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(54) Title: FLOATING ANIMATED PUSH INTERFACES FOR INTERACTIVE DYNAMIC PUSH NOTIFICATIONS AND OTHER CONTENT

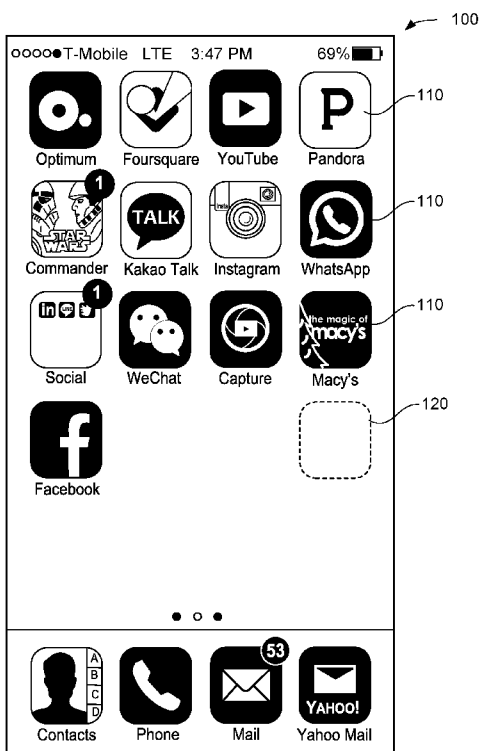


FIG. 1

(57) Abstract: Systems and methods for providing a dynamically animated icon on a display screen of a user device are included in the disclosure. The display screen includes a plurality of static icons. The method includes receiving, by a server system, dynamic content from a service provider, generating, by the server system, a dynamically animated icon that illustrates the dynamic content received from the service provider, and causing, by the server system, the user device to display the dynamically animated icon on the display screen, the dynamically animated icon overlaying one or more of the plurality of static icons.

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## **FLOATING ANIMATED PUSH INTERFACES FOR INTERACTIVE DYNAMIC PUSH NOTIFICATIONS AND OTHER CONTENT**

### **CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of the following U.S. Patent Applications: Serial No. 62/280,474, filed on January 19, 2016 and Serial No. 62/265,702, filed on December 10, 2015. The entire contents of the earlier applications are incorporated herein by reference.

### **TECHNICAL FIELD**

[0002] This disclosure relates to presenting interactive and dynamically changing information to users of electronic devices, such as smartphones and the like.

### **BACKGROUND**

[0003] Electronic devices (e.g., cellular phones, tablet computers, smartphones, personal data assistants, smart watches, and virtual reality devices) can facilitate interactions between two or more different entities. For example, in some cases, a user can operate an electronic device in order to transmit information to others through a communications network. As another example, in some cases, a user can operate an electronic device in order to receive and review information from others through a communications network.

### **SUMMARY**

[0004] The present disclosure describes techniques for providing a dynamically animated icon to a display screen of a user device.

[0005] In one aspect, for example, computer-implemented method for providing a dynamically animated icon on a display screen of a user device, in which the display screen includes a plurality of static icons, is described. The method includes receiving, by a server system, dynamic content from a service provider, generating, by the server system, a dynamically animated icon to illustrate the dynamic content received from the service provider, and causing, by the server system, the user device to display the dynamically animated icon on the display screen, the dynamically animated icon overlaying one or more of the plurality of static icons.

[0006] The foregoing and other aspects can each optionally include one or more of the following features, alone or in combination. Causing the user device to display the dynamically animated icon may include causing the user device to display the dynamically animated icon on a home screen of the user device. Causing the user device to display the dynamically animated icon may include causing the user device to display the dynamically animated icon on top of all applications that are running on the user device. The dynamic content may include a map showing a current position of a moving object on the map. The dynamic content may include content of a calendar invitation. The dynamic content may include information regarding an outcome of a bid of the user to purchase an item on an auction site. The dynamic content may include a promotion or offer that is currently offered by the service provider. The service provider may include one of the following: a dating site, bank or other financial institution, music retailer, ticket seller, television shopping and retail, auction site, messaging service, social networking service, sports and fantasy sports related company, video game provider, gambling site, food service provider, clothing and shoes retailer, Federal State and local government, technology retailer or wholesaler, software products and service provider, or weather and geological service. The service provider may be an individual user who wants to engage friends, family members, or personal network with personal alerts such as upcoming birthdays or events, personal "for sale" items, personal marketing ventures and other alerts. Generating the dynamically animated icon may include causing an icon to change a color and/or a shape of the icon. Generating the dynamically animated icon may include causing the icon to change an image, object, and/or text that is displayed within the icon. Generating the dynamically animated icon may include causing an icon to blink. Generating the dynamically animated icon may include causing an icon to displaying an animation, movie, or video within a portion of the icon or across the entirety of the icon. The service provider may be a dating site and the dynamic content includes information regarding dating prospects. The service provider may be a messaging service and the dynamic includes a receipt of a message from the messaging service.

[0007] According to another aspect, another method for providing a dynamically animated icon on a display screen of a user device, in which the display screen

includes a plurality of static icons, is described. The method comprising receiving, by at least one processor, from a server system, a dynamically animated icon that illustrates dynamic content provided by a service provider, and displaying, by the at least one processor, the dynamically animated icon on the display screen, the dynamically animated icon overlaying one or more of the plurality of static icons.

[0008] The foregoing and other aspects can each optionally include one or more of the following features, alone or in combination. The method can further include receiving, by the at least one processor, from a user of the user device, a selection of the dynamically animated icon and in response, performing one or more of the following operations: displaying additional information, executing an application, or transmitting information to one or more other users. Receiving, from the user, a selection of the dynamically animated icon may include receiving a user gesture with respect to the icon or a voice command. The method further includes detecting, by the at least one processor, a user click on the display screen outside of the dynamically animated icon, and in response to detecting the user click, causing the dynamically animated icon to vanish from the display.

[0009] Systems for presenting content are described as well. For example, a system includes at least one computing device, and a computer-readable medium coupled to the at least one computing device having instructions stored thereon which, when executed by the at least one computing device, cause the at least one computing device to perform operations to provide a dynamically animated icon on a display screen of a user device, in which the display screen including a plurality of static icons. The operations include receiving dynamic content from a service provider, generating a dynamically animated icon that illustrates the dynamic content received from the service provider, and causing the user device to display the dynamically animated icon on the display screen of the user device, the dynamically animated icon overlaying one or more of the plurality of static icons.

[0010] In some embodiments, implementations for interactive dynamic interfaces (DPis) on a user device are described. Dynamic Push Interfaces (DPis) provide automated tools that allow enterprises of any size to engage their customers, clients, and user base more intimately by transforming software application icons into

interactive interfaces or “pushing” new interfaces directly to the home screens of users’ devices. These interfaces can receive Dynamic Messages (e.g., messages of 1024 bits or more or messages such as pictures, videos, GIFs, animations, fluttering badges, and “mini” software applications), allow Navigation to more desired or preferred locations and pages within the software application or outside of the software application (also referred to as “Deep Linking”), and also sends data back to organizations that are sending the Dynamic Messages (e.g., Market or User Analytics). The transmission of the Dynamic Messages, the option to register (opt-in) and the ability to delete (opt-out) the interactive dynamic push notification, the setting of Deep Link preferences of the desired landing page or location, and the reception of the data from the interaction with the user can all be viewed, controlled, maintained, administered, structured, and queried from a central dashboard.

[0011] Various other aspects, features and advantages will be apparent from the detailed description, the drawings and the claims.

#### BRIEF DESCRIPTION OF DRAWINGS

[0012] FIG. 1 depicts an example user interface.

[0013] FIGS. 2A-F depict an example icon that is dynamically animated in order to display and receive information.

[0014] FIGS. 3A – 3D illustrate examples of floating animated dynamic push icon functionality.

[0015] FIGS. 3E – 3I illustrate an example of an interactive animated icon.

[0016] FIGS. 3J – 3P illustrate an example of a floating animated dynamic push icon.

[0017] FIGS. 3Q – 3S illustrate another example of a floating animated dynamic push icon.

[0018] FIG. 4A depicts an example administrator interface.

[0019] FIG. 4B depicts an example analytics interface.

[0020] FIG. 5 is a diagram of an example system architecture for implementing interactive dynamic push notifications and campaigns.

[0021] FIG. 6 is a component view of the architecture.

[0022] FIG. 7 illustrates an example of a sequential flow for the push notification architecture.

## DETAILED DESCRIPTION

[0023] Implementations for displaying interactive dynamic notifications on a user device are described herein. One or more implementations can be used for advertising goods or services, or relaying information relevant to an application, company, and/or user. The user can also interact with these notifications to request additional information, execute applications, transmit information to others, and/or perform any other function.

[0024] In an example implementation, a user device (e.g., a smartphone or a tablet computer) includes a display screen that is used to present information visually to a user. For example, the display screen presents a graphical user interface, upon which one or more applications are each visually represented using a graphical icon. In the following description, references to “icon” should be understood as applying to icons, apps, instant apps and/or widgets. References to “icon” can also refer to icons associated with Progressive Web Applications (PWAs). Specifically, a PWA is an app that can allow a user to visit an URL and immediately start using the app without actually installing the app in the user’s device. A PWA can eliminate unnecessary steps for using an app such as downloading, installing, and opening the app.

[0020] The graphical icons can be dynamically animated in order to display information to the user and receive information from the user. As one example, an icon representing a retail store can be animated to display promotions offered by the retail store. As another example, an icon representing a bank can be animated to display information regarding a user’s relationship with the bank (e.g., balance or transaction information). As yet another example, an icon representing an auction site can be animated to display information regarding outcomes of a user’s bids to purchase an item. As yet another example, an icon representing a dating service can be animated to display information regarding dating prospects. This animation can be “pushed” to the user device (e.g., from a server system) in order to provide the user with notifications in real-time or substantially real-time. Animations can be cached in case the phone is turned off, and when the phone is turned on, all cached animations can run sequentially as a commercial advertisement. In some instances, this animation can be displayed within a portion of an icon or across the entirety of an

icon that is currently residing in a grid of icons on the display screen of the user device.

[0025] In some other instances, icons be displayed on top of other user content, applications, or app icons that are residing in the display screen of the user device. The icons can be dynamically animated to show notification content and can be interactive. For example, the icons can be dynamically animated to show a product which is currently on a sale for the Christmas, a current position (real-time or nearly real-time position) of a moving object moving on a map (e.g., a car arriving on a map), or the date of a calendar invite. The user does not have to open an app to see the notification content or other important information. In addition, the user of the user device can directly interact with the notification content without the need of opening an app. As an example, the user can click on the animated icon to purchase the sale product. In another example, when the animated icon shows a new message sent through a messaging app, the user can directly reply to the new message by clicking on the animated icon without opening the messaging app. In yet when the animated icon shows a calendar invite notification for an event scheduled through an event app, the user can accept the calendar invite within the notification.

[0026] Icons can be dynamically animated in various ways, including modifying the icon's color, shape, and/or displayed image with or without audio. For example, an animated icon can blink, change color, and/or change shape. As another example, an animated icon can depict the appearance, modification, and/or disappearance of text and objects displayed within the icon. As another example, an animated icon can display an animation, movie, audio and/or video within a portion of the icon or across the entirety of the icon. As another example, an animated icon can display a commercial or cartoon within a portion of the icon or across the entirety of the icon. In some cases, the animated icon can be hidden from view, then selectively revealed or displayed to the user. This can be useful, for example, to notify users of particular types of information (e.g., receipt of a message) while conserving space in the user interface when no information is being displayed.

[0027] In some instances, icons and their animations can be customized so that they display the desired information. For example, an icon can be customized by a user of the device, other users, advertisers, retailers, banks, or any other entity.

[0028] The user can also interact with the icon. For example, the user can select the icon in order to request additional information, execute applications, transmit information to others, load videos, open videos, and/or perform other operations. A user can interact with the icon in one or more different ways. For example, in some cases, a device can include a touch sensitive display screen that detects when the user touches or otherwise physically interacts with the display screen; to select an icon, the user can use his finger or hand to click, touch, or hold the display screen above the location where the icon appears. As another example, in some cases, a device can include an input device (e.g., a mouse, a trackpad, a keyboard, a joystick, a stylus, a dial, an eye-tracking device, or a voice-command or gesture-tracking device) that allows a user to move or activate a selection element of the graphical user interface (e.g., a cursor or selection box) on the graphical display; to select an icon, the user can use the input device to move the selection element over the icon and confirm his selection. In some cases, when the user interacts with the icon, information regarding the user's interaction is transmitted to a third party (e.g., an administrator for the application, an advertiser, a retailer, or any other party). As an example, in some cases, information regarding the user installing the application (and accompanying icon), the time and nature of the user's interaction with the icon, and the user's location when he interacted with the icon can be transmitted to a third party for analysis. This information can be combined with other information (e.g., other usage data related to one or more users) in order to obtain more detailed information regarding each user's behavior.

[0029] An example user interface 100 is shown in FIG. 1. User interface 100 includes several icons 110, each of which represents a particular application that is available on an electronic device. A user can select any one of the icons (e.g., by touching a graphical representation of an icon on a touch-sensitive or pressure-sensitive display device or clicking on a graphical representation of an icon using an input device such as a mouse or a voice-command device) in order to execute the associated application. For example, a user can touch a graphical representation of an

icon corresponding to a “Macy’s” application in order to execute a “Macy’s” application. In some cases, the user interface 100 can be referred to as a “launcher,” a “home screen,” a “spring board,” or a “start screen.”

[0030] One or more of the icons 110 can be dynamically animated in order to display information to the user. In some cases, a dynamically animated icon can be presented as a series of static images (e.g., “frames”) that visually differ from each other in some way. When viewed as a sequence, the images provide an appearance of motion or dynamic change. In some cases, the differences between sequential images can be relatively slight, such that the sequence of images provides an appearance of fluid motion.

As an example, FIGS. 2A-F show, in sequence, the appearance of the icon 110 over a period of time. As shown in FIG. 2A, the icon 110 initially shows a star shape (e.g., representing a logo of an application or organization). As shown in FIGS. 2B-C, a tree shape is depicted entering the icon and covering the star shape. As shown in FIG. 2D-E, the tree shape is depicted leaving the icon, revealing a promotional message. As shown in FIG. 2F, the promotional message is maintained.

[0031] Although one example animation sequence is shown in FIGS. 2A-F, this is merely an illustrative example. In general, icons can be dynamically animated in various ways, including modifications to its color, shape, and displayed image. Further, animations can be played a single time (e.g., by playing a single animation sequence from the beginning to the end) and/or repeated (e.g., by playing the animation sequence multiple times, either with or without a period of rest in between).

[0032] In some cases, a dynamically animated icon can display a movie or video (e.g., a movie or video with or without accompanying sound) within a portion of the icon or across the entirety of the icon. For example, in some cases, an animated icon can display a live-action film (e.g., a film produced using one or more live actors, physical objects, and/or real-world locations). Thus, a live-action film can be presented within the icon in order to display information to the user. In some cases, the live-action film can be presented in a native video format (e.g., a video file), or it can be represented in an animated image format (e.g., an animated GIF) with or without audio.

[0033] In some cases, a dynamically animated icon can simultaneously depict several display elements (e.g., several different shapes, lines, objects, and/or patterns), where at least some of the display elements appear to be moving differently from others. For example, in some cases, a dynamically animated icon can depict a first display element that appears to be traveling in one direction, while simultaneously depicting a second display element that appears to be traveling in a different direction. As another example, in addition to the first and second display elements, the dynamically animated icon can simultaneously depict a third display element that appears to be changing shape. As another example, in addition to the first, second, and third display elements, the dynamically animated icon can simultaneously depict a fourth display element that appears to be changing size. In this manner, several different display elements can be displayed simultaneously on an animated icon, each of which can be moving differently from and/or independently of one another.

[0034] In some cases, a dynamically animated icon does not merely depict one or more static display elements (e.g., static images or text) and cycle between those static display elements using transition effects (e.g., a “sliding” effect, a “screen wipe” effect, or “flipping” effect). Instead, in some cases, a dynamically animated icon can depict one or more display elements that appear to be interacting with each other in a dynamic manner. As an example, in some cases, a dynamically animated icon can depict one or more articulating objects (e.g., cartoon representations of persons, animals, figures, or objects) and/or one or more objects that appear to be physically interacting with each other. Thus, in some cases, a dynamically animated icon does not merely display static images or text according to a transition effect, and instead provides the user with a more vibrant visual experience.

[0035] In some cases, an icon can be dynamically animated such that the icon is hidden from view (e.g., not displayed on a user interface), then selectively revealed or displayed to the user (e.g., graphically displayed on the user interface such that it becomes visible to a user). In some cases, when the icon is hidden, a portion of the user interface can be reserved for the icon, such that it is positioned at a particular location once it is revealed. For example, referring to FIG. 1, the user interface 100 can reserve a region 120 (denoted by a dotted box) for a hidden icon, such that other

icons do not occupy the region 120. When the icon is revealed, it is displayed in the region 120.

[0036] Icons and their animations can be customized so that they display the desired information. For instance, in an example implementation, the icon 110 is typically static (e.g., not animated), such that it appears as a traditional still image on the graphical interface 100. However, when a particular event occurs with respect to an application (e.g., the availability of a promotional offer, the availability of a message from an organization associated with an application, a change in status of the application, or any other information), the icon 110 is animated to indicate that the particular event has occurred. This can have the effect of attracting the user's attention, and notifying the user that the event has occurred. The user can then select the icon to learn more information regarding the event.

[0037] In some cases, an icon 110 can be dynamically animated to show promotional offers. For example, in some cases, an icon 110 can represent a shopping application (e.g., an application related to a particular retailer). When a promotion is made available to the user for that application (e.g., a promotion offered by the retailer), the icon 110 representing the application can be animated to indicate the availability of that promotion. Once the promotion is no longer available, the animation can cease or the icon 110 can disappear.

[0038] In some cases, an icon 110 can be dynamically animated to show the receipt of messages from a messaging service (e.g., an e-mail, an instant message, a social media message). For example, in some cases, an icon 110 can represent a messaging application (e.g., a client application that provides a user with access to a messaging system or social media platform). When a message is transmitted to the user of that application, the icon 110 representing the application can be animated to indicate receipt of that message. In some cases, the message can be animated to show content from the message. For example, the icon can be animated to show text, images, movies, videos from the message. In some cases, for example when the icon includes a movie, video, or audio clip having an audio portion, the audio portion can be played as the icon is animated. Once the message has been read or discarded, the animation can cease or the icon 110 can disappear.

[0039] In some cases, an icon 110 can be dynamically animated to show the status of a financial transaction or the status of a financial account. For example, in some cases, an icon 110 can represent a banking or brokerage application (e.g., an application that provides a user with access to a financial account at a financial institution). When a particular financial transaction has been conducted (e.g., a transfer of money or assets to or from the user's financial account), the icon 110 representing the application can be animated to indicate that the financial transaction has been conducted. For instance, the icon 110 can be animated to indicate when a purchase of a stock has been successfully completed, or to verify the purchase of any other security of asset. Further, the icon can be animated to show the status of the user's financial account (e.g., the user's account balance). The user can stop the animation (e.g., by interacting with the icon) once he has received the information. In some cases, sensitive information (e.g., account balances or payment confirmations) can be hidden unless the user authenticates his identity (e.g., by providing a password, a biometric input such as a fingerprint, voice command or any other credential).

[0040] Although an example implementations are described above, these are merely illustrative examples. In practice, animations can be used to indicate other types of information, statuses, or events directly on a user interface (e.g., on an application launcher interface, such as a "launcher," a "home screen," a "spring board," or a "start screen").

[0041] In some instances, a Dynamic Push Interface (DPI) can be implemented as an animated floating icon 110 that automatically loads or replaces a traditional static icon. For example, as indicated by FIG. 3A, a user of a smart phone or other personal computing can download an app, along with a DPI, from an app store. The mobile device updates, and a floating DPI that mimics the app's appearance is set on the device's home screen in a predetermined position, which previously may have been occupied by the static app icon. The floating DPI can receive dynamic pushes that will trigger it to animate or play Graphics Interchange Format (GIF) images.

[0042] In some cases, an application can respond in one, two, three, or more different ways, depending on whether the application's icon was animated when the user

selected it. For example, in some cases, when the user selects the icon while the icon is static (e.g., not animated), the device executes the application associated with the icon and presents the user with a default application interface (e.g., a “general” user interface). However, when the user selects the icon while it is animated a first way, the device executes the application and presents the user with a secondary application interface (e.g., a “promotional” interface that provides more information regarding a particular promotion). Further, when the user selects the icon while it is animated a second way, the device executes the application and presents the user with a tertiary application interface (e.g., a “notification” interface that provides more information regarding a particular notification or alert). In this manner, the application can be executed differently, depending on whether the icon is animated at the time of selection.

[0043] In some cases, the user can interact with the icon in one, two or more different ways in order to perform different functions. For example, in some cases, the user can select an icon once (e.g., by tapping a touch sensitive display) to perform a first action (e.g., execute an application according to a default behavior), select the icon twice (e.g., by double tapping) to perform a second action (e.g., execute an application in an alternative interface), and select the icon three times (e.g., by triple tapping) to perform a second action (e.g., execute an application in another alternative interface). In some cases, the user also can perform gestures with respect to the icon (e.g., using his finger, stylus or hand to draw a line, a circle, a check mark, or an “X” mark on the device’s display screen above the location where the icon appears or initiate a response using a voice command) in order to cause the application to perform different actions. In some cases, the user can vary the length of time in which he performs a gesture (e.g., pressing the device’s display screen for a length of time vs. tapping the device’s display screen for a shorter period of time) in order to perform different functions. In some cases, a user can define custom gestures, and associate those gestures with particular functions.

[0044] Thus, as also indicated by FIG. 3A, in some cases, a user can tap on the floating DPI, which links the device to a new landing page specific to the static or animated images presented in the dynamic push it is currently executing. Further,

clicking anywhere on the screen outside of the floating DPI closes out the app and causes the animation to vanish.

[0045] An example is illustrated in FIG. 3B in which a DPI animates. When a user taps the DPI, the device links to and displays a promotion specific to the DPI. The user then can take advantage of the promotion or return to the home screen. Upon returning to the home screen, DPI has disappeared and no longer appears on the display screen.

[0046] As illustrated in the example of FIG. 3C, a user of the mobile device on which the floating DPI appears is moveable to any position on the home screen. When the user opens an app on the device, the DPI does not play within the app; instead it is deactivated and is no longer visible on the home screen.

[0047] As illustrated in the example of FIG. 3D, a user can interact with the floating DPI by tapping the DPI one or more times. Tapping anywhere on the screen outside the DPI will close DPI.

[0048] FIGS. 3E – 3I illustrate a particular example of an interactive animated icon 200. Content associated with the interactive icon 200 is pushed to the user device (e.g., smart phone) from a server, and the dynamic content is visible in the dynamic interactive icon. By tapping the icon (e.g., using a finger), the user device links to a landing page corresponding to the animation being displayed in the icon 200.

[0049] FIGS. 3J – 3P illustrate a particular example of an animated floating DPI 300. The information associated with the animated floating DPI 300 is pushed to the user device (e.g., smart phone) from a server and appears at a predetermined position on the device's display screen (e.g., the top right corner as in FIG. 3J). The user can drag the animated floating DPI 300 to any part of the screen (see FIG. 3K). For example, the animated floating DPI 300 can occupy a spot on the screen that app icons generally occupy or it can float in between icons (see FIG. 3L). In some cases, the animated floating DPI 300 partially overlays another icon 302 (see FIG. 3M) or even can overlay another icon such that the other icon 302 is not visible on the screen (FIG. 3N). In some implementations, if the user taps on the display screen anywhere other

than on the animated floating DPI 300, the animated floating DPI 300 disappears from the screen. On the other hand, if the user taps on the animated floating DPI 300, the user device links to a landing page corresponding to the content being displayed by DPI 300.

[0050] FIGS. 3Q – 3S illustrate another example of pushing content to a personal computing device such as a smart phone. The information associated with an animated floating DPI 400 is sent from a server to the user device. The animated floating DPI 400 appears at a predetermined position on the device display screen (e.g., in the lower half of the screen as shown in FIG. 3Q). The animated floating DPI 400 can appear at a set size ranging, for example, from 1x1 to half screen or even full screen. The user can drag the animated floating DPI 400 to any other position on the screen (see FIGS. 3R and 3S). In some implementations, if the user taps on the display screen anywhere other than on the animated floating DPI 400, the animated floating DPI 400 disappears from the screen. On the other hand, if the user taps on the animated floating DPI 400, the user device links to a landing page corresponding to the content being displayed by DPI 400.

[0051] Icons and their animations can be customized so that they display the desired information. For example, an icon can be customized by a user of the device, other users, advertisers, retailers, banks, or any other entity. In some cases, icon animations can be customized by the entity that is associated with an application. For example, if an icon represents an application provided by retailer, the retailer (or its agent) can customize the animation in order to display the desired information. As another example, if an icon represents an application provided by a bank, the bank (or its agent) can customize the animation in order to display the desired information.

[0052] In some cases, icon animation can be selectively controlled for each of multiple sub-sets of users. For example, in some cases, even though several users each may have a particular application installed, different sub-sets of users each may see different icon animations. In some cases, users can be divided into different sub-sets based on demographic information. This can be particularly useful, for example, in providing targeted advertising, such that a particular promotion is presented to particular types of users who may find the promotion useful, while not presenting the

promotion to other users who might not find the promotion useful. In some cases, a user's demographic information can be determined based on a user's input. For example, in some implementations, a user can input his gender, age, location, ethnicity, interests, income, family information, and/or any other demographic information into an application associated with the animated icon. The collection or use of such information may, in some situations, be subject to privacy laws or regulations.

[0053] In some cases, icon animations can be customized by a user of a device. For example, the user can input his own animations or select particular animations from among a collection of pre-defined animations, such that icons are animated according to the user's preferences. This can be useful, for example, as it allows the user to select animations that are more aesthetically pleasing and/or more useful to that user.

[0054] As another example, the user can associate particular animations with particular criteria. For example, the user can specify that an icon should animate a certain way in order to display one type of information (e.g., a promotional offer from one merchant), and that the icon should animate a different way in order to display another type of information (e.g., a message from another user).

[0055] As another example, the user can specify the conditions under which an icon will animate. For example, the user can select particular merchants from which he wishes to receive promotional offers. Upon receipt of a promotional offer from one of the selected merchants, an icon can animate to present the promotion to the user. In some cases, a user can be presented with a list or grid of several different merchants, and a user can select one or more of these merchants to indicate particular merchants from which he wishes to receive promotional offers, or deselect one or more of these merchants to indicate particular merchants from which he no longer wishes to receive promotional offers.

[0056] As another example, the user can control animations (e.g., by selectively starting or stopping animations). This can be useful, for example, as it allows the user to cease icon animations that he is no longer interested in viewing, and initiate and/or maintain animations that he is interested in viewing. As an example, in some cases,

an icon might be animated to alert the user to a promotion, and the user can cease the animation after he is no longer interested in the promotion. In some cases, the user can control animations by inputting commands, for example by selecting the icon (e.g., by tapping the device's display screen above the location where the icon appears) or performing a gesture with respect to the icon (e.g., by drawing a line on the device's display screen above the location where the icon appears).

[0057] In some cases, a user can specify which icons he wishes to be animated. For example, the user can specify that a first sub-set of icons should be animated in order to display particular types of information, while a second sub-set of icons should remain static. This can be useful, for example, as it allows the user to specify that icons pertaining to particular applications of interest should be animated, while specifying that icons pertaining to other applications (e.g., applications in which he has less interest) are not animated. In some implementations, the user can specify each of these icons manually. In some implementations, icons can be specified at least in part, based on automated processes that identify icons that may be of interest to the user.

[0058] In some cases, icon animations can be generated or customized by a third party that is not directly related to the user or entity that associated with the application. For example, in some cases, icons can be animated by a third party advertiser that maintains promotional offers or advertising campaigns on behalf of a retailer, but otherwise is not directly related to the retailer. In some cases, the advertiser can customize the icon animations on behalf of one or more entities (e.g., one or more retailer) as a service to those entities.

[0059] Icons provided by third-parties can replace the existing icon of an application, or can be presented in conjunction with the existing icon of the application. For example, in some cases, an animated icon provided by an advertiser can replace the existing icon of a retailer's application, such that the user accesses the application through the icon provided by the advertiser. This can be useful, for example, as it allows the advertiser and retailer to maintain a single unified presence with respect to the user. As another example, in some cases, an animated icon provided by an advertiser can be displayed in addition to the existing icon of the retailer's application,

such that the user can access the application through either icon. This can be useful, for example, as it allows the retailer and the advertiser to maintain distinct presences with respect to the user. In practice, either arrangement can be used, depending on the relationship between the party maintaining the application and the third-party providing the animated icon.

[0060] In some cases, animations can be time sensitive, such that they occur during particular periods of time, and do not occur during other periods of time. This can be beneficial, for example, in presenting time sensitive information or information that may be of diminished usefulness outside of a particular range of time. For example, animations can be time sensitive in order to provide information regarding limited promotions or time-sensitive messages. In some cases, icon animations can be scheduled ahead of time (e.g., by an administrator) such that they are initiated at a particular point in time in the future. This allows administrators to coordinate the release of information (e.g., to coordinate the release of information as a part of a larger advertising campaign, or to coordinate the release of information upon the planned release of a product or service).

[0061] In some instances, the animation of an icon can be controlled through a user interface (e.g., an administrator interface). An example administrator interface 300 is shown in FIG. 4A. A user (e.g., an administrator) can selectively enable or disable animations on one or more user devices (e.g., devices operated by one or more customers, clients, or other users) by selecting an appropriate option on the administration interface 300. For example, an administrator can toggle a first animation by selecting an interface element 310, and toggle a second animation by selecting an interface element 320. In response, the first animation and second animation are selectively enabled or disabled on one or more customers' devices. In some cases, an administrator associated with an advertiser can control icon animations on several customers' devices in order to display promotional information selectively to those customers. An administrator also can edit the content shown by the icon animations selectively. For example, the administrator can edit the content of the first animation by select an interface element 330, and can edit the content of the second animation by select an interface element 340. In response, the administrator interface

300 can present the administrator with an appropriate interface (e.g., an animation editing interface) such that the administrator can make changes to the animation.

[0062] In some cases, when the user (e.g., a customer) interacts with an icon, information regarding the user's interaction is transmitted to a third party (e.g., an administrator for the application, an advertiser, a retailer, or any other party). This information can be viewed using a user interface (e.g., an analytics interface). An example analytics interface 400 is shown in FIG. 4B. A user (e.g., an administrator) can use the analytics interface 400 to view how another user (e.g., a customer) interacts with the icon. For example, the administrator can view when the customer has single tapped the icon (e.g., as shown by event 402), and when the customer has double tapped an icon (e.g., as shown by event 404). In some cases, the analytics interface 400 can show information regarding a single user or several users (e.g., a single customer or several customers). In some cases, information shown in analytics interface 400 can be filtered in order to show information selectively according to one or more criteria (e.g., information pertaining to a particular user or group of users).

[0063] FIG. 5 illustrates an example of the logical representation of the architecture for a system operable to implement the push campaigns. FIG. 6 is a component view of the architecture. FIG. 7 illustrates an example of the sequential flow for the architecture. In the illustrated example, DynamicPush® SDK with Admin Dashboard is an animated push notification service product named "DynamicPush®." Architecture is designed and developed to support both Android and iOS platforms in the form of SDKs. For Android platforms, DynamicPush® can be an application without a Launcher icon and can display notifications on top of all user content and apps. For iOS platforms, DynamicPush® can use iOS expanded detail view with 3D Touch (iOS versions 10 and up) that displays rich content, such as an animation or a video; or an applet, such as a map or a calendar with or without audio. The admin web application can manage the DynamicPush® Animated Push Notifications, for example as a campaigns via Google Cloud Messaging Systems and Amazon Simple Notification Service (SNS) as Pub-sub Service for Mobile and Enterprise Messaging and facilitation of analytics tracked by DynamicPush® with different attributes of Mobile App Users (User Attributes, User Activities, User locations, Retarget Audiences and Marketing Activities), text, app pages, web page url and in-app

messages with animations. The DynamicPush® can be provided using the Java, Android Java using Android Studio, Objective- C, and Swift using X-Code iOS Platform on Unix Platform and hosted on Amazon Cloud. The Presentation (UI) tier, Web Admin Dashboard can be provided using Ruby on Rails, AngularJS, jQuery, Bootstrap framework following the HTML 5 and CSS3 standards. The business tier will be instantiated using Ruby gems Library. The data access and connected to MySQL data base, No SQL, Big Data and AWS S3 Web RESTful Services.

[0064] In some implementations, dynamically animated icons can be incorporated into an existing application using one or more software development kits SDKs in order to provide interactive dynamic push notification functionality. An SDK can be, for example, a set of software development tools that facilitates the creation of applications or the creation of sub-routines that can be incorporated into an existing application. In some cases, an SDK can include one or more application programming interfaces (APIs) (e.g., sets of routines, protocols, and tools that express a software component in terms of its operations, inputs, outputs, and underlying types). In some cases, an SDK can be provided to a software developer by a third party (e.g., a party who is not directly involved in the development of the existing application). For instance, an advertiser can provide a merchant with an SDK that enables the merchant to add interactive dynamic push notification functionality to the merchant's application.

[0065] In some cases, in addition to providing an SDK to a software developer, the third party can also provide the software developer with systems that manage the interactive dynamic push notification features of the application. For example, the third party can provide a server system that allows the software developer to generate icon animations and transmit those animations to one or more user devices running the software developer's application. The server system can also receive information regarding users' interactions with the application, aggregate and analyze the information, and present the information to the software developer for review. This can be beneficial, for example, as it allows the software developer to incorporate interactive dynamic push notification features into his own application without requiring that he also provide his own systems to support and manage those features.

[0066] Although a third party, in some cases, can provide systems that support and manage the interactive dynamic push notification features of an application, this need not be the case. For example, in some cases, a third party can provide a software developer with an SDK that enables the software developer to incorporate interactive dynamic push notification features into his application, but does not provide the software developer with a server system to support or manage those features. The software developer can, in these cases, provide his own server system or otherwise acquire a server system independently from the third party to provide this functionality. This allows the software developer to maintain greater control of his application and the information collected from its users. This can particularly be beneficial, for example, if the software developer wishes to limit others from accessing potentially sensitive or private data.

[0067] In some cases, icon animations can be accompanied by auditory effects. For example, in some cases when a user's device animates an icon, the user's device can also generate a particular sound (e.g., a sound effect, music, speech, and/or other audio). In some cases, this can be used to notify the user that an animation is being played, even if the user is not currently viewing the device. In some cases, the sound can depend on the type of information that is being presented. For example, certain types of sound can be played for certain types of animations, such that the user can differentiate between them.

[0068] Although example implementations are described with respect to user devices such as smartphones and tablets, these are merely illustrative examples. In practice, implementations of animated icons can be used with any other type of electronic device, including desktop computer computers, notebook computers, media players, "smart" TVs, digital video recorders (DVRs), virtual reality systems, in-car systems for mobile apps that control a vehicle's dashboard display, intelligent devices that include voice recognition, watches and other wearable intelligent devices (e.g., smart glasses).

[0069] Further, although example implementations are described with respect to "icons," an "icon" can, in some cases, encompass any graphical element that represents an application on a user interface, presents information pertaining to the

application, or is otherwise associated with the application. For example, in some cases, an icon can include graphical elements such as widgets, images, thumbnails, textual labels, and/or combinations thereof. As described above, any of these graphical elements can be animated as described above in order to present interactive and dynamically changing information to users of electronic devices. Likewise, the user can interact with these any of these graphical elements in order to perform a variety of tasks on their electronic devices.

[0070] Some implementations of subject matter and operations described in this specification can be implemented in digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them. Some implementations described in this specification can be implemented as one or more groups or modules of digital electronic circuitry, computer software, firmware, or hardware, or in combinations of one or more of them. Although different modules can be used, each module need not be distinct, and multiple modules can be implemented on the same digital electronic circuitry, computer software, firmware, or hardware, or combination thereof.

[0071] Some implementations described in this specification can be implemented as one or more computer programs, i.e., one or more modules of computer program instructions, encoded on computer storage medium for execution by, or to control the operation of, data processing apparatus. A computer storage medium can be, or can be included in, a computer-readable storage device, a computer-readable storage substrate, a random or serial access memory array or device, or a combination of one or more of them.

[0072] Moreover, while a computer storage medium is not a propagated signal, a computer storage medium can be a source or destination of computer program instructions encoded in an artificially generated propagated signal. The computer storage medium can also be, or be included in, one or more separate physical components or media (e.g., multiple CDs, disks, or other storage devices).

[0073] The term “data processing apparatus” encompasses all kinds of apparatus, devices, and machines for processing data, including by way of example a programmable processor, a computer, a system on a chip, or multiple ones, or combinations, of the foregoing. The apparatus can include special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit). The apparatus can also include, in addition to hardware, code that creates an execution environment for the computer program in question, e.g., code that constitutes processor firmware, a protocol stack, a database management system, an operating system, a cross-platform runtime environment, a virtual machine, or a combination of one or more of them. The apparatus and execution environment can realize various different computing model infrastructures, such as web services, distributed computing and grid computing infrastructures.

[0074] A computer program (also known as a program, software, software application, script, or code) can be written in any form of programming language, including compiled or interpreted languages, declarative or procedural languages. A computer program may, but need not, correspond to a file in a file system. A program can be stored in a portion of a file that holds other programs or data (e.g., one or more scripts stored in a markup language document), in a single file dedicated to the program in question, or in multiple coordinated files (e.g., files that store one or more modules, sub programs, or portions of code). A computer program can be deployed to be executed on one computer or on multiple computers that are located at one site or distributed across multiple sites and interconnected by a communication network.

[0075] Some of the processes and logic flows described in this specification can be performed by one or more programmable processors executing one or more computer programs to perform actions by operating on input data and generating output. The processes and logic flows can also be performed by, and apparatus can also be implemented as, special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit).

[0076] Processors suitable for the execution of a computer program include, by way of example, both general and special purpose microprocessors, and processors of any kind of digital computer. Generally, a processor will receive instructions and data

from a read only memory or a random access memory or both. A computer includes a processor for performing actions in accordance with instructions and one or more memory devices for storing instructions and data. A computer may also include, or be operatively coupled to receive data from or transfer data to, or both, one or more mass storage devices for storing data, e.g., magnetic, magneto optical disks, or optical disks. However, a computer need not have such devices. Devices suitable for storing computer program instructions and data include all forms of non-volatile memory, media and memory devices, including by way of example semiconductor memory devices (e.g., EPROM, EEPROM, flash memory devices, and others), magnetic disks (e.g., internal hard disks, removable disks, and others), magneto optical disks, and CD ROM and DVD-ROM disks. The processor and the memory can be supplemented by, or incorporated in, special purpose logic circuitry.

[0077] To provide for interaction with a user, operations can be implemented on a computer having a display device (e.g., a monitor, or another type of display device) for displaying information to the user and a keyboard and a pointing device (e.g., a mouse, a trackball, a tablet, a touch sensitive screen, or another type of pointing device) by which the user can provide input to the computer. Other kinds of devices can be used to provide for interaction with a user as well; for example, feedback provided to the user can be any form of sensory feedback, e.g., visual feedback, auditory feedback, or tactile feedback; and input from the user can be received in any form, including acoustic, speech, or tactile input. In addition, a computer can interact with a user by sending documents to and receiving documents from a device that is used by the user; for example, by sending web pages to a web browser on a user's client device in response to requests received from the web browser.

[0078] A computer system may include a single computing device, or multiple computers that operate in proximity or generally remote from each other and typically interact through a communication network. Examples of communication networks include a local area network ("LAN") and a wide area network ("WAN"), an inter-network (e.g., the Internet), a network comprising a satellite link, and peer-to-peer networks (e.g., ad hoc peer-to-peer networks). A relationship of client and server may arise by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

[0079] The foregoing techniques and features, including the DPIs, can be used in a wide range of applications. Examples include, but are not limited, to the following:

- Clothing/Shoes Retailers and Wholesalers can utilize DPIs to engage customers with new items, special sales, targeted discounts, and other alerts.
- Software Products and Service Providers can utilize DPIs to engage customers with alerts about upcoming software updates and bug fixes.
- Technology Retailers and Wholesalers can utilize DPIs to engage customers with new items, special sales, targeted discounts, and other alerts such as recalls or product updates.
- Video Game and Computer Game Providers can utilize DPIs to engage customers with new items, special sales, targeted discounts, and other alerts such as software updates and bug fixes.
- Sports Organizations and Venues that Host Live Events can utilize DPIs to engage customers with new events, performances, appearances, special sales, targeted discounts, and other alerts.
- Food Service Providers and utilize DPIs to engage customers with new items, special sales, targeted discounts, and other alerts.
- Banks and Financial Institutions can utilize DPIs to engage customers with account updates, fraud alert, low balance, and other alerts.
- Federal, State, and Local Governments and Government Related Organizations can utilize DPIs to engage civilians with traffic or service updates/announcements, possible threat or emergency alerts, reminders about days for refuse collection and parking rules, and other alerts.
- Weather and Geological Services can utilize DPIs to engage customers with inclement or hazardous weather alerts, safe zone directions, and other alerts.
- Individual Users can utilize DPIs to engage friends, family members, or personal network with personal alerts such as upcoming birthdays or events, personal “for sale” items, personal marketing ventures, and other alerts.
- Gambling sites

- Dating sites
- Music retailers and ticket sales
- Television shopping and Retail
- Auction sites
- Messaging activities
- Social networking activities
- Sports and Fantasy sports

[0080] Various modifications may be made without departing from the spirit and scope of the disclosure. Accordingly, other implementations are within the scope of the claims.

What is claimed is:

1. A computer-implemented method for providing a dynamically animated icon on a display screen of a user device, the display screen including a plurality of static icons, the method comprising:

receiving, by a server system, dynamic content from a service provider;

generating, by the server system, a dynamically animated icon to illustrate the dynamic content received from the service provider; and

causing, by the server system, the user device to display the dynamically animated icon on the display screen, the dynamically animated icon overlaying one or more of the plurality of static icons.

2. The method of claim 1, wherein causing the user device to display the dynamically animated icon includes causing the user device to display the dynamically animated icon on a home screen of the user device.

3. The method of claim 1, wherein causing the user device to display the dynamically animated icon includes causing the user device to display the dynamically animated icon on top of all applications that are running on the user device.

4. The method of claim 1, wherein the dynamic content includes a map showing a current position of a moving object on the map.

5. The method of claim 1, wherein the dynamic content includes content of a calendar invitation.

6. The method of claim 1, wherein the dynamic content includes information regarding an outcome of a bid of the user to purchase an item on an auction site.

7. The method of claim 1, wherein the dynamic content includes a promotion or offer that is currently offered by the service provider.

8. The method of claim 1, wherein the service provider includes one of the following: a dating site, bank or other financial institution, music retailer, ticket seller, television shopping and retail, auction site, messaging service, social networking service, sports and fantasy sports related company, video game provider, gambling

site, food service provider, clothing and shoes retailer, Federal State and local government, technology retailer or wholesaler, software products and service provider, or weather and geological service.

9. The method of claim 1, wherein the service provider is an individual user who wants to engage friends, family members, or personal network with personal alerts such as upcoming birthdays or events, personal "for sale" items, personal marketing ventures and other alerts.

10. The method of claim 1, wherein generating the dynamically animated icon includes causing an icon to change a color and/or a shape of the icon.

11. The method of claim 1, wherein generating the dynamically animated icon includes causing the icon to change an image, object, and/or text that is displayed within the icon.

12. The method of claim 1, wherein generating the dynamically animated icon includes causing an icon to blink.

13. The method of claim 1, wherein generating the dynamically animated icon includes causing an icon to displaying an animation, movie, or video within a portion of the icon or across the entirety of the icon.

14. The method of claim 1, wherein the service provider is a dating site and the dynamic content includes information regarding dating prospects.

15. The method of claim 1, wherein the service provider is a messaging service and the dynamic includes a receipt of a message from the messaging service.

16. A computer-implemented method for providing a dynamically animated icon on a display screen of a user device, the display screen includes a plurality of static icons, the method comprising:

receiving, by at least one processor, from a server system, a dynamically animated icon that illustrates dynamic content provided by a service provider; and

displaying, by the at least one processor, the dynamically animated icon on the display screen, the dynamically animated icon overlaying one or more of the plurality of static icons.

17. The method of claim 16, further comprising:

receiving, by the at least one processor, from a user of the user device, a selection of the dynamically animated icon and in response, performing one or more of the following operations:

displaying additional information,  
executing an application, or  
transmitting information to one or more other users.

18. The method of claim 17, wherein receiving, from the user, a selection of the dynamically animated icon includes receiving a user gesture with respect to the icon or a voice command.

19. The method of claim 16, further comprising:

detecting, by the at least one processor, a user click on the display screen outside of the dynamically animated icon; and  
in response to detecting the user click, causing the dynamically animated icon to vanish from the display.

20. A system comprising:

at least one computing device; and  
a computer-readable medium coupled to the at least one computing device having instructions stored thereon which, when executed by the at least one computing device, cause the at least one computing device to perform operations to provide a dynamically animated icon on a display screen of a user device, the display screen including a plurality of static icons, the operations comprising:

in response to receiving dynamic content from a service provider,  
generating a dynamically animated icon that illustrates the dynamic content received from the service provider; and

causing the user device to display the dynamically animated icon on the display screen of the user device, the dynamically animated icon overlaying one or more of the plurality of static icons.

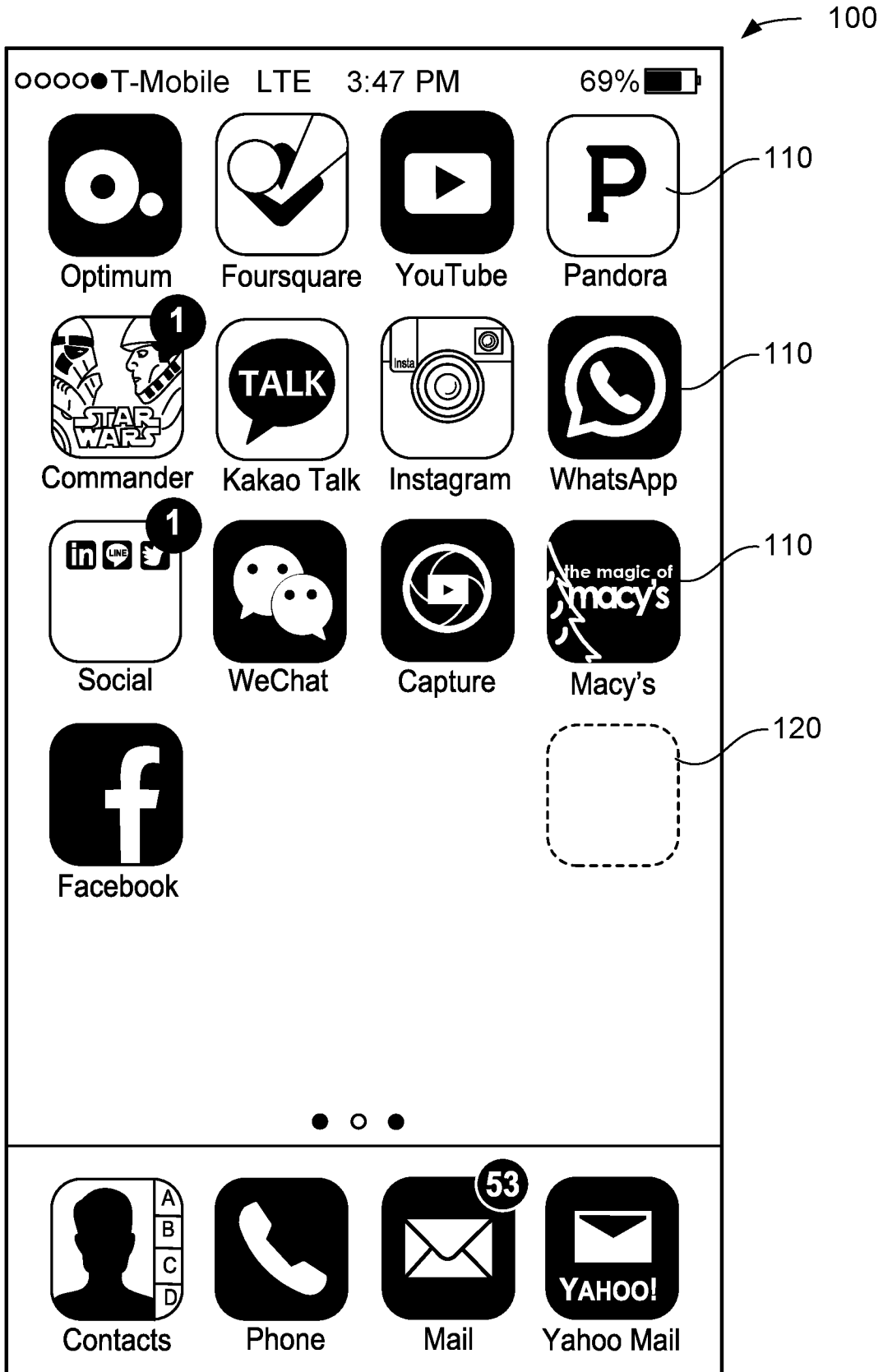


FIG. 1

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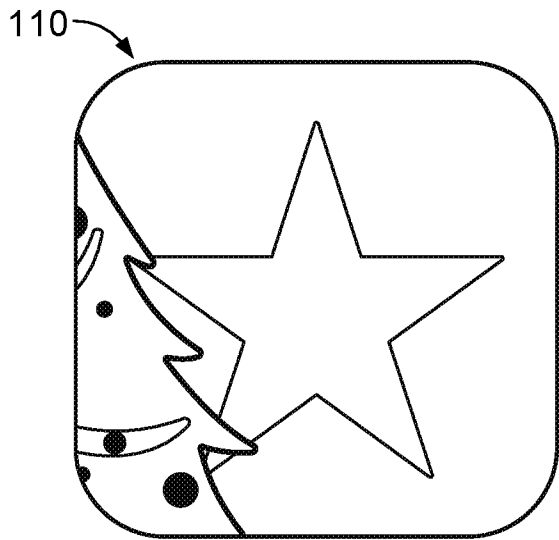


FIG. 2A

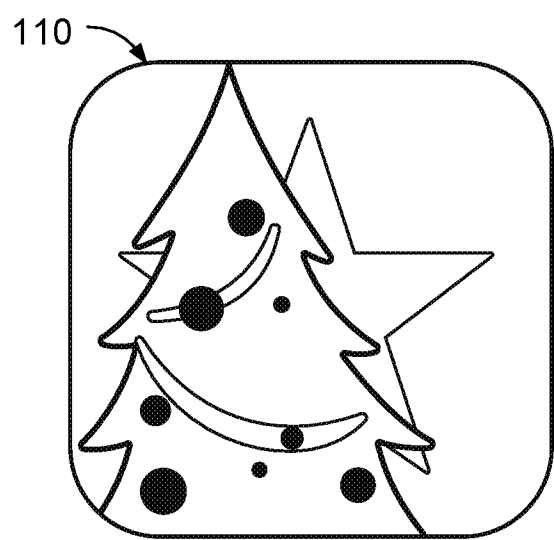


FIG. 2B

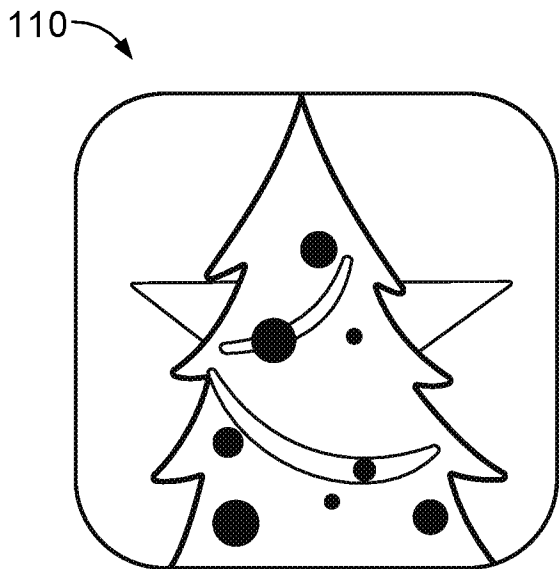


FIG. 2C

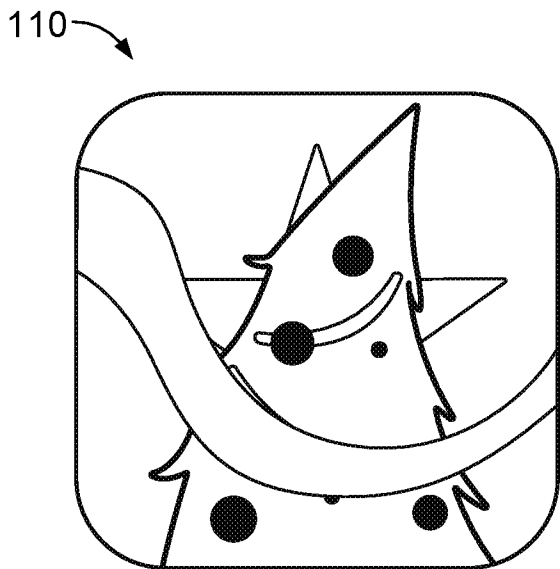


FIG. 2D



FIG. 2E



FIG. 2F

DYNAMIC PUSH – ANIMATION FLOATING ANIMATED DYNAMIC PUSH ICON (DPI) AUTO LOADS OR REPLACES TRADITIONAL STATIC ICON

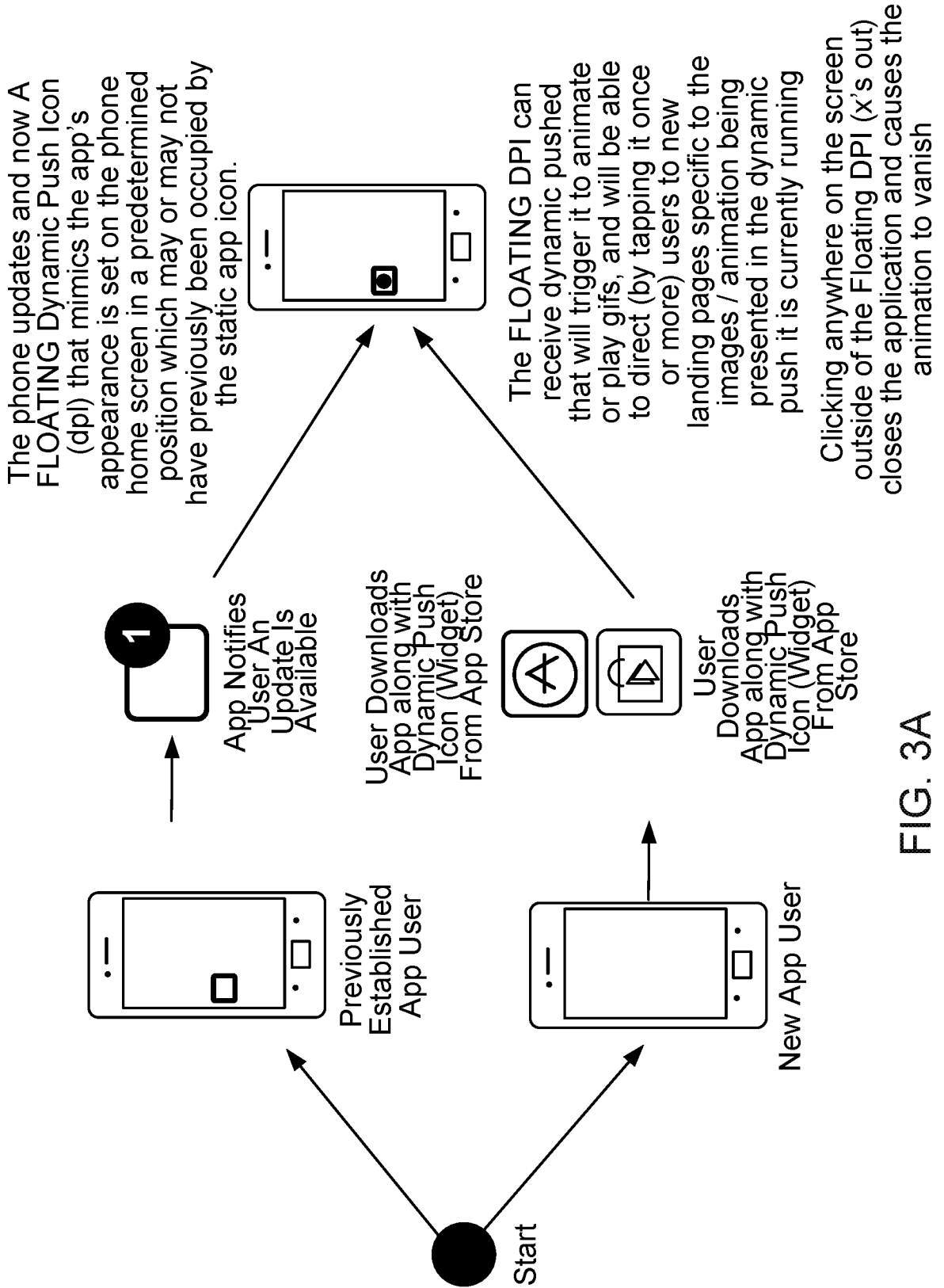


FIG. 3A

DYNAMIC PUSH – PROVISIONAL PATENT – FLOATING ANIMATED INTERACTIVE FLOATING DYNAMIC PUSH ICON (DPI) – DISAPPEAR ON CLICK

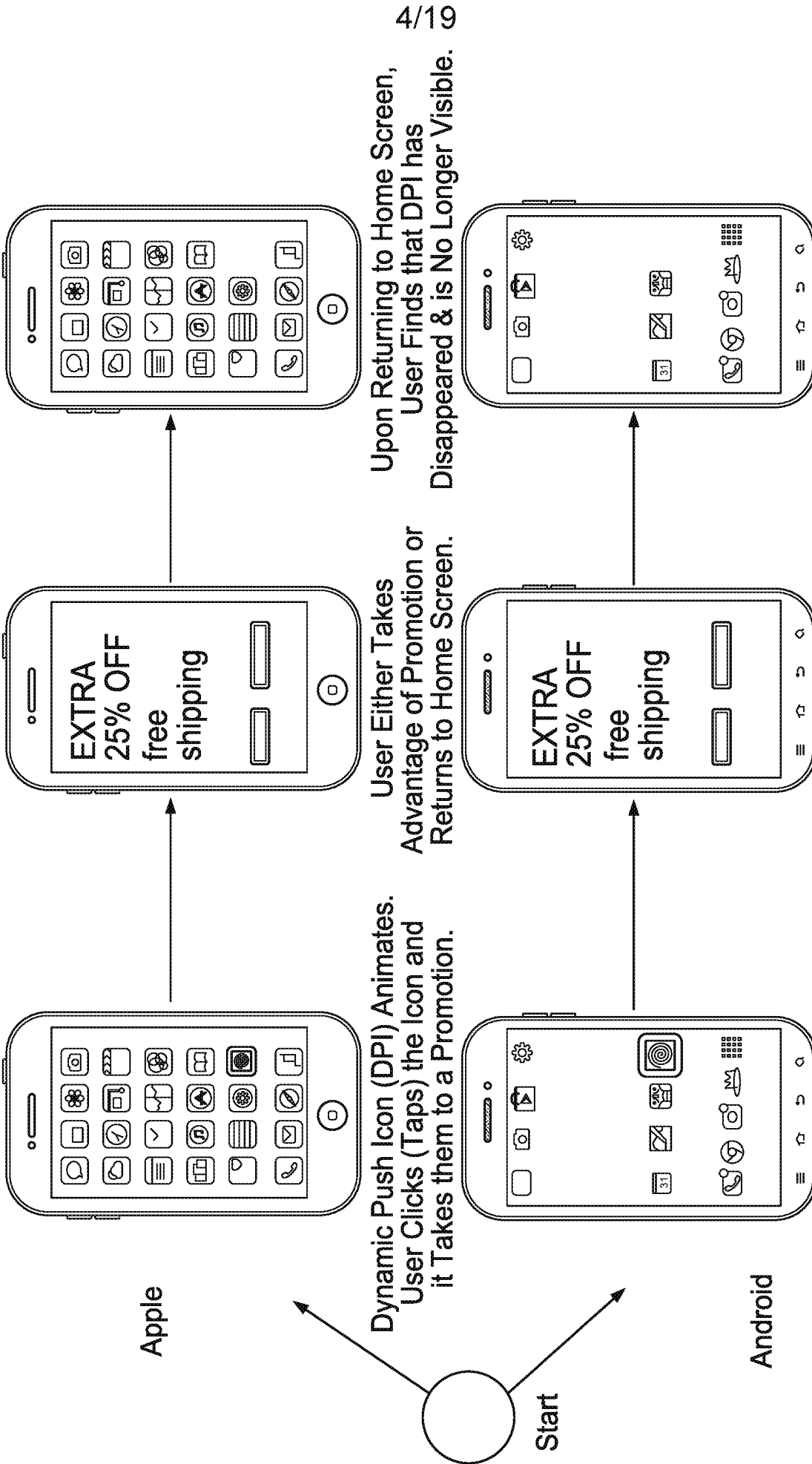


FIG. 3B

DYNAMIC PUSH – FLOATING ANIMATED INTERACTIVE FLOATING DYNAMIC PUSH ICON (DPI) – ONLY ON HOME DECK

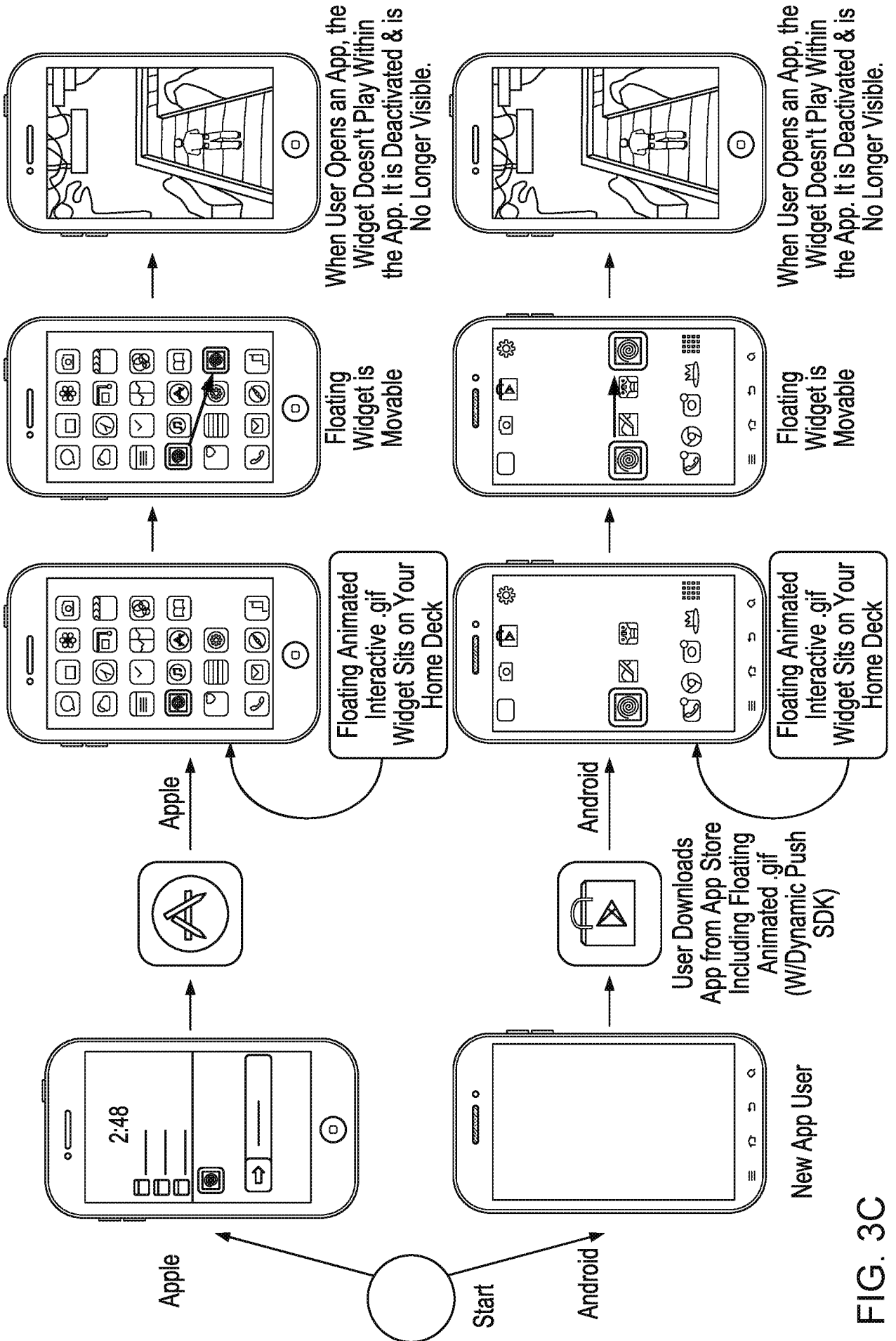
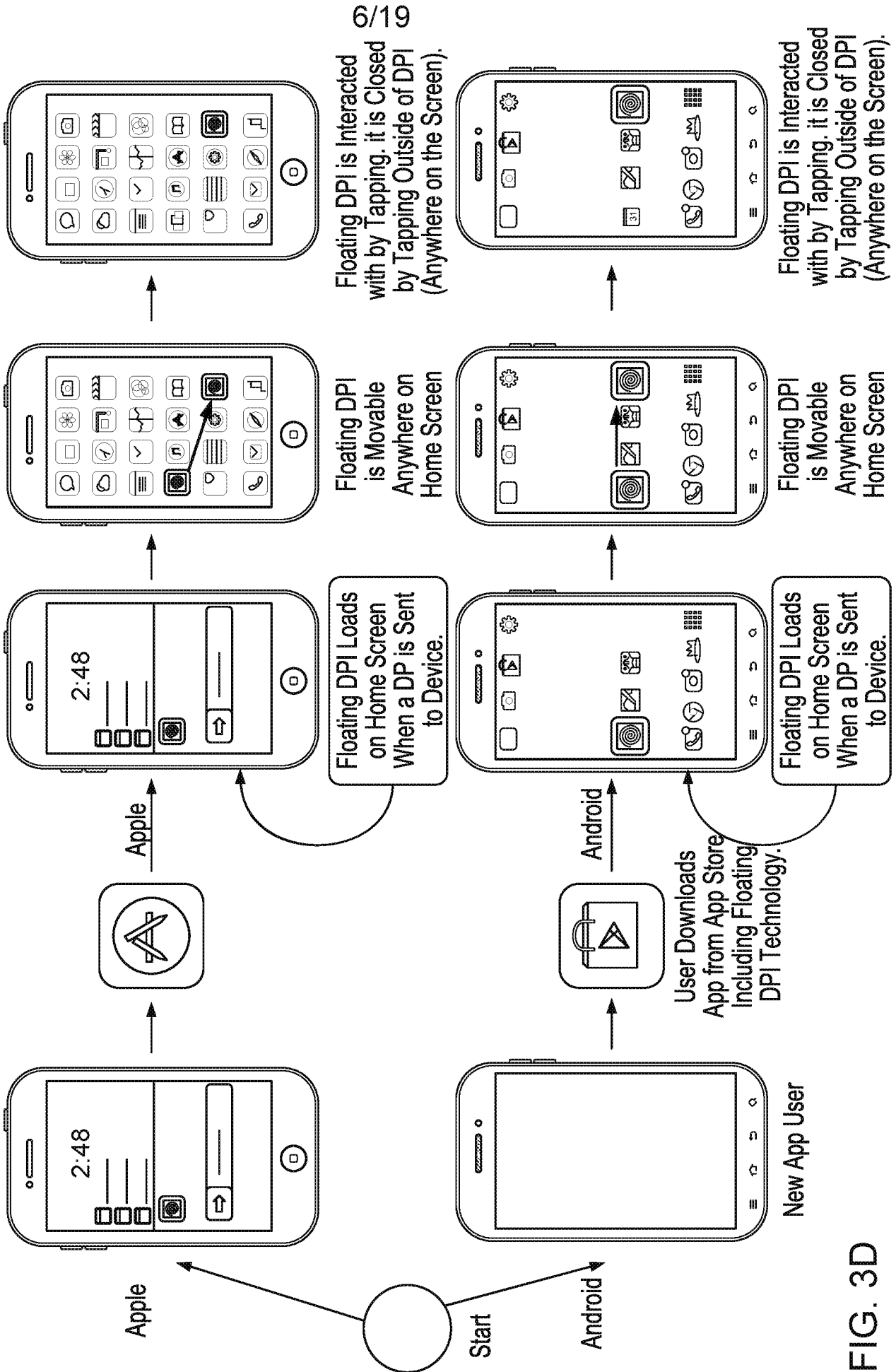


FIG. 3C

DYNAMIC PUSH - FLOATING ANIMATED INTERACTIVE DYNAMIC PUSH ICON (DPI) - HOME SCREEN



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FIG. 3D

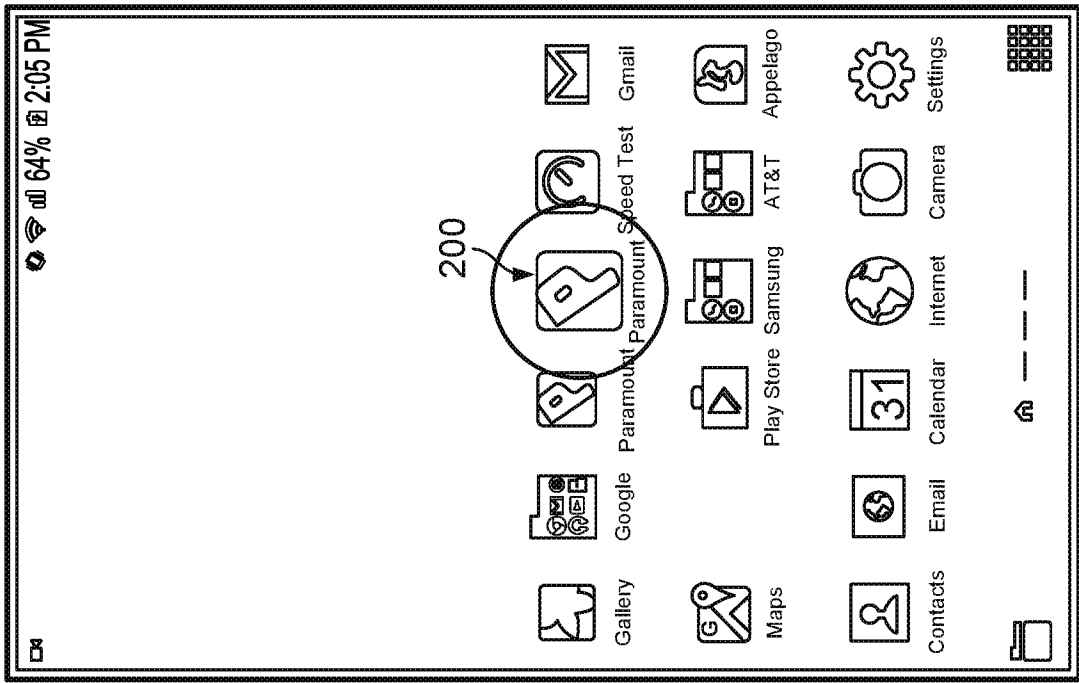


FIG. 3E

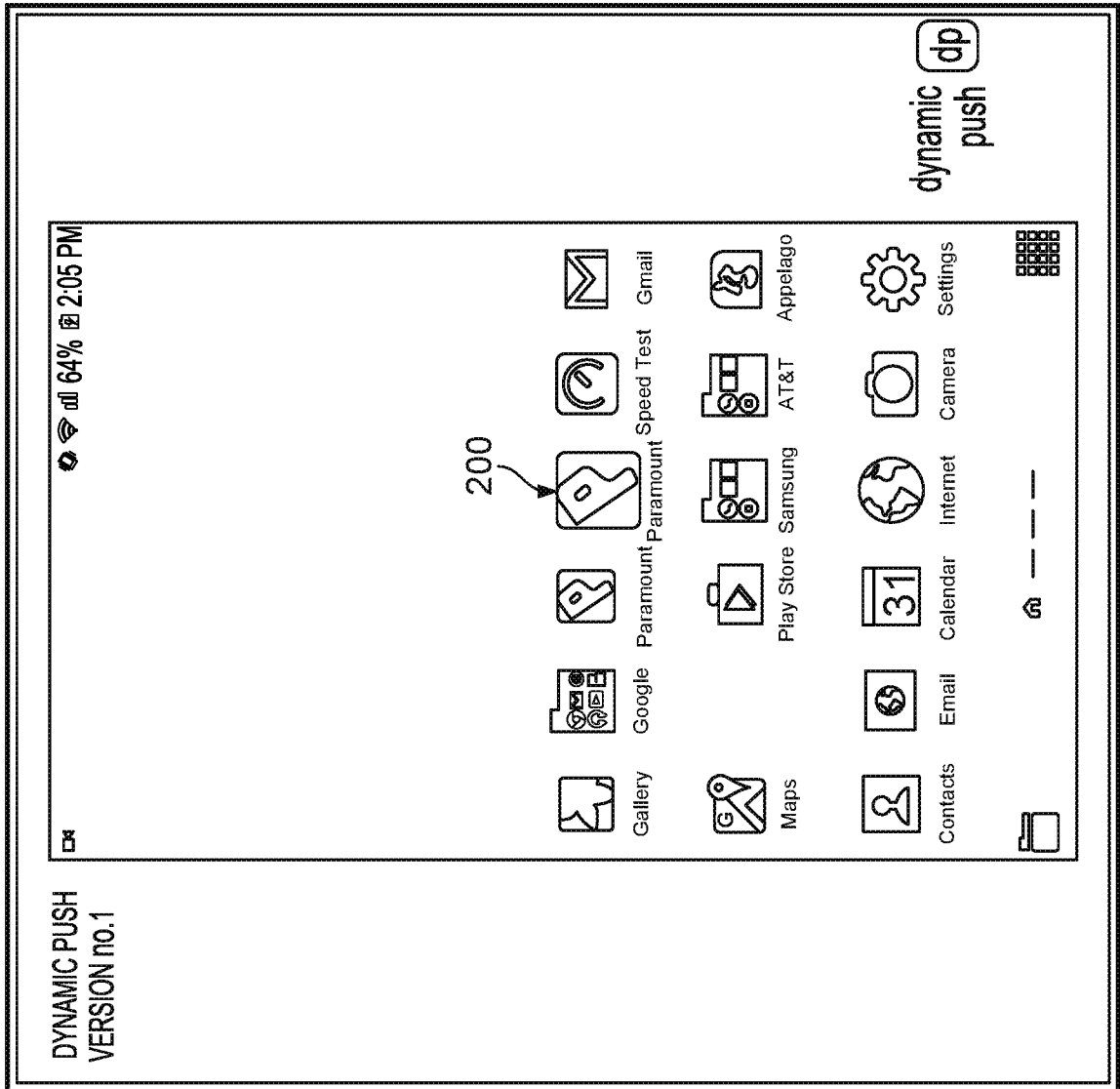


FIG. 3F

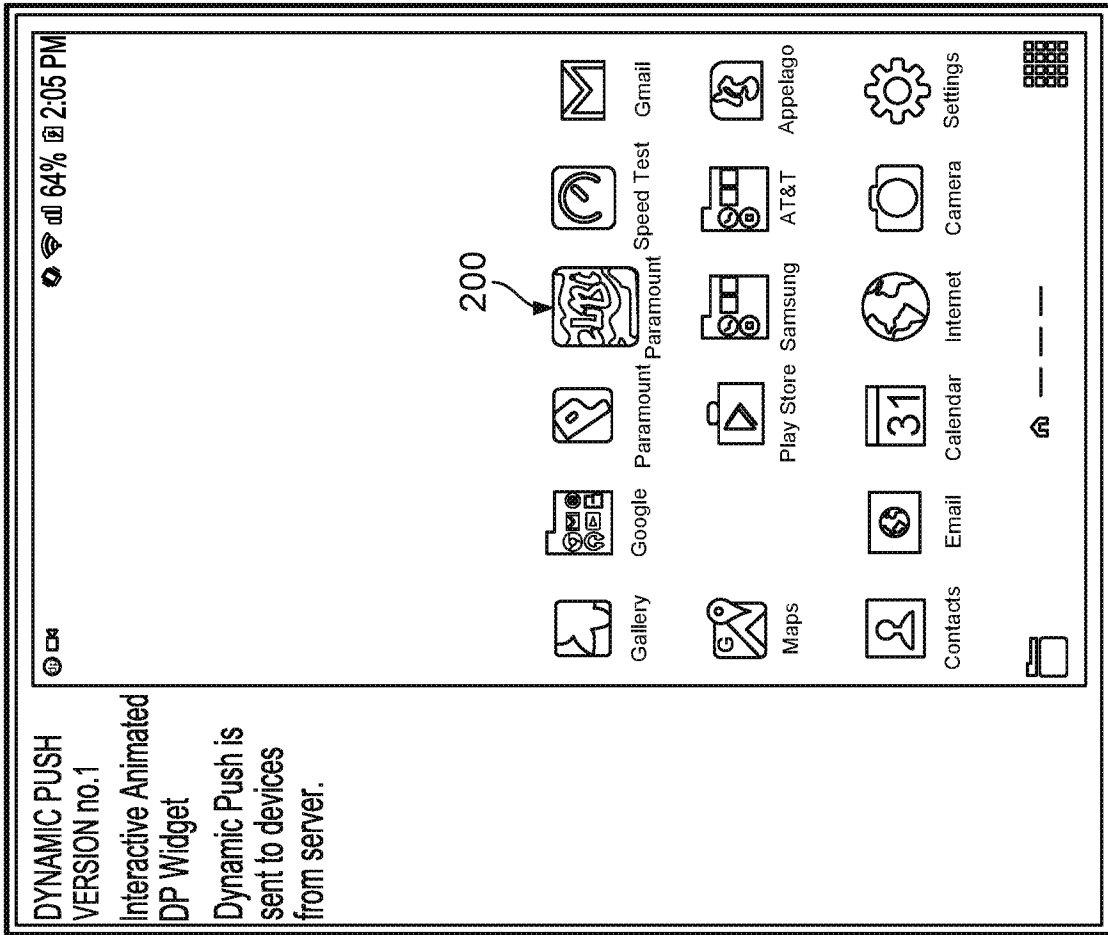


FIG. 3H

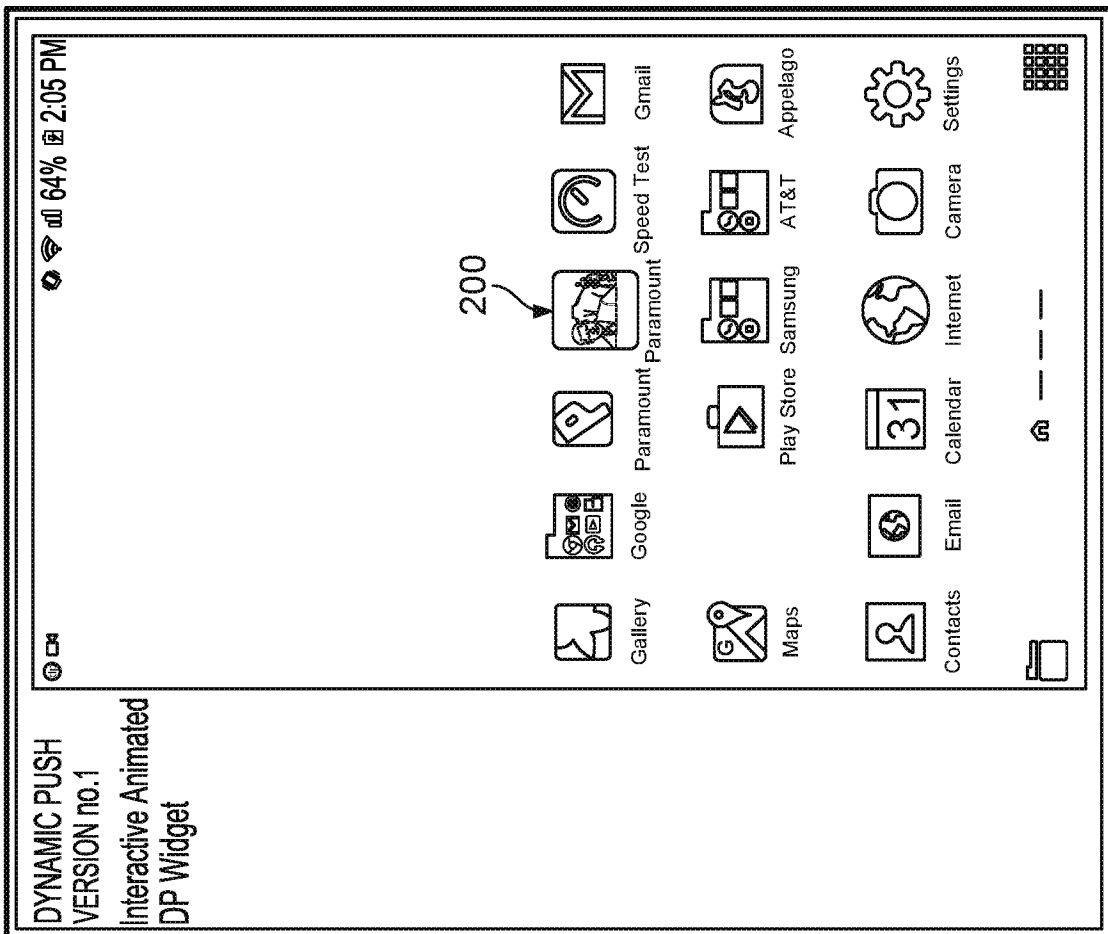


FIG. 3G

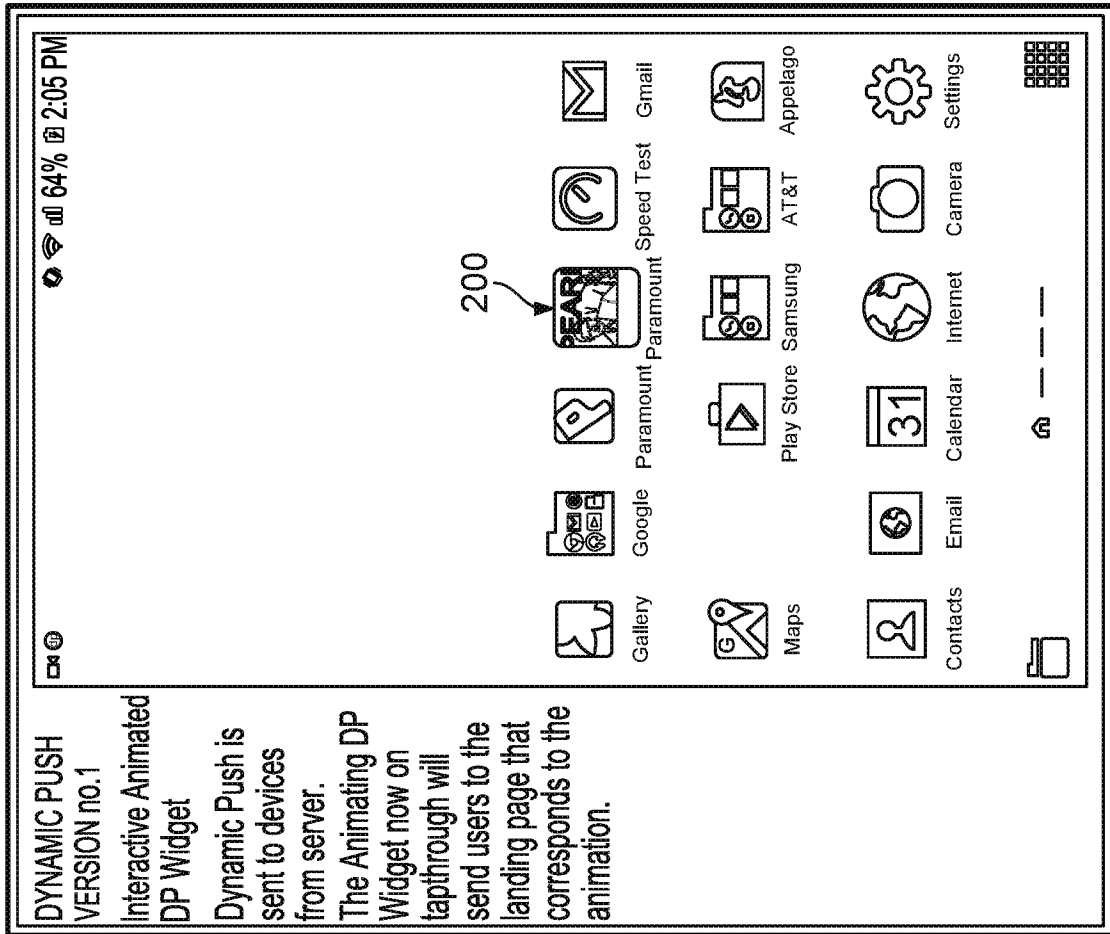
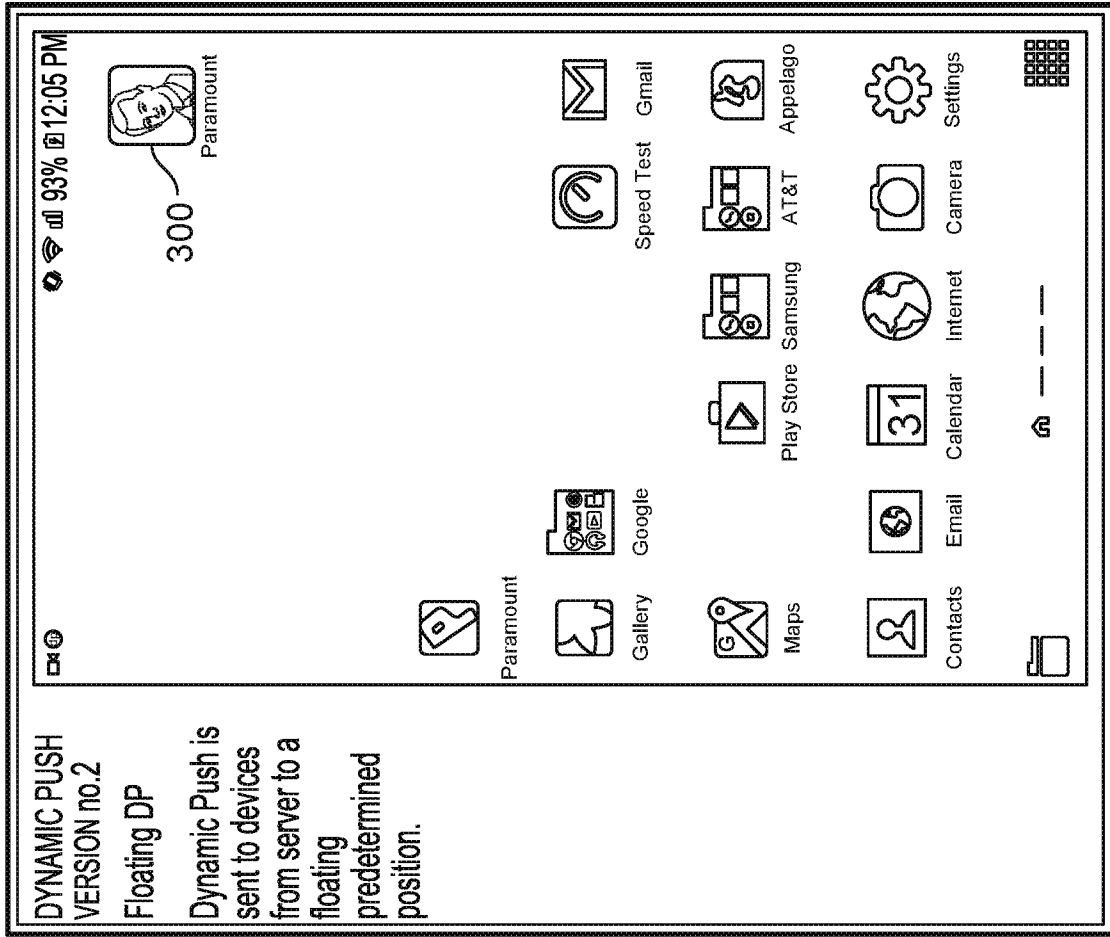
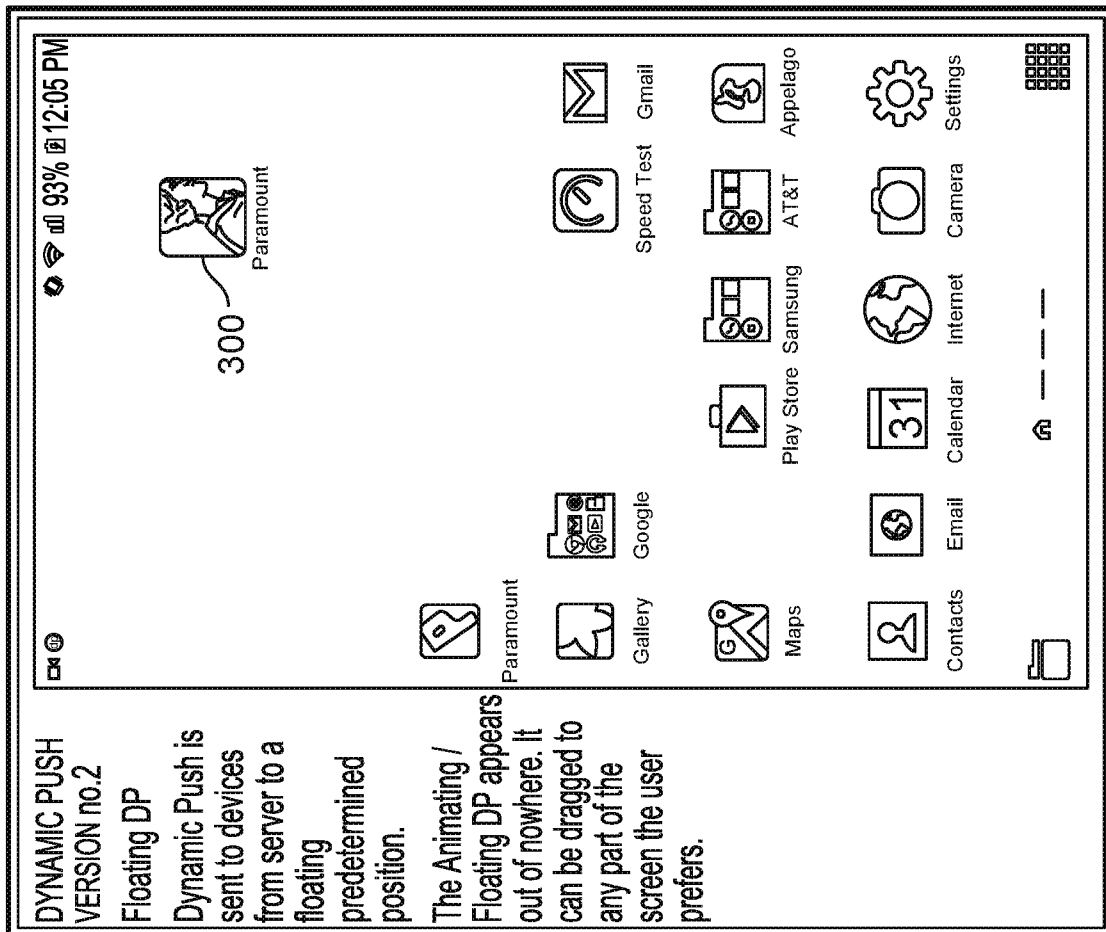


FIG. 3I



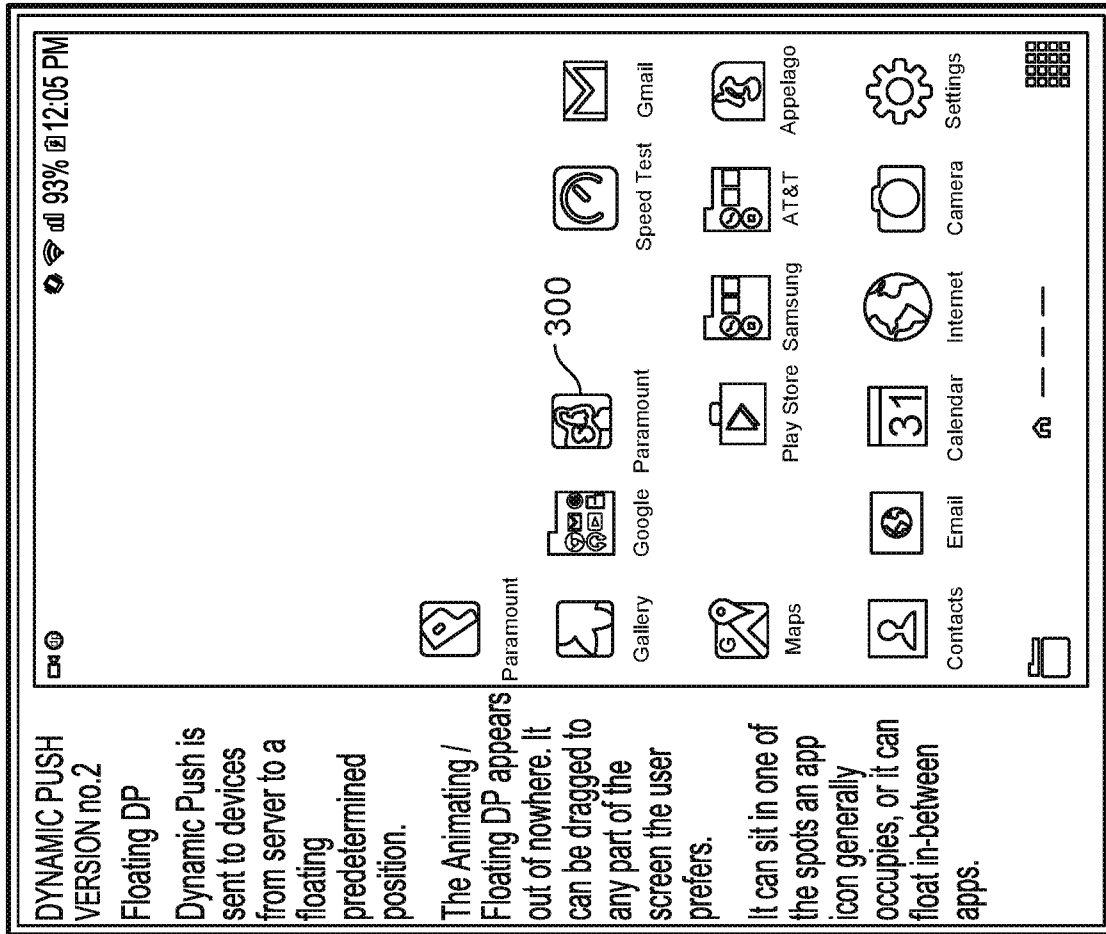
Predetermined location = e.g., top right corner

FIG. 3J



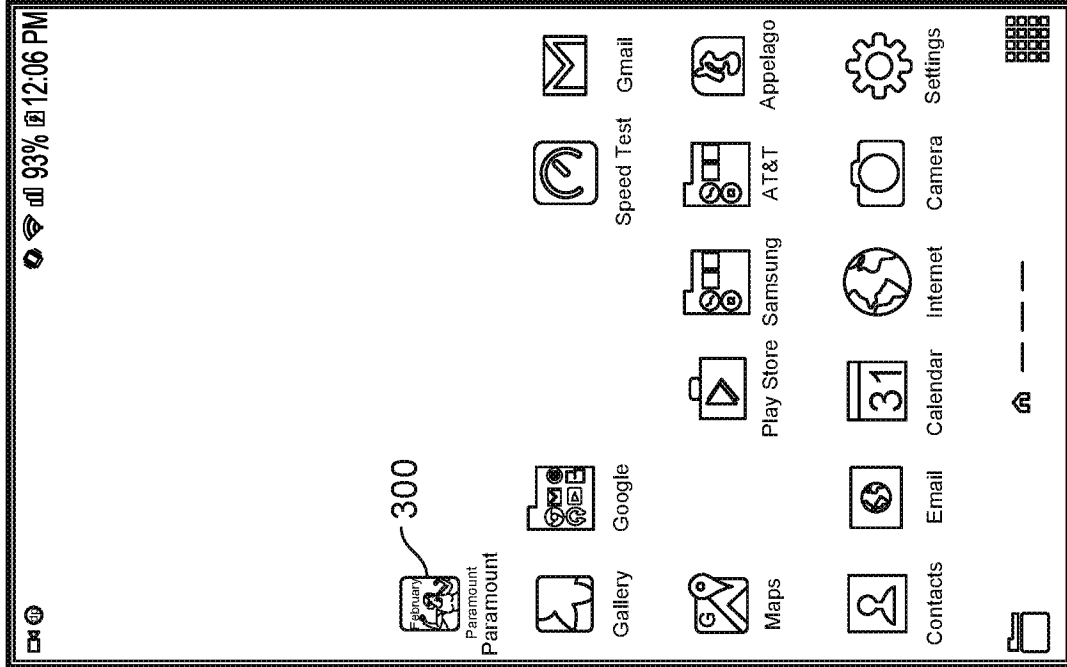
Floating DP moving from top right corner downward

FIG. 3K



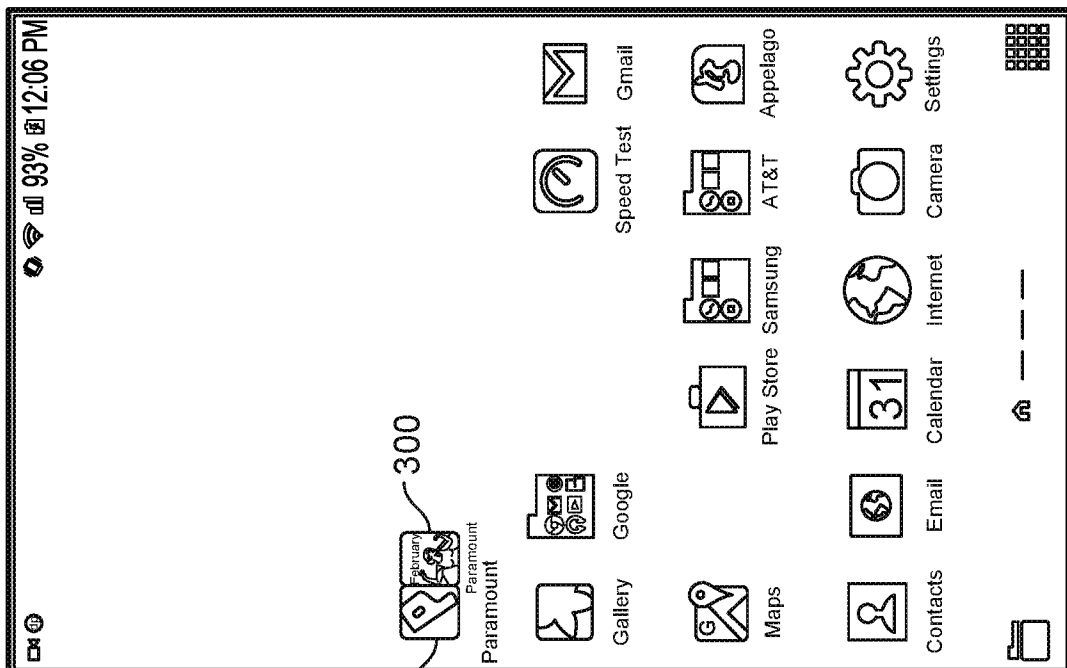
Floating DP is now next to the Google icon.

FIG. 3L



Overlying the Paramount icon, which is no longer visible

FIG. 3N



Partially overlying the Paramount icon

FIG. 3M

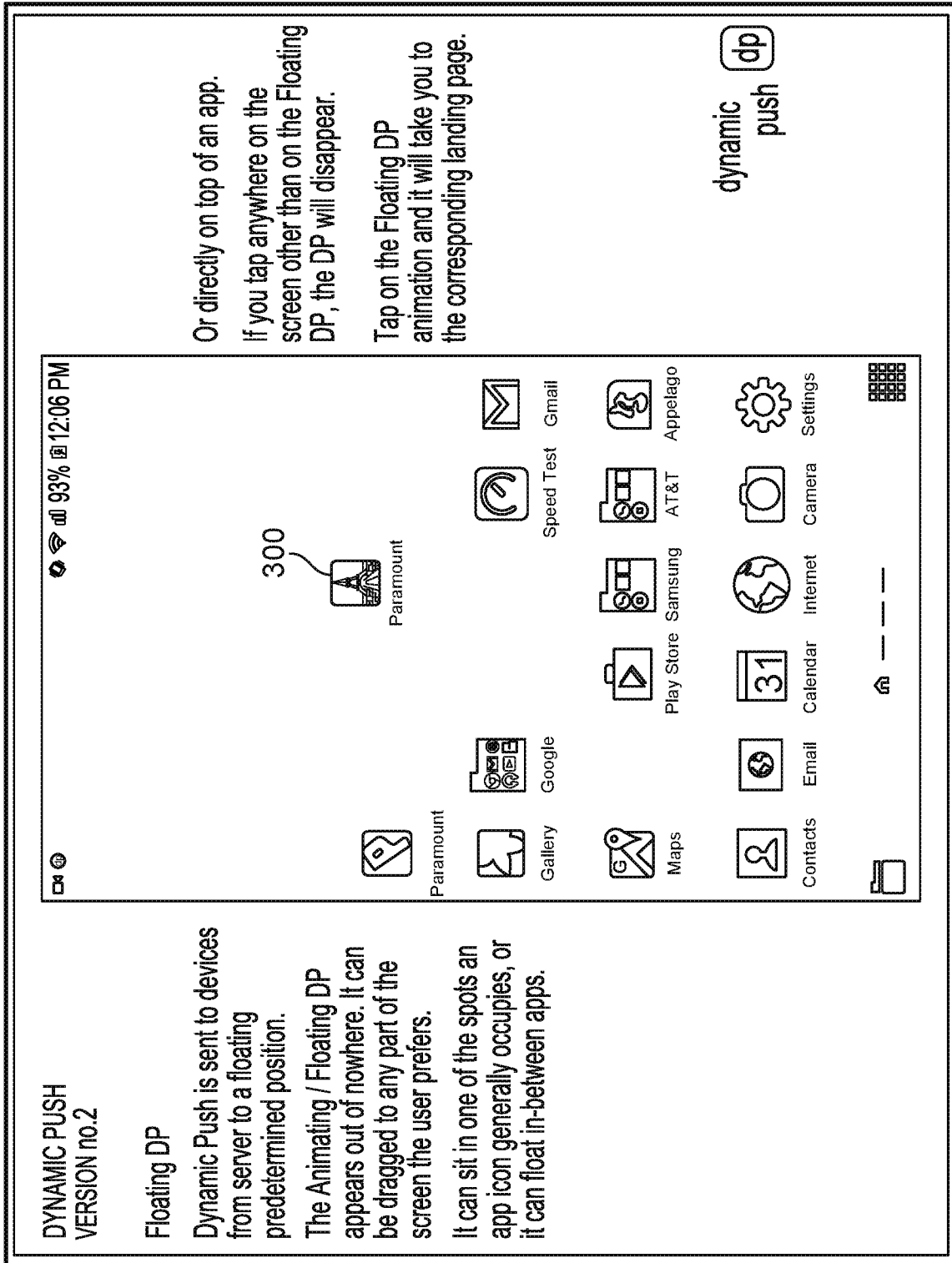


FIG. 30

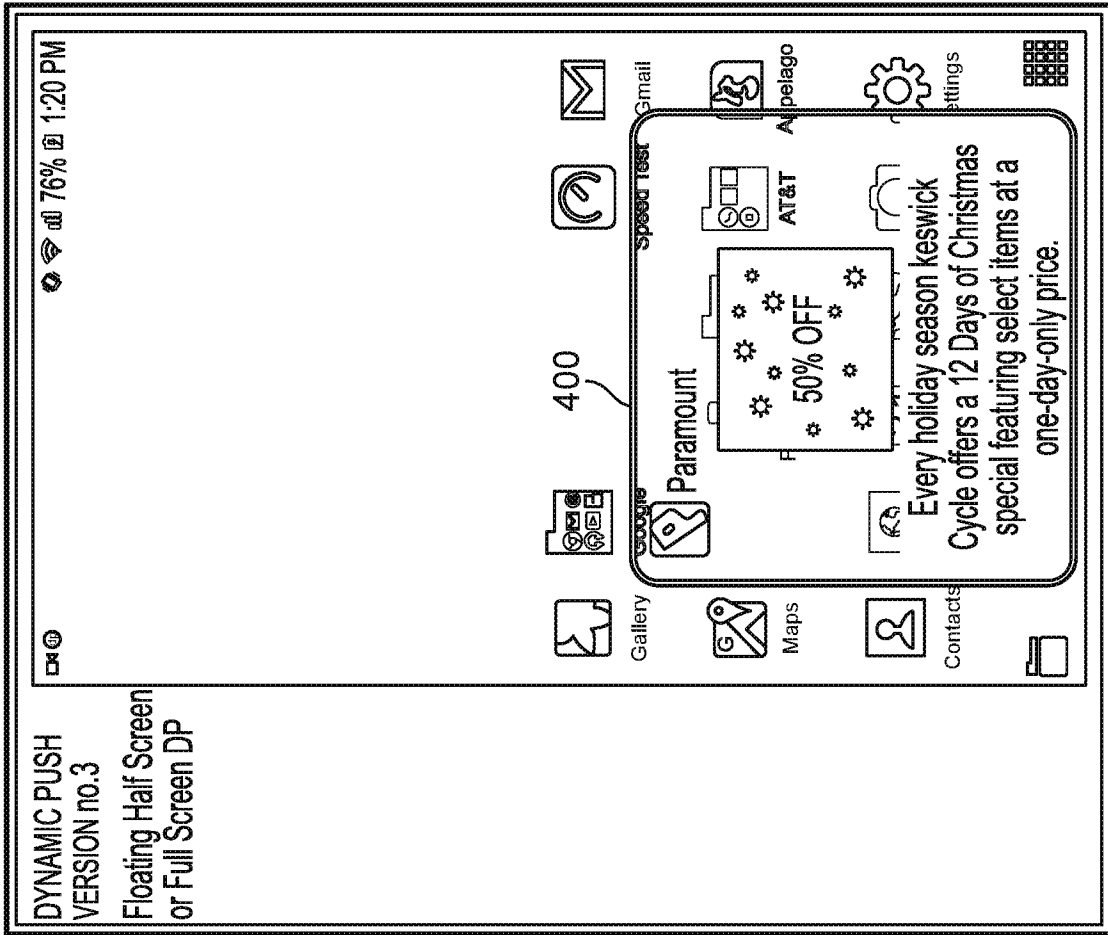


FIG. 3Q

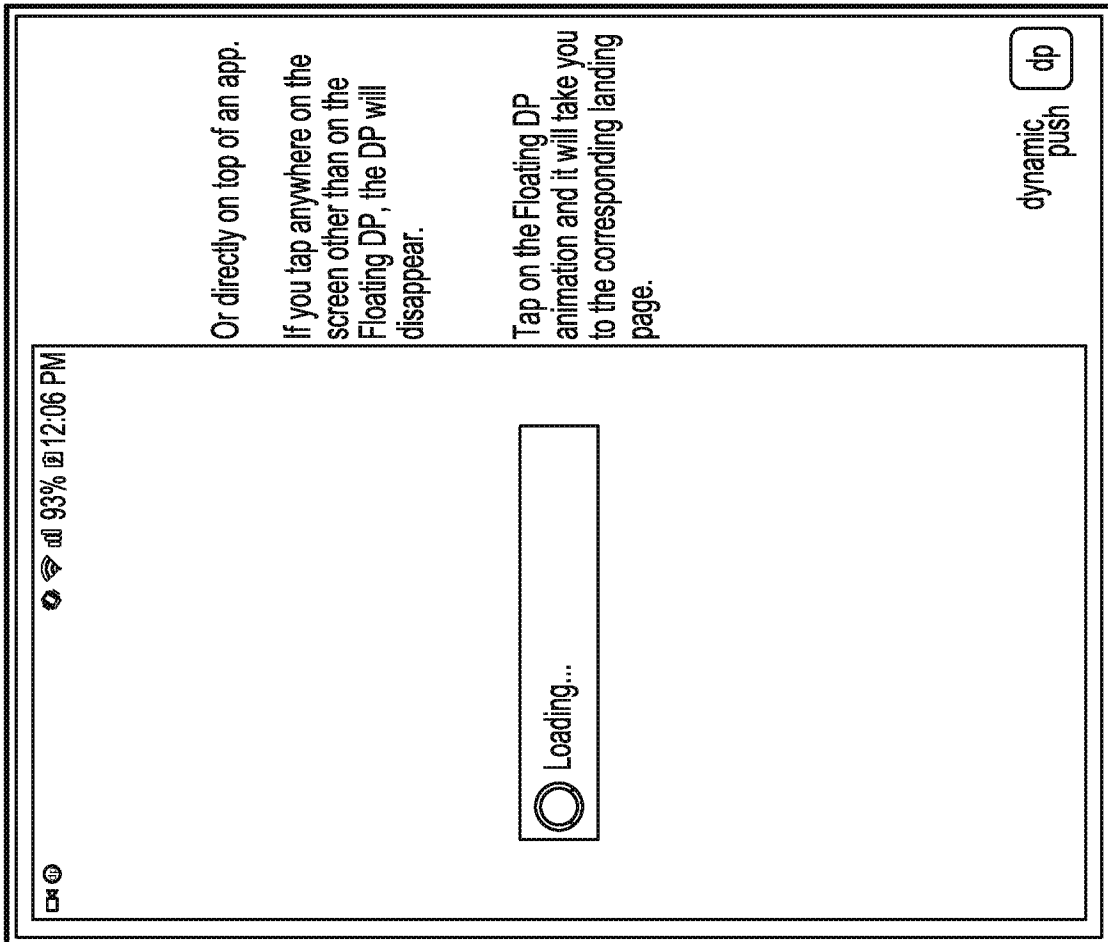


FIG. 3P

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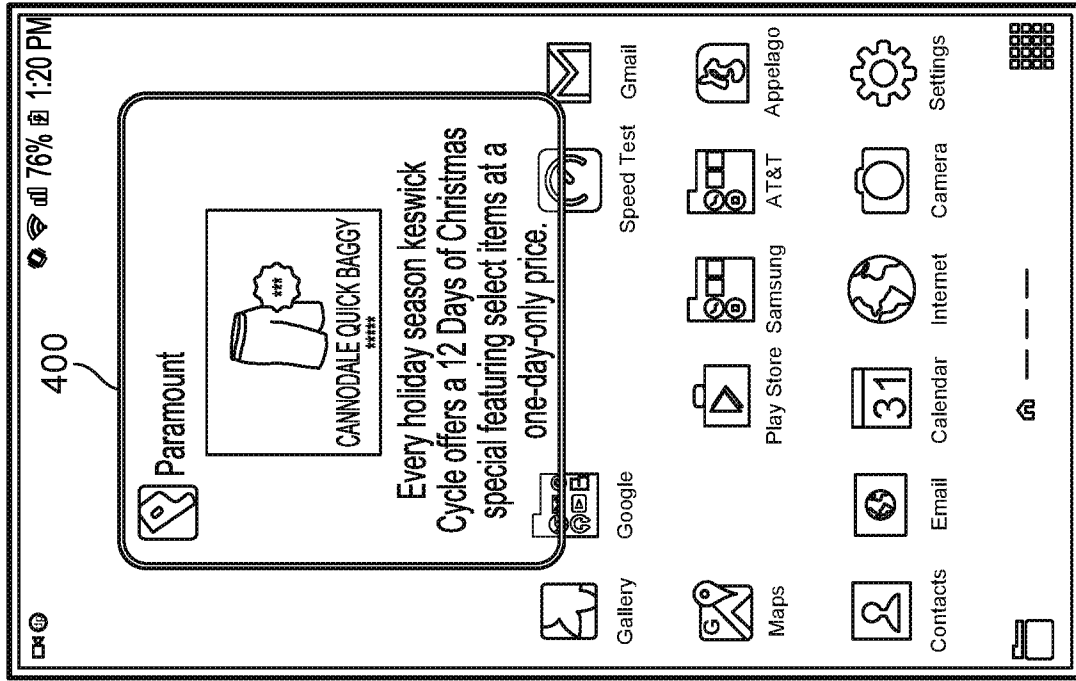


FIG. 3S

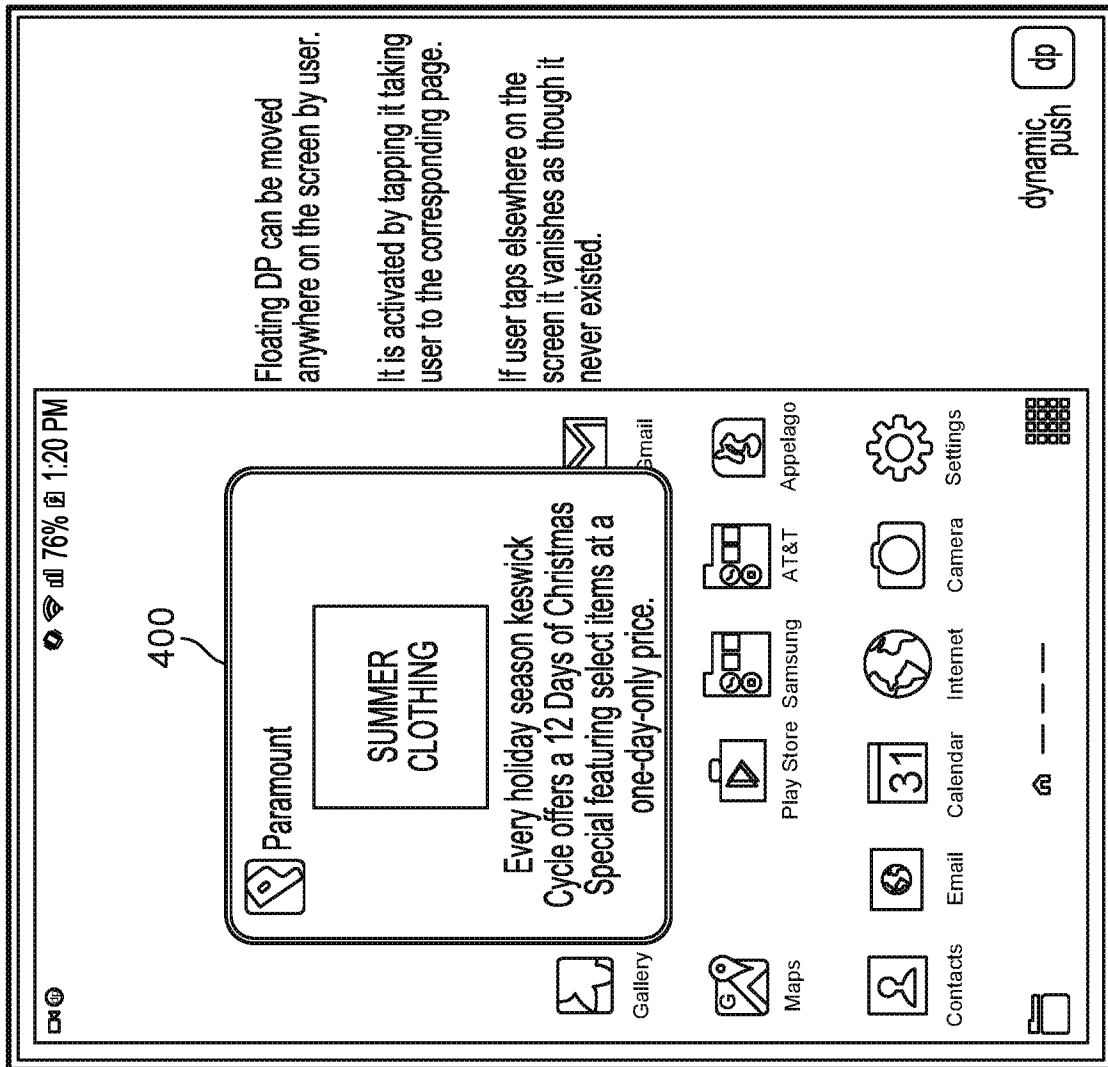


FIG. 3R

300

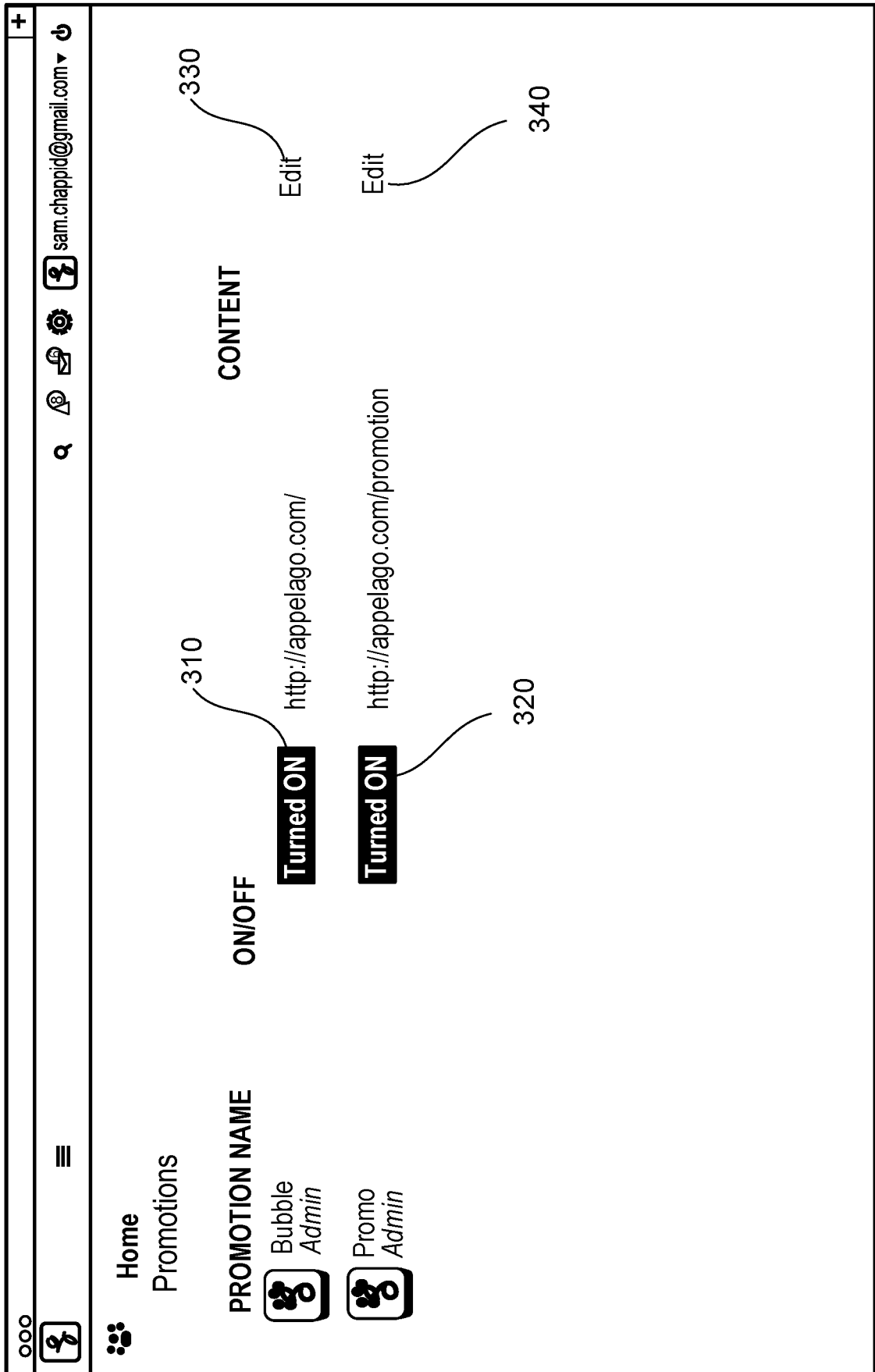


FIG. 4A

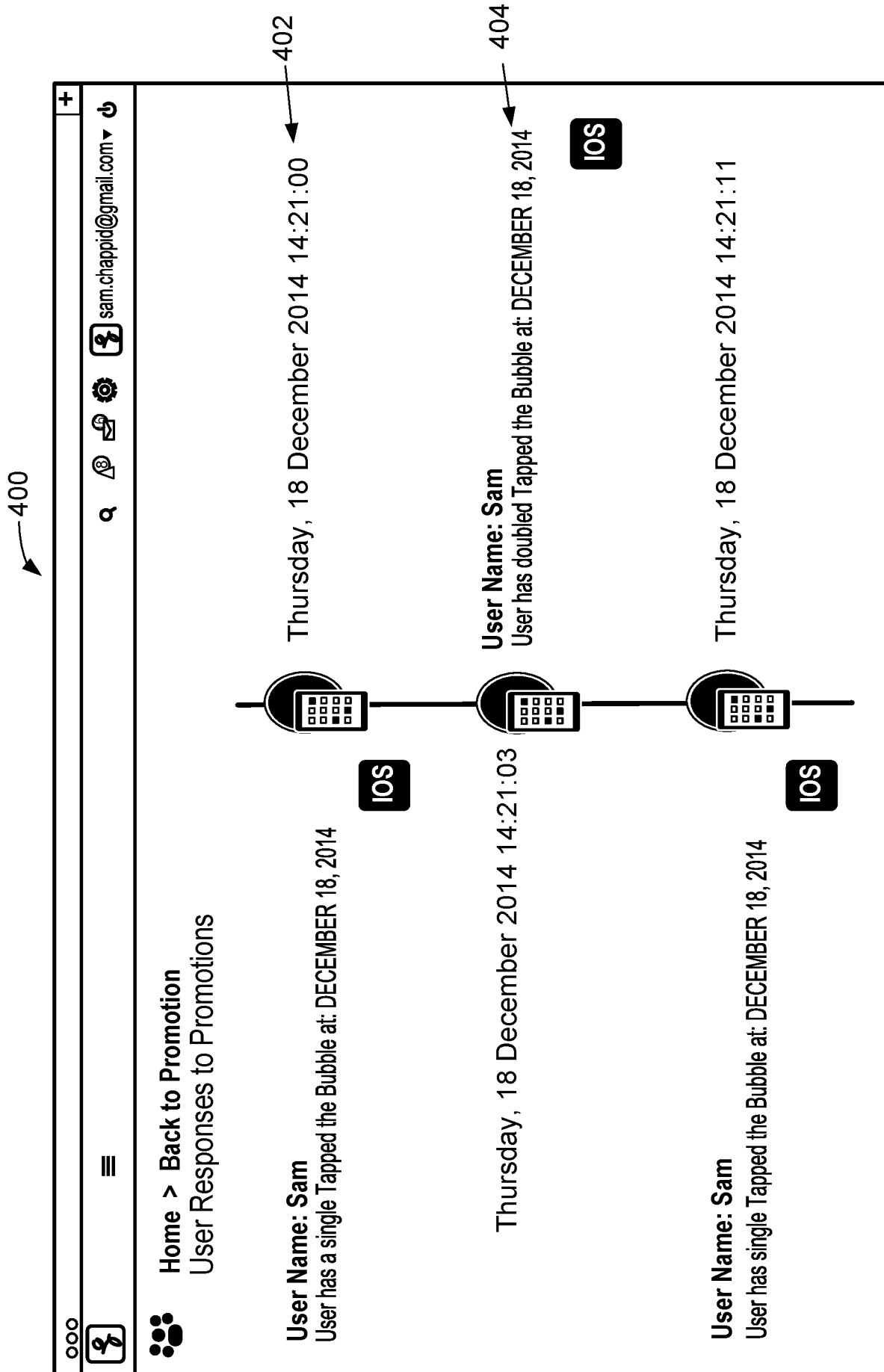


FIG. 4B

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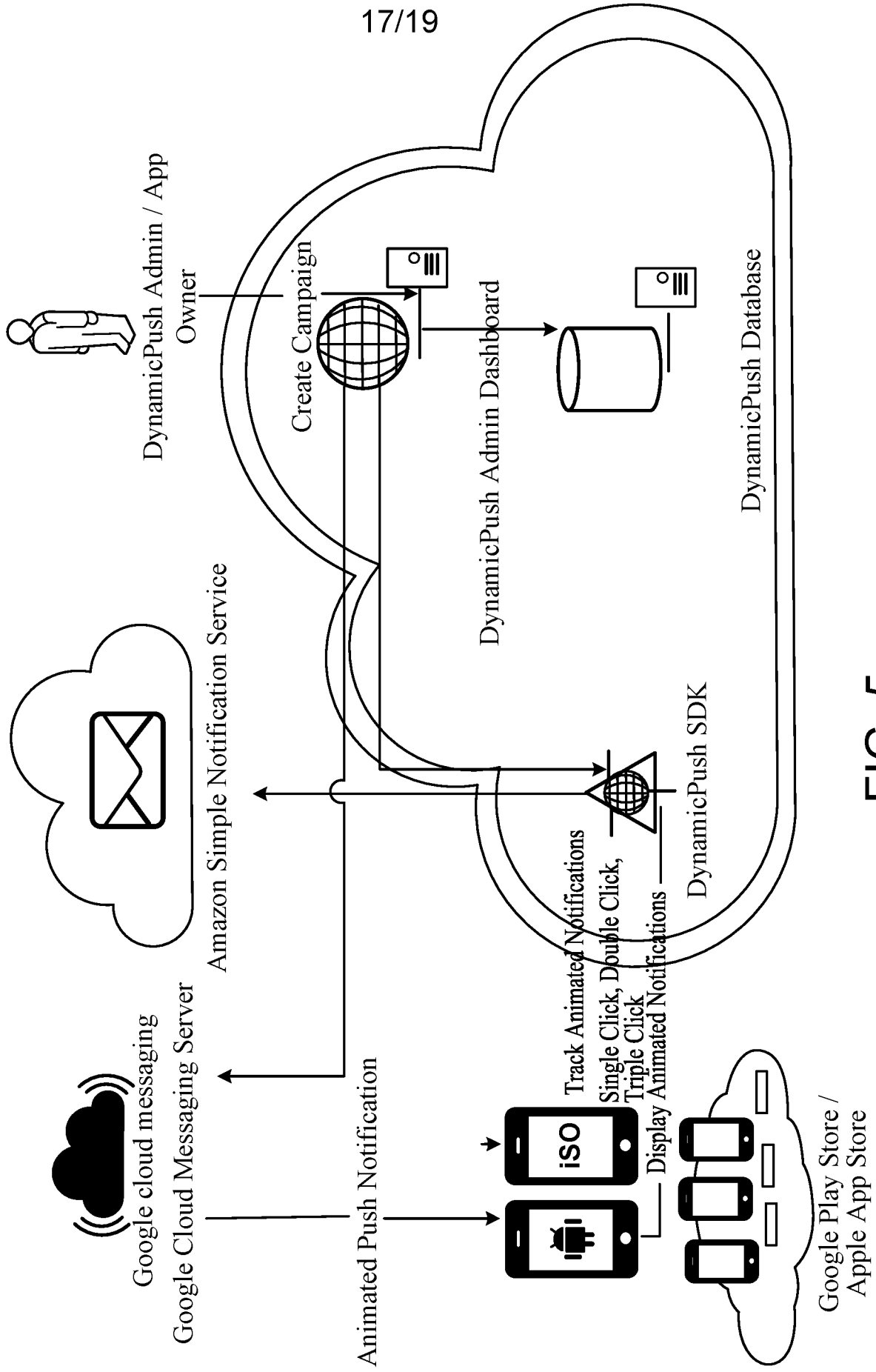


FIG. 5

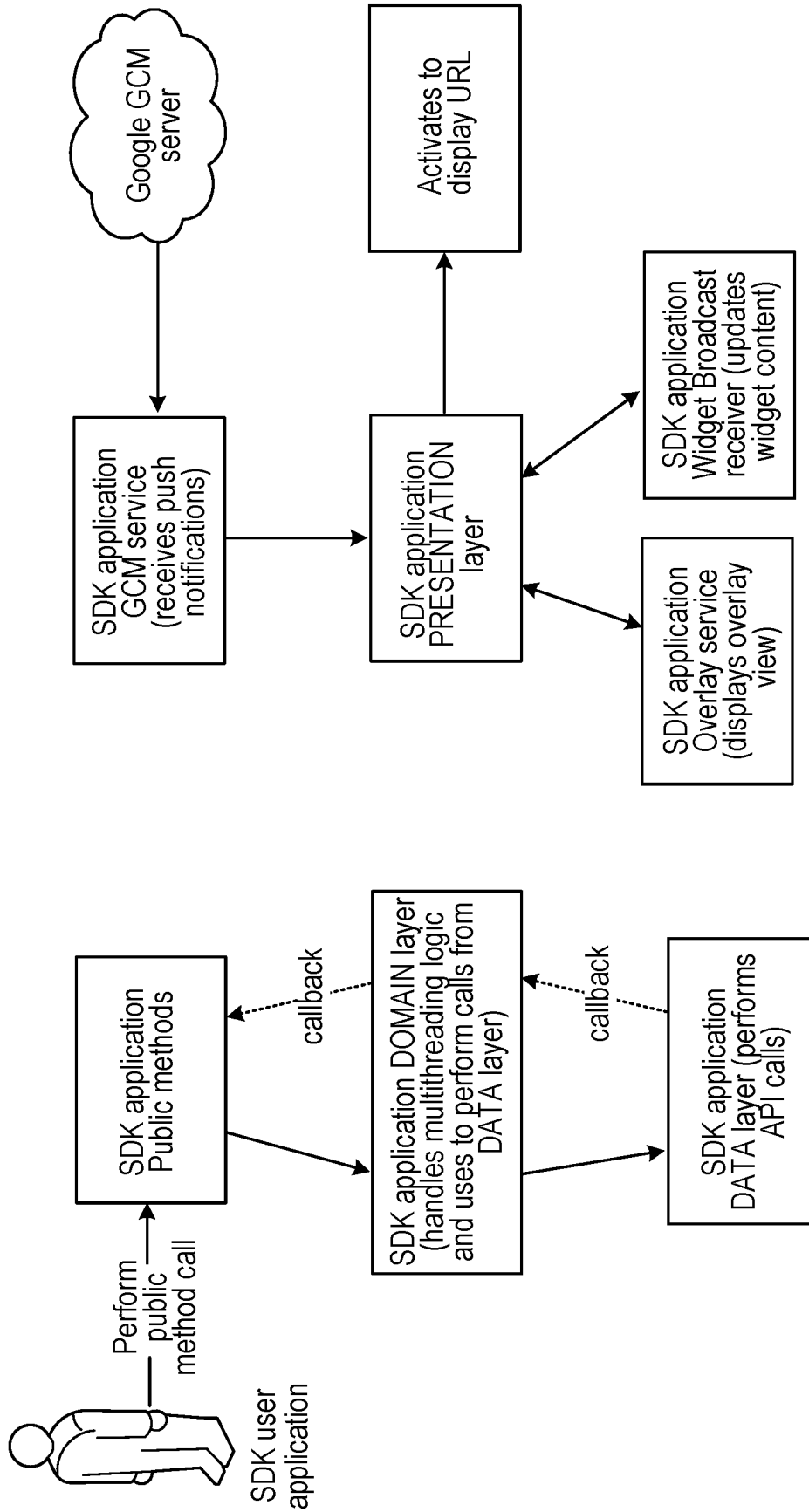


FIG. 6

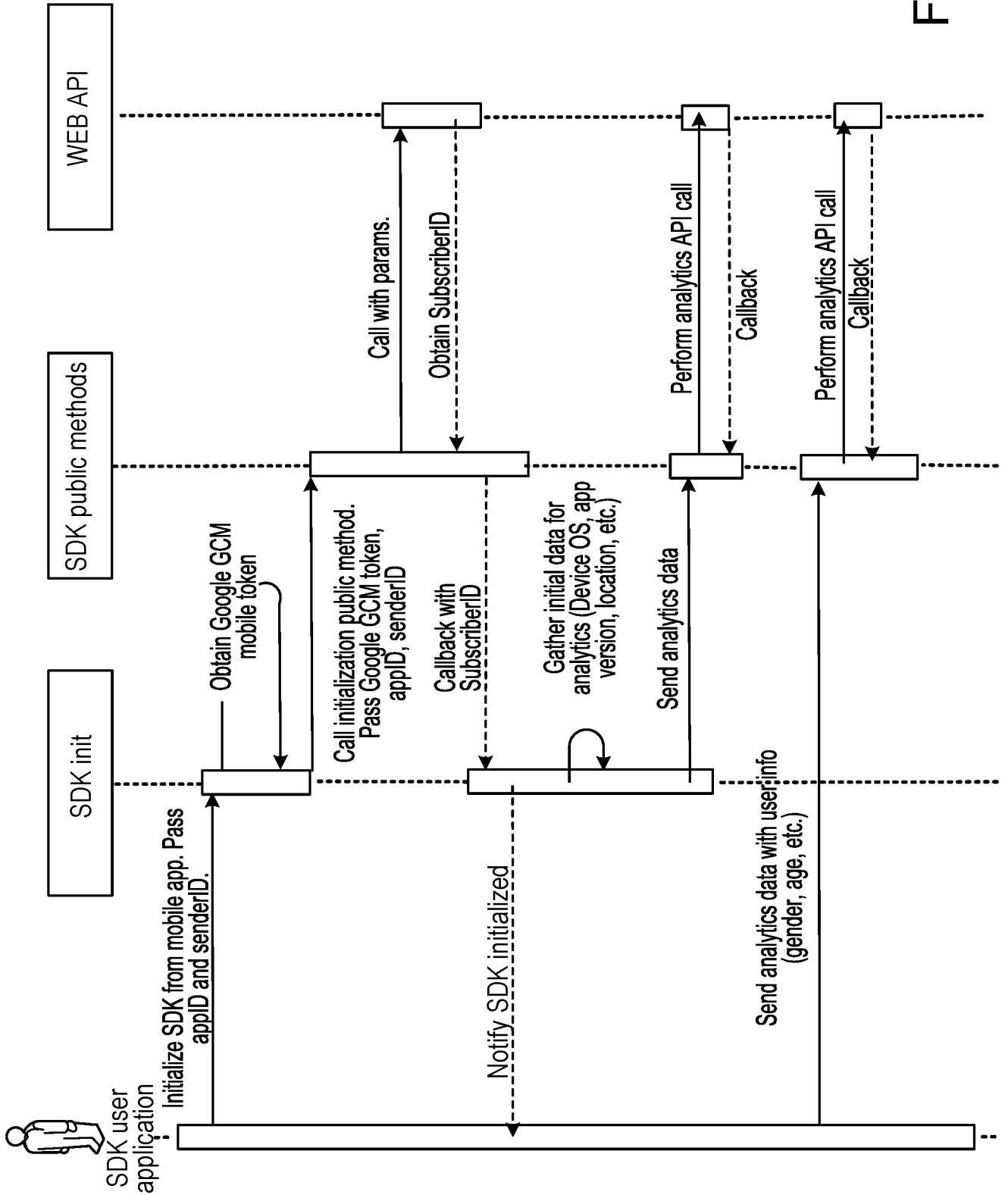


FIG. 7

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/66151

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - G06F 3/048 (2017.01) CPC - G06F 3/0481; G06F 3/04817; G06F 3/0482 According to International Patent Classification (IPC) or to both national classification and IPC																												
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8): G06F 3/048 (2017.01); USPC: 715/977; 715/861; 345/473; 345/949; CPC: G06F 3/0481; G06F 3/04817; G06F 3/0482 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8): G06F3/0481 G06F3/0482 G06F3/0484 G06T13/00 G06T13/80 (2017.01); CPC: G06T13/00 G06T13/80 G06T2200/24 H04M1/72544; USPC: 715/763 715/765 715/835 715/837 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Google Web/Patents; Patbase; Search Terms: Animate icon symbol static dynamic overlay forefront foreground superimpose top front forefront phone smartphone tablet running active stack application program display map blink love romance select auction bid gesture voice																												
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																												
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X ----- Y</td> <td>US 2010/0281121 A1 (CHENG et al.) 04 November 2010 (04.11.2010), entire document, especially para [0008]-[0010], [0021]</td> <td>1, 8, 11, 13, 15, 16, 20 ----- 2-7, 9, 10, 12, 14, 17-19</td> </tr> <tr> <td>Y</td> <td>US 2014/0245227 A1 (XU et al.) 28 August 2014 (28.08.2014), para [0040], [0045], [0052], [0057]</td> <td>2, 5, 19</td> </tr> <tr> <td>Y</td> <td>US 7,271,815 B2 (CLAS) 18 September 2007 (18.09.2007), col 1, ln 11-18; col 2, ln 8-15</td> <td>3, 12</td> </tr> <tr> <td>Y</td> <td>US 2015/0178972 A1 (BARCAY et al.) 25 June 2015 (25.06.2015), Abstract, para [0005]</td> <td>4</td> </tr> <tr> <td>Y</td> <td>US 7,945,503 B2 (GOTTLIEB) 17 May 2011 (17.05.2011), col 6, ln 47 - col 7, ln 2</td> <td>6, 10</td> </tr> <tr> <td>Y</td> <td>US 2012/0290978 A1 (DEVECKA) 15 November 2012 (15.11.2012), para [0019], [0024], [0067], [0123], [0166]</td> <td>7, 9, 14</td> </tr> <tr> <td>Y</td> <td>WO 2014/111924 A1 (POOW INNOVATION LTD.) 24 July 2014 (07.24.2014), pg 13, ln 27 - pg 14, ln 5; pg 12, ln 6-8; pg 8, ln 16-21; pg 8, ln 27-30</td> <td>17, 18</td> </tr> <tr> <td>A</td> <td>US 2014/0098108 A1 (FONG et al.) 10 April 2014 (10.04.2014), entire document</td> <td>1-20</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X ----- Y	US 2010/0281121 A1 (CHENG et al.) 04 November 2010 (04.11.2010), entire document, especially para [0008]-[0010], [0021]	1, 8, 11, 13, 15, 16, 20 ----- 2-7, 9, 10, 12, 14, 17-19	Y	US 2014/0245227 A1 (XU et al.) 28 August 2014 (28.08.2014), para [0040], [0045], [0052], [0057]	2, 5, 19	Y	US 7,271,815 B2 (CLAS) 18 September 2007 (18.09.2007), col 1, ln 11-18; col 2, ln 8-15	3, 12	Y	US 2015/0178972 A1 (BARCAY et al.) 25 June 2015 (25.06.2015), Abstract, para [0005]	4	Y	US 7,945,503 B2 (GOTTLIEB) 17 May 2011 (17.05.2011), col 6, ln 47 - col 7, ln 2	6, 10	Y	US 2012/0290978 A1 (DEVECKA) 15 November 2012 (15.11.2012), para [0019], [0024], [0067], [0123], [0166]	7, 9, 14	Y	WO 2014/111924 A1 (POOW INNOVATION LTD.) 24 July 2014 (07.24.2014), pg 13, ln 27 - pg 14, ln 5; pg 12, ln 6-8; pg 8, ln 16-21; pg 8, ln 27-30	17, 18	A	US 2014/0098108 A1 (FONG et al.) 10 April 2014 (10.04.2014), entire document	1-20	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>
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Date of the actual completion of the international search 23 February 2017 (23.02.2017)	Date of mailing of the international search report <b>31 MAR 2017</b>																											
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