.), and whether the channel access is currently active or inactive via a slider toggle **1712** (where "Y" means the channel is active, and "N" means the channel is inactive). A channel may be a customer device **108** (e.g., a wearable device, a payment card, etc.) or a third-party system **106** (e.g., a mobile wallet, a retailer bill pay system, a utility company system, etc.).

[0184] The customer **102** can interact with a given slider toggle **1712** to activate or deactivate a given channel's access to the selected account. For example, as shown in the user interface **1700**, the debit card is active (as shown by the associated slider toggle **1712** being in the "Y" position). Accordingly, when the customer **102** attempts to use the debit card to make a payment (e.g., a purchase with a merchant) or withdraw cash from an ATM, the debit card is linked to the checking account identified in the drop down box **1708**, and the payment can go through or funds can be withdrawn (assuming the checking account has the appropriate balance). If the customer **102** interacts with the slider toggle **1712** to deactivate the debit card's access to the checking account (e.g., by sliding the toggle **1712** to the "N" position), the debit card is no longer linked to the checking account. If the sliding toggle **1712** is in the "N" position and the customer **102** attempts to use the debit card at a merchant point-of-sale system or an ATM, the transaction will be denied or not processed from the checking account.

[0185] The user interface **1700** also includes an add button **1714** and a delete button **1716**. If the customer **102** interacts with the add button **1714**, the customer **102** can add a new channel to the listing **1710** of approved channels that are

linked to the identified account. In doing so, the customer **102** may need to register the customer device **108** (e.g., by providing a device identifier, by providing a primary account number of a payment card, by logging into an application or website via the customer device **108**, etc.) or the third-party system **106** (e.g., by logging into a third-party website or application associated with the third-party system **106**) with the financial institution **104** to pair the channel with the financial institution computing system **110**. If the customer **102** interacts with the delete button **1716**, the customer **102** can select a channel in the listing **1710** to revoke access of the selected channel to the account.

[0186] In certain implementations, toggling the sliding toggle **1712** to "N" temporarily deactivates the channel's link to the account while maintaining the link for possible future reactivation and use. Deactivation of a link can be implemented, for example, by declining requests for access unless and until the link reactivated, without requiring re-registration to reestablish a new link between the channel and the account. By contrast, deletion of a channel may dissociate the account from the channel and sever the link between the account and the deleted channel, such that subsequent steps (e.g., selecting add button **1714** or otherwise registering or "signing up" anew) may be required for relinking. In some implementations, deleting a channel may include deletion or deactivation of encryption keys and access tokens such that a new key and/or access token would need to be generated if a new link is to be established.

[0187] In various embodiments, deletion of a channel may additionally or alternatively require or involve deletion of certain information with respect to the customer or the account. For example, deletion of a channel may result in deletion of customer data from the computing systems of a third party, from relevant applications, and/or from applicable devices. In some implementations, deletion of an account may result in the transmission of a scrub command, instruction, or message from the financial institution client application **208**, from the financial institution computing system **110**, and/or from a third-party intermediary (e.g., a computing system in a financial network, such as a computing system of Visa Inc.) to one or more third-party systems **106**, customer devices **108**, and/or third-party client applications **206**. In some implementations, the scrub command, instruction, or message may request or require, for example, that the customer's account (e.g., a PayPal account) be deleted from third-party systems. Additionally or alternatively, the scrub command, instruction, or message may request or require, for example, that all customer data, or a specified subset thereof, be wiped from third-party systems and applications. In some implementations, if a customer selects the delete button **1716**, the customer may be prompted (e.g., via another graphical user interface) about whether a scrub command is desired. The customer may be asked, for example, "Would you like your data scrubbed from third-party systems and applications?" If the customer responds affirmatively, the scrub command may be transmitted. Otherwise, if the customer does not respond affirmatively, the link may be severed without the scrub command being transmitted.

[0188] Referring to FIG. **18**, a data control tower user interface **1800** is shown according to an example embodiment. The user interface **1800** is similar to the user interface **1700**. As such, like numbering is used between FIGS. **17** and **18** to designate like components of the user interfaces **1700** and **1800**. The user interface **1800** is shown as a display on the mobile device **200**. As with the user interface **1700**, the user interface **1800** includes the account toggle **1704** and the channel toggle **1706**. As shown by the bolded outline of the channel toggle **1706**, the channel toggle **1706** is selected. Accordingly, the user interface **1800** is a channel level management user interface. While in the channel level management user interface, the customer **102** can select a channel that is paired with the financial institution **104** via the drop down box **1802**. A channel may be a customer device **108** (e.g., a wearable device, a payment card, etc.) or a third-party system **106** (e.g., a mobile wallet, a retailer bill pay system, a utility company system, a cloud storage system, etc.). As shown in FIG. **18**, the customer **102** has selected a mobile wallet as the channel to manage. After selecting a specific channel, a listing **1804** of accounts associated with the channel is populated. The listing **1804** identifies each account that that the customer **102** has previously configured to be accessed by the selected channel. Each entry in the listing **1804** identifies a specific account (e.g., a debit card, a credit card, etc.), an account access mechanism (e.g., a payment token), and whether the account is currently active or inactive via a slider toggle **1806** (where "Y" means the account is active, and "N" means the account is inactive).

[0189] The customer **102** can interact with a given slider toggle **1806** to activate or deactivate the selected channel's access to an account associated with the slider toggle **1806**. For example, as shown in the user interface **1800**, the token associated with credit card **1** is active (as shown by the associated slider toggle **1806** being in the "Y" position). Accordingly, when the customer **102** attempts to make a payment with the mobile wallet (e.g., a purchase with a merchant) credit card **1** is listed as an option for the payment source of the transaction. If the customer **102** interacts with the slider toggle **1806** to deactivate the channel's access to the token associated with credit card **1** (e.g., by sliding the toggle **1806** to the "N" position), the credit card is no longer listed as a payment source in the mobile wallet (or is listed as an unavailable payment source). For example, in response to the customer **102** deactivating the channel's access, the financial institution computing system **110** may transmit a command to a third party system **106** associated with a token service provider instructing the third party system **106** to delete or temporarily deactivate the token.

[0190] Each entry in the listing **1804** also includes a default payment indicator **1808** and a delete payment button **1810**. The default payment indicator **1808** is highlighted to indicate the default payment source of the mobile wallet. As shown in FIG. **18**, the selected default payment method for the mobile wallet is the debit card. If the customer **102** interacts with the default payment indicator **1808** of a different entry (e.g., credit card **1** or credit card **2**), the customer **102** can change the default payment source for the mobile wallet even though the customer is not interacting directly with the mobile wallet. If the customer **102** interacts with the delete payment button **1810** for a given entry, the customer **102** can remove the associated payment source from the mobile wallet. Thus, the user interface **1800** enables the customer **102** to deactivate and activate tokens, select a default payment vehicle for a mobile wallet, and remove a payment vehicle from a mobile wallet on the same user interface. To populate the user interface **1800**, the financial institution computing system **110** may utilize one

of the customer information APIs **128** associated with a mobile wallet provider of the mobile wallet selected via the drop down box **1802**. In other words, in response to receiving an indication of the customer **102**'s selection of the mobile wallet via the drop down box **1802**, the financial institution computing system **110** may formulate an API information request including an identifier associated with the third party system **106**. The API information request may request information regarding the customer **102**'s mobile wallet account (e.g., token activation statuses, default payment vehicles, etc.). Upon receipt of the API information request, the third party system **106** may verify the financial institution computing system **110** and, in response, provide the requested information.

[0191] Still referring to FIG. **18**, the user interface **1800** also includes an add new payment source button **1812**. If the customer **102** interacts with the add new payment source button **1812**, the customer **102** can provision a payment token associated with a new payment source to the mobile wallet. The customer **102** can manually input the payment card information (e.g., primary account number, expiration date, billing address, card security code, card verification value, etc.) or select a payment card that the customer **102** has that is associated with (i.e., issued by) the financial institution **104**. When the payment card information is provided by the customer **102**, the FI computing system **110** can automatically request a payment card token (e.g., from a payment network associated with the payment card) and transmit the payment card token to the mobile wallet system (e.g., via a customer information API **128**) such that the payment card is provisioned to the mobile wallet.

[0192] Referring to FIG. **19**, a data control tower user interface **1900** is shown, according to an example embodiment. The user interface **1900** is similar to the user interfaces **1700** and **1800**. As such, like numbering is used between FIGS. **17** through **19** to designate like components of the user interfaces **1700**, **1800**, and **1900**. The user interface **1900** is shown as a display on the mobile device **200**. As with the user interfaces **1700** and **1800**, the user interface **1900** includes the account toggle **1704** and the channel toggle **1706**. As shown by the bolded outline of the channel toggle **1706**, the channel toggle **1706** is selected. Accordingly, the user interface **1900** is a channel level management user interface. While in the channel level management user interface, the customer **102** can select a channel that is paired with the financial institution **104** via the drop down box **1802**. As shown in FIG. **19**, the customer **102** has selected a debit card as the channel to manage. The debit card channel of FIG. **19** has different manageable features than the mobile wallet of FIG. **18**. Accordingly, the specific channel level management user interfaces presented to the customer **102** while accessing the access control tower portal may differ depending on the channel selected by the user.

[0193] The debit card specific user interface **1900** includes a linked account drop down box **1902**. The linked account drop down box **1902** allows the customer **102** to change the account associated with the selected debit card. As shown in FIG. **19**, the debit card is currently linked to a checking account ending in "5678". If the customer **102** has additional demand deposit accounts with the financial institution **104**, the customer **102** selects a different account to associate the debit card with via the drop down box **1902**.

[0194] Additionally, the user interface **1900** includes a plurality of different purchase controls **1904**. Each of the purchase controls **1904** includes a toggle slider **1906** that allows the customer **102** to activate or deactivate a particular control associated with the debit card (where "Y" means the feature is active, and "N" means the feature is inactive). The purchase controls **1904** may include a point of sale control that either permits or blocks the debit card from being used at a merchant point of sale system, an ATM control that either permits or blocks the debit card from being used at an ATM, a mobile wallet control that either permits or blocks the debit card from being used in a mobile wallet, a merchant e-commerce control that either permits or blocks the debit card from being used at a merchant e-commerce site, a travel fraud detection control that turns on or off a fraud detection feature, and the like. The customer **102** can interact with a given toggle slider **1906** to activate or deactivate the associated purchase control **1904**. The available purchase controls may vary by channel. In some implementations, toggling a toggle slider (or other user input) alternatively or additionally restricts the storage of customer data information following use of the information in a transaction. For example, a user input may allow the customer to prohibit customer information from being stored, such as prevention of the storage by an e-commerce merchant of debit or credit card information as a stored payment method.

[0195] Referring now to FIG. **20**, an account control customer interface **2000** is shown, according to an example embodiment. In various embodiments, the customer is presented with the account user interface **2000** (e.g., via the financial institution client application **208**) upon the customer selecting an account on the data control tower interface **1000** described with respect to FIG. **10**. As shown, the account control customer interface **2000** includes a listing of various controls associated with an account. As shown, a first toggle switch control **2002** is configured to receive an input from the customer to turn off the account as a whole. As a result of receiving this input, the customer mobile device **200** transmits a notification signal to the financial institution computing system **110**, which in turn temporarily deactivates the customer's account from use in any sort of transaction. This is particularly useful if the customer temporarily misplaces a card. Another set of toggle switches **2004** provides the customer with a more particularized control. For example, via the set of toggle switches **2004**, the customer is able to turn the selected accounts on and off for international and United States payments. As shown, the selected account has been turned off for international transactions, but left on for domestic transactions. As such, upon receipt of a transaction request from an international payment network, the financial institution computing system **110** would automatically deny the transaction request. This way, fraudulent international transaction activity can be prevented. Additionally, the customer need not contact the financial institution to turn the account on prior to travelling internationally.

[0196] Another toggle switch **2006** enables the customer to turn the selected account on and off for use in a particular mobile wallet. Thus, the account control interface **2000** may include a number of toggle switches similar to the toggle switch **2006** depending on the mobile wallets that the customer has registered for. In response to the customer switching a card off for a particular mobile wallet, the financial institution computing system **110** may contact a

token service provider associated with the mobile wallet (or contact the mobile wallet provider directly) to, for example, deactivate an account token to disable access. In various embodiments, the account control customer interface **2000** includes many additional transaction controls. For example, the user may manually restrict amounts (e.g., transactions exceeding a threshold dollar value), locations (e.g., transactions in certain geographical locations, certain types of merchants such as certain retailers, etc.), times (e.g., between specified hours, on particular days of the week or month or on holidays, etc.), and the like that the card may be turned off or turned on for use in transactions. As such, not only does the financial institution client application **208** provide the customer with control over external entities that have access to customer account information, but it also provides the customer with an extensive amount of personal controls over each individual account.

[0197] In various embodiments, a control tower portal allows the customer to instruct entities (e.g., third party computing systems and applications, customer computing devices, etc.) to delete accounts, restrict the use or sharing of customer data, and/or to delete customer data (e.g., all data or data of a particular type). In some implementations, restrictions on customer data or deletion thereof may be accomplished by, for example, the financial institution computing system **110** and/or the financial institution client application **208** making an API call to third party systems **106** to have customer data restricted or deleted (or marked for subsequent restriction or deletion). The control tower portal may allow for multiple levels of deletion or scrubbing. For example, an account may be deleted, all accounts may be deleted, all accounts of a certain type may be deleted, certain customer data or customer data of particular types may be deleted, and/or all customer data may be deleted. In some implementations, only customer data received from the financial institution computing system **110** through access granted by the customer (and not received by the third party from other sources, such as directly from the customer) may be marked for deletion. Advantageously, the ability to choose to have account data deleted empowers the customer with the right to be partially or wholly forgotten.

[0198] Referring to FIG. **21**, a data control tower customer interface **2100** is shown according to an example embodiment. The customer interface **2100** is similar to the customer interfaces **400** and **700**. Like numbering is used between FIGS. **4** and **7** to designate like components. The customer interface **2100** is shown as a display on the customer mobile device **200**. The interface **2100** includes a device listing **702** with customer devices **108** that the customer **102** has registered with the financial institution **104**. In addition to the add button **426** and the delete button **428**, customer interface **2100** additionally provides a scrub button **2130** to allow the customer to have customer data deleted from one of the devices in the device listing **702**. In response to selection of the scrub button **2130**, the customer may be asked to select which device to scrub. In various implementations, after a device to be scrubbed has been selected, the customer may be asked (e.g., via another interface) to identify the customer data to be deleted from the device. For example, the customer may be allowed to specify that personal information should be deleted (e.g., name, address, telephone number, social security number, etc.), financial information should be deleted (e.g., account numbers, balances, etc.), all customer data should be deleted (e.g., all data that the device received via the financial institution computing system **110**, or all customer information regardless of source), an account should be deleted (e.g., a subscription, profile, or payment account), etc.

[0199] In the example customer interface **2100**, devices from which customer data have been deleted or accounts deleted are marked as having been "scrubbed" by scrubbed icon **2104**. As shown in customer interface **2100**, the smart vehicle has been scrubbed. The customer may wish to scrub a device if, for example, the device is lost, stolen, sold, or donated (such as a stolen car or a lost smart watch). It is noted that, as a consequence of the smart vehicle being scrubbed, granting the smart vehicle with access to customer data cannot be turned on or off (as indicated by the "-- N/A --" in FIG. **21**). The link may be re-established via add button **426**, and/or the smart vehicle may be removed from device listing **702** via delete button **428**.

[0200] Similarly, referring to FIG. **22**, a data control tower interface **2200** is shown, according to an example embodiment. The data control tower interface **2200** is shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interface **2200** serves as an alternative to interfaces **400**, **500**, **700**, and **1000** described above. As shown, the interface **2200** includes entity listing **1010** (e.g., applications and merchants) and device listing **1014** (e.g., customer devices **108**). Among the entity entries **1012**, entity **2202** ("Entity **3**") is indicated as having been scrubbed. In some implementations, the indication that the entity has been scrubbed is not presented in interface **2200** until confirmation is received from the entity (e.g., a third party client application **206** and/or a third party system **106**) by the financial institution client application **208** (directly or via the financial institution computing system **110**) that the account or other customer data has been deleted from the entity's computing system. Similarly, among device entries **1016**, device **2204** ("Device **3**") is indicated as having been scrubbed, which may not be presented until confirmation is received by the financial institution client application **208** (directly or via the financial institution computing system **110**) directly from the device or from a computing system with which the device is networked. In certain implementations, scrubbed entities and devices can be removed from listings **1010** and **1014**, respectively, using a delete button (similar to the delete button in FIG. **21**, not shown in FIG. **22**).

[0201] Referring to FIG. **23**, a data control tower interface **2300** is shown, according to an example embodiment. The data control tower interface **2300** is shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interface **2300** serves as an alternative to interfaces **400**, **500**, **700**, and **1000** described above. Interface **2300** may serve as a landing page for a customer using control tower to manage digital connections between entities, applications, devices, etc. As shown, interface **2300** includes an access toggle **2302** that allows the customer to select viewing all digital connections, cards, and recurring payments. As indicated by the underlining, "View All" has been selected by the customer **102**. The interface **2300** includes a card listing **2304** and a recurring payments listing **2306**. The card listing **2304** identifies customer accounts and

their statuses. At **2304**, the Platinum Debit Card with number ending in **1603** is indicated as being "on" or enabled or otherwise accessible.

[0202] Referring to FIG. **24**, a data control tower interface **2400** is shown, according to an example embodiment. The data control tower interface **2400** is shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interface **2400** serves as a "details" page showing more details with respect to, for example, one of the cards listed in FIG. **23**. In interface **2400**, "Debit, ATM, and Prepaid Cards" **2404** are listed, as are their statuses. For the Platinum Debit Card ending in **1603**, a transaction controls section **2406** allows the customer to control the transactions that may involve the debit card through, for example, geographical or other restrictions. In interface **2400**, the identified card is not restricted from being used internationally, as indicated by the status toggle **2414**. The customer may use the status toggle **2414** to block transactions outside of the United States for the card.

[0203] A digital wallet controls section **2408** allows for control over the use of the card in transactions and funds transfers. An entities listing **2410** lists entities that are linked with the card (e.g., that may use the card for transactions, like making purchases or funds transfers, or that otherwise may access data related to the card, such as for checking account balance, confirming that the account is still open, or determining the next payment due date). Entities listing **2410** in interface **2400** includes two entities (Entity **1** and Entity **2**), and each entity is provided with a corresponding remove button **2416**. Selection of the remove button **2416** for an entity allows the customer to, for example, delete customer data and/or delete the account that is maintained by the entity and with which the customer's debit card is linked. For example, Entity **1** may be PayPal Holdings or Amazon.com, and the customer may have a PayPal account which uses the debit card for payments, or an account at Amazon.com which uses the debit card for purchases. In various versions, the customer may press the remove button **2416** corresponding with one of the entities to, for example, delete the user account at the entity (e.g., delete the PayPal account or Amazon.com account). Alternatively or additionally, the remove button **2416** may allow the customer to delete the customer's account data specific to the debit card ending in **1603** (e.g., the account number, expiration date, etc.) saved in a database in a computing system of PayPal, Amazon.com, or other entity, without necessarily deleting other customer data. In some implementations, the remove button **2416** causes a scrub command, instruction, or message to be generated and transmitted to the application, device, or system of the entity. In various implementations, the scrub command identifies the data to be deleted from the databases of the third-party systems **106**. The scrub command may be transmitted to the third party system **106** (with an identification of the customer data to be scrubbed) directly or via a financial payment processing network.

[0204] Referring to FIG. **25**, a data control tower interface **2500** is shown, according to an example embodiment. The data control tower interface **2500** is shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interface **2500** serves as a confirmation modal for card removal following selection of one of the remove buttons **2416** of interface **2400**. In interface **2500**, a confirmation window **2516** requires the customer to confirm that removal of the debit card ending in **1603** from Entity **1** is desired by selecting the "continue" button, or to cancel the removal request by selecting a "cancel" button. If removal is confirmed, the customer may be presented with an interface **2600** shown in FIG. **26**, which provides a details page with the selected entity removed. That is, interface **2600** corresponds with interface **2400**, but Entity **1** is "removed" from listing **2410**. The customer may choose to also remove Entity **2** in the same manner that Entity **1** was removed, as discussed above, or leave the connection with Entity **2** in place.

[0205] Referring to FIGS. **27**A-**27**F, control tower interfaces **2700**A-**2700**F are shown, according to example embodiments. The control tower interfaces are shown as a display presented via the customer mobile device **200** (e.g., via the financial institution client application **208**). In some embodiments, the interfaces **2700**A-**2700**F allow for review and management of recurring payments. For example, the interfaces **2700**A-**2700**F may allow a user to view payees receiving payments on a recurring basis for each account/payment vehicle, view past payments to payees from one or more accounts/payment vehicles, stop all subsequent payments to a payee from a particular account/payment vehicle (permanently or for a specified time period), and/or stop one or more subsequent payments to the payee from the account/payment vehicle. In various implementations, a recurring payment involves an arrangement in which a user makes payments regularly (e.g., each month or each quarter) or as debts become due, commonly from a predetermined (although changeable) account (e.g., a checking account, debit card, or credit card). A recurring payment may have a predetermined end date (e.g., loan payments that end when the loan is repaid), or may continue indefinitely until a potential future occurrence (e.g., utility payments that will continue until the user moves from a residence at which the utilities are consumed). Recurring payments may be initiated by the payor (e.g., a user's financial institution initiates a transfer of funds from an account of the user), and/or by the payee (e.g., an authorized payee submits a request that indicates a user account number, an amount to be paid, a payee account number, and/or a payment authorization from the payor). Recurring payments may be for fixed amounts (e.g., a mortgage) or for variable amounts (e.g., depending on what goods/services were actually consumed). In certain implementations, a recurring payment may be identified as a consequence of the user having made multiple payments to the same payee in the past, regardless of whether there is a particular arrangement between the user and the payee.

[0206] FIG. **27**A provides interface **2700**A with an example recurring payments landing page, which may be presented, for example, upon selection of recurring payments listing **2306** in FIG. **23**. Interface **2700**A includes a payment vehicle identification region **2702**. In FIG. **27**A, the payment vehicle is a debit card with a number ending in **3669**. A status indicator **2704** indicates that the identified payment vehicle ("Alliance Debit Card") has a status of "On." If the user wishes to change the status (to, e.g., deactivate the identified payment vehicle for particular or all entities or to otherwise make another change), the user may activate/select a change-status icon **2706**, and make a change via, for example, interface **1200** of FIG. **12**, interface **2000** of FIG. **20**, interface **2400** of FIG. **24**, or another suitable interface. A payee listing **2708** identifies recipients of recur-

ring payments. Additional payees not presented in interface **2700**A, if any, may be viewed by selecting show-more icon **2710**. The listed payees may be selected for details and changes.

[0207] In interface **2700**B of FIG. **27**B, payee Bay Club Systems has been selected (e.g., by selecting the arrowhead **2712**, the name "Bay Club Systems," or somewhere in the region **2714** identifying the payee). Interface **2700**B allows the user to review a listing of payments for the payee identified at **2718** using the account identified at **2720**. The identified account has its status indicated at status indicator **2722**, and like change-status icon **2706**, a change-status icon **2724** allows the user to make a change to the status of the account identified at **2718**. In various implementations, the listing **2726** includes past payments by date and amount. The list may be collapsed using minimizer icon **2728** to "hide" the transaction history. In some implementations, listing **2726** may additionally or alternatively include future payments that have not been made but are scheduled/arranged, and/or future payments which are not necessarily known to be scheduled or arranged but are expected/anticipated/deduced based on payment history. Moreover, the listing **2726** may include payments that are being processed but not yet paid. A payment may be in-process if, for example, a financial institution has begun a funds transfer process (upon, e.g., receipt of a valid payment request from a payee). The different types of payments may be presented differently or otherwise presented so as to indicate their different status. For example, past/completed payments, in-process, and future payments may be presented with differing emphasis (e.g., different colors, fonts, font sizes, formatting, etc.), or may be presented in separate sections (e.g., past payments, followed by in-process payments, followed by future payments) that may be, for example, labeled or separated by a line or other markings or alphanumeric characters.

[0208] In various implementations, interface **2700**B may provide a manage payee icon **2730** and/or a hide payee icon **2732**, depending on the payee or payment arrangement. Interface **2700**B (as well as interfaces **2700**C-**2700**F) also provide a home-page icon **2734** to allow the user to leave the recurring payments interfaces and return to the control tower main/home page (e.g., interface **400** of FIG. **4**, or interface **1000** of FIG. **10**). If manage payee icon **2730** is selected, the user may be presented with, for example, interface **2700**C of FIG. **27**C to select from one or more actions. Via interface **2700**C, the user may select to stop making payments to the selected payee at **2740**, or to suppress the payment from being displayed in a recurring payments list (e.g., payee listing **2708**) at **2742**. In certain versions, the user may make a selection using one of the corresponding selectors **2744**, **2746** (in FIG. **27**C, **2744** corresponding with "stop this payment" has been selected). In other versions, other selection mechanisms may be employed, such as drop-down menus, selectable icons, voice command, etc. The user may then cancel the "manage payee" process by selecting cancel icon **2748**, or proceed with the selected option by selecting continue icon **2750**. If the cancel icon is selected, the user may be returned to the recurring payments landing page at interface **2700**A, or to another control tower screen.

[0209] In various embodiments, if the user selects the continue icon **2750**, the user may be presented with a suggestion or recommendation to contact the payee. This may be suitable, for example, in cases in which the user has granted the payee with authorization that, by agreement, is only revocable through the payee. Even in cases in which the recurring payment may be stopped at any time through the financial institution, the user may wish to contact the payee to arrange for payment in an alternative manner (e.g., using a different account/payment vehicle). Interface **2700**D provides contact information for the payee at **2756**. The user may be allowed to select a cancel icon **2758** to turn back, or continue icon **2760** to proceed with the request.

[0210] In various embodiments, a user wishing to continue may, for example, be presented with a confirmation page via interface **2700**E in FIG. **27**E. The user may be asked to confirm that he or she wishes to stop the one or more subsequent payments. Interface **2700**E includes a cancel icon **2766** to turn back, and a continue icon **2768** to proceed with the stop payment request. Interface **2700**E may provide additional details on the request, such as timing (e.g., stop payment takes effect immediately, within a specified time, or starting at a future date, which may be selectable by the user), and whether the stop payment is inapplicable to any payments, such as certain in-process payments. Optionally, in various embodiments, the user may be allowed to select a duration for which the stop payment remains in effect via a duration selector **2770**. By default, a stop payment request may be permanent, indefinite, or for a certain specified time (such as three years). In interface **2700**E, the user may optionally be presented with various selectable durations at **2772**, such as 6 months, 1 year, or 2 years. The user may be allowed to select one of the identified time periods, and may optionally be allowed to select another time period by selecting "other" and selecting/entering a time period that is not listed. Other mechanisms for selecting a duration may be used. Interface **2700**E also provides the user another chance to change his or her mind via a cancel icon **2774**, or to choose to proceed with confirmation (potentially for a selected duration) via a continue icon **2776**.

[0211] In various embodiments, if the stop recurring payment is confirmed (e.g., by selection of continue icon **2776**), the financial institution may: cancel future payments that would have been initiated by the financial institution; decline one or more subsequent payment requests from the identified payee from the corresponding account/payment vehicle; and/or to communicate to the payee the user's desire to revoke his or her authorization for, or to otherwise cease, subsequent payments, from the identified account/payment vehicle. In some implementations, a payment authorization may be revoked via, for example, an API call from the financial institution computing system **110** to the third-party system **106** of the payee. Such an API call may include, for example: a security/access token (which may have been received from the third-party system **106**) that authenticates the financial institution computing system **110**; an identification of the user/payor; an identification of the account/payment vehicle; a unique identifier for the recurring payment (which may have been generated/assigned by the financial institution or the payee); details on one or more past payments; details on one or more subsequent payments; an effective date; a duration for the cessation of the recurring payment, if the user identified a duration (e.g., at **2770**) or the cessation is otherwise not permanent; and/or any other relevant information.

[0212] In various embodiments, the user may additionally or alternatively be allowed to remove (hide/suppress) a payee/recurring payment from being listed. For example, in interface **2700**B, a user may select hide payee icon **2732**. In

certain implementations, control tower may, upon detecting that the hide payee icon **2732** has been selected, present the user with, for example, interface **2700**F in FIG. **27**F. Interface **2700**F requests that the user confirm that he or she wishes to hide a selected payee from the landing page list (i.e., the list on the landing page of interface **2700**A). The user may be presented with a cancel icon **2784** to be selected if he or she does not wish to hide the payee from the list, and a continue icon **2786** to be selected if he or she wishes to proceed with the request to hide the payee. Selection of one of the icons **2784**, **2786** may, in various implementations, return the user to the landing page of interface **2700** or to payee management interface **2700**B.

[0213] In some implementations, the option to stop a recurring payment for a particular account/payment vehicle and/or for a particular payee may not be available for various reasons, and the user may thus only be provided the option to hide the recurring payment (e.g., **2732** but not **2730**). Additionally or alternatively, if a recurring payment is not cancelable via control tower, the user may be advised to contact the merchant (see, e.g., interface **2700**D and the contact information at **2756**). In some implementations, if the user indicated a desire to have the financial institution send a request to the payee on the user's behalf to request that the payee cancel or pause a recurring payment (with the understanding that a recurring payment will be deemed to remain in effect until the payee confirms that it will stop/pause the recurring payment) but the payee does not honor the request, the user may wish to contact the payee himself/herself, and/or hide the recurring payment.

[0214] Referring to FIGS. **28**A-**28**J, control tower interfaces **2800**A-**2800**J are shown, according to example embodiments. The control tower interfaces may be presented via, for example, a display of mobile device **200**. In some embodiments, the interfaces **2800**A-**2800**J allow for control over automated or other recurring payments. For example, the interfaces **2800**A-**2800**F may allow a user to view and manage automated payments from a first source account held by a first entity to one or more recipients (which may be financial or non-financial (e.g., merchant or service provider) accounts at the first entity and/or at other entities), and disable or otherwise control or manage the automated payments, while the interfaces **2800**G-**2800**J may allow a user to view and manage automated payments from a second source account held by the first entity or by a second entity to one or more recipients (which may be financial or non-financial accounts at the first and/or second entities, and/or at other entities), and disable or otherwise control or manage the automated payments. In various implementations, an automated payment may be a recurring payment involving an arrangement in which a source account is used to make payments on an automated basis periodically (e.g., each month, each quarter, or each year) or as debts become due, commonly from a predetermined (although changeable) account (e.g., a checking account, debit card, or credit card) to a destination account or recipient. An automated payment may have a predetermined end date, or may continue indefinitely until a potential future occurrence. Automated payments may be initiated by the payor and/or by the payee. Automated payments may be for fixed amounts or for variable amounts.

[0215] FIG. **28**A provides interface **2800**A with an example automated payments landing page, which may be presented, for example, upon selection of recurring payments listing **2306** in FIG. **23**. Interface **2800**A allows a user to select a source account at **2802** via a source account selector **2804**, which as illustrated in FIG. **28**A, is a drop-down menu but may be any other selection mechanism. In interface **2800**B of FIG. **28**B, the drop-down menu of selector **2804** has been selected, and selectable accounts are presented at **2806**. The user may be allowed to select an account from among one or more accounts (financial or otherwise) at one or more entities (e.g., one or more financial institutions). One or more of the accounts, potentially held at multiple entities, may be managed via the "Control Tower" application. Status indicators may indicate whether each account is enabled or disabled with respect to one or more functionalities (e.g., usability in certain types of or all transactions, accessibility by devices, accounts, and/or entities, etc.).

[0216] In interface **2800**C of FIG. **28**C, Account **1***a* at Entity **1** has been selected via selector **2804**. Entity **1** may be, but need not be, the entity providing the "Control Tower" client application used to review recurring payments. An entity listing **2808** identifies recipients of automated payments from the selected account (i.e., Account **1***a* in FIG. **28**C). Because payments may be made from one account (e.g., a checking account) held by an entity (e.g., a bank) to another account (e.g., a credit card) held by the same entity, entity listing **2808** identifies Entity **1** for Account **1***a*. The listed entities may be selected for reviewing details and/or for making changes. In interface **2800**D of FIG. **28**D, Entity **3** has been selected (e.g., by selecting the arrowhead **2810** or the name "Entity **3**"). Interface **2800**D allows the user to review an automated payments listing **2812** identifying automated payment arrangements with Entity **3** using Account **1***a*. In FIG. **28**D, recurring payments from Account **1***a* held by Entity **1** are made to Accounts **3***b* and **3***c* held by Entity **3**. The payments to Account **3***b* are identified as currently being "enabled," with a frequency of payments to Account **3***b* set to monthly. In some implementations, a frequency selector **2814** (such as a drop-down menu or other selection mechanism) may be used to make a change to the frequency with which automated payments are made from Account **1***a* to Account **3***b*. The payments to account **3***c* are identified as currently being "disabled," with a frequency set to quarterly. A status changer **2816** allows the user to change the status of the automated payments. The status changer may be, for example, a slider that allows the user to move a black square between the left and right sides of a rectangle, or any other selector mechanism. Because the current status of payments to Account **3***b* is enabled, the black square of its status changer **2816** is on the left side, and because the current status of payments to Account **3***c* is disabled, the black square of its status changer is on the right side. The status may be changed to disabled by sliding or otherwise touching or selecting the status changer **2816** to move the black square leftward, and enabled by sliding or otherwise touching or selecting the status changer **2816** to move the square rightward.

[0217] In interface **2800**E of FIG. **28**E, the user has made a selection (via, e.g., status changer **2816**) to disable automatic payments from Account **1***a* to Account **3***b*. A dialogue box **2820** requests confirmation. Optionally, in various embodiments, the user may be allowed to select a duration for which the disabling of the automated payments remains in effect via a duration selector **2822**. In interface **2800**E, a duration of 1 year has been selected (as indicated by the

black rectangle with "1 year"). The user may cancel the request to disable the automated payment by choosing "cancel," or may choose to confirm disabling of the automatic payment by choosing "disable."

[0218] After confirming that the automated payment is to be disabled (e.g., by selecting "disable" in dialogue box **2820** of interface **2800**E), the user may be returned to the listing of automated payments made to Entity **3** using Account **1***a*, as illustrated by interface **2800**F of FIG. **28**F. Interface **2800**F shows at **2830** that the status of automated payments to Account **3***b* has been disabled (as indicated by "disabled" in bold). In the illustrated example, the automated payment has only been disabled for a certain duration. Interface **2800**F may thus indicate that automated payment to Account **3***b* has been disabled until a specified date (e.g., one year from the current date if "1 year" is selected as the optional duration).

[0219] In example implementations, the user may then wish to select another source account from which automated payments are made to one or more entities. Interface **2800**G in FIG. **28**G illustrates that the user may select a source account via the source account selector **2804**. In interface **2800**G, the drop-down menu of selector **2804** has been selected, and selectable accounts are presented at **2840**. The user may then choose, for example, Account **2***a* at Entity **2**, and be presented with, for example, interface **2800**H in FIG. **28**H. The user may then be presented with a list of entities to which automated payments are made via listing **2844**, and may select Entity **1** via arrowhead **2848**.

[0220] In various embodiments, the user may then be presented with interface **2800**I of FIG. **28**I, which indicates that Account **2***a* held by Entity **2** is used to make automated payments to Accounts **1***b* and **1***c* held by Entity **1**. As illustrated in FIG. **28**I, automated payment to Account **1***b* is disabled, while automated payment to Account **1***c* is enabled. The user may then choose to, for example, enable automated payment from Account **2**A at Entity **2** to Account **1***b* at Entity **1** via status changer **2850**, and/or to disable automated payment from Account **2***a* to Account **1***c* via status changer **2852**.

[0221] In interface **2800**J of FIG. **28**J, the user has made a selection to disable automatic payment from Account **2***a* to Account **1***c*. In certain implementations, the user may be presented with a dialogue box analogous to dialogue box **2820**. In some versions, the user may alternatively or additionally be presented with modified dialogue box **2860** for confirming that an automated payment is to be disabled. Dialogue box **2860** allows the user to disable the automated payment "indefinitely." In some implementations, such a selection would leave the automated payment in the corresponding listing of automated payments with a disabled status (until changed). Dialogue box **2860** also allows the user to choose to permanently disable the recurring payment. In certain embodiments, such a selection would disable automated payment and also remove the option to re-enable the automated payment. In some embodiments, permanent disablement would additionally delete the account from the listing of automated payments from Account **2***a* to Entity **1**. The user may be also be allowed to cancel the request to disable the automated payment and, for example, return to interface **2800**I.

[0222] Once an automated payment is disabled or enabled, the entity holding the source account and/or the entity holding the destination account may be notified via a transmission to a computing system or device associated with the entities. In some versions, this may involve an API call to the computing system or device. For example, in some implementations, if an automated payment from Account **1***c* to Account **2***a* is disabled, an API call (or other transmission) may be sent by a computing system or device of the entity providing the "Control Tower" application (e.g., Entity **1**, Entity **2**, or a third-party entity), or by the user device running the application, to a computing system or device of the one or more entities holding the accounts involved in the automated payment. Alternatively or additionally to such a notification, in some implementations, a subsequent payment request may be declined. The API calls may be accompanied by security tokens and data identifying the automated payment or relevant users, entities, and/or accounts.

[0223] Referring to FIGS. **29**A and **29**B, control tower interfaces **2900**A and **2900**B are shown, according to example embodiments. The control tower interfaces may be presented via, for example, a display of mobile device **200**. In some embodiments, the interfaces **2900**A and **2900**B allow for control over automated or other recurring payments by selecting the automated payment arrangement to be managed or controlled. For example, interface **2900**A provides an automated payment listing **2904** with automated payments **1**, **2**, and **3**. The automated payments need not be organized by funding account or recipient, but may instead involve any combination of source and destination accounts. For example, automated payment **1** involves payment from account **1***a* to **2***b*, automated payment **2** involves payment from account **2***a* to **1***c*, and automated payment **3** involves payment from account **3***b* to **4***b*.

[0224] In interface **2900**B, automated payment **2** has been selected via arrowhead **2908**. Interface **2900**B identifies the selected automated payment (i.e., automated payment **2**) at **2910**. At **2912**, interface **2900**B identifies the entity and account (i.e., Entity **2**, Account **2***a*) used to make the automated payment, as well as historical, account, or other information on the payments or recipient (such as the most recent payment to Account **1***c*, as presented in FIG. **29**B). Interface **2900**B may also allow the user to choose to disable automated payments via selector **2914** (while allowing for subsequent re-enablement) or delete automated payments via selector **2916** (requiring the automated payment to be set up or otherwise added again). The user may also be allowed to manage the source account (i.e., Account **2***a*) via selector **2918**, and manage the destination account (i.e., Account **1***c*) via selector **2920**. Selecting to manage the source and/or destination accounts via **2918** and/or **2920** may allow the user to, for example, disable (e.g., turn off) an account, unlink the account from various applications, devices, etc.), or otherwise review information on and control aspects of the corresponding accounts.

[0225] In example versions, a "Control Tower" application allows for control of transactions between financial institutions. For example, a user may have a Bank A checking account and a Bank B credit card. The user is able to disable automatic payment of the Bank B credit card from the Bank A checking account via Control Tower. The same Control Tower user may also have a Bank A credit card and a Bank C checking account. In addition to being able to disable automatic payment of the Bank B credit card from the Bank A checking account via Control Tower, the user is

able to disable automatic payment of the Bank A credit card from the Bank C checking account via Control Tower.

[0226] In various embodiments, the Control Tower application is not a client application of any of the financial institutions involved in the transactions that are controllable via the client application. The application may be a client application of a third-party entity. In various embodiments, the Control Tower application may be a client application of one of the financial institutions involved in the inter-institutional transactions controllable via the client application.

[0227] Referring to FIGS. **30**A-**30**P, control tower interfaces **3000**A-**3000**P are shown, according to various potential embodiments. The control tower interfaces may be presented via, for example, a display of mobile device **200**. In some embodiments, the interfaces **3000**A-**3000**P allow for control over use of virtual rewards currency (used interchangeably with "rewards") corresponding with value provided to an account holder but not yet exchanged by the account holder for a benefit (i.e., not yet "redeemed"), such as bonuses, discounts, and promotional gifts. Certain rewards may be exchanged for a benefit by being converted into monetary currency, such as when a bonus is a "cash-back" bonus redeemable via a monetary deposit into a user's financial account or for a purchase. Certain rewards may be redeemed for other benefits, such as a percent discount on a purchase or receipt of a (non-monetary) gift (e.g., an item gifted by a merchant with a purchase).

[0228] A user may be granted rewards (i.e., rewards may be "earned" by a user from, e.g., an issuer of a credit card) through, for example, use of a payment card or other payment vehicle, and the value of the rewards may be determined based on types of transactions (e.g., purchases of certain categories of items or from certain merchants), amounts of transactions (e.g., one percent of purchases), etc. In certain embodiments, rewards may be conferred based on performance of certain activities, such as visiting a certain location, presenting a mobile device to a scanner device capable of detecting the mobile device (via, e.g., NFC), speaking certain promotional phrases (which may be detected via a microphone of a mobile device, and the sound recording, or confirmation that the phrase was recognized as having been spoken in a sound recording, may be transmitted to, e.g., a device associated with a merchant or payment card issuer), or otherwise.

[0229] In various implementations, whether a user has visited a certain location (e.g., a mall or gas station) may be determined in different ways. For example, a mobile device's location sensor (e.g., GPS device) may be used to determine a location of a mobile device (e.g., a mobile device known to be associated with an account holder) to determine, for example, that a user has walked into a store, even if no purchase is made. Alternatively or additionally, a mobile device's microphone may be used to detect ambient sounds, and the ambient sounds analyzed (e.g., by the mobile device, such as by using an application running on the mobile device, or by a remote computing system to which the ambient sounds are transmitted) to determine whether a sound signature in the ambient sounds matches (or is sufficiently close to) the sounds expected at the location being visited (e.g., a sound signature of a musical tune being broadcast over a speaker at the destination to be visited may be recognized in the ambient sounds captured using the microphone of the mobile device of the user/account holder). Similarly, a mobile device's camera or other sensor may be used, alternatively or additionally, to capture an image and the image analyzed to determine whether the image includes an item (such as a landmark, signage, a person, a feature of the landscape, etc.) expected to be located at the place to be visited for earning a reward.

[0230] In example embodiments in which virtual rewards currency is earned through performance of activities (e.g., activities other than purchases or other transactions involving the relevant payment card or other payment vehicle), an account holder may install and run an application, such as a "control tower" application, rewards application, or banking application, on his or her mobile device (e.g., a smartphone). The application may be retrieved, for example, through a digital distribution platform. The application, when running, may interface with various devices of the mobile device, such as a GPS device or other location sensors, ambient sensors like a microphone and/or a camera, and user interfaces such as a touchscreen. The mobile application may track or otherwise determine whether certain activities have been performed through interaction with the user and the devices of the mobile device. The signals from the devices (e.g., GPS, microphone, etc.) of the mobile device may be received (via, e.g., an operating system of the mobile device) and processed by the application and/or by a remote server receiving data from the mobile device. If the signals reveal that an activity that earns rewards has been performed, the value of the corresponding rewards may be determined and credited to the user's account.

[0231] The interfaces **3000**A-**3000**P may allow a user to view and manage when and how rewards may be exchanged for a benefit. Interface **3000**A in FIG. **30**A provides an example rewards home page that allows the user to select certain potential functionalities with respect to rewards management. Interface **3000**B in FIG. **30**B provides an example definitions page upon selection of "Definitions" icon **3002**A in FIG. **30**A. Interface **3000**B optionally allows the user to categorize certain accounts, providers, or rewards by creating groups. For example, a user may wish to group selected accounts, providers, and/or rewards together so that an action or selection is automatically applied to multiple accounts, providers, and/or rewards in batch (e.g., all the accounts, providers, and/or rewards in a defined group).

[0232] In interface **3000**B, the user has chosen to define a new group (as indicated by the thicker, bolded rectangle of new group icon **3004**) of providers (as indicated by the thicker, bolded rectangle of providers icon **3008**). A user may also choose to edit an existing group (e.g., a group previously defined via new group icon **3004**). Providers may be merchants (such as online merchants and/or merchants with physical stores) or other entities through which rewards may be redeemed in exchange for something of value. The user may enter a name or other designation for the grouping (for easier reference) at name field **3010**. If the user were editing a group (rather than defining a new group), the (unpopulated) name field **3008** may be a replaced with, for example, a drop-down menu or other selector allowing the user to identify which group is to be edited.

[0233] In example interface **3000**B, providers may be added (e.g., via add provider icon **3012**) or deleted (e.g., via delete provider icon **3014**) from the grouping being defined. The user may select providers to add or delete via, for example, drop-down menus. Through an "add provider" drop-down menu (such as drop-down **3016**), the user may be presented with a list of known providers via which a reward

may be redeemed, and the user may select one of the providers to add to the group being defined or edited. Similarly, through a "delete provider" drop-down menu (not shown), the user may be presented with selectable providers that have previously been added to the provider group, and selected providers would be removed from the group being defined or edited. If "accounts" or "rewards" were selected, it would be accounts or rewards, respectively (rather than providers), that could be selected for addition to or deletion from a group. Once a user is done with entries, the user may choose to save the new group (or save changes to an edited group) via a save group icon **3018**, after which the user may be, for example, returned to the rewards home (e.g., interface **3000**A) or returned to a rewards definitions page (e.g., interface **3000**B with settings reset to default so as to remove prior selections) in which a user is allowed to select whether to create or edit a group (e.g., via icon **3004** or **3006**).

[0234] Example interface **3000**C of FIG. **30**C may be presented upon, for example, selection of accounts icon **3002**C in FIG. **30**A. Interface **3000**C presents an account listing **3020**, which identifies user accounts that may earn, or have earned, rewards, and/or through which rewards may be redeemable. The accounts may be held by or at multiple entities (e.g., multiple banks or other financial institutions), and they may be accounts of different types (e.g., credit card, debit card, savings account, etc.) with different methods in which rewards are earned and/or redeemed (e.g., different percentages, transaction types, performable activities, etc.). Each account has a status indicator that indicates whether the account is currently "On" (and thus enabled, activated, or otherwise always usable or usable in some respect, such as usable for certain transactions or during certain times) or "Off" (and thus disabled, deactivated, or otherwise entirely unusable or unusable in some respect). The user may be allowed to change the status of an account by, for example, selecting the corresponding status indicator (e.g., by touching "Status" or "On" or "Off" for a particular account on a touchscreen) and selecting a different status (e.g., via another interface discussed herein). If there are other accounts that do not fit on the screen, a user may view them by, for example, scrolling the page (e.g., by swiping up on a touchscreen) or by selecting "Show More Accounts" at the bottom of interface **3000**C.

[0235] One of the accounts from account listing **3020** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the account identifier (e.g., the label "Entity **4** Account **3**"or the designation" . . . **3456**") or a corresponding arrowhead or other icon. In FIG. **30**D, arrowhead icon **3022** corresponding with Entity **3** Account **2** has been selected. Interface **3000**D of FIG. **30**D includes a selection identification region **3024**, which identifies which account has been selected for review and/or management. A provider listing **3026** identifies available providers through which rewards may be redeemed. For each provider, rewards redeemable at the provider is listed. In certain implementations, rewards earned with respect to one account may be usable with respect to another account at the same entity or at another entity. For example, a reward earned via one or more transactions involving a first account (e.g., purchases made using a credit card issued by bank A) may be redeemed via one or more transactions involving a second account (e.g., for a purchase made with a debit card issued by Bank B).

[0236] In FIG. **30**D, provider listing **3026** identifies Providers **1** and **2**, each of which has two rewards that may be activated for redemption through a transaction involving the corresponding provider (e.g., a purchase from the provider). A status indicator **3028** indicates whether use of rewards in transactions involving the selected account is enabled for the corresponding provider. In the version of status indicator **3028** shown in FIG. **30**D, a black solid square may be positioned to the left of a rectangle to indicate, for example, that all selectable rewards are enabled, the black solid square may be positioned to the right of the rectangle to indicate that all selectable rewards are disabled, and the black solid square may be positioned in the middle (or otherwise somewhere between the left and right) to indicate that at least one reward is enabled while at least one reward is disabled. Status indicators corresponding to particular rewards may indicate whether the corresponding reward is enabled or disabled in a similar fashion. For example, status indicator **3030**A may indicate that a particular reward is enabled (i.e., would be applied or otherwise used) if a square is positioned to the left (e.g., a square with a "Y" for "yes"), and status indicator **3030**B may indicate that a particular reward is disabled (i.e., would not be applied or otherwise used) if a square is positioned to the right (e.g., a square with a "N" for "no").

[0237] Status indicators discussed herein (e.g., the status indicators in FIGS. **30**A-**30**P, such as status indicators **3028**, **3030**A, **3030**B) may function as "toggles" or switches that may be selected or otherwise activated to toggle or otherwise change the indicated status. For example, the status corresponding to "Pay with Bonus" (valued at "$YY") is indicated as being enabled ("Y") at status indicator **3030**A in FIG. **30**D, and can be changed to disabled ("N)" by, for example, touching (or touching and dragging rightward) the status indicator **3030**A on a touchscreen.

[0238] In certain implementations, a user may be allowed to indicate a frequency for a reward, such as a maximum number of times the reward would be applied or otherwise used. Frequency may be indicated via a frequency selector **3032**, and may have a value of, for example, "1", "2", or another selected value "z". The frequency value may be changed, for example, via a selection made using a drop down menu or via an input into a text box. Additionally or alternatively to frequency, the user may be allowed to provide a time window or duration during which the reward will be applied, after which the reward would be deactivated until reactivated again. Duration may be indicated via a duration selector **3034**, and may have a value of, for example, an hour from activation, 24 hours from activation, the day of activation (e.g., until midnight), within a week ("Wk") from activation, the week of activation (e.g., until midnight on the upcoming Sunday), indefinitely (e.g., until deactivated or expended), or a specified future time period (e.g., during a promotional period, during a lunch hour, etc.). The time window may be changed, for example, via a selection made using a drop down menu, via an input into a text box, or otherwise.

[0239] In various implementations, the application may indicate how far away a provider is from a location, such as the current location of the mobile device on which the application is running, from the user's known residence, or from the user's anticipated location based on the current date and time (e.g., from a user's workplace during work hours). At distance indicator **3036**, interface **3000**D may indicate

that Provider **1**, through which certain rewards may be redeemable, is a certain distance away (e.g., 0.1 miles), and a navigation selector ("Navigate"), if activated (e.g., by touching "Navigate" on a touchscreen), may assist the user in reaching the provider. For example, the navigation selector may launch a mapping or driving application and provide the address of the provider to the mapping/driving application as the user's destination, or the application may display driving directions (with or without GPS navigation) within the application without launching or interfacing with another application or device. Interface **3000**D also provides a "Switch View" selector **3038** (which may include a drop down menu with alternative selectable views) to allow the user to switch from the current view (e.g., providers for a selected account as in interface **3000**D) to another view (e.g., the view of interface **3000**F).

[0240] Example interface **3000**E of FIG. **30**E is another example interface that may be presented upon, for example, selection of accounts icon **3002**C in FIG. **30**A. Interface **3000**E presents an account listing **3040**, which identifies user accounts and account groups ("Account Group 1" and "Account Group 2"), which may correspond with multiple accounts that can be selected, enabled, disabled, etc., as a group. Such groupings may have been defined, for example, via interface **3000**B. Account groups may include accounts in certain categories (which may be, e.g., user-defined or automatically categorized by, e.g., the application), such as all credit cards regardless of issuing financial institution, all payment cards of a particular issuing financial institution, all non-credit payment vehicles, etc. Each account group may include accounts held at multiple entities or one entity, and they may be accounts of a certain type or a certain method in which rewards are earned and/or redeemed, or may be accounts of different types with different methods in which rewards are earned and/or redeemed. Each grouping has a status indicator that indicates whether some or all of the accounts in the group/category are currently "On" or "Off".

[0241] One of the accounts from account listing **3040** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the account identifier or a corresponding arrowhead or other icon. In FIG. **30**F, arrowhead icon **3042** corresponding with Entity **3** Account **2** has been selected, analogous to FIG. **30**D. A rewards listing **3044** identifies available rewards which may be redeemed through transactions involving the selected account (e.g., Entity **3** Account **2**). For each reward, providers at which the reward is redeemable are listed. In certain implementations, rewards earned with respect to one provider may be transferable or otherwise redeemable with another provider. For example, a discount earned for a first provider may be applied in one or more transactions involving a second provider.

[0242] In FIG. **30**F, rewards listing **3044** identifies "Cash Bonus" as a first reward that may be redeemed through transactions involving Providers **2** and **4**, and "Discount" as a second reward that may be redeemed through transactions involving Providers **4** and **5**. A balance indicator **3046** may specify what rewards balance remains. A status indicator **3048** indicates whether use of a corresponding reward ("Cash Bonus") is enabled with respect to transactions involving the selected account (e.g., Entity **3** Account **2**) at the listed provider or providers (e.g., Providers **2** and **4**). In the version of status indicator **3048** shown in FIG. **30**F, a black solid square may be positioned to the left of a rectangle to indicate, for example, that use of the reward is enabled with respect to all listed providers, the black solid square may be positioned to the right of the rectangle to indicate that use of the reward is disabled for all listed providers, and the black solid square may be positioned in the middle (or otherwise somewhere between the left and right) to indicate that use of the reward is enabled with respect to at least one provider while use of the reward is disabled with respect to at least one provider. Status indicators corresponding to particular providers may indicate whether use of a reward is enabled or disabled in a similar fashion (e.g., a square positioned to the left with a "Y" for "yes" may indicate the reward is enabled for use at a corresponding provider in a transaction involving the identified account, and a square positioned to the right with a "N" for "no" may indicate the reward is not usable at the corresponding provider in a transaction involving the identified account).

[0243] Example interface **3000**G of FIG. **30**G may be presented upon, for example, selection of providers icon **3002**G in FIG. **30**A. Interface **3000**G presents a provider listing **3050**, which identifies providers at which rewards are or may be redeemable. Each provider has a status indicator that indicates whether the provider is currently "On" (and thus use of rewards is enabled, activated, or otherwise usable) or "Off" (and thus use of rewards is disabled, deactivated, or otherwise unusable). The user may be allowed to change the status for a provider by, for example, selecting the corresponding status indicator (e.g., by touching "Status" or "On" or "Off" for a particular provider on a touchscreen) and selecting a different status (e.g., via another interface discussed elsewhere). The application may allow the user to "visit" (virtually and/or physically) a provider via a visit icon **3052**. If the provider is an online merchant, selection of the visit icon **3052** may direct the user to the merchant's website (in-application or via a separate Internet browser or other application launched by the application), and if the provider has a physical location, selection of the visit icon **3052** may provide directions or navigation (e.g., within the same application and/or by launching another application). If there are other providers that do not fit on the screen, a user may view them by, for example, scrolling the page (e.g., by swiping up on a touchscreen) or by selecting "Show More Providers" at the bottom of interface **3000**G.

[0244] One of the providers from provider listing **3050** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the identified provider or a corresponding arrowhead or other icon. In FIG. **30**H, arrowhead icon **3054** corresponding with Provider **3** has been selected. The provider, as well as its location, promotional offerings, and/or other information may be presented at a provider identification region **3056**, which identifies which provider has been selected for review and/or management. An account listing **3058** identifies particular accounts with specified rewards which may be redeemable through the identified provider. Rewards earned with respect to more than one account may be usable with respect to one provider. In FIG. **30**H, account listing **3058** identifies Entity **2** Account **1** and Entity **3** Account **3**, each of which has two rewards that may be individually activated and deactivated for redemption through a transaction involving the corresponding provider (e.g., a purchase from Provider **3**). Status indicators corresponding to particular rewards (e.g., "Apply 15% Discount") may indicate whether the particular reward

is enabled or disabled for use at the identified provider (e.g., Provider **3**) in a transaction involving the identified account (e.g., Entity **2** Account **1**).

[0245] Example interface **30001** of FIG. **30**I may, in a similar fashion, be presented upon, for example, selection of providers icon **3002**G in FIG. **30**A. Interface **30001** presents a provider listing **3060**, which identifies providers or provider categories at which rewards are or may be redeemable. Provider categories may correspond with multiple providers that can be selected, enabled, disabled, etc., as a group. Such groupings may have been defined, for example, via interface **3000**B. Provider groups may include providers in certain categories (which may be, e.g., user-defined or automatically categorized by, e.g., the application), such as merchants selling a certain category of goods. One of the providers from provider listing **3060** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the provider identifier or a corresponding arrowhead or other icon. In FIG. **30**J, arrowhead icon **3062** corresponding with Provider **3** has been selected. A rewards listing **3064** identifies particular rewards (e.g., discount and cash bonus) which may be redeemable at the identified provider.

[0246] Example interfaces **3000**K of FIGS. **30**K and **3000**M of FIG. **30**M may be presented upon, for example, selection of rewards icon **3002**K in FIG. **30**A. Interfaces **3000**K and **3000**M present rewards listings **3070** and **3080**, which identify earned or earnable rewards and rewards groupings. If there are other rewards or rewards groupings that do not fit on the screen, a user may view them by, for example, scrolling the page (e.g., by swiping up on a touchscreen) or by selecting "Show More Rewards" at the bottom of interfaces **3000**K and **3000**M. One of the rewards from rewards listings **3070** and **3080** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the identified reward or a corresponding arrowhead or other icon. In FIGS. **30**L and **30**N, arrowhead icons **3072** and **3082**, respectively, corresponding with Cash Bonus **1** has been selected. Rewards listing **3074** in FIG. **30**L may identify particular accounts through which the identified reward (here, Cash Bonus **1**) has been earned and may be redeemed, with specified providers through which the identified reward may be redeemable listed below the account identifier (e.g., "Cash Bonus **1**" may be activated for use at Provider **3** and/or at the providers in Provider Category 5 in one or more transactions involving Entity **2** Account **1**). Status indicator **3076** indicates that use of "Cash Bonus **1**" is disabled for use at Provider **3** in transactions involving Entity **2** Account **1**, and may be enabled by toggling status indicator **3076**. Rewards listing **3084** in FIG. **30**N identifies particular providers or provider groups at which the identified rewards may be redeemed (e.g., the cash bonus may be activated for use at the providers in Provider Category 3). Status indicator **3086** indicates that use of "Cash Bonus **1**" (which may have been earned through past transactions involving Entity **1** Account **1**) is disabled for use at the providers in Provider Category 3 in subsequent transactions involving Entity **1** Account **1**, and may be enabled by toggling status indicator **3086**.

[0247] Example interface **30000** of FIG. **30**O may be presented upon, for example, selection of history icon **30020** in FIG. **30**A. Interface **30000** presents transaction listing **3090**, which identifies transactions (by, e.g., account, provider, date, and transaction amount) involving user accounts accessible to the Control Tower application. If rewards were applied to the transaction, transaction listing **3090** may indicate, for example, which rewards were applied, the amount of rewards applied, the amount of the transaction not covered by the reward, the remaining rewards balance, etc. If there are other transactions that do not fit on the screen, a user may view them by, for example, scrolling the page (e.g., by swiping up on a touchscreen) or by selecting "Show More Transactions" at the bottom of interface **30000**.

[0248] One of the transactions from transaction listing **3090** may be selected by, for example, activating (e.g., by touching or otherwise selecting) the identified transaction or a corresponding arrowhead or other icon. In FIG. **30**P, arrowhead icons **3092** corresponding with the transaction at Provider **6**, has been selected. Interface **3000**P provides additional information for the selected transaction. Interface **3000**P may allow the user to retroactively apply an available reward to the transaction at **3094**. The rewards that are redeemable for the transaction are a $Y bonus and a Z % discount. As indicated by the bolded rectangles, the user has selected (at **3096**) the bonus, and has selected (at **3098**) to confirm application of the selected bonus to the transaction. This allows the user to retroactively apply a virtual rewards currency to a transaction that was partially or wholly paid-for using monetary currency, and may result in a credit to the corresponding account of the user once the retroactive application of the rewards has been processed. In various implementations, rewards may be retroactively applied so as to apply multiple rewards to a transaction, to apply a reward to a transaction to which a reward was not previously applied, and/or to change the reward that is applied to selected transactions. In certain implementations, in-process transactions may be listed in a transaction listing, and the user allowed to select which rewards (if any) are to be applied to the transactions before processing of the transaction is completed (e.g., before debiting and crediting of monies and rewards has occurred).

[0249] It is noted that any of the features, selectors, icons, functionalities, information, elements, or other aspects of any one interface or figure may be combined or swapped with or applied to any of the features, selectors, icons, functionalities, information, elements, or other aspects of any other interface or figure.

[0250] The embodiments described herein have been described with reference to drawings. The drawings illustrate certain details of specific embodiments that implement the systems, methods and programs described herein. However, describing the embodiments with drawings should not be construed as imposing on the disclosure any limitations that may be present in the drawings.

[0251] It should be understood that no claim element herein is to be construed under the provisions of 35 U.S.C. § 112(f), unless the element is expressly recited using the phrase "means for."

[0252] As used herein, the term "circuit" may include hardware structured to execute the functions described herein. In some embodiments, each respective "circuit" may include machine-readable media for configuring the hardware to execute the functions described herein. The circuit may be embodied as one or more circuitry components including, but not limited to, processing circuitry, network interfaces, peripheral devices, input devices, output devices, sensors, etc. In some embodiments, a circuit may take the form of one or more analog circuits, electronic circuits (e.g., integrated circuits (IC), discrete circuits, system on a chip

(SOCs) circuits, etc.), telecommunication circuits, hybrid circuits, and any other type of "circuit." In this regard, the "circuit" may include any type of component for accomplishing or facilitating achievement of the operations described herein. For example, a circuit as described herein may include one or more transistors, logic gates (e.g., NAND, AND, NOR, OR, XOR, NOT, XNOR, etc.), resistors, multiplexers, registers, capacitors, inductors, diodes, wiring, and so on).

[0253] The "circuit" may also include one or more dedicated processors communicatively coupled to one or more dedicated memory or memory devices. In this regard, the one or more dedicated processors may execute instructions stored in the dedicated memory or may execute instructions otherwise accessible to the one or more dedicated processors. In some embodiments, the one or more dedicated processors may be embodied in various ways. The one or more dedicated processors may be constructed in a manner sufficient to perform at least the operations described herein. In some embodiments, the one or more dedicated processors may be shared by multiple circuits (e.g., circuit A and circuit B may comprise or otherwise share the same processor which, in some example embodiments, may execute instructions stored, or otherwise accessed, via different areas of memory). Alternatively or additionally, the one or more dedicated processors may be structured to perform or otherwise execute certain operations independent of one or more co-processors. In other example embodiments, two or more processors may be coupled via a bus to enable independent, parallel, pipelined, or multi-threaded instruction execution. Each processor may be implemented as one or more general-purpose processors, application specific integrated circuits (ASICs), field programmable gate arrays (FPGAs), digital signal processors (DSPs), or other suitable electronic data processing components structured to execute instructions provided by memory. The one or more dedicated processors may take the form of a single core processor, multi-core processor (e.g., a dual core processor, triple core processor, quad core processor, etc.), microprocessor, etc.

[0254] Any foregoing references to currency or funds are intended to include fiat currencies, non-fiat currencies (e.g., precious metals), and math-based currencies (often referred to as cryptocurrencies). Examples of math-based currencies include Bitcoin, Litecoin, Dogecoin, and the like.

[0255] It should be noted that although the diagrams herein may show a specific order and composition of method steps, it is understood that the order of these steps may differ from what is depicted. For example, two or more steps may be performed concurrently or with partial concurrence. Also, some method steps that are performed as discrete steps may be combined, steps being performed as a combined step may be separated into discrete steps, the sequence of certain processes may be reversed or otherwise varied, and the nature or number of discrete processes may be altered or varied. The order or sequence of any element or apparatus may be varied or substituted according to alternative embodiments. Accordingly, all such modifications are intended to be included within the scope of the present disclosure as defined in the appended claims.

[0256] The foregoing description of embodiments has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure to the precise form disclosed, and modifications and variations are possible in light of the above teachings or may be acquired from this disclosure. The embodiments were chosen and described in order to explain the principals of the disclosure and its practical application to enable one skilled in the art to utilize the various embodiments and with various modifications as are suited to the particular use contemplated. Other substitutions, modifications, changes and omissions may be made in the design, operating conditions and arrangement of the embodiments without departing from the scope of the present disclosure as expressed in the appended claims

What is claimed is:

1. A system of a first entity, the system comprising one or more hardware processors configured to:

provide, via an internet portal accessed on a user device, an account listing comprising a financial account linked with a service provider client application which communicates, when executed on the user device, with a service provider computing system of a second entity;

provide, via the internet portal, based at least in part on selection of the financial account, an access permissions listing comprising one or more security settings attributable to the service provider client application running on the user device;

receive, via the internet portal, selection of a first set of security settings corresponding to one or more data types or functionalities associated with the service provider client application;

receive, at a security system of the first entity, a first application programming interface (API) call comprising a first account request transmitted from the service provider computing system of the second entity based at least in part on the service provider client application executing at the user device communicating with the service provider computing system;

determine, by the security system, that the first API call does not comply with the first set of security settings attributed to the service provider client application; and

decline the first account request from the service provider client application based at least in part on determining that the first API call does not comply with the first set of security settings.

2. The system of claim **1**, wherein the one or more hardware processors are further configured to:

accept a login credential via the internet portal; and

verify that the login credential permits access to the account listing.

3. The system of claim **2**, wherein the one or more hardware processors are further configured to provide the account listing in response to verifying that the login credential permits access to the account listing.

4. The system of claim **1**, wherein the one or more hardware processors are further configured to:

receive, at the security system of the first entity, a second API call comprising a second account request transmitted from the service provider computing system of the second entity;

determine that the second API call complies with the first set of security settings attributed to the service provider client application; and

grant the second account request based at least in part on determining that the second API call complies with the first set of security settings.

5. The system of claim **4**, wherein the one or more hardware processors are further configured to verify that the second API call complies with the first set of security settings attributed to the service provider client application by determining that the second API call comprises a request for a data type or a functionality granted to the service provider client application via the first set of security settings.

6. The system of claim **1**, wherein the one or more hardware processors are further configured to:

receive a second selection of a second set of security settings corresponding to the one or more data types or functionalities associated with the service provider client application; and

revoke at least a subset of the first set of security settings based on the second selection of the second set of security settings.

7. The system of claim **6**, wherein the second set of security settings adds one or more access permissions revoked by the first set of security settings.

8. The system of claim **6**, wherein the one or more hardware processors are further configured to generate an access token indicating limited access, by the service provider client application, to a subset of financial and non-financial data of the financial account.

9. The system of claim **1**, wherein the one or more hardware processors are further configured to determine that the first API call does not comply with the first set of security settings based on a determination that the first API call comprises a request for a data type or a functionality not granted to the service provider client application through the first set of security settings.

10. A method, comprising:

providing, via an internet portal accessed on a user device, an account listing comprising a financial account linked with a service provider client application which communicates, when executed on the user device, with a service provider computing system of a second entity;

providing, by the one or more processors via the internet portal, based at least in part on selection of the financial account, an access permissions listing comprising one or more security settings attributable to the service provider client application running on the user device;

receiving, by the one or more processors via the internet portal, selection of a first set of security settings corresponding to one or more data types or functionalities associated with the service provider client application;

receiving, by the one or more processors at a security system of the first entity, a first application programming interface (API) call comprising a first account request transmitted from the service provider computing system of the second entity based at least in part on the service provider client application executing at the user device communicating with the service provider computing system;

determining, by the one or more processors at the security system, that the first API call does not comply with the first set of security settings attributed to the service provider client application; and

declining, by the one or more processors, the first account request from the service provider client application based at least in part on determining that the first API call does not comply with the first set of security settings.

11. The method of claim **10**, further comprising:

accepting, by the one or more processors via the internet portal, a login credential; and

verifying, by the one or more processors, that the login credential permits access to the account listing.

12. The method of claim **11**, further comprising providing, by the one or more processors, the account listing in response to verifying that the login credential permits access to the account listing.

13. The method of claim **10**, further comprising:

receiving, by the one or more processors at the security system of the first entity, a second API call comprising a second account request transmitted from the service provider computing system of the second entity;

determining, by the one or more processors, that the second API call complies with the first set of security settings attributed to the service provider client application; and

granting, by the one or more processors, the second account request based at least in part on determining that the second API call complies with the first set of security settings.

14. The method of claim **13**, further comprising verifying, by the one or more processors, that the second API call complies with the first set of security settings attributed to the service provider client application by determining that the second API call comprises a request for a data type or a functionality granted to the service provider client application via the first set of security settings.

15. The method of claim **10**, further comprising:

receiving, by the one or more processors, a second selection of a second set of security settings corresponding to the one or more data types or functionalities associated with the service provider client application; and

revoking, by the one or more processors, at least a subset of the first set of security settings based on the second selection of the second set of security settings.

16. The method of claim **15**, wherein the second set of security settings adds one or more access permissions revoked by the first set of security settings.

17. The method of claim **15**, further comprising generating, by the one or more processors, an access token indicating limited access, by the service provider client application, to a subset of financial and non-financial data of the financial account.

18. The method of claim **10**, wherein determining that the first API call does not comply with the first set of security settings comprises determining, by the one or more processors, that the first API call comprises a request for a data type or a functionality not granted to the service provider client application through the first set of security settings.

19. A non-transitory computer-readable storage medium storing instructions that, when executed by one or more processors of a first entity, cause the one or more processors to perform operations comprising:

providing, via an internet portal accessed on a user device, an account listing comprising a financial account linked with a service provider client application which communicates, when executed on the user device, with a service provider computing system of a second entity;

providing, via the internet portal, based at least in part on selection of the financial account, an access permissions listing comprising one or more security settings

attributable to the service provider client application running on the user device;

receiving, via the internet portal, selection of a first set of security settings corresponding to one or more data types or functionalities associated with the service provider client application;

receiving, at a security system of the first entity, a first application programming interface (API) call comprising a first account request transmitted from the service provider computing system of the second entity based at least in part on the service provider client application executing at the user device communicating with the service provider computing system;

determining, by the security system, that the first API call does not comply with the first set of security settings attributed to the service provider client application; and

declining the first account request from the service provider client application based at least in part on determining that the first API call does not comply with the first set of security settings.

20. The non-transitory computer-readable storage medium of claim **19**, wherein the operations further comprise:

accepting a login credential via the internet portal; and

verifying that the login credential permits access to the account listing.

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