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(54) **EFFECT DISPLAY BASED ON TEXT RECOGNITION AND ROOM SCALING WITHIN AN AUGMENTED REALITY ENVIRONMENT**

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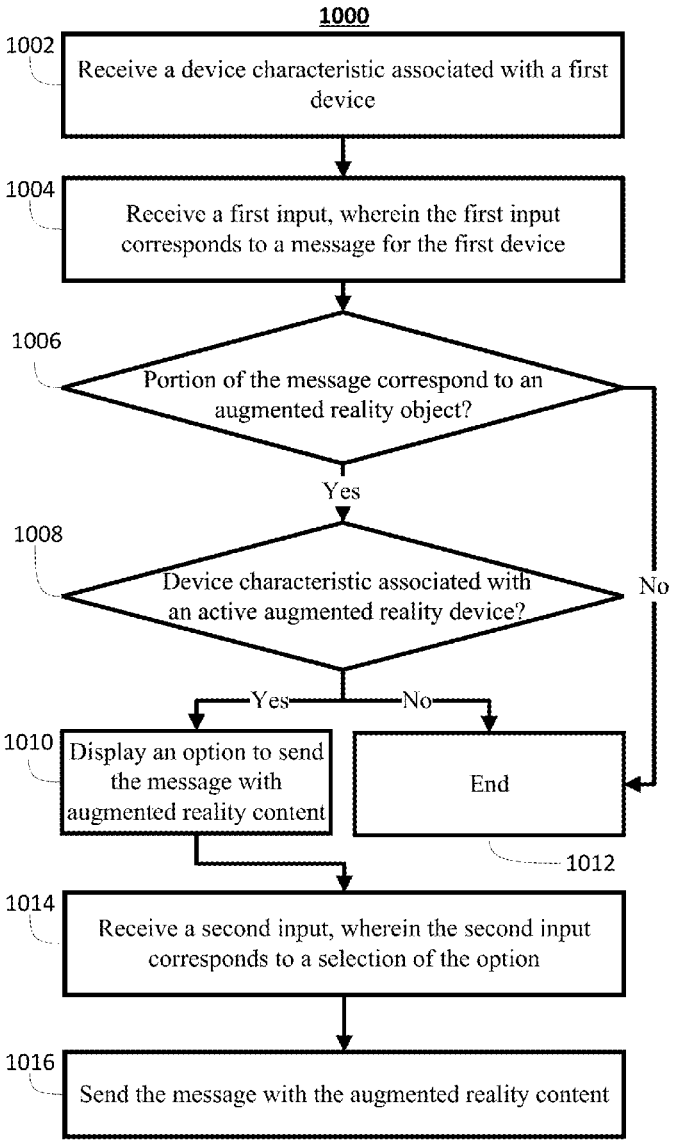
(57) **ABSTRACT**

Systems and methods are provided herein for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words. This may be accomplished by a system displaying an augmented reality view to a user and detecting a received message. The system can determine whether a portion of the message corresponds to an augmented reality object. In response to detecting that the portion of the message corresponds to the augmented reality object, the system can display the augmented reality object in the augmented reality view in a first format. The first format can be based on the environment around the user.



100

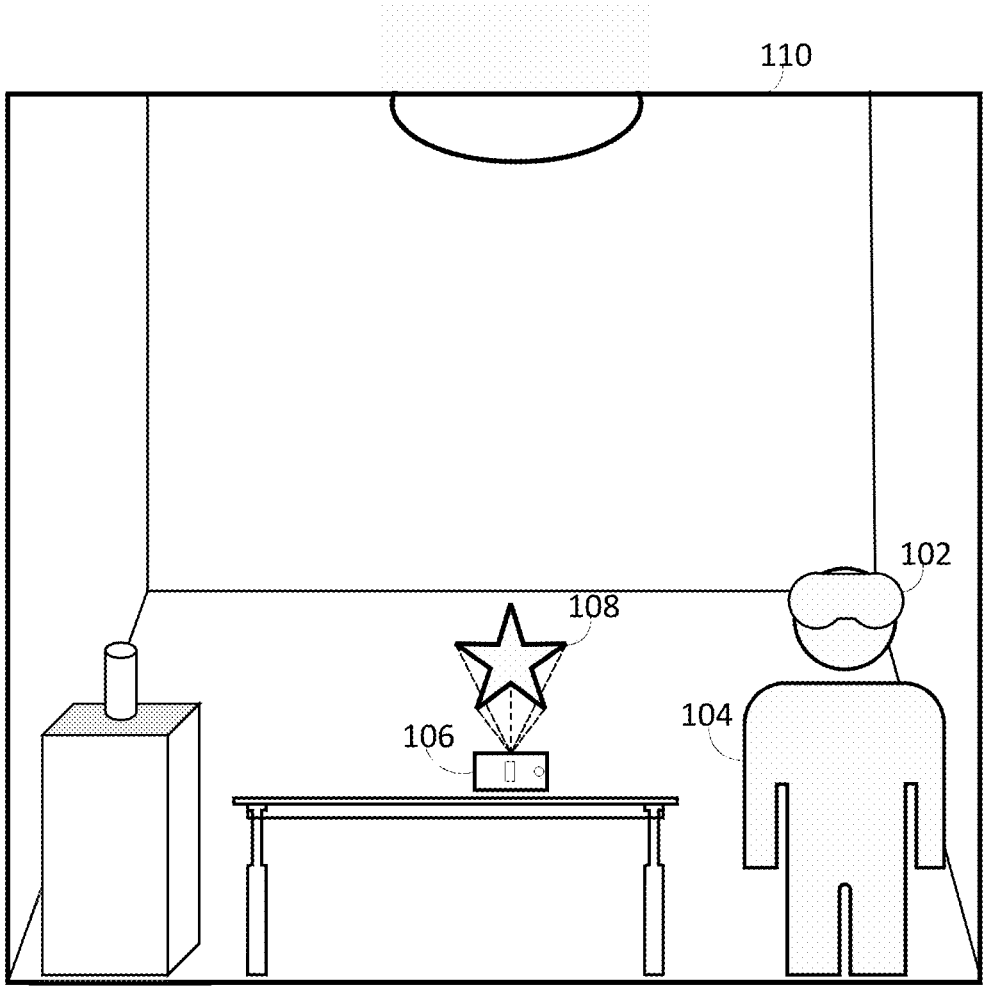


FIG. 1

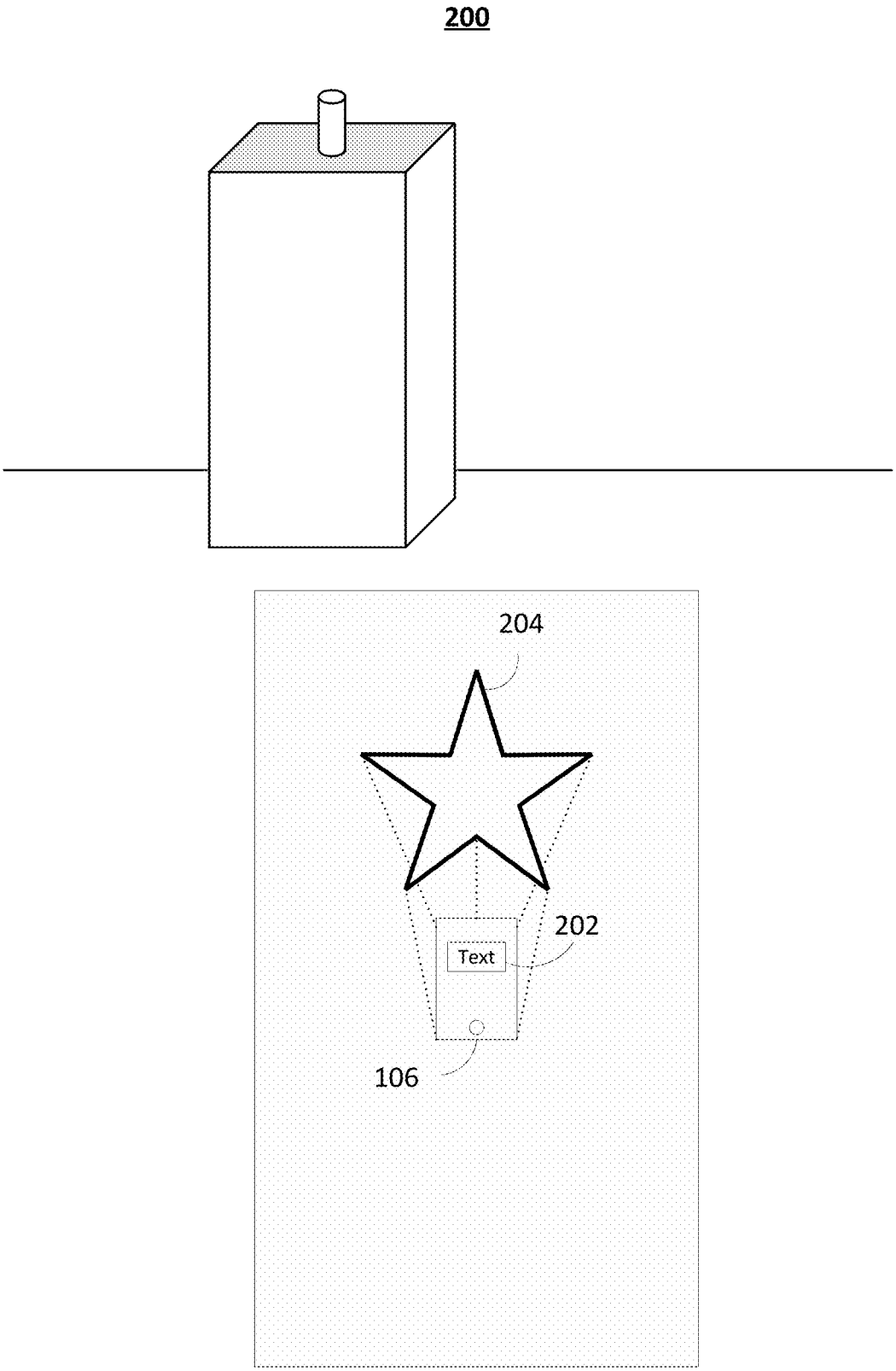


FIG. 2A

220

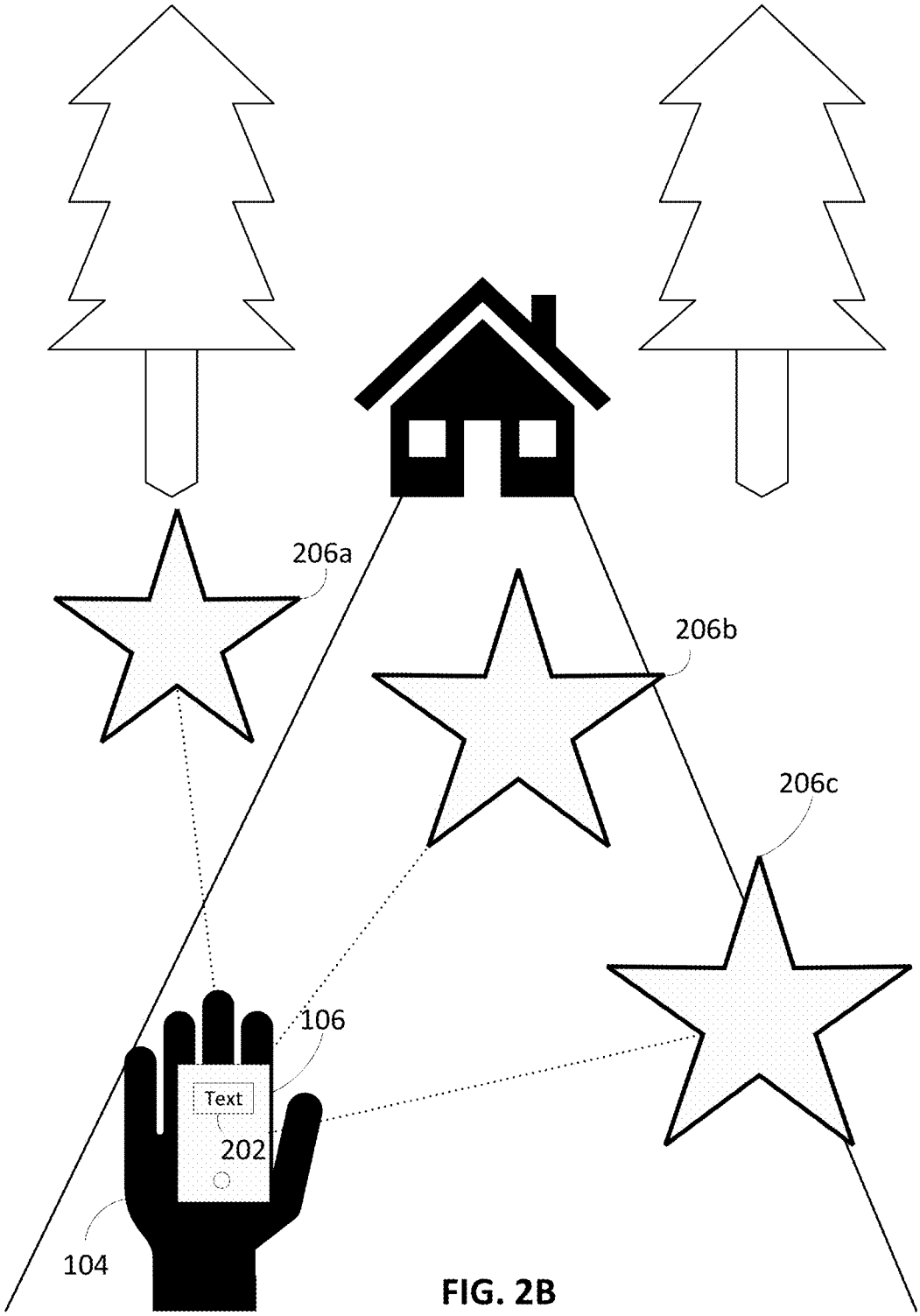


FIG. 2B

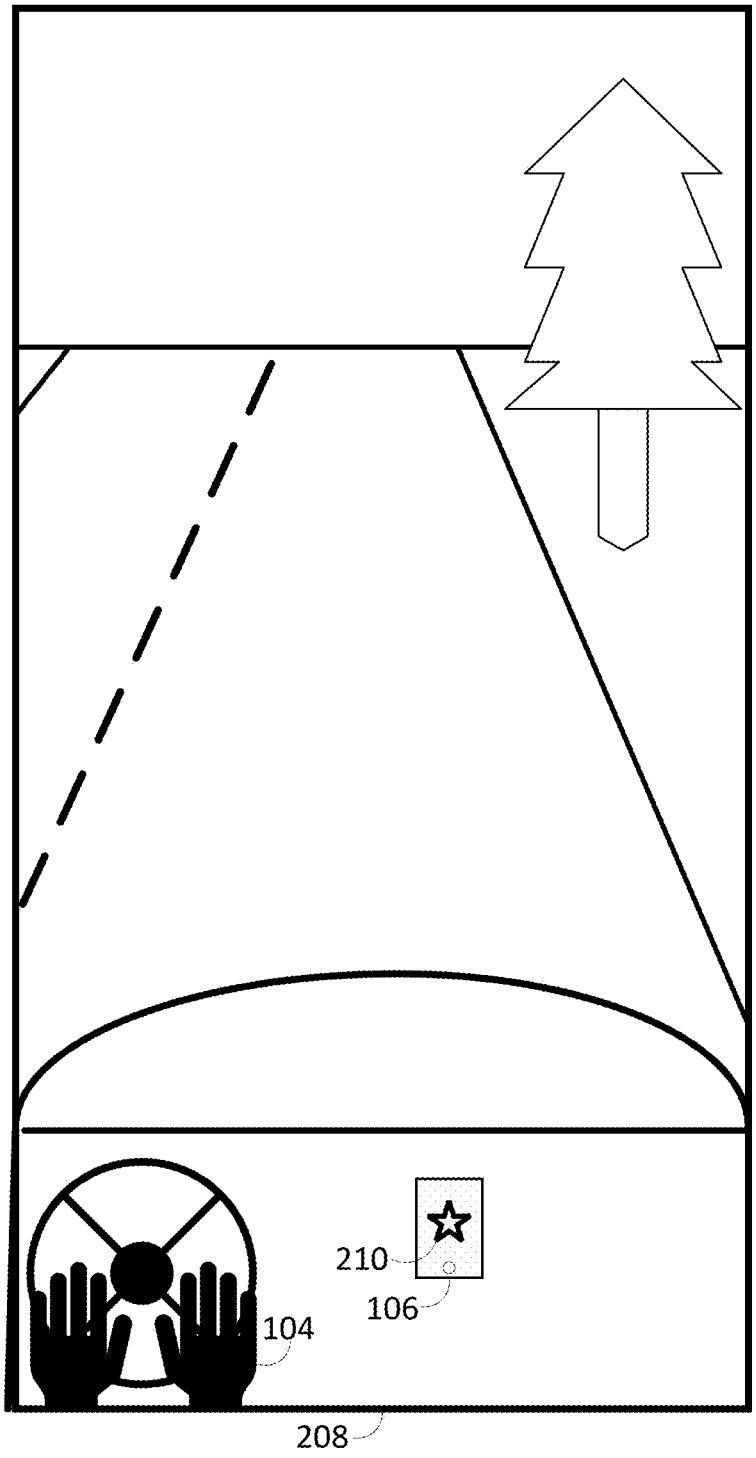


FIG. 2C

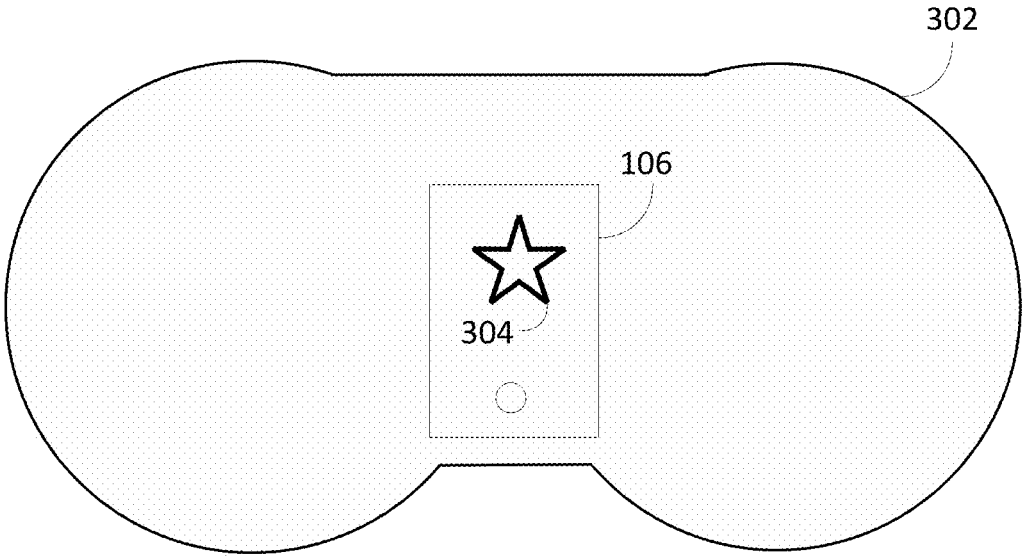


FIG. 3A

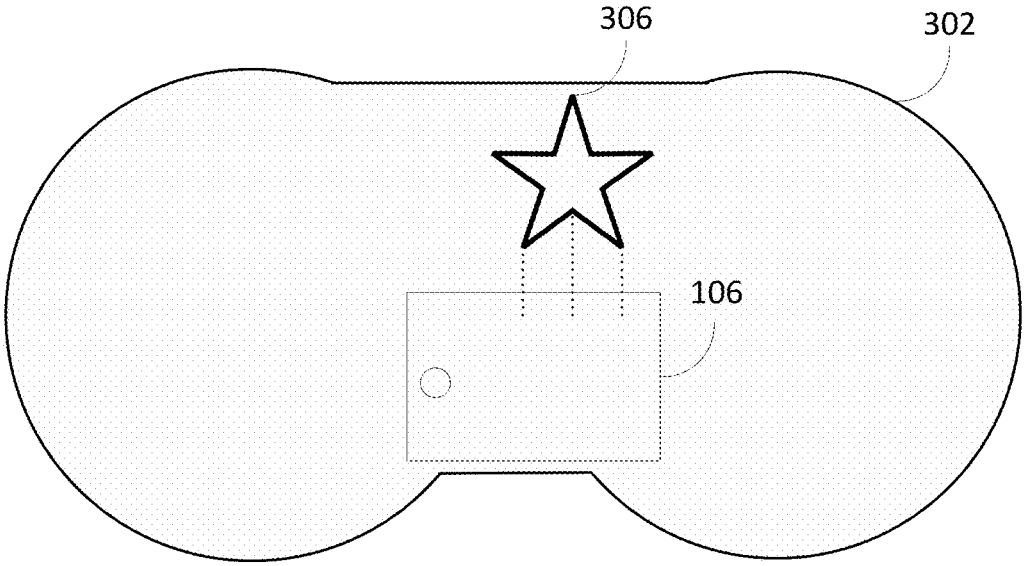


FIG. 3B

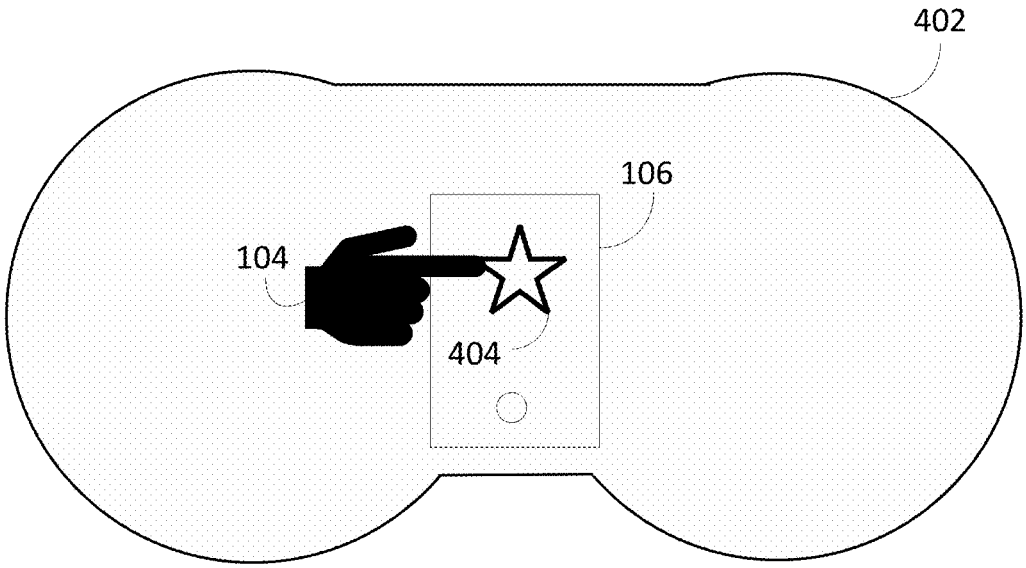


FIG. 4A

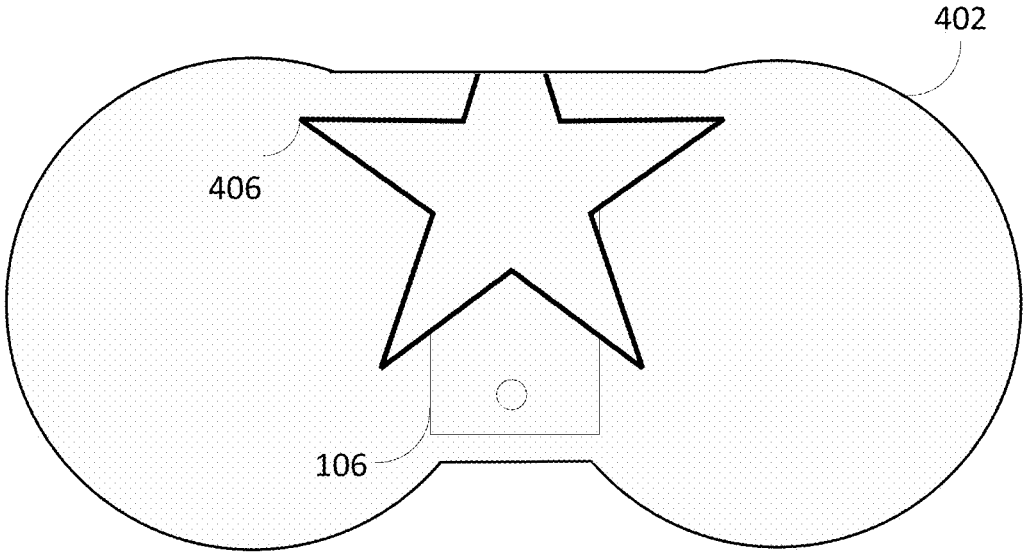


FIG. 4B

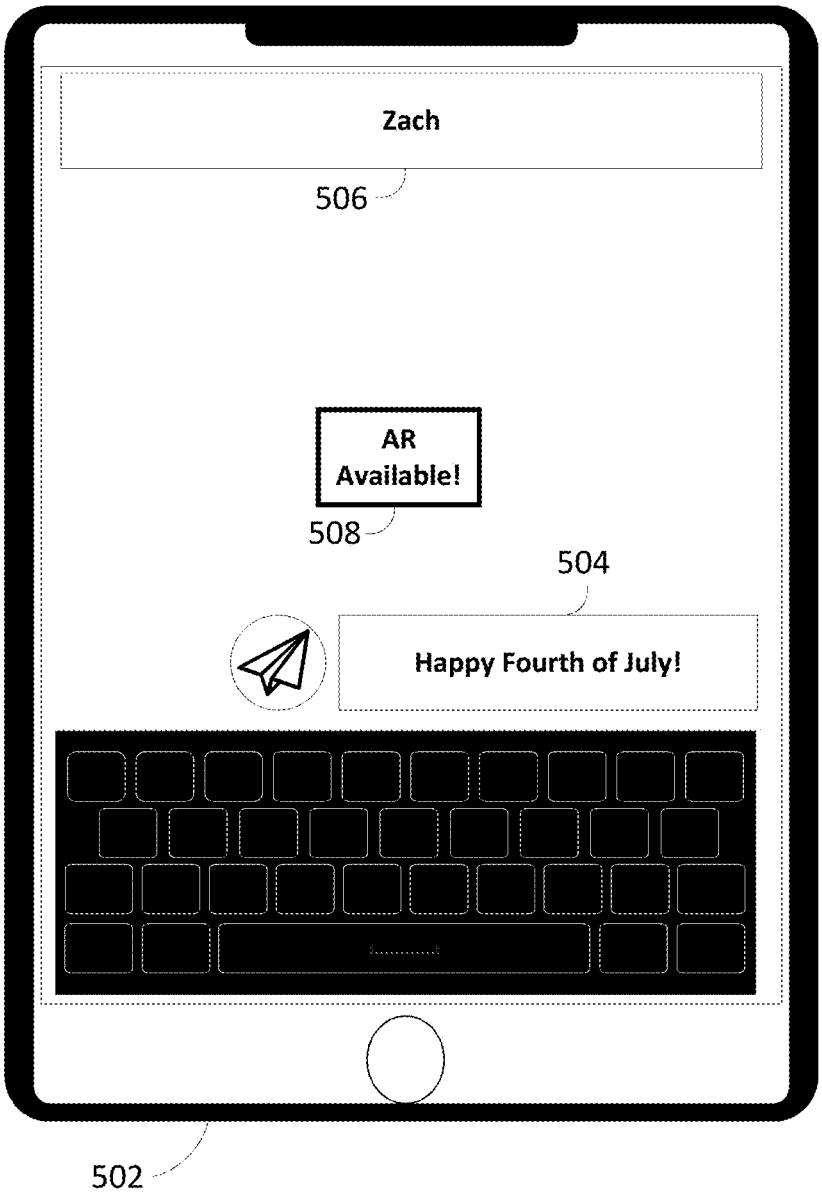


FIG. 5A

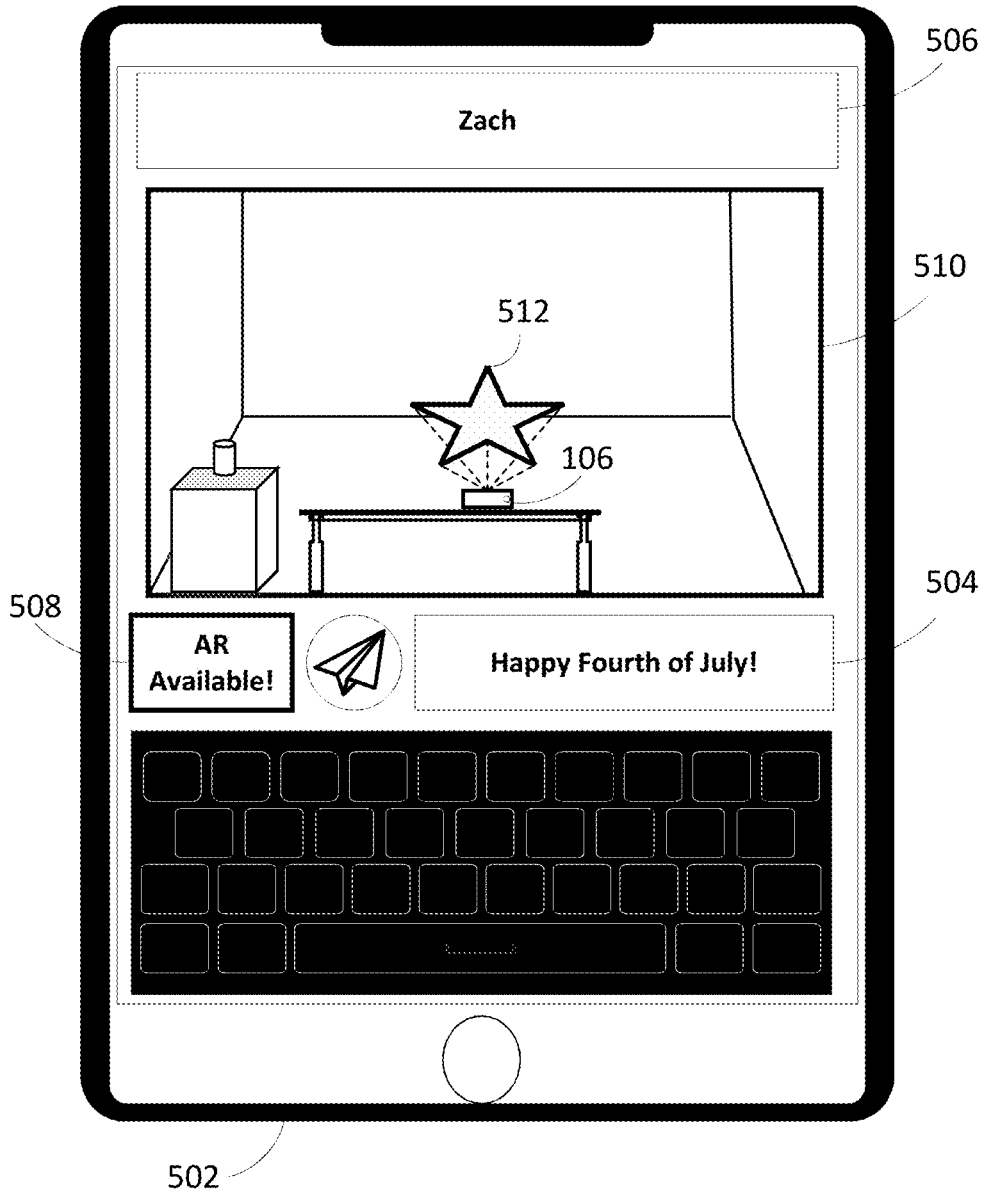

506
Zach
510
512
106
508
504
AR Available!
Happy Fourth of July!
502

FIG. 5B

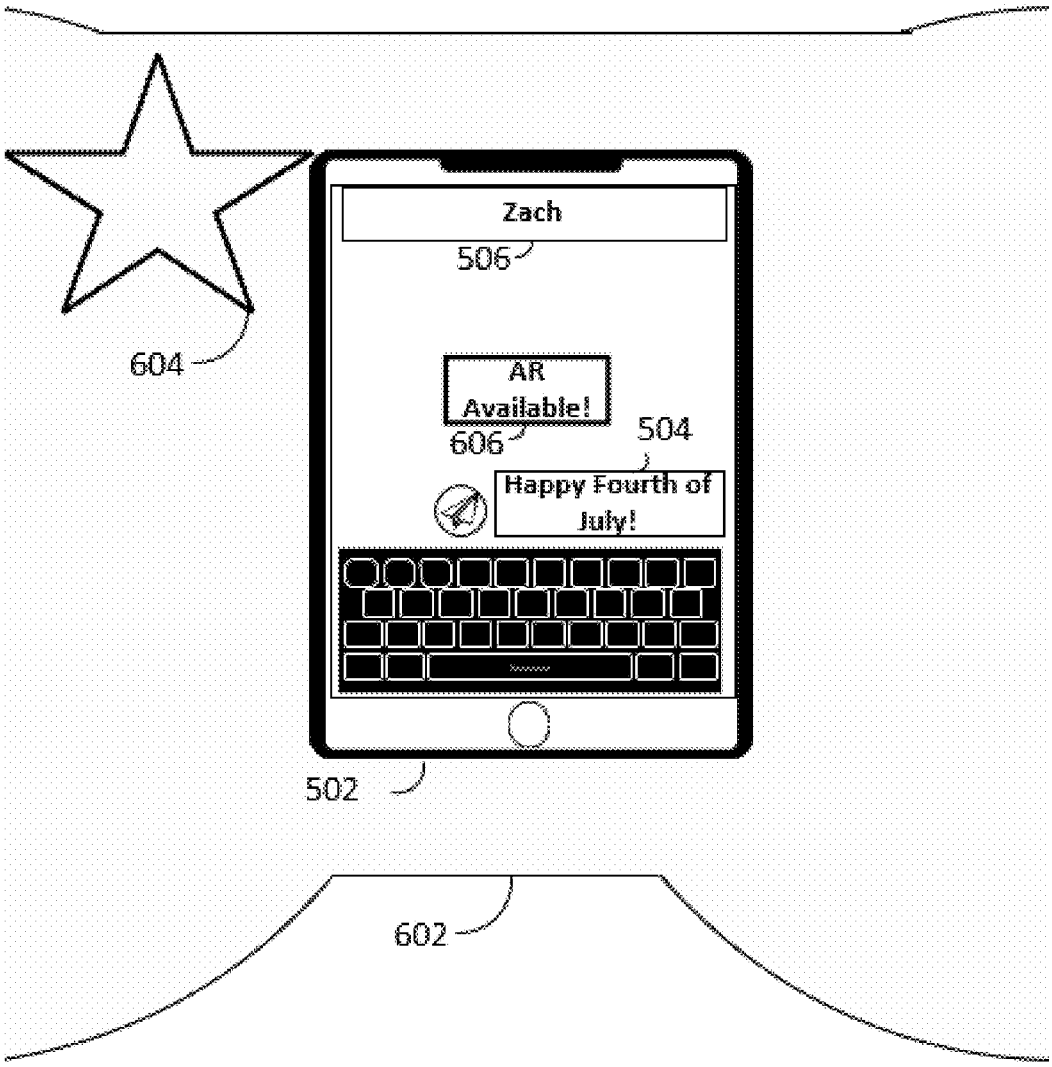

Zach
506
604
AR Available!
606
504
Happy Fourth of July!
502
602

FIG. 6

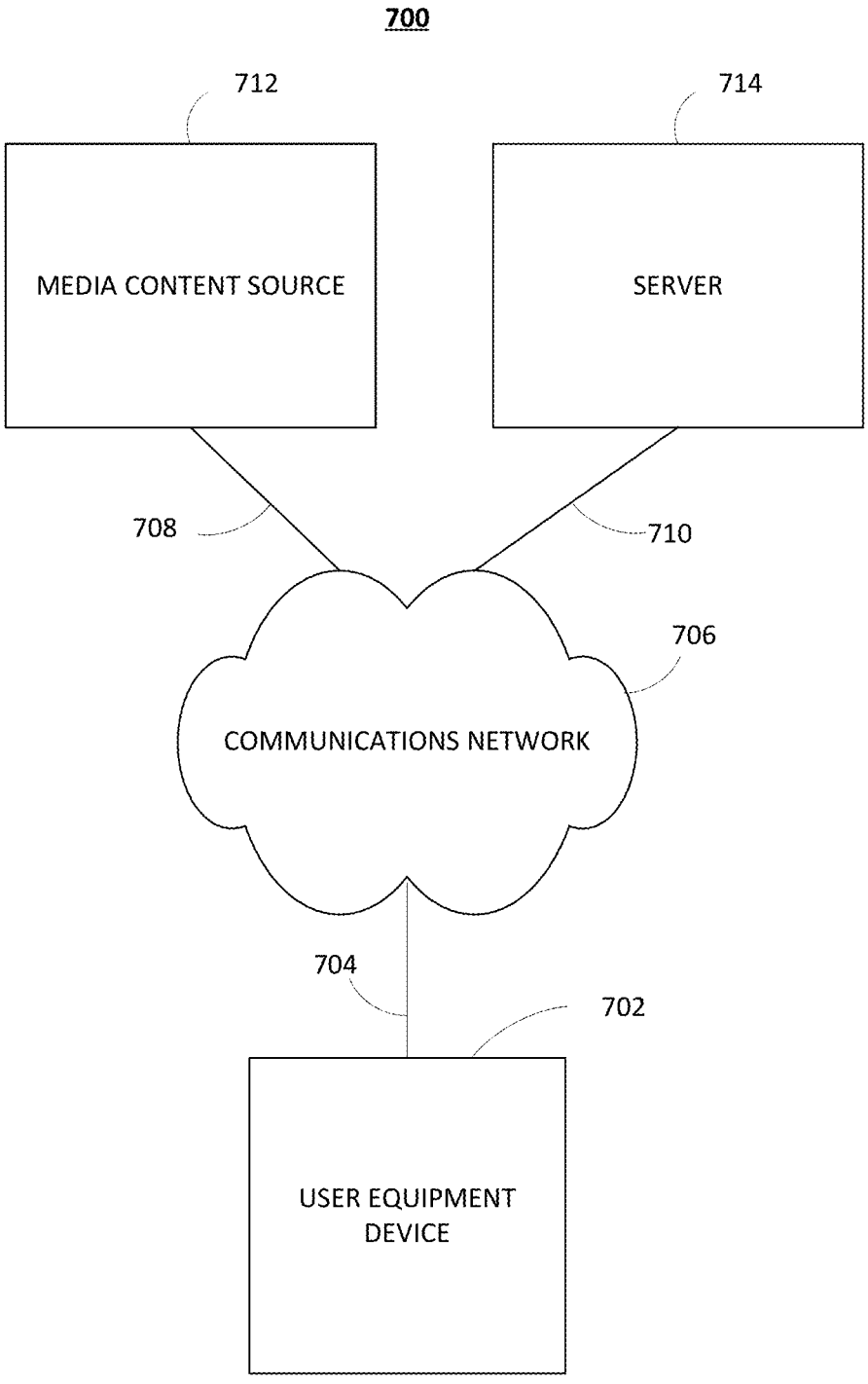

700
712
714
MEDIA CONTENT SOURCE
SERVER
708
710
706
COMMUNICATIONS NETWORK
704
702
USER EQUIPMENT DEVICE

FIG. 7

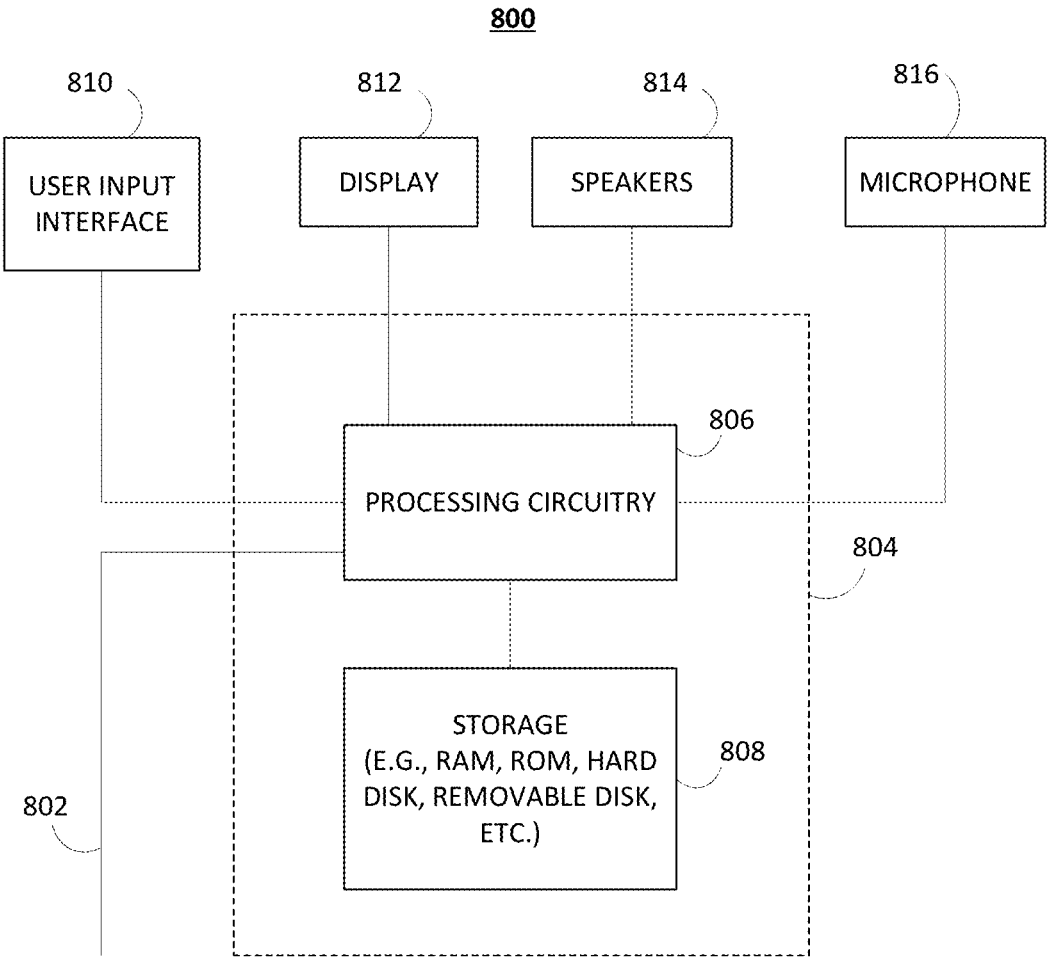

800
810
USER INPUT INTERFACE
812
DISPLAY
814
SPEAKERS
816
MICROPHONE
806
PROCESSING CIRCUITRY
804
STORAGE (E.G., RAM, ROM, HARD DISK, REMOVABLE DISK, ETC.)
808
802

FIG. 8

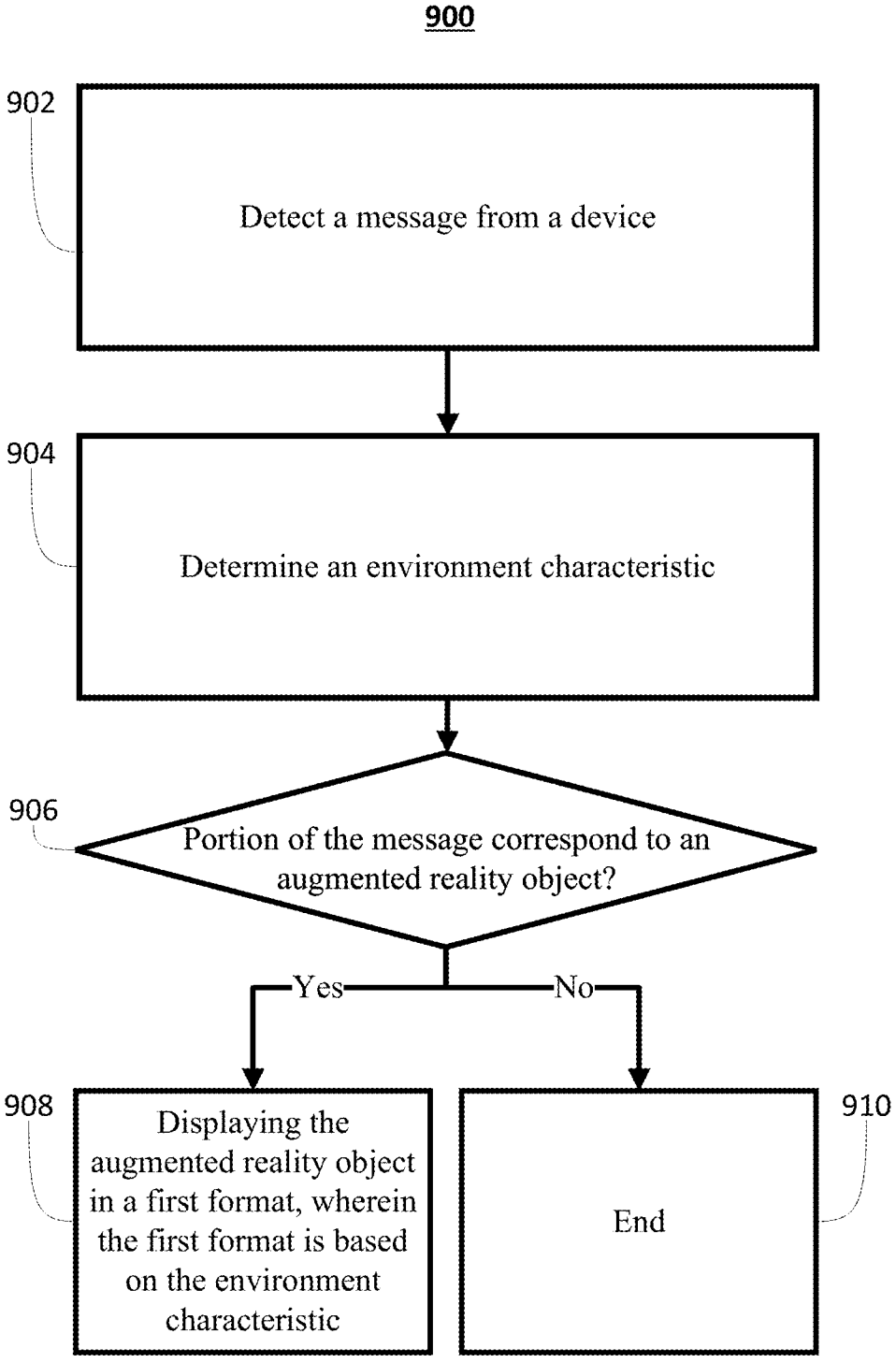

900
902
Detect a message from a device
904
Determine an environment characteristic
906
Portion of the message correspond to an augmented reality object?
Yes
No
908
Displaying the augmented reality object in a first format, wherein the first format is based on the environment characteristic
910
End

FIG. 9

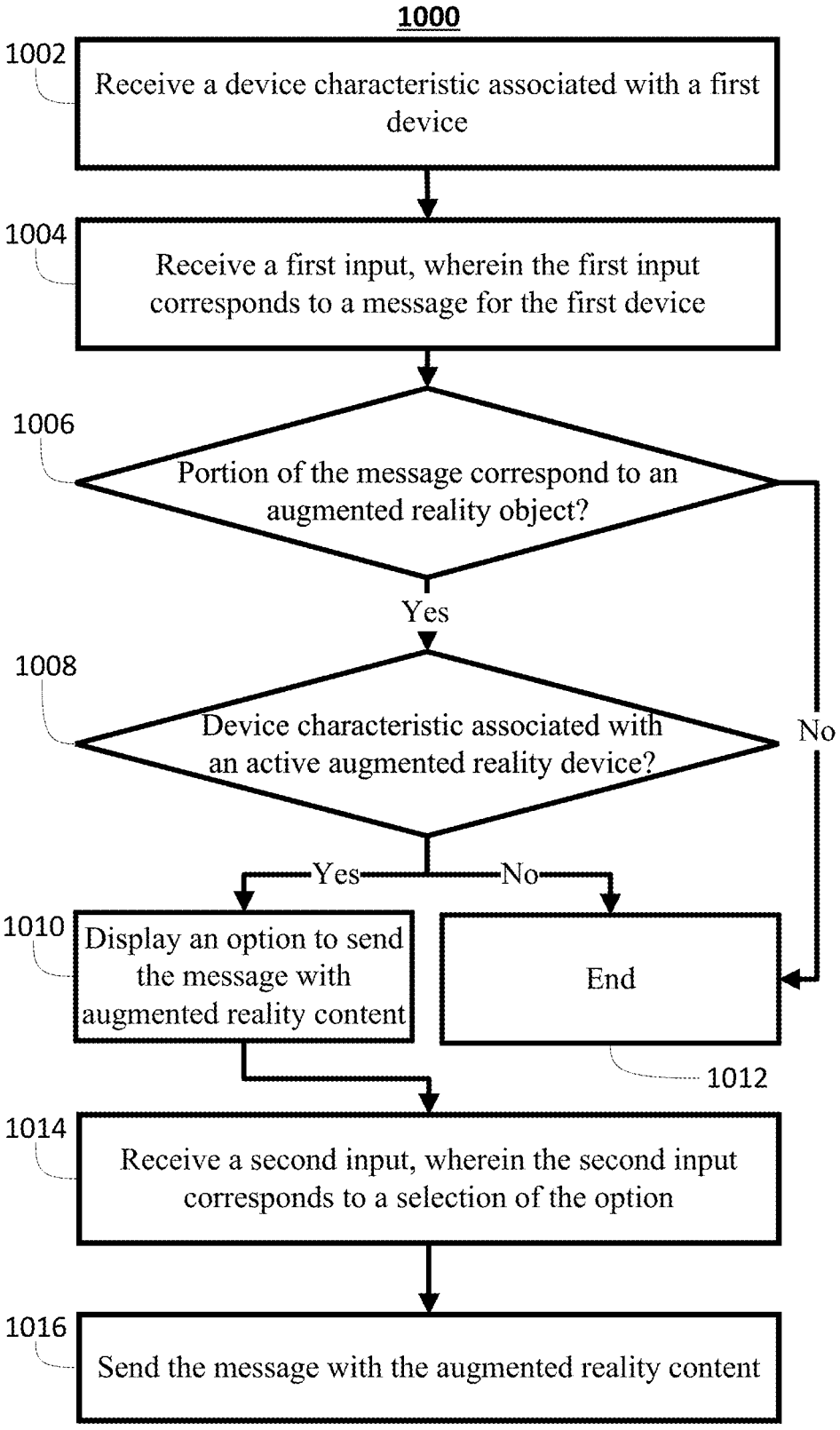

1000
1002
Receive a device characteristic associated with a first device
1004
Receive a first input, wherein the first input corresponds to a message for the first device
1006
Portion of the message correspond to an augmented reality object?
Yes
No
1008
Device characteristic associated with an active augmented reality device?
Yes
No
1010
Display an option to send the message with augmented reality content
End
1012
1014
Receive a second input, wherein the second input corresponds to a selection of the option
1016
Send the message with the augmented reality content

FIG. 10

EFFECT DISPLAY BASED ON TEXT RECOGNITION AND ROOM SCALING WITHIN AN AUGMENTED REALITY ENVIRONMENT

BACKGROUND

[0001] The present disclosure relates to augmented reality, and in particular to techniques for displaying an object in augmented reality.

SUMMARY

[0002] Advancements in media technology have led to the development of extended reality technologies, such as augmented reality (AR). AR overlays comprise content and information with respect to attributes of the physical environment surrounding the user. AR devices and overlays paired together enable devices to enhance a user's experience with media content such that the user experiences their surroundings and content simultaneously. An AR overlay enables the user to view the real world with an additional interactive layer of digital information projected into it (e.g., the overlay may be at least partially transparent to enable a user to remain aware of their surroundings while consuming content). The AR overlay may comprise two-dimensional or three-dimensional virtual objects as part of an interactive interface within the user's field of view (e.g., using an AR headset or a screen of a device enabled to present video corresponding to the user's surroundings). Current AR systems fail to fully utilize information provided by other devices to improve the AR environment displayed for the user. For example, most AR systems lack the ability to supplement or enhance messages, pictures, and alarms displayed on a second device within the AR environment. In view of these deficiencies, there exists a need for improved systems and methods for generating virtual objects based on detecting information provided by devices within the displayed AR environment.

[0003] Accordingly, techniques are disclosed herein for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words. For example, an AR device may display an AR environment for a user. The AR device may also communicate with one or more additional devices (e.g., smartphones, tablets, desktops, televisions, etc.) over a wired or wireless communication protocol. For example, the AR device may use Bluetooth to pair with a smartphone that is within a threshold distance of the user. The AR device may determine whether information on a first additional device corresponds to a virtual object. For example, the AR device may determine that the first additional device received a message. The AR device may perform image and/or text recognition on the received message to determine whether the message comprises a word or phrase corresponding to a virtual object. If the AR device determines that information on the first additional device corresponds to a virtual object, the AR device displays the virtual object in a first format in the AR environment.

[0004] In some embodiments, the AR device uses one or more factors when determining a format for displaying the virtual object. For example, the AR device may use one or more environment characteristics relating to the space around the AR device to determine a format of the virtual object. The AR device may display the virtual object in a first format if the AR device determines that the AR device is indoors and may display the virtual object in a second format if the AR device determines that the AR device is outdoors. The animation of the virtual object in the first format may be smaller than the animation of the virtual object in the second format because there is more space in the outdoor environment. In another example, the AR device may display the virtual object in a first format if the AR device determines that the AR device is in a vehicle and may display the virtual object in a second format if the AR device determines that the AR device is not in a vehicle. The virtual object in the first format may have no animation and may just be an icon to avoid distracting a user while driving and the virtual object in the second format may be animated. In another example, the AR device may display the virtual object in a first format if the AR device determines that the additional device is in a first orientation and may display the virtual object in a second format if the AR device determines that the additional device is in a second orientation. The virtual object in the first format may have animation vectors originating from the additional device in the first orientation while the virtual object in the second format may have animation vectors originating from the additional device in the second orientation. Changing the format of the virtual object depending on the orientation of the additional device allows for a more realistic user experience. Additionally, the user may change the orientation of the additional device to view the virtual object in different formats.

[0005] A first device may indicate whether a second device is associated with a user using an AR device. For example, a first device may receive one or more inputs (e.g., a second user typing a message) corresponding to a message. The first device may determine (e.g., using image and/or text recognition on the message) whether a portion of the message comprises a word or phrase corresponding to a virtual object. The first device may also determine that the recipient of the message is a second device. The first device may receive a device characteristic associated with the second device. In some embodiments, the device characteristic indicates whether a user associated with the second device is using an AR device. For example, the second device may communicate (e.g., using Bluetooth, Wi-Fi, and/or similar such communication methods) with one or more AR devices and determine that the one or more AR devices are displaying an AR environment for the user. The second device itself can be an AR device (e.g., AR glasses) that can display text, audio and video messages to the user (e.g., via installed messaging apps) or the second device can act as an extension to another user device (e.g., a phone) where the second device receives and displays content that was sent to the phone. In another example, the second device is associated with a profile. In some embodiments, one or more devices (e.g., the second device) are associated with the profile. The profile may indicate whether any of the devices associated with the profile are displaying an AR environment, whether they have AR capabilities, and whether the AR device(s) are online. In some embodiments, if a user is wearing the AR device (e.g., AR glasses), then such status is also sent to the first device. Accordingly, the AR device may use the profile to determine if the user is using an AR device. After determining that the user is using an AR device, the second device may transmit a device characteristic (e.g., indicating that the user is using an AR device) to the first device.

[0006] In response to the first device determining that a portion of the message for the second device comprises a word or phrase corresponding to a virtual object and that a user associated with the second device is using an AR device, the first device may display an option to send the message with the virtual object. In some embodiments, the first device also displays an example of how the virtual object will look when displayed by the AR device. If the option to send the message with the virtual object is selected, the first device transmits the message along with an indicator to the second device. The indicator may indicate that a portion of the message corresponds to a virtual object. The AR device may display the virtual object for the user based on the second device receiving the indicator. The indicator may be metadata associated with the message and/or may comprise information about the virtual object. If the first device determines that a portion of the message for the second device comprises a word or phrase corresponding to a virtual object, but the user associated with the second device is not using an AR device, the first device may not display an option to send the message with the virtual object because there is no way for the user to currently view the virtual object.

[0007] In some embodiments, the first device may use a received device characteristic to generate the display of the example of the virtual object. For example, if a device characteristic indicates that the AR device is indoors, the first device may generate an example of the virtual object in a first format in an enclosed environment. In another example, if a device characteristic indicates that the AR device is outdoors, the first device may generate an example of the virtual object in a second format in an outdoor environment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The below and other objects and advantages of the disclosure will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings in which:

[0009] FIG. **1** shows an illustrative diagram of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0010] FIGS. **2**A-**2**C show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0011] FIGS. **3**A and **3**B show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0012] FIGS. **4**A and **4**B show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0013] FIGS. **5**A and **5**B show illustrative diagrams of a system for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0014] FIG. **6** shows another illustrative diagram of a system for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure;

[0015] FIG. **7** shows an illustrative block diagram of a media system, in accordance with embodiments of the disclosure;

[0016] FIG. **8** shows an illustrative block diagram of a user equipment device system, in accordance with some embodiments of the disclosure;

[0017] FIG. **9** is an illustrative flowchart of a process for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure; and

[0018] FIG. **10** is an illustrative flowchart of a process for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure.

DETAILED DESCRIPTION

[0019] FIG. **1** shows an illustrative diagram of a system **100** for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. System **100** includes a user **104** wearing an AR device **102**. Although the AR device **102** is shown as a headset, any device or devices that can display an AR environment may be used. In some embodiments, the AR device **102** is in communication with an additional device **106**. The additional device **106** may be a smartphone, tablet, desktop, television, and/or similar such devices. In some embodiments, the AR device **102** communicates with the device **106** using one or more wired and/or wireless communication protocols. For example, the AR device **102** and the additional device **106** may communicate via a Wi-Fi network.

[0020] In some embodiments, the AR device **102** uses one or more methods to determine whether one or more events associated with a virtual object **108** occurs. In some embodiments, the one or more events include the additional device **106** receiving a message, typing a message, interacting with an application, and/or similar such events. In some embodiments, the AR device **102** determines that an event associated with the virtual object **108** has occurred by communicating with an Application Programming Interface (API) that notifies that AR device **102** that the additional device **106** is interacting with an application corresponding to the virtual object **108**. In some embodiments, the AR device **102** determines that an event associated with the virtual object **108** has occurred when the AR device **102** receives a notification from the additional device **106** indicating the additional device **106** received a message corresponding to the virtual object **108**. In some, the AR device **102** determines that an event associated with the virtual object **108** has occurred by using computer vision to detect that the additional device **106** is displaying a message corresponding to the virtual object **108**.

[0021] In some embodiments, the AR device **102** determines that an event associated with the virtual object **108** has occurred after detecting that the additional device **106** outputs an audio message using one or more speakers. For example, the AR device may detect the additional device outputting "Happy Fourth of July" using one or more speakers.

[0022] In some embodiments, the AR device **102** determines that an event corresponding to the virtual object **108**

has occurred after comparing a message received by the additional device **106** to a virtual object database. For example, the AR device **102** may perform image and/or text recognition on the received message and cross-references the message or one or more portions of the message with a database linking virtual objects to words, phrases, and/or images. If the AR device **102** determines that the message or one or more portions of the message correspond to a virtual object, the AR device **102** determines that an event corresponding to the virtual object **108** has occurred.

[0023] If the AR device **102** determines that an event corresponding to the virtual object **108** has occurred, the AR device **102** displays the virtual object **108** in a first format in the AR environment. In some embodiments, the format corresponds to the size, shape, color, animation, sound, speed, direction, start position, end position, and/or similar such attributes related to the virtual object **108**. In some embodiments, the AR device **102** uses one or more factors when determining a format for displaying the virtual object **108**. For example, the AR device **102** can use one or more environment characteristics relating to a space **110** around the AR device **102** to determine the format of the virtual object **108**. In some embodiments, the AR device **102** uses computer vision, one or more sensors, and/or a profile with stored environment characteristics, to determine environment characteristics. For example, the AR device **102** may use a sensor (e.g., a camera) located on the AR device **102** to capture information about the space **110** and use the information about the space **110** to determine that the that the AR device **102** is indoors (e.g., environment characteristic). The AR device **102** may then determine a first format for the virtual object **108** based on the AR device **102** being indoors. In another example, the AR device **102** may determine whether the AR device **102** is able to connect to a known Wi-Fi network. The AR device may store past Wi-Fi connections in a profile and determine that one or more networks correspond to certain locations. In some embodiments, if the AR device **102** is able to connect to a known Wi-Fi network the AR device **102** determines a location of the AR device **102** using the profile. The AR device **102** may then determine a first format for the virtual object **108** based on the AR device **102** being at the determined location.

[0024] In some embodiments, the AR device **102** can use one or more environment characteristics relating to the additional device **106** associated with virtual object **108** to determine the format of the virtual object **108**. For example, the AR device **102** may use computer vision to determine the angle of incident (e.g., environment characteristic) between the frontal plane of the AR device **102** and the display of the additional device **106** associated with the virtual object. The AR device **102** may then determine a first format for the virtual object **108** based on the determined angle of incident. In another example, the AR device **102** may receive the orientation of the additional device **106** from the additional device **106**. The additional device **106** may use one or more sensors to determine device information (e.g., the orientation of the additional device **106**) and send the device information to the AR device **102**. The AR device **102** may then determine a first format for the virtual object **108** based on the orientation of the additional device **106**.

[0025] In some embodiments, the AR device **102** accesses a database with entries associating one or more factors with one or more formats for the virtual object **108**. For example, a first entry may associate a first factor (e.g., AR device **102** being indoors) with a first format and a second entry may associate a second factor (e.g., AR device **102** being outdoors) with a second format. In another example, a first entry may associate a first factor (e.g., AR device **102** being indoors) and a second factor (e.g., AR device **102** having a first orientation) with a first format and a second entry may associate the first factor (e.g., AR device **102** being indoors) and a third factor (e.g., AR device **102** having a second orientation) with a second format.

[0026] Once the AR device **102** determines a format for the virtual object **108**, the AR device **102** displays the virtual object **108** in the AR environment. In some embodiments, the AR device **102** determines the format for the virtual object **108** using a first factor and then displays the virtual object **108** in the determined format according to a second factor. For example, the AR device **102** may determine a size (e.g., first format) of the virtual object **108** based on the AR device **102** being indoors (e.g., first factor). The AR device **102** may then display the virtual object **108** in the AR environment so that the virtual object **108** has the same orientation as the orientation of additional device **106** (e.g., second factor). The AR device **102** displaying the virtual object **108** in the AR environment so that the virtual object **108** has the same orientation as the orientation of the additional device **106** may better simulate that the virtual object **108** is originating from the addition device **106**.

[0027] FIGS. **2**A-**2**C show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. In some embodiments, FIGS. **2**A-**2**C show AR environments displayed by one or more AR devices (e.g., AR device **202**). In some embodiments, the one or more AR devices use one or more of the methodologies described in FIG. **1** to display the AR environments.

[0028] FIG. **2**A illustrates a first AR environment **200** displayed by an AR device. In some embodiments, the first AR environment **200** corresponds to the space **110** described in FIG. **1**. In some embodiments, an AR device determines that an event corresponding to a virtual object has occurred after comparing a message **202** received by the additional device **106** to a virtual object database. For example, the AR device may perform image and/or text recognition on the message **202** and cross-reference the message or one or more portions of the message **202** with a database linking virtual objects to words, phrases, and/or images. If the AR device determines that the message **202** or one or more portions of the message **202** correspond to the virtual object, the AR device determines that an event corresponding to the virtual object has occurred.

[0029] If the AR device determines that an event corresponding to the virtual object has occurred, the AR device displays the virtual object in a first format **204** in the first AR environment **200**. In some embodiments, the AR device uses one or more factors when determining a format for displaying the virtual object. In some embodiments, the AR device uses computer vision, one or more sensors, and/or a profile with stored environment characteristics, to determine environment characteristics. In some embodiments, the AR device uses a sensor (e.g., a camera) located on the AR device to capture information about the space around the AR device and then uses the information about the space around the AR device to determine that the AR device is indoors

(e.g., environment characteristic). The AR device may then determine the first format **204** for the virtual object based on the AR device being indoors.

[0030] In some embodiments, once the AR device determines the first format **204** for the virtual object, the AR device display the first format **204** of the virtual object in the first AR environment **200**. In some embodiments, the AR device determines the first format **204** of the virtual object using a first factor and then displays the virtual object in the first format **204** according to a second factor. For example, the AR device may determine the size and shape of the virtual object based on the AR device being indoors (e.g., first factor). As shown, the AR device may then display the virtual object in the first format **204** in the first AR environment **200** so that the virtual object in the first format **204** has the same orientation as the orientation of additional device **106** (e.g., second factor).

[0031] FIG. **2**B illustrates a second AR environment **220** displayed by an AR device. In some embodiments, an AR device determines that an event corresponding to a virtual object has occurred after comparing the message **202** received by the additional device **106** to a virtual object database. If the AR device determines that the message **202** or one or more portions of the message **202** correspond to the virtual object, the AR device determines that an event corresponding to the virtual object has occurred.

[0032] In some embodiments, if the AR device determines that an event corresponding to the virtual object has occurred, the AR device displays the virtual object in a second format **206***a-c* in the second AR environment **220**. In some embodiments, the AR device uses one or more factors when determining a format for displaying the virtual object. In some embodiments, the AR device uses computer vision, one or more sensors, and/or a profile with stored environment characteristics, to determine environment characteristics. In some embodiments, the AR device connects to a network to determine the location of the AR device. For example, the AR device may access a global positioning system to determine the location (e.g., environment characteristic) of the AR device. In some embodiments, the AR device determines the second format **206***a-c* for the virtual object based on the location of the AR device. For example, the location of the AR device may indicate that the AR device is outdoors. The AR device may access a database with a first entry linking the second format **206***a-c* for the virtual object with the environment characteristic associated with the AR device being outdoors. In another example, the location of the AR device may indicate that the AR device is located in a first region (e.g., building, neighborhood, city, state, country, etc.). The AR device may access the database with a second entry linking the second format **206***a-c* for the virtual object with the environment characteristic associated with the first region.

[0033] In some embodiments, the second format **206***a-c* for the virtual object comprises more animation and/or larger animations than the first format **204** of the virtual object. In some embodiments, once the AR device determines the second format **206***a-c* for the virtual object, the AR device display the second format **206***a-c* of the virtual object in the second AR environment **220**. In some embodiments, the AR device determines the second format **206***a-c* of the virtual object using a first factor and then displays the virtual object in the second format **206***a-c* according to a second factor. For example, the AR device may determine the size and animation of the virtual object based on the AR device being outdoors (e.g., first factor). As shown, the AR device may then display the virtual object in the second format **206***a-c* in the second AR environment **220** so that the virtual object in the second format **206***a-c* originates from the location of the additional device **106** (e.g., second factor).

[0034] FIG. **2**C illustrates a third AR environment **208** displayed by an AR device. In some embodiments, an AR device determines that an event corresponding to a virtual object has occurred after receiving a notification indicating that a message received by the additional device **106** is associated with a virtual object. For example, the message may comprise metadata indicating that the message is associated with a virtual object. If the AR device receives the notification indicating that a message received by the additional device **106** is associated with a virtual object, the AR device determines that an event corresponding to the virtual object has occurred.

[0035] In some embodiments, if the AR device determines that an event corresponding to the virtual object has occurred, the AR device displays the virtual object in a third format **210** in the third AR environment **208**. In some embodiments, the AR device uses one or more factors when determining a format for displaying the virtual object. In some embodiments, the AR device uses computer vision, one or more sensors, and/or a profile with stored environment characteristics, to determine environment characteristics. In some embodiments, the AR device determines that the AR device and/or the additional device **106** are moving. For example, the AR device may use sensors (e.g., accelerometers, motion sensors, and/or similar such sensors) to determine that the AR device and/or additional device **106** are in a moving vehicle (e.g., environment characteristic) of the AR device. In some embodiments, the AR device determines the third format **210** for the virtual object based on the AR device being in a moving vehicle.

[0036] In some embodiments, the third format **210** for the virtual object is much smaller than the first format **204** and the second format **206***a-c* of the virtual object. In some embodiments, the third format **210** has no animation to avoid distracting the user **104**. In some embodiments, the third format **210** is an icon displayed over the contents of the received message. In some embodiments, the AR device does not display the virtual object in the third format until the AR device determines that the vehicle has stopped moving. In some embodiments, the third format **210** of the virtual object is selectable and when the user selects the virtual object in the third format **210** the AR device displays the virtual object in another format (e.g., first format **204**). For example, the third format **210** of the virtual object may correspond to an option for a user to indicate that they are riding in a moving vehicle but are not driving. The AR device may display the virtual object in another format (e.g., first format **204**) after the user select the option.

[0037] FIGS. **3**A and **3**B show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. In some embodiments, an AR device **302** displays an AR environment comprising real-world objects (e.g., additional device **106**) and AR objects (e.g., virtual object **306**). In some embodiments, the AR device **302** displays the virtual object **306** in response to an action.

[0038] FIG. **3**A shows the AR device **302** displaying an indication **304** on the display of the additional device **106**. In some embodiments, the indication **304** is only displayed by the AR device **302** and is not displayed on the additional device **106** outside of the AR environment. In some embodiments, the indication **304** is also displayed on the screen of the additional device **106** in the real world (outside of the AR environment). In some embodiments, the indication **304** informs the user that a virtual object is available if the user performs an action. For example, the indication **304** may inform the user that a virtual object is available if the user changes the orientation of the additional device **106**.

[0039] FIG. **3**B shows the AR device **302** displaying the virtual object **306** in response to the user changing the orientation of the additional device **106**. In some embodiments, the AR device **302** displays the virtual object **306** in response to other actions. For example, the AR device **302** may display the virtual object **306** in response to a user selecting the indication **304** by tapping on the indication **304** on the additional device **106**. In another example, the AR device **302** may display the virtual object **306** in response to receiving a voice command (e.g., "Show AR animation") from a user. In another example, the AR device **302** may display the virtual object **306** in response to the user gesturing (e.g., pointing, waving, nodding, winking, blinking, etc.). In some embodiments, the AR device **302** may display the virtual object **306** in response to the additional device **106** entering the field of view of the user. For example, the user may turn the AR device **302** so that the additional device **106** is displayed in the AR environment and the AR device **302** may display the virtual object **306**. In some embodiments, the AR device **302** displays the virtual object **306** after a threshold time-period. For example, if the user does not interact with the indication **304** within one minute the AR device **302** may display the virtual object **306**.

[0040] In some embodiments, the AR device **302** detects one or more of the actions using sensors communicating with the AR device **302**. For example, the AR device **302** may use one or more accelerometers housed within the addition device **106** to determine that a user has changed the position of the additional device **106**. In another example, the AR device **302** may use one or cameras positioned around the user to determine that a user has gestured (e.g., waved). In another example, the AR device **302** may use computer vision to determine that a user has pointed at the indication **304**. In another example, the AR device may receive a notification from the additional device **106** indicating that the user has selected the indication **304** at the additional device **106**.

[0041] FIGS. **4**A and **4**B show additional illustrative diagrams of a system for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. In some embodiments, an AR device **402** displays an AR environment comprising real-world objects (e.g., additional device **106**) and AR objects (e.g., virtual object **406**). In some embodiments, the AR device **402** displays the virtual object **406** in response to an action.

[0042] FIG. **4**A shows the AR device **402** displaying an indication **404** on the display of the additional device **106**. In some embodiments, the indication **404** is only displayed by the AR device **402** and is not displayed on the additional device **106** outside of the AR environment. In some embodiments, the indication **404** is also displayed on the screen of additional device **106** in the real world (outside of the AR environment). In some embodiments, a user **104** selects the indication **404**. In some embodiments, the user **104** selects the indication **404** by tapping on the display of the additional device **106**. In some embodiments, the user **104** selects the indication **404** by pointing at the indication **404**. FIG. **4**B displays the AR device **402** displaying the virtual object **406** in response to the user's selection of the indication **404**.

[0043] FIGS. **5**A and **5**B show illustrative diagrams of a system for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure.

[0044] FIG. **5**A shows a first device **502** displaying an application (e.g., messaging application). Although a smartphone is displayed, similar such devices (e.g., AR headsets, tablets, desktop computers, televisions, etc.) may be used. In some embodiments, the first device **502** receives one or more inputs corresponding to a message **504**. For example, a user may type "Happy Fourth of July!" using the user interface provided by the first device **502**. In some embodiments, the first device **502** determines whether the message **504**, or portions of the message **504**, comprise a word of phrase corresponding to a virtual object. For example, the first device **502** may perform image and/or text recognition on the message **504** and cross-references the message, or one or more portions of the message **504**, with a database linking virtual objects to words, phrases, and/or images. In some embodiments, the first device **502** also provides the first user with the ability to select one or more of a plurality of virtual object to send to the second user **506**. For example, a first entry in the database may associate a portion of the message **504** with a plurality of virtual objects. The first device **502** may display the plurality of virtual objects and allow the user to select one or more of the displayed plurality of virtual objects to send to the second user **506**. In another example, a first portion of the message **504** may be associated with a first virtual object and a second portion of the message **504** may be associated with a second virtual object. The first device **502** may display the first virtual object and the second virtual object for the user. The first device **502** may then send one or more of the displayed virtual objects based on a selection of the user.

[0045] In some embodiments, the first device **502** receives a device characteristic of a second device that is associated with a second user **506** who is the intended recipient of the message **504**. In some embodiments, the device characteristic indicates whether the second user **506** is using an AR device. For example, the second device (e.g., smartphone) associated with the second user may communicate (e.g., using Bluetooth, Wi-Fi, and/or similar such communication methods) with one or more AR devices and determine that the one or more AR devices are displaying an AR overlay for the second user. In some embodiments, if the second device determines that the second user **506** is using an AR device, the second device may transmit a device characteristic (e.g., indicating that the second user is using an AR device) to the first device **502**.

[0046] In some embodiments, the first device **502** displays an option **508** to send the message **504** to the second device with a virtual object in response to determining that a portion of the message **504** comprises a word or phrase corresponding to a virtual object and that the second user **506** is using an AR device. In some embodiments, the option **508** is a selectable icon displayed on the first device **502**. In some

embodiments, if the first user selects the option **508**, the first device **502** transmits the message **504** along with an indicator to the second device associated with the second user **506**. In some embodiments, the first device **502** does not display the option **508** if the first device **502** determines that the second user **506** is not using an AR device, because there is no way for the second user **506** to view the virtual object.

[0047] In some embodiments, the indicator indicates that a portion of the message **504** corresponds to a virtual object. An AR device associated with the second user may display the virtual object in an AR environment based on the second device receiving the message **504** and the indicator. In some embodiments, the indicator is stored in metadata associated with the message. The indicator may also include information about the virtual object. For example, the indicator may include an identifier corresponding to a type of virtual object. In another example, the indicator may include the size, shape, color, animation, sound, speed, direction, start position, end position, and/or similar such attributes relating to the virtual object.

[0048] FIG. **5**B illustrates the first device **502** displaying the option **508** to send the message **504** to the second device with a virtual object in response to determining that a portion of the message **504** comprises a word or phrase corresponding to a virtual object and that the second user **506** is using an AR device. In some embodiments, the first device **502** also displays an example **510** of how the virtual object **512** will look when displayed by the AR device associated with the second user **506**.

[0049] In some embodiments, the example **510** displayed by the first device **502** is a generic example of how the virtual object **512** will look when display in an AR environment. In some embodiments, the example **510** is generated based on one or more device characteristics associated with the second user **506**. For example, if a device characteristic associated with the second user **506** indicates that the AR device associated with the second user **506** is indoors, the first device **502** may generate an example of the virtual object **512** in a first format in an enclosed environment. In another example, if a device characteristic associated with the second user **506** indicates that the AR device associated with the second user **506** is outdoors, the first device **502** may generate an example of the virtual object **512** in a second format in an outdoor environment. In another example, the first device **502** may receive information relating to the AR environment generated by the AR device associated with the second user **506**. The first device **502** may use the received information to customize the example **510** to reflect a version of the AR environment generated by the AR device associated with the second user **506**. For example, the example **510** may have the same or similar dimensions and/or objects as what is displayed in the AR environment.

[0050] FIG. **6** shows another illustrative diagram of a system for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. In some embodiments, an AR device **602** displays an an AR environment comprising real-world objects (e.g., first device **502**) and AR objects (e.g., virtual object **604**). In some embodiments, the AR device **602** corresponds to an AR device of the first user described in FIGS. **5**A and **5**B.

[0051] In some embodiments, the AR device **602** and/or the first device **502** uses one or more of the methodologies described herein to detect and determine that the message **504** corresponds to the virtual object **604**. In some embodiments, the AR device **602** displays an option **606** to send the message **504** to the second device with a virtual object **604** in response to determining that a portion of the message **504** comprises a word or phrase corresponding to the virtual object **604** and that the second user **506** is using an AR device. In some embodiments, the option **606** is a selectable icon displayed on the first device **502**. In some embodiments, the option **606** is displayed in the AR environment generated by the AR device **602**. In some embodiments, the AR device **602** also displays the virtual object **604** in the AR environment generated by the AR device **602** to aid the user in deciding on whether to send the virtual object **604** to the second user **506**. In some embodiments, if the first user selects the option **606**, the first device **502** transmits the message **504** along with an indicator to the second device associated with the second user **506**.

[0052] FIGS. **7**-**8** describe exemplary devices, systems, servers, and related hardware for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments. In the system **700**, there can be more than one user equipment device **702** but only one is shown in FIG. **7** to avoid overcomplicating the drawing. In addition, a user may utilize more than one type of user equipment device **702** and more than one of each type of user equipment device. As described above, the user equipment device **702** may be an AR device and/or an audio output device. In an embodiment there may be paths between user equipment devices, so that the devices may communicate directly with each other via communications paths, as well as other short-range point-to-point communications paths, such as USB cables, IEEE 1394 cables, wireless paths (e.g., Bluetooth, infrared, IEEE 802-11x, etc.), or other short-range communication via wired or wireless paths. In an embodiment, the user equipment devices may also communicate with each other directly through an indirect path via the communications network **706**.

[0053] The user equipment devices may be coupled to communications network **706**. Namely, the user equipment device **702** is coupled to the communications network **706** via communications path **704**. The communications network **706** may be one or more networks including the Internet, a mobile phone network, mobile voice or data network (e.g., a 4G, 5G, or LTE network), cable network, public switched telephone network, or other types of communications network or combinations of communications networks. The path **704** may separately or in together with other paths include one or more communications paths, such as, a satellite path, a fiber-optic path, a cable path, a path that supports Internet communications (e.g., IPTV), free-space connections (e.g., for broadcast or other wireless signals), or any other suitable wired or wireless communications path or combination of such paths. In one embodiment path **704** can be a wireless path. Communication with the user equipment device may be provided by one or more communications paths but is shown as a single path in FIG. **7** to avoid overcomplicating the drawing.

[0054] The system **700** also includes media content source **712**, and server **714**, which can be coupled to any number of databases providing information to the user equipment devices. For example, media content source **712** and server **714** may have access to augmentation data, 2D and/or 3D

mapping data, and/or similar such information. The media content source **712** represents any computer-accessible source of content, such as a storage for audio content, metadata, or, similar such information. The server **714** may store and execute various software modules for the detecting key words and acquiring virtual objects based on the detected key words functionality. In some embodiments, the user equipment device **702**, media content source **712**, and server **714** may store metadata associated with media content.

[0055] FIG. **8** shows a generalized embodiment of a user equipment device **800**, in accordance with one embodiment. In an embodiment, the user equipment device **800**, is an example of the user equipment devices described in FIGS. **1-6** (e.g., AR device **102**). The user equipment device **800** may receive content and data via input/output (I/O) path **802**. The I/O path **802** may provide audio content (e.g., broadcast programming, on-demand programming, Internet content, content available over a local area network (LAN) or wide area network (WAN), and/or other content) and data to control circuitry **804**, which includes processing circuitry **806** and a storage **808**. The control circuitry **804** may be used to send and receive commands, requests, and other suitable data using the I/O path **802**. The I/O path **802** may connect the control circuitry **804** (and specifically the processing circuitry **806**) to one or more communications paths. I/O functions may be provided by one or more of these communications paths but are shown as a single path in FIG. **8** to avoid overcomplicating the drawing.

[0056] The control circuitry **804** may be based on any suitable processing circuitry such as the processing circuitry **806**. As referred to herein, processing circuitry should be understood to mean circuitry based on one or more microprocessors, microcontrollers, digital signal processors, programmable logic devices, field-programmable gate arrays ("FPGAs"), application-specific integrated circuits ("ASICs"), etc., and may include a multi-core processor (e.g., dual-core, quad-core, hexa-core, or any suitable number of cores) or supercomputer. In some embodiments, processing circuitry may be distributed across multiple separate processors or processing units, for example, multiple of the same type of processing units (e.g., two Intel Core i7 processors) or multiple different processors (e.g., an Intel Core i5 processor and an Intel Core i7 processor). The detecting key words and acquiring virtual objects based on the detected key words functionality can be at least partially implemented using the control circuitry **804**. The detecting key words and acquiring virtual objects based on the detected key words functionality described herein may be implemented in or supported by any suitable software, hardware, or combination thereof. The providing of augmentation data, 2D data, and/or 3D data can be implemented on user equipment, on remote servers, or across both.

[0057] In client-server-based embodiments, the control circuitry **804** may include communications circuitry suitable for communicating with one or more servers that may at least implement the described detecting key words and acquiring virtual objects based on the detected key words. The instructions for carrying out the above-mentioned functionality may be stored on the one or more servers. Communications circuitry may include a cable modem, an integrated service digital network ("ISDN") modem, a digital subscriber line ("DSL") modem, a telephone modem, Ethernet card, or a wireless modem for communications with other equipment, or any other suitable communications circuitry. Such communications may involve the Internet or any other suitable communications networks or paths. In addition, communications circuitry may include circuitry that enables peer-to-peer communication of user equipment devices, or communication of user equipment devices in locations remote from each other (described in more detail below).

[0058] Memory may be an electronic storage device provided as the storage **808** that is part of the control circuitry **804**. As referred to herein, the phrase "electronic storage device" or "storage device" should be understood to mean any device for storing electronic data, computer software, or firmware, such as random-access memory, read-only memory, hard drives, optical drives, digital video disc ("DVD") recorders, compact disc ("CD") recorders, BLU-RAY disc ("BD") recorders, BLU-RAY 3D disc recorders, digital video recorders ("DVR", sometimes called a personal video recorder, or "PVR"), solid-state devices, quantum storage devices, gaming consoles, gaming media, or any other suitable fixed or removable storage devices, and/or any combination of the same. The storage **808** may be used to store various types of content described herein. Nonvolatile memory may also be used (e.g., to launch a boot-up routine and other instructions). Cloud-based storage, described in relation to FIG. **7**, may be used to supplement the storage **808** or instead of the storage **808**.

[0059] The control circuitry **804** may include audio generating circuitry and tuning circuitry, such as one or more analog tuners, audio generation circuitry, filters or any other suitable tuning or audio circuits or combinations of such circuits. The control circuitry **804** may also include scaler circuitry for upconverting and down converting content into the preferred output format of the user equipment device **800**. The control circuitry **804** may also include digital-to-analog converter circuitry and analog-to-digital converter circuitry for converting between digital and analog signals. The tuning and encoding circuitry may be used by the user equipment device **800** to receive and to display, to play, or to record content. The circuitry described herein, including, for example, the tuning, audio generating, encoding, decoding, encrypting, decrypting, scaler, and analog/digital circuitry, may be implemented using software running on one or more general purpose or specialized processors. If the storage **808** is provided as a separate device from the user equipment device **800**, the tuning and encoding circuitry (including multiple tuners) may be associated with the storage **808**.

[0060] The user may utter instructions to the control circuitry **804**, which are received by the microphone **816**. The microphone **816** may be any microphone (or microphones) capable of detecting human speech. The microphone **816** is connected to the processing circuitry **806** to transmit detected voice commands and other speech thereto for processing. In some embodiments, voice assistants (e.g., Siri, Alexa, Google Home and similar such voice assistants) receive and process the voice commands and other speech.

[0061] The user equipment device **800** may optionally include an interface **810**. The interface **810** may be any suitable user interface, such as a remote control, mouse, trackball, keypad, keyboard, touch screen, touchpad, stylus input, joystick, or other user input interfaces. A display **812** may be provided as a stand-alone device or integrated with other elements of the user equipment device **800**. For

example, the display **812** may be a touchscreen or touch-sensitive display. In such circumstances, the interface **810** may be integrated with or combined with the microphone **816**. When the interface **810** is configured with a screen, such a screen may be one or more of a monitor, a television, a liquid crystal display ("LCD") for a mobile device, active matrix display, cathode ray tube display, light-emitting diode display, organic light-emitting diode display, quantum dot display, or any other suitable equipment for displaying visual images. In some embodiments, the interface **810** may be HDTV-capable. In some embodiments, the display **812** may be a 3D display. A speaker **814** may be controlled by the control circuitry **804**. The speaker (or speakers) **814** may be provided as integrated with other elements of user equipment device **800** or may be a stand-alone unit. In some embodiments, the display **812** may be outputted through speaker **814**.

[0062] The user equipment device **800** of FIG. **8** can be implemented in system **700** of FIG. **7** as user equipment device **702**, but any other type of user equipment suitable detecting key words and acquiring virtual objects based on the detected key words may be used. For example, user equipment devices such as television equipment, computer equipment, wireless user communication devices, or similar such devices may be used. User equipment devices may be part of a network of devices.

[0063] FIG. **9** is an illustrative flowchart of a process **900** for detecting key words provided by ancillary devices and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. Process **900**, and any of the following processes, may be executed by control circuitry **804** on a user equipment device **800**. In some embodiments, control circuitry **804** may be part of a remote server separated from the user equipment device **800** by way of a communications network or distributed over a combination of both. In some embodiments, instructions for executing process **900** may be encoded onto a non-transitory storage medium (e.g., the storage **808**) as a set of instructions to be decoded and executed by processing circuitry (e.g., the processing circuitry **806**). Processing circuitry may, in turn, provide instructions to other sub-circuits contained within control circuitry **804**, such as the encoding, decoding, encrypting, decrypting, scaling, analog/digital conversion circuitry, and the like. It should be noted that any of the processes, or any step thereof, could be performed on, or provided by, any of the devices shown in FIGS. **1-8**. Although the processes are illustrated and described as a sequence of steps, it is contemplated that various embodiments of the processes may be performed in any order or combination and need not include all the illustrated steps.

[0064] At **902**, control circuitry detects a message from a device. In some embodiments, the device may be an AR device, smartphone, tablet, desktop, television, and/or similar such devices. In some embodiments, the control circuitry communicates with the device using one or more wired and/or wireless communication protocols. For example, the control circuitry may communicate with the device via a Wi-Fi network.

[0065] In some embodiments, the device transmits the message to the control circuitry and/or to a second device within a threshold distance of the control circuitry. In some embodiments, the control circuitry uses one or more methods to detect the message from the device. For example, the control circuitry may detect the message when the control circuitry receives the message from the device. In another example, the control circuitry may use computer vision and/or one or more sensors to detect the message displayed on a screen of the second device. In another example, the control circuitry may receive a notification from the second device indicating the second device received a message. In another example, the control circuitry may detect the message from the device by communicating with an API that notifies that control circuitry that the second device has received a messaged.

[0066] At **904**, control circuitry determines an environment characteristic. In some embodiments, the environment characteristic relates to the space around the control circuitry. In some embodiments, the control circuitry determines more than one environment characteristic. In some embodiments, the control circuitry uses computer vision, one or more sensors, and/or a profile with stored environment characteristics, to determine environment characteristics. For example, the control circuitry may use a sensor (e.g., a camera) to capture information about the space around the control circuitry and use the information about the space to determine that the that the control circuitry is indoors (e.g., environment characteristic). In some embodiments, the environment characteristic corresponds to one or more dimensions of the space around the control circuitry. For example, the control circuitry may use a sensor (e.g., ultrasonic sensor) to determine that the space around the control circuitry is three meters long, four meters wide, and five meters high. In some embodiments, one or more environment characteristics includes a 2D and/or 3D mapping of the space around the control circuitry. For example, one or more devices may scan the environment around the control circuitry and create a 3D map.

[0067] At **906**, control circuitry determines whether a portion of the message corresponds to an AR object. In some embodiments, the control circuitry determines whether a portion of the message corresponds to an AR object using one or more databases linking messages or portions of messages to AR objects. For example, the control circuitry may perform image and/or text recognition on the received message and determine that the message contains the phrase "Happy Fourth of July." The control circuitry can cross-reference the portion of the message ("Happy Fourth of July") with the one or more databases to determine if one or more AR objects correspond to the portion of the message. In some embodiments, the message and/or portions of the message relate to an application. For example, the message may be displayed as part of a social media platform. When the second device displays the message of the social media platform, the control circuitry may use the one or more databases to determine if the message corresponds to an AR object. If the control circuitry determines that a portion of the message does correspond to an AR object, then the process **900** continues to step **908**. If the control circuitry determines that a portion of the message does not correspond to an AR object, then the process **900** ends at step **910** and no AR object is displayed.

[0068] At **908**, control circuitry displays the AR object in a first format, wherein the first format is based on the environment characteristic. In some embodiments, the format corresponds to the size, shape, color, animation, sound, speed, direction, start position, end position, and/or similar such attributes related to AR objects. In some embodiments,

the control circuitry accesses one or more databases with entries linking one or more environment characteristics with formats of AR objects. For example, a first entry may associate an environment characteristic (e.g., control circuitry being indoors) with a first format and a second entry may associate a second environment characteristic (e.g., control circuitry being outdoors) with a second format. In another example, a first entry may associate a first environment characteristic (e.g., control circuitry being indoors) and a second characteristic (e.g., a second user being within a threshold distance of the control circuitry) with a first format and a second entry may associate the first environment characteristic and a third environment characteristic (e.g., a second user not being within the threshold distance of the control circuitry) with a second format. Accordingly, if the control circuitry determines that the control circuitry is indoors and a second user is within a threshold distance of the control circuitry, the control circuitry may display the AR object in the first format.

[0069] In some embodiments, when determining a format for displaying the AR object, the environment characteristic relates to one or more devices (e.g., second device associated with the AR object) shown in an AR environment. For example, the control circuitry may use computer vision to determine the angle of incident between the frontal plane of a device displaying the AR environment for the user and the display of the additional device associated with the AR object. The control circuitry may then determine a first format for the AR object based on the determined angle of incident. In another example, the second device may transmit the location of the second device to the control circuitry. The control circuitry may then determine a first format for the AR object based on the location of the second device.

[0070] In some embodiments, when determining a format for displaying the AR object, the environment characteristic relates to a 2D and/or 3D mapping of the space around the control circuitry. For example, the control circuitry may use a 3D map of the space around the control circuitry to determine a real-world object in the space around the control circuitry. The control circuitry may then determine a first format for the AR object, wherein the first format animates the AR object to avoid a collision between the animation of the AR object and the real-world object.

[0071] Once the control circuitry determines a format for the AR object, the control circuitry displays the AR object in an AR environment. In some embodiments, the control circuitry determines the format for the AR object and then displays the AR object in the determined format according to one or more factors. For example, the control circuitry may determine a size (e.g., first format) of the AR object based on the control circuitry being indoors (e.g., first factor). The control circuitry may then display the AR object in the AR environment so that the AR object has the same orientation as the orientation of the second device (e.g., second factor). The control circuitry displaying the AR object in the AR environment so that the AR object has the same orientation as the orientation of the second device may simulate that the AR object is originating from the second device.

[0072] FIG. **10** is an illustrative flowchart of a process **1000** for detecting key words and acquiring virtual objects based on the detected key words, in accordance with some embodiments of the disclosure. Like the process **900**, the process **1000** may be executed by control circuitry **804** on a user equipment device **800**, and the user equipment device **800** may be configured in a manner similar to that described regarding the process **900** to implement the process **900**.

[0073] At **1002**, control circuitry receives a device characteristic associated with a first device. In some embodiments, the device characteristic indicates whether a user is using an AR device. For example, the first device may be an AR device and the device characteristic indicates whether the first device is displaying an AR view. In some embodiments, an AR view is an AR environment and/or a portion of an AR environment. In another example, the first device may be in communication with a second device that is an AR device, and the device characteristic indicates whether the second device is active (e.g., connected to a network, powered on, worn by a user, etc.). In some embodiments, the first device may be associated with the user and may be in communication (e.g., using Bluetooth, Wi-Fi, and/or similar such communication methods) with one or more other devices also associated with the user. The one or more other devices associated with the user may communicate one or more device characteristics to the first device. In some embodiments, if the first device determines that any of the devices associated with the user are displaying an AR view for the user and/or are active, then the first device transmits one or more device characteristics (e.g., indicating that the second user is using an AR device, indicating that an AR device associated with the user is active, etc.) to the control circuitry.

[0074] At **1004**, control circuitry receives a first input, wherein the first input corresponds to a message for the first device. In some embodiments, the control circuitry receives the first input when a user types in a message using a user input interface (e.g., user input interface **810**). For example, the user may type "Happy Fourth of July!" using a touch screen. In some embodiments, the control circuitry receives the first input when the control circuitry detects the user's speech using a microphone (e.g., microphone **816**). For example, the user may say "happy fourth of July!" or "Send message to Zach saying happy fourth of July."

[0075] At **1006**, control circuitry determines whether a portion of the message corresponds to an augmented reality object. In some embodiments, the control circuitry determines whether a portion of the message corresponds to an AR object using one or more databases linking messages or portions of messages to AR objects. For example, the control circuitry may perform image and/or text recognition on the received message and determine that the message contains the phrase "Happy Fourth of July." The control circuitry can cross-reference the portion of the message ("Happy Fourth of July") with the one or more databases to determine if one or more AR objects correspond to the portion of the message. If the control circuitry determines that a portion of the message does correspond to an AR object, then the process **1000** continues to step **1008**. If the control circuitry determines that a portion of the message does not correspond to an AR object, then the process **1000** ends at step **1012**.

[0076] At **1008**, control circuitry determines whether the device characteristic is associated with an active augmented reality device. In some embodiments, the device characteristic indicates whether the first device and/or any devices associated with the user of the first device are displaying an AR view. In some embodiments, the device characteristic indicates whether any of devices (e.g., the first device and/or any devices associated with the user) associated with the

user are active AR devices. If the control circuitry determines that the device characteristic is associated with an active augmented reality device, then the process **1000** continues to step **1010**. If the control circuitry determines that the device characteristic is not associated with an active augmented reality device, then the process **1000** ends at step **1012**.

[0077] At **1010**, control circuitry displays an option to send the message with augmented reality content. In some embodiments, the option is a selectable icon displayed by a display (e.g., display **812**). In some embodiments, the option is an AR object displayed in an AR view by the display. In some embodiments, the control circuitry also displays an example of how the AR object will look when displayed by an AR view associated with the user of the first device. In some embodiments, the control circuitry displays a generic example of how the AR object may look in an AR view. In some embodiments, the control circuitry generates an example based on one or more device characteristics received in step **1002**. For example, if a device characteristic indicates that the AR view generated for the user of the first device is indoors with certain dimensions, the control circuitry may generate an example showing the AR object in a first format in an enclosed environment with the same or similar dimensions to the AR view generated for the user (e.g., FIG. **5**B). In another example, if a device characteristic indicates that the AR view generated for the user of the first device is outdoors, the control circuitry may generate an example of the AR object in a second format in an outdoor environment. In some embodiments, the control circuitry generates an option that allows a user to select an AR object. For example, the option may provide a plurality of AR objects for the user to select. In some embodiments, the control circuitry determines the plurality of AR objects using the same or similar methodologies described in step **1006** above.

[0078] At **1014**, control circuitry receives a second input, wherein the second input corresponds to a selection of the option. In some embodiments, the control circuitry receives the second input when a user selects the option using the user input interface (e.g., user input interface **810**). For example, the user may click on the option using a touch screen. In some embodiments, the control circuitry receives the second input when the control circuitry detects the user's speech using a microphone (e.g., microphone **816**). For example, the user may say "send with AR content."

[0079] At **1016**, control circuitry sends the message with AR content to the first device. In some embodiments the AR content comprises one or more AR objects determined in step **1006**. In some embodiments, the control circuitry sends the message with AR content by sending the message with an indicator indicating that a portion of the message corresponds to an AR object. In some embodiments, one or more devices display the AR object in an AR view based on receiving the message and the indicator. For example, if the first device is displaying the AR view, the first device may display the message and the AR object in response to receiving the message with the indicator. In another example, if an additional device associated with the first device is displaying the AR view, the additional device may display the message and the AR object in response to detecting the first device receiving the message with the indicator. In some embodiments, the additional device may detect that the first device received the message with the indicator after receiving a notification from the first device. In some embodiments, the indicator is stored in metadata associated with the message. The indicator may also include information about the AR object. For example, the indicator may include an identifier corresponding to a type of AR object. In another example, the indicator may include the size, shape, color, animation, sound, speed, direction, start position, end position, and/or similar such attributes relating to the AR object.

[0080] It is contemplated that some suitable steps or suitable descriptions of FIGS. **9-10** may be used with other suitable embodiments of this disclosure. In addition, some suitable steps and descriptions described in relation to FIGS. **9-10** may be implemented in alternative orders or in parallel to further the purposes of this disclosure. For example, some suitable steps may be performed in any order or in parallel or substantially simultaneously to reduce lag or increase the speed of the system or method. Some suitable steps may also be skipped or omitted from the process. Furthermore, it should be noted that some suitable devices or equipment discussed in relation to FIGS. **1-8** could be used to perform one or more of the steps in FIGS. **9-10**.

[0081] The processes discussed above are intended to be illustrative and not limiting. One skilled in the art would appreciate that the steps of the processes discussed herein may be omitted, modified, combined, and/or rearranged, and any additional steps may be performed without departing from the scope of the invention. More generally, the above disclosure is meant to be exemplary and not limiting. Only the claims that follow are meant to set bounds as to what the present invention includes. Furthermore, it should be noted that the features and limitations described in any one embodiment may be applied to any other embodiment herein, and flowcharts or examples relating to one embodiment may be combined with any other embodiment in a suitable manner, done in different orders, or done in parallel. In addition, the systems and methods described herein may be performed in real time. It should also be noted that the systems and/or methods described above may be applied to, or used in accordance with, other systems and/or methods.

1. A method comprising:

detecting, by a first device, a message received from a second device;

detecting, by the first device, that a portion of the message corresponds to an augmented reality object;

determining, by the first device, an environment characteristic relating to a space around the first device;

in response to detecting that the portion of the message corresponds to the augmented reality object, displaying, by the first device, the augmented reality object in an augmented reality view in a first format, wherein the first format is based on the determined environment characteristic.

2. The method of claim **1**, wherein determining an environment characteristic comprises determining whether the first device is connected to a wi-fi network.

3. The method of claim **1**, wherein the environment characteristic indicates that the first device is located in a moving vehicle.

4. The method of claim **1**, wherein determining an environment characteristic comprises determining that the first device is moving.

5. The method of claim 1, wherein determining an environment characteristic comprises determining whether a person is within a threshold distance of the first device.

6. The method of claim 1, wherein the environment characteristic indicates that the first device is located outside.

7. The method of claim 1, wherein the first format corresponds to an animated graphic.

8. The method of claim 3, wherein the first format indicates that the message is available as an animated graphic.

9. The method of claim 8, further comprising:

determining, by the first device, a second environment characteristic relating to a space around the first device, wherein the second characteristic is determined after the first characteristic and the second characteristic indicates that the device is not located in a moving vehicle; and

displaying, by the first device, the augmented reality object in an augmented reality view in a second format, wherein the second format corresponds to the animated graphic.

10. The method of claim 1, wherein the first device uses two-dimensional and/or three-dimensional mapping when determining the augmented reality view.

11. An apparatus comprising:

control circuitry; and

at least one memory including computer program code for one or more programs, the at least one memory and the computer program code configured to, with the control circuitry, cause the apparatus to perform at least the following:

detect a message received from a device;

detect that a portion of the message corresponds to an augmented reality object;

determine an environment characteristic relating to a space around the apparatus;

in response to detecting that the portion of the message corresponds to the augmented reality object, displaying the augmented reality object in an augmented reality view in a first format, wherein the first format is based on the determined environment characteristic.

12. The apparatus of claim 11, wherein the apparatus is further caused, when determining an environment characteristic relating to the space around the apparatus, to determine whether the apparatus is connected to a wi-fi network.

13. The apparatus of claim 11, wherein the environment characteristic indicates that the apparatus is located in a moving vehicle.

14. The apparatus of claim 11, wherein the apparatus is further caused, when determining an environment characteristic relating to the space around the apparatus, to determine that the apparatus is moving.

15. The apparatus of claim 11, wherein the apparatus is further caused, when determining an environment characteristic relating to the space around the apparatus, to determine whether a person is within a threshold distance of the apparatus.

16. The apparatus of claim 11, wherein the environment characteristic indicates that the apparatus is located outside.

17. The apparatus of claim 11, wherein the first format corresponds to an animated graphic.

18. The apparatus of claim 13, wherein the first format indicates that the message is available as an animated graphic.

19. The apparatus of claim 18, wherein the apparatus is further caused to:

determine a second environment characteristic relating to a space around the apparatus, wherein the second characteristic is determined after the first characteristic and the second characteristic indicates that the apparatus is not located in a moving vehicle; and

display the augmented reality object in an augmented reality view in a second format, wherein the second format corresponds to the animated graphic.

20. (canceled)

21. A non-transitory computer-readable medium having instructions encoded thereon that, when executed by control circuitry, cause the control circuitry to:

detect a message received from a device;

detect that a portion of the message corresponds to an augmented reality object;

determine an environment characteristic relating to a space around the control circuitry;

in response to detecting that the portion of the message corresponds to the augmented reality object, displaying the augmented reality object in an augmented reality view in a first format, wherein the first format is based on the determined environment characteristic.

22.-54. (canceled)

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