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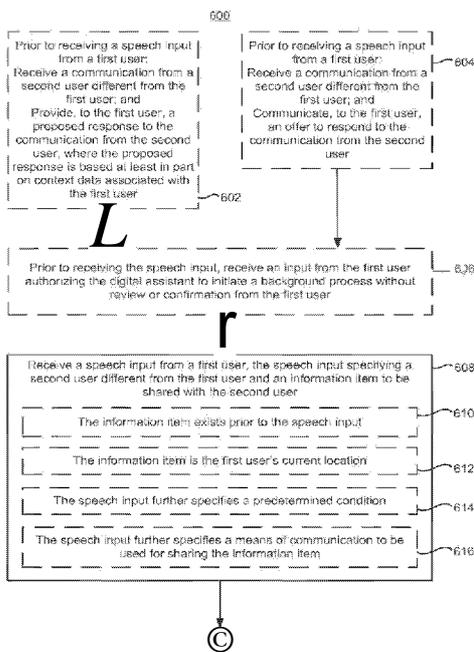
(57) Abstract: An electronic device with one or more processors and memory includes a procedure for sharing information with a third party recipient. In some embodiments, the device receives a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user. In response to the speech input, the device initiates a background process during which a digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

Figure 6A

INTERPRETING AND ACTING UPON COMMANDS THAT INVOLVE SHARING INFORMATION WITH REMOTE DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001]   This application claims priority from U.S. Provisional Serial No. 61/832,821, filed on June 8, 2013, entitled INTERPRETING AND ACTING UPON COMMANDS THAT INVOLVE SHARING INFORMATION   WITH REMOTE DEVICES, which is hereby incorporated by reference in its entirety for all purposes.

TECHNICAL FIELD

[0002]   The disclosed embodiments relate generally to digital assistant systems, and more specifically, to sharing an information item with a third party.

BACKGROUND

[0003]   Just like human personal assistants, digital assistant systems can perform requested tasks and provide requested advice, information, or services. A digital assistant system's ability to fulfill a user's request is dependent on the digital assistant system's correct comprehension of the request or instructions. Recent advances in natural language processing have enabled users to interact with digital assistant systems using natural language, in spoken or textual forms. Such digital assistant systems can interpret the user's input to infer the user's intent, translate the inferred intent into actionable tasks and parameters, execute operations or deploy services to perform the tasks, and produce output that is intelligible to the user. Ideally, the output produced by a digital assistant system should fulfill the user's intent expressed during the natural language interaction between the user and the digital assistant system.

[0004]   The ability of a digital assistant system to produce satisfactory responses to user requests depends on the natural language processing, knowledge base, and artificial intelligence available to the digital assistant system. Moreover, while numerous third party systems and services currently exist, there is no efficient means for a digital assistant system to share an information item with a third party different from the user of the digital assistant system.

SUMMARY

[0005]   The embodiments disclosed herein provide methods, devices, systems, and non-transitory computer readable storage media for operating a digital assistant so as to share an information item with a third party.

[0006]   Accordingly, some embodiments provide a method of operating a digital assistant, the method including, at an electronic device including one or more processors and memory: receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and in response to the speech input, initiating a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

[0007]   In some embodiments, the information item exists prior to the speech input.

[0008]   In some embodiments, the information item is the first user' s current location, and the digital assistant searches for the information item based on context data associated with the first user.

[0009]   In some embodiments, the speech input further specifies a predetermined condition, and the digital assistant causes the information item to be sent to the second user when the predetermined condition is satisfied.

[0010]   In some embodiments, the speech input further specifies a means of communication to be used for sharing the information item, and the digital assistant causes the information item to be sent to the second user using said means of communication during the background process.

[0011]   In some embodiments, the digital assistant searches for information item at an information source local to the device or at an information source external to the device.

[0012]   In some embodiments, the device is a first device, and the source external to the device is a memory for a second device of the first user.

[0013]   In some embodiments, the method further comprises, prior to receiving the speech input, receiving an input from the first user authorizing the digital assistant to initiate the background process without review or confirmation from the first user.

[0014]   In some embodiments, the method further comprising, during the background process: receiving one or more additional speech inputs from the user; and in response to the one or more additional speech inputs, executing one or more additional tasks for the first user in a foreground process.

[0015] In some embodiments, during the background process, the digital assistant further causes the information item to be sent to the first user.

[0016] In some embodiments, the speech input further specifies a means of communication to be used for sharing the information item, and the digital assistant causes the information item to be sent to the first user using said means of communication.

[0017] In some embodiments, during the background process, the digital assistant downloads the information item; and the method further comprising, providing the information item to the first user subsequent to the background process.

[0018] In some embodiments, the method further comprising, prior to receiving the speech input from the first user: receiving a communication from the second user different from the first user; and providing, to the first user, a proposed response to the communication from the second user, where the proposed response is based at least in part on context data associated with the first user.

[0019] In some embodiments, the method further comprising, prior to receiving the speech input from the first user: receiving a communication from the second user different from the first user; and communicating, to the first user, an offer to respond to the communication from the second user.

[0020] In accordance with some embodiments, a non-transitory computer readable storage medium has stored therein instructions, which, when executed by an electronic device, cause the device to perform the operations of any of the methods described above. In accordance with some embodiments, an electronic device includes one or more processors, memory, and one or more programs; the one or more programs are stored in the memory and configured to be executed by the one or more processors and the one or more programs include instructions for performing the operations of any of the methods described above. In accordance with some embodiments, a graphical user interface on an electronic device with a display, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods described above. In accordance with some embodiments, an electronic device includes means for performing the operations of any of the methods described above. In accordance with some embodiments, an information processing apparatus, for use in an electronic device includes means for performing the operations of any of the methods described above.

[0021] In accordance with some embodiments, an electronic device includes a sound receiving unit configured to receive a speech input from a first user, the speech input

specifying a second user different from the first user, and an information item to be shared with the second user. The electronic device also includes a processing unit coupled to the sound receiving unit. In response to the speech input, the processing unit is configured to initiate a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

[0022]   The details of one or more embodiments of the subject matter described in this specification are set forth in the accompanying drawings and the description below. Other features, aspects, and advantages of the subject matter will become apparent from the description, the drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023]   Figure 1 is a block diagram illustrating an environment in which a digital assistant operates in accordance with some embodiments.

[0024]   Figure 2 is a block diagram illustrating a digital assistant client system in accordance with some embodiments.

[0025]   Figure 3A is a block diagram illustrating a digital assistant system or a server portion thereof in accordance with some embodiments.

[0026]   Figure 3B is a block diagram illustrating functions of the digital assistant shown in Figure 3A in accordance with some embodiments.

[0027]   Figure 3C is a diagram of a portion of an ontology shown in Figure 3B in accordance with some embodiments.

[0028]   Figure 4 is a diagram of a portion of an ontology for sharing an information item with a third party in accordance with some embodiments.

[0029]   Figure 5 is a block diagram of a background process module shown in Figure 3B in accordance with some embodiments.

[0030]   Figures 6A-B illustrate a flow diagram for an exemplary process of operating a digital assistant in accordance with some embodiments.

[0031]   Figure 7 is a functional block diagram of an electronic device in accordance with some embodiments.

[0032]   Like reference numerals refer to corresponding parts throughout the drawings.

DESCRIPTION OF EMBODIMENTS

[0033]   Figure 1 is a block diagram of an operating environment 100 of a digital assistant according to some embodiments. The terms "digital assistant," "virtual assistant," "intelligent automated assistant," or "automatic digital assistant," refer to any information processing system that interprets natural language input in spoken and/or textual form to infer user intent, and performs actions based on the inferred user intent. For example, to act on an inferred user intent, the system can perform one or more of the following: identifying a task flow with steps and parameters designed to accomplish the inferred user intent; inputting specific requirements from the inferred user intent into the task flow; executing the task flow by invoking programs, methods, services, APIs, or the like; and generating output responses to the user in an audible (e.g., speech) and/or visual form.

[0034]   Specifically, a digital assistant (DA) is capable of accepting a user request at least partially in the form of a natural language command, request, statement, narrative, and/or inquiry. Typically, the user request seeks either an informational answer or performance of a task by the digital assistant. A satisfactory response to the user request is either provision of the requested informational answer, performance of the requested task, or a combination of the two. For example, a user may ask the digital assistant a question, such as "Where am I right now?" Based on the user's current location, the digital assistant may answer, "You are in Central Park." The user may also request the performance of a task, for example, "Please remind me to call Mom at 4 PM today." In response, the digital assistant may acknowledge the request and then create an appropriate reminder item in the user's electronic schedule. During performance of a requested task, the digital assistant sometimes interacts with the user in a continuous dialogue involving multiple exchanges of information over an extended period of time. There are numerous other ways of interacting with a digital assistant to request information or performance of various tasks. In addition to providing verbal responses and taking programmed actions, the digital assistant also provides responses in other visual or audio forms (e.g., as text, alerts, music, videos, animations, etc.).

[0035]   An example of a digital assistant is described in Applicant's U.S. Utility Application Serial No. 12/987,982 for "Intelligent Automated Assistant," filed January 10, 201 1, the entire disclosure of which is incorporated herein by reference.

[0036]   As shown in Figure 1, in some embodiments, a digital assistant is implemented according to a client-server model. The digital assistant includes a client-side portion 102a, 102b (hereafter "DA-client 102") executed on a user device 104a, 104b, and a server-side portion 106 (hereafter "DA-server 106") executed on a server system 108. DA-client 102 communicates with DA-server 106 through one or more networks 110. DA-client 102

provides client-side functionalities such as user-facing input and output processing and communications with DA-server 106. DA server 106 provides server-side functionalities for any number of DA-clients 102 each residing on a respective user device 104.

[0037]   In some embodiments, DA-server 106 includes a client-facing I/O interface 112, one or more processing modules 114, data and models 116, and an I/O interface to external services 118. The client-facing I/O interface facilitates the client-facing input and output processing for digital assistant server 106. One or more processing modules 114 utilize data and models 116 to determine the user's intent based on natural language input and perform task execution based on inferred user intent. In some embodiments, DA-server 106 communicates with external services 120 through the network(s) 110 for task completion or information acquisition. The I/O interface to external services 118 facilitates such communications.

[0038]   Examples of user device 104 include, but are not limited to, a handheld computer, a personal digital assistant (PDA), a tablet computer, a laptop computer, a desktop computer, a cellular telephone, a smart phone, an enhanced general packet radio service (EGPRS) mobile phone, a media player, a navigation device, a game console, a television, a remote control, or a combination of any two or more of these data processing devices or other data processing devices. More details on user device 104 are provided in reference to an exemplary user device 104 shown in Figure 2.

[0039]   Examples of the communication network(s) 110 include local area networks ("LAN") and wide area networks ("WAN") such as the Internet. Communication network(s) 110 are, optionally, implemented using any known network protocol, including various wired or wireless protocols, such as Ethernet, Universal Serial Bus (USB), FIREWTRE, Global System for Mobile Communications (GSM), Enhanced Data GSM Environment (EDGE), code division multiple access (CDMA), time division multiple access (TDMA), Bluetooth, Wi-Fi, voice over Internet Protocol (VoIP), Wi-MAX, or any other suitable communication protocol.

[0040]   Server system 108 is implemented on one or more standalone data processing apparatuses or a distributed network of computers. In some embodiments, server system 108 also employs various virtual devices and/or services of third party service providers (e.g., third-party cloud service providers) to provide the underlying computing resources and/or infrastructure resources of server system 108.

[0041]   Although the digital assistant shown in Figure 1 includes both a client-side portion (e.g., DA-client 102) and a server-side portion (e.g., DA-server 106), in some embodiments,

the functions of a digital assistant is implemented as a standalone application installed on a user device. In addition, the division of functionalities between the client and server portions of the digital assistant can vary in different embodiments. For example, in some embodiments, DA-client 102 is a thin-client that provides only user-facing input and output processing functions, and delegates all other functionalities of the digital assistant to a backend server.

[0042]   Figure 2 is a block diagram of a user-device 104 in accordance with some embodiments. User device 104 includes a memory interface 202, one or more processors 204, and a peripherals interface 206. The various components in user device 104 are coupled by one or more communication buses or signal lines. User device 104 includes various sensors, subsystems, and peripheral devices that are coupled to the peripherals interface 206. The sensors, subsystems, and peripheral devices gather information and/or facilitate various functionalities of user device 104.

[0043]   For example, a motion sensor 210, a light sensor 212, and a proximity sensor 214 are coupled to the peripherals interface 206 to facilitate orientation, light, and proximity sensing functions. One or more other sensors 216, such as a positioning system (e.g., a GPS receiver), a temperature sensor, a biometric sensor, a gyroscope, a compass, an accelerometer, and the like, are also connected to peripherals interface 206, to facilitate related functionalities.

[0044]   In some embodiments, a camera subsystem 220 and an optical sensor 222 are utilized to facilitate camera functions, such as taking photographs and recording video clips. Communication functions are facilitated through one or more wired and/or wireless communication subsystems 224, which can include various communication ports, radio frequency receivers and transmitters, and/or optical (e.g., infrared) receivers and transmitters. An audio subsystem 226 is coupled to speakers 228 and a microphone 230 to facilitate voice-enabled functions, such as voice recognition, voice replication, digital recording, and telephony functions.

[0045]   In some embodiments, an I/O subsystem 240 is also coupled to peripheral interface 206. I/O subsystem 240 includes a touch screen controller 242 and/or other input controller(s) 244. Touch-screen controller 242 is coupled to a touch screen 246. Touch screen 246 and the touch screen controller 242 can, for example, detect contact and movement or break thereof using any of a plurality of touch sensitivity technologies, such as capacitive, resistive, infrared, surface acoustic wave technologies, proximity sensor arrays, and the like. Other input controller(s) 244 can be coupled to other input/control devices 248, such as one or more

buttons, rocker switches, a thumb-wheel, an infrared port, a USB port, and/or a pointer device such as a stylus.

[0046]   In some embodiments, memory interface 202 is coupled to memory 250. Memory 250 can include high-speed random access memory and/or non-volatile memory, such as one or more magnetic disk storage devices, one or more optical storage devices, and/or flash memory (e.g., NAND or NOR).

[0047]   In some embodiments, the memory 250 stores an operating system 252, a communication module 254, a graphical user interface module 256, a sensor processing module 258, a phone module 260, and applications 262. Operating system 252 includes instructions for handling basic system services and for performing hardware dependent tasks. Communication module 254 facilitates communicating with one or more additional devices, one or more computers and/or one or more servers. Graphical user interface module 256 facilitates graphic user interface processing. Sensor processing module 258 facilitates sensor-related processing and functions. Phone module 260 facilitates phone-related processes and functions. Application module 262 facilitates various functionalities of user applications, such as electronic-messaging, web browsing, media processing, navigation, imaging and/or other processes and functions.

[0048]   As described in this specification, memory 250 also stores client-side digital assistant instructions (e.g., in a digital assistant client module 264) and various user data 266 (e.g., user-specific vocabulary data, preference data, and/or other data such as the user's electronic address book, to-do lists, shopping lists, etc.) to provide the client-side functionalities of the digital assistant.

[0049]   In various embodiments, digital assistant client module 264 is capable of accepting voice input (e.g., speech input), text input, touch input, and/or gestural input through various user interfaces (e.g., I/O subsystem 244) of user device 104. Digital assistant client module 264 is also capable of providing output in audio (e.g., speech output), visual, and/or tactile forms. For example, output can be provided as voice, sound, alerts, text messages, menus, graphics, videos, animations, vibrations, and/or combinations of two or more of the above. During operation, digital assistant client module 264 communicates with the digital assistant server using communication subsystems 224.

[0050]   In some embodiments, digital assistant client module 264 utilizes the various sensors, subsystems and peripheral devices to gather additional information from the surrounding environment of user device 104 to establish a context associated with a user, the current user interaction, and/or the current user input. In some embodiments, digital assistant

client module 264 provides the context information or a subset thereof with the user input to the digital assistant server to help infer the user's intent. In some embodiments, the digital assistant also uses the context information to determine how to prepare and deliver outputs to the user.

[0051]   In some embodiments, the context information that accompanies the user input includes sensor information, such as lighting, ambient noise, ambient temperature, images or videos of the surrounding environment, and the like. In some embodiments, the context information also includes the physical state of user device 104 (e.g., device orientation, device location, device temperature, power level, speed, acceleration, motion patterns, cellular signals strength, etc.). In some embodiments, information related to the software state of user device 104 (e.g., running processes, installed programs, past and present network activities, background services, error logs, resources usage, etc.) is provided to the digital assistant server as context information associated with a user input.

[0052]   In some embodiments, digital assistant client module 264 selectively provides information (e.g., user data 266) stored on user device 104 in response to requests from the digital assistant server. In some embodiments, digital assistant client module 264 also elicits additional input from the user via a natural language dialogue or other user interfaces upon request by digital assistant server 106. Digital assistant client module 264 passes the additional input to digital assistant server 106 to help digital assistant server 106 in intent inference and/or fulfillment of the user's intent expressed in the user request.

[0053]   In various embodiments, memory 250 includes additional instructions or fewer instructions. Furthermore, various functions of user device 104 may be implemented in hardware and/or in firmware, including in one or more signal processing and/or application specific integrated circuits.

[0054]   Figure 3A is a block diagram of an example digital assistant system 300 in accordance with some embodiments. In some embodiments, digital assistant system 300 is implemented on a standalone computer system. In some embodiments, digital assistant system 300 is distributed across multiple computers. In some embodiments, some of the modules and functions of the digital assistant are divided into a server portion and a client portion, where the client portion resides on a user device (e.g., user device 104) and communicates with the server portion (e.g., server system 108) through one or more networks (e.g., network(s) 110). In some embodiments, digital assistant system 300 is an embodiment of server system 108 (and/or digital assistant server 106) shown in Figure 1. It should be noted that digital assistant system 300 is only one example of a digital assistant system, and

that digital assistant system 300 may have more or fewer components than shown, may combine two or more components, or may have a different configuration or arrangement of the components. The various components shown in Figure 3A may be implemented in hardware, software instructions for execution by one or more processors, firmware, including one or more signal processing and/or application specific integrated circuits, or a combination of thereof.

[0055]   Digital assistant system 300 includes memory 302, one or more processors 304, an input/output (I/O) interface 306, and a network communications interface 308. These components communicate with one another over one or more communication buses or signal lines 310.

[0056]   In some embodiments, memory 302 includes a non-transitory computer readable storage medium, such as high-speed random access memory and/or a non-volatile storage medium (e.g., one or more magnetic disk storage devices, flash memory devices, or other non-volatile solid-state memory devices).

[0057]   In some embodiments, I/O interface 306 couples input/output devices 316 of digital assistant system 300, such as displays, keyboards, touch screens, and microphones, to user interface module 322. I/O interface 306, in conjunction with user interface module 322, receives user inputs (e.g., voice input, keyboard inputs, touch inputs, etc.) and processes them accordingly. In some embodiments, digital assistant system 300 includes any of the components and I/O and communication interfaces described with respect to user device 104 in Figure 2 (e.g., when the digital assistant is implemented on a standalone user device). In some embodiments, digital assistant system 300 represents the server portion of a digital assistant implementation, and interacts with the user through a client-side portion residing on a user device (e.g., user device 104 shown in Figure 2).

[0058]   In some embodiments, network communications interface 308 includes wired communication port(s) 312 and/or wireless transmission and reception circuitry 314. Wired communication port(s) receive and send communication signals via one or more wired interfaces such as Ethernet, Universal Serial Bus (USB), FIREWIRE, and the like. Wireless circuitry 314 receives and sends RF signals and/or optical signals from/to communications networks and other communications devices. The wireless communications, optionally, use any of a plurality of communications standards, protocols and technologies, such as GSM, EDGE, CDMA, TDMA, Bluetooth, Wi-Fi, VoIP, Wi-MAX, or any other suitable communication protocol. Network communications interface 308 enables communication between digital assistant system 300 and other devices via one or more networks (e.g., the

Internet, an intranet, a wireless network, such as a cellular telephone network, a wireless local area network (LAN) or a metropolitan area network (MAN)).

[0059]   In some embodiments, memory 302, or the computer readable storage media of memory 302, stores programs, modules, instructions, and data structures including all or a subset of: an operating system 318, a communications module 320, a user interface module 322, one or more applications 324, and a digital assistant module 326. One or more processors 304 execute these programs, modules, and instructions, and reads/writes from/to the data structures.

[0060]   Operating system 318 (e.g., Darwin, RTXC, LINUX, UNIX, OS X, WINDOWS, or an embedded operating system such as VxWorks) includes various software components and/or drivers for controlling and managing general system tasks (e.g., memory management, storage device control, power management, etc.) and facilitates communications between various hardware, firmware, and software components.

[0061]   Communications module 320 facilitates communications over network communications interface 308 between digital assistant system 300 and other devices. For example, communication module 320, optionally, communicates with communication interface 254 of user device 104 shown in Figure 2. Communications module 320 also includes various components for handling data received by wireless circuitry 314 and/or wired communications port 312.

[0062]   User interface module 322 receives commands and/or inputs from a user via I/O interface 306 (e.g., from a keyboard, touch screen, pointing device, controller, and/or microphone), and generates user interface objects on a display. User interface module 322 also prepares and delivers outputs (e.g., speech, sound, animation, text, icons, vibrations, haptic feedback, light, etc.) to the user via I/O interface 306 (e.g., through displays, audio channels, speakers, touch-pads, etc.).

[0063]   The one or more applications 324 include programs and/or modules that are configured to be executed by the one or more processors 304. For example, if the digital assistant system is implemented on a standalone user device, one or more applications 324, optionally, include user applications, such as games, a calendar application, a navigation application, or an email application. If digital assistant system 300 is implemented on a server farm, the one or more applications 324, optionally, include resource management applications, diagnostic applications, or scheduling applications.

[0064]   Memory 302 also stores digital assistant module 326 (or the server portion of a digital assistant). In some embodiments, digital assistant module 326 includes the following

sub-modules, or a subset or superset thereof: an input/output processing module 328, a speech-to-text (STT) processing module 330, a natural language processing module 332, a dialogue flow processing module 340, a task flow processing module 342, a service processing module 346, and a background processing module 350. Each of these modules has access to one or more of the following data and models of the digital assistant 326, or a subset or superset thereof: ontology 334, vocabulary index 336, user data 338, task flow models 344, service models 348, and user log 352.

[0065]   In some embodiments, using the processing modules, data, and models implemented in digital assistant module 326, digital assistant system 300 performs at least some of the following: identifying a user's intent expressed in a natural language input received from the user; actively eliciting and obtaining information needed to fully infer the user's intent (e.g., by disambiguating words, names, intentions, etc.); determining the task flow for fulfilling the inferred intent; and executing the task flow to fulfill the inferred intent. In some embodiments, the digital assistant also takes appropriate actions when a satisfactory response was not or could not be provided to the user for various reasons.

[0066]   In some embodiments, as shown in Figure 3B, I/O processing module 328 interacts with the user through the I/O devices 316 in Figure 3A or with a user device (e.g., user device 104 in Figure 1) through the network communications interface 308 in Figure 3A to obtain user input (e.g., a speech input) and to provide responses (e.g., as speech outputs) to the user input. I/O processing module 328, optionally, obtains context information associated with the user input from the user device, along with or shortly after the receipt of the user input. The context information includes user-specific data, vocabulary, and/or preferences relevant to the user input. In some embodiments, the context information also includes software and hardware states of the device (e.g., user device 104 in Figure 1) at the time the user request is received, and/or information related to the surrounding environment of the user at the time that the user request was received. In some embodiments, I/O processing module 328 also sends follow-up questions to, and receives answers from, the user regarding the user request. When a user request is received by I/O processing module 328 and the user request contains a speech input, I/O processing module 328 forwards the speech input to the speech-to-text (STT) processing module 330 for speech-to-text conversion.

[0067]   STT processing module 330 receives speech input (e.g., a user utterance captured in a voice recording) through I/O processing module 328. In some embodiments, STT processing module 330 uses various acoustic and language models to recognize the speech input as a sequence of phonemes, and ultimately, a sequence of words or tokens written in

one or more languages. The speech-to-text processing module 330 can be implemented using any suitable speech recognition techniques, acoustic models, and language models such as Hidden Markov Models, Dynamic Time Warping (DTW) based speech recognition, and other statistical and/or analytical techniques. In some embodiments, speech-to-text processing can be performed at least partially by a third party service or on the user's device. Once STT processing module 330 obtains the result of the speech-to-text processing (e.g., a sequence of words or tokens), STT processing module 330 passes the result to natural language processing module 332 for intent inference.

[0068]   More details on the speech-to-text processing are described in U.S. Utility Application Serial No. 13/236,942 for "Consolidating Speech Recognition Results," filed on September 20, 201 1, the entire disclosure of which is incorporated herein by reference.

[0069]   Natural language processing module 332 (sometimes herein also called a "natural language processor") of the digital assistant takes the sequence of words or tokens (or token sequence) generated by speech-to-text processing module 330, and attempts to associate the token sequence with one or more actionable intents recognized by the digital assistant. An "actionable intent" represents a task that can be performed by the digital assistant and has an associated task flow implemented in task flow models 344. The associated task flow is a series of programmed actions and steps that the digital assistant takes in order to perform the task. The scope of a digital assistant' s capabilities is dependent on the number and variety of task flows that have been implemented and stored in task flow models 344 or, in other words, on the number and variety of actionable intents that the digital assistant recognizes. The effectiveness of the digital assistant, however, is also dependent on the digital assistant's ability to infer the correct actionable intent(s) from the user request expressed in natural language.

[0070]   In some embodiments, in addition to the token sequence obtained from STT processing module 330,natural language processor 332 also receives context information associated with the user request (e.g., from I/O processing module 328). Natural language processor 332, optionally, uses the context information to clarify, supplement, and/or further define the information contained in the token sequence received from STT processing module 330. The context information includes, for example, user preferences, hardware and/or software states of the user device, sensor information collected before, during, or shortly after the user request, prior interactions (e.g., dialogue) between the digital assistant and the user, and the like.

[0071]   In some embodiments, the natural language processing is based on ontology 334. Ontology 334 is a hierarchical structure containing many nodes, each node representing either an "actionable intent" or a "property" relevant to one or more of the "actionable intents" or other "properties." As noted above, an "actionable intent" represents a task that the digital assistant is capable of performing (i.e., it is actionable or can be acted on). A "property" represents a parameter associated with an actionable intent or a sub-aspect of another property. A linkage between an actionable intent node and a property node in ontology 334 defines how a parameter represented by the property node pertains to the task represented by the actionable intent node.

[0072]   In some embodiments, ontology 334 is made up of actionable intent nodes and property nodes. Within ontology 334, each actionable intent node is linked to one or more property nodes either directly or through one or more intermediate property nodes. Similarly, each property node is linked to one or more actionable intent nodes either directly or through one or more intermediate property nodes. For example, as shown in Figure 3C, ontology 334 optionally includes a "restaurant reservation" node-an actionable intent node. Property nodes "restaurant," "date/time" (for the reservation), and "party size" are each directly linked to the actionable intent node (e.g., the "restaurant reservation" node). In addition, property nodes "cuisine," "price range," "phone number," and "location" are sub-nodes of the property node "restaurant," and are each linked to the "restaurant reservation" node through the intermediate property node "restaurant." For another example, as shown in Figure 3C, ontology 334 may also include a "set reminder" node (e.g., another actionable intent node). Property nodes "date/time" (for the setting the reminder) and "subject" (for the reminder) are each linked to the "set reminder" node. Since the property "date/time" is relevant to both the task of making a restaurant reservation and the task of setting a reminder, the property node "date/time" is linked to both the "restaurant reservation" node and the "set reminder" node in ontology 334.

[0073]   An actionable intent node, along with its linked property nodes, is sometimes described as a "domain." In the present discussion, each domain is associated with a respective actionable intent, and refers to the group of nodes (and the relationships therebetween) associated with the particular actionable intent. For example, ontology 334 shown in Figure 3C includes an example of a restaurant reservation domain 362 and an example of a reminder domain 364 within ontology 334. The restaurant reservation domain includes the actionable intent node "restaurant reservation," property nodes "restaurant," "date/time," and "party size," and sub-property nodes "cuisine," "price range," "phone

number," and "location." Reminder domain 364 includes the actionable intent node "set reminder," and property nodes "subject" and "date/time." In some embodiments, ontology 334 is made up of many domains. Each domain optionally shares one or more property nodes with one or more other domains. For example, the "date/time" property node is optionally associated with many different domains (e.g., a scheduling domain, a travel reservation domain, a movie ticket domain, etc.), in addition to restaurant reservation domain 362 and reminder domain 364.

[0074] While Figure 3C illustrates two example domains within ontology 334, other domains (or actionable intents) include, for example, "initiate a phone call," "find directions," "schedule a meeting," "send a message," and "provide an answer to a question," and so on. A "send a message" domain is associated with a "send a message" actionable intent node, and optionally further includes property nodes such as "recipient(s)," "message type," and "message body." The property node "recipient" is optionally further defined, for example, by the sub-property nodes such as "recipient name" and "message address."

[0075] In some embodiments, the ontology 334 includes all the domains (and hence actionable intents) that the digital assistant is capable of understanding and acting upon. In some embodiments, ontology 334 is optionally modified, such as by adding or removing entire domains or nodes, or by modifying relationships between the nodes within ontology 334.

[0076] In some embodiments, nodes associated with multiple related actionable intents are optionally clustered under a "super domain" in ontology 334. For example, a "travels" super domain optionally includes a cluster of property nodes and actionable intent nodes related to travel. The actionable intent nodes related to travel optionally include "airline reservation," "hotel reservation," "car rental," "get directions," "find points of interest," and so on. The actionable intent nodes under the same super domain (e.g., the "travels" super domain) sometimes have many property nodes in common. For example, the actionable intent nodes for "airline reservation," "hotel reservation," "car rental," "get directions," "find points of interest" sometimes share one or more of the property nodes "start location," "destination," "departure date/time," "arrival date/time," and "party size."

[0077] In some embodiments, each node in ontology 334 is associated with a set of words and/or phrases that are relevant to the property or actionable intent represented by the node. The respective set of words and/or phrases associated with each node is the so-called "vocabulary" associated with the node. The respective set of words and/or phrases associated with each node can be stored in vocabulary index 336 in association with the property or

actionable intent represented by the node. For example, returning to Figure 3B, the vocabulary associated with the node for the property of "restaurant" optionally includes words such as "food," "drinks," "cuisine," "hungry," "eat," "pizza," "fast food," "meal," and so on. For another example, the vocabulary associated with the node for the actionable intent of "initiate a phone call" optionally includes words and phrases such as "call," "phone," "dial," "call this number," "make a call to," and so on. The vocabulary index 336, optionally, includes words and phrases in different languages.

[0078]   Natural language processor 332 receives the token sequence (e.g., a text string) from speech-to-text processing module 330, and determines what nodes are implicated by the words in the token sequence. In some embodiments, if a word or phrase in the token sequence is found to be associated with one or more nodes in ontology 334 (via vocabulary index 336), the word or phrase will "trigger" or "activate" those nodes. Based on the quantity and/or relative importance of the activated nodes, natural language processor 332 will select one of the actionable intents as the task that the user intended the digital assistant to perform. In some embodiments, the domain that has the most "triggered" nodes is selected. In some embodiments, the domain having the highest confidence value (e.g., based on the relative importance of its various triggered nodes) is selected. In some embodiments, the domain is selected based on a combination of the number and the importance of the triggered nodes. In some embodiments, additional factors are considered in selecting the node as well, such as whether the digital assistant has previously correctly interpreted a similar request from a user.

[0079]   In some embodiments, the digital assistant also stores names of specific entities in vocabulary index 336, so that when one of these names is detected in the user request, natural language processor 332 will be able to recognize that the name refers to a specific instance of a property or sub-property in the ontology. In some embodiments, the names of specific entities are names of businesses, restaurants, people, movies, and the like. In some embodiments, the digital assistant searches and identifies specific entity names from other data sources, such as the user's address book, a movies database, a musicians database, and/or a restaurant database. In some embodiments, when natural language processor 332 identifies that a word in the token sequence is a name of a specific entity (e.g., a name in the user's address book), that word is given additional significance in selecting the actionable intent within the ontology for the user request.

[0080]   For example, when the words "Mr. Santo" are recognized in a user request and the last name "Santo" is found in vocabulary index 336 as one of the contacts in the user's address book, then it is likely that the user request corresponds to a "send a message" or an

"initiate a phone call" domain. For another example, when the words "ABC Cafe" are found in a user request and the term "ABC Cafe" is found in the vocabulary index 336 as the name of a particular restaurant in the user's city, then it is likely that the user request corresponds to a "restaurant reservation" or a "find restaurants" domain.

[0081]   User data 338 includes user-specific information, such as user-specific vocabulary, user preferences, user address or home location, user's default and secondary languages, user's address book, and other short-term or long-term information for each user. In some embodiments, natural language processor 332 uses the user-specific information to supplement the information contained in a user input to further define the user intent. For example, for a user request "invite my friends to my birthday party," natural language processor 332 is able to access user data 338 to determine who the "friends" are and when and where the "birthday party" would be held, rather than requiring the user to provide such information explicitly in his/her request.

[0082]   Other details of searching an ontology based on a token string is described in U.S. Utility Application Serial No. 12/341,743 for "Method and Apparatus for Searching Using An Active Ontology," filed December 22, 2008, the entire disclosure of which is incorporated herein by reference.

[0083]   In some embodiments, once natural language processor 332 identifies an actionable intent (or domain) based on the user request, natural language processor 332 generates a structured query to represent the identified actionable intent. In some embodiments, the structured query includes parameters for one or more nodes within the domain for the actionable intent, and at least some of the parameters are populated with the specific information and requirements specified in the user request. For example, the user states to the DA, "Make me a dinner reservation at a sushi place at 7." In this case, natural language processor 332 may be able to correctly identify the actionable intent to be "restaurant reservation" based on the user input. According to the ontology, a structured query for a "restaurant reservation" domain optionally includes parameters such as {Cuisine}, {Time}, {Date}, {Party Size}, and the like. In some embodiments, based on the information contained in the user's utterance, natural language processor 332 generates a partial structured query for the restaurant reservation domain, where the partial structured query includes the parameters {Cuisine = "Sushi"} and {Time = "7 PM"}. In this example, the user's utterance, however, contains insufficient information to complete the structured query associated with the domain. Therefore, other necessary parameters such as {Party Size} and {Date} are not specified in the structured query based on the information currently available. In some

embodiments, natural language processor 332 populates some parameters of the structured query with received context information. For example, in some embodiments, if the user requested a sushi restaurant "near me," natural language processor 332 populates a {location Jparameter in the structured query with GPS coordinates from user device 104.

[0084]   In some embodiments, natural language processor 332 passes the structured query (including any completed parameters) to task flow processing module 342 (sometimes herein also called a "task flow processor"). Task flow processor 342 is configured to receive the structured query from natural language processor 332, complete the structured query, if necessary, and perform the actions required to "complete" the user's ultimate request. In some embodiments, the various procedures necessary to complete these tasks are provided in task flow models 344. In some embodiments, task flow models 344 include procedures for obtaining additional information from the user, and task flows for performing actions associated with the actionable intent.

[0085]   As described above, in order to complete a structured query, task flow processor 342 sometimes needs to initiate additional dialogue with the user in order to obtain additional information, and/or disambiguate potentially ambiguous utterances. When such interactions are necessary, task flow processor 342 invokes dialogue processing module 340 (sometimes herein also called a "dialogue processor") to engage in a dialogue with the user. In some embodiments, dialogue processor 340 determines how (and/or when) to ask the user for the additional information, and receives and processes the user responses. The questions are provided to and answers are received from the users through I/O processing module 328. In some embodiments, dialogue processor 340 presents dialogue output to the user via audio and/or visual output, and receives input from the user via spoken or physical (e.g., clicking) responses. Continuing with the example above, when task flow processor 342 invokes dialogue flow processor 340 to determine the "party size" and "date" information for the structured query associated with the domain "restaurant reservation," dialogue flow processor 335 generates questions, such as "For how many people?" and "On which day?," to pass to the user . Once answers are received from the user, the dialogue flow processor 340 can then populate the structured query with the missing information, or pass the information to task flow processor 342 to complete the missing information from the structured query.

[0086]   Once task flow processor 342 has completed the structured query for an actionable intent, task flow processor 342 proceeds to perform the ultimate task associated with the actionable intent. Accordingly, task flow processor 342 executes the steps and instructions in the task flow model according to the specific parameters contained in the structured query.

For example, the task flow model for the actionable intent of "restaurant reservation," optionally, includes steps and instructions for contacting a restaurant and actually requesting a reservation for a particular party size at a particular time. For example, using a structured query, such as {restaurant reservation, restaurant = ABC Cafe, date = 3/ 12/2012, time = 7 PM, party size = 5}, task flow processor 342, optionally, performs the steps of: (1) logging onto a server of the ABC Cafe or a restaurant reservation system such as OPENTABLE®; (2) entering the date, time, and party size information in a form on the website; (3) submitting the form; and (4) making a calendar entry for the reservation in the user' s calendar.

[0087]   In some embodiments, task flow processor 342 employs the assistance of a service processing module 346 (sometimes herein also called a "service processor") to complete a task requested in the user input or to provide an informational answer requested in the user input. For example, service processor 346 can act on behalf of task flow processor 342 to make a phone call, set a calendar entry, invoke a map search, invoke or interact with other user applications installed on the user device, and invoke or interact with third party services (e.g., a restaurant reservation portal, a social networking website, a banking portal, etc.). In some embodiments, the protocols and application programming interfaces (API) required by each service can be specified by a respective service model among services models 348. Service processor 346 accesses the appropriate service model for a service and generates requests for the service in accordance with the protocols and APIs required by the service according to the service model.

[0088]   For example, if a restaurant has enabled an online reservation service, the restaurant can submit a service model specifying the necessary parameters for making a reservation and the APIs for communicating the values of the necessary parameter to the online reservation service. When requested by task flow processor 342, service processor 346 can establish a network connection with the online reservation service using the web address stored in the service model, and send the necessary parameters of the reservation (e.g., time, date, party size) to the online reservation interface in a format according to the API of the online reservation service.

[0089]   In some embodiments, natural Language processor 332, dialogue processor 340, and task flow processor 342 are used collectively and iteratively to infer and define the user's intent, obtain information to further clarify and refine the user intent, and finally generate a response (e.g., an output to the user, or the completion of a task) to fulfill the user's intent.

[0090]   In some embodiments, after all of the tasks needed to fulfill the user's request have been performed, digital assistant 326 formulates a confirmation response, and sends the

response to the user through the **170** processing module 328. If the user request seeks an informational answer, the confirmation response presents the requested information to the user. In some embodiments, the digital assistant also requests the user to indicate whether the user is satisfied with the response produced by digital assistant 326.

[0091]   In some embodiments, digital assistant 326 includes a background processing module 350. Background processing module 350 is configured to share an information item with a third party recipient (e.g., one or more other devices 360) during a background process in accordance with some embodiments. Background processing module 350 is discussed in more detail below with reference to Figure 5. In this context, "during a background process" means during execution of a background process. In some implementations, each operation that is performed during the background process is either performed by the background process of the DA, or is caused to be performed by the background process of the DA. In some implementations, background processing module 350 performs each of these operations, or initiates the performance of these operations, during the background process. In some implementations, the background process or portions of the background process are executed by server system 108 and/or other services (e.g., 120, Figure 1) external to user device 104.

[0092]   More details on the digital assistant can be found in the U.S. Utility Application No. 12/987,982, entitled "Intelligent Automated Assistant," filed January 10, 2011, and also in U.S. Utility Application No. 61/493,201, entitled "Generating and Processing Data Items That Represent Tasks to Perform," filed June 3, 201 1, the entire disclosures of which are incorporated herein by reference.

[0093]   Figure 4 illustrates an information sharing domain 400 within ontology 334 associated with an actionable intent 402 of sharing an information item with a third party recipient (sometimes herein also called the "information sharing" actionable intent). For example, a user requests the DA to share an information item with a third party recipient.

[0094]   Third party recipient property node 404 specifies a third party recipient to which the information item is to be sent. In some embodiments, third party recipient property node 404 includes sub-property nodes identifying the third party recipient such as a name in the user' s address book, a phone number, an email address, and the like. Information item property node 406 specifies the information item to be sent to the third party recipient. In some embodiments, information item property node 406 includes sub-property nodes identifying the information item such as the information item' s current location, a webpage, a document, contact information for a contact in the user's address book, and the like.

[0095] For example, the user of user device 104 states to the DA, "Send an article on black-footed ferrets to Greg." In this case, natural language processor 332 identifies the actionable intent to be "information sharing" based on the user speech input including an existing information item (e.g., an article on black-footed ferrets) and a third party recipient (e.g., Greg). According to ontology 334, a structured query for the information sharing domain 400, optionally, includes parameters such as {third party recipient 404} and {information item 406}. For example, using a structured query, such as {information sharing, third party recipient = Greg, information item = article on black-footed ferrets}, during a background process, task flow processor 342 (or a component thereof) performs the steps of: (1) searching the Internet for an article on black-footed ferrets; and (2) causing an email message that includes a link to the article to be sent to Greg's email address.

[0096] Condition property mode 408 specifies a condition that must be satisfied in order to cause the information item to be sent to the third party recipient. Communication means property node 410 specifies a means by which the information is to be sent to the third party recipient. In some embodiments, communication means property node 410 includes sub-property nodes identifying the communication means such as email, SMS, voice message, and the like.

[0097] In some embodiments, if a condition precedent to sending the information item is not specified, the information item is sent to the third party recipient immediately, or shOltly, after the user's request. In some embodiments, if a means of communication is not specified, the DA causes the information item to be sent to the third party recipient using a default, or most frequent, means of communication.

[0098] In some embodiments, the structured query further includes {condition 408} and/or {communication means 410} parameters in addition to {third party recipient 404} and {information item 406}. For example, the user states to the DA, "Send Martin the price of a bushel of corn on the fourth of July." In this case, natural language processor 332 correctly identifies the actionable intent to be "information sharing" based on the user speech input including an information item (e.g., the price of a bushel of corn) and a third party recipient (e.g., Martin). For example, using a structured query, such as {information sharing, third party recipient= Martin, information item= price of a bushel of corn, condition= July 4}, during a background process, task flow processor 342 (or a component thereof) queues a process to: (1) search for the price of corn to be run at the close of trading on July 4; and (2) subsequently send the price to Martin.

[0099]   In another example, the user states to the DA, "Send Andre the local time in Moscow once my plane lands." In this case, natural language processor 332 correctly identifies the actionable intent to be "information sharing" based on the user speech input including an information item (e.g., the local time in Moscow) and a third party recipient (e.g., Andre). For example, using a structured query, such as {information sharing, third party = Andre, information item = local time in Moscow, condition = upon arrival of user's plane}, during a background process, task flow processor 342 (or a component thereof) queues a process to: (1) search for the local time in Moscow to be run once the user's plane lands; and (2) subsequently send the time to Andre.

[0100]   In yet another example, the user states to the DA, "Send a text to 650-843- 8888 with the address of the nearest Mongolian BBQ restaurant to Santa Clara University." In this case, natural language processor 332 correctly identifies the actionable intent to be "information sharing" based on the user speech input including an information item (e.g., the address of the Mongolian BBQ restaurant nearest to Santa Clara University) and a third party recipient (e.g., 650-843-8888) . For example, using a structured query, such as {information sharing, third party recipient = 650-843-8888, information item = Mongolian BBQ restaurant nearest to Santa Clara University, communication means= text message or SMS}, during a background process, task flow processor 342 (or a component thereof) performs the steps of: (1) searching the Internet for Mongolian BBQ restaurant near Santa Clara University; and (2) causing the address of the Mongolian BBQ restaurant nearest to Santa Clara University to be sent to 650-843-8888 via text message (or SMS).

[0101]   Figure 5 illustrates a block diagram of background processing module 350 included in digital assistant 326 in accordance with some embodiments. In some implementations, each operation that is performed during the background process is either performed by the background process of the DA, or is caused to be performed by the background process of the DA. In some implementations, background processing module 350 performs the each of these operations, or initiates the performance of these operations, during the background process.

[0102]   In some embodiments, background processing module 350 is a component of task flow processor 342. In some other embodiments, background processing module 350 is separate from task flow processor 342. Background processing module 350 is configured to perform steps during a background process to fulfill a user request that triggers information sharing domain 400 in ontology 334. In other words, background processing module 350 is configured to perform a task flow related to information sharing domain 400. In some embodiments, background processing module 350 includes a searching module 510, a

sending module 512, which includes a carbon copy (CC) module 514, and a communications interception module 516.

[0103]   Searching module 510 is configured to search a plurality of locations (e.g., memory local to user device 104, the Internet, the memory of another device associated with the user, etc.) for an information item specified in a user speech input, where the user speech input specifies at least the information item and a third party recipient different from the user of user device 104. Sending module 512 is configured to cause the information item to be sent to the third party recipient specified in the user speech input. For example, the third party recipient is associated with one of the other devices 360 that is communicatively coupled to user device 104 through one or more networks 110. In some embodiments, sending module 512 includes a carbon copy (CC) module 514 configured to send the information item to the user of user device 104 in addition to the third party recipient specified in the speech input.

[0104]   Communications interception module 516 is configured to intercept communications (e.g., a voicemail, phone call, VoIP call, SMS, MMS, email, etc.) from a third party to the user of user device 104. In response to intercepting the communication, communications interception module 516 is configured to either offer to respond to the communication or provide a proposed response to the communication for review by the user. In some embodiments, a predefined filter or custom constraint is placed on the information included in the proposed response. For example, if information requested by the third party in their communication to the user of user device 104 is sensitive or not germane to the third party, a privacy flag is raised. In addition, in some embodiments, when the privacy flag is raised, the DA does not provide a proposed response to the communication or does not offer to respond to the communication.

[0105]   Although Figure 5 does not explicitly show the communication interfaces between all components of the digital assistant 326 in Figure 3B, it is to be understood that the components shown in Figure 5 are capable of communicating with other components of the digital assistant 326 in Figure 3B either directly or through one or more other interfaces, such as application programming interfaces (APIs), database query interfaces, and/or other interfaces, protocols, and/or communication channels .

[0106]   Figures 6A-B illustrate a flow diagram of a method 600 of operating a digital assistant in accordance with some embodiments. In some embodiments, method 600 is performed at an electronic device including one or more processors and memory (e.g., a respective DA-client 102 or DA-server 106). In some embodiments, method 600 is performed at digital assistant 326 illustrated in Figures 3A-B and 5. In some embodiments, method 600

is governed by a set of instructions that are stored in memory (e.g., a non-transitory computer readable storage medium) and are executed by the one or more processors of the electronic device.

[0107]   In some embodiments, prior to receiving a speech input from a first user of the device specifying a second user different from the first user and an information item to be shared with the second user, the digital assistant (602): receives a communication from a second user different from the first user; and provides, to the first user, a proposed response to the communication from the second user, where the proposed response is based at least in part on context data associated with the first user. For example, the DA intercepts an SMS from the second user stating, "What was the name of the restaurant we went to last week?" The DA offers to respond to the second's user's SMS based on contextual information associated with the first user (e.g., the first user's calendar, user log, or location log). For example, the DA audibly presents the proposed response to the first user such as "Do you want me to respond to the second user stating 'We went to Paw's Diner last week'?" In turn, the first user accepts the proposed response by stating, "Yes, send the proposed response to the second user." Thereafter, the DA sends an SMS to the second user stating, "We went to Paw's Diner last week." In this example, the DA composes the proposed response based on information stored in the first user's historical calendar entries.

[0108]   In some embodiments, prior to receiving a speech input from a first user of the device, the speech input specifying a second user different from the first user and an information item to be shared with the second user, the digital assistant (604): receives a communication from the second user different from the first user; and communicates, to the first user, an offer to respond to the communication from the second user. For example, the DA intercepts an SMS from the second user stating, "What time is our meeting on Friday?" The DA offers to respond to the second's user's SMS based on contextual information associated with the first user (e.g., the first user's calendar, user log, or location log). In this example, the DA offers to respond to the communication from the second user by stating, "Do you want me to respond to the second user?" Also, in this example, the DA does not provide (or present) the proposed response to the first user. Subsequently, in this example, the first user accepts the DA's offer by stating, "Yes, respond to the second user with our meeting time." Thereafter, in this example, the DA sends an SMS to the second user stating, "Our meeting is at 2 PM PDT Friday May 17." In this example, the DA composes the proposed response based on information stored in the first user's calendar.

[0109]   In some embodiments, prior to receiving a speech input from a first user of the device specifying a second user different from the first user and an information item to be shared with the second user, the digital assistant receives (606) an input from the first user (e.g., a manual input or a speech input) authorizing the digital assistant to initiate the background process without review or confirmation from the first user. In one example, prior to receiving the speech input, the first user "manually" sets a mode within DA settings, authorizing the DA to send information items to users different from the first user without review or confirmation. In another example, prior to receiving the speech input, the first user audibly authorizes the DA to send information items to users different from the first user without review or confirmation.

[0110]   The device receives (608) a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user. For example, the DA receives a speech input from a first user of the device stating, "Send an email to my Mom with the last three photos I've taken." In this example, the second user different from the first user is the first user's Mom, and the information item is the last three photos captured by the first user's device. In this example, the DA is configured to determine Mom's email address by accessing user data 338 including the user's address book (i.e., including Mom's email address).

[0111]   In some embodiments, the information item exists (610) prior to the speech input (e.g., neither the user nor the DA composes the information item). For example, the speech input from the first user specifies that an existing Wikipedia article is to be emailed to a friend. In another example, the speech input from the first user specifies that an existing contact's information (e.g., an address, email address or phone number) is to be sent to a recipient.

[0112]   In some embodiments, the information item is (612) the first user's current location. For example, the DA receives a speech input from a first user of user device 104 stating, "Send Bill my current coordinates" or "Send Bill directions to my current location." With both of these requests, the information item to be sent to the third party recipient (e.g., Bill) includes the first user's current location (e.g., coordinates or directions to the first user's current location).

[0113]   In some embodiments, the speech input further specifies (614) a predetermined condition. For example, the DA receives a speech input from a first user of user device 104 stating, "Send Gary the PE ratio and market capitalization for Macy's once Macy's shares reach $50 per share." In this example, the speech input from the first user specifies a

condition (e.g., the publicly traded security having the symbol "M" reaching $50 per share) in addition to a third party recipient (e.g., Gary) and an information item (e.g., Macy's PE ratio and market capitalization).

[0114] In some embodiments, the speech input further specifies (616) a means of communication to be used for sharing the information item. For example, the DA receives a speech input from a first user of user device 104 stating, "Send Allison an email with a recipe for Carolina mustard BBQ sauce." In this example, the speech input from the first user specifies a means of communication (e.g., email) in addition to a third party recipient (e.g., Allison) and an information item (e.g., recipe for Carolina mustard BBQ sauce).

[0115] In response to the speech input, the device initiates (618) a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user. In some implementations, each operation that is performed during the background process is either performed by the background process of the DA, or is caused to be performed by the background process of the DA. In some implementations, background processing module 350 performs the each of these operations, or initiates the performance of these operations, during the background process.

[0116] After receiving the speech input from the first user of user device 104, digital assistant 326 determines whether information sharing domain 400 has been triggered (e.g., with natural language processor 332) by the speech input. In response to determining that information sharing domain 400 has been triggered, background processing module 350 (e.g., a component of task flow processor 342) searches for the information item specified in the speech input and causes the information item to be sent to the second user (e.g., third party recipient) without further review, instruction or input from the first user of user device 104. In some implementations, background processing module 350 performs the aforementioned steps during a background process.

[0117] In some embodiments, the digital assistant searches (620) for the information item based on context data associated with the first user when the information item is the first user's location (e.g., the first user requests that the DA send the second user the first user's current location). The digital assistant is configured to send the first user's location to the second user based on context data (e.g., physical/hardware or software state of user device 104) associated with the first user such as calendar entries, GPS coordinates obtained by a navigation application executed by the user device 104, network based location (e.g., the IP address of user device 104, the location of an WiFi access point used by user device 104 to

access a network, the location of any other network access portal used by user device 104, etc.), or other geolocation techniques.

[0118]   In some embodiments, the digital assistant causes the information item to be sent (622) to the second user when the predetermined condition specified in the speech input is satisfied (e.g., the first user's speech input specifies that the information item is to be sent to the second user when a condition occurs). For example, the speech input from the first user of user device 104 states, "At 3:25 PM, send showtimes to Jessica for tonight's showings of 'Charade' at the Retro Theater." In this example, the digital assistant is configured to send the information item (e.g., evening showtimes of 'Charade' at the Retro Theater) to the third party recipient (e.g., Jessica) once the predetermined condition (e.g., 3:25 PM) is satisfied.

[0119]   In some embodiments, the digital assistant causes the information item to be sent (624) to the second user using the means of communication specified in the speech input during the background process. For example, the background process of the DA shares the information item with the second user in the manner (e.g., an SMS, email, voice message, etc.) specified by the speech input from the first user of user device 104.

[0120]   In some embodiments, the digital assistant searches (626) for the information item at an information source local to the device or at an information source external to the device. In some embodiments, the information item (e.g., a contact's email or phone number, or a picture or video captured by user device 104) is stored on user device 104. In some other embodiments, the DA searches for the information item (e.g., a Wikipedia article, a sports score, a podcast, or directions to a restaurant) on the Internet or a source external to user device 104.

[0121]   n some embodiments, the device is (628) a first device, and the source external to the device is a memory for a second device of the first user. For example, while the first user of user device 104 is out running errands, the DA receives a speech input from a first user of user device 104 stating, "Send Suzanne a copy of the itinerary for my upcoming vacation." In this example, the specified itinerary is an electronic document located on the hard drive of the first user's home computer. The DA associated with user device 104 (e.g., DA-client 102) is configured to access the hard drive of the first user's home computer so as to send the information item (e.g., the first user's vacation itinerary) to the third party recipient (e.g., Suzanne).

[0122]   In some embodiments, the digital assistant downloads (630) the information item during the background process, and the digital assistant provides the information item to the first user subsequent to the background process. Background processing module 350 is

further configured to download the information item specified by the speech input onto user device 104. After downloading the information item, background processing module 350 is configured to cause user device 104 to visually or audibly present the information item to the first user. In some embodiments, the information item is presented to the first user once the background process is complete (e.g., the information has been sent to the third party recipient). In some other embodiments, the information item is presented to the first user immediately after, or shortly after, downloading the information item.

[0123] In some embodiments, during the background process, the digital assistant further causes the information item to be sent (632) to the first user (e.g., the DA carbon-copies (CCs) the first user on the information item sent to the second user). In some embodiments, the first user enables, or commands, the DA (e.g., via a manual setting or an audible command) to CC the first user on all information items sent to third part recipients. For example, the DA receives a speech input from a first user of user device 104 stating, "Please send Sam flight 909's arrival time into SFO." In this example, the DA causes an email to be sent to Sam with the arrival time of flight 909 into SFO, and, when CC mode is enabled, the first user of user device 104 is also emailed the arrival time of flight 909 into SFO.

[0124] In some embodiments, the speech input further specifies (634) a means of communication to be used for sharing the information item, and the digital assistant causes the information item to be sent to the first user using said means of communication. In some embodiments, the DA sends the information item to the first user in the same way as the information item was sent to the second user. For example, the DA receives a speech input from a first user of user device 104 stating, "Email John the kickoff time for the upcoming Clemson football game versus Georgia Tech." In this example, the DA causes an email to be sent to John with the kickoff time of the game, and, when carbon-copy (CC) mode is enabled, the first user of user device 104 is also emailed the kickoff time of the game.

[0125] In some embodiments, during the background process, the digital assistant receives (636) one or more additional speech inputs from the user and executes one or more additional tasks for the first user in a foreground process in response to the one or more additional speech inputs. For example, after receiving a speech input from the first user of user device 104 stating, "Send my sister a link to a website with the GDP of Bhutan," the digital assistant determines that information sharing domain 400 has been triggered and initiates a background process to fulfill the information sharing task specified by the user request. While the background process is being performed, the DA receives an additional speech input from the first user of user device 104 stating, "What is the current temperature in Palo Alto?" In

this example, the digital assistant performs the task specified in the additional speech input (e.g., displaying the current temperature in Palo Alto) in the foreground (i.e., by the foreground process) while the information sharing task is being completed in the background (i.e., by the background process).

[0126]   It should be understood that the particular order in which the operations in Figures 6A-B have been described is merely exemplary and is not intended to indicate that the described order is the only order in which the operations could be performed. One of ordinary skill in the art would recognize various ways to reorder the operations described herein.

[0127]   In accordance with some embodiments, Figure 7 shows a functional block diagram of an electronic device 700 configured in accordance with the principles of the various described embodiments. The functional blocks of the device are, optionally, implemented by hardware, software, or a combination of hardware and software to carry out the principles of the various described embodiments. It is understood by persons of skill in the art that the functional blocks described in Figure 7 are, optionally, combined or separated into sub-blocks to implement the principles of the various described embodiments. Therefore, the description herein optionally supports any possible combination or separation or further definition of the functional blocks described herein.

[0128]   As shown in Figure 7, an electronic device 700 includes a sound receiving unit 702 configured to receive a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user. In some embodiments, electronic device 700, optionally, includes a speaker unit 704 configured to generate sound and a touch screen display unit 706 configured to display information and to receive touch input. Electronic device 700 also includes a processing unit 708 coupled to sound receiving unit 702 (and, optionally, coupled to speaker unit 704 and touch screen display unit 706). In some embodiments, processing unit 708 includes a searching unit 710, a sending unit 712, an executing unit 714, a downloading unit 716, a providing unit 718, and a communications interception unit 720.

[0129]   In some embodiments, and/or in some circumstances, in response to the speech input, processing unit 708 is configured to initiate a background process during which a digital assistant searches (e.g., with searching unit 710) for the information item and causes the information item to be sent (e.g., with sending unit 712) to the second user without further review and instruction from the first user.

[0130]   In some embodiments, the information item exists prior to the speech input.

[0131]   In some embodiments, the information item is the first user's current location, and processing unit 708 is configured to search (e.g., with searching unit 710) for the information item based on context data associated with the first user.

[0132]   In some embodiments, the speech input further specifies a predetermined condition, and processing unit 708 is configured to cause the information item to be sent (e.g., with sending unit 712) to the second user when the predetermined condition is satisfied.

[0133]   In some embodiments, the speech input further specifies a means of communication to be used for sharing the information item, and processing unit 708 is configured to cause the information item to be sent (e.g., with sending unit 712) to the second user using said means of communication during the background process.

[0134]   In some embodiments, processing unit 708 is configured to search (e.g., with searching unit 710) for information item at an information source local to device 700 or at an information source external to device 700.

[0135]   In some embodiments, device 700 is a first device, and the source external to device 700 is a memory for a second device of the first user.

[0136]   In some embodiments, prior to sound receiving unit 702 receiving the speech input, sound receiving unit 702, or alternatively touch screen display unit 706, is configured to receive an input from the first user, authorizing the digital assistant to initiate the background process without review or confirmation from the first user.

[0137]   In some embodiments, during the background process: sound receiving unit 702 is configured to receive one or more additional speech inputs from the user; and in response to the one or more additional speech inputs, processing unit 708 is configured to execute (e.g., with executing unit 714) one or more additional tasks for the first user in a foreground process.

[0138]   In some embodiments, during the background process, processing unit 708 is configured to cause the information item to be sent (e.g., with sending unit 712) to the first user.

[0139]   In some embodiments, the speech input further specifies a means of communication to be used for sharing the information item, and processing unit 708 is configured to cause the information item to be sent (e.g., with sending unit 712) to the first user using said means of communication.

[0140]   In some embodiments, processing unit 708 is configured to: download (e.g., with downloading unit 716) the information item during the background process; and provide

(e.g., with providing unit 718) the information item to the first user subsequent to the background process.

[0141]   In some embodiments, prior to sound receiving unit 702 receiving the speech input from the first user, processing unit 708 is configured to: receive a communication (e.g., with communications interception unit 720) from the second user different from the first user; and provide (e.g., with providing unit 718), to the first user, a proposed response to the communication from the second user, where the proposed response is based at least in part on context data associated with the first user.

[0142]   In some embodiments, prior to sound receiving unit 702 receiving the speech input from the first user, the processing unit 708 is configured to: receive a communication (e.g., with communications interception unit 720) from the second user different from the first user; and communicate (e.g., with providing unit 718), to the first user, an offer to respond to the communication from the second user.

[0143]   The foregoing description, for purpose of explanation, has been described with reference to specific implementations. However, the illustrative discussions above are not intended to be exhaustive or to limit the disclosed implementations to the precise forms disclosed. Many modifications and variations are possible in view of the above teachings. The implementations were chosen and described in order to best explain the principles and practical applications of the disclosed ideas, to thereby enable others skilled in the art to best utilize them with various modifications as are suited to the particular use contemplated.

[0144]   Although the terms "first," "second," etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first speech input could be termed a second speech input, and, similarly, a second speech input could be termed a first speech input, without changing the meaning of the description, so long as all occurrences of the "first speech input" are renamed consistently and all occurrences of the "second speech input" are renamed consistently. The first speech input and the second speech input are both speech inputs, but they are not the same speech input.

[0145]   The terminology used herein is for the purpose of describing particular implementations only and is not intended to be limiting of the claims. As used in the description of the implementations and the appended claims, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will also be understood that the term "and/or" as used herein refers to and encompasses any and all possible combinations of one or more of the associated listed items.

It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0146]   As used herein, the term "if may be construed to mean "when" or "upon" or "in response to determining" or "in accordance with a determination" or "in response to detecting," that a stated condition precedent is true, depending on the context. Similarly, the phrase "if it is determined [that a stated condition precedent is true]" or "if [a stated condition precedent is true]" or "when [a stated condition precedent is true]" may be construed to mean "upon determining" or "upon a determination that" or "in response to determining" or "in accordance with a determination" or "upon detecting" or "in response to detecting" that the stated condition precedent is true, depending on the context.

What is claimed is:

1.   A method of operating a digital assistant, comprising:

at an electronic device having one or more processors and memory:

receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and

in response to the speech input, initiating a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

2.   The method of claim 1, wherein the information item exists prior to the speech input.

3.   The method of any of claims 1-2, wherein the information item is the first user's current location, and wherein the digital assistant searches for the information item based on context data associated with the first user.

4.   The method of any of claims 1-3, wherein the speech input further specifies a predetermined condition, and wherein the digital assistant causes the information item to be sent to the second user when the predetermined condition is satisfied.

5.   The method of any of claims 1-4, wherein the speech input further specifies a means of communication to be used for sharing the information item, and wherein the digital assistant causes the information item to be sent to the second user using said means of communication during the background process .

6.   The method of any of claims 1-5, wherein the digital assistant searches for the information item at an information source local to the device or at an information source external to the device.

7.   The method of claim 6, wherein the device is a first device, and wherein the source external to the device is a memory for a second device of the first user.

8.   The method of any of claims 1-7, further comprising, prior to receiving the speech input, receiving an input from the first user authorizing the digital assistant to initiate the background process without review or confirmation from the first user.

9.   The method of any of claims 1-8, further comprising, during the background process:

receiving one or more additional speech inputs from the user; and

in response to the one or more additional speech inputs, executing one or more additional tasks for the first user in a foreground process.

10.   The method of any of claims 1-9, wherein during the background process, the digital assistant further causes the information item to be sent to the first user.

11.   The method of claim 10, wherein the speech input further specifies a means of communication to be used for sharing the information item, and wherein the digital assistant causes the information item to be sent to the first user using said means of communication.

12.   The method of any of claims 1-11, wherein, during the background process, the digital assistant downloads the information item; and

the method further comprising, providing the information item to the first user subsequent to the background process.

13.   The method of any of claims 1-12, further comprising, prior to receiving the speech input from the first user:

receiving a communication from the second user different from the first user; and

providing, to the first user, a proposed response to the communication from the second user, wherein the proposed response is based at least in part on context data associated with the first user.

14.   The method of any of claims 1-12, further comprising, prior to receiving the speech input from the first user:

receiving a communication from the second user different from the first user; and communicating, to the first user, an offer to respond to the communication from the second user.

15.   A non-transitory computer-readable medium storing instructions for operating a digital assistant, the instructions, when executed by one or more processors, cause the processors to perform operations comprising:

receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and

in response to the speech input, initiating a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

16.   An electronic device, comprising:

one or more processors; and

memory storing instructions for operating a digital assistant, the instructions, when executed by the one or more processors, cause the processors to perform operations comprising:

receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and

in response to the speech input, initiating a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

17.   An electronic device, comprising:

means for receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and

means, responsive to the speech input, for initiating a background process during which a digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

18.   An information processing apparatus for use in an electronic device, comprising:

means for receiving a speech input from a first user, the speech input specifying a second user different from the first user, and an information item to be shared with the second user; and

means, responsive to the speech input, for initiating a background process during which a digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

19.   A non-transitory computer readable storage medium storing one or more programs, the one or more programs comprising instructions, which, when executed by an electronic device with one or more processors, cause the device to perform any of the methods of claims 1-14.

20.   An electronic device, comprising one or more processors and memory storing one or more programs for execution by the one or more processors, the one or more programs including instructions for performing any of the methods of claims 1-14.

21.   A graphical user interface on an electronic device with a display, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 1-14.

22.   An electronic device, comprising means for performing any of the methods of claims 1-14.

23.   An information processing apparatus for use in an electronic device, comprising means for performing any of the methods of claims 1-14.

24.   An electronic device, comprising:

a sound receiving unit configured to receive a user request from a mobile client device, the user request including at least a speech input and seeks an informational answer or performance of a task; and

a processing unit coupled to the sound receiving unit, the processing unit configured to:

in response to the speech input, initiate a background process during which a digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user.

25.   The device of claim 24, wherein the information item exists prior to the speech input.

26.   The device of any of claims 24-25, wherein the information item is the first user's current location, and wherein the processing unit is configured to search for the information item based on context data associated with the first user.

27.   The device of any of claims 24-26, wherein the speech input further specifies a predetermined condition, and wherein the processing unit is configured to cause the information item to be sent to the second user when the predetermined condition is satisfied.

28.   The device of any of claims 24-27, wherein the speech input further specifies a means of communication to be used for sharing the information item, and wherein the processing unit is configured to cause the information item to be sent to the second user using said means of communication during the background process.

29.   The device of any of claims 24-28, wherein the processing unit is configured to search for the information item at an information source local to the device or at an information source external to the device.

30.   The device of claim 29, wherein the device is a first device, and wherein the source external to the device is a memory for a second device of the first user.

31.   The device of any of claims 24-30, wherein, prior to receiving the speech input, the sound receiving unit is configured to receive an input from the first user authorizing the digital assistant to initiate the background process without review or confirmation from the first user.

32.   The device of any of claims 24-31, wherein, during the background process:

the sound receiving unit is configured to receive one or more additional speech inputs from the user; and

the processing unit is configured to execute one or more additional tasks for the first user in a foreground process in response to the one or more additional speech inputs.

33.   The device of any of claims 24-32, wherein the processing unit is configured to cause the information item to be sent to the first user during the background process.

34.   The device of claim 33, wherein the speech input further specifies a means of communication to be used for sharing the information item, and wherein the processing unit is configured to cause the information item to be sent to the first user using said means of communication.

35.   The device of any of claims 24-34, wherein the processing unit is configured to:

during the background process, download the information item; and

subsequent to the background process, provide the information item to the first user.

36.   The device of any of claims 24-35, wherein, prior to the sound receiving unit receiving the speech input from the first user, the processing unit is configured to:

receive a communication from the second user different from the first user; and

provide, to the first user, a proposed response to the communication from the second user, wherein the proposed response is based at least in part on context data associated with the first user.

37.   The device of any of claims 24-35, wherein, prior to the sound receiving unit receiving the speech input from the first user, the processing unit is configured to:

receive a communication from the second user different from the first user; and

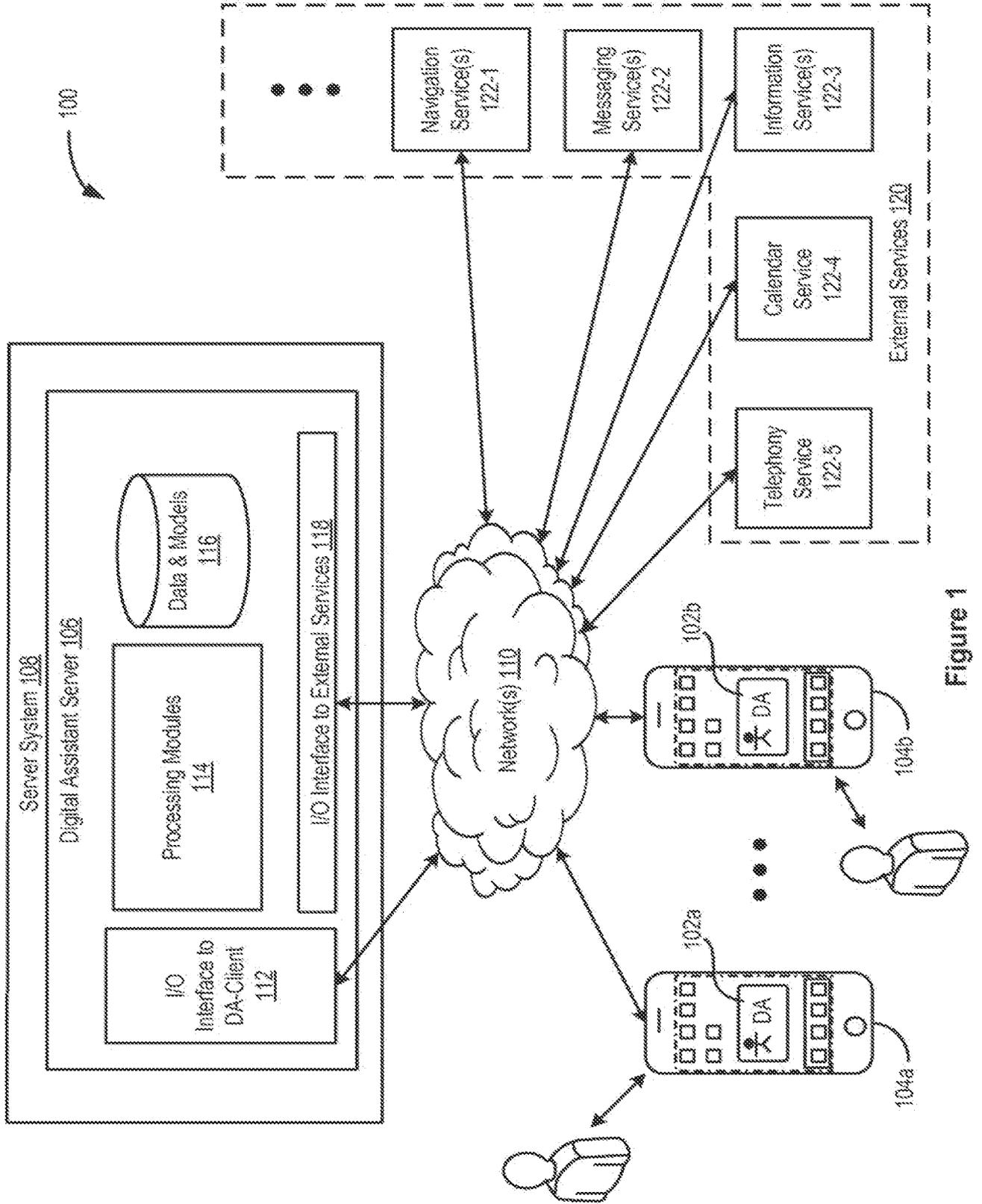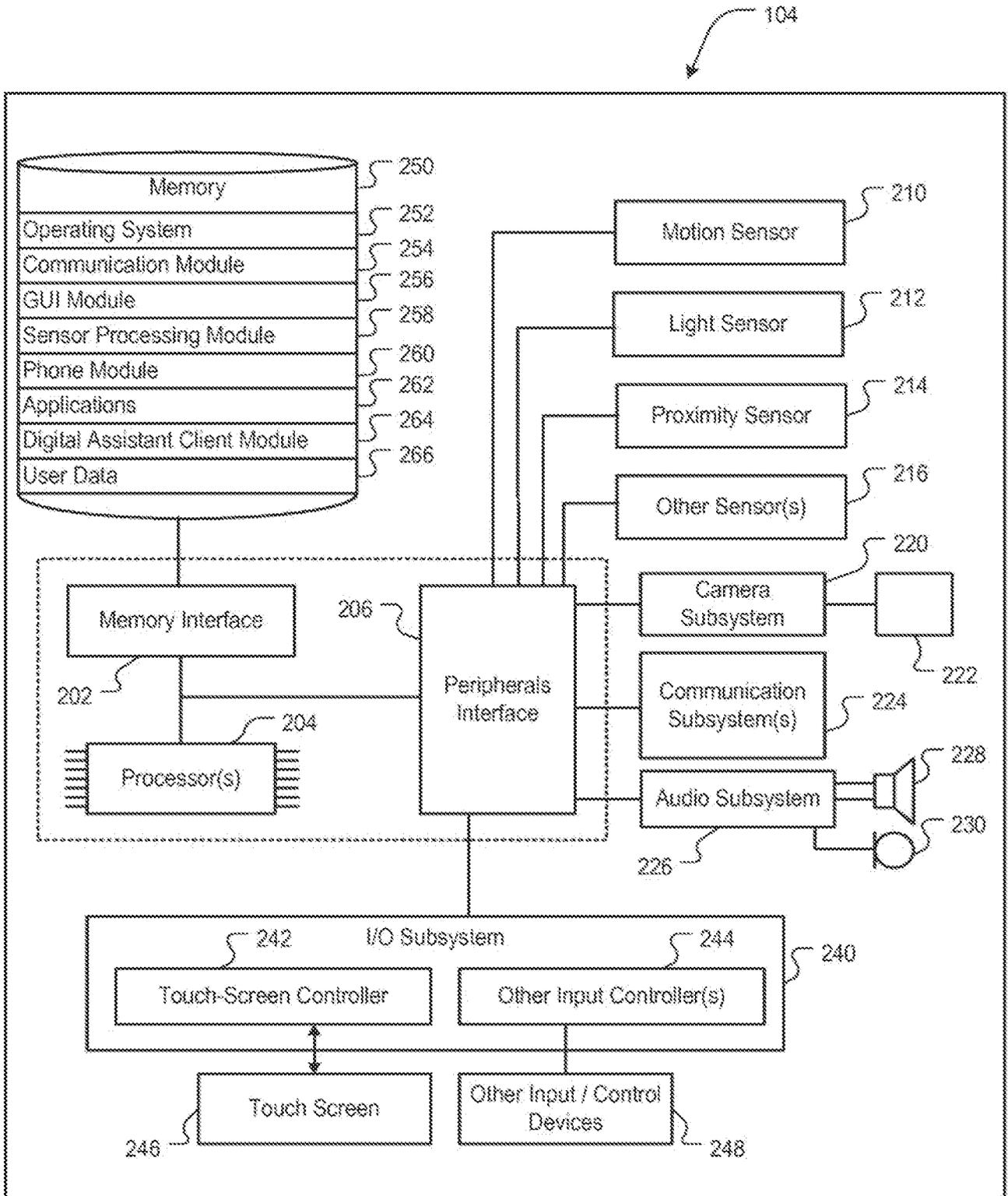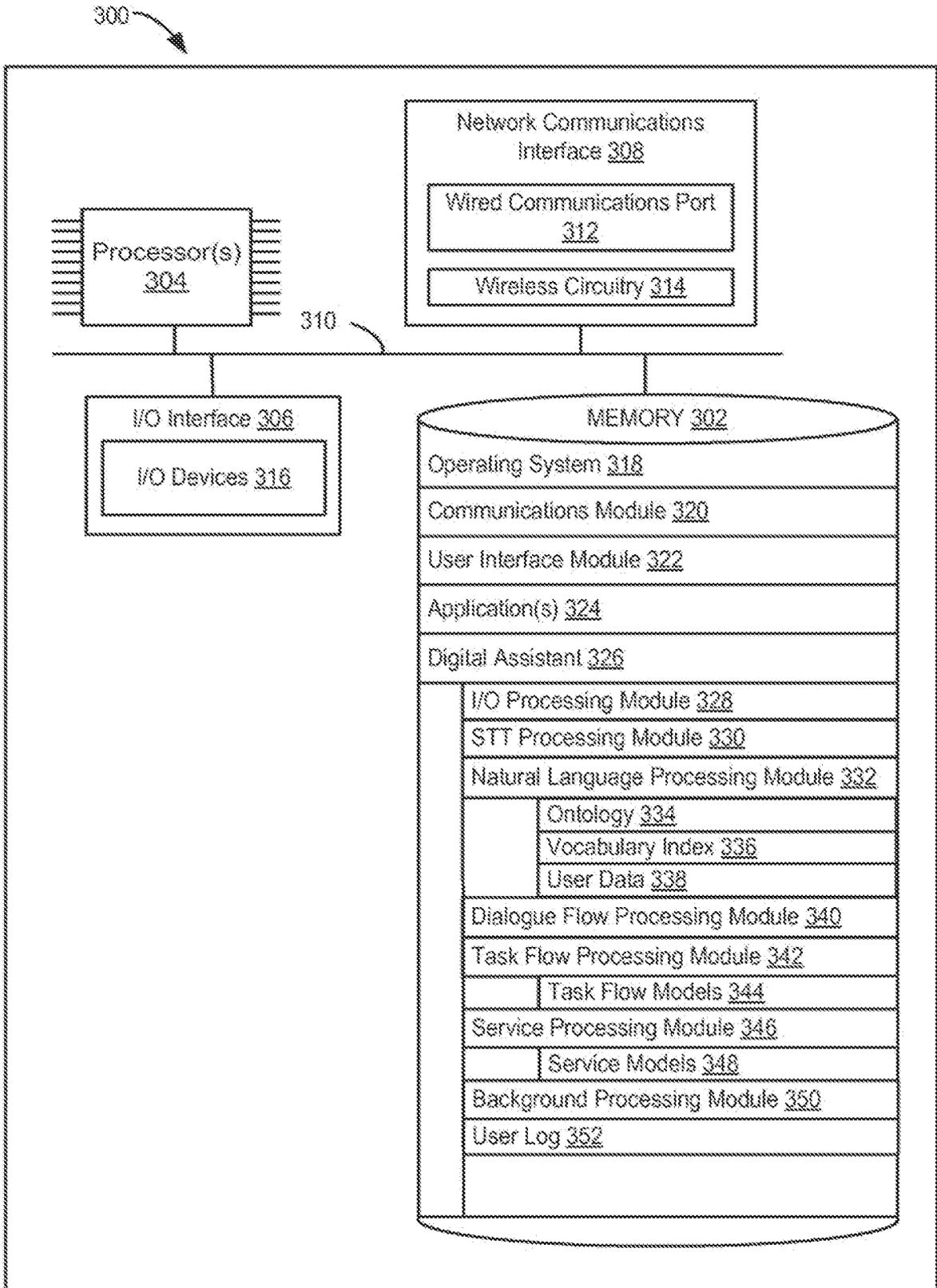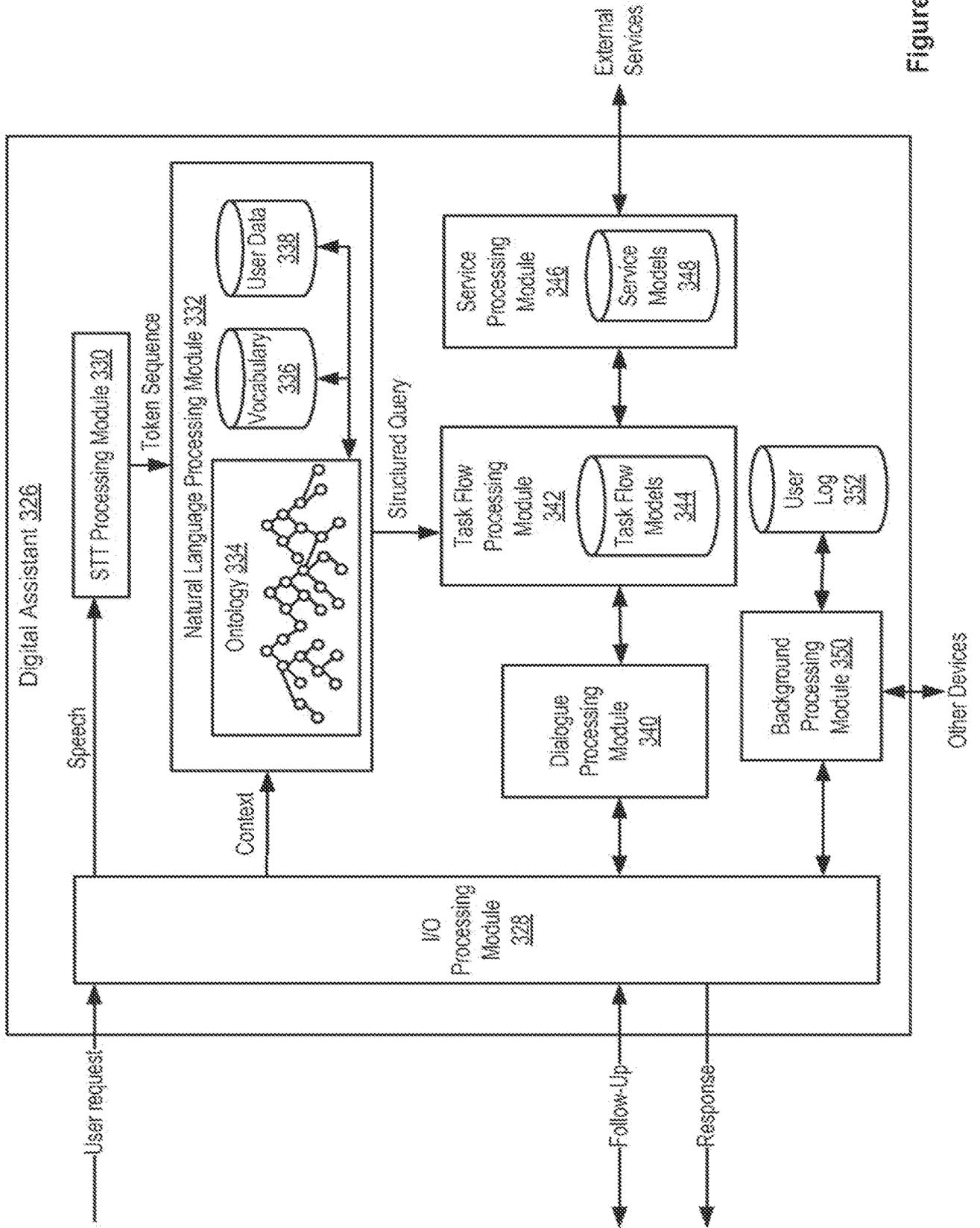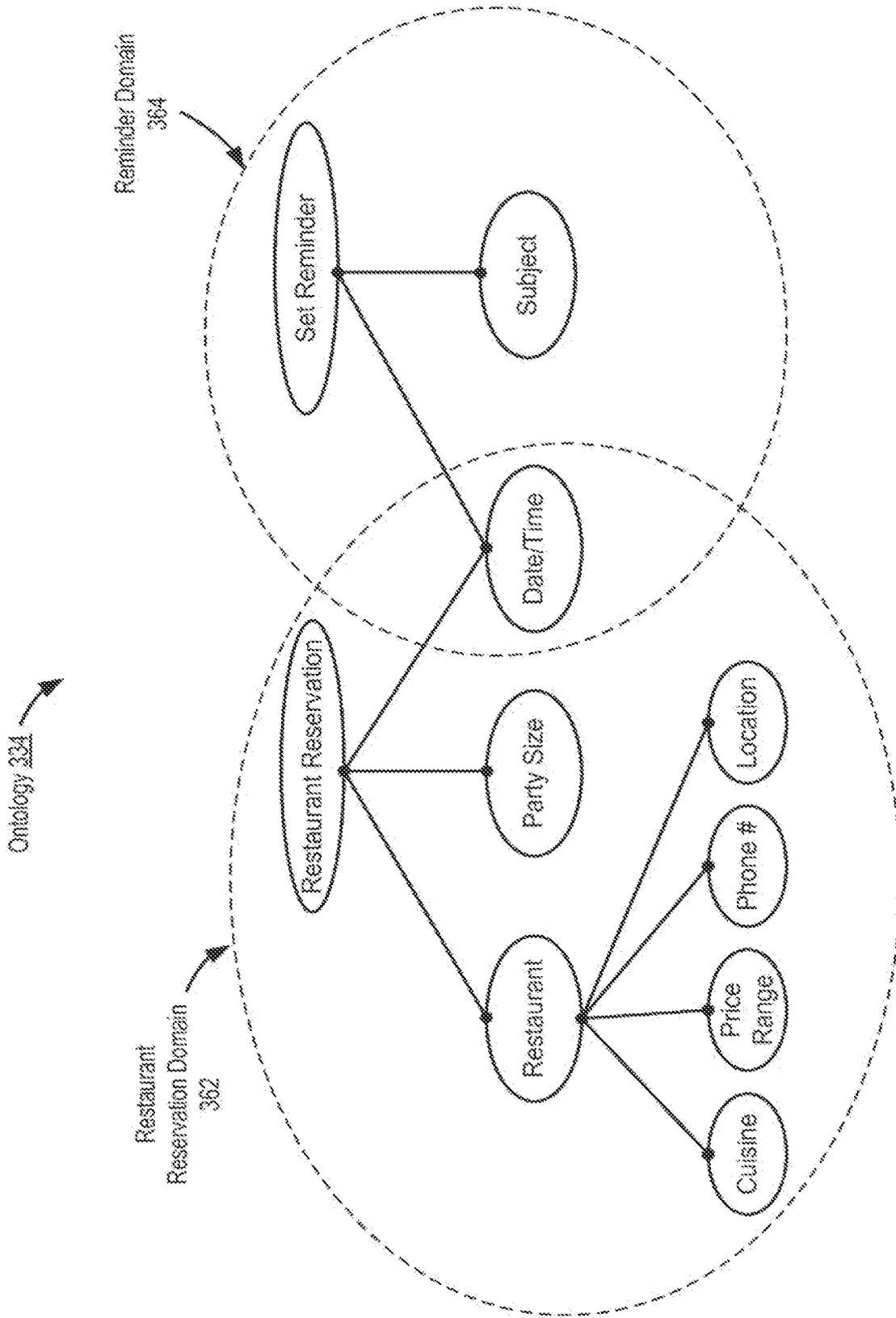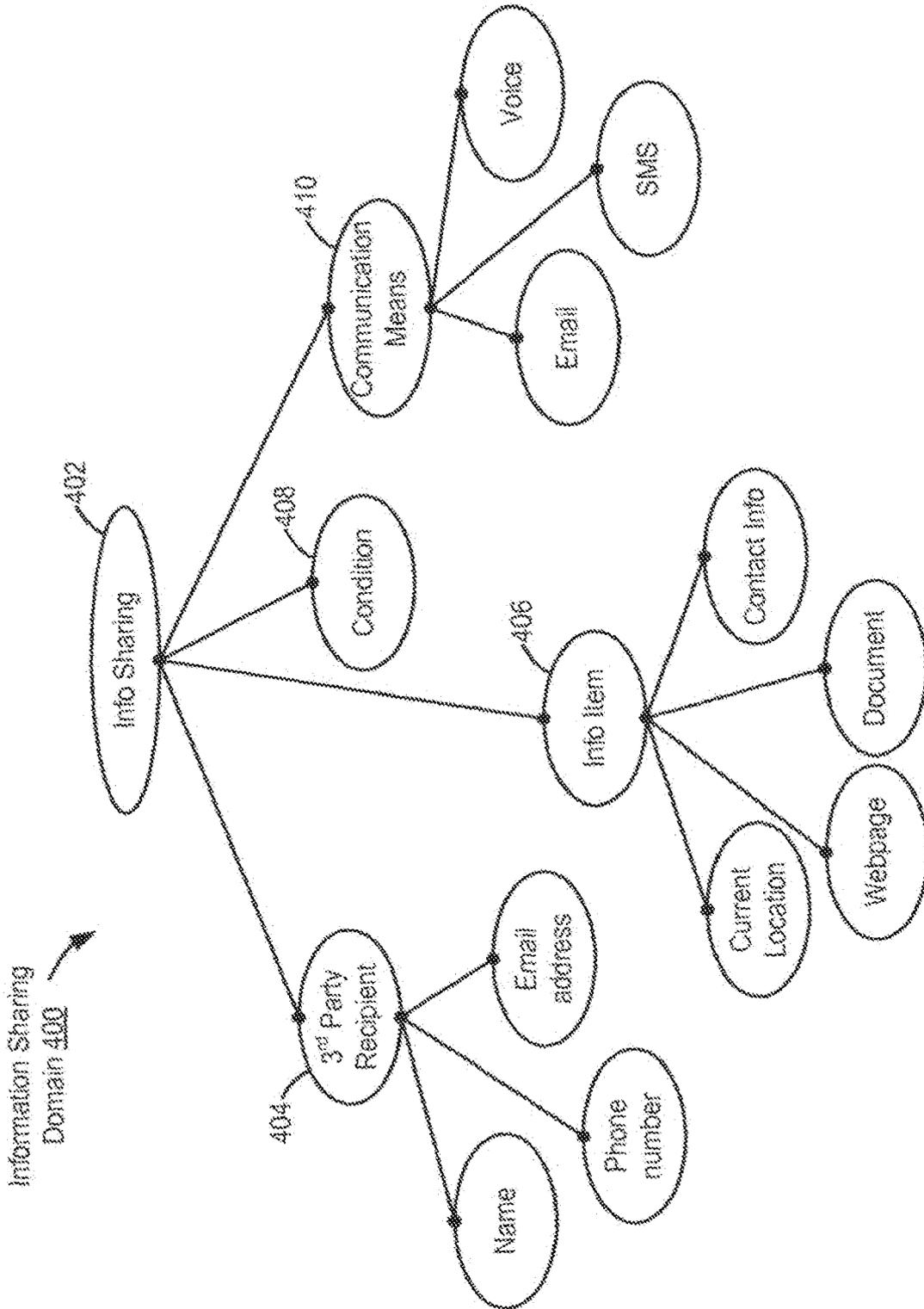communicate, to the first user, an offer to respond to the communication from the second user.
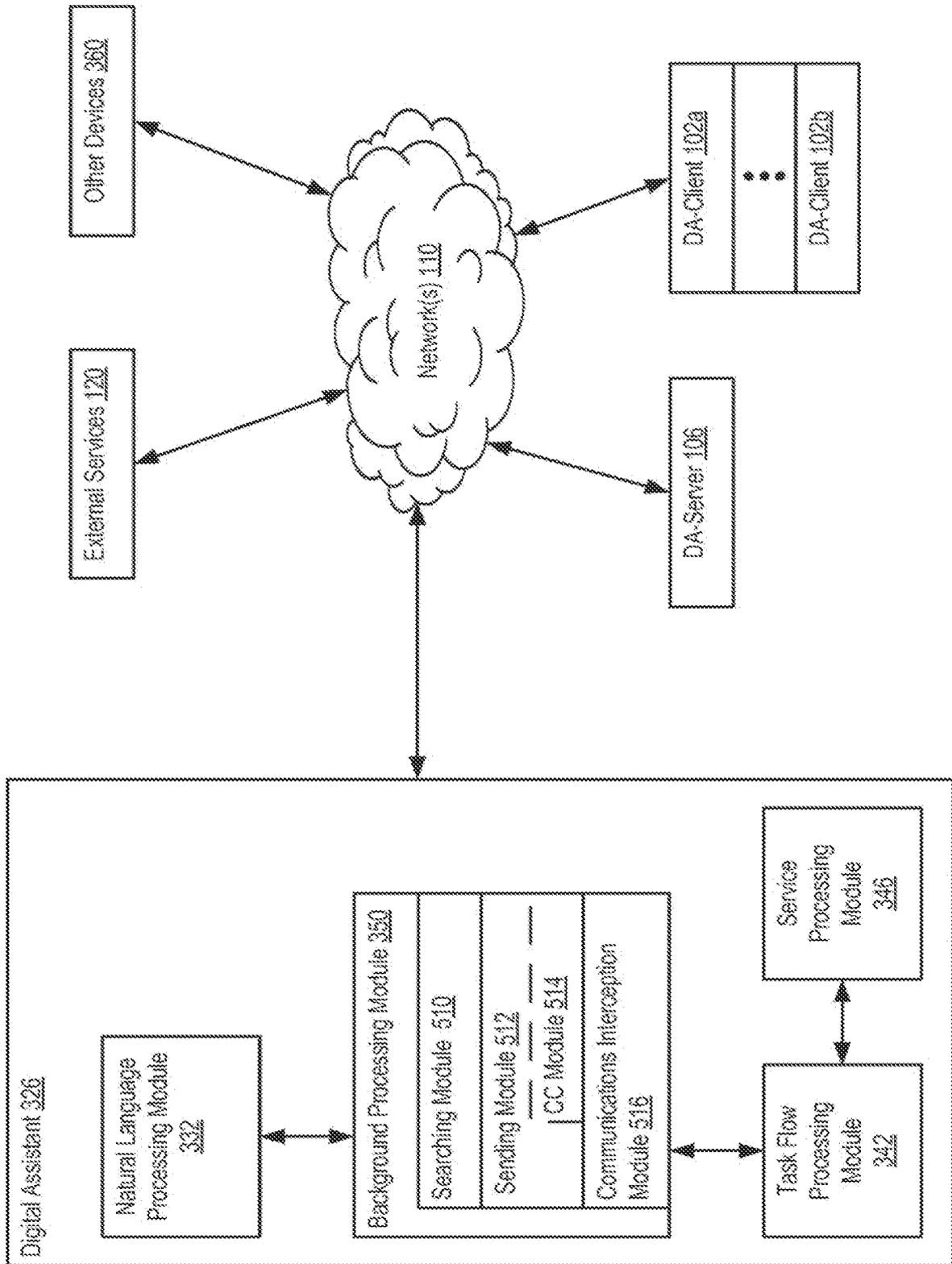
Figure 1

Figure 2

Figure 3A

Figure 3B

Figure 3C

Figure 4

Figure 5

600
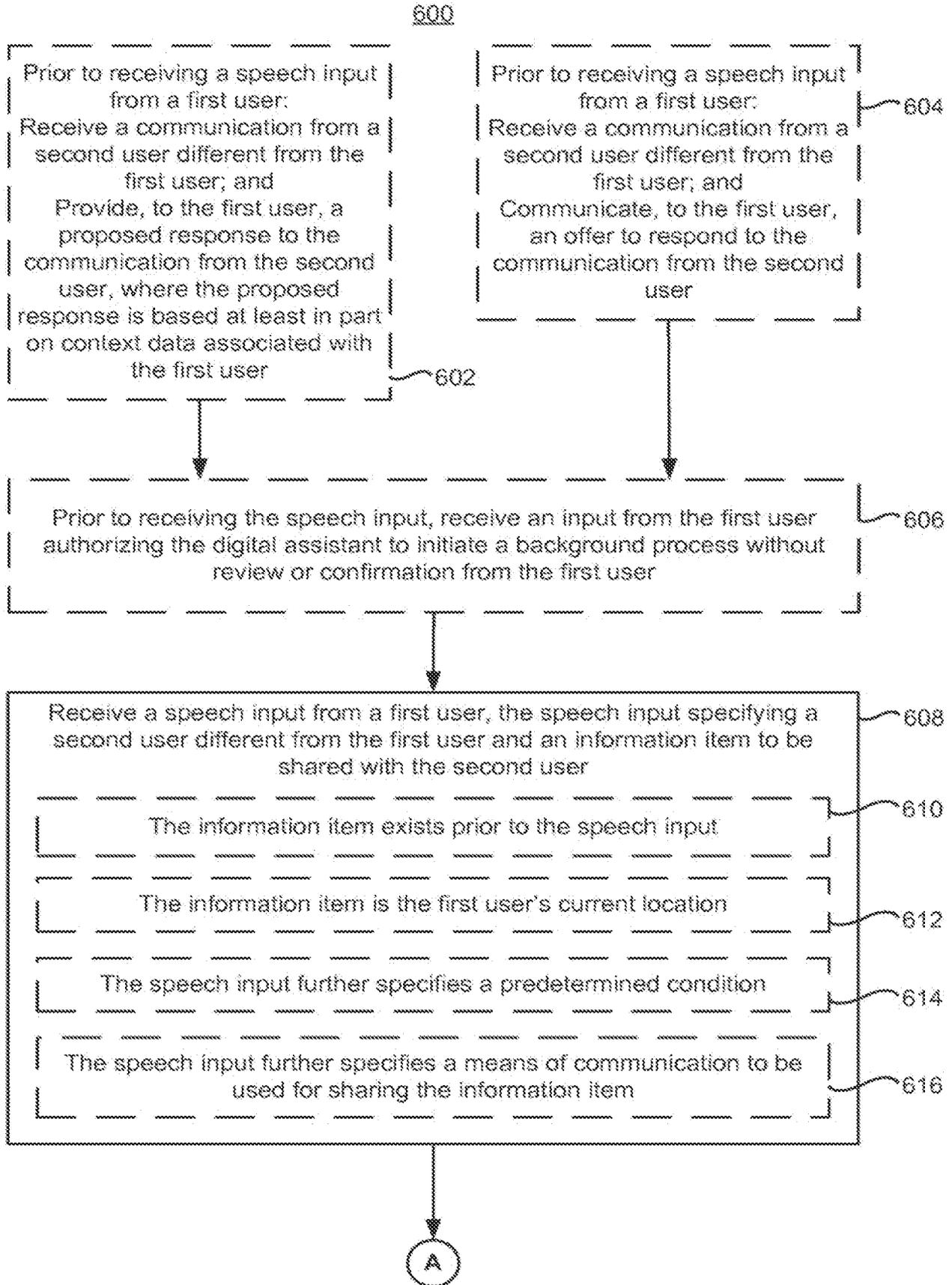
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┌─ ── ── ── ── ── ── ──┐      ┌── ── ── ── ── ── ──┐
│  Prior to receiving a speech input │      │ Prior to receiving a speech input │
│       from a first user:       │      │       from a first user:       │──604
│  Receive a communication from a │      │ Receive a communication from a │
│  second user different from the │      │ second user different from the │
│         first user; and        │      │        first user; and         │
│   Provide, to the first user, a │      │  Communicate, to the first user, │
│    proposed response to the     │      │   an offer to respond to the   │
│ communication from the second  │      │ communication from the second  │
│   user, where the proposed     │      │            user                │
│ response is based at least in part│     └── ── ── ── ── ── ──┘
│ on context data associated with │
│          the first user         │──602
└── ── ── ── ── ── ── ──┘
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┌── ── ── ── ── ── ── ── ── ── ── ── ── ── ──┐
│  Prior to receiving the speech input, receive an input from the first user │──606
│  authorizing the digital assistant to initiate a background process without │
│            review or confirmation from the first user                   │
└── ── ── ── ── ── ── ── ── ── ── ── ── ── ──┘
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┌────────────────────────────────────────────┐
│ Receive a speech input from a first user, the speech input specifying a │──608
│ second user different from the first user and an information item to be │
│                   shared with the second user                  │
│ ┌─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┐ │──610
│ │      The information item exists prior to the speech input      │ │
│ └─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┘ │
│ ┌─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┐ │
│ │     The information item is the first user's current location    │ │──612
│ └─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┘ │
│ ┌─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┐ │
│ │      The speech input further specifies a predetermined condition │ │──614
│ └─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┘ │
│ ┌─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┐ │
│ │ The speech input further specifies a means of communication to be │ │──616
│ │            used for sharing the information item           │ │
│ └─ ── ── ── ── ── ── ── ── ── ── ── ── ── ─┘ │
└────────────────────────────────────────────┘
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(A)

Figure 6A

(A)

In response to the speech input, initiate a background process during which the digital assistant searches for the information item and causes the information item to be sent to the second user without further review and instruction from the first user ——618

When the information item is the first user's location, search for the information item based on context data associated with the first user ——620

Cause the information item to be sent to the second user when the predetermined condition is satisfied ——622

Cause the information item to be sent to the second user using said means of communication during the background process ——624

Search for the information item at an information source local to the device or at an information source external to the device ——626

The device is a first device, and the source external to the device is a memory for a second device of the first user ——628

During the background process, download the information item; and Subsequent to the background process, provide the information item to the first user ——630

During the background process, cause the information item to be sent the first user ——632

The speech input further specifies a means of communication to be used for sharing the information item, and the digital assistant causes the information item to be sent to the first user using said means of communication ——634

During the background process:
Receive one or more additional speech inputs from the user; and
In response to the one or more additional speech inputs,
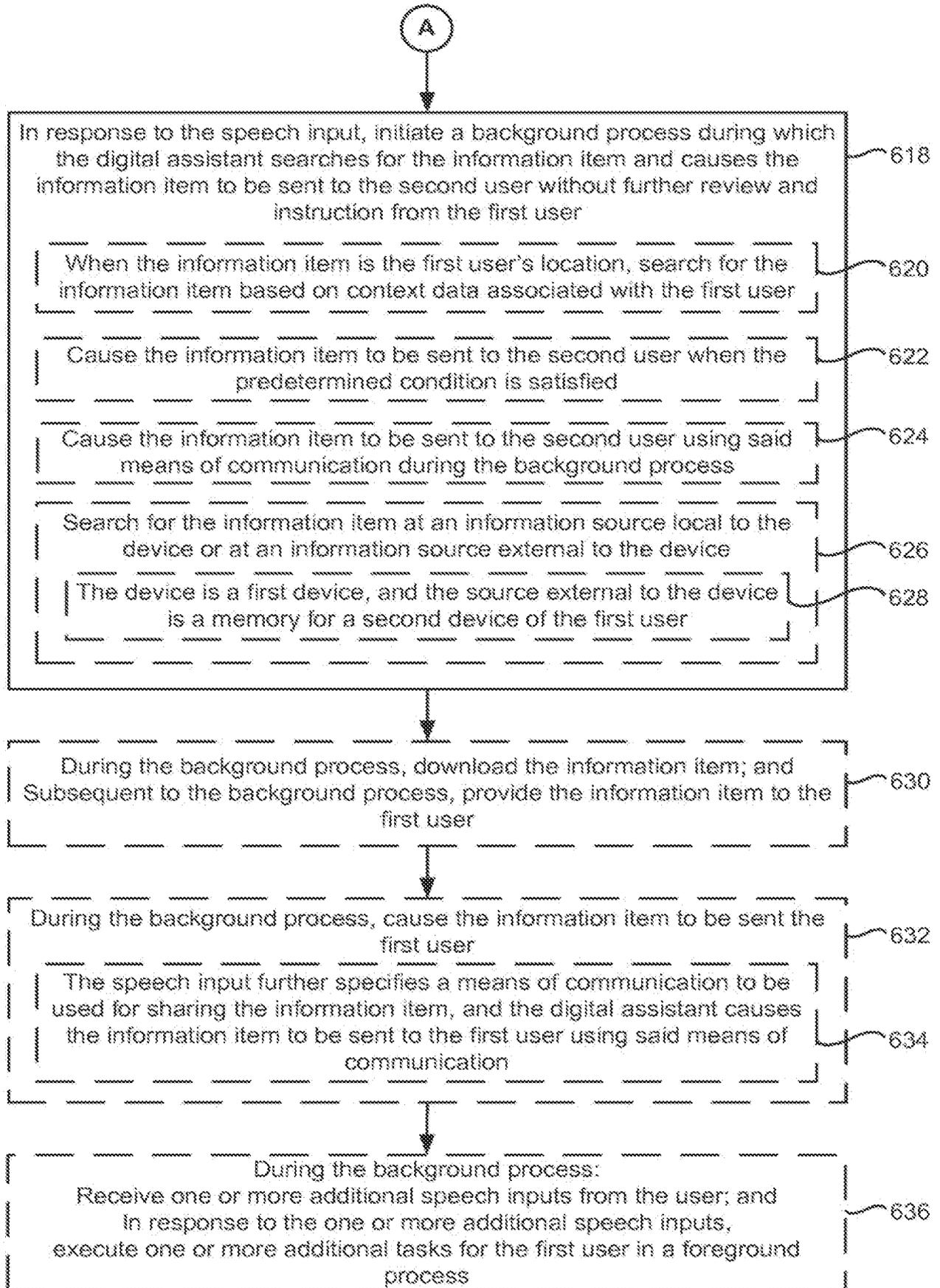execute one or more additional tasks for the first user in a foreground process ——636
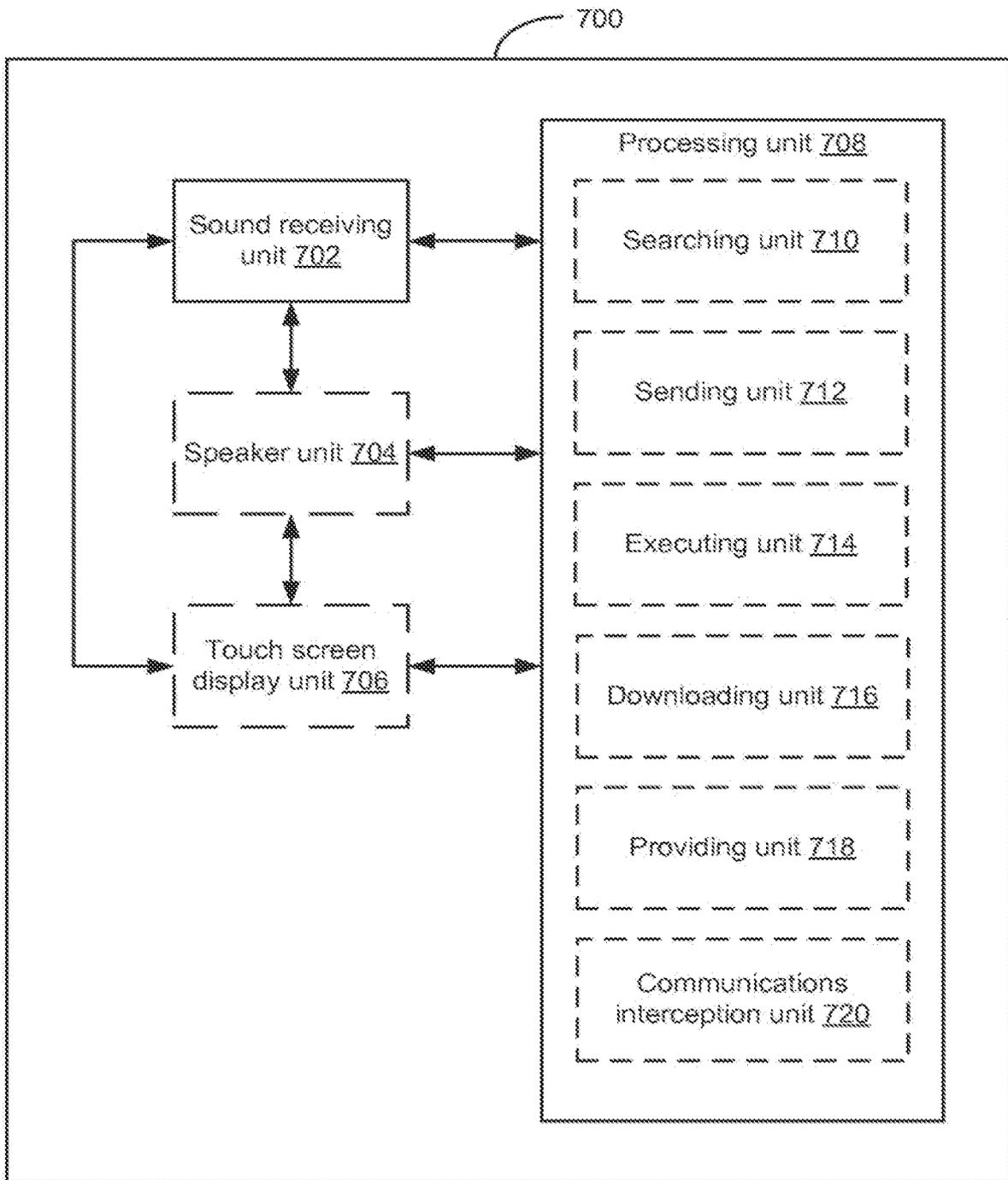
Figure 6B

Figure 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/04Q397

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/16   G06F17/3Q   G10L15/22   H04W4/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F   G1QL   H04W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Al lyson Kazmucha: "How to send map locations using iMessage", iMore. com , 2 August 2012 (2012-08-02) , pages 1-5 , XP055135241, Retrieved from the Internet: URLrhttp: //www. imore. com/how-use-imessage-share-your-1 ocati on-your-i phone [retri eved on 2014-08-19] page 1 - page 2 ----- -/ - -	1-37

☒ Further documents are listed in the continuation of Box C.	☒ See patent family annex.

Date of the actual completion of the international search	Date of mailing of the international search report
20 August 2014	27/08/2014

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer De Ceul aer, Bart

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2014/04Q397

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Anonymous: "Get a List of Siri Commands Directly from Siri", OSXDaily. com , 5 February 2013 (2013-02-05) , pages 1-12 , XP055135306, Retrieved from the Internet: URL:http://osxdai ly. com/2013/02/05/1 i st-si ri -commands/#bigsi ri commmandl i st [retri eved on 2014-08-19] pages 1,2 ,4 -----	1-37
X	EP 1 280 326 Al (SOUND OF DATA B V [NL]) 29 January 2003 (2003-01-29) paragraphs [0009] , [0014] , [0015] ; figure 1 paragraphs [0023] - [0026] ; figure 4 paragraphs [0046] - [0055] ; figure 6 paragraphs [0056] - [0059] ; figure 7 paragraph [0060] ; figure 8 paragraphs [0072] - [0081] ; figure 9 paragraphs [0082] - [0083] ; figure 10 -----	1,9, 10, 13-24, 32 ,33 ,36

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1280326 A1	29-01-2003	NONE	